Rhode Island Airport Corporation

September 17, 2025

ADDENDUM NO. 2
Invitation for Bids (IFB) No. 36131
PVD Gates 7 & 8 Reconfiguration
Rhode Island T. F. Green International Airport

Prospective proposers and all concerned are hereby notified of the following changes in the **Invitation for Bids (IFB) No. 36131**. These changes shall be incorporated in and shall become an integral part of the contract documents.

Questions in **bold** and responses or additions in *italics*.

1. **Specification section 347713**
   1.2 General Conditions, Proposed equipment table, depicts the proposed PBB models of A3-58/110 at both gates

   Response: See RFI #2 response below.

2. **We would like to request to use TB 39/19.0-3 for both gates with the following limits:**

- **Recommended operational retraction limit of 55.12' (16.80 m)**
- **Recommended operation extension limit of 114.18' (34.80m)**
- **Retraction min 63.32' (19.30m)**
- **Extension max 128.94 (39.30m)**

Response: The Contractor shall provide complete supporting documentation and evidence demonstrating that the proposed PBB model fully satisfies all operating requirements, dimensional criteria, and performance parameters as indicated in the Contract Drawings and Specifications. Please be advised that acceptance of any revisions to the specified PBB model shall be subject to the shop drawing review and approval process. No substitution or revision shall be considered approved until such evidence has been reviewed and a formal approval has been issued. The Owner and Engineer expressly reserve the right to reject the proposed PBB model should it fail to demonstrate full compliance with the Contract requirements.

3. **Drawings and specs make numerous references to match finishes of Terminal improvement project. Not all bidders have access to those plans. Please provide a list of the approved finish selections for that job for bidders to cross reference.**

Response: The Terminal Improvement project plans are not needed. The finishes outlined in the construction documents have been coordinated with the Terminal Improvement project. The reference to the Terminal Improvement project is so that final finish selection can be coordinated during construction. The awarded contractor will need to coordinate the final selections with the Terminal Improvement contractor.

4. **Need clarification on the following finishes on the finish schedule on A-701.**

- **062023 Interior Finish Carpentry - Specifications call to match Terminal Improvement project (material key C5)**
- **064216 Flush Wood Paneling – Specifications call to match Terminal Refresh project control sample (material key C4)**
- **093013 Ceramic Tiling – Specifications call to match or compliment Terminal Improvement project finish selections and as selected by Architect (material key PCT & TILE)**
- **095113 Acoustical Panel Ceilings – Specifications call to match or compliment Terminal Improvement project finish selections and as selected by Architect (material key C1 & C1*)**
- **096340 Stone Flooring - Specifications call to match or compliment Terminal Improvement project finish selections and match Architect's samples (material key MBT)**
- **096519 Resilient Tile Flooring – Specifications call for Rubber Floor Tile as selected by Architect and VCT at Primary Screening and Stair 10 to match existing (material key RF and VCT)**

Response: Contractor to follow the intent as written in the specifications. Matching materials and final color selection will be done during construction.

- **096813 Tile Carpeting – Specifications call to match architect's samples and as selected by Architect (material key CPT)**

Response: Contractor to follow the intent as written in the specifications. Matching materials and final color selection will be done during construction.

- **097200 Wall Coverings – Specifications call to match or compliment Terminal Improvement project finish selections and as selected by Architect (material key L1)**

Response to all Question 4 items except those noted: The Terminal Improvement project plans are not needed. The finishes are specified in Part 2 of the specifications, and have been coordinated with the Terminal Improvement project. The reference to the Terminal Improvement project is so that final finish selection can be coordinated during construction. The awarded contractor will need to coordinate the final selections with the Terminal Improvement contractor.

- **096813 Tile Carpeting – Specifications call to match architect's samples and as selected by Architect (material key CPT)**

Response: Contractor to follow the intent as written in the specifications. Matching materials and final color selection will be done during construction.

- **097200 Wall Coverings – Specifications call to match or compliment Terminal Improvement project finish selections and as selected by Architect (material key L1)**

Response to all Question 4 items except those noted: The Terminal Improvement project plans are not needed. The finishes are specified in Part 2 of the specifications, and have been coordinated with

the Terminal Improvement project. The reference to the Terminal Improvement project is so that final finish selection can be coordinated during construction. The awarded contractor will need to coordinate the final selections with the Terminal Improvement contractor.

5. **The specifications state the following, Gate Guards: Contractor gate guards are not anticipated on this project. Who is responsible at Gate 37 to give access to workers, deliveries and the documentation?**

Response: RIAC will issue Non-Movement Area (NMA) permits to a limited number of the contractor's personnel once they have successfully completed the required training sessions. Those approved individuals will have access to Gate 37 and will be authorized to escort other badged personnel who do not hold an NMA permit for deliveries and work access.

6. **Is the contractor responsible for escorting personnel and deliveries from Gate 37 to Gate 7 & 8 work area and back to Gate 37? Also, remaining with the escorted vehicle/personnel full-time while they're airside?**

Response: As stated in the response to RFI #5, the contractor is responsible for providing full-time escorts for all deliveries, personnel, and subcontractors while they are airside, including travel between Gate 37 and the Gate 7 & 8 work areas and back. RIAC will not provide escorts.

7. **How will the contractor be compensated for the following.**
   a. **Throughout construction, Gate 7 and/or Gate 8 must remain capable of supporting passenger aircraft operations. The contractor may need to adjust barricade boundaries as directed by RIAC operations.**

Response: As shown in the construction documents, passenger access is required from 0600-0800 daily during construction. Please base your bid assuming a total of six adjustments to barricades and include this in the Schedule of Values – Base Bid in Item No. 8, Pay Item 1H.

8. **The low-profile barricades – are they required to be filled with sand or water?**

Response: Low profile barricades shall be filled as indicated on the contract drawings.

9. **The spec calls for *Laminated-Insulated-Core Metal Wall Panels*. Centria's Formawall panels differ from other IMPs because they are foamed in place, creating a solid, void-free bond that delivers superior insulation, strength, and flatness. Mapes claims their panels have a 25 lamination warranty; foarmed-in-place panels do not delaminate. I wanted to make that clear as is it states, "or otherwise securely bonded to facing sheets".**

2.2 LAMINATED-INSULATION-CORE METAL WALL PANELS

A. General: Provide factory-formed and -assembled metal wall panels fabricated from two metal facing sheets and core material laminated or otherwise securely bonded to facing sheets during fabrication without use of contact adhesives, and with joints between panels designed to form weathertight seals. Include accessories required for weathertight installation.

B. Wrapped-Edge, Laminated-Insulation-Core Metal Wall Panels: Formed with flush exterior panel facing wrapped over panel edges; designed for independent installation by mechanically attaching through extended panel edges to supports using concealed fasteners; with sealant joints.

1. Manufacturers:

a. Mapes
b. Nucor
c. Centria
d. Or Approved Equal

Response: Refer to the response to Question 10 below.

10. The specification does not identify a specific panel type (Formawall, Versawall, etc.). Since it calls for a 16" wide panel, Formawall is the most likely option given its range of widths, but this should be confirmed with the architect. The interior panel substrate also needs clarification—are the face sheets galvanized with aluminum on the interior? If so, what is the reason for using different materials?

2. Metallic-Coated Steel Sheet: Facings of zinc-coated (galvanized) steel sheet complying with ASTM A653/A653M, G90 (Z275) coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A792/A792M, Class AZ50 (Class AZM150) coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755/A755M.

a. Nominal Thickness: 16 inches (406.4 mm)
b. Exterior Finish: Three-coat fluoropolymer

1) Color: As selected by Architect from manufacturer's full range or to match adjacent finish.

Interior Finish: Aluminum

2) Color: As selected by Architect from manufacturer's full range or to match adjacent finish.

Response:

- *Delete Section 074213.19 in its entirety and replace with the enclosed revised Section 074213.19.*
- *Drawing A-901: Revise Details 3, 7 and 9 per attached drawing.*
  Drawing A-903: Revise Details 1, 2 and 5 per attached drawing

11. Finally, regarding the aluminum sheet: Centria offers stainless steel face sheets (Type 304 architectural grade alloy), but aluminum is not available. The exterior clear anodized finish will also need to be confirmed as that is not a standard option.

Response:

Aluminum Sheet: Fabricate panel with exterior and interior facings of same material and thickness. Provide facings of aluminum coil-coated sheet, ASTM B209 (ASTM B209M), alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.

c. Thickness: 2 inches (50.8 mm)
d. Surface: Smooth, flat finish.
e. Exterior Finish: Clear anodized

1) Color: As selected by Architect from manufacturer's full range or to match existing.

f. Interior Finish: Siliconized polyester

1) Color: As selected by Architect from manufacturer's full range or to match adjacent finish.

Core Material: Manufacturers' standard.

g. Polyisocyanurate Insulation: Closed cell, modified polyisocyanurate foam using a non-CFC blowing agent, board type, with a maximum flame-spread index of 25 and a smoke-developed index of 450.

1) Closed-Cell Content: 90 percent when tested according to ASTM D6226.

12. Could I please get a copy of the plan holder list?

Response: Please refer to the attachment.

13. Who is the fire suppression vendor for TF Green?
- **Who is the contact for any shutdowns/tie-ins for fire alarm and fire suppression?**

Response: RIAC Building Maintenance is the point of contact for coordinating any fire suppression or fire alarm shutdowns and tie-ins at T.F. Green.

14. Who is the ATC/BMS (HVAC controls) vendor for TF Green? Siemens? JCI?

Response: Siemens is the BMS vendor.

15. What glass is being used in the curtainwall 1600 system? Specifications list GL1 and GL3.

Response: The glass that is to be installed in the exterior curtain wall is GL1 as indicated on sheet A-701.

16. Regarding M/B/WBE goals:
- **Spec binder indicate 3.0% MBE and 6.9% WBE goals.**
- **Specs also indicate that the terms MBE/WBE and DBE are interchangeable.**
- **"On any work funded by the Federal Aviation Administration the term Minority Business Enterprise (MBE) shall be substituted for Disadvantaged Business Enterprise (DBE) and Women Business Enterprise (WBE)", pg 135 of the spec binder.**
- **Based on that sentence, is the total goal for the project 9.9% MBE? or do we need to have both WBE and MBE at the previously mentioned percentages?**

Response: The indicated 3.0% MBE and 6.9% WBE goals is a standard FAA solicitation clause per 41 CFR 60-4.3 Equal Opportunity Clause.
The total goal is not 9.9%, Please see our current DBE Plan at www.flyRI.com/Procurement.

17. Are there any other opportunities for subcontractors to visit the space?
- **Alternatively, is there a larger set of photos that could be shared with the general contractors to share with their subs?**

Response: No additional site visits are planned at this time, and no additional photos beyond those already provided are available for distribution.

18. Request for Bid Extension: Can additional time be granted for the submission of bids? There is a high volume of active bids at the moment, and an extension will help ensure adequate preparation of a comprehensive proposal.

Response: Unfortunately, we are unable to extend the bid submission deadline.

19. Specification Section 347713 – Passenger Boarding Bridges – Section 2.02.E.1 of this specification calls for 12 foot vertical drive columns. Questions on this subject are:
- **Can a 10 foot vertical drive column be provided on the Gate 7 PBB? (Per the Gate Compatibility information listed on plan drawing AP-404, it appears that a 10 foot vertical drive column will work at Gate 7.)**

Response: Should the Contractor wish to propose the use of 10-foot vertical drive columns, such request shall be submitted as a formal substitution and will be subject to the shop drawing review and approval process. The Contractor shall provide complete supporting documentation and evidence demonstrating that the substituted components will perform in full compliance with all operational requirements, dimensional criteria, and performance parameters set forth in the Contract Drawings and Specifications.

- **Do the existing PBBs have 12 foot vertical drive columns? If so, can these lift columns be taken during the existing PBB removal and fully refurbished (new ball screw assemblies/motors/etc.) for use on the newly refurbished PBBs to be provided?**

Response: Should the Contractor wish to propose the reuse of existing 12-foot vertical drive columns, such request shall be submitted as a formal substitution and will be subject to the shop drawing review and approval process. The Contractor shall provide complete supporting documentation and evidence demonstrating that any reused components, once refurbished, will perform in full compliance with all operational requirements, dimensional criteria, and performance parameters set forth in the Contract Drawings and Specifications. No reuse or substitution shall be considered approved until such evidence has been reviewed and a formal approval has been issued. The Owner and Engineer expressly reserve the right to reject the proposed reuse should it fail to demonstrate full compliance with the Contract requirements.

20. Specification Section 347713 – Passenger Boarding Bridges – Section 1.6.E.1: Can you please confirm the correct value for the wind speed to be accommodated when the PBB is in use/extended? The same 139mph wind speed is noted for both the stowed/retracted and the

in use/extended conditions – should there be a much lower wind speed listed for the in use/extended condition?

Response: Per FAA AC 150/5220-21C, a wind speed of 90 MPH may be used for the in-use and extended positions of the passenger boarding bridge. The Supplier shall design, furnish, and install the equipment in accordance with this requirement and all other applicable codes, standards, and contract specifications. Compliance with the above does not relieve the Supplier of responsibility for the structural integrity, safety, and performance of the passenger boarding bridge under all specified operating conditions. Final acceptance remains subject to review and approval during the shop drawing and submittal process.

21. In keeping with the advisement on plan drawing AP-404 that "CONTRACTOR MUST VERIFY ALL PBB MODELS, PBB SLOPES, PBB LIFT COLUMN CONNECTION HEIGHT…" – can you please provide CAD files for the relevant gate layouts and aircraft parking plans to assist in this verification process?

Response: CAD files associated with the Contract Drawings will be made available as reference materials to the successful Bidder. These files will be transmitted following award through the procurement process and shall be used for reference only. The Contract Drawings and Specifications, as issued, shall remain the governing documents for all requirements.

22. SECTION 238121 PRECONDITIONED AIR UNIT AND ACCESSORIES
PART 1 GENERAL
1.1 SUMMARY
PART 2 PRODUCTS
2.4 DIRECT EXPANSION PRECONDITIONED AIR UNIT (PCAIR)
B. Design Parameters and Requirements:
24 The PCAir unit shall provide information to the PBB HMI so that the PBB HMI can display status and error messages that will include, but not limited to:
a. A graphic representation of the PCAir unit and its major components.
Question: Would a Summary Fault solid red LED indication located on the door panel and at the control panel be acceptable?

Response: The red Summary Fault indicator light may be located on the door panel and control panel such that it is clearly designated to illustrate the associated PCA Unit for ease of recognition. The indicator shall remain solid red upon detection of a fault condition and extinguish when the fault has been cleared. All labeling, installation, and functionality shall comply with the project specifications, approved submittals, and applicable codes. Final acceptance is subject to verification during testing and commissioning.

23. SECTION 238121 PRECONDITIONED AIR UNIT AND ACCESSORIES
PART 1 GENERAL
1.1 SUMMARY
PART 2 PRODUCTS
2.4 DIRECT EXPANSION PRECONDITIONED AIR UNIT (PCAIR)
C. Unit Construction.

1 Manufacturer's standard casing construction and shall have corrosion protection coating, and exterior finish.
b. Color shall match the color of the PBB's and shall be coordinated with Owner PM.
Question: What is the Passenger Boarding Bridge color code?

Response: The color scheme and finishes for the passenger boarding bridge and its ancillary equipment shall be coordinated and finalized during the shop drawing review phase. The Supplier shall submit their standard sample options for review and approval by RIAC. Final acceptance of color and finish selections will be subject to RIAC's written approval during the submittal process, and no deviations shall be permitted without prior written authorization.

24. SECTION 238121 PRECONDITIONED AIR UNIT AND ACCESSORIES
PART 1 GENERAL
1.1 SUMMARY
PART 2 PRODUCTS
2.4 DIRECT EXPANSION PRECONDITIONED AIR UNIT (PCAIR)
E. Air Conditioning Components.
3 Filter-Drier:
a. A replaceable core type filter-drier shall be in the liquid line, to remove moisture and contamination.
Question: Can a filter dryer designed to last the life of the Pre-conditioned air unit be acceptable instead of a replaceable core?

Response: A filter dryer designed to last the life of the unit in lieu of a replaceable core is not permitted, and the Contractor shall provide a replaceable core filter dryer as specified.

25. SECTION 263543
400HZ GROUND POWER UNIT AND ACCESSORIES
PART 2 PRODUCTS
2.4 400Hz GROUND POWER UNIT (GPU)
C. Overload
1 Overload Capacity: The GPU shall be capable of supplying overloads of up to 125% for 10 minutes, 150% for 3 seconds and 200% for 1 second.
Question: Can the following overload thresholds be accepted in leu of 200% for 1 second?
250% for 30 seconds
300% for 15 seconds
400% for 3 seconds

Response: The proposed overload thresholds listed below may be accepted in lieu of the 200% for 1 second requirement, provided all applicable codes, standards, and project specifications are met. This acceptance shall not relieve the Supplier of responsibility for safe and reliable equipment performance, nor waive any other contractual obligations. Final acceptance remains subject to Engineer's review, written approval, and verification during the shop drawing and commissioning phases.

26. SECTION 263543
400HZ GROUND POWER UNIT AND ACCESSORIES

PART 2 PRODUCTS
2.4 400Hz GROUND POWER UNIT (GPU)
D. Fault Systems
1 The GPU will be capable of monitoring the following items and shutting down in the event they are out of tolerance. The faults listed below will be displayed or indicated.
a. Input power phase rotation.
Question: Can a unit that operates with any input phase rotation be accepted?

Response: A unit capable of operating with any input phase rotation will be acceptable provided the Contractor demonstrates through submittals that the unit fully complies with all other requirements of the Contract Drawings and Specifications.

27. SECTION 263543
400HZ GROUND POWER UNIT AND ACCESSORIES
PART 2 PRODUCTS
2.4 400Hz GROUND POWER UNIT (GPU)
E. Indicators
1 The GPU shall display operating information of the GPU using:
c. via downloading to the Owner's laptop PC via an RS232 port.
(1) If the use of an RS232 port interface is required, the Contractor shall supply the necessary cables and software to connect to the laptop of the Owner's maintenance contractor to the GPU, retrieve and display the required data.
Question: Can the operating information in a USB flash drive in CSV file format be accepted?

Response: Providing the operating information on a USB flash drive in CSV file format will be acceptable provided the submittal demonstrates that all other requirements of the Contract Drawings and Specifications are met in full.

28. SECTION 263543
400HZ GROUND POWER UNIT AND ACCESSORIES
PART 2 PRODUCTS
2.4 400Hz GROUND POWER UNIT (GPU)
E. Indicators
9 The following controls and indicators shall be located on the inside of the GPU unit:
a. Line drop compensation adjustment
b. Voltage adjustment (± 10%)
c. Hour meter (99,999 hours).
Question: Can the controls and indicators displayed on the front door HMI be accepted?

Response: Display of controls and indicators on the front door HMI will be acceptable provided the Contractor demonstrates through the submittal process that the HMI meets all other requirements of the Contract Drawings and Specifications.

29. There are two openings on the door schedule requesting an STC 50 rating. This would require a complete acoustic system. I don't see a spec for acoustic. Please advise how we should proceed.

Response:

- *Section 081113– Part 2 – Article 2.1 delete A, B, C and D and insert the following:*
  - *A. Non-Acoustical Door Manufacturers*
    1. *Ceco Door (Assa Abloy Group)*
    2. *Doors Unlimited Inc.*
    3. *Capital Aluminum & Glass Corp.*
    4. *Or Approved Equal.*
  - *B. Acoustic Door Manufacturers*
    1. *Ceco Door (Assa Abloy Group)*
    2. *Republic Doors and Frames*
    3. *Overlay Door Company*
    4. *Or Approved Equal*
- *Section 081113 Subsection 2.3.B.1.d refers to the door schedule for door STC rating. The contractor shall proceed by obtaining the 50 STC door system from the above indicated manufacturers or approved equal. Door thickness shall be 1-3/4".*

30. Specification Section 00003, Table of Contents:

Response: Delete Section 20 (Proposal Requirements and Conditions) and Section 30 (Award and Execution of Contract).

31. Specification Section 00003, Table of Contents:

Response: ADD FAA Technical Specifications Sections C-100, C-102, C-105, P-101, P-152, P-209, P-501, P-605, P-610, P-620. These sections are attached.

32. Sheet No. GI-004 and GP-100:

Response: On the plan, Replace "Airport Gate 27.." with "Airport Gate 37…" and replace "Airport Gate 28…" with "Airport Gate 38…".

33. Compliance with Buy America provisions:

Response: Buy America provisions are not required for this project.

34. The interior storefront calls for 1/4" glass on one sheet, minimum 3/8" glass on another sheet and 1 1/8" on yet another sheet. Please clarify.

Response: Storefront glazing shall be 3/8" thick minimum and is part of the storefront delegated design. Final thickness shall be as needed to comply with the specified load requirements.

35. The job specific lab testing the architect is calling for will wind up costing more that the curtain wall (Spec 084413 Section 1.9)

Response: The lab test may be based on a test that the curtain wall manufacturer can provide using previous testing on identical system, demonstrating compliance with the specified loads. The Contractor may propose an alternative means to provide this information. However, the constructed curtain wall system must demonstrate compliance with the criteria specified in paragraph 1.9 of Section 084413.

36. **The testing of every other bay on the curtain walls in 3 different locations each will slow the job down to a crawl. (Spec 084413 Section 3.6)**

Response: Provided the importance and location of this project, the 50% test of the glazed area is a field water test that should not slow the construction of the project significantly. Several bays can be tested at the same time to minimize slow down.

37. **The exterior glass the architect is calling for as 1 1/8" thick is no big deal but it would help if they gave the make-up of the glass such as 1/4" exterior glass, 1/2" air space, 3/8" interior glass and where they appear to be doing it for sound purposes at least one light or both should be laminated glass. Please clarify.**

Response: Glass shall be composed as a minimum of 3/8" FT exterior, ½" airspace and ¼" fully tempered interior with Low E as specified and OITC rating of 34 as specified in 2.2.F.

38. **11/A-303. Where the passenger boarding bridges attach to the curtain wall the Architect calls for internal reinforcing to secure the bridge to the inside of the reinforcing. What is this product and is it included with Jet bridge system?**

Response: This should be coordinated with the boarding bridge work and is part of the delegated design of the curtain wall. Regular operation may not transfer any load to the curtain wall but load may be transferred at wind event.

39. **Drawings and sections are mislabeled. For example, Exterior Elevation 5/ A-301 is labeled A-201. Also, Section 5 on A902 for a cut through the insulated composite aluminum spandrel header actually takes you to a lighting fixture mounting detail. Please clarify.**

Response: Regarding the drawing title for 5/A-301, refer to A-001 for the drawing symbol legend. The sheet number at the bottom of each drawing title is a cross-reference number. Delete detail callout 5/A-902 as shown on 5/A-301.

RIAC would like to remind all prospective bidders/offerors that additional Addendums may be issued by RIAC until the deadline for bid submissions. As such, RIAC encourages prospective bidders/offerors to visit www.flyri.com/riac/procurement on a frequent basis.

####END OF ADDENDUM###

SECTION 074213.19

INSULATED METAL INFILL PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Interior Acoustic: Infill Panels at Existing Curtainwall

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at T.F. Green International Airport, Warwick, RI.

   1. Meet with Owner, Architect, Owner's insurer if applicable, metal panel Installer, metal panel manufacturer's representative, structural-support Installer, and installers whose work interfaces with or affects metal panels, including installers of doors, windows, and louvers.
   2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   3. Review methods and procedures related to metal panel installation, including manufacturer's written instructions.
   4. Examine support conditions for compliance with requirements, including alignment between and attachment to structural members.
   5. Review flashings, special siding details, wall penetrations, openings, and condition of other construction that affect metal panels.
   6. Review governing regulations and requirements for insurance, certificates, and tests and inspections if applicable.
   7. Review temporary protection requirements for metal panel assembly during and after installation.
   8. Review procedures for repair of metal panels damaged after installation.
   9. Document proceedings, including corrective measures and actions required, and furnish copy of record to each participant.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of panel and accessory.

B. Shop Drawings:

1. Include fabrication and installation layouts of metal panels; details of edge conditions, joints, panel profiles, corners, anchorages, attachment system, trim, closures, and accessories; and special details.
2. Accessories: Include details of the trim, and anchorage systems, at a scale of not less than 1-1/2 inches per 12 inches (1:10).

C. Samples for Initial Selection: For each type of metal panel indicated with factory-applied color finishes.

1. Include similar Samples of trim and accessories involving color selection.

D. Samples for Verification: For each type of exposed finish, including color and texture, prepared on Samples of size indicated below.

1. Metal Panels: 12 inches (305 mm) square. Include fasteners, closures, and other metal panel accessories.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For metal panels to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

B. Mockups: Build mockups to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockup of typical metal panel assembly including supports, attachments, and accessories.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver components, metal panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.

B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.

C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.

D. Retain strippable protective covering on metal panels during installation.

1.9 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

   a. Structural failures including rupturing, cracking, or puncturing.
   b. Deterioration of metals and other materials beyond normal weathering.

2. Warranty Period: Five years from date of Substantial Completion.

B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E72:

1. Other Design Loads: As indicated below

B. Structural Loads: 40 psf.

C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 20 deg F (7 deg C), ambient; 86 deg F (30 deg C), material surfaces

D. Fire-Test-Response Characteristics: Provide metal wall panels and system components with the following fire-test-response characteristics, as determined by testing identical panels and system components per test method indicated below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

1. Fire-Resistance Characteristics: Provide materials and construction tested for fire resistance per ASTM E119.
2. Radiant Heat Exposure: No ignition when tested according to NFPA 268.
3. Potential Heat: Acceptable level when tested according to NFPA 259.
4. Surface-Burning Characteristics: Provide wall panels with a flame-spread index of 25 or less and a smoke-developed index of 450 or less, per ASTM E84.

2.2 INTERIOR ACOUSTIC INFILL PANELS AT EXISTING CURTAINWALL

A. General: Provide factory-formed and -assembled metal wall panels fabricated from two metal facing sheets and core material laminated or otherwise securely bonded to facing sheets during fabrication without use of contact adhesives, and with joints between panels designed to form weathertight seals.

B. Laminated, insulated metal faced

1. Manufacturers:

a. Mapes
b. Americlad
c. CAP Industries
d. Or Approved Equal

2. Finishes:
   a. Exterior: Standard Kynar Color
   b. Interior: Standard Kynar Color
   c. Color as selected by Architect

3. Panel Fabrication:

   a. Exterior Skin: 0.24" – 0.32" smooth Aluminum
   b. Exterior Substrate: 1/8" Premium Hardboard
   c. Core: Polystyrene
   d. Interior Substrate: 1/8" Premium Hardboard
   e. Interior Skin: 0.24" – 0.32" smooth Aluminum
   f. Tolerances: -.8% of panels dimension length and width – (+/-) 1-16" thickness
   g. Panel Thickness: -1"
   h. STC 20

2.3 MISCELLANEOUS MATERIALS

A. Panel Fasteners: Self tapping screws designed to withstand design loads. Exposed fasteners are not acceptable.

B. Panel Sealants: Provide sealant type recommended by manufacturer that are compatible with panel materials, are nonstaining, and do not damage panel finish.

1. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch (13 mm) wide and 1/8 inch (3 mm) thick.
2. Joint Sealant: ASTM C920; elastomeric polyurethane or silicone sealant; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended in writing by metal panel manufacturer.
3. Butyl-Rubber-Based, Solvent-Release Sealant: ASTM C1311.

2.4 FABRICATION

A. General: Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.

B. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of panel.

C. Fabricate metal panel as one single panel per opening with captive gaskets or separator strips that minimize noise from movements.

2.5 FINISHES

A. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

C. Aluminum Accessories:
   1. Siliconized Polyester: Epoxy primer and silicone-modified, polyester-enamel topcoat; with a dry film thickness of not less than 0.2 mil (0.005 mm) for primer and 0.8 mil (0.02 mm) for topcoat.
   2. Anodized Finish at Concealed Surfaces:

      a. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, metal panel supports, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. Do not install panels that are observed to be defective including warped, bowed, dented, scratched and delaminating components.

3.2 PREPARATION

A. Miscellaneous Supports: Install subframing, furring, and other miscellaneous panel support members and anchorages according to ASTM C754 and metal panel manufacturer's written recommendations.

B. Panel surfaces shall be free from defects prior to installation.

3.3 METAL PANEL INSTALLATION

A. General: Install metal panels according to manufacturer's written instructions in orientation, sizes, and locations indicated. Install panels perpendicular to supports unless otherwise indicated. Glaze and anchor metal panels and other components of the Work securely in place,

with provisions for thermal and structural movement and support. Erect panels plumb, level and true.

1. Shim or otherwise plumb substrates receiving metal panels.
2. Seal metal panels at perimeter of all openings. Fasten with self-tapping screws.
3. Install screw fasteners in predrilled holes.
4. Locate and space fastenings in uniform vertical and horizontal alignment.
5. Install trim as metal panel work proceeds.

B. Fasteners:

1. Aluminum Panels: Use aluminum or stainless-steel fasteners for surfaces exposed to the exterior; use aluminum or galvanized-steel fasteners for surfaces exposed to the interior.

C. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action as recommended in writing by metal panel manufacturer.

D. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for acoustic performance of metal wall panel assemblies. Provide types of gaskets, fillers, and sealants indicated by metal panel manufacturer; or, if not indicated, provide types recommended by metal wall panel manufacturer.

1. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.4 CLEANING AND PROTECTION

A. Remove temporary protective coverings and strippable films, if any, as metal panels are installed, unless otherwise indicated in manufacturer's written installation instructions. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.

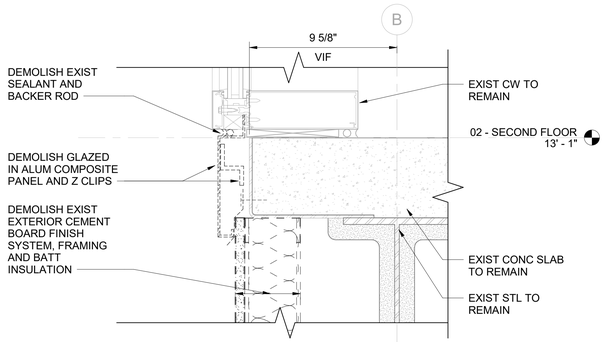
B. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

3.5 MEASUREMENT AND PAYMENT

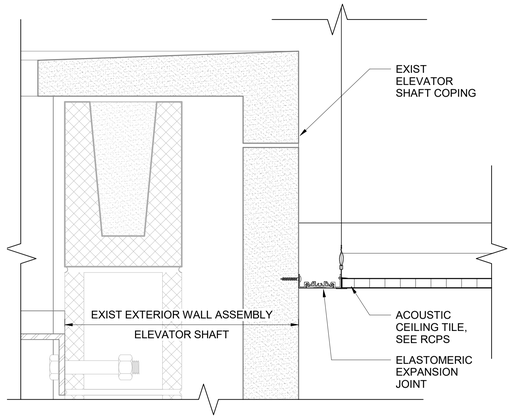
A. The work specified in this section shall be included as a lump sum within the Contract Bid Amount.

B. Payment for the work specified in this section and designated in the Contract Documents shall include all materials, equipment, labor, and incidentals required to furnish and install complete in place and shall be included within the Contract Bid Amount.

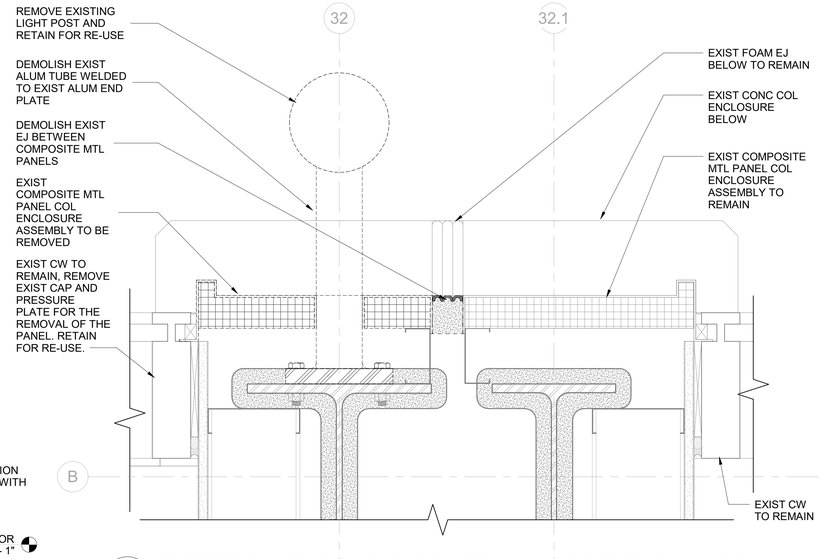
END OF SECTION 074213.19



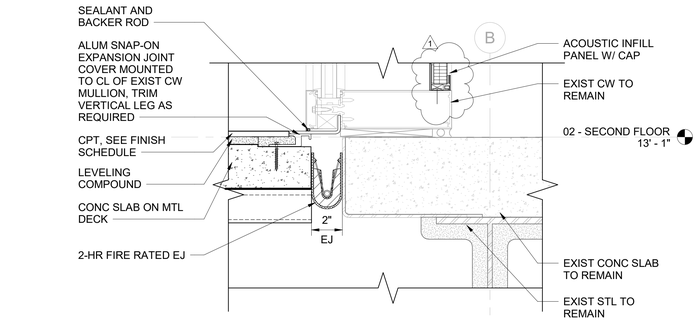
8 FLOOR AT EXISTING WALL DEMO DETAIL
AD-101 3" = 1'-0"



4 INTERIOR CLG AT ELEVATOR SHAFT
A-302 3" = 1'-0"

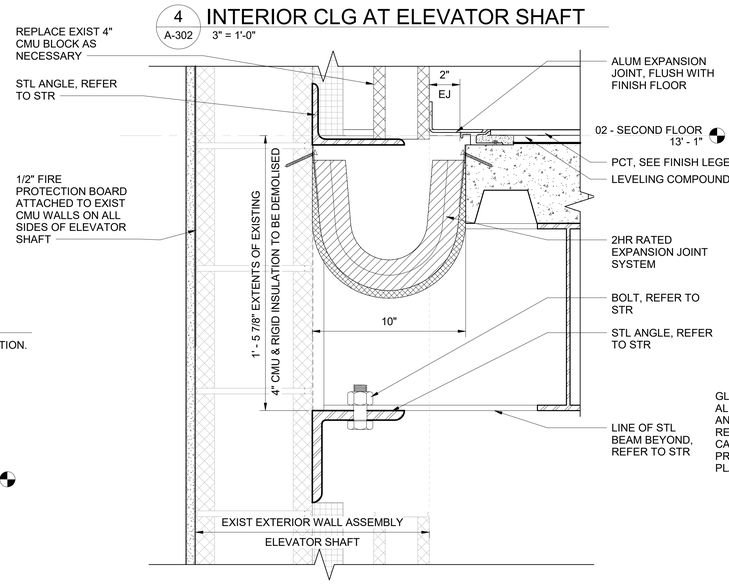


1 EXTERIOR - EXISTING EXPANSION JOINT DEMO PLAN DTL
AD-101 3" = 1'-0"

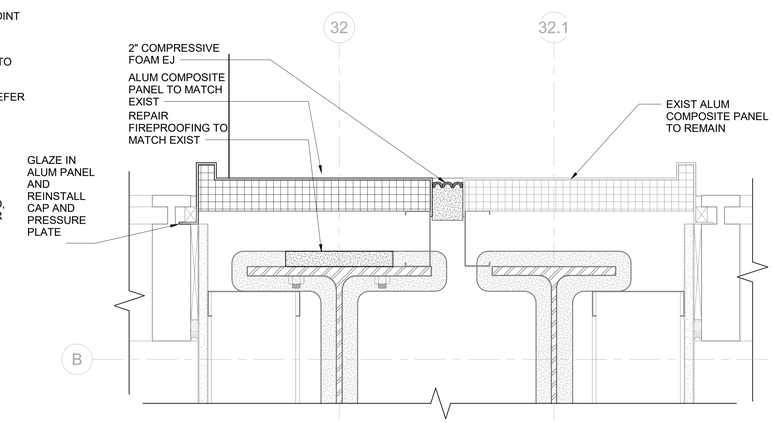


9 INTERIOR - EXPANSION JOINT AT EXISTING WALL
A-202 3" = 1'-0"

NOTE: REFER TO DETAIL 8/A-901 FOR DEMOLITION.

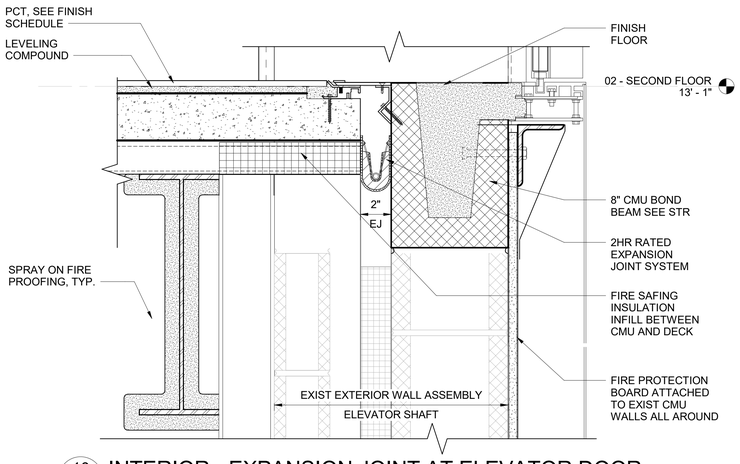


5 FLOOR AT ELEVATOR SHAFT
A-302 3" = 1'-0"

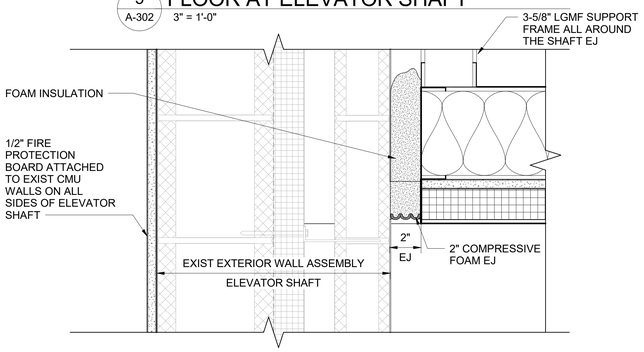


2 INTERIOR - EXPANSION JOINT PLAN DTL
A-202 3" = 1'-0"

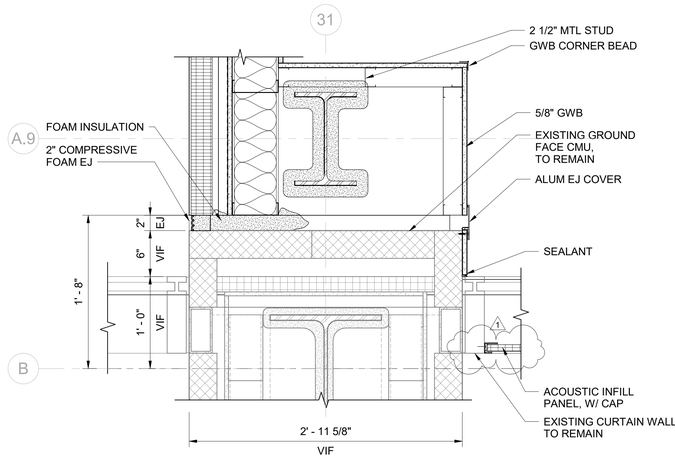
NOTE: REFER TO DETAIL 1/A-901 FOR DEMOLTION.



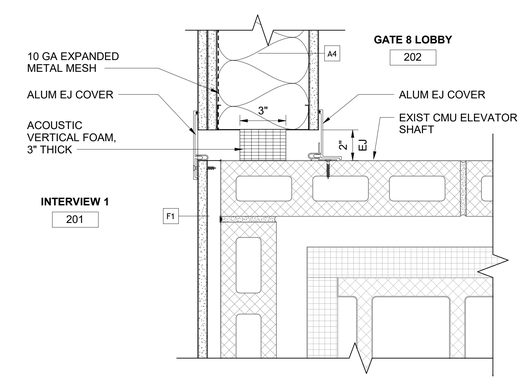
10 INTERIOR - EXPANSION JOINT AT ELEVATOR DOOR
A-402 3" = 1'-0"



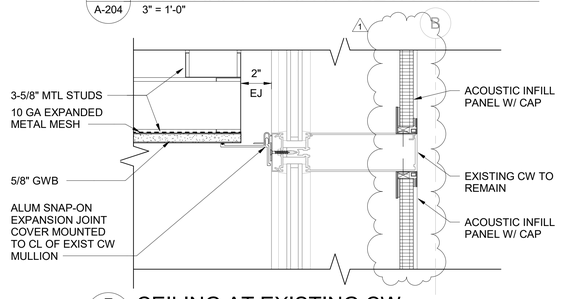
6 EXTERIOR - CLG AT ELEVATOR SHAFT
A-204 3" = 1'-0"



3 EXTERIOR/INTERIOR - EXPANSION JOINT PLAN DTL
A-202 1 1/2" = 1'-0"



11 INTERIOR - EXPANSION JOINT AT ELEVATOR SHAFT WALL
A-202 3" = 1'-0"



7 CEILING AT EXISTING CW
A-205 3" = 1'-0"

0 3 6 12 inches

SCALE: 3"=1'-0"

RHODE ISLAND T. F. GREEN INTERNATIONAL AIRPORT
WARWICK, RHODE ISLAND

STATE OF RHODE ISLAND
RHODE ISLAND AIRPORT CORPORATION

Daniel Mckee - Governor
Jonathan N. Savage - Chair, RIAC Board
Iftikhar Ahmad - President and CEO
Dawn Mineker - Project Manager

PROJECT SUBMISSION PHASE:
CONSTRUCTION DOCUMENTS

PRIMARY:

WSP USA Inc.
100 SUMMER STREET
BOSTON, MA 02110
TEL: +1 617.426.7330

CONSULTANT:

REGISTRATION STAMP:

REVISIONS:

REV. NO.	DATE	DESCRIPTION	BY
1	09/17/20 25	Bid Addendum 2	AD

KEY PLAN:

AREA OF WORK

CALLED

PROJECT NUMBER AND TITLE:

RIAC CIP NO. PVD.386

RIAC PVD Gates 7 & 8 Reconfiguration

SHEET TITLE:

EXPANSION JOINT DETAILS

DISCIPLINE:

ARCHITECTURE

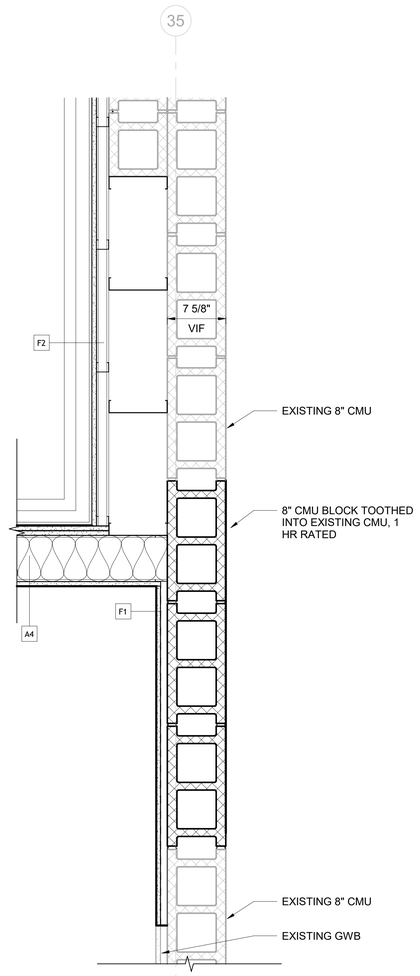
DESIGN BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:
JAD	SA	AD	AD

SCALE: AS NOTED

DATE: 08/01/2025

SHEET NUMBER: SHEET OF 100

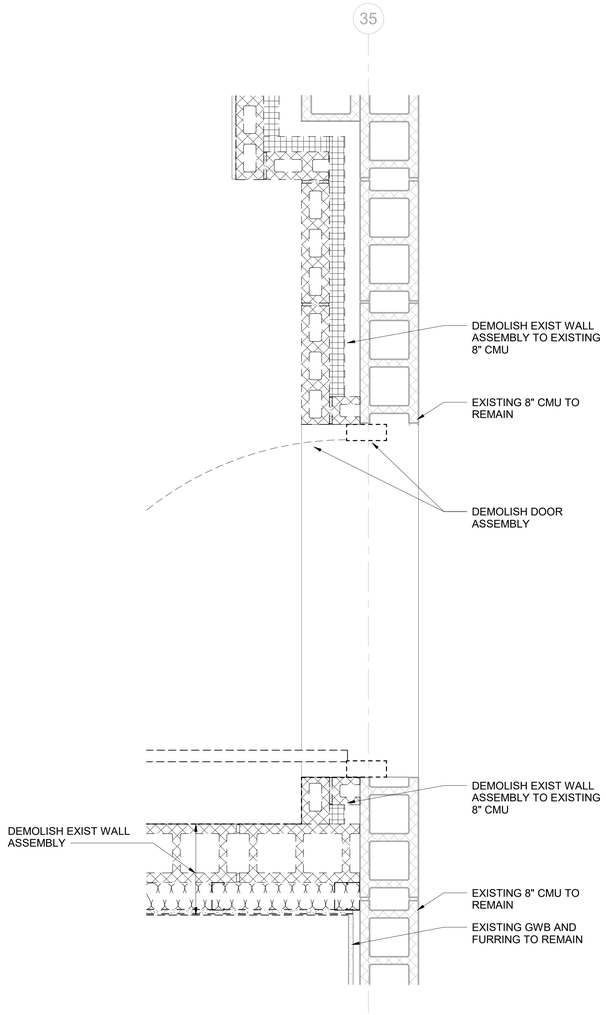
A-901



4 A-201 PLAN DETAIL AT EXISTING DOOR INFILL

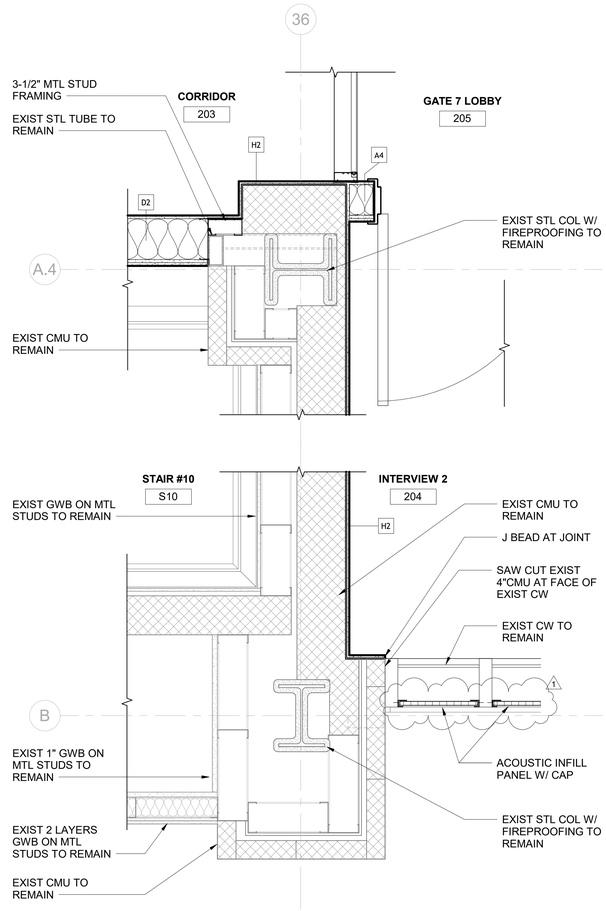
1 1/2" = 1'-0"

NOTE: REFER TO DETAIL 3/A-903 FOR DEMOLITION.



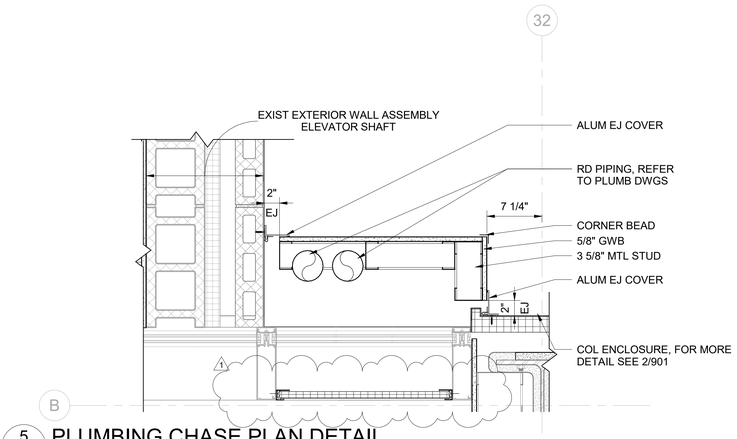
3 AD-101 DEMO PLAN DETAIL AT EXISTING DOOR INFILL

1 1/2" = 1'-0"



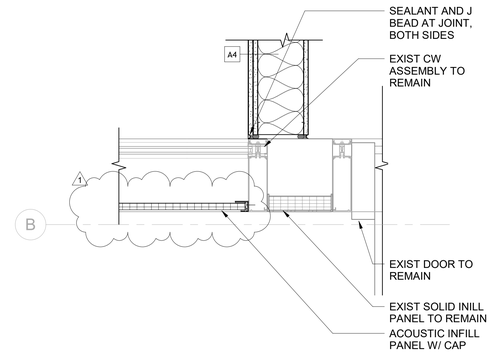
1 A-202 PLAN DETAIL AT STAIR ENCLOSURE

1" = 1'-0"



5 A-501 PLUMBING CHASE PLAN DETAIL

1 1/2" = 1'-0"



2 A-202 PLAN DETAIL AT EXIST CW

1 1/2" = 1'-0"

0 6 12 24 inches

SCALE: 1 1/2" = 1'-0"

0 6 12 24 inches

SCALE: 1"=1'-0"

RHODE ISLAND T. F. GREEN INTERNATIONAL AIRPORT

WARWICK, RHODE ISLAND

STATE OF RHODE ISLAND
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Daniel Mckee - Governor
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CONSULTANT:

REGISTRATION STAMP:

REVISIONS:

REV. NO.	DATE	DESCRIPTION	BY
1	09/17/20 25	Bid Addendum 2	AD

KEY PLAN:

AREA OF WORK

CALLED

PROJECT NUMBER AND TITLE:

RIAC CIP NO. PVD.386

RIAC PVD Gates 7 & 8 Reconfiguration

SHEET TITLE:

INTERIOR PLAN DETAILS

DISCIPLINE:

ARCHITECTURE

DESIGN BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:
JAD	SA	AD	AD

SCALE: AS NOTED

DATE: 08/01/2025

SHEET NUMBER: SHEET OF 100

A-903

IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)

Planholders as of 2:05pm - 9/15/2025

	Email	First Name	Last Name	Download Date	Solicitation	Firm Name	Age of Firm (years)
1	mlafazia@riconusa.com	Matthew	LaFazia	8/28/2025 14:15	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	RICON Construction, LLC	11
2	ssadozai@pvdairport.com	TEST	TEST	8/28/2025 14:16	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	TEST	TEST
3	alex.martichuski@collins.com	alex	martichuski	8/28/2025 14:18	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Collins Aerospace	50
4	julia.andreoli@sita.aero	Julia	Andreoli	8/28/2025 14:18	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	SITA Inc	75
5	t.karl@vrhcorp.com	Tim	Karl	8/28/2025 14:19	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	VRH Construction	66
6	kdrolet@jhlynch.com	Kelly	Drolet	8/28/2025 14:25	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	J.H. Lynch & Sons, Inc.	67
7	bacs@maine.rr.com	Richard	Yarnold	8/28/2025 14:43	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Ballantine Aviation Consulting Services	14
8	matt@towerconstructioncorp.com	Matthew	Kapaon	8/28/2025 14:47	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Tower Construction	30
9	jbambara@chasolutions.com	Joseph	Bambara	8/28/2025 14:53	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	CHA Consulting	70
10	ascothon@digregoriocorp.com	Arthur	Scothon	8/28/2025 14:51	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	DiGregorio	28
11	slaplante@pariseault.com	Seth	LaPlante	8/28/2025 14:22	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Pariseault	80
12	lnau@westerncon.com	Lawrence	Nau	8/28/2025 15:04	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Western Industrial Contractors	43
13	pcox@tracbuilders.com	Philip	Cox	8/28/2025 15:53	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	TRAC Builders	40
14	dcaggiano@synetinc.com	Dana	Caggiano	8/28/2025 14:23	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	SyNet Inc.	36
15	creynolds@dubonmasonry.com	Chris	Reynolds	8/28/2025 15:56	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Dubon Masonry Construction, LLC	9
16	slamontagne@pariseault.com	Sean	Lamontagne	8/28/2025 16:18	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Pariseault Builders	79
17	snarkiewicz@jrvinagrocorp.com	Sophia	Narkiewicz	8/28/2025 17:37	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	JR Vinagro	25
18	cmatthes@gilbaneco.com	Calvin	Matthes	8/28/2025 18:32	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Gilbane Building Company	155
19	bpevsner@symbrant.com	Bryan	Pevsner	8/28/2025 19:05	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Symbrant Aviation Services, Inc.	5
20	clayton@yahoo.com	na	na	8/28/2025 22:58	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	na	15
21	jayalakshmil@construction.com	Dodge	Data & Analytics jayalakshmi	8/29/2025 5:56	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	jayalakshmi	d
22	planroom@wjgei.com	Tiffany	DiSanto	8/29/2025 13:11	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Wayne J. Griffin Electric, Inc.	45
23	Michael.Yu@Keleusmatic.com	Michael	Yu	8/29/2025 21:07	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Keleusmatic Technologies, Inc	11
24	camille.bechara@wsp.com	camille	bechara	8/29/2025 22:52	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	WSP USA	150
25	camille.bechara@wsp.com	camille	bechara	8/29/2025 23:28	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	WSP USA	150
26	camille.bechara@wsp.com	camille	bechara	8/29/2025 23:32	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	WSP USA	150
27	camille.bechara@wsp.com	camille	bechara	8/30/2025 3:02	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	WSP USA	150
28	camille.bechara@wsp.com	camille	bechara	8/30/2025 12:13	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	WSP USA	150
29	rjirsa@tracbuilders.com	Randy	Jirsa	8/30/2025 14:24	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	TRAC Builders	30
30	deltekplusonvia@gmail.com	Deltek	onvia	9/2/2025 4:22	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	onvia	bid
31	content@constructconnect.com	Michael	Stubbs	9/2/2025 8:33	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Constructconnect	3
32	agould@bentleycompanies.com	angel	gould	9/2/2025 11:42	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Bentley Builders, LLC	10
33	agould@bentleycompanies.com	angel	gould	9/2/2025 11:43	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Bentley Builders, LLC	10
34	estimating@ewburman.com	Robert	Dandeneau	9/2/2025 12:48	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	E. W. Burman, Inc.	58
35	jonathan.simpson@energysource.com	Larry	Simpson	9/2/2025 13:47	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Energy Source LLC	25
36	patrick@haynesgroupinc.com	Patrick	Andrews	9/2/2025 13:48	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Haynes Group	25
37	johnf@matternconstruction.com	John	Farrell	9/2/2025 13:54	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Mattern Construction INC.	38
38	hdonahue@haynesgroupinc.com	Hilary	Donahue	9/2/2025 14:33	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Haynes Group	24
39	sreid@haynesgroupinc.com	Sean	Reid	9/2/2025 15:37	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Haynes Group	24
40	wclarke@jrvinagrocorp.com	Wayne	Clarke	9/2/2025 16:22	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	JR Vinagro Corp	26
41	snarkiewicz@jrvinagrocorp.com	Sophia	Narkiewicz	9/2/2025 16:34	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	JR Vinagro	25
42	jmcdonough@rossielectric.com	John	McDonough	9/2/2025 17:53	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Rossi Electric Co LLC	30
43	kdrolet@jhlynch.com	Kelly	Drolet	9/2/2025 17:53	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	J.H. Lynch & Sons, Inc.	67
44	jmcdonough@rossielectric.com	John	McDonough	9/2/2025 17:56	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Rossi Electric Co LLC	30
45	jmcdonough@rossielectric.com	John	McDonough	9/2/2025 17:57	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Rossi Electric Co LLC	30
46	acherry@buildri.org	Anthony	Cherry	9/2/2025 18:23	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Build Rhode Island	25
47	cmatthes@gilbaneco.com	Calvin	Matthes	9/2/2025 19:34	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Gilbane Building Company	155
48	laurie_barton@crlaurence.com	Laurie	Barton	9/2/2025 19:44	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	CR Laurence	50
49	bpevsner@symbrant.com	Bryan	Pevsner	9/2/2025 19:39	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Symbrant Aviation Services, Inc.	5
50	erik.strand@aerosys.net	Erik	Strand	9/2/2025 19:50	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	AERO	27
51	sean.quinton@aerobridgeworks.net	SEAN	QUINTON	9/2/2025 20:03	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	AERO Bridgeworks Inc.	26
52	sjoseph@consigli.com	Suzette	Joseph	9/2/2025 21:45	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Consigli Construction	120
53	malisa.fearing@koboutility.com	Malisa	Fearing	9/3/2025 12:23	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	KOBO Utility Construction	28
54	agould@bentleycompanies.com	angel	gould	9/3/2025 13:06	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Bentley Builders, LLC	10
55	sales.tkas.usa@tkelevator.com	Glenda	Leake	9/3/2025 14:35	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	TK Airport Solutions, Inc.	29 year
56	t.karl@vrhcorp.com	Tim	Karl	9/3/2025 21:12	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	VRH Construction	66
57	lnau@westerncon.com	Lawrence	Nau	9/4/2025 15:55	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Western Industrial Contractors	43
58	rob.brethauer@aerobridgeworks.net	Rob	Brethauer	9/4/2025 17:55	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	AERO BridgeWorks	26
59	rob.brethauer@aerobridgeworks.net	Rob	Brethauer	9/4/2025 17:57	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	AERO BridgeWorks	26
60	mrichards@a-bridgellc.com	Mike	Richards	9/4/2025 18:21	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Dabico A-Bridge LLC	4 (under current name/ownership - almost 40 years experience in full company history)
61	jetwayproposals@oshkoshaerotech.com	Tracie	Gesel	9/4/2025 20:57	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Oshkosh Aerotech	66
62	Gen.Canada@ConstructConnect.com	Gen	Canada	9/5/2025 15:11	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	ConstructConnect	10
63	pcalcagni@manafort.com	Peter	Calcagni	9/5/2025 15:19	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Manafort Brothers	105
64	lucasg@matternconstruction.com	Lucas	Girard	9/5/2025 17:02	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Mattern Construction Inc.	38
65	patricia.cabarcos@dabico.com	Patricia	Cabarcos	9/5/2025 19:08	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Dabico Airport Solutions, Inc	30
66	brandi.flanagan@construction.com	Brandi	Flanagan	9/8/2025 14:18	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Dodge Construction Network	50
67	kate@ewaudet.com	kate	sweeney	9/8/2025 17:24	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	E.W. Audet & Sons, Inc.	59
68	jpeters@synetinc.com	JAY	PETERS	9/10/2025 12:33	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	SyNet Inc.	32
69	mrichards@a-bridgellc.com	Michael	Richards	9/10/2025 15:11	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Dabico A-Bridge LLC	3 (30+ years experience from predecessor
70	olivia.desmond@siemens.com	olivia	desmond	9/11/2025 14:02	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Siemens Industry Inc	150
71	ryoung@mgt.us	Robert	Young	9/12/2025 12:28	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	MGT Impact Solutions	50
72	dereka@matternconstruction.com	Derek	Allard	9/12/2025 13:16	Invitation for Bids (IFB) 36131 – Gates 7 & 8 Building Reconfiguration at PVD (Construction Contract)	Mattern Construction, Inc.	38

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Changes in these sections are identified as Bold for additions and ~~Strikethrough~~ for deletions

Section 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:

Paragraph Number	Term	Definition
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.

Paragraph Number	Term	Definition
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

Paragraph Number	Term	Definition
		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

Paragraph Number	Term	Definition
		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

Paragraph Number	Term	Definition
		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 Rhode Island Airport Corporation (RIAC).
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.'

Paragraph Number	Term	Definition
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

Paragraph Number	Term	Definition
		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.

Paragraph Number	Term	Definition
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

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. See Division 1, Specification 01260 for requirements.

40-03 Omitted items. See Division 1, Specification 01260 for requirements.

40-04 Extra work. See Division 1, Specification 01260 for requirements.

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.

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

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): ASCII point data file and AutoCAD version 2022.

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.

END OF SECTION 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. The Contractor shall provide dedicated space for the use of the engineer, RPR, and inspectors, as a field office for the duration of the project. This space shall be located conveniently near the construction and shall be separate from any space used by the Contractor. The Contractor shall furnish water, sanitary facilities, heat, air conditioning, and electricity.

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

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: There is proposed plumbing work that connects to the sanitary system and Warwick Sewer Authority. See sheet f

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 sheets GP-101 to GP-104 of the project plans. The CSPP narrative is Attachment A to Section 70.

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 the contract drawings for specific project phasing elements and Construction Safety Phasing Plan (CSPP)

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.

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**.** Not used.

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 Division 0, Section 00100, Information to Bidders for insurance requirements specific to this project.

END OF SECTION 70

ATTACHMENT A

CSPP Narrative

Rhode Island
T. F. Green International Airport

CONSTRUCTION SAFETY AND PHASING PLAN

FOR

RIAC PVD Gates 7 & 8 Reconfiguration

RIAC CIP NO. PVD.386

RHODE ISLAND T.F GREEN INTERNATIONAL AIRPORT
CITY OF WARWICK, RHODE ISLAND

Submitted: August 2025
IFC Submission

100 Summer Street
Boston, MA 02110
WSP Project No.: US0037040.6333

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INTRODUCTION

Rhode Island T. F. Green International Airport (PVD) is a commercial service primary airport located in Warwick, Rhode Island and is the largest airport in the state. Owned and operated by the Rhode Island Airport Corporation (RIAC), the airport offers commercial passenger and cargo flights, as well as general aviation. The current runway configuration for PVD is comprised of the main 8,700' long, 150' wide Runway 5-23 and crosswind 6,081' long, 150' wide Runway 16-34.

This project consists of expanding the terminal to accommodate a new FIS corridor and reconfiguring the airside gate layouts at Gates 7 and 8. A new "bump-out" will be constructed into the existing apron which will accommodate a new passenger ramp. The ramp will be utilized as the new Federal Inspection Services (FIS) corridor for inbound international passengers arriving at either Gate 7 or 8. The existing Passenger Boarding Bridges (PBBs) at Gates 7 and 8 will be removed and replaced with newly refurbished PBBs at new locations on new foundations. The airside apron pavement markings will be remarked to accommodate a new aircraft parking layout. Specific components of the project include the following:

- Demolition of existing terminal curtain wall
- Demolition of existing pavement markings
- Demolition of existing apron pavement
- Demolition of existing sidewalk
- Demolition and removal of existing Passenger Boarding Bridges
- Construction of new PBB and building foundations/footings
- Installation of construction of newly refurbished PBB and new ancillary equipment.
- Construction of new FIS corridor and ramp
- Construction of building electrical, mechanical, and security components
- Construction of temporary passenger walkways and pavement markings
- Installation of new access doors
- Installation of new in-ground bollards

*No existing utilities are expected to be removed or relocated during this project.

The Construction Notice to Proceed (NTP) is anticipated to be given in October of 2025 and the project completion is anticipated to be within the total contract time of 300 Calendar Days, commencing at NTP. Phase 1 may commence upon issuance of NTP, however work in Phases 2-3 have work hours and site availability restrictions associated with them, see Appendix 3 and Project Plans for more information. Phase 3 must reach substantial completion by August, 2026. Detailed durations of each phase can be found below in Section 2.

Throughout construction, Gate 7 and/or Gate 8 must remain capable of supporting passenger aircraft operations. The contractor may need to adjust barricade boundaries as directed by RIAC operations. All pedestrian walkways specified in the phasing plans should remain clear, and apron areas are to be maintained as clean as possible.

This Narrative was prepared to meet the requirements of FAA Advisory Circular 150/5370-2G, "*Operational Safety on Airports During Construction"*. The project area is shown in the attached Construction Safety and Phasing Plans in Appendix 3.

RIAC will provide a Resident Project Representative (RPR). Throughout this document, the RPR and Airport will be referred to as RIAC. RIAC has contracted with WSP to provide engineering services. WSP USA Inc. (Engineer), the RPR, and Contractor will report to RIAC.

The purpose of the CSPP is to identify all construction activities that will occur within the Air Operations Area (AOA) of the airfield and define how each construction area will comply with the requirements of FAR Part 139 and all applicable FAA rules and regulations.

The CSPP is a standalone document written to correspond with the safety and security set forth in Advisory Circular 150/5370-2G, RIAC's safety and security requirements, in addition to all local codes, requirements and procedures. The CSPP is to be used by all personnel involved in the project. The CSPP covers the actions and responsibilities of design, construction, inspection and airport personnel.

Prior to the start of the project, the Contractor must submit a "Safety Plan Compliance Document" (SPCD) to RIAC. The SPCD must demonstrate how the Contractor will meet the safety requirements of the contract and CSPP, including details on toolbox safety meetings, types, locations, and maintenance of barricades, work access routes, and proposed procedures used by the Contractor to monitor aircraft activity. Procedures utilized by the Contractor to eliminate conflicts between construction operations and aircraft traffic must be included in the SPCD. Within the content of the SPCD the Contractor shall include a statement that includes:

- The Contractor has read and understands the CSPP.
- The Contractor will comply with all the requirements and safety procedures detailed within the CSPP.

The SPCD must address all safety considerations specific to each project location in accordance with the advisory circular and any information not discussed in the original CSPP must be outlined in the SPCD. The SPCD must be submitted to RIAC prior to the pre-construction meeting and approved by RIAC at minimum fourteen (14) calendar days prior to the commencement of construction. Any changes to the constructability of the project must be outlined in the SPCD and re-submitted to RIAC for review and approval before continuation of that portion of work.

In the event that the Contractor's activities are found to be in non-compliance with the requirements of the CSPP or SPCD, RIAC will direct the Contractor in writing to immediately stop all operations of that particular work until such time all deficiencies are mitigated and/or corrected to the satisfaction of RIAC.

The CSPP and SPCD must be available at all times on the jobsite. It is the responsibility of the Contractor to ensure all construction personnel are familiar with the safety procedures and regulations of RIAC.

1. COORDINATION

Pre-bid coordination with project stakeholders will consist of a pre-bid meeting with the potential bidders to describe phasing restrictions, safety requirements and project details. The Contractor shall always provide FAA representative unencumbered access to FAA facilities and underground cables, if any, within or adjacent to the project location.

Contractor Progress Meetings

As stated above, the SPCD must be submitted prior to the pre-construction meeting so that it can be discussed during the meeting as an agenda item. Additionally, RIAC must hold weekly progress meetings, and special meetings at other times, to discuss construction schedules, airfield closures, safety and security issues, and other related matters. The Contractor must be prepared to discuss the overall project schedule as well as a detailed 21-day look ahead schedule at every meeting. The Contractor must provide RIAC a fourteen-day (14-day) advance notice of intended work plans prior to the implementation of work. Operational safety will be a standing agenda item for discussion during every meeting conducted both before and during the construction project.

Daily/Weekly Safety Briefings

Safety briefings are to be held daily and prior to major closures. Agenda items must include where the Contractor can and can't go.

Scope and Schedule Change Management

During the execution of the construction, changes in conditions which impact the scope and/or schedule of the work may be necessary. If this occurs, the CSPP and SPCD must be updated and resubmitted for review and approval by the FAA and RIAC for each change in condition related to the project. Coordination with the project stakeholders will occur again as necessary when scope and schedule related changes warrant.

FAA ATO Coordination

The Contractor must have a heightened awareness of all aircraft in the vicinity of the project. The Contractor must always obey the aviation instructions of the FAA and RIAC. The Contractor must contact RIAC at the start of each week to inform them of his or her activities.

Project Contacts

The table below provides a comprehensive list of parties involved in the project.

Organization	Role	Point of Contact	Email Address	Phone Number
RIAC	Senior Vice President, Infrastructure	Dawn Mineker, P.E.	dmineker@pvdairport.com	(401) 691-2417
RIAC	Project Manager, Engineering	Tala Norouziasl	snorouziasl@pvdairport.com	(401) 895-0543
RIAC	AVP, Airport Operations & Airport Security Coordinator	Femi Odunbaku	fodunbaku@pvdairport.com	(401) 862-5129
RIAC	VP Airport Operations	Bryce Collins, CM	bcollins@pvdairport.com	(401) 862-9990
RIAC	Vice President, Customer Service	Tim Pimental	TPimental@pvdairport.com	(401) 691-2418
WSP	Consultant, Project Manager	Camille Bechara, P.E	camille.bechara@wsp.com	(617) 461-7284

WSP	Consultant, Airside Lead	Chris Conley, P.E	chris.conley@wsp.com	(860) 815-9421
WSP	Consultant, Lead Architect	Amir Degany, AIA, NCARB, LEED AP	amir.degany@wsp.com	(617) 960-5060

2. PHASING

RIAC must review and approve Contractor's proposed schedule prior to the issuance of NTP. Resubmittals may be required for review and final approval. Contractor to notify RIAC in writing if a change to schedule is proposed prior to the scheduled completion date. The construction schedule is subject to holiday moratoriums as determined by the FAA. The Contractor's schedule shall allow time to perform field inspections prior to the end of each working day.

Phase Elements

The project will be built in three phases, with most work occurring in the second phase.

Construction is set to begin upon issuance of a Notice-To-Proceed (NTP). Phasing may be constructed concurrent with other phases as outlined in the plans and in coordination with RIAC. Phase 3 must reach substantial completion and reopened to full service aircraft operations by July, 2026.

PHASE 1

Phase 1 will consist of building and airside construction. The major work items of Phase 1 include:

- Contractor's Staging Area Set-up and Construction
- Barricade placement around work area
- PBB and ancillary equipment salvage and removal
- Pavement marking demolition
- The Contractor shall schedule work activities to minimize disruption to ongoing operations at Gate 8, with careful coordination ensuring safe access routes and secure separation between active work zones and operational areas.
- The Contractor shall ensure clear communication with RIAC and any impacted stakeholders.

The estimated time expected to complete the Phase 1 work is 2 weeks.

PHASE 2

Phase 2 will consist of building and airside construction. The major work items of Phase 2 include:

- Barricade placement around work area
- Remove existing concrete apron and sidewalk
- Install new PBB and building foundations
- Install new bollards
- Pavement restoration and sidewalk installation
- Building expansion
- Temporary pavement marking for ground passenger boarding
- The contractor shall schedule work activities to minimize disruption to ongoing operations at Gate 7 and Gate 8, with careful coordination ensuring safe access routes and secure separation between active work zones and operational areas.
- The Contractor shall ensure clear communication with RIAC and any impacted stakeholders.

The estimated time expected to complete the Phase 2 work is 33-35 weeks.

PHASE 3

Phase 3 will consist of building and airside construction. The major work items of Phase 3 include:

- Barricade placement around work area
- Install new PBBs and ancillary equipment
- Install final pavement markings
- Complete startup and final testing on new PBB equipment
- Complete demonstration testing and substantial completion inspection for PBBs
- Complete all maintenance and operator training for PBBs
- Airside final security sweep and remove barricades from around work area
- CBP inspection/commissioning of FIS corridor
- RIAC final inspection of Gate 7&8 hold rooms
- The Contractor shall schedule work activities to minimize disruption to ongoing operations at Gate 8, with careful coordination ensuring safe access routes and secure separation between active work zones and operational areas.

The estimate time expected to complete the Phase 3 work is 3-6 weeks.

Construction Safety Drawings

See Appendix 3 plans for phase limits, contractor staging areas, and other critical phase items.

3. AREAS AND OPERATIONS AFFECTED BY CONSTRUCTION ACTIVITY

Identification of Affected Areas

See Appendix 3 plans for the phasing of construction and safety areas for the project. Contractor personnel must control their equipment, vehicles and personnel to not impose an incursion with aircraft operations. Aircraft, airport vehicles, airline vehicles, fuel trucks and emergency vehicles must always have the right-of-way. The Contractor must strictly adhere to speed restrictions on access roads and must not deviate from the designated routes.

Mitigation of Effects

Emergency operating conditions may require the Contractor's personnel and/or equipment be temporarily cleared from the safety areas. The contract documents will mandate that the Contractor immediately comply with directives from the Airport Operations and Air Traffic Control personnel during these emergency conditions.

Access / Egress control to the AOA: Access to the AOA will only be from the access gates identified on the Construction Safety and Phasing Plans, shown in Appendix 3.

It is the sole responsibility of the Contractor to control the access of personnel and vehicles through the non-manned construction access gates. No other vehicles or persons shall be given access by the Contractor.

Precautions for control of vehicular traffic on AOA: Contractor's vehicles must not be allowed access to portions of the airport other than the work and staging areas. The requirements for vehicle identification for when the Contractor's vehicles are operating in the AOA are outlined below in Section 5 - Contractor Access.

Means of separating construction area from AOA: The AOA will be separated from construction by use of low-profile barricades. Additional details can be found below in Sections 5, 15, and 16.

Radio Communication: The Contractor must obtain and is required to have at all times a sufficient number of operable radios. Radios are for Contractor communication where flaggers/gate guards are being used – no direct radio contact will be made between the Contractor and RIAC.

The Contractor must, before the start of construction, test their radio with RIAC to demonstrate the capabilities and to demonstrate the performance of the operator and the equipment.

Flaggers: Flaggers are not anticipated on this project.

Gate Guards: Contractor gate guards are not anticipated on this project.

ARFF/Emergency Airport Operation Routes: Contractor must yield right of way to all aircraft, Fire Fighting and Airport vehicles. Contractor vehicles must stay within the designated project/phase limits at all times.

Equipment height restrictions: The building expansion structure height will be completed to a height of 31' above grade with existing High Mast Light poles relocated up to 44' above grade. As such, the Contractor should anticipate utilizing equipment up to 50' for the building construction and up to 100' for setting and installing the PBBs on foundations. Construction equipment cannot exceed the FAR PART 77 Surface or as indicated on the 7460 exhibits. See Appendix 4 for 7460 Exhibits previously filed on 6/6/2025 with corresponding ASNs 2025-ANE-1393 to 1397-NRA. If the Contractor chooses to use vehicles or equipment that exceed this height, the Contractor is responsible for submitting the information for an FAA airspace analysis (FAA Form 7460-1). The Contractor is advised that the FAA review may take up to 90 calendar days from the time of submittal. The Contractor is responsible for all costs and time delays associated with 7460-1 applications related to special equipment.

4. PROTECTION OF NAVIGATION AIDS (NAVAIDs)

Contractor must not damage in any way the physical condition of airport navigational aids or NAVAIDs or alter or affect in any way their function during this project. NAVAIDs on the airport include: MALSR, Glide Slope, Localizer, PAPI, ALSF-2, and VOR. Contractor must notify RIAC of any damage, impact or alteration of these NAVAIDs or their functions, caused by the Contractor. Following notification, the Contractor must, at the Contractor's cost, immediately correct to the satisfaction of RIAC any damage, impact or alteration as previously noted.

The Contractor is responsible for locating, marking and protecting NAVAID critical areas, existing underground NAVAID and lighting cables prior to construction. The Contractor must contact RIAC in advance to allow adequate time to locate and mark NAVAID critical areas and existing field cables and to

avoid unscheduled system outages. The Contractor must coordinate with RIAC at minimum fourteen (14) calendar days in advance of any work within a NAVAID critical area.

The Contractor must maintain access to all FAA NAVAID facilities adjacent to the work at all times. Access requirements must be coordinated with RIAC.

Refer to Sections 1, 9, and 11 for references.

5. CONTRACTOR ACCESS

Location of Stockpiled Construction Materials

No materials may be stored in the AOA unless authorized by RIAC. Stockpiled materials and equipment storage are not permitted within the Runway Safety Area (RSA), Object Free Zone (OFZ), or the Object Free Area (OFA). Stockpiles must not penetrate the FAR Part 77 imaginary surfaces or present FOD (see Section 7) problems. The Contractor is responsible for the security of their materials and must maintain stabilization of these stored equipment and materials to prevent FOD hazards and prevent wildlife attraction (see Section 6). RIAC will ensure that stockpiled materials and equipment adjacent to these areas are prominently marked and lighted during hours of restricted visibility or darkness (see Section 16). Any approved storage of equipment must not present a line-of-sight problem with vehicle traffic, aircraft or the Air Traffic Control Tower (ATCT). The Contractor must maintain dust control for Staging Area. Dust must not impact the ATCT or its operations at any time. Appropriate dust control for any potential concrete batch plant and stockpiles is required that includes but is not limited to Sprinkler system, water trucks, etc. See GI-004 in Appendix 3 for stockpile and haul route locations.

Vehicle and Pedestrian Operations

Contractor Vehicles and FOD: The Contractor's vehicles for personnel, materials and/or equipment delivery must use load covers and must be checked to confirm load and equipment are secure to the vehicle. Any material, parts of equipment, tools, trash or other debris that fall from the vehicle onto the access road are considered potential foreign object debris (FOD). Any FOD dropped from the Contractor vehicles on the access road or other public roads must be retrieved and cleaned up immediately. FOD is a serious danger to aircraft and can cause severe damage to aircraft, other vehicles, property or even people. Cleanliness of other public roads the Contractor uses for hauling or access to the site must also be kept clean.

Construction site and equipment parking: Contractor must coordinate with RIAC on specified Contractor employee parking locations. No individual employee vehicle will have access to any secure areas, including the airport runways/taxiways/aprons. All vehicles will be parked at the designated Contractor parking areas.

Potential Contractor storage/staging areas and parking for trailers/equipment are located as shown on the Construction Safety & Phasing Plans, see Appendix 3. Final locations may vary slightly as coordinated with RIAC. Contractor employees must park and service all construction vehicles at the stockpile and staging locations that are not in use and at the end of each day, making sure to never obstruct the line of sight by the Airport Traffic Control Tower (ATCT) to any taxiways or runways under air traffic control nor obstruct any runway visual aids, signs, or NAVAIDs. 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).

Access and haul routes: The access locations are as shown on the Construction Safety & Phasing Plan, see Appendix 3. These locations, along with haul routes must be coordinated between the Contractor and RIAC and are subject to change in the weekly planning meetings. The Contractor is not permitted to use any access or haul routes other than those approved by RIAC. If construction access is to share or cross any Aircraft Rescue and Fire Fighting (ARFF) routes, ARFF right-of-way is not to be impeded at any time by the Contractor. Contractor and RIAC must ensure that traffic on haul routes does not interfere with NAVAIDs or approach surfaces of all runways. The Contractor must strictly adhere to speed restrictions on access roads and must not deviate from the designated route. Speed limit on an Airport Haul Route is 10 miles per hour unless posted otherwise.

Vehicle Identification and Operation: While working within the AOA, the Contractor must do the following:

- Each motorized vehicle or equipment operating within the AOA must have a 3-foot square flag consisting of international orange and white squares in full view above the vehicle. During periods of low visibility, the vehicle or equipment must have a flashing yellow beacon. For fabric color specifications and lighting requirements, see current FAA Advisory Circular 150/5210-5 "Painting, Marking, and Lighting of Vehicles Used on an Airport".
- Each vehicle must have Contractor's name clearly identified on both sides of the vehicle.
- The Contractor must provide an updated list at the weekly progress meetings of the expected construction and material delivery vehicles to RIAC for the upcoming week.
- Contractor vehicles must yield right-of-way to aircraft and emergency vehicles. Contractor will ensure that under no circumstances will any contractor or subcontractor or other vehicle associated with the job pass beneath any part of an aircraft, block the access to any parking gate, or delay any aircraft movement.
- Vehicles must remain within established haul routes and project limits. It is prohibited to use runways or taxiways or adjacent field areas unless specifically authorized.
- Proper vehicle operations under normal conditions, lost communications and emergency conditions are to be discussed before the start of construction and updated as needed at weekly progress meetings.

Vehicle operator training: Vehicles and equipment may only enter the AOA through the identified access gates. All construction personnel driving on the airfield must obtain a valid non-movement area badge. RIAC will not provide escorts for construction personnel. Contractor's supervisor(s) and personnel, operating vehicles or equipment, will be required to successfully complete the airport's safety and security training course and driver's training program including non-movement area driving training before being allowed to drive within the active AOA. Time and expenses for safety, security and driving classes will be at the Contractor's expense. Speed limit on haul routes and active aprons is 10 mph unless otherwise posted.

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. There is no

requirement for an aircraft to have radio communications with the Contractor, and because aircraft do not always broadcast their positions or intentions, visual checking, radio monitoring, and situational awareness of the surroundings is critical to safety.

Airport Security

All work within the SIDA fence shall be completed by properly badged personnel per RIAC security requirements. The Contractor shall maintain full perimeter SIDA fencing at all times.

All incoming vehicles to the AOA are subject to inspection. If the United States Department of Homeland Security raises the National Terrorism Advisory System security threat level to "elevated" or "imminent", or if otherwise required at any time by RIAC, FAA or the Transportation Security Administration, RIAC will search all vehicles entering the AOA.

6. WILDLIFE MANAGEMENT

The Contractor must contact RIAC immediately in the event that wildlife, which poses a hazard to aircraft operations, is observed.

Trash

The Contractor must observe strict adherence to site cleanliness. The Contractor must maintain a clean worksite, clear of excess debris and trash, food garbage or other nuisance attractants. Trash is considered a hazard in that it may become windblown and become Foreign Object Debris (FOD); or it may attract unwanted wildlife which may present serious hazards to aircraft in the AOA.

Standing Water

During construction, the Contractor must ensure that there is no standing water within the work site and within the staging areas.

Tall Grass and Seeds

The airport is regularly maintained for vegetation (mowing, weed removal, etc.). These maintenance items are regularly scheduled and RIAC will continue them indefinitely. Any area that has become disturbed by the Contractor is the responsibility of the Contractor until vegetation has been established and accepted. Only the seed indicated in the project documents will be allowed for use in and around the airport.

Poorly Maintained Fencing and Gates

The Contractor will be required to maintain in good working order any gate used for site access. The Contractor must maintain security during the removal and replacement of the security fencing. See section 5 – Airport Security above for additional information regarding AOA fencing requirements.

Disruption of Existing Wildlife Habitat

No known habitat disruption is anticipated.

7. FOREIGN OBJECT DEBRIS (FOD) MANAGEMENT

Any FOD on the active AOA surfaces or public roadways must be immediately cleaned by the Contractor to the satisfaction of RIAC. The Contractor will utilize whatever equipment is necessary (including such equipment as a Sweeper/Vac Truck) to keep these routes free and clear of dust, debris, mud, etc. The

Contractor must always maintain on-site a full water truck for wetting down dust-blown prone areas. All equipment and labor necessary to maintain a clean route is considered incidental to the contract. Failure to keep the airport pavements, access routes and/or public road surfaces free of debris could result in the stoppage of the project. The Contractor is responsible for all damage to airport property, aircraft or public vehicles because of FOD in the construction areas, access routes and/or public roads.

The Contractor must keep the project site and vehicles clean, using a "Clean As You Go" approach throughout the duration of the project. This will include taking an inventory of tools before entering the AOA and after leaving the AOA to ensure no tools are unaccounted for or inadvertently left within the AOA. Refer to Section 10 for additional requirements.

8. HAZARDOUS MATERIALS (HAZMAT) MANAGEMENT

The Contractor will be required to submit a safety and health plan, which details how their company manages and handles hazardous materials, for circumstances which may occur on this project. All lubricating liquids and solids (oils and greases) must be secured and contained in dry areas until used by trained personnel or mechanics. All waste material must be properly disposed of in accordance with all applicable environmental laws and according to manufacturer's directions. Construction fuel must not be stored at the site. Excess material from the existing system removal must be legally disposed of off airport property unless directed otherwise in the plans or by RIAC.

If hazardous materials are encountered on the site which are impacted by the work, the Contractor must notify RIAC immediately of their presence.

Mechanized equipment operated near surface waters must be inspected and maintained regularly to prevent contamination from fuels, lubricants, hydraulic fluids, or other toxic materials to the extent feasible.

9. NOTIFICATION OF CONSTRUCTION ACTIVITIES

Maintenance of a List of Responsible Representatives or Points of Contact

The list of representatives and their contact information (24-hour contact information as required) from the Airport, the Tower, the Contractor and all other associated parties must be maintained and kept current at all times. This list will initially be distributed at the pre-construction meeting prior to the Notice-to-Proceed for construction and must be updated weekly, as necessary, at the weekly progress status meetings (or more frequent if required).

Notice to Airmen (NOTAM)

RIAC shall generate and maintain "Notice to Airmen" (NOTAMs) prior to closures as required. Contractor will give RIAC at minimum fourteen (14) calendar days' notice for all necessary airfield closures.

Emergency Notification Procedures

In the event of an emergency, the contractor must call RIAC immediately. RIAC will coordinate emergency response.

Identification and qualifications of a dedicated security and safety point of contact: The Contractor must identify a qualified, dedicated safety and security point of contact that is approved by RIAC.

24-hour emergency contacts for police, fire, medical response, and key project personnel: The Contractor will produce an emergency contact list within seven (7) calendar days following the pre-construction meeting. At a minimum, the following emergency contacts shall be included on the contact list:

Airport Dispatch (Police, Fire, Environmental, etc.)		401-691-2247
Airport Project Manager	Tala Norouziasl	401-895-0543
Airport Construction Manager	TBD	
Airport Operations Duty Phone	TBD	401-447-6893
Contractor's Main Office	TBD	
Contractor's Project Manager	TBD	
Contractor's Safety Officer	TBD	
Contractor's Site Superintendent	TBD	

Coordination with ARFF Personnel

The Airport has an onsite Aircraft Rescue and Fire Fighting (ARFF) emergency response team. The Contractor is responsible for notifying RIAC to coordinate with the ARFF for any impacts to emergency access routes, and for the use of hazardous materials on the airfield.

Notification to the FAA

The Contractor will be required to coordinate directly with RIAC as needed.

FAA Form 7460-1, Notice of Proposed Construction or Alteration, is not required to be submitted to the FAA for vehicles or construction equipment 100-feet in height or less as those have been previously submitted under ASNs 2025-ANE-1393 to 1397-NRA. If the Contractor chooses to use vehicles or equipment in excess of this height, the Contractor shall be responsible for submitting for an airspace analysis (FAA Form 7460-1). The Contractor is advised that the FAA review may take up to 90 calendar days from the time of submittal. The Contractor will be responsible for all costs and time delays associated with the 7460-1 application.

10. INSPECTION REQUIREMENTS

The Contractor must provide unencumbered access to FAA and RIAC of the work areas at all times.

Daily (or more frequent) Inspections

The Contractor is responsible for Quality Control inspection of his/her own work, as well as for all safety requirements for the project. The Contractor is required to adhere to the Contract Documents, which include all safety requirements of this Safety and Phasing Plan.

The Contractor must identify, in writing to RIAC, the individuals responsible for conducting inspections prior to the inspection taking place.

The Contractor must complete a daily inspection of the work site for safety by completing the "Construction Project Daily Safety Inspection Checklist" found in AC 150/5370-2. The inspection must verify that all equipment, lighting, barricades, stockpiles, etc. are secure at the completion of work each day/shift. The Contractor must include enough time within the allowable closure requirements to

accommodate inspections and acceptance of work by RIAC and the FAA prior to reopening the Taxiways and Runways impacted. The inspections may include but are not limited to the following:
Foreign Object Debris (FOD) Inspections
Airport Operations Daily Inspections
RIAC Inspections
Substantial and Final Completion Inspections
Additional Inspections

It is the Contractor's responsibility to address construction safety issues adjacent or incidental to the project, even if they are not directly related to this project.

Final Inspections
Any damage along the haul routes, due to the Contractor's vehicles or equipment, must be repaired by the Contractor at their expense prior to the completion of the phase that the route is used.

A final inspection is required once substantial completion has been determined by RIAC. Representatives from RIAC, FAA, Engineer and Contractor will be present for the inspection. The final inspection will note any deficiencies or safety concerns of all Contractor-performed work that needs attention prior to final acceptance and opening/re-opening of airport pavement. The airport pavements shall not be opened/re-opened until the pavement is swept free of loose or blowable debris.

11. UNDERGROUND UTILITIES

All known underground utilities, both public and privately owned (FAA or RIAC) are shown in the construction plans. Their locations are based on record information and survey data; vertical elevation information has not been confirmed. Prior to the start of construction, the Contractor must locate all utilities. The Contractor will be required to coordinate the location of all public utilities which traverse the airfield within the project site. The location of these utilities will require coordination with the RIAC for public utilities inside the AOA. The contractor shall refer to Section 9 for additional requirements.

Procedure for locating and protecting existing underground utilities, cables and wires: The Contractor will be responsible for the protection of existing pavements, turfed areas, underground pipes and utilities, and all other existing features unless otherwise noted on these plans. The Contractor must repair to original conditions all features including existing pavements and turfed areas disturbed by their activities to the satisfaction of RIAC. This repair will be considered incidental to the work and no additional compensation will be made for it.

12. PENALTIES

In the event an employee of the Contractor commits a safety or security violation, they will be prohibited from returning to work on the project without remedial training and the approval of RIAC. Violations may be deemed as just and sufficient cause to require the employee to be permanently removed from the job site. For the Contractor's violation of the Security Identification Display Area (SIDA) outside the scope of this project, the Contractor will be responsible for all penalties issued by the Transportation Security Administration (TSA).

The Contractor will be responsible for all costs and delays caused by safety or security violations.

Construction personnel driving erratically on the airport, exceeding the speed limit, or violating any other Airport driving rule or safety regulation, at a minimum, must be removed from the project permanently. Airport Operations can remove any Contractor personnel, at any time, for any duration, due to a violation. Airport Operations will report any occurrences to the Contractor and RIAC.

Non-compliance by the Contractor with airport rules and regulations or failure to comply with the approved CSPP and SPCD, airport security regulations, vehicle speed restrictions and any other applicable airport regulation may result in fines as allowed by law as well as the removal of the contractor personnel from the work site.

Liquidated Damages

For each calendar day or working day, as specified in the contract, that any work remains uncompleted after the contract time including all extensions and adjustments as provided in Division 0, SECTION 00100. INFORMATION TO BIDDERS of the Project Manual. Detailed liquidated damages and requirements associated therewithin 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.

13. SPECIAL CONDITIONS

Temporary Gate Operations During Construction:

- Phase 1 – The Contractor will work with RIAC Operations for international arrivals at Gate 8, temporarily moving barricades as needed for aircraft parking and gate operations. The Contractor must ensure safe passenger access from the plane to the FIS entrance as outlined in the phasing plans.
- Phase 2 – The Contractor is required to ensure passenger access from the Gate 7 holdroom to the Gate 7 aircraft boarding ramp each day from 0600 to 0800 as outlined in the phasing plans. Additionally, the Contractor must not interfere with full-service gate operations at Gate 8, as specified in the phasing plans.
- Phase 3 – The Contractor will work with RIAC Operations for international arrivals at Gate 8, temporarily moving barricades as needed for aircraft parking and gate operations. At a minimum, RIAC must be able to plane and deplane passengers to/from the apron for all aircraft noted at gate 8.

Emergency situations: Should a life-threatening injury occur on site, whether it be to the Contractor's workforce or RIAC's inspection crew or others, RIAC must be immediately notified, and they will notify the appropriate departments. The Contractor must follow all instructions by the Airport, the RPR, FAA officials or their designees.

The Contractor must yield to all safety personnel. In the event of a work stoppage due to aircraft emergency, the Contractor will, if possible, make safe the construction site and vacate the area under escort.

The Contractor must take full responsibility of the safety of workmen throughout the construction site and for the entire duration of the project. In particular, the Contractor must be aware of aircraft activity

on the airport and fully acquaint themselves with the dangers of jet blast and its effect on work in adjacent areas, especially in non-movement areas. Material capable of being displaced must not be stockpiled or stored without being secured in work areas adjacent to active aircraft operational areas.

The contractor shall refer to Section 5 for additional safety and security requirements.

14. TAXIWAY AND APRON VISUAL AIDS

General

No taxiway closures are expected during the project construction.

Markings

Marking removal and placement for phasing purposes are outlined in plan sheets GP-001 to GP-004 Phasing Plans.

15. MARKING AND SIGNS FOR ACCESS ROUTES

The contractor must provide at their own expense portable barricades or cones to clearly establish access and haul routes on the AOA to prevent inadvertent entry to active airfields. Cones must be highly visible and weighted to prevent from being blown over by jet blast. Cones may not be left at the site and must be cleaned up at the completion of each working period. Barricades must be low-profile with red flashing lights and held down by water. The Contractor must coordinate with RIAC for all haul routes.

All signs shall be in accordance with MUTCD, and any alterations due to height/frangibility must be detailed by the Contractor.

16. HAZARD MARKING, LIGHTING AND SIGNS

General

The Contractor is responsible for replacing in-kind any markings destroyed, obliterated, or otherwise rendered unusable by construction activities. Contractor must ensure continuity of service for lighting systems not associated with this project. See Section 9 for additional requirements.

Equipment

See Vehicle Identification above for vehicle and equipment identification requirements. All barricades will be low-profile with red battery-operated lights. See FAA Advisory Circular 150/5370-2 for additional equipment requirements.

The Contractor shall place and maintain the barricades as shown on the Construction Safety and Phasing Plans Notes and Details. All barricades for each construction phase shall be in place prior to starting work in each construction phase.

17. WORK ZONE LIGHTING FOR NIGHTTIME CONSTRUCTION

Lighting equipment must adequately illuminate the work area when construction is to be performed during nighttime hours. 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.

Light should be positioned down towards the work site and in such a way as to provide the most natural color illumination and contrast with a minimum of shadows. The spacing must be determined by trial. Light towers must be positioned and adjusted to aim away from ATCT cabs and active runways, taxiways and terminal ramps to prevent blinding effects. Shielding may be necessary. Light towers must be removed from the construction site when the area is reopened to aircraft operations. A Construction Lighting Plan must be submitted, reviewed and approved by RIAC/FAA prior to start of nighttime construction.

18. PROTECTION

Taxiway Safety, Object Free Areas (TSA and TOFA), ILS Critical Areas and Obstacle Free Zones (OFZ)

Unless officially closed by RIAC, no construction activity shall encroach on an active runway or taxiway, or on any active runway OFZ. Where aircraft may be required to taxi along or adjacent to active work areas, low profile barricades shall be placed at the limits of the TOFA as appropriate and shown on the Construction Safety and Phasing Plan. Contractor shall coordinate with RIAC Operations for placement of barricades. Additionally, temporary construction signs will be placed 15 feet inside the work area at intersecting runways and taxiways indicating "No Construction Traffic Beyond This Point" as a reminder for workers not to operate on in service pavements. See phasing plans for details and requirements specific to each phase.

Taxiway Safety Area (TSA)

There will be no work within the TSA of any active Taxiways.

Taxiway Object Free Area (TOFA)

There will be no work within the TOFA of any active Taxiways.

Obstacle Free Zones (OFZ)

There will be no work within the OFZ of any active Runways.

Runway Approach/Departure Surfaces

There will be no work within any active runway approach/departure areas or clearways.

19. OTHER LIMITATIONS ON CONSTRUCTION

The following restrictions will be in place during the construction of this project unless otherwise accepted by written authorization:

- A 7460 Letter will be in place for equipment up to 100 feet. No use of tall equipment greater than 100 feet (cranes, concrete pumps, etc.) unless a 7460-1 determination letter is used for such equipment.
- No use of open flames, welding or torches unless adequate fire safety precautions are provided and approved in writing by the Airport.
- No use of flare pots within the AOA at any time.
- No use of electrical blasting caps on or within 1,000 feet of airport property.

- No smoking is permitted on airport property.
- No disruption of utilities serving the facilities occupied by the Airport or their tenants, unless permitted in writing (with provisions for temporary utilities in their place). Notify the RPR and the Airport a minimum of 48 hours in advance of proposed utility disruptions and do not proceed with utility interruption without written permission.
- Contractor should be aware of jet blast at all times, especially while around active runways, taxiways and aprons. Barricades should be fixed to the group or pavement to prevent movement due to jet blast. Stockpiles and construction equipment should be kept away from places where jet blast is likely to occur (run-up aprons, taxiway corners, ends of runways, etc.)
- Contractor's working days or times may be limited at the RPR's discretion for special operations or special events.
- All work within the SIDA fence must be completed by properly trained personnel per RIAC security requirements.
- The use of flood lighting for nighttime work must be limited to non-directional light. Lights cannot be pointed at the tower or pointed toward the airfield or runway approaches. Lights that cause glare or blind spots to the tower or to pilots will not be allowed.

APPENDIX 1

Safety and Phasing Plan Checklist

This checklist is intended as an aid, not a required submittal.

Table 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.	1.				
Operational safety is a standing agenda item for construction progress meetings.	1.				
Scheduling of the construction phases is properly addressed.	2.				
Any formal agreements are established.	2.				
Areas and Operations Affected by Construction Activity					
Drawings showing affected areas are included.	3.				
Closed or partially closed runways, taxiways, and aprons are depicted on drawings.	3.				
Access routes used by ARFF vehicles affected by the project are addressed.	3.				
Access routes used by airport and airline support vehicles affected by the project are addressed.	3.				
Underground utilities, including water supplies for firefighting and drainage.	3.				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
Approach/departure surfaces affected by heights of temporary objects are addressed.	3.				
Construction areas, storage areas, and access routes near runways, taxiways, aprons, or helipads are properly depicted on drawings.	3.				
Temporary changes to taxi operations are addressed.	3.				
Detours for ARFF and other airport vehicles are identified.	3.				
Maintenance of essential utilities and underground infrastructure is addressed.	3.				
Temporary changes to air traffic control procedures are addressed.	3.				
NAVAIDs					
Critical areas for NAVAIDs are depicted on drawings.	4.				
Effects of construction activity on the performance of NAVAIDS, including unanticipated power outages, are addressed.	4.				
Protection of NAVAID facilities is addressed.	4.				
The required distance and direction from each NAVAID to any construction activity is depicted on drawings.	4.				
Procedures for coordination with FAA ATO/Technical Operations, including identification of points of contact, are included.	4.				
Contractor Access					

The CSPP addresses areas to which contractor will have access and how	5.				

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.	5.				
The location of stockpiled construction materials is depicted on drawings.	5.				
The requirement for stockpiles in the ROFA to be approved by FAA is included.	5.				
Requirements for proper stockpiling of materials are included.	5.				
Construction site parking is addressed.	5.				
Construction equipment parking is addressed.	5.				
Access and haul roads are addressed.	5.				
A requirement for marking and lighting of vehicles to comply with AC 150/5210-5, *Painting, Marking and Lighting of Vehicles Used on an Airport,* is included.	5.				
Proper vehicle operations, including requirements for escorts, are described.	5.				
Training requirements for vehicle drivers are addressed.	5.				
Two-way radio communications procedures are described.	5.				
Maintenance of the secured area of the airport is addressed.	5.				
Wildlife Management					
The airport operator's wildlife management procedures are addressed.	6.				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
Foreign Object Debris Management					
The airport operator's FOD management procedures are addressed.	7.				
Hazardous Materials Management					
The airport operator's hazardous materials management procedures are addressed.	8.				
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.	9.				
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.	9.				
A list of local ATO/Technical Operations personnel is included.	9.				
A list of ATCT managers on duty is included.	9.				
A list of authorized representatives to the OCC is included.	9.				
Procedures for coordinating, issuing, maintaining and cancelling by the airport operator of NOTAMS about airport conditions resulting from construction are included.	9.				
Provision of information on closed or hazardous conditions on airport movement areas by the airport operator to the OCC is specified.	9.				

Emergency notification procedures for medical, fire fighting, and police	9.				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
response are addressed.					
Coordination with ARFF personnel for non-emergency issues is addressed.	9.				
Notification to the FAA under 14 CFR parts 77 and 157 is addressed.	9.				
Reimbursable agreements for flight checks and/or design and construction for FAA owned NAVAIDs are addressed.	9.				
Inspection Requirements					
Daily and interim inspections by both the airport operator and contractor are specified.	10.				
Final inspections at certificated airports are specified when required.	10.				
Underground Utilities					
Procedures for protecting existing underground facilities in excavation areas are described.	11.				
Penalties					
Penalty provisions for noncompliance with airport rules and regulations and the safety plans are detailed.	12.				
Special Conditions					
Any special conditions that affect the operation of the airport or require the activation of any special procedures are addressed.	13.				
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.	14.				

Frangibility of airport markings, lighting, signs, and visual NAVAIDs is specified.	14.				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
The requirement for markings to be in compliance with AC 150/5340-1, *Standards for Airport Markings,* is specified.	14.				
Detailed specifications for materials and methods for temporary markings are provided.	14.				
The requirement for lighting to conform to AC 150/5340-30, *Design and Installation Details for Airport Visual Aids;* AC 150/5345-50, *Specification for Portable Runway and Taxiway Lights;* and AC 150/5345-53, *Airport Lighting Certification Program,* is specified.	14.				
The use of a lighted X is specified where appropriate.	14.				
The requirement for signs to conform to AC 150/5345-44, *Specification for Runway and Taxiway Signs;* AC 50/5340-18, *Standards for Airport Sign Systems;* and AC 150/5345-53, *Airport Lighting Certification Program,* is specified.	14.				
Marking and Signs For Access Routes					
The CSPP specifies that pavement markings and signs intended for construction personnel should conform to AC 150/5340-18 and, to the extent practicable, with the MUTCD and/or State highway specifications.	15.				
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.	16.				

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.	16.				
The CSPP considers less obvious construction-related hazards.	16.				
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.	16.				
The spacing of barricades is specified such that a breach is physically prevented barring a deliberate act.	16.				
Red lights meeting the luminance requirements of the State Highway Department are specified.	16.				
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.	16.				
Barricades are specified to indicate construction locations in which no part of an aircraft may enter.	16.				
Highly reflective barriers with lights are specified to barricade taxiways leading to closed runways.	16.				
Markings for temporary closures are specified.	16.				
The provision of a contractor's representative on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades is specified.	16.				

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.	17.				
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.	18.				
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.	18.				
Procedures for ensuring adequate distance for protection from blasting operations, if required by operational considerations, are detailed.	18.				
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.	18.				
Appropriate covering of excavations in the RSA or TSA that cannot be backfilled before the associated runway or taxiway is open is detailed.	18.				
The CSPP includes provisions for prominent marking of open trenches and excavations at the construction site.	18.				

Grading and soil erosion control to maintain RSA/TSA standards are	18.				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
addressed.					
The CSPP specifies that equipment is to be removed from the ROFA when not in use.	18.				
The CSPP clearly states that no construction may occur within a taxiway safety area while the taxiway is open for aircraft operations.	18.				
Appropriate details are specified for any construction work to be accomplished in a taxiway object free area.	18.				
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.	18.				
Provisions for protection of runway approach/departure areas and clearways are included.	18.				
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.	19.				
The CSPP prohibits the use of electrical blasting caps on or within 1,000 ft (300 m) of the airport property.	19.				

APPENDIX 2

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 2. 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.		

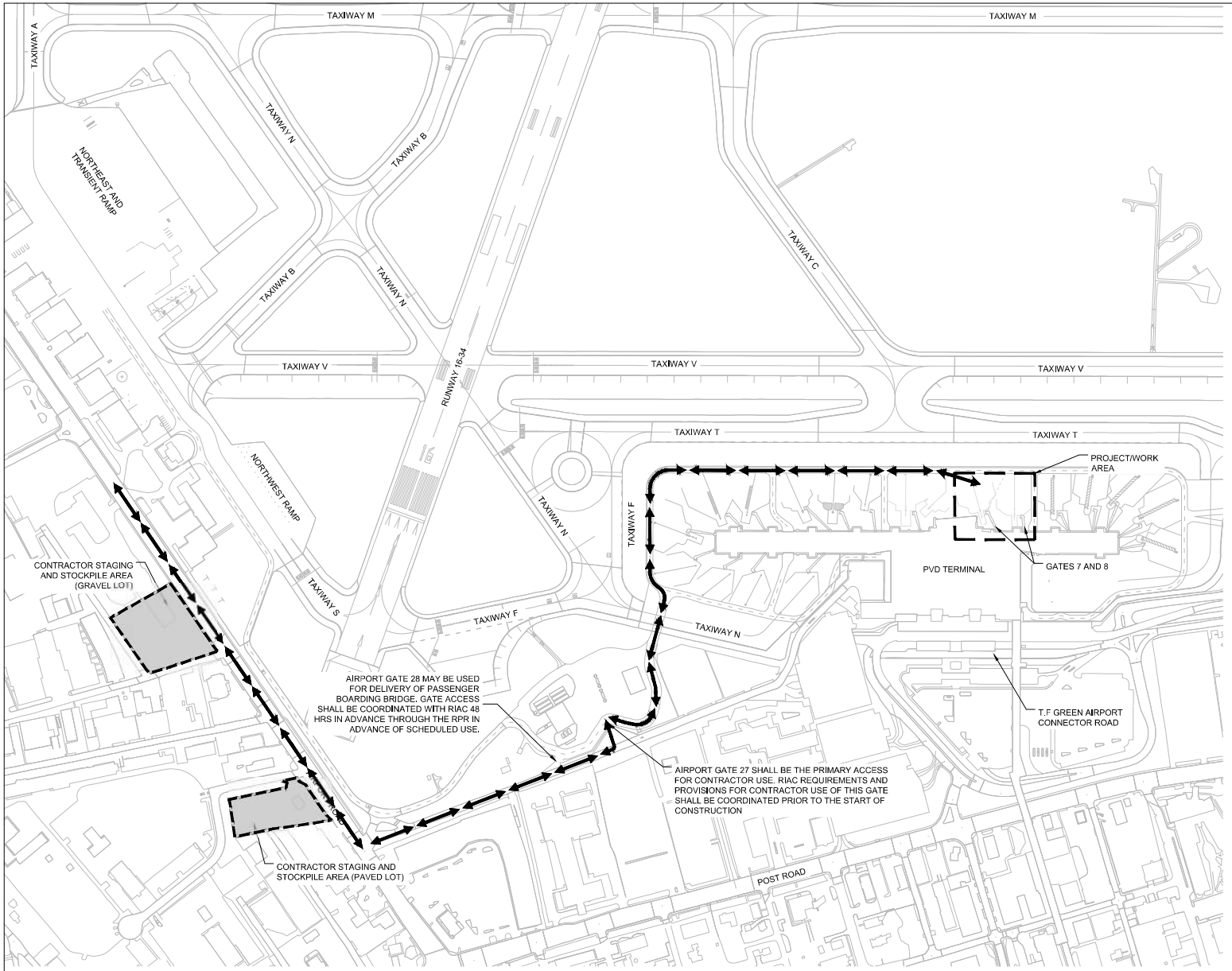
Item	Action Required (Describe)	No Action Required (Check)
Failure to issue, update, or cancel NOTAMs about airport or runway closures or other construction related airport conditions.		
Failure to mark and identify utilities or power cables. Damage to utilities and power cables during construction activity 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.		

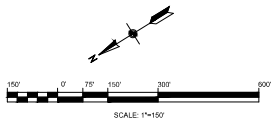
Failure to maintain drainage system integrity during construction (for example, no temporary drainage provided when working on a drainage system).		

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 3

Construction Safety and Phasing Plans





LEGEND:

- CONTRACTOR HAUL ROUTE
- PROJECT BOUNDARY LIMITS.
- CONTRACTOR STAGING AREA

CONSTRUCTION STAGING AND HAUL ROUTE NOTES:

1. HAUL ROUTES MUST BE FOLLOWED AS INDICATED. ON-SITE HAUL ROUTES ARE SHARED BETWEEN THE CONTRACTOR, AIRPORT PERSONNEL AND OPERATIONS. THE HAUL ROUTES MUST BE MAINTAINED BY THE CONTRACTOR AND MUST BE RESTORED TO THEIR ORIGINAL CONDITION TO THE SATISFACTION OF RIAC UPON COMPLETION OF THE PROJECT. THE BEFORE AND AFTER CONDITION OF THE ON-SITE HAUL ROUTES MUST BE JOINTLY INSPECTED AND DOCUMENTED BY THE CONTRACTOR AND RIAC. ANY RESTORATION COSTS FOR THE ON-SITE HAUL ROUTES WILL BE AT THE CONTRACTOR'S EXPENSE.
2. THE CONTRACTOR'S USE OF THE HAUL ROUTE AND ACCESS ROAD MUST IN NO WAY HINDER THE SAFE AND UNOBSTRUCTED FLOW OF AIRPORT TRAFFIC. AIRCRAFT WILL HAVE THE RIGHT OF WAY AT ALL TIMES. THE CONTRACTOR MUST SCHEDULE ALL WORK ON THE AOA SO AS TO MINIMIZE THE TIME THAT ANY OPERATIONAL AREA IS CLOSED TO AIRPORT TRAFFIC.
3. NO CONTRACTOR'S VEHICLES OR PERSONNEL WILL BE ALLOWED TO ENTER ONTO OR CROSS ANY ACTIVE RUNWAY OR TAXIWAY WITHOUT APPROVAL FROM GROUND CONTROL. INCURSION ONTO OR ACROSS ANY ACTIVE RUNWAY OR TAXIWAY/TAXILANE WITHOUT PRIOR APPROVAL IS A SERIOUS VIOLATION THAT WILL SUBJECT THE CONTRACTOR TO THE MAXIMUM FINE ALLOWED BY THE FEDERAL AVIATION ADMINISTRATION.
4. TRACK DRIVEN VEHICLES MUST BE DELIVERED TO THE WORK AREA. TRACK VEHICLES ARE NOT PERMITTED TO OPERATE ON PAVEMENT SURFACES THAT ARE TO REMAIN.
5. THE CONTRACTOR MUST MAINTAIN A PAVEMENT CLEANING OPERATION DURING PERIODS OF ACTIVITY REQUIRING CONTRACTOR TRAFFIC ACROSS ACTIVE APRONS, TAXIWAYS AND/OR RUNWAYS. ALL DEBRIS DEPOSITED ON PAVEMENT DUE TO CONSTRUCTION ACTIVITIES MUST BE REMOVED IMMEDIATELY. METHODS FOR REMOVAL WILL BE SUBJECT TO THE APPROVAL OF RIAC. THE OPERATIONAL AREA OF THE AIRPORT PAVEMENT MUST BE FREE FROM FOD AT ALL TIMES. AT A MINIMUM, A SELF-PROPELLED, STREET TYPE, VACUUM SWEEPER TRUCK IN GOOD OPERATING CONDITION MUST BE ON SITE AT ALL TIMES. THE CONTRACTOR MUST MAINTAIN ONGOING VACUUM OPERATIONS DURING ALL WORKING HOURS WITHIN AND ADJACENT TO THE CONSTRUCTION SITE AREAS AS DETERMINED BY RIAC. CONTRACTOR MUST HAVE STANDBY SWEEPER ON SITE AT ALL TIME IN THE EVENT OF EQUIPMENT FAILURE.
6. LIMITS OF WORK MUST BE VERIFIED BY THE CONTRACTOR AND RIAC PRIOR TO BEGINNING WORK FOR EACH PHASE. THE CONTRACTOR'S VEHICLES AND EQUIPMENT MUST BE RESTRICTED TO THE CONSTRUCTION AREA LIMITS AND CONTRACTOR'S STAGING AREA ONLY. NO VEHICLES ARE PERMITTED ON THE ACTIVE AOA OR MOVEMENT AREA UNLESS ESCORTED OR WITH PROPER IDENTIFICATION AND TRAINING.
7. ACCESS ROUTES MUST BE CLEANED CONTINUOUSLY THROUGHOUT THE WORK SHIFT AND AT THE END OF THE SHIFT. VACUUM TRUCK/SWEEPER COMBO AND OPERATORS MUST REMAIN AT THE SITE UNTIL THE AREA IS ACCEPTED BY RIAC AND AIRPORT OPERATIONS FOR START OF AIRCRAFT OPERATIONS.
8. SOME PORTIONS OF THE HAUL ROAD MAY REQUIRE TWO-WAY TRAFFIC ON A SINGLE LANE ROAD. THE CONTRACTOR MUST PROVIDE THEIR OWN TRAFFIC CONTROL ON THESE PORTIONS OF THE HAUL ROUTE.
9. TAXIWAY AND RUNWAY DESIGNATIONS SHOWN IN THIS PLAN REPRESENT EXISTING CONDITIONS.
10. MAXIMUM CONSTRUCTION TRAFFIC SPEED IN THE CONSTRUCTION ZONE AND HAUL ROUTE MUST BE 10 MPH.
11. EQUIPMENT ACCESS THROUGH ANY RIAC PERIMETER GATE, EXCEPT GATE 27 MUST BE COORDINATED AND APPROVED BY RIAC SECURITY AND ACCESS TO THE AOA GRANTED ONLY AFTER PROPER SECURITY SWEEPS ARE COMPLETED IN COMPLIANCE WITH FAA AND RIAC STANDARDS. LARGE EQUIPMENT DELIVERIES THAT DO NOT FIT THROUGH GATE 27 (SUCH AS THE PBBS OR CRANE) SHALL USE GATE 28 AFTER RECEIVING PERMISSION TO DO SO FROM RIAC SECURITY.
12. THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH EQUIPMENT STORAGE, SAFETY AND SECURITY ON SITE, AT MANUFACTURER FACILITY AND ANY OTHER STORAGE LOCATIONS THAT MAY BE ASSOCIATED WITH THE PROJECT.
13. STAGING AREA FOR THIS PROJECT WILL BE LIMITED TO THE IMMEDIATE GATE AREA WHERE THE WORK IS BEING PERFORMED. NO OUTSIDE STAGING AREAS WILL BE PROVIDED FOR THIS PROJECT EXCEPT AS NOTED ON THE PLANS AND AFTER COORDINATION WITH RIAC PRIOR TO THE START OF CONSTRUCTION.
14. FOR ANY OF THE STAGING AREAS, ALL COSTS ASSOCIATED WITH MAINTAINING POSITIVE DRAINAGE, REPAIRING AND MAINTAINING THE AREA THROUGH THE DURATION OF THE PROJECT, WILL BE INCIDENTAL TO THE MOBILIZATION PAY ITEM AND OTHER RELATED PAY ITEMS.
15. NO INDIVIDUAL EMPLOYEE VEHICLE WILL HAVE ACCESS TO ANY SECURE AREAS, INCLUDING THE AIRPORT RUNWAYS/TAXIWAYS/APRONS. ALL VEHICLES MUST BE PARKED OFFSITE AT DESIGNATED CONTRACTOR PARKING AREAS. LOCATION OF THIS AREA IS TO BE COORDINATED WITH RIAC PRIOR TO START OF CONSTRUCTION.

RHODE ISLAND T. F. GREEN INTERNATIONAL AIRPORT

WARWICK,RHODE ISLAND

TERMINAL IMPROVEMENTS

STATE OF RHODE ISLAND
RHODE ISLAND AIRPORT CORPORATION

Daniel McKee - Governor
Jonathan N. Snaggs - Chair, RIAC Board
P. Trevor Kimball - President and CEO
Jessica Zarrilli - Project Manager

PROJECT SUBMISSION PHASE:
CONSTRUCTION DOCUMENTS

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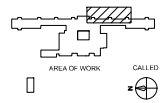
CONSULTANT:

REGISTRATION STAMP:

REVISIONS:

REV. NO.	DATE	DESCRIPTION	BY

KEY PLAN:



PROJECT NUMBER AND TITLE:

RIAC CIP NO. PVD.386
RIAC PVD GATES 7 & 8 RECONFIGURATION

SHEET TITLE:
HAUL ROUTE AND CONTRACTOR STAGING AREA

DISCIPLINE:
AIRSIDE/CIVIL

DESIGN BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:
CB	BF	CB	CC

SCALE: 1" = 150'

DATE: 08/01/2025

SHEET NUMBER: SHEET OF

GI-004

GENERAL PHASING NOTES:

1. THE FOLLOWING NOTES ARE APPLICABLE TO ALL PHASES AND WORK AREAS OF THE PROJECT.
2. SUBSEQUENT OPERATIONAL PLAN SHEETS PROVIDE A DETAILED PHASING PLAN FOR EACH OF THE WORK AREAS, ADDITIONAL PHASING DESCRIPTIONS SHALL BE FOUND IN THE CONSTRUCTION SAFETY PHASING PLAN (CSPP) INCLUDED AS APPENDIX A IN SECTION 70 OF THE FAA GENERAL PROVISIONS.
3. THE CONTRACTOR AND ALL SUBCONTRACTORS SHALL ATTEND A PRE-CONSTRUCTION MEETING, AT THE PRE-CONSTRUCTION MEETING, THE CONTRACTOR SHALL SUBMIT A PLAN OF OPERATION AND SCHEDULE OF WORK TO THE RPR FOR APPROVAL. THE CONTRACTOR'S PLAN OF OPERATION SHALL INDICATE, IN DETAIL, RIAC OPERATIONAL SUPPORT, AND THE NUMBER OF SCHEDULED SHIFTS (DAYTIME AND NIGHT TIME OPERATIONS) PROPOSED. THE SCHEDULE OF WORK SHALL CLEARLY INDICATE THE SEQUENCE OF WORK ELEMENTS TO BE PERFORMED AND SHALL INDICATE THE START DATE AND END DATE OF EACH PHASE AND WORK AREA. THE CONTRACTOR SHALL CONFORM AT ALL TIMES WITH THE REQUIREMENTS OF THE PHASING PLAN, SPECIFICATIONS, GENERAL PROVISIONS AND THE APPROVED SCHEDULE.
4. PRIOR TO SUBSTANTIAL COMPLETION AND NOTICE TO PROCEED FOR EACH PHASE, A FORMAL PRE-WORK MEETING SHALL BE CONDUCTED TO ADDRESS BARRICADES, MARKING, LIGHTING AND REQUIRED CHANGES AND SEQUENCE OF WORK FOR THE PHASE CHANGE. THE PRE-WORK MEETING SHALL BE HELD A MINIMUM OF FIVE (5) CALENDAR DAYS BEFORE THE ANTICIPATED PHASE CHANGE.
5. TEMPORARY WORK REQUIRED FOR EACH PHASE IS SHOWN IN THE GP-100 SERIES. IT SHALL BE COMPLETED BEFORE WORK MAY BEGIN WITHIN THE WORK AREA LIMITS OF EACH PHASE AND MAY REQUIRE WORK OUTSIDE OF THE WORK AREAS SHOWN. WHEN IN DOUBT, THE CONTRACTOR SHALL REQUEST DIRECTION FROM THE RPR ON THE WORK REQUIRED AT THE BEGINNING OF EACH PHASE AND IN NO CASE SHALL THE CONTRACTOR BE ALLOWED TO PROCEED WITH CLOSURE OF AREAS BEYOND THE SUBSEQUENT PHASE WITHOUT WRITTEN APPROVAL FROM THE RPR. IT MAY ALSO BE POSSIBLE TO PERFORM THIS WORK EARLIER THAN THE PHASE IT IS SHOWN. ALL EARLY TEMPORARY WORK SHALL BE COORDINATED AND APPROVED BY THE RPR AND RIAC OPERATIONS. TEMPORARY WORK MAY INCLUDE PLACEMENT OF LOW-PROFILE BARRICADES, REMOVAL OF EXISTING PAVEMENT MARKINGS, AND APPLICATION OF TEMPORARY PAVEMENT MARKINGS.
6. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE WITH RIAC AND THE RPR FOR ACCESS TO ANY AND ALL HYDRANTS NECESSARY DURING THE WORK. CONTRACTOR SHALL FOLLOW ALL APPLICABLE RIAC RULES, REGULATIONS AND GUIDANCE RELATING TO USE. RIAC RESERVES THE RIGHT TO NOT APPROVE USE OF ANY HYDRANTS WHICH MAY IMPACT THE EXISTING WATER SUPPLY SYSTEM IN A NEGATIVE MANNER. ALL HYDRANTS MUST HAVE A METER AND BACKFLOW PREVENTION DEVICE, PER RIAC REQUIREMENTS, INSTALLED PRIOR TO USE.
7. NO WORK SHALL BE PERFORMED INSIDE THE TOFA ON AN ACTIVE TAXIWAY. NO MATERIALS, FORMWORK, OR OTHER ITEMS LOCATED WITHIN THE TAXIWAY OBJECT FREE AREA MAY EXTEND NO MORE THAN 3 INCHES ABOVE THE ULTIMATE ELEVATIONS OVERNIGHT OR ON NON-WORK DAYS. NO OPEN TRENCHES MAY BE ALLOWED WITHIN AN ACTIVE TAXIWAY SAFETY AREA.
8. CONTRACTOR SHALL APPLY TEMPORARY OR PERMANENT PAVEMENT MARKINGS IN ACCORDANCE WITH ITEM P-620 PRIOR TO OPENING TO AIRCRAFT TRAFFIC FOR EACH WORK SHIFT. TEMPORARY MARKINGS SHALL BE INSPECTED AND APPROVED BY AIRPORT OPERATIONS PRIOR TO OPENING TO AIRCRAFT TRAFFIC.
9. THE CONTRACTOR SHALL PROTECT IN-PLACE ALL AIRFIELD LIGHTING, GUIDANCE SIGNS, AND VISUAL AIDS THAT ARE TO REMAIN DURING CONSTRUCTION UNLESS OTHERWISE NOTED IN THE PLAN SHEETS. ANY DAMAGE SHALL BE REPORTED IMMEDIATELY TO RIAC AND FIXED AT THE COST OF THE CONTRACTOR.
10. CONTRACTOR ESCORTING VEHICLE SHALL BE RESTRICTED TO A PICKUP TRUCK/SUV, MAXIMUM NUMBER OF VEHICLES ALLOWED TO BE ESCORTED SHALL BE THREE (3) OR LESS, PER RIAC OPERATIONS.
11. FOR NIGHT CONSTRUCTION LIGHT TOWERS SHALL BE POSITIONED AND ADJUSTED TO AIM AWAY FROM THE ATCT CAB, ACTIVE RUNWAYS, AND ACTIVE TAXIWAYS TO PREVENT BLINDING EFFECTS. LIGHT TOWERS SHALL BE REMOVED FROM THE CONSTRUCTION SITE PRIOR TO OPENING THE PAVEMENT TO AIRCRAFT OPERATIONS. IT IS RECOMMENDED THAT ALL EQUIPMENT, EXCEPT HAUL TRUCKS, BE EQUIPPED WITH ARTIFICIAL ILLUMINATION TO SAFELY ILLUMINATE THE AREA IMMEDIATELY SURROUNDING THEIR LOCATION.
12. CONCURRENCE OF WORK AREAS SHALL NOT BE ALLOWED UNLESS OTHERWISE NOTED ON THE PLAN SHEETS.
13. CONTRACTOR SHALL BE PERMITTED TO PERFORM PRE-CONSTRUCTION EXPLORATORY TASK WITH RIAC APPROVAL. WORK SHALL BE PERFORMED AT NIGHT FROM 10:00 PM TO 5:00 AM. PRE-CONSTRUCTION EXPLORATORY WORK SHALL BE PERFORMED AT THE CONTRACTOR'S EXPENSE. WORK ITEMS MAY INCLUDE BUT ARE NOT LIMITED TO:
    - PROJECT SURVEY AND STAKEOUT
    - SOFT DIGS
    - ELECTRICAL INVESTIGATION
    - ANY OTHER EXPLORATORY PRE-CONSTRUCTION ITEMS.
14. SAFETY AND SECURITY ARE PARAMOUNT. CONTRACTOR WILL NEED TO PROTECT THE PUBLIC. ALL EQUIPMENT USED ON SITE MUST BE APPROVED BY RIAC PRIOR TO MOBILIZATION.
15. WHEN CONSTRUCTION EQUIPMENT IS NOT IN USE, IT MUST BE LOWERED AND PLACED IN AN AREA THAT DOES NOT PENETRATE THE PART 77 SURFACES. CONTRACTOR MUST ADHERE TO THE 7460 DETERMINATION FOR THIS PROJECT.
16. CONTRACTOR MUST CONTINUOUSLY VACUUM SWEEP/POWER BROOM CONSTRUCTION SITE AND ACCESS ROADS.
17. ALL OVERSIZED OR HEAVY EQUIPMENT DELIVERED TO THE PROJECT SITE SHOULD ENTER THE AOA, DURING DAY HOURS, VIA GATE 27 OR AS DIRECTED BY RIAC AND RPR. COORDINATION WITH SECURITY FOR ACCESS TO GATE IS REQUIRED. ALL OVERSIZED DELIVERIES WILL REQUIRE 7 DAYS FOR COORDINATION PRIOR TO ARRIVING ON SITE WITH RIAC SECURITY AND OPERATIONS.
18. A SAFETY MEETING WILL BE REQUIRED FOR CONTRACTOR STAFF TO COORDINATE DAILY ACTIVITIES WITH RIAC OPERATIONS PRIOR TO THE START OF EVERY WORK SHIFT.
19. IMMEDIATELY AFTER TAKING CONTROL OF A GATE FOR PBB REPLACEMENT, SET UP LOW PROFILE BARRIERS AROUND THE GATE AREA AND AT THE END OF THE LEAD-IN LINE TO IDENTIFY THE CONSTRUCTION ZONE. BARRIER PLACEMENT MUST BE COORDINATED WITH RIAC AND RPR AND PLACED SO AS NOT TO IMPEDE ADJACENT GATE OPERATIONS. SEE INDIVIDUAL PHASING PLANS FOR ADDITIONAL INFORMATION.
20. GATE 7 IS ANTICIPATED TO BE CLOSED FOR APPROXIMATELY 6 MONTHS FOR FIS CONSTRUCTION ACTIVITY. GATE 8 PASSENGERS WILL REMAIN A GROUND LOAD POSITION DURING THE FIS CONSTRUCTION.
21. THE CONTRACTOR MUST ALLOW RIAC A 72 HOUR WINDOW FOR SALVAGE ACTIVITIES AT GATES 7 AND 8 PRIOR TO ANY DISPOSALS. THE CONTRACTOR MUST REMOVE, HAUL, AND DISPOSE OF EXISTING PBB AND ASSOCIATED EQUIPMENT FROM THE PROJECT SITE ONCE SALVAGE ACTIVITIES BY RIAC ARE COMPLETED. EQUIPMENT WILL BE REMOVED FROM AIRPORT PROPERTY AND WILL BE DISPOSED LEGALLY THROUGH AN AGREEMENT WITH A DESIGNATED SCRAP YARD. THE CONTRACTOR MUST PROVIDE RIAC WITH A CERTIFICATE OF SCRAP FROM THE SCRAP YARD FOR EACH PBB AND ASSOCIATED GATE EQUIPMENT THAT IS TAKEN OFFSITE FOR DISPOSAL.
22. THE MAXIMUM ALLOWABLE HEIGHT OF CONTRACTOR'S VEHICLES AND EQUIPMENT WITHIN THE AOA CANNOT EXCEED THE PART 77 SURFACE. THE CONTRACTOR MUST COORDINATE WITH RIAC FOR MAXIMUM PERMISSIBLE EQUIPMENT HEIGHT FOR WORK IN THE SAFETY AREAS OF TAXIWAY T. SEE SHEETS GP-100 THROUGH GP-104 FOR THE PLAN AND DETAILS. IF THE CONTRACTOR CHOOSES TO USE EQUIPMENT IN EXCESS OF THIS HEIGHT, THEY WILL BE RESPONSIBLE FOR SUBMITTING A REVISION TO THE AIRSPACE ANALYSIS (FAA FORM 7460-1) TO RIAC FOR APPROVAL. THE CONTRACTOR IS ADVISED THAT THE FAA REVIEW MAY TAKE UP TO 90 DAYS FROM TIME OF SUBMITTAL. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL COSTS AND TIME DELAYS ASSOCIATED WITH THE 7460-1 APPLICATION.

PHASING NOTES:

1. IN ADDITION TO THESE GENERAL PHASING NOTES AND THE NOTES ON THE PHASING PLANS, THE FOLLOWING ARE ADDITIONAL PHASING REQUIREMENTS.
    1.1 FOR PBB REMOVALS: CONTRACTOR PERMITTED TO CLOSE GATE 7 AND 8 CONCURRENTLY.
    1.2 FOR FIS BUILDING CONSTRUCTION: GATE 8 PASSENGERS WILL BE GROUND LOADED ONLY. GATE 7 PASSENGERS WILL BE GROUND LOADED FOR DEPARTURES ONLY FROM 0600-0800.
    1.3 FOR PBB INSTALLATIONS: CONTRACTOR PERMITTED TO CLOSE GATE 7 AND 8 CONCURRENTLY.
2. REFER TO INDIVIDUAL CIVIL, ELECTRICAL, ARCHITECTURAL, AND STRUCTURAL PLANS FOR DETAILED INFORMATION ON EACH GATE.
3. SEQUENCE OF CONSTRUCTION WILL DEPEND ON COORDINATION WITH AIRLINE SCHEDULE AND RIAC APPROVAL. CONTRACTOR MUST CLOSELY COORDINATE CONSTRUCTION SCHEDULE WITH RIAC.
4. FOR ALL MATERIAL THAT IS TO BE REMOVED, THE CONTRACTOR IS TO REMOVE AND HAUL FROM THE PROJECT SITE AND DISPOSE OF OFF AIRPORT.
5. BARRICADE ALIGNMENT MUST NOT RESTRICT USE OF ADJACENT GATES.

GENERAL SAFETY REQUIREMENTS:

1. THE CONTRACTOR MUST ACQUAINT THEIR SUPERVISORS AND EMPLOYEES WITH THE AIRPORT ACTIVITY AND OPERATIONS THAT ARE INHERENT TO THE T.F GREEN INTERNATIONAL AIRPORT AND MUST CONDUCT THEIR CONSTRUCTION ACTIVITIES TO CONFORM TO ALL ROUTINE AND EMERGENCY AIR TRAFFIC REQUIREMENTS AND GUIDELINES FOR SAFETY SPECIFIED HEREIN. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING ALL SAFETY DEVICES AS REQUIRED FOR THE PROTECTION OF THEIR PERSONNEL.
2. PROTECTION OF ALL PERSONS MUST BE PROVIDED THROUGHOUT THE PROGRESS OF THE WORK. THE WORK MUST PROCEED IN SUCH A MANNER AS TO PROVIDE SAFE CONDITIONS FOR ALL WORKERS AND AIRPORT PERSONNEL. THE SEQUENCE OF OPERATION MUST BE SUCH THAT MAXIMUM PROTECTION IS AFFORDED TO CONSTRUCTION AND NON-CONSTRUCTION PERSONNEL. TO ENSURE THAT PERSONNEL AND WORKERS IN THE AREA ARE PROTECTED THE CONTRACTOR MUST PROVIDE SAFETY MEASURES TO GUARD AGAINST INJURY.
3. DURING PERFORMANCE OF THIS CONTRACT, THE AIRPORT RUNWAYS, TAXIWAYS, AND AIRCRAFT HOLDING APRONS WILL REMAIN IN USE BY AIRCRAFT TO THE MAXIMUM EXTENT POSSIBLE. ALL AIRCRAFT TRAFFIC IN THESE AREAS MUST HAVE PRIORITY OVER CONTRACTOR'S TRAFFIC. THE OWNER RESERVES THE RIGHT TO ORDER THE CONTRACTOR AT ANY TIME TO VACATE ANY AREA NECESSARY TO MAINTAIN SAFE AIRCRAFT OPERATIONS. USE OF AREAS NEAR THE CONTRACTOR'S WORK WILL BE CONTROLLED TO MINIMIZE DISTURBANCE TO THE CONTRACTOR'S OPERATION. THE CONTRACTOR MUST NOT ALLOW UNAUTHORIZED PERSONS TO ENTER OR REMAIN IN ANY AIRPORT AREA WHICH WOULD BE HAZARDOUS TO PERSONS OR TO AIRCRAFT OPERATIONS.
4. ALL WORK PERFORMED WITHIN SAFETY AREAS OF AN ACTIVE TAXIWAY OR APRON UNDER OPERATIONAL CONDITIONS MUST BE PERFORMED WHEN THE TAXIWAY OR APRON IS NOT IN USE. SUCH WORK MUST ONLY BE ACCOMPLISHED WITH PRIOR PERMISSION FROM RIAC AND COORDINATION WITH AIRPORT OPERATIONS. REQUESTED CLOSINGS MUST BE DIRECTED TO THE RPR WHO WILL COORDINATE WITH RIAC OPERATIONS AT LEAST 48 HOURS IN ADVANCE.

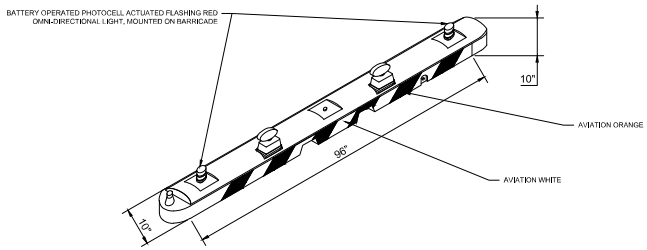
GATE AND TAXIWAY OPERATIONS PHASING MATRIX

GATE AND TAXILANE CLOSURES			
GATE/TAXIWAY	PHASE 1	PHASE 2	PHASE 3
7	X	X*	
8	X	X*	

PHASING MATRIX LEGEND

X CLOSURE
X* TEMPORARY PARKING POSITIONS

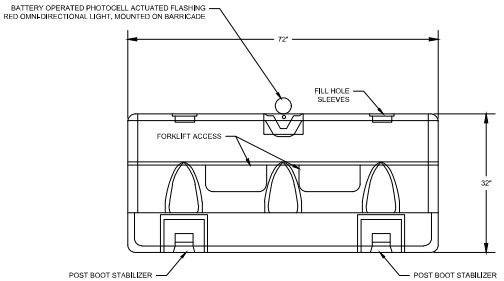
NOTE: GATES AND TAXIWAYS TO REMAIN ACTIVE IF NOT DESIGNATED.



NOTES:

1. BARRICADES MUST BE WATER FILLED TYPE BARRICADES AS DESCRIBED IN THE SPECIFICATIONS.
2. BARRICADES MUST BE PLACED FROM END TO END WITH NO SPACE IN BETWEEN.
3. PLACE ON PAVEMENT EDGE NEAR EXCAVATED CUTS ADJACENT TO AIRCRAFT OPERATIONAL PAVEMENTS AND WHERE INDICATED ON THE DRAWINGS.
4. THE CONTRACTOR MUST PROVIDE LIGHTED BARRICADES AS REQUIRED IN THIS CONTRACT FOR THE DURATION OF THE CONSTRUCTION OF THE ENTIRE PROJECT.
5. COLOR OF BARRICADE MUST BE EITHER INTERNATIONAL ORANGE OR WHITE, WITH ALTERNATING ORANGE/WHITE CHEVRON STRIPES ON EXPOSED SIDES.

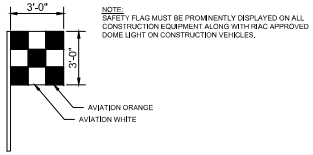
1 GP-100 LOW PROFILE BARRICADE — NOT TO SCALE



NOTES:

1. WATER FILLED PLASTIC BARRIERS TO BE INSTALLED AROUND THE WORK AREA MUST BE ALTERNATING ORANGE AND WHITE YODOCK 2001 MB (6' LONG X 18" WIDE X 32" HEIGHT) OR AN APPROVED EQUAL.
2. BARRIERS TO BE PLACED END TO END WITH NO GAPS IN BETWEEN INDIVIDUAL BARRIERS.
3. PLACEMENT OF BARRIERS, DELINEATING THE WORK AREA, MUST NOT IMPACT ADJACENT AIRPORT OR GATE OPERATIONS AND MUST BE APPROVED PRIOR TO FILLING WITH WATER.

2 GP-100 WATER FILLED PLASTIC BARRIER — NOT TO SCALE



NOTE:
SAFETY FLAG MUST BE PROMINENTLY DISPLAYED ON ALL CONSTRUCTION EQUIPMENT ALONG WITH RIAC APPROVED DOME LIGHT ON CONSTRUCTION VEHICLES.

3 GP-100 VEHICLE FLAG — NOT TO SCALE

RHODE ISLAND T. F. GREEN INTERNATIONAL AIRPORT

WARWICK, RHODE ISLAND

TERMINAL IMPROVEMENTS

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RHODE ISLAND AIRPORT CORPORATION

Daniel McKee - Governor
Jonathan N. Snead - Chair, RIAC Board
P. Raul Yarnall - President and CEO
Jessica Zarrilli - Project Manager

PROJECT SUBMISSION PHASE:
CONSTRUCTION DOCUMENTS

PRIMARY:

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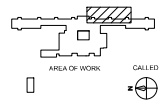
CONSULTANT:

REGISTRATION STAMP:

REVISIONS:

REV. NO.	DATE	DESCRIPTION	BY

KEY PLAN:



PROJECT NUMBER AND TITLE:

RIAC CIP NO. PVD.386
RIAC PVD GATES 7 & 8 RECONFIGURATION

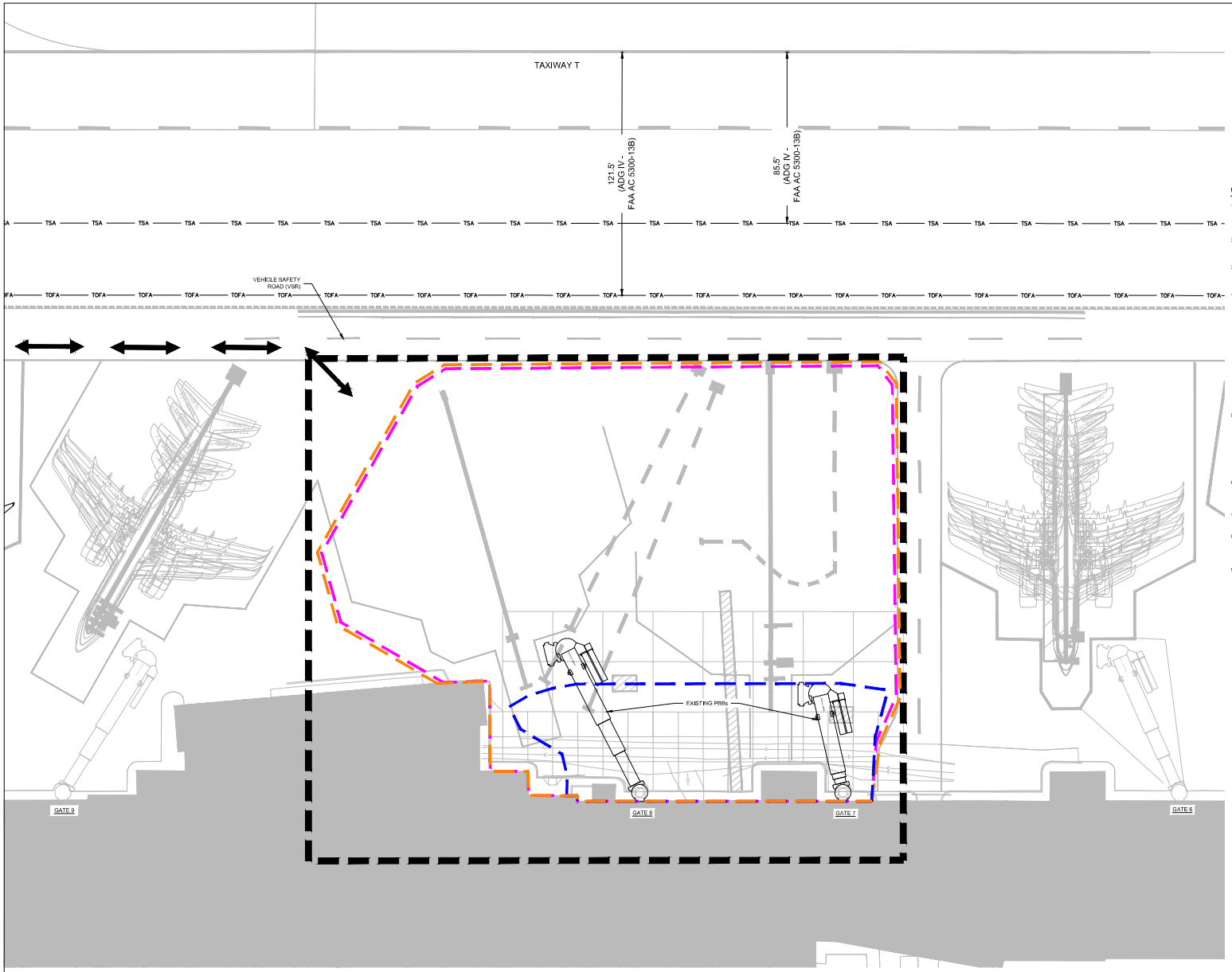
SHEET TITLE:
CONSTRUCTION SAFETY AND PHASING NOTES

DISCIPLINE:
AIRSIDE/CIVIL

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DATE: 08/01/2025

SHEET NUMBER: GP-100 SHEET OF



20' 0' 10' 20' 40' 80'

SCALE: 1"=20'

GENERAL CONTRACT NOTES:

1. THIS PROJECT INCLUDES THE REMOVAL AND REPLACEMENT OF PASSENGER BOARDING BRIDGES AND ANCILLARY EQUIPMENT TO SUPPORT THE BUILDING CONSTRUCTION / EXPANSION AND UPDATED APRON PAVEMENT MARKINGS FOR RELOCATED GATES 7 AND 8.
2. THE CONTRACTOR MUST STRICTLY KEEP TO THE HAUL ROUTE AND ACCESS ROADS TO THE WORK AREAS SHOWN IN THE PLANS AS DIRECTED BY RIAC OPERATIONS AND RPR.
3. ALL AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS ARE TO BE COMPLETELY RESTORED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF RIAC.
4. THE CONTRACTOR IS RESPONSIBLE FOR COMPLIANCE WITH FAA ADVISORY CIRCULAR (AC) 150/5370-2G "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION" AND MUST SUBMIT A SAFETY PLAN COMPLIANCE DOCUMENT (SPCD). CONSTRUCTION CANNOT PROCEED UNTIL THIS PLAN HAS BEEN ACCEPTED BY RIAC. THE SPCD MUST DEMONSTRATE HOW THE CONTRACTOR WILL MEET THE SAFETY REQUIREMENTS OF THE CONTRACT, INCLUDING DETAILS ON TOOL BOX SAFETY MEETINGS (SEE NOTE 8 BELOW), TYPES, LOCATIONS, AND MAINTENANCE OF BARRICADES, WORK ACCESS ROUTES, AND PROPOSED PROCEDURES USED BY THE CONTRACTOR TO MONITOR AIRCRAFT ACTIVITY. PROCEDURES UTILIZED BY THE CONTRACTOR TO ELIMINATE CONFLICTS BETWEEN CONSTRUCTION OPERATIONS AND AIRCRAFT TRAFFIC MUST BE INCLUDED IN THE SPCD. THE SPCD MUST BE UPDATED AND RESUBMITTED FOR REVIEW AND APPROVAL BY RIAC FOR EACH CHANGE IN CONDITION RELATED TO THE PROJECT, AT THE BEGINNING OF ANY SHIFT CHANGE, TRUCK DRIVER CHANGE, ETC., THE CONTRACTOR MUST REITERATE TO EACH EMPLOYEE THE IMPORTANCE OF STRICT ADHERENCE TO THE SPCD.
5. CONTRACTOR TO FOLLOW RIAC SECURITY STANDARDS FOR MAINTAINING AND ENFORCING A SAFE AND SECURE ENVIRONMENT AT THE AIRPORT AND CONSTRUCTION SITES. WHEN NECESSARY, MAJOR UPDATES TO SECURITY STANDARDS WILL BE ISSUED BY RIAC VIA OPERATIONAL IMPACT NOTICES, OR OTHER COMMUNICATION CHANNELS. CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT THEIR EMPLOYEES HAVE READ AND UNDERSTAND THE SECURITY STANDARDS AND EACH UPDATE THEREAFTER TO ENSURE THEY HAVE THE LATEST INFORMATION NECESSARY TO SUPPORT RIAC SECURITY PROGRAM AND AVOID UNFORTUNATE AND PREVENTABLE VIOLATIONS.
6. THE CONTRACTOR MUST PROVIDE RIAC WITH THE NAME OF THEIR SAFETY OFFICER AND THEIR FIELD FOREMAN IN CHARGE DURING WORKING HOURS. ADDITIONALLY, THE CONTRACTOR MUST IDENTIFY THE 24-HOUR EMERGENCY RESPONSE TELEPHONE NUMBERS FOR THEIR SUPERVISOR(S) IN CHARGE.
7. THE AIRCRAFT PARKING LAYOUT MAY OCCUR DURING NIGHTS AND/OR WEEKENDS UNLESS OTHERWISE COORDINATED WITH RIAC OPERATIONS.
8. THE CONTRACTOR MUST SCHEDULE AND CONDUCT DAILY/NIGHTLY SAFETY/PROGRESS MEETINGS WITH RIAC. SAFETY MEETINGS WILL BE REQUIRED FOR CONTRACTOR STAFF TO COORDINATE DAILY ACTIVITIES WITH RIAC OPERATIONS PRIOR TO THE START OF EVERY WORK SHIFT.
9. AT THE END OF EACH WORK SHIFT THE CONTRACTOR MUST PERFORM A FOREIGN OBJECT DEBRIS (FOD) WALK OF THE AREA PRIOR TO REVIEW BY RIAC OPERATIONS. THE FOD WALK MUST BE STARTED ONE HOUR PRIOR TO THE WORK AREA SCHEDULED RE-OPENING AND BE COMPLETED NO LESS THAN 30 MINUTES PRIOR TO RE-OPENING FOR OPERATION INSPECTION. IF SWEEPING IS NEEDED OR REQUIRED, CONTRACTOR MUST PROVIDE EQUIPMENT FOR THIS EFFORT.

LEGEND:

- HAUL ROUTE
- WORK LIMITS
- PHASE 1
- PHASE 2
- PHASE 3
- TOFA — TAXIWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA

RHODE ISLAND T. F. GREEN INTERNATIONAL AIRPORT

WARWICK, RHODE ISLAND

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CONSULTANT:

REGISTRATION STAMP:

REVISIONS:

REV. NO.	DATE	DESCRIPTION	BY

KEY PLAN:

AREA OF WORK — CALLED

PROJECT NUMBER AND TITLE:

RIAC CIP NO. PVD.386
RIAC PVD GATES 7 & 8 RECONFIGURATION

SHEET TITLE:
OVERALL PHASING PLAN

DISCIPLINE:
AIRSIDE/CIVIL

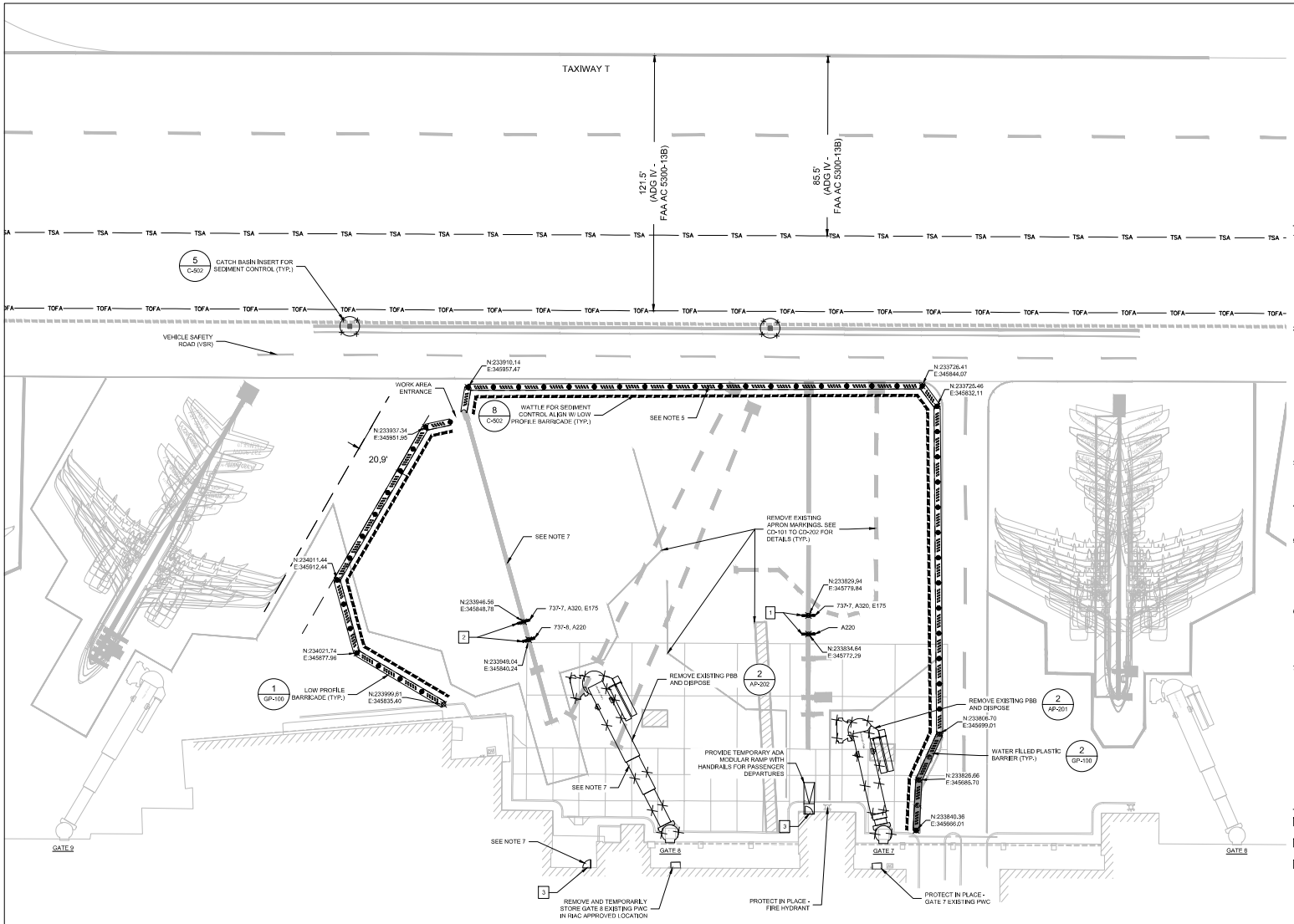
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DATE: 08/01/2025

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GP-101



PHASE 1 NOTES:

1. PRE-GATE SHUTDOWN WORK:
   - 1.1. COORDINATE GATE CLOSURE WITH RIAC AT LEAST 7-DAYS PRIOR TO INTENDED CLOSURE DATE.
   - 1.3. LOCK OUT HOLDROOM DOOR.
   - 1.4. INSTALL TEMPORARY SECURITY BARRIER TO DELINEATE LIMIT OF WORK.
   - 1.5. INSTALL AND MAINTAIN TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN.
   - 1.6. ELECTRICAL SHUTDOWN AND MAKE SAFE, SEE ELECTRICAL PLANS FOR REQUIREMENTS.
   - 1.7. COORDINATE WITH THE ELECTRICAL CONTRACTOR AND RIAC SSI TO DISABLE DOOR SECURITY COMPONENTS PRIOR TO REMOVING THE JETBRIDGE/HOLDROOM DOOR.
2. EQUIPMENT DEMOLITION AND PAVEMENT MARKING DEMOLITION:
   - 2.1. INSTALL BARRICADES AS INDICATED. CONTRACTOR MUST COORDINATE PLACEMENT WITH RIAC SO AS NOT TO IMPEDE ADJACENT GATE OPERATIONS. CONTRACTOR TO PROVIDE TEMPORARY CONSTRUCTION SIGNAGE AND CLEAR ZONES FOR GROUND PERSONNEL ENTERING AND EXITING WORK AREA FROM TERMINAL BUILDING.
   - 2.2. PROVIDE 72 HOUR NOTICE FOR PVD MAINTENANCE TO SALVAGE EQUIPMENT FROM EXISTING PBB AND ANCILLARY EQUIPMENT AS NECESSARY. DISCONNECT UTILITIES AND REMOVE EXISTING PBB AND ASSOCIATED EQUIPMENT AS INDICATED IN PLANS. REMOVE EXISTING POTABLE WATER CABINET AND TEMPORARILY STORE. REMOVE AND DISPOSE EXISTING PCAIR AND GPU UNIT.
   - 2.3. HAUL REMOVED EQUIPMENT OFF PROJECT SITE AND DISPOSE OF LEGALLY AT A CERTIFIED SCRAP YARD/RECYCLE UNLESS INDICATED FOR SALVAGE OR REINSTALLATION.
   - 2.4. DEMOLISH EXISTING PBB FOUNDATIONS PER DETAIL 9/C-502.
   - 2.5. REMOVE EXISTING APRON MARKING AS INDICATED. INSTALL TEMPORARY STOP BARS AS INDICATED.
3. ARCHITECTURE DEMOLITION AND CONSTRUCTION:
   - 3.1. DEMOLISH EXISTING CURTAIN WALLS FOR NEW PASSENGER ACCESS DOORS PER ARCHITECTURE PLANS.
   - 3.2. INSTALL NEW PASSENGER ACCESS DOORS.
   - 3.3. CONSTRUCT AND INSTALL TEMPORARY PASSENGER RAMP.
4. SPECIFIC GATE CONSTRUCTION ACTIVITIES MAY BE COMPLETED CONCURRENTLY. CONTRACTOR MUST SUBMIT PROPOSED CONSTRUCTION SCHEDULE TO RIAC FOR REVIEW AND APPROVAL PRIOR TO COMMENCING WORK.
5. BARRICADES ARE SHOWN FOR MAXIMUM WORK AREA. TEMPORARY BARRICADE LOCATIONS MAY BE REQUIRED TO ACCOMMODATE AIRPORT OPERATIONS. THESE OPERATIONS MAY INCLUDE, BUT ARE NOT LIMITED TO, FULL AIRCRAFT SERVICE OPERATIONS AT GATE 7 AND/OR GATE 8, UPON COMPLETION OF WORK IN THE TEMPORARY BARRICADED AREA THE CONTRACTOR MUST SWEEP AND CLEAN THE AREA TO THE SATISFACTION OF RIAC OPERATIONS AND THE RPR PRIOR TO REOPENING. RIAC OPERATIONS TO PROVIDE FLIGHT SCHEDULE AND / OR 2 HOUR PRIOR NOTICE TO THE CONTRACTOR FOR ANY GATE OPERATION ACTIVITIES.
6. NO AIRCRAFT ARRIVALS OR DEPARTURES MAY BE SCHEDULED FOR GATE 7 AND GATE 8 FOR THE WORK AREA AS SHOWN, UNLESS OTHERWISE NOTED OR COORDINATED WITH RIAC OPERATIONS PRIOR TO AIRCRAFT OPERATIONS. GATE 8 WILL BE UTILIZED FOR ANY POTENTIAL INTERNATIONAL DIVERSIONS TO PVD, AS SUCH, THE GATE 8 WORK AREA MUST BE CONSTANTLY PREPARED FOR AN EMERGENCY INTERNATIONAL AIRCRAFT ARRIVAL.
7. GATE 8 PBB REMOVAL, ANCILLARY EQUIPMENT REMOVAL, APRON MARKING REMOVALS, AND PASSENGER ACCESS DOOR INSTALLATION MUST BE COMPLETED WITHIN 7 CALENDAR DAYS FROM INITIAL BARRICADE PLACEMENT. GATE 8 MUST BE OPEN AND FULLY OPERATIONAL FOR THE TEMPORARY AIRCRAFT PARKING LAYOUT AS SHOWN. AT A MINIMUM, GATE 8 MUST HAVE THE NECESSARY WORK COMPLETED TO SAFELY DEPLANE PASSENGERS AND SERVICE THE A220-300.

KEYNOTE:

1. GATE 7 TEMPORARY RON POSITIONS. MARK NEW STOP BARS AS SHOWN.
2. GATE 8 TEMPORARY RON POSITIONS. MARK NEW STOP BARS AS SHOWN.
3. INSTALL NEW PASSENGER ACCESS DOOR. SEE ARCHITECTURAL PLANS FOR DETAILS.

LEGEND:

- LOW PROFILE BARRICADE
- WATER FILLED PLASTIC BARRIER
- TOFA — TAXIWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- CATCH BASIN INSERT
- WATTLE FOR SEDIMENT CONTROL

RHODE ISLAND T. F. GREEN INTERNATIONAL AIRPORT

WARWICK, RHODE ISLAND

TERMINAL IMPROVEMENTS

STATE OF RHODE ISLAND
RHODE ISLAND AIRPORT CORPORATION

Daniel McKee - Governor
Jonathan N. Snipes - Chair, RIAC Board
 Native Ahmad - Pres. & Interim CEO
Becca Dennis - Project Manager

PROJECT SUBMISSION PHASE: CONSTRUCTION DOCUMENTS

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WSP USA Inc.
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BOSTON, MA 02110
TEL: +1 617.426.7330

CONSULTANT:

REGISTRATION STAMP:

REVISIONS:

REV. NO.	DATE	DESCRIPTION	BY

KEY PLAN:

AREA OF WORK — CALLED

PROJECT NUMBER AND TITLE:

RIAC CIP NO. PVD.386
RIAC PVD GATES 7 & 8 RECONFIGURATION

SHEET TITLE:

CONSTRUCTION SAFETY AND PHASING PLAN - PHASE 1

DISCIPLINE: AIRSIDE/CIVIL

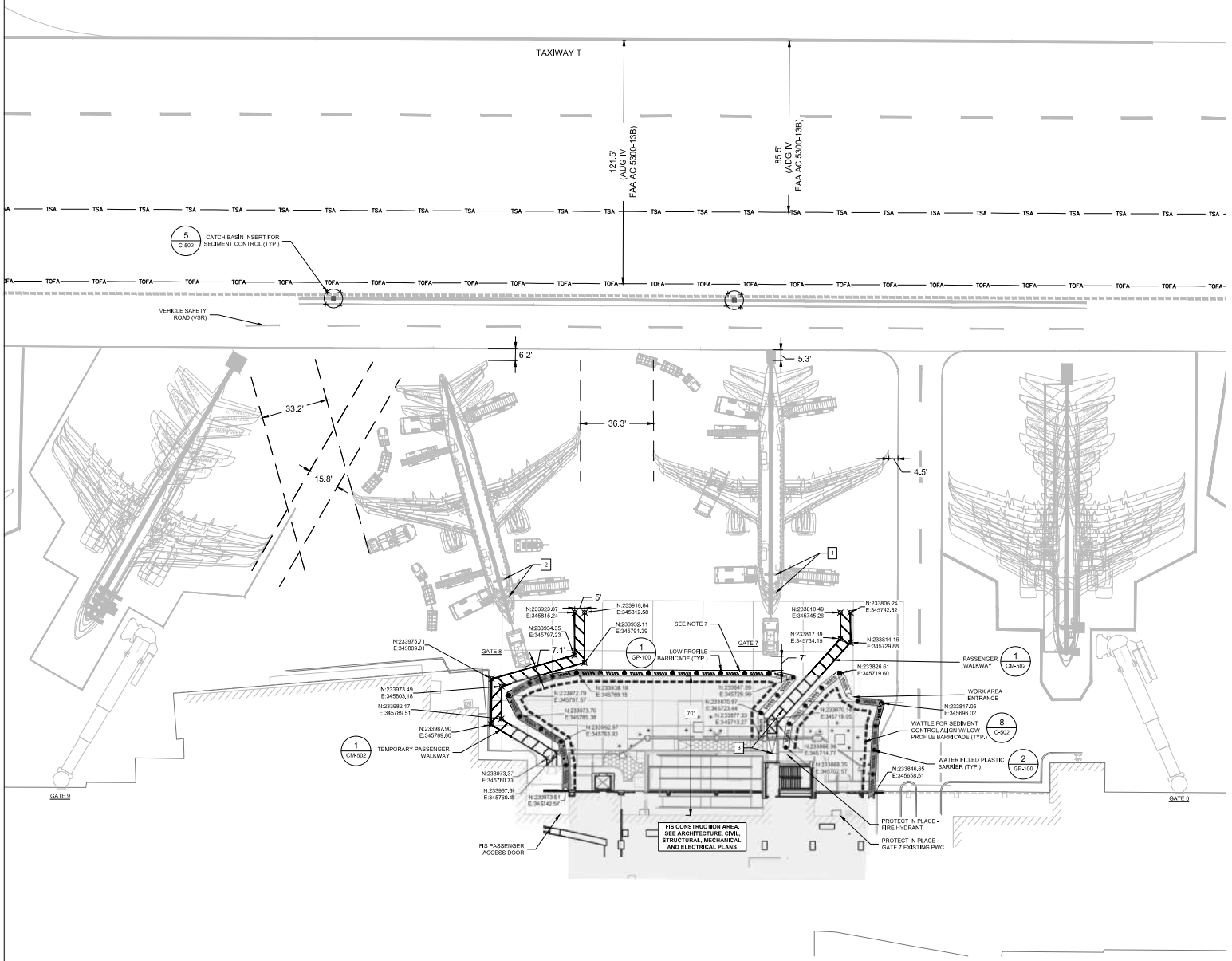
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CB	BF	CB	CC

SCALE: 1" = 20'

DATE: 08/01/2025

SHEET NUMBER: SHEET OF

GP-102



SCALE: 1"=20'

PHASE 2 NOTES:

1. INSTALL BARRICADES AS INDICATED TO DELINEATE LIMIT OF WORK. CONTRACTOR MUST COORDINATE PLACEMENT WITH RIAC SO AS NOT TO IMPEDE ADJACENT GATE OPERATIONS. BARRICADES MAY BE TEMPORARILY ADJUSTED AS REQUIRED FOR PERFORMING WORK UPON APPROVAL BY RIAC. CONTRACTOR TO PROVIDE TEMPORARY CONSTRUCTION SIGNAGE AND CLEAR ZONES FOR GROUND PERSONNEL ENTERING AND EXITING WORK AREA FROM TERMINAL BUILDING.
2. CIVIL AIRSIDE CONSTRUCTION:
   - 2.1. INSTALL AND MAINTAIN TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES AS SHOWN.
   - 2.2. REMOVE EXISTING CONCRETE APRON PANELS PER CD-101 TO CD-102.
   - 2.3. REMOVE EXISTING CONCRETE SIDEWALK PER CD-101 TO CD-102.
   - 2.4. INSTALL NEW BUILDING AND PRR FOUNDATIONS. SEE STRUCTURAL AND ARCHITECTURAL PLANS FOR DETAILS.
   - 2.5. INSTALL NEW BOLLARDS PER C-301.
   - 2.6. INSTALL NEW CONCRETE PANELS, CURBS, LANDINGS AND SIDEWALK PER C-101 TO C-102.
3. FIS CONSTRUCTION:
   - 3.1. CONSTRUCT FIS EXPANSION PER CONTRACT DRAWINGS. SEE ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING, ELECTRICAL , AND COMMUNICATION PLANS.
4. SPECIFIC GATE CONSTRUCTION ACTIVITIES MAY BE COMPLETED CONCURRENTLY. CONTRACTOR MUST SUBMIT PROPOSED CONSTRUCTION SCHEDULE TO RIAC FOR REVIEW AND APPROVAL PRIOR TO COMMENCING WORK.
5. TEMPORARY PASSENGER WALKWAYS TO BE REMOVED UPON COMPLETION OF THIS PHASE.
6. GATE 7 AND 8 TEMPORARY LEAD-IN LINES, GATE ID'S, AND STOP BARS TO BE REMOVED UPON COMPLETION OF THIS PHASE.
7. BARRICADES ARE SHOWN FOR MAXIMUM WORK AREA. TEMPORARY BARRICADE LOCATIONS MAY BE REQUIRED TO ACCOMMODATE AIRPORT OPERATIONS. THESE OPERATIONS MAY INCLUDE, BUT ARE NOT LIMITED TO, FULL AIRCRAFT SERVICE OPERATIONS AT GATE 7 AND/OR GATE 8, UPON COMPLETION OF WORK IN THE TEMPORARY BARRICADED AREA THE CONTRACTOR MUST SWEEP AND CLEAN THE AREA TO THE SATISFACTION OF RIAC OPERATIONS AND THE RPR PRIOR TO REOPENING. RIAC OPERATIONS TO PROVIDE FLIGHT SCHEDULE AND / OR 2 HOUR PRIOR NOTICE TO THE CONTRACTOR FOR ANY GATE OPERATION ACTIVITIES.
8. GATE 8 WILL BE UTILIZED FOR ANY POTENTIAL INTERNATIONAL DIVERSIONS TO PVD, AS SUCH, THE GATE 8 WORK AREA MUST BE CONSTANTLY PREPARED FOR AN EMERGENCY INTERNATIONAL AIRCRAFT ARRIVAL.

KEYNOTE:

1. GATE 7 TEMPORARY GATE POSITIONS. FLEET MIX RESTRICTED TO A320 AND BELOW
2. GATE 8 TEMPORARY GATE POSITIONS. FLEET MIX RESTRICTED TO 737-8 AND BELOW.
3. PASSENGER ACCESS REQUIRED FROM 0600-0800 DAILY. ADJACENT BARRICADES MAY BE REPOSITIONED DURING CONSTRUCTION FOLLOWING THE APPROVAL OF THE RPR AND RIAC.

LEGEND:

- LOW PROFILE BARRICADE
- WATER FILLED PLASTIC BARRIER
- TOFA — TAXIWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- CATCH BASIN INSERT
- BOLLARDS
- WATTLE FOR SEDIMENT CONTROL

RHODE ISLAND T. F. GREEN INTERNATIONAL AIRPORT

WARWICK, RHODE ISLAND

TERMINAL IMPROVEMENTS

STATE OF RHODE ISLAND
RHODE ISLAND AIRPORT CORPORATION

Daniel McKee - Governor
Jonathan N. Snow - Chair, RIAC Board
Peter Alviti - Pres. & Interim CEO
Becca Dennis - Project Manager

PROJECT SUBMISSION PHASE: CONSTRUCTION DOCUMENTS

PRIMARY:

WSP USA Inc.
100 SUMMER STREET
BOSTON, MA 02110
TEL: +1 617.426.7330

CONSULTANT:

REGISTRATION STAMP:

REVISIONS:

REV. NO.	DATE	DESCRIPTION	BY

KEY PLAN:

AREA OF WORK — CALLED

PROJECT NUMBER AND TITLE:

RIAC CIP NO. PVD.386
RIAC PVD GATES 7 & 8 RECONFIGURATION

SHEET TITLE:

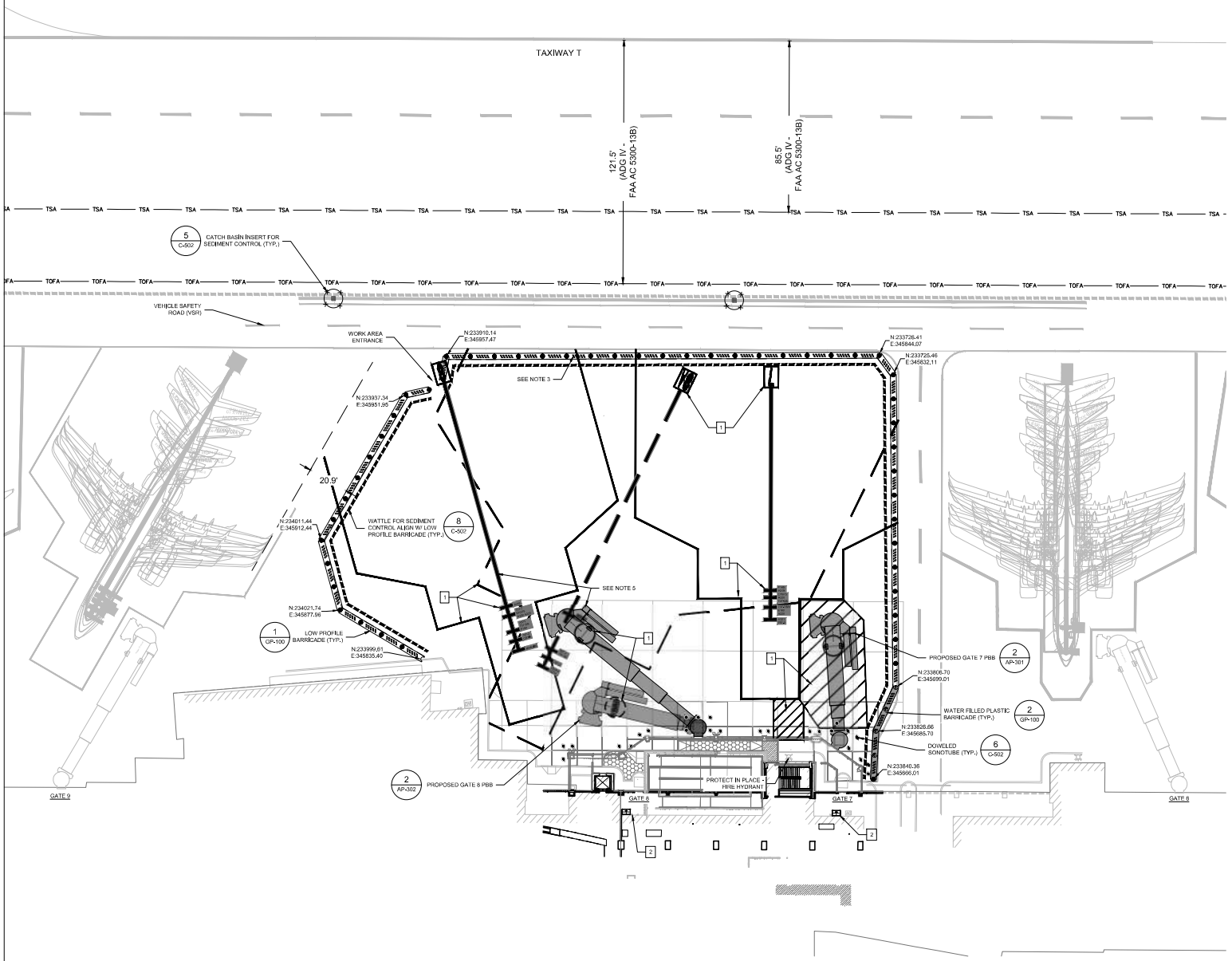
CONSTRUCTION SAFETY AND PHASING PLAN - PHASE 2

DISCIPLINE: AIRSIDE/CIVIL

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CB	BF	CB	CC

SCALE: 1" = 20' — DATE: 08/01/2025

SHEET NUMBER: GP-103 — SHEET OF



PHASE 3 NOTES:

1. PRE-INSTALLATION WORK:
   - 1.1. INSTALL BARRICADES AS INDICATED. CONTRACTOR MUST COORDINATE PLACEMENT WITH RIAC AS NOT TO IMPEDE ADJACENT GATE OPERATIONS. BARRICADES MAY BE TEMPORARILY ADJUSTED AS REQUIRED FOR PERFORMING WORK UPON APPROVAL BY RPR AND RIAC. CONTRACTOR TO PROVIDE TEMPORARY CONSTRUCTION SIGNAGE AND CLEAR ZONES FOR GROUND PERSONNEL ENTERING AND EXITING WORK AREA FROM TERMINAL BUILDING.
   - 1.2. SPECIFIC GATE CONSTRUCTION ACTIVITIES MAY BE COMPLETED CONCURRENTLY. CONTRACTOR MUST SUBMIT PROPOSED CONSTRUCTION SCHEDULE TO RIAC FOR REVIEW AND APPROVAL PRIOR TO COMMENCING WORK.
2. EQUIPMENT INSTALLATIONS AND APRON MARKINGS:
   - 2.1. INSTALL NEW PBBs.
   - 2.2. INSTALL NEW ASSOCIATED EQUIPMENT INCLUDING POTABLE WATER CABINET, PCAP UNIT AND GPU.
   - 2.3. COMPLETE STARTUP AND FINAL TESTING ON NEWLY INSTALLED EQUIPMENT.
   - 2.4. INSTALL NEW APRON MARKINGS AND SET PBB LIMITS.
   - 2.5. COMPLETE DEMONSTRATION TESTING AND SUBSTANTIAL COMPLETION INSPECTION.
   - 2.6. COMPLETE PUNCHLIST ITEMS.
   - 2.7. COMPLETE OPERATOR AND MAINTENANCE TRAINING.
   - 2.8. FINAL SECURITY SWEEP AND BARRICADE REMOVAL.
3. BARRICADES ARE SHOWN FOR MAXIMUM WORK AREA. TEMPORARY BARRICADE LOCATIONS MAY BE REQUIRED TO ACCOMMODATE AIRPORT OPERATIONS. THESE OPERATIONS MAY INCLUDE, BUT ARE NOT LIMITED TO, FULL AIRCRAFT SERVICE OPERATIONS AT GATE 7 AND/OR GATE 8. UPON COMPLETION OF WORK IN THE TEMPORARY BARRICADED AREA THE CONTRACTOR MUST SWEEP AND CLEAN THE AREA TO THE SATISFACTION OF RIAC OPERATIONS AND THE RPR PRIOR TO REOPENING. RIAC OPERATIONS TO PROVIDE FLIGHT SCHEDULE AND / OR 2 HOUR PRIOR NOTICE TO THE CONTRACTOR FOR ANY GATE OPERATION ACTIVITIES.
4. NO AIRCRAFT ARRIVALS OR DEPARTURES MAY BE SCHEDULED FOR GATE 7 AND GATE 8 FOR THE WORK AREA AS SHOWN, UNLESS OTHERWISE NOTED OR COORDINATED WITH RIAC OPERATIONS PRIOR TO AIRCRAFT OPERATIONS. GATE 8 WILL BE UTILIZED FOR ANY POTENTIAL INTERNATIONAL DIVERSIONS TO PVD, AS SUCH, THE GATE 8 WORK AREA MUST BE CONSTANTLY PREPARED FOR AN EMERGENCY INTERNATIONAL AIRCRAFT ARRIVAL.
5. GATE 8 PBB INSTALLATION, ANCILLARY EQUIPMENT INSTALLATION, AND APRON MARKING INSTALLATION, MUST BE COMPLETED WITHIN 7 CALENDAR DAYS FROM INITIAL BARRICADE PLACEMENT. GATE 8 MUST BE OPEN AND FULLY OPERATIONAL FOR THE AIRCRAFT PARKING LAYOUT AS SHOWN, AT A MINIMUM, RIAC MUST BE ABLE TO PLANE AND DEPLANE PASSENGERS TO/FROM THE APRON FOR ALL AIRCRAFT NOTED AT GATE 8.

KEYNOTE:

1. INSTALL PROPOSED MARKINGS AS INDICATED. SEE CM SERIES FOR DETAILS.
2. REINSTALL POTABLE WATER CABINET AS INDICATED. SEE PLUMBING SERIES FOR DETAILS.

LEGEND:

- LOW PROFILE BARRICADE
- WATER FILLED PLASTIC BARRIER
- TOFA — TAXIWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- CATCH BASIN INSERT
- BOLLARDS
- WATTLE FOR SEDIMENT CONTROL

RHODE ISLAND T. F. GREEN INTERNATIONAL AIRPORT

WARWICK, RHODE ISLAND

TERMINAL IMPROVEMENTS

STATE OF RHODE ISLAND
RHODE ISLAND AIRPORT CORPORATION

Daniel McKee • Governor
Jonathan N. Snow • Chair, RIAC Board
 Native Ahmad • Pro Tem and CEO
Becca Dennis • Project Manager

PROJECT SUBMISSION PHASE:
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CONSULTANT:

REGISTRATION STAMP:

REVISIONS:

REV. NO.	DATE	DESCRIPTION	BY

KEY PLAN:

AREA OF WORK — CALLED

PROJECT NUMBER AND TITLE:

RIAC CIP NO. PVD.386
RIAC PVD GATES 7 & 8 RECONFIGURATION

SHEET TITLE:
CONSTRUCTION SAFETY AND PHASING PLAN - PHASE 3

DISCIPLINE:
AIRSIDE/CIVIL

DESIGN BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:
CB	BF	CB	CC

SCALE: 1" = 20'

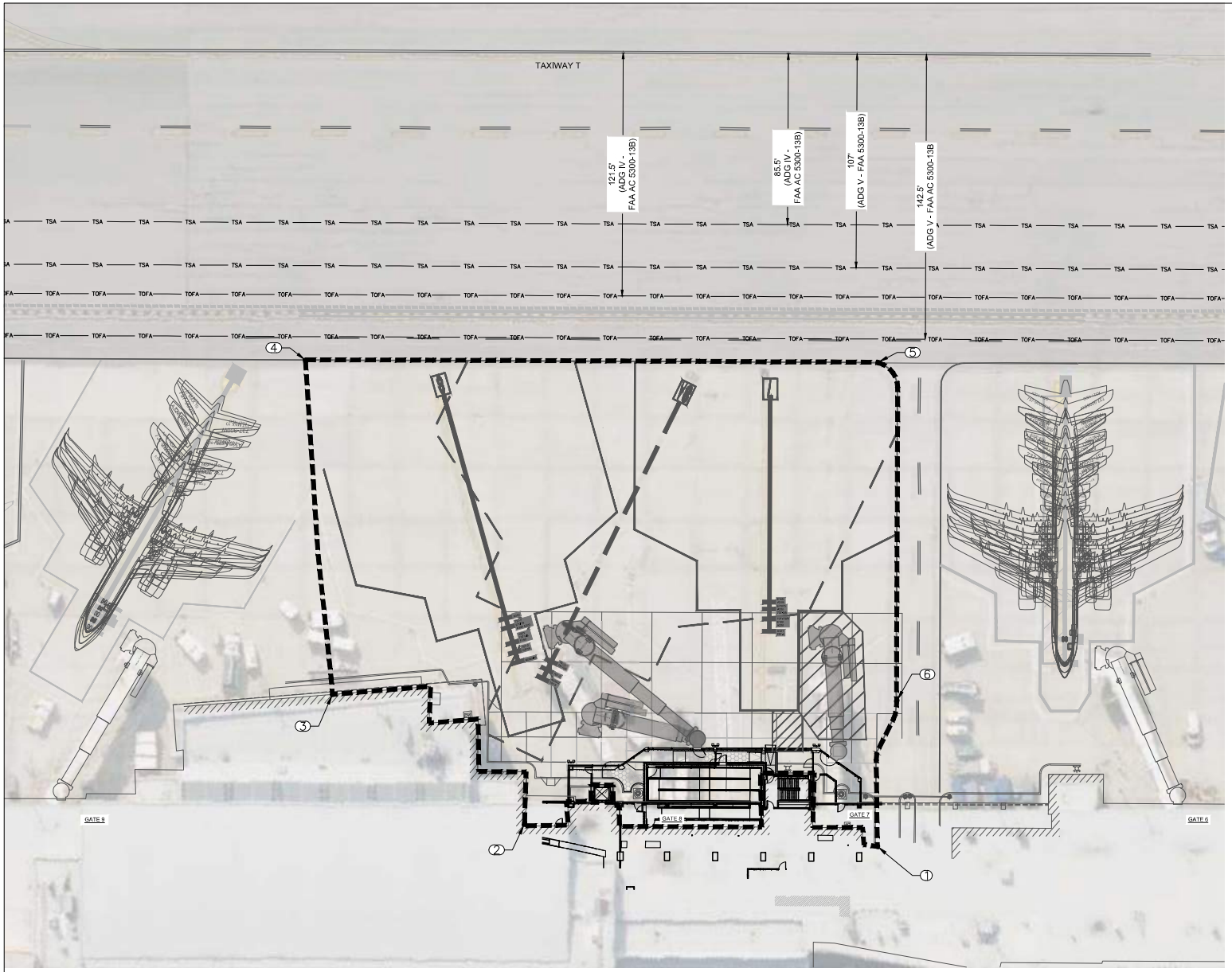
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SHEET NUMBER: SHEET OF

GP-104

APPENDIX 4

7460 Exhibits



20' 0' 10' 20' 40' 80'

SCALE: 1"=20'

LEGEND:

TOFA — TAXIWAY OBJECT FREE AREA

TSA — TAXIWAY SAFETY AREA

TEMPORARY CONSTRUCTION BOUNDARY

POINT TABLE				
POINT NO.	LATITUDE	LONGITUDE	EXISTING GROUND ELEV. (FT)	EQUIPMENT HEIGHT (FT)
1	N041° 43' 30.40"	W071° 26' 08.46"	57'	50'
2	N041° 43' 31.82"	W071° 26' 07.11"	57'	50'
3	N041° 43' 32.29"	W071° 26' 05.71"	57'	50'
4	N041° 43' 31.53"	W071° 26' 03.75"	54'	50'
5	N041° 43' 29.14"	W071° 26' 05.75"	54'	50'
6	N041° 43' 29.94"	W071° 26' 07.71"	56'	50'

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P. Trevor Wyman - Pres. Elect and CEO
Jessica Dorrico - Project Manager

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KEY PLAN:

AREA OF WORK — CALLED

PROJECT NUMBER AND TITLE:

RIAC CIP NO. PVD.386

RIAC PVD GATES 7 & 8 RECONFIGURATION

SHEET TITLE:

CONSTRUCTION 7460

DISCIPLINE:

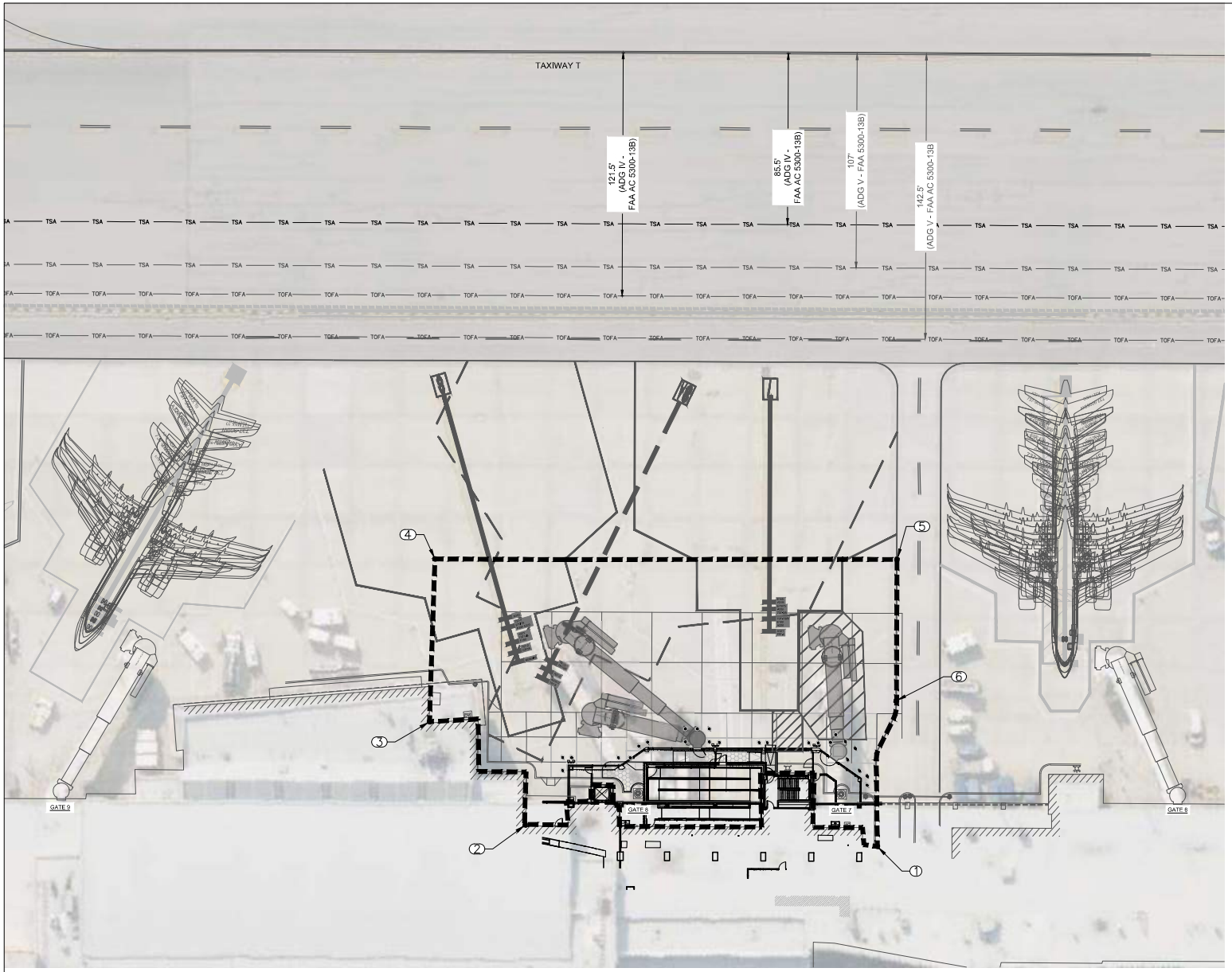
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RG	RG	CB	CC

SCALE:

DATE: 08/01/2025

SHEET NUMBER: SHEET OF

7460-1



20' 0' 10' 20' 40' 80'

SCALE: 1"=20'

LEGEND:

TOFA — TAXIWAY OBJECT FREE AREA

TSA — TAXIWAY SAFETY AREA

TEMPORARY CONSTRUCTION BOUNDARY

POINT TABLE				
POINT NO.	LATITUDE	LONGITUDE	EXISTING GROUND ELEV. (FT)	EQUIPMENT HEIGHT (FT)
1	N041° 43' 30.40"	W071° 26' 08.46"	57'	100'
2	N041° 43' 31.82"	W071° 26' 07.11"	57'	100'
3	N041° 43' 31.95"	W071° 26' 06.20"	57'	100'
4	N041° 43' 31.50"	W071° 26' 05.31"	55'	100'
5	N041° 43' 29.57"	W071° 26' 06.92"	55'	100'
6	N041° 43' 29.94"	W071° 26' 07.71"	56'	100'

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Peter Hymel - President and CEO
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REV NO.	DATE	DESCRIPTION	BY

KEY PLAN:

AREA OF WORK — CALLED

PROJECT NUMBER AND TITLE:

RIAC CIP NO. PVD.386

RIAC PVD GATES 7 & 8 RECONFIGURATION

SHEET TITLE:

CRANE 7460

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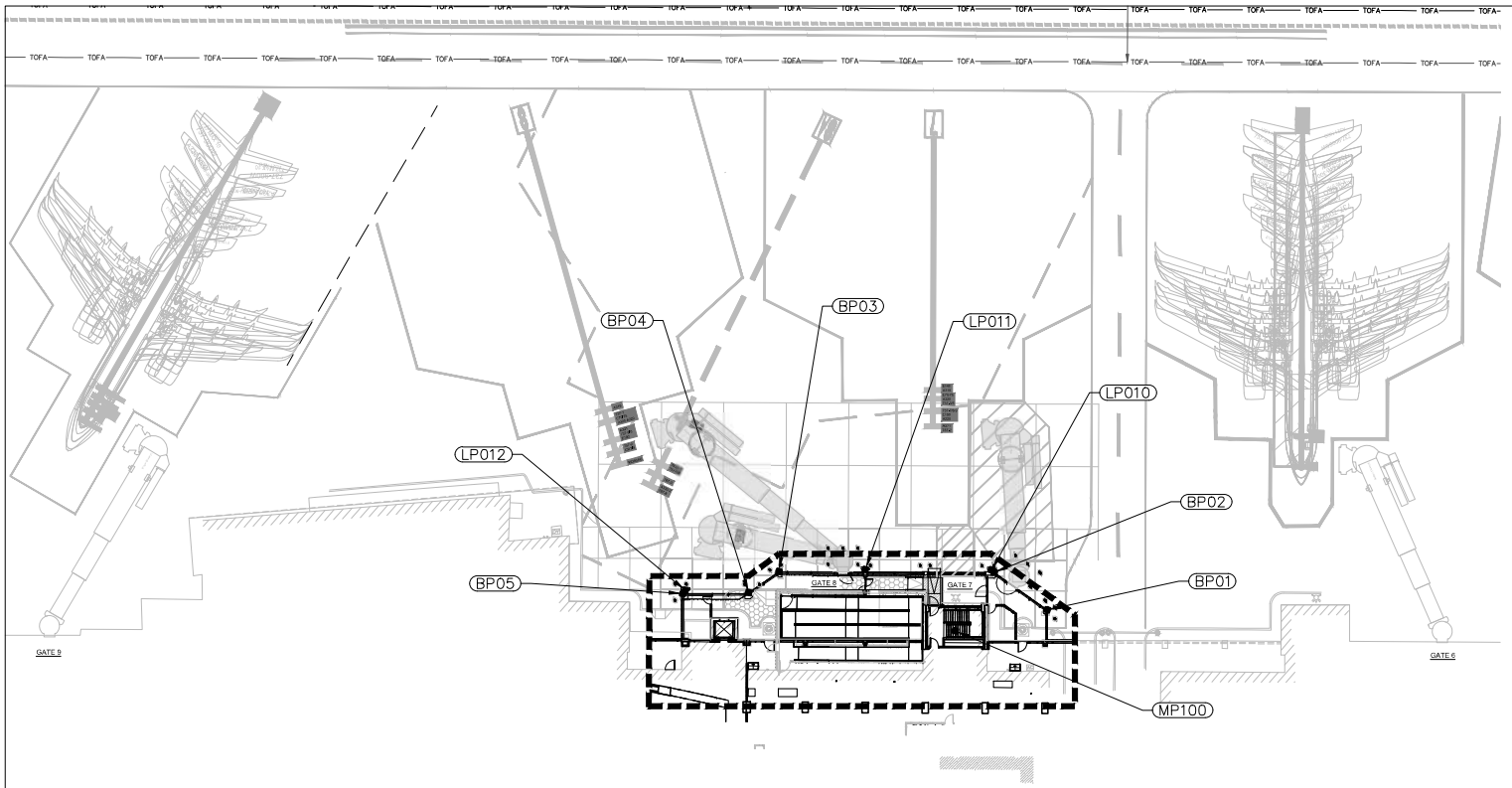
DESIGN BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:
RG	RG	CB	CC

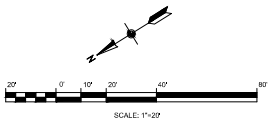
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DATE: 08/01/2025

SHEET NUMBER: SHEET OF

7460-2





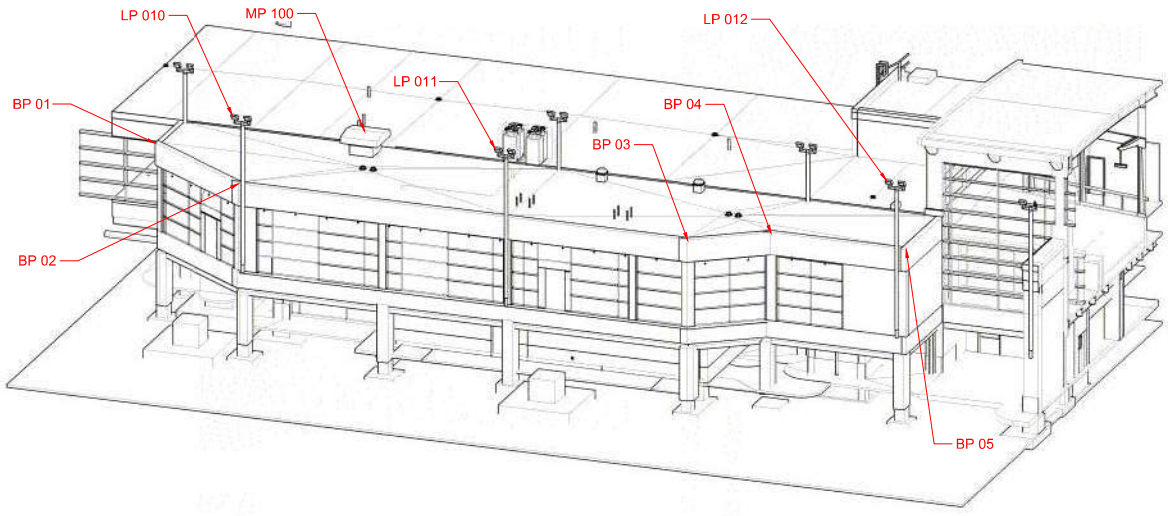
LEGEND:

- TOFA — TAXIWAY OBJECT FREE AREA
- TSA — TAXIWAY SAFETY AREA
- TEMPORARY CONSTRUCTION BOUNDARY

BUILDING POINT TABLE				
POINT NO.	LATITUDE	LONGITUDE	EXISTING GROUND ELEVATION	STRUCTURE HEIGHT
BP01	N041° 43' 30.29"	W071° 26' 08.02"	57'	31'
BP02	N041° 43' 30.39"	W071° 26' 07.70"	57'	31'
BP03	N041° 43' 31.11"	W071° 26' 07.10"	57'	31'
BP04	N041° 43' 31.26"	W071° 26' 07.11"	57'	31'
BP05	N041° 43' 31.48"	W071° 26' 06.93"	57'	31'

LIGHT POLES POINT TABLE				
POINT NO.	LATITUDE	LONGITUDE	EXISTING GROUND ELEVATION	STRUCTURE HEIGHT
LP010	N041° 43' 30.39"	W071° 26' 07.69"	57'	44'
LP011	N041° 43' 30.82"	W071° 26' 07.33"	57'	44'
LP012	N041° 43' 31.46"	W071° 26' 06.92"	57'	44'

MECHANICAL UNIT POINT TABLE				
POINT NO.	LATITUDE	LONGITUDE	EXISTING GROUND ELEVATION	STRUCTURE HEIGHT
MP100	N041° 43' 30.64"	W071° 26' 07.86"	57'	39'





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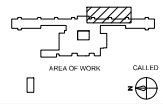
CONSULTANT:

REGISTRATION STAMP:

REVISIONS:

REV. NO.	DATE	DESCRIPTION	BY

KEY PLAN:



PROJECT NUMBER AND TITLE:

RIAC CIP NO. PVD.386

RIAC PVD GATES 7 & 8 RECONFIGURATION

SHEET TITLE:

PERMANENT STRUCTURES - 7460 EXHIBIT

DISCIPLINE:

DESIGN BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:
CB	BF	CB	CC

SCALE: 1" = 20'

DATE: 08/01/2025

SHEET NUMBER: SHEET OF

7460-3

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 on the effective date of the Construction NTP. The Contractor shall notify the RPR at least 72 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 14 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 weekly 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 specified in the CSPP:

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.

80-07.1 Contract Time

Contract time is 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. See Division 1, Section 00100 Information to Bidders for contract time requirements.

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 or working 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. See Division 1, Section 00800 Summary of Work for sequence of work and liquidated damages requirements.

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

Section 90 Measurement and Payment

90-01 Measurement of quantities. All work completed under the contract will be measured as lump sum.

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.

Measurement and Payment Terms

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*.

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.

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. Light Emitting Diode emitting diode (LED) light fixtures with the exception of obstruction lighting, must

be warranted by the manufacturer for a minimum of four (4) years after date of installation inclusive of all electronics.

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

Item C-100 Contractor Quality Control Program (CQCP)

100-1 General. Quality is more than test results. Quality is the combination of proper materials, testing, workmanship, equipment, inspection, and documentation of the project. Establishing and maintaining a culture of quality is key to achieving a quality project. The Contractor shall establish, provide, and maintain an effective Contractor Quality Control Program (CQCP) that details the methods and procedures that will be taken to assure that all materials and completed construction required by this contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors. Although guidelines are established and certain minimum requirements are specified here and elsewhere in the contract technical specifications, the Contractor shall assume full responsibility for accomplishing the stated purpose.

The Contractor shall establish a CQCP that will:

a. Provide qualified personnel to develop and implement the CQCP.

b. Provide for the production of acceptable quality materials.

c. Provide sufficient information to assure that the specification requirements can be met.

d. Document the CQCP process.

The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the CQCP has been reviewed and approved by the Resident Project Representative (RPR). No partial payment will be made for materials subject to specific quality control (QC) requirements until the CQCP has been reviewed and approved.

The QC requirements contained in this section and elsewhere in the contract technical specifications are in addition to and separate from the quality assurance (QA) testing requirements. QA testing requirements are the responsibility of the RPR or Contractor as specified in the specifications.

A Quality Control (QC)/Quality Assurance (QA) workshop with the Engineer, Resident Project Representative (RPR), Contractor, subcontractors, testing laboratories, and Owner's representative must be held prior to start of construction. The QC/QA workshop will be facilitated by the Contractor. The Contractor shall coordinate with the Airport and the RPR on time and location of the QC/QA workshop. Items to be addressed, at a minimum, will include:

a. Review of the CQCP including submittals, QC Testing, Action & Suspension Limits for Production, Corrective Action Plans, Distribution of QC reports, and Control Charts.

b. Discussion of the QA program.

c. Discussion of the QC and QA Organization and authority including coordination and information exchange between QC and QA.

d. Establish regular meetings to discuss control of materials, methods and testing.

e. Establishment of the overall QC culture.

100-2 Description of program.

a. General description. The Contractor shall establish a CQCP to perform QC inspection and testing of all items of work required by the technical specifications, including those performed by subcontractors. The CQCP shall ensure conformance to applicable specifications and plans with respect to materials, off-site fabrication, workmanship, construction, finish, and functional performance. The CQCP shall be effective for control of all construction work performed under this Contract and shall specifically include

surveillance and tests required by the technical specifications, in addition to other requirements of this section and any other activities deemed necessary by the Contractor to establish an effective level of QC.

b. Contractor Quality Control Program (CQCP). The Contractor shall describe the CQCP in a written document that shall be reviewed and approved by the RPR prior to the start of any production, construction, or off-site fabrication. The written CQCP shall be submitted to the RPR for review and approval at least **14** calendar days before the CQCP Workshop. The Contractor's CQCP and QC testing laboratory must be approved in writing by the RPR prior to the Notice to Proceed (NTP).

The CQCP shall be organized to address, as a minimum, the following:

1. QC organization and resumes of key staff
2. Project progress schedule
3. Submittals schedule
4. Inspection requirements
5. QC testing plan
6. Documentation of QC activities and distribution of QC reports
7. Requirements for corrective action when QC and/or QA acceptance criteria are not met
8. Material quality and construction means and methods. Address all elements applicable to the project that affect the quality of the pavement structure including subgrade, subbase, base, and surface course. Some elements that must be addressed include, but is not limited to mix design, aggregate grading, stockpile management, mixing and transporting, placing and finishing, quality control testing and inspection, smoothness, laydown plan, equipment, and temperature management plan.

The Contractor must add any additional elements to the CQCP that is necessary to adequately control all production and/or construction processes required by this contract.

100-3 CQCP organization. The CQCP shall be implemented by the establishment of a QC organization. An organizational chart shall be developed to show all QC personnel, their authority, and how these personnel integrate with other management/production and construction functions and personnel.

The organizational chart shall identify all QC staff by name and function, and shall indicate the total staff required to implement all elements of the CQCP, including inspection and testing for each item of work. If necessary, different technicians can be used for specific inspection and testing functions for different items of work. If an outside organization or independent testing laboratory is used for implementation of all or part of the CQCP, the personnel assigned shall be subject to the qualification requirements of paragraphs 100-03a and 100-03b. The organizational chart shall indicate which personnel are Contractor employees and which are provided by an outside organization.

The QC organization shall, as a minimum, consist of the following personnel:

a. Program Administrator. The Contractor Quality Control Program Administrator (CQCPA) must be a full-time employee of the Contractor, or a consultant engaged by the Contractor. The CQCPA must have a minimum of five (5) years of experience in QC pavement construction with prior QC experience on a project of comparable size and scope as the contract.

Included in the five (5) years of paving/QC experience, the CQCPA must meet at least one of the following requirements:

(1) Professional Engineer with one (1) year of airport paving experience.

(2) Engineer-in-training with two (2) years of airport paving experience.

(3) National Institute for Certification in Engineering Technologies (NICET) Civil Engineering Technology Level IV with three (3) years of airport paving experience.

(4) An individual with four (4) years of airport paving experience, with a Bachelor of Science Degree in Civil Engineering, Civil Engineering Technology or Construction.

The CQCPA must have full authority to institute any and all actions necessary for the successful implementation of the CQCP to ensure compliance with the contract plans and technical specifications. The CQCPA authority must include the ability to immediately stop production until materials and/or processes are in compliance with contract specifications. The CQCPA must report directly to a principal officer of the construction firm. The CQCPA may supervise the Quality Control Program on more than one project provided that person can be at the job site within two (2) hours after being notified of a problem.

b. QC technicians. A sufficient number of QC technicians necessary to adequately implement the CQCP must be provided. These personnel must be either Engineers, engineering technicians, or experienced craftsman with qualifications in the appropriate field equivalent to NICET Level II in Civil Engineering Technology or higher, and shall have a minimum of two (2) years of experience in their area of expertise.

The QC technicians must report directly to the CQCPA and shall perform the following functions:

(1) Inspection of all materials, construction, plant, and equipment for conformance to the technical specifications, and as required by paragraph 100-6.

(2) Performance of all QC tests as required by the technical specifications and paragraph100-8.

(3) Performance of tests for the RPR when required by the technical specifications.

Certification at an equivalent level of qualification and experience by a state or nationally recognized organization will be acceptable in lieu of NICET certification.

c. Staffing levels. The Contractor shall provide sufficient qualified QC personnel to monitor each work activity at all times. Where material is being produced in a plant for incorporation into the work, separate plant and field technicians shall be provided at each plant and field placement location. The scheduling and coordinating of all inspection and testing must match the type and pace of work activity. The CQCP shall state where different technicians will be required for different work elements.

100-4 Project progress schedule. Critical QC activities must be shown on the project schedule as required by Section 80, paragraph 80-03, *Execution and Progress*.

100-5 Submittals schedule. The Contractor shall submit a detailed listing of all submittals (for example, mix designs, material certifications) and shop drawings required by the technical specifications. The listing can be developed in a spreadsheet format and shall include as a minimum:

a. Specification item number

b. Item description

c. Description of submittal

d. Specification paragraph requiring submittal

e. Scheduled date of submittal

100-6 Inspection requirements. QC inspection functions shall be organized to provide inspections for all definable features of work, as detailed below. All inspections shall be documented by the Contractor as specified by paragraph 100-9.

Inspections shall be performed as needed to ensure continuing compliance with contract requirements until completion of the particular feature of work. Inspections shall include the following minimum requirements:

a. During plant operation for material production, QC test results and periodic inspections shall be used to ensure the quality of aggregates and other mix components, and to adjust and control mix proportioning to meet the approved mix design and other requirements of the technical specifications. All equipment used in proportioning and mixing shall be inspected to ensure its proper operating condition. The CQCP shall detail how these and other QC functions will be accomplished and used.

b. During field operations, QC test results and periodic inspections shall be used to ensure the quality of all materials and workmanship. All equipment used in placing, finishing, and compacting shall be inspected to ensure its proper operating condition and to ensure that all such operations are in conformance to the technical specifications and are within the plan dimensions, lines, grades, and tolerances specified. The CQCP shall document how these and other QC functions will be accomplished and used.

100-7 Contractor QC testing facility.

a. For projects that include Item P-401, Item P-403, and Item P-404, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM D3666, *Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials*:

- 8.1.3 Equipment Calibration and Checks;
- 8.1.9 Equipment Calibration, Standardization, and Check Records;
- 8.1.12 Test Methods and Procedures

b. For projects that include P-501, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM C1077, Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation:

- 7 Test Methods and Procedures
- 8 Facilities, Equipment, and Supplemental Procedures

100-8 QC testing plan. As a part of the overall CQCP, the Contractor shall implement a QC testing plan, as required by the technical specifications. The testing plan shall include the minimum tests and test frequencies required by each technical specification Item, as well as any additional QC tests that the Contractor deems necessary to adequately control production and/or construction processes.

The QC testing plan can be developed in a spreadsheet fashion and shall, as a minimum, include the following:

a. Specification item number (e.g., P-401)

b. Item description (e.g., Hot Mix Asphalt Pavements)

c. Test type (e.g., gradation, grade, asphalt content)

d. Test standard (e.g., ASTM or American Association of State Highway and Transportation Officials (AASHTO) test number, as applicable)

e. Test frequency (e.g., as required by technical specifications or minimum frequency when requirements are not stated)

f. Responsibility (e.g., plant technician)

g. Control requirements (e.g., target, permissible deviations)

The QC testing plan shall contain a statistically-based procedure of random sampling for acquiring test samples in accordance with ASTM D3665. The RPR shall be provided the opportunity to witness QC sampling and testing.

All QC test results shall be documented by the Contractor as required by paragraph 100-9.

100-9 Documentation. The Contractor shall maintain current QC records of all inspections and tests performed. These records shall include factual evidence that the required QC inspections or tests have been performed, including type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, etc.; proposed remedial action; and corrective actions taken.

These records must cover both conforming and defective or deficient features, and must include a statement that all supplies and materials incorporated in the work are in full compliance with the terms of the contract. Legible copies of these records shall be furnished to the RPR daily. The records shall cover all work placed subsequent to the previously furnished records and shall be verified and signed by the CQCPA.

Contractor QC records required for the contract shall include, but are not necessarily limited to, the following records:

a. Daily inspection reports. Each Contractor QC technician shall maintain a daily log of all inspections performed for both Contractor and subcontractor operations. These technician's daily reports shall provide factual evidence that continuous QC inspections have been performed and shall, as a minimum, include the following:

(1) Technical specification item number and description

(2) Compliance with approved submittals

(3) Proper storage of materials and equipment

(4) Proper operation of all equipment

(5) Adherence to plans and technical specifications

(6) Summary of any necessary corrective actions

(7) Safety inspection.

[(8) Photographs and/or video **]**

The daily inspection reports shall identify all QC inspections and QC tests conducted, results of inspections, location and nature of defects found, causes for rejection, and remedial or corrective actions taken or proposed.

The daily inspection reports shall be signed by the responsible QC technician and the CQCPA. The RPR shall be provided at least one copy of each daily inspection report on the work day following the day of record. When QC inspection and test results are recorded and transmitted electronically, the results must be archived.

b. Daily test reports. The Contractor shall be responsible for establishing a system that will record all QC test results. Daily test reports shall document the following information:

(1) Technical specification item number and description
(2) Test designation
(3) Location
(4) Date of test
(5) Control requirements
(6) Test results
(7) Causes for rejection
(8) Recommended remedial actions
(9) Retests

Test results from each day's work period shall be submitted to the RPR prior to the start of the next day's work period. When required by the technical specifications, the Contractor shall maintain statistical QC charts. When QC daily test results are recorded and transmitted electronically, the results must be archived.

100-10 Corrective action requirements. The CQCP shall indicate the appropriate action to be taken when a process is deemed, or believed, to be out of control (out of tolerance) and detail what action will be taken to bring the process into control. The requirements for corrective action shall include both general requirements for operation of the CQCP as a whole, and for individual items of work contained in the technical specifications.

The CQCP shall detail how the results of QC inspections and tests will be used for determining the need for corrective action and shall contain clear rules to gauge when a process is out of control and the type of correction to be taken to regain process control.

When applicable or required by the technical specifications, the Contractor shall establish and use statistical QC charts for individual QC tests. The requirements for corrective action shall be linked to the control charts.

100-11 Inspection and/or observations by the RPR. All items of material and equipment are subject to inspection and/or observation by the RPR at the point of production, manufacture or shipment to determine if the Contractor, producer, manufacturer or shipper maintains an adequate QC system in conformance with the requirements detailed here and the applicable technical specifications and plans. In addition, all items of materials, equipment and work in place shall be subject to inspection and/or observation by the RPR at the site for the same purpose.

Inspection and/or observations by the RPR does not relieve the Contractor of performing QC inspections of either on-site or off-site Contractor's or subcontractor's work.

100-12 Noncompliance.

a. The Resident Project Representative (RPR) will provide written notice to the Contractor of any noncompliance with their CQCP. After receipt of such notice, the Contractor must take corrective action.

b. When QC activities do not comply with either the CQCP or the contract provisions or when the Contractor fails to properly operate and maintain an effective CQCP, and no effective corrective actions have been taken after notification of non-compliance, the RPR will recommend the Owner take the following actions:

(1) Order the Contractor to replace ineffective or unqualified QC personnel or subcontractors and/or

(2) Order the Contractor to stop operations until appropriate corrective actions are taken.

METHOD OF MEASUREMENT

100-13 Basis of measurement and payment. The CQCP shall be considered incidental to the various contract items and no separate measurement shall be made.

BASIS OF PAYMENT

100-14 Payment will be made under:

Item C-100	Contractor Quality Control Program (CQCP), incidental to other work items

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.

National Institute for Certification in Engineering Technologies (NICET)

ASTM International (ASTM)

ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials

END OF ITEM C-100

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Item C-102 Temporary Air and Water Pollution, Soil Erosion, and Siltation Control

DESCRIPTION

102-1. This item shall consist of temporary control measures as shown on the plans or as ordered by the Resident Project Representative (RPR) during the life of a contract to control pollution of air and water, soil erosion, and siltation through the use of silt fences, berms, dikes, dams, sediment basins, fiber mats, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.

Temporary erosion control shall be in accordance with the approved erosion control plan; the approved Construction Safety and Phasing Plan (CSPP) and AC 150/5370-2, *Operational Safety on Airports During Construction*. The temporary erosion control measures contained herein shall be coordinated with the permanent erosion control measures specified as part of this contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction period.

Temporary control may include work outside the construction limits such as borrow pit operations, equipment and material storage sites, waste areas, and temporary plant sites.

Temporary control measures shall be designed, installed and maintained to minimize the creation of wildlife attractants that have the potential to attract hazardous wildlife on or near public-use airports.

MATERIALS

102-2.1 Grass. Grass that will not compete with the grasses sown later for permanent cover per Item T-901shall be a quick-growing species (such as ryegrass, Italian ryegrass, or cereal grasses) suitable to the area providing a temporary cover. Selected grass species shall not create a wildlife attractant.

102-2.2 Mulches. Mulches may be hay, straw, fiber mats, netting, bark, wood chips, or other suitable material reasonably clean and free of noxious weeds and deleterious materials per Item T-908. Mulches shall not create a wildlife attractant.

102-2.3 Fertilizer. Fertilizer shall be a standard commercial grade and shall conform to all federal and state regulations and to the standards of the Association of Official Agricultural Chemists.

102-2.4 Slope drains. Slope drains may be constructed of pipe, fiber mats, rubble, concrete, asphalt, or other materials that will adequately control erosion.

102-2.5 Silt fence. Silt fence shall consist of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life. Silt fence shall meet the requirements of ASTM D6461.

102-2.6 Compost Filter Sock. Compost filter sock shall be machine produced, consisting of compost filled tubes of compacted straw of rice, wheat, or barley and is to be certified as weed free. Netting for socks to be seamless, high-density polyethylene with ultraviolet inhibitors. Compost filter socks shall weigh 2.5 pounds (minimum) per linear foot. Compost used for filter materials shall be weed free and derived from a well-decomposed source of organic matter. The compost shall be produced using an aerobic composting process and shall be free of any refuse, contaminants, or other materials toxic to plant growth. Non-composted products will not be accepted.

102-2.7 Sack Insert Catch Basin Inlet Protection. Inlet protection shall be manufactured inlet filter bags in accordance with the detail as shown on the plans.

CONSTRUCTION REQUIREMENTS

102-3.1 General. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.

The RPR shall be responsible for assuring compliance to the extent that construction practices, construction operations, and construction work are involved.

102-3.2 Schedule. Prior to the start of construction, the Contractor shall submit schedules in accordance with the approved Construction Safety and Phasing Plan (CSPP) and the plans for accomplishment of temporary and permanent erosion control work for clearing and grubbing; grading; construction; paving; and structures at watercourses. The Contractor shall also submit a proposed method of erosion and dust control on haul roads and borrow pits and a plan for disposal of waste materials. Work shall not be started until the erosion control schedules and methods of operation for the applicable construction have been accepted by the RPR.

102-3.3 Construction details. The Contractor will be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in the plans and approved CSPP. Except where future construction operations will damage slopes, the Contractor shall perform the permanent seeding and mulching and other specified slope protection work in stages, as soon as substantial areas of exposed slopes can be made available. Temporary erosion and pollution control measures will be used to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of permanent control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

Where erosion may be a problem, schedule and perform clearing and grubbing operations so that grading operations and permanent erosion control features can follow immediately if project conditions permit. Temporary erosion control measures are required if permanent measures cannot immediately follow grading operations. The RPR shall limit the area of clearing and grubbing, excavation, borrow, and embankment operations in progress, commensurate with the Contractor’s capability and progress in keeping the finish grading, mulching, seeding, and other such permanent control measures current with the accepted schedule. If seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified as directed by the RPR.

The Contractor shall provide immediate permanent or temporary pollution control measures to minimize contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment as directed by the RPR. If temporary erosion and pollution control measures are required due to the Contractor’s negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or directed by the RPR, the work shall be performed by the Contractor and the cost shall be incidental to this item.

The RPR may increase or decrease the area of erodible earth material that can be exposed at any time based on an analysis of project conditions.

The erosion control features installed by the Contractor shall be maintained by the Contractor during the construction period.

Provide temporary structures whenever construction equipment must cross watercourses at frequent intervals. Pollutants such as fuels, lubricants, bitumen, raw sewage, wash water from concrete mixing operations, and other harmful materials shall not be discharged into any waterways, impoundments or into natural or manmade channels.

102-3.4 Installation, maintenance and removal of silt fence. Silt fences shall extend a minimum of 16 inches (41 cm) and a maximum of 34 inches (86 cm) above the ground surface. Posts shall be set no more than 10 feet (3 m) on center. Filter fabric shall be cut from a continuous roll to the length required minimizing joints where possible. When joints are necessary, the fabric shall be spliced at a support post with a minimum 12-inch (300-mm) overlap and securely sealed. A trench shall be excavated approximately 4 inches (100 mm) deep by 4 inches (100 mm) wide on the upslope side of the silt fence. The trench shall be backfilled and the soil compacted over the silt fence fabric. The Contractor shall remove and dispose of silt that accumulates during construction and prior to establishment of permanent erosion control. The fence shall be maintained in good working condition until permanent erosion control is established. Silt fence shall be removed upon approval of the RPR.

102-3.5 Installation, maintenance and removal of compost filter sock.

a. Install at locations indicated on the Drawings or as directed by the RPR.
b. Remove all rocks, vegetation, or other obstructions at filter sock locations.
c. Anchor compost filter tube with stakes placed a maximum 10-feet apart.
d. The end stakes shall be placed 6-inches from the end of compost filter sock and angled toward previously laid compost filter sock to force compost filter sock together.
e. Refer to detail on Drawings for additional installation requirements.
f. Maintain compost filter socks throughout the entire duration of the project. Damaged or displaced compost filter socks shall be replaced by the Contractor at no additional cost to the Owner.
g. Remove sediments when depths accumulate to 50% of the depth of the compost filter sock height, or as necessary.
h. All compost filter socks shall be removed at project completion. Remove all sediment collected by the compost filter sock, remove the compost filter sock, and restore the area to pre-existing conditions.

102-3.6 Installation, maintenance and removal of sack insert catch basin inlet protection.

a. Install at locations indicated on the Drawings or as directed by the RPR.
b. Install manufactured inlet filter devices in accordance with the manufacturer's written installation instructions.
c. Refer to detail on Drawings for additional installation requirements.
d. Maintain inlet devices throughout the entire duration of the project. Damaged or displaced inlet devices shall be replaced by the Contractor at no additional cost to the Owner.
e. Remove sediments when depths accumulate to 50% of the inlet device height, or as necessary.
f. All inlet devices shall be removed at project completion. Remove all sediment collected by the inlet devices, remove the inlet devices, and restore the area to pre-existing conditions.

METHOD OF MEASUREMENT

102-4.1 Temporary erosion and pollution control work required will be performed as scheduled or directed by the RPR. Completed and accepted work will be measured as follows:

a. Temporary seeding and mulching will be measured by lump sum.

b. Temporary slope drains will be measured by lump sum.

c. Temporary benches, dikes, dams, and sediment basins will be measured by lump sum of excavation performed, including necessary cleaning of sediment basins, and the lump sum of embankment placed as directed by the RPR.

d. All fertilizing will be measured by lump sum.

e. All Compost filter socks will be measured by lump sum.

f. All drain inlet protection will be measured by lump sum.

102-4.2 Control work performed for protection of construction areas outside the construction limits, such as borrow and waste areas, haul roads, equipment and material storage sites, and temporary plant sites, will not be measured and paid for directly but shall be considered as a subsidiary obligation of the Contractor.

BASIS OF PAYMENT

102-5.1 Accepted quantities of temporary water pollution, soil erosion, and siltation control work ordered by the RPR and measured as provided in paragraph 102-4.1 will be paid as lump sum. Payment for the work specified in this section and designated in the Contract Documents shall include all materials, equipment, labor, and incidentals required to furnish and install complete in place and shall be included within the Contract Bid Amount.

Item C-102-5.1a Not used.

Item C-102-5.1b Not used.

Item C-102-5.1c Not used.

Item C-102-5.1d Not used.

Item C-102-5.1e Not used.

Item C-102.5.1f Not used.

Item C-102.5.1g Not used.

Temporary control features not covered by contract items that are ordered by the RPR will be paid for in accordance with Section 90, paragraph 90-05 *Payment for Extra Work*.

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.

Advisory Circulars (AC)

AC 150/5200-33 *Hazardous Wildlife Attractants on or Near Airports*

AC 150/5370-2 *Operational Safety on Airports During Construction*

ASTM International (ASTM)

ASTM D6461 *Standard Specification for Silt Fence Materials*

United States Department of Agriculture (USDA)

FAA/USDA Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM C-102

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 considered incidental to the various contract items and no separate measurement or payment shall be made unless otherwise noted.

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. Mobilization shall be considered incidental to the various contract items and no separate measurement or payment shall be made unless otherwise noted.

BASIS OF PAYMENT

105-6 Payment will be made under:

Item C-105 Mobilization, incidental to other work items

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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Item P-101 Preparation/Removal of Existing Pavements

DESCRIPTION

101-1 This item shall consist of preparation of existing pavement surfaces for overlay, surface treatments, removal of existing pavement, and other miscellaneous items. The work shall be accomplished in accordance with these specifications and the applicable plans.

EQUIPMENT AND MATERIALS

101-2 All equipment and materials shall be specified here and in the following paragraphs or approved by the Resident Project Representative (RPR). The equipment shall not cause damage to the pavement to remain in place.

CONSTRUCTION

101-3.1 Removal of existing pavement.

The Contractor's removal operation shall be controlled to not damage adjacent pavement structure, and base material, cables, utility ducts, pipelines, or drainage structures which are to remain under the pavement.

a. Concrete pavement removal. Full depth saw cuts shall be made perpendicular to the slab surface. The Contractor shall saw through the full depth of the slab including any dowels at the joint, removing the pavement and installing new dowels as shown on the plans and per the specifications. Where the perimeter of the removal limits is not located on the joint and there are no dowels present, the perimeter shall be saw cut the full depth of the pavement. The pavement inside the saw cut shall be removed by methods which will not cause distress in the pavement which is to remain in place. If the material is to be wasted on the airport site, it shall be reduced to a maximum size of 1½ inches. Concrete slabs that are damaged by under breaking shall be repaired or removed and replaced as directed by the RPR.

The edge of existing concrete pavement against which new pavement abuts shall be protected from damage at all times. Spall and underbreak repair shall be in accordance with the plans. Any underlaying material that is to remain in place, shall be recompacted and/or replaced as shown on the plans. Adjacent areas damaged during repair shall be repaired or replaced at the Contractor's expense.

b. Asphalt pavement removal. Not Used.

c. Repair or removal of Base, Subbase, and/or Subgrade. All failed material including surface, base course, subbase course, and subgrade shall be removed and repaired as shown on the plans or as directed by the RPR. Materials and methods of construction shall comply with the applicable sections of these specifications. Any damage caused by Contractor's removal process shall be repaired at the Contractor's expense.

101-3.2 Preparation of joints and cracks prior to overlay/surface treatment. Remove all vegetation and debris from cracks to a minimum depth of 1 inch (25 mm). If extensive vegetation exists, treat the specific area with a concentrated solution of a water-based herbicide approved by the RPR. Fill all cracks greater than 1/4 inch (6 mm) wide) with a crack sealant per ASTM D6690. The crack sealant, preparation, and application shall be compatible with the surface treatment/overlay to be used. To minimize contamination of the asphalt with the crack sealant, underfill the crack sealant a minimum of 1/8 inch (3

mm), not to exceed ¼ inch (6 mm). Any excess joint or crack sealer shall be removed from the pavement surface.

101-3.3 Removal of Foreign Substances/contaminates prior to overlay, seal-coat or **remarking.** Removal of foreign substances/contaminates from existing pavement that will affect the bond of the new treatment shall consist of removal of rubber, fuel spills, oil, crack sealer, at least 90% of paint, and other foreign substances from the surface of the pavement. Areas that require removal are designated on the plans and as directed by the RPR in the field during construction. High-pressure water, heater scarifier (asphaltic concrete only), cold milling, rotary grinding or sandblasting may be used. If chemicals are used, they shall comply with the state's environmental protection regulations. Removal methods used shall not cause major damage to the pavement, or to any structure or utility within or adjacent to the work area. Major damage is defined as changing the properties of the pavement, removal of asphalt causing the aggregate to ravel, or removing pavement over 1/8 inch (3 mm) deep. If it is deemed by the RPR that damage to the existing pavement is caused by operational error, such as permitting the application method to dwell in one location for too long, the Contractor shall repair the damaged area without compensation and as directed by the RPR.

Removal of foreign substances shall not proceed until approved by the RPR. Water used for high-pressure water equipment shall be provided by the Contractor at the Contractor's expense. No material shall be deposited on the pavement shoulders. All wastes shall be disposed of in areas indicated in this specification or shown on the plans.

101-3.4 Concrete spall or failed asphaltic concrete pavement repair. Not Used.

101-3.5 Cold milling. Not Used.

101-3.6. Preparation of asphalt pavement surfaces prior to surface treatment. Not Used.

101-3.7 Maintenance. The Contractor shall perform all maintenance work necessary to keep the pavement in a satisfactory condition until the full section is complete and accepted by the RPR. The surface shall be kept clean and free from foreign material. The pavement shall be properly drained at all times. If cleaning is necessary or if the pavement becomes disturbed, any work repairs necessary shall be performed at the Contractor's expense.

101-3.8 Preparation of Joints in Rigid Pavement prior to resealing. Prior to application of sealant material, clean and dry the joints of all scale, dirt, dust, old sealant, curing compound, moisture and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method used cleans the joint and does not damage the joint.

101-3.8.1 Removal of Existing Joint Sealant. All existing joint sealants will be removed by plowing or use of hand tools. Any remaining sealant and or debris will be removed by use of wire brushes or other tools as necessary. Resaw joints removing no more than 1/16 inch (2 mm) from each joint face. Immediately after sawing, flush out joint with water and other tools as necessary to completely remove the slurry.

101-3.8.2 Cleaning prior to sealing. Immediately before sealing, joints shall be cleaned by removing any remaining laitance and other foreign material. Allow sufficient time to dry out joints prior to sealing. Joint surfaces will be surface-dry prior to installation of sealant.

101-3.8.3 Joint sealant. Joint material and installation will be in accordance with Item P-605.

101-3.9 Preparation of Cracks in Flexible Pavement prior to sealing. Prior to application of sealant material, clean and dry the joints of all scale, dirt, dust, old sealant, curing compound, moisture and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method used cleans the cracks and does not damage the pavement.

101-3.9.1 Preparation of Crack. Widen crack with router or random crack saw by removing a minimum of 1/16 inch (2 mm) from each side of crack. Immediately before sealing, cracks will be blown out with a hot air lance combined with oil and water-free compressed air.

101-3.9.2 Removal of Existing Crack Sealant. Existing sealants will be removed by routing or random crack saw. Following routing or sawing any remaining debris will be removed by use of a hot lance combined with oil and water-free compressed air.

101-3.9.3 Crack Sealant. Crack sealant material and installation will be in accordance with Item P-605.

101-3.9.4 Removal of Pipe and other Buried Structures. Not Used.

METHOD OF MEASUREMENT

101-4.1 No separate measurements for payment will be made. The work specified in this section shall be included as a lump sum within the Contract Bid Amount.

101-4.1 Pavement removal**.** No separate measurements for payment will be made. The work specified in this section shall be included as a lump sum within the Contract Bid Amount.

101-4.2 Joint and crack repair**.** Not required.

101-4.3 Removal of Foreign Substances/contaminates**.** Not required.

101-4.4 Spalled and failed asphalt pavement repair. Not required.

101-4.5 Concrete Spall Repair. Not required.

101-4.6 Cold milling. Not required.

101-4.7 Removal of Pipe and other Buried Structures. Not required.

BASIS OF PAYMENT

101-5.1 The work covered by this section shall be considered as a subsidiary obligation of the Contractor covered under the other contract items. No separate payment will be made. This shall be full compensation for furnishing all materials and for all preparation, hauling, and placing of the material and for all labor, equipment, tools, and incidentals necessary to complete this item.

Item P 101-5.1 Pavement Removal – Lump sum

Item P 101-5.2 Joint and Crack Repair – Not used.

Item P 101-5.3 Removal of Foreign Substances/contaminates – Not used.

Item P-101-5.4 Spalled and Failed Asphalt Pavement Repair – Not used.

Item P-101-5.5 Concrete Spall Repair – Not used.

Item P-101-5.6 Cold Milling – Not used.

Item P-101-5.7 Removal of Pipe and other Buried Structures – Not used.

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.

Advisory Circulars (AC)

AC 150/5380-6 Guidelines and Procedures for Maintenance of Airport Pavements.

ASTM International (ASTM)

ASTM D6690 Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements

END OF ITEM P-101

Item P-152 Excavation, Subgrade, and Embankment

DESCRIPTION

152-1.1 This item covers excavation, disposal, placement, and compaction of all materials within the limits of the work required to construct safety areas, runways, taxiways, aprons, and intermediate areas as well as other areas for drainage, building construction, parking, or other purposes in accordance with these specifications and in conformity to the dimensions and typical sections shown on the plans.

152-1.2 Classification. All material excavated shall be classified as defined below:

a. Unclassified excavation. Unclassified excavation shall consist of the excavation and disposal of all material, regardless of its nature which is not otherwise classified and paid for under one of the following items.

152-1.3 Unsuitable excavation. Unsuitable material shall be disposed in designated waste areas as shown on the plans. Materials containing vegetable or organic matter, such as muck, peat, organic silt, or sod shall be considered unsuitable for use in embankment construction. Material suitable for topsoil may be used on the embankment slope when approved by the RPR.

CONSTRUCTION METHODS

152-2.1 General. Before beginning excavation, grading, and embankment operations in any area, the area shall be cleared or cleared and grubbed in accordance with Item P-151.

The suitability of material to be placed in embankments shall be subject to approval by the RPR. All unsuitable material shall be disposed of in waste areas as shown on the plans. All waste areas shall be graded to allow positive drainage of the area and adjacent areas. The surface elevation of waste areas shall be specified on the plans or approved by the RPR.

When the Contractor's excavating operations encounter artifacts of historical or archaeological significance, the operations shall be temporarily discontinued and the RPR notified per Section 70, paragraph 70-20. At the direction of the RPR, the Contractor shall excavate the site in such a manner as to preserve the artifacts encountered and allow for their removal. Such excavation will be paid for as extra work.

Areas outside the limits of the pavement areas where the top layer of soil has become compacted by hauling or other Contractor activities shall be scarified and disked to a depth of 4 inches (100 mm), to loosen and pulverize the soil. Stones or rock fragments larger than 4 inches (100 mm) in their greatest dimension will not be permitted in the top 6 inches (150 mm) of the subgrade.

If it is necessary to interrupt existing surface drainage, sewers or under-drainage, conduits, utilities, or similar underground structures, the Contractor shall be responsible for and shall take all necessary precautions to preserve them or provide temporary services. When such facilities are encountered, the Contractor shall notify the RPR, who shall arrange for their removal if necessary. The Contractor, at their own expense, shall satisfactorily repair or pay the cost of all damage to such facilities or structures that may result from any of the Contractor's operations during the period of the contract.

a. Blasting. Blasting shall not be allowed.

152-2.2 Excavation. No excavation shall be started until the work has been staked out by the Contractor and the RPR has obtained from the Contractor, the survey notes of the elevations and measurements of the ground surface. The Contractor and RPR shall agree that the original ground lines shown on the

original topographic mapping are accurate, or agree to any adjustments made to the original ground lines. Digital terrain model (DTM) files of the existing surfaces, finished surfaces and other various surfaces were used to develop the design plans. Volumetric quantities were calculated by comparing DTM files of the applicable design surfaces and generating Triangle Volume Reports. Electronic copies of DTM files and a paper copy of the original topographic map will be issued to the successful bidder. Volumetric quantities were calculated using design cross sections which were created for this project using the DTM files of the applicable design surfaces and generating End Area Volume Reports. Paper copies of design cross sections and a paper copy of the original topographic map will be issued to the successful bidder. Existing grades on the design cross sections or DTM's, where they do not match the locations of actual spot elevations shown on the topographic map, were developed by computer interpolation from those spot elevations. Prior to disturbing original grade, Contractor shall verify the accuracy of the existing ground surface by verifying spot elevations at the same locations where original field survey data was obtained as indicated on the topographic map. Contractor shall recognize that, due to the interpolation process, the actual ground surface at any particular location may differ somewhat from the interpolated surface shown on the design cross sections or obtained from the DTM's. Contractor's verification of original ground surface, however, shall be limited to verification of spot elevations as indicated herein, and no adjustments will be made to the original ground surface unless the Contractor demonstrates that spot elevations shown are incorrect. For this purpose, spot elevations which are within 0.1 foot (30 mm) of the stated elevations for ground surfaces, or within 0.04 foot (12 mm) for hard surfaces (pavements, buildings, foundations, structures, etc.) shall be considered "no change". Only deviations in excess of these will be considered for adjustment of the original ground surface. If Contractor's verification identifies discrepancies in the topographic map, Contractor shall notify the RPR in writing at least two weeks before disturbance of existing grade to allow sufficient time to verify the submitted information and make adjustments to the design cross sections or DTM's. Disturbance of existing grade in any area shall constitute acceptance by the Contractor of the accuracy of the original elevations shown on the topographic map for that area.

All areas to be excavated shall be stripped of vegetation and topsoil. Topsoil shall be stockpiled for future use in areas designated on the plans or by the RPR. All suitable excavated material shall be used in the formation of embankment, subgrade, or other purposes **as** shown on the plans. All unsuitable material shall be disposed of as shown on the plans.

The grade shall be maintained so that the surface is well drained at all times.

When the volume of the excavation exceeds that required to construct the embankments to the grades as indicated on the plans, the excess shall be used to grade the areas of ultimate development or disposed as directed by the RPR. When the volume of excavation is not sufficient for constructing the embankments to the grades indicated, the deficiency shall be obtained from borrow areas.

a. Selective grading. When selective grading is indicated on the plans, the more suitable material designated by the RPR shall be used in constructing the embankment or in capping the pavement subgrade. If, at the time of excavation, it is not possible to place this material in its final location, it shall be stockpiled in approved areas until it can be placed. The more suitable material shall then be placed and compacted as specified. Selective grading shall be considered incidental to the work involved. The cost of stockpiling and placing the material shall be included in the various pay items of work involved.

b. Undercutting. Rock, shale, hardpan, loose rock, boulders, or other material unsatisfactory for safety areas, subgrades, roads, shoulders, or any areas intended for turf shall be excavated to a minimum depth of 12 inches (300 mm) below the subgrade or to the depth specified by the RPR. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be `disposed off the airport. The cost is`

incidental to this item. This excavated material shall be paid for at the contract unit price per lump sum. The excavated area shall be backfilled with suitable material obtained from the grading operations or borrow areas and compacted to specified densities. The necessary backfill will constitute a part of the embankment. Where rock cuts are made, backfill with select material. Any pockets created in the rock surface shall be drained in accordance with the details shown on the plans. Undercutting will be paid as unclassified excavation.

c. Over-break. Over-break, including slides, is that portion of any material displaced or loosened beyond the finished work as planned or authorized by the RPR. All over-break shall be graded or removed by the Contractor and disposed of as directed by the RPR. The RPR shall determine if the displacement of such material was unavoidable and their own decision shall be final. Payment will not be made for the removal and disposal of over-break that the RPR determines as avoidable. Unavoidable over-break will be classified as "Unclassified Excavation."

d. Removal of utilities. The removal of existing structures and utilities required to permit the orderly progress of work will be accomplished by the Contractor as indicated on the plans. All existing foundations shall be excavated at least 2 feet (60 cm) below the top of subgrade or as indicated on the plans, and the material disposed of as directed by the RPR. All foundations thus excavated shall be backfilled with suitable material and compacted as specified for embankment or as shown on the plans.

152-2.3 Borrow excavation. Borrow areas are not required.

152-2.4 Drainage excavation. Drainage excavation shall consist of excavating drainage ditches including intercepting, inlet, or outlet ditches; or other types as shown on the plans. The work shall be performed in sequence with the other construction. Ditches shall be constructed prior to starting adjacent excavation operations. All satisfactory material shall be placed in embankment fills; unsuitable material shall be placed in designated waste areas or as directed by the RPR. All necessary work shall be performed true to final line, elevation, and cross-section. The Contractor shall maintain ditches constructed on the project to the required cross-section and shall keep them free of debris or obstructions until the project is accepted.

152-2.5 Preparation of cut areas or areas where existing pavement has been removed. In those areas on which a subbase or base course is to be placed, the top 12 inches (300 mm) of subgrade shall be compacted to not less than 100 % of maximum density for non-cohesive soils, and 95% of maximum density for cohesive soils as determined by ASTM 1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

152-2.6 Preparation of embankment area. All sod and vegetative matter shall be removed from the surface upon which the embankment is to be placed. The cleared surface shall be broken up by plowing or scarifying to a minimum depth of 6 inches (150 mm) and shall then be compacted per paragraph 152-2.10.

Sloped surfaces steeper than one (1) vertical to four (4) horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material. When the subgrade is part fill and part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 12 inches (300 mm) and compacted as specified for the adjacent fill.

No direct payment shall be made for the work performed under this section. The necessary clearing and grubbing and the quantity of excavation removed will be paid for under the respective items of work.

152-2.7 Control Strip. The first half-day of construction of subgrade and/or embankment shall be considered as a control strip for the Contractor to demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of this specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. The maximum compacted thickness may be increased to a maximum of 12 inches (300 mm) upon the

Contractor's demonstration that approved equipment and operations will uniformly compact the lift to the specified density. The RPR must witness this demonstration and approve the lift thickness prior to full production.

Control strips that do not meet specification requirements shall be reworked, re-compacted, or removed and replaced at the Contractor's expense. Full operations shall not begin until the control strip has been accepted by the RPR. The Contractor shall use the same equipment, materials, and construction methods for the remainder of construction, unless adjustments made by the Contractor are approved in advance by the RPR.

152-2.8 Formation of embankments. The material shall be constructed in lifts as established in the control strip, but not less than 6 inches (150 mm) nor more than 12 inches (300 mm) of compacted thickness.

When more than one lift is required to establish the layer thickness shown on the plans, the construction procedure described here shall apply to each lift. No lift shall be covered by subsequent lifts until tests verify that compaction requirements have been met. The Contractor shall rework, re-compact and retest any material placed which does not meet the specifications.

The lifts shall be placed, to produce a soil structure as shown on the typical cross-section or as directed by the RPR. Materials such as brush, hedge, roots, stumps, grass and other organic matter, shall not be incorporated or buried in the embankment.

Earthwork operations shall be suspended at any time when satisfactory results cannot be obtained due to rain, freezing, or other unsatisfactory weather conditions in the field. Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material. Material shall not be placed on surfaces that are muddy, frozen, or contain frost. The Contractor shall drag, blade, or slope the embankment to provide surface drainage at all times.

The material in each lift shall be within ±2% of optimum moisture content before rolling to obtain the prescribed compaction. The material shall be moistened or aerated as necessary to achieve a uniform moisture content throughout the lift. Natural drying may be accelerated by blending in dry material or manipulation alone to increase the rate of evaporation.

The Contractor shall make the necessary corrections and adjustments in methods, materials or moisture content to achieve the specified embankment density.

The RPR will take samples of excavated materials which will be used in embankment for testing and develop a Moisture-Density Relations of Soils Report (Proctor) in accordance with ASTM D 1557. A new Proctor shall be developed for each soil type based on visual classification.

Density tests will be taken by the RPR for every 3,000 square yards of compacted embankment for each lift which is required to be compacted, or other appropriate frequencies as determined by the RPR.

If the material has greater than 30% retained on the 3/4-inch (19.0 mm) sieve, follow AASHTO T-180 Annex Correction of maximum dry density and optimum moisture for oversized particles.

Rolling operations shall be continued until the embankment is compacted to not less than 100% of maximum density for non-cohesive soils, and 95% of maximum density for cohesive soils as determined by ASTM D1557. Under all areas to be paved, the embankments shall be compacted to a depth of 12 inches and to a density of not less than 95 percent of the maximum density as determined by ASTM D1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

On all areas outside of the pavement areas, no compaction will be required on the top 4 inches (100 mm) which shall be prepared for a seedbed in accordance with Item T-901.

The in-place field density shall be determined in accordance with ASTM D1556 or ASTM 6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938.]. The contractors laboratory shall perform all density tests in the RPR's presence and provide the test results upon completion to the RPR for acceptance. If the specified density is not attained, the area represented by the test or as designated by the RPR shall be reworked and/or re-compacted and additional random tests made. This procedure shall be followed until the specified density is reached.

Compaction areas shall be kept separate, and no lift shall be covered by another lift until the proper density is obtained.

During construction of the embankment, the Contractor shall route all construction equipment evenly over the entire width of the embankment as each lift is placed. Lift placement shall begin in the deepest portion of the embankment fill. As placement progresses, the lifts shall be constructed approximately parallel to the finished pavement grade line.

When rock, concrete pavement, asphalt pavement, and other embankment material are excavated at approximately the same time as the subgrade, the material shall be incorporated into the outer portion of the embankment and the subgrade material shall be incorporated under the future paved areas. Stones, fragmentary rock, and recycled pavement larger than 4 inches (100 mm) in their greatest dimensions will not be allowed in the top 12 inches (300 mm) of the subgrade. Rockfill shall be brought up in lifts as specified or as directed by the RPR and the finer material shall be used to fill the voids forming a dense, compact mass. Rock, cement concrete pavement, asphalt pavement, and other embankment material shall not be disposed of except at places and in the manner designated on the plans or by the RPR.

When the excavated material consists predominantly of rock fragments of such size that the material cannot be placed in lifts of the prescribed thickness without crushing, pulverizing or further breaking down the pieces, such material may be placed in the embankment as directed in lifts not exceeding 2 feet (60 cm) in thickness. Each lift shall be leveled and smoothed with suitable equipment by distribution of spalls and finer fragments of rock. The lift shall not be constructed above an elevation 4 feet (1.2 m) below the finished subgrade.

There will be no separate measurement of payment for compacted embankment. All costs incidental to placing in lifts, compacting, discing, watering, mixing, sloping, and other operations necessary for construction of embankments will be included in the contract price for excavation, borrow, or other items. Payment for compacted embankment will be made under embankment in-place and no payment will be made for excavation, borrow, or other items.

152-2.9 Proof rolling. Not Used.

152-2.10 Compaction requirements. The subgrade under areas to be paved shall be compacted to a depth of 12 inches (300 mm) and to a density of not less than 100 percent of the maximum dry density as determined by ASTM D1557. The subgrade in areas outside the limits of the pavement areas shall be compacted to a depth of 12 inches (300 mm) and to a density of not less than 95 percent of the maximum density as determined by ASTM D698.

The material to be compacted shall be within ±2% of optimum moisture content before being rolled to obtain the prescribed compaction (except for expansive soils). When the material has greater than 30 percent retained on the ¾ inch (19.0 mm) sieve, follow the methods in ASTM D1557 procedures in AASHTO T180 Annex for correction of maximum dry density and optimum moisture for oversized particles. Tests for moisture content and compaction will be taken at a minimum of 1000 S.Y. of

subgrade. All quality assurance testing shall be done by the Contractor's laboratory in the presence of the RPR, and density test results shall be furnished upon completion to the RPR for acceptance determination.

The in-place field density shall be determined in accordance with ASTM D1556 or ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938 within 12 months prior to its use on this contract. The gage shall be field standardized daily.

Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

If the specified density is not attained, the entire lot shall be reworked and/or re-compacted and additional random tests made. This procedure shall be followed until the specified density is reached.

All cut-and-fill slopes shall be uniformly dressed to the slope, cross-section, and alignment shown on the plans or as directed by the RPR and the finished subgrade shall be maintained.

152-2.11 Finishing and protection of subgrade. Finishing and protection of the subgrade is incidental to this item. Grading and compacting of the subgrade shall be performed so that it will drain readily. All low areas, holes or depressions in the subgrade shall be brought to grade. Scarifying, blading, rolling and other methods shall be performed to provide a thoroughly compacted subgrade shaped to the lines and grades shown on the plans. All ruts or rough places that develop in the completed subgrade shall be graded, re-compacted, and retested. The Contractor shall protect the subgrade from damage and limit hauling over the finished subgrade to only traffic essential for construction purposes.

The Contractor shall maintain the completed course in satisfactory condition throughout placement of subsequent layers. No subbase, base, or surface course shall be placed on the subgrade until the subgrade has been accepted by the RPR.

152-2.12 Haul. All hauling will be considered a necessary and incidental part of the work. The Contractor shall include the cost in the contract unit price for the pay of items of work involved. No payment will be made separately or directly for hauling on any part of the work.

The Contractor's equipment shall not cause damage to any excavated surface, compacted lift or to the subgrade as a result of hauling operations. Any damage caused as a result of the Contractor's hauling operations shall be repaired at the Contractor's expense.

The Contractor shall be responsible for providing, maintaining and removing any haul roads or routes within or outside of the work area, and shall return the affected areas to their former condition, unless otherwise authorized in writing by the Owner. No separate payment will be made for any work or materials associated with providing, maintaining and removing haul roads or routes.

152-2.13 Surface Tolerances. In those areas on which a subbase or base course is to be placed, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches (75 mm), reshaped and re-compacted to grade until the required smoothness and accuracy are obtained and approved by the RPR. The Contractor shall perform all final smoothness and grade checks in the presence of the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense.

a. Smoothness. The finished surface shall not vary more than +/- ½ inch (12 mm) when tested with a 12-foot (3.7-m) straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot (3.7-m) straightedge for the full length of each line on a 50-foot (15-m) grid.

b. Grade. The grade and crown shall be measured on a 50-foot (15-m) grid and shall be within +/- 0.05 feet (15 mm) of the specified grade.

On safety areas, turfed areas and other designated areas within the grading limits where no subbase or base is to placed, grade shall not vary more than 0.10 feet (30 mm) from specified grade. Any deviation in excess of this amount shall be corrected by loosening, adding or removing materials, and reshaping.

152-2.14 Topsoil. When topsoil is specified or required as shown on the plans or under Item T-905, it shall be salvaged from stripping or other grading operations. The topsoil shall meet the requirements of Item T-905. If, at the time of excavation or stripping, the topsoil cannot be placed in its final section of finished construction, the material shall be stockpiled at approved locations. Stockpiles shall be located as shown on the plans and the approved CSPP, and shall not be placed on areas that subsequently will require any excavation or embankment fill. If, in the judgment of the RPR, it is practical to place the salvaged topsoil at the time of excavation or stripping, the material shall be placed in its final position without stockpiling or further re-handling.

Upon completion of grading operations, stockpiled topsoil shall be handled and placed as shown on the plans and as required in Item T-905. Topsoil shall be paid for as provided in Item T-905. No direct payment will be made for topsoil under Item P-152.

METHOD OF MEASUREMENT

152-3.1 Lump Sum. No separate measurement for payment will be made. The work covered by this section shall be considered as a subsidiary obligation of the Contractor under the other contract items.

BASIS OF PAYMENT

152-4.1 Payment. Payment for the work specified in this section and designated in the Contract Documents shall be full compensation for furnishing all materials and for all preparation, hauling, and placing of the material and for all labor, equipment, tools, and incidentals necessary to complete this item. Payment shall be made as lump sum.

Payment will be made under:

`Item P-152-4.1` `Unclassified` Excavation, Lump Sum

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.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO T-180	Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop

ASTM International (ASTM)

ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))

ASTM D1556 Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

ASTM D1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2700 kN-m/m^3))

ASTM D6938 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

Advisory Circulars (AC)

AC 150/5370-2 Operational Safety on Airports During Construction Software

Software

FAARFIELD – FAA Rigid and Flexible Iterative Elastic Layered Design

U.S. Department of Transportation

FAA RD-76-66 Design and Construction of Airport Pavements on Expansive Soils

END OF ITEM P-152

Item P-209 Crushed Aggregate Base Course

DESCRIPTION

209-1.1 This item consists of a base course composed of crushed aggregate base constructed on a prepared course in accordance with these specifications and in conformity to the dimensions and typical cross-sections shown on the plans.

MATERIALS

209-2.1 Crushed aggregate base. Crushed aggregate shall consist of clean, sound, durable particles of crushed stone or crushed gravel and shall be free from coatings of clay, silt, organic material, clay lumps or balls or other deleterious materials or coatings. The method used to produce the crushed gravel shall result in the fractured particles in the finished product as consistent and uniform as practicable. Fine aggregate portion, defined as the portion passing the No. 4 (4.75 mm) sieve shall consist of fines from the coarse aggregate crushing operation. The fine aggregate shall be produced by crushing stone or gravel that meet the coarse aggregate requirements for wear and soundness. Aggregate base material requirements are listed in the following table.

Crushed Aggregate Base Material Requirements

Material Test	Requirement	Standard
Coarse Aggregate		
Resistance to Degradation	Loss: 45% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Percentage of Fractured Particles	Minimum 90% by weight of particles with at least two fractured faces and 98% with at least one fractured face[1]	ASTM D5821
Flat Particles, Elongated Particles, or Flat and Elongated Particles	10% maximum, by weight, of flat, elongated, or flat and elongated particles [2]	ASTM D4791
Fine Aggregate		
Liquid limit	Less than or equal to 25	ASTM D4318
Plasticity Index	Not more than five (5)	ASTM D4318

[1] The area of each face shall be equal to at least 75% of the smallest mid-sectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces.

[2] A flat particle is one having a ratio of width to thickness greater than five (5); an elongated particle is one having a ratio of length to width greater than five (5).

209-2.2 Gradation requirements. The gradation of the aggregate base material shall meet the requirements of the gradation given in the following table when tested per ASTM C117 and ASTM C136.

The gradation shall be well graded from coarse to fine and shall not vary from the lower limit on one sieve to the high limit on an adjacent sieve or vice versa.

Gradation of Aggregate Base

Sieve Size	Design Range Percentage by Weight passing	Contractor's Final Gradation	Job Control Grading Band Tolerances[1] (Percent)
2 inch (50 mm)	100		0
1-1/2 inch (37.5 mm)	95-100		±5
1 inch (25.0 mm)	70-95		±8
3/4 inch (19.0 mm)	55-85		±8
No. 4 (4.75 mm)	30-60		±8
No. 40[2] (425 µm)	10-30		±5
No. 200[2] (75 µm)	[0-10]		±3

[1] The "Job Control Grading Band Tolerances for Contractor's Final Gradation" in the table shall be applied to "Contractor's Final Gradation" to establish a job control grading band. The full tolerance still applies if application of the tolerances results in a job control grading band outside the design range.

[2] The fraction of material passing the No 200 (75 µm) sieve shall not exceed two-thirds the fraction passing the No 40 (425 µm) sieve.

209-2.3 Sampling and Testing.

a. Aggregate base materials. The Contractor shall take samples of the aggregate base in accordance with ASTM D75 to verify initial aggregate base requirements and gradation. Material shall meet the requirements in paragraph 209-2.1. This sampling and testing will be the basis for approval of the aggregate base quality requirements.

b. Gradation requirements. The Contractor shall take at least two aggregate base samples per day in the presence of the Resident Project Representative (RPR) to check the final gradation. Sampling shall be per ASTM D75. Material shall meet the requirements in paragraph 209-2.2. The samples shall be taken from the in-place, un-compacted material at sampling points and intervals designated by the RPR.

209-2.4 Separation Geotextile. Not used.

CONSTRUCTION METHODS

209-3.1 Control strip. The first half-day of construction shall be considered the control strip. The Contractor shall demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of the specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. The maximum compacted thickness may be

increased to a maximum of 12 inches (300 mm) upon the Contractor's demonstration that approved equipment and operations will uniformly compact the lift to the specified density. The RPR must witness this demonstration and approve the lift thickness prior to full production.

Control strips that do not meet specification requirements shall be reworked, re-compacted or removed and replaced at the Contractor's expense. Full operations shall not continue until the control strip has been accepted by the RPR. The Contractor shall use the same equipment, materials, and construction methods for the remainder of construction, unless adjustments made by the Contractor are approved by the RPR.

209-3.2 Preparing underlying subgrade and/or subbase. The underlying subgrade and/or subbase shall be checked and accepted by the RPR before base course placing and spreading operations begin. Re-proof rolling of the subgrade or proof rolling of the subbase in accordance with Item P-152, at the Contractor's expense, may be required by the RPR if the Contractor fails to ensure proper drainage or protect the subgrade and/or subbase. Any ruts or soft, yielding areas due to improper drainage conditions, hauling, or any other cause, shall be corrected before the base course is placed. To ensure proper drainage, the spreading of the base shall begin along the centerline of the pavement on a crowned section or on the high side of the pavement with a one-way slope.

209-3.3 Production. The aggregate shall be uniformly blended and, when at a satisfactory moisture content per paragraph 209-3.5, the approved material may be transported directly to the placement.

209-3.4 Placement. The aggregate shall be placed and spread on the prepared underlying layer by spreader boxes or other devices as approved by the RPR, to a uniform thickness and width. The equipment shall have positive thickness controls to minimize the need for additional manipulation of the material. Dumping from vehicles that require re-handling shall not be permitted. Hauling over the uncompacted base course shall not be permitted.

The aggregate shall meet gradation and moisture requirements prior to compaction. The base course shall be constructed in lifts as established in the control strip, but not less than 4 inches (100 mm) nor more than 12 inches (300 mm) of compacted thickness.

When more than one lift is required to establish the layer thickness shown on the plans, the construction procedure described here shall apply to each lift. No lift shall be covered by subsequent lifts until tests verify that compaction requirements have been met. The Contractor shall rework, re-compact and retest any material placed which does not meet the specifications at the Contractor's expense.

209-3.5 Compaction. Immediately after completion of the spreading operations, compact each layer of the base course, as specified, with approved compaction equipment. The number, type, and weight of rollers shall be sufficient to compact the material to the required density within the same day that the aggregate is placed on the subgrade.

The field density of each compacted lift of material shall be at least 100% of the maximum density of laboratory specimens prepared from samples of the base material delivered to the jobsite. The laboratory specimens shall be compacted and tested in accordance with ASTM D1557. The moisture content of the material during placing operations shall be within ±2 percentage points of the optimum moisture content as determined by ASTM D1557. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

209-3.6 Weather limitations. Material shall not be placed unless the ambient air temperature is at least 40°F (4°C) and rising. Work on base course shall not be conducted when the subgrade or subbase is wet or frozen or the base material contains frozen material.

209-3.7 Maintenance. The base course shall be maintained in a condition that will meet all specification requirements. When material has been exposed to excessive rain, snow, or freeze-thaw conditions, prior to placement of additional material, the Contractor shall verify that materials still meet all specification requirements. Equipment may be routed over completed sections of base course, provided that no damage results and the equipment is routed over the full width of the completed base course. Any damage resulting to the base course from routing equipment over the base course shall be repaired by the Contractor at the Contractor's expense.

209-3.8 Surface tolerances. After the course has been compacted, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches (75 mm), reshaped and recompacted to grade until the required smoothness and accuracy are obtained and approved by the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense. The smoothness and accuracy requirements specified here apply only to the top layer when base course is constructed in more than one layer.

a. Smoothness. The finished surface shall not vary more than 3/8-inch (9 mm) when tested with a 12-foot (3.7-m) straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot (3.7-m) straightedge for the full length of each line on a 50-foot (15-m) grid.

b. Grade. The grade and crown shall be measured on a 50-foot (15-m) grid and shall be within +0 and -1/2 inch (12 mm) of the specified grade.

209-3.9 Acceptance sampling and testing. Crushed aggregate base course shall be accepted for density and thickness on an area basis. Two tests shall be made for density and thickness for each 1200 square yds (1000 m2). Sampling locations will be determined on a random basis per ASTM D3665

a. Density. The Contractor's laboratory shall perform all density tests in the RPR's presence and provide the test results upon completion to the RPR for acceptance.

Each area shall be accepted for density when the field density is at least 100% of the maximum density of laboratory specimens compacted and tested per ASTM 1557. The in-place field density shall be determined per ASTM D1556 or ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938. If the specified density is not attained, the area represented by the failed test must be reworked and/or recompacted and two additional random tests made. This procedure shall be followed until the specified density is reached. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

b. Thickness. Depth tests shall be made by test holes at least 3 inches (75 mm) in diameter that extend through the base. The thickness of the base course shall be within +0 and -1/2 inch (12 mm) of the specified thickness as determined by depth tests taken by the Contractor in the presence of the RPR for each area. Where the thickness is deficient by more than 1/2-inch (12 mm), the Contractor shall correct such areas at no additional cost by scarifying to a depth of at least 3 inches (75 mm), adding new material of proper gradation, and the material shall be blended and recompacted to grade. The Contractor shall replace, at his expense, base material where depth tests have been taken.

METHOD OF MEASUREMENT

209-4.1 The work specified in this section shall be included as a lump sum within the Contract Bid Amount.

209-4.2 Not used.

BASIS OF PAYMENT

209-5.1 Payment for the work specified in this section and designated in the Contract Documents shall include all materials, equipment, labor, and incidentals required to furnish and install complete in place and shall be included within the Contract Bid Amount.

209-5.2 Not used.

Payment will be made under:

Item P-209-5.1	Crushed Aggregate Base Course – lump sum
Item P-209-5.2	Not used.

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.

ASTM International (ASTM)

ASTM C29	Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2700 kN-m/m^3))
ASTM D2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate

ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4643	Standard Test Method for Determination of Water Content of Soil and Rock by Microwave Oven Heating
ASTM D4751	Standard Test Methods for Determining Apparent Opening Size of a Geotextile
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM D7928	Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis

American Association of State Highway and Transportation Officials (AASHTO)

M288	Standard Specification for Geosynthetic Specification for Highway Applications

END OF ITEM P-209

Item P-501 Cement Concrete Pavement

DESCRIPTION

501-1.1 This work shall consist of pavement composed of cement concrete with reinforcement constructed on a prepared underlying surface in accordance with these specifications and shall conform to the lines, grades, thickness, and typical cross-sections shown on the plans. The terms cement concrete, hydraulic cement concrete, and concrete are interchangeable in this specification.

MATERIALS

501-2.1 Aggregates.

a. Reactivity. Fine and Coarse aggregates to be used in PCC on this project shall be tested and evaluated by the Contractor for alkali-aggregate reactivity in accordance with both ASTM C1260 and ASTM C1567. Tests must be representative of aggregate sources which will be providing material for production. ASTM C1260 and ASTM C1567 tests may be run concurrently.

(1) Coarse aggregate and fine aggregate shall be tested separately in accordance with ASTM C1260, however, the length of test shall be extended to 28 days (30 days from casting). Tests must have been completed within 6 months of the date of the concrete mix submittal.

(2) The combined coarse and fine aggregate shall be tested in accordance with ASTM C1567, modified for combined aggregates, using the proposed mixture design proportions of aggregates, cementitious materials, and/or specific reactivity reducing chemicals. If the expansion does not exceed 0.10% at 28 days, the proposed combined materials will be accepted. If the expansion is greater than 0.10% at 28 days, the aggregates will not be accepted unless adjustments to the combined materials mixture can reduce the expansion to less than 0.10% at 28 days, or new aggregates shall be evaluated and tested.

(3) If lithium nitrate is proposed for use with or without supplementary cementitious materials, the aggregates shall be tested in accordance with Corps of Engineers (COE) Concrete Research Division (CRD) C662 in lieu of ASTM C1567. If lithium nitrate admixture is used, it shall be nominal 30% ±0.5% weight lithium nitrate in water. If the expansion does not exceed 0.10% at 28 days, the proposed combined materials will be accepted. If the expansion is greater than 0.10% at 28 days, the aggregates will not be accepted unless adjustments to the combined materials mixture can reduce the expansion to less than 0.10% at 28 days, or new aggregates shall be evaluated and tested.

b. Fine aggregate. Grading of the fine aggregate, as delivered to the mixer, shall conform to the requirements of ASTM C33 and the parameters identified in the fine aggregate material requirements below. Fine aggregate material requirements and deleterious limits are shown in the table below.

Fine Aggregate Material Requirements		
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 10% maximum using Sodium sulfate - or - 15% maximum using magnesium sulfate	ASTM C88
Sand Equivalent	45 minimum	ASTM D2419
Fineness Modulus (FM)	$2.50 \leq FM \leq 3.40$	ASTM C136
Limits for Deleterious Substances in Fine Aggregate for Concrete		
Clay lumps and friable particles	1.0% maximum	ASTM C142
Coal and lignite	0.5% using a medium with a density of Sp. Gr. of 2.0	ASTM C123
Total Deleterious Material	1.0% maximum	

c. Coarse aggregate. The maximum size coarse aggregate shall be **1-1/2-inch**.

Aggregates delivered to the mixer shall be clean, hard, uncoated aggregates consisting of crushed stone, crushed or uncrushed gravel, air-cooled iron blast furnace slag, crushed recycled concrete pavement, or a combination. The aggregates shall have no known history of detrimental pavement staining. Steel blast furnace slag shall not be permitted. Coarse aggregate material requirements and deleterious limits are shown in the table below; washing may be required to meet aggregate requirements.

Coarse Aggregate Material Requirements

Material Test	Requirement	Standard
Resistance to Degradation	Loss: 40% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Flat, Elongated, or Flat and Elongated Particles	8% maximum, by weight, of flat, elongated, or flat and elongated particles at 5:1 for any size group coarser than 3/8 (9.5 mm) sieve [1]	ASTM D4791
Bulk density of slag [2]	Weigh not less than 70 pounds per cubic foot (1.12 Mg/cubic meter)	ASTM C29
D-cracking (Freeze-Thaw)[3]	Durability factor ≥ 95	ASTM C666

[1] A flat particle is one having a ratio of width to thickness greater than five (5); an elongated particle is one having a ratio of length to width greater than five (5).

[2] Only required if slag is specified.

[3] Coarse aggregate may only be accepted from sources that have a 20-year service history for the same gradation to be supplied with no history of D-Cracking. Aggregates that do not have a 20-year record of service free from major repairs (less than 5% of slabs replaced) in similar conditions without D-cracking shall not be used unless

the material currently being produced has a durability factor greater than or equal to 95 per ASTM C666. The Contractor shall submit a current certification and test results to verify the aggregate acceptability. Test results will only be accepted from a State Department of Transportation (DOT) materials laboratory or an accredited laboratory. Certification and test results which are not dated or which are over one (1) year old or which are for different gradations will not be accepted.

The amount of deleterious material in the coarse aggregate shall not exceed the following limits:

Limits for Deleterious Substances in Coarse Aggregate

Deleterious material	ASTM	Percentage by Mass
Clay Lumps and friable particles	ASTM C142	1.0
Material finer than No. 200 sieve (75 µm)	ASTM C117	1.0[1]
Lightweight particles	ASTM C123 using a medium with a density of Sp. Gr. of 2.0	0.5
Chert[2] (less than 2.40 Sp Gr.)	ASTM C123 using a medium with a density of Sp. Gr. of 2.40)	0.1[3]

[1] The limit for material finer than 75-µm is allowed to be increased to 1.5% for crushed aggregates consisting of dust of fracture that is essentially free from clay or shale. Test results supporting acceptance of increasing limit to 1.5% with statement indicating material is dust of fracture must be submitted with Concrete mix. Acceptable techniques to characterizing these fines include methylene blue adsorption or X-ray diffraction analysis.

[2] Chert and aggregates with less than 2.4 specific gravity.

[3] The limit for chert may be increased to 1.0 percent by mass in areas not subject to severe freeze and thaw.

d. Combined aggregate gradation. This specification is targeted for a combined aggregate gradation developed following the guidance presented in United States Air Force Engineering Technical Letter (ETL) 97-5: Proportioning Concrete Mixtures with Graded Aggregates for Rigid Airfield Pavements. Base the aggregate grading upon a combination of all the aggregates (coarse and fine) to be used for the mixture proportioning. Three aggregate sizes may be required to achieve an optimized combined gradation that will produce a workable concrete mixture for its intended use. Use aggregate gradations that produce concrete mixtures with well-graded or optimized aggregate combinations. The Contractor shall submit complete mixture information necessary to calculate the volumetric components of the mixture. The combined aggregate grading shall meet the following requirements:

(1) The materials selected and the proportions used shall be such that when the Coarseness Factor (CF) and the Workability Factor (WF) are plotted on a diagram as described in paragraph 501-2.1d(4) below, the point thus determined shall fall within the parallelogram described therein.

(2) The CF shall be determined from the following equation:

CF = (cumulative percent retained on the 3/8 in. (9.5 mm) sieve)(100) / (cumulative percent retained on the No. 8 (2.36 mm) sieve)

(3) The WF is defined as the percent passing the No. 8 (2.36 mm) sieve based on the combined gradation. However, WF shall be adjusted, upwards only, by 2.5 percentage points for each 94 pounds (42 kg) of cementitious material per cubic meter yard greater than 564 pounds per cubic yard (335 kg per cubic meter).

(4) A diagram shall be plotted using a rectangular scale with WF on the Y-axis with units from 20 (bottom) to 45 (top), and with CF on the X-axis with units from 80 (left side) to 30 (right side). On this

diagram a parallelogram shall be plotted with corners at the following coordinates (CF-75, WF-28), (CF-75, WF-40), (CF-45, WF-32.5), and (CF-45, WF-44.5). If the point determined by the intersection of the computed CF and WF does not fall within the above parallelogram, the grading of each size of aggregate used and the proportions selected shall be changed as necessary. The point determined by the plotting of the CF and WF may be adjusted during production ±3 WF and ±5 CF. Adjustments to gradation may not take the point outside of the parallelogram.

e. Contractors combined aggregate gradation. The Contractor shall submit their combined aggregate gradation using the following format:

Contractor's Combined Aggregate Gradation

Sieve Size	Contractor's Concrete mix Gradation (Percent passing by weight)
2 inch (50 mm)	*
1-1/2 inch (37.5 mm)	*
1 inch (25.0 mm)	*
3/4 inch (19.0 mm)	*
1/2 inch (12.5 mm)	*
3/8 inch (9.5 mm)	*
No. 4 (4.75 mm)	*
No. 8 (2.36 mm)	*
No. 16 (1.18 mm)	*
No. 30 (600 µm)	*
No. 50 (300 µm)	*
No. 100 (150 µm)	*

501-2.2 Cement. Cement shall conform to the requirements of ASTM **C150** Type **I, II, or IV**.

501-2.3 Cementitious materials.

a. Fly ash. Fly ash shall meet the requirements of ASTM C618, with the exception of loss of ignition, where the maximum shall be less than 6%. Fly ash shall have a Calcium Oxide (CaO) content of less than 15% and a total alkali content less than 3% per ASTM C311. The Contractor shall furnish the previous three most recent, consecutive ASTM C618 reports for each source of fly ash proposed in the concrete mix, and shall furnish each additional report as they become available during the project. The reports can be used for acceptance or the material may be tested independently by the Resident Project Representative (RPR).

b. Slag cement (ground granulated blast furnace (GGBF)). Slag cement shall conform to ASTM C989, Grade 100 or Grade 120. Slag cement shall be used only at a rate between 25% and 55% of the total cementitious material by mass.

c. Raw or calcined natural pozzolan. Natural pozzolan shall be raw or calcined and conform to ASTM C618, Class N, including the optional requirements for uniformity and effectiveness in controlling Alkali-Silica reaction and shall have a loss on ignition not exceeding 6%. Class N pozzolan for use in mitigating Alkali-Silica Reactivity shall have a total available alkali content less than 3%.

d. Ultrafine fly ash and ultrafine pozzolan . UltraFine Fly Ash (UFFA) and UltraFine Pozzolan (UFP) shall conform to ASTM C618, Class F or N, and the following additional requirements:

(1) The strength activity index at 28 days of age shall be at least 95% of the control specimens.

(2) The average particle size shall not exceed 6 microns.

501-2.4 Joint seal. The joint seal for the joints in the concrete pavement shall meet the requirements of Item P-605 and shall be of the type specified in the plans.

501-2.5 Isolation joint filler. Premolded joint filler for isolation joints shall conform to the requirements of ASTM D1751 or ASTM D1752 and shall be where shown on the plans. The filler for each joint shall be furnished in a single piece for the full depth and width required for the joint, unless otherwise specified by the RPR. When the use of more than one piece is required for a joint, the abutting ends shall be fastened securely and held accurately to shape by stapling or other positive fastening means satisfactory to the RPR.

501-2.6 Steel reinforcement. Reinforcing shall consist of **deformed bars and welded wire fabric** conforming to the requirements of **ASTM A615 and ASTM A1064**:

ASTM A615 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

ASTM A884 Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement

Welded wire fabric shall be furnished in flat sheets only.

501-2.7 Dowel and tie bars. Dowel bars shall be plain steel bars conforming to ASTM A615 and shall be free from burring or other deformation restricting slippage in the concrete.

a. Dowel Bars. Before delivery to the construction site each dowel bar shall be epoxy coated per ASTM A1078, Type 1, with a coating thickness after curing greater than 10 mils. Patched ends are not required for Type 1 coated dowels. The dowels shall be coated with a bond-breaker recommended by the manufacturer. Dowel sleeves or inserts are not permitted. Grout retention rings shall be fully circular metal or plastic devices capable of supporting the dowel until the grout hardens.

b. Tie Bars. Tie bars shall be deformed steel bars and conform to the requirements of ASTM A615. Tie bars designated as Grade 60 in ASTM A615 or ASTM A706 shall be used for construction requiring bent bars.

501-2.8 Water. Water used in mixing or curing shall be potable. If water is taken from other sources considered non-potable, it shall meet the requirements of ASTM C1602.

501-2.9 Material for curing concrete. Curing materials shall conform to one of the following specifications:

a. Liquid membrane-forming compounds for curing concrete shall conform to the requirements of ASTM C309, Type 2, Class A, or Class B.

b. White polyethylene film for curing concrete shall conform to the requirements of ASTM C171.

c. White burlap-polyethylene sheeting for curing concrete shall conform to the requirements of ASTM C171.

d. Waterproof paper for curing concrete shall conform to the requirements of ASTM C171.

501-2.10 Admixtures. Admixtures shall conform to the following specifications:

a. Air-entraining admixtures. Air-entraining admixtures shall meet the requirements of ASTM C260 and shall consistently entrain the air content in the specified ranges under field conditions. The air-entraining agent and any water reducer admixture shall be compatible.

b. Water-reducing admixtures. Water-reducing admixture shall meet the requirements of ASTM C494, Type A, B, or D.

c. Other admixtures. The use of set retarding and set-accelerating admixtures shall be approved by the RPR prior to developing the concrete mix. Retarding admixtures shall meet the requirements of ASTM C494, Type A, B, or D and set-accelerating admixtures shall meet the requirements of ASTM C494, Type C. Calcium chloride and admixtures containing calcium chloride shall not be used.

d. Lithium Nitrate. The lithium admixture shall be a nominal 30% aqueous solution of Lithium Nitrate, with a density of 10 pounds/gallon (1.2 kg/L), and shall have the approximate chemical form as shown below:

Lithium Admixture

Constituent	Limit (Percent by Mass)
LiNO3 (Lithium Nitrate)	30 ±0.5
SO4 (Sulfate Ion)	0.1 (max)
Cl (Chloride Ion)	0.2 (max)
Na (Sodium Ion)	0.1 (max)
K (Potassium Ion)	0.1 (max)

The lithium nitrate admixture dispensing and mixing operations shall be verified and certified by the lithium manufacturer's representative.

501-2.11 Epoxy-resin. All epoxy-resin materials shall be two-component materials conforming to the requirements of ASTM C881, Class as appropriate for each application temperature to be encountered, except that in addition, the materials shall meet the following requirements:

a. Material for use for embedding dowels and anchor bolts shall be Type IV, Grade 3.

b. Material for use as patching materials for complete filling of spalls and other voids and for use in preparing epoxy resin mortar shall be Type III, Grade as approved.

c. Material for use for injecting cracks shall be Type IV, Grade 1.

d. Material for bonding freshly mixed Portland cement concrete or mortar or freshly mixed epoxy resin concrete or mortar to hardened concrete shall be Type V, Grade as approved.

501-2.12 Bond Breaker. Not required.

CONCRETE MIX

501-3.1. General. No concrete shall be placed until an acceptable concrete mix has been submitted to the RPR for review and the RPR has taken appropriate action. The RPR's review shall not relieve the Contractor of the responsibility to select and proportion the materials to comply with this section.

501-3.2 Concrete Mix Laboratory. The laboratory used to develop the concrete mix shall be accredited in accordance with ASTM C1077. The laboratory accreditation must be current and listed on the accrediting authority's website. All test methods required for developing the concrete mix must be included in the lab accreditation. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the RPR prior to start of construction.

501-3.3 Concrete Mix Proportions. Develop the mix using the procedures contained in Portland Cement Association (PCA) publication, "Design and Control of Concrete Mixtures." Concrete shall be proportioned to achieve a 28-day flexural strength that meets or exceeds the acceptance criteria contained in paragraph 501-6.6 for a flexural strength of **650** psi per ASTM C78.

The minimum cementitious material shall be adequate to ensure a workable, durable mix. The minimum cementitious material (cement plus fly ash, or slag cement) shall be **5470** pounds per cubic yard. The ratio of water to cementitious material, including free surface moisture on the aggregates but not including moisture absorbed by the aggregates shall be between 0.38 – 0.45 by weight.

Flexural strength test specimens shall be prepared in accordance with ASTM C192 and tested in accordance with ASTM C78. At the start of the project, the Contractor shall determine an allowable slump as determined by ASTM C143 not to exceed 2 inches (50 mm) for slip-form placement. For fixed-form placement, the slump shall not exceed 3 inches (75 mm). For hand placement, the slump shall not exceed 4 inches (100 mm).

The results of the concrete mix shall include a statement giving the maximum nominal coarse aggregate size and the weights and volumes of each ingredient proportioned on a one cubic yard (meter) basis. Aggregate quantities shall be based on the mass in a saturated surface dry condition.

If a change in source(s) is made, or admixtures added or deleted from the mix, a new concrete mix must be submitted to the RPR for approval.

The RPR may request samples at any time for testing, prior to and during production, to verify the quality of the materials and to ensure conformance with the applicable specifications.

501-3.4 Concrete Mix submittal. The concrete mix shall be submitted to the RPR at least 30 days prior to the start of operations. The submitted concrete mix shall not be more than 180 days old and must use the materials to be used for production for the project. Production shall not begin until the concrete mix is approved in writing by the RPR.

Each of the submitted concrete mixes (i.e, slip form, side form machine finish and side form hand finish) shall be stamped or sealed by the responsible professional Engineer of the laboratory and shall include the following items and quantities as a minimum:

- Certified material test reports for aggregate in accordance with paragraph 501-2.1. Certified reports must include all tests required; reporting each test, test method, test result, and requirement specified (criteria).
- Combined aggregate gradations and analysis; and including plots of the fine aggregate fineness modulus.
- Reactivity Test Results.
- Coarse aggregate quality test results, including deleterious materials.
- Fine aggregate quality test results, including deleterious materials.
- Mill certificates for cement and supplemental cementitious materials.
- Certified test results for all admixtures, including Lithium Nitrate if applicable.

- Specified flexural strength, slump, and air content.
- Recommended proportions/volumes for proposed mixture and trial water-cementitious materials ratio, including actual slump and air content.
- Flexural and compressive strength summaries and plots, including all individual beam and cylinder breaks.
- Correlation ratios for acceptance testing and Contractor QC testing, when applicable.
- Historical record of test results documenting production standard deviation, when applicable.

501-3.5 Cementitious materials.

a. Fly ash. When fly ash is used as a partial replacement for cement, the replacement rate shall be determined from laboratory trial mixes, and shall be between 20 and 30% by weight of the total cementitious material. If fly ash is used in conjunction with slag cement the maximum replacement rate shall not exceed 10% by weight of total cementitious material.

b. Slag cement (ground granulated blast furnace (GGBF)). Slag cement may be used. The slag cement, or slag cement plus fly ash if both are used, may constitute between 25 to 55% of the total cementitious material by weight.

c. Raw or calcined natural pozzolan. Natural pozzolan may be used in the concrete mix. When pozzolan is used as a partial replacement for cement, the replacement rate shall be determined from laboratory trial mixes, and shall be between 20 and 30% by weight of the total cementitious material. If pozzolan is used in conjunction with slag cement the maximum replacement rate shall not exceed 10% by weight of total cementitious material.

d. Ultrafine fly ash (UFFA) and ultrafine pozzolan (UFP). UFFA and UFP may be used in the concrete mix with the RPR's approval. When UFFA and UFP is used as a partial replacement for cement, the replacement rate shall be determined from laboratory trial mixes, and shall be between 7% and 16% by weight of the total cementitious material.

501-3.6 Admixtures.

a. Air-entraining admixtures. Air-entraining admixture are to be added in such a manner that will ensure uniform distribution of the agent throughout the batch. The air content of freshly mixed air-entrained concrete shall be based upon trial mixes with the materials to be used in the work adjusted to produce concrete of the required plasticity and workability. The percentage of air in the mix shall be **5.5%**. Air content shall be determined by testing in accordance with ASTM C231 for gravel and stone coarse aggregate and ASTM C173 for slag and other highly porous coarse aggregate.

b. Water-reducing admixtures. Water-reducing admixtures shall be added to the mix in the manner recommended by the manufacturer and in the amount necessary to comply with the specification requirements. Tests shall be conducted with the materials to be used in the work, in accordance with ASTM C494.

c. Other admixtures. Set controlling, and other approved admixtures shall be added to the mix in the manner recommended by the manufacturer and in the amount necessary to comply with the specification requirements. Tests shall be conducted with the materials to be used in the work, in accordance with ASTM C494.

d. Lithium nitrate. Lithium nitrate shall be added to the mix in the manner recommended by the manufacturer and in the amount necessary to comply with the specification requirements in accordance with paragraph 501-2.10d.

CONSTRUCTION METHODS

501-4.1 Control Strip. The control strip(s) shall be to the next planned joint after the initial 250 feet (75 m) of each type of pavement construction (slip-form pilot lane, slip-form fill-in lane, or fixed form). The Contractor shall demonstrate, in the presence of the RPR, that the materials, concrete mix, equipment, construction processes, and quality control processes meet the requirements of the specifications. The concrete mixture shall be extruded from the paver meeting the edge slump tolerance and with little or no finishing. Pilot, fill-in, and fixed-form control strips will be accepted separately. Minor adjustments to the mix design may be required to place an acceptable control strip. The production mix will be the adjusted mix design used to place the acceptable control strip. Upon acceptance of the control strip by the RPR, the Contractor must use the same equipment, materials, and construction methods for the remainder of concrete paving. Any adjustments to processes or materials must be approved in advance by the RPR. Acceptable control strips will meet edge slump tolerance and surface acceptable with little or no finishing, air content within action limits, strength equal or greater than requirements of P501-3.3. The control strip will be considered one lot for payment (no sublots required for control strip). Payment will only be made for an acceptable control strip in accordance with paragraph 501-8.1 using a lot pay factor equal to 100.

501-4.2 Equipment. The Contractor is responsible for the proper operation and maintenance of all equipment necessary for handling materials and performing all parts of the work to meet this specification.

a. Plant and equipment. The plant and mixing equipment shall conform to the requirements of ASTM C94 and/or ASTM C685. Each truck mixer shall have attached in a prominent place a manufacturer's nameplate showing the capacity of the drum in terms of volume of mixed concrete and the speed of rotation of the mixing drum or blades. The truck mixers shall be examined daily for changes in condition due to accumulation of hard concrete or mortar or wear of blades. The pickup and throwover blades shall be replaced when they have worn down 3/4 inch (19 mm) or more. The Contractor shall have a copy of the manufacturer's design on hand showing dimensions and arrangement of blades in reference to original height and depth.

Equipment for transferring and spreading concrete from the transporting equipment to the paving lane in front of the finishing equipment shall be provided. The equipment shall be specially manufactured, self-propelled transfer equipment which will accept the concrete outside the paving lane and will spread it evenly across the paving lane in front of the paver and strike off the surface evenly to a depth which permits the paver to operate efficiently.

b. Finishing equipment.

(1) Slip-form. The standard method of constructing concrete pavements shall be with an approved slip-form paving equipment designed and operated to spread, consolidate, screed, and finish the freshly placed concrete in one complete pass of the machine so that the end result is a dense and homogeneous pavement which is achieved with a minimum of hand finishing. The paver-finisher shall be a heavy duty, self-propelled machine designed specifically for paving and finishing high quality concrete pavements.

(2) Fixed-form. On projects requiring less than 10,000 cubic yards of concrete pavement or irregular areas at locations inaccessible to slip-form paving equipment, concrete pavement may be placed with equipment specifically designed for placement and finishing using stationary side forms. Methods and equipment shall be reviewed and accepted by the RPR. Hand screeding and float finishing may only be used on small irregular areas as allowed by the RPR.

c. Vibrators. Vibrator shall be the internal type. The rate of vibration of each vibrating unit shall be sufficient to consolidate the pavement without segregation or voids. The number, spacing, and frequency shall be as necessary to provide a dense and homogeneous pavement and meet the recommendations of

American Concrete Institute (ACI) 309R, Guide for Consolidation of Concrete. Adequate power to operate all vibrators shall be available on the paver. The vibrators shall be automatically controlled so that they shall be stopped as forward motion ceases. The Contractor shall provide an electronic or mechanical means to monitor vibrator status. The checks on vibrator status shall occur a minimum of two times per day or when requested by the RPR.

Hand held vibrators may only be used in irregular areas and shall meet the recommendations of ACI 309R, Guide for Consolidation of Concrete.

d. Concrete saws. The Contractor shall provide sawing equipment adequate in number of units and power to complete the sawing to the required dimensions. The Contractor shall provide at least one standby saw in good working order and a supply of saw blades at the site of the work at all times during sawing operations.

e. Fixed forms. Straight side fixed forms shall be made of steel and shall be furnished in sections not less than 10 feet (3 m) in length. Forms shall be provided with adequate devices for secure settings so that when in place they will withstand, without visible spring or settlement, the impact and vibration of the consolidating and finishing equipment. Forms with battered top surfaces and bent, twisted or broken forms shall not be used. Built-up forms shall not be used, except as approved by the RPR. The top face of the form shall not vary from a true plane more than 1/8 inch (3 mm) in 10 feet (3 m), and the upstanding leg shall not vary more than 1/4 inch (6 mm). The forms shall contain provisions for locking the ends of abutting sections together tightly for secure setting. Wood forms may be used under special conditions, when approved by the RPR. The forms shall extend the full depth of the pavement section.

501-4.3 Form setting. Forms shall be set to line and grade as shown on the plans, sufficiently in advance of the concrete placement, to ensure continuous paving operation. Forms shall be set to withstand, without visible spring or settlement, the impact and vibration of the consolidating and finishing equipment. Forms shall be cleaned and oiled prior to the concrete placement.

501-4.4 Base surface preparation prior to placement. Any damage to the prepared base, subbase, and subgrade shall be corrected full depth by the Contractor prior to concrete placement. The underlying surface shall be entirely free of frost when concrete is placed. The prepared grade shall be moistened with water, without saturating, immediately ahead of concrete placement to prevent rapid loss of moisture from concrete. `Bond breaker shall be applied in accordance with 501-2.12`

501-4.5 Handling, measuring, and batching material. Aggregate stockpiles shall be constructed and managed in such a manner that prevents segregation and intermixing of deleterious materials. Aggregates from different sources shall be stockpiled, weighed and batched separately at the concrete batch plant. Aggregates that have become segregated or mixed with earth or foreign material shall not be used. All aggregates produced or handled by hydraulic methods, and washed aggregates, shall be stockpiled or binned for draining at least 12 hours before being batched. Store and maintain all aggregates at a uniform moisture content prior to use. A continuous supply of materials shall be provided to the work to ensure continuous placement.

501-4.6 Mixing concrete. The concrete may be mixed at the work site, in a central mix plant or in truck mixers. The mixer shall be of an approved type and capacity. Mixing time shall be measured from the time all materials are placed into the drum until the drum is emptied into the truck. All concrete shall be mixed and delivered to the site in accordance with the requirements of ASTM C94 or ASTM C685.

Mixed concrete from the central mixing plant shall be transported in truck mixers, truck agitators, or non-agitating trucks. The elapsed time from the addition of cementitious material to the mix until the concrete is discharged from the truck should not exceed 30 minutes when the concrete is hauled in non-agitating trucks, nor 90 minutes when the concrete is hauled in truck mixers or truck agitators. In no case shall the

temperature of the concrete when placed exceed 90°F (32°C). Retempering concrete by adding water or by other means will not be permitted. With transit mixers additional water may be added to the batch materials and additional mixing performed to increase the slump to meet the specified requirements provided the addition of water is performed within 45 minutes after the initial mixing operations and provided the water/cementitious ratio specified is not exceeded.

501-4.7 Weather Limitations on mixing and placing. No concrete shall be mixed, placed, or finished when the natural light is insufficient, unless an adequate and approved artificial lighting system is operated.

a. Cold weather. Unless authorized in writing by the RPR, mixing and concreting operations shall be discontinued when a descending air temperature in the shade and away from artificial heat reaches 40°F (4°C) and shall not be resumed until an ascending air temperature in the shade and away from artificial heat reaches 35°F (2°C).

The aggregate shall be free of ice, snow, and frozen lumps before entering the mixer. The temperature of the mixed concrete shall not be less than 50°F (10°C) at the time of placement. Concrete shall not be placed on frozen material nor shall frozen aggregates be used in the concrete.

When concreting is authorized during cold weather, water and/or the aggregates may be heated to not more than 150°F (66°C). The apparatus used shall heat the mass uniformly and shall be arranged to preclude the possible occurrence of overheated areas which might be detrimental to the materials.

Curing during cold weather shall be in accordance with paragraph 501-4.13d.

b. Hot weather. During periods of hot weather when the maximum daily air temperature exceeds 85°F (30°C), the following precautions shall be taken.

The forms and/or the underlying surface shall be sprinkled with water immediately before placing the concrete. The concrete shall be placed at the coolest temperature practicable, and in no case shall the temperature of the concrete when placed exceed 90°F (32°C). The aggregates and/or mixing water shall be cooled as necessary to maintain the concrete temperature at or not more than the specified maximum.

The concrete placement shall be protected from exceeding an evaporation rate of 0.2 psf (0.98 kg/m^2 per hour) per hour. When conditions are such that problems with plastic cracking can be expected, and particularly if any plastic cracking begins to occur, the Contractor shall immediately take such additional measures as necessary to protect the concrete surface. If the Contractor's measures are not effective in preventing plastic cracking, paving operations shall be immediately stopped.

Curing during hot weather shall be in accordance with paragraph 501-4.13e.

c. Temperature management program. Prior to the start of paving operation for each day of paving, the Contractor shall provide the RPR with a Temperature Management Program for the concrete to be placed to assure that uncontrolled cracking is avoided. (Federal Highway Administration HIPERPAV 3 is one example of a temperature management program.) As a minimum, the program shall address the following items:

(1) Anticipated tensile strains in the fresh concrete as related to heating and cooling of the concrete material.

(2) Anticipated weather conditions such as ambient temperatures, wind velocity, and relative humidity; and anticipated evaporation rate using Figure 19-9, PCA, Design and Control of Concrete Mixtures.

(3) Anticipated timing of initial sawing of joint.

(4) Anticipated number and type of saws to be used.

d. **Rain.** The Contractor shall have available materials for the protection of the concrete during inclement weather. Such protective materials shall consist of rolled polyethylene sheeting at least 4 mils (0.1 mm) thick of sufficient length and width to cover the plastic concrete slab and any edges. The sheeting may be mounted on either the paver or a separate movable bridge from which it can be unrolled without dragging over the plastic concrete surface. When rain appears imminent, all paving operations shall stop and all available personnel shall begin covering the surface of the unhardened concrete with the protective covering.

501-4.8 Concrete Placement. At any point in concrete conveyance, the free vertical drop of the concrete from one point to another or to the underlying surface shall not exceed 3 feet (1 m). The finished concrete product must be dense and homogeneous, without segregation and conforming to the standards in this specification. Backhoes and grading equipment shall not be used to distribute the concrete in front of the paver. Front end loaders will not be used. All concrete shall be consolidated without voids or segregation, including under and around all load-transfer devices, joint assembly units, and other features embedded in the pavement. Hauling equipment or other mechanical equipment can be permitted on adjoining previously constructed pavement when the concrete strength reaches a **flexural strength of 550 psi (3.8 MPa)** or a compressive strength of 3,100 psi, based on the average of four field cured specimens per 2,000 cubic yards (1,530 cubic meters) of concrete placed. The Contractor must determine that the above minimum strengths are adequate to protection the pavement from overloads due to the construction equipment proposed for the project.

The Contractor shall have available materials for the protection of the concrete during cold, hot and/or inclement weather in accordance with paragraph 501-4.7.

a. Slip-form construction. The concrete shall be distributed uniformly into final position by a self-propelled slip-form paver without delay. The alignment and elevation of the paver shall be regulated from outside reference lines established for this purpose. The paver shall vibrate the concrete for the full width and depth of the strip of pavement being placed and the vibration shall be adequate to provide a consistency of concrete that will stand normal to the surface with sharp well-defined edges. The sliding forms shall be rigidly held together laterally to prevent spreading of the forms. The plastic concrete shall be effectively consolidated by internal vibration with transverse vibrating units for the full width of the pavement and/or a series of equally placed longitudinal vibrating units. The space from the outer edge of the pavement to longitudinal unit shall not exceed 9 inches (23 cm) for slipform and at the end of the dowels for the fill-in lanes. The spacing of internal units shall be uniform and shall not exceed 18 inches (0.5 m).

The term internal vibration means vibrating units located within the specified thickness of pavement section.

The rate of vibration of each vibrating unit shall be sufficient to consolidate the pavement without, segregation, voids, or vibrator trails and the amplitude of vibration shall be sufficient to be perceptible on the surface of the concrete along the entire length of the vibrating unit and for a distance of at least one foot (30 cm). The frequency of vibration or amplitude should be adjusted proportionately with the rate of travel to result in a uniform density and air content. The paving machine shall be equipped with a tachometer or other suitable device for measuring and indicating the actual frequency of vibrations.

The concrete shall be held at a uniform consistency. The slip-form paver shall be operated with as nearly a continuous forward movement as possible and all operations of mixing, delivering, and spreading concrete shall be coordinated to provide uniform progress with stopping and starting of the paver held to a minimum. If for any reason, it is necessary to stop the forward movement of the paver, the vibratory and tamping elements shall also be stopped immediately. No tractive force shall be applied to the machine, except that which is controlled from the machine.

When concrete is being placed adjacent to an existing pavement, that part of the equipment which is supported on the existing pavement shall be equipped with protective pads on crawler tracks or rubber-tired wheels on which the bearing surface is offset to run a sufficient distance from the edge of the pavement to avoid breaking the pavement edge.

Not more than 15% of the total free edge of each 500-foot (150 m) segment of pavement, or fraction thereof, shall have an edge slump exceeding 1/4 inch (6 mm), and none of the free edge of the pavement shall have an edge slump exceeding 3/8 inch (9 mm). (The total free edge of 500 feet (150 m) of pavement will be considered the cumulative total linear measurement of pavement edge originally constructed as nonadjacent to any existing pavement; that is, 500 feet (150 m) of paving lane originally constructed as a separate lane will have 1,000 feet (300 m) of free edge, 500 feet (150 m) of fill-in lane will have no free edge, etc.). The area affected by the downward movement of the concrete along the pavement edge shall be limited to not more than 18 inches (0.5 m) from the edge.

When excessive edge slump cannot be corrected before the concrete has hardened, the area with excessive edge slump will be removed the full width of the slip form lane and replaced at the expense of the Contractor as directed by the RPR.

b. Fixed-form construction. Forms shall be drilled in advance of being placed to line and grade to accommodate tie bars / dowel bars where these are specified.

Immediately in advance of placing concrete and after all subbase operations are completed, side forms shall be trued and maintained to the required line and grade for a distance sufficient to prevent delay in placing.

Side forms shall remain in place at least 12 hours after the concrete has been placed, and in all cases until the edge of the pavement no longer requires the protection of the forms. Curing compound shall be applied to the concrete immediately after the forms have been removed.

Side forms shall be thoroughly cleaned and coated with a release agent each time they are used and before concrete is placed against them.

Concrete shall be spread, screed, shaped and consolidated by one or more self-propelled machines. These machines shall uniformly distribute and consolidate concrete without segregation so that the completed pavement will conform to the required cross-section with a minimum of handwork.

The number and capacity of machines furnished shall be adequate to perform the work required at a rate equal to that of concrete delivery. The equipment must be specifically designed for placement and finishing using stationary side forms. Methods and equipment shall be reviewed and accepted by the RPR.

Concrete for the full paving width shall be effectively consolidated by internal vibrators. The rate of vibration of each vibrating unit shall be sufficient to consolidate the pavement without segregation, voids, or leaving vibrator trails.

Power to vibrators shall be connected so that vibration ceases when forward or backward motion of the machine is stopped.

c. Consolidation. Concrete shall be consolidated with the specified type of lane-spanning, gang-mounted, mechanical, immersion type vibrating equipment mounted in front of the paver, supplemented, in rare instances as specified, by hand-operated vibrators. The vibrators shall be inserted into the concrete to a depth that will provide the best full-depth consolidation but not closer to the underlying material than 2 inches (50 mm). Vibrators shall not be used to transport or spread the concrete. For each paving train, at least one additional vibrator spud, or sufficient parts for rapid replacement and repair of vibrators shall be maintained at the paving site at all times. Any evidence of inadequate consolidation (honeycomb along

the edges, large air pockets, or any other evidence) or over-consolidation (vibrator trails, segregation, or any other evidence) shall require the immediate stopping of the paving operation and adjustment of the equipment or procedures as approved by the RPR.

If a lack of consolidation of the hardened concrete is suspected by the RPR, referee testing may be required. Referee testing of hardened concrete will be performed by the RPR by cutting cores from the finished pavement after a minimum of 24 hours curing. The RPR shall visually examine the cores for evidence of lack of consolidation. Density determinations will be made by the RPR based on the water content of the core as taken. ASTM C642 shall be used for the determination of core density in the saturated-surface dry condition. When required, referee cores will be taken at the minimum rate of one for each 500 cubic yards (382 m^2) of pavement, or fraction. The Contractor shall be responsible for all referee testing cost if they fail to meet the required density.

The average density of the cores shall be at least 97% of the original concrete mix density, with no cores having a density of less than 96% of the original concrete mix density. Failure to meet the referee tests will be considered evidence that the minimum requirements for vibration are inadequate for the job conditions. Additional vibrating units or other means of increasing the effect of vibration shall be employed so that the density of the hardened concrete conforms to the above requirements.

501-4.9 Strike-off of concrete and placement of reinforcement. Following the placing of the concrete, it shall be struck off to conform to the cross-section shown on the plans and to an elevation that when the concrete is properly consolidated and finished, the surface of the pavement shall be at the elevation shown on the plans. When reinforced concrete pavement is placed in two layers, the bottom layer shall be struck off to such length and depth that the sheet of reinforcing steel fabric or bar mat may be laid full length on the concrete in its final position without further manipulation. The reinforcement shall then be placed directly upon the concrete, after which the top layer of the concrete shall be placed, struck off, and screed. If any portion of the bottom layer of concrete has been placed more than 30 minutes without being covered with the top layer or if initial set has taken place, it shall be removed and replaced with freshly mixed concrete at the Contractor's expense. When reinforced concrete is placed in one layer, the reinforcement may be positioned in advance of concrete placement or it may be placed in plastic concrete by mechanical or vibratory means after spreading.

Reinforcing steel, at the time concrete is placed, shall be free of mud, oil, or other organic matter that may adversely affect or reduce bond. Reinforcing steel with rust, mill scale or a combination of both will be considered satisfactory, provided the minimum dimensions, weight, and tensile properties of a hand wire-brushed test specimen are not less than the applicable ASTM specification requirements.

501-4.10 Joints. Joints shall be constructed as shown on the plans and in accordance with these requirements. All joints shall be constructed with their faces perpendicular to the surface of the pavement and finished or edged as shown on the plans. Joints shall not vary more than 1/2-inch (12 mm) from their designated position and shall be true to line with not more than 1/4-inch (6 mm) variation in 10 feet (3 m). The surface across the joints shall be tested with a 12-foot (3 m) straightedge as the joints are finished and any irregularities in excess of 1/4 inch (6 mm) shall be corrected before the concrete has hardened. All joints shall be so prepared, finished, or cut to provide a groove of uniform width and depth as shown on the plans.

a. Construction. Longitudinal construction joints shall be slip-formed or formed against side forms as shown in the plans.

Transverse construction joints shall be installed at the end of each day's placing operations and at any other points within a paving lane when concrete placement is interrupted for more than 30 minutes or it appears that the concrete will obtain its initial set before fresh concrete arrives. The installation of the

joint shall be located at a planned contraction or expansion joint. If placing of the concrete is stopped, the Contractor shall remove the excess concrete back to the previous planned joint.

b. Contraction. Contraction joints shall be installed at the locations and spacing as shown on the plans. Contraction joints shall be installed to the dimensions required by forming a groove or cleft in the top of the slab while the concrete is still plastic or by sawing a groove into the concrete surface after the concrete has hardened. When the groove is formed in plastic concrete the sides of the grooves shall be finished even and smooth with an edging tool. If an insert material is used, the installation and edge finish shall be according to the manufacturer's instructions. The groove shall be finished or cut clean so that spalling will be avoided at intersections with other joints. Grooving or sawing shall produce a slot at least 1/8 inch (3 mm) wide and to the depth shown on the plans.

c. Isolation (expansion). Isolation joints shall be installed as shown on the plans. The premolded filler of the thickness as shown on the plans, shall extend for the full depth and width of the slab at the joint. The filler shall be fastened uniformly along the hardened joint face with no buckling or debris between the filler and the concrete interface, including a temporary filler for the sealant reservoir at the top of the slab. The edges of the joint shall be finished and tooled while the concrete is still plastic

d. Dowels and Tie Bars for Joints

(1) Tie bars. Tie bars shall consist of deformed bars installed in joints as shown on the plans. Tie bars shall be placed at right angles to the centerline of the concrete slab and shall be spaced at intervals shown on the plans. They shall be held in position parallel to the pavement surface and in the middle of the slab depth and within the tolerances in paragraph 501-4.10(f.). When tie bars extend into an unpaved lane, they may be bent against the form at longitudinal construction joints, unless threaded bolt or other assembled tie bars are specified. Tie bars shall not be painted, greased, or enclosed in sleeves. When slip-form operations call for tie bars, two-piece hook bolts can be installed.

(2) Dowel bars. Dowel bars shall be placed across joints in the proper horizontal and vertical alignment as shown on the plans. The dowels shall be coated with a bond-breaker or other lubricant recommended by the manufacturer and approved by the RPR. Dowels bars at longitudinal construction joints shall be bonded in drilled holes.

(3) Placing dowels and tie bars. Horizontal spacing of dowels shall be within a tolerance of ±3/4 inch (19 mm). The vertical location on the face of the slab shall be within a tolerance of ±1/2 inch (12 mm). The method used to install dowels shall ensure that the horizontal and vertical alignment will not be greater than 1/4 inch per feet (6 mm per 0.3 m), except for those across the crown or other grade change joints. Dowels across crowns and other joints at grade changes shall be measured to a level surface. Horizontal alignment shall be checked perpendicular to the joint edge. The portion of each dowel intended to move within the concrete or expansion cap shall be wiped clean and coated with a thin, even film of lubricating oil or light grease before the concrete is placed. Dowels shall be installed as specified in the following subparagraphs.

(a) Contraction joints. Dowels and tie bars in longitudinal and transverse contraction joints within the paving lane shall be held securely in place by means of rigid metal frames or basket assemblies of an approved type. The basket assemblies shall be held securely in the proper location by means of suitable pins or anchors. Do not cut or crimp the dowel basket tie wires.

At the Contractor's option, dowels and tie bars in contraction joints may be installed by insertion into the plastic concrete using approved equipment and procedures per the paver manufacturer's design. Approval of installation methods will be based on the results of the control strip showing that the dowels and tie bars are installed within specified tolerances as verified by cores or non-destructive rebar location devices approved by the RPR.

(b) Construction joints. Install dowels and tie bars by the cast-in- place or the drill-and-dowel method. Installation by removing and replacing in preformed holes will not be permitted. Dowels and tie bars shall be prepared and placed across joints where indicated, correctly aligned, and securely held in the proper horizontal and vertical position during placing and finishing operations, by means of devices fastened to the forms.

(c) Joints in hardened concrete. Install dowels in hardened concrete by bonding the dowels into holes drilled into the concrete. The concrete shall have cured for seven (7) days or reached a minimum flexural strength of 450 psi (3.1 MPa) before drilling begins. Holes 1/8 inch (3 mm) greater in diameter than the dowels shall be drilled into the hardened concrete using rotary-core drills. Rotary-percussion drills may be used, provided that excessive spalling does not occur. Spalling beyond the limits of the grout retention ring will require modification of the equipment and operation. Depth of dowel hole shall be within a tolerance of ±1/2 inch (12 mm) of the dimension shown on the drawings. On completion of the drilling operation, the dowel hole shall be blown out with oil-free, compressed air. Dowels shall be bonded in the drilled holes using epoxy resin. Epoxy resin shall be injected at the back of the hole before installing the dowel and extruded to the collar during insertion of the dowel so as to completely fill the void around the dowel. Application by buttering the dowel will not be permitted. The dowels shall be held in alignment at the collar of the hole by means of a suitable metal or plastic grout retention ring fitted around the dowel.

e. Sawing of joints. Sawing shall commence, without regard to day or night, as soon as the concrete has hardened sufficiently to permit cutting without chipping, spalling, or tearing and before uncontrolled shrinkage cracking of the pavement occurs and shall continue without interruption until all joints have been sawn. All slurry and debris produced in the sawing of joints shall be removed by vacuuming and washing. Curing compound or system shall be reapplied in the initial saw-cut and maintained for the remaining cure period.

Joints shall be cut in locations as shown on the plans. The initial joint cut shall be a minimum 1/8 inch (3 mm) wide and to the depth shown on the plans. Prior to placement of joint sealant or seals, the top of the joint shall be widened by sawing as shown on the plans.

501-4.11 Finishing. Finishing operations shall be a continuing part of placing operations starting immediately behind the strike-off of the paver. Initial finishing shall be provided by the transverse screed or extrusion plate. The sequence of operations shall be transverse finishing, longitudinal machine floating if used, straightedge finishing, edging of joints, and then texturing. Finishing shall be by the machine method. The hand method shall be used only on isolated areas of odd slab widths or shapes and in the event of a breakdown of the mechanical finishing equipment. Supplemental hand finishing for machine finished pavement shall be kept to an absolute minimum. Any machine finishing operation which requires appreciable hand finishing, other than a moderate amount of straightedge finishing, shall be immediately stopped and proper adjustments made or the equipment replaced. Equipment, mixture, and/or procedures which produce more than 1/4 inch (6 mm) of mortar-rich surface shall be immediately modified as necessary to eliminate this condition or operations shall cease. Compensation shall be made for surging behind the screeds or extrusion plate and settlement during hardening and care shall be taken to ensure that paving and finishing machines are properly adjusted so that the finished surface of the concrete (not just the cutting edges of the screeds) will be at the required line and grade. Finishing equipment and tools shall be maintained clean and in an approved condition. At no time shall water be added to the surface of the slab with the finishing equipment or tools, or in any other way. Fog (mist) sprays or other surface applied finishing aids specified to prevent plastic shrinkage cracking, approved by the RPR, may be used in accordance with the manufacturers requirements.

a. Machine finishing with slipform pavers. The slipform paver shall be operated so that only a very minimum of additional finishing work is required to produce pavement surfaces and edges meeting the

specified tolerances. Any equipment or procedure that fails to meet these specified requirements shall immediately be replaced or modified as necessary. A self-propelled non-rotating pipe float may be used while the concrete is still plastic, to remove minor irregularities and score marks. Only one pass of the pipe float shall be allowed. Equipment, mixture, and/or procedures which produce more than 1/4 inch (6 mm) of mortar-rich surface shall be immediately modified as necessary to eliminate this condition or operations shall cease. Remove excessive slurry from the surface with a cutting straightedge and wipe off the edge. Any slurry which does run down the vertical edges shall be immediately removed by hand, using stiff brushes or scrapers. No slurry, concrete or concrete mortar shall be used to build up along the edges of the pavement to compensate for excessive edge slump, either while the concrete is plastic or after it hardens.

b. Machine finishing with fixed forms. The machine shall be designed to straddle the forms and shall be operated to screed and consolidate the concrete. Machines that cause displacement of the forms shall be replaced. The machine shall make only one pass over each area of pavement. If the equipment and procedures do not produce a surface of uniform texture, true to grade, in one pass, the operation shall be immediately stopped and the equipment, mixture, and procedures adjusted as necessary.

c. Other types of finishing equipment. Clary screeds, other rotating tube floats, or bridge deck finishers are not allowed on mainline paving, but may be allowed on irregular or odd-shaped slabs, and near buildings or trench drains, subject to the RPR's approval.

Bridge deck finishers shall have a minimum operating weight of 7500 pounds (3400 kg) and shall have a transversely operating carriage containing a knock-down auger and a minimum of two immersion vibrators. Vibrating screeds or pans shall be used only for isolated slabs where hand finishing is permitted as specified, and only where specifically approved.

d. Hand finishing. Hand finishing methods will not be permitted, except under the following conditions: (1) in the event of breakdown of the mechanical equipment, hand methods may be used to finish the concrete already deposited on the grade and (2) in areas of narrow widths or of irregular dimensions where operation of the mechanical equipment is impractical.

e. Straightedge testing and surface correction. After the pavement has been struck off and while the concrete is still plastic, it shall be tested for trueness with a 12-foot (3.7-m) finishing straightedge swung from handles capable of spanning at least one-half the width of the slab. The straightedge shall be held in contact with the surface in successive positions parallel to the centerline and the whole area gone over from one side of the slab to the other, as necessary. Advancing shall be in successive stages of not more than one-half the length of the straightedge. Any excess water and laitance in excess of 1/8 inch (3 mm) thick shall be removed from the surface of the pavement and wasted. Any depressions shall be immediately filled with freshly mixed concrete, struck off, consolidated, and refinished. High areas shall be cut down and refinished. Special attention shall be given to assure that the surface across joints meets the smoothness requirements. Straightedge testing and surface corrections shall continue until the entire surface is found to be free from observable departures from the straightedge and until the slab conforms to the required grade and cross-section. The use of long-handled wood floats shall be confined to a minimum; they may be used only in emergencies and in areas not accessible to finishing equipment.

501-4.12 Surface texture. The surface of the pavement shall be finished as designated below for all newly constructed concrete pavements. It is important that the texturing equipment not tear or unduly roughen the pavement surface during the operation. The texture shall be uniform in appearance and approximately 1/16 inch (2 mm) in depth. Any imperfections resulting from the texturing operation shall be corrected to the satisfaction of the RPR.

a . Brush or broom finish. Shall be applied when the water sheen has practically disappeared. The equipment shall operate transversely across the pavement surface.

b. Burlap drag finish. Burlap, at least 15 ounces per square yard (555 grams per square meter), will typically produce acceptable texture. To obtain a textured surface, the transverse threads of the burlap shall be removed approximately one foot (30 cm) from the trailing edge. A heavy buildup of grout on the burlap threads produces the desired wide sweeping longitudinal striations on the pavement surface.

c. Artificial turf finish. Shall be applied by dragging the surface of the pavement in the direction of concrete placement with an approved full-width drag made with artificial turf. The leading transverse edge of the artificial turf drag will be securely fastened to a lightweight pole on a traveling bridge. At least 2 feet (60 cm) of the artificial turf shall be in contact with the concrete surface during dragging operations. Approval of the artificial turf will be done only after it has been demonstrated by the Contractor to provide a satisfactory texture. One type that has provided satisfactory texture consists of 7,200 approximately 0.85-inch-long polyethylene turf blades per square foot.

501-4.13 Curing. Immediately after finishing operations are completed and bleed water is gone from the surface, all exposed surfaces of the newly placed concrete shall be cured for a 7-day cure period in accordance with one of the methods below. Failure to provide sufficient cover material of whatever kind the Contractor may elect to use, or lack of water to adequately take care of both curing and other requirements, shall be cause for immediate suspension of concreting operations. The concrete shall not be left exposed for more than 1/2 hour during the curing period.

When a two-saw-cut method is used to construct the contraction joint, the curing compound shall be applied to the saw-cut immediately after the initial cut has been made. The sealant reservoir shall not be sawed until after the curing period has been completed. When the one cut method is used to construct the contraction joint, the joint shall be cured with wet rope, wet rags, or wet blankets. The rags, ropes, or blankets shall be kept moist for the duration of the curing period.

a. Impervious membrane method. Curing with liquid membrane compounds should not occur until bleed and surface moisture has evaporated. All exposed surfaces of the pavement shall be sprayed uniformly with white pigmented curing compound immediately after the finishing of the surface and before the set of the concrete has taken place. The curing compound shall not be applied during rainfall. Curing compound shall be applied by mechanical sprayers under pressure at the rate of one gallon (4 liters) to not more than 150 square feet (14 sq m). The spraying equipment shall be of the fully atomizing type equipped with a tank agitator. At the time of use, the compound shall be in a thoroughly mixed condition with the pigment uniformly dispersed throughout the vehicle. During application, the compound shall be stirred continuously by mechanical means. Hand spraying of odd widths or shapes and concrete surfaces exposed by the removal of forms will be permitted. When hand spraying is approved by the RPR, a double application rate shall be used to ensure coverage. Should the film become damaged from any cause, including sawing operations, within the required curing period, the damaged portions shall be repaired immediately with additional compound or other approved means. Upon removal of side forms, the sides of the exposed slabs shall be protected immediately to provide a curing treatment equal to that provided for the surface.

b. White burlap-polyethylene sheets. The surface of the pavement shall be entirely covered with the sheeting. The sheeting used shall be such length (or width) that it will extend at least twice the thickness of the pavement beyond the edges of the slab. The sheeting shall be placed so that the entire surface and both edges of the slab are completely covered. The sheeting shall be placed and weighted to remain in contact with the surface covered, and the covering shall be maintained fully saturated and in position for seven (7) days after the concrete has been placed.

c. Water method. The entire area shall be covered with burlap or other water absorbing material. The material shall be of sufficient thickness to retain water for adequate curing without excessive runoff. The material shall be kept wet at all times and maintained for seven (7) days. When the forms are stripped, the

vertical walls shall also be kept moist. It shall be the responsibility of the Contractor to prevent ponding of the curing water on the subbase.

d. Concrete protection for cold weather. Maintain the concrete at a temperature of at least 50°F (10°C) for a period of 72 hours after placing and at a temperature above freezing for the remainder of the 7-day curing period. The Contractor shall be responsible for the quality and strength of the concrete placed during cold weather; and any concrete damaged shall be removed and replaced at the Contractor's expense.

e. Concrete protection for hot weather. Concrete should be continuous moisture cured for the entire curing period and shall commence as soon as the surfaces are finished and continue for at least 24 hours. However, if moisture curing is not practical beyond 24 hours, the concrete surface shall be protected from drying with application of a liquid membrane-forming curing compound while the surfaces are still damp. Other curing methods may be approved by the RPR.

501-4.14 Removing forms. Unless otherwise specified, forms shall not be removed from freshly placed concrete until it has hardened sufficiently to permit removal without chipping, spalling, or tearing. After the forms have been removed, the sides of the slab shall be cured in accordance with paragraph 501-4.13.

If honeycombed areas are evident when the forms are removed, materials, placement, and consolidation methods must be reviewed and appropriate adjustments made to assure adequate consolidation at the edges of future concrete placements. Honeycombed areas that extend into the slab less than approximately 1 inch (25 mm), shall be repaired with an approved grout, as directed by the RPR. Honeycombed areas that extend into the slab greater than a depth of 1 inch (25 mm) shall be considered as defective work and shall be removed and replaced in accordance with paragraph 501-4.19.

501-4.15 Saw-cut grooving. If shown on the plans, grooved surfaces shall be provided in accordance with the requirements of Item P-621.

501-4.16 Sealing joints. The joints in the pavement shall be sealed in accordance with Item P-605.

501-4.17 Protection of pavement. The Contractor shall protect the pavement and its appurtenances against both public traffic and traffic caused by the Contractor's employees and agents until accepted by the RPR. This shall include watchmen to direct traffic and the erection and maintenance of warning signs, lights, pavement bridges, crossovers, and protection of unsealed joints from intrusion of foreign material, etc. Any damage to the pavement occurring prior to final acceptance shall be repaired or the pavement replaced at the Contractor's expense.

Aggregates, rubble, or other similar construction materials shall not be placed on airfield pavements. Traffic shall be excluded from the new pavement by erecting and maintaining barricades and signs until the concrete is at least seven (7) days old, or for a longer period if directed by the RPR.

In paving intermediate lanes between newly paved pilot lanes, operation of the hauling and paving equipment will be permitted on the new pavement after the pavement has been cured for seven (7) days, the joints are protected, the concrete has attained a minimum field cured flexural strength of 450 psi (3100 kPa), and the slab edge is protected.

All new and existing pavement carrying construction traffic or equipment shall be kept clean and spillage of concrete and other materials shall be cleaned up immediately.

Damaged pavements shall be removed and replaced at the Contractor's expense. Slabs shall be removed to the full depth, width, and length of the slab.

501-4.18 Opening to construction traffic. The pavement shall not be opened to traffic until test specimens molded and cured in accordance with ASTM C31 have attained a flexural strength of 450

pounds per square inch (3100 kPa) when tested in accordance with ASTM C78. If such tests are not conducted, the pavement shall not be opened to traffic until 14 days after the concrete was placed. Prior to opening the pavement to construction traffic, all joints shall either be sealed or protected from damage to the joint edge and intrusion of foreign materials into the joint. As a minimum, backer rod or tape may be used to protect the joints from foreign matter intrusion.

501-4.19 Repair, removal, or replacement of slabs. New pavement slabs that are broken or contain cracks or are otherwise defective or unacceptable as defined by acceptance criteria in paragraph 501-6.6 shall be removed and replaced or repaired, as directed by the RPR, at the Contractor's expense. Spalls along joints shall be repaired as specified. Removal of partial slabs is not permitted. Removal and replacement shall be full depth, shall be full width of the slab, and the limit of removal shall be normal to the paving lane and to each original transverse joint. The RPR will determine whether cracks extend full depth of the pavement and may require cores to be drilled on the crack to determine depth of cracking. Such cores shall be have a diameter of 2 inches (50 mm) to 4 inches (100 mm), shall be drilled by the Contractor and shall be filled by the Contractor with a well consolidated concrete mixture bonded to the walls of the hole with a bonding agent, using approved procedures. Drilling of cores and refilling holes shall be at no expense to the Owner. Repair of cracks as described in this section shall not be allowed if in the opinion of the RPR the overall condition of the pavement indicates that such repair is unlikely to achieve an acceptable and durable finished pavement. No repair of cracks shall be allowed in any panel that demonstrates segregated aggregate with an absence of coarse aggregate in the upper 1/8 inch (3 mm) of the pavement surface.

a. Shrinkage cracks. Shrinkage cracks which do not exceed one-third of the pavement depth shall be cleaned and either high molecular weight methacrylate (HMWM) applied; or epoxy resin (Type IV, Grade 1) pressure injected using procedures recommended by the manufacturer and approved by the RPR. Sandblasting of the surface may be required following the application of HMWM to restore skid resistance. Care shall be taken to ensure that the crack is not widened during epoxy resin injection. All epoxy resin injection shall take place in the presence of the RPR. Shrinkage cracks which exceed one-third the pavement depth shall be treated as full depth cracks in accordance with paragraphs 501-4.19b and 501-19c.

b. Slabs with cracks through interior areas. Interior area is defined as that area more than 6 inches (150 mm) from either adjacent original transverse joint. The full slab shall be removed and replaced at no cost to the Owner, when there are any full depth cracks, or cracks greater than one-third the pavement depth, that extend into the interior area.

c. Cracks close to and parallel to joints. All full-depth cracks within 6 inches (150 mm) either side of the joint and essentially parallel to the original joints, shall be treated as follows.

(1) Full depth cracks and original joint not cracked. The full-depth crack shall be treated as the new joint and the original joint filled with an epoxy resin.

i. Full-depth crack. The joint sealant reservoir for the crack shall be formed by sawing to a depth of 3/4 inches (19 mm), ±1/16 inch (2 mm), and to a width of 5/8 inch (16 mm), ±1/8 inch (3 mm). The crack shall be sawed with equipment specially designed to follow random cracks. Any equipment or procedure which causes raveling or spalling along the crack shall be modified or replaced to prevent raveling or spalling. The joint shall be sealed with sealant in accordance with P-605 or as directed by the RPR.

ii. Original joint. If the original joint sealant reservoir has been sawed out, the reservoir and as much of the lower saw cut as possible shall be filled with epoxy resin, Type IV, Grade 2, thoroughly tooled into the void using approved procedures.

If only the original narrow saw cut has been made, it shall be cleaned and pressure injected with epoxy resin, Type IV, Grade 1, using approved procedures.

Where a parallel crack goes part way across paving lane and then intersects and follows the original joint which is cracked only for the remained of the width, it shall be treated as specified above for a parallel crack, and the cracked original joint shall be prepared and sealed as originally designed.

(2) Full depth cracks and original joint cracked. If there is any place in the lane width where a parallel crack and a cracked portion of the original joint overlap, the entire slab containing the crack shall be removed and replaced.

d. Removal and replacement of full slabs. Make a full depth cut perpendicular to the slab surface along all edges of the slab with a concrete saw cutting any dowels or tie-bars. Remove damaged slab protecting adjacent pavement from damage. Damage to adjacent slabs may result in removal of additional slabs as directed by the RPR at the Contractor's expense.

The underlying material shall be repaired, re-compacted and shaped to grade.

Dowels of the size and spacing specified for other joints in similar pavement on the project shall be installed along all four (4) edges of the new slab in accordance with paragraph 501-4.10d.

Placement of concrete shall be as specified for original construction. The joints around the new slab shall be prepared and sealed as specified for original construction.

e. Spalls along joints.

(1) Spalls less than one inch wide and less than the depth of the joint sealant reservoir, shall be filled with joint sealant material.

(2) Spalls larger than one inch and/or deeper than the joint reservoir, but less than ½ the slab depth, and less than 25% of the length of the adjacent joint shall be repaired as follows:

i. Make a vertical saw cut at least one inch (25 mm) outside the spalled area and to a depth of at least 2 inches (50 mm). Saw cuts shall be straight lines forming rectangular areas surrounding the spalled area.

ii. Remove unsound concrete and at least 1/2 inch (12 mm) of visually sound concrete between the saw cut and the joint or crack with a light chipping hammer.

iii. Clean cavity with high-pressure water jets supplemented with compressed air as needed to remove all loose material.

iv. Apply a prime coat of epoxy resin, Type III, Grade I, to the dry, cleaned surface of all sides and bottom of the cavity, except any joint face.

v. Fill the cavity with low slump concrete or mortar or with epoxy resin concrete or mortar.

vi. An insert or other bond-breaking medium shall be used to prevent bond at all joint faces.

vii. A reservoir for the joint sealant shall be sawed to the dimensions required for other joints, or as required to be routed for cracks. The reservoir shall be thoroughly cleaned and sealed with the sealer specified for the joints.

(3) Spalls deeper than 1/2 of the slab depth or spalls longer than 25% of the adjacent joint require replacement of the entire slab.

f. Diamond grinding of Concrete surfaces. Diamond grinding shall be completed prior to pavement grooving. Diamond grinding of the hardened concrete should not be performed until the concrete is at least 14 days old and has achieved full minimum strength. Equipment that causes ravels, aggregate fractures, spalls or disturbance to the joints will not be permitted. The depth of diamond grinding shall not

exceed 1/2 inch (13 mm) and all areas in which diamond grinding has been performed will be subject to the final pavement thickness tolerances specified.

Diamond grinding shall be performed with a machine specifically designed for diamond grinding capable of cutting a path at least 3 feet (0.9 m) wide. The saw blades shall be 1/8-inch (3-mm) wide with sufficient number of flush cut blades that create grooves between 0.090 and 0.130 inches (2 and 3.5 mm) wide; and peaks and ridges approximately 1/32 inch (1 mm) higher than the bottom of the grinding cut. The Contractor shall determine the number and type of blades based on the hardness of the aggregate. Contractor shall demonstrate to the RPR that the grinding equipment will produce satisfactory results prior to making corrections to surfaces.

Grinding will be tapered in all directions to provide smooth transitions to areas not requiring grinding. The slurry resulting from the grinding operation shall be continuously removed and the pavement left in a clean condition. All grinding shall be at the expense of the Contractor.

CONTRACTOR QUALITY CONTROL (CQC)

501-5.1 Quality control program. The Contractor shall develop a Quality Control Program in accordance with Item C-100. No partial payment will be made for materials that are subject to specific quality control requirements without an approved quality control program.

501-5.2 Contractor Quality Control (CQC). The Contractor shall provide or contract for testing facilities in accordance with Item C-100. The RPR shall be permitted unrestricted access to inspect the Contractor's QC facilities and witness QC activities. The RPR will advise the Contractor in writing of any noted deficiencies concerning the QC facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to be adversely affecting the test results, the incorporation of the materials into the work shall be suspended immediately and will not be permitted to resume until the deficiