



MTAA

METROPOLITAN TOPEKA AIRPORT AUTHORITY

TOPEKA REGIONAL AIRPORT & BUSINESS CENTER | BILLARD AIRPORT

PROJECT MANUAL

for

NEW PASSENGER BOARDING BRIDGE

AIP Project No. 3-20-0113-044

AT

TOPEKA REGIONAL AIRPORT

November 7th, 2022

Prepared By:



WSP USA Inc.
300 Wyandotte
Suite 200
Kansas City, Missouri 64105

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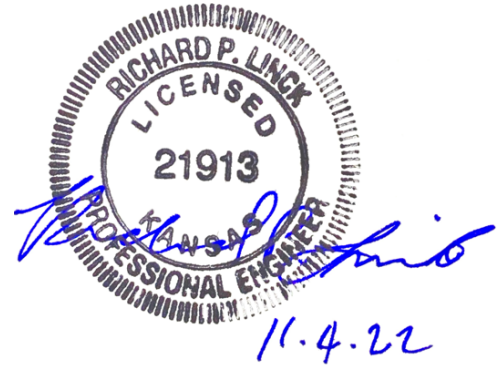
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CERTIFICATION PAGE

I am responsible for the following specifications and drawings:

Specifications:

- 03 10 00 Concrete Forming and Accessories
- 03 20 00 Concrete Reinforcing
- 03 30 00 Cast-In-Place Concrete
- 31 63 29 Drilled Concrete Piers and Shafts

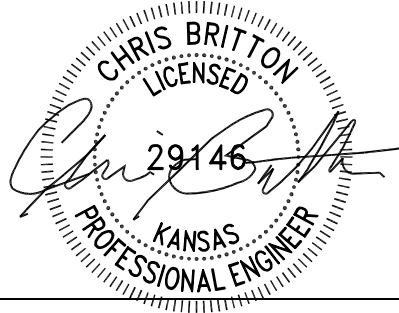


_____(SEAL)

I am responsible for the following specifications and drawings:

Specifications:

- 11 85 04 Passenger Boarding Bridge
- 26 05 19 Low-Voltage Electrical Power Conductors and Cables
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_____(SEAL)

I am responsible for the following specifications and drawings:

Specifications:

Responsible for Sections: Front End Documents, General Provisions



_____(SEAL)

Each professional whose signature and personal seal appears above assumes responsibility in these bidding documents only for what is listed above and disclaims any responsibility for all other plans, specifications, estimates, reports, or other documents or instruments not sealed by the signed professional relating to or intended to be used for any part or parts of the project.

REQUESTS FOR BIDS / INVITATION FOR BIDS
(Advertisement)

METROPOLITAN TOPEKA AIRPORT AUTHORITY
NEW PASSENGER BOARDING BRIDGE
TOPEKA REGIONAL AIRPORT
TOPEKA, KANSAS
AIP PROJECT NO. 3-20-0113-044

Sealed bids will be received until **2:00 PM (CST) December 7th, 2022**, and then publicly opened and read at **Metropolitan Topeka Airport Authority Administrative Offices, 6510 SE Forbes Avenue, Suite # 1, Topeka, Kansas 66619** for furnishing all labor, materials and equipment and performing all work necessary for **New Passenger Boarding Bridge, Topeka Regional Airport, Topeka, Kansas, AIP Project No. 3-20-0113-044.**

Copies of the bid documents including project drawings and technical specifications are on file and may be inspected at:

Metropolitan Topeka Airport Authority
6510 SE Forbes Avenue, Suite # 1
Topeka, KS 66619

A “pdf” copy of the project construction drawings and project manual will be provided via e-mail to prospective bidders upon request and at no cost by contacting the project manager at the address provided below or via e-mail. Printing of the project documents from the pdf file are to be borne by the prospective bidder.

Sam Stallbaumer, PE, Project Manager
WSP USA
300 Wyandotte, Suite 200
Kansas City, Missouri 64105
TEL: 816-702-4244
MOB: 210-867-6532
E-Mail: sam.stallbaumer@wsp.com

A pre-bid conference for this project will be held at **Metropolitan Topeka Airport Authority Administrative Offices, 6510 SE Forbes Avenue, Suite # 1, Topeka, Kansas on Monday, November 28th, 2022 at 2:00 PM (CST)**. There will be a Microsoft Teams Link (below) to join virtually. Representatives of the Owner and the Engineer will be present to answer questions. Attendance at the pre-bid conference is **mandatory**.

Microsoft Teams meeting

Join on your computer, mobile app or room device

[Click here to join the meeting](#)

Meeting ID: 370 029 260 573

Passcode: LC64kR

[Download Teams](#) | [Join on the web](#)

Or call in (audio only)

[+1 213-267-3760,201197207#](#) United States, Los Angeles

Phone Conference ID: 201 197 207#

[Find a local number](#) | [Reset PIN](#)

[Learn More](#) | [Meeting options](#)

Each proposal must be accompanied by a bid guarantee in the amount of five (5) percent of the total amount of the bid. The bid guarantee may be by certified check, cashier's check or bid bond made payable to the **Metropolitan Topeka Airport Authority**.

Bids may be held by the Metropolitan Topeka Airport Authority for a period not to exceed ninety (90) days from the date of the bid opening for the purpose of evaluating bids prior to award of contract.

The right is reserved, as the Metropolitan Topeka Airport Authority may require, to reject any and all bids and to waive any informality in the bids received.

This project is subject to the requirements of the Davis-Bacon Act, as amended. The Contractor is required to comply with wage and labor provisions and to pay minimum wages in accordance with the schedule of wage rates established by the United States Department of Labor.

This project is subject to the requirements of 49 CFR Part 26 Disadvantaged Business Enterprise Participation. The owner has established a contract goal of nine percent (9.0%) participation for small business concerns owned and controlled by qualified disadvantaged business enterprises (DBE). The bidder shall make and document good faith efforts, as defined in Appendix A of 49 CFR Part 26, to meet the established goal.

The CONTRACTOR agrees to commence construction on or about March 1, 2023, and to have the project substantially completed within 60 Consecutive Calendar Days from the start of construction. A limited Notice-To-Proceed will be issued for the procurement of equipment.

The bidder acknowledges and accepts that for each and every Calendar Day the project remains incomplete beyond the contract time of performance, the substantial completion date, or not open to traffic as stipulated in the preceding paragraphs of this section, the CONTRACTOR shall pay the non-penal amount of \$3,600.00 per day as a liquidated damage to the OWNER.

All persons seeking to enter into a contract with the Metropolitan Topeka Airport Authority shall submit and acceptable affirmative action program in accordance with Federal Regulations.

Bidders shall take note of requirements for notification of Disadvantaged Business Enterprise (DBE).

Award of contract is also subject to the Federal provisions provided for in the section of the project manual entitled "Federal Contract Provisions for Construction and Equipment Contracts".

END OF REQUEST FOR BIDDERS

NOTICE TO BIDDERS

METROPOLITAN TOPEKA AIRPORT AUTHORITY
NEW PASSENGER BOARDING BRIDGE
TOPEKA REGIONAL AIRPORT
TOPEKA, KANSAS
AIP PROJECT NO. 3-20-0113-044

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Sam Stallbaumer, PE, Project Manager
WSP USA
300 Wyandotte, Suite 200
Kansas City, Missouri 64105
TEL: 816-702-4244
MOB: 210-867-6532
E-Mail: sam.stallbaumer@wsp.com

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Microsoft Teams meeting

Join on your computer, mobile app or room device

[Click here to join the meeting](#)

Meeting ID: 370 029 260 573

Passcode: LC64kR

[Download Teams](#) | [Join on the web](#)

Or call in (audio only)

[+1 213-267-3760,201197207#](#) United States, Los Angeles

Phone Conference ID: 201 197 207#

[Find a local number](#) | [Reset PIN](#)

[Learn More](#) | [Meeting options](#)

CONTRACT WORK ITEMS. This project will involve the following work items and estimated quantities. Prospective bidders are hereby advised that the quantities indicated herein are approximate and are subject to change per the Section 40 of the General Provisions.

Line Number	Description	Estimated Quantity	Unit
1	Passenger Boarding Bridge	1	LS

CONTRACT TIME. The anticipated date that project work may commence on or about **March 1, 2023**. The owner has established a contract time of 60 Consecutive Calendar Days. All project work shall be substantially completed within the stated timeframe. This project is subject to liquidated damages as prescribed within the project manual.

BID GUARANTEE. Each proposal must be accompanied by a bid guarantee in the amount of five (5) percent of the total amount of the bid. The bid guarantee may be by certified check or bid bond made payable to Metropolitan Topeka Airport Authority.

BONDING REQUIREMENTS. The successful bidder will be required to furnish separate performance and payment bonds each in the amount equal to 100% of the contract price at the time of contract execution.

AWARD OF CONTRACT. All proposals submitted in accordance with the instructions presented herein will be subject to evaluation. Bids may be held by the Metropolitan Topeka Airport Authority for a period not to exceed **ninety (90) days** from the date of the bid opening for the purpose of evaluating bids prior to award of contract.

Award of contract will be based on the lowest aggregate sum proposal submitted from those bidders that are confirmed as being responsive and responsible. The right is reserved, as the Metropolitan Topeka Airport Authority may require, to reject any and all bids and to waive any informality in the bids received.

Prospective Bidders are hereby advised that award of contract is contingent upon the owner receiving Federal funding assistance under the Airport Improvement Program.

PROJECT SCHEDULE AND LIQUIDATED DAMAGES. The CONTRACTOR agrees to commence construction on or about March 1, 2023, and to have the project substantially completed within 60 Consecutive Calendar Days from the start of construction. A limited Notice-To-Proceed will be issued for the procurement of equipment.

The bidder acknowledges and accepts that for each and every Calendar Day the project remains incomplete beyond the contract time of performance, the substantial completion date, or not open to traffic as stipulated in the preceding paragraphs of this section, the CONTRACTOR shall pay the non-penal amount of \$3,600.00 per calendar day as a liquidated damage to the OWNER.

FEDERAL PROVISIONS. This project is subject to the following partial listing of Federal provisions, statutes and regulations:

Equal Employment Opportunity - Executive Order 11246 and 41 CFR Part 60: The Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth within the supplementary provisions. The successful Bidder shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin.

Goals for Minority and Female Participation – Executive Order 11246 and 41 CFR Part 60:

1. The Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth within the supplementary provisions.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Timetables:

Goals for minority participation for each trade:	9.0%
Goals for female participation in each trade:	6.9%

These goals are applicable to all of the contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its Federally involved and non-federally involved construction.

Certification of Non-Segregated Facilities – 41 CFR Part 60: A certification of Non-Segregated Facilities must be submitted prior to the award of a federally-assisted construction contract exceeding \$10,000 which is not exempt from the provisions of the Equal Opportunity Clause.

Contractors receiving federally assisted construction contract awards exceeding \$10,000, which are not exempt from the provisions of the Equal Opportunity Clause will be required to provide for the forwarding of the notice to prospective subcontractors for supplies and construction contracts where the subcontracts exceed \$10,000 and are not exempt from the provisions of the Equal Opportunity Clause. The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

Disadvantaged Business Enterprise – 49 CFR Part 26: The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of this DOT-assisted contracts. In accordance with 49 CFR Part 26.45, the sponsor has established a contract goal of nine percent (9.0%) participation for small business concerns owned and controlled by certified socially and economically disadvantaged enterprise (DBE). The bidder shall make and document good faith efforts, as defined in Appendix A of 49 CFR Part 26, to meet this established goal.

Davis-Bacon Act, as amended – 29 CFR Part 5: The Contractor is required to comply with wage and labor provisions and to pay minimum wages in accordance with the current schedule of wage rates established by the United States Department of Labor.

Debarment, Suspension, Ineligibility and Voluntary Exclusion – 49 CFR Part 29: The bidder certifies, by submission of a proposal or acceptance of a contract, that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency. Individuals or companies listed in the General Services Administration's "Excluded Parties Listing System" will not be considered for award of contract.

Foreign Trade Restriction – 49 CFR Part 30

The Bidder and Bidder's subcontractors, by submission of an offer and/or execution of a contract, is required to certify that it:

- a. Is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms published by the Office of the United States Trade Representative (USTR);

- b. Has not knowingly entered into any contract or subcontract for this project with a person that is a citizen or national of a foreign country on said list, or is owned or controlled directly or indirectly by one or more citizens or nationals of a foreign country on said list;
- c. Has not procured any product nor subcontracted for the supply of any product for use on the project that is produced in a foreign country on said list.

Buy American Certificate – Aviation Safety and Capacity Act of 1990:

This contract is subject to the “Buy American Preferences” of the Aviation Safety and Capacity Act of 1990. Per Title 49 U.S.C. Section 50101, all steel and manufactured products installed under an AIP assisted project must be produced in the United States unless the Federal Aviation Administration has granted a formal waiver. As a condition of bid responsiveness, Bidders must submit the appropriate Buy American certification with their proposal.

ADDITIONAL PROVISIONS. A complete listing of the provisions applicable to this project can be found in the Supplemental Provisions.

MODIFICATION OF DOCUMENTS. Modification to the project documents may only be made by written addendum by the Owner or Owner’s authorized Representative.

The proposal must be made on the forms provided within the bound project manual. Bidders must supply all required information prior to the time of bid opening.

SUBMITTAL OF PROPOSALS. Additional information and instruction for submittal of a proposal are provided within the Instructions-to-Bidders. Envelopes containing bids must be sealed and addressed to:

Hand Delivery of Proposals: Metropolitan Topeka Airport Authority
6510 SE Forbes Avenue, Suite # 1
Topeka, KS 66619
TEL: 785-862-2362

Mail Delivery of Proposals: Metropolitan Topeka Airport Authority
P.O. Box 19053
Topeka, KS 66619

The upper left-hand corner of the sealed envelope must identify the following information:

CONTRACT PROPOSAL

Bid of {Insert Name of Bidder}

New Passenger Boarding Bridge

AIP Project No.: 3-20-0113-044

To be opened at: 2:00 PM (CST), December 7th, 2022

END OF NOTICE TO BIDDERS

INSTRUCTIONS TO BIDDERS

OWNER AND OWNER'S REPRESENTATIVE. The Owner as stated herein refers to the following agency **Metropolitan Topeka Airport Authority**. The Owner's authorized representative as stated herein refers to the Owner's Consultant **WSP USA Inc.** herein referred to as Engineer.

SUCCESSFUL BIDDER. The term "Successful Bidder" means the lowest, qualified, responsible Bidder to whom the Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award.

BIDDER REPRESENTATIONS. By submittal of a proposal (bid), the BIDDER represents the following:

- The Bidder has read and thoroughly examined the project documents
- The Bidder has a complete understanding of the terms and conditions required for the satisfactory performance of project work.
- The Bidder has familiarized themselves of the requirements of working on an operating airport, has fully informed themselves of the project site conditions and the surrounding area, and has visited the site to familiarize himself with local conditions that may in any manner affect cost, progress or performance of the work.
- The Bidder has studied and carefully correlated Bidder's observations with that of the project documents.
- The Bidder has found no errors, conflicts, ambiguities or omissions in the project documents, except as previously submitted in writing to the owner that would affect cost, progress or performance of the work.
- The Bidder is familiar with all applicable Federal, State and local laws, rules and regulations pertaining to execution of the contract and the project work that may in any manner affect cost, progress or performance of the Work.
- The Bidder has complied with all requirements of these instructions and the associated bid documents.

BID DOCUMENTS/PROJECT MANUAL. The bid documents are comprised of the following; Notice-to-Bidders, Instructions-to-Bidders, Supplementary Provisions, General Provisions, Technical Specifications, Project Drawings, Proposal Form with attachments, Form of Contract Agreement, any authorized addenda issued by the Owner and any document incorporated in whole or in part by reference therein.

All documents comprising the Bid Documents are complementary to one another and together establish the complete terms, conditions and obligations of the successful bidder.

Those individual elements of the Contract Documents that are bound together shall also be referred to as the Project Manual. No part of the project manual that is bound may be removed or detached.

Complete set of Bid Documents shall be used in preparing Bids; neither the Owner nor the Engineer assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bid Documents/Project Manual.

Prospective bidders may obtain a copy of the project manual and project drawings from the designated office identified within the Notice-to-Bidders.

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

MODIFICATIONS TO BID DOCUMENTS. Modifications to the bid documents may only be made by written addendum issued by the Owner or the Engineer. Verbal explanations, interpretations or comments made by the Owner or Owner's representative shall not be binding. Addenda will be transmitted to all known official plan holders. Each bidder shall certify at the time of bid submittal that they acknowledge receipt of all issued addenda.

ERRORS AND DISCREPANCIES IN BID DOCUMENTS. Should Bidder find an error, discrepancy, ambiguity or omission in the bid documents prior to submittal of a proposal, the Bidder is obligated to contact the Owner or the Engineer with written notice of the error, discrepancy, ambiguity or omission. The written notice shall identify the nature and location of the error, discrepancy, ambiguity or omission. Corrections or modifications to the project documents will only be made by written addendum as prescribed herein. By submittal of a Bid Proposal, Bidder represents that they have thoroughly reviewed the bid documents and that they have not identified any error, discrepancy, ambiguity or omission that would affect cost, progress or performance of the project work.

CLARIFICATIONS AND INTERPRETATIONS. A bidder requiring a clarification or interpretation of the bid documents shall make a written request to the Owner or Engineer. The Owner or Engineer must receive the written request a minimum of ten (10) calendar days prior to the date of the bid opening. All questions and answers will be posted to the Bid Event. Questions and answers that result in a material changed to the scope of work or quantities will require issuance of an addendum. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.

INTERPRETATIONS OF ESTIMATED PROPOSAL QUANTITIES. An estimate of quantities of work to be accomplished and materials to be furnished under these specifications is stated within the project manual. This estimate is a result of careful calculations and is believed to be correct. The estimated quantities are given only as a basis for comparison of proposals and the award of contract. The Owner does not expressly or impliedly agree that the actual quantities involved will correspond exactly with the estimated quantities.

The Bidder shall not plead misunderstandings or deception because of such estimates of quantities, or of the character, location, or other conditions pertaining to the work. Payment to the Contractor will be made only for the actual quantities of work performed or materials furnished in accordance with the plans and specifications. It is understood that the quantities may be increased or decreased as hereinafter provided in the subsection titled "Alteration of Work and Quantities" of the general provisions without in any way invalidating the unit bid prices.

SUBSTITUTE MATERIAL AND EQUIPMENT. The Contract, if awarded, will be on the basis of material and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "or equal" items. Whenever it is indicated in the Drawings or specified in the Specifications that a substitute or "or-equal" item of material or equipment may be furnished or used by Contractor if acceptable to the Engineer, application for such acceptance will not be considered by the Engineer until after the "Effective date of the Agreement". The procedure for submittal of any such application by Contractor and consideration by Engineer is set forth in the General Provisions.

EXAMINATION OF CONTRACT DOCUMENTS, PLANS, SPECIFICATIONS AND SITE CONDITIONS. As stated within the "Bidder Representations" and reaffirmed herein, the Bidder is expected to carefully examine the Contract Documents, visit the site of the proposed work, examine the proposal, drawings, specifications, terms and conditions of the proposed agreement and the form of agreement and familiarize himself with federal, state and local laws, ordinances, rules and regulations that may in any manner affect cost, progress or performance of Work.

The Bidder shall satisfy themselves as to the character, quality, and quantities of work to be performed, materials to be furnished and as to the requirements of the proposed contract. The submission of a

proposal shall be prima facie evidence that the Bidder has made such examination and is satisfied as to the conditions to be encountered in performing the work and as to the requirements of the proposed contract, plans and specifications.

Boring logs and other records of subsurface investigations and tests, as appropriate may be available for inspection by the Bidder. It is understood and agreed that such subsurface information, whether included in the project drawings, specifications or otherwise made available to the Bidder, was obtained and is intended for the owner's design and estimating purposes only. Such information has been made available for the convenience of all bidders. It is further understood and agreed that the Bidder is solely responsible for all assumptions, deductions, or conclusions which he or she may make from his or her examination of the boring logs and other records of subsurface investigations and tests that are furnished by the Owner.

These reports are not guaranteed as to accuracy or completeness, nor are they part of the Bid Documents. Before submitting the Bid each Bidder will, at his own expense, make such additional investigations and tests as the Bidder may deem necessary to determine his Bid for performance of the Work in accordance with the time, price and other terms and conditions of the Bid Documents.

On request Owner will provide each Bidder access to the site to conduct such investigations and tests as each Bidder deems necessary for submission of his Bid.

The lands upon which the Work is to be performed, rights-of-way for access thereto and other lands designated for use by Contractor in performing the Work are identified in the Specifications or Drawings.

The submission of a Bid will constitute an incontrovertible representation by the Bidder that he has complied with every requirement described and that the Bid Documents are sufficient in scope and detail to indicate and convey understanding of all terms, and conditions for performance of the Work.

ISSUANCE OF PROPOSAL FORMS. The Owner reserves the right to refuse to issue a proposal form to a prospective bidder should the bidder be in default for any of the following reasons:

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

BID PROPOSAL FORM. All bid proposals shall be made on the forms provided by the Owner within the bound Project Manual. No bidder may submit more than one proposal. All proposals are to be written in ink and shall be clearly legible. All blank spaces in the proposal forms shall be legibly completed for each and every bid item. The Bidder shall not qualify any bid item. The Bidder shall initial any erasures and alterations made on the proposal form by the bidder.

The Bidder shall state the price of their bid in U.S. dollars and cents in both written and numeral format. In the event of a discrepancy, the written value will take precedence.

SIGNATURE OF PROPOSAL. The proposal shall be signed and dated by an authorized representative of the Bidder. All signatures shall be made with an ink pen. The Bidder's representative shall have the legal authority to obligate and bind the Bidder to the terms and conditions of the contract. The Bidder shall legibly state the name of the Bidder's representative, the legal name of the Bidder, the address of the Bidder including City, State and Zip Code, and the telephone number of the Bidder.

Bids submitted by an agent, evidence of the power of attorney shall be attached to the bid.

MODIFICATION OR WITHDRAWAL OF BID PROPOSAL. Bidder may modify or withdraw their proposal at any point up to the specified time and date identified for receipt of proposals. Any request for

bid withdrawal or modification by the Bidder that is received after the specified time and date for receipt of proposals will be returned unopened to the sender.

Any modification to a Bidder's proposal, subject to the time constraint noted herein, must be made on the proposal forms contained in the project manual. The Bidder's authorized representative must sign the modification. The modification shall be placed in a sealed envelope and the statement "Modification to Proposal" shall be legibly marked in the upper left-hand corner. Withdrawal of a proposal may be made, subject to the time constraint noted herein, only with written confirmation under signature of the Bidder.

BID GUARANTEE. Each bid proposal must be accompanied by a Bid Guarantee, to be made payable to the Owner, in the amount of five percent (5%) of the Bidder's maximum Bid price (including alternates) and in the form of a certified check, cashier's check or bid bond issued by the Surety meeting the requirements of the General Provisions. The bid bond shall be from a responsible surety qualified to conduct business within the State of Kansas. A certified check shall be issued from a responsible and solvent bank or trust company. All forms of Bid guarantee must be delivered in original form. Facsimile transmissions of Bid guarantee documents will not be accepted.

SUBCONTRACTORS, ETC. Bidder must submit to Owner, as part of their Bid Form, a complete list of all Subcontractors and other persons and organizations (including those who will be furnishing the principal items of material and equipment) proposed to be used by the bidder to complete this project. Failure by the Bidder to provide this list with his bid shall render the bid nonresponsive. If requested by the Owner, the Successful Bidder shall submit to the Owner, in writing, an experience statement with pertinent information as to similar projects and other evidence of qualifications for each such Subcontractor, person and organization listed on the Bid Form. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, other person or organization, either Owner or Engineer may before giving the award of contract, request the apparent Successful Bidder to submit an acceptable substitute without an increase in Bid Price. If the apparent Successful Bidder declines to make any such substitution, the contract shall not be awarded to such Bidder, but his declining to make any such substitution will not constitute grounds for sacrificing his Bid Guarantee. Any Subcontractor, other person or organization so listed and to whom Owner or Engineer does not make written objection prior to the giving the award of contract, will be deemed acceptable to Owner and Engineer. Substitutions to this list of acceptable Subcontractors and other persons and organizations after the apparent Successful Bidder has been awarded a contract by the Owner will not be allowed without the written approval of the Owner or Engineer.

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

The amount of the Work performed by Subcontractors in aggregate shall not exceed seventy (70) percent of the Total Bid. A contract will not be awarded to a bidder not in compliance with this requirement.

DISADVANTAGE BUSINESS ENTERPRISE (DBE). The requirements of 49 CFR Part 26, Regulations of the U.S. Department of Transportation, apply to this contract. It is the policy of the Metropolitan Topeka Airport Authority to practice nondiscrimination based on race, color, sex or national origin in the award or performance of this contract. All firms qualifying under this solicitation are encouraged to submit bids/proposals. Award of this contract will be conditioned upon satisfying the requirements of this bid specification. These requirements apply to all bidders, including those who qualify as a Disadvantaged Business Enterprise.

The Owner has established a DBE contract goal of **nine (9) percent** for this contract. The Bidder/Offeror shall make good faith efforts, as defined in Appendix A, 49 CFR Part 26, to subcontract **nine (9) percent** of the dollar value of the prime contract to certified DBE firms as defined in 49 CFR Part 26.

All bidders shall submit the following information with their proposal on the forms provided:

The names and addresses of DBE firms that will participate in the contract,

A description of the work that each DBE firm will perform,

The dollar amount of the participation of each DBE firm participating,

Written documentation of the Bidder/Offeror's commitment to use a DBE subcontractor whose participation it submits to meet the contract goal.

Evidence of good faith efforts undertaken by the bidder, as described in appendix A to 49 CFR Part 26.

The successful Bidder will be required to provide written confirmation from the participating DBE firms verifying their intent to participate as in the project. This written confirmation shall be submitted along with the proposal documents as a condition of bid responsiveness.

GOOD FAITH EFFORTS (DBE). Bidder must demonstrate that they made good faith efforts to achieve participation with DBE firms. This requires that the bidder show that it took all necessary and reasonable steps to secure participation by certified DBE firms. Mere pro forma efforts will not be considered as a good faith effort.

Actions constituting evidence of good faith efforts are described in appendix A to 49 CFR Part 26. Such actions include but are not limited to:

- Soliciting DBE participation through all reasonable and available means. This may include public advertisements and phone calls/faxes to known certified DBE firms.
- Consult State Department of Transportation office to obtain a list of certified DBE firms.
- Selecting portions of work that increases the likelihood that DBE firms will be available to participate
- Providing DBE firms with sufficient information and time to review the project plans and specifications.
- Documenting all contacts with DBE firms. This includes name, address, phone number, date of contact and record of conversation/negotiation.

BIDDER QUALIFICATIONS. Each Bidder shall furnish the owner satisfactory evidence of their competency and financial capability to perform the proposed work. The Bidder shall demonstrate that they are a responsible firm that possesses the skills, abilities, and integrity to faithfully perform the project work. To be determined responsible, a prospective contractor must:

- Have adequate resources (financial, technical, etc.) to perform the contract, or the ability to obtain them.
- Have previous experience and evidence of authority to conduct business in the jurisdiction where the Project is located and evidence of Bidder's qualification to do business in the State of Kansas or covenant to obtain such qualification prior to award of the contract.
- Be able to comply with the required or proposed delivery or performance schedule, considering all existing business commitments.
- Have a satisfactory performance record.
- Have a satisfactory record of integrity and business ethics.
- Be otherwise qualified and eligible to receive an award under applicable laws and regulations.

Evidence of competency shall consist of statements covering the Bidder's past experience on similar work, a listing of plant and equipment immediately available for use on the project, and a listing of key personnel that are available for the project. The listing for plant and equipment shall identify the type, the capacity and the present condition of the item.

Evidence of financial responsibility shall consist of a confidential statement or report of the Bidder's financial resources and liabilities as of the last calendar year. A public accountant must certify such statements and reports. If the Bidder is presently pre-qualified with the State Highway agency, evidence of this pre-qualification may serve as evidence of financial responsibility in lieu of the certified financial statements and reports.

STATE REGISTRATION OF OUT-OF-STATE CONTRACTORS. Bidders are advised that K.S.A. 79-1008, 79-1009 requires the registration of out-of-state contractors with the Director of Revenue for collection of tax.

NON-RESIDENT BIDDERS. Attention is directed to Section 16-113 and 16-114 of the Kansas Statutes Annotated which requires that any Non-Resident Contractor who undertakes the construction of any public improvement to be paid for out of public funds, must appoint in writing and file with the Kansas Secretary of State, some person (resident in Shawnee County, Kansas) on whom service may be had in any civil action which may arise out of such contractual relation.

ALTERNATE BIDS. Bidder shall complete all blanks provided on the proposal forms. When so permitted by the Owner, the Bidder shall legibly write the statement "No Bid" for those alternate bid options that the Bidder elects not to submit a proposal.

SUBMISSION OF BID PROPOSAL. Proposals shall be sent to arrive at the specified time and date for receipt of bids. Proposals received after the specified time will not receive consideration and will be returned unopened. Proposals shall be enclosed in a sealed opaque envelope. Each proposal shall be addressed to the office location identified in the Notice-to-bidders. The upper left-hand corner of the envelope shall be marked as follows:

CONTRACT PROPOSAL

Bid of {Insert Name of Bidder}

FOE New Passenger Boarding Bridge

AIP Project No.: 3-20-0113-044

To be opened at: 2:00 PM, December 7th, 2022

BID OPENING. All proposals submitted prior to the stated time and date for receipt of bids will be publicly opened and read aloud by the Owner or the Owner's representative. Bidders, their authorized agents, and other interested parties are invited to attend. Proposals submitted after the stated time and date for receipt of bids will be automatically rejected without consideration and will be returned unopened.

EVALUATION OF PROPOSALS. Proposals may be held by the Owner, in his sole discretion, for purposes of review and evaluation by the Owner for a period not to exceed ninety (90) calendar days from the stated date for receipt of bids. The Owner will tabulate all bids and verify proper extension of unit costs. The Bidder shall honor their proposal for the duration of this period of review and evaluation. The bid guaranty will be held by the Owner until this period of review has expired or a contract has been formally executed.

BID INFORMALITIES AND IRREGULARITIES. The Owner reserves the right to waive any informality or irregularity discovered in any proposal, which in the owner's judgment best serves the Owner's interest. In the situation where an extension of a unit price is found to be incorrect, the stated unit price and correct extension will govern. In the event of a discrepancy between the written and numeral values, the written value shall take precedence.

IRREGULAR PROPOSALS. Proposals meeting the following criteria are subject to consideration as being irregular:

- If the proposal is on a form other than that furnished by the Owner or Owner's representative.
- If the form furnished by the Owner or Owner's representative is altered or detached from the original document.
- If there are unauthorized additions, conditional or alternate pay items or irregularities of any kind that make the proposal incomplete, indefinite, or otherwise ambiguous.
- If the proposal does not contain a unit price for each pay item listed in the proposal, except in the case of authorized pay items, for which the Bidder is not required to furnish a unit price.
- If the proposal contains unit prices that are obviously unbalanced.
- If the proposal is not accompanied by the bid guarantee specified herein.

DISQUALIFICATION OF BID PROPOSALS. The Owner reserves the right to reject any or all bids, as determined to be in the best interest of the Owner.

Causes for rejection of proposals include but are not limited to:

- Submittal of an irregular proposal.
- Submittal of more than one proposal from the same partnership, firm or corporation.
- Failure by Bidder to submit the bid prior to the stated time and date for receipt of bids.
- Failure by Bidder to furnish satisfactory bid guarantee.
- Failure by Bidder to provide all information required of the bid forms.
- Failure by Bidder to comply with the requirements of bid instructions.
- Failure by the Bidder to demonstrate good faith efforts in obtaining participation by certified DBE firms.
- Failure by the Bidder to conform to the Affirmative Action and Notification of DBE requirements shall be deemed non-responsive and will not be accepted.
- Determination by the Owner that Bidder is not qualified to accomplish the project work.
- Determination by the Owner that the Bidder has placed conditions on or qualified their proposal.
- Discovery of any alteration, interlineations or erasure of any project requirement by the Bidder.
- Inclusion of the Bidder on the "Excluded Parties Listing System" as maintained and published by the General Services Administration.
- Evidence of collusion among bidders.

MODIFICATION AND WITHDRAWAL OF BIDS. Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.

If, within twenty-four hours after Bids are opened, any Bidder files a duly signed written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of his Bid, Owner may, at its sole discretion, allow that bidder to withdraw his Bid and the Bid Security will be returned.

CANCELLATION OF AWARD. At any time prior to execution of a contract agreement, the Owner reserves the right to cancel the award for any reason without liability to the Bidder, with the exception of the return of the bid guaranty, at any time prior to execution of the contract.

NOTICE OF AWARD OF CONTRACT. It is the intent of the Owner, after a period of review and evaluation, to award a contract to the responsible bidder that submits the lowest responsive proposal. The successful bidder will be informed their bid has been accepted through the Owner's issuance of a Notice-of-Award. The Notice-of-Award shall not be construed as a binding agreement. The proper execution of a contract agreement shall serve as the binding agreement.

FEDERAL FUNDING ASSISTANCE. It is the intent of the Owner to seek Federal participation assistance for this project under the Airport Improvement Program (AIP). Award of contract is conditioned upon the FAA concurring in award of contract and the owner securing Federal assistance. The issuance of the Notice-of-award will not be made until the FAA has concurred in award and Federal funding is confirmed.

AWARD OF ALTERNATES. Unless specifically stated, the Owner reserves the right to accept alternates in any order or combination, which in the judgment of the Owner, best serves the Owner's interest.

RETURN OF BID GUARANTY. The bid guaranty of the successful Bidder will be returned upon successful execution of the contract documents as specified herein. Failure by the successful Bidder to execute the contract documents within the specified time shall result in forfeiture of the bid guaranty. The bid guaranty of the second and third lowest responsible bidders will be retained for a period of ninety (90) days pending the execution of the contract documents by the successful bidder. Except as noted above, the bid guaranty of unsuccessful bidders will be returned at the point their proposal is rejected.

CONTRACT AGREEMENT. The successful Bidder shall execute the contract agreement in accordance with the accepted bid proposal within **thirty (30) days** of the date of the Notice-of-Award. Failure to execute the contract agreement within the specified time frame may result in the bid being awarded to the next low bidder and shall result in the forfeiture of the Bidder's bid guarantee as a liquidated damage.

CONTRACT TIME. The number of days within which or the date by which the Work is to be completed (the Contract Time) is set forth in the Agreement.

LIQUIDATED DAMAGES. Provisions for liquidated damages are set forth in the Agreement.

PERFORMANCE AND PAYMENT BONDS. The successful Bidder shall furnish separate performance and payment bonds each in the amount of 100% of the contract price. The bonds shall be made payable to the Owner as security for faithful performance of the contract and for the payment of all persons, firms or corporations to whom the Bidder may become legally indebted for labor, materials, tools, equipment or services in the performance of the project work. The form of the bond shall be that provided within the project manual. The current power of attorney for the person signing the bond as a representative of the surety shall be attached to the bonds.

The executed bonds shall be delivered to the Owner within fifteen (15) calendar days from the date of contract execution. Bonds should not be executed prior to execution of the contract agreement. The bonds shall be issued by a solvent Surety, which is certified to operate within the State the project work is located, and which is listed in the current issue of the U.S. Treasury Circular 570. If specifically requested by the Owner, the successful Bidder shall obtain and submit information on the surety's financial strength rating.

SALES TAXES. For all projects, payment of Kansas State Sales Tax or Compensating (Use) tax is not necessary and should not be included in unit prices bid for materials to be incorporated in the work. The Metropolitan Topeka Airport Authority will furnish an exemption certificate (including exemption

certificate number) obtained from the Sales and Compensating Tax Division of the Department of Revenue of the State of Kansas to the Contractor, Subcontractor or repairmen making purchases of any tangible personal property to be incorporated in this project. The Contractor, Subcontractor or repairmen must furnish all suppliers with a copy of the properly executed exemption certificate secured for this project. He may reproduce as many copies of the certificate as he may need.

CERTIFICATES OF INSURANCE. The successful Bidder shall furnish to the Owner all required certificates of insurance as specified with the project manual.

DBE AFFIRMATION. If not submitted with the proposal, the successful Bidder shall furnish, prior to execution of the contract agreement, written affirmation from each identified Disadvantaged Business Enterprise (DBE) firm of their intent to participate in the project.

APPROVAL OF THE CONTRACT. Upon receipt of the Contract Agreement, Contract Bonds and Certificate of Insurance as executed by the successful Bidder, the Owner will complete execution of the contract conditioned upon the Owner's judgment that it remains in their best interest to enter into the Agreement.

Delivery of the fully executed Contract Agreement to the successful Bidder shall constitute the Owner's approval to be bound by the successful Bidder's proposal and all terms and conditions of the Contract Agreement.

Upon satisfactory execution of the contract by the successful Bidder and the Owner, all references to "Bidder" in the bid documents become equivalent to the term "Contractor".

STANDARD TECHNICAL SPECIFICATIONS. This project shall be subject to the applicable Advisory Circulars (latest edition) of the Federal Aviation Administration with any addenda thereto, except as modified or supplemented by specifications contained in this Project Manual.

END OF INSTRUCTIONS TO BIDDERS

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PROPOSAL FORM
METROPOLITAN TOPEKA AIRPORT AUTHORITY
NEW PASSENGER BOARDING BRIDGE
TOPEKA REGIONAL AIRPORT
TOPEKA, KANSAS
AIP PROJECT NO. 3-20-0113-044

BIDDERS NAME: _____

TO: Metropolitan Topeka Airport Authority
6510 SE Forbes Avenue, Suite # 1
Topeka, Kansas 66619

AIP Project No.: 3-20-0113-044

Description: New Passenger Boarding Bridge, Topeka Regional Airport, Topeka, Kansas.

The undersigned Bidder, in compliance with the request for bids for construction of the above mentioned Project, hereby proposes and agrees, if this Bid is accepted, to enter into an agreement with the Owner in the form included in the contract Documents to furnish all labor, permits, material, machinery, tools, supplies and equipment to faithfully perform all work as specified or indicated in the Bid Documents in accordance with the project manual, project drawings and issued Addenda within the specified time of performance for the following prices:

Line Number	Description	Estimated Quantity	Unit	Unit Price	Extension
1	Passenger Boarding Bridge	1	LS		

TOTAL BASE BID (Numeral Format) \$ _____

TOTAL BASE BID (Word Format) _____

ACKNOWLEDGEMENTS BY BIDDER

- a. By submittal of a proposal, the BIDDER acknowledges and accepts that the quantities established by the OWNER are an approximate estimate of the quantities required to fully complete the Project and that the estimated quantities are principally intended to serve as a basis for evaluation of bids. The BIDDER further acknowledges and accepts that payment under this contract will be made only for actual quantities and that quantities will vary in accordance with the General Provisions subsection entitled "Alteration of Work and Quantities".
- b. The BIDDER acknowledges and accepts that the Bid Documents are comprised of the documents identified within the Instructions to Bidders, including without limitation those dealing with the disposition of Bid guarantee. The BIDDER further acknowledges that each of the individual documents that comprise the Bid Documents are complementary to one another and together establishes the complete terms, conditions and obligations of the successful BIDDER.

- c. As evidence of good faith in submitting this proposal, the undersigned encloses a bid guaranty in the form of a certified check, cashier's check or bid bond in the amount of 5% of the bid price. The BIDDER acknowledges and accepts that refusal or failure to accept award and execute a contract within the terms and conditions established herein will result in forfeiture of the bid guaranty to the owner as a liquidated damage.
- d. The BIDDER acknowledges and accepts the OWNER'S right to reject any or all bids and to waive any minor informality in any Bid or solicitation procedure.
- e. The BIDDER acknowledges and accepts the OWNER'S right to hold all Proposals for purposes of review and evaluation and not issue a notice-of-award for a period not to exceed **ninety (90) days** from the stated date for receipt of bids.
- f. The undersigned agrees that upon written notice of award of contract, he or she will execute the contract within **thirty (30) days** of the notice-of-award and furthermore, provide executed payment and performance bonds within **fifteen (15) days** from the date of contract execution. The undersigned accepts that failure to execute the contract and provide the required bonds within the stated timeframe shall result in forfeiture of the bid guaranty to the owner as a liquidated damage.
- g. By submittal of this proposal, the undersigned acknowledges and agrees to commence work within ten (10) calendar days of the date specified in the written "Notice-to-Proceed" as issued by the OWNER. The anticipated date that project work may commence is on or about **March 1, 2023**. The undersigned further agrees to complete the Project within 45 Calendar Days from the Notice-to-Proceed.
- h. The bidder acknowledges and accepts that for each and every Calendar Day the project remains incomplete beyond the contract time of performance, the substantial completion date, or not open to traffic as stipulated in the preceding paragraphs of this section, the CONTRACTOR shall pay the non-penal amount of \$3,600.00 per calendar day as a liquidated damage to the OWNER.
- i. The BIDDER acknowledges that the OWNER has established a contract Disadvantaged Business Enterprise goal of **nine (9) percent** for this project. The BIDDER acknowledges and accepts the requirement to apply and document good faith efforts, as defined in Appendix A, 49 CFR Part 26, for subcontracting a portion of the prime contract to certified Disadvantaged Business Enterprises (DBE), as defined in 49 CFR Part 26 for purposes of meeting the OWNER'S established goal. The BIDDER, in complying with this requirement, proposes participation by Disadvantaged Business Enterprises as stated on the attached forms, "Utilization Statement" and "Letter of Intent".
- j. The BIDDER, by submission of a proposal, acknowledges that award of this contract is subject to the provisions of the Davis-Bacon Act. The BIDDER accepts the requirement to pay prevailing wages for each classification and type of worker as established in the attached wage rate determination as issued by the United States Department of Labor. The BIDDER further acknowledges and accepts their requirement to incorporate the provision to pay the established prevailing wages in every subcontract agreement entered into by the Bidder under this project.

Compliance Reports (41 CFR Part 60-1.7): Within 30 days after award of this contract, the Contractor/Subcontractor shall file a compliance report (Standard Form 100) if s/he has not submitted a complete compliance report within 12 months preceding the date of award. This report is required if the Contractor/Subcontractor meets all of the following conditions:

- 1. Contractors/Subcontractors are not exempt based on 41 CFR 60-1.5.
- 2. Has 50 or more employees.
- 3. Is a prime contractor or first tier subcontractor.
- 4. There is a contract, subcontract, or purchase order amounting to \$50,000 or more

- k. The undersigned acknowledges receipt of the following addenda:

Addendum Number ____ dated _____ Received _____

Addendum Number ____ dated _____ Received _____

Addendum Number ____ dated _____ Received _____

REPRESENTATIONS BY BIDDER

By submittal of a proposal (bid), the BIDDER represents the following:

- a. The BIDDER has read and thoroughly examined the bid documents including all authorized addenda.
- b. The BIDDER has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests and studies (in addition to or to supplement these referred to in (c) above) which pertain to the subsurface or physical conditions at the site or otherwise may affect the cost, progress, performance or furnishing of the Work as Bidder considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents; and no additional examinations, investigations, explorations, tests, reports or similar information or data are or will be required by Bidder for such purposes.
- c. The BIDDER has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports or similar information or data in respect of said Underground Facilities are or will be required by Bidder in order to perform and furnish the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents.
- d. The BIDDER has correlated the results of all such observations, examinations, investigations, explorations, tests, reports and studies with the terms and conditions of the Contract Documents.
- e. The BIDDER has given the Engineer written notice of all conflicts, errors, or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by Engineer is acceptable to Bidder.
- f. The BIDDER has a complete understanding of the terms and conditions required for the satisfactory performance of project work.
- g. The BIDDER has fully informed themselves of the project site, the project site conditions and the surrounding area.
- h. The BIDDER has familiarized themselves of the requirements of working on an operating airport and understands the conditions that may in any manner affect cost, progress, or performance of the work
- i. The BIDDER has correlated their observations with that of the project documents.
- j. The BIDDER has found no errors, conflicts, ambiguities, or omissions in the project documents, except as previously submitted in writing to the owner that would affect cost, progress or performance of the work.
- k. The BIDDER is familiar with all applicable Federal, State, and local laws, rules and regulations pertaining to execution of the contract and the project work that may in any manner affect cost, progress or performance of the work.

- l. The BIDDER has complied with all requirements of these instructions and the associated project documents.
- m. This BID is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any person, firm or corporation to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other bidder or over Owner.

CERTIFICATIONS BY BIDDER

- a. The undersigned hereby declares and certifies that the only parties interested in this proposal are named herein and that this proposal is made without collusion with any other person, firm or corporation. The undersigned further certifies that no member, officer, or agent of OWNER'S has direct or indirect financial interest in this proposal.
- b. **Certification of Non-Segregated Facilities:** (41 CFR Part 60-1.8) The BIDDER, as a potential federally assisted construction contractor, certifies that it does not maintain or provide, for its employees, any segregated facilities at any of its establishments and that it does not permit its employees to perform their services at any location, under its control, where segregated facilities are maintained. The BIDDER certifies that it will not maintain or provide, for its employees, segregated facilities at any of its establishments and that it will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Bidder agrees that a breach of this certification is a violation of the Equal Opportunity Clause, which is to be incorporated in the contract.

As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms, and washrooms, restaurants and other eating areas, timeclocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated on the basis of race, color, religion, or national origin because of habit, local custom, or any other reason. The Bidder agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause and that it will retain such certifications in its files.

- c. **Trade Restriction Certification:** (49 CFR Part 30)
The Bidder, by submission of an offer certifies that it:
 1. is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms published by the Office of the United States Trade Representative (USTR).
 2. has not knowingly entered into any contract or subcontract for this project with a person that is a citizen or national of a foreign country on said list, or is owned or controlled directly or indirectly by one or more citizens or nationals of a foreign country on said list.
 3. has not procured any product nor subcontracted for the supply of any product for use on the project that is produced in a foreign country on said list.
- d. **Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion:** (49 CFR Part 29) The Bidder certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency. It further agrees by

submitting this proposal that it will include this clause without modification in all lower tier transactions, solicitations, proposals, contracts, and subcontracts. Where the Bidder or any lower tier participant is unable to certify to this statement, it shall attach an explanation to this solicitation/proposal.

- e. **Buy American Certification:** (Title 49 U.S.C. Chapter 501) As a condition of bid responsiveness, the bidder must certify its compliance with the Buy American preferences established under Title 49 U.S.C. Section 50101. Bidders must complete the Buy American certification that is attached to this proposal form.

ATTACHMENTS TO THIS BID

The following documents are attached to and made a part of this Bid:

1. Bid Guaranty in the form of _____;
2. Completed DBE forms "Utilization Statement" and "Letter of Intent".
3. Evidence of good faith efforts required by 49 CFR Part 26, Appendix A. If proposed DBE goal is met, submittal of evidence of good faith efforts is not required.
4. Evidence of BIDDER'S qualifications per the requirements of the Instructions-to-Bidders.
5. Buy American Certification.

SIGNATURE OF BIDDER

IF AN INDIVIDUAL:

Name: _____

By: _____
(Signature of Individual)

Doing Business as: _____

Business Address: _____

Telephone Number: _____

IF A PARTNERSHIP:

Partnership Name: _____

By: _____
(Authorized Signature)
(Attach Evidence of Authority to sign as a Partnership)

Name and Title: _____

Business Address: _____

Telephone Number: _____

IF A CORPORATION:

Corporation Name: _____

By: _____
(Authorized Signature)
(Attach Evidence of Authority to sign)

Name and Title: _____

Business Address: _____

Telephone Number: _____ (CORPORATE SEAL)

ATTEST:

By: _____
(Authorized Signature)

Name and Title: _____

IF A JOINT VENTURE: *(Attach copy of Joint Venture Agreement)*

Joint Venture Name: _____

By: _____

(Authorized Signature)
(Attach Evidence of Authority to sign)

Name and Title: _____

Business Address: _____

Telephone Number: _____

Joint Venture Name: _____

By: _____

(Authorized Signature)
(Attach Evidence of Authority to sign)

Name and Title: _____

Business Address: _____

Telephone Number: _____

Project Number: AIP 3-20-0113

Contractor's Name: _____

List of Subcontractors

The Bidder is required to furnish the following information in accordance with the provisions of paragraph Subcontractors, Etc., in the **Instructions to Bidders** for ALL Subcontractors. Do not list alternate subcontractors for the same work. The Contractor shall list only one subcontractor for each such portion of Work as is defined by the Contractor in his bid. Contractor shall not substitute any person as subcontractor in the place of a subcontractor listed below, except as provided in paragraph Subcontractors, Etc.

The Bidder understands that if he fails to specify a subcontractor for any portion of the Work to be performed under the contract or specifies more than one subcontractor for the same portion of the Work, he shall be deemed to have agreed that he is fully qualified to perform that portion himself and that he shall not be permitted to sublet or subcontract that portion of the Work, except as provided in paragraph Subcontractors, Etc.

Subcontractor: _____
Amount: _____ (\$ _____)
(words)

Subcontractor: _____
Amount: _____ (\$ _____)
(words)

Subcontractor: _____
Amount: _____ (\$ _____)
(words)

Subcontractor: _____
Amount: _____ (\$ _____)
(words)

Subcontractor: _____
Amount: _____ (\$ _____)
(words)

Subcontractor: _____
Amount: _____ (\$ _____)
(words)

Subcontractor: _____
Amount: _____ (\$ _____)
(words)

CERTIFICATE OF BUY AMERICAN COMPLIANCE FOR TOTAL FACILITY

PROJECT NAME:	New Passenger Boarding Bridge
AIRPORT NAME:	Topeka Regional Airport
AIP NUMBER:	3-20-0113-044

As a matter of bid responsiveness, the bidder or offeror must complete, sign, date, and submit this certification statement with its proposal. The bidder or offeror must indicate how it intends to comply with 49 USC § 50101 by selecting one of the following certification statements. These statements are mutually exclusive. Bidder must select one or the other (i.e. not both) by inserting a checkmark (✓) or the letter "X".

- ☐ Bidder or offeror hereby certifies that it will comply with 49 USC § 50101 by:
- a) Only installing steel and manufactured products produced in the United States; or
 - b) Installing manufactured products for which the Federal Aviation Administration (FAA) has issued a waiver as indicated by inclusion on the current FAA Nationwide Buy American Waivers Issued listing; or
 - c) Installing products listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation Subpart 25.108.

By selecting this certification statement, the bidder or offeror agrees:

- To provide to the Owner evidence that documents the source and origin of the steel and manufactured product.
- To faithfully comply with providing U.S. domestic products.
- To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

- ☐ The bidder or offeror hereby certifies it cannot comply with the 100 percent Buy American Preferences of 49 USC § 50101(a) but may qualify for either a Type 3 or Type 4 waiver under 49 USC § 50101(b). By selecting this certification statement, the apparent bidder or offeror with the apparent low bid agrees:

- a) To submit to the Owner within 15 calendar days of the bid opening, a formal waiver request and required documentation that supports the type of waiver being requested.
- b) That failure to submit the required documentation within the specified timeframe is cause for a non-responsive determination that may result in rejection of the proposal.
- c) To faithfully comply with providing U.S. domestic products at or above the approved U.S. domestic content percentage as approved by the FAA.
- d) To furnish U.S. domestic product for any waiver request that the FAA rejects.
- e) To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

Required Documentation

Type 3 Waiver – The cost of components and subcomponents produced in the United States is more than 60 percent of the cost of all components and subcomponents of the “facility”. The required documentation for a Type 3 waiver is:

- a) Listing of all manufactured products that are not comprised of 100 percent U.S. domestic content (excludes products listed on the FAA Nationwide Buy American Waivers Issued listing and products excluded by Federal Acquisition Regulation Subpart 25.108; products of unknown origin must be considered as non-domestic products in their entirety).
- b) Cost of non-domestic components and subcomponents, excluding labor costs associated with final assembly and installation at project location.
- c) Percentage of non-domestic component and subcomponent cost as compared to total “facility” component and subcomponent costs, excluding labor costs associated with final assembly and installation at project location.

Type 4 Waiver – Total cost of project using U.S. domestic source product exceeds the total project cost using non-domestic product by 25 percent. The required documentation for a Type 4 of waiver is:

- a) Detailed cost information for total project using U.S. domestic product
- b) Detailed cost information for total project using non-domestic product

False Statements: Per 49 USC § 47126, this certification concerns a matter within the jurisdiction of the Federal Aviation Administration and the making of a false, fictitious or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code.

Date

Signature

Company Name

Title

UTILIZATION STATEMENT
Disadvantage Business Enterprise

The undersigned bidder/offeror has satisfied the requirements of the bid specification in the following manner. (Please mark the appropriate box)

- ☐ The bidder/offeror is committed to a minimum of _____% DBE utilization on this contract.
- ☐ The bidder/offeror, while unable to meet the DBE contract goal of _____%, hereby commits to a minimum of _____% DBE utilization on this contract and submits the attached documentation as evidence demonstrating good faith efforts (GFE) in seeking participation by certified DBE firms.

The undersigned hereby further assures that the information included herein is true and correct, and that the DBE firm or firms identified within the submitted Letter-of-Intent forms have agreed to perform a commercially useful function for the indicated work elements. The undersigned further understands that no changes to this statement may be made without prior approval from the Owner and the Federal Aviation Administration

Bidder's/Offeror's Firm Name

Signature

Date

DBE UTILIZATION SUMMARY

	<u>Contract Amount</u>		<u>DBE Amount</u>	<u>Contract</u>
<u>Percentage</u>				
DBE Prime Contractor	\$ _____ x 1.00 =		\$ _____	_____ %
DBE Subcontractor	\$ _____ x 1.00 =		\$ _____	_____ %
DBE Supplier	\$ _____ x 0.60 =		\$ _____	_____ %
DBE Manufacturer	\$ _____ x 1.00 =		\$ _____	_____ %
Total Amount DBE			\$ _____	_____ %
DBE Goal			\$ _____	_____ %

Note: If the total proposed DBE participation is less than the established DBE goal, Bidder must provide written documentation of the good faith efforts as required by 49 CFR Part 26.

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LETTER OF INTENT

Disadvantage Business Enterprise
(This page shall be submitted for each DBE firm)

Bidder/Offer

Name: _____
Address: _____
City: _____ State: _____ Zip: _____

DBE Firm:

DBE Firm: _____
Address: _____
City: _____ State: _____ Zip: _____

DBE Contact Person:

Name: _____ Phone: () _____

DBE Certifying Agency:

_____ Expiration Date: _____

Each DBE Firm shall submit evidence (such as a photocopy) of their certification status.

Classification:

☐

Prime Contractor

☐

Subcontractor

☐

Joint Venture

☐

Manufacturer

☐

Supplier

Work item(s) to be performed by DBE	Description of Work Item	Quantity	Total

The bidder/offeror is committed to utilizing the above-named DBE firm for the work described above. The estimated participation is as follows:

DBE contract amount: \$ _____ Percent of total contract: _____ %

AFFIRMATION:

The above-named DBE firm affirms that it will perform the portion of the contract for the estimated dollar value as stated above.

By: _____
(Signature) (Title)

Note: In the event the bidder/offeror does not receive award of the prime contract, any and all representations in this Letter of Intent and Affirmation shall be null and void.

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**Form of
CONTRACT AGREEMENT**

METROPOLITAN TOPEKA AIRPORT AUTHORITY
NEW PASSENGER BOARDING BRIDGE
TOPEKA REGIONAL AIRPORT
TOPEKA, KANSAS
AIP PROJECT NO. 3-20-0113-044

THIS AGREEMENT, made as of _____, 2022 is

BY AND BETWEEN

The OWNER: Metropolitan Topeka Airport Authority
6510 SE Forbes Avenue, Suite # 1
Topeka, KS 66619

And the CONTRACTOR:

WITNESSETH:

WHEREAS it is the intent of the Owner to make improvements at Topeka Regional Airport generally described as follows: **New Passenger Boarding Bridge, Topeka Regional Airport, Topeka, Kansas, AIP 3-20-0113-044**, hereinafter referred to as the "Project".

NOW THEREFORE in consideration of the mutual covenants hereinafter set forth, OWNER and CONTRACTOR agree as follows:

Article 1 - Work

It is hereby mutually agreed that for and in consideration of the payments as provided for herein to the CONTRACTOR by the OWNER, CONTRACTOR shall faithfully furnish all necessary labor, equipment, and material and shall fully perform all necessary work to complete the Project in strict accordance with this Contract Agreement and the Contract Documents.

Article 2 – Contract Documents

CONTRACTOR agrees that the Contract Documents consist of the following: this Agreement, General Provisions, Supplementary Provisions, Specifications, Drawings, all issued addenda, Notice-to-Bidders, Instructions-to-Bidders, Proposal and associated attachments, Performance Bond, Payment Bond, Wage Rate Determination, Insurance certificates, Equal Opportunity and Affirmative Action Plan, documents incorporated by reference, documents incorporated by attachment, and all OWNER authorized change orders issued subsequent to the date of this agreement. All documents comprising the Contract Documents are complementary to one another and together establish the complete terms, conditions and obligations of the CONTRACTOR. All said Contract Documents are incorporated by reference into the Contract Agreement as if fully rewritten herein or attached thereto.

Article 3 – Contract Price

In consideration of the faithful performance and completion of the Work by the CONTRACTOR in accordance with the Contract Documents, OWNER shall pay the CONTRACTOR an amount equal to:

\$ _____

(Amount in Written Words)

(\$ _____)

(Amount in Numerals)

subject to the following:

- a. Said amount is based on the schedule of prices and estimated quantities stated in CONTRACTOR'S Bid Proposal, which is attached to and made a part of this Agreement;
- b. Said amount is the aggregate sum of the result of the CONTRACTOR'S stated unit prices multiplied by the associated estimated quantities;
- c. CONTRACTOR and OWNER agree that said estimated quantities are not guaranteed and that the determination of actual quantities is to be made by the OWNER'S ENGINEER;
- d. Said amount is subject to modification for additions and deductions as provided for within the Contract General Provisions.

Article 4 – Payment

Upon the completion of the work and its acceptance by the OWNER, all sums due the CONTRACTOR by reason of faithful performance of the work, taking into consideration additions to or deductions from the Contract price by reason of alterations or modifications of the original Contract or by reason of "Extra Work" authorized under this Contract, will be paid to the CONTRACTOR by the OWNER after said completion and acceptance.

The acceptance of final payment by the CONTRACTOR shall be considered as a release in full of all claims against the OWNER, arising out of, or by reason of, the work completed and materials furnished under this Contract.

OWNER shall make progress payments to the CONTRACTOR in accordance with the terms set forth in the General Provisions. Progress payments shall be based on estimates prepared by the ENGINEER for the value of work performed and materials completed in place in accordance with the Contract Drawings and Specifications.

Progress payments are subject to retainage requirements as set forth in the General Provisions.

Article 5 – Contract Time

The CONTRACTOR agrees to commence and to have the project substantially completed within 45 Calendar Days of the Notice-to-Proceed.

It is expressly understood and agreed that the stated Contract Time is reasonable for the completion of the Work, taking all factors into consideration. Furthermore, extensions of the Contract Time may only be permitted by execution of a formal modification to this Contract Agreement in accordance with the General Provisions and as approved by the OWNER.

Article 6 – Liquidated Damages

The undersigned acknowledges and accepts that for each and every Calendar Day the project remains incomplete beyond the contract time of performance, the substantial completion date, or not open to traffic as stipulated in the preceding paragraphs of this section, the CONTRACTOR shall pay the non-penal amount of \$3,600.00 per calendar day as a liquidated damage to the OWNER.

Furthermore, the CONTRACTOR understands and agrees that.

- a. the OWNER has the right to deduct from any moneys due the CONTRACTOR, the amount of said liquidated damages,
- b. the OWNER has the right to recover the amount of said liquidated damages from the CONTRACTOR, SURETY or both.

Article 7 – CONTRACTOR’S Representations

The CONTRACTOR understands and agrees that all representations made by the CONTRACTOR within the Proposal shall apply under this Agreement as if fully rewritten herein.

Article 8 – CONTRACTOR’S Certifications

The CONTRACTOR understands and agrees that all certifications made by the CONTRACTOR within the Proposal shall apply under this Agreement as if fully rewritten herein. The CONTRACTOR further certifies the following;

- a. Certification of Eligibility (29 CFR Part 5.5)
 - i. By Entering into this contract, the CONTRACTOR certifies that neither he or she nor any person or firm who has an interest in the CONTRACTOR’S firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1);
 - ii. No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1);
 - iii. The penalty for making false statements is prescribed in the U.S. Criminal Code 18 U.S.C.
- b. Certification of Non-Segregated Facilities (41 CFR Part 60-1.8)

The federally assisted construction CONTRACTOR, certifies that it does not maintain or provide, for its employees, any segregated facilities at any of its establishments and that it does not permit its employees to perform their services at any location, under its control,

where segregated facilities are maintained. The BIDDER certifies that it will not maintain or provide, for its employees, segregated facilities at any of its establishments and that it will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Bidder agrees that a breach of this certification is a violation of the Equal Opportunity Clause, which is to be incorporated in the contract.

As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms, and washrooms, restaurants and other eating areas, timeclocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated on the basis of race, color, religion, or national origin because of habit, local custom, or any other reason. The Bidder agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding \$10,000 which are not exempt from the provisions of the Equal Opportunity Clause and that it will retain such certifications in its files.

Article 9 – Miscellaneous

- a. CONTRACTOR understands that it shall be solely responsible for the means, methods, techniques, sequences and procedures of construction in connection with completion of the Work,
- b. CONTRACTOR understands and agrees that it shall not accomplish any work or furnish any materials that are not covered or authorized by the Contract Documents unless authorized in writing by the OWNER or ENGINEER,
- c. The rights of each party under this Agreement shall not be assigned or transferred to any other person, entity, firm or corporation without prior written consent of both parties,
- d. OWNER and CONTRACTOR each bind itself, their partners, successors, assigns and legal representatives to the other party in respect to all covenants, agreements, and obligations contained in the Contract Documents.
- e. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

Article 10 – OWNER'S Representative

The OWNER'S Representative, herein referred to as ENGINEER, and is defined as follows:

Sam Stallbaumer, PE, Project Manager
WSP USA
300 Wyandotte, Suite 200
Kansas City, Missouri 64105
TEL: 816-72-4244
MOB: 210-867-6532
E-Mail: sam.stallbaumer@wsp.com

Said ENGINEER will act as the OWNER'S representative and shall assume all rights and authority assigned to the ENGINEER as stated within the Contract Documents in connection with the completion of the Project Work.

IN WITNESS WHEREOF, OWNER and CONTRACTOR have executed five (5) copies of this Agreement on the day and year first noted herein.

OWNER

Name: Metropolitan Topeka Airport Authority

Address: 6510 SE Forbes Avenue, Suite 1
Topeka, Kansas 66619

By: _____
Signature: Eric M. Johnson

President & Director of Airports
Title of Representative

ATTEST

By: _____
Signature: Cheryl Trobough

Title: Director of Administration & Finance

CONTRACTOR

Name: _____

Address: _____

By: _____
Signature

Title of Representative

ATTEST

By: _____
Signature:

Title: _____

Project Number:	3-20-0113-044
Contractor's Name:	

List of Subcontractors

The Bidder is required to furnish the following information in accordance with the provisions of the Instructions to Bidders for ALL Subcontractors. Do not list alternate subcontractors for the same work. The Contractor shall list only one subcontractor for each such portion of Work as is defined by the Contractor in his bid. Contractor shall not substitute any person as subcontractor in the place of a subcontractor listed below, except as provided in the Instruction to Bidders.

The Bidder understands that if he fails to specify a subcontractor for any portion of the Work to be performed under the contract or specifies more than one subcontractor for the same portion of the Work, he shall be deemed to have agreed that he is fully qualified to perform that portion himself and that he shall not be permitted to sublet or subcontract that portion of the Work, except as provided in the Instruction to Bidders.

Subcontractor: _____
Amount: _____ (\$ _____)
(words)

Subcontractor: _____
Amount: _____ (\$ _____)
(words)

Subcontractor: _____
Amount: _____ (\$ _____)
(words)

Subcontractor: _____
Amount: _____ (\$ _____)
(words)

Subcontractor: _____
Amount: _____ (\$ _____)
(words)

Subcontractor: _____
Amount: _____ (\$ _____)
(words)

Performance Bond

Any singular reference to Contractor, Surety, Owner of other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Address of Principal Place of
Business):

OWNER (Name and Address): Metropolitan Topeka Airport Authority
6510 SE Forbes Avenue, Suite 1
Topeka, KS 66619

CONTRACT

Date:

Amount:

Description (Name and Location): AIP 3-20-0113-044
New Passenger Boarding Bridge
Topeka Regional Airport

BOND

Date (Not earlier than Contract Date):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent or representative.

CONTRACTOR AS PRINCIPAL

Company: (Corp. Seal)

Signature: _____

Name and Title:

SURETY

Company: (Corp. Seal)

Signature: _____

Name and Title:

(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

CONTRACTOR AS PRINCIPAL

Company: (Corp. Seal)

Signature: _____

Name and Title:

SURETY

Company: (Corp. Seal)

Signature: _____

Name and Title:

EJCDC No. 1910-28-A (1996 Edition)

Originally prepared through the joint efforts of the Surety Association of America, Engineers Joint Contract Documents Committee, the Associated General Contractors of America, and the American Institute of Architects.

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1. The CONTRACTOR and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner for the performance of the Contract, which is incorporated herein by reference.

2. If the CONTRACTOR performs the Contract, the Surety and the CONTRACTOR have no obligation under this Bond, except to participate in conferences as provided in paragraph 3.1.

3. If there is no OWNER Default, the Surety's obligation under this Bond shall arise after:

3.1. The OWNER has notified the CONTRACTOR and the Surety at the addresses described in paragraph 10 below, that the OWNER is considering declaring a CONTRACTOR Default and has requested and attempted to arrange a conference with the CONTRACTOR and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Contract. If the OWNER, the CONTRACTOR and the Surety agree, the CONTRACTOR shall be allowed a reasonable time to perform the Contract, but such an agreement shall not waive the OWNER's right, if any, subsequently to declare a CONTRACTOR Default; and

3.2. The OWNER has declared a CONTRACTOR Default and formally terminated the CONTRACTOR's right to complete the Contract. Such CONTRACTOR Default shall not be declared earlier than twenty days after the CONTRACTOR and Surety have received notice as provided in paragraph 3.1; and

3.3. The OWNER has agreed to pay the Balance of the Contract Price to:

3.3.1. The Surety in accordance with the terms of the Contract;

3.3.2. Another contractor selected pursuant to paragraph 4.3 to perform the Contract.

4. When the OWNER has satisfied the conditions of paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

4.1. Arrange for the CONTRACTOR, with consent of the OWNER, to perform and complete the Contract; or

4.2. Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or

4.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the OWNER for a contract for performance and completion of the Contract, arrange for a contract to be prepared for execution by the OWNER and the contractor selected with the OWNER's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the Bonds issued on the Contract, and pay to the OWNER the amount of damages as described in paragraph 6 in excess of the Balance of the Contract Price incurred by the OWNER resulting from the CONTRACTOR Default; or

4.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances;

4.4.1. After investigation, determine the amount for which it may be liable to the OWNER and, as soon as practicable after the amount is determined, tender payment therefor to the OWNER; or

4.4.2. Deny liability in whole or in part and notify the OWNER citing reasons therefor.

5. If the Surety does not proceed as provided in paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the OWNER to the Surety demanding that the Surety perform its obligations under this Bond, and the OWNER shall be entitled to enforce any remedy available to the OWNER. If the Surety proceeds as provided in paragraph 4.4, and the OWNER refuses

the payment tendered or the Surety has denied liability, in whole or in part, without further notice the OWNER shall be entitled to enforce any remedy available to the OWNER.

6. After the OWNER has terminated the CONTRACTOR's right to complete the Contract, and if the Surety elects to act under paragraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the OWNER shall not be greater than those of the CONTRACTOR under the Contract, and the responsibilities of the OWNER to the Surety shall not be greater than those of the OWNER under the Contract. To a limit of the amount of this Bond, but subject to commitment by the OWNER of the Balance of the Contract Price to mitigation of costs and damages on the Contract, the Surety is obligated without duplication for:

6.1. The responsibilities of the CONTRACTOR for correction of defective Work and completion of the Contract;

6.2. Additional legal, design professional and delay costs resulting from the CONTRACTOR's Default, and resulting from the actions or failure to act of the Surety under paragraph 4; and

6.3. Liquidated damages, or if no liquidated damages are specified in the Contract, actual damages caused by delayed performance or non-performance of the CONTRACTOR.

7. The Surety shall not be liable to the OWNER or others for obligations of the CONTRACTOR that are unrelated to the Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the OWNER or its heirs, executors, administrators, or successors.

8. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders and other obligations.

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the Work or part of the Work is located and shall be instituted within two years after CONTRACTOR Default or within two years after the CONTRACTOR ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to the Surety, the OWNER or the CONTRACTOR shall be mailed or delivered to the address shown on the signature page.

11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the Contract was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. Definitions.

12.1. Balance of the Contract Price: The total amount payable by the OWNER to the CONTRACTOR under the Contract after all proper adjustments have been made, including allowance to the CONTRACTOR of any amounts received or to be received by the OWNER in settlement of insurance or other Claims for damages to which the CONTRACTOR is entitled, reduced by all valid and proper payments made to or on behalf of the CONTRACTOR under the Contract.

12.2. Contract: The agreement between the OWNER and the CONTRACTOR identified on the signature page, including all Contract Documents and changes thereto.

12.3. CONTRACTOR Default: Failure of the CONTRACTOR, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Contract.

12.4. OWNER Default: Failure of the OWNER, which has neither been remedied nor waived, to pay the CONTRACTOR as required by the Contract or to perform and complete or comply with the other terms thereof.

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(FOR INFORMATION ONLY---Name, Address and Telephone)

AGENT or BROKER: OWNER’S REPRESENTATIVE (Engineer or other party):

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Payment Bond

Any singular reference to Contractor, Surety, Owner of other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Address of Principal Place of
Business):

OWNER (Name and Address): Metropolitan Topeka Airport Authority
6510 SE Forbes Avenue, Suite 1
Topeka, KS 66619

CONTRACT

Date:

Amount:

Description (Name and Location): AIP 3-20-0113-044
New Passenger Boarding Bridge
Topeka Regional Airport

BOND

Date (Not earlier than Contract Date):

Amount:

Modifications to this Bond Form:

Surety and Contractor, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Performance Bond to be duly executed on its behalf by its authorized officer, agent or representative.

CONTRACTOR AS PRINCIPAL

Company: (Corp. Seal)

Signature: _____

Name and Title:

SURETY

Company: (Corp. Seal)

Signature: _____

Name and Title:

(Attach Power of Attorney)

(Space is provided below for signatures of additional parties, if required.)

CONTRACTOR AS PRINCIPAL

Company: (Corp. Seal)

Signature: _____

Name and Title:

SURETY

Company: (Corp. Seal)

Signature: _____

Name and Title:

EJCDC No. 1910-28-B (1996 Edition)

Originally prepared through the joint efforts of the Surety Association of America, Engineers Joint Contract Documents Committee, the Associated General Contractors of America, and the American Institute of Architects.

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New Passenger Boarding Bridge
Topeka Regional Airport
AIP 3-20-0113-044

1. The CONTRACTOR and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the OWNER to pay for labor, materials and equipment furnished for use in the performance of the Contract, which is incorporated herein by reference.

2. With respect to the OWNER, this obligation shall be null and void if the CONTRACTOR:

2.1. Promptly makes payment, directly or indirectly, for all sums due Claimants, and

2.2. Defends, indemnifies and holds harmless the OWNER from all claims, demands, liens or suits by any person or entity who furnished labor, materials or equipment for use in the performance of the Contract, provided the OWNER has promptly notified the CONTRACTOR and the Surety (at the addresses described in paragraph 12) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to the CONTRACTOR and the Surety, and provided there is no OWNER Default.

3. With respect to Claimants, this obligation shall be null and void if the CONTRACTOR promptly makes payment, directly or indirectly, for all sums due.

4. The Surety shall have no obligation to Claimants under this Bond until:

4.1. Claimants who are employed by or have a direct contract with the CONTRACTOR have given notice to the Surety (at the addresses described in paragraph 12) and sent a copy, or notice thereof, to the OWNER, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

4.2. Claimants who do not have a direct contract with the CONTRACTOR:

1. Have furnished written notice to the CONTRACTOR and sent a copy, or notice thereof, to the OWNER, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and

2. Have either received a rejection in whole or in part from the CONTRACTOR, or not received within 30 days of furnishing the above notice any communication from the CONTRACTOR by which the CONTRACTOR had indicated the claim will be paid directly or indirectly; and

3. Not having been paid within the above 30 days, have sent a written notice to the Surety and sent a copy, or notice thereof, to the OWNER, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the CONTRACTOR.

5. If a notice required by paragraph 4 is given by the OWNER to the CONTRACTOR or to the Surety, that is sufficient compliance.

6. When the Claimant has satisfied the conditions of paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:

6.1. Send an answer to the Claimant, with a copy to the OWNER, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.

6.2. Pay or arrange for payment of any undisputed amounts.

7. The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

8. Amounts owed by the OWNER to the CONTRACTOR under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any Performance Bond. By the CONTRACTOR furnishing and the

OWNER accepting this Bond, they agree that all funds earned by the CONTRACTOR in the performance of the Contract are dedicated to satisfy obligations of the CONTRACTOR and the Surety under this Bond, subject to the OWNER's priority to use the funds for the completion of the Work.

9. The Surety shall not be liable to the OWNER, Claimants or others for obligations of the CONTRACTOR that are unrelated to the Contract. The OWNER shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. The Surety hereby waives notice of any change, including changes of time, to the Contract or to related Subcontracts, purchase orders and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than a court of competent jurisdiction in the location in which the Work or part of the Work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by paragraph 4.1 or paragraph 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the OWNER or the CONTRACTOR shall be mailed or delivered to the address shown on the signature page. Actual receipt of notice by Surety, the OWNER or the CONTRACTOR, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the Contract was performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is, that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Upon request of any person or entity appearing to be a potential beneficiary of this Bond, the CONTRACTOR shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. DEFINITIONS.

15.1. Claimant: An individual or entity having a direct contract with the CONTRACTOR or with a Subcontractor of the CONTRACTOR to furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Contract, architectural and engineering services required for performance of the Work of the CONTRACTOR and the CONTRACTOR's Subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

15.2. Contract: The agreement between the OWNER and the CONTRACTOR identified on the signature page, including all Contract Documents and changes thereto.

15.3. OWNER Default: Failure of the OWNER, which has neither been remedied nor waived, to pay the CONTRACTOR as required by the Contract or to perform and complete or comply with the other terms thereof.

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(FOR INFORMATION ONLY---Name, Address and Telephone)

AGENT or BROKER: OWNER'S REPRESENTATIVE (Engineer or other party):

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SUPPLEMENTARY PROVISIONS

These Supplementary Conditions amend and/or supplement the General Provision of the Contract and other provisions of the Contract Documents as indicated herein. All contract provisions that are not so amended or supplemented remain in full force and effect.

FEDERAL PROVISIONS

The provisions provided in the section "*Contract Provision Guidelines for Obligated Sponsors and Airport Improvement Program Projects*" (Federal Provisions) as provided for in this project manual are made a part of the project contract documents.

WARRANTY / GUARANTEE

All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

STORMWATER POLLUTION PREVENTION PLAN

Successful bidder shall assume ownership and responsibility of the project's Stormwater Pollution Prevention Plan from the Metropolitan Topeka Airport Authority. Successful bidder shall satisfactorily demonstrate to the MTAA/Engineer that the bidder has transferred the ownership of the SWPPP to himself at the start of the project. Contractor shall be responsible for installation, maintenance, and inspection of the stormwater pollution prevention installations during the course of the project. At the completion of the project, Contractor shall be responsible for the removal and disposal of stormwater pollution prevention devices from the project site.

STATE PROVISIONS - None

LOCAL PROVISIONS None

CONTRACTOR'S LIABILITY INSURANCE

1.1. Contractor shall purchase and maintain such commercial general liability and other insurance as is appropriate for the Project and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance and furnishing of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed or furnished by Contractor, by any Subcontractor, by anyone directly or indirectly employed by any of them to perform or furnish any of the Work, or by anyone for whose acts any of them may be liable:

1.1.1. Claims under workers' or workmen's compensation, disability benefits and other similar employee benefit acts, as per state and federal statutory requirements.

1.1.2. Employers Liability Insurance covering claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees with a \$500,000.00 each person, limit.

1.1.3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

1.10.4. Claims for property damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom;

1.1.5. Claims arising out of operation of Laws or Regulations for damages because of bodily injury or death of any person or for damage to property; and

1.1.6. The commercial general liability insurance required under paragraphs 1.1.3 through 1.1.5 shall have the following specific coverages:

(1) General Liability:

1. Each Occurrence	\$1,000,000
2. Personal and Advertising Injury	\$1,000,000
3. Products and Completed Operations Aggregate	\$1,000,000
4. General Aggregate	\$2,000,000
5. Rented Premises	\$ 100,000
6. Medical Expenses	\$ 5,000

(2) Excess Liability:

Bodily Injury and Property Damage Combined:

\$1,000,000 Each Occurrence

\$1,000,000 Annual Aggregate

The commercial general liability insurance shall include completed operations insurance. Property Damage liability insurance shall be provided with coverages for explosion, collapse and underground hazards, where applicable. The Owner shall be named as an additional insured on the Contractor's general liability policy.

(3) Automobile Liability:

Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle. Coverages for hired car and employee non-owned auto liability shall also be provided. The coverage limits shall be:

Combined Single Limit for Each Occurrence \$1,000,000

(4) Contractual Liability Insurance:

1.2. The commercial general liability insurance required by paragraph 1.1 will include contractual liability insurance applicable to Contractor's obligations under the Contract Documents.

(5) Property Insurance:

1.3. Contractor shall purchase and maintain property insurance upon the Work at the site to the full insurable value thereof (subject to such deductible amounts as required by Laws and Regulations) for all projects which include construction of or modification to above ground structures. This insurance shall include the interests of Owner, Contractor and Subcontractors all of whom shall be listed as insured or additional insured parties, shall insure against the perils of fire and extended coverage and shall include "all risk" insurance for physical loss and damage including theft, vandalism and malicious mischief, collapse and water damage, and shall include damages, losses and expenses arising out of or resulting from any insured loss or incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers, architects, attorneys and other professionals). If not covered under the "all risk" insurance, Contractor shall purchase and maintain similar property insurance on portions of the Work stored on and off the site or in transit when such portions of the Work are to be included in an Application for Payment.

1.4. Contractor shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by Laws and Regulations which will include the interests of Owner, Contractor and Subcontractors all of whom shall be listed as insured or additional insured parties.

Owners Liability Insurance

1.5. Contractor, at his sole expense, shall purchase Owner's Protective Liability Insurance and provide owner with the original policy. This insurance shall be maintained in full force and effect for the duration of the Contract by Contractor and shall name the Owner as the named Insured. This insurance shall have the following limits:

Each Occurrence \$1,000,000

General Aggregate \$1,000,000

This insurance shall protect Owner against any and all claims and liabilities for injury to or death of persons, or damage to property caused in whole or in part by, or alleged to have been caused in whole or in part by, the negligent acts or omissions of Contractor or Subcontractors or any agent, servant, worker or employee of Contractor or Subcontractor arising from the operations or Work for the project.

Notice of Cancellation

1.6. All of the policies of insurance so required to be purchased and maintained (or the certificates) in accordance with paragraphs 1.1 through 1.5 shall contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least thirty (30) days prior written notice has been given to Owner. All such insurance shall remain in effect until final payment and at all times thereafter when Contractor may be correcting, removing or replacing defective Work in accordance with the Project Manual. In addition, Contractor shall maintain such completed operations insurance for one year after

final payment and furnish Owner with evidence of continuation of such insurance at final payment.

Receipt and Application of Proceeds

1.7. Any insured loss under the policies of insurance required by paragraphs 1.3 and 1.4 will be adjusted with Owner and made payable to Owner as trustee for the insured, as their interests may appear, subject to the requirements of any applicable mortgage clause and of paragraph 1.10, Owner shall deposit in a separate account any money so received, and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof and the Work and the cost thereof covered by an appropriate Change Order.

1.8. Owner as trustee shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within fifteen days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as trustee shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If required in writing by any party in interest, Owner as trustee shall, upon the occurrence of an insured loss, give bond for the proper performance of such duties.

Acceptance of Insurance

1.9. If Owner has any objection to the coverage afforded by or other provisions of the insurance required to be purchased and maintained by Contractor in accordance with paragraphs 1.1 through 1.5 on the basis of its not complying with the Contract Documents, Owner shall notify Contractor in writing thereof within thirty days of the date of delivery of such certificates to Owner. Contractor shall provide to Owner such additional information in respect of insurance provided by Contractor as Owner may reasonably request. Failure by Owner to give any such notice of objection within the time provided shall constitute acceptance of such insurance purchased by Contractor as complying with the Contract Documents. All Certificates of Insurance shall utilize the ACORD 25-S form, most recent revision date.

Partial Utilization - Property Insurance

1.10. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, such use or occupancy may be accomplished in accordance with the Project Manual; provided that no such use or occupancy shall commence before the insurers providing the property insurance have acknowledged notice thereof and in writing effected the changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or lapse on account of any such partial use or occupancy.

WAGE RATES Reference is made to 29 CFR 1 §1.6 Use and effectiveness of wage determinations, paragraph (c) (3) (iv).

The wage rates for the project are contained in the wage rate determination included in the project manual. The wage rates for the project may change and the current wage rate may be incorporated into the project under two conditions.

Condition 1:

If wage rate is updated 10 days before bid opens, the updated wage rate will be added to the project documents via an addendum and shall be used in the development of the bid.

Condition 2:

Wage rate is updated after bids are opened and the contract was not awarded within 90 days of bid opening, the contract will be amended to incorporate the wage rate as of the contract award date. The Notice to Proceed date will not be considered to be the contract award date.

ATTACHMENTS TO SUPPLEMENTARY CONDITIONS

- A. Department of Labor Wage Rate Determination – See Section WR - Wage Rates Decision Number KS20220058 Modification Number 8 – 10/027/2022

Any references to Architect, Engineer, Construction Inspector, Resident Project Representative will be construed to be “Owner’s Representative”.

END OF SUPPLEMENTARY PROVISIONS

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SECTION GP-10 DEFINITION OF TERMS

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

10-01 AASHTO. The American Association of State Highway and Transportation Officials.

10-02 ACCESS ROAD. The right-of-way, the roadway and all improvements constructed thereon connecting the airport to a public roadway.

10-03 ADVERTISEMENT. A public announcement, as required by local law, inviting bids for work to be performed and materials to be furnished.

10-04 AIRPORT. Airport means an area of land or water which is used or intended to be used for the landing and takeoff of aircraft; an appurtenant area used or intended to be used for airport buildings or other airport facilities or rights of way; airport buildings and facilities located in any of these areas, and a heliport.

10-05 AIRPORT IMPROVEMENT PROGRAM (AIP). A grant-in-aid program, administered by the Federal Aviation Administration (FAA).

10-06 AIR OPERATIONS AREA (AOA). The term air operations area (AOA) shall mean any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operation area shall include such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiway, or apron.

10-07 APRON. Area where aircraft are parked, unloaded or loaded, fueled and/or serviced.

10-08 ASTM INTERNATIONAL (ASTM). Formerly known as the American Society for Testing and Materials (ASTM).

10-09 AWARD. The Owner's notice to the successful bidder of the acceptance of the submitted bid.

10-10 BIDDER. Any individual, partnership, firm, or corporation, acting directly or through a duly authorized representative, who submits a proposal for the work contemplated.

10-11 BUILDING AREA. An area on the airport to be used, considered, or intended to be used for airport buildings or other airport facilities or rights-of-way together with all airport buildings and facilities located thereon.

10-12 CALENDAR DAY. Every day shown on the calendar.

10-13 CERTIFICATE OF ANALYSIS (COA). The COA is the manufacturer's Certificate of Compliance (COC) including all applicable test results required by the specifications.

10-14 CERTIFICATE OF COMPLIANCE (COC). The manufacturer's certification stating that materials or assemblies furnished fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer's authorized representative.

10-15 CHANGE ORDER. A written order to the Contractor covering changes in the plans, specifications, or proposal quantities and establishing the basis of payment and contract time adjustment, if any, for work within the scope of the contract and necessary to complete the project.

10-16 CONTRACT. A written agreement between the Owner and the Contractor that establishes the obligations of the parties including but not limited to performance of work, furnishing of labor, equipment and materials and the basis of payment.

The awarded contract includes but may not be limited to: Advertisement, Contract form, Proposal, Performance bond, payment bond, General provisions, certifications and representations, Technical Specifications, Plans, Supplemental Provisions, standards incorporated by reference and issued addenda.

10-17 CONTRACT ITEM (PAY ITEM). A specific unit of work for which a price is provided in the contract.

10-18 CONTRACT TIME. The number of calendar days or working days, stated in the proposal, allowed for completion of the contract, including authorized time extensions. If a calendar date of completion is stated in the proposal, in lieu of a number of calendar or working days, the contract shall be completed by that date.

10-19 CONTRACTOR. The individual, partnership, firm, or corporation primarily liable for the acceptable performance of the work contracted and for the payment of all legal debts pertaining to the work who acts directly or through lawful agents or employees to complete the contract work.

10-20 CONTRACTORS QUALITY CONTROL (QC) FACILITIES. The Contractor's QC facilities in accordance with the Contractor Quality Control Program (CQCP).

10-21 CONTRACTOR QUALITY CONTROL PROGRAM (CQCP). Details the methods and procedures that will be taken to assure that all materials and completed construction required by the contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors.

10-22 CONTROL STRIP A demonstration by the Contractor that the materials, equipment, and construction processes results in a product meeting the requirements of the specification.

10-23 CONSTRUCTION SAFETY AND PHASING PLAN (CSPP). The overall plan for safety and phasing of a construction project developed by the airport operator, or developed by the airport operator's consultant and approved by the airport operator. It is included in the invitation for bids and becomes part of the project specifications.

10-24 DRAINAGE SYSTEM. The system of pipes, ditches, and structures by which surface or subsurface waters are collected and conducted from the airport area.

10-25 ENGINEER. The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for engineering, inspection, and/or observation of the contract work and acting directly or through an authorized representative.

10-26 EQUIPMENT. All machinery, together with the necessary supplies for upkeep and maintenance; and all tools and apparatus necessary for the proper construction and acceptable completion of the work.

10-27 EXTRA WORK. An item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, but which is found by the Owner's Engineer or Resident Project Representative (RPR) to be necessary to complete the work within the intended scope of the contract as previously modified.

10-28 FAA. The Federal Aviation Administration. When used to designate a person, FAA shall mean the Administrator or their duly authorized representative.

10-29 FEDERAL SPECIFICATIONS. The federal specifications and standards, commercial item descriptions, and supplements, amendments, and indices prepared and issued by the General Services Administration.

10-30 FORCE ACCOUNT. a. Contract Force Account - A method of payment that addresses extra work performed by the Contractor on a time and material basis.

b. Owner Force Account - Work performed for the project by the Owner's employees.

10-31 INTENTION OF TERMS. Whenever, in these specifications or on the plans, the words “directed,” “required,” “permitted,” “ordered,” “designated,” “prescribed,” or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the Engineer and/or Resident Project Representative (RPR) is intended; and similarly, the words “approved,” “acceptable,” “satisfactory,” or words of like import, shall mean approved by, or acceptable to, or satisfactory to the Engineer and/or RPR, subject in each case to the final determination of the Owner.

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

10-32 LIGHTING. A system of fixtures providing or controlling the light sources used on or near the airport or within the airport buildings. The field lighting includes all luminous signals, markers, floodlights, and illuminating devices used on or near the airport or to aid in the operation of aircraft landing at, taking off from, or taxiing on the airport surface.

10-33 MAJOR AND MINOR CONTRACT ITEMS. A major contract item shall be any item that is listed in the proposal, the total cost of which is equal to or greater than 20% of the total amount of the award contract. All other items shall be considered minor contract items.

10-34 MATERIALS. Any substance specified for use in the construction of the contract work.

10-35 MODIFICATION OF STANDARDS (MOS). Any deviation from standard specifications applicable to material and construction methods in accordance with FAA Order 5300.1.

10-36 NOTICE TO PROCEED (NTP). A written notice to the Contractor to begin the actual contract work on a previously agreed to date. If applicable, the Notice to Proceed shall state the date on which the contract time begins.

10-37 OWNER. The term “Owner” shall mean the party of the first part or the contracting agency signatory to the contract. Where the term “Owner” is capitalized in this document, it shall mean airport Sponsor only. The Owner for this project is the **Metropolitan Topeka Airport Authority**.

10-38 PASSENGER FACILITY CHARGE (PFC). Per 14 Code of Federal Regulations (CFR) Part 158 and 49 United States Code (USC) § 40117, a PFC is a charge imposed by a public agency on passengers enplaned at a commercial service airport it controls.

10-39 PAVEMENT STRUCTURE. The combined surface course, base course(s), and subbase course(s), if any, considered as a single unit.

10-40 PAYMENT BOND. The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will pay in full all bills and accounts for materials and labor used in the construction of the work.

10-41 PERFORMANCE BOND. The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will complete the work in accordance with the terms of the contract.

10-42 PLANS. The official drawings or exact reproductions which show the location, character, dimensions and details of the airport and the work to be done and which are to be considered as a part of the contract, supplementary to the specifications. Plans may also be referred to as 'contract drawings.'

10-43 PROJECT. The agreed scope of work for accomplishing specific airport development with respect to a particular airport.

10-44 PROPOSAL. The written offer of the bidder (when submitted on the approved proposal form) to perform the contemplated work and furnish the necessary materials in accordance with the provisions of the plans and specifications.

10-45 PROPOSAL GUARANTY. The security furnished with a proposal to guarantee that the bidder will enter into a contract if their own proposal is accepted by the Owner.

10-46 QUALITY ASSURANCE (QA). Owner's responsibility to assure that construction work completed complies with specifications for payment.

10-47 QUALITY CONTROL (QC). Contractor's responsibility to control material(s) and construction processes to complete construction in accordance with project specifications.

10-48 QUALITY ASSURANCE (QA) INSPECTOR. An authorized representative of the Engineer and/or Resident Project Representative (RPR) assigned to make all necessary inspections, observations, tests, and/or observation of tests of the work performed or being performed, or of the materials furnished or being furnished by the Contractor.

10-49 QUALITY ASSURANCE (QA) LABORATORY. The official quality assurance testing laboratories of the Owner or such other laboratories as may be designated by the Engineer or RPR. May also be referred to as Engineer's, Owner's, or QA Laboratory.

10-50 RESIDENT PROJECT REPRESENTATIVE (RPR). The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for all necessary inspections, observations, tests, and/or observations of tests of the contract work performed or being performed, or of the materials furnished or being furnished by the Contractor, and acting directly or through an authorized representative.

10-51 RUNWAY. The area on the airport prepared for the landing and takeoff of aircraft.

10-52 RUNWAY SAFETY AREA (RSA). A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft. See the construction safety and phasing plan (CSPP) for limits of the RSA.

10-53 SAFETY PLAN COMPLIANCE DOCUMENT (SPCD). Details how the Contractor will comply with the CSPP.

10-54 SPECIFICATIONS. A part of the contract containing the written directions and requirements for completing the contract work. Standards for specifying materials or testing which are cited in the contract specifications by reference shall have the same force and effect as if included in the contract physically.

10-55 SPONSOR. A Sponsor is defined in 49 USC § 47102(24) as a public agency that submits to the FAA for an AIP grant; or a private Owner of a public-use airport that submits to the FAA an application for an AIP grant for the airport.

10-56 STRUCTURES. Airport facilities such as bridges; culverts; catch basins, inlets, retaining walls, cribbing; storm and sanitary sewer lines; water lines; underdrains; electrical ducts, manholes, handholes, lighting fixtures and bases; transformers; navigational aids; buildings; vaults; and, other manmade features of the airport that may be encountered in the work and not otherwise classified herein.

10-57 SUBGRADE. The soil that forms the pavement foundation.

10-58 SUPERINTENDENT. The Contractor's executive representative who is present on the work during progress, authorized to receive and fulfill instructions from the RPR, and who shall supervise and direct the construction.

10-59 SUPPLEMENTAL AGREEMENT. A written agreement between the Contractor and the Owner that establishes the basis of payment and contract time adjustment, if any, for the work affected by the supplemental agreement. A supplemental agreement is required if: (1) in scope work would increase or decrease the total amount of the awarded contract by more than 25%; (2) in scope work would increase or decrease the total of any major contract item by more than 25%; (3) work that is not within the scope of the originally awarded contract; or (4) adding or deleting of a major contract item.

10-60 SURETY. The corporation, partnership, or individual, other than the Contractor, executing payment or performance bonds that are furnished to the Owner by the Contractor.

10-61 TAXILANE. A taxiway designed for low speed movement of aircraft between aircraft parking areas and terminal areas.

10-62 TAXIWAY. The portion of the air operations area of an airport that has been designated by competent airport authority for movement of aircraft to and from the airport's runways, aircraft parking areas, and terminal areas.

10-63 TAXIWAY/TAXILANE SAFETY AREA (TSA). A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an aircraft. See the construction safety and phasing plan (CSPP) for limits of the TSA.

10-64 WORK. The furnishing of all labor, materials, tools, equipment, and incidentals necessary or convenient to the Contractor's performance of all duties and obligations imposed by the contract, plans, and specifications.

10-65 WORKING DAY. A working day shall be any day other than a legal holiday, Saturday, or Sunday on which the normal working forces of the Contractor may proceed with regular work for at least six (6) hours toward completion of the contract. When work is suspended for causes beyond the Contractor's control, it will not be counted as a working day. Saturdays, Sundays and holidays on which the Contractor's forces engage in regular work will be considered as working days.

10-66 OWNER DEFINED TERMS. None

END OF SECTION 10

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SECTION 20 PROPOSAL REQUIREMENTS AND CONDITIONS

20-01 Advertisement (Notice to Bidders). See Section NTB – Notice to Bidders

20-02 Qualification of bidders. Each bidder shall submit evidence of competency and evidence of financial responsibility to perform the work to the Owner at the time of bid opening.

Evidence of competency, unless otherwise specified, shall consist of statements covering the bidder's past experience on similar work, and a list of equipment and a list of key personnel that would be available for the work.

Each bidder shall furnish the Owner satisfactory evidence of their financial responsibility. 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 bidder'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 their 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 the 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 they are prequalified with the State Highway Division and are on the current "bidder's list" of the state in which the proposed work is located. Evidence of State Highway Division prequalification may be submitted as evidence of financial responsibility in lieu of the certified statements or reports specified above.

20-03 Contents of proposal forms. The Owner's proposal forms state the location and description of the proposed construction; the place, date, and time of opening of the proposals; and the estimated quantities of the various items of work to be performed and materials to be furnished for which unit bid prices are asked. The proposal form states the time in which the work must be completed, and the amount of the proposal guaranty that must accompany the proposal. The Owner will accept only those Proposals properly executed on physical forms or electronic forms provided by the Owner. Bidder actions that may cause the Owner to deem a proposal irregular are given in paragraph 20-09 Irregular proposals.

Mobilization is limited to five percent (5%) of the total project cost.

20-04 Issuance of proposal forms. The Owner reserves the right to refuse to issue a proposal form to a prospective bidder if the bidder is in default for any of the following reasons:

- a. Failure to comply with any prequalification regulations of the Owner, if such regulations are cited, or otherwise included, in the proposal as a requirement for bidding.
- b. Failure to pay, or satisfactorily settle, all bills due for labor and materials on former contracts in force with the Owner at the time the Owner issues the proposal to a prospective bidder.
- c. Documented record of Contractor default under previous contracts with the Owner.
- d. Documented record of unsatisfactory work on previous contracts with the Owner.

20-05 Interpretation of estimated proposal quantities. An estimate of quantities of work to be done and materials to be furnished under these specifications is given in the proposal. It is the result of careful calculations and is believed to be correct. It is given only as a basis for comparison of proposals and the award of the contract. The Owner does not expressly, or by implication, agree that the actual quantities involved will correspond exactly therewith; nor shall the bidder plead misunderstanding or deception because of such estimates of quantities, or of the character, location, or other conditions pertaining to the work. Payment to the Contractor will be made only for the actual quantities of work performed or materials furnished in accordance with the plans and specifications. It is understood that the quantities may be

increased or decreased as provided in the Section 40, paragraph 40-02, Alteration of Work and Quantities, without in any way invalidating the unit bid prices.

20-06 Examination of plans, specifications, and site. The bidder is expected to carefully examine the site of the proposed work, the proposal, plans, specifications, and contract forms. Bidders shall satisfy themselves to the character, quality, and quantities of work to be performed, materials to be furnished, and to the requirements of the proposed contract. The submission of a proposal shall be prima facie evidence that the bidder has made such examination and is satisfied to the conditions to be encountered in performing the work and the requirements of the proposed contract, plans, and specifications.

Boring logs and other records of subsurface investigations and tests are available for inspection of bidders. It is understood and agreed that such subsurface information, whether included in the plans, specifications, or otherwise made available to the bidder, was obtained and is intended for the Owner's design and estimating purposes only. Such information has been made available for the convenience of all bidders. It is further understood and agreed that each bidder is solely responsible for all assumptions, deductions, or conclusions which the bidder may make or obtain from their own examination of the boring logs and other records of subsurface investigations and tests that are furnished by the Owner.

20-07 Preparation of proposal. The bidder shall submit their proposal on the forms furnished by the Owner. All blank spaces in the proposal forms, unless explicitly stated otherwise, must be correctly filled in where indicated for each and every item for which a quantity is given. The bidder shall state the price (written in ink or typed) both in words and numerals which they propose for each pay item furnished in the proposal. In case of conflict between words and numerals, the words, unless obviously incorrect, shall govern.

The bidder shall correctly sign the proposal in ink. If the proposal is made by an individual, their name and post office address must be shown. If made by a partnership, the name and post office address of each member of the partnership must be shown. If made by a corporation, the person signing the proposal shall give the name of the state where the corporation was chartered and the name, titles, and business address of the president, secretary, and the treasurer. Anyone signing a proposal as an agent shall file evidence of their authority to do so and that the signature is binding upon the firm or corporation.

20-08 Responsive and responsible bidder. A responsive bid conforms to all significant terms and conditions contained in the Owner's invitation for bid. It is the Owner's responsibility to decide if the exceptions taken by a bidder to the solicitation are material or not and the extent of deviation it is willing to accept.

A responsible bidder has the ability to perform successfully under the terms and conditions of a proposed procurement, as defined in 2 CFR § 200.318(h). This includes such matters as Contractor integrity, compliance with public policy, record of past performance, and financial and technical resources.

20-09 Irregular proposals. Proposals shall be considered irregular for the following reasons:

a. If the proposal is on a form other than that furnished by the Owner, or if the Owner's form is altered, or if any part of the proposal form is detached.

b. If there are unauthorized additions, conditional or alternate pay items, or irregularities of any kind that make the proposal incomplete, indefinite, or otherwise ambiguous.

c. If the proposal does not contain a unit price for each pay item listed in the proposal, except in the case of authorized alternate pay items, for which the bidder is not required to furnish a unit price.

d. If the proposal contains unit prices that are obviously unbalanced.

e. If the proposal is not accompanied by the proposal guaranty specified by the Owner.

f. If the applicable Disadvantaged Business Enterprise information is incomplete.

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

20-10 Bid guarantee. Each separate proposal shall be accompanied by a bid bond, certified check, or other specified acceptable collateral, in the amount specified in the proposal form. Such bond, check, or collateral shall be made payable to the Owner.

20-11 Delivery of proposal. Each proposal submitted shall be placed in a sealed envelope plainly marked with the project number, location of airport, and name and business address of the bidder on the outside. When sent by mail, preferably registered, the sealed proposal, marked as indicated above, should be enclosed in an additional envelope. No proposal will be considered unless received at the place specified in the advertisement or as modified by Addendum before the time specified for opening all bids. Proposals received after the bid opening time shall be returned to the bidder unopened.

20-12 Withdrawal or revision of proposals. A bidder may withdraw or revise (by withdrawal of one proposal and submission of another) a proposal provided that the bidder's request for withdrawal is received by the Owner in writing or by fax or by email before the time specified for opening bids. Revised proposals must be received at the place specified in the advertisement before the time specified for opening all bids.

20-13 Public opening of proposals. Proposals shall be opened, and read, publicly at the time and place specified in the advertisement. Bidders, their authorized agents, and other interested persons are invited to attend. Proposals that have been withdrawn (by written or telegraphic request) or received after the time specified for opening bids shall be returned to the bidder unopened.

20-14 Disqualification of bidders. A bidder shall be considered disqualified for any of the following reasons:

a. Submitting more than one proposal from the same partnership, firm, or corporation under the same or different name.

b. Evidence of collusion among bidders. Bidders participating in such collusion shall be disqualified as bidders for any future work of the Owner until any such participating bidder has been reinstated by the Owner as a qualified bidder.

c. If the bidder is considered to be in "default" for any reason specified in paragraph 20-04, *Issuance of Proposal Forms*, of this section.

20-15 Discrepancies and Omissions. A Bidder who discovers discrepancies or omissions with the project bid documents shall immediately notify the Owner's Engineer of the matter. A bidder that has doubt as to the true meaning of a project requirement may submit to the Owner's Engineer a written request for interpretation no later than seven (7) days prior to bid opening.

Any interpretation of the project bid documents by the Owner's Engineer will be by written addendum issued by the Owner. The Owner will not consider any instructions, clarifications or interpretations of the bidding documents in any manner other than written addendum.

END OF SECTION 20

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SECTION 30 AWARD AND EXECUTION OF CONTRACT

30-01 Consideration of proposals. After the proposals are publicly opened and read, they will be compared on the basis of the summation of the products obtained by multiplying the estimated quantities shown in the proposal by the unit bid prices. If a bidder's proposal contains a discrepancy between unit bid prices written in words and unit bid prices written in numbers, the unit bid price written in words shall govern.

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

a. If the proposal is irregular as specified in Section 20, paragraph 20-09, *Irregular Proposals*.

b. If the bidder is disqualified for any of the reasons specified Section 20, paragraph 20-14, *Disqualification of Bidders*.

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

30-02 Award of contract. The award of a contract, if it is to be awarded, shall be made within 90 calendar days of the date specified for publicly opening proposals, unless otherwise specified herein.

If the Owner elects to proceed with an award of contract, the Owner will make award to the responsible bidder whose bid, conforming with all the material terms and conditions of the bid documents, is the lowest in price.

30-03 Cancellation of award. The Owner reserves the right to cancel the award without liability to the bidder, except return of proposal guaranty, at any time before a contract has been fully executed by all parties and is approved by the Owner in accordance with paragraph 30-07 *Approval of Contract*.

30-04 Return of proposal guaranty. All proposal guaranties, except those of the two lowest bidders, will be returned immediately after the Owner has made a comparison of bids as specified in the paragraph 30-01, *Consideration of Proposals*. Proposal guaranties of the two lowest bidders will be retained by the Owner until such time as an award is made, at which time, the unsuccessful bidder's proposal guaranty will be returned. The successful bidder's proposal guaranty will be returned as soon as the Owner receives the contract bonds as specified in paragraph 30-05, *Requirements of Contract Bonds*.

30-05 Requirements of contract bonds. At the time of the execution of the contract, the successful bidder shall furnish the Owner a surety bond or bonds that have been fully executed by the bidder and the surety guaranteeing the performance of the work and the payment of all legal debts that may be incurred by reason of the Contractor's performance of the work. The surety and the form of the bond or bonds shall be acceptable to the Owner. Unless otherwise specified in this subsection, the surety bond or bonds shall be in a sum equal to the full amount of the contract.

30-06 Execution of contract. The successful bidder shall sign (execute) the necessary agreements for entering into the contract and return the signed contract to the Owner, along with the fully executed surety bond or bonds specified in paragraph 30-05, *Requirements of Contract Bonds*, of this section, within 15 calendar days from the date mailed or otherwise delivered to the successful bidder.

30-07 Approval of contract. Upon receipt of the contract and contract bond or bonds that have been executed by the successful bidder, the Owner shall complete the execution of the contract in accordance with local laws or ordinances and return the fully executed contract to the Contractor. Delivery of the fully executed contract to the Contractor shall constitute the Owner's approval to be bound by the successful bidder's proposal and the terms of the contract.

30-08 Failure to execute contract. Failure of the successful bidder to execute the contract and furnish an acceptable surety bond or bonds within the period specified in paragraph 30-06, *Execution of Contract*, of this section shall be just cause for cancellation of the award and forfeiture of the proposal guaranty, not as a penalty, but as liquidated damages to the Owner.

END OF SECTION GP-30

SECTION 40 SCOPE OF WORK

40-01 Intent of contract. The intent of the contract is to provide for construction and completion, in every detail, of the work described. It is further intended that the Contractor shall furnish all labor, materials, equipment, tools, transportation, and supplies required to complete the work in accordance with the plans, specifications, and terms of the contract.

40-02 Alteration of work and quantities. The Owner reserves the right to make such changes in quantities and work as may be necessary or desirable to complete, in a satisfactory manner, the original intended work. Unless otherwise specified in the Contract, the Owner's Engineer or RPR shall be and is hereby authorized to make, in writing, such in-scope alterations in the work and variation of quantities as may be necessary to complete the work, provided such action does not represent a significant change in the character of the work.

For purpose of this section, a significant change in character of work means: any change that is outside the current contract scope of work; any change (increase or decrease) in the total contract cost by more than 25%; or any change in the total cost of a major contract item by more than 25%.

Work alterations and quantity variances that do not meet the definition of significant change in character of work shall not invalidate the contract nor release the surety. Contractor agrees to accept payment for such work alterations and quantity variances in accordance with Section 90, paragraph 90-03, *Compensation for Altered Quantities*.

Should the value of altered work or quantity variance meet the criteria for significant change in character of work, such altered work and quantity variance shall be covered by a supplemental agreement. Supplemental agreements shall also require consent of the Contractor's surety and separate performance and payment bonds. If the Owner and the Contractor are unable to agree on a unit adjustment for any contract item that requires a supplemental agreement, the Owner reserves the right to terminate the contract with respect to the item and make other arrangements for its completion.

40-03 Omitted items. The Owner, the Owner's Engineer or the RPR may provide written notice to the Contractor to omit from the work any contract item that does not meet the definition of major contract item. Major contract items may be omitted by a supplemental agreement. Such omission of contract items shall not invalidate any other contract provision or requirement.

Should a contract item be omitted or otherwise ordered to be non-performed, the Contractor shall be paid for all work performed toward completion of such item prior to the date of the order to omit such item. Payment for work performed shall be in accordance with Section 90, paragraph 90-04, *Payment for Omitted Items*.

40-04 Extra work. Should acceptable completion of the contract require the Contractor to perform an item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, Owner may issue a Change Order to cover the necessary extra work. Change orders for extra work shall contain agreed unit prices for performing the change order work in accordance with the requirements specified in the order, and shall contain any adjustment to the contract time that, in the RPR's opinion, is necessary for completion of the extra work.

When determined by the RPR to be in the Owner's best interest, the RPR may order the Contractor to proceed with extra work as provided in Section 90, paragraph 90-05, *Payment for Extra Work*. Extra work that is necessary for acceptable completion of the project, but is not within the general scope of the work covered by the original contract shall be covered by a supplemental agreement as defined in Section 10, paragraph 10-59, *Supplemental Agreement*.

If extra work is essential to maintaining the project critical path, RPR may order the Contractor to commence the extra work under a Time and Material contract method. Once sufficient detail is available to

establish the level of effort necessary for the extra work, the Owner shall initiate a change order or supplemental agreement to cover the extra work.

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

40-05 Maintenance of traffic. It is the explicit intention of the contract that the safety of aircraft, as well as the Contractor's equipment and personnel, is the most important consideration. The Contractor shall maintain traffic in the manner detailed in the Construction Safety and Phasing Plan (CSPP).

a. It is understood and agreed that the Contractor shall provide for the free and unobstructed movement of aircraft in the air operations areas (AOAs) of the airport with respect to their own operations and the operations of all subcontractors as specified in Section 80, paragraph 80-04, *Limitation of Operations*. It is further understood and agreed that the Contractor shall provide for the uninterrupted operation of visual and electronic signals (including power supplies thereto) used in the guidance of aircraft while operating to, from, and upon the airport as specified in Section 70, paragraph 70-15, *Contractor's Responsibility for Utility Service and Facilities of Others*.

b. With respect to their own operations and the operations of all subcontractors, the Contractor shall provide marking, lighting, and other acceptable means of identifying personnel, equipment, vehicles, storage areas, and any work area or condition that may be hazardous to the operation of aircraft, fire-rescue equipment, or maintenance vehicles at the airport in accordance with the construction safety and phasing plan (CSPP) and the safety plan compliance document (SPCD).

c. When the contract requires the maintenance of an existing road, street, or highway during the Contractor's performance of work that is otherwise provided for in the contract, plans, and specifications, the Contractor shall keep the road, street, or highway open to all traffic and shall provide maintenance as may be required to accommodate traffic. The Contractor, at their expense, shall be responsible for the repair to equal or better than preconstruction conditions of any damage caused by the Contractor's equipment and personnel. The Contractor shall furnish, erect, and maintain barricades, warning signs, flag person, and other traffic control devices in reasonable conformity with the Manual on Uniform Traffic Control Devices (MUTCD) (<http://mutcd.fhwa.dot.gov/>), unless otherwise specified. The Contractor shall also construct and maintain in a safe condition any temporary connections necessary for ingress to and egress from abutting property or intersecting roads, streets or highways. Unless otherwise specified herein, the Contractor will not be required to furnish snow removal for such existing road, street, or highway.

40-06 Removal of existing structures. All existing structures encountered within the established lines, grades, or grading sections shall be removed by the Contractor, unless such existing structures are otherwise specified to be relocated, adjusted up or down, salvaged, abandoned in place, reused in the work or to remain in place. The cost of removing such existing structures shall not be measured or paid for directly, but shall be included in the various contract items.

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

Except as provided in Section 40, paragraph 40-07, *Rights in and Use of Materials Found in the Work*, it is intended that all existing materials or structures that may be encountered (within the lines, grades, or grading sections established for completion of the work) shall be used in the work as otherwise provided for in the contract and shall remain the property of the Owner when so used in the work.

40-07 Rights in and use of materials found in the work. Should the Contractor encounter any material such as (but not restricted to) sand, stone, gravel, slag, or concrete slabs within the established lines, grades,

or grading sections, the use of which is intended by the terms of the contract to be embankment, the Contractor may at their own option either:

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

Should the Contractor wish to exercise option a., b., or c., the Contractor shall request the RPR's approval in advance of such use.

Should the RPR approve the Contractor's request to exercise option a., b., or c., the Contractor shall be paid for the excavation or removal of such material at the applicable contract price. The Contractor shall replace, at their expense, such removed or excavated material with an agreed equal volume of material that is acceptable for use in constructing embankment, backfills, or otherwise to the extent that such replacement material is needed to complete the contract work. The Contractor shall not be charged for use of such material used in the work or removed from the site.

Should the RPR approve the Contractor's exercise of option a., the Contractor shall be paid, at the applicable contract price, for furnishing and installing such material in accordance with requirements of the contract item in which the material is used.

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

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

40-08 Final cleanup. Upon completion of the work and before acceptance and final payment will be made, the Contractor shall remove from the site all machinery, equipment, surplus and discarded materials, rubbish, temporary structures, and stumps or portions of trees. The Contractor shall cut all brush and woods within the limits indicated and shall leave the site in a neat and presentable condition. Material cleared from the site and deposited on adjacent property will not be considered as having been disposed of satisfactorily, unless the Contractor has obtained the written permission of the property Owner.

END OF SECTION 40

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SECTION 50 CONTROL OF WORK

50-01 Authority of the Resident Project Representative (RPR). The RPR has final authority regarding the interpretation of project specification requirements. The RPR shall determine acceptability of the quality of materials furnished, method of performance of work performed, and the manner and rate of performance of the work. The RPR does not have the authority to accept work that does not conform to specification requirements.

50-02 Conformity with plans and specifications. All work and all materials furnished shall be in reasonably close conformity with the lines, grades, grading sections, cross-sections, dimensions, material requirements, and testing requirements that are specified (including specified tolerances) in the contract, plans, or specifications.

If the RPR finds the materials furnished, work performed, or the finished product not within reasonably close conformity with the plans and specifications, but that the portion of the work affected will, in their opinion, result in a finished product having a level of safety, economy, durability, and workmanship acceptable to the Owner, the RPR will advise the Owner of their determination that the affected work be accepted and remain in place. The RPR will document the determination and recommend to the Owner a basis of acceptance that will provide for an adjustment in the contract price for the affected portion of the work. Changes in the contract price must be covered by contract change order or supplemental agreement as applicable.

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

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

The term "reasonably close conformity" is also intended to provide the RPR with the authority, after consultation with the Sponsor and FAA, to use sound engineering judgment in their determinations to accept work that is not in strict conformity, but will provide a finished product equal to or better than that required by the requirements of the contract, plans and specifications.

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

50-03 Coordination of contract, plans, and specifications. The contract, plans, specifications, and all referenced standards cited are essential parts of the contract requirements. If electronic files are provided and used on the project and there is a conflict between the electronic files and hard copy plans, the hard copy plans shall govern. A requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In case of discrepancy, calculated dimensions will govern over scaled dimensions; contract technical specifications shall govern over contract general provisions, plans, cited standards for materials or testing, and cited advisory circulars (ACs); contract general provisions shall govern over plans, cited standards for materials or testing, and cited ACs; plans shall govern over cited standards for materials or testing and cited ACs. If any paragraphs contained in the Special Provisions conflict with General Provisions or Technical Specifications, the Special Provisions shall govern.

From time to time, discrepancies within cited testing standards occur due to the timing of the change, edits, and/or replacement of the standards. If the Contractor discovers any apparent discrepancy within standard test methods, the Contractor shall immediately ask the RPR for an interpretation and decision, and such decision shall be final.

The Contractor shall not take advantage of any apparent error or omission on the plans or specifications. In the event the Contractor discovers any apparent error or discrepancy, Contractor shall immediately notify the Owner or the designated representative in writing requesting their written interpretation and decision.

50-04 List of Special Provisions. None

50-05 Cooperation of Contractor. The Contractor shall be supplied with five hard copies or an electronic PDF of the plans and specifications. The Contractor shall have available on the construction site at all times one hardcopy each of the plans and specifications. Additional hard copies of plans and specifications may be obtained by the Contractor for the cost of reproduction.

The Contractor shall give constant attention to the work to facilitate the progress thereof, and shall cooperate with the RPR and their inspectors and with other Contractors in every way possible. The Contractor shall have a competent superintendent on the work at all times who is fully authorized as their agent on the work. The superintendent shall be capable of reading and thoroughly understanding the plans and specifications and shall receive and fulfill instructions from the RPR or their authorized representative.

50-06 Cooperation between Contractors. The Owner reserves the right to contract for and perform other or additional work on or near the work covered by this contract.

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

Each Contractor involved shall assume all liability, financial or otherwise, in connection with their own contract and shall protect and hold harmless the Owner from any and all damages or claims that may arise because of inconvenience, delays, or loss experienced because of the presence and operations of other Contractors working within the limits of the same project.

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

50-07 Construction layout and stakes. The Engineer/RPR shall establish necessary horizontal and vertical control. The establishment of Survey Control and/or reestablishment of survey control shall be by a State Licensed Land Surveyor. Contractor is responsible for preserving integrity of horizontal and vertical controls established by Engineer/RPR. In case of negligence on the part of the Contractor or their employees, resulting in the destruction of any horizontal and vertical control, the resulting costs will be deducted as a liquidated damage against the Contractor.

Prior to the start of construction, the Contractor will check all control points for horizontal and vertical accuracy and certify in writing to the RPR that the Contractor concurs with survey control established for the project. All lines, grades and measurements from control points necessary for the proper execution and control of the work on this project will be provided to the RPR. The Contractor is responsible to establish all layout required for the construction of the project.

Copies of survey notes will be provided to the RPR for each area of construction and for each placement of material as specified to allow the RPR to make periodic checks for conformance with plan grades, alignments and grade tolerances required by the applicable material specifications. Surveys will be provided to the RPR prior to commencing work items that cover or disturb the survey staking. Survey(s) and notes shall be provided in the following format(s): hard copy and electronic text files.

Laser, GPS, String line, or other automatic control shall be checked with temporary control as necessary. In the case of error, on the part of the Contractor, their surveyor, employees or subcontractors, resulting in established grades, alignment or grade tolerances that do not concur with those specified or shown on the plans, the Contractor is solely responsible for correction, removal, replacement and all associated costs at no additional cost to the Owner.

No direct payment will be made, unless otherwise specified in contract documents, for this labor, materials, or other expenses. The cost shall be included in the price of the bid for the various items of the Contract.

50-08 Authority and duties of Quality Assurance (QA) inspectors. QA inspectors shall be authorized to inspect all work done and all material furnished. Such QA inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials to be used. QA inspectors are not authorized to revoke, alter, or waive any provision of the contract. QA inspectors are not authorized to issue instructions contrary to the plans and specifications or to act as foreman for the Contractor.

QA Inspectors are authorized to notify the Contractor or their representatives of any failure of the work or materials to conform to the requirements of the contract, plans, or specifications and to reject such nonconforming materials in question until such issues can be referred to the RPR for a decision.

50-09 Inspection of the work. All materials and each part or detail of the work shall be subject to inspection. The RPR shall be allowed access to all parts of the work and shall be furnished with such information and assistance by the Contractor as is required to make a complete and detailed inspection.

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

Provide advance written notice to the RPR of work the Contractor plans to perform each week and each day. Any work done or materials used without written notice and allowing opportunity for inspection by the RPR may be ordered removed and replaced at the Contractor's expense.

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

50-10 Removal of unacceptable and unauthorized work. All work that does not conform to the requirements of the contract, plans, and specifications will be considered unacceptable, unless otherwise determined acceptable by the RPR as provided in paragraph 50-02, *Conformity with Plans and Specifications*.

Unacceptable work, whether the result of poor workmanship, use of defective materials, damage through carelessness, or any other cause found to exist prior to the final acceptance of the work, shall be removed immediately and replaced in an acceptable manner in accordance with the provisions of Section 70, paragraph 70-14, *Contractor's Responsibility for Work*.

No removal work made under provision of this paragraph shall be done without lines and grades having been established by the RPR. Work done contrary to the instructions of the RPR, work done beyond the lines shown on the plans or as established by the RPR, except as herein specified, or any extra work done without authority, will be considered as unauthorized and will not be paid for under the provisions of the contract. Work so done may be ordered removed or replaced at the Contractor's expense.

Upon failure on the part of the Contractor to comply with any order of the RPR made under the provisions of this subsection, the RPR will have authority to cause unacceptable work to be remedied or removed and replaced; and unauthorized work to be removed and recover the resulting costs as a liquidated damage against the Contractor.

50-11 Load restrictions. The Contractor shall comply with all legal load restrictions in the hauling of materials on public roads beyond the limits of the work. A special permit will not relieve the Contractor of liability for damage that may result from the moving of material or equipment.

The operation of equipment of such weight or so loaded as to cause damage to structures or to any other type of construction will not be permitted. Hauling of materials over the base course or surface course under construction shall be limited as directed. No loads will be permitted on a concrete pavement, base, or structure before the expiration of the curing period. The Contractor, at their own expense, shall be responsible for the repair to equal or better than preconstruction conditions of any damage caused by the Contractor's equipment and personnel.

50-12 Maintenance during construction. The Contractor shall maintain the work during construction and until the work is accepted. Maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and forces so that the work is maintained in satisfactory condition at all times.

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

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

50-13 Failure to maintain the work. Should the Contractor at any time fail to maintain the work as provided in paragraph 50-12, *Maintenance during Construction*, the RPR shall immediately notify the Contractor of such noncompliance. Such notification shall specify a reasonable time within which the Contractor shall be required to remedy such unsatisfactory maintenance condition. The time specified will give due consideration to the exigency that exists.

Should the Contractor fail to respond to the RPR's notification, the Owner may suspend any work necessary for the Owner to correct such unsatisfactory maintenance condition, depending on the exigency that exists. Any maintenance cost incurred by the Owner, shall be recovered as a liquidated damage against the Contractor.

50-14 Partial acceptance. If at any time during the execution of the project the Contractor substantially completes a usable unit or portion of the work, the occupancy of which will benefit the Owner, the Contractor may request the RPR to make final inspection of that unit. If the RPR finds upon inspection that the unit has been satisfactorily completed in compliance with the contract, the RPR may accept it as being complete, and the Contractor may be relieved of further responsibility for that unit. Such partial acceptance and beneficial occupancy by the Owner shall not void or alter any provision of the contract.

50-15 Final acceptance. Upon due notice from the Contractor of presumptive completion of the entire project, the RPR and Owner will make an inspection. If all construction provided for and contemplated by the contract is found to be complete in accordance with the contract, plans, and specifications, such inspection shall constitute the final inspection. The RPR shall notify the Contractor in writing of final acceptance as of the date of the final inspection.

If, however, the inspection discloses any work, in whole or in part, as being unsatisfactory, the RPR will notify the Contractor and the Contractor shall correct the unsatisfactory work. Upon correction of the work, another inspection will be made which shall constitute the final inspection, provided the work has been satisfactorily completed. In such event, the RPR will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of final inspection.

50-16 Claims for adjustment and disputes. If for any reason the Contractor deems that additional compensation is due for work or materials not clearly provided for in the contract, plans, or specifications or previously authorized as extra work, the Contractor shall notify the RPR in writing of their intention to claim such additional compensation before the Contractor begins the work on which the Contractor bases the claim. If such notification is not given or the RPR is not afforded proper opportunity by the Contractor for keeping strict account of actual cost as required, then the Contractor hereby agrees to waive any claim for such additional compensation. Such notice by the Contractor and the fact that the RPR has kept account of the cost of the work shall not in any way be construed as proving or substantiating the validity of the claim. When the work on which the claim for additional compensation is based has been completed, the Contractor shall, within 10 calendar days, submit a written claim to the RPR who will present it to the Owner for consideration in accordance with local laws or ordinances.

Nothing in this subsection shall be construed as a waiver of the Contractor's right to dispute final payment based on differences in measurements or computations.

50-17 Value Engineering Cost Proposal. The provisions of this paragraph will apply only to contracts awarded to the lowest bidder pursuant to competitive bidding.

On projects with original contract amounts in excess of \$100,000, the Contractor may submit to the RPR, in writing, proposals for modifying the plans, specifications or other requirements of the contract for the sole purpose of reducing the cost of construction. The value engineering cost proposal shall not impair, in any manner, the essential functions or characteristics of the project, including but not limited to service life, economy of operation, ease of maintenance, desired appearance, design and safety standards. This provision shall not apply unless the proposal submitted is specifically identified by the Contractor as being presented for consideration as a value engineering proposal.

Not eligible for value engineering cost proposals are changes in the basic design of a pavement type, runway and taxiway lighting, visual aids, hydraulic capacity of drainage facilities, or changes in grade or alignment that reduce the geometric standards of the project.

As a minimum, the following information shall be submitted by the Contractor with each proposal:

- a. A description of both existing contract requirements for performing the work and the proposed changes, with a discussion of the comparative advantages and disadvantages of each.
- b. An itemization of the contract requirements that must be changed if the proposal is adopted.
- c. A detailed estimate of the cost of performing the work under the existing contract and under the proposed changes.
- d. A statement of the time by which a change order adopting the proposal must be issued.
- e. A statement of the effect adoption of the proposal will have on the time for completion of the contract.
- f. The contract items of work affected by the proposed changes, including any quantity variation attributable to them.

The Contractor may withdraw, in whole or in part, any value engineering cost proposal not accepted by the RPR, within the period specified in the proposal. The provisions of this subsection shall not be construed to require the RPR to consider any value engineering cost proposal that may be submitted.

The Contractor shall continue to perform the work in accordance with the requirements of the contract until a change order incorporating the value engineering cost proposal has been issued. If a change order has not been issued by the date upon which the Contractor's value engineering cost proposal specifies that a decision should be made, or such other date as the Contractor may subsequently have requested in writing, such value engineering cost proposal shall be deemed rejected.

The RPR shall be the sole judge of the acceptability of a value engineering cost proposal and of the estimated net savings from the adoption of all or any part of such proposal. In determining the estimated net savings, the RPR may disregard the contract bid prices if, in the RPR's judgment such prices do not represent a fair measure of the value of the work to be performed or deleted.

The Owner may require the Contractor to share in the Owner's costs of investigating a value engineering cost proposal submitted by the Contractor as a condition of considering such proposal. Where such a condition is imposed, the Contractor shall acknowledge acceptance of it in writing. Such acceptance shall constitute full authority for the Owner to deduct the cost of investigating a value engineering cost proposal from amounts payable to the Contractor under the contract.

If the Contractor's value engineering cost proposal is accepted in whole or in part, such acceptance will be by a contract change order that shall specifically state that it is executed pursuant to this paragraph. Such change order shall incorporate the changes in the plans and specifications which are necessary to permit the value engineering cost proposal or such part of it as has been accepted and shall include any conditions upon which the RPR's approval is based. The change order shall also set forth the estimated net savings attributable to the value engineering cost proposal. The net savings shall be determined as the difference in costs between the original contract costs for the involved work items and the costs occurring as a result of the proposed change. The change order shall also establish the net savings agreed upon and shall provide for adjustment in the contract price that will divide the net savings equally between the Contractor and the Owner.

The Contractor's 50% share of the net savings shall constitute full compensation to the Contractor for the value engineering cost proposal and the performance of the work.

Acceptance of the value engineering cost proposal and performance of the work shall not extend the time of completion of the contract unless specifically provided for in the contract change order.

END OF SECTION GP-50

SECTION 60 CONTROL OF MATERIALS

60-01 Source of supply and quality requirements. The materials used in the work shall conform to the requirements of the contract, plans, and specifications. Unless otherwise specified, such materials that are manufactured or processed shall be new (as compared to used or reprocessed).

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

At the RPR's option, materials may be approved at the source of supply before delivery. If it is found after trial that sources of supply for previously approved materials do not produce specified products, the Contractor shall furnish materials from other sources.

The Contractor shall furnish airport lighting equipment that meets the requirements of the specifications; and is listed in AC 150/5345-53, *Airport Lighting Equipment Certification Program* and *Addendum*, that is in effect on the date of advertisement.

60-02 Samples, tests, and cited specifications. All materials used in the work shall be inspected, tested, and approved by the RPR before incorporation in the work unless otherwise designated. Any work in which untested materials are used without approval or written permission of the RPR shall be performed at the Contractor's risk. Materials found to be unacceptable and unauthorized will not be paid for and, if directed by the RPR, shall be removed at the Contractor's expense.

Unless otherwise designated, quality assurance tests will be made by and at the expense of the Owner in accordance with the cited standard methods of ASTM, American Association of State Highway and Transportation Officials (AASHTO), federal specifications, Commercial Item Descriptions, and all other cited methods, which are current on the date of advertisement for bids.

The testing organizations performing on-site quality assurance field tests shall have copies of all referenced standards on the construction site for use by all technicians and other personnel. Unless otherwise designated, samples for quality assurance will be taken by a qualified representative of the RPR. All materials being used are subject to inspection, test, or rejection at any time prior to or during incorporation into the work. Copies of all tests will be furnished to the Contractor's representative at their request after review and approval of the RPR.

A copy of all Contractor QC test data shall be provided to the RPR daily, along with printed reports, in an approved format, on a weekly basis. After completion of the project, and prior to final payment, the Contractor shall submit a final report to the RPR showing all test data reports, plus an analysis of all results showing ranges, averages, and corrective action taken on all failing tests.

The Contractor shall employ a Quality Control (QC) testing organization to perform all Contractor required QC tests in accordance with Item C-100 Contractor Quality Control Program (CQCP).

60-03 Certification of compliance/analysis (COC/COA). The RPR may permit the use, prior to sampling and testing, of certain materials or assemblies when accompanied by manufacturer's COC stating that such materials or assemblies fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer. Each lot of such materials or assemblies delivered to the work must be accompanied by a certificate of compliance in which the lot is clearly identified. The COA is the manufacturer's COC and includes all applicable test results.

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

The form and distribution of certificates of compliance shall be as approved by the RPR.

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

- a. Conformance to the specified performance, testing, quality or dimensional requirements; and,
- b. Suitability of the material or assembly for the use intended in the contract work.

The RPR shall be the sole judge as to whether the proposed “or equal” is suitable for use in the work.

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

60-04 Plant inspection. The RPR or their authorized representative may inspect, at its source, any specified material or assembly to be used in the work. Manufacturing plants may be inspected from time to time for the purpose of determining compliance with specified manufacturing methods or materials to be used in the work and to obtain samples required for acceptance of the material or assembly.

Should the RPR conduct plant inspections, the following conditions shall exist:

- a. The RPR shall have the cooperation and assistance of the Contractor and the producer with whom the Contractor has contracted for materials.

- b. The RPR shall have full entry at all reasonable times to such parts of the plant that concern the manufacture or production of the materials being furnished.

- c. If required by the RPR, the Contractor shall arrange for adequate office or working space that may be reasonably needed for conducting plant inspections. Place office or working space in a convenient location with respect to the plant.

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

60-05 Engineer/ Resident Project Representative (RPR) field office. An Engineer/RPR field office is not required.

60-06 Storage of materials. Materials shall be stored to assure the preservation of their quality and fitness for the work. Stored materials, even though approved before storage, may again be inspected prior to their use in the work. Stored materials shall be located to facilitate their prompt inspection. The Contractor shall coordinate the storage of all materials with the RPR. Materials to be stored on airport property shall not create an obstruction to air navigation nor shall they interfere with the free and unobstructed movement of aircraft. Unless otherwise shown on the plans and/or CSPP, the storage of materials and the location of the Contractor’s plant and parked equipment or vehicles shall be as directed by the RPR. Private property shall not be used for storage purposes without written permission of the Owner or lessee of such property. The Contractor shall make all arrangements and bear all expenses for the storage of materials on private property. Upon request, the Contractor shall furnish the RPR a copy of the property Owner’s permission.

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

60-07 Unacceptable materials. Any material or assembly that does not conform to the requirements of the contract, plans, or specifications shall be considered unacceptable and shall be rejected. The Contractor shall remove any rejected material or assembly from the site of the work, unless otherwise instructed by the RPR.

Rejected material or assembly, the defects of which have been corrected by the Contractor, shall not be returned to the site of the work until such time as the RPR has approved its use in the work.

60-08 Owner furnished materials. The Contractor shall furnish all materials required to complete the work, except those specified, if any, to be furnished by the Owner. Owner-furnished materials shall be made available to the Contractor at the location specified.

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

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

END OF SECTION 60

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SECTION 70 LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC

70-01 Laws to be observed. The Contractor 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; and shall protect and indemnify the Owner and all their officers, agents, or servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by the Contractor or the Contractor's employees.

70-02 Permits, licenses, and taxes. The Contractor shall procure all permits and licenses, pay all charges, fees, and taxes, and give all notices necessary and incidental to the due and lawful execution of the work.

70-03 Patented devices, materials, and processes. If the Contractor is required or desires to use any design, device, material, or process covered by letters of patent or copyright, the Contractor shall provide for such use by suitable legal agreement with the Patentee or Owner. The Contractor and the surety shall indemnify and hold harmless the Owner, any third party, or political subdivision from any and all claims for infringement by reason of the use of any such patented design, device, material or process, or any trademark or copyright, and shall indemnify the Owner for any costs, expenses, and damages which it may be obliged to pay by reason of an infringement, at any time during the execution or after the completion of the work.

70-04 Restoration of surfaces disturbed by others. The Owner reserves the right to authorize the construction, reconstruction, or maintenance of any public or private utility service, FAA or National Oceanic and Atmospheric Administration (NOAA) facility, or a utility service of another government agency at any time during the progress of the work. To the extent that such construction, reconstruction, or maintenance has been coordinated with the Owner, such authorized work (by others) must be shown on the plans and is indicated as follows:

- Owner (Utility or Other Facility): MTAA
- Location (See Plan Sheet No.): AP-2.0
- Person to Contact (Name, Title, Address and Phone): Terry Poley, MTAA
Maintenance Director, 785-633-9957

Except as listed above, the Contractor shall not permit any individual, firm, or corporation to excavate or otherwise disturb such utility services or facilities located within the limits of the work without the written permission of the RPR.

Should the Owner of public or private utility service, FAA, or NOAA facility, or a utility service of another government agency be authorized to construct, reconstruct, or maintain such utility service or facility during the progress of the work, the Contractor shall cooperate with such Owners by arranging and performing the work in this contract to facilitate such construction, reconstruction or maintenance by others whether or not such work by others is listed above. When ordered as extra work by the RPR, the Contractor shall make all necessary repairs to the work which are due to such authorized work by others, unless otherwise provided for in the contract, plans, or specifications. It is understood and agreed that the Contractor shall not be entitled to make any claim for damages due to such authorized work by others or for any delay to the work resulting from such authorized work.

70-05 Federal Participation. The United States Government has agreed to reimburse the Owner for some portion of the contract costs. The contract work is subject to the inspection and approval of duly authorized representatives of the FAA Administrator. No requirement of this contract shall be construed as making the United States a party to the contract nor will any such requirement interfere, in any way, with the rights of either party to the contract.

70-06 Sanitary, health, and safety provisions. The Contractor's worksite and facilities shall comply with applicable federal, state, and local requirements for health, safety and sanitary provisions.

70-07 Public convenience and safety. The Contractor shall control their operations and those of their subcontractors and all suppliers, to assure the least inconvenience to the traveling public. Under all circumstances, safety shall be the most important consideration.

The Contractor shall maintain the free and unobstructed movement of aircraft and vehicular traffic with respect to their own operations and those of their own subcontractors and all suppliers in accordance with Section 40, paragraph 40-05, *Maintenance of Traffic*, and shall limit such operations for the convenience and safety of the traveling public as specified in Section 80, paragraph 80-04, *Limitation of Operations*.

The Contractor shall remove or control debris and rubbish resulting from its work operations at frequent intervals, and upon the order of the RPR. If the RPR determines the existence of Contractor debris in the work site represents a hazard to airport operations and the Contractor is unable to respond in a prompt and reasonable manner, the RPR reserves the right to assign the task of debris removal to a third party and recover the resulting costs as a liquidated damage against the Contractor.

70-08 Construction Safety and Phasing Plan (CSPP). The Contractor shall complete the work in accordance with the approved Construction Safety and Phasing Plan (CSPP) developed in accordance with AC 150/5370-2, Operational Safety on Airports During Construction. The CSPP is on sheet(s) C0.01 thru C0.04

70-09 Use of explosives. The use of explosives is not permitted on this project.

70-10 Protection and restoration of property and landscape. The Contractor shall be responsible for the preservation of all public and private property, and shall protect carefully from disturbance or damage all land monuments and property markers until the Engineer/RPR has witnessed or otherwise referenced their location and shall not move them until directed.

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

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

70-11 Responsibility for damage claims. The Contractor shall indemnify and hold harmless the Engineer/RPR and the Owner and their officers, agents, and employees from all suits, actions, or claims, of any character, brought because of any injuries or damage received or sustained by any person, persons, or property on account of the operations of the Contractor; or on account of or in consequence of any neglect in safeguarding the work; or through use of unacceptable materials in constructing the work; or because of any act or omission, neglect, or misconduct of said Contractor; or because of any claims or amounts recovered from any infringements of patent, trademark, or copyright; or from any claims or amounts arising or recovered under the "Workmen's Compensation Act," or any other law, ordinance, order, or decree. Money due the Contractor under and by virtue of their own contract considered necessary by the Owner for such purpose may be retained for the use of the Owner or, in case no money is due, their own surety may be held until such suits, actions, or claims for injuries or damages shall have been settled and suitable evidence to that effect furnished to the Owner, except that money due the Contractor will not be withheld

when the Contractor produces satisfactory evidence that he or she is adequately protected by public liability and property damage insurance.

70-12 Third party beneficiary clause. It is specifically agreed between the parties executing the contract that it is not intended by any of the provisions of any part of the contract to create for the public or any member thereof, a third-party beneficiary or to authorize anyone not a party to the contract to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of the contract.

70-13 Opening sections of the work to traffic. If it is necessary for the Contractor to complete portions of the contract work for the beneficial occupancy of the Owner prior to completion of the entire contract, such “phasing” of the work must be specified below and indicated on the approved Construction Safety and Phasing Plan (CSPP) and the project plans. When so specified, the Contractor shall complete such portions of the work on or before the date specified or as otherwise specified. See Sheet C1.1.0 in the plans for suggested construction phasing.

Upon completion of any portion of work listed above, such portion shall be accepted by the Owner in accordance with Section 50, paragraph 50-14, *Partial Acceptance*.

No portion of the work may be opened by the Contractor until directed by the Owner in writing. Should it become necessary to open a portion of the work to traffic on a temporary or intermittent basis, such openings shall be made when, in the opinion of the RPR, such portion of the work is in an acceptable condition to support the intended traffic. Temporary or intermittent openings are considered to be inherent in the work and shall not constitute either acceptance of the portion of the work so opened or a waiver of any provision of the contract. Any damage to the portion of the work so opened that is not attributable to traffic which is permitted by the Owner shall be repaired by the Contractor at their expense.

The Contractor shall make their own estimate of the inherent difficulties involved in completing the work under the conditions herein described and shall not claim any added compensation by reason of delay or increased cost due to opening a portion of the contract work.

The Contractor must conform to safety standards contained AC 150/5370-2 and the approved CSPP.

Contractor shall refer to the plans, specifications, and the approved CSPP to identify barricade requirements, temporary and/or permanent markings, airfield lighting, guidance signs and other safety requirements prior to opening up sections of work to traffic.

70-14 Contractor’s responsibility for work. Until the RPR’s final written acceptance of the entire completed work, excepting only those portions of the work accepted in accordance with Section 50, paragraph 50-14, *Partial Acceptance*, the Contractor shall have the charge and care thereof and shall take every precaution against injury or damage to any part due to the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the work. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of the work occasioned by any of the above causes before final acceptance and shall bear the expense thereof except damage to the work due to unforeseeable causes beyond the control of and without the fault or negligence of the Contractor, including but not restricted to acts of God such as earthquake, tidal wave, tornado, hurricane or other cataclysmic phenomenon of nature, or acts of the public enemy or of government authorities.

If the work is suspended for any cause whatever, the Contractor shall be responsible for the work and shall take such precautions necessary to prevent damage to the work. The Contractor shall provide for normal drainage and shall erect necessary temporary structures, signs, or other facilities at their own expense. During such period of suspension of work, the Contractor shall properly and continuously maintain in an acceptable growing condition all living material in newly established planting, seeding, and sodding furnished under the contract, and shall take adequate precautions to protect new tree growth and other important vegetative growth against injury.

70-15 Contractor's responsibility for utility service and facilities of others. As provided in paragraph 70-04, *Restoration of Surfaces Disturbed by Others*, the Contractor shall cooperate with the owner of any public or private utility service, FAA or NOAA, or a utility service of another government agency that may be authorized by the Owner to construct, reconstruct or maintain such utility services or facilities during the progress of the work. In addition, the Contractor shall control their operations to prevent the unscheduled interruption of such utility services and facilities.

To the extent that such public or private utility services, FAA, or NOAA facilities, or utility services of another governmental agency are known to exist within the limits of the contract work, the approximate locations have been indicated on the plans and/or in the contract documents and the owners are indicated as follows:

Federal Aviation Administration – Forbes FCT
Rick Stadler
Building 620, P.O. Box 19305
Forbes Field Airport
Topeka, Kansas 66619
Office Number: 785-862-9421

AT & T
Doug Holthaus
823 SE Quincy Street, Room 1050
Topeka, Kansas 66612
Office Number: 785-276-6146

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

It is further understood and agreed that the Contractor shall, upon execution of the contract, notify the Owners of all utility services or other facilities of their plan of operations. Such notification shall be in writing addressed to "The Person to Contact" as provided in this paragraph and paragraph 70-04, *Restoration of Surfaces Disturbed By Others*. A copy of each notification shall be given to the RPR.

In addition to the general written notification provided, it shall be the responsibility of the Contractor to keep such individual Owners advised of changes in their plan of operations that would affect such Owners.

Prior to beginning the work in the general vicinity of an existing utility service or facility, the Contractor shall again notify each such Owner of their plan of operation. If, in the Contractor's opinion, the Owner's assistance is needed to locate the utility service or facility or the presence of a representative of the Owner is desirable to observe the work, such advice should be included in the notification. Such notification shall be given by the most expeditious means to reach the utility owner's "Person to Contact" no later than two normal business days prior to the Contractor's commencement of operations in such general vicinity. The Contractor shall furnish a written summary of the notification to the RPR.

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

Where the outside limits of an underground utility service have been located and staked on the ground, the Contractor shall be required to use hand excavation methods within 3 feet (1 m) of such outside limits at such points as may be required to ensure protection from damage due to the Contractor's operations.

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

The Contractor shall bear all costs of damage and restoration of service to any utility service or facility due to their operations whether due to negligence or accident. The Owner reserves the right to deduct such costs from any monies due or which may become due the Contractor, or their own surety.

70-15.1 FAA facilities and cable runs. The Contractor is hereby advised that the construction limits of the project include existing facilities and buried cable runs that are owned, operated and maintained by the FAA. The Contractor, during the execution of the project work, shall comply with the following:

a. The Contractor shall permit FAA maintenance personnel the right of access to the project work site for purposes of inspecting and maintaining all existing FAA owned facilities.

b. The Contractor shall provide notice to the FAA Air Traffic Organization (ATO)/Technical Operations/System Support Center (SSC) Point-of-Contact through the airport Owner a minimum of seven (7) calendar days prior to commencement of construction activities in order to permit sufficient time to locate and mark existing buried cables and to schedule any required facility outages.

c. If execution of the project work requires a facility outage, the Contractor shall contact the FAA Point-of-Contact a minimum of 72 hours prior to the time of the required outage.

d. Any damage to FAA cables, access roads, or FAA facilities during construction caused by the Contractor's equipment or personnel whether by negligence or accident will require the Contractor to repair or replace the damaged cables, access road, or FAA facilities to FAA requirements. The Contractor shall not bear the cost to repair damage to underground facilities or utilities improperly located by the FAA.

e. If the project work requires the cutting or splicing of FAA owned cables, the FAA Point-of-Contact shall be contacted a minimum of 72 hours prior to the time the cable work commences. The FAA reserves the right to have a FAA representative on site to observe the splicing of the cables as a condition of acceptance. All cable splices are to be accomplished in accordance with FAA specifications and require approval by the FAA Point-of-Contact as a condition of acceptance by the Owner. The Contractor is hereby advised that FAA restricts the location of where splices may be installed. If a cable splice is required in a location that is not permitted by FAA, the Contractor shall furnish and install a sufficient length of new cable that eliminates the need for any splice.

70-16 Furnishing rights-of-way. The Owner will be responsible for furnishing all rights-of-way upon which the work is to be constructed in advance of the Contractor's operations.

70-17 Personal liability of public officials. In carrying out any of the contract provisions or in exercising any power or authority granted by this contract, there shall be no liability upon the Engineer, RPR, their authorized representatives, or any officials of the Owner either personally or as an official of the Owner. It is understood that in such matters they act solely as agents and representatives of the Owner.

70-18 No waiver of legal rights. Upon completion of the work, the Owner will expeditiously make final inspection and notify the Contractor of final acceptance. Such final acceptance, however, shall not preclude or stop the Owner from correcting any measurement, estimate, or certificate made before or after completion of the work, nor shall the Owner be precluded or stopped from recovering from the Contractor or their surety, or both, such overpayment as may be sustained, or by failure on the part of the Contractor to fulfill their obligations under the contract. A waiver on the part of the Owner of any breach of any part of the contract shall not be held to be a waiver of any other or subsequent breach.

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

70-19 Environmental protection. The Contractor shall comply with all federal, state, and local laws and regulations controlling pollution of the environment. The Contractor shall take necessary precautions to prevent pollution of streams, lakes, ponds, and reservoirs with fuels, oils, asphalts, chemicals, or other harmful materials and to prevent pollution of the atmosphere from particulate and gaseous matter.

70-20 Archaeological and historical findings. Unless otherwise specified in this subsection, the Contractor is advised that the site of the work is not within any property, district, or site, and does not contain any building, structure, or object listed in the current National Register of Historic Places published by the United States Department of Interior.

Should the Contractor encounter, during their operations, any building, part of a building, structure, or object that is incongruous with its surroundings, the Contractor shall immediately cease operations in that location and notify the RPR. The RPR will immediately investigate the Contractor's finding and the Owner will direct the Contractor to either resume operations or to suspend operations as directed.

Should the Owner order suspension of the Contractor's operations in order to protect an archaeological or historical finding, or order the Contractor to perform extra work, such shall be covered by an appropriate contract change order or supplemental agreement as provided in Section 40, paragraph 40-04, *Extra Work*, and Section 90, paragraph 90-05, *Payment for Extra Work*. If appropriate, the contract change order or supplemental agreement shall include an extension of contract time in accordance with Section 80, paragraph 80-07, *Determination and Extension of Contract Time*.

70-21 Insurance Requirements. See the Supplementary Provisions for insurance requirements.

END OF SECTION 70

SECTION 80 EXECUTION AND PROGRESS

80-01 Subletting of contract. The Owner will not recognize any subcontractor on the work. The Contractor shall at all times when work is in progress be represented either in person, by a qualified superintendent, or by other designated, qualified representative who is duly authorized to receive and execute orders of the Resident Project Representative (RPR).

The Contractor shall perform, with his organization, an amount of work equal to at least 25 percent of the total contract cost.

Should the Contractor elect to assign their contract, said assignment shall be concurred in by the surety, shall be presented for the consideration and approval of the Owner, and shall be consummated only on the written approval of the Owner.

The Contractor shall provide copies of all subcontracts to the RPR 14 days prior to being utilized on the project. As a minimum, the information shall include the following:

- Subcontractor's legal company name.
- Subcontractor's legal company address, including County name.
- Principal contact person's name, telephone and fax number.
- Complete narrative description, and dollar value of the work to be performed by the subcontractor.
- Copies of required insurance certificates in accordance with the specifications.
- Minority/ non-minority status.

80-02 Notice to proceed (NTP). The Owners notice to proceed will state the date on which contract time commences. The Contractor is expected to commence project operations within 10 days of the NTP date. The Contractor shall notify the RPR at least 24 hours in advance of the time contract operations begins. The Contractor shall not commence any actual operations prior to the date on which the notice to proceed is issued by the Owner.

80-03 Execution and progress. Unless otherwise specified, the Contractor shall submit their coordinated construction schedule showing all work activities for the RPR's review and acceptance at least 10 days prior to the start of work. The Contractor's progress schedule, once accepted by the RPR, will represent the Contractor's baseline plan to accomplish the project in accordance with the terms and conditions of the Contract. The RPR will compare actual Contractor progress against the baseline schedule to determine that status of the Contractor's performance. The Contractor shall provide sufficient materials, equipment, and labor to guarantee the completion of the project in accordance with the plans and specifications within the time set forth in the proposal.

If the Contractor falls significantly behind the submitted schedule, the Contractor shall, upon the RPR's request, submit a revised schedule for completion of the work within the contract time and modify their operations to provide such additional materials, equipment, and labor necessary to meet the revised schedule. Should the execution of the work be discontinued for any reason, the Contractor shall notify the RPR at least 24 hours in advance of resuming operations.

The Contractor shall not commence any actual construction prior to the date on which the NTP is issued by the Owner.

The project schedule shall be prepared as a network diagram in Critical Path Method (CPM), Program Evaluation and Review Technique (PERT), or other format, or as otherwise specified. It shall include information on the sequence of work activities, milestone dates, and activity duration. The schedule shall

show all work items identified in the project proposal for each work area and shall include the project start date and end date.

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

80-04 Limitation of operations. The Contractor shall control their operations and the operations of their subcontractors and all suppliers to provide for the free and unobstructed movement of aircraft in the air operations areas (AOA) of the airport.

When the work requires the Contractor to conduct their operations within an AOA of the airport, the work shall be coordinated with airport operations (through the RPR) at least 48 hours prior to commencement of such work. The Contractor shall not close an AOA until so authorized by the RPR and until the necessary temporary marking, signage and associated lighting is in place as provided in Section 70, paragraph 70-08, *Construction Safety and Phasing Plan (CSPP)*.

When the contract work requires the Contractor to work within an AOA of the airport on an intermittent basis (intermittent opening and closing of the AOA), the Contractor shall maintain constant communications as specified; immediately obey all instructions to vacate the AOA; and immediately obey all instructions to resume work in such AOA. Failure to maintain the specified communications or to obey instructions shall be cause for suspension of the Contractor's operations in the AOA until satisfactory conditions are provided. The areas of the AOA identified in the Construction Safety Phasing Plan (CSPP) and as listed below, cannot be closed to operating aircraft to permit the Contractor's operations on a continuous basis and will therefore be closed to aircraft operations intermittently as follows: See CSPP Sheets C0.1 thru C0.3 in the plans for AOA closures, time periods they can be closed, type of communications required and the control authority necessary.

The Contractor shall be required to conform to safety standards contained in AC 150/5370-2, Operational Safety on Airports During Construction and the approved CSPP.

80-04.1 Operational safety on airport during construction. All Contractors' operations shall be conducted in accordance with the approved project Construction Safety and Phasing Plan (CSPP) and the Safety Plan Compliance Document (SPCD) and the provisions set forth within the current version of AC 150/5370-2, Operational Safety on Airports During Construction. The CSPP included within the contract documents conveys minimum requirements for operational safety on the airport during construction activities. The Contractor shall prepare and submit a SPCD that details how it proposes to comply with the requirements presented within the CSPP.

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

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

No deviation or modifications may be made to the approved CSPP and SPCD unless approved in writing by the Owner. The necessary coordination actions to review Contractor proposed modifications to an approved CSPP or approved SPCD can require a significant amount of time.

80-05 Character of workers, methods, and equipment. The Contractor shall, at all times, employ sufficient labor and equipment for prosecuting the work to full completion in the manner and time required by the contract, plans, and specifications.

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

Any person employed by the Contractor or by any subcontractor who violates any operational regulations or operational safety requirements and, in the opinion of the RPR, does not perform his work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the RPR, be removed immediately by the Contractor or subcontractor employing such person, and shall not be employed again in any portion of the work without approval of the RPR.

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

All equipment that is proposed to be used on the work shall be of sufficient size and in such mechanical condition as to meet requirements of the work and to produce a satisfactory quality of work. Equipment used on any portion of the work shall not cause injury to previously completed work, adjacent property, or existing airport facilities due to its use.

When the methods and equipment to be used by the Contractor in accomplishing the work are not prescribed in the contract, the Contractor is free to use any methods or equipment that will accomplish the work in conformity with the requirements of the contract, plans, and specifications.

When the contract specifies the use of certain methods and equipment, such methods and equipment shall be used unless otherwise authorized by the RPR. If the Contractor desires to use a method or type of equipment other than specified in the contract, the Contractor may request authority from the RPR to do so. The request shall be in writing and shall include a full description of the methods and equipment proposed and of the reasons for desiring to make the change. If approval is given, it will be on the condition that the Contractor will be fully responsible for producing work in conformity with contract requirements. If, after trial use of the substituted methods or equipment, the RPR determines that the work produced does not meet contract requirements, the Contractor shall discontinue the use of the substitute method or equipment and shall complete the remaining work with the specified methods and equipment. The Contractor shall remove any deficient work and replace it with work of specified quality, or take such other corrective action as the RPR may direct. No change will be made in basis of payment for the contract items involved nor in contract time as a result of authorizing a change in methods or equipment under this paragraph.

80-06 Temporary suspension of the work. The Owner shall have the authority to suspend the work wholly, or in part, for such period or periods the Owner may deem necessary, due to unsuitable weather, or other conditions considered unfavorable for the execution of the work, or for such time necessary due to the failure on the part of the Contractor to carry out orders given or perform any or all provisions of the contract.

In the event that the Contractor is ordered by the Owner, in writing, to suspend work for some unforeseen cause not otherwise provided for in the contract and over which the Contractor has no control, the Contractor may be reimbursed for actual money expended on the work during the period of shutdown. No allowance will be made for anticipated profits. The period of shutdown shall be computed from the effective date of the written order to suspend work to the effective date of the written order to resume the work. Claims for such compensation shall be filed with the RPR within the time period stated in the RPR's order to resume work. The Contractor shall submit with their own claim information substantiating the amount shown on the claim. The RPR will forward the Contractor's claim to the Owner for consideration in accordance with local laws or ordinances. No provision of this article shall be construed as entitling the Contractor to compensation for delays due to inclement weather or for any other delay provided for in the contract, plans, or specifications.

If it becomes necessary to suspend work for an indefinite period, the Contractor shall store all materials in such manner that they will not become an obstruction nor become damaged in any way. The Contractor shall take every precaution to prevent damage or deterioration of the work performed and provide for normal drainage of the work. The Contractor shall erect temporary structures where necessary to provide for traffic on, to, or from the airport.

80-07 Determination and extension of contract time. The number of calendar days shall be stated in the proposal and contract and shall be known as the Contract Time.

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

80-07.1 Contract time based on calendar days. Contract Time based on calendar days shall consist of the number of calendar days stated in the contract counting from the effective date of the Notice to Proceed and including all Saturdays, Sundays, holidays, and non-work days. All calendar days elapsing between the effective dates of the Owner's orders to suspend and resume all work, due to causes not the fault of the Contractor, shall be excluded.

At the time of final payment, the contract time shall be increased in the same proportion as the cost of the actually completed quantities bears to the cost of the originally estimated quantities in the proposal. Such increase in the contract time shall not consider either cost of work or the extension of contract time that has been covered by a change order or supplemental agreement. Charges against the contract time will cease as of the date of final acceptance.

80-08 Failure to complete on time. For each calendar day, as specified in the contract, that any work remains uncompleted after the contract time (including all extensions and adjustments as provided in paragraph 80-07, *Determination and Extension of Contract Time*) the sum specified in the contract and proposal as liquidated damages (LD) will be deducted from any money due or to become due the Contractor or their own surety. Such deducted sums shall not be deducted as a penalty but shall be considered as liquidation of a reasonable portion of damages including but not limited to additional engineering services that will be incurred by the Owner should the Contractor fail to complete the work in the time provided in their contract.

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

80-09 Default and termination of contract. The Contractor shall be considered in default of their contract and such default will be considered as cause for the Owner to terminate the contract for any of the following reasons, if the Contractor:

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

- i. For any other cause whatsoever, fails to carry on the work in an acceptable manner.

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

If the Contractor or surety, within a period of 10 days after such notice, does not proceed in accordance therewith, then the Owner will, upon written notification from the RPR of the facts of such delay, neglect, or default and the Contractor's failure to comply with such notice, have full power and authority without violating the contract, to take the execution of the work out of the hands of the Contractor. The Owner may appropriate or use any or all materials and equipment that have been mobilized for use in the work and are acceptable and may enter into an agreement for the completion of said contract according to the terms and provisions thereof, or use such other methods as in the opinion of the RPR will be required for the completion of said contract in an acceptable manner.

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

80-10 Termination for national emergencies. The Owner shall terminate the contract or portion thereof by written notice when the Contractor is prevented from proceeding with the construction contract as a direct result of an Executive Order of the President with respect to the execution of war or in the interest of national defense.

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

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

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

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

80-11 Work area, storage area and sequence of operations. The Contractor shall obtain approval from the RPR prior to beginning any work in all areas of the airport. No operating runway, taxiway, or air operations area (AOA) shall be crossed, entered, or obstructed while it is operational. The Contractor shall plan and coordinate work in accordance with the approved CSPP and SPCD.

END OF SECTION 80

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SECTION 90 MEASUREMENT AND PAYMENT

90-01 Measurement of quantities. All work completed under the contract will be measured by the RPR, or their authorized representatives, using United States Customary Units of Measurement.

The method of measurement and computations to be used in determination of quantities of material furnished and of work performed under the contract will be those methods generally recognized as conforming to good engineering practice.

Unless otherwise specified, longitudinal measurements for area computations will be made horizontally, and no deductions will be made for individual fixtures (or leave-outs) having an area of 9 square feet or less. Unless otherwise specified, transverse measurements for area computations will be the neat dimensions shown on the plans or ordered in writing by the RPR.

Unless otherwise specified, all contract items which are measured by the linear foot such as electrical ducts, conduits, pipe culverts, underdrains, and similar items shall be measured parallel to the base or foundation upon which such items are placed.

The term “lump sum” when used as an item of payment will mean complete payment for the work described in the contract. When a complete structure or structural unit (in effect, “lump sum” work) is specified as the unit of measurement, the unit will be construed to include all necessary fittings and accessories.

When requested by the Contractor and approved by the RPR in writing, material specified to be measured by the cubic yard may be weighed, and such weights will be converted to cubic yards for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the RPR and shall be agreed to by the Contractor before such method of measurement of pay quantities is used.

Excavation and Embankment Volume In computing volumes of excavation, the average end area method will be used unless otherwise specified.

Measurement and Proportion by Weight The term “ton” will mean the short ton consisting of 2,000 pounds avoirdupois. All materials that are measured or proportioned by weights shall be weighed on accurate, independently certified scales by competent, qualified personnel at locations designated by the RPR. If material is shipped by rail, the car weight may be accepted provided that only the actual weight of material is paid for. However, car weights will not be acceptable for material to be passed through mixing plants. Trucks used to haul material being paid for by weight shall be weighed empty daily at such times as the RPR directs, and each truck shall bear a plainly legible identification mark.

Measurement by Volume Materials to be measured by volume in the hauling vehicle shall be hauled in approved vehicles and measured therein at the point of delivery. Vehicles for this purpose may be of any size or type acceptable for the materials hauled, provided that the body is of such shape that the actual contents may be readily and accurately determined. All vehicles shall be loaded to at least their water level capacity, and all loads shall be leveled when the vehicles arrive at the point of delivery.

Asphalt Material will be measured by the gallon or ton. When measured by volume, such volumes will be measured at 60°F or will be corrected to the volume at 60°F using ASTM D1250 for asphalts. Net certified scale weights or weights based on certified volumes in the case of rail shipments will be used as a basis of measurement, subject to correction when asphalt material has been lost from the car or the distributor, wasted, or otherwise not incorporated in the work. When asphalt materials are shipped by truck or transport, net certified weights by volume, subject to correction for loss or foaming, will be used for computing quantities.

Cement will be measured by the ton or hundredweight.

Structures will be measured according to neat lines shown on the plans or as altered to fit field conditions.

Timber will be measured by the thousand feet board measure (MFBM) actually incorporated in the structure. Measurement will be based on nominal widths and thicknesses and the extreme length of each piece.

Plates and Sheets The thickness of plates and galvanized sheet used in the manufacture of corrugated metal pipe, metal plate pipe culverts and arches, and metal cribbing will be specified and measured in decimal fraction of inch.

Miscellaneous Items When standard manufactured items are specified such as fence, wire, plates, rolled shapes, pipe conduit, etc., and these items are identified by gauge, unit weight, section dimensions, etc., such identification will be considered to be nominal weights or dimensions. Unless more stringently controlled by tolerances in cited specifications, manufacturing tolerances established by the industries involved will be accepted.

Scales must be tested for accuracy and serviced before use. Scales for weighing materials which are required to be proportioned or measured and paid for by weight shall be furnished, erected, and maintained by the Contractor, or be certified permanently installed commercial scales. Platform scales shall be installed and maintained with the platform level and rigid bulkheads at each end.

Scales shall be accurate within 0.5% of the correct weight throughout the range of use. The Contractor shall have the scales checked under the observation of the RPR before beginning work and at such other times as requested. The intervals shall be uniform in spacing throughout the graduated or marked length of the beam or dial and shall not exceed 0.1% of the nominal rated capacity of the scale, but not less than one pound. The use of spring balances will not be permitted.

In the event inspection reveals the scales have been “overweighing” (indicating more than correct weight) they will be immediately adjusted. All materials received subsequent to the last previous correct weighting-accuracy test will be reduced by the percentage of error in excess of 0.5%.

In the event inspection reveals the scales have been under-weighing (indicating less than correct weight), they shall be immediately adjusted. No additional payment to the Contractor will be allowed for materials previously weighed and recorded.

Beams, dials, platforms, and other scale equipment shall be so arranged that the operator and the RPR can safely and conveniently view them.

Scale installations shall have available ten standard 50-pound weights for testing the weighing equipment or suitable weights and devices for other approved equipment.

All costs in connection with furnishing, installing, certifying, testing, and maintaining scales; for furnishing check weights and scale house; and for all other items specified in this subsection, for the weighing of materials for proportioning or payment, shall be included in the unit contract prices for the various items of the project.

Rental Equipment will be measured by time in hours of actual working time and necessary traveling time of the equipment within the limits of the work. Special equipment ordered in connection with extra work will be measured as agreed in the change order or supplemental agreement authorizing such work as provided in paragraph 90-05 *Payment for Extra Work*.

Pay Quantities When the estimated quantities for a specific portion of the work are designated as the pay quantities in the contract, they shall be the final quantities for which payment for such specific portion of the work will be made, unless the dimensions of said portions of the work shown on the plans are revised

by the RPR. If revised dimensions result in an increase or decrease in the quantities of such work, the final quantities for payment will be revised in the amount represented by the authorized changes in the dimensions.

90-02 Scope of payment. The Contractor shall receive and accept compensation provided for in the contract as full payment for furnishing all materials, for performing all work under the contract in a complete and acceptable manner, and for all risk, loss, damage, or expense of whatever character arising out of the nature of the work or the execution thereof, subject to the provisions of Section 70, paragraph 70-18, *No Waiver of Legal Rights*.

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

90-03 Compensation for altered quantities. When the accepted quantities of work vary from the quantities in the proposal, the Contractor shall accept as payment in full, so far as contract items are concerned, payment at the original contract price for the accepted quantities of work actually completed and accepted. No allowance, except as provided for in Section 40, paragraph 40-02, *Alteration of Work and Quantities*, will be made for any increased expense, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor which results directly from such alterations or indirectly from their own unbalanced allocation of overhead and profit among the contract items, or from any other cause.

90-04 Payment for omitted items. As specified in Section 40, paragraph 40-03, *Omitted Items*, the RPR shall have the right to omit from the work (order nonperformance) any contract item, except major contract items, in the best interest of the Owner.

Should the RPR omit or order nonperformance of a contract item or portion of such item from the work, the Contractor shall accept payment in full at the contract prices for any work actually completed and acceptable prior to the RPR’s order to omit or non-perform such contract item.

Acceptable materials ordered by the Contractor or delivered on the work prior to the date of the RPR’s order will be paid for at the actual cost to the Contractor and shall thereupon become the property of the Owner.

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

90-05 Payment for extra work. Extra work, performed in accordance with Section 40, paragraph 40-04, *Extra Work*, will be paid for at the contract prices or agreed prices specified in the change order or supplemental agreement authorizing the extra work.

90-06 Partial payments. Partial payments will be made to the Contractor at least once each month as the work progresses. Said payments will be based upon estimates, prepared by the RPR, of the value of the work performed and materials complete and in place, in accordance with the contract, plans, and specifications. Such partial payments may also include the delivered actual cost of those materials stockpiled and stored in accordance with paragraph 90-07, *Payment for Materials on Hand*. No partial payment will be made when the amount due to the Contractor since the last estimate amounts to less than five hundred dollars.

a. From the total of the amount determined to be payable on a partial payment, 10% percent of such total amount will be deducted and retained by the Owner for protection of the Owner’s interests. Unless otherwise instructed by the Owner, the amount retained by the Owner will be in effect until the final payment is made except as follows:

(1) Contractor may request release of retainage on work that has been partially accepted by the Owner in accordance with Section 50-03. Contractor must provide a certified invoice to the RPR that supports the value of retainage held by the Owner for partially accepted work.

(2) In lieu of retainage, the Contractor may exercise at its option the establishment of an escrow account per paragraph 90-08.

b. The Contractor is required to pay all subcontractors for satisfactory performance of their contracts no later than 30 days after the Contractor has received a partial payment. Contractor must provide the Owner evidence of prompt and full payment of retainage held by the prime Contractor to the subcontractor within 30 days after the subcontractor's work is satisfactorily completed. A subcontractor's work is satisfactorily completed when all the tasks called for in the subcontract have been accomplished and documented as required by the Owner. When the Owner has made an incremental acceptance of a portion of a prime contract, the work of a subcontractor covered by that acceptance is deemed to be satisfactorily completed.

c. When at least 95% of the work has been completed to the satisfaction of the RPR, the RPR shall, at the Owner's discretion and with the consent of the surety, prepare estimates of both the contract value and the cost of the remaining work to be done. The Owner may retain an amount not less than twice the contract value or estimated cost, whichever is greater, of the work remaining to be done. The remainder, less all previous payments and deductions, will then be certified for payment to the Contractor.

It is understood and agreed that the Contractor shall not be entitled to demand or receive partial payment based on quantities of work in excess of those provided in the proposal or covered by approved change orders or supplemental agreements, except when such excess quantities have been determined by the RPR to be a part of the final quantity for the item of work in question.

No partial payment shall bind the Owner to the acceptance of any materials or work in place as to quality or quantity. All partial payments are subject to correction at the time of final payment as provided in paragraph 90-09, *Acceptance and Final Payment*.

The Contractor shall deliver to the Owner a complete release of all claims for labor and material arising out of this contract before the final payment is made. If any subcontractor or supplier fails to furnish such a release in full, the Contractor may furnish a bond or other collateral satisfactory to the Owner to indemnify the Owner against any potential lien or other such claim. The bond or collateral shall include all costs, expenses, and attorney fees the Owner may be compelled to pay in discharging any such lien or claim.

90-07 Payment for materials on hand. Partial payments may be made to the extent of the delivered cost of materials to be incorporated in the work, provided that such materials meet the requirements of the contract, plans, and specifications and are delivered to acceptable sites on the airport property or at other sites in the vicinity that are acceptable to the Owner. Such delivered costs of stored or stockpiled materials may be included in the next partial payment after the following conditions are met:

a. The material has been stored or stockpiled in a manner acceptable to the RPR at or on an approved site.

b. The Contractor has furnished the RPR with acceptable evidence of the quantity and quality of such stored or stockpiled materials.

c. The Contractor has furnished the RPR with satisfactory evidence that the material and transportation costs have been paid.

d. The Contractor has furnished the Owner legal title (free of liens or encumbrances of any kind) to the material stored or stockpiled.

e. The Contractor has furnished the Owner evidence that the material stored or stockpiled is insured against loss by damage to or disappearance of such materials at any time prior to use in the work.

It is understood and agreed that the transfer of title and the Owner's payment for such stored or stockpiled materials shall in no way relieve the Contractor of their responsibility for furnishing and placing such materials in accordance with the requirements of the contract, plans, and specifications.

In no case will the amount of partial payments for materials on hand exceed the contract price for such materials or the contract price for the contract item in which the material is intended to be used.

No partial payment will be made for stored or stockpiled living or perishable plant materials.

The Contractor shall bear all costs associated with the partial payment of stored or stockpiled materials in accordance with the provisions of this paragraph.

90-08 Payment of withheld funds. At the Contractor's option, if an Owner withholds retainage in accordance with the methods described in paragraph 90-06 *Partial Payments*, the Contractor may request that the Owner deposit the retainage into an escrow account. The Owner's deposit of retainage into an escrow account is subject to the following conditions:

a. The Contractor shall bear all expenses of establishing and maintaining an escrow account and escrow agreement acceptable to the Owner.

b. The Contractor shall deposit to and maintain in such escrow only those securities or bank certificates of deposit as are acceptable to the Owner and having a value not less than the retainage that would otherwise be withheld from partial payment.

c. The Contractor shall enter into an escrow agreement satisfactory to the Owner.

d. The Contractor shall obtain the written consent of the surety to such agreement.

90-09 Acceptance and final payment. When the contract work has been accepted in accordance with the requirements of Section 50, paragraph 50-15, *Final Acceptance*, the RPR will prepare the final estimate of the items of work actually performed. The Contractor shall approve the RPR's final estimate or advise the RPR of the Contractor's objections to the final estimate which are based on disputes in measurements or computations of the final quantities to be paid under the contract as amended by change order or supplemental agreement. The Contractor and the RPR shall resolve all disputes (if any) in the measurement and computation of final quantities to be paid within 30 calendar days of the Contractor's receipt of the RPR's final estimate. If, after such 30-day period, a dispute still exists, the Contractor may approve the RPR's estimate under protest of the quantities in dispute, and such disputed quantities shall be considered by the Owner as a claim in accordance with Section 50, paragraph 50-16, *Claims for Adjustment and Disputes*.

After the Contractor has approved, or approved under protest, the RPR's final estimate, and after the RPR's receipt of the project closeout documentation required in paragraph 90-11, *Contractor Final Project Documentation*, final payment will be processed based on the entire sum, or the undisputed sum in case of approval under protest, determined to be due the Contractor less all previous payments and all amounts to be deducted under the provisions of the contract. All prior partial estimates and payments shall be subject to correction in the final estimate and payment.

If the Contractor has filed a claim for additional compensation under the provisions of Section 50, paragraph 50-16, *Claims for Adjustments and Disputes*, or under the provisions of this paragraph, such claims will be considered by the Owner in accordance with local laws or ordinances. Upon final adjudication of such claims, any additional payment determined to be due the Contractor will be paid pursuant to a supplemental final estimate.

90-10 Construction warranty.

a. In addition to any other warranties in this contract, the Contractor warrants that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material,

workmanship, or design furnished, or performed by the Contractor or any subcontractor or supplier at any tier.

b. This warranty shall continue for a period of one year from the date of final acceptance of the work, except as noted. If the Owner takes possession of any part of the work before final acceptance, this warranty shall continue for a period of one year from the date the Owner takes possession. However, this will not relieve the Contractor from corrective items required by the final acceptance of the project work.

c. The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Owner real or personal property, when that damage is the result of the Contractor's failure to conform to contract requirements; or any defect of equipment, material, workmanship, or design furnished by the Contractor.

d. The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for one year from the date of repair or replacement.

e. The Owner will notify the Contractor, in writing, within seven (7) days after the discovery of any failure, defect, or damage.

f. If the Contractor fails to remedy any failure, defect, or damage within 14 days after receipt of notice, the Owner shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

g. With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall: (1) Obtain all warranties that would be given in normal commercial practice; (2) Require all warranties to be executed, in writing, for the benefit of the Owner, as directed by the Owner, and (3) Enforce all warranties for the benefit of the Owner.

h. This warranty shall not limit the Owner's rights with respect to latent defects, gross mistakes, or fraud.

90-11 Contractor Final Project Documentation. Approval of final payment to the Contractor is contingent upon completion and submittal of the items listed below. The final payment will not be approved until the RPR approves the Contractor's final submittal. The Contractor shall:

a. Provide two (2) copies of all manufacturers warranties specified for materials, equipment, and installations.

b. Provide weekly payroll records (not previously received) from the general Contractor and all subcontractors.

c. Complete final cleanup in accordance with Section 40, paragraph 40-08, *Final Cleanup*.

d. Complete all punch list items identified during the Final Inspection.

e. Provide complete release of all claims for labor and material arising out of the Contract.

f. Provide a certified statement signed by the subcontractors, indicating actual amounts paid to the Disadvantaged Business Enterprise (DBE) subcontractors and/or suppliers associated with the project.

g. When applicable per state requirements, return copies of sales tax completion forms.

h. Manufacturer's certifications for all items incorporated in the work.

i. All required record drawings, as-built drawings or as-constructed drawings.

j. Project Operation and Maintenance (O&M) Manual(s).

k. Security for Construction Warranty.

l. Equipment commissioning documentation submitted, if required.

END OF SECTION 90

SECTION 11 85 04
PASSENGER BOARDING BRIDGE

PART 1 GENERAL

1.01 SUMMARY

- A. This specification pertains to the apron drive passenger boarding bridges (PBBs) to be furnished and installed as part of this project.
 - 1. This specification is intended to include both two and three tunnel type passenger boarding bridges, of corrugated or truss style construction, and all lengths thereof, as well as any fixed section of tunnel used as a walkway to the apron drive bridge.
 - 2. The aircraft parking requirements for each PBB can be seen in the contract drawings.
- B. Products Supplied But Not Installed Under This Section
 - 1. None
- C. Products Installed But Not Supplied Under This Section
 - 1. None
- D. Unless noted otherwise on the drawings, the work shall include everything necessary or incidental to complete the installation including wire raceway (conduit), raceway fittings, outlet boxes, pull boxes, terminal cabinets, 120 volt AC power circuits, and insulated ground cables. Such equipment shall be furnished and installed as Division 26 electrical work. The Contractor shall furnish all necessary information to other contractor(s) to ensure that a proper conduit system will be installed. Provide accurate as-built drawings indicating all installed conduit and junction boxes.
- E. The Contractor shall cooperate with all other contractors engaged in this project and shall coordinate the passenger boarding bridge installation so that all work will proceed in a manner which is in the best interests of the project.
- F. It is the purpose of this specification to require the furnishing of highest quality materials, equipment, and workmanship. The work shall be in accordance with this specification and conform to the designs, layouts, and descriptions on the drawings.

1.02 RELATED SECTIONS

- A. Drawings, General Provisions of the Contract, including General and Special Conditions, as well as General mechanical and electrical materials and methods of installation apply to work of this section.

1.03 REFERENCES

- A. The bridge shall conform to all applicable federal, state, and municipal codes and regulations that apply to the installation site. The design of all parts and subassemblies shall be in accordance with good commercial practices to assure safe, efficient, and practical designs in keeping with standards that have been adopted by the passenger loading bridge industry. Applicable documents include, but are not limited to, the following. The latest approved version or edition, by the authority having jurisdiction, of the following codes, references and standards shall apply. If the authority having jurisdiction has not approved or adopted a particular code, reference, or standard, the latest published edition shall be applicable.
 - 1. American Institute of Steel Construction (AISC)
 - 2. Society of Automotive Engineers (SAE) Standards
 - 3. American Society of Mechanical Engineers (ASME) Standards
 - 4. National Fire Protection Association (NFPA-415)
 - 5. Life Safety Code (NFPA-101)
 - 6. American's with Disabilities Act (ADA)
 - 7. Steel Structures Painting Council (SSPC)
 - 8. National Electrical Code (NEC)
 - 9. National Electrical Manufacturers Association (NEMA) Standards
 - 10. Occupational Safety and Health Administration (OSHA)
 - 11. American Welding Society (AWS) Standards

12. American Society for Testing and Materials (ASTM)
13. American Insurance Association (AIA)
14. Structural Steel ASTM-A36
15. Hollow Structural Sections (HSS) ASTM-500
16. Wide Flange Sections ASTM-A992
17. Steel Pipe ASTM-A53
18. Steel Sheet ASTM-A570
19. T-1 Steel ASTM-A514 and A517
20. Hinge Pins ASTM-A 311 Grade 1018 and Grade 1144
21. Bolts—Standard ASTM-A307
22. Bolts—High Strength SAE-J429 Grade 5 and 8

- B. In the event of conflict between a reference and another reference or this specification, request clarifications. All responses are final, and will be at no additional cost to the Owner.

1.04 DEFINITIONS

- A. The term "Owner", shall include the Owner, or his authorized representative.
- B. The term "Architect" shall refer to SmithgroupJRR/Corgan as defined in Division 1.
- C. The terms, "Seller", "Contractor", "Provider" and "Manufacturer" as referred to herein, are synonymous.
- D. The term "Passenger Boarding Bridge", "Passenger Loading Bridge", "Boarding Bridge" "Loading Bridge", "bridge", "PLB", and "PBB" as used within this specification and throughout the contract documents is understood to mean the components, subcomponents and subsystems that constitute a complete, operable, and maintainable Passenger Boarding Bridge and as referred to herein, are synonymous.

1.05 SUBMITTALS

- A. Each PBB shall have a standalone submittal package.
 1. Fixed walkways, and/or corridors when present, shall be included in the associated PBB submittal under a separate tab/section.
 2. Gates will multiple PBB shall have a submittal for each bridge.
 3. Ancillary equipment (PCA, PWC, 400Hz, etc) for each PBB should be included in each passenger boarding bridge submittal with separate tabs/sections for each.
- B. Drawings, sketches, details, and materials shall be submitted in the English language, with United States Units, including dimensions, volumes, weights, and forces. The use of the metric or SI units is not acceptable.
- C. Delegated Design Submittals:
 1. Short circuit study & calculation
 - a. Upon completion of the installation of the PBB, a study shall be completed with the final "as built" information in coordination with the building electrical contractor for a complete evaluation up to the disconnect(s). Disconnects may include manufacturers panel, or external fused/non-fused disconnects as indicated in the design drawings.
 2. Arc Flash Analysis
 - a. Upon completion of the installation of the PBB, an analysis shall be completed with the final "as built" information in coordination with the building electrical contractor for a complete evaluation up to the disconnect(s). Disconnects may include manufacturers panel, or external fused/non-fused disconnects as indicated in the design drawings.
- D. Bid-Submittals: The following submittals shall be included with bid.
 1. NFPA 415 certificates and manufacturer's compliance statement per 1.12.C.9.
 2. Spare Parts List: Provide manufacturer's recommended spare parts list. Spare parts list shall include Owner applicable pricing. Spare parts pricing shall remain valid for two (2) years from the date of final completion.
 3. Proposed PBB models with manufacturer's standard cut sheets for proposed models.
 4. Foundation loads for each passenger boarding bridge model proposed.
 5. UL/ETL Certification per 1.06.C.

- E. Pre-Manufacture Submittals: The following submittals shall be made as necessary to meet the project schedule, and shall be submitted to and approved prior to manufacturing the PBB units.
1. The manufacturer shall submit shop drawings, technical specifications, and descriptive product data for review and approval. An index prepared in chronological order listing drawings, sketches, details, and material submitted shall be provided.
 2. Product data for selected models including specialties, accessories, and the following:
 - a. Critical design items related to the human factors including operation and maintenance shall be addressed with Shop Drawing and shall include, but not be limited to:
 - 1) General:
 - (a) General Arrangement drawings to include dimensions
 - (b) General Erections drawings to include dimensions
 - (c) Plan drawings showing foundation locations and details. Any change to aircraft position(s) must be approved by the Owners Project Manager.
 - 2) Load Sheets for each bridge shall be provided
 - 3) Interior Finishes:
 - (a) Interior scheme of each type
 - (b) Transition details
 - (c) Wall finish attachment
 - (d) Light fixture details and layout
 - (e) Joint details
 - (f) Interior Finishes
 - (g) Floor cover edging details, including, lines of demarcation between floor cover material and hard surfaced floor at wall areas and treatment at doors and thresholds
 - 4) Exterior Configurations:
 - (a) General bridge layout
 - (b) Exterior sketch of each type
 - (c) Graphics
 - (d) Paint finishes
 - (e) Handrails
 - (f) Flashing (terminal to passenger loading bridge)
 - (g) Flashing (terminal to fixed walkway)
 - (h) Flashing (fixed walkway to passenger loading bridge)
 - (i) Flashing (bridge segments)
 - (j) Cab door seal
 - (k) Ramp Service Stairway
 - (l) Illuminated gate signs including fonts and font sizes.
 - (m) Horizontal
 - 5) Cab:
 - (a) Operator's cone of visibility
 - (b) Control panel location and functional layout with labeling.
 - (c) View panels
 - (d) Interface with aircraft
 - (e) Designs necessary for appropriate mating with required aircraft types (including auto-leveling devices)
 - (f) Operator protection while bridge is in motion with weather door open
 - (g) Operator instruction placard
 - (h) Copies of all graphic screen shots in color, including indication of different colors for those items that change colors to indicate changing states of equipment or systems.
 - 6) Electrical:
 - (a) Large electrical schematic drawings (11"x17" sheet size minimum).
 - 7) Safety Markings:

- (a) All safety decals and stencils
 - b. PBB operational envelopes dimensioned.
 - c. Motor ratings and electrical characteristics including motor and fan accessories.
 - d. Materials, gauges and finishes, including paints, wallboards, floor coverings, etcetera.
 - e. Engineering Certification:
 - 1) Manufacturer shall submit Engineering Certification stating that the PBB and all components thereof are constructed in accordance with this specification, as well as all codes and standards and local laws and regulations applicable to the design and construction of passenger boarding bridges, including without limitation, NFPA, Underwriter's Laboratories, and OSHA.
 - f. Shop Drawings: Provide schematics and interconnection diagrams, indicate front and side views of PBB with overall dimensions and weights shown; conduit/cable entrance locations and requirements; and nameplate legends. Differentiate between manufacturer-installed wiring and field-installed connections.
 - g. Installation Details: Provide complete installation details including, without limitation, installation details of all appurtenances. Show installed configuration as well as any pertinent details regarding interface to other equipment and systems, include electrical connection service points.
- F. Pre-Ship Submittals: The following shall be submitted for approval prior to shipping PBB units to the project site:
 - 1. Factory Test Reports: Indicate factory tests and results and inspection procedures.
- G. Pre-Substantial Completion Submittals: The following submittals shall be submitted and approved prior to 14 days before substantial completion, unless otherwise noted herein.
 - 1. Operation and Maintenance Manuals.
 - a. Provide two (2) bound copies, and three (3) electronic copies (CD) of the approved, comprehensive Operation and Maintenance Manual for each model PBB supplied fourteen (14) days prior to Substantial Completion.
 - b. The manuals shall fully describe each product, system, or subsystem numbered logically and separated into sections and contained in rigid plastic binders with identification inserted in clear plastic pockets on front and spine of each binder. Manuals shall be assembled in accordance with ATA 101.
 - c. The content of the manuals shall be limited to information and data that specifically apply to products provided and shall include, at minimum, a general description, theory of operation, routine normal and special operating instructions and sequences. Also included shall be routine maintenance procedures and guides for troubleshooting, disassembly and reassembly instructions, and recommended spare parts list including current prices and sources.
 - d. Wiring diagrams and schematics shall be incorporated into the manuals to clearly show features such as controls, switches, instruments, and indicators by name and location.
 - e. Interconnection with other systems shall clearly be indicated, including 400Hz equipment, Preconditioned Air equipment, and ancillaries.
 - f. Special Tools List: Provide a list of any special tools required to perform any field performable maintenance tasks.
 - g. Spare Parts List: Provide manufacturer's recommended spare parts list.
 - h. Lubricants list: Provide manufacturer's recommended lubrication product list. Base on a single lubricant manufacturer.
 - 2. Training Program: At least 60 days prior to substantial completion, a training program summary, course syllabus, instructor qualifications, and copy of the training manual shall be submitted for review and approval.
 - 3. Field Commissioning Report: Submit proposed field commissioning report for approval. This approved form shall be utilized for the final field commissioning as specified in Section 3.
- H. Installation Submittals: The following submittals shall be submitted and approved during installation if necessary per these specifications.

1. Welding Certifications per PBB Mechanical Erection and Lifting section of this specification.
- I. Pre-Final Completion Submittals: The following submittals shall be submitted and approved prior to 14 days before final completion.
 1. As-Built Drawings. Provide field edited redlined project drawings showing deviations from design documents.
 2. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and have been registered with the manufacturer.
 3. Field Commissioning Report: A completed field commissioning report as specified herein. Utilize approved form.
 4. Training Rosters. Provide training roster with trainee names, dates and types of training, as well as durations.
 5. All original software packages and documentation, registered in the Owner's name.
 6. Hard copies as well as electronic (compact disk or flash card) copies of all final programs loaded into all machinery under this contract.
 7. Training DVD's.

1.06 QUALITY ASSURANCE

- A. The PBB and all components thereof shall be constructed in accordance with all codes and standards and local laws and regulations applicable to the design and construction of this type of equipment, which are generally accepted and used as good practice throughout the industry, including without limitation, NFPA, Underwriter's Laboratories, OSHA, SAE Publications, American National Standards, Military Standards, etc. The design of all parts and subassemblies shall be in accordance with good commercial practice and shall be the responsibility of the manufacturer to assure safe, efficient and practical design in keeping with requirements peculiar to this type system.
 1. NFPA Compliance:
 - a. Comply with applicable portions of NFPA 70 and NFPA 415 for components and completed and installed products.
 2. NEMA Compliance:
 - a. Motors, enclosures and electrical accessories shall comply with NEMA standards and be so rated.
 3. UL Compliance:
 - a. PBB shall be UL, or ETL listed and shall be labeled by a nationally recognized testing laboratory at the time of bid. Submit verification with bid submittals.
- B. The manufacturer shall be a qualified source, who has been regularly engaged in the engineering, manufacturing and installation of commercial aviation PBB equipment and components for a minimum of five (5) years and with a minimum of one hundred (100) units installed.
- C. Qualified manufacturers and installers will have completed no less than five (5) jobs of similar size and scope within the last five (5) years.
- D. The manufacturer shall have proven technical capabilities and adequate manufacturing facilities together with sufficient financial depth and stability to permit prompt and satisfactory execution of the contract.
- E. Workmanship
 1. High standards of workmanship and methods shall be employed in the manufacture of the passenger boarding bridge. Particular attention shall be given to metal finishes to assure freedom from blemishes, defects, burrs and sharp edges. Quality of welding, painting, riveting and alignment of parts shall be maintained.
 2. All welds shall be of adequate length, area and strength to sustain the design load. Welds shall be reasonably uniform in appearance and cross section, and shall be free of cracks, inclusion, porosity, cavities, and other physical and metallurgical defects. Welds shall not be ground in order to improve appearance except as required for flush surfaces or non-structural parts. All welding performed in the fabrication, assembly and/or mounting of the passenger boarding bridge shall be accomplished by an appropriately licensed certified

welder.

3. Assembly screws, bolts, studs, and other threaded fasteners shall be corrosion-resistant material or plated to prevent corrosion. All fasteners shall be tight and shall retain tension in service.
4. All wires and lines subject to chafing shall be provided with some means of protection. Acceptable anti-chafing devices include grommets, flexible sleeves or jackets, and other approved materials.

1.07 DELIVERY, STORAGE, AND PROTECTION

- A. Lift and support PBB's with the manufacturer's designated lifting or supporting points.
- B. Deliver equipment as factory-assembled unit, or sub-units whenever practical for shipping purposes with protective covering.
- C. Store equipment and material in suitable facilities until delivery, installation, and final acceptance.
- D. Coordinate the delivery acceptance of this equipment at the job site. Receive, offload, store and protect this equipment until such time as it has been installed and final accepted by the Owner.
- E. Properly dispose of all waste, including, but not limited to, packaging, crates, etcetera.

1.08 PROJECT/SITE CONDITIONS

- A. This is a new construction. It shall be the responsibility of the responding Contractor to verify all conditions and dimensions which pertain to this work.
- B. The Manufacturer shall be responsible for verifying installation locations and methods and shall notify the Engineer of any conflicts or code violations prior to manufacture of the PBB units. Verifications shall include field verifications of terminal building heights, appurtenances and finishes, including terminal doors; electrical, mechanical, special systems, and communications interfaces; as well as PBB and walkway foundation locations, rotations, elevations and bolt details.
 1. Modifications to eliminate conflicts or code violations will be coordinated with and approved by the Engineer. +Modifications shall be made at no additional cost to the Owner.
- C. Should alternate mounting configurations or physical attributes, other than those specified herein, or indicated on the project drawings, be proposed, manufacturers shall submit alternates for approval prior to bid date. Alternate mounting, configurations, or attributes shall be provided at no additional cost to the Owner.

1.09 ROYALTIES AND LICENSE FEES

- A. The PBB manufacturer shall pay all royalties and license fees and shall defend all suits or claims for whatever infringements of any prior, pending, or future patent rights and shall save the Owner and Engineer harmless from liability, expense, or loss on account thereof, with respect to any processes, devices, methods, articles, inventions, or procedures used by the manufacturer.

1.10 WARRANTY

- A. Provide a full parts and labor warranty for the new units and ancillaries. Labor warranty shall be performed by factory trained service technicians. Warranty shall run 24 months from the date of substantial completion . Date of substantial completion is defined as the date the system is turned over by the manufacturer, and accepted by the Owner for normal operation, or the date that the facility/Gate is placed into commercial operation, whichever occurs later. All warranty services shall be at the site of the installation. Provider shall be responsible for all travel and sustenance expenses necessary for warranty services.
 1. Any equipment items or sub-systems requiring repair or replacement during the Owner's 30 day operational test specified in Section 3 of this specification will be provided a new warranty start date of the date that the item or subsystem was repaired or replaced.
- B. Shipping and handling charges for warranty parts are the responsibility of the Provider.

- C. Warranty Services shall be commenced with on site representation, by qualified repair technicians, within 72 hours from the request of the Owner.

1.11 TRAINING

- A. Manufacturer shall provide a complete training program for the Owner's operating, engineering, and maintenance personnel. Training shall include both classroom and hands-on instruction and be of sufficient duration to adequately train personnel to perform on site routine, preventative, and remedial maintenance of the equipment, product or system. Unless noted otherwise, maintenance training shall consist of a minimum of three (3) training sessions of eight (8) hours classroom instruction and eight (8) hours hands-on instruction for eight (8) personnel, and operator's training shall consist of a minimum of six (6) classes at two (2) hours duration each hands-on instruction for eight (8) personnel.
1. Operator's training may require some night hour training classes at the Owner's discretion without additional cost to the Owner.
 2. The maintenance training course will fulfill the technical information requirements of the Owner's maintenance instructors, engineers and mechanics. This course, with number of classes as specified shall emphasize the following:
 - a. Orientation providing overview of system/subsystem concept, configuration, and operation.
 - b. Familiarization with and use of electrical schematics, control programs and functional block diagrams.
 - c. Operations theory and interfaces.
 - d. Instruction in basic theoretical and practical understanding of equipment appearance, layout, and functions.
 - e. Safety precautions.
 - f. Use of standard and special tools and test equipment.
 - g. Adjustment, calibration, and use of related test equipment.
 - h. Detailed preventative maintenance activities.
 - i. Troubleshooting, diagnostics, and testing.
 - j. Equipment assembling/disassembling.
 - k. Repair and parts replacement.
 - l. Failure and recovery procedures.
 - m. Cabling and/or interface connectors.
 - n. Operation and Maintenance Manuals, and related reference publications familiarization.
 - o. Procedures, practices, documentation and materials required for system maintenance.
 - p. Towing and Jack Stand operations.
- B. Operator training shall be completed no later than seven (7) days prior to beneficial use. The manufacturer shall provide maintenance training within 30 days of beneficial use. At least 60 days prior to substantial completion, a training program summary, course syllabus, instructor qualifications, and copy of the training manual shall be submitted for review and approval.
- C. Training shall be conducted prior to final acceptance of respective equipment, products, and systems and shall be given at the installation site property at the direction of the Owner.
- D. Provide Owner a minimum of seven (7) days notice prior to conducting any training.

1.12 EXTRA MATERIALS TO BE SUPPLIED

- A. Towbar
1. Manufacturer shall provide the Owner with one (1) Tow bar.
- B. Jackstand
1. Manufacturer shall provide the Owner with one (1) A-Frame.
- C. Laptop
1. Manufacturer shall provide the Owner with one (1) new laptop.

2. Laptop shall be equipped with the necessary software and interconnecting cables for maintenance staff to interface and troubleshoot. Source code is not required.

PART 2: PRODUCTS

2.01 GENERAL

- A. The aircraft passenger boarding bridges covered by this specification shall be designed to extend from the terminal departure lounge doorway to the aircraft boarding door so that passengers can walk between the two, completely protected from inclement weather, aircraft engine blast, and blown dust. The bridge shall provide a simple, convenient, safe, and controlled method for passenger boarding. The complete assembly shall be weatherproof, both when sealed to the aircraft and when parked with the cab weather door closed. Particular attention shall be given to the safety of the passengers.
- B. The apron drive loading bridge must be capable of reaching all passenger doors of specified aircraft parking positions as indicated on the project drawings. The bridge cab shall have sufficient flexibility to enable it to mate with the aircraft passenger loading door when the aircraft is parked at the gate. The bridge shall have sufficient vertical travel to accommodate all aircraft specified on the aircraft parking layout drawings. The bridge shall have additional extended travel beyond the outer most aircraft operational requirement and additional retract travel from the closest aircraft operational requirement or PBB stow box as indicated on the project drawings.
- C. As shown on the drawings and described in these specifications, the Passenger Boarding Bridge installation work will include the following major components:
 1. Fixed Walkway (if specified, or indicated on the project drawings)
 2. Passenger Boarding Bridge
 - a. Rotunda Entry Corridor
 - b. Rotunda
 - c. Telescoping Tunnels (2 or 3 tunnel as specified)
 - d. Dog Legs (Pantographs)
 - e. Vertical Drive System
 - f. Rotating Aircraft Cab with Operator Control Console
 - g. Canopy Closure to Aircraft
 - h. Automatic Leveling System
 - i. Service Door, Landing, Service Stair
 - j. Baggage Slide
 3. Passenger Boarding Bridge Control System(s)
 4. Passenger Boarding Bridge Electrical System(s)
 5. Passenger Boarding Bridge Communication System(s)
 6. Equipment Interfacing with Passenger Boarding Bridge
 - a. Roof Top Mounted HVAC Unit
 - b. 400 Hertz Ground Power Unit (Point of Use)
 - c. Preconditioned Air Unit (Point of Use)
 - d. Potable Water Cabinet

2.02 MANUFACTURERS

- A. Passenger Boarding Bridges & Fixed Walkways
 1. JBT AEROTech – FMC Jetway
 2. Thyssen Airport Systems
 3. Substitutions: None
- B. Ancillary Equipment
 1. Baggage Slides
 2. P&W Quality Machine Inc. Baggage Slide
 3. PAGE
 4. Substitutions: None
- C. Substitutions: None

2.03 FIXED WALKWAY

- A. Where indicated on the aircraft parking layout, fixed walkways are to be installed between the rotunda entry corridor and the terminal building exit. Construction of the fixed walkway shall be substantially identical to that of the bridge tunnels, and shall meet the same applicable specifications.
- B. The fixed walkway shall be designed, furnished, and installed so as not to impose any load on the terminal building.
- C. The contractor must provide all required supports and haunches for final support of existing walkways.
- D. Coordinate base plate with details as indicated on the construction documents. Field verify details prior to manufacture.
- E. Field verify all dimensions prior to manufacture.
- F. The minimum inside height of the fixed walkway shall be 7 feet, 6 inches and the minimum inside width shall be 5 feet, 7 inches.
- G. Walkway design shall meet the same design requirements as the apron drive passenger loading bridges.
- H. Walkways shall be equipped with handrails, both sides, to match "A" tunnel rails.
- I. Exterior and interior construction and finish to match PBB tunnels.
- J. One 120V convenience receptacle, GFCI style, should be installed for every 25' of walkway, with a minimum of one being installed on any walkway over 10'.

2.04 PASSENGER BOARDING BRIDGE

- A. Safety Provisions
 - 1. The bridge shall be designed to achieve the maximum safety of aircraft passengers, crew, operators, and maintenance personnel. The bridge shall conform to all current federal, state, and local Occupational Health and Safety Codes, along with standards developed and adopted by the passenger loading bridge industry.
 - 2. All elements of the bridge shall be designed to be fail-safe in operation.
 - 3. Operating controls and maintenance features shall be designed so that errors in the operation and maintenance of the bridge cannot cause structural damage to any of its elements.
 - 4. All operating mechanisms shall be designed so that the drive mechanism is locked when power fails or is turned off.
 - 5. Electrical-Mechanical lift columns shall be equipped with a fault detector to sense differential motion of the ball screw assemblies. The detector shall disconnect electrical power from the vertical drive motors if a fault is detected.
 - 6. Positive mechanical stops shall be provided to prevent hazardous over-travel where any component might become disengaged from its guiding or restraining component.
 - 7. The operator's position in the cab shall be arranged to permit the operator to operate the loading bridge with the cab weather door closed.
 - 8. Transition ramps shall have floor coverings as indicated in the finishes section with yellow chamfered edges and be equipped with brushed aluminum handrails on both sides.
 - 9. Sheared or sharp metal edges must be deburred or broken and all exposed metal corners are to be rounded. All critical fasteners are to incorporate suitable locking devices.
 - 10. The loading bridge shall conform to the requirements of the National Fire Protection Association (NFPA) "Standards of Construction and Protection of Aircraft Boarding Walkways," NFPA-415, latest edition.
 - a. Submit certificates of compliance for its bridges including any assemblies or appurtenances affected, with NFPA 415, most recent edition, from a Nationally Recognized Testing Laboratory (NRTL) located in the United States.
 - b. Provide written certification that the total PBB, including any design changes, is in compliance with NFPA 415, most recent edition.

11. The innermost or "A" tunnels, as well as the interiors of any fixed walkway section, and all interior ramps, to include brushed aluminum handrails on both sides. 1-1/2" O.D. with returns on ends.
 12. Provide emergency lighting with 90-minute battery back-up complete with self-contained charger and automatic on-off control. Emergency lighting may be incorporated into normal lighting fixtures. Emergency lighting shall meet the minimum lighting level requirements of NFPA 101 - Life Safety Codes.
 13. The PBB shall comply with all applicable Life Safety Codes in effect at the time of manufacture.
- B. Personnel Safety
1. A high resolution color video camera (CCTV) shall be installed beneath the PBB in such a manner as to allow the PBB operator to view at a control console mounted monitor, the wheel bogey and service stair areas during PBB operation.
 - a. Install and adjust as necessary to prevent blocking the operator's view by items such as PCA units, hoses, etcetera.
 - b. See other camera requirements in individual airline specification sections.
 2. The operator's position in the control cab shall be designed so as to permit the operator to position the loading bridge with the outer door open or closed. Suitable enclosures, guard rails, etc. shall be provided to protect the operators from being pitched out the open end of the cab in case of sudden stops or inadvertent movements of the bridge when operated with the outer door open.
 3. Where required, heat shields or guards shall be installed to protect personnel operating the equipment or performing routine periodic maintenance on it against accidental contact with exposed parts which are subject to high operating temperatures.
 4. The loading bridge shall be provided with a caged, OSHA approved roof access ladder accessed from the service stair platform. All items to be galvanized steel.
 5. OSHA approved handrails will be installed atop the outer most tunnel section to provide fall protection to personnel working on drive motors, etc. The other tunnel section(s), as well as any fixed walkway installed, shall be equipped with full length OSHA compliant fall protection. Handrails, ladders, cages, brackets, etcetera shall be galvanized steel.
 6. Additional handrails, ladders, cages etcetera shall be provided as necessary to gain OSHA compliant and protected access to any roof located equipment requiring access. There shall be no need for maintenance personnel to utilize portable ladders or the like.
 7. OSHA and NFPA approved emergency lighting shall be provided as a means of safe exit in the event of a power interruption. They shall provide sufficient illumination throughout the PBB as specified herein.
 8. Suitable OSHA compliant guards shall be provided for all sprockets, gears, chains, fans, belts, and other moving parts located where operating or maintenance personnel may make accidental contact with them. Warning decals shall be added where applicable.
 9. Exposure of operating and maintenance personnel to electric shock hazards shall be minimized by provision of suitable interlocks, grounding means or protective devices.
 10. Guards or enclosures shall be provided for all exposed portions of electrical equipment.
 11. Elevating devices shall be protected from uncontrolled movement or actuation in the event of a power source failure of any type (i.e., electrical, or pneumatic).
 12. Electrically operated lifting devices shall be equipped with brakes to lock the system in the event of power failure or malfunction.
 13. Vertical drive units shall be equipped with a redundant safety locking device and/or safety brake to prevent the bridge from dropping in the event of a vertical drive system failure. The safety locking device shall be designed for a positive mechanical stop of the lifting system.
 14. All pinch and shear points, sharp edges and protruding objects must be eliminated wherever possible and practical. If elimination is not possible, adequate guarding must be achieved to prevent injury and/or damage exposure.
 15. All stairs, ladders, scaffolds, platforms, and handrails shall comply with all applicable OSHA requirements.

16. PBB design shall eliminate wherever possible all tripping hazards. Possible tripping hazards such as transition ramps (nosings), gutters, etc. shall be identified. Transition ramps shall be identified by using a durable, one-inch, yellow (OSHA Alert Yellow) trim band at the beginning of such ramp or hazard. Interior rain gutters shall be indicated with alternating yellow/black safety striping the entire length. Other methods of striping may be acceptable, but shall be submitted for approval prior to installation.
 17. All carpeting shall have edge strips to prevent fraying.
- C. Equipment Safety
1. Sharp edges, projections and hinged devices with hazardous characteristics shall be avoided in the design and construction of the loading bridge. Suitable edge detailing shall be provided where necessary.
 2. When in operate mode, all equipment shall be designed to be fail safe and bridge motion controls (i.e. horizontal and vertical travel, cab rotation) shall require the operator to apply constant pressure to remain engaged (dead-man).
 3. All operating mechanisms, i.e. horizontal and vertical drive, cab rotation, etc. shall be designed so that the drive mechanism is locked when power fails or is shut "off".
 4. Positive mechanical stops shall be provided to prevent dangerous over travel when any component might become disengaged from its guiding or restraining component.
- D. Noise and Vibration
1. The maximum average sound level and loading bridge vibration limits shall comply with the requirements of S.A.E. ARP 1247, current revision.
- E. Technical and Performance Requirements
1. The boarding bridge shall be designed to accommodate all imposed loads collectively. In the worst operating configuration, structural margins of safety as recommended by AISC specifications for the design and erection of steel structures shall be maintained.
 2. In determining the design factor of safety, weld efficiencies as designated by the American Welding Society or applicable design codes shall be used.
 3. Joint efficiencies shall be included in determination of the factor for bolted connections.
 4. All lifting devices shall be designed to AISC standards, (except wire rope) with a minimum factor of safety of 5 based on ultimate strength.
 5. The unit shall be designed with sufficient structural rigidity so that deflections due to load, wind, and motions of working parts do not create interferences, cause malfunctioning of the equipment, or present any safety hazards to personnel, aircraft, or the unit itself.
 6. In the case of standard component or component assemblies used by the end product manufacturer, certification of the application by the component manufacturer will constitute structural acceptability of such components.
 7. Shoulder bolts, bearings, or bushings shall be used when attaching parts that have relative rotary or linear motion.
 8. The wheels used on the equipment shall be of a type and size which will not damage or cause undue wear to the surface over which they will normally operate. The tires must be capable of supporting the design load of the passenger boarding bridge, roof load, snow load, and all ancillary equipment. The tires must be capable, under dead load and/or roof load, including snow loads, of operating satisfactorily without operational degradation.
 9. All mechanisms for actuating, restraining, and guiding the bridge and its components shall be designed so that no noise, sway, or sense of insecurity will be apparent to the passengers. No operating vibration or loads are to be transmitted to the terminal building.
 10. The passenger boarding bridge(s) submitted shall be designed not to exceed 1 in 12 (8.33%) tunnel slope when servicing any aircraft in the fleet mix designated for the gate where the PBB is to be located; however, the PBB shall be capable of achieving a minimum of 12% slope without causing damage to the PBB or ancillary equipment, including PCA or 400 Hz equipment, for maintenance or irregular operation activities.
 11. The bridge floor structure shall be designed to accommodate a dynamic load of 40 pounds per square foot over the total floor area.
 12. The roof shall accommodate snow loads of 25 pounds per square foot over the total roof area, or as otherwise required by code, whichever is greater.

13. The bridge, when in use at any extended length, shall accommodate, while maintaining operability, a wind load of 12.5 pounds per square foot and a wind velocity of 60 M.P.H. from any direction without loss of stability or control.
14. In conditions of sustained wind loads greater than 60 M.P.H., the bridge will be stowed. At wind loads above 60 M.P.H., the bridge, when retracted to the stowed position, shall accommodate a wind load of 25 pounds per square foot and a wind velocity of 90 M.P.H., from any direction.
15. The bridge shall be able to accommodate the added loads of 400 HZ ground power, preconditioned air equipment on the roof, and potable water cabinet on the side of the lift column including appurtenances, including dynamic operational loads presented by the PBB and these additional equipment items. These loads may be applied in total or in part, singularly or simultaneously. The design shall be based on the combination, which imposes the most adverse loading.
16. The bridge when maintained in accordance with the manufacturer's O&M manual by Airport maintenance personnel trained by the manufacturer as indicated herein, shall provide a useful service life of 20 years minimum.

F. Environmental Considerations

1. The bridge shall function satisfactorily and in accordance with these specifications under ambient temperatures from -25 degrees F to 120 degrees F with winds up to 60 miles per hour on wet, iced, or snow laden apron surfaces.
2. The entire bridge is to be weatherproof.
3. Equipment and controls that are exposed to the weather are to be of a weatherproof type or housed in weatherproof boxes.
4. PBB shall be equipped with external tunnel roller ice scrapers to remove ice from the tracks prior to contact with the rollers.
5. Electro-mechanical drive systems shall have suitable protective coverings over motors, chains, sprockets, actuator arms, linear actuator arms, etcetera, to both protect operating personnel and passengers, as well as to protect the systems themselves from exposure to weather elements or traffic abuse.
6. The structure shall be designed to resist the accumulation of debris or water in low points and/or pockets in the structure. Dimpled drain holes or suitable covers will be provided where necessary. Drain holes shall be located so as to drain collection points with the bridge in any normal attitude. Scupper drains from the internal gutters shall carry moisture clear of the structure and shall be sized to eliminate blockage. Welding and drilling operations after application of prime coats shall be prohibited.
7. Where access holes have been created to gain access to components of the PBB, or where pockets otherwise exist, that could trap or accumulate debris, such pocket or opening shall be suitably covered with screw attached covers.
8. All parts shall be resistant to, or protected from corrosion caused by contaminated turbine fuel or moisture blown or splashed from the ground. Provisions shall be made to resist electrolytic corrosion where conditions tend to cause this corrosion. Fasteners shall be of corrosion resistant material or plated to prevent corrosion.
9. All edges of marine grade plywood are to be sealed with an approved APA sealer prior to installation.

G. Service and Access

1. The design shall stress simplicity, ruggedness and ease of maintenance. All systems shall be designed to operate with a minimum of routine maintenance using long life components sealed or self-lubricating mechanisms, etc.
2. Equipment components and systems requiring frequent inspection or maintenance shall be readily accessible. Suitable access doors or removable enclosures shall be approved for this purpose.
3. Access doors, covers, and protective guards shall be designed for quick removal or opening.
4. Access panels shall be hinged, pinned, etc. to prevent loss from the unit. Large panels of over 4 feet, in both height and width, which are normally removed only for heavy maintenance, i.e. major component overhaul or removal, may be designed to be removed

- from the equipment when hinging or pinning is not practical.
5. Hinges shall be located on the forward edge of all vertically hung doors and on the lower edge of all horizontally hinged doors. Where possible, at least 8 inches of clearance above the ground shall exist when any door is open.
 6. All hinge doors shall be provided with devices to secure them either in the open or closed position such that they will not be blown by jet blast or ambient winds.
 7. Stops or bumpers shall be installed so that the doors, when open, do not mark or scratch the paint work.
 8. Major assemblies and components shall be capable of being disconnected and removed from the equipment without the necessity for extensive disassembly of other components. A design goal shall be that any major component should be able to be removed and reinstalled in a period not to exceed eight man-hours. All components/assemblies exceeding 80 lb. for two person-handling or 30 lb. for single person handling, require mechanical assistance and shall be provided with lift eyes, forklift guides, etc.
 9. Fastener heads and nuts shall be provided with adequate clearance for wrenches or drivers.
 10. The design of the unit shall be such that only ordinary common hand tools and test equipment are required in routine maintenance operations and special tool requirements for overhaul/heavy repair work is kept at a minimum.
 11. The equipment compartment shall be designed so as to provide easy access to the controls, relays, valves and other components within the enclosure. Provisions shall be made for ready adjustment, servicing, or replacement of these and other components frequently replaced or serviced.
 12. Maintenance service points and access covers shall be located and positioned in such a manner that a minimum time and effort are required during servicing operations. There shall be no interference to the servicing or draining of lubricants to or from any assembly or component by frame members or other obstructions.
 13. Any special tools or test equipment designed solely to service, overhaul or test performance of the loading bridge shall be identified in writing and submitted as specified.
 14. Pressure lubrication fittings shall be provided at all points where heavy loads, close tolerance, relative rotary or linear motion of parts occurs. Where access to fittings are difficult, a lubrication panel should be utilized.
 15. Components shall be protected from mechanical, electrical, and corrosion damage and malfunctions due to rain, snow, ice, sand, grit, deicing fluids, and other contaminants.
 16. All chains and belt drives shall have provisions for adjustment, and once adjusted, a positive means of retaining this adjustment, as well as OSHA compliant covers or guards.
 17. All hydraulic components, if present, shall be provided with drip pans to prevent the dripping of hydraulic fluid onto the ramp.
- H. Rotunda Entry Corridor
1. The minimum inside height of the entry corridor shall be 7 feet, 7 inches and the minimum inside width shall be 4 feet, 4.5 inches.
 2. A polished aluminum diamond plate threshold plate with a non-slip surface shall bridge the gap between the terminal building and the adjacent fixed walkway or between the terminal building and the rotunda corridor.
 3. Interior and exterior flashing shall be installed between the terminal building and the adjacent fixed walkway or between the terminal building and the rotunda corridor to effect a weather-tight connection. Interior flashing shall be stainless steel or painted metal to match bridge interior color. Exterior flashing shall be NFPA-415 compliant weather resistant fabric.
 4. The design of the rotunda and connecting corridor shall accommodate a terminal door sized 4'-0" x 6'-10" or as otherwise may be existing.
 5. Provide extended corridors where indicated on project documents.
- I. Rotunda
1. The rotunda is to be supported on an independent support column. It shall allow the telescoping tunnels to swing through an arc of 175 degrees (87.5 degrees clockwise and 87.5 degrees counterclockwise).

2. The rotunda support column shall not be anchored or secured to the terminal building, nor shall it transmit any live or dead loads or vibrations to the terminal building.
 3. Coordinate base plate with details as indicated on the construction documents. Field verify prior to manufacture.
 4. Field verify column dimensions prior to manufacture.
 5. The operational and ultimate swing limits shall include a position sensor located in the rotunda ceiling that shall be accessible from the rotunda interior and a physical limit switch mounted at the support column. The physical limit switch located on the support column shall be an ultimate limit, serving as backup to the operational limits defined by the position sensor. Together the sensor and limit switch shall provide three levels of safety for bridge swing (side-to-side) motion: 1) Approach: Bridge speed shall be reduced when within 1 to 2 degrees of the operational limit. 2) Operational Limit: Bridge motion shall be stopped when operation limits are reached. A Yellow warning Text message shall be displayed at the PBB controls informing the operator that an operation swing limit has been activated. Additionally an audible alarm shall sound while the bridge is at the limit and the Joystick is active. Motion in the opposite direction shall remain enabled. 3) Ultimate Limit: Bridge 3-phase power shall be disconnected and a red fault text message displayed at the PBB controls. Should the bridge pass through the operational swing limits, the ultimate swing limit shall trip and stop bridge motion. The ultimate limit switch shall be normally set 2 to 3 degrees past the point where the operational limits are set. Should the ultimate swing limit be reached, maintenance personnel will be required to move the bridge.
 6. The opening between the rotunda and the hinged telescoping tunnels shall have a complete weatherproof seal.
 7. The side coiling curtain barrel assemblies shall be covered to protect them from the weather. These covers shall be hinged to allow easy access to curtain assemblies. Hinges shall be full length stainless steel.
 8. The rotunda floor shall remain level regardless of the movements of the bridge tunnels.
 9. The rotunda shall include positive bird nesting prevention features.
 10. Weather seals shall be provided at curtains to prevent wind blown dust, rain or snow from entering bridge interior.
 11. Curtains, seals and covers shall provide complete protection from the exterior elements. There shall be no visible gaps or daylight apparent through the rotunda.
 - a. A slat-type cab curtain shall be provided in accordance with the following specifications:
 - 1) Allow for the rotation of the cab 87.5-degrees to the left of and 87.5-degrees right of the boarding bridge tunnel center
 - 2) Protective cover installed over cab and rotunda curtains
 12. Threshold plates shall have chamfered edges to reduce tripping hazards.
 13. The rotunda shall be connected to the terminal building or fixed walkway using both interior and exterior flashing. Flexible exterior flashing material shall be installed between the rotunda and the terminal or fixed walkway. Metal flashing shall be used in the interior to cover any gaps between the rotunda and the terminal or fixed walkway.
 14. Slope, over-travel and operational swing limits shall be located on the rotunda assembly. Slope limits shall be adjusted to up to 10 percent (5.71 degrees) for both up and down slopes. This limit shall be adjustable to meet local operating conditions and requirements.
 15. The corridor interface between the rotunda and the terminal building shall have a minimum inside clear width of 4'-4.5" and a minimum clear height of 7'-7" for a minimum of 15 inches. The corridor design shall allow installation of flexible weather seals and floor threshold to the face of the building.
 16. Existing ground connections shall be reconnected after installation or relocation of all PBBs.
 17. Rotunda and support column configurations shall be available to permit rotunda floor heights as low as 3 feet 6 inches (1.07m) above the surface of the supporting foundation.
- J. Telescoping Tunnels (2 or 3 tunnel as specified)

1. The telescoping tunnels shall be rectangular in cross section and hinged for vertical motion at the rotunda.
 - a. The telescoping tunnels shall permit servicing of all commercial jet aircraft as required by the aircraft parking layout such that the slope of the tunnels does not exceed 1 in 12 (8.33%), with the exception of the transition ramps.
 - b. The minimum inside width of the tunnels shall be as follows:
 - 1) Minimum width, wall-to-wall 57.5 inches
 - 2) Minimum interior height 84 inches
 - 3) Minimum inter-tunnel ramp width 53.5 inches
 - 4) Minimum corridor width 52.0 inches
 - c. All bridge/walkway sub-flooring shall be fully sealed, 3/4 inch thick, marine grade plywood or galvanized flat steel panels. Substitutes for marine grade plywood are not acceptable. All flooring shall be securely fastened with fasteners suitable for this purpose. Supplier shall insure that adjoining plywood sheets are supported and fastened to a common member to provide smooth, even joints. Steel panels shall be formed, welded and sealed. Sub-flooring is not required if a smooth metal floor surface is provided. The metal floor needs to be supported such that it prevents the washboard effect.
 - d. The Jet bridge manufacturer will procure the flooring material. The product needs to be glued, (no peel and stick will be accepted) and shall be installed as outlined in the attached Scope of Work. Yellow "nosing" shall be installed on the leading edge of all transition ramps.
 - e. Transition ramps with both fixed and hinged sloping sections shall accommodate the differences in floor elevations where telescoping tunnel sections overlap. Slope of the transition ramps shall not exceed 1:16 (3.6 degrees) relative to the tunnel floors. The fixed transition ramp sections shall comprise sloping floor areas within the tunnels to minimize the slope of the hinged transition ramp sections. Handrails shall be provided on both sides of the tunnels in the ramp areas. The handrails for the A-tunnel transition ramp fixed section shall be attached to the tunnel walls. The B-tunnel handrails shall be attached to the tunnel header.
 - f. High pressure laminated wallboards with blacktrim shall be used.
 - g. Insulation
 - 1) The ceiling shall be fully insulated to have a minimum average R value of 7.5.
 - 2) The tunnel wall shall be insulated to have a minimum average R value of 8.5.
 - h. Flexible seals are to be used between the tunnel sections to provide a weather-tight seal preventing entry of blowing dust, rain, or snow.
 - i. Where the telescoping sections overlap, ramps shall be provided to accommodate the difference in elevation. The ramps shall have yellow chamfered edges and handrails on both sides. Ramps shall have floor coverings as indicated in the finishes section.
 - j. The exterior sides of the boarding bridge shall be constructed of no less than 14 gauge flat steel panels. The Supplier shall detail panel specifications in the proposal. The tunnel sides are to allow for 100% insulation throughout.
 - k. The exterior roof and sides shall be constructed of a minimum of 18 gauge steel panels. All tunnels shall have flat or crowned roofs that are designed to facilitate positive water drainage. Corrugated roofs will not be approved.
 - l. Roof drainage and seals between tunnels shall be designed and constructed to prevent leakage of water runoff onto carpeted areas in the interior of the bridge. Special attention is required in the areas of hinge joints, telescoping tunnel sections, at the top and bottom of rotating portions (rotundas and cabs) and at canopies over aircraft doors.
 - m. All external metal shall be a uniformly smooth surface and free of all mill scale, rust and dirt before painting. A primer coat of epoxy primer shall be applied followed by one finish coat. A total nominal minimum prime and paint thickness of four mils when dry is required.
 - n. Electrical cable conveyance and management:

- 1) The telescoping tunnels shall be equipped with an exterior electrical cable conveyance system. The cable system shall be accessible to maintenance personnel for inspection at all PBB positions and operating conditions. Access to the cable conveyance system shall not impede passenger traffic or bridge operation. The cable conveyance system shall be capable of supporting a combination of cables and hoses.
- K. Horizontal & Vertical Drive Systems
1. The drive column assembly shall provide the force to swing, extend or retract, and raise or lower the bridge. This assembly shall be electro-mechanical.
 2. The motors and mechanisms for vertical, horizontal, and radial motion shall be integral parts of the drive and lift column assembly and operate in a smooth and quiet manner.
 3. The assembly shall be designed to permit simultaneous vertical travel, horizontal travel, and steering to permit expeditious movement to the aircraft.
 4. The vertical lift speed as measured at the cab bumper shall be 2.5 - 3.6 FPM nominal.
 5. The drive system shall permit the unit to be extended/retracted and rotated to any point within its operating envelope and shall permit these movements at variable speeds between 0 and 90 FPM. Maximum speed shall be limited to 85-90 FPM. Control of the drive system shall be such as to provide smooth starts and stops and positive fail safe braking. The brakes shall remain effective with power removed from the unit.
 6. Axles, wheels and tires shall be operated within their respective manufacturer's recommendations.
 7. Wheel/Tire assemblies shall be solid rubber tire tread on steel wheels as manufactured by Trelleborg or approved equal. Drive assembly shall operate satisfactorily as specified in the construction documents on wet, iced, or snow laden ramp surfaces.
 8. Provide a 2" wide reference stripe on each inner column tube indicating upper and lower travel limits.
 9. The assembly shall be electro-mechanical driven and the following requirements shall be met as applicable:
 10. Electro Mechanical Drive
 - a. Horizontal Drive (Electro-Mechanical)
 - 1) The tires used on the horizontal drive wheels shall be solid elastomer, specially designed for PBB applications and rated for the applicable load.
 - 2) The horizontal drive system shall use AC gear motors with integral brakes. The AC motors shall be driven by solid state, variable frequency motor controllers for smooth variable speed proportional control operation. The AC drive system shall provide high efficiency, smooth performance, and good component availability. The individual variable frequency drive controller for each drive motor shall provide adjustable speeds from 0 to 90 feet per minute (27.4m/min), and be factory preset to a maximum 60 feet per minute (18.3m/min). The controller shall be adjustable to provide optimum responsiveness to the horizontal controls. The controller shall provide built-in diagnostics to assist with trouble shooting.
 - 3) A steer angle of 200° shall be possible both in place and in motion. The wheel carriage shall steer 110° to the left and 90° to the right of the centered position. Steering speed shall be adjustable between 16° and 42° per second. The steering rate shall be factory set at a maximum 23° per second. The horizontal drive wheel system shall be equipped with mechanical stops to prevent over steer. A wheel position potentiometer shall monitor rotational alignment with the bridge and provide operational steering limits before the mechanical hard stops are contacted. Wheel bogey position shall be indicated on the touch screen at the operator's console.
 - 4) A dynamic braking system shall allow the PBB to come to smooth controlled stops. Integral spring-applied, electrically-released brakes shall be provided with each drive motor. The brakes lock the PBB in place when electrical power is disconnected, when the operator control stick is in the neutral position or when operating power is turned off at the PBB controls.

- 5) The horizontal drive motors shall be equipped with manual brake releases to allow the PBB to be towed in the event of power failure. Tow lugs shall be provided at the lower wheel frame. The manual brake release shall automatically reset and re-engage the motor brakes when the PBB drive is engaged.
 - 6) Tire Manufacturer:
 - (a) Low Profile Trelleborg Tires (solid tires)
 - b. Vertical Drive (Electro-Mechanical)
 - 1) The lift mechanism shall consist of two (2) recirculating ball bearing screw assemblies. Each assembly shall be independent of the other, with individual motors, and be capable of supporting the bridge under full design load and raising and lowering the bridge at an approximate speed of 60 inches per minute +15% measured at the aircraft end of the PBB. The ball nut of this assembly shall be equipped with wiper brushes to remove grit or dirt from screw threads and a self-locking Acme type thread to prevent unit collapse in the event of a ball nut failure.
 - 2) The vertical drive motors shall be fitted with spring-applied brakes that release only when electric power is applied and vertical motion, up or down, is signaled from the operator's console or the auto-leveler system.
 - 3) The brakes shall hold securely at all elevations, without creeping, whether the bridge is in operation or not.
 - 4) The fault detector circuit shall shut down the electrical power to the vertical drive motors and set the brakes independently of the operator. This shall occur if the bridge is in the vertical-operate mode and there is differential motion at the ball screws.
 - c. PBB's shall provide for "conventional steering" .
 - 1) "Point & Go Steering" shall be selectable through a password protected maintenance screen.
11. HYDRAULIC DESIGN:
- a. General
 - 1) The hydraulic fluid shall be fire resistant, have low toxicity, and have biodegradable properties.
 - 2) The hydraulic fluid shall allow satisfactory operation of the drive column under ambient temperatures of -40°F to 140°F with winds up to 60 miles per hour and meet the requirements of MIL-H-5606, latest edition. The hydraulic reservoir (tank) shall have the capability of being electrically heated during severe weather conditions.
 - 3) The system should have shutoff valves installed to facilitate changing of components such as filters, pump, and hoses without draining the system.
 - 4) The hydraulic fluid desired will be specified by the controlling specification. A nameplate stating the type of hydraulic fluid used and the total tank capacity shall be installed adjacent to the reservoir filler neck.
 - 5) The preferred maximum pressure required by an operation is 2000 psi or less.
 - 6) Maximum allowable flow velocity (Ft/Sec) through any hose, tube or pipe shall be determined from the following table:
 - (a) Suction: 04
 - (b) Pressure - Continuous Duty: 15
 - (c) Pressure - Intermittent (up to 50% Duty): 25
 - (d) Pressure - Infrequent (up to 20% Duty): 40
 - 7) In cases where pressure drop due to tube and hose length becomes excessive with the flow specified above, such tubes and hoses shall be made of a larger diameter to reduce the pressure drop.
 - 8) Hydraulic components shall be protected from flaws in excess of manufacture's published ratings.
 - 9) The hydraulic fluid reservoir shall have a minimum reserve of 25% of displaced hydraulic fluid, making the capacity equal to 1.25 times the total maximum displaced volume of the hydraulic components including that contained in the

hydraulic lines, accumulators, and cylinders. The reservoir design is to include the following:

- (a) Weatherproof breather with 10 micron filtering, having air flow capacity adequate to maintain essentially atmospheric pressure in the reservoir under maximum flow conditions.
 - (b) A magnetic drain plug is to be incorporated in a sump located at the return end of the tank. The tank should be arranged such that the sump and drain are at the lowest point.
 - (c) Full range fluid level indicator with adequate protection from breakage and located in an easily observable area.
 - (d) A strainer type filler neck with attached cap is required.
 - (e) The tank outlet to the pump and the major return port are to be located at opposite ends of the tank and one inch (25.4 mm) above the tank bottom. Any pump case, seal leakage, or other gravity drains are to be returned to the top of the tank with the actual discharge below that level at which oil should be added to the tank to prevent aeration.
 - (f) An access opening to allow full access to interior for cleaning. Access cover is to be gasketed and fastened leak tight.
 - (g) Reservoir to be thoroughly cleaned and protected from contamination during assembly of the unit. Material and construction to conform to commercial quality and adequately protected against corrosion. Coated tanks are unacceptable. Items such as strainers, check valves, relief valves, filters, or any other item requiring periodic inspection or repair shall not be located inside the tank, but outside where they can be serviced easily.
- 10) The hydraulic system should include a "high" and "low" side hydraulic filter, spin-on design, with a minimum 10 micron filtering capacity. A low pressure filter canister of micron size to be determined by pump manufacturer shall be located between the tank and pump system. Easy accessibility to the clean out port shall be provided.
 - 11) Pumps are to be chosen so that their capacity will meet peak demands within manufacturers' capacity ratings of flow, pressure, and RPM. Where system reliability and/or pump manufacturers' specifications require it, a boost pump and low pressure filter with a differential pressure indication will be provided.
 - 12) The system pump(s) and components are to be protected by a relief valve(s) which have a capacity equal to or greater than pump capacity. Relief valve(s) shall dump directly to tank.
 - 13) The hydraulic fluid temperature during continuous operation shall not exceed 150°F (66°C) on a 115°F (46°C) day and in no case shall exceed the hydraulic system components manufacturers' recommendations.
 - 14) Dynamic pressure surges, spikes, and fluctuations shall be minimized with use of accumulators if necessary. Pre-charge information tags shall be attached adjacent to charge fitting.
 - 15) The material for all hydraulic lines shall be specified. Flexible lines shall be made of hydraulic fluid resistant material. The lines shall be protected and supported from chafing and binding. Hydraulic lines shall be routed so that, where possible, structural members will provide protection. Lines shall be supported so that fittings, tubing and hoses are separated from engine exhaust systems, and are not subject to damage from heat, external loads, and vibration. If necessary, heat barriers or shields shall be installed. Lines shall be protected from kinking and abrasion.
 - 16) All hydraulic fittings will be in accordance with SAE J514. If flared, the 37° (0.646 rad) flare with "B" nut and sleeve is to be used. Flared copper seats are not to be applied to fittings for sealing purposes.
 - 17) All pipe threads are to be joined with a suitable pipe sealant.

- 18) Hydraulic systems are to incorporate such devices as hydraulic fuses, pilot check valves, holding valves, accumulators where necessary, and interlock systems to eliminate uncontrolled action of mechanisms (i.e., the fall of the bridge, etc.) in the event of energy failure. Manual actuation of systems shall be provided to return systems to a safe condition should energy failure occur.
 - 19) Test port locations shall be provided at points in the hydraulic system requiring access for pressure adjustments and troubleshooting. Each port shall be plugged with a 1/4 in. NPT plug.
 - 20) The hydraulic tank filler and breather and lines shall be located away from heat sources to prevent oil from splashing onto hot surfaces in the event of overflow, leak or component failure.
 - 21) Hydraulic hoses shall conform to the quality of the SAE 100R1 through 100R7, per SAE Standard J517, as applicable.
 - 22) All components which are capped when received from suppliers shall have the protective caps left in place until connection is made to each port.
 - 23) When charging the hydraulic system with oil, the manufacturer shall take steps to ensure that the oil is free from contamination. The supply container shall be protected from water and dirt contamination during storage. All transfer containers and fittings shall be thoroughly cleaned and dried prior to use to prevent contamination from dirt, water, and other fluids.
 - 24) The manufacturer shall operate all segments of the hydraulic system for a period of one hour to thoroughly circulate the hydraulic fluid, remove the hydraulic filter element, examine for contaminants, and replace with a new element. This shall be repeated until the used filter shows no evidence of contaminants. In the case of dead end lines to actuators, provisions for bleeding shall be made and measures shall be taken to ensure that fluid not normally being re-circulated shall be made to do so during the cleansing period to ensure that all fluid, lines, and components are clean.
 - 25) Pressure vessels such as air receivers shall comply with all applicable requirements of the ASME Unfired Pressure Vessel Code, Section VIII. Such equipment shall bear an ASME "U" Code Label and certification.
 - 26) Manufacturers shall furnish sufficient details of their proposed hydraulic system to allow an engineering evaluation.
- b. Horizontal Drive (For Hydraulically-Driven PBB)
- 1) A hydraulic drive system shall provide the extend, retract, swing and steer capabilities at variable speeds up to 90 feet per minute. This two-wheeled system shall operate on solid tires. Both wheels shall be independently driven by hydraulic motors.
 - 2) The wheel motors shall be equipped with an automatic brake that locks the undercarriage when the power is "off." In case of a power outage, the brakes shall be manually released so the bridge can be towed. Tow bar and tow bar lugs are to be included on the undercarriage.
 - 3) Switch-controlled wheel stops shall be provided to prevent overturning of the wheel bogey.
- c. Vertical Drive (For Hydraulically-Driven PBB)
- 1) The lift mechanism shall consist of two (2) extra capacity hydraulic rams. Each assembly shall be independent of the other and capable of supporting the bridge under full design load. An adjustable rate pump and cylinder system shall provide the necessary lift speed measured at the aircraft cab bumper.
 - 2) The lift cylinders shall be equipped with pilot-operated check valves that prevent the bridge from descending in the event of fluid loss or other system failure. The hydraulic system shall be designed so that the bridge can be lowered manually in case of a power failure.
 - 3) Mechanical stops in the cylinders shall be provided to prevent over-travel of the vertical lift column. The system shall not be damaged if the bridge is raised or lowered into the cylinder stops.

- d. PBB's shall provide for "conventional steering" as well as "point & go" steering. The PBB shall default to "point & go" steering, but mode shall be selectable through a password protected maintenance screen.
- L. Rotating Aircraft Cab with Operator Control Console
 - 1. The aircraft cab with operator's station shall be designed to rotate a minimum of 125 degrees, a minimum of 92.5 degrees counterclockwise and 32.5 degrees clockwise on bridges with right-side service stairs and a minimum of 92.5 degrees clockwise and 32.5 degrees counterclockwise on bridges with left-side service stairs from the tunnel centerline to facilitate alignment with multiple aircraft parking configurations. The rotation speed shall be between 2 and 2.5 degrees per second. The cab shall be enclosed to provide maximum security and protection from the outside environment throughout the docking and passenger loading operation.
 - a. All cab rotate motors shall be provided with VFD inverter drives suitable rated for the connected load.
 - 1) Provides smooth start/stop functions.
 - 2) Equip enclosure with heaters per environmental section.
 - 2. Cab rotation assemblies shall be provided with sealed bearings or an accessible lubrication points and shall be included in the PBB preventative maintenance program.
 - 3. Control console and operator visibility. The cab shall be equipped with a forward facing control console, with a laminated safety glass window providing full forward view of the aircraft interface. It shall be possible to operate the PBB without opening the cab weather doors. Additional visibility shall be provided for the operator by a wire glass window to the left of the operator, a window to the right, and by windows in the weather doors and a wire glass window in the service door. Wire glass vision panels shall be provided in the cab side-coiling curtains. The front window size shall be 31.5 X 24 inches (800mm x 610mm). The left window size shall be 30.5 X 10.5 inches (775mm x 267mm). The right window shall be 32 X 6 inches (813mm x 152mm).
 - 4. The cab shall have sufficient windows to allow the operator to view the ramp area during operation.
 - 5. Mirrors shall be provided to allow the operator full view of the horizontal
 - a. A round rear view mirror shall be provided on both sides of the cab to allow the operator full view of the horizontal drive wheels (wheel bogie) during operation. Provide additional mirrors as necessary such that operator has full view of wheel bogie and service stairs during bridge operations.
 - 6. The cab side coiling curtain slats shall be equipped with upper and lower safety glass view panels to allow the operator maximum visibility of the aircraft and ramp during operation.
 - 7. A slat-type cab curtain shall be provided in accordance with the following specifications:
 - a. Allow for the rotation of the cab 92-degrees to the left of and 35-degrees right of the boarding bridge tunnel center
 - b. Provide full visibility of the ramp area in the cab curtain through the use of wire reinforced glass windows of uniform size and shape throughout the curtain
 - c. Protective cover installed over cab and rotunda curtains
 - 8. A closed circuit television system shall be provided complete with a monitor housed in or near the control console. The camera shall be focused on the drive bogie and service stair so that the operator has an unobstructed view when servicing all aircraft.
 - 9. The side coiling curtain barrel assemblies shall be covered to protect them from the weather. Covers shall be hinged to allow easy access to curtain assemblies. Hinges shall be full length stainless steel.
 - 10. Weather seals shall be provided at curtains to prevent wind blown dust, rain or snow from entering bridge interior.
 - 11. Curtains, seals and covers shall provide complete protection from the exterior elements. There shall be no visible gaps or daylight apparent through the cab except at windows and clear curtain slats.
 - 12. The cab shall have weather proof doors to protect the interior of the bridge when it is not in operation. This door shall be located to the right of the operator's station and have the capability of being locked. This door shall be double inward swinging weather doors. The

opening shall have a clear width of 43 inches and a minimum clear height of 7 feet 8.5 inches. The upper portion of each door shall be equipped with a 12 inches wide X 32 inches high (305mm x 812mm) safety glass window to enhance visibility and shall be equipped with 1/2 door height wire reinforced safety glass windows to enhance visibility.

- a. Door to incorporate suitable stops to hold open when opened and closed when closed.
 - b. Door to be lockable from inside the cab bubble area.
 - c. Doors shall utilize a commercial grade door closer such that a minimum of effort is required to open or close the doors.
 - d. Doors shall be fitted with three non corrosive hinges per door.
13. The aircraft end of the cab floor shall be equipped with a full width aircraft spacer (bumper) 122 inches wide. The spacer shall be of a material that will retain its flexibility during constant usage regardless of the temperature and must be non-abrasive to prevent scratching or other damage to the aircraft fuselage. The spacer shall provide safe and secure human support when stepped upon. The color of the bumper shall be safety yellow. The bumper shall have a dead load strength of 500 lbs, a cold crack minimum of -40°F, and a flame resistance (max) of 2 second flameout. Appropriate designed and fabricated cut-outs shall be provided to accommodate all design aircraft devices, including without limitation, the door of the A300, MD80 and B737 series aircraft pitot tubes without violating NFPA 415, current edition, requirements. The bumper is to be designed to provide a replacement 18" of bumper material from the left-hand side of the bumper (i.e., with respect to the operator's perspective) with a 1" thick bumper material. This provides proper interface with the MD-80 aircraft. The PBB spacer material shall comply with NFPA 415, current edition, requirements.
- a. Submit bumper details for approval.
14. Adjustable cab floor: The aircraft end of the cab shall be equipped with a cab floor that adjusts to level for various aircraft floor heights and bridge slope angles. The floor shall be individually actuated and independently adjustable to adapt to aircraft doorsills. The adjustable cab floor shall level automatically and shall be equipped with a manual override control switch. The floor shall be capable of providing a level surface adjacent to the aircraft doorsill for PBB slopes from -10% to +10%. The automatic leveling system shall correct the floor to a slope not to exceed +2% (+1.2°) from level. The maximum slope of the cab floor shall be limited to plus or minus 6.5 degrees (11.4%).
15. The floor shall be double hinged and shall provide a smooth transition between the level floor and the tunnel section. This transition floor shall provide a smooth platform sloped approximately in the direction of passenger traffic flow. There shall be no raised surfaces that may introduce a tripping hazard to the passengers. Adjacent surfaces shall be the same level regardless of the position of the cab floor or the passenger loading bridge. The cab floor walking surfaces shall be ribbed rubber
16. Operator's station shall be equipped with an operators platform for the operator to stand on while rotating the cab. This prevents the operator from having to walk while also attempting to operate the bridge.
17. Control console doors/lid shall be interlocked to drop main power in the event they are opened. These limit switch interlocks shall be defeatable by maintenance staff.
18. Control console doors/lid shall have hold open devices.
- M. Console Controls and Indicators
1. Controls
 - a. The operator's control console shall be designed to allow accurate operation by personnel possessing no special skills and trained by the manufacturer or manufacturer-certified trainers, in accordance with the manufacturer's operation manual.
 - b. A placard outlining the bridge operating instructions shall be displayed in a prominent location in the cab of each bridge so as to be easily visible to the Operator while operating the bridge.
 - c. All motor controls shall be motion oriented. For example, in raise and lower functions, the "raise" push-button will be located above the "lower" push-button, etc.

- d. The operator's console shall be Owners standard and meet the following specifications:
 - 1) Faceplate cover shall be made of a heat and scratch resistant material
 - 2) All labels shall be integrated into the cover material
 - 3) Non-removable type button faces shall be used
 - 4) Labeling shall be simplified and consistently placed above or below the switches - above if the control is a warning light or push button, below if the control is an on/off switch
 - 5) Labels are to be placed on all sides on multi-directional joystick or set buttons
 - 6) A four quad joystick providing forward, reverse and left and right steering is to be provided
 - 7) An intuitive display for jetbridge cab height
 - 8) The alarm speaker is to be mounted inside the console so the agents are unable to disable the speaker
 - e. Smoke detectors in the PCA and Cab (or any other ancillary equipment with a smoke detector, ex. PCA) shall be wired to provide a single point back to the building fire alarm system. This alarm shall trigger a local alarm per airport standards.
 - f. Power and control circuit switches or combined power/control circuit switch shall be key operated using a three position (i.e. OPERATE, OFF, AUTO) locking switch device, with a remove core as follows.
 - 1) Power-On Circuit and Control Circuit lock or combination shall be Best #1W6E2, US260
 - 2) Operator's Console panel lock shall be Best # 7L6R14, US26D
 - 3) One set of CORE keys are to be furnished by the supplier to the Owner prior to installation of Owners cores.
 - 4) The operator must be able to remove the key from the switch when the switch is in either the OFF or AUTO position.
 - g. The maintenance console shall be equipped to accept a Best Lock removable core.
 - h. Control requirements shall include a Human Machine Interface (HMI) touchscreen.
 - 1) All control and display schemes shall be submitted for approval. See submittals section.
2. Indicators.
- a. The following indicators shall be labeled to indicate function and shall be located on the control panel.
 - 1) A cab floor height indicator shall show when the cab floor elevation is at the proper height (theoretically correct) for each aircraft to be serviced. See airline specific requirements.
 - 2) A wheel position indicator shall show the orientation of the wheels along with the true tunnel centerline, regardless of the cab's rotational position.
 - 3) An amber light to indicate that the auto level function is energized and operating.
 - 4) An auto level malfunction shall be indicated with a red light and shall be accompanied by an audible warning.
 - 5) A swing limit reached shall be indicated with a red light and shall be accompanied by an audible warning.
 - 6) An amber light shall indicate when the aircraft canopy closure is in the down position (aircraft closure must be retracted before the bridge can be moved). Green shall indicate up, red shall indicate canopy down and the key selector switch to ON.
 - 7) A red light shall indicate a lift column malfunction has occurred.
 - 8) A light shall indicate if the adjustable cab floor is in the automatic or manual mode.
 - 9) A red light shall indicate when the 400 Hz aircraft cable is deployed.
 - 10) An green light shall indicate when the 400 Hz SSFC or PCA units are operating, red shall indicate faults, amber shall indicate standby.
 - 11) Any operator correctable condition that prevents the PBB from operating with the Key switch in the ON position should be displayed in an approved manner.

- 12) Any condition that causes an audible alarm shall be displayed.
- 13) Video control monitor.
- 14) Display requirements shall be met with a Human Machine Interface (HMI).
 - (a) All control and display schemes shall be submitted for approval. See submittals section.

N. Canopy Closure to Aircraft

1. The outermost end of the cab is to be equipped with an accordion-type bellows closure. Both sides of the closure shall be independently adjustable to provide a weather-tight seal against the most critical aircraft contours. When fitted against the aircraft fuselage, the closure shall enclose both the open aircraft door and doorway. Pressure sensitive limit switches shall be incorporated into each side of the closure actuator mechanisms, as necessary, to prevent excessive pressure on the skin of the aircraft. The aircraft contact point of the closure shall be a soft material to prevent scratching or damage of any kind. The closure is to be non-abrasive, highly tear resistant, and weather resistant as well as able to remain elastic and flexible in extreme cold and hot climates and meet the requirements of NFPA-415, latest edition.
2. To maximize UV protection and increase service life, the assembly shall be two ply, the outer ply will be a rugged, polyester fabric while the inner ply will be a NFPA 415 compliant material.
3. The material for the outer ply shall meet the following minimum requirements: FIBER-Polyester, DENIER-1000, COUNT-18 x18, TEAR (LBS/IN)-242/213, TENSILE (LBS/IN)-439/441.
4. The material for the inner ply shall meet the following minimum requirements: FIBER-Fiberglass-Satin Weave, DENIER-, COUNT-, TEAR (LBS/IN)-50/45, TENSILE (LBS/IN)-300/275.
5. A minimum two (2) inch thick cushion pad shall be provided at the point of contact between the canopy and the aircraft fuselage to prevent damage to the aircraft skin and cabin or cockpit windows. Canopy supports in the leading edge of the canopy shall be padded to prevent contact with the aircraft. This padding shall be firmly attached in such a manner to prevent its slipping, turning, twisting, or distortion from normal usage. It shall be possible to replace the padding in sections without removal of the entire canopy.
6. The horizontal width of the canopy opening at the aircraft interface shall be at least 10 feet (3.05m).
7. The closure must be capable of mating with all aircraft from BAE-146/RJ-85 through B757, B767, B777, B747 and Airbus aircraft compatible. This shall be a minimum requirement. Additionally, the manufacturer shall review the aircraft parking planning drawings and shall ensure that all canopies shall mate properly to all indicated aircraft, irrespective of gate position.
 - a. The canopy fabric must conform to the following specifications:
 - 1) Color – See Finishes
 - 2) Base Material - Polyester
 - 3) Minimum Fabric Weight - 5.0 oz./SY
 - 4) Vinyl Coated - Minimum Finished Coated
 - 5) Material Weight - 24.0 oz./SY
 - 6) Tongue Tear Strength - 190/190 lbs
 - 7) Trapezoid Tear Strength - 50/60 lbs
 - 8) Grab Tensile Strength - 375/350 lbs/in
 - 9) Strip Tensile Strength - 300/275 lbs/in
 - 10) Adhesion (min.) - 10 lbs/in
 - 11) Hydrostatic Resistance - 500 psi
 - 12) Cold Crack Minimum - -40°F
 - 13) Flame Resistance (max) - 2 second flameout
 - 14) Lining - 2 inch foam
 - 15) NFPA-415 Certification - Yes

8. The canopy will be designed to provide a removable 18" long canopy pad from the lower left-hand side of the canopy (i.e., with respect to the operator's perspective). This provides proper interface with the MD-80 aircraft.
 9. A metal canopy hood is to be installed to protect the canopy in the retracted position. At no time shall the hood come in contact with the aircraft.
 10. Supplier is required to submit a sample of fabric and associated specifications with proposal.
 11. The closure when in its retracted position shall be protected by a hood or other device to prevent water and/or debris from laying in the folds of the closure material when the bridge is not in use.
 12. Any exposed arms, struts, etcetera should be covered.
- O. Automatic Leveling System
1. PBB's shall be equipped with an automatic leveling device which permits the bridge to automatically respond to changes, including small changes, in aircraft door sill height thus maintaining a constant relationship between the floor of the aircraft and the floor of the PBB. It shall not exert stress on the fuselage skin. The leveling device actuating mechanism or rotary sensor which contacts the aircraft shall be located on the right side of the cab in full view of the operator. If the actuating mechanism or sensor is located in the cab interior or other area normally exposed to passenger traffic, it shall be located in a remote area not typically occupied by the passengers, and it shall be adequately protected and shrouded to preclude passenger interference. "DANGER - DO NOT TOUCH" shall be printed in 1/2" red letters on the device or shroud to advise passengers to stay clear. It shall function reliably on each specified aircraft regardless of door location, fuselage contour, and aircraft door sill height. The auto-leveler shall be engaged when the PBB is in the "AUTO" mode.
 2. In the event of an auto leveler failure, an alarm shall sound and an "Auto Leveler" Warning light shall flash, at the console to alert the operator. The console alarm shall be a different alarm with a distinct sound so as to distinguish it from other PBB alarms. The audible alarm shall be of sufficient volume to be heard throughout the interior of the PBB.
 3. The system shall stop vertical travel and sound an audible alarm in the event the system does not neutralize within a pre-set adjustable distance (1 inch to 4 inches). The audible warning device will be installed at the console and at the rotunda, or walkway, whichever is closest to the terminal door. Provisions to allow an external audible device shall be made in case there are requirements to have the device at the gate counter.
 4. Since the aircraft and PBB are exposed to various wind conditions and jet blast during the servicing period, the auto-leveler actuating mechanism shall be capable of activating within the full range of its horizontal and lateral clearance.
 5. The control circuitry shall include an adjustable timer which shall limit the auto-leveler's continuous response in either direction. The timer shall be adjustable from 1.6 to 16 seconds, and shall be preset to 2 seconds, and have a minimum rotation of one revolution and allow a range of adjustment of at least six inches up or down from a neutral position. The circuitry shall include both audible and visual alarms at the operator's console, and a bell or horn in the general ramp area, which shall produce a distinctively different sound from the other alarms on the unit, when the timer interrupts the response to the system. When the timer circuit de-activates the auto-leveler, the vertical lift system shall automatically be de-energized and locked in position, a vertical brake system shall automatically engage, and the audible and visual alarms at both the operator's console and ramp area shall be activated.
 6. The auto-leveler actuating mechanism and sensor shall be durable and operate reliably even in the most adverse weather and ramp environment. It shall also be protected against accidental damage.
 7. A remote audible alarm shall be located at the rotunda or fixed walkway, at the building interface to alert in the event of an auto leveler fault. This will be in addition to the console located audible alarm.
- P. Service Door, Landing, Service Stair

1. A ramp service door, landing, and service stair shall be provided at the aircraft end of the bridge for apron access by authorized personnel. The door, landing, and stair shall be positioned on the right-hand side of the cab bubble unless otherwise indicated.
2. The service door shall be a minimum of 2'-3" wide by 6'-7" high, half wire-glass hollow core, steel door, with a 45-minute fire rating. The door shall open outward on the landing and be equipped with a heavy duty door closure. The door shall include a #4 finish, 16 gauge stainless steel cover plate with horizontal brush marks along with weather stripping on the jambs and header and a vertically adjustable bottom weatherstrip. The door shall include a weatherproof, heavy-duty, exterior mounted, door closer.
3. The door shall be equipped with an electronic keypad keyless lockset conforming to FAR 107.14 security requirements. Security system shall match airfield standard.
 - a. The door shall be equipped with electronic access conforming to FAR 107.14 security requirements.
 - 1) Service door options:
 - (a) 30 inch (762mm) high stainless steel kick plate shall cover the lower inside and/or outside portions of the door.
 - b. Door shall incorporate hold open devices to hold door open in high wind conditions and due to forces associated with a sloping bridge.
 - c. Maglock style doors shall be equipped with exterior pull handle and interior pushplate as necessary.
 - d. Equip door exterior with gutter or drip diverter for overhead condensation.
 - e. Equip with weatherproof exterior adjustable heavy duty door closer
 - f. Confirm all details with the tenants prior to manufacturing.
4. The service stair shall be equipped with self-adjusting risers and open mesh steel treads made from galvanized steel channel sections with open serrated grating (similar to Grip Strut™) providing high-traction, high-drainage walking surfaces. All steps shall have an equal rise. The treat width shall be 28 inches (711mm) and the maximum tread depth shall be 9.5 inches (241mm). The length of the stair stringers shall be selected depending on the operational height range of the PBB. The service stair shall be protected on both sides by handrails compliant with OSHA standards. The entire service stair assembly shall be constructed from hot-dip galvanized steel. The service stair shall be accessible to ramp service personnel at all operational heights and positions of the PBB.
5. Service stair and landing illumination. An exterior rated 60 watt incandescent light fixture shall be provided on the exterior of the PBB above the service stair and landing to illuminate the service access. The light shall be controlled by a light switch provided on the interior wall of the PBB adjacent to the service stair access door.
6. Service landing illumination control options:
7. A photo cell shall operate the service access light automatically during darkness, with an interior light switch that shall override the photo cell to shut off the light.

Q. Baggage Slide

1. New baggage slides are indicated on the drawings. Where indicated on the drawings, provide and install new baggage slides.

2.05 CONTROLS

- A. The bridge shall be designed with safety as the first priority; at a minimum, the following control features, interlocks, and warning devices shall be included in the bridge:
 1. With the PBB in the "Off" mode, all controls shall be inoperative.
 2. Spring-loaded wheel brake(s) shall be automatically set whenever controls for horizontal travel are not actuated by the operator. The drive system shall have provisions to manually release the brakes to permit towing of the unit in the event of a power failure.
 3. The vertical lift column safety stops are to be automatically engaged whenever controls for vertical travel are not actuated by the operator.
 4. With the PBB in the "Auto-Level" mode, all manual motion controls shall be inoperative. In this mode, vertical travel shall be regulated by the automatic leveling system.
 5. With the PBB in the "Operate" mode, the Auto-Leveler shall be retracted and become inoperative.

6. The control circuits shall be designed and wired so that it is impossible to select opposite motions simultaneously, e.g., extend and retract or raise and lower travel.
 7. Two limit switches, one to slow the bridge to half speed and one to halt forward or reverse travel of the bridge when the tunnel extension or retraction limits have been reached.
 8. Limit switches shall prevent movement of the bridge beyond specified Rotunda operating parameters as specified in these Specifications.
 9. A 6-inch diameter alarm bell located under the aircraft cab shall sound continuously whenever the bridge is in drive mode of operation.
 10. An amber colored rotating beacon located under the aircraft cab shall illuminate when the selector switch on the operators' console is in the "Operate" position.
 11. Adjustable slope limit switches shall be added to prevent movement of the bridge in a way that can damage the loading bridge or any auxiliary equipment that is mounted on the bridge.
 12. Vertical travel limit switches shall be provided to prevent travel of the vertical lift columns into the mechanical stops.
 13. Horizontal travel limit switches shall be provided to prevent travel of the tunnels into the mechanical stops.
 14. Cab rotation limit switches shall prevent over rotation (left or right) of the cab into mechanical stops.
 15. Preconditioned air and 400 Hz operating interlocks shall prevent horizontal bridge motion while these units are operating or the 400 Hz aircraft cable is not in the stowed position. Suitable warning indicators shall be provided for each of these conditions.
 16. Drive forward and cab rotate controls shall be locked out when canopy is down on the aircraft.
 17. Forward or reverse "drive" controls are locked out by their respective extend or retract switches.
 18. The bridge shall be fitted with slope vertical limiting switches which shall lock out appropriate vertical and drive functions if operated beyond 10.0% (or as required by airline specifications) slope limits.
 19. Adjustable switches shall be provided to limit the swing or rotation of the bridge to prevent contact with the terminal building or other fixed obstruction. This system will stop drive motions in the direction of contact and the system shall incorporate suitable warning lights and buzzers on/or inside the operator's panel.
- B. The operator shall be able to pre-position the bridge to the approximate height of the aircraft serviced while raising or lowering the bridge in the manual mode. A vertical height indicator shall be provided.
- C. The control station or operator compartment shall be located at the aircraft end of the PBB. It provides the operator with a control console, service utilities, and control interlocks required for PBB operation. The control station shall be positioned on the left side of the cab and oriented to position the operator facing forward in full view of the aircraft during bridge operations. It provides the optimum PBB maneuvering visibility without obstructing passenger traffic flow. An operator of average height shall have an unobstructed view of the boarding bridge cab spacer to position it at the aircraft fuselage during bridge operations.
1. Control console: The control console shall be located at the control station in the operator compartment and shall be protected from the outside environment. The control console shall include a Graphical User Interface (GUI) touchscreen, joystick and pushbutton controls; and a cabinet containing the main programmable controller for the PBB plus terminal blocks, relays and related electrical components necessary for full, safe control of the PBB.
 2. Programmable Logic Controller (PLC): PBB functions and information systems shall be controlled using a Beckhoff Programmable Logic Controller (PLC). The PLC system used shall comply with IEC 61131
 3. Graphical User Interface (GUI): The control console shall include a Graphical User Interface (GUI) on a 10.4 inch (264mm) touchscreen graphical display that provides the operator with a means to login, control interfaces, bridge set up displays, maintenance and diagnostic information, wheel position information, fault/limit/status and warning

messages and fault history as described in the following sections.

4. Networking with gate equipment: The PLC shall be designed to allow Modbus TCP/IP networking of the boarding bridges and appropriately equipped ancillary equipment, such as pre-conditioned air (PCA) units and ground power units (GPU), to a common remote monitoring station using Ethernet protocols and appropriate hardware.
 5. Controls: All bridge major motion controls shall be momentary contact type pushbuttons or joystick located on the control console. All major motions shall only occur while a control is maintained in the active position ("deadman" functionality). All of the motion controls shall be designed to be relative to the function of the PBB being controlled. For example, "raise" push button shall be located above the "lower" push button.
 - a. Horizontal drive control: Bridge movement in the horizontal (forward/reverse propulsion and left/right steering) shall be controlled by a four-quadrant variable control stick (Joystick). Forward/reverse propulsion shall be controlled by fore/aft motion of the control stick and steering shall be controlled by right/left motion of the control stick. A wheel position indicator on the GUI shall display the direction of drive. Speed shall be proportionally controlled: as the control stick is moved progressively from the neutral position, wheel speed increases proportionally with the position of the control stick. The control stick shall have a momentary "dead man" type trigger that when depressed shall enable PBB horizontal motion after a 3-second delay. During the 3-second delay the travel warning bell at the horizontal drive shall sound and an amber indication shall be displayed at the console to inform the operator to wait to drive. After the 3-second delay period is complete and the trigger remains depressed a green indicator on the console shall indicate that drive is enabled.
 - b. Vertical drive control: Push button switches shall be provided that raise and lower the PBB.
 - c. Cab rotation control: Push button switches shall be provided that for cab rotation, left or right, shall be available at the control console.
 - d. Emergency stop: The control console shall be equipped with an illuminated red mushroom type push button switch for discontinuing all bridge movement in an emergency. Two additional illuminated emergency stop switches accessible to ground personnel shall be installed, one at the lower end of the left vertical drive column and one at the lower end of the service stairs.
 - e. Closed-circuit TV (CCTV) monitor: A 5 inch (125mm) diagonal color monitor shall be mounted in the control console that continuously displays a camera image of the PBB horizontal drive wheels area. The CCTV camera shall be mounted at a location that provides a clear view of the wheels area.
- D. Slow and Stop Proximity Sensors
1. The manufacturer shall equip each PBB with a proximity switch system, or comparable, to prevent the bridge bumper from hitting the aircraft, causing damage. At 2' to 10' (adjustable) from the aircraft, slow-down circuitry shall be initiated, slowing forward movement to half speed. As the bridge continues to approach the aircraft, stop proximity sensors shall activate, no part of the bumper will be permitted to come within 0" to 2" (adjustable) of the aircraft. Appropriate forward motion and cab rotation in the direction of the aircraft will be locked out to prevent the bridge from contacting the aircraft. Movement away from the aircraft will be unrestricted.

2.06 OPERATION AND CONTROL LOGIC

- A. Operator log on and security: An Operator, Maintenance or Administration Password shall be required to access PBB operations or maintenance activities. An operator shall be required to log on at the GUI using a valid password to operate the PBB, to include enabling or disabling the automatic leveling mode. Passwords shall be used to control access to bridge functions, set up, maintenance and diagnostic screens and password maintenance. The PBB shall have three levels of passwords:
1. Level I – Operator Passwords. Up to forty-two (42) operator passwords shall allow access to all aircraft docking functions.
 2. Level II – Maintenance Passwords. One (1) maintenance password shall allow access to all operator and maintenance/setup functions.

3. Level III – Administrative Password. One (1) administrative password shall allow access to all Level I and II functions plus allow the administrative user to view and edit passwords.
4. Operator log on options:
 - a. A three position, master key switch shall be used to select “OFF”, “OPERATE” or “AUTO” (automatic leveling) modes. The key may be removed only in the “OFF” or “AUTO” positions.
 - b. A three position, master switch with no key shall be used to select “OFF”, “OPERATE” or “AUTO” (automatic leveling) modes.
 - c. Both a keyed (or non-keyed) master selector switch plus operator log on shall be required to operate the PBB.
 - d. A card swipe system shall be used for operator log on. The customer must specify in detail the card swipe system to be used and its required input power and control interface.
 - e. Both a keyed (or non-keyed) master selector switch plus a card swipe shall be required to operate the PBB.
- B. Log Off: To log off, the Operator shall touch the Logoff touch button on the GUI. This will return the GUI to the opening log on/password screen.
- C. PBB Operation Modes: The controls shall provide auto level, operate and logged off modes that shall be selected using touch buttons on the touchscreen.
 1. Auto Level: Selecting the “Auto Level Mode” touch button shall initiate the auto level sequence. The auto level arm extends toward the aircraft, and the system shall perform an automatic check (test nod) of the auto level system to verify that the aircraft sensor has made contact with the aircraft and that the auto level control system is functional. Upon completion of the verification process, a message shall be displayed indicating that the PBB is in “Auto Level Mode”. When in auto level mode, the PBB shall allow only vertical travel; canopy, cab rotation and horizontal travel become inactive. In auto level mode, the PBB shall engage the auto level system and automatically follow the vertical movement of the parked aircraft. To exit auto level mode and return to manual mode, the operator must touch the auto level mode touch button and enter a valid password.
 2. Operate: Logging on using a valid password, or exit auto level mode using a valid password enables all bridge movements – extend/retract, vertical, floor movement, and cab rotation – provided there are no faults or activated limits. In operate mode, all bridge movement shall be initiated by the operator. The appropriate pushbuttons shall be lighted to indicate those functions available, and a message on the GUI panel shall be displayed indicating the PBB is in Operate Mode.
 3. Logged Off: The operator must touch the “Logoff” touch button to exit the Main Screen and return to the Log on Screen. All PBB functions except lighting shall be disabled.
- D. Languages: The operator shall be able to select one of the optional preprogrammed languages for display on the GUI. English shall be the standard default language, unless otherwise specified. Up to three (3) additional languages can be programmed into the PLC as options. Once a language has been selected, all messages shall be displayed in the selected language until a different language is selected on the log on screen.
- E. Cab Floor Adjustment: The cab floor of the PBB shall be both automatically and manually adjustable to align the floor level with the aircraft doorsill. Touch buttons on the GUI shall allow control of the cab floor to be toggled between the automatic and manual modes of operation. Text on the touch button shall display which mode is active.
 1. Upon selection of cab floor manual mode, two additional touch buttons become active enabling the manual movement of the cab floor up or down. Touching the Up button shall move the right side of the cab floor in the upward direction. Touching the Down button shall lower the right side of the cab floor. When the PBB is “Auto Level Mode”, all cab floor movement shall be disabled and the touch buttons shall NOT be visible. The Cab Floor mode of operation previously selected when the auto level mode of operation was energized shall be reactivated when the auto level mode is deactivated.
- F. Canopy Closure Control: The bellows-type aircraft closure canopy shall be powered for extend and retract operation. The control console shall contain GUI touch buttons to control extension

and retraction of the canopy.

1. The aircraft canopy closure shall be capable of dual activation of both sides of the canopy simultaneously or independent activation of the right or left sides of the canopy in the up or down directions. A GUI touch button shall be provided to select either independent adjustment of the left and right sides of the aircraft closure or simultaneous operation of both sides. Canopy actuation shall be active only when the PBB is in Operate Mode. When the PBB is in Auto Level Mode both canopy touch buttons shall be not visible. Therefore, the canopies must be deployed prior to entering auto level mode. The left and right side canopy actuator motors shall be independently controlled by limit switches that sense both the pressure against the aircraft, and operational range limits to provide positioning of the canopy to the aircraft and prevent over extension or retraction of the canopy closures.
- G. Floodlights Control: A GUI touch button shall be provided to allow control of the apron floodlights that shall be located on the underside of the PBB. These floodlights shall be positioned to illuminate the apron for a distance of approximately 10 m or 30 feet forward of the PBB, and around the wheel carriage area. Touching the Floodlight touch button will toggle the apron flood lighting on and off.
- H. Travel Bell Control: A momentary GUI touch button shall be provided to allow manual activation of the travel warning bell. When touched, the travel bell shall be activated until the button is released. (The travel warning bell sounds automatically while the PBB is moving and also during the three-second motion delay period.)
- I. More Controls" Button: A touch button labelled "More Controls" shall be available on the GUI to allow additional PBB features to be selected and controlled. These features may include selections such as floor heating, window heating, additional lighting and others dependent upon customer-selected options and features.
- J. Maintenance Button: A GUI touch button shall be provided that shall access maintenance functions available at the GUI. The maintenance touch button shall function only when a maintenance or administrative password has been entered during log on. The maintenance button shall provide access to:
 1. Calibration
 2. Limits Setup
 3. Options Selection
 4. Diagnostics
 5. Save and Restore Data
 6. Passwords (Administrative User Only)
 7. Warnings History
 8. Faults History
- K. Operational Indicators: The following indicators are displayed on the GUI in both auto level and manual modes.
 1. Vertical Height: The current vertical height of the PBB measured from ground level shall be measured and indicated. The measurement shall be displayed as a percentage between 0% (minimum height) and 100% (maximum height).
 2. Rotational Angle: The rotational angle of the bridge shall be displayed. The display identifies angular counterclockwise (left) rotation in positive (+) degrees, and clockwise (right) rotation in negative (-) degrees from the centerline axis in reference to a programmed zero position.
 3. Cab Rotation Angle: The cab rotation angle shall be measured and indicated. The zero data point shall be identified when the aircraft spacer shall be positioned perpendicular to the telescoping tunnel centerline. The display shall indicate counterclockwise (left) rotation in positive (+) degrees and clockwise (right) rotation in negative degrees from the centerline axis.
 4. Wheel Position Angle: The wheel position angle shall be measured and indicated. Zero degrees shall be identified when the drive wheels shall be positioned parallel to bridge telescoping tunnel centerline axis. The display will indicate counterclockwise (left) rotation in positive (+) degrees and clockwise (right) rotation in negative degrees from the

- centerline axis.
5. An amber indicator lamp and a text message on the GUI shall indicate the auto-leveling system is energized and functioning.
 6. A red indicator lamp and a text message on the GUI and an audible warning shall indicate the auto leveler sustained travel timer has activated, indicating an auto level failure alarm.
 7. An amber flashing indicator on the GUI to indicate the aircraft canopy is down. The canopy must be fully retracted before the PBB can be moved forward.
 8. A red indicator and a text message on the GUI and audible alarm indicate vertical drive column faults.
 9. Flashing Travel Beacons: A flashing amber beacon shall be mounted under the cab. The beacon shall indicate that power is on and the bridge may move at any moment. Two additional flashing amber beacons shall be provided, one mounted at the bottom end of each vertical lift column, that shall flash during the 3-second travel delay period and during PBB horizontal motion.
 10. Warning Bell: An audible warning bell shall be mounted under the bridge on the wheel carriage and shall ring (98 decibels at 10 feet (3.0m) when the bridge shall be moving horizontally and also during the 3-second travel delay period.
- L. GUI Message Display. The GUI shall provide status and fault information to the operator. Standard messages shall include the following:
1. Limit Messages: shall be displayed as yellow warning messages.
 2. Horizontal Extend Limit. Forward motion disabled.
 3. Horizontal Retract Limit. Reverse motion disabled.
 4. Vertical Up Limit reached. Drive PBB down.
 5. Vertical Down Limit reached. Drive PBB up.
 6. Cab Left Limit reached. Rotate cab right.
 7. Cab Right Limit reached. Rotate cab left.
 8. Left Swing Limit reached. Rotate PBB right.
 9. Right Swing Limit reached. Rotate PBB left.
 10. ACF Fault. Level floor manually.
 11. Main contactor not energized. Check interlocks and emergency stops.
 12. Limits Disabled. Use caution while driving the PBB with the Limits disabled.
 13. Slope Up Limit reached. Reverse and up motion disabled.
 14. Slope Down Limit reached. Reverse and down motion disabled.
 15. Slowdown Sensor Activated. PBB in Horizontal Slow-down. Speed reduced by $\frac{1}{2}$.
 16. Main Contactor Disabled. To reset Main Contactor you must log OFF then ON.
 17. Fault Messages: shall be displayed as red fault messages.
 - a. Vertical Up Ultimate Limit. Call Maintenance.
 - b. Vertical Down Ultimate Limit. Call Maintenance.
 - c. Horizontal Extend Ultimate Limit. Retract bridge.
 - d. Horizontal Retract Ultimate. Extend bridge.
 - e. Cab Left Ultimate Limit. Rotate right.
 - f. Cab Right Ultimate Limit. Rotate left.
 - g. Inverter Fault. Log Off, Wait XX Seconds, Log back On. Call Maintenance.
 - h. Vertical Column Fault. Call Maintenance.
 - i. Swing Ultimate Limit. Call Maintenance.
 - j. Auto Level Failure. Reset Auto Level System. Call Maintenance.
 - k. Left Vertical Overload activated. Call Maintenance.
 - l. Right Vertical Overload activated. Call Maintenance.
 - m. Cab Position Sensor Failure. Call Maintenance.
 - n. Main Contactor Weld Fault. Press E-Stop and Call Maintenance.
 - o. Vertical Up Contactor Weld Fault. Call Maintenance.
 - p. Vertical Down Contactor Weld Fault. Call Maintenance.
 - q. Cab Left Contactor Weld Fault. Call Maintenance.
 - r. Cab Right Contactor Weld Fault. Call Maintenance.

- M. Control Features and Interlocks: The following control interlocks shall be provided.
1. Mechanical and logical interlocks shall be provided to prevent damage to control circuits or boarding bridge components by selecting opposite motions simultaneously. For example, depressing an "up" button prevents depressing a "down" button.
 2. When the operator selects the auto level mode, or logs off the control system, all basic bridge operational controls shall be inoperative.
 3. Basic functional logic of the PBB shall be programmed by the manufacturer. This logic resides in non-volatile memory.
 4. The software shall act upon PBB location sensor inputs and operator control inputs to provide valid PBB motions. If a conflict arises between operator inputs and sensor inputs, error routines shall be executed to display messages on the GUI, turn on warning lights, sound an alarm and/or stop the bridge as necessary.
 5. PBB motions that if unprotected could endanger personnel or cause damage to the PBB shall be protected by three levels of limits. First level limits shall provide a slowdown of PBB motion. The second level shall provide warning to the operator and motion interruption. Motions selected by the operator that do not conflict with current limits shall be allowed. Other motions shall be disabled. Information suggesting allowable motions shall be displayed for the operator on the GUI where applicable. A third level of limits shall prevent physical travel. The third level limit devices shall interrupt the main line input power to all bridge control circuits except lighting. The PLC shall monitor the limit fault and the error and operator instructions shall be displayed on the GUI. Maintenance personnel shall be required to resolve the fault and reset the PLC to allow further PBB operation.
 6. A motion-enabled interlock shall require that an operator must initiate any bridge movement by activating a control panel switch. Otherwise, power cannot be applied to the energizing circuitry. As a result, if the PLC should command the bridge to move by sending an erroneous signal, the bridge will not move until a control console switch has been activated as well. Both the PLC command and the motion enable circuitry shall be activated prior to bridge movement.
 7. A non-contact sensor shall slow the bridge horizontal motion as it approaches the aircraft when in operate mode.
 8. An interlock shall prevent the PBB from being driven forward when the aircraft closure canopy is deployed.

2.07 ELECTRICAL SYSTEM(S)

- A. A NEMA 4 (IP65) rated stainless steel heavy-duty electrical disconnect panel, mounted on the rotunda support column, shall provide electrical disconnects, overcurrent protection and transformers – if required - to adapt and distribute the specified, customer-provided 3-phase, 5-wire, 480/277 Volt supply power to the motor, lighting, and control circuits with thermal magnetic trip circuit breakers. The disconnect panel shall be equipped with an interior dead front door, accessible only with a tool or a key. A variety of power source options shall be accommodated where needed: for example either a single power feed or separate power feeds into the disconnect panel shall be accommodated.
1. The PBB main circuit breaker shall remove all power from all bridge circuits (exclusive of PCA & 400 Hz systems).
- B. PBB disconnect enclosure shall have SCCR rating of 35kA or greater.
- C. The passenger boarding bridge shall be capable of operating on an emergency power backed up source of 3-phase, 5-wire, 480/277 Volt, 60 Amps service terminating in a panel on the terminal wall adjacent to the rotunda column of the bridge, which shall be provided by others. This power shall remain separate from non-critical load power such as PCA and 400 Hz loads.
- D. All circuit breakers shall be lockable in the "OFF" position.
- E. All primary disconnecting means shall be suitably rated to be capable of withstanding and interrupting fault currents available at the input.
- F. All standard lighting, duplex receptacles, and operator controls shall operate on 120 volt, single phase, 60 Hz power. The transformer and separate circuit breakers for lighting and control power shall be mounted in the power control panel.

1. All circuit breakers shall be lockable in the "OFF" position.
 2. All circuits and systems shall be protected by circuit breakers. Fuses will not be allowed.
- G. Disconnect panel shall either be equipped with exterior handles, or shall be guarded such that all circuit breakers can be operated by an operator without having access to energized components.
- H. All electrical components, which are exposed to the weather, shall be of a weatherproof type or housed in weather-tight NEMA 3R enclosures (or better), except for main power disconnect(s), which shall be a NEMA 4 stainless steel enclosure. Where dictated by the environment, electrical enclosures shall be equipped with heaters to control condensation.
- I. All electrical equipment and methods of installation shall conform to the requirements and recommendations of the American Insurance Association (AIA), the National Electrical Manufacturers Association (NEMA), and the National Electrical Code (NEC).
- J. All electrical components utilized shall be recognized by Underwriters Laboratories (UL) or an approved equal testing laboratory.
- K. Wiring and installation shall be in accordance with National Electric Code and applicable local electrical codes.
- L. Both ends of each conductor shall be color coded or identified. Particular attention shall be given to separating circuits of different voltages, emergency lighting, and telephone lines.
- M. Receptacles
1. Receptacles/receptacle circuits shall be protected with ground fault circuit interruption (GFCI) or a residual current circuit breaker (RCCB)
 2. Provide at least two (2) 120 volt, 60 Hz, 1-phase, 20 Amp, three conductor, U ground duplex receptacles inside bridge.
 - a. One shall be located in cab section
 - b. One shall be located in the vestibule-end near the terminal door.
 3. Provide a weatherproof 120-volt, 60 Hz, 1-phase, 20 Amp, three conductor, U ground duplex receptacle on the drive column of each bridge.
 - a. Exterior outlets shall be equipped with extra heavy duty, metallic, while in use, wet cover assemblies such as Red Dot Model CKMUV or equivalent.
- N. Control console lid, wiring harness should be of sufficient length to allow the panel to be pulled out and turned over, facilitating repairs.
- O. All wiring shall be brought to terminal blocks and/or suitable connectors. The wiring shall be formed and restrained to give a neat appearance. Wire splices shall not be used. Connections shall be made using terminal strips and staked lugs or by patent connectors.
- P. Grommets and suitable anti-chafe material shall be used where wires are required to pass through structure or other similar relief or opening which exposes the wire to possible chafing. All wiring shall be in conduit (preferably automotive split loom) or spot-tied and shall be routed away from possible pinch points. Wiring shall be adequately supported to protect it from damage due to ice and snow buildup, bumping, kinking, and flexing.
- Q. Quick disconnect fittings, where required, shall be UL or ETL approved.
- R. Lighting
1. All PBB lighting shall be LED type without ballasts.
 2. Interior Lighting
 - a. Interior lighting shall be activated by occupancy sensors when someone enters the cab, rotunda or walkway.
 - b. Interior lighting shall include the lighting in the walkways, tunnels, cab/bubble, and rotunda areas.
 - c. The level of illumination shall average 200 lux at the finished floor level with the weather door closed.
 - d. Tunnel lighting shall be provided by recessed LED panel fixtures with diffusers. The fixtures shall be 4 feet long and shall be positioned parallel to the tunnel centerline.

- e. The lights shall be controlled by two 3-way switches. One shall be located in the control cab and one in the rotunda corridor adjacent to the terminal door.
 - f. Rotunda and bubble area lighting shall be provided in a similar manner, shall meet the same lighting level requirements and shall be controlled from the same tunnel switches.
 - g. Walkway Lighting
 - 1) Shall match the interior lighting design requirements.
 - 2) For walkways greater than 10' in length, the lights shall be controlled with two 3-way switches. One shall be located at the exit end of the walkway, and one shall be adjacent to the terminal door.
 - 3) For walkways less than 10" one light switch adjacent to the terminal door will suffice.
 - 4)
 - h. The operator's console shall be provided additional lighting via recessed LED light fixtures which shall be controlled via a switch on the operator's console. Provide a minimum of 645 lux at the console faceplate.
 - i. PBB electrical control cabinets shall be equipped with interior LED light fixtures as necessary to eliminate the controls for maintenance purposes, control via manual switch interior to cabinet.
 - j. Provide emergency lighting with 90 minutes battery backup complete with self-contained charger and automatic on-off control. Emergency lighting shall be incorporated into the normal lighting fixtures, and shall meet illumination requirements of NFPA-101 life safety codes. Wall mounted battery units are not acceptable.
3. Exterior Lighting
- a. Two exterior LED floodlights shall be provided under the tunnel to illuminate the apron area ahead of the bridge. An additional LED floodlight shall be provided to illuminate the area around the drive column.
 - b. A sealed exterior type LED fixture shall illuminate the cab area forward of the overhead roll-up door. Level of illumination shall be 200 lux at the finished floor level with the weather door closed.
 - c. A weatherproof exterior fixture with a 100 watt LED equivalent lamp shall be installed over the service door to illuminate the service stairs and landing. It shall be controlled by a switch located on the inside wall of the tunnel adjacent to the door.
- S. Electrical interlocks shall be fail-safe design.
- T. Electrical devices including lights, switches, relays, wiring, and terminals when located in an area exposed to weather, shall be of weatherproof design or protected by weatherproof enclosures. All exterior located limits switches, potentiometers, or other electrical devices, shall be protected by suitable covers to prevent the accumulation of snow or ice from preventing switch action or causing false switch action, as well as to protect the devices from physical damage.
- U. Electrical conductors or cables exposed to weather shall be suitably rated and UL approved.
- V. Flexible cables/conduits shall not exceed 24" except where relational motion is required. All cables and conduits shall be adequately supported.
- W. New PBB's shall be equipped with all miscellaneous power, data, control, etcetera cables/connectors as required by airline specifications.

2.08 COMMUNICATION SYSTEM(S)

- A. CAT 6 cables routed through the passenger boarding bridge cable carrier system shall meet the following minimum requirements:
 - 1. Rated for a minimum of 600V
 - 2. Rated for outdoor use with sunlight resistant jacket when any portion of the cable is not installed in conduit.
 - 3. Rated for High Flex applications
 - 4. Comply with ANSI/TIA-568.2-D Standard

- B. Wireless Access Points
 - 1. Refer to design drawings for quantity and type of cables.
- C. Fire Alarm:
 - 1. Provide stranded CAT6 cable for fire alarm interface
 - 2. The fire alarm cable shall extend across the PBB and must have sufficient length at the rotunda end of the bridge to allow connection to the terminal building communications J box located on the building face near the passenger boarding door as indicated in project drawings. Provide and install terminations at the building face end of cable.
 - 3. Refer to the design drawings for quantity and type of cables
- D. Security Cameras:
 - 1. Provide stranded CAT6 cable for security cameras.
 - 2. Refer to the design drawings for quantity and type of cables
- E. ACAMS:
 - 1. Provide connectivity for ACAMS entry and exit at the service door in the cab of the PBB
 - 2. Separate 4"x4" boxes shall be installed for future card reader installation. One box shall be located inside the cab adjacent to the service door, and the other shall be located on the exterior of the cab adjacent to the service door .
 - 3. The boxes shall be recessed for a flush mounting design, with covers installed that are designed for their uses (interior and exterior).
 - 4. One conduit shall be route to each enclosure for future installation of ACAMS cabling back to the rotunda/terminal building. Provide pull strings in each conduit.
 - 5. Refer to the design drawings for quantity and type of cables .
- F. Telephone:
 - 1. The bridge shall contain appropriate telephone communications equipment. The provisions shall include a flush mounted "J" box containing a 4-pair CAT-6 communication cable near the operator's position.
 - 2. The communications cable shall extend across the PBB and must have sufficient length at the rotunda end of the bridge to allow connection to the terminal building communications J box located on the building face near the passenger boarding door as indicated in project drawings. Provide and install terminations at the building face end of cable.
 - 3. Telephone cabling shall be extended to the wheel bogey and shall terminate in a junction box for the potential future installation of wheel bogey telephones.
 - 4. Telephone will be provided by others.
- G. Remote Monitoring
 - 1. Each passenger boarding bridge shall be capable of being remotely monitored for status, alarms, usage rates, etc.
 - 2. Remote monitoring of the passenger boarding bridge shall include ancillary equipment including: pre-conditioned air unit, ground power unit, etc.
 - 3. Remote monitoring shall be provided via a
 - 4. This specification does not provide specific requirements for any additional software or hardware for the Owner to monitor the passenger boarding bridges equipment with remote monitoring capabilities.
 - 5. Any additional service fees for remote monitoring software shall be clearly identified and submitted to the Owner or Owners representative for review and consideration.
- H. Owner Equipment Enclosure
 - 1. The manufacturer shall provide a 12"x12"x6" NEMA 12 enclosure inside of the cab of each PBB, mounted above the service stair door.
 - 2. Each enclosure shall be equipped with a duplex receptacle, with power supplied by a separate circuit breaker inside of the cab control cabinet.
 - 3. Each enclosure shall have a 1" conduit pathway provided to it to allow for communications cables to be routed from the dog legs to this enclosure. One CAT6 cable shall be prewired to this enclosure at the factor, coiled for future use by the owner.

2.09 MAINTENANCE AND SET-UP SCREENS

- A. GUI maintenance and Set Up Screens: The PBB shall be designed to provide a quick method for programming the PLC to accept new operational parameters. The Maintenance / Setup Screens shall allow maintenance personnel to complete initial setup or adjustment of the PBB operational parameters directly using the GUI at the PBB control console without the use of additional programming devices or external computer. These screens provide for Preposition and Location Setup, Status Calibration, and initial Bridge Operational Limit Set Up.
- B. Calibrations and Set Up: The following PBB control calibrations and set up operations shall be possible at the GUI touchscreen. A maintenance or admin password shall be required to access these functions:
 - 1. Calibration:
 - a. Height Calibration
 - b. Cab Angle Calibration
 - c. Rotunda/Bridge Angle Calibration
 - d. Wheel Bogie Angle Calibration
 - e. Extension Calibration (optional)
 - 2. Analog Limit Setup:
 - a. Vertical Up Limit Set
 - b. Vertical Down Limit Set
 - c. Cab Right Limit Set
 - d. Cab Left Limit Set
 - e. Swing Right Limit Set
 - f. Swing Left Limit Set
 - g. Extend Limit Set (optional)
 - h. Retract Limit Set (optional)
 - 3. Password Control:
 - a. Change Passwords (Admin password required)
 - 4. Adjustable Auto Level Timer (1.0 – 10.0 Seconds)
 - 5. Optional Features:
 - a. Pre-position Setup (optional): Set Pre-positioning Points
 - b. Others as required
- C. Prepositioning (optional): Prepositioning shall be easily programmed by local maintenance personnel without the use of ancillary programming devices. A maintenance person shall be required to log onto the PBB using a maintenance password. From the Maintenance Set-Up Screen located in the Setup Screen menu, the Preposition Setup Mode of Operation shall be selected. The PBB shall then be rotated, moved vertically, extended, and the cab rotated to the desired aircraft service position. Upon reaching the desired aircraft service position, one of the preposition setup buttons, labeled as specific aircraft types, shall be depressed to program the PLC with the required coordinates for that particular prepositioning location. No other programming shall be required.
- D. PBB Calibration: The Status Calibration screen shall be provided to accommodate input of critical data used in establishing operational parameters for a particular gate location during the initial PBB set-up operation. The calibration includes the following data:
 - 1. Units (feet/meters) selection: A selection shall be provided to allow the linear measurements that shall be displayed on the main screen status display panel to be toggled providing linear measurement readout in either feet or meters.
 - 2. Height Calibration: This screen provides the ability to establish vertical data points that shall be used as the base for calculation for the vertical height measurements displayed on the screen.
 - 3. Wheel Bogie Calibration: This screen provide the ability to establish a zero or straight forward calibration point and 90° left calibration point used in determining wheel bogie position.
 - 4. Cab Calibration: This screen provide the ability to establish a zero or straight forward calibration point and 90° left calibration point used in determining Cab position.

5. Bridge/Swing Calibration: This screen provide the ability to establish a zero calibration point and a second reference point used in determining Bridge/Swing position.
 6. Length Calibration: This screen provides the ability of setting up two length reference points used in determining Bridge Length.
- E. PBB Limits Set-Up.
1. PBB Height: This gives maintenance the ability of setting Vertical Up/ Down Height Limits anywhere within the operation Vertical range of the PBB with just the touch of a couple touch buttons.
 2. Cab Rotation: This gives maintenance the ability of setting Cab Left/Right Limits anywhere within the operational Cab rotation range of the PBB with just the touch of a couple touch buttons.
 3. PBB/Swing Rotation: This gives maintenance the ability of setting PBB Rotation/Swing Left/Right Limits anywhere within the PBB Rotation/Swing operational range of the PBB with just the touch of a couple touch buttons.
 4. PBB Length (Optional): This gives maintenance the ability of setting a PBB Length Extend/Retract Limit anywhere within the Length operational range of the PBB with just the touch of a couple touch buttons.
- F. Password Maintenance. There are three password levels. Operator, Maintenance and Administration.
1. Operator: There are up to forty-two (42) operator passwords available. These passwords give the operator the ability to logon and operate the PBB in Manual and Auto level Mode with full rights to drive the PBB and select Auto level Mode once they are next to an aircraft. The alarm history screen and I/O diagnostic screens shall also be available to operators.
 2. Maintenance: This password gives the Maintenance person the ability of Operating and Configuring the PBB with all Calibration and Limit set-ups and all other configuration screens.
 3. Administration: This password gives the Administrator the ability to Operate, Set-Up and Maintain passwords on the PBB plus access to Alarm History Screen, I/O Diagnostic Screens and all other configuration screens.

2.10 IDENTIFICATIONS, MARKINGS, SIGNAGE & LABELING

- A. All instruments, relays, circuit boards, pumps, motors, controls, etc. and instructions shall be suitably identified with permanent, non-fading placards, or pictographs impervious to the effects of weather, oil, cleaning solvents, aircraft hydraulic fluids, fuel and other effects of normal operation for the life of the equipment without deterioration, fading, or loosening.
- B. Placards shall be in sharp color contrast in large enough letters to be easily read from the operator's position indicating the function, direction and/or identification.
- C. A metal nameplate shall be riveted to the equipment specifying manufacturer's name and/or trademark, manufacturer's part or model number, manufacturer's serial number, date of manufacture, and equipment's rating.
- D. Circuit breakers shall be labeled as to the circuit that they feed.
- E. Three Sided Illuminated Sign
 1. Passenger Boarding Bridge Identification Signs shall be supplied by the manufacturer for each bridge identified in the construction documents.
 2. These three sided illuminated triangular signs are mounted to the top of the jetbridge end cab and are visible from any angle by the pilots as they approach the gate area. The gate number is approximately 2'-5" high with a readable distance of 600 feet or more. The hot dipped galvanized or aluminum-fabricated structure shall be painted to match the color of the passenger boarding bridge, and shall have 1/4" thick acrylic sign faces with surface sprayed color. The letters will be masked during the spraying process and, when removed, the translucent acrylic will be revealed. Approximate size of the sign faces will be 4'-5&1/2". This sign will require out-door weatherproof detailing.
 3. Gate signs shall be activated by a photocell. Power shall be distributed from a circuit breaker located within the electrical control cabinet. Accessible switches that could be

- inadvertently turned off will not be allowed.
- 4. Match airfield standard colors and fonts.
- F. Vinyl Gate No. decals shall be installed on the terminal side of all PBB wheel bogies.
 - 1. Match airfield standard size, colors and fonts.
- G. Other Signage

2.11 FINISHES

- A. The exterior and exterior design shall be aesthetically pleasing and in keeping with contemporary trends. Where necessary to meet this requirement, and when not in conflict and maintainability standards, enclosures should be utilized to cover unsightly appurtenances.
- B. All interior and exterior systems shall be fitted and trimmed as necessary to present a neat and clean finished product
- C. All finishes shall meet NFPA requirements
- D. Interior
 - 1. All interior surfaces of the structure shall be cleaned in accordance with SSPC-SP3 or sand/grit-blasted in accordance with SSPC-SP6, as appropriate, and shall be coated with a rust inhibiting primer applied to a minimum 4 mil total dry thickness over the average measured blast profile. Exposed interior surfaces shall be coated with an additional 2 mils of polyurethane finish coat.
 - 2. Interior Wall Treatment
 - a. Shall consist of floor to ceiling (or as noted) high pressure laminate wallboard, with black trim kick plates.
 - b. Paint all exposed interior metal surfaces to match interior wall panels, except brushed aluminum or bright finish work.
 - c. Color: Nevamar Platinum Gray S6023T, Textured
 - 3. Ceiling:
 - a. 8" metal plank with flat black recessed filler strips or coil coated galvanized steel panels shall be used as ceiling material. A suitable molding shall be provided along the longitudinal corners of the ceiling finish.
 - b. Color: Brushed Aluminum
 - 4. Flooring:
 - a. Tunnels:
 - 1) The PBB's shall be carpeted with heavy commercial non-skid carpeting, or rubber as indicated. Flooring to be supplied and installed by bridge manufacturer in the factory.
 - 2) Color:
 - 3) Type:
 - b. Transition Ramps:
 - 1) Ribbed rubber 0.1875 inch (4.8mm) thick
 - 2) Color: verify with owner
 - 3) Type: verify with owner
 - c. Cab/Bubble
 - 1) The PBB's shall be carpeted with heavy commercial non-skid carpeting, or rubber as indicated. Flooring to be supplied and installed by bridge manufacturer in the factory.
 - 2) Ribbed rubber 0.1875 inch (4.8mm) thick
 - 3) Color: verify with owner
 - 4) Type: verify with owner
 - 5. Sub-floors
 - a. Shall be constructed of 3/4" fire retardant marine plywood which shall be securely fastened with fasteners suitable for this purpose. Insure adjoining sheets are supported and fastened to a common member to provide smooth even joints. Any remaining unevenness will be removed with filler. The sub-floor fasteners will not protrude through the exterior tunnel siding.

- b. Cab sub floors shall be aluminum
 - c. Other sub-floors as required by floor covering manufacturers.
 - d. See flooring requirements.
- 6. Cover Plates
 - a. All receptacles and light switch cover plates to be stainless steel, ANSI No. 4 finish.
- E. Exterior
 - 1. All exterior surfaces, including support columns and base plates, shall be sand/grit blasted in accordance with specification SSPC-SP6 to a 1-1/2 mil minimum to 2 mil maximum profile.
 - 2. The exterior shall be coated with a rust inhibiting primer applied to a minimum of 4 mil total dry thickness over the average measured blast profile followed by a finish coat of 5-1/2 mil thickness catalyzed polyurethane enamel. The cured dry film thickness of the total system shall achieve a minimum of 8 mils.
 - a. Color: JBT Standard Arctic White
 - 3. All external metal shall be a uniformly smooth surface and free of all mill scale, rust and dirt before painting. A primer coat of epoxy primer shall be applied followed by one finish coat. A total nominal minimum prime and paint thickness of four mils when dry is required.
 - a. Color: Arctic White
 - 4. Anodized aluminum, galvanized or stainless steel trim items, roll-up doors, and cab curtains shall be supplied in their original unpainted bright finish. Machined surfaces shall not be painted unless they are exposed after assembly.
 - a. Dog Legs (Pantagraphs)
 - b. Service Stair & Platform
 - 5. Canopy
 - a. Color: Light Grey
 - 6. Electrical Enclosures
 - a. Stainless Steel (Manufacturers Disconnect)
 - b. tbd (other enclosures)

2.12 MATERIALS, PARTS AND PROCESSES

- A. Only standard components of highest commercial quality, commercially available and conforming to recommendations of standards established by the Society of Automotive Engineers (SAE) and the American Society of Mechanical Engineers (ASME) will be used.
- B. All material and components assembled or fabricated into the equipment are to be new, unused, of high quality, of current production and free from defects or imperfections which might affect the appearance or serviceability of the finished product.
- C. All parts and materials needed to fabricate, assemble, and finish the equipment shall be furnished by the manufacturer unless otherwise specified.
- D. All bolted, screwed, and threaded fastenings shall incorporate adequate locking devices. Safety wire shall be incorporated in critical applications.
- E. Weldments requiring alignment with assemblies, interchangeability, fit, and flatness shall be fabricated with fixtures capable of maintaining dimensions in the finished part within design tolerance.
- F. Specified sections and weld design and application shall be such that heat distortion of plates and members is minimized in the final weldment.
- G. All intersecting steel planes, e.g. side to top, side to bottom, of exterior steel sections of the passenger boarding bridge shall be 100% welded. Caulk shall not be used to provide weather seals.
- H. Components must be installed per the manufacturer's recommendations. Modification of the component which could affect its performance must be approved in writing from the manufacturer of the component. Any modified component should be identified as such to the Owner for purposes of interchangeability.

- I. All components shall be chosen to be within their manufacturer's published ratings under the most severe conditions of operation. This shall include, but not be limited to the following:
 - 1. Mechanical Components: Speed, torque, force, environment, lubrication means, and expected service life of chains, belts, sheaves, sprockets, shafts, bearings, gears, etc.
 - 2. Electrical Components: Voltage, current, load characteristics, and duty cycle of electrical components.
 - 3. Others: For components proprietary to the manufacturer, design shall conform to established industry practices.
- J. Fastener heads shall not be located on rub or wear surfaces unless recessed below the surface.

2.13 MAINTAINABILITY

- A. The bridge shall be designed to emphasize simplicity, ruggedness, and ease of maintenance. There shall be no special tools required for routine maintenance.
- B. Attention shall be given to the design of each component and assembly to minimize the number of routine maintenance items on the bridge.
- C. Components shall be selected and assemblies shall be designed to facilitate troubleshooting and to minimize repair or replacement time.
- D. Access panels enclosing areas requiring maintenance shall be large enough to permit accomplishment of the task required.
- E. Where practical, components shall be built in subassemblies for ease of replacement and shall be designed to be installed or removed by one person.
- F. Where the weight of a component requires mechanical assistance, the component shall be provided with lifting eyes or other suitable hoisting arrangement.
- G. Drawings, sketches, details, and all materials/equipment shall be submitted and provided in the English language and systems of measure, including, without limitation, dimensions, volumes, weights, threads, forces, fasteners, devices, panels, labels, signs, notices, communications etcetera. The use of metric or SI units is not acceptable.
- H. All parts having the same manufacturer's part number shall be directly and completely interchangeable with each other with respect to installation and performance.
- I. All components and assemblies incorporated into the loading bridge shall be designed and manufactured to dimensional tolerances which will permit future interchangeability and facilitate replacement of parts.
- J. The individual parts and components of each unit shall be of the same original manufacture and part number. Minor component parts need not comply with the above, provided interchangeability and safety are not compromised.

2.14 FACTORY TESTING

- A. The manufacturer shall test one of each model (not size) of every PBB to assure compliance with the specifications. Certification test sheets shall be submitted. The Owner shall be notified fourteen (14) days prior to the date of such tests. The Owner reserves the right to witness tests and request additional tests if necessary to demonstrate compliance with the specifications.
- B. Should factory tests fail to indicate compliance with specifications, all costs associated with re-testing, including costs associated with Owner's witness services, will be the responsibility of the manufacturer.

2.15 PRODUCT SUPPORT

- A. Spare Parts
 - 1. The manufacturer shall maintain an adequate inventory of all proprietary or vendor fabricated or modified parts, especially the long lead time items, for routine maintenance of the unit. All stock shall be maintained, whether or not the unit is in current production, for a minimum of ten (10) years from the date of the last unit manufactured.
- B. Field Support Services

1. The manufacturer shall provide supervisory and service personnel, certified by the manufacturer, during the installation of the boarding bridge to assure proper installation.
2. The manufacturer shall provide the Owner with all appropriate Service Bulletins for bridges supplied for a minimum of twenty years from the date of final acceptance.

PART 3 EXECUTION

3.01 GENERAL

- A. This specification shall act as a supplement to the Manufacturer's standard installation procedures only, and in no way shall it be construed so as to limit the installing contractor from providing a complete and operable installation, in accordance with all generally accepted good passenger boarding bridge installation practices, as well as the manufacturer's written installation procedures. Any reference to the installing contractor or contractor herein shall be construed to mean that entity installing this equipment in the field.
- B. Installations shall be performed in strict compliance with the Manufacturer's written Installation Procedures.
 1. Manufacturer shall submit a copy of their Installation Procedures for approval, prior to installation.

3.02 INSTALLATION

- A. Install in accordance with Manufacturer instructions
- B. Any and all damage sustained by the new PBB caused by equipment used for the lifting, transportation, movement, staging, or otherwise, of the new PBB, assemblies, or components shall be the responsibility of the contractor.
- C. PBB Mechanical Erection and Lifting
 1. Use of Heavy Equipment
 - a. The use of crane(s), fork lifts, and/or other heavy equipment throughout the project shall be detailed in advance with and approved by appropriate Aviation Authority offices. Equipment used shall not exceed maximum allowable airfield heights.
 - b. Heavy equipment capacity and operator experience shall be adequate to ensure safe and efficient lifting of the PBB systems, assemblies, and/or components.
 - c. Damage to the terminal building, apron, foundations, and/or PBB shall be the complete responsibility of the installing contractor.
 - d. Paint damage to PBBs and related assemblies shall be minimized, and where occurring, shall be repaired in accordance with the "Exterior Finishes" section of this section.
 - e. Heavy equipment operator's shall be fully trained and certified to operate equipment in their control.
 2. Rigging
 - a. Original Manufacturer designed PBB lifting lugs shall be utilized for rigging and handling of PBB systems, assemblies, and/or components. Where lifting lugs are not present, approved straps, cradles, chains, couplings, cables, and/or fixtures shall be utilized.
 - b. Where applicable, lifting tools shall be of the proper strength rating and shall have current certifications.
 3. Tunnel/Drive System Assembly Installation
 - a. The assembly of PBB vertical and horizontal drive assemblies shall be accomplished using safe and approved practices. All assembly shall be accomplished using new installation bolts/fasteners in accordance with manufacturer's specifications in the originally designed quantities.
 - b. Any structural modifications necessary to allow the correct use of fasteners shall be accomplished in a safe and professional manner. All welds, where necessary shall be complete, continuous, and in compliance with AWS standards, and shall be performed by certified welders. Contractor's performing welding operations shall submit copies of the welder's certifications.
 - c. PBB structural support integrity shall not be compromised.

- d. The complete tunnel assembly shall be pinned to the fixed rotunda assembly using manufacturer supplied hinge pins.
- e. If hinge pins, hinge pin plates, and/or associated welds show any damage, they are to be replaced.
- f. Ensure that the hinge pins are properly greased and installed without causing any damage or deformation to the pins.

D. Electrical Requirements

- 1. Miscellaneous Electrical Requirements
 - a. All field terminated wiring, interior and exterior, shall be checked for damage and improper or unsafe installation. Damaged wires and cables shall be replaced. All replacement wiring and components shall be UL approved and shall be selected and/or sized in accordance with NEC based upon the intended use.
 - b. Wiring shall be color coded in accordance with existing wiring and Manufacturer's specifications and shall be easily traced.
 - c. Wiring shall be neatly routed in secured harnesses and shall be labeled.
 - d. All electrical enclosures shall be UL approved, and NEMA rated.
 - e. The installing contractor shall be responsible for all PBB related electrical inter-connects, component/assembly wiring, and PBB electro-mechanical system functions, unless specifically identified otherwise.
 - f. All exterior or otherwise exposed conductors/cables shall be installed within conduit unless required for flexibility to be a flexible cable and then exposed cables shall be limited to 48", unless mechanical requirements dictate otherwise.
 - g. All electrical devices/conduits shall be properly secured. Beam clamps will not be allowed.
- 2. Main Power Electrical Disconnect Assembly
 - a. The installing contractor shall be responsible for mounting the PBB Disconnect Power Panels on the rotunda located mounting brackets.
 - b. The installing contractor shall be responsible for providing all PBB terminations to the disconnect panel, and shall coordinate his installation with the Project electrical contractor. Electrical contractor shall provide final building utility terminations to the PBB main disconnect panel.
 - c. All cables/conductors shall be neatly color coded and marked.
 - d. All original manufacturer rating and labels shall remain intact and unmarred.
 - e. All enclosures shall be securely fastened to the stand using approved Manufacturer provided fasteners.
 - f. All PBB power cables shall be verified to be in new condition. Damaged cables shall be replaced with OEM cables provided by the Manufacturer.
 - g. All cables shall be safely routed between PBB junction boxes, utility carrier and the main PBB disconnect. All cables shall be secured to PBBs in accordance with Manufacturer's instructions.
 - h. All power cables, wiring, and utilities installed the across the exterior "A" and "B" tunnels shall be installed in the utility carrier.
 - i. All power cables, wiring and utilities installed across the exterior of of the outermost tunnel, shall be contained in conduit and shall be installed on the underside of the bridge.
 - j. Conduits shall be attached to the PBBs using secure clamps or shall utilize bolted or welded mounting brackets.
 - k. All wire/cable terminations shall end neatly in PBB mounted junction boxes.
- 3. Cable Hoist(s)
 - a. The installing contractor shall mount the cable hoist(s) with Manufacturer provided provisions, and shall inspect and verify proper operation.
- 4. The hoist housing shall be securely mounted. All mounting bolts shall be inspected and replaced where missing or damaged.
- 5. Any damage to the cable hoist exterior finish shall be re-painted in accordance with the "Exterior Finishes" section of this scope.

6. Up/down limit switches shall be fully functional and shall cutoff control motor operation when the cable is fully deployed or retrieved.
7. The three output cable support hooks (sling) are to be in good working condition and shall remain detachable from the aircraft cable. Hoist up/down control is accomplished from an exterior operator control station mounted on the PBB wheel bogie.

3.03 SETUP

A. PBB Mechanical Setup

1. Limit Switches
 - a. All mechanical stops, limit switch mounting brackets, mechanical limit switch "trip tabs", and associated fasteners shall be inspected, repaired, secured, and/or replaced, as applicable, prior to final operational testing of PBB electrical systems. Limit switch mounting brackets shall be structurally sound and straightened, if necessary, to ensure proper alignment of limit switches. Where adjustable or sliding stops are utilized, slide tracks shall be securely attached to PBB structures and lock bolts, adjustment threads, etc. shall be fully functional.
2. PBB Lubrication
 - a. Ensure that all grease fittings are functional and that grease points have been properly purged of old grease material and foreign material by displacing old material with new material.
 - b. Perform all other OEM recommended lubrication of moveable areas throughout the PBBs. Only OEM approved lubricants shall be utilized. Chains containing old grease and/or foreign debris shall be fully degreased and re-lubricated. All residual grease and oil displaced or drained onto the PBBs shall be thoroughly cleaned. Lubrication shall include, but shall not necessarily be limited to, the following:
 - 1) Rotunda thrust bearing.
 - 2) Wheel bogey thrust bearing.
 - 3) Lift column screws.
 - 4) Cab rotational guide chain.
3. Door Locks and Keys
 - a. Set proper stations code, as defined by stations personnel for service stair door.
 - b. Turn over all keys to stations personnel.

B. PBB Electrical System Setup

1. All wiring and electrical connections shall be safely completed in accordance with national, state, and local electrical code by qualified electricians.
2. Tunnel interconnects and primary electrical system wiring (480Volt) shall be checked and maintained as per the original manufacturer's design.
3. PBB electrical setup procedures shall be accomplished by the Contractor in accordance with Manufacturer's installation instructions and any pertinent service bulletins.
4. Limit Switches
 - a. PBB electrical limit settings shall be set to conform to the structural design limits of the PBBs and in accordance with aircraft parking requirements.
5. Rotunda limit switches (swing limits) shall be adjusted to prevent the PBBs from being capable of swinging into Ground Support Equipment (GSE) staging areas, the terminal building, or adjacent PBBs.
 - a. Rotunda mounted slope limits shall be set to prevent operational PBB slopes from exceeding 10.0 percent.
 - b. Tunnel travel limits ("full extend/retract" and "slow down") shall be set to safely meet each gate's operating requirements.
 - c. Oversteer limits for the wheel bogie assembly shall ensure that oversteer conditions cannot be encountered.
 - d. Ensure that the column travel limits and/or height indicator assembly is installed and functional so as to prevent damage to the vertical drive column assembly. Ensure that height indicator functions/limits are calibrated.
 - e. Ensure that the cab rotation limits are functional and that the cab cannot exceed safe rotations

6. Electrical System Inspection
 - a. Test the auto-level system for proper operation prior to PBB use. Verify auto-level travel response time and time-out relay function. Ensure that the limit switch is in good working order.
 - b. Ensure proper function of the canopy deployment system. Verify proper unit operation to ensure that excess canopy pressure on the aircraft will not occur. Ensure that canopy deployment speed is consistent on both sides and that no binding occurs.
 - c. Perform a comprehensive operational inspection of all 480-Volt drive systems to ensure proper operation and condition.
 - d. Ensure that all lighting circuits and lights are functioning as designed. Bulbs and ballasts shall be checked and replaced if non-operational. All bulbs should be the same style.
 - e. Ensure interior lighting function properly with occupancy sensors.
 - f. Ensure that all other electrical systems, including all travel alarms, operation bell, indicator lights, and warning beacons or strobes are functioning properly.
 - g. Test smoke detector interlocks to ensure they are functioning as designed.

3.04 INSPECTIONS

- A. Manufacturing Representative
 1. Manufacturer's representative shall be on site, as necessary, during the installation of the equipment, as required to ensure the equipment is properly installed in accordance with the Project Specifications.
 2. Manufacturer's representative shall be present during preliminary equipment installation inspection.
 3. Manufacturer and/or contractor shall diligently pursue the completion of all punch list items.
 4. Manufacturer shall notify the Owner when the equipment installation is considered ready for a final inspection.
 5. Manufacturer's representative shall be present during final inspection.
 6. The manufacturer shall provide a qualified representative on site for at least 30 days after the date the terminal is opened for commercial passenger traffic to assist with operational issues and electromechanical difficulties encountered.
- B. The Owner will not accept the boarding bridge until it has been inspected to verify that the installation, function and quality of the PBB meet The Owner's standards. Any deficiencies and/or violations shall be immediately corrected by the Manufacturer at no additional cost to the Owner and shall be re-inspected.
- C. The term "Beneficial Acceptance" shall be defined as the time that the bridge is installed and available for The Owner use, but prior to the correction of items listed on discrepancy list. In other words, The Owner derives the 'benefits' of using the system prior to "Final Design Acceptance". Warranty and training requirements shall be based on "Beneficial Acceptance".
- D. "Final Design Acceptance" of the unit is contingent upon the Manufacturer satisfactorily correcting all items that the Owner believes to be non-complying with this specification.
- E. After the "Manufacturer" corrects all discrepancies identified during the initial operational demonstration, and after the gate opens for commercial operations, a 30 day test period under normal operating conditions will commence. During this time frame, the bridge must operate trouble free and the "Manufacturer" must demonstrate that the bridge meets the design and performance requirements of this specification. The Owner will have the option of restarting the 30 day test if at any time during the test, additional non-complying specification discrepancies or faults are detected.
- F. Final acceptance of the boarding bridge is contingent upon the Manufacturer satisfactorily correcting all items that the Owner believes to be non-complying with this specification, and the satisfactory completion of the 30 day operational demonstration.
- G. The Manufacturer shall be responsible for providing all necessary test, measuring and recording devices required to demonstrate the boarding bridge's compliance with this

specification.

3.05 INTERFACE WITH OTHER WORK

- A. The Contractor shall cooperate and coordinate his work with the 400 Hz, PCA, and related equipment installations including ancillaries.
- B. The Contractor shall coordinate with the 400 Hz, PCA, and related equipment for the provisions for or installation of all necessary infrastructure prior to final factory painting of the passenger boarding bridge. The intent is to eliminate site welding/painting after final factory painting.
- C. Installation of units shall be coordinated with other trades and activities associated with the project and site.
- D. Install phone, provide building face terminations and verify proper operation.

3.06 EXAMINATION

- A. Verify/perform the following items or tasks.
 - 1. Verify all cables and conductors are properly terminated.
 - 2. Check to be sure that there are no tools or loose objects in the unit.
 - 3. Make a final check of the security of the power connections.
 - 4. Re-install any covers removed during installation.
 - 5. Perform full passenger boarding bridge and related equipment operational non-interference test.

3.07 CLEANING

- A. Clean unit from all construction dust and debris prior to start-up.
- B. Touch up scratched or marred surfaces to match original finish.
- C. Protect the installed unit from subsequent construction operations.
- D. Wash exterior of bridge.
- E. Clean all windows, wallboards, windows and interior surfaces.

3.08 STARTING EQUIPMENT AND SYSTEMS

- A. Complete approved field commissioning report, including, but not limited to the following:
 - 1. Verification that the bridge swings to the right and left, and that the swing limits switches function as required.
 - 2. Verification the bridge “raises” and “lowers”, and that the vertical limit switches function as required.
 - 3. Verification that the rack limit switches function as required (if present).
 - 4. Verification that the vertical drive brakes function as required (if present).
 - 5. Verification that the bridge “extends” and “retracts”, and that the extend and retract limit switches function as required.
 - 6. Verification that the cab rotates, and that the cab rotation limit switches function as required.
 - 7. Verification that wheel alignment matches the gauge.
 - 8. Verification that the canopy extends and retracts as required and that the canopy interlocks function as required.
 - 9. Ensure that the bridge “autoleveler” functions, and it alarms after it times out.
 - 10. Ensure that the “floor leveling” works as required.
 - 11. Verification that the bridge “slow down” and “bumper proximity switches” function as required.
 - 12. Ensure all lights, outlets, fans and other accessories function as required.
 - 13. Ensure that all alarms, interlocks, emergency lighting and other safety features functions as required.
 - 14. Ensure that the door locks work.
 - 15. PBB OEM Lubrication.
 - 16. All other items listed on the approved Field Commissioning Report.

- B. Demonstrate complete functional operation of equipment to the satisfaction of the Own

END OF SECTION

"General Decision Number: KS20220058 10/28/2022

Superseded General Decision Number: KS20210058

State: Kansas

Construction Type: Building

County: Shawnee County in Kansas.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	<ul style="list-style-type: none">. Executive Order 14026 generally applies to the contract.. The contractor must pay all covered workers at least \$15.00 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2022.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	<ul style="list-style-type: none">. Executive Order 13658 generally applies to the contract.. The contractor must pay all covered workers at least \$11.25 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2022.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Modification Number	Publication Date
0	01/07/2022
1	02/18/2022

2	02/25/2022
3	04/15/2022
4	06/03/2022
5	06/17/2022
6	09/02/2022
7	10/07/2022
8	10/28/2022

BRKS0015-011 06/01/2020

	Rates	Fringes
TILE SETTER.....	\$ 36.79	15.78

BRKS0015-012 04/01/2020

	Rates	Fringes
BRICKLAYER.....	\$ 36.83	19.65

BRKS0015-014 06/01/2020

	Rates	Fringes
TILE FINISHER.....	\$ 17.99	.91

* ELEC0226-003 09/01/2022

	Rates	Fringes
ELECTRICIAN.....	\$ 34.75	20.80

ENGI0101-040 04/01/2016

	Rates	Fringes
POWER EQUIPMENT OPERATOR:		
Bobcat/Skid Steer/Skid		
Loader.....	\$ 37.63	15.97
Oiler.....	\$ 32.08	15.97
Paver (Asphalt, Aggregate,		
and Concrete).....	\$ 38.44	15.97

IRON0010-018 04/01/2022

	Rates	Fringes
IRONWORKER		
(Ornamental/Reinforcing).....	\$ 35.50	32.68

LAB01290-013 04/01/2022

	Rates	Fringes
LABORER		
Mason Tender - Brick.....	\$ 31.10	18.05

PAIN2012-008 04/20/2022

	Rates	Fringes
PAINTER (Brush, Roller, and		
Spray).....	\$ 33.35	18.73

PLUM0441-016 06/01/2022

	Rates	Fringes
PIPEFITTER (HVAC Pipe Installation Only).....	\$ 38.63	19.21

PLUM0441-017 06/01/2022		

	Rates	Fringes
PLUMBER.....	\$ 38.63	19.21

PLUM0533-012 06/01/2016		

	Rates	Fringes
PIPEFITTER (Excludes HVAC Pipe Installation).....	\$ 45.33	19.32

ROOF0020-021 06/01/2022		

	Rates	Fringes
ROOFER.....	\$ 36.75	20.99

SHEE0002-011 07/01/2019		

	Rates	Fringes
SHEET METAL WORKER (HVAC Duct Installation Only).....	\$ 43.89	23.50

SHEE0002-012 07/01/2021		

	Rates	Fringes
SHEET METAL WORKER (Excludes HVAC Duct Installation).....	\$ 47.19	24.44

TEAM0541-010 04/01/2020		

	Rates	Fringes
TRUCK DRIVER (Lowboy Truck).....	\$ 34.29	15.25

TEAM0541-011 04/01/2020		

	Rates	Fringes
TRUCK DRIVER (Semi-Trailer Truck).....	\$ 34.29	15.25

SUKS2015-027 07/08/2015		

	Rates	Fringes
ASBESTOS WORKER/HEAT & FROST INSULATOR.....	\$ 23.95	11.59
CARPENTER.....	\$ 22.94	7.04
CEMENT MASON/CONCRETE FINISHER...	\$ 21.01	3.31
IRONWORKER, STRUCTURAL.....	\$ 29.00	25.35

LABORER: Common or General.....\$ 19.31	9.42
LABORER: Mason Tender - Cement/Concrete.....\$ 17.86	1.01
OPERATOR: Backhoe/Excavator/Trackhoe.....\$ 26.69	7.01
OPERATOR: Bulldozer.....\$ 33.12	13.96
OPERATOR: Crane.....\$ 33.19	14.16
OPERATOR: Forklift.....\$ 34.83	14.16
OPERATOR: Grader/Blade.....\$ 31.05	13.26
OPERATOR: Loader.....\$ 30.35	12.04
OPERATOR: Roller.....\$ 33.78	13.64
TRUCK DRIVER: Dump (All Types)...\$ 25.50	10.38

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at <https://www.dol.gov/agencies/whd/government-contracts>.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour National Office because National Office has responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISIO"

SUPPLEMENTARY PROVISIONS

PART A - FEDERAL CONTRACT PROVISIONS FOR CONSTRUCTION AND EQUIPMENT CONTRACTS

APPLICATION OF REFERENCES

ALL REFERENCES MADE HEREIN TO “CONTRACTOR”, “BIDDER”, AND “OFFEROR” SHALL PERTAIN TO THE PRIME CONTRACTOR. ALL REFERENCES MADE HEREIN TO “SUBCONTRACTOR” SHALL PERTAIN TO ANY AND ALL SUBCONTRACTORS UNDER CONTRACT WITH THE PRIME CONTRACTOR OR A SUBCONTRACTOR.

ALL REFERENCES MADE HEREIN TO “CONSULTANT” SHALL PERTAIN TO ARCHITECT/ENGINEER (A/E) UNDER CONTRACT WITH THE SPONSOR. ALL REFERENCES MADE HEREIN TO “SUBCONSULTANT” SHALL PERTAIN TO ANY AND ALL SUBCONSULTANTS UNDER CONTRACT WITH THE A/E.

ALL REFERENCES MADE HEREIN TO “SPONSOR” AND “OWNER” SHALL PERTAIN TO THE STATE, CITY, AIRPORT AUTHORITY OR OTHER PUBLIC ENTITY EXECUTING CONTRACTS WITH THE PRIME CONTRACTOR AND/OR THE A/E.

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PROVISIONS APPLICABLE TO ALL CONTRACTS

ACCESS TO RECORDS AND REPORTS

Reference: 2 CFR § 200.333, 2 CFR § 200.336, and FAA Order 5100.38

The Contractor must maintain an acceptable cost accounting system. The Contractor agrees to provide the Owner, the Federal Aviation Administration, and the Comptroller General of the United States or any of their duly authorized representatives, access to any books, documents, papers, and records of the Contractor, which are directly pertinent to the specific contract for the purpose of making audit, examination, excerpts and transcriptions. The Contractor agrees to maintain all books, records and reports required under this contract for a period of not less than three years after final payment is made and all pending matters are closed.

BUY AMERICAN PREFERENCE

Reference: 49 USC § 50101

The Contractor agrees to comply with 49 USC § 50101, which provides that Federal funds may not be obligated unless all steel and manufactured goods used in AIP funded projects are produced in the United States, unless the Federal Aviation Administration (FAA) has issued a waiver for the product; the product is listed as an Excepted Article, Material Or Supply in Federal Acquisition Regulation subpart 25.108; or is included in the FAA Nationwide Buy American Waivers Issued list.

A Bidder or Offeror must complete and submit the Buy America certification included herein with their bid or offer. The Owner will reject as nonresponsive any bid or offer that does not include a completed Certificate of Buy American Compliance.

CIVIL RIGHTS – GENERAL

Reference: 49 USC § 47123

The Contractor agrees that it will 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 of Title VI of the Civil Rights Act of 1964.

CIVIL RIGHTS – TITLE VI ASSURANCES

Title VI Solicitation Notice

The Sponsor, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 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. **Non-discrimination:** 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 U.S.C. § 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 U.S.C. § 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 U.S.C. § 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 U.S.C. § 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 U.S.C. §§ 12131 – 12189) as implemented by U.S. Department of Transportation regulations at 49 CFR parts 37 and 38;
- The Federal Aviation Administration’s Non-discrimination statute (49 U.S.C. § 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 non-discrimination 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 U.S.C. 1681 et seq).

DISADVANTAGED BUSINESS ENTERPRISE

Reference: 49 CFR Part 26

Solicitation Language (Project Goal)

Information Submitted as a matter of bidder responsiveness:

The Owner's award of this contract is conditioned upon Bidder or Offeror satisfying the good faith effort requirements of 49 CFR §26.53.

As a condition of bid responsiveness, the Bidder or Offeror must submit the following information with their proposal on the forms provided herein:

- 1) The names and addresses of Disadvantaged Business Enterprise (DBE) firms that will participate in the contract;
- 2) A description of the work that each DBE firm will perform;
- 3) The dollar amount of the participation of each DBE firm listed under (1)
- 4) Written statement from Bidder or Offeror that attests their commitment to use the DBE firm(s) listed under (1) to meet the Owner's project goal;
- 5) If Bidder or Offeror cannot meet the advertised project DBE goal; evidence of good faith efforts undertaken by the Bidder or Offeror as described in appendix A to 49 CFR Part 26.

Information submitted as a matter of bidder responsibility:

The Owner's award of this contract is conditioned upon Bidder or Offeror satisfying the good faith effort requirements of 49 CFR §26.53.

The successful Bidder or Offeror must provide written confirmation of participation from each of the DBE firms the Bidder or Offeror lists in its commitment within five (5) days after bid opening.

- 1) The names and addresses of Disadvantaged Business Enterprise (DBE) firms that will participate in the contract;
- 2) A description of the work that each DBE firm will perform;
- 3) The dollar amount of the participation of each DBE firm listed under (1)
- 4) Written statement from Bidder or Offeror that attests their commitment to use the DBE firm(s) listed under (1) to meet the Owner's project goal; and
- 5) If Bidder or Offeror cannot meet the advertised project DBE goal, evidence of good faith efforts undertaken by the Bidder or Offeror as described in appendix A to 49 CFR part 26.

Race/Gender Neutral

The requirements of 49 CFR Part 26 apply to this contract. It is the policy of the Owner to practice nondiscrimination based on race, color, sex or national origin in the award or performance of this contract. The Owner encourages participation by all firms qualifying under this solicitation regardless of business size or ownership.

Contract Assurance (§ 26.13)

The Contractor or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR part 26 in the award and administration of U.S. Department of Transportation-assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the Owner deems appropriate, which may include, but is not limited to:

- 1) Withholding monthly progress payments;
- 2) Assessing sanctions;
- 3) Liquidated damages; and/or
- 4) Disqualifying the Contractor from future bidding as non-responsible.

Prompt Payment (§26.29)

The Prime Contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than thirty (30) calendar days from the receipt of each payment the Prime Contractor receives from the Owner. The Prime Contractor agrees further to return retainage payments to each subcontractor within thirty (30) calendar days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the Owner. This clause applies to both DBE and non-DBE subcontractors.

ENERGY CONSERVATION REQUIREMENTS

Reference: 2 CFR § 200 Appendix II(H)

Contractor and Subcontractor(s) agree to comply with mandatory standards and policies relating to energy efficiency as contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. 6201 et seq).

FEDERAL FAIR LABOR STANDARDS ACT (FEDERAL MINIMUM WAGE)

Reference: 29 USC § 201, et seq.

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.

OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970

Reference: 20 CFR Part 1910

All contracts and subcontracts that result from this solicitation incorporate by reference the requirements of 29 CFR Part 1910 with the same force and effect as if given in full text. The employer must provide a work environment that is free from recognized hazards that may cause death or serious physical harm to the employee. The employer retains full responsibility to monitor its compliance and their subcontractor's compliance with the applicable requirements of the Occupational Safety and Health Act of 1970 (20 CFR Part 1910). The employee must address any claims or disputes that pertain to a referenced requirement directly with the U.S. Department of Labor – Occupational Safety and Health Administration.

RIGHT TO INVENTIONS

Reference: 2 CFR § 200 Appendix II(F) and 37 CFR §401

Contracts or agreements that include the performance of experimental, developmental, or research work must provide for the rights of the Federal Government and the Owner in any resulting invention as established by 37 CFR Part 401, Rights to Inventions Made by Non-profit Organizations and Small Business Firms under Government Grants, Contracts, and Cooperative Agreements. This contract incorporates by reference the patent and inventions rights as specified within in the 37 CFR §401.14. Contractor must include this requirement in all sub-tier contracts involving experimental, developmental or research work.

SEISMIC SAFETY

Reference: 49 CFR Part 41

The Contractor agrees to ensure that all work performed under this contract, including work performed by subcontractors, conforms to a building code standard that provides a level of seismic safety substantially equivalent to standards established by the National Earthquake Hazards Reduction Program (NEHRP). Local building codes that model their code after the current version of the International Building Code (IBC) meet the NEHRP equivalency level for seismic safety.

TAX DELINQUENCY AND FELONY CONVICTIONS

Reference: Sections 415 and 416 of Title IV, Division L of the Consolidated Appropriations Act, 2014 (Pub. L. 113-76) and DOT Order 4200.6

The Contractor certifies:

- 1) It 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. 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.

- 2) It is not a corporation that was convicted of a criminal violation under any Federal law within the preceding 24 months. A felony conviction is 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.

The Contractor agrees to incorporate the above certification in all lower tier subcontracts.

TRADE RESTRICTION CERTIFICATION

Reference: 49 USC § 50104 and 49 CFR Part 30

By submission of an offer, the Offeror certifies that with respect to this solicitation and any resultant contract, the Offeror:

- 1) is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms as published by the Office of the United States Trade Representative (U.S.T.R.);
- 2) has not knowingly entered into any contract or subcontract for this project with a person that is a citizen or national of a foreign country included on the list of countries that discriminate against U.S. firms as published by the U.S.T.R; and
- 3) has not entered into any subcontract for any product to be used on the Federal project that is produced in a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R.

This certification concerns a matter within the jurisdiction of an agency of the United States of America and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

The Offeror/Contractor must provide immediate written notice to the Owner if the Offeror/Contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The Contractor must require subcontractors provide immediate written notice to the Contractor if at any time it learns that its certification was erroneous by reason of changed circumstances.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR 30.17, no contract shall be awarded to an Offeror or subcontractor:

- 1) who is owned or controlled by one or more citizens or nationals of a foreign country included on the list of countries that discriminate against U.S. firms published by the U.S.T.R. or
- 2) whose subcontractors are owned or controlled by one or more citizens or nationals of a foreign country on such U.S.T.R. list or
- 3) who incorporates in the public works project any product of a foreign country on such U.S.T.R. list;

Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by this provision. The knowledge

and information of a Contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

The Offeror agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in all lower tier subcontracts. The Contractor may rely on the certification of a prospective subcontractor that it is not a firm from a foreign country included on the list of countries that discriminate against U.S. firms as published by U.S.T.R, unless the Offeror has knowledge that the certification is erroneous.

This certification is a material representation of fact upon which reliance was placed when making an award. If it is later determined that the Contractor or subcontractor knowingly rendered an erroneous certification, the Federal Aviation Administration may direct through the Owner cancellation of the contract or subcontract for default at no cost to the Owner or the Federal Aviation Administration.

VETERAN'S PREFERENCE

Reference: 49 USC § 47112(c)

In the employment of labor (excluding executive, administrative, and supervisory positions), the Contractor and all sub-tier contractors must give preference to covered veterans as defined within Title 49 United States Code Section 47112. Covered veterans include Vietnam-era veterans, Persian Gulf veterans, Afghanistan-Iraq war veterans, disabled veterans, and small business concerns (as defined by 15 U.S.C. 632) owned and controlled by disabled veterans. This preference only applies when there are covered veterans readily available and qualified to perform the work to which the employment relates.

PROVISIONS APPLICABLE TO CONTRACTS EXCEEDING \$2,000

COPELAND "ANTI-KICKBACK" ACT

Reference: 2 CFR § 200 Appendix II(D) and 29 CFR Parts 3 and 5

Contractor must comply with the requirements of the Copeland "Anti-Kickback" Act (18 U.S.C. 874 and 40 U.S.C. 3145), as supplemented by Department of Labor regulation 29 CFR part 3. Contractor and subcontractors are prohibited from inducing, by any means, any person employed on the project to give up any part of the compensation to which the employee is entitled. The Contractor and each Subcontractor must submit to the Owner, a weekly statement on the wages paid to each employee performing on covered work during the prior week. Owner must report any violations of the Act to the Federal Aviation Administration.

DAVIS-BACON REQUIREMENTS

Reference: 2 CFR § 200 Appendix II(D) and 29 CFR Part 5

1. Minimum Wages

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalent thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR Part 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided* that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under (1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can easily be seen by the workers.

(ii) (A) thru (D)

(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under

the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

- (1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
- (2) The classification is utilized in the area by the construction industry; and
- (3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within thirty (30) days of receipt and so advise the contracting officer or will notify the contracting officer within the thirty (30)-day period that additional time is necessary.

(C) In the event the Contractor, the laborers, or mechanics to be employed in the classification, or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within thirty (30) days of receipt and so advise the contracting officer or will notify the contracting officer within the thirty (30)-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii) (B) or (C) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program: *Provided*, that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding

The Federal Aviation Administration or the Sponsor shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same Prime Contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same Prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of work, all or part of the wages required by the contract, the Federal Aviation Administration may, after written notice to the Contractor, Sponsor, Applicant, or Owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and basic records

(i) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in 1(b)(2)(B) of the Davis-Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records that show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and that show the costs anticipated or the actual costs incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii) (A) thru (D)

(A) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Federal Aviation Administration if the agency is a party to the contract, but if the agency is not such a party, the Contractor will submit the payrolls to the applicant, Sponsor, or Owner, as the case may be, for transmission to the Federal Aviation Administration. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g. the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <https://www.dol.gov/whd/forms/wh347instr.htm> or its successor site. The Prime

Contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the Federal Aviation Administration if the agency is a party to the contract, but if the agency is not such a party, the Contractor will submit them to the applicant, Sponsor, or Owner, as the case may be, for transmission to the Federal Aviation Administration, the Contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a Prime Contractor to require a subcontractor to provide addresses and social security numbers to the Prime Contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, Sponsor, or Owner).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

- (1) The payroll for the payroll period contains the information required to be provided under 29 CFR § 5.5(a)(3)(ii), the appropriate information is being maintained under 29 CFR § 5.5 (a)(3)(i) and that such information is correct and complete;
- (2) Each laborer and mechanic (including each helper, apprentice and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations 29 CFR Part 3;
- (3) Each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The Contractor or subcontractor shall make the records required under paragraph (3)(i) of this section available for inspection, copying or transcription by authorized representatives of the Sponsor, the Federal Aviation Administration, or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the Contractor, Sponsor, Applicant, or Owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and Trainees

(i) Apprentices

Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first ninety (90) days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice.

The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a Contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination.

Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees

Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination.

Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the

full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination that provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate that is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal Employment Opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

5. Compliance with Copeland Act Requirements

The Contractor shall comply with the requirements of 29 CFR Part 3, which are incorporated by reference in this contract.

6. Subcontracts

The Contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR Part 5.5(a)(1) through (10) and such other clauses as the Federal Aviation Administration may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The Prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR Part 5.5.

7. Contract Termination: Debarment

A breach of the contract clauses in paragraph 1 through 10 of this section may be grounds for termination of the contract, and for debarment as a Contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act Requirements

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes Concerning Labor Standards

Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6 and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of Eligibility

(i) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

PROVISIONS APPLICABLE TO CONTRACTS EXCEEDING \$3,500

DISTRACTED DRIVING

Reference: Executive Order 13513 and DOT Order 3902.10

In accordance with Executive Order 13513, "Federal Leadership on Reducing Text Messaging While Driving" (10/1/2009) and DOT Order 3902.10 "Text Messaging While Driving" (12/30/2009), the Federal Aviation Administration encourages recipients of Federal grant funds to adopt and enforce safety policies that decrease crashes by distracted drivers, including policies to ban text messaging while driving when performing work related to a grant or sub-grant.

In support of this initiative, the Owner encourages the Contractor to promote policies and initiatives for its employees and other work personnel that decrease crashes by distracted drivers, including policies that ban text messaging while driving motor vehicles while performing work activities associated with the project. The Contractor must include the substance of this clause in all sub-tier contracts exceeding \$3,500 and involve driving a motor vehicle in performance of work activities associated with the project.

PROVISIONS APPLICABLE TO CONTRACTS EXCEEDING \$10,000

AFFIRMATIVE ACTION REQUIREMENT

Reference: 41 CFR Part 60-4 and Executive Order 11246

1. The Bidder's or Offeror's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.
2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Timetables:	Goal:
Goals for minority participation for each trade:	0.00%
Goals for female participation in each trade:	6.9%

These goals are applicable to all of the Contractor's construction work (whether or not it is Federal or federally-assisted) performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the Contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs (OFCCP) within ten (10) working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address, and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed.
4. As used in this notice and in the contract resulting from this solicitation, the "covered area" is:

State	County	City

EQUAL EMPLOYMENT OPPORTUNITY (EEO)

Reference: 2 CFR 200, Appendix II(C), 41 CFR § 60-1.4, 41 CFR § 60-4.3, and Executive Order 11246

Equal Opportunity Clause

During the performance of this contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identify or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.

(3) The Contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the Contractor's commitments under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

(5) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(7) The Contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (7) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: *Provided, however*, that in the event a Contractor becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

Standard Federal Equal Employment Opportunity Construction Contract Specifications

1. As used in these specifications:

- a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
- b. "Director" means Director, Office of Federal Contract Compliance Programs (OFCCP), U.S. Department of Labor, or any person to whom the Director delegates authority;
- c. "Employer identification number" means the Federal social security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941;
- d. "Minority" includes:

- (1) Black (all) persons having origins in any of the Black African racial groups not of Hispanic origin);
- (2) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin regardless of race);
- (3) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
- (4) American Indian or Alaskan native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors shall be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or subcontractor participating in an approved plan is individually required to comply with its obligations under the EEO clause and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other contractors or subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7.a through 7.p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. Covered construction contractors performing construction work in a geographical area where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work is being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement nor the failure by a union with whom the Contractor has a collective bargaining agreement to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the non-working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees shall be employed by the Contractor during the training

period and the Contractor shall have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees shall be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully and shall implement affirmative action steps at least as extensive as the following:

- a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other onsite supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
- b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations' responses.
- c. Maintain a current file of the names, addresses, and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source, or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefore along with whatever additional actions the Contractor may have taken.
- d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or female sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
- e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7b above.
- f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
- g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff,

termination, or other employment decisions including specific review of these items with onsite supervisory personnel such as superintendents, general foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.

h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other contractors and subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female, and community organizations, to schools with minority and female students; and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations, such as the above, describing the openings, screening procedures, and tests to be used in the selection process.

j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer, and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.

k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.

l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel, for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.

m. Ensure that seniority practices, job classifications, work assignments, and other personnel practices do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.

n. Ensure that all facilities and company activities are non-segregated except that separate or single user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.

o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female Contractor associations and other business associations.

p. Conduct a review, at least annually, of all supervisor's adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations, which assist in fulfilling one or more of their affirmative action obligations (7.a through 7.p). The efforts of a Contractor association, joint Contractor union, Contractor community, or other similar groups of which the Contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7.a through 7.p of these specifications provided that the Contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the

program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, if the particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally), the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized.

10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The Contractor shall not enter into any subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination, and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government, and to keep records. Records shall at least include for each employee, the name, address, telephone number, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

PROCUREMENT OF RECOVERED MATERIALS

Reference: 2 CFR § 200.322, 40 CFR Part 247, and Solid Waste Disposal Act

Contractor and subcontractor agree to comply with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, and the regulatory provisions of 40 CFR Part 247. In the performance of this contract and to the extent practicable, the Contractor and subcontractors are to use products containing the highest percentage of recovered materials for items designated by the Environmental Protection Agency (EPA) under 40 CFR Part 247 whenever:

- a) The contract requires procurement of \$10,000 or more of a designated item during the fiscal year; or,
- b) The Contractor has procured \$10,000 or more of a designated item using Federal funding during the previous fiscal year.

The list of EPA-designated items is available at:

<https://www.epa.gov/smm/comprehensive-procurement-guidelines-construction-products>

Section 6002(c) establishes exceptions to the preference for recovery of EPA-designated products if the Contractor can demonstrate the item is:

- a) Not reasonably available within a timeframe providing for compliance with the contract performance schedule;
- b) Fails to meet reasonable contract performance requirements; or
- c) Is only available at an unreasonable price.

PROHIBITION OF SEGREGATED FACILITIES

Reference: 41 CFR § 60

(a) The Contractor agrees that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The Contractor agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.

(b) "Segregated facilities," as used in this clause, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or necessary dressing or sleeping areas provided to assure privacy between the sexes.

(c) The Contractor shall include this clause in every subcontract and purchase order that is subject to the Equal Opportunity clause of this contract.

TERMINATION OF CONTRACT

Reference: 2 CFR § 200 Appendix II(B) and FAA Advisory Circular 150/5370-10, Section 80-09

Termination for Convenience (Construction & Equipment Contracts)

The Owner may terminate this contract in whole or in part at any time by providing written notice to the Contractor. Such action may be without cause and without prejudice to any other right or remedy of Owner. Upon receipt of a written notice of termination, except as explicitly directed by the Owner, the Contractor shall immediately proceed with the following obligations regardless of any delay in determining or adjusting amounts due under this clause:

1. Contractor must immediately discontinue work as specified in the written notice.
2. Terminate all subcontracts to the extent they relate to the work terminated under the notice.
3. Discontinue orders for materials and services except as directed by the written notice.
4. Deliver to the Owner all fabricated and partially fabricated parts, completed and partially completed work, supplies, equipment and materials acquired prior to termination of the work and as directed in the written notice.
5. Complete performance of the work not terminated by the notice.
6. Take action as directed by the Owner to protect and preserve property and work related to this contract that Owner will take possession.

Owner agrees to pay Contractor for:

- 1) completed and acceptable work executed in accordance with the contract documents prior to the effective date of termination;
- 2) documented expenses sustained prior to the effective date of termination in performing work and furnishing labor, materials, or equipment as required by the contract documents in connection with uncompleted work;
- 3) reasonable and substantiated claims, costs and damages incurred in settlement of terminated contracts with Subcontractors and Suppliers; and
- 4) reasonable and substantiated expenses to the Contractor directly attributable to Owner's termination action

Owner will not pay Contractor for loss of anticipated profits or revenue or other economic loss arising out of or resulting from the Owner's termination action.

The rights and remedies this clause provides are in addition to any other rights and remedies provided by law or under this contract.

Termination for Default (Construction)

Section 80-09 of FAA Advisory Circular 150/5370-10 establishes conditions, rights and remedies associated with Owner termination of this contract due to default of the Contractor.

Termination for Default (Equipment)

The Owner may, by written notice of default to the Contractor, terminate all or part of this Contract if the Contractor:

1. Fails to commence the Work under the Contract within the time specified in the Notice- to-Proceed;
2. Fails to make adequate progress as to endanger performance of this Contract in accordance with its terms;
3. Fails to make delivery of the equipment within the time specified in the Contract, including any Owner approved extensions;
4. Fails to comply with material provisions of the Contract;
5. Submits certifications made under the Contract and as part of their proposal that include false or fraudulent statements; or
6. Becomes insolvent or declares bankruptcy;

If one or more of the stated events occur, the Owner will give notice in writing to the Contractor and Surety of its intent to terminate the contract for cause. At the Owner's discretion, the notice may allow the Contractor and Surety an opportunity to cure the breach or default.

If within ten (10) days of the receipt of notice, the Contractor or Surety fails to remedy the breach or default to the satisfaction of the Owner, the Owner has authority to acquire equipment by other procurement action. The Contractor will be liable to the Owner for any excess costs the Owner incurs for acquiring such similar equipment.

Payment for completed equipment delivered to and accepted by the Owner shall be at the Contract price. The Owner may withhold from amounts otherwise due the Contractor for such completed equipment, such sum as the Owner determines to be necessary to protect the Owner against loss because of Contractor default.

Owner will not terminate the Contractor's right to proceed with the Work under this clause if the delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such acceptable causes include: acts of God, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, and severe weather events that substantially exceed normal conditions for the location.

If, after termination of the Contractor's right to proceed, the Owner determines that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the Owner issued the termination for the convenience the Owner.

The rights and remedies of the Owner in this clause are in addition to any other rights and remedies provided by law or under this contract.

PROVISIONS APPLICABLE TO CONTRACTS EXCEEDING \$25,000

DEBARMENT AND SUSPENSION

Reference: 2 CFR Part 180 (Subpart C), 2 CFR Part 1200, DOT Order 4200.5

Certification of Bidder/Offerer Regarding Debarment

By submitting a bid/proposal under this solicitation, the Bidder or Offeror certifies that neither it nor its principals are presently debarred or suspended by any Federal department or agency from participation in this transaction.

Certification of Lower Tier Contractors Regarding Debarment

The successful Bidder, by administering each lower tier subcontract that exceeds \$25,000 as a "covered transaction", must verify each lower tier participant of a "covered transaction" under the project is not presently debarred or otherwise disqualified from participation in this federally assisted project. The successful Bidder will accomplish this by:

1. Checking the System for Award Management at website: <https://www.sam.gov>.
2. Collecting a certification statement similar to the Certificate Regarding Debarment and Suspension (Bidder or Offeror), above.
3. Inserting a clause or condition in the covered transaction with the lower tier contract

If the Federal Aviation Administration (FAA) later determines that a lower tier participant failed to disclose to a higher tier participant that it was excluded or disqualified at the time it entered the covered transaction, the FAA may pursue any available remedies, including suspension and debarment of the non-compliant participant.

PROVISIONS APPLICABLE TO CONTRACTS EXCEEDING \$100,000

CONTRACT WORKHOURS AND SAFETY STANDARDS ACT REQUIREMENTS

Reference: 2 CFR § 200 Appendix II (E)

1. Overtime Requirements.

No Contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic, including watchmen and guards, in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; Liability for Unpaid Wages; Liquidated Damages.

In the event of any violation of the clause set forth in paragraph (1) of this clause, the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for

liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this clause, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this clause.

3. Withholding for Unpaid Wages and Liquidated Damages.

The Federal Aviation Administration (FAA) or the Owner shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor under any such contract or any other Federal contract with the same Prime Contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same Prime Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this clause.

4. Subcontractors.

The Contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs (1) through (4) and also a clause requiring the subcontractor to include these clauses in any lower tier subcontracts. The Prime Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this clause.

LOBBYING AND INFLUENCING FEDERAL EMPLOYEES

Reference: 31 U.S.C. § 1352 – Byrd Anti-Lobbying Amendment, 2 CFR part 200, Appendix II(J), and 49 CFR part 20, Appendix A

CERTIFICATION REGARDING LOBBYING

The Bidder or Offeror certifies by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

- 1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Bidder or Offeror, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- 2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- 3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts

under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

PROVISIONS APPLICABLE TO CONTRACTS EXCEEDING \$150,000

BREACH OF CONTRACT TERMS

Reference: 2 CFR § 200 Appendix II(A)

Any violation or breach of terms of this contract on the part of the Contractor or its subcontractors may result in the suspension or termination of this contract or such other action that may be necessary to enforce the rights of the parties of this agreement.

Owner will provide Contractor written notice that describes the nature of the breach and corrective actions the Contractor must undertake in order to avoid termination of the contract. Owner reserves the right to withhold payments to Contractor until such time the Contractor corrects the breach or the Owner elects to terminate the contract. The Owner's notice will identify a specific date by which the Contractor must correct the breach. Owner may proceed with termination of the contract if the Contractor fails to correct the breach by deadline indicated in the Owner's notice.

The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder are in addition to, and not a limitation of, any duties, obligations, rights and remedies otherwise imposed or available by law.

CLEAN AIR AND WATER POLLUTION CONTROL

References: 2 CFR § 200 Appendix II(G)

Contractor agrees to comply with all applicable standards, orders, and regulations issued pursuant to the Clean Air Act (42 U.S.C. § 740-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. § 1251-1387). The Contractor agrees to report any violation to the Owner immediately upon discovery. The Owner assumes responsibility for notifying the Environmental Protection Agency (EPA) and the Federal Aviation Administration.

The Contractor agrees to incorporate the above certification in all lower tier subcontracts that exceed \$150,000.

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CONCRETE FORMING AND ACCESSORIES - 031000

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Form-facing material for cast-in-place concrete.
 - 2. Shoring, bracing, and anchoring.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site

1.3 ACTION SUBMITTALS

- A. Product Data: For each of the following:
 - 1. Concealed surface form-facing material.
 - 2. Form ties.
 - 3. Form-release agent.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.
- B. Minutes of preinstallation conference.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Concealed Surface Form-Facing Material: Lumber, plywood, metal, plastic, or another approved material.
 - 1. Provide lumber dressed on at least two edges and one side for tight fit.

RELATED MATERIALS

- B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.

- C. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- D. Form Ties: Factory-fabricated, removable or snap-off, glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, leave holes no larger than 1 inch in diameter in concrete surface.

PART 3 - EXECUTION

3.1 INSTALLATION OF FORMWORK

- A. Comply with ACI 301
- B. Construct formwork, so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities as follows:
 - 1. Surface Finish-1.0: ACI 117 Class D, 1 inch (25 mm).
- D. Construct forms tight enough to prevent loss of concrete mortar.
 - 1. Minimize joints.
- E. Construct removable forms for easy removal without hammering or prying against concrete surfaces.
 - 1. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces.
 - 2. Install keyways, recesses, and other accessories, for easy removal.
- F. Do not use rust-stained, steel, form-facing material.
- G. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces.
 - 1. Provide and secure units to support screed strips.
 - 2. Use strike-off templates or compacting-type screeds.
- H. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work.

1. Determine sizes and locations from trades providing such items.
2. Obtain written approval of Architect prior to forming openings not indicated on Drawings.

- I. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- J. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- K. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete.
 1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
 3. Clean embedded items immediately prior to concrete placement.

3.3 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare test reports.
- B. Inspections:
 1. Inspect formwork for shape, location, and dimensions of the concrete member being formed.

END OF SECTION 031000

CONCRETE FORMING AND ACCESSORIES - 031000

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Form-facing material for cast-in-place concrete.
 - 2. Shoring, bracing, and anchoring.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site

1.3 ACTION SUBMITTALS

- A. Product Data: For each of the following:
 - 1. Concealed surface form-facing material.
 - 2. Form ties.
 - 3. Form-release agent.

1.4 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.
- B. Minutes of preinstallation conference.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Concealed Surface Form-Facing Material: Lumber, plywood, metal, plastic, or another approved material.
 - 1. Provide lumber dressed on at least two edges and one side for tight fit.

RELATED MATERIALS

- B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.

- C. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- D. Form Ties: Factory-fabricated, removable or snap-off, glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, leave holes no larger than 1 inch in diameter in concrete surface.

PART 3 - EXECUTION

3.1 INSTALLATION OF FORMWORK

- A. Comply with ACI 301
- B. Construct formwork, so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities as follows:
 - 1. Surface Finish-1.0: ACI 117 Class D, 1 inch (25 mm).
- D. Construct forms tight enough to prevent loss of concrete mortar.
 - 1. Minimize joints.
- E. Construct removable forms for easy removal without hammering or prying against concrete surfaces.
 - 1. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces.
 - 2. Install keyways, recesses, and other accessories, for easy removal.
- F. Do not use rust-stained, steel, form-facing material.
- G. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces.
 - 1. Provide and secure units to support screed strips.
 - 2. Use strike-off templates or compacting-type screeds.
- H. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work.

1. Determine sizes and locations from trades providing such items.
2. Obtain written approval of Architect prior to forming openings not indicated on Drawings.

- I. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- J. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- K. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete.
 1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
 3. Clean embedded items immediately prior to concrete placement.

3.3 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare test reports.
- B. Inspections:
 1. Inspect formwork for shape, location, and dimensions of the concrete member being formed.

END OF SECTION 031000

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CONCRETE REINFORCING - 032000

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel reinforcement bars.
2. Welded-wire reinforcement.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data: For the following:

1. Each type of steel reinforcement.
2. Bar supports.
3. Mechanical splice couplers.

B. Shop Drawings: Comply with ACI SP-066:

1. Include placing drawings that detail fabrication, bending, and placement.
2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.

1.4 INFORMATIONAL SUBMITTALS

A. Material Test Reports: For the following, from a qualified testing agency:

1. Steel Reinforcement:

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.

2.2 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.
 - 1. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
- B. Steel Tie Wire: ASTM A1064/A1064M, annealed steel, not less than 0.0508 inch in diameter.

2.3 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

3.2 INSTALLATION OF STEEL REINFORCEMENT

- A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.
- B. Accurately position, support, and secure reinforcement against displacement.
 - 1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
- C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.
- D. Provide concrete coverage in accordance with ACI 318.
- E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- F. Install welded-wire reinforcement in longest practicable lengths.
 - 1. Support welded-wire reinforcement in accordance with CRSI "Manual of Standard Practice."
 - a. For reinforcement less than W4.0 or D4.0, continuous support spacing shall not exceed 12 inches.
 - 2. Lap edges and ends of adjoining sheets at least one wire spacing plus 2 inches for plain wire and 8 inches for deformed wire.
 - 3. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.

4. Lace overlaps with wire.

3.3 JOINTS (Not used)

3.4 INSTALLATION TOLERANCES

1. Comply with ACI 117.

3.5 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare test reports.
- B. Inspections:
 1. Steel-reinforcement placement.

END OF SECTION 032000

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CAST-IN-PLACE CONCRETE -033000

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

B. Related Requirements:

1. Section 032000 "Concrete Reinforcing" for steel reinforcing bars and welded-wire reinforcement.
2. Section 031000 "Concrete Forming and Accessories" for form facing materials and waterstops.

1.2 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, and other pozzolans materials subject to compliance with requirements.
- B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each of the following.

1. Portland cement.
2. Fly ash.
3. Blended hydraulic cement.
4. Aggregates.
5. Admixtures:
 - a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
6. Curing materials.
7. Joint fillers.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Durability exposure class.
4. Maximum w/cm.
5. Slump limit.
6. Air content.
7. Nominal maximum aggregate size.
8. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
9. Intended placement method.
10. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.5 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Curing compounds.

B. Material Test Reports: For the following, from a qualified testing agency:

1. Portland cement.
2. Fly ash.
3. Blended hydraulic cement.
4. Aggregates.
5. Admixtures:

C. Research Reports: For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.

D. Preconstruction Test Reports: For each mix design.

E. Field quality-control reports.

F. Minutes of preinstallation conference.

1.6 QUALITY ASSURANCE

A. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

1.7 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on each concrete mixture.

1. Include the following information in each test report:

- a. Admixture dosage rates.
- b. Slump.
- c. Air content.
- d. Seven-day compressive strength.
- e. 28-day compressive strength.

1.8 DELIVERY, STORAGE, AND HANDLING

Comply with ASTM C94/C94M and ACI 301.FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 301 & ACI 306.
- B. Hot-Weather Placement: Comply with ACI 301 & ACI 305.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.2 CONCRETE MATERIALS

- A. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, Type I.
2. Fly Ash: ASTM C618, Class C or F.

- B. Normal-Weight Aggregates: ASTM C33/C33M, class 3S coarse aggregate or better, graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 1 inch nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

- C. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
 - 2. Retarding Admixture: ASTM C494/C494M, Type B.
 - 3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
 - 4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
 - 5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
 - 6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.
- D. Water and Water Used to Make Ice: ASTM C94/C94M, potable

2.3 RELATED MATERIALS

- 1. CONCRETE MIXTURES, GENERAL
- B. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301 .
 - 1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.
- C. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 - 1. Fly Ash or Other Pozzolans: 25 percent by mass.
- D. Admixtures: Use admixtures in accordance with manufacturer's written instructions.
 - 1. Use water-reducing high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
 - 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 - 3. Use water-reducing admixture in pumped concrete, and concrete with a w/cm below 0.50.

2.4 CONCRETE MIXTURES

- A. Class A : Normal-weight concrete used for footings, drilled piers and grade beams.
 - 1. Minimum Compressive Strength: 4000 psi at 28 days.
 - 2. Maximum w/cm: 0.45.
 - 3. Slump Limit: 4 inches plus or minus 1" before adding high-range water-reducing admixture or plasticizing admixture at Project site.

PART 3 - EXECUTION

3.1 INSTALLATION OF EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.
 - 1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.

3.2 JOINTS (Not Used)

3.3 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.
- B. Notify Architect and testing and inspection agencies 24 hours prior to commencement of concrete placement.
- C. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect in writing, but not to exceed the amount indicated on the concrete delivery ticket.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301, but not to exceed the amount indicated on the concrete delivery ticket.
 - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- E. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.
 - 1. If a section cannot be placed continuously, provide construction joints as indicated.
 - 2. Deposit concrete to avoid segregation.
 - 3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301 .
 - a. Do not use vibrators to transport concrete inside forms.
 - b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.

- c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
 - d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Level concrete, cut high areas, and fill low areas.
 - 5. Slope surfaces uniformly to drains where required.
 - 6. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
 - 7. Do not further disturb slab surfaces before starting finishing operations.

3.4 FINISHING FLOORS AND SLABS

- A. Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Trowel Finish:
 - 1. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel.
 - 2. Continue troweling passes and restraighen until surface is free of trowel marks and uniform in texture and appearance.
 - 3. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
 - 4. Do not add water to concrete surface.
 - 5. Do not apply hard-troweled finish to concrete, which has a total air content greater than 3 percent.
 - 6. Apply a trowel finish to surfaces exposed to view.
 - 7. Finish and measure surface, so gap at any point between concrete surface and an unlevelled, freestanding, 10-ft.- (3.05-m-) long straightedge resting on two high spots and placed anywhere on the surface does not exceed 3/16 inch and also no more than 1/16 inch in 2 feet.

3.5 INSTALLATION OF MISCELLANEOUS CONCRETE ITEMS

- A. Filling In:
 - 1. Fill in holes and openings left in concrete structures after Work of other trades is in place unless otherwise indicated.
 - 2. Mix, place, and cure concrete, as specified, to blend with in-place construction.
 - 3. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Equipment Bases and Foundations:

1. Coordinate sizes and locations of concrete bases with actual equipment provided.
2. Minimum Compressive Strength: 4000 psi at 28 days.
3. Prior to pouring concrete, place and secure anchorage devices.
 - a. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - b. Cast anchor-bolt insert into bases.
 - c. Install anchor bolts to elevations required for proper attachment to supported equipment.

3.6 CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.
2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.

B. Curing Unformed Surfaces: Comply with ACI 308.1 as follows:

1. Begin curing immediately after finishing concrete.
 - 1) Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches , and sealed by waterproof tape or adhesive.
 - a) Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - b) Cure for not less than seven days.

3.7 TOLERANCES

A. Conform to ACI 117.

3.8 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.

B. Testing Agency: Owner will engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

1. Testing agency shall be responsible for providing curing container for composite samples on Site and verifying that field-cured composite samples are cured in accordance with ASTM C31/C31M.
2. Testing agency shall immediately report to Architect, Contractor, and concrete manufacturer any failure of Work to comply with Contract Documents.

3. Testing agency shall report results of tests and inspections, in writing, to Owner, Architect, Contractor, and concrete manufacturer within 48 hours of inspections and tests.
 - a. Test reports shall include reporting requirements of ASTM C31/C31M, ASTM C39/C39M, and ACI 301, including the following as applicable to each test and inspection:
 - 1) Project name.
 - 2) Name of testing agency.
 - 3) Names and certification numbers of field and laboratory technicians performing inspections and testing.
 - 4) Name of concrete manufacturer.
 - 5) Date and time of inspection, sampling, and field testing.
 - 6) Date and time of concrete placement.
 - 7) Location in Work of concrete represented by samples.
 - 8) Date and time sample was obtained.
 - 9) Truck and batch ticket numbers.
 - 10) Design compressive strength at 28 days.
 - 11) Concrete mixture designation, proportions, and materials.
 - 12) Field test results.
 - 13) Information on storage and curing of samples before testing, including curing method and maximum and minimum temperatures during initial curing period.
 - 14) Type of fracture and compressive break strengths at seven days and 28 days.
- C. Batch Tickets: For each load delivered, submit three copies of batch delivery ticket to testing agency, indicating quantity, mix identification, admixtures, design strength, aggregate size, design air content, design slump at time of batching, and amount of water that can be added at Project site.
- D. Inspections:
 1. Headed bolts and studs.
 2. Verification of use of required design mixture.
 3. Concrete placement, including conveying and depositing.
 4. Curing procedures and maintenance of curing temperature.
 5. Verification of concrete strength before removal of shores and forms from beams and slabs.
 6. Batch Plant Inspections: On a random basis, as determined by Architect.
- E. Concrete Tests: Testing of composite samples of fresh concrete obtained in accordance with ASTM C 172/C 172M shall be performed in accordance with the following requirements:
 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. , but less than 25 cu. yd. , plus one set for each additional 50 cu. yd. or fraction thereof.
 - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C143/C143M:
 - a. One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 - b. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C231/C231M pressure method, for normal-weight concrete.
 - a. One test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C1064/C1064M:
 - a. One test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C31/C31M:
 - a. Cast and laboratory cure two sets of two 6-inch by 12-inch or 4-inch by 8-inch cylinder specimens for each composite sample.
 - b. Cast, initial cure, and field cure two sets of two standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C39/C39M.
 - a. Test one set of two laboratory-cured specimens at seven days and one set of two specimens at 28 days.
 - b. Test one set of two field-cured specimens at seven days and one set of two specimens at 28 days.
 - c. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
7. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
8. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi if specified compressive strength is 4000 psi, or no compressive strength test value is less than 10 percent of specified compressive strength if specified compressive strength is greater than 4000 psi (34.5 MPa).
9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
10. Additional Tests:
 - a. Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect.

- b. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42/C42M or by other methods as directed by Architect.

- 1) Acceptance criteria for concrete strength shall be in accordance with ACI 301, section 1.6.6.3.

- 11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- 12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

3.9 PROTECTION

- 1. Protect concrete surfaces as follows:
 - a. Protect from petroleum stains.
 - b. Diaper hydraulic equipment used over concrete surfaces.
 - c. Prohibit use of pipe-cutting machinery over concrete surfaces.
 - d. Prohibit placement of steel items on concrete surfaces.
 - e. Prohibit use of acids or acidic detergents over concrete surfaces.

END OF SECTION 033000

SECTION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 2 PRODUCTS

1.01 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

- A. Provide products that comply with requirements of NFPA 70.
- B. Provide products listed, classified, and labeled as suitable for the purpose intended.
- C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
- D. Comply with NEMA WC 70.
- E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
- F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
- G. Conductor Material:
 - 1. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
 - 2. Tinned Copper Conductors: Comply with ASTM B33.
- H. Conductor Color Coding:
 - 1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
 - 2. Color Coding Method: Integrally colored insulation.
 - 3. Color Code:
 - a. Equipment Ground, All Systems: Green.

1.02 WIRING CONNECTORS

- A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

END OF SECTION

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 2 PRODUCTS

1.01 GROUNDING AND BONDING REQUIREMENTS

- A. Do not use products for applications other than as permitted by NFPA 70 and product listing.
- B. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.
- C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

1.02 GROUNDING AND BONDING COMPONENTS

- A. General Requirements:
 - 1. Provide products listed, classified, and labeled as suitable for the purpose intended.
 - 2. Provide products listed and labeled as complying with UL 467 where applicable.
- B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 05 26:
 - 1. Use insulated copper conductors unless otherwise indicated.
 - a. Exceptions:
 - 1) Use bare copper conductors where installed underground in direct contact with earth.
 - 2) Use bare copper conductors where directly encased in concrete (not in raceway).
- C. Connectors for Grounding and Bonding:
 - 1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
 - 2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
 - 3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

END OF SECTION

SECTION 26 05 29
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 2 PRODUCTS

1.01 SUPPORT AND ATTACHMENT COMPONENTS

- A. General Requirements:
 - 1. Comply with the following. Where requirements differ, comply with most stringent.
 - a. NFPA 70.
 - b. Requirements of authorities having jurisdiction.
 - 2. Provide required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for complete installation of electrical work.
 - 3. Provide products listed, classified, and labeled as suitable for purpose intended, where applicable.
 - 4. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
 - 5. Do not use products for applications other than as permitted by NFPA 70 and product listing.
 - 6. Steel Components: Use corrosion-resistant materials suitable for environment where installed.
 - a. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
 - b. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.
- B. Conduit and Cable Supports: Straps and clamps suitable for conduit or cable to be supported.
 - 1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
 - 2. Conduit Clamps: Bolted type unless otherwise indicated.
- C. Outlet Box Supports: Hangers and brackets suitable for boxes to be supported.
- D. Metal Channel/Strut Framing Systems:
 - 1. Description: Factory-fabricated, continuous-slot, metal channel/strut and associated fittings, accessories, and hardware required for field assembly of supports.
 - 2. Comply with MFMA-4.
- E. Hanger Rods: Threaded, zinc-plated steel unless otherwise indicated.
- F. Anchors and Fasteners:
 - 1. Unless otherwise indicated and where not otherwise restricted, use anchor and fastener types indicated for specified applications.

END OF SECTION

SECTION 26 05 33.13
CONDUIT FOR ELECTRICAL SYSTEMS

PART 2 PRODUCTS

1.01 CONDUIT - GENERAL REQUIREMENTS

- A. Comply with NFPA 70.
- B. Provide conduit, fittings, supports, and accessories required for complete raceway system.
- C. Provide products listed, classified, and labeled as suitable for purpose intended.
- D. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

END OF SECTION

SECTION 26 05 33.16
BOXES FOR ELECTRICAL SYSTEMS

PART 2 PRODUCTS

1.01 BOXES

- A. General Requirements:
 - 1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
 - 2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
 - 3. Provide products listed, classified, and labeled as suitable for the purpose intended.
 - 4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
 - 5. Provide grounding terminals within boxes where equipment grounding conductors terminate.
- B. Outlet and Device Boxes Up to 100 cubic inches, Including Those Used as Junction and Pull Boxes:
 - 1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
 - 2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
 - 3. Use suitable concrete type boxes where flush-mounted in concrete.
 - 4. Use suitable masonry type boxes where flush-mounted in masonry walls.
 - 5. Use raised covers suitable for the type of wall construction and device configuration where required.
 - 6. Use shallow boxes where required by the type of wall construction.
 - 7. Do not use "through-wall" boxes designed for access from both sides of wall.
 - 8. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
 - 9. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
 - 10. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
 - 11. Boxes for Ganged Devices: Use multigang boxes of single-piece construction. Do not use field-connected gangable boxes unless specifically indicated or permitted.
 - 12. Wall Plates: Comply with Section 26 07 26.
- C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches:
 - 1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
 - 2. NEMA 250 Environment Type, Unless Otherwise Indicated:
 - 3. Junction and Pull Boxes Larger Than 100 cubic inches:
 - a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.

END OF SECTION

DRILLED CONCRETE PIERS AND SHAFTS - 316329

Part 1 - General

1.1 SUMMARY

A. Section Includes:

1. Dry-installed drilled piers.

1.2 PREINSTALLATION MEETINGS

- ##### A. Preinstallation Conference: Conduct conference at Project site

1.3 ACTION SUBMITTALS

- ##### A. Product Data: For each type of product.
- ##### B. Design Mixtures: For each concrete mixture.
- ##### C. Shop Drawings: For concrete reinforcement.

1.4 INFORMATIONAL SUBMITTALS

- ##### A. Material certificates.
- ##### B. Material test reports.
- ##### C. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- ##### A. Record drawings.

1.6 FIELD CONDITIONS

- ##### A. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses conducted by geotechnical engineer. Owner is not responsible for interpretations or conclusions drawn from this data.
1. Make additional test borings and conduct other exploratory operations necessary for drilled piers.

2. The geotechnical report is included elsewhere in the Project Manual.
- B. Survey Work: Engage a qualified land surveyor or professional engineer to perform surveys, layouts, and measurements for drilled piers. Before excavating, lay out each drilled pier to lines and levels required. Record actual measurements of each drilled pier's location, shaft diameter, bottom and top elevations, deviations from specified tolerances, and other specified data.
 1. Record and maintain information pertinent to each drilled pier and indicate on record Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Drilled-Pier Standard: ACI 336.1 except as modified in this Section.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615/A615M, Grade 60 , deformed.
- B. Low-Alloy-Steel Reinforcing Bars: ASTM A706/A706M, deformed.

2.3 CONCRETE MATERIALS

- A. See Section 033000 "Cast-in-Place Concrete" for concrete materials.

PART 3 - EXECUTION

3.1 EXCAVATION

- A. Classified Excavation: Excavation is classified as standard excavation, special excavation, and obstruction removal and includes excavation to bearing elevations as follows:
 1. Standard excavation includes excavation accomplished with conventional augers fitted with soil or rock teeth, drilling buckets, or underreaming tools attached to drilling equipment of size, power, torque, and downthrust necessary for the Work.
 2. Special excavation includes excavation that requires special equipment or procedures where drilled-pier excavation equipment used in standard excavation, operating at maximum power, torque, and downthrust, cannot advance the shaft.
 3. Obstructions: Payment for removing unanticipated boulders, concrete, masonry, or other subsurface obstructions that cannot be removed by conventional augers fitted with soil or rock teeth, drilling buckets, or underreaming tools attached to drilling equipment of size, power, torque, and downthrust necessary for the Work is according to Contract provisions for changes in the Work.
- B. Excavate shafts for drilled piers to indicated elevations. Remove loose material from bottom of excavation.

- C. Notify and allow testing and inspecting agency to test and inspect bottom of excavation. If unsuitable bearing stratum is encountered, make adjustments to drilled piers as determined by Architect.
 - 1. Do not excavate shafts deeper than elevations indicated unless approved by Architect.
 - 2. Payment for additional authorized excavation is according to Contract provisions for changes in the Work.
- D. End-Bearing Drilled Piers: Probe with auger to a depth below bearing elevation, equal to diameter of the bearing area of drilled pier. Determine whether voids, clay seams, or solution channels exist.
- E. Tolerances: Construct drilled piers to remain within ACI 336.1 tolerances.

3.2 INSTALLATION

- A. Comply with recommendations in CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
- B. Place concrete in continuous operation and without segregation immediately after inspection and approval of shaft by a qualified Special Inspector.
- C. Place concrete to fall vertically down the center of drilled pier without striking sides of shaft or steel reinforcement.

3.3 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 - 1. Drilled piers.
 - 2. Excavation.
 - 3. Concrete.
- B. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- C. Drilled-Pier Tests and Inspections: For each drilled pier, before concrete placement.
 - 1. Soil Testing: Bottom elevations, bearing capacities, and lengths of drilled piers indicated have been estimated from available soil data. Actual elevations and drilled-pier lengths and bearing capacities are determined by testing and inspecting agency. Final evaluations and approval of data are determined by Architect.
- D. Concrete Tests and Inspections: ACI 301.

3.4 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 316329

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C-ITEM C-105 MOBILIZATION

105-1 Description. This item of work shall consist of, but is not limited to, work and operations necessary for the movement of personnel, equipment, material and supplies to and from the project site for work on the project except as provided in the contract as separate pay items.

105-2 Mobilization limit. Mobilization shall be limited to ten percent (10) of the total project cost.

105-3 Posted notices. Prior to commencement of construction activities, the Contractor must post the following documents in a prominent and accessible place where they may be easily viewed by all employees of the prime Contractor and by all employees of subcontractors engaged by the prime Contractor: Equal Employment Opportunity (EEO) Poster “Equal Employment Opportunity is the Law” in accordance with the Office of Federal Contract Compliance Programs Executive Order 11246, as amended; Davis Bacon Wage Poster (WH 1321) - DOL “Notice to All Employees” Poster; and Applicable Davis-Bacon Wage Rate Determination. These notices must remain posted until final acceptance of the work by the Owner.

105-4 Engineer/RPR field office. An Engineer/RPR field office is not required.

METHOD OF MEASUREMENT

105-5 Basis of measurement and payment. Based upon the contract lump sum price for “Mobilization” partial payments will be allowed as follows:

- a. With first pay request, 25%.
- b. When 25% or more of the original contract is earned, an additional 25%.
- c. When 50% or more of the original contract is earned, an additional 40%.
- d. After Final Inspection, staging area clean-up and delivery of all Project Closeout materials as required by Section 90, paragraph 90-11, *Contractor Final Project Documentation*, the final 10%.

BASIS OF PAYMENT

105-6 Payment will be made under:

This item shall be subsidiary to other bid items in the contract.

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

Office of Federal Contract Compliance Programs (OFCCP)

Executive Order 11246, as amended

EEOC-P/E-1 – Equal Employment Opportunity is the Law Poster

United States Department of Labor, Wage and Hour Division (WHD)

WH 1321 – Employee Rights under the Davis-Bacon Act Poster

END OF ITEM C-105

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U.S. Department
of Transportation

Federal Aviation
Administration

Advisory Circular

Subject: Painting, Marking, and Lighting of
Vehicles Used on an Airport

Date: April 1, 2010

AC No: AC 150/5210-5D

Initiated by: AAS-100

Change:

1. **PURPOSE.** This advisory circular (AC) provides guidance, specifications, and standards for painting, marking, and lighting of vehicles operating in the airport air operations area (AOA). The approved lights, colors, and markings herein assure the conspicuity of vehicles operating in the AOA from both the ground and the air.

2. **CANCELLATION.** This AC cancels AC 150/5210-5C, Painting, Marking, and Lighting of Vehicles Used on an Airport, dated August 31, 2007.

3. **APPLICATION.** The Federal Aviation Administration (FAA) recommends the guidelines and standards in this Advisory Circular for vehicles operating in the airport AOA. In general, use of this AC is not mandatory. *However*, use of this AC is mandatory for vehicles funded with federal grant monies through the Airport Improvement Program (AIP) and/or with revenue from the Passenger Facility Charges (PFC) Program. See Grant Assurance No. 34, "Policies, Standards, and Specifications," and PFC Assurance No. 9, "Standard and Specifications."

Vehicles covered by this AC that do not meet this standard may be used until the vehicle is repainted or replaced, but no later than **December 31, 2010**.

4. **PRINCIPAL CHANGES.** This AC contains new specifications and recommendations for the painting, marking, and lighting of Towbarless Tow Vehicles (TLTVs).

5. **METRIC UNITS.** To promote an orderly transition to metric units, this AC includes both English and metric dimensions. The metric conversions may not be exact equivalents, and until there is an official changeover to the metric system, the English dimensions will govern.

6. **COMMENTS OR SUGGESTIONS** for improvements to this AC should be sent to:

Manager, Airport Engineering Division
Federal Aviation Administration
ATTN: AAS-100
800 Independence Avenue, S.W.
Washington, DC 20591

Michael J. O'Donnell
Director of Airport Safety and Standards

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PAINTING, MARKING, AND LIGHTING OF VEHICLES USED ON AN AIRPORT

1. SOURCES OF APPLICABLE DOCUMENTS.

- a.** American National Standards Institute, Inc. (ANSI), 25 West 43rd St. 4th Floor, New York, NY 10036. Website: **www.ansi.org**
- b.** American Society for Testing & Materials (ASTM), ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959. Website: **www.astm.org**
- c.** The National Fire Protection Association (NFPA), 1 Batterymarch Park, Quincy, Massachusetts 02169-7471. Website: **www.nfpa.org**
- d.** The U. S. General Services Administration (GSA), Centralized Mailing List Services, 501 West Felix Street, Whse 9, South End P.O. Box 6477, Fort Worth, Texas 76115-6477. Website: **www.gsa.gov**
- e.** The Superintendent of Documents, U.S. Government Printing Office, 732 North Capitol St. NW, Washington, DC 20401.
- f.** Society of Automotive Engineers, Inc. (SAE), 400 Commonwealth Drive, Warrendale, PA 15096-0001. Website: **www.sae.org**
- g.** FAA Advisory Circulars: U.S. Department of Transportation, Subsequent Distribution Office, Ardmore East Business Center, 3341 Q 75th Ave., Landover, MD 20785. Website: **www.faa.gov**
- h.** FAA Engineering Briefs: **www.faa.gov/airports/engineering/engineering_briefs/**

2. DEFINITIONS. The following definitions apply in this AC:

- a. Vehicle** – All conveyances, except aircraft, used on the ground to transport persons, cargo, equipment or those required to perform maintenance, construction, service, and security duties.
- b. Air Operations Area (AOA)** – The portion of airport that encompasses the landing, take off, taxiing, and parking areas for aircraft.
- c. Airport Emergency Vehicles** – Vehicles that are authorized in the AOA for emergency purposes (e.g., ambulances, aircraft rescue and fire fighting (ARFF) vehicles and emergency response vehicles) as authorized by the airport traffic control tower (ATCT) or an authorized on-site accident/incident commander.
- d. Airport Operations Vehicles** – Vehicles routinely used by airport operations personnel for airport inspection and duties associated with airfield operations (such as airfield condition reporting and Incident Command) on the AOA and Movement Area.
- e. Airport Security Vehicles** – Vehicles that are authorized in the AOA for security purposes, as needed (e.g. police cars).

- f. Airfield Service Vehicles** – Vehicles that are routinely used in the AOA for airfield service, maintenance, or construction (e.g. snow blowers, snowplows, maintenance trucks, and tractors).
- g. Aircraft Support Vehicles** – Vehicles that are routinely used in the AOA to support aircraft operations (e.g. aircraft pushback tractors, baggage/cargo tractors or trucks, air conditioning and aviation fuel trucks). These vehicles are typically owned by airlines, vendors, or contractors and are not eligible for Federal funding.
- h. Reduced Visibility** – Prevailing visibility is less than one statute mile (1609 meters) and/or the runway visual range (RVR) is less than 6,000 feet (1830 meters).
- i. Movement Area** – The runways, taxiways, and other areas of an airport/heliport that are used for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports/heliports with an operating airport traffic control tower (ATCT), specific approval for entry onto the movement area must be obtained from air traffic control (ATC).
- j. Other Vehicles** – Vehicles that are not routinely authorized in the AOA (e.g. construction vehicles). These vehicles are typically owned by airlines, vendors, or contractors and are not eligible for Federal funding.
- k. Peak Intensity** – Peak intensity, for purposes of this document, means the maximum magnitude of luminescence as measured in candela.
- l. Towbarless Tow Vehicle (TLTV)** – a type of aircraft support vehicle whose main purpose is to tow aircraft in the AOA by way of nose gear capture.

3. VEHICLE PAINTING.

NOTE: *Airport vehicle paint and markings are a safety of flight requirement. The approved colors/markings herein assure conspicuity of vehicles operating in the AOA from both the ground and air.*

a. Airport Emergency Vehicles.

(1) Ambulances. Ambulance vehicles are painted per the most current version of Federal Specification KKK-A-1822, *Federal Specification for the Star-of-Life Ambulance*. Ambulances are not considered vehicles routinely operating on the AOA.

(2) Aircraft Rescue and Fire Fighting (ARFF) Vehicles. Yellowish-green is the vehicle color standard. Color specifications are per Appendix A.

NOTE: *A yellowish-green color provides optimum visibility during all light levels encountered during a 24-hour day and under variations of light that result from weather and seasonal changes.*

b. Airport Operations Vehicles. Airport operations vehicles may be painted in colors designated by the airport operator. The characteristics must be coordinated with the respective ATCT and identified in the tower letter of agreement.

c. Airport Security Vehicles. Comply with specific state or local requirements.

d. Airfield Service Vehicles. Chrome yellow is the vehicle color standard. Color specifications are per Appendix A. When vehicles are equipped with bumper bars 8 inches (200 mm) or more in depth, the bars must be painted in alternate stripes 4 inches (100 mm) in width of chrome yellow and black inclined 45° to the vertical.

e. Aircraft Support Vehicles.

(1) Any color or combination of colors other than yellowish-green or chrome yellow. The bumper bar paint scheme in paragraph 3.d (of alternating chrome yellow and black stripe) is recommended.

(2) **TLTVs.** International orange is the vehicle color standard. Retroreflective tape covering more than 25 percent of the vehicle's vertical surfaces may be used as a temporary measure to meet this standard prior to scheduled vehicle painting.

f. Other Vehicles. Any color or combination of colors other than solid black or white.

4. VEHICLE MARKING.

a. Airport Emergency Vehicles.

(1) **Ambulances.** Ambulances are marked per the most current version of Federal Specification KKK-A-1822.

(2) **ARFF Vehicles.** Emergency rescue and fire fighting vehicles are marked with the letters "ARFF," "Fire," or "Rescue" and in accordance with 4.c.(1)-(5) of this AC.

b. Airport Operations Vehicles. Airport operations vehicles may be marked as designated by the airport operator. Marking must be coordinated with the respective ATCT and identified in the tower letter of agreement.

c. Airfield Service Vehicles and Aircraft Support Vehicles.

(1) Airport operator owned vehicles must display an identification number on each side and on the roof (the hood should be used if the vehicle has no roof).

(2) Side numbers will be a minimum of 16 inches (410 mm) in height and conspicuously located.

(3) Roof numbers will be a minimum of 24 inches (610 mm) in height and affixed with their bases toward the front of the vehicle. The identification numbers should provide sharp color contrast to the vehicle color.

(4) In addition to the identification numbers, airport operator-owned vehicles must display either the name of the airport and/or the airport insignia.

(5) To further improve night-time recognition of vehicles, a minimum 8 inch (200 mm) wide horizontal band of high gloss white paint or white reflective tape (Retroreflective, ASTM-D 4956-09, *Standard Specification for Retroreflective Sheeting for Traffic Control*, Type III & above) must be used around the vehicle's surface. Figures 1, 2, and 3 show suggested locations for the horizontal reflective band.

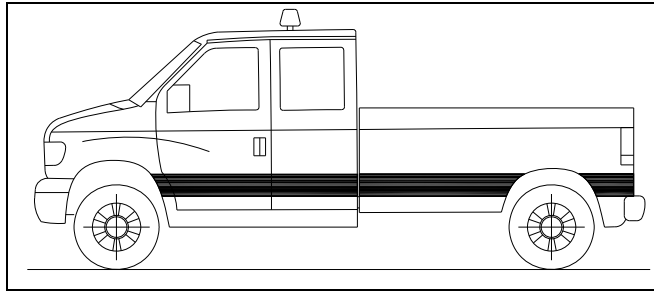


Figure 1: Suggested location for the horizontal reflective band, Option 1

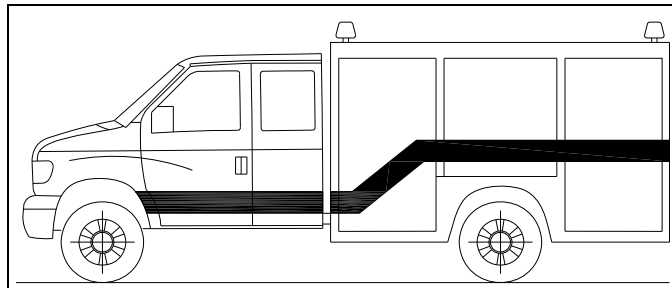


Figure 2: Suggested location for the horizontal reflective band, Option 2

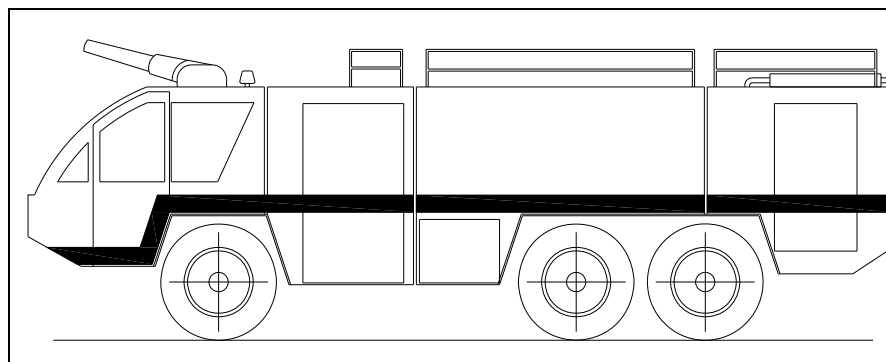


Figure 3: Suggested location for the horizontal reflective band, Option 3

(6) TLTVs. Retroreflective tape is used to outline the shape of a TLTV. If the vertical edge of the vehicle is rounded, the tape should be placed on the rounded portion to reflect light in both the horizontal and vertical planes. Where the placement of the tape may interfere with, or may be worn down by, maintenance or operational activities, tape is not required. Suggested locations for the retroreflective bands are shown in Figure 4.

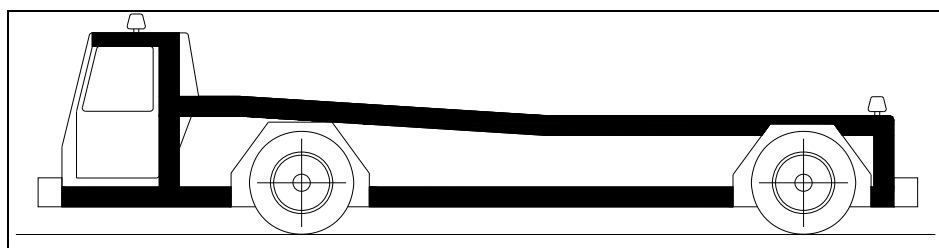


Figure 4: Suggested placement of retroreflective tape on a TLTV

d. Airport Security and Other Vehicles.

- (1) Vehicles other than those that routinely traverse any portion of the AOA under the control of ATC, which are not escorted by a vehicle in constant two-way radio communication with ATC and properly equipped and authorized to operate in the AOA, must be provided with a flag on a staff attached to the vehicle so that the flag will be readily visible.
- (2) At airports without air traffic control facilities, flags must be provided on all vehicles.
- (3) The flag must be at least a 3-foot by 3-foot (0.9 meter by 0.9 meter) square having a checkered pattern of international orange and white squares at least 1 foot (300 mm) on each side (see Appendix A for the fabric color specification).

5. VEHICLE LIGHTING.

a. Airfield Service, Aircraft Support, and Airport Operations Vehicles.

- (1) The standard for identification lighting is a yellow flashing light that is mounted on the uppermost part of the vehicle structure. A steady yellow light designates vehicles limited to non-movement areas.
- (2) The light must be visible from any direction, day and night, including from the air.
- (3) Color specifications for vehicle identification lights are per Appendix B.
- (4) **TLTVs.** An LED light bar placed above the operator's cab may be used in place of the rotating yellow flashing light. In addition, a yellow flashing light (of any type) must be installed on the upper left-rear and right-rear corners of the TLTV, and must be activated when an aircraft is in tow. The size of the rear flashing lights must be large enough to meet the requirements of Section 5.c, but not so large as to interfere with the normal or towing operations of the TLTV.

b. Airport Emergency, Security, and Other Vehicles, which are not escorted by a properly lighted vehicle, must be identified during periods of low visibility by a light.

c. Characteristics of Flashing Lights:

- (1) Ambulance lights must meet the specifications in the most current version of Federal Specification KKK-A-1822, and ARFF vehicles must meet NFPA, state, and local requirements.
- (2) Lights must have peak intensity within the range of 40 to 400 candelas (effective) from 0° (horizontal) up to 10° above the horizontal and for 360° horizontally. The upper limit of 400 candelas (effective) is necessary to avoid damage to night vision.
- (3) From 10° to 15° above the horizontal plane, the light output must be 1/10th of peak intensity or between 4 and 40 candelas (effective).

- (4) Lights must flash at 75 ± 15 flashes per minute.

NOTES:

- 1. The effective intensity of a flashing light is equal to the intensity of a steady-burning (fixed) light of the same color that produces the same visual range under identical conditions of observation.*
- 2. If xenon flashtubes are used, refer to AC 150/5345-43, Specification for Obstruction Lighting Equipment, for guidance concerning methods of calculating effective intensity.*

d. Light Colors.

(1) Airport Emergency Vehicles.

(a) **Ambulances.** Per the most current version of Federal Specification KKK-A-1822.

(b) **ARFF Vehicles.** Red or a combination of red-and-white flashing lights per the chromaticity requirements in Appendix B.

(2) Airport Security Vehicles. Signal blue or a combination of red and signal blue flashing light per the chromaticity requirements in Appendix B.

(3) Airfield Service, Aircraft Support, Airport Operations, and Other Vehicles. Yellow flashing light per the chromaticity requirements in Appendix B.

APPENDIX A. COLOR SPECIFICATIONS

A-1. SPECIFICATIONS. Colors specified in Table A-1 are per the Commission Internationale de l'Eclairage (CIE) L*a*b* system of color specification. For a description of this system, refer to American Society for Testing & Materials (ASTM) D 2244, *Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates*.

Table A-1. Specification for vehicle and flag colors

Standard Illuminant D65 Usage	Chrome Yellow			Yellowish-Green			International Orange		
	Vehicle Paint			Vehicle Paint			Vehicle Paint / Flag Fabric		
CIELAB DATA	L*	a*	b*	L*	a*	b*	L*	a*	b*
Centroid Color	72.8	24.4	77.6	78.3	-10.2	80.4	45.0	53.5	52.0
Point 1	72.8	31.8	82.9	78.3	-9.0	92.0	45.0	61.4	47.8
Point 2	72.8	25.5	66.7	78.3	-7.6	73.2	45.0	53.9	41.4
Point 3	72.8	18.0	69.3	78.3	-11.0	69.3	45.0	53.5	53.4
Point 4	72.8	22.4	86.0	78.3	-13.4	86.2	45.0	49.7	60.4
Light Limit	77.8			83.3			49.9		
Dark Limit	67.8			73.3			41.6		
Max ΔE	11.1			11.7			10.7		

A-2. COLOR TESTS. Acceptable colors are those that meet the gloss rating test and either a visual or an instrumental color test as follows:

NOTE: Flag fabric colors must meet either the instrumental tests in Table A-1 or the visual method described in paragraph A-2b(1).

a. Gloss Rating Test. This test is performed per ASTM D 523, *Standard Test Method for Specular Gloss*, on a paint sample of the color to be applied on the vehicle. An acceptable color sample is high gloss with a minimum gloss rating of 70 units, for 60° geometry.

b. Color Test Methods:

(1) Visual. Prepare a master specimen of the color (per Table A-1) and gloss (per paragraph A-2a). This specimen will be the master color and be used as the basis of comparison per ASTM D 5531-05, *Standard Guide for the Preparation, Maintenance, and Distribution of Physical Product Standards for Color and Geometric Appearance of Coatings*. To verify the paint color of a vehicle visually, vehicle paint samples must be

prepared and viewed per ASTM D 1729-96 (Reapproved 2009), *Standard Practice for Visual Appraisal of Colors and Color Differences of Diffusely-Illuminated Opaque Materials*.

(2) Instrumental. This test requires a test specimen sample and reference to Table A-1. All test specimen measurements should be conducted per ASTM E 1164-09a *Standard Practice for Obtaining Spectrometric Data for Object-Color Evaluation*. Test specimen tolerances must be per Table A-1 per the following:

- (a) Plot the centroid color using the a^* and b^* CIELAB coordinate data from Table A-1 on graph paper or by entry of the coordinate data into a computer program. Plot and connect points 1 through 4 from the same table to form a quadrilateral; noting that the centroid color is within this figure. See Figure A-1 for plots of all three color specifications in Table A-1.
- (b) Perform color sample measurements per ASTM E 1164-09a. If necessary, convert measurements to CIELAB L^* , a^* , and b^* color space. See ASTM E 308-08, *Standard Practice for Computing the Colors of Objects by Using the CIE System*, for color space conversion formulae.
- (c) An acceptable color is one that meets:
 - (i) the chromaticity requirements of the color samples a^* and b^* CIELAB coordinate data by falling within the quadrilateral;
 - (ii) the L^* data lightness requirement by falling within the range defined by the light and dark data of Table A-1;
 - (iii) the total color difference (ΔE) by not exceeding the limits in Table A-1 when the CIELAB data are computed in the following formula:

$$\Delta E = (\Delta L^{*2} + \Delta a^{*2} + \Delta b^{*2})^{\frac{1}{2}}$$

where ΔL^* , Δa^* , and Δb^* values are the differences between those values for the centroid color in Table A-1 and those of the color sample measurements.

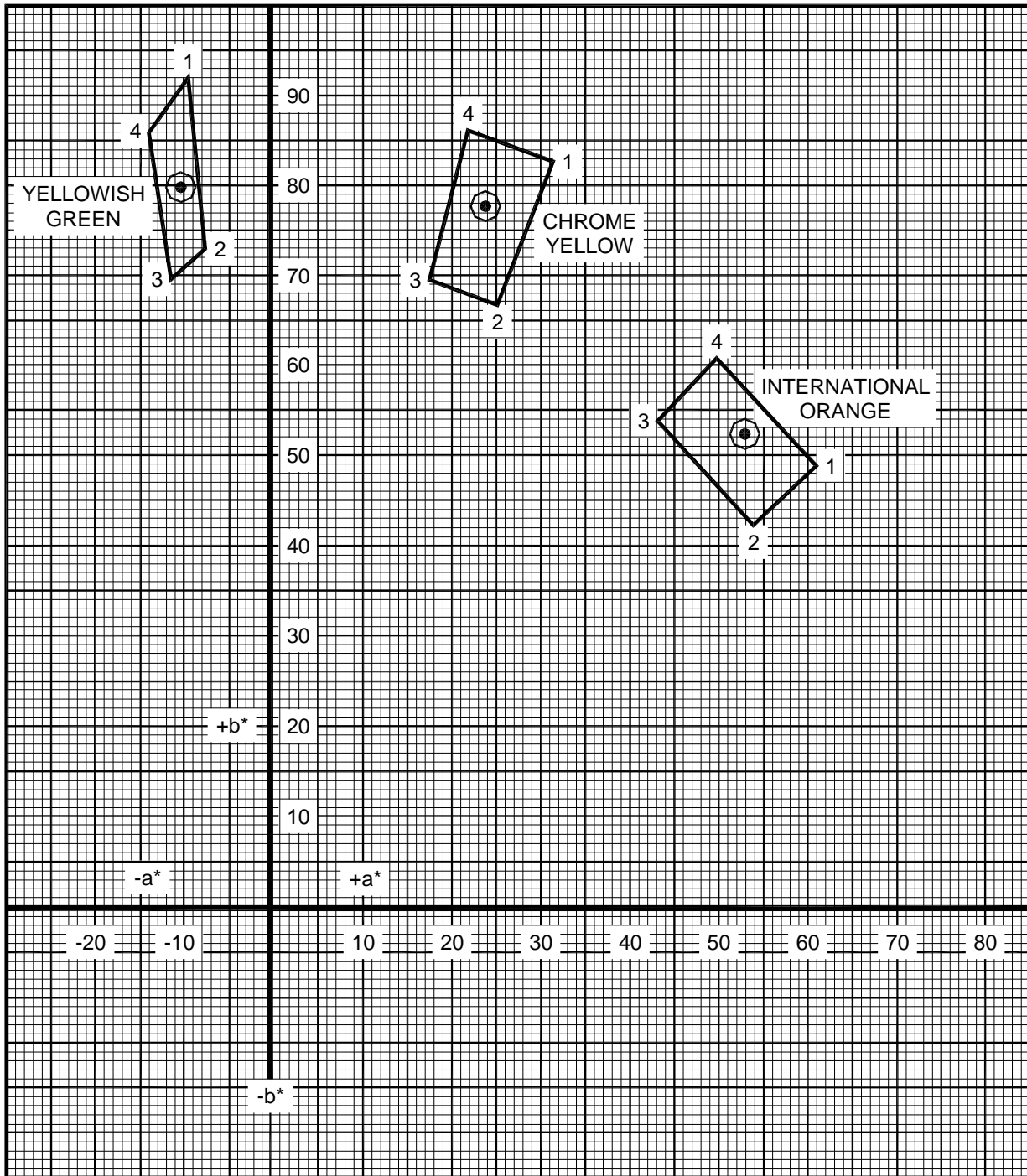


Figure A-1. Plot of selected color paint specifications

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APPENDIX B. COLOR SPECIFICATIONS FOR VEHICLE IDENTIFICATION LIGHTS

B-1. SPECIFICATIONS. The Society of Automotive Engineers (SAE) Standard J578 Revised December 2006, *Color Specification*, defines the acceptable color boundary limits and measurement of emitted red, white, signal blue, and yellow light for vehicle lights. This standard applies to the overall emitted color of light from the device in lieu of emitted light from any small area of the lens. The color of emitted light must fall within the color boundaries per SAE J578 Revised December 2006 (color boundary equations are in the standard) using color measurement methods detailed in the standard. See FAA Engineering Brief #67, Light Sources Other Than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures, for additional information and Alternative Lighting Devices.

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U.S. Department
of Transportation
**Federal Aviation
Administration**

Advisory Circular

Subject: Operational Safety on
Airports During Construction

Date: 12/13/2017

Initiated By: AAS-100

AC No: 150/5370-2G

Change:

1 **Purpose.**

This AC sets forth guidelines for operational safety on airports during construction.

2 **Cancellation.**

This AC cancels AC 150/5370-2F, *Operational Safety on Airports during Construction*, dated September 29, 2011.

3 **Application.**

This AC assists airport operators in complying with Title 14 Code of Federal Regulations (CFR) Part 139, *Certification of Airports*. For those certificated airports, this AC provides one way, but not the only way, of meeting those requirements. The use of this AC is mandatory for those airport construction projects receiving funds under the Airport Improvement Program (AIP). See Grant Assurance No. 34, *Policies, Standards, and Specifications*. While we do not require non-certificated airports without grant agreements or airports using Passenger Facility Charge (PFC) Program funds for construction projects to adhere to these guidelines, we recommend that they do so to help these airports maintain operational safety during construction.

4 **Related Documents.**

ACs and Orders referenced in the text of this AC do not include a revision letter, as they refer to the latest version. Appendix A contains a list of reading material on airport construction, design, and potential safety hazards during construction, as well as instructions for obtaining these documents.

5 **Principal Changes.**

The AC incorporates the following principal changes:

1. Notification about impacts to both airport owned and FAA-owned NAVAIDs was added. See paragraph 2.13.5.3, NAVAIDs.

2. Guidance for the use of orange construction signs was added. See paragraph 2.18.4.2, Temporary Signs.
3. Open trenches or excavations may be permitted in the taxiway safety area while the taxiway is open to aircraft operations, subject to restrictions. See paragraph 2.22.3.4, Excavations.
4. Guidance for temporary shortened runways and displaced thresholds has been enhanced. See Figure 2-1 and Figure 2-2.
5. Figures have been improved and a new Appendix F on the placement of orange construction signs has been added.

Hyperlinks (allowing the reader to access documents located on the internet and to maneuver within this document) are provided throughout this document and are identified with underlined text. When navigating within this document, return to the previously viewed page by pressing the “ALT” and “ ← ” keys simultaneously.

Figures in this document are schematic representations and are not to scale.

6 **Use of Metrics.**

Throughout this AC, U.S. customary units are used followed with “soft” (rounded) conversion to metric units. The U.S. customary units govern.

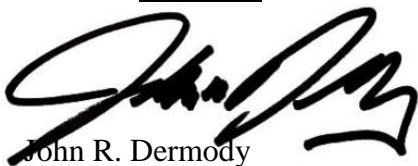
7 **Where to Find this AC.**

You can view a list of all ACs at

http://www.faa.gov/regulations_policies/advisory_circulars/. You can view the Federal Aviation Regulations at http://www.faa.gov/regulations_policies/faa_regulations/.

8 **Feedback on this AC.**

If you have suggestions for improving this AC, you may use the Advisory Circular Feedback form at the end of this AC.



John R. Dermody

Director of Airport Safety and Standards

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CHAPTER 1. PLANNING AN AIRFIELD CONSTRUCTION PROJECT

1.1 Overview.

Airports are complex environments, and procedures and conditions associated with construction activities often affect aircraft operations and can jeopardize operational safety. Safety considerations are paramount and may make operational impacts unavoidable. However, careful planning, scheduling, and coordination of construction activities can minimize disruption of normal aircraft operations and avoid situations that compromise the airport's operational safety. The airport operator must understand how construction activities and aircraft operations affect one another to be able to develop an effective plan to complete the project. While the guidance in this AC is primarily used for construction operations, the concepts, methods and procedures described may also enhance the day-to-day airport maintenance operations, such as lighting maintenance and snow removal operations.

1.2 Plan for Safety.

Safety, maintaining aircraft operations, and construction costs are all interrelated. Since safety must not be compromised, the airport operator must strike a balance between maintaining aircraft operations and construction costs. This balance will vary widely depending on the operational needs and resources of the airport and will require early coordination with airport users and the FAA. As the project design progresses, the necessary construction locations, activities, and associated costs will be identified and their impact to airport operations must be assessed. Adjustments are made to the proposed construction activities, often by phasing the project, and/or to airport operations to maintain operational safety. This planning effort will ultimately result in a project Construction Safety and Phasing Plan (CSPP). The development of the CSPP takes place through the following five steps:

1.2.1 Identify Affected Areas.

The airport operator must determine the geographic areas on the airport affected by the construction project. Some, such as a runway extension, will be defined by the project. Others may be variable, such as the location of haul routes and material stockpiles.

1.2.2 Describe Current Operations.

Identify the normal airport operations in each affected area for each phase of the project. This becomes the baseline from which the impact on operations by construction activities can be measured. This should include a narrative of the typical users and aircraft operating within the affected areas. It should also include information related to airport operations: the Aircraft Approach Category (AAC) and Airplane Design Group (ADG) of the airplanes that operate on each runway; the ADG and Taxiway Design Group (TDG)¹ for each affected taxiway; designated approach visibility minimums;

¹ Find Taxiway Design Group information in AC 150/5300-13, Airport Design.

available approach and departure procedures; most demanding aircraft; declared distances; available air traffic control services; airport Surface Movement Guidance and Control System (SMGCS) plan; and others. The applicable seasons, days and times for certain operations should also be identified as applicable.

1.2.3 Allow for Temporary Changes to Operations.

To the extent practical, current airport operations should be maintained during the construction. In consultation with airport users, Aircraft Rescue and Fire Fighting (ARFF) personnel, and FAA Air Traffic Organization (ATO) personnel, the airport operator should identify and prioritize the airport's most important operations. The construction activities should be planned, through project phasing if necessary, to safely accommodate these operations. When the construction activities cannot be adjusted to safely maintain current operations, regardless of their importance, then the operations must be revised accordingly. Allowable changes include temporary revisions to approach procedures, restricting certain aircraft to specific runways and taxiways, suspension of certain operations, decreased weights for some aircraft due to shortened runways, and other changes. An example of a table showing temporary operations versus current operations is shown in Appendix E.

1.2.4 Take Required Measures to Revise Operations.

Once the level and type of aircraft operations to be maintained are identified, the airport operator must determine the measures required to safely conduct the planned operations during the construction. These measures will result in associated costs, which can be broadly interpreted to include not only direct construction costs, but also loss of revenue from impacted operations. Analysis of costs may indicate a need to reevaluate allowable changes to operations. As aircraft operations and allowable changes will vary widely among airports, this AC presents general guidance on those subjects.

1.2.5 Manage Safety Risk.

The FAA is committed to incorporating proactive safety risk management (SRM) tools into its decision-making processes. FAA Order 5200.11, *FAA Airports (ARP) Safety Management System (SMS)*, requires the FAA to conduct a Safety Assessment for certain triggering actions. Certain airport projects may require the airport operator to provide a Project Proposal Summary to help the FAA determine whether a Safety Assessment is required prior to FAA approval of the CSPP. The airport operator must coordinate with the appropriate FAA Airports Regional or District Office early in the development of the CSPP to determine the need for a Safety Risk Assessment. If the FAA requires an assessment, the airport operator must at a minimum:

1. Notify the appropriate FAA Airports Regional or District Office during the project "scope development" phase of any project requiring a CSPP.
2. Provide documents identified by the FAA as necessary to conduct SRM.
3. Participate in the SRM process for airport projects.
4. Provide a representative to participate on the SRM panel.

5. Ensure that all applicable SRM identified risks elements are recorded and mitigated within the CSPP.

1.3 **Develop a Construction Safety and Phasing Plan (CSPP).**

Development of an effective CSPP will require familiarity with many other documents referenced throughout this AC. See Appendix A for a list of related reading material.

1.3.1 List Requirements.

A CSPP must be developed for each on-airfield construction project funded by the Airport Improvement Program (AIP) or located on an airport certificated under Part 139. For on-airfield construction projects at Part 139 airports funded without AIP funds, the preparation of a CSPP represents an acceptable method the certificate holder may use to meet Part 139 requirements during airfield construction activity. As per FAA Order 5200.11, projects that require Safety Assessments do not include construction, rehabilitation, or change of any facility that is entirely outside the air operations area, does not involve any expansion of the facility envelope and does not involve construction equipment, haul routes or placement of material in locations that require access to the air operations area, increase the facility envelope, or impact line-of-sight. Such facilities may include passenger terminals and parking or other structures. However, extraordinary circumstances may trigger the need for a Safety Assessment and a CSPP. The CSPP is subject to subsequent review and approval under the FAA's Safety Risk Management procedures (see paragraph 1.2.5).

1.3.2 Prepare a Safety Plan Compliance Document (SPCD).

The Safety Plan Compliance Document (SPCD) details how the contractor will comply with the CSPP. Also, it will not be possible to determine all safety plan details (for example specific hazard equipment and lighting, contractor's points of contact, construction equipment heights) during the development of the CSPP. The successful contractor must define such details by preparing an SPCD that the airport operator reviews for approval prior to issuance of a notice-to-proceed. The SPCD is a subset of the CSPP, similar to how a shop drawing review is a subset to the technical specifications.

1.3.3 Assume Responsibility for the CSPP.

The airport operator is responsible for establishing and enforcing the CSPP. The airport operator may use the services of an engineering consultant to help develop the CSPP. However, writing the CSPP cannot be delegated to the construction contractor. Only those details the airport operator determines cannot be addressed before contract award are developed by the contractor and submitted for approval as the SPCD. The SPCD does not restate nor propose differences to provisions already addressed in the CSPP.

1.4 **Who Is Responsible for Safety During Construction?**

1.4.1 Establish a Safety Culture.

Everyone has a role in operational safety on airports during construction: the airport operator, the airport's consultants, the construction contractor and subcontractors, airport users, airport tenants, ARFF personnel, Air Traffic personnel, including Technical Operations personnel, FAA Airports Division personnel, and others, such as military personnel at any airport supporting military operations (e.g. national guard or a joint use facility). Close communication and coordination between all affected parties is the key to maintaining safe operations. Such communication and coordination should start at the project scoping meeting and continue through the completion of the project. The airport operator and contractor should conduct onsite safety inspections throughout the project and immediately remedy any deficiencies, whether caused by negligence, oversight, or project scope change.

1.4.2 Assess Airport Operator's Responsibilities.

An airport operator has overall responsibility for all activities on an airport, including construction. This includes the predesign, design, preconstruction, construction, and inspection phases. Additional information on the responsibilities listed below can be found throughout this AC. The airport operator must:

- 1.4.2.1 Develop a CSPP that complies with the safety guidelines of Chapter 2, Construction Safety and Phasing Plans, and Chapter 3, Guidelines for Writing a CSPP. The airport operator may develop the CSPP internally or have a consultant develop the CSPP for approval by the airport operator. For tenant sponsored projects, approve a CSPP developed by the tenant or its consultant.
- 1.4.2.2 Require, review and approve the SPCD by the contractor that indicates how it will comply with the CSPP and provides details that cannot be determined before contract award.
- 1.4.2.3 Convene a preconstruction meeting with the construction contractor, consultant, airport employees and, if appropriate, tenant sponsor and other tenants to review and discuss project safety before beginning construction activity. The appropriate FAA representatives should be invited to attend the meeting. See AC 150/5370-12, Quality Management for Federally Funded Airport Construction Projects. (Note “FAA” refers to the Airports Regional or District Office, the Air Traffic Organization, Flight Standards Service, and other offices that support airport operations, flight regulations, and construction/environmental policies.)
- 1.4.2.4 Ensure contact information is accurate for each representative/point of contact identified in the CSPP and SPCD.
- 1.4.2.5 Hold weekly or, if necessary, daily safety meetings with all affected parties to coordinate activities.
- 1.4.2.6 Notify users, ARFF personnel, and FAA ATO personnel of construction and conditions that may adversely affect the operational safety of the airport via Notices to Airmen (NOTAM) and other methods, as appropriate. Convene a meeting for review and discussion if necessary.
- 1.4.2.7 Ensure construction personnel know applicable airport procedures and changes to those procedures that may affect their work.
- 1.4.2.8 Ensure that all temporary construction signs are located per the scheduled list for each phase of the project.
- 1.4.2.9 Ensure construction contractors and subcontractors undergo training required by the CSPP and SPCD.
- 1.4.2.10 Ensure vehicle and pedestrian operations addressed in the CSPP and SPCD are coordinated with airport tenants, the airport traffic control tower (ATCT), and construction contractors.
- 1.4.2.11 At certificated airports, ensure each CSPP and SPCD is consistent with Part 139.

- 1.4.2.12 Conduct inspections sufficiently frequently to ensure construction contractors and tenants comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards.
 - 1.4.2.13 Take immediate action to resolve safety deficiencies.
 - 1.4.2.14 At airports subject to 49 CFR Part 1542, *Airport Security*, ensure construction access complies with the security requirements of that regulation.
 - 1.4.2.15 Notify appropriate parties when conditions exist that invoke provisions of the CSPP and SPCD (for example, implementation of low-visibility operations).
 - 1.4.2.16 Ensure prompt submittal of a Notice of Proposed Construction or Alteration (Form 7460-1) for conducting an aeronautical study of potential obstructions such as tall equipment (cranes, concrete pumps, other), stock piles, and haul routes. A separate form may be filed for each potential obstruction, or one form may be filed describing the entire construction area and maximum equipment height. In the latter case, a separate form must be filed for any object beyond or higher than the originally evaluated area/height. The FAA encourages online submittal of forms for expediency at <https://oeaaa.faa.gov/oeaaa/external/portal.jsp>. The appropriate FAA Airports Regional or District Office can provide assistance in determining which objects require an aeronautical study.
 - 1.4.2.17 Ensure prompt transmission of the Airport Sponsor Strategic Event Submission, FAA Form 6000-26, located at https://oeaaa.faa.gov/oeaaa/external/content/AIRPORT_SPONSOR_STRATEGIC_EVENT_SUBMISSION_FORM.pdf, to assure proper coordination for NAS Strategic Interruption per Service Level Agreement with ATO.
 - 1.4.2.18 Promptly notify the FAA Airports Regional or District Office of any proposed changes to the CSPP prior to implementation of the change. Changes to the CSPP require review and approval by the airport operator and the FAA. The FAA Airports Regional or District office will determine if further coordination within the FAA is needed. Coordinate with appropriate local and other federal government agencies, such as Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), Transportation Security Administration (TSA), and the state environmental agency.
- 1.4.3 Define Construction Contractor's Responsibilities.
- The contractor is responsible for complying with the CSPP and SPCD. The contractor must:

- 1.4.3.1 Submit a Safety Plan Compliance Document (SPCD) to the airport operator describing how it will comply with the requirements of the CSPP and supply any details that could not be determined before contract award. The SPCD must include a certification statement by the contractor, indicating an understanding of the operational safety requirements of the CSPP and the assertion of compliance with the approved CSPP and SPCD unless written approval is granted by the airport operator. Any construction practice proposed by the contractor that does not conform to the CSPP and SPCD may impact the airport's operational safety and will require a revision to the CSPP and SPCD and re-coordination with the airport operator and the FAA in advance.
- 1.4.3.2 Have available at all times copies of the CSPP and SPCD for reference by the airport operator and its representatives, and by subcontractors and contractor employees.
- 1.4.3.3 Ensure that construction personnel are familiar with safety procedures and regulations on the airport. Provide a point of contact who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport. Many projects will require 24-hour coverage.
- 1.4.3.4 Identify in the SPCD the contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD during construction. At least one of these employees must be on-site when active construction is taking place.
- 1.4.3.5 Conduct sufficient inspections to ensure construction personnel comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards.
- 1.4.3.6 Restrict movement of construction vehicles and personnel to permitted construction areas by flagging, barricading, erecting temporary fencing, or providing escorts, as appropriate, and as specified in the CSPP and SPCD.
- 1.4.3.7 Ensure that no contractor employees, employees of subcontractors or suppliers, or other persons enter any part of the air operations area (AOA) from the construction site unless authorized.
- 1.4.3.8 Ensure prompt submittal through the airport operator of Form 7460-1 for the purpose of conducting an aeronautical study of contractor equipment such as tall equipment (cranes, concrete pumps, and other equipment), stock piles, and haul routes when different from cases previously filed by the airport operator. The FAA encourages online submittal of forms for expediency at <https://oeaaa.faa.gov/oeaaa/external/portal.jsp>.

- 1.4.3.9 Ensure that all necessary safety mitigations are understood by all parties involved, and any special requirements of each construction phase will be fulfilled per the approved timeframe.
- 1.4.3.10 Participate in pre-construction meetings to review construction limits, safety mitigations, NOTAMs, and understand all special airport operational needs during each phase of the project.

1.4.4 Define Tenant's Responsibilities.

If planning construction activities on leased property, Airport tenants, such as airline operators, fixed base operators, and FAA ATO/Technical Operations sponsoring construction are strongly encouraged to:

1. Develop, or have a consultant develop, a project specific CSPP and submit it to the airport operator. The airport operator may forgo a complete CSPP submittal and instead incorporate appropriate operational safety principles and measures addressed in the advisory circular within their tenant lease agreements.
2. In coordination with its contractor, develop an SPCD and submit it to the airport operator for approval issued prior to issuance of a Notice to Proceed.
3. Ensure that construction personnel are familiar with safety procedures and regulations on the airport during all phases of the construction.
4. Provide a point of contact of who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport.
5. Identify in the SPCD the contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD during construction. At least one of these employees must be on-site when active construction is taking place.
6. Ensure that no tenant or contractor employees, employees of subcontractors or suppliers, or any other persons enter any part of the AOA from the construction site unless authorized.
7. Restrict movement of construction vehicles to construction areas by flagging and barricading, erecting temporary fencing, or providing escorts, as appropriate, as specified in the CSPP and SPCD.
8. Ensure prompt submittal through the airport operator of Form 7460-1 for conducting an aeronautical study of contractor equipment such as tall equipment (cranes, concrete pumps, other), stock piles, and haul routes. The FAA encourages online submittal of forms for expediency at <https://oeaaa.faa.gov/oeaaa/external/portal.jsp>.
9. Participate in pre-construction meetings to review construction limits, safety mitigations, NOTAMs, and understand all special airport operational needs during each phase of the project.

CHAPTER 2. CONSTRUCTION SAFETY AND PHASING PLANS

2.1 Overview.

Aviation safety is the primary consideration at airports, especially during construction. The airport operator's CSPP and the contractor's Safety Plan Compliance Document (SPCD) are the primary tools to ensure safety compliance when coordinating construction activities with airport operations. These documents identify all aspects of the construction project that pose a potential safety hazard to airport operations and outline respective mitigation procedures for each hazard. They must provide information necessary for the Airport Operations department to conduct airfield inspections and expeditiously identify and correct unsafe conditions during construction. All aviation safety provisions included within the project drawings, contract specifications, and other related documents must also be reflected in the CSPP and SPCD.

2.2 Assume Responsibility.

Operational safety on the airport remains the airport operator's responsibility at all times. The airport operator must develop, certify, and submit for FAA approval each CSPP. It is the airport operator's responsibility to apply the requirements of the FAA approved CSPP. The airport operator must revise the CSPP when conditions warrant changes and must submit the revised CSPP to the FAA for approval. The airport operator must also require and approve a SPCD from the project contractor.

2.3 Submit the CSPP.

Construction Safety and Phasing Plans should be developed concurrently with the project design. Milestone versions of the CSPP should be submitted for review and approval as follows. While these milestones are not mandatory, early submission will help to avoid delays. Submittals are preferred in 8.5×11 inch or 11×17 inch format for compatibility with the FAA's Obstruction Evaluation / Airport Airspace Analysis (OE / AAA) process.

2.3.1 Submit an Outline/Draft.

By the time approximately 25% to 30% of the project design is completed, the principal elements of the CSPP should be established. Airport operators are encouraged to submit an outline or draft, detailing all CSPP provisions developed to date, to the FAA for review at this stage of the project design.

2.3.2 Submit a CSPP.

The CSPP should be formally submitted for FAA approval when the project design is 80 percent to 90 percent complete. Since provisions in the CSPP will influence contract costs, it is important to obtain FAA approval in time to include all such provisions in the procurement contract.

2.3.3 Submit an SPCD.

The contractor should submit the SPCD to the airport operator for approval to be issued prior to the Notice to Proceed.

2.3.4 Submit CSPP Revisions.

All revisions to a previously approved CSPP must be re-submitted to the FAA for review and approval/disapproval action.

2.4 **Meet CSPP Requirements.**

2.4.1 To the extent possible, the CSPP should address the following as outlined in Chapter 3, Guidelines for Writing a CSPP. Details that cannot be determined at this stage are to be included in the SPCD.

1. Coordination.
 - a. Contractor progress meetings.
 - b. Scope or schedule changes.
 - c. FAA ATO coordination.
2. Phasing.
 - a. Phase elements.
 - b. Construction safety drawings.
3. Areas and operations affected by the construction activity.
 - a. Identification of affected areas.
 - b. Mitigation of effects.
4. Protection of navigation aids (NAVAIDs).
5. Contractor access.
 - a. Location of stockpiled construction materials.
 - b. Vehicle and pedestrian operations.
6. Wildlife management.
 - a. Trash.
 - b. Standing water.
 - c. Tall grass and seeds.
 - d. Poorly maintained fencing and gates.
 - e. Disruption of existing wildlife habitat.
7. Foreign Object Debris (FOD) management.
8. Hazardous materials (HAZMAT) management.
9. Notification of construction activities.

- a. Maintenance of a list of responsible representatives/ points of contact.
 - b. NOTAM.
 - c. Emergency notification procedures.
 - d. Coordination with ARFF Personnel.
 - e. Notification to the FAA.
10. Inspection requirements.
- a. Daily (or more frequent) inspections.
 - b. Final inspections.
11. Underground utilities.
12. Penalties.
13. Special conditions.
14. Runway and taxiway visual aids. Marking, lighting, signs, and visual NAVAIDs.
- a. General.
 - b. Markings.
 - c. Lighting and visual NAVAIDs.
 - d. Signs, temporary, including orange construction signs, and permanent signs.
15. Marking and signs for access routes.
16. Hazard marking and lighting.
- a. Purpose.
 - b. Equipment.
17. Work zone lighting for nighttime construction (if applicable).
18. Protection of runway and taxiway safety areas, object free areas, obstacle free zones, and approach/departure surfaces.
- a. Runway Safety Area (RSA).
 - b. Runway Object Free Area (ROFA).
 - c. Taxiway Safety Area (TSA). Provide details for any adjustments to Taxiway Safety Area width to allow continued operation of smaller aircraft. See paragraph 2.22.3.
 - d. Taxiway Object Free Area (TOFA). Provide details for any continued aircraft operations while construction occurs within the TOFA. See paragraph 2.22.4.
 - e. Obstacle Free Zone (OFZ).
 - f. Runway approach/departure surfaces.
19. Other limitations on construction.
- a. Prohibitions.

b. Restrictions.

2.4.2 The Safety Plan Compliance Document (SPCD) should include a general statement by the construction contractor that he/she has read and will abide by the CSPP. In addition, the SPCD must include all supplemental information that could not be included in the CSPP prior to the contract award. The contractor statement should include the name of the contractor, the title of the project CSPP, the approval date of the CSPP, and a reference to any supplemental information (that is, “I, (Name of Contractor), have read the (Title of Project) CSPP, approved on (Date), and will abide by it as written and with the following additions as noted:”). The supplemental information in the SPCD should be written to match the format of the CSPP indicating each subject by corresponding CSPP subject number and title. If no supplemental information is necessary for any specific subject, the statement, “No supplemental information,” should be written after the corresponding subject title. The SPCD should not duplicate information in the CSPP:

1. Coordination. Discuss details of proposed safety meetings with the airport operator and with contractor employees and subcontractors.
2. Phasing. Discuss proposed construction schedule elements, including:
 - a. Duration of each phase.
 - b. Daily start and finish of construction, including “night only” construction.
 - c. Duration of construction activities during:
 - i. Normal runway operations.
 - ii. Closed runway operations.
 - iii. Modified runway “Aircraft Reference Code” usage.
3. Areas and operations affected by the construction activity. These areas and operations should be identified in the CSPP and should not require an entry in the SPCD.
4. Protection of NAVAIDs. Discuss specific methods proposed to protect operating NAVAIDs.
5. Contractor access. Provide the following:
 - a. Details on how the contractor will maintain the integrity of the airport security fence (gate guards, daily log of construction personnel, and other).
 - b. Listing of individuals requiring driver training (for certificated airports and as requested).
 - c. Radio communications.
 - i. Types of radios and backup capabilities.
 - ii. Who will be monitoring radios.
 - iii. Who to contact if the ATCT cannot reach the contractor’s designated person by radio.

- d. Details on how the contractor will escort material delivery vehicles.
- 6. Wildlife management. Discuss the following:
 - a. Methods and procedures to prevent wildlife attraction.
 - b. Wildlife reporting procedures.
- 7. Foreign Object Debris (FOD) management. Discuss equipment and methods for control of FOD, including construction debris and dust.
- 8. Hazardous Materials (HAZMAT) management. Discuss equipment and methods for responding to hazardous spills.
- 9. Notification of construction activities. Provide the following:
 - a. Contractor points of contact.
 - b. Contractor emergency contact.
 - c. Listing of tall or other requested equipment proposed for use on the airport and the timeframe for submitting 7460-1 forms not previously submitted by the airport operator.
 - d. Batch plant details, including 7460-1 submittal.
- 10. Inspection requirements. Discuss daily (or more frequent) inspections and special inspection procedures.
- 11. Underground utilities. Discuss proposed methods of identifying and protecting underground utilities.
- 12. Penalties. Penalties should be identified in the CSPP and should not require an entry in the SPCD.
- 13. Special conditions. Discuss proposed actions for each special condition identified in the CSPP.
- 14. Runway and taxiway visual aids. Including marking, lighting, signs, and visual NAVAIDs. Discuss proposed visual aids including the following:
 - a. Equipment and methods for covering signage and airfield lights.
 - b. Equipment and methods for temporary closure markings (paint, fabric, other).
 - c. Temporary orange construction signs.
 - d. Types of temporary Visual Guidance Slope Indicators (VGSI).
- 15. Marking and signs for access routes. Discuss proposed methods of demarcating access routes for vehicle drivers.
- 16. Hazard marking and lighting. Discuss proposed equipment and methods for identifying excavation areas.
- 17. Work zone lighting for nighttime construction (if applicable). Discuss proposed equipment, locations, aiming, and shielding to prevent interference with air traffic control and aircraft operations.

18. Protection of runway and taxiway safety areas, object free areas, obstacle free zones, and approach/departure surfaces. Discuss proposed methods of identifying, demarcating, and protecting airport surfaces including:
 - a. Equipment and methods for maintaining Taxiway Safety Area standards.
 - b. Equipment and methods to ensure the safe passage of aircraft where Taxiway Safety Area or Taxiway Object Free Area standards cannot be maintained.
 - c. Equipment and methods for separation of construction operations from aircraft operations, including details of barricades.
19. Other limitations on construction should be identified in the CSPP and should not require an entry in the SPCD.

2.5 **Coordination.**

Airport operators, or tenants responsible for design, bidding and conducting construction on their leased properties, should ensure at all project developmental stages, such as predesign, prebid, and preconstruction conferences, they capture the subject of airport operational safety during construction (see AC 150/5370-12, *Quality Management for Federally Funded Airport Construction Projects*). In addition, the following should be coordinated as required:

2.5.1 Progress Meetings.

Operational safety should be a standing agenda item for discussion during progress meetings throughout the project developmental stages.

2.5.2 Scope or Schedule Changes.

Changes in the scope or duration at any of the project stages may require revisions to the CSPP and review and approval by the airport operator and the FAA (see paragraph 1.4.2.17).

2.5.3 FAA ATO Coordination.

Early coordination with FAA ATO is highly recommended during the design phase and is required for scheduling Technical Operations shutdowns prior to construction. Coordination is critical to restarts of NAVAID services and to the establishment of any special procedures for the movement of aircraft. Formal agreements between the airport operator and appropriate FAA offices are recommended. All relocation or adjustments to NAVAIDs, or changes to final grades in critical areas, should be coordinated with FAA ATO and may require an FAA flight inspection prior to restarting the facility. Flight inspections must be coordinated and scheduled well in advance of the intended facility restart. Flight inspections may require a reimbursable agreement between the airport operator and FAA ATO. Reimbursable agreements should be coordinated a minimum of 12 months prior to the start of construction. (See paragraph 2.13.5.3.2 for required FAA notification regarding FAA-owned NAVAIDs.)

2.6 **Phasing.**

Once it has been determined what types and levels of airport operations will be maintained, the most efficient sequence of construction may not be feasible. In this case, the sequence of construction may be phased to gain maximum efficiency while allowing for the required operations. The development of the resulting construction phases should be coordinated with local Air Traffic personnel and airport users. The sequenced construction phases established in the CSPP must be incorporated into the project design and must be reflected in the contract drawings and specifications.

2.6.1 Phase Elements.

For each phase the CSPP should detail:

- Areas closed to aircraft operations.
- Duration of closures.
- Taxi routes and/or areas of reduced TSA and TOFA to reflect reduced ADG use.
- ARFF access routes.
- Construction staging, disposal, and cleanout areas.
- Construction access and haul routes.
- Impacts to NAVAIDs.
- Lighting, marking, and signing changes.
- Available runway length and/or reduced RSA and ROFA to reflect reduced ADG use.
- Declared distances (if applicable).
- Required hazard marking, lighting, and signing.
- Work zone lighting for nighttime construction (if applicable).
- Lead times for required notifications.

2.6.2 Construction Safety Drawings.

Drawings specifically indicating operational safety procedures and methods in affected areas (i.e., construction safety drawings) should be developed for each construction phase. Such drawings should be included in the CSPP as referenced attachments and should also be included in the contract drawing package.

2.7 **Areas and Operations Affected by Construction Activity.**

Runways and taxiways should remain in use by aircraft to the maximum extent possible without compromising safety. Pre-meetings with the FAA ATO will support operational simulations. See Appendix E for an example of a table showing temporary operations versus current operations. The tables in Appendix E can be useful for coordination among all interested parties, including FAA Lines of Business.

2.7.1 Identification of Affected Areas.

Identifying areas and operations affected by the construction helps to determine possible safety problems. The affected areas should be identified in the construction safety drawings for each construction phase. (See paragraph 2.6.2.) Of particular concern are:

2.7.1.1 **Closing, or Partial Closing, of Runways, Taxiways and Aprons, and Displaced Thresholds.**

When a runway is partially closed, a portion of the pavement is unavailable for any aircraft operation, meaning taxiing, landing, or takeoff in either direction on that pavement is prohibited. A displaced threshold, by contrast, is established to ensure obstacle clearance and adequate safety area for landing aircraft. The pavement prior to the displaced threshold is normally available for take-off in the direction of the displacement and for landing and takeoff in the opposite direction. Misunderstanding this difference, may result in issuance of an inaccurate NOTAM, and can lead to a hazardous condition.

2.7.1.1.1 Partially Closed Runways.

The temporarily closed portion of a partially closed runway will generally extend from the threshold to a taxiway that may be used for entering and exiting the runway. If the closed portion extends to a point between taxiways, pilots will have to back-taxi on the runway, which is an undesirable operation. See Figure 2-1 for a desirable configuration.

2.7.1.1.2 Displaced Thresholds.

Since the portion of the runway pavement between the permanent threshold and a standard displaced threshold is available for takeoff and for landing in the opposite direction, the temporary displaced threshold need not be located at an entrance/exit taxiway. See Figure 2-2.

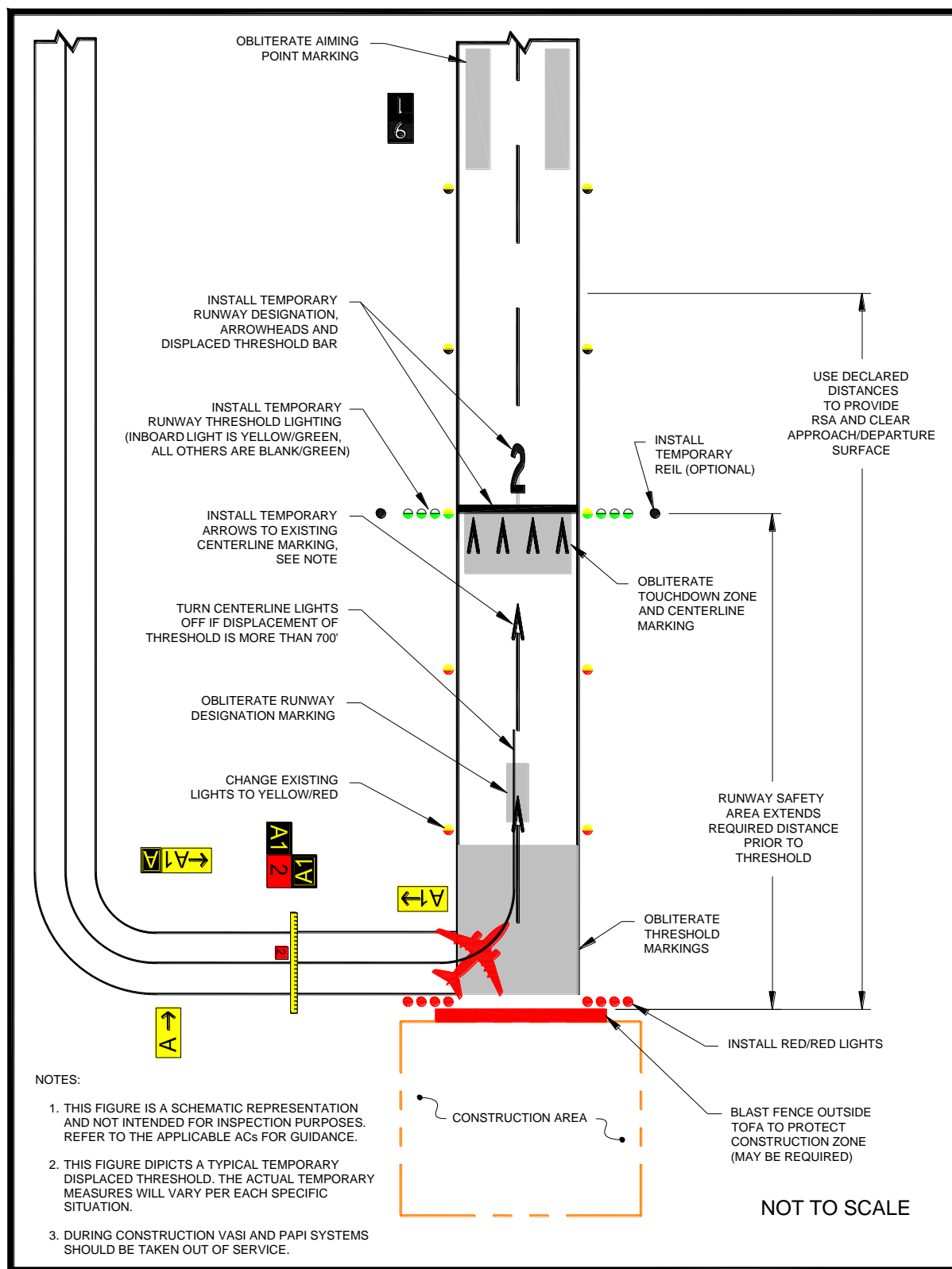
2.7.1.2 Closing of aircraft rescue and fire fighting access routes.

2.7.1.3 Closing of access routes used by airport and airline support vehicles.

2.7.1.4 Interruption of utilities, including water supplies for fire fighting.

2.7.1.5 Approach/departure surfaces affected by heights of objects.

2.7.1.6 Construction areas, storage areas, and access routes near runways, taxiways, aprons, or helipads.

Figure 2-2. Temporary Displaced Threshold

Note: See paragraph 2.18.2.5.

2.7.2 Mitigation of Effects.

Establishment of specific procedures is necessary to maintain the safety and efficiency of airport operations. The CSPP must address:

- 2.7.2.1 Temporary changes to runway and/or taxi operations.
- 2.7.2.2 Detours for ARFF and other airport vehicles.
- 2.7.2.3 Maintenance of essential utilities.
- 2.7.2.4 Temporary changes to air traffic control procedures. Such changes must be coordinated with the ATO.

2.8 **Navigation Aid (NAVAID) Protection.**

Before commencing construction activity, parking vehicles, or storing construction equipment and materials near a NAVAID, coordinate with the appropriate FAA ATO/Technical Operations office to evaluate the effect of construction activity and the required distance and direction from the NAVAID. (See paragraph 2.13.5.3.) Construction activities, materials/equipment storage, and vehicle parking near electronic NAVAIDs require special consideration since they may interfere with signals essential to air navigation. If any NAVAID may be affected, the CSPP and SPCD must show an understanding of the “critical area” associated with each NAVAID and describe how it will be protected. Where applicable, the operational critical areas of NAVAIDs should be graphically delineated on the project drawings. Pay particular attention to stockpiling material, as well as to movement and parking of equipment that may interfere with line of sight from the ATCT or with electronic emissions. Interference from construction equipment and activities may require NAVAID shutdown or adjustment of instrument approach minimums for low visibility operations. This condition requires that a NOTAM be filed (see paragraph 2.13.2.). Construction activities and materials/equipment storage near a NAVAID must not obstruct access to the equipment and instruments for maintenance. Submittal of a 7460-1 form is required for construction vehicles operating near FAA NAVAIDs. (See paragraph 2.13.5.3.)

2.9 **Contractor Access.**

The CSPP must detail the areas to which the contractor must have access, and explain how contractor personnel will access those areas. Specifically address:

2.9.1 Location of Stockpiled Construction Materials.

Stockpiled materials and equipment storage are not permitted within the RSA and OFZ, and if possible should not be permitted within the Object Free Area (OFA) of an operational runway. Stockpiling material in the OFA requires submittal of a 7460-1 form and justification provided to the appropriate FAA Airports Regional or District Office for approval. The airport operator must ensure that stockpiled materials and equipment adjacent to these areas are prominently marked and lighted during hours of restricted visibility or darkness. (See paragraph 2.18.2.) This includes determining and

verifying that materials are stabilized and stored at an approved location so as not to be a hazard to aircraft operations and to prevent attraction of wildlife and foreign object damage from blowing or tracked material. See paragraphs 2.10 and 2.11.

2.9.2 Vehicle and Pedestrian Operations.

The CSPP should include specific vehicle and pedestrian requirements. Vehicle and pedestrian access routes for airport construction projects must be controlled to prevent inadvertent or unauthorized entry of persons, vehicles, or animals onto the AOA. The airport operator should coordinate requirements for vehicle operations with airport tenants, contractors, and the FAA air traffic manager. In regard to vehicle and pedestrian operations, the CSPP should include the following, with associated training requirements:

2.9.2.1 **Construction Site Parking.**

Designate in advance vehicle parking areas for contractor employees to prevent any unauthorized entry of persons or vehicles onto the AOA. These areas should provide reasonable contractor employee access to the job site.

2.9.2.2 **Construction Equipment Parking.**

Contractor employees must park and service all construction vehicles in an area designated by the airport operator outside the OFZ and never in the safety area of an active runway or taxiway. Unless a complex setup procedure makes movement of specialized equipment infeasible, inactive equipment must not be parked on a closed taxiway or runway. If it is necessary to leave specialized equipment on a closed taxiway or runway at night, the equipment must be well lighted. Employees should also park construction vehicles outside the OFA when not in use by construction personnel (for example, overnight, on weekends, or during other periods when construction is not active). Parking areas must not obstruct the clear line of sight by the ATCT to any taxiways or runways under air traffic control nor obstruct any runway visual aids, signs, or navigation aids. The FAA must also study those areas to determine effects on airport design criteria, surfaces established by 14 CFR Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace (Part 77), and on NAVAIDs and Instrument Approach Procedures (IAP). See paragraph 2.13.1 for further information.

2.9.2.3 **Access and Haul Roads.**

Determine the construction contractor's access to the construction sites and haul roads. Do not permit the construction contractor to use any access or haul roads other than those approved. Access routes used by contractor vehicles must be clearly marked to prevent inadvertent entry to areas open to airport operations. Pay special attention to ensure that if construction traffic is to share or cross any ARFF routes that ARFF right of way is not impeded at any time, and that construction traffic on haul

roads does not interfere with NAVAIDs or approach surfaces of operational runways. Address whether access gates will be blocked or inoperative or if a rally point will be blocked or inaccessible.

- 2.9.2.4 Marking and lighting of vehicles in accordance with AC 150/5210-5, *Painting, Marking, and Lighting of Vehicles Used on an Airport*.
- 2.9.2.5 Description of proper vehicle operations on various areas under normal, lost communications, and emergency conditions.
- 2.9.2.6 Required escorts.
- 2.9.2.7 **Training Requirements for Vehicle Drivers to Ensure Compliance with the Airport Operator's Vehicle Rules and Regulations.**

Specific training should be provided to vehicle operators, including those providing escorts. See AC 150/5210-20, *Ground Vehicle Operations on Airports*, for information on training and records maintenance requirements.
- 2.9.2.8 **Situational Awareness.**

Vehicle drivers must confirm by personal observation that no aircraft is approaching their position (either in the air or on the ground) when given clearance to cross a runway, taxiway, or any other area open to airport operations. In addition, it is the responsibility of the escort vehicle driver to verify the movement/position of all escorted vehicles at any given time. At non-towered airports, all aircraft movements and flight operations rely on aircraft operators to self-report their positions and intentions. However, there is no requirement for an aircraft to have radio communications. Because aircraft do not always broadcast their positions or intentions, visual checking, radio monitoring, and situational awareness of the surroundings is critical to safety.
- 2.9.2.9 **Two-Way Radio Communication Procedures.**
- 2.9.2.9.1 General.

The airport operator must ensure that tenant and construction contractor personnel engaged in activities involving unescorted operation on aircraft movement areas observe the proper procedures for communications, including using appropriate radio frequencies at airports with and without ATCT. When operating vehicles on or near open runways or taxiways, construction personnel must understand the critical importance of maintaining radio contact, as directed by the airport operator, with:

 1. Airport operations
 2. ATCT

3. Common Traffic Advisory Frequency (CTAF), which may include UNICOM, MULTICOM.
4. Automatic Terminal Information Service (ATIS). This frequency is useful for monitoring conditions on the airport. Local air traffic will broadcast information regarding construction related runway closures and “shortened” runways on the ATIS frequency.

2.9.2.9.2 Areas Requiring Two-Way Radio Communication with the ATCT.

Vehicular traffic crossing active movement areas must be controlled either by two-way radio with the ATCT, escort, flagman, signal light, or other means appropriate for the particular airport.

2.9.2.9.3 Frequencies to be Used.

The airport operator will specify the frequencies to be used by the contractor, which may include the CTAF for monitoring of aircraft operations. Frequencies may also be assigned by the airport operator for other communications, including any radio frequency in compliance with Federal Communications Commission requirements. At airports with an ATCT, the airport operator will specify the frequency assigned by the ATCT to be used between contractor vehicles and the ATCT.

2.9.2.9.4 Proper radio usage, including read back requirements.

2.9.2.9.5 Proper phraseology, including the International Phonetic Alphabet.

2.9.2.9.6 Light Gun Signals.

Even though radio communication is maintained, escort vehicle drivers must also familiarize themselves with ATCT light gun signals in the event of radio failure. See the FAA safety placard “Ground Vehicle Guide to Airport Signs and Markings.” This safety placard may be downloaded through the Runway Safety Program Web site at http://www.faa.gov/airports/runway_safety/publications/ (see “Signs & Markings Vehicle Dashboard Sticker”) or obtained from the FAA Airports Regional Office.

2.9.2.10 **Maintenance of the secured area of the airport, including:**

2.9.2.10.1 Fencing and Gates.

Airport operators and contractors must take care to maintain security during construction when access points are created in the security fencing to permit the passage of construction vehicles or personnel. Temporary gates should be equipped so they can be securely closed and locked to prevent access by animals and unauthorized people. Procedures should be in place to ensure that only authorized persons and vehicles have access to the AOA and to prohibit “piggybacking” behind another person or vehicle. The Department of Transportation (DOT) document DOT/FAA/AR-

00/52, *Recommended Security Guidelines for Airport Planning and Construction*, provides more specific information on fencing. A copy of this document can be obtained from the Airport Consultants Council, Airports Council International, or American Association of Airport Executives.

2.9.2.10.2 Badging Requirements.

Airports subject to 49 CFR Part 1542, *Airport Security*, must meet standards for access control, movement of ground vehicles, and identification of construction contractor and tenant personnel.

2.10 **Wildlife Management.**

The CSPP and SPCD must be in accordance with the airport operator's wildlife hazard management plan, if applicable. See AC 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports*, and CertAlert 98-05, *Grasses Attractive to Hazardous Wildlife*. Construction contractors must carefully control and continuously remove waste or loose materials that might attract wildlife. Contractor personnel must be aware of and avoid construction activities that can create wildlife hazards on airports, such as:

2.10.1 Trash.

Food scraps must be collected from construction personnel activity.

2.10.2 Standing Water.

2.10.3 Tall Grass and Seeds.

Requirements for turf establishment can be at odds with requirements for wildlife control. Grass seed is attractive to birds. Lower quality seed mixtures can contain seeds of plants (such as clover) that attract larger wildlife. Seeding should comply with the guidance in AC 150/5370-10, *Standards for Specifying Construction of Airports*, Item T-901, Seeding. Contact the local office of the United States Department of Agriculture Soil Conservation Service or the State University Agricultural Extension Service (County Agent or equivalent) for assistance and recommendations. These agencies can also provide liming and fertilizer recommendations.

2.10.4 Poorly Maintained Fencing and Gates.

See paragraph 2.9.2.10.1.

2.10.5 Disruption of Existing Wildlife Habitat.

While this will frequently be unavoidable due to the nature of the project, the CSPP should specify under what circumstances (location, wildlife type) contractor personnel should immediately notify the airport operator of wildlife sightings.

2.11 Foreign Object Debris (FOD) Management.

Waste and loose materials, commonly referred to as FOD, are capable of causing damage to aircraft landing gears, propellers, and jet engines. Construction contractors must not leave or place FOD on or near active aircraft movement areas. Materials capable of creating FOD must be continuously removed during the construction project. Fencing (other than security fencing) or covers may be necessary to contain material that can be carried by wind into areas where aircraft operate. See AC 150/5210-24, *Foreign Object Debris (FOD) Management*.

2.12 Hazardous Materials (HAZMAT) Management.

Contractors operating construction vehicles and equipment on the airport must be prepared to expeditiously contain and clean-up spills resulting from fuel or hydraulic fluid leaks. Transport and handling of other hazardous materials on an airport also requires special procedures. See AC 150/5320-15, *Management of Airport Industrial Waste*.

2.13 Notification of Construction Activities.

The CSPP and SPCD must detail procedures for the immediate notification of airport users and the FAA of any conditions adversely affecting the operational safety of the airport. It must address the notification actions described below, as applicable.

2.13.1 List of Responsible Representatives/points of contact for all involved parties, and procedures for contacting each of them, including after hours.

2.13.2 NOTAMs.

Only the airport operator may initiate or cancel NOTAMs on airport conditions, and is the only entity that can close or open a runway. The airport operator must coordinate the issuance, maintenance, and cancellation of NOTAMs about airport conditions resulting from construction activities with tenants and the local air traffic facility (control tower, approach control, or air traffic control center), and must either enter the NOTAM into NOTAM Manager, or provide information on closed or hazardous conditions on airport movement areas to the FAA Flight Service Station (FSS) so it can issue a NOTAM. The airport operator must file and maintain a list of authorized representatives with the FSS. Refer to AC 150/5200-28, *Notices to Airmen (NOTAMs) for Airport Operators*, for a sample NOTAM form. Only the FAA may issue or cancel NOTAMs on shutdown or irregular operation of FAA owned facilities. Any person having reason to believe that a NOTAM is missing, incomplete, or inaccurate must notify the airport operator. See paragraph 2.7.1.1 about issuing NOTAMs for partially closed runways versus runways with displaced thresholds.

2.13.3 Emergency notification procedures for medical, fire fighting, and police response.

2.13.4 Coordination with ARFF.

The CSPP must detail procedures for coordinating through the airport sponsor with ARFF personnel, mutual aid providers, and other emergency services if construction requires:

1. The deactivation and subsequent reactivation of water lines or fire hydrants, or
2. The rerouting, blocking and restoration of emergency access routes, or
3. The use of hazardous materials on the airfield.

2.13.5 Notification to the FAA.

2.13.5.1 **Part 77.**

Any person proposing construction or alteration of objects that affect navigable airspace, as defined in Part 77, must notify the FAA. This includes construction equipment and proposed parking areas for this equipment (i.e., cranes, graders, other equipment) on airports. FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, can be used for this purpose and submitted to the appropriate FAA Airports Regional or District Office. See Appendix A to download the form. Further guidance is available on the FAA web site at oeaaa.faa.gov.

2.13.5.2 **Part 157.**

With some exceptions, Title 14 CFR Part 157, *Notice of Construction, Alteration, Activation, and Deactivation of Airports*, requires that the airport operator notify the FAA in writing whenever a non-Federally funded project involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; or the deactivation or abandoning of an entire airport. Notification involves submitting FAA Form 7480-1, *Notice of Landing Area Proposal*, to the nearest FAA Airports Regional or District Office. See Appendix A to download the form.

2.13.5.3 **NAVAIDs.**

For emergency (short-notice) notification about impacts to both airport owned and FAA owned NAVAIDs, contact: 866-432-2622.

2.13.5.3.1 Airport Owned/FAA Maintained.

If construction operations require a shutdown of 24 hours or greater in duration, or more than 4 hours daily on consecutive days, of a NAVAID owned by the airport but maintained by the FAA, provide a 45-day minimum notice to FAA ATO/Technical Operations prior to facility shutdown, using Strategic Event Coordination (SEC) Form 6000.26 contained within FAA Order 6000.15, *General Maintenance Handbook for National Airspace System (NAS) Facilities*.

2.13.5.3.2 FAA Owned.

1. The airport operator must notify the appropriate FAA ATO Service Area Planning and Requirements (P&R) Group a minimum of 45 days prior to implementing an event that causes impacts to NAVAIDs, using SEC Form 6000.26.
2. Coordinate work for an FAA owned NAVAID shutdown with the local FAA ATO/Technical Operations office, including any necessary reimbursable agreements and flight checks. Detail procedures that address unanticipated utility outages and cable cuts that could impact FAA NAVAIDs. Refer to active Service Level Agreement with ATO for specifics.

2.14 **Inspection Requirements.**

2.14.1 Daily Inspections.

Inspections should be conducted at least daily, but more frequently if necessary to ensure conformance with the CSPP. A sample checklist is provided in Appendix D, Construction Project Daily Safety Inspection Checklist. See also AC 150/5200-18, Airport Safety Self-Inspection. Airport operators holding a Part 139 certificate are required to conduct self-inspections during unusual conditions, such as construction activities, that may affect safe air carrier operations.

2.14.2 Interim Inspections.

Inspections should be conducted of all areas to be (re)opened to aircraft traffic to ensure the proper operation of lights and signs, for correct markings, and absence of FOD. The contractor should conduct an inspection of the work area with airport operations personnel. The contractor should ensure that all construction materials have been secured, all pavement surfaces have been swept clean, all transition ramps have been properly constructed, and that surfaces have been appropriately marked for aircraft to operate safely. Only if all items on the list meet with the airport operator's approval should the air traffic control tower be notified to open the area to aircraft operations. The contractor should be required to retain a suitable workforce and the necessary equipment at the work area for any last minute cleanup that may be requested by the airport operator prior to opening the area.

2.14.3 Final Inspections.

New runways and extended runway closures may require safety inspections at certificated airports prior to allowing air carrier service. Coordinate with the FAA Airport Certification Safety Inspector (ACSI) to determine if a final inspection will be necessary.

2.15 Underground Utilities.

The CSPP and/or SPCD must include procedures for locating and protecting existing underground utilities, cables, wires, pipelines, and other underground facilities in excavation areas. This may involve coordinating with public utilities and FAA ATO/Technical Operations. Note that “One Call” or “Miss Utility” services do not include FAA ATO/Technical Operations.

2.16 Penalties.

The CSPP should detail penalty provisions for noncompliance with airport rules and regulations and the safety plans (for example, if a vehicle is involved in a runway incursion). Such penalties typically include rescission of driving privileges or access to the AOA.

2.17 Special Conditions.

The CSPP must detail any special conditions that affect the operation of the airport and will require the activation of any special procedures (for example, low-visibility operations, snow removal, aircraft in distress, aircraft accident, security breach, Vehicle / Pedestrian Deviation (VPD) and other activities requiring construction suspension/resumption).

2.18 Runway and Taxiway Visual Aids.

This includes marking, lighting, signs, and visual NAVAIDs. The CSPP must ensure that areas where aircraft will be operating are clearly and visibly separated from construction areas, including closed runways. Throughout the duration of the construction project, verify that these areas remain clearly marked and visible at all times and that marking, lighting, signs, and visual NAVAIDs that are to continue to perform their functions during construction remain in place and operational. Visual NAVAIDs that are not serving their intended function during construction must be temporarily disabled, covered, or modified as necessary. The CSPP must address the following, as appropriate:

2.18.1 General.

Airport markings, lighting, signs, and visual NAVAIDs must be clearly visible to pilots, not misleading, confusing, or deceptive. All must be secured in place to prevent movement by prop wash, jet blast, wing vortices, and other wind currents and constructed of materials that will minimize damage to an aircraft in the event of inadvertent contact. Items used to secure such markings must be of a color similar to the marking.

2.18.2 Markings.

During the course of construction projects, temporary pavement markings are often required to allow for aircraft operations during or between work periods. During the design phase of the project, the designer should coordinate with the project manager,

airport operations, airport users, the FAA Airports project manager, and Airport Certification Safety Inspector for Part 139 airports to determine minimum temporary markings. The FAA Airports project manager will, wherever a runway is closed, coordinate with the appropriate FAA Flight Standards Office and disseminate findings to all parties. Where possible, the temporary markings on finish grade pavements should be placed to mirror the dimensions of the final markings. Markings must be in compliance with the standards of AC 150/5340-1, *Standards for Airport Markings*, except as noted herein. Runways and runway exit taxiways closed to aircraft operations are marked with a yellow X. The preferred visual aid to depict temporary runway closure is the lighted X signal placed on or near the runway designation numbers. (See paragraph 2.18.2.1.2.)

2.18.2.1 Closed Runways and Taxiways.

2.18.2.1.1 Permanently Closed Runways.

For runways, obliterate the threshold marking, runway designation marking, and touchdown zone markings, and place an X at each end and at 1,000-foot (300 m) intervals. For a multiple runway environment, if the lighted X on a designated number will be located in the RSA of an adjacent active runway, locate the lighted X farther down the closed runway to clear the RSA of the active runway. In addition, the closed runway numbers located in the RSA of an active runway must be marked with a flat yellow X.

2.18.2.1.2 Temporarily Closed Runways.

For runways that have been temporarily closed, place an X at each end of the runway directly on or as near as practicable to the runway designation numbers. For a multiple runway environment, if the lighted X on a designated number will be located in the RSA of an adjacent active runway, locate the lighted X farther down the closed runway to clear the RSA of the active runway. In addition, the closed runway numbers located in the RSA of an active runway must be marked with a flat yellow X. See Figure 2-3. See also paragraph 2.18.3.3.

2.18.2.1.3 Partially Closed Runways and Displaced Thresholds.

When threshold markings are needed to identify the temporary beginning of the runway that is available for landing, the markings must comply with AC 150/5340-1. An X is not used on a partially closed runway or a runway with a displaced threshold. See paragraph 2.7.1.1 for the difference between partially closed runways and runways with displaced thresholds. Because of the temporary nature of threshold displacement due to construction, it is not necessary to re-adjust the existing runway centerline markings to meet standard spacing for a runway with a visual approach. Some of the requirements below may be waived in the cases of low-activity airports and/or short duration changes that are measured in days rather than weeks. Consider whether the presence of an airport traffic

control tower allows for the development of special procedures. Contact the appropriate FAA Airports Regional or District Office for assistance.

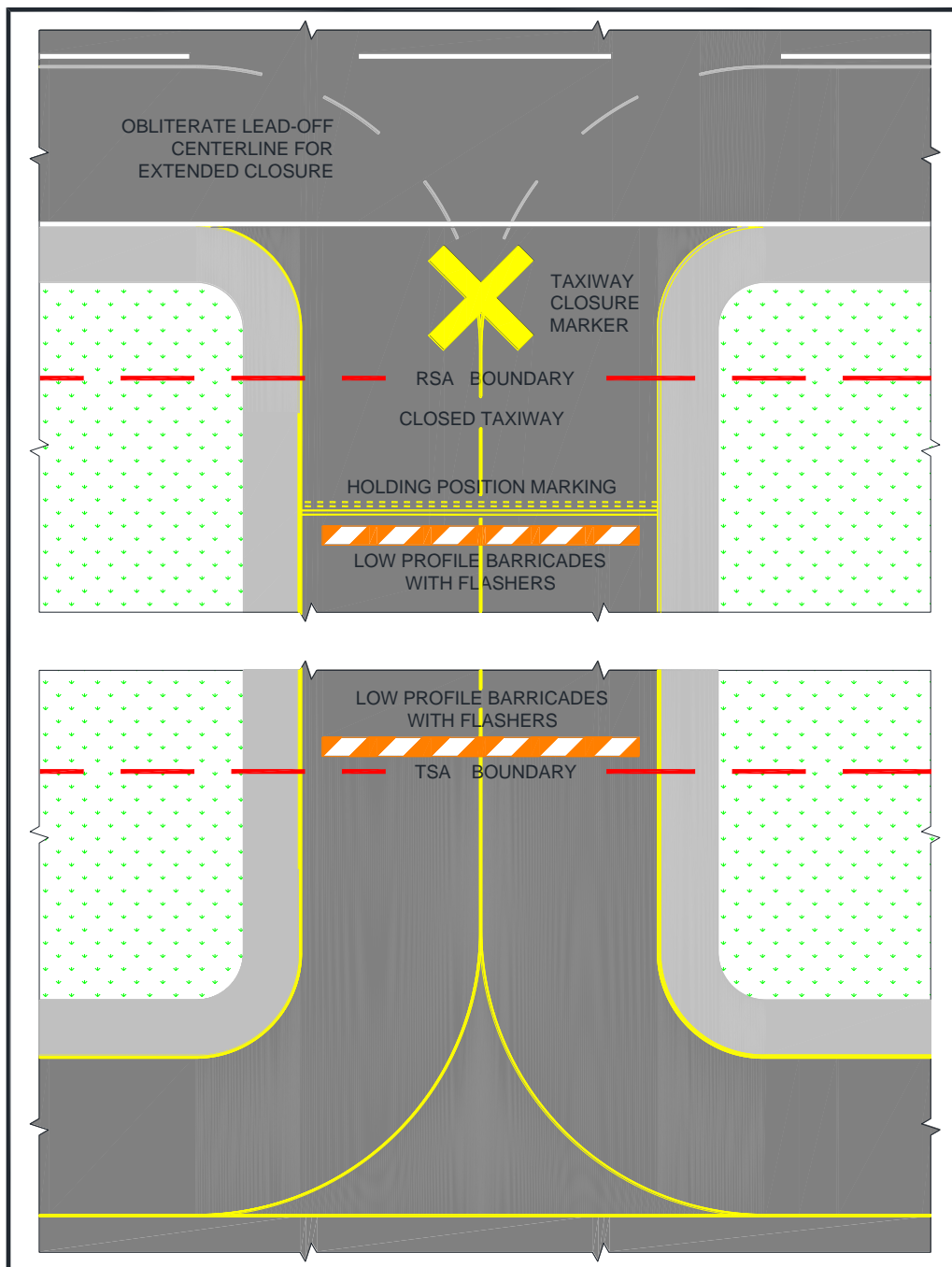
Figure 2-3. Markings for a Temporarily Closed Runway



1. **Partially Closed Runways.** Pavement markings for temporary closed portions of the runway consist of a runway threshold bar, runway designation, and yellow chevrons to identify pavement areas that are unsuitable for takeoff or landing (see [AC 150/5340-1](#)). Obliterate or cover markings prior to the moved threshold. Existing touchdown zone markings beyond the moved threshold may remain in place. Obliterate aiming point markings. Issue appropriate NOTAMs regarding any nonstandard markings. See [Figure 2-4](#).
2. **Displaced Thresholds.** Pavement markings for a displaced threshold consist of a runway threshold bar, runway designation, and white arrowheads with and without arrow shafts. These markings are required to identify the portion of the runway before the displaced threshold to provide centerline guidance for pilots during approaches, takeoffs, and landing rollouts from the opposite direction. See [AC 150/5340-1](#). Obliterate markings prior to the displaced threshold. Existing touchdown zone markings beyond the displaced threshold may remain in place. Obliterate aiming point markings. Issue appropriate NOTAMs regarding any nonstandard markings. See [Figure 2-2](#).

2.18.2.1.4 Taxiways.

1. **Permanently Closed Taxiways.** AC 150/5300-13 Airport Design, notes that it is preferable to remove the pavement, but for pavement that is to remain, place an X at the entrance to both ends of the closed section. Obliterate taxiway centerline markings, including runway leadoff lines, leading to the closed taxiway. See Figure 2-4.

Figure 2-4. Temporary Taxiway Closure

2. **Temporarily Closed Taxiways.** Place barricades outside the safety area of intersecting taxiways. For runway/taxiway intersections, place an X at the entrance to the closed taxiway from the runway. If the taxiway will be closed for an extended period, obliterate taxiway centerline markings, including runway leadoff lines and taxiway to taxiway turns, leading to the closed section. Always obliterate runway lead-off lines for high speed exits, regardless of the duration of the closure. If the centerline markings will be reused upon reopening the taxiway, it is preferable to paint over the marking. This will result in less damage to the pavement when the upper layer of paint is ultimately removed. See Figure 2-4.

2.18.2.1.5 Temporarily Closed Airport.

When the airport is closed temporarily, mark all the runways as closed.

- 2.18.2.2 If unable to paint temporary markings on the pavement, construct them from any of the following materials: fabric, colored plastic, painted sheets of plywood, or similar materials. They must be properly configured and appropriately secured to prevent movement by prop wash, jet blast, or other wind currents. Items used to secure such markings must be of a color similar to the marking.

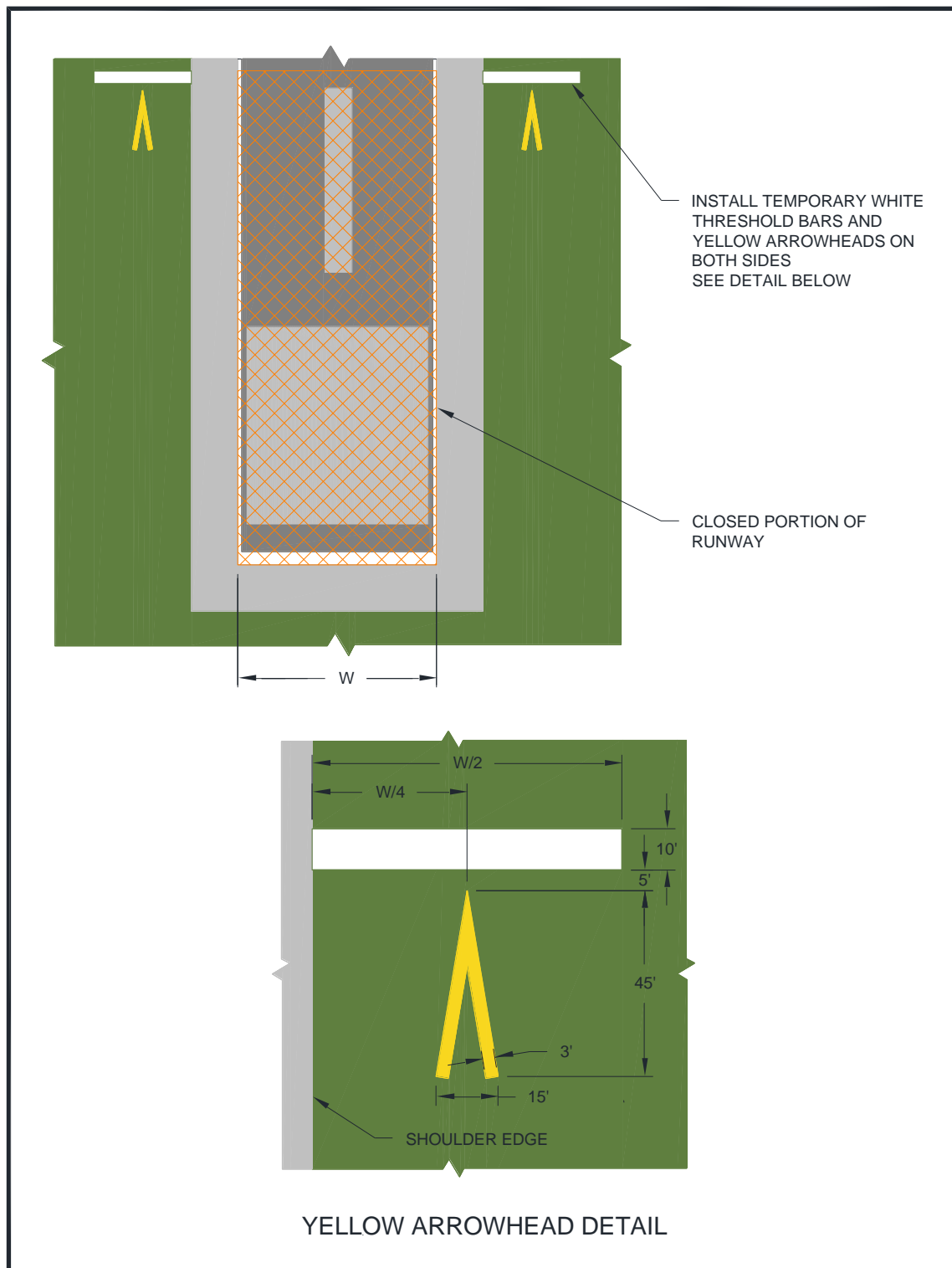
- 2.18.2.3 It may be necessary to remove or cover runway markings, including but not limited to, runway designation markings, threshold markings, centerline markings, edge stripes, touchdown zone markings and aiming point markings, depending on the length of construction and type of activity at the airport. When removing runway markings, apply the same treatment to areas between stripes or numbers, as the cleaned area will appear to pilots as a marking in the shape of the treated area.

- 2.18.2.4 If it is not possible to install threshold bars, chevrons, and arrows on the pavement, “temporary outboard white threshold bars and yellow arrowheads”, see Figure 2-5, may be used. Locate them outside of the runway pavement surface on both sides of the runway. The dimensions must be as shown in Figure 2-5. If the markings are not discernible on grass or snow, apply a black background with appropriate material over the ground to ensure they are clearly visible.

- 2.18.2.5 The application rate of paint to mark a short-term temporary runway and taxiway markings may deviate from the standard (see Item P-620, “Runway and Taxiway Painting,” in AC 150/5370-10), but the dimensions must meet the existing standards. When applying temporary markings at night, it is recommended that the fast curing, Type II paint be used to help offset the higher humidity and cooler temperatures often experienced at night. Diluting the paint will substantially increase cure time and is not recommended. Glass beads are not recommended for temporary markings. Striated markings may also be used for certain temporary markings. AC

150/5340-1, Standards for Airport Markings, has additional guidance on temporary markings.

Figure 2-5. Temporary Outboard White Threshold Bars and Yellow Arrowheads



2.18.3 Lighting and Visual NAVAIDs.

This paragraph refers to standard runway and taxiway lighting systems. See below for hazard lighting. Lighting installation must be in conformance with AC 150/5340-30, *Design and Installation Details for Airport Visual Aids*, and fixture design in conformance with AC 150/5345-50, *Specification for Portable Runway and Taxiway Lights*. When disconnecting runway and taxiway lighting fixtures, disconnect the associated isolation transformers. See AC 150/5340-26, *Maintenance of Airport Visual Aid Facilities*, for disconnect procedures and safety precautions. Alternately, cover the light fixture in such a way as to prevent light leakage. Avoid removing the lamp from energized fixtures because an excessive number of isolation transformers with open secondaries may damage the regulators and/or increase the current above its normal value. Secure, identify, and place any above ground temporary wiring in conduit to prevent electrocution and fire ignition sources. Maintain mandatory hold signs to operate normally in any situation where pilots or vehicle drivers could mistakenly be in that location. At towered airports certificated under Part 139, holding position signs are required to be illuminated on open taxiways crossing to closed or inactive runways. If the holding position sign is installed on the runway circuit for the closed runway, install a jumper to the taxiway circuit to provide power to the holding position sign for nighttime operations. Where it is not possible to maintain power to signs that would normally be operational, install barricades to exclude aircraft. Figure 2-1, Figure 2-2, Figure 2-3, and Figure 2-4 illustrate temporary changes to lighting and visual NAVAIDs.

2.18.3.1 **Permanently Closed Runways and Taxiways.**

For runways and taxiways that have been permanently closed, disconnect the lighting circuits.

2.18.3.2 **Temporarily Closed Runways and New Runways Not Yet Open to Air Traffic.**

If available, use a lighted X, both at night and during the day, placed at each end of the runway on or near the runway designation numbers facing the approach. (Note that the lighted X must be illuminated at all times that it is on a runway.) The use of a lighted X is required if night work requires runway lighting to be on. See AC 150/5345-55, *Specification for L-893, Lighted Visual Aid to Indicate Temporary Runway Closure*. For runways that have been temporarily closed, but for an extended period, and for those with pilot controlled lighting, disconnect the lighting circuits or secure switches to prevent inadvertent activation. For runways that will be opened periodically, coordinate procedures with the FAA air traffic manager or, at airports without an ATCT, the airport operator. Activate stop bars if available. Figure 2-6 shows a lighted X by day. Figure 2-7 shows a lighted X at night.

Figure 2-6. Lighted X in Daytime**Figure 2-7. Lighted X at Night**

2.18.3.3 **Partially Closed Runways and Displaced Thresholds.**

When a runway is partially closed, a portion of the pavement is unavailable for any aircraft operation, meaning taxiing and landing or taking off in either direction. A displaced threshold, by contrast, is put in place to ensure obstacle clearance by landing aircraft. The pavement prior to the displaced threshold is available for takeoff in the direction of the displacement, and for landing and takeoff in the opposite direction. Misunderstanding this difference and issuance of a subsequently inaccurate NOTAM can result in a hazardous situation. For both partially

closed runways and displaced thresholds, approach lighting systems at the affected end must be placed out of service.

2.18.3.3.1 Partially Closed Runways.

Disconnect edge and threshold lights on that part of the runway at and behind the threshold (that is, the portion of the runway that is closed). Alternately, cover the light fixtures in such a way as to prevent light leakage. See Figure 2-1.

2.18.3.3.2 Temporary Displaced Thresholds.

Edge lighting in the area of the displacement emits red light in the direction of approach and yellow light (white for visual runways) in the opposite direction. If the displacement is 700 feet or less, blank out centerline lights in the direction of approach or place the centerline lights out of service. If the displacement is over 700 feet, place the centerline lights out of service. See AC 150/5340-30 for details on lighting displaced thresholds. See Figure 2-2.

2.18.3.3.3 Temporary runway thresholds and runway ends must be lighted if the runway is lighted and it is the intended threshold for night landings or instrument meteorological conditions.

2.18.3.3.4 A temporary threshold on an unlighted runway may be marked by retroreflective, elevated markers in addition to markings noted in paragraph 2.18.2.1.3. Markers seen by aircraft on approach are green. Markers at the rollout end of the runway are red. At certificated airports, temporary elevated threshold markers must be mounted with a frangible fitting (see 14 CFR Part 139.309). At non-certificated airports, the temporary elevated threshold markings may either be mounted with a frangible fitting or be flexible. See AC 150/5345-39, *Specification for L-853, Runway and Taxiway Retroreflective Markers*.

2.18.3.3.5 Temporary threshold lights and runway end lights and related visual NAVAIDs are installed outboard of the edges of the full-strength pavement only when they cannot be installed on the pavement. They are installed with bases at grade level or as low as possible, but not more than 3 inch (7.6 cm) above ground. (The standard above ground height for airport lighting fixtures is 14 inches (35 cm)). When any portion of a base is above grade, place properly compacted fill around the base to minimize the rate of gradient change so aircraft can, in an emergency, cross at normal landing or takeoff speeds without incurring significant damage. See AC 150/5370-10.

2.18.3.3.6 Maintain threshold and edge lighting color and spacing standards as described in AC 150/5340-30. Battery powered, solar, or portable lights that meet the criteria in AC 150/5345-50 may be used. These systems are intended primarily for visual flight rules (VFR) aircraft operations but may

be used for instrument flight rules (IFR) aircraft operations, upon individual approval from the Flight Standards Division of the applicable FAA Regional Office.

- 2.18.3.3.7 When runway thresholds are temporarily displaced, reconfigure yellow lenses (caution zone), as necessary, and place the centerline lights out of service.
- 2.18.3.3.8 Relocate the Visual Glide Slope Indicator (VGSI), such as Visual Approach Slope Indicator (VASI) and Precision Approach Path Indicator (PAPI); other airport lights, such as Runway End Identifier Lights (REIL); and approach lights to identify the temporary threshold. Another option is to disable the VGSI or any equipment that would give misleading indications to pilots as to the new threshold location. Installation of temporary visual aids may be necessary to provide adequate guidance to pilots on approach to the affected runway. If the FAA owns and operates the VGSI, coordinate its installation or disabling with the local ATO/Technical Operations Office. Relocation of such visual aids will depend on the duration of the project and the benefits gained from the relocation, as this can result in great expense. See FAA JO 6850.2, *Visual Guidance Lighting Systems*, for installation criteria for FAA owned and operated NAVAIDs.
- 2.18.3.3.9 Issue a NOTAM to inform pilots of temporary lighting conditions.
- 2.18.3.4 **Temporarily Closed Taxiways.**

If possible, deactivate the taxiway lighting circuits. When deactivation is not possible (for example other taxiways on the same circuit are to remain open), cover the light fixture in a way as to prevent light leakage.

2.18.4 Signs.

To the extent possible, signs must be in conformance with AC 150/5345-44, *Specification for Runway and Taxiway Signs*, and AC 150/5340-18, *Standard for Airport Sign Systems*.

2.18.4.1 **Existing Signs.**

Runway exit signs are to be covered for closed runway exits. Outbound destination signs are to be covered for closed runways. Any time a sign does not serve its normal function or would provide conflicting information, it must be covered or removed to prevent misdirecting pilots. Note that information signs identifying a crossing taxiway continue to perform their normal function even if the crossing taxiway is closed. For long term construction projects, consider relocating signs, especially runway distance remaining signs.

2.18.4.2 Temporary Signs.

Orange construction signs comprise a message in black on an orange background. Orange construction signs may help pilots be aware of changed conditions. The airport operator may choose to introduce these signs as part of a movement area construction project to increase situational awareness when needed. Locate signs outside the taxiway safety limits and ahead of construction areas so pilots can take timely action. Use temporary signs judiciously, striking a balance between the need for information and the increase in pilot workload. When there is a concern of pilot “information overload,” the applicability of mandatory hold signs must take precedence over orange construction signs recommended during construction. Temporary signs must meet the standards for such signs in Engineering Brief 93, *Guidance for the Assembly and Installation of Temporary Orange Construction Signs*. Many criteria in AC 150/5345-44, *Specification for Runway and Taxiway Signs*, are referenced in the Engineering Brief. Permissible sign legends are:

1. CONSTRUCTION AHEAD,
2. CONSTRUCTION ON RAMP, and
3. RWY XX TAKEOFF RUN AVAILABLE XXX FT.

Phasing, supported by drawings and sign schedule, for the installation of orange construction signs must be included in the CSPP or SPCD.

2.18.4.2.1 Takeoff Run Available (TORA) signs.

Recommended: Where a runway has been shortened for takeoff, install orange TORA signs well before the hold lines, such as on a parallel taxiway prior to a turn to a runway hold position. See EB 93 for sign size and location.

2.18.4.2.2 Sign legends are shown in Figure F-1.

Note: See Figure E-1, Figure E-2, Figure E-3, Figure F-2, and Figure F-3 for examples of orange construction sign locations.

2.19 Marking and Signs for Access Routes.

The CSPP should indicate that pavement markings and signs for construction personnel will conform to AC 150/5340-18 and, to the extent practicable, with the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD) and/or State highway specifications. Signs adjacent to areas used by aircraft must comply with the frangibility requirements of AC 150/5220-23, *Frangible Connections*, which may require modification to size and height guidance in the MUTCD.

2.20 **Hazard Marking, Lighting and Signing.**

2.20.1 Hazard marking, lighting, and signing prevent pilots from entering areas closed to aircraft, and prevent construction personnel from entering areas open to aircraft. The CSPP must specify prominent, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles. Hazard marking and lighting must also be specified to identify open manholes, small areas under repair, stockpiled material, waste areas, and areas subject to jet blast. Also consider less obvious construction-related hazards and include markings to identify FAA, airport, and National Weather Service facilities cables and power lines; instrument landing system (ILS) critical areas; airport surfaces, such as RSA, OFA, and OFZ; and other sensitive areas to make it easier for contractor personnel to avoid these areas.

2.20.2 Equipment.

2.20.2.1 **Barricades.**

Low profile barricades, including traffic cones, (weighted or sturdily attached to the surface) are acceptable methods used to identify and define the limits of construction and hazardous areas on airports. Careful consideration must be given to selecting equipment that poses the least danger to aircraft but is sturdy enough to remain in place when subjected to typical winds, prop wash and jet blast. The spacing of barricades must be such that a breach is physically prevented barring a deliberate act. For example, if barricades are intended to exclude aircraft, gaps between barricades must be smaller than the wingspan of the smallest aircraft to be excluded; if barricades are intended to exclude vehicles, gaps between barricades must be smaller than the width of the excluded vehicles, generally 4 feet (1.2 meters). Provision must be made for ARFF access if necessary. If barricades are intended to exclude pedestrians, they must be continuously linked. Continuous linking may be accomplished through the use of ropes, securely attached to prevent FOD.

2.20.2.2 **Lights.**

Lights must be red, either steady burning or flashing, and must meet the luminance requirements of the State Highway Department. Batteries powering lights will last longer if lights flash. Lights must be mounted on barricades and spaced at no more than 10 feet (3 meters). Lights must be operated between sunset and sunrise and during periods of low visibility whenever the airport is open for operations. They may be operated by photocell, but this may require that the contractor turn them on manually during periods of low visibility during daytime hours.

2.20.2.3 **Supplement Barricades with Signs (for example) As Necessary.**

Examples are “No Entry” and “No Vehicles.” Be aware of the increased effects of wind and jet blast on barricades with attached signs.

2.20.2.4 Air Operations Area – General.

Barricades are not permitted in any active safety area or on the runway side of a runway hold line. Within a runway or taxiway object free area, and on aprons, use orange traffic cones, flashing or steady burning red lights as noted above, highly reflective collapsible barricades marked with diagonal, alternating orange and white stripes; and/or signs to separate all construction/maintenance areas from the movement area. Barricades may be supplemented with alternating orange and white flags at least 20 by 20 inch (50 by 50 cm) square and securely fastened to eliminate FOD. All barricades adjacent to any open runway or taxiway / taxilane safety area, or apron must be as low as possible to the ground, and no more than 18 inches high, exclusive of supplementary lights and flags. Barricades must be of low mass; easily collapsible upon contact with an aircraft or any of its components; and weighted or sturdily attached to the surface to prevent displacement from prop wash, jet blast, wing vortex, and other surface wind currents. If affixed to the surface, they must be frangible at grade level or as low as possible, but not to exceed 3 inch (7.6 cm) above the ground. Figure 2-8 and Figure 2-9 show sample barricades with proper coloring and flags.

Figure 2-8. Interlocking Barricades



Figure 2-9. Low Profile Barricades**2.20.2.5 Air Operations Area – Runway/Taxiway Intersections.**

Use highly reflective barricades with lights to close taxiways leading to closed runways. Evaluate all operating factors when determining how to mark temporary closures that can last from 10 to 15 minutes to a much longer period of time. However, even for closures of relatively short duration, close all taxiway/runway intersections with barricades. The use of traffic cones is appropriate for short duration closures.

2.20.2.6 Air Operations Area – Other.

Beyond runway and taxiway object free areas and aprons, barricades intended for construction vehicles and personnel may be many different shapes and made from various materials, including railroad ties, sawhorses, jersey barriers, or barrels.

2.20.2.7 Maintenance.

The construction specifications must include a provision requiring the contractor to have a person on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades. The contractor must file the contact person's information with the airport operator. Lighting should be checked for proper operation at least once per day, preferably at dusk.

2.21 Work Zone Lighting for Nighttime Construction.

Lighting equipment must adequately illuminate the work area if the construction is to be performed during nighttime hours. Refer to [AC 150/5370-10](#) for minimum illumination levels for nighttime paving projects. Additionally, it is recommended that all support equipment, except haul trucks, be equipped with artificial illumination to safely

illuminate the area immediately surrounding their work areas. The lights should be positioned to provide the most natural color illumination and contrast with a minimum of shadows. The spacing must be determined by trial. Light towers should be positioned and adjusted to aim away from ATCT cabs and active runways to prevent blinding effects. Shielding may be necessary. Light towers should be removed from the construction site when the area is reopened to aircraft operations. Construction lighting units should be identified and generally located on the construction phasing plans in relationship to the ATCT and active runways and taxiways.

2.22 **Protection of Runway and Taxiway Safety Areas.**

Runway and taxiway safety areas, OFZs, OFAs, and approach surfaces are described in AC 150/5300-13. Protection of these areas includes limitations on the location and height of equipment and stockpiled material. An FAA airspace study may be required. Coordinate with the appropriate FAA Airports Regional or District Office if there is any doubt as to requirements or dimensions (see paragraph 2.13.5) as soon as the location and height of materials or equipment are known. The CSPP should include drawings showing all safety areas, object free areas, obstacle free zones and approach departure surfaces affected by construction.

2.22.1 Runway Safety Area (RSA).

A runway safety area is the defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway (see AC 150/5300-13). Construction activities within the existing RSA are subject to the following conditions:

- 2.22.1.1 No construction may occur within the existing RSA while the runway is open for aircraft operations. The RSA dimensions may be temporarily adjusted if the runway is restricted to aircraft operations requiring an RSA that is equal to the RSA width and length beyond the runway ends available during construction. (See AC 150/5300-13). The temporary use of declared distances and/or partial runway closures may provide the necessary RSA under certain circumstances. Coordinate with the appropriate FAA Airports Regional or District Office to have declared distances information published, and appropriate NOTAMs issued. See AC 150/5300-13 for guidance on the use of declared distances.
- 2.22.1.2 The airport operator must coordinate the adjustment of RSA dimensions as permitted above with the appropriate FAA Airports Regional or District Office and the local FAA air traffic manager and issue a NOTAM.
- 2.22.1.3 The CSPP and SPCD must provide procedures for ensuring adequate distance for protection from blasting operations, if required by operational considerations.

2.22.1.4 Excavations.

2.22.1.4.1 Open trenches or excavations are not permitted within the RSA while the runway is open. Backfill trenches before the runway is opened. If backfilling excavations before the runway must be opened is impracticable, cover the excavations appropriately. Covering for open trenches must be designed to allow the safe operation of the heaviest aircraft operating on the runway across the trench without damage to the aircraft.

2.22.1.4.2 Construction contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

2.22.1.5 Erosion Control.

Soil erosion must be controlled to maintain RSA standards, that is, the RSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and fire fighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

2.22.2 Runway Object Free Area (ROFA).

Construction, including excavations, may be permitted in the ROFA. However, equipment must be removed from the ROFA when not in use, and material should not be stockpiled in the ROFA if not necessary. Stockpiling material in the OFA requires submittal of a 7460-1 form and justification provided to the appropriate FAA Airports Regional or District Office for approval.

2.22.3 Taxiway Safety Area (TSA).

2.22.3.1 A taxiway safety area is a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway. (See AC 150/5300-13.) Since the width of the TSA is equal to the wingspan of the design aircraft, no construction may occur within the TSA while the taxiway is open for aircraft operations. The TSA dimensions may be temporarily adjusted if the taxiway is restricted to aircraft operations requiring a TSA that is equal to the TSA width available during construction. Give special consideration to TSA dimensions at taxiway turns and intersections. (see AC 150/5300-13).

2.22.3.2 The airport operator must coordinate the adjustment of the TSA width as permitted above with the appropriate FAA Airports Regional or District Office and the FAA air traffic manager and issue a NOTAM.

2.22.3.3 The CSPP and SPCD must provide procedures for ensuring adequate distance for protection from blasting operations.

2.22.3.4 **Excavations.**

1. Curves. Open trenches or excavations are not permitted within the TSA while the taxiway is open. Trenches should be backfilled before the taxiway is opened. If backfilling excavations before the taxiway must be opened is impracticable, cover the excavations appropriately. Covering for open trenches must be designed to allow the safe operation of the heaviest aircraft operating on the taxiway across the trench without damage to the aircraft.
2. Straight Sections. Open trenches or excavations are not permitted within the TSA while the taxiway is open for unrestricted aircraft operations. Trenches should be backfilled before the taxiway is opened. If backfilling excavations before the taxiway must be opened is impracticable, cover the excavations to allow the safe passage of ARFF equipment and of the heaviest aircraft operating on the taxiway across the trench without causing damage to the equipment or aircraft. In rare circumstances where the section of taxiway is indispensable for aircraft movement, open trenches or excavations may be permitted in the TSA while the taxiway is open to aircraft operations, subject to the following restrictions:
 - a. Taxiing speed is limited to 10 mph.
 - b. Appropriate NOTAMs are issued.
 - c. Marking and lighting meeting the provisions of paragraphs 2.18 and 2.20 are implemented.
 - d. Low mass, low-profile lighted barricades are installed.
 - e. Appropriate temporary orange construction signs are installed.
3. Construction contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

2.22.3.5 **Erosion control.**

Soil erosion must be controlled to maintain TSA standards, that is, the TSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

2.22.4 Taxiway Object Free Area (TOFA).

Unlike the Runway Object Free Area, aircraft wings regularly penetrate the taxiway object free area during normal operations. Thus, the restrictions are more stringent. Except as provided below, no construction may occur within the taxiway object free area while the taxiway is open for aircraft operations.

- 2.22.4.1 The taxiway object free area dimensions may be temporarily adjusted if the taxiway is restricted to aircraft operations requiring a taxiway object free area that is equal to the taxiway object free area width available. Give special consideration to TOFA dimensions at taxiway turns and intersections.
- 2.22.4.2 Offset taxiway centerline and edge pavement markings (do not use glass beads) may be used as a temporary measure to provide the required taxiway object free area. Where offset taxiway pavement markings are provided, centerline lighting, centerline reflectors, or taxiway edge reflectors are required. Existing lighting that does not coincide with the temporary markings must be taken out of service.
- 2.22.4.3 Construction activity, including open excavations, may be accomplished without adjusting the width of the taxiway object free area, subject to the following restrictions:
 - 2.22.4.3.1 Taxiing speed is limited to 10 mph.
 - 2.22.4.3.2 NOTAMs issued advising taxiing pilots of hazard and recommending reduced taxiing speeds on the taxiway.
 - 2.22.4.3.3 Marking and lighting meeting the provisions of paragraphs 2.18 and 2.20 are implemented.
 - 2.22.4.3.4 If desired, appropriate orange construction signs are installed. See paragraph 2.18.4.2 and Appendix F.
 - 2.22.4.3.5 Five-foot clearance is maintained between equipment and materials and any part of an aircraft (includes wingtip overhang). If such clearance can only be maintained if an aircraft does not have full use of the entire taxiway width (with its main landing gear at the edge of the usable pavement), then it will be necessary to move personnel and equipment for the passage of that aircraft.
 - 2.22.4.3.6 Flaggers furnished by the contractor must be used to direct and control construction equipment and personnel to a pre-established setback distance for safe passage of aircraft, and airline and/or airport personnel. Flaggers must also be used to direct taxiing aircraft. Due to liability issues, the airport operator should require airlines to provide flaggers for directing taxiing aircraft.

2.22.5 Obstacle Free Zone (OFZ).

In general, personnel, material, and/or equipment may not penetrate the OFZ while the runway is open for aircraft operations. If a penetration to the OFZ is necessary, it may be possible to continue aircraft operations through operational restrictions. Coordinate with the FAA through the appropriate FAA Airports Regional or District Office.

2.22.6 Runway Approach/Departure Areas and Clearways.

All personnel, materials, and/or equipment must remain clear of the applicable threshold siting surfaces, as defined in AC 150/5300-13. Objects that do not penetrate these surfaces may still be obstructions to air navigation and may affect standard instrument approach procedures. Coordinate with the FAA through the appropriate FAA Airports Regional or District Office.

2.22.6.1 Construction activity in a runway approach/departure area may result in the need to partially close a runway or displace the existing runway threshold. Partial runway closure, displacement of the runway threshold, as well as closure of the complete runway and other portions of the movement area also require coordination through the airport operator with the appropriate FAA air traffic manager (FSS if non-towered) and ATO/Technical Operations (for affected NAVAIDS) and airport users.

2.22.6.2 **Caution About Partial Runway Closures.**

When filing a NOTAM for a partial runway closure, clearly state that the portion of pavement located prior to the threshold is not available for landing and departing traffic. In this case, the threshold has been moved for both landing and takeoff purposes (this is different than a displaced threshold). There may be situations where the portion of closed runway is available for taxiing only. If so, the NOTAM must reflect this condition).

2.22.6.3 **Caution About Displaced Thresholds.**

Implementation of a displaced threshold affects runway length available for aircraft landing over the displacement. Depending on the reason for the displacement (to provide obstruction clearance or RSA), such a displacement may also require an adjustment in the landing distance available and accelerate-stop distance available in the opposite direction. If project scope includes personnel, equipment, excavation, or other work within the existing RSA of any usable runway end, do not implement a displaced threshold unless arrivals and departures toward the construction activity are prohibited. Instead, implement a partial closure.

2.23 **Other Limitations on Construction.**

The CSPP must specify any other limitations on construction, including but not limited to:

2.23.1 Prohibitions.

- 2.23.1.1 No use of tall equipment (cranes, concrete pumps, and so on) unless a 7460-1 determination letter is issued for such equipment.
- 2.23.1.2 No use of open flame welding or torches unless fire safety precautions are provided and the airport operator has approved their use.
- 2.23.1.3 No use of electrical blasting caps on or within 1,000 feet (300 meters) of the airport property. See AC 150/5370-10.

2.23.2 Restrictions.

- 2.23.2.1 Construction suspension required during specific airport operations.
- 2.23.2.2 Areas that cannot be worked on simultaneously.
- 2.23.2.3 Day or night construction restrictions.
- 2.23.2.4 Seasonal construction restrictions.
- 2.23.2.5 Temporary signs not approved by the airport operator.
- 2.23.2.6 Grades changes that could result in unplanned effects on NAVAIDs.

CHAPTER 3. GUIDELINES FOR WRITING A CSPP

3.1 General Requirements.

The CSPP is a standalone document written to correspond with the subjects outlined in paragraph 2.4. The CSPP is organized by numbered sections corresponding to each subject listed in paragraph 2.4, and described in detail in paragraphs 2.5 - 2.23. Each section number and title in the CSPP matches the corresponding subject outlined in paragraph 2.4 (for example, 1. Coordination, 2. Phasing, 3. Areas and Operations Affected by the Construction Activity, and so on). With the exception of the project scope of work outlined in Section 2. Phasing, only subjects specific to operational safety during construction should be addressed.

3.2 Applicability of Subjects.

Each section should, to the extent practical, focus on the specific subject. Where an overlapping requirement spans several sections, the requirement should be explained in detail in the most applicable section. A reference to that section should be included in all other sections where the requirement may apply. For example, the requirement to protect existing underground FAA ILS cables during trenching operations could be considered FAA ATO coordination (Coordination, paragraph 2.5.3), an area and operation affected by the construction activity (Areas and Operations Affected by the Construction Activity, paragraph 2.7.1.4), a protection of a NAVAID (Protection of Navigational Aids (NAVAIDs), paragraph 2.8), or a notification to the FAA of construction activities (Notification of Construction Activities, paragraph 2.13.5.3.2). However, it is more specifically an underground utility requirement (Underground Utilities, paragraph 2.15). The procedure for protecting underground ILS cables during trenching operations should therefore be described in 2.4.2.11: “The contractor must coordinate with the local FAA System Support Center (SSC) to mark existing ILS cable routes along Runway 17-35. The ILS cables will be located by hand digging whenever the trenching operation moves within 10 feet of the cable markings.” All other applicable sections should include a reference to 2.4.2.11: “ILS cables shall be identified and protected as described in 2.4.2.11” or “See 2.4.2.11 for ILS cable identification and protection requirements.” Thus, the CSPP should be considered as a whole, with no need to duplicate responses to related issues.

3.3 Graphical Representations.

Construction safety drawings should be included in the CSPP as attachments. When other graphical representations will aid in supporting written statements, the drawings, diagrams, and/or photographs should also be attached to the CSPP. References should be made in the CSPP to each graphical attachment and may be made in multiple sections.

3.4 **Reference Documents.**

The CSPP must not incorporate a document by reference unless reproduction of the material in that document is prohibited. In that case, either copies of or a source for the referenced document must be provided to the contractor. Where this AC recommends references (e.g. as in paragraph 3.9) the intent is to include a reference to the corresponding section in the CSPP, not to this Advisory Circular.

3.5 **Restrictions.**

The CSPP should not be considered as a project design review document. The CSPP should also avoid mention of permanent (“as-built”) features such as pavements, markings, signs, and lighting, except when such features are intended to aid in maintaining operational safety during the construction.

3.6 **Coordination.**

Include in this section a detailed description of conferences and meetings to be held both before and during the project. Include appropriate information from AC 150/5370-12. Discuss coordination procedures and schedules for each required FAA ATO Technical Operations shutdown and restart and all required flight inspections.

3.7 **Phasing.**

Include in this section a detailed scope of work description for the project as a whole and each phase of work covered by the CSPP. This includes all locations and durations of the work proposed. Attach drawings to graphically support the written scope of work. Detail in this section the sequenced phases of the proposed construction. Include a reference to paragraph 3.8, as appropriate.

3.8 **Areas and Operations Affected by Construction.**

Focus in this section on identifying the areas and operations affected by the construction. Describe corresponding mitigation that is not covered in detail elsewhere in the CSPP. Include references to paragraphs below as appropriate. Attach drawings as necessary to graphically describe affected areas and mechanisms proposed. See Appendix F for sample operational effects tables and figures.

3.9 **NAVAID Protection.**

List in this section all NAVAID facilities that will be affected by the construction. Identify NAVAID facilities that will be placed out of service at any time prior to or during construction activities. Identify individuals responsible for coordinating each shutdown and when each facility will be out of service. Include a reference to paragraph 3.6 for FAA ATO NAVAID shutdown, restart, and flight inspection coordination. Outline in detail procedures to protect each NAVAID facility remaining in service from interference by construction activities. Include a reference to paragraph 3.14 for the

issuance of NOTAMs as required. Include a reference to paragraph 3.16 for the protection of underground cables and piping serving NAVAIDs. If temporary visual aids are proposed to replace or supplement existing facilities, include a reference to paragraph 3.19. Attach drawings to graphically indicate the affected NAVAIDS and the corresponding critical areas.

3.10 **Contractor Access.**

This will necessarily be the most extensive section of the CSPP. Provide sufficient detail so that a contractor not experienced in working on airports will understand the unique restrictions such work will require. Due to this extent, it should be broken down into subsections as described below:

3.10.1 Location of Stockpiled Construction Materials.

Describe in this section specific locations for stockpiling material. Note any height restrictions on stockpiles. Include a reference to paragraph 3.21 for hazard marking and lighting devices used to identify stockpiles. Include a reference to paragraph 3.11 for provisions to prevent stockpile material from becoming wildlife attractants. Include a reference to paragraph 3.12 for provisions to prevent stockpile material from becoming FOD. Attach drawings to graphically indicate the stockpile locations.

3.10.2 Vehicle and Pedestrian Operations.

While there are many items to be addressed in this major subsection of the CSPP, all are concerned with one main issue: keeping people and vehicles from areas of the airport where they don't belong. This includes preventing unauthorized entry to the AOA and preventing the improper movement of pedestrians or vehicles on the airport. In this section, focus on mechanisms to prevent construction vehicles and workers traveling to and from the worksite from unauthorized entry into movement areas. Specify locations of parking for both employee vehicles and construction equipment, and routes for access and haul roads. In most cases, this will best be accomplished by attaching a drawing. Quote from AC 150/5210-5 specific requirements for contractor vehicles rather than referring to the AC as a whole, and include special requirements for identifying HAZMAT vehicles. Quote from, rather than incorporate by reference, AC 150/5210-20 as appropriate to address the airport's rules for ground vehicle operations, including its training program. Discuss the airport's recordkeeping system listing authorized vehicle operators.

3.10.3 Two-Way Radio Communications.

Include a special section to identify all individuals who are required to maintain communications with Air Traffic (AT) at airports with active towers, or monitor CTAF at airports without or with closed ATCT. Include training requirements for all individuals required to communicate with AT. Individuals required to monitor AT frequencies should also be identified. If construction employees are also required to communicate by radio with Airport Operations, this procedure should be described in detail. Usage of vehicle mounted radios and/or portable radios should be addressed. Communication procedures for the event of disabled radio communication (that is, light

signals, telephone numbers, others) must be included. All radio frequencies should be identified (Tower, Ground Control, CTAF, UNICOM, ATIS, and so on).

3.10.4 **Airport Security.**

Address security as it applies to vehicle and pedestrian operations. Discuss TSA requirements, security badging requirements, perimeter fence integrity, gate security, and other needs. Attach drawings to graphically indicate secured and/or Security Identification Display Areas (SIDA), perimeter fencing, and available access points.

3.11 **Wildlife Management.**

Discuss in this section wildlife management procedures. Describe the maintenance of existing wildlife mitigation devices, such as perimeter fences, and procedures to limit wildlife attractants. Include procedures to notify Airport Operations of wildlife encounters. Include a reference to paragraph 3.10 for security (wildlife) fence integrity maintenance as required.

3.12 **FOD Management.**

In this section, discuss methods to control and monitor FOD: worksite housekeeping, ground vehicle tire inspections, runway sweeps, and so on. Include a reference to paragraph 3.15 for inspection requirements as required.

3.13 **HAZMAT Management.**

Describe in this section HAZMAT management procedures: fuel deliveries, spill recovery procedures, Safety Data Sheet (SDS), Material Safety Data Sheet (MSDS) or Product Safety Data Sheet (PSDS) availability, and other considerations. Any specific airport HAZMAT restrictions should also be identified. Include a reference to paragraph 3.10 for HAZMAT vehicle identification requirements. Quote from, rather than incorporate by reference, AC 150/5320-15.

3.14 **Notification of Construction Activities.**

List in this section the names and telephone numbers of points of contact for all parties affected by the construction project. We recommend a single list that includes all telephone numbers required under this section. Include emergency notification procedures for all representatives of all parties potentially impacted by the construction. Identify individual representatives – and at least one alternate – for each party. List both on-duty and off-duty contact information for each individual, including individuals responsible for emergency maintenance of airport construction hazard lighting and barricades. Describe procedures to coordinate immediate response to events that might adversely affect the operational safety of the airport (such as interrupted NAVAID service). Explain requirements for and the procedures for the issuance of Notices to Airmen (NOTAMs), notification to FAA required by 14 CFR Part 77 and Part 157 and in the event of affected NAVAIDs. For NOTAMs, identify an individual, and at least one alternate, responsible for issuing and cancelling each specific type of Notice to

Airmen (NOTAM) required. Detail notification methods for police, fire fighting, and medical emergencies. This may include 911, but should also include direct phone numbers of local police departments and nearby hospitals. Identify the E911 address of the airport and the emergency access route via haul roads to the construction site. Require the contractor to have this information available to all workers. The local Poison Control number should be listed. Procedures regarding notification of Airport Operations and/or the ARFF Department of such emergencies should be identified, as applicable. If airport radio communications are identified as a means of emergency notification, include a reference to paragraph 3.10. Differentiate between emergency and nonemergency notification of ARFF personnel, the latter including activities that affect ARFF water supplies and access roads. Identify the primary ARFF contact person and at least one alternate. If notification is to be made through Airport Operations, then detail this procedure. Include a method of confirmation from the ARFF department.

3.15 Inspection Requirements.

Describe in this section inspection requirements to ensure airfield safety compliance. Include a requirement for routine inspections by the resident engineer (RE) or other airport operator's representative and the construction contractors. If the engineering consultants and/or contractors have a Safety Officer who will conduct such inspections, identify this individual. Describe procedures for special inspections, such as those required to reopen areas for aircraft operations. Part 139 requires daily airfield inspections at certificated airports, but these may need to be more frequent when construction is in progress. Discuss the role of such inspections on areas under construction. Include a requirement to immediately remedy any deficiencies, whether caused by negligence, oversight, or project scope change.

3.16 Underground Utilities.

Explain how existing underground utilities will be located and protected. Identify each utility owner and include contact information for each company/agency in the master list. Address emergency response procedures for damaged or disrupted utilities. Include a reference to paragraph 3.14 for notification of utility owners of accidental utility disruption as required.

3.17 Penalties.

Describe in this section specific penalties imposed for noncompliance with airport rules and regulations, including the CSPP: SIDA violations, VPD, and others.

3.18 Special Conditions.

Identify any special conditions that may trigger specific safety mitigation actions outlined in this CSPP: low visibility operations, snow removal, aircraft in distress, aircraft accident, security breach, VPD, and other activities requiring construction suspension/resumption. Include a reference to paragraph 3.10 for compliance with airport safety and security measures and for radio communications as required. Include

a reference to paragraph 3.14 for emergency notification of all involved parties, including police/security, ARFF, and medical services.

3.19 Runway and Taxiway Visual Aids.

Include marking, lighting, signs, and visual NAVAIDS. Detail temporary runway and taxiway marking, lighting, signs, and visual NAVAIDS required for the construction. Discuss existing marking, lighting, signs, and visual NAVAIDS that are temporarily, altered, obliterated, or shut down. Consider non-federal facilities and address requirements for reimbursable agreements necessary for alteration of FAA facilities and for necessary flight checks. Identify temporary TORA signs or runway distance remaining signs if appropriate. Identify required temporary visual NAVAIDS such as REIL or PAPI. Quote from, rather than incorporate by reference, AC 150/5340-1, Standards for Airport Markings; AC 150/5340-18, Standards for Airport Sign Systems; and AC 150/5340-30, as required. Attach drawings to graphically indicate proposed marking, lighting, signs, and visual NAVAIDS.

3.20 Marking and Signs for Access Routes.

Detail plans for marking and signs for vehicle access routes. To the extent possible, signs should be in conformance with the Federal Highway Administration MUTCD and/or State highway specifications, not hand lettered. Detail any modifications to the guidance in the MUTCD necessary to meet frangibility/height requirements.

3.21 Hazard Marking and Lighting.

Specify all marking and lighting equipment, including when and where each type of device is to be used. Specify maximum gaps between barricades and the maximum spacing of hazard lighting. Identify one individual and at least one alternate responsible for maintenance of hazard marking and lighting equipment in the master telephone list. Include a reference to paragraph 3.14. Attach drawings to graphically indicate the placement of hazard marking and lighting equipment.

3.22 Work Zone Lighting for Nighttime Construction.

If work is to be conducted at night, specify all lighting equipment, including when and where each type of device is to be used. Indicate the direction lights are to be aimed and any directions that aiming of lights is prohibited. Specify any shielding necessary in instances where aiming is not sufficient to prevent interference with air traffic control and aircraft operations. Attach drawings to graphically indicate the placement and aiming of lighting equipment. Where the plan only indicates directions that aiming of lights is prohibited, the placement and positioning of portable lights must be proposed by the Contractor and approved by the airport operator's representative each time lights are relocated or repositioned.

3.23 Protection of Runway and Taxiway Safety Areas.

This section should focus exclusively on procedures for protecting all safety areas, including those altered by the construction: methods of demarcation, limit of access, movement within safety areas, stockpiling and trenching restrictions, and so on. Reference AC 150/5300-13, as required. Include a reference to paragraph 3.10 for procedures regarding vehicle and personnel movement within safety areas. Include a reference to paragraph 3.10 for material stockpile restrictions as required. Detail requirements for trenching, excavations, and backfill. Include a reference to paragraph 3.21 for hazard marking and lighting devices used to identify open excavations as required. If runway and taxiway closures are proposed to protect safety areas, or if temporary displaced thresholds and/or revised declared distances are used to provide the required Runway Safety Area, include a reference to paragraphs 3.14 and 3.19. Detail procedures for protecting the runway OFZ, runway OFA, taxiway OFA and runway approach surfaces including those altered by the construction: methods of demarcation, limit of cranes, storage of equipment, and so on. Quote from, rather than incorporate by reference, AC 150/5300-13, as required. Include a reference to paragraph 3.24 for height (i.e., crane) restrictions as required. One way to address the height of equipment that will move during the project is to establish a three-dimensional “box” within which equipment will be confined that can be studied as a single object. Attach drawings to graphically indicate the safety area, OFZ, and OFA boundaries.

3.24 Other Limitations on Construction.

This section should describe what limitations must be applied to each area of work and when each limitation will be applied: limitations due to airport operations, height (i.e., crane) restrictions, areas which cannot be worked at simultaneously, day/night work restrictions, winter construction, and other limitations. Include a reference to paragraph 3.7 for project phasing requirements based on construction limitations as required.

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APPENDIX A. RELATED READING MATERIAL

Obtain the latest version of the following free publications from the FAA on its Web site at <http://www.faa.gov/airports/>.

Table A-1. FAA Publications

Number	Title and Description
<u>AC 150/5200-28</u>	<i>Notices to Airmen (NOTAMs) for Airport Operators</i> Guidance for using the NOTAM System in airport reporting.
<u>AC 150/5200-30</u>	<i>Airport Field Condition Assessments and Winter Operations Safety</i> Guidance for airport owners/operators on the development of an acceptable airport snow and ice control program and on appropriate field condition reporting procedures.
<u>AC 150/5200-33</u>	<i>Hazardous Wildlife Attractants On or Near Airports</i> Guidance on locating certain land uses that might attract hazardous wildlife to public-use airports.
<u>AC 150/5210-5</u>	<i>Painting, Marking, and Lighting of Vehicles Used on an Airport</i> Guidance, specifications, and standards for painting, marking, and lighting vehicles operating in the airport air operations areas.
<u>AC 150/5210-20</u>	<i>Ground Vehicle Operations to include Taxiing or Towing an Aircraft on Airports</i> Guidance to airport operators on developing ground vehicle operation training programs.
<u>AC 150/5300-13</u>	<i>Airport Design</i> FAA standards and recommendations for airport design. Establishes approach visibility minimums as an airport design parameter, and contains the Object Free area and the obstacle free-zone criteria.
<u>AC 150/5210-24</u>	<i>Airport Foreign Object Debris (FOD) Management</i> Guidance for developing and managing an airport foreign object debris (FOD) program

Number	Title and Description
<u>AC 150/5320-15</u>	<p><i>Management of Airport Industrial Waste</i></p> <p>Basic information on the characteristics, management, and regulations of industrial wastes generated at airports. Guidance for developing a Storm Water Pollution Prevention Plan (SWPPP) that applies best management practices to eliminate, prevent, or reduce pollutants in storm water runoff with particular airport industrial activities.</p>
<u>AC 150/5340-1</u>	<p><i>Standards for Airport Markings</i></p> <p>FAA standards for the siting and installation of signs on airport runways and taxiways.</p>
<u>AC 150/5340-18</u>	<p><i>Standards for Airport Sign Systems</i></p> <p>FAA standards for the siting and installation of signs on airport runways and taxiways.</p>
<u>AC 150/5345-28</u>	<p><i>Precision Approach Path Indicator (PAPI) Systems</i></p> <p>FAA standards for PAPI systems, which provide pilots with visual glide slope guidance during approach for landing.</p>
<u>AC 150/5340-30</u>	<p><i>Design and Installation Details for Airport Visual Aids</i></p> <p>Guidance and recommendations on the installation of airport visual aids.</p>
<u>AC 150/5345-39</u>	<p><i>Specification for L-853, Runway and Taxiway Retroreflective Markers</i></p>
<u>AC 150/5345-44</u>	<p><i>Specification for Runway and Taxiway Signs</i></p> <p>FAA specifications for unlighted and lighted signs for taxiways and runways.</p>
<u>AC 150/5345-53</u>	<p><i>Airport Lighting Equipment Certification Program</i></p> <p>Details on the Airport Lighting Equipment Certification Program (ALECP).</p>
<u>AC 150/5345-50</u>	<p><i>Specification for Portable Runway and Taxiway Lights</i></p> <p>FAA standards for portable runway and taxiway lights and runway end identifier lights for temporary use to permit continued aircraft operations while all or part of a runway lighting system is inoperative.</p>
<u>AC 150/5345-55</u>	<p><i>Specification for L-893, Lighted Visual Aid to Indicate Temporary Runway Closure</i></p>

Number	Title and Description
<u>AC 150/5370-10</u>	<i>Standards for Specifying Construction of Airports</i> Standards for construction of airports, including earthwork, drainage, paving, turfing, lighting, and incidental construction.
<u>AC 150/5370-12</u>	<i>Quality Management for Federally Funded Airport Construction Projects</i>
EB 93	<i>Guidance for the Assembly and Installation of Temporary Orange Construction Signs</i>
FAA Order 5200.11	<u>FAA Airports (ARP) Safety Management System (SMS)</u> Basics for implementing SMS within ARP. Includes roles and responsibilities of ARP management and staff as well as other FAA lines of business that contribute to the ARP SMS.
FAA Certalert 98-05	<i>Grasses Attractive to Hazardous Wildlife</i> Guidance on grass management and seed selection.
FAA Form 7460-1	<u>Notice of Proposed Construction or Alteration</u>
FAA Form 7480-1	<u>Notice of Landing Area Proposal</u>
FAA Form 6000.26	National NAS Strategic Interruption Service Level Agreement, Strategic Events Coordination, Airport Sponsor Form

Obtain the latest version of the following free publications from the Electronic Code of Federal Regulations at <http://www.ecfr.gov/>.

Table A-2. Code of Federal Regulation

Number	Title
Title 14 CFR Part 77	Safe, Efficient Use and Preservation of the Navigable Airspace
Title 14 CFR Part 139	Certification of Airports
Title 49 CFR Part 1542	Airport Security

Obtain the latest version of the Manual on Uniform Traffic Control Devices from the Federal Highway Administration at <http://mutcd.fhwa.dot.gov/>.

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APPENDIX B. TERMS AND ACRONYMS**Table B-1. Terms and Acronyms**

Term	Definition
Form 7460-1	Notice of Proposed Construction or Alteration. For on-airport projects, the form submitted to the FAA regional or airports division office as formal written notification of any kind of construction or alteration of objects that affect navigable airspace, as defined in 14 CFR Part 77, <i>Safe, Efficient Use, and Preservation of the Navigable Airspace</i> . (See guidance available on the FAA web site at https://oeaaa.faa.gov .) The form may be downloaded at http://www.faa.gov/airports/resources/forms/ , or filed electronically at: https://oeaaa.faa.gov .
Form 7480-1	Notice of Landing Area Proposal. Form submitted to the FAA Airports Regional Division Office or Airports District Office as formal written notification whenever a project without an airport layout plan on file with the FAA involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; or the deactivation or abandoning of an entire airport. The form may be downloaded at http://www.faa.gov/airports/resources/forms/ .
Form 6000-26	Airport Sponsor Strategic Event Submission Form
AC	Advisory Circular
ACSI	Airport Certification Safety Inspector
ADG	Airplane Design Group
AIP	Airport Improvement Program
ALECP	Airport Lighting Equipment Certification Program
ANG	Air National Guard
AOA	Air Operations Area, as defined in 14 CFR Part 107. Means a portion of an airport, specified in the airport security program, in which security measures are carried out. This area includes aircraft movement areas, aircraft parking areas, loading ramps, and safety areas, and any adjacent areas (such as general aviation areas) that are not separated by adequate security systems, measures, or procedures. This area does not include the secured area of the airport terminal building.
ARFF	Aircraft Rescue and Fire Fighting
ARP	FAA Office of Airports
ASDA	Accelerate-Stop Distance Available
AT	Air Traffic
ATCT	Airport Traffic Control Tower
ATIS	Automatic Terminal Information Service
ATO	Air Traffic Organization
Certificated Airport	An airport that has been issued an Airport Operating Certificate by the FAA under

Term	Definition
	the authority of 14 CFR Part 139, <i>Certification of Airports</i> .
CFR	Code of Federal Regulations
Construction	The presence of construction-related personnel, equipment, and materials in any location that could infringe upon the movement of aircraft.
CSPP	Construction Safety and Phasing Plan. The overall plan for safety and phasing of a construction project developed by the airport operator, or developed by the airport operator's consultant and approved by the airport operator. It is included in the invitation for bids and becomes part of the project specifications.
CTAF	Common Traffic Advisory Frequency
Displaced Threshold	A threshold that is located at a point on the runway other than the designated beginning of the runway. The portion of pavement behind a displaced threshold is available for takeoffs in either direction or landing from the opposite direction.
DOT	Department of Transportation
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FOD	Foreign Object Debris/Damage
FSS	Flight Service Station
GA	General Aviation
HAZMAT	Hazardous Materials
HMA	Hot Mix Asphalt
IAP	Instrument Approach Procedures
IFR	Instrument Flight Rules
ILS	Instrument Landing System
LDA	Landing Distance Available
LOC	Localizer antenna array
Movement Area	The runways, taxiways, and other areas of an airport that are used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading aprons and aircraft parking areas (reference 14 CFR Part 139).
MSDS	Material Safety Data Sheet
MUTCD	Manual on Uniform Traffic Control Devices
NAVAID	Navigation Aid
NAVAID Critical Area	An area of defined shape and size associated with a NAVAID that must remain clear and graded to avoid interference with the electronic signal.
Non-Movement Area	The area inside the airport security fence exclusive of the Movement Area. It is important to note that the non-movement area includes pavement traversed by aircraft.

Term	Definition
NOTAM	Notices to Airmen
Obstruction	Any object/obstacle exceeding the obstruction standards specified by 14 CFR Part 77, subpart C.
OCC	Operations Control Center
OE / AAA	Obstruction Evaluation / Airport Airspace Analysis
OFA	Object Free Area. An area on the ground centered on the runway, taxiway, or taxi lane centerline provided to enhance safety of aircraft operations by having the area free of objects except for those objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes. (See <u>AC 150/5300-13</u> for additional guidance on OFA standards and wingtip clearance criteria.)
OFZ	Obstacle Free Zone. The airspace below 150 ft (45 m) above the established airport elevation and along the runway and extended runway centerline that is required to be clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance protection for aircraft landing or taking off from the runway and for missed approaches. The OFZ is subdivided as follows: Runway OFZ, Inner Approach OFZ, Inner Transitional OFZ, and Precision OFZ. Refer to <u>AC 150/5300-13</u> for guidance on OFZ.
OSHA	Occupational Safety and Health Administration
OTS	Out of Service
P&R	Planning and Requirements Group
NPI	NAS Planning & Integration
PAPI	Precision Approach Path Indicator
PFC	Passenger Facility Charge
PLASI	Pulse Light Approach Slope Indicator
Project Proposal Summary	A clear and concise description of the proposed project or change that is the object of Safety Risk Management.
RA	Reimbursable Agreement
RE	Resident Engineer
REIL	Runway End Identifier Lights
RNAV	Area Navigation
ROFA	Runway Object Free Area
RSA	Runway Safety Area. A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway, in accordance with <u>AC 150/5300-13</u> .
SDS	Safety Data Sheet
SIDA	Security Identification Display Area
SMS	Safety Management System

Term	Definition
SPCD	Safety Plan Compliance Document. Details developed and submitted by a contractor to the airport operator for approval providing details on how the performance of a construction project will comply with the CSPP.
SRM	Safety Risk Management
SSC	System Support Center
Taxiway Safety Area	A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway, in accordance with <u>AC 150/5300-13</u> .
TDG	Taxiway Design Group
Temporary	Any condition that is not intended to be permanent.
Temporary Runway End	The beginning of that portion of the runway available for landing and taking off in one direction, and for landing in the other direction. Note the difference from a displaced threshold.
Threshold	The beginning of that portion of the runway available for landing. In some instances, the landing threshold may be displaced.
TODA	Takeoff Distance Available
TOFA	Taxiway Object Free Area
TORA	Takeoff Run Available. The length of the runway less any length of runway unavailable and/or unsuitable for takeoff run computations. See <u>AC 150/5300-13</u> for guidance on declared distances.
TSA	Taxiway Safety Area, or Transportation Security Administration
UNICOM	A radio communications system of a type used at small airports.
VASI	Visual Approach Slope Indicator
VGSI	Visual Glide Slope Indicator. A device that provides a visual glide slope indicator to landing pilots. These systems include precision approach path indicator (PAPI), visual approach slope indicator (VASI), and pulse light approach slope indicator (PLASI).
VFR	Visual Flight Rules
VOR	Very High Frequency Omnidirectional Radio Range
VPD	Vehicle / Pedestrian Deviation

APPENDIX C. SAFETY AND PHASING PLAN CHECKLIST

This appendix is keyed to Chapter 2. In the electronic version of this AC, clicking on the paragraph designation in the Reference column will access the applicable paragraph. There may be instances where the CSPP requires provisions that are not covered by the list in this appendix.

This checklist is intended as an aid, not a required submittal.

Table C-1. CSPP Checklist

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
General Considerations					
Requirements for predesign, prebid, and preconstruction conferences to introduce the subject of airport operational safety during construction are specified.	<u>2.5</u>				
Operational safety is a standing agenda item for construction progress meetings.	<u>2.5</u>				
Scheduling of the construction phases is properly addressed.	<u>2.6</u>				
Any formal agreements are established.	<u>2.5.3</u>				
Areas and Operations Affected by Construction Activity					
Drawings showing affected areas are included.	<u>2.7.1</u>				
Closed or partially closed runways, taxiways, and aprons are depicted on drawings.	<u>2.7.1.1</u>				
Access routes used by ARFF vehicles affected by the project are addressed.	<u>2.7.1.2</u>				
Access routes used by airport and airline support vehicles affected by the project are addressed.	<u>2.7.1.3</u>				
Underground utilities, including water supplies for firefighting and drainage.	<u>2.7.1.4</u>				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
Approach/departure surfaces affected by heights of temporary objects are addressed.	<u>2.7.1.5</u>				
Construction areas, storage areas, and access routes near runways, taxiways, aprons, or helipads are properly depicted on drawings.	<u>2.7.1</u>				
Temporary changes to taxi operations are addressed.	<u>2.7.2.1</u>				
Detours for ARFF and other airport vehicles are identified.	<u>2.7.2.2</u>				
Maintenance of essential utilities and underground infrastructure is addressed.	<u>2.7.2.3</u>				
Temporary changes to air traffic control procedures are addressed.	<u>2.7.2.4</u>				
NAVAIDs					
Critical areas for NAVAIDs are depicted on drawings.	<u>2.8</u>				
Effects of construction activity on the performance of NAVAIDS, including unanticipated power outages, are addressed.	<u>2.8</u>				
Protection of NAVAID facilities is addressed.	<u>2.8</u>				
The required distance and direction from each NAVAID to any construction activity is depicted on drawings.	<u>2.8</u>				
Procedures for coordination with FAA ATO/Technical Operations, including identification of points of contact, are included.	<u>2.8, 2.13.1, 2.13.5.3.1, 2.18.1</u>				
Contractor Access					
The CSPP addresses areas to which contractor will have access and how	<u>2.9</u>				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
the areas will be accessed.					
The application of 49 CFR Part 1542 Airport Security, where appropriate, is addressed.	<u>2.9</u>				
The location of stockpiled construction materials is depicted on drawings.	<u>2.9.1</u>				
The requirement for stockpiles in the ROFA to be approved by FAA is included.	<u>2.9.1</u>				
Requirements for proper stockpiling of materials are included.	<u>2.9.1</u>				
Construction site parking is addressed.	<u>2.9.2.1</u>				
Construction equipment parking is addressed.	<u>2.9.2.2</u>				
Access and haul roads are addressed.	<u>2.9.2.3</u>				
A requirement for marking and lighting of vehicles to comply with <u>AC 150/5210-5, Painting, Marking and Lighting of Vehicles Used on an Airport</u> , is included.	<u>2.9.2.4</u>				
Proper vehicle operations, including requirements for escorts, are described.	<u>2.9.2.5, 2.9.2.6</u>				
Training requirements for vehicle drivers are addressed.	<u>2.9.2.7</u>				
Two-way radio communications procedures are described.	<u>2.9.2.9</u>				
Maintenance of the secured area of the airport is addressed.	<u>2.9.2.10</u>				
Wildlife Management					
The airport operator's wildlife management procedures are addressed.	<u>2.10</u>				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
Foreign Object Debris Management					
The airport operator’s FOD management procedures are addressed.	<u>2.11</u>				
Hazardous Materials Management					
The airport operator’s hazardous materials management procedures are addressed.	<u>2.12</u>				
Notification of Construction Activities					
Procedures for the immediate notification of airport user and local FAA of any conditions adversely affecting the operational safety of the airport are detailed.	<u>2.13</u>				
Maintenance of a list by the airport operator of the responsible representatives/points of contact for all involved parties and procedures for contacting them 24 hours a day, seven days a week is specified.	<u>2.13.1</u>				
A list of local ATO/Technical Operations personnel is included.	<u>2.13.1</u>				
A list of ATCT managers on duty is included.	<u>2.13.1</u>				
A list of authorized representatives to the OCC is included.	<u>2.13.2</u>				
Procedures for coordinating, issuing, maintaining and cancelling by the airport operator of NOTAMS about airport conditions resulting from construction are included.	<u>2.8, 2.13.2, 2.18.3.3.9</u>				
Provision of information on closed or hazardous conditions on airport movement areas by the airport operator to the OCC is specified.	<u>2.13.2</u>				
Emergency notification procedures for medical, fire fighting, and police	<u>2.13.3</u>				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
response are addressed.					
Coordination with ARFF personnel for non-emergency issues is addressed.	<u>2.13.4</u>				
Notification to the FAA under 14 CFR parts 77 and 157 is addressed.	<u>2.13.5</u>				
Reimbursable agreements for flight checks and/or design and construction for FAA owned NAVAIDs are addressed.	<u>2.13.5.3.2</u>				
Inspection Requirements					
Daily and interim inspections by both the airport operator and contractor are specified.	<u>2.14.1, 2.14.2</u>				
Final inspections at certificated airports are specified when required.	<u>2.14.3</u>				
Underground Utilities					
Procedures for protecting existing underground facilities in excavation areas are described.	<u>2.15</u>				
Penalties					
Penalty provisions for noncompliance with airport rules and regulations and the safety plans are detailed.	<u>2.16</u>				
Special Conditions					
Any special conditions that affect the operation of the airport or require the activation of any special procedures are addressed.	<u>2.17</u>				
Runway and Taxiway Visual Aids - Marking, Lighting, Signs, and Visual NAVAIDs					
The proper securing of temporary airport markings, lighting, signs, and visual NAVAIDs is addressed.	<u>2.18.1</u>				
Frangibility of airport markings, lighting, signs, and visual NAVAIDs is specified.	<u>2.18.1, 2.18.3, 2.18.4.2, 2.20.2.4</u>				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
The requirement for markings to be in compliance with <u>AC 150/5340-1</u> , <i>Standards for Airport Markings</i> , is specified.	<u>2.18.2</u>				
Detailed specifications for materials and methods for temporary markings are provided.	<u>2.18.2</u>				
The requirement for lighting to conform to <u>AC 150/5340-30</u> , <i>Design and Installation Details for Airport Visual Aids</i> ; <u>AC 150/5345-50</u> , <i>Specification for Portable Runway and Taxiway Lights</i> ; and <u>AC 150/5345-53</u> , <i>Airport Lighting Certification Program</i> , is specified.	<u>2.18.3</u>				
The use of a lighted X is specified where appropriate.	<u>2.18.2.1.2</u> , <u>2.18.3.2</u>				
The requirement for signs to conform to <u>AC 150/5345-44</u> , <i>Specification for Runway and Taxiway Signs</i> ; <u>AC 150/5340-18</u> , <i>Standards for Airport Sign Systems</i> ; and <u>AC 150/5345-53</u> , <i>Airport Lighting Certification Program</i> , is specified.	<u>2.18.4</u>				
Marking and Signs For Access Routes					
The CSPP specifies that pavement markings and signs intended for construction personnel should conform to <u>AC 150/5340-18</u> and, to the extent practicable, with the MUTCD and/or State highway specifications.	<u>2.18.4.2</u>				
Hazard Marking and Lighting					
Prominent, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles are specified.	<u>2.20.1</u>				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
Hazard marking and lighting are specified to identify open manholes, small areas under repair, stockpiled material, and waste areas.	<u>2.20.1</u>				
The CSPP considers less obvious construction-related hazards.	<u>2.20.1</u>				
Equipment that poses the least danger to aircraft but is sturdy enough to remain in place when subjected to typical winds, prop wash and jet blast is specified.	<u>2.20.2.1</u>				
The spacing of barricades is specified such that a breach is physically prevented barring a deliberate act.	<u>2.20.2.1</u>				
Red lights meeting the luminance requirements of the State Highway Department are specified.	<u>2.20.2.2</u>				
Barricades, temporary markers, and other objects placed and left in areas adjacent to any open runway, taxiway, taxi lane, or apron are specified to be as low as possible to the ground, and no more than 18 inch high.	<u>2.20.2.3</u>				
Barricades are specified to indicate construction locations in which no part of an aircraft may enter.	<u>2.20.2.3</u>				
Highly reflective barriers with lights are specified to barricade taxiways leading to closed runways.	<u>2.20.2.5</u>				
Markings for temporary closures are specified.	<u>2.20.2.5</u>				
The provision of a contractor's representative on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades is specified.	<u>2.20.2.7</u>				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
Work Zone Lighting for Nighttime Construction					
If work is to be conducted at night, the CSPP identifies construction lighting units and their general locations and aiming in relationship to the ATCT and active runways and taxiways.	<u>2.21</u>				
Protection of Runway and Taxiway Safety Areas					
The CSPP clearly states that no construction may occur within a safety area while the associated runway or taxiway is open for aircraft operations.	<u>2.22.1.1,</u> <u>2.22.3.1</u>				
The CSPP specifies that the airport operator coordinates the adjustment of RSA or TSA dimensions with the ATCT and the appropriate FAA Airports Regional or District Office and issues a local NOTAM.	<u>2.22.1.2,</u> <u>2.22.3.2</u>				
Procedures for ensuring adequate distance for protection from blasting operations, if required by operational considerations, are detailed.	<u>2.22.3.3</u>				
The CSPP specifies that open trenches or excavations are not permitted within a safety area while the associated runway or taxiway is open, subject to approved exceptions.	<u>2.22.1.4</u>				
Appropriate covering of excavations in the RSA or TSA that cannot be backfilled before the associated runway or taxiway is open is detailed.	<u>2.22.1.4</u>				
The CSPP includes provisions for prominent marking of open trenches and excavations at the construction site.	<u>2.22.1.4</u>				
Grading and soil erosion control to maintain RSA/TSA standards are	<u>2.22.3.5</u>				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
addressed.					
The CSPP specifies that equipment is to be removed from the ROFA when not in use.	<u>2.22.2</u>				
The CSPP clearly states that no construction may occur within a taxiway safety area while the taxiway is open for aircraft operations.	<u>2.22.3</u>				
Appropriate details are specified for any construction work to be accomplished in a taxiway object free area.	<u>2.22.4</u>				
Measures to ensure that personnel, material, and/or equipment do not penetrate the OFZ or threshold siting surfaces while the runway is open for aircraft operations are included.	<u>2.22.4.3.6</u>				
Provisions for protection of runway approach/departure areas and clearways are included.	<u>2.22.6</u>				
Other Limitations on Construction					
The CSPP prohibits the use of open flame welding or torches unless adequate fire safety precautions are provided and the airport operator has approved their use.	<u>2.23.1.2</u>				
The CSPP prohibits the use of electrical blasting caps on or within 1,000 ft (300 m) of the airport property.	<u>2.23.1.3</u>				

APPENDIX D. CONSTRUCTION PROJECT DAILY SAFETY INSPECTION CHECKLIST

The situations identified below are potentially hazardous conditions that may occur during airport construction projects. Safety area encroachments, unauthorized and improper ground vehicle operations, and unmarked or uncovered holes and trenches near aircraft operating surfaces pose the most prevalent threats to airport operational safety during airport construction projects. The list below is one tool that the airport operator or contractor may use to aid in identifying and correcting potentially hazardous conditions. It should be customized as appropriate for each project including information such as the date, time and name of the person conducting the inspection.

Table D-1. Potentially Hazardous Conditions

Item	Action Required (Describe)	No Action Required (Check)
Excavation adjacent to runways, taxiways, and aprons improperly backfilled.		
Mounds of earth, construction materials, temporary structures, and other obstacles near any open runway, taxiway, or taxi lane; in the related Object Free area and aircraft approach or departure areas/zones; or obstructing any sign or marking.		
Runway resurfacing projects resulting in lips exceeding 3 inch (7.6 cm) from pavement edges and ends.		
Heavy equipment (stationary or mobile) operating or idle near AOA, in runway approaches and departures areas, or in OFZ.		
Equipment or material near NAVAIDs that may degrade or impair radiated signals and/or the monitoring of navigation and visual aids. Unauthorized or improper vehicle operations in localizer or glide slope critical areas, resulting in electronic interference and/or facility shutdown.		
Tall and especially relatively low visibility units (that is, equipment with slim profiles) — cranes, drills, and similar objects — located in critical areas, such as OFZ and		

Item	Action Required (Describe)	No Action Required (Check)
approach zones.		
Improperly positioned or malfunctioning lights or unlighted airport hazards, such as holes or excavations, on any apron, open taxiway, or open taxi lane or in a related safety, approach, or departure area.		
Obstacles, loose pavement, trash, and other debris on or near AOA. Construction debris (gravel, sand, mud, paving materials) on airport pavements may result in aircraft propeller, turbine engine, or tire damage. Also, loose materials may blow about, potentially causing personal injury or equipment damage.		
Inappropriate or poorly maintained fencing during construction intended to deter human and animal intrusions into the AOA. Fencing and other markings that are inadequate to separate construction areas from open AOA create aviation hazards.		
Improper or inadequate marking or lighting of runways (especially thresholds that have been displaced or runways that have been closed) and taxiways that could cause pilot confusion and provide a potential for a runway incursion. Inadequate or improper methods of marking, barricading, and lighting of temporarily closed portions of AOA create aviation hazards.		
Wildlife attractants — such as trash (food scraps not collected from construction personnel activity), grass seeds, tall grass, or standing water — on or near airports.		
Obliterated or faded temporary markings on active operational areas.		
Misleading or malfunctioning obstruction lights. Unlighted or unmarked obstructions in the approach to any open runway pose aviation hazards.		

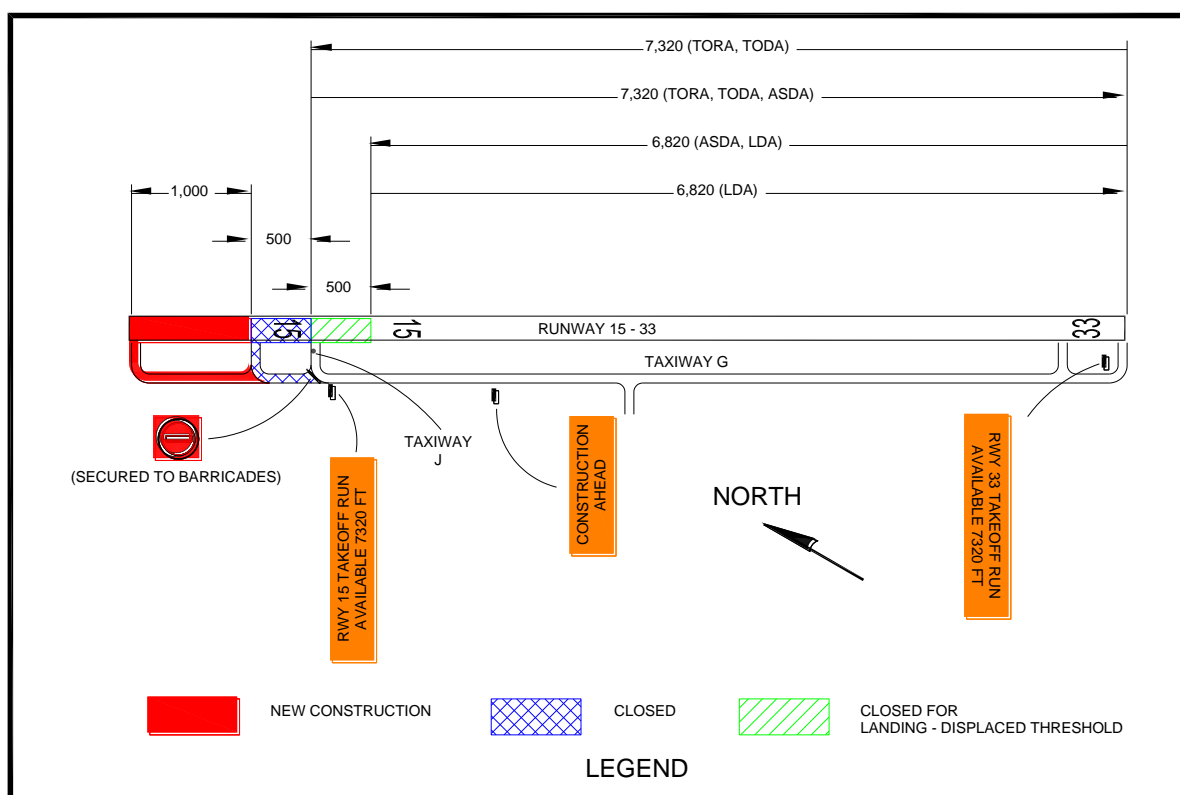
Item	Action Required (Describe)	No Action Required (Check)
Failure to issue, update, or cancel NOTAMs about airport or runway closures or other construction related airport conditions.		
Failure to mark and identify utilities or power cables. Damage to utilities and power cables during construction activity can result in the loss of runway / taxiway lighting; loss of navigation, visual, or approach aids; disruption of weather reporting services; and/or loss of communications.		
Restrictions on ARFF access from fire stations to the runway / taxiway system or airport buildings.		
Lack of radio communications with construction vehicles in airport movement areas.		
Objects, regardless of whether they are marked or flagged, or activities anywhere on or near an airport that could be distracting, confusing, or alarming to pilots during aircraft operations.		
Water, snow, dirt, debris, or other contaminants that temporarily obscure or derogate the visibility of runway/taxiway marking, lighting, and pavement edges. Any condition or factor that obscures or diminishes the visibility of areas under construction.		
Spillage from vehicles (gasoline, diesel fuel, oil) on active pavement areas, such as runways, taxiways, aprons, and airport roadways.		
Failure to maintain drainage system integrity during construction (for example, no temporary drainage provided when working on a drainage system).		

Item	Action Required (Describe)	No Action Required (Check)
Failure to provide for proper electrical lockout and tagging procedures. At larger airports with multiple maintenance shifts/workers, construction contractors should make provisions for coordinating work on circuits.		
Failure to control dust. Consider limiting the amount of area from which the contractor is allowed to strip turf.		
Exposed wiring that creates an electrocution or fire ignition hazard. Identify and secure wiring, and place it in conduit or bury it.		
Site burning, which can cause possible obscuration.		
Construction work taking place outside of designated work areas and out of phase.		

APPENDIX E. SAMPLE OPERATIONAL EFFECTS TABLE**E.1 Project Description.**

Runway 15-33 is currently 7820 feet long, with a 500 foot stopway on the north end. This project will remove the stopway and extend the runway 1000 feet to the north and 500 feet to the south. Finally, the existing portion of the runway will be repaved. The runway 33 glide slope will be relocated. The new runway 33 localizer has already been installed by FAA Technical Operations and only needs to be switched on. Runway 15 is currently served only by a localizer, which will remain in operation as it will be beyond the future RSA. Appropriate NOTAMS will be issued throughout the project.

- E.1.1 During Phase I, the runway 15 threshold will be displaced 1000 feet to keep construction equipment below the approach surface. The start of runway 15 takeoff and the departure end of runway 33 will also be moved 500 feet to protect workers from jet blast. Declared distances for runway 33 will be adjusted to provide the required RSA and applicable departure surface. Excavation near Taxiway G will require its ADG to be reduced from IV to III. See [Figure E-1](#).

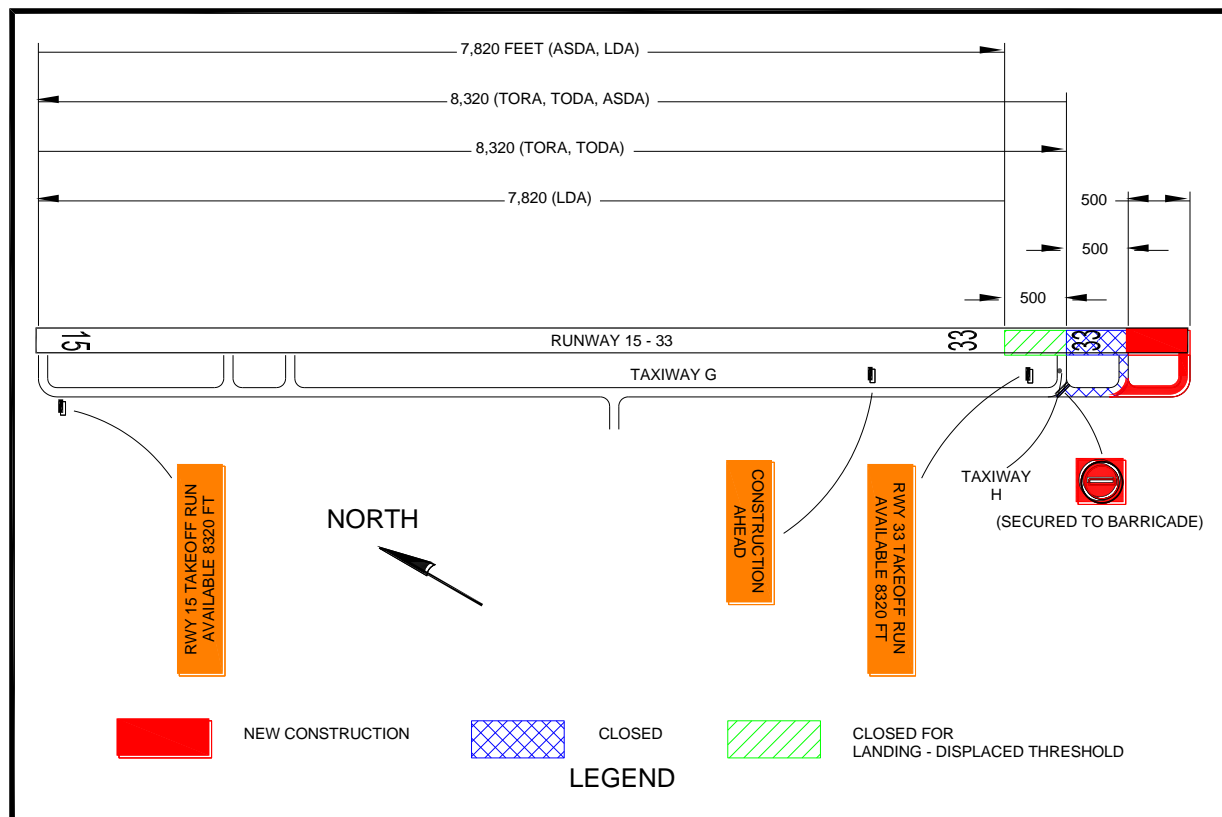
Figure E-1. Phase I Example

Note 1: Where hold signs are installed on both sides of a taxiway, install the TORA sign on the left side of the taxiway before the final turn to the runway intersection.

Note 2: Based on the declared distances for Runway 33 departures, the maximum equipment height in the construction area is 12.5 feet ($500/40 = 12.5$).

- E.2 During Phase II, the runway 33 threshold will be displaced 1000 feet to keep construction equipment below the approach surface. The start of runway 33 takeoff and the departure end of runway 15 will also be moved 500 feet to protect workers from jet blast. Declared distances for runway 15 will be adjusted to provide the required RSA and applicable departure surface. See Figure E-2.

Figure E-2. Phase II Example



Note 1: Where hold signs are installed on both sides of a taxiway, install the TORA sign on the left side of the taxiway before the final turn to the runway intersection.

Note 2: Based on the declared distances for Runway 15 departures, the maximum equipment height in the construction area is 12.5 feet ($500/40 = 12.5$).

- E.3 During Phase III, the existing portion of the runway will be repaved with Hot Mix Asphalt (HMA) and the runway 33 glide slope will be relocated. Construction will be accomplished between the hours of 8:00 pm and 5:00 am, during which the runway will be closed to operations.

Figure E-3. Phase III Example

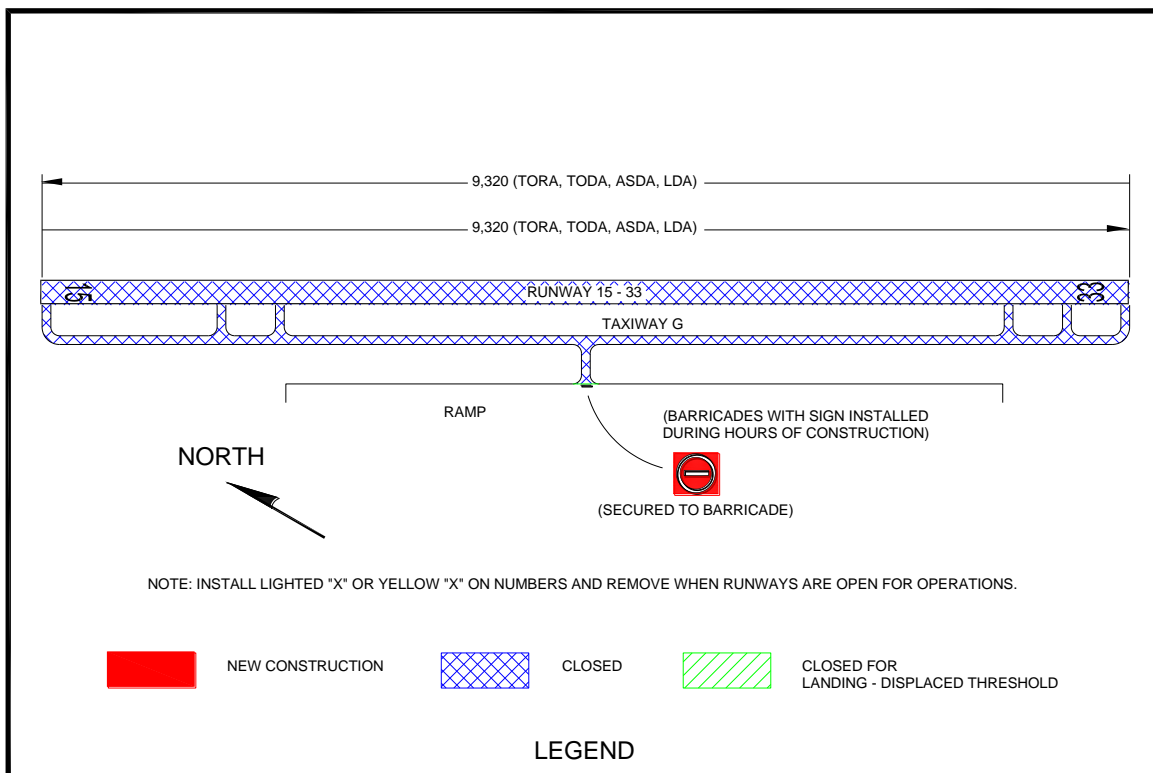


Table E-1. Operational Effects Table

Project	Runway 15-33 Extension and Repaving			
Phase	Normal (Existing)	Phase I: Extend Runway 15 End	Phase II: Extend Runway 33 End	Phase III: Repave Runway
Scope of Work	N/A	Extend Runway 15-33 1,000 ft on north end with Hot Mix Asphaltic Concrete (HMA).	Extend Runway 15-33 500 ft on south end with Hot Mix Asphaltic Concrete (HMA).	Repave existing runway with HMA Relocate Runway 33 Glide Slope
Effects of Construction Operations	N/A	Existing North 500 ft closed	Existing South 500 ft closed	Runway closed between 8:00 pm and 5:00 am Edge lighting out of service
Construction Phase	N/A	Phase I (Anticipated)	Phase II (Anticipated)	Phase III (Anticipated)
Runway 15 Average Aircraft Operations	Carrier: 52 /day GA: 26 /day Military: 11 /day	Carrier: 40 /day GA: 26 /day Military: 0 /day	Carrier: 45 /day GA: 26 /day Military: 5 /day	Carrier: 45 / day GA: 20 / day Military: 0 /day
Runway 33 Average Aircraft Operations	Carrier: 40 /day GA: 18 /day Military: 10 /day	Carrier: 30 /day GA: 18 /day Military: 0 /day	Carrier: 25 /day GA: 18 /day Military: 5 /day	Carrier: 20 /day GA: 5 /day Military: 0 /day
Runway 15-33 Aircraft Category	C-IV	C-IV	C-IV	C-IV
Runway 15 Approach Visibility Minimums	1 mile	1 mile	1 mile	1 mile
Runway 33 Approach Visibility Minimums	$\frac{3}{4}$ mile	$\frac{3}{4}$ mile	$\frac{3}{4}$ mile	1 mile

Note: Proper coordination with Flight Procedures group is necessary to maintain instrument approach procedures during construction.

Project		Runway 15-33 Extension and Repaving			
Phase		Normal (Existing)	Phase I: Extend Runway 15 End	Phase II: Extend Runway 33 End	Phase III: Repave Runway
Runway 15 Declared Distances	TORA	7,820	7,320	8,320	9,320
	TODA	7,820	7,320	8,320	9,320
	ASDA	7,820	7,320	7,820	9,320
	LDA	7,820	6,820	7,820	9,320
Runway 33 Declared Distances	TORA	7,820	7,320	8,320	9,320
	TODA	7,820	7,320	8,320	9,320
	ASDA	8,320	6,820	8,320	9,320
	LDA	7,820	6,820	7,820	9,320
Runway 15 Approach Procedures		LOC only	LOC only	LOC only	LOC only
		RNAV	RNAV	RNAV	RNAV
		VOR	VOR	VOR	VOR
Runway 33 Approach Procedures		ILS	ILS	ILS	LOC only
		RNAV	RNAV	RNAV	RNAV
		VOR	VOR	VOR	VOR
Runway 15 NAVAIDs		LOC	LOC	LOC	LOC
Runway 33 NAVAIDs		ILS, MALSR	ILS, MALSR	ILS, MALSR	LOC, MALSR
Taxiway G ADG		IV	III	IV	IV
Taxiway G TDG		4	4	4	4
ATCT (hours open)		24 hours	24 hours	24 hours	0500 - 2000
ARFF Index		D	D	D	D

Project	Runway 15-33 Extension and Repaving			
Phase	Normal (Existing)	Phase I: Extend Runway 15 End	Phase II: Extend Runway 33 End	Phase III: Repave Runway
Special Conditions	Air National Guard (ANG) military operations	All military aircraft relocated to alternate ANG Base	Some large military aircraft relocated to alternate ANG Base	All military aircraft relocated to alternate ANG Base
Information for NOTAMs		Refer above for applicable declared distances. Taxiway G limited to 118 ft wingspan	Refer above for applicable declared distances.	Refer above for applicable declared distances. Airport closed 2000 – 0500. Runway 15 glide slope OTS.

Note: This table is one example. It may be advantageous to develop a separate table for each project phase and/or to address the operational status of the associated NAVAIDs per construction phase.

Complete the following chart for each phase to determine the area that must be protected along the runway and taxiway edges:

Table E-2. Runway and Taxiway Edge Protection

Runway/Taxiway	Aircraft Approach Category* A, B, C, or D	Airplane Design Group* I, II, III, or IV	Safety Area Width in Feet Divided by 2*

*See AC 150/5300-13 to complete the chart for a specific runway/taxiway.

Complete the following chart for each phase to determine the area that must be protected before the runway threshold:

Table E-3. Protection Prior to Runway Threshold

Runway End Number	Airplane Design Group* I, II, III, or IV	Aircraft Approach Category* A, B, C, or D	Minimum Safety Area Prior to the Threshold*	Minimum Distance to Threshold Based on Required Approach Slope*	
				ft	: 1
				ft	: 1
				ft	: 1
				ft	: 1

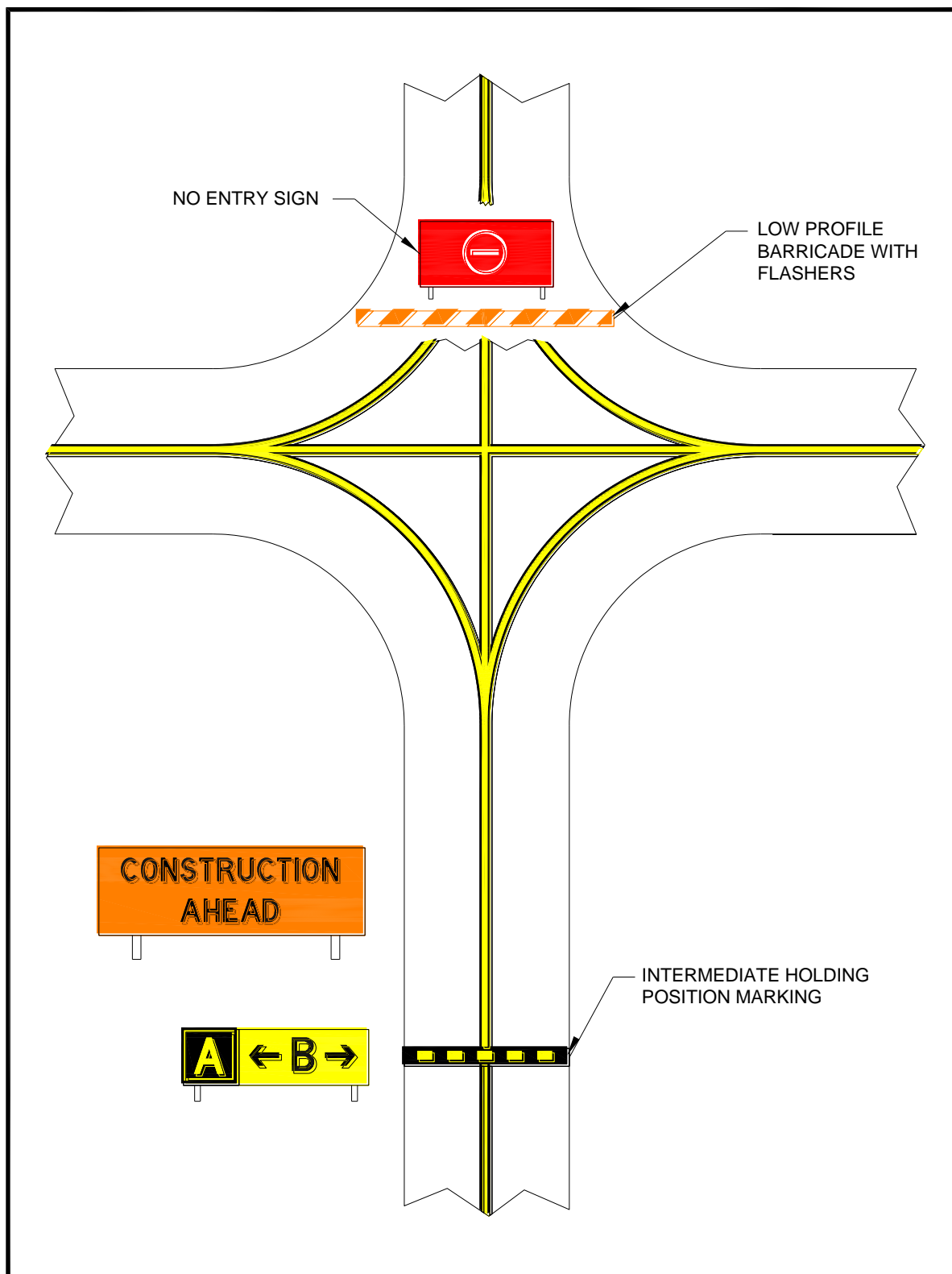
*See AC 150/5300-13 to complete the chart for a specific runway.

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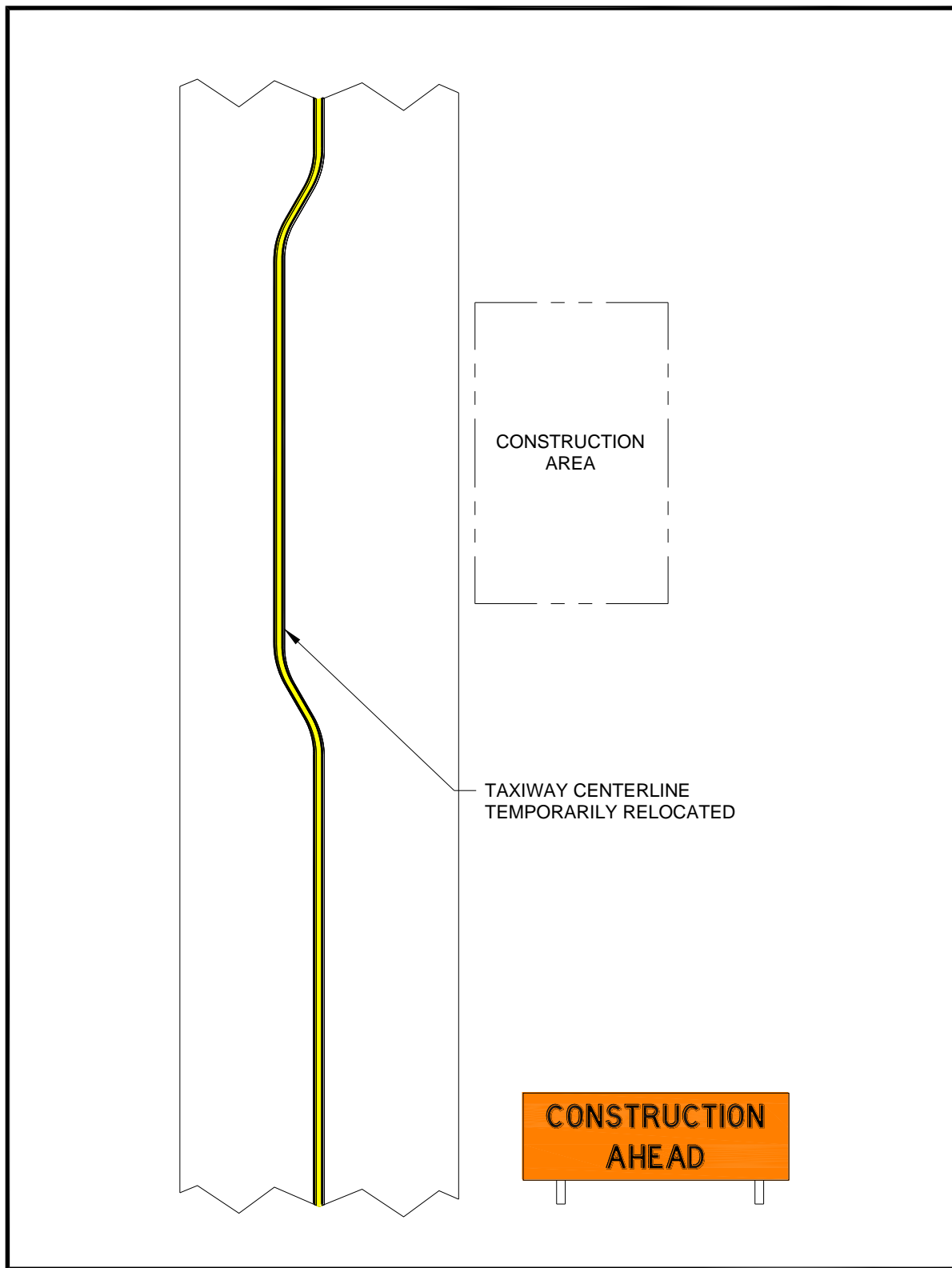
APPENDIX F. ORANGE CONSTRUCTION SIGNS

Figure F-1. Approved Sign Legends



Figure F-2. Orange Construction Sign Example 1

Note: For proper placement of signs, refer to EB 93.

Figure F-3. Orange Construction Sign Example 2

Note: For proper placement of signs, refer to EB 93.

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Advisory Circular Feedback

If you find an error in this AC, have recommendations for improving it, or have suggestions for new items/subjects to be added, you may let us know by (1) mailing this form to Manager, Airport Engineering Division, Federal Aviation Administration ATTN: AAS-100, 800 Independence Avenue SW, Washington DC 20591 or (2) faxing it to the attention of the Office of Airport Safety and Standards at (202) 267-5383.

Subject: AC 150/5370-2G

Date: _____

Please check all appropriate line items:

- ☐ An error (procedural or typographical) has been noted in paragraph _____ on page _____.
- ☐ Recommend paragraph _____ on page _____ be changed as follows:
- _____
- _____
- _____
- ☐ In a future change to this AC, please cover the following subject:
(Briefly describe what you want added.)
- _____
- _____
- _____
- ☐ Other comments:
- _____
- _____
- _____
- ☐ I would like to discuss the above. Please contact me at (phone number, email address).
- _____

Submitted by: _____

Date: _____

REPORT OF SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING EVALUATION

MTAA FOE PASSENGER BOARDING BRIDGE
TOPEKA, KANSAS
TSI PROJECT NO. 20222041.00

WSP USA, INC.
300 Wyandotte Street
Kansas City, Missouri 64105



8248 NW 101st Terrace, #5
Kansas City, Missouri 64153

November 7, 2022



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November 7, 2022

Mr. Sam Stallbaumer, PE
WSP USA, INC.
300 Wyandotte Street
Kansas City, Missouri 64105

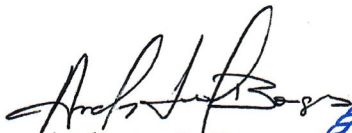
**Re: Report of Subsurface Exploration and
Geotechnical Engineering Evaluation
MTAA FOE Passenger Boarding Bridge
Topeka, Kansas
TSi Project No. 20222041.00**

Dear Mr. Stallbaumer:

TSi Geotechnical, Inc. (TSi) has completed the authorized Subsurface Exploration and Geotechnical Engineering Evaluation for the referenced project and is pleased to submit this report of our findings to WSP USA, Inc. (WSP). The purpose of our work was to assess subsurface conditions a specific test boring location in order to prepare geotechnical recommendations for use in the design and construction of the proposed passenger boarding bridge structure located on the apron near Gate 1 at the Topeka Regional Airport in Topeka, Kansas. This report presents the field and laboratory data and includes our evaluations and recommendations relative to the geotechnical engineering aspects of the project.

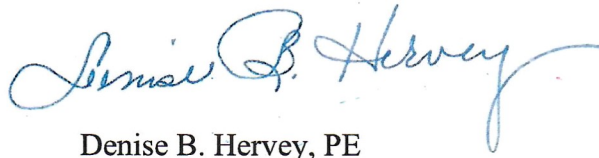
We appreciate the opportunity to assist you with this project. If you have any questions, or if we may be of further service to you, please call us.

Respectfully submitted,
TSI GEOTECHNICAL, INC.


Anderson L. Borges
Project Manager




Niles R. Lal, PE
Geotechnical Department Manager


Denise B. Hervey, PE
Principal

PROFESSIONAL SERVICES SINCE 1989

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SUBSURFACE EXPLORATION AND
GEOTECHNICAL ENGINEERING EVALUATION
MTAA FOE PASSENGER BOARDING BRIDGE
TOPEKA, KANSAS

1.0 SCOPE OF WORK

This report summarizes the results of a subsurface exploration and geotechnical evaluation completed for use in the design and construction of the proposed MATT FOE Passenger Boarding Bridge in Topeka, Kansas. The study was performed in general accordance with TSi's proposal to WSP dated August 24, 2022, and authorized by WSP issuing a Task Order. Based on TSi's understanding of the project, the following items have been identified for inclusion in this geotechnical study report:

- subsurface conditions including material types at the boring location;
- laboratory test results for soil samples;
- the influence of groundwater on design and construction;
- recommendations for shallow foundations;
- recommendations for use in the design of drilled shaft foundations under static loading, including LPILE parameters;
- settlement estimates for shallow and deep foundations based on the general character of the soil and the anticipated structural loads;
- recommendations for fill materials, placement, and compaction; and
- recommendations for engineering observation and testing during construction.

2.0 PROJECT AND SITE DESCRIPTIONS

The following understanding of the project is based on information provided by WSP. We understand the project includes construction of shallow or deep foundations for a passenger boarding bridge structure with a corridor 16.5 feet wide and 8.4 feet high. Structural details have not been finalized at this time, and we anticipate that the maximum loads for individual columns, and bearing walls, will be about 102 kips and 6.6 kips per linear foot (kips/ft), respectively. We anticipate the site grading will be limited to no more than 3 feet of cut or fill. The design structure elevation is assumed to be near the existing grades.

The existing project area is an apron with a concrete surface area located on near Gate 1 at the Topeka Regional Airport in Topeka, Kansas. The general location of the project site is shown on the Vicinity Map, Figure 1 in Appendix A. General site features and the location of the test boring performed for this study are provided on the Site and Boring Location Plan, Figure 2 in Appendix A.

3.0 FIELD EXPLORATION AND LABORATORY TESTING

3.1 FIELD EXPLORATION

On September 14, 2022, TSi conducted a subsurface exploration at the site of the proposed MATT FOE Passenger Boarding Bridge. The field exploration consisted of completing one (1) boring designated B-1. The boring was drilled by with CME-550 ATV drill rig using flight augers and an auto SPT hammer. The boring location was selected by WSP, and marked in the field by TSi. The boring was located by using a site plan and measuring from site physical features and handheld GPS device. Ground surface elevation was estimated from Google Earth and provided plans. The approximate location of the boring is indicated on the Site and Boring Location Plan, Figure 2.

A geotechnical specialist from TSi observed drilling and sampling procedures for the boring that was drilled. Split-spoon sample was recovered using a 2-inch outside-diameter, split-barrel sampler, driven by an automatic hammer, in accordance with ASTM D 1586. The hammer efficiency is 89.9 %. Shelby tube samples were obtained in accordance with ASTM D 1587. The split-spoon sample was placed in a plastic bag for later testing in the laboratory. Shelby tube samples were preserved by sealing the entire sample in the tube. A bulk sample was recovered at the boring and was sealed in 5-gallon buckets. The sampling sequence for each boring is summarized on the Logs of Boring in Appendix B of this report.

The results of the field tests and measurements were recorded on field logs and appropriate data sheets. Those data sheets and logs contain information concerning the boring methods, samples attempted and recovered, indications of the presence of various subsurface materials, and the observation of groundwater. The field logs and data sheets contain the geotechnical specialist's interpretations of the conditions between samples, based on the performance of the drilling equipment and the cuttings brought to the surface by the drilling tools.

3.2 LABORATORY TESTING

A laboratory testing program was conducted by TSi to determine selected engineering properties of the obtained soil samples. The results of the individual tests are presented on the Logs of Boring in Appendix B and in the Laboratory Test Reports in Appendix C. The following laboratory tests were performed on the samples recovered from the borings in general accordance with the applicable ASTM standards:

- visual descriptions by color and texture of each sample;
- natural moisture content of soil samples;
- unconfined compression strength of soil;
- unit weight on selected cohesive samples; and
- Atterberg limit tests.
- Modified Proctor moisture-density relationship;
- California Bearing Ratio;

Data and observations from laboratory tests were recorded on laboratory data sheets during the course of the testing program. The log represent considered interpretation of the field and laboratory data. The analyses and conclusions contained in this report are based on field and laboratory test results and on the interpretations of the subsurface conditions as reported on the log. Only data pertinent to the objectives of this report have been included on the log; therefore, this log should not be used for other purposes.

4.0 SUBSURFACE CONDITIONS

Details of the subsurface conditions encountered at the test boring is presented on the Log of Boring in Appendix B. The general subsurface conditions encountered and their pertinent engineering characteristics are described in the following paragraphs. Conditions represented by the boring should be considered applicable only at that exploration location on the date shown; the reported conditions may be different at other locations or at other times.

4.1 GENERAL GEOLOGY

Based on the United States Geological Survey (USGS) and the Kansas Geological Survey (KGS) databases, the site lies in the Quaternary System geologic formation.

The Quaternary System in this location typically consists of deposits of glacial drift soils overlying residual soils that have been formed by weathering of the underlying bedrock. The glacial drift typically consists of lean clays, fat clays with various amounts of sand, whereas the residual soils are usually composed of lean and fat clays, frequently with remnant particles of weathered bedrock.

4.2 GENERALIZED SUBSURFACE PROFILE

The generalized subsurface profile encountered at the boring location consists of approximately 32 inches of Portland Cement Concrete (PCC). Underlying the pavement material, the boring encountered native deposits of medium stiff to stiff lean and fat clays materials.

In general, the native materials consist of lean and fat clays (CL and CH respectively, in accordance with the Unified Soil Classification System) with trace amounts of sand and gravel. The native soils continued to a termination depth of approximately fifteen (15) feet at the boring location where auger refusal on bedrock was encountered. No further data or sampling was collected for Boring B-1 below the auger refusal depth. Standard penetration test (N) values in the native material ranged from 16 blow per foot (bpf) to 50 blows over zero inch. Moisture contents within the native material ranged from 22% to 27%. Atterberg limit tests resulted in liquid limits (LL) ranging from 42 to 52, and plasticity indices (PI) varying from 26 to 31. Undrained shear values and densities ranged from 0.34 tons per square foot (tsf) to 1.33 tsf and 97 pounds per cubic foot (pcf) to 103 pcf, respectively.

4.3 GROUNDWATER

Groundwater was not observed in the boring either during drilling or at completion of drilling. The presence or absence of groundwater at a particular location does not necessarily mean that groundwater will be present or absent at that location at other times. Seasonal variations and other unknown considerations could cause fluctuations in water levels and the presence of water in the soils.

5.0 DESIGN RECOMMENDATIONS

5.1 HIGH PLASTIC CLAYS-SWELL POTENTIAL

The support of the foundations and floor slabs directly on the potentially expansive materials is not recommended. It is recommended that where high plasticity clays with liquid limit over 50 or plasticity index over 25 are found at the subgrade levels of the proposed foundations and slab subgrade, they should be overexcavated to a depth of approximately 24 inches below the subgrade level. These materials should be replaced with Low Volume Change (LVC) fill material. LVC fill should consist of approved, well-graded granular materials or low plasticity cohesive soil. Low plasticity cohesive materials used as LVC fill should consist of inorganic clay with a liquid limit less than 45 and a plasticity index between 10 and 25. Granular fill should be well-graded and have a maximum particle size of 1.0 inch.

5.2 SHALLOW FOUNDATIONS

Structures that will not be subjected to substantial lateral loading and overturning moment may be supported by shallow or bearing on the native soils or new structural fill such as crushed limestone placed as outlined in Section 6.4 of this report, *Fill and Backfill Placement*. A net allowable bearing capacity of 2,000 pounds per square foot (psf) may be used to design shallow footings up to 102 kips or 6.6 kips/ft. Fat clay was encountered in the boring and should not be used for the support of the shallow foundations. Where fat clays are encountered at the bearing elevation of shallow foundations, overexcavation and replacement of at least 2 feet with compacted crushed limestone or lean clay should be performed in order to reduce the risk of shrink swell potential of the fat clay. This overexcavation should be made horizontally wider by at least 1 to 2 feet in each direction of the footing bearing surface to allow for proper compaction. Deep foundation system may also be used in lieu of the shallow foundations.

Footings should be constructed at least 30 inches below the exterior finish grade to provide protection against the detrimental effects of seasonal moisture variations and frost penetration. Strip-type footings should be at least 2 feet wide and square footings at least 3.0 feet in dimension, regardless of the applied structural load, in order to provide a bearing area that will account for minor variations in the supporting soil. The design loads will result in some compression of the soils beneath the footings. Based on the general character of the soils encountered in the borings, and if the footing subgrade is over excavated and re-compacted according to Section 6.0 of this report, the maximum anticipated settlement of lightly loaded footings should be no greater than 1 inch. The differential settlements are anticipated to be approximately one-half the total settlements.

5.3 DRILLED PIER FOUNDATIONS

Structures with significant lateral loads may be supported by individual drilled pier foundations or placed on concrete pads supported by drilled piers. Drilled piers may be designed for vertical compression loads using the allowable side friction and end-bearing values presented on LPILE

parameters in Appendix C.

The piers may be designed using friction resistance within the soil material. The upper 3 to 15 feet of soil will provide an allowable side friction capacity of 0.22 kips per square foot (ksf) and a net allowable end-bearing pressure of 3 ksf. Drilled piers bearing on the underlying sound limestone may be designed for a net allowable end-bearing pressure (pressure in excess of the adjacent overburden pressure) of 20 ksf. The limestone bedrock should be cored to a depth of two pier diameters below the pier tip to use this value. A Factor of Safety (FS) of 2.5 has been applied to the side resistance values and a FS of 3.0 has been applied for end-bearing. The side resistance values should be reduced by one third to apply for uplift loading. The length of each pier should be at least four times the diameter and be imbedded one pier diameter into the bearing material to use the full end-bearing value stated.

If end bearing on limestone, the base of the piers should be formed entirely in limestone. Sound, hard limestone should be exposed over the entire base of the pier, and the base should be free of clay seams. Excessively weathered or highly fractured rock encountered at the bearing surface is not suitable for support of the end bearing pier and should be removed. Settlement should be negligible for drill shafts meeting the minimum shaft length requirement and embedded into the sound bedrock. The design of drilled piers to resist lateral loads may be accomplished using the LPILE analysis program. Assuming that the drilled piers are properly installed as discussed herein, total pier settlement should be no greater than 0.5 inch or less.

The base of each pier should be observed by a TSi representative from the ground surface to verify the condition of the limestone bearing surface. The pier base should be augered clean, and any loose or softened material should be removed from the bearing surface.

The pier should be cast the same day it is completed and approved. If groundwater is present, the pier base should continually be pumped as necessary to prevent the accumulation of water. No more than 2 inches of water accumulation should be allowed at the time of concrete placement. Temporary casing will likely be required to advance the drill hole to prevent the hole collapse or inflow of water, along with conventional pumps during concrete placement. The contractor should be prepared to utilize a tremie pipe for concrete placement if groundwater in excess of 2 inches of accumulation occurs with pumping.

5.4 LATERAL EARTH PRESSURES

Lateral earth pressure parameters are provided for the design of below-grade structures such as cast-in-place retaining walls. Structures that are restricted from movement at the top should be designed to resist at-rest earth pressures. Structures that are free to move and deflect at the top may be designed to resist active earth pressures. A horizontal deflection at the top of the structure of approximately 1% of the supported height is typically required to permit active pressure to develop.

Earth pressures are a function of the excavation configuration and the backfill materials. These backfill materials should extend from the wall base at an upward 45 degree angle projection to use these values. The following design parameters are recommended for the stated backfill materials:

TABLE 1.
LATERAL EARTH PRESSURE PARAMETERS

Parameter		Crushed Limestone	Cohesive Soil
At-Rest Equivalent Fluid Pressure	Drained	55 pcf	70 pcf
	Undrained	90 pcf	95 pcf
Active Equivalent Fluid Pressure	Drained	35 pcf	50 pcf
	Undrained	80 pcf	85 pcf
Passive Equivalent Fluid Pressure	Drained	480 pcf	295 pcf
	Undrained	310 pcf	205 pcf
Soil Wet Unit Weight		130 pcf	120 pcf
Angle of Internal Friction		35°	25°
Assumed Surcharge Condition		None	None
Ground Surface Profile		Horizontal	Horizontal

No factor of safety has been applied to the values above.

Undrained values should be used for the calculation of lateral pressures for those portions of the structure that extend below the highest level of anticipated groundwater. This level may be assumed to be the existing ground surface. The values for undrained fluid pressure for active and at-rest conditions include hydrostatic pressures and should be used for design unless these pressures are relieved by gravity drains or sump pumps.

Significant movement would generally be necessary to develop the full values of passive pressures given; typically the passive values stated are reduced by up to one-half for design. The effects of vertical surcharge loads or sloping ground behind the structure are not included for the stated fluid pressures. Vertical loading may be accounted for by assuming a lateral force equal to 0.5 times the vertical load. Resistance to sliding of the structure base may be analyzed using a friction factor of 0.3 for mass concrete bearing on soil. No safety factor has been applied to the values stated. No global stability analysis has been performed.

5.5 REGIONAL SEISMICITY

Based on the general soil characteristics as determined by field and laboratory tests, anticipated depths to bedrock, and anticipated soil types, the project area is designated as Site Class D, in accordance with the ASCE 7. The N-values and Undrained Shear Strength from the boring suggest that the soil has adequate density and cohesion to resist liquefaction in consideration of the distance to known seismic sources. Thus, the site soil is not considered to be susceptible to liquefaction, or to substantial settlement or loss in strength when subject to the design earthquake loading.

6.0 SITE PREPARATION AND EXCAVATION CONSIDERATIONS

6.1 SUBGRADE PREPARATION

Prior to construction, the structure area should be stripped of any pavement, unsuitable existing fill, organic soil, and any deleterious materials. The exposed subgrade should be proofrolled. Proofrolling is accomplished by passing over the subgrade with proper compaction equipment and observing the subgrade for pockets of excessively soft, wet, disturbed, or otherwise unsuitable soils. Any soft, loose, wet, or otherwise unsuitable areas identified by proofrolling should be reworked in accordance with the recommendations presented in this report. After proofrolling and the removal of any unsuitable soils, the subgrade should be scarified to a depth of 6 inches, the moisture content of the soil adjusted to near its optimum moisture content, and the subgrade recompacted to a minimum of 90% of the modified Proctor (ASTM D 1557) maximum dry density of the soil. The recommended proofrolling and recompaction of the subgrade may be waived by TSi if it is determined, based on field observations, that it is unnecessary or could be detrimental to the existing subgrade condition.

6.2 SUBGRADE PROTECTION

Construction areas should be properly drained in order to reduce or prevent surface runoff from collecting on the subgrade. Any ponded water on the exposed subgrade should be removed immediately. To prevent unnecessary disturbance of the subgrade soils, heavy construction vehicles should be restricted from traveling through the finished subgrade. If areas of disturbed subgrade develop, they should be properly repaired in accordance with the recommendations in this report.

6.3 FILL AND BACKFILL MATERIALS

Excavations of high plasticity clays at least 2 feet below the bearing elevations should be performed. Foundations should be excavated with a smooth-edged, clawless excavating bucket to reduce disturbance of the bearing surface. Any fat clays exposed during excavations are not recommended for use as fill due to their shrink/swell potential. The suitability of any existing fill material should be determined by TSi as it is excavated. Off-site fill should consist of lean clay having a liquid limit of 45 or less and a plasticity index between 10 and 25. Off-site fill should be approved by TSi prior to being imported to the job site. In general, acceptable fill materials would include predominantly soil with no significant content of inert material such as brick, concrete, or stone pieces. Soil with decayable material such as wood, metal, or vegetation is not acceptable. Well-graded granular soils with the maximum particle size of 1 inch are acceptable, such as MODOT Type 5 aggregate.

At this time, the moisture content of the on-site soil is variable, and at the time of construction may not be within a range necessary for proper placement and compaction. Prior to compaction, some of the soil may require moisture reduction. During warm weather, moisture reduction can generally be accomplished by disking, or otherwise aerating the soil. Some of the soil may

require the addition of moisture prior to compaction. This should be performed in a controlled manner using a tank truck with a spray bar, and the moistened soil should be thoroughly blended with a disk or pulverizer to produce a uniform moisture content. Repeated passages of the equipment may be required to achieve uniform moisture content.

If the project is constructed during the winter season, fill materials should be carefully observed to see that no ice or frozen soils are placed as fill or remain in the base materials upon which fill is placed.

6.4 FILL AND BACKFILL PLACEMENT

Lean clay placed for structure support should be compacted to a dry density of at least 90% of the modified Proctor maximum dry density (ASTM D 1557) of the soil. Fat clay should not be used as structural fill or backfill. Granular material, such as crushed limestone that is placed for structure support, should be compacted to at least 95% of the modified Proctor maximum dry density. The moisture content of fill at the time of compaction should generally be within plus or minus 3% of the optimum moisture content of the material as determined by the modified Proctor compaction test. Fill should be placed in loose lifts not in excess of 8 inches thick, and compacted to the aforementioned criterion. However, it may be necessary to place fill in thinner lifts to achieve the recommended compaction when using small hand-operated equipment.

7.0 CONSTRUCTION OBSERVATION AND TESTING

It is recommended that TSi be retained during construction to perform testing and observation, and documentation services for the following items:

- site stripping, proofrolling, recompaction, and preparation of the soil subgrade that will support new fill or structural elements;
- evaluation of the suitability of fill and backfill materials;
- placement and compaction of fill and backfill;
- observation and documentation of ground improvements;
- observation and documentation of the installation of spread footing foundations for suitability of the supporting soil and proper preparation;
- observation and documentation of drilled pier construction; and
- quality assurance testing for concrete materials.

These quality assurance services should help to verify the design assumptions and maintain construction procedures in accordance with the project plans, specifications, and good engineering practice.

8.0 REPORT LIMITATIONS

This report has been prepared for the exclusive use of **WSP USA, INC.** for the specific application to the subject project. The recommendations contained in this report have been made in accordance with generally accepted soil and foundation engineering practices; no other warranties are implied or expressed.

The analysis and recommendations submitted in this report are based in part upon the data obtained from the test boring. The nature and extent of variations away from the boring may not become evident until construction. If variations then appear evident, it may be necessary to re-evaluate the recommendations of this report.

We emphasize that this report was prepared for design purposes only and may not be sufficient to prepare an accurate construction bid. Contractors reviewing this report should acknowledge that the information and recommendations contained herein are for design purposes.

If conditions at the site have changed due to natural causes or construction operations, this report should be reviewed by TSi to determine the applicability of the analysis and recommendations considering the changed conditions. The report should also be reviewed by TSi if changes occur in the structure locations, sizes, and types, or in the planned loads, elevations, or project concepts.

TSi requests the opportunity to review the final plans and specifications for the project prior to construction to verify that the recommendations in this report are properly interpreted and incorporated in the design and construction documents. If TSi is not accorded the opportunity to make this recommended review, we can assume no responsibility for the misinterpretation of our recommendations.

APPENDIX A

Figure 1, Vicinity Map
Figure 2, Site and Boring Location Plan



Note: This plan was prepared from an image obtained from Google Earth on September 13, 2022.



Figure 1, Vicinity Map

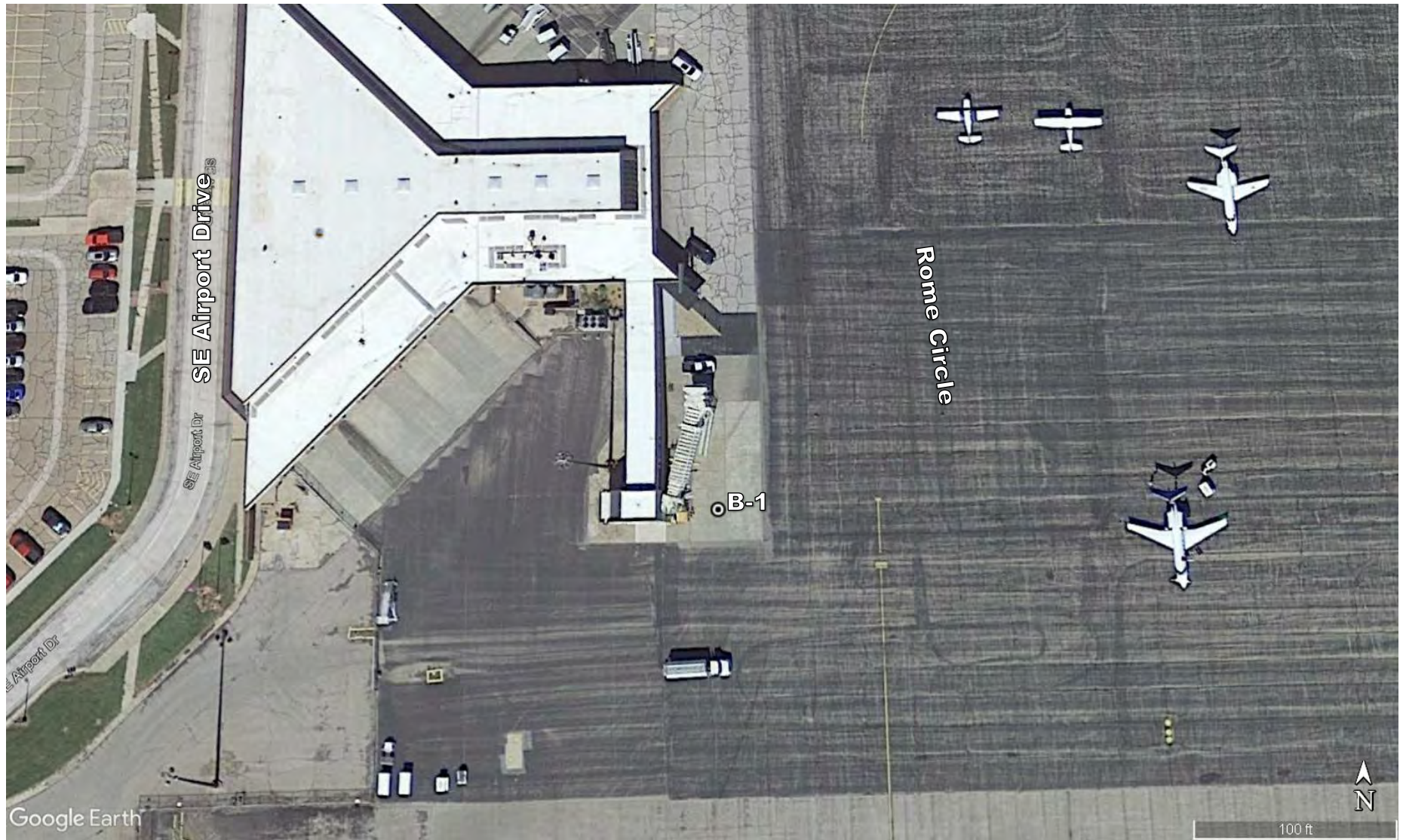
Project No. 20222041.00

**MTAA FOE Passenger Boarding Bridge
Topeka, KS**

Not to Scale

Approved by: AB






Legend

⊙ Approximate Boring Location

Note: This plan was prepared from an image obtained from Google Earth on September 14, 2022.



Figure 2, Site and Boring Location Plan		Project No. 20222041.00
MTAA FOE Passenger Boarding Bridge Topeka, KS		
Not to Scale	Approved by: AB	

APPENDIX B

Log of Boring
General Notes
Boring Log Notes
Unified Soil Classification System

LOG OF BORING NO. B-1

Project Description: **MTAA FOE Passenger Boarding Bridge
Topeka, KS**

TSi Geotechnical Inc.
8248 NW 101st Terrace, #5
Kansas City, Missouri 64153
(816) 599-7965 (816) 599-7967 FAX



Depth, feet	Samples	Sample #	Graphic Log	Surface El.: Approx. 1,066 Location: See Site and Boring Location Plan	Recovery %	RQD	Penetration Blows Per 6 inches Hand Penetrometer, Qu TSF	Undrained Shear Strength, TSF	Unit Dry Weight, lb/cu ft.	Water Content, %	Liquid Limit	Plastic Limit	Plasticity Index
MATERIAL DESCRIPTION													
				Portland Cement Concrete (32")									
5		ST-1		Brown, fat CLAY (CH), trace sand	83		2.50	1.33	100	25	52	21	31
		ST-2		Light brown and gray, lean CLAY (CL), trace sand	100		3.50	0.34	100	22			
		ST-3			80		2.50	0.98	97	23	45	19	26
10		SS-4		- trace gravel and calcium carbonate from 9.15 to 9.75 ft.	89		22 8 8	1.50		27			
		ST-5		Brown and gray, fat CLAY (CH), trace sand	100		3.50	0.82	103	23	50	20	30
15		SS-6		- rough drilling below 14.7 ft. Boring terminated at 15.0 ft.			50/0"						
25													

KC LOG WITH LAB BORING LOGS - MTAA FOE PASSENGER BOARDING BRIDGE.GPJ 10/6/22

Completion Depth: 15.0
Date Boring Started: 9/14/22
Date Boring Completed: 9/14/22
Engineer/Geologist: JM
Project No.: 20222041.00

Remarks: Boring drilled with CME-550 using FA and auto SPT.
Groundwater not encountered during drilling. Auger refusal at 15.0 ft.

The stratification lines represent approximate strata boundaries.
In situations, the transition may be gradual.



GENERAL NOTES

The number of borings is based on: topographic and geologic factors; the magnitude of structure loading; the size, shape, and value of the structure; consequences of failure; and other factors. The type and sequence of sampling are selected to reduce the possibility of undiscovered anomalies and maintain drilling efficiency. Attempts are made to detect and/or identify occurrences during drilling and sampling such as the presence of water, boulders, gas, zones of lost circulation, relative ease or resistance to drilling progress, unusual sample recovery, variation in resistance to driving split-spoon samplers, unusual odors, etc. However, lack of notation regarding these occurrences does not preclude their presence.

Although attempts are made to obtain stabilized groundwater levels, the levels shown on the Logs of Boring may not have stabilized, particularly in more impermeable cohesive soils. Consequently, the indicated groundwater levels may not represent present or future levels. Groundwater levels may vary significantly over time due to the effects of precipitation, infiltration, or other factors not evident at the time indicated.

Unless otherwise noted, soil classifications indicated on the Logs of Boring are based on visual observations and are not the result of classification tests. Although visual classifications are performed by experienced technicians or engineers, classifications so made may not be conclusive.

Generally, variations in texture less than one foot in thickness are described as layers within a stratum, while thicker zones are logged as individual strata. However, minor anomalies and changes of questionable lateral extent may appear only in the verbal description. The lines indicating changes in strata on the Logs of Borings are approximate boundaries only, as the actual material change may be between samples or may be a gradual transition.

Samples chosen for laboratory testing are selected in such a manner as to measure selected physical characteristics of each material encountered. However, as samples are recovered only intermittently and not all samples undergo a complete series of tests, the results of such tests may not conclusively represent the characteristics of all subsurface materials present.

NOTATION USED ON BORING LOGS

APPROXIMATE PROPORTIONS

TRACE	<15%
WITH	15-30%
MODIFIER	>30%

Clay or clayey may be used as major material or modifier, regardless of relative proportions, if the clay content is sufficient to dominate the soil properties.

PARTICLE SIZE

BOULDERS	>12 Inches
COBBLES	12 Inches – 3 Inches
GRAVEL	
Coarse	3 Inches – ¾ Inch
Fine	¾ Inch – No. 4 Sieve (4.750 mm)
SAND	
Coarse	No. 4 – No. 10 Sieve (2.000 mm)
Medium	No. 10 – No. 40 Sieve (0.420 mm)
Fine	No. 40 – No. 200 Sieve (0.074 mm)
SILT	No. 200 Sieve - 0.002 mm
CLAY	< 0.002 mm

PENETRATION – BLOWS







Number of impacts of a 140-pound hammer falling a distance of 30 inches to cause a standard split-barrel sampler, 1 3/8 inches I.D., to penetrate a distance of 6 inches. The number of impacts for the first 6 inches of penetration is known as the seating drive. The sum of the impacts for the last 12 inches of penetration is the Standard Penetration Test Resistance or “N” value, blows per foot. For example, if blows = 6-8-9, “N” = 8+9 or 17.

OTHER NOTATIONS

Recovery % – length of recovered soil divided by length of sample attempted.

50/2”	Impacts of hammer to cause sampler to penetrate the indicated number of inches
WR	Sampler penetrated under the static loading of the weight of the drill rods
WH	Sampler penetrated under the static loading the weight of the hammer and drill rods
HSA	Hollow stem auger drilling method
FA	Flight auger drilling method
RW	Rotary wash drilling methods with drilling mud
AH	Automatic hammer used for Standard Penetration Test sample
SH	Safety hammer with rope and cathead used for Standard Penetration Test sample

GRAPHIC SYMBOLS

	Depth at which groundwater was encountered during drilling
	Depth at which groundwater was measured after drilling
	Standard Penetration Test Sample, ASTM D1586
	3-inch diameter Shelby Tube Sample, ASTM D1587
	Sample grabbed from auger
	NX Size rock core sample



UNIFIED SOIL CLASSIFICATION SYSTEM, (ASTM D-2487)

Major Divisions			Group Symbols		Typical Names	Laboratory Classification Criteria																																			
<div>Coarse-grained soils (More than half of materials is larger than No. 200 sieve size)</div> <div>Gravels (More than half of coarse fraction is larger than No. 4 sieve size)</div> <div>Clean gravels (Little or no fines)</div> <div>Gravels with fines (Appreciable amount of fines)</div> <div>GW</div> <div>GP</div> <div>GM^a</div> <div>d</div> <div>u</div> <div>GC</div> <div>Well-graded gravels, gravel-sand mixtures, little or no fines</div> <div>Poorly graded gravels, gravel-sand mixtures, little or no fines</div> <div>Silty gravels, gravel-sand-silt mixtures</div> <div>Clayey gravels, gravel-sand-clay mixtures</div> <div>Sands (More than half of coarse fraction is smaller than No. 4 sieve size)</div> <div>Clean sands (Little or no fines)</div> <div>SW</div> <div>SP</div> <div>Sands with fines (Appreciable amount of fines)</div> <div>SM^a</div> <div>d</div> <div>u</div> <div>SC</div> <div>Well-graded sands, gravelly sands, little or no fines</div> <div>Poorly graded sands, gravelly sands, little or no fines</div> <div>Silty sands, sand-mix mixtures</div> <div>Clayey sands, sand-clay mixtures</div>						<div>Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows: Less than 5 per cent More than 12 per cent 5 to 12 per cent</div> <div>GW, GP, SW, SP GM, GC, SM, SC Borderline cases requiring dual symbols^b</div> <div>$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3</div> <div>Not meeting all gradation requirements for GW</div> <div>Atterberg limits below “A” line or P.I. less than 4</div> <div>Above “A” line with P.I. between 4 and 7 are <i>borderline</i> cases requiring use of dual symbols</div> <div>Atterberg limits below “A” line with P.I. greater than 7</div> <div>$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3</div> <div>Not meeting all gradation requirements for SW</div> <div>Atterberg limits about “A” line or P.I. less than 4</div> <div>Limits plotting in hatched zone with P.I. between 4 and 7 are <i>borderline</i> cases requiring use of dual symbols</div> <div>Atterberg limits about “A” line with P.I. greater than 7</div>																																			
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^aDivision of GM and SM groups into subdivisions of d and u are for roads and airfields only. Subdivision is based on Atterberg limits; suffix d used when L.L. is 26 or less and the P.I. is 6 or less; the suffix u used when L.L. is greater than 28.

^bBorderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example: GW-GC, well-graded gravel-sand mixture with clay binder.

APPENDIX C

LPILE Pier Parameters

Boring	B-1
Date Drilled	9/14/22
Ground Elevation at Structure	Approx. 1,066.00
Ground Elevation at Boring	Approx. 1,066.00
Boring Coordinates	TBD
Boring Offset from Structure	TBD
Groundwater Depth:	Not Encountered

By: AB
Checked: FH

Date: 10.6.22
Date: 10.7.22

DRILLED PIER DESIGN PARAMETERS - REPORT										
Approximate Depth Range (ft)	LPILE Soil Type	Effective Unit Weight (pcf)	Cohesion (psf)	Angle of Internal Friction (degrees)	Uniaxial Compressive Strength, Qu (psi)	Strain at 50% Maximum Stress	Static p-y Soil Modulus, K (pci)	Material Classification	Allowable Unit Side Resistance (psf)*	Allowable End-Bearing (psf)*
0 to 3	Pavement	150	-----	-----	-----	-----	-----	Pavement	-----	---
3 to 5.5	Stiff Clay w/o Free Water	120	1000			0.009	350	Medium Stiff Clay	220	3000
5.5 to 11	Stiff Clay w/o Free Water	120	1000			0.009	350	Medium Stiff Clay	220	3000
11 to 15	Stiff Clay w/o Free Water	120	1000			0.009	350	Medium Stiff Clay	220	3000
Below 15 **	Limestone	150	-----	-----	-----	-----	-----	Bedrock	-----	20,000
GENERAL COMMENTS:		Temporary casing might be needed								
Seismic Site Class: D										

* Factor of Safety (F.S.) applied for Allowable Unit Side Resistance is F.S. = 2.5. The F.S. applied for Allowable End-Bearing is F.S. = 3.0.

** The limestone bedrock should be cored to a depth of two pier diameters below the pier tip to use these values.

Soil or Rock Classification	Approximate Depth (ft)	Effective Unit Weight (pcf)	Water Content (%)	Vertical Effective Stress (ksf)	Avg. Pocket Pen Qu (tsf)	Avg. N-Value (bpf)	Avg. N60 (bpf)	Avg. N1(60) (bpf)	ML, CL, CH?	Cohesion from N-Value (psf)	Cohesion from PPT Value (psf)	Calculated Design Cohesion (psf)	Override Cohesion (psf)	Relative Density (%)	Internal Friction Angle (deg)
	0														
	3														
Clay	3	120.0				8	9		CL	1067		1000	1000		
	5.5	120.0				8	9		CL						
Clay	5.5	120.0				8	9		CL	1067		1000	1000		
	11	120.0				8	10		CL						
Clay	11	120.0				8	10		CL	1067		1000	1000		
	15	120.0				8	10		CL						

APPENDIX D

Laboratory Test Reports

Atterberg Limits

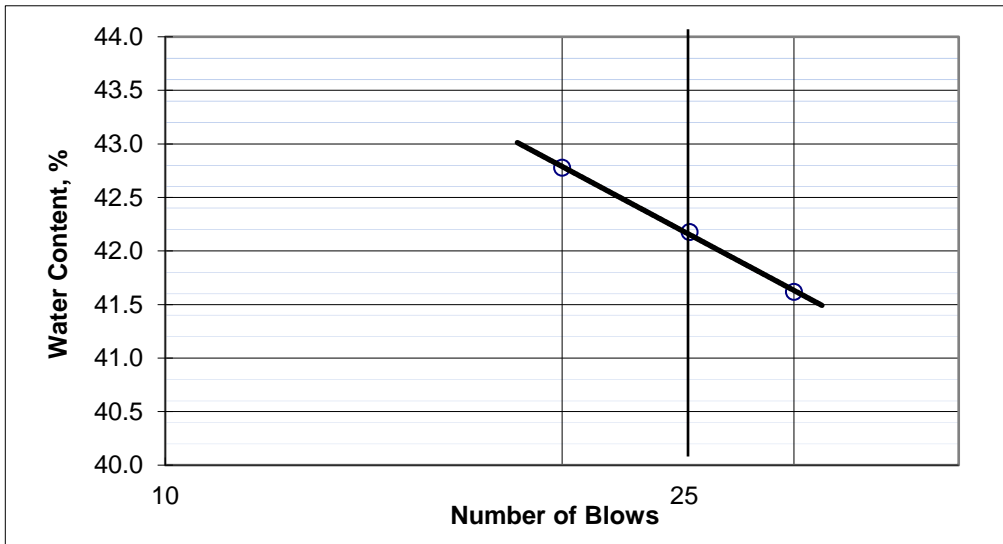


8248 NW 101st Terr
Kansas City, MO

PROJECT # 20222041PROJECT MTAA FOEDATE 9/23/2022BORING # B-1 SAMPLE # Bulk DEPTH 3.0 to 8.0 ft.

LIQUID LIMIT

Run No.	1 (25-35)	2 (20-30)	3 (15-25)	4	5	6	7
Tare No.	79	66	53				
Tare Plus Wet Soil, g	21.29	20.98	21.34				
Tare Plus Dry Soil, g	19.13	18.77	19.00				
Water, g	2.16	2.21	2.34				
Tare, g	13.94	13.53	13.53				
Dry Soil, g	5.19	5.24	5.47				
Water content, %	41.6	42.2	42.8				
Number of Blows	30	25	20				

LL 42PL 21PI 21Symbol from
plasticity chart

CL

Plastic LIMIT

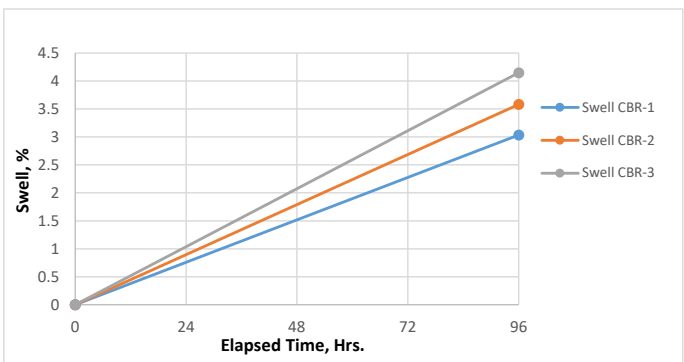
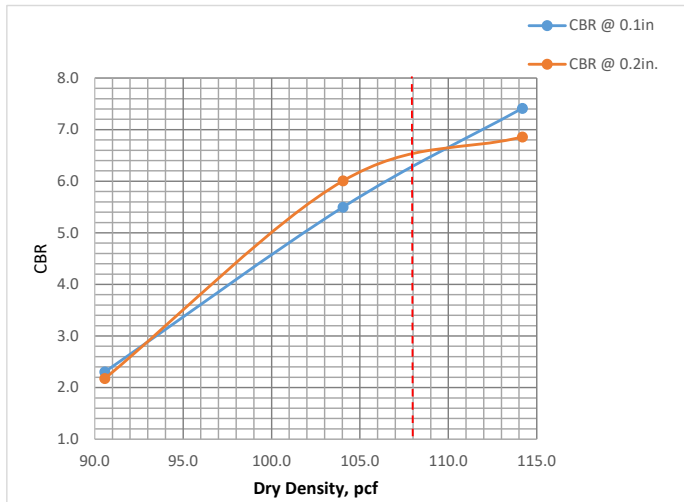
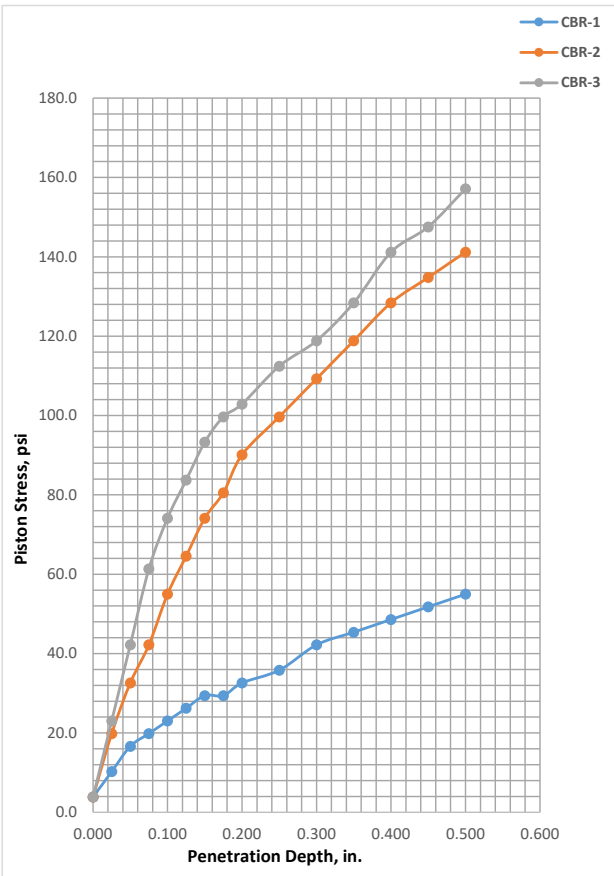
Run No.	1	2	3	4	5	6	7
Tare No.	77	75					
Tare Plus Wet Soil, g	20.31	19.77					
Tare Plus Dry Soil, g	19.21	18.72					
Water, g	1.10	1.05					
Tare, g	13.93	13.66					
Dry Soil, g	5.28	5.06					
Water content, %	20.83	20.75					
Plastic Limit	20.8						

Remarks _____

Technician MLComputed By MNChecked By ABRevised 10.6.2022

CALIFORNIA BEARING RATIO TEST REPORT ASTM D 1883-07

% CBR Value @ 90% Compaction = 5.1 @ 0.1 in. penetration
% CBR Value @ 90% Compaction = 5.6 @ 0.2 in. penetration



Specimen ID	Molded			CBR%		Moisture of Top 1" Layer, %	Surcharge lbs	Max Swell, %
	Density, pcf	Percent of Max. Density	Moisture	0.1 in.	0.2 in			
CBR-1	90.6	79.7	15.6	2.3	2.2	29.3	10	3.0
CBR-2	104.0	91.5	15.6	5.5	6.0	29.1	10	3.6
CBR-3	114.2	100.4	15.8	7.4	6.9	28.5	10	4.1
Material Description				USCS	MAX DENSITY, pcf	OPTIMUM MOISTURE, %	LL	PI
Brown, lean CLAY (CL)				CL	113.7	16.0	42	21

Remarks:

Compaction Method: ASTM D1557

Project: MTAA FOE Passenger Boarding Bridge



8248 NW 101st
Terrace #5
Kansas City,
Missouri 64153
p| 816.599.7965
f| 816.599.7967

Location:

Client:

Sample No.: B-1

Boring: Bulk

Depth: 3 to 8 ft.

Project No.: 20222041.00

Date: 9/27/2022



CBR of Laboratory Compacted Soils

(ASTM D1883 / AASHTO T193)

Job Name: MTAA FOE Passenger Boarding Bridge Sample: B-1 Depth: 3 to 8 ft. Date: 9/22/2022
 Job Number: 20222041
 CBR Test Number: 1 CBR Mold Number: 1
 Visual Classification (USCS): Brown, lean CLAY (CL)

Mold Diameter (in)	6
Height of Mold (in)	4.58
Volume of Soil (cf)	0.07494
Mold Weight (gm)	4189.8
Initial wet weight + Mold (gm)	7754.8
Initial wet Weight (gm)	3565
Initial wet Density (pcf)	104.657
<input checked="" type="checkbox"/> Soaked or <input type="checkbox"/> Unsoaked	
Final wet Weight + Mold (gm)	8181
Final wet Weight (gm)	3991.2
Weight of Absorbed H ₂ O (gm)	426.2
% Water Absorbed	12.0%
Surcharge (lbs)	10

COMPACTION ENERGY	
Hammer Weight (lbs)	10
Number of Layers	5
Blows/Layer	10
Moisture at Compaction	16

☒ Load Cell Proving Ring
☒ Proving Ring No.: 3966
 Proving Ring Constant 0.1048 lbs/div.
 CBR Piston Area 3.00 Inch²

MOISTURE CONTENT DETERMINATION					
	Before Compaction	After Compaction	Top 1" after Test	Middle After Test	Average After Test
Tare Number	1	2	3	4	
Wet weight + Tare (gm)	394.44	372.79	299.76	296.7	
Dry Weight + Tare (gm)	342.42	323.99	233.99	232.56	
Water Weight (gm)	52.02	48.80	65.77	64.14	
Tare Weight (gm)	9.22	9.07	9.35	9.75	
Dry Weight (gm)	333.2	314.92	224.64	222.81	
Water Content (%)	15.61	15.50	29.28	28.79	22.29
Dry Density: <u>85.57875</u> (pcf)	(use average moisture after test)				

SHRINK / SWELL			
Start Time and Date	Elapsed Time (min)	Dial Reading (0.001")	% = S/H(100)
9/22/2022	0	0.044	
9/26/2022	5760	0.183	3.0

LOADING		
Strain Dial (0.001")	Load <input type="checkbox"/> (lbs) <input type="checkbox"/> (div)	Stress = P/A (psi)
0.000	0	3.9
0.025	0.0002	10.3
0.050	0.0004	16.6
0.075	0.0005	19.8
0.100	0.0006	23.0
0.125	0.0007	26.2
0.150	0.0008	29.4
0.175	0.0008	29.4
0.200	0.0009	32.6
0.250	0.001	35.8
0.300	0.0012	42.2
0.350	0.0013	45.4
0.400	0.0014	48.6
0.450	0.0015	51.8
0.500	0.0016	55.0

CBR at 0.1" Penetration=(23.0 /1000)*100 = 2.3%

CBR at 0.2" Penetration =(32.6 /1500)*100 = 2.2%

CBR = 2%

Comments: _____



CBR of Laboratory Compacted Soils

(ASTM D1883 / AASHTO T193)

Job Name: MTAA FOE Passenger Boarding Bridge Sample: B-1 Depth: 3 to 8 ft. Date: 9/22/2022
 Job Number: 20222041
 CBR Test Number: 2 CBR Mold Number: 2
 Visual Classification (USCS): Brown, lean CLAY (CL)

Mold Diameter (in)	6
Height of Mold (in)	4.58
Volume of Soil (cf)	0.07494
Mold Weight (gm)	4193.5
Initial wet weight + Mold (gm)	8290.3
Initial wet Weight (gm)	4096.8
Initial wet Density (pcf)	120.269
<input checked="" type="checkbox"/> Soaked or <input type="checkbox"/> Unsoaked	
Final wet Weight + Mold (gm)	8556
Final wet Weight (gm)	4362.5
Weight of Absorbed H ₂ O (gm)	265.7
% Water Absorbed	6.5%
Surcharge (lbs)	10

COMPACTION ENERGY	
Hammer Weight (lbs)	10
Number of Layers	5
Blows/Layer	25
Moisture at Compaction	16

☒ Load Cell Proving Ring
☒ Proving Ring No.: 3966
 Proving Ring Constant 0.1048 lbs/div.
 CBR Piston Area 3.00 Inch²

MOISTURE CONTENT DETERMINATION					
	Before Compaction	After Compaction	Top 1" after Test	Middle After Test	Average After Test
Tare Number	5	6	7	8	
Wet weight + Tare (gm)	383.45	401.61	271.95	291.61	
Dry Weight + Tare (gm)	332.97	348.76	212.90	232.97	
Water Weight (gm)	50.48	52.85	59.05	58.64	
Tare Weight (gm)	9.77	9.27	9.69	9	
Dry Weight (gm)	323.2	339.49	203.21	223.97	
Water Content (%)	15.62	15.57	29.06	26.18	21.61
Dry Density: <u>98.89994</u> (pcf)	(use average moisture after test)				

SHRINK / SWELL			
Start Time and Date	Elapsed Time (min)	Dial Reading (0.001")	% = S/H(100)
9/22/2022	0	0.037	
9/26/2022	5760	0.201	3.6

LOADING		
Strain Dial (0.001")	Load <input type="checkbox"/> (lbs) <input type="checkbox"/> (div)	Stress = P/A (psi)
0.000	0	3.9
0.025	0.0005	19.8
0.050	0.0009	32.6
0.075	0.0012	42.2
0.100	0.0016	55.0
0.125	0.0019	64.6
0.150	0.0022	74.1
0.175	0.0024	80.5
0.200	0.0027	90.1
0.250	0.003	99.7
0.300	0.0033	109.3
0.350	0.0036	118.8
0.400	0.0039	128.4
0.450	0.0041	134.8
0.500	0.0043	141.2

CBR at 0.1" Penetration=(55.0 /1000)*100 = 5.5%

CBR at 0.2" Penetration =(90.1 /1500)*100 = 6.0%

CBR = 5%

Comments: _____



CBR of Laboratory Compacted Soils

(ASTM D1883 / AASHTO T193)

Job Name: MTAA FOE Passenger Boarding Bridge Sample: B-1 Depth: 3 to 8 ft. Date: 9/22/2022
 Job Number: 20222041
 CBR Test Number: 3 CBR Mold Number: 3
 Visual Classification (USCS): Brown, lean CLAY (CL)

Mold Diameter (in)	6
Height of Mold (in)	4.58
Volume of Soil (cf)	0.07494
Mold Weight (gm)	4187.7
Initial wet weight + Mold (gm)	8690.3
Initial wet Weight (gm)	4502.6
Initial wet Density (pcf)	132.182
<input checked="" type="checkbox"/> Soaked or <input type="checkbox"/> Unsoaked	
Final wet Weight + Mold (gm)	8830.5
Final wet Weight (gm)	4642.8
Weight of Absorbed H ₂ O (gm)	140.2
% Water Absorbed	3.1%
Surcharge (lbs)	10

COMPACTION ENERGY	
Hammer Weight (lbs)	10
Number of Layers	5
Blows/Layer	56
Moisture at Compaction	16

☒ Load Cell Proving Ring
☒ Proving Ring No.: 3966
 Proving Ring Constant 0.1048 lbs/div.
 CBR Piston Area 3.00 Inch²

MOISTURE CONTENT DETERMINATION					
	Before Compaction	After Compaction	Top 1" after Test	Middle After Test	Average After Test
Tare Number	9	10	11	12	
Wet weight + Tare (gm)	339.62	355.23	273.15	261.09	
Dry Weight + Tare (gm)	294.69	308.11	214.61	213.06	
Water Weight (gm)	44.93	47.12	58.54	48.03	
Tare Weight (gm)	9.28	9.35	9.17	9.9	
Dry Weight (gm)	285.41	298.76	205.44	203.16	
Water Content (%)	15.74	15.77	28.49	23.64	20.91
Dry Density: <u>109.3203</u> (pcf)	(use average moisture after test)				

SHRINK / SWELL			
Start Time and Date	Elapsed Time (min)	Dial Reading (0.001")	% = S/H(100)
9/22/2022	0	0.033	
9/26/2022	5760	0.223	4.1

LOADING		
Strain Dial (0.001")	Load <input type="checkbox"/> (lbs) <input type="checkbox"/> (div)	Stress = P/A (psi)
0.000	0	3.9
0.025	0.0006	23.0
0.050	0.0012	42.2
0.075	0.0018	61.4
0.100	0.0022	74.1
0.125	0.0025	83.7
0.150	0.0028	93.3
0.175	0.003	99.7
0.200	0.0031	102.9
0.250	0.0034	112.5
0.300	0.0036	118.8
0.350	0.0039	128.4
0.400	0.0043	141.2
0.450	0.0045	147.6
0.500	0.0048	157.1

CBR at 0.1" Penetration=(74.1 /1000)*100 = 7.4%

CBR at 0.2" Penetration =(102.9 /1500)*100 = 6.9%

CBR = 7%

Comments: _____



PROCTOR TEST

PROJECT NAME: MTA FOE Passenger Boarding Bridge

PROJECT No.: 20222041

SAMPLE NUMBER: B-1

SAMPLE LOCATION: Bulk

DEPTH: 3 to 8 ft.

VISUAL CLASS. (USCS): Brown, lean CLAY (CL)

TYPE OF COMPACTION	Mod.	D1557		
SIEVE ANALYSIS RESULTS	0.75	0.375	No. 4	PROCEDURE
% Retained(cummulative)				A

SOIL WEIGHT DATA					
Determination Number	1	2	3	4	5
Weight- Soil + Mold (wet),g	4012.8	3970.7	3930.8		
Weight of Mold,g	2016.3	2016.3	2017.0		
Weight Wet Soil,g	1996.5	1954.4	1913.8		
Volume of Mold (ft ³)	0.0333	0.0333	0.0333		

MOISTURE DATA					
Weight- Soil + Tare (wet),g	350.4	442.4	357.1		
Weight- Soil + Tare (dry),g	302.7	370.8	315.5		
Weight- Tare,g	9.2	9.8	10.9		

COMPUTED DATA					
Wet unit weight (pcf)	132.2	129.4	126.7		
Moisture content (%)	16.2	19.8	13.7		
Dry unit weight (pcf)	113.7	108.0	111.5		

Maximum Dry Density (pcf)	113.7
Optimum Moisture Content (%)	16.0
Natural Moisture Content (%)*	16.2

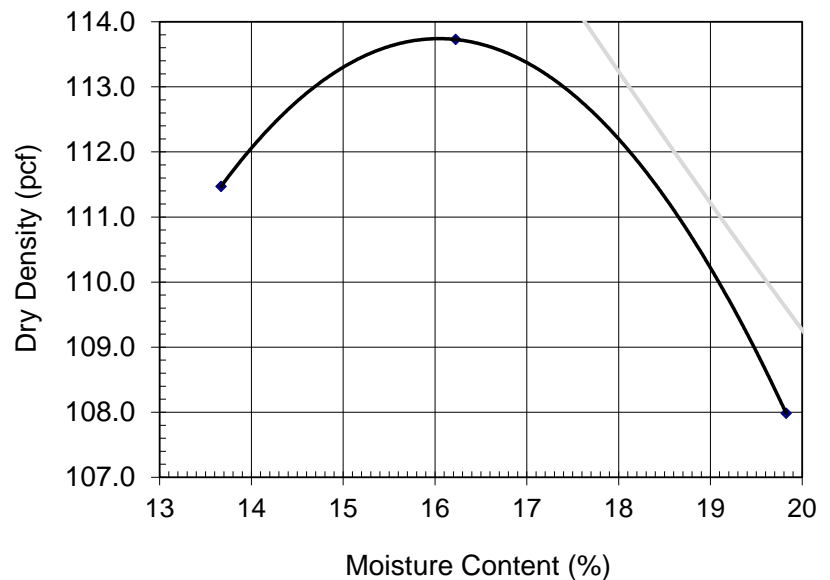
Liquid Limit	42
Plastic Limit	21
Plasticity Index	21
CLASSIFICATION. (USCS)*	CL

* with additive

	Date
Tested by: MN	9/20/2022
Calculated by: MN	9/21/2022
Checked by: FH	10.7.2022
Entered Into Excel by: MN	9/21/2022

NOTE:

Proctor Curve





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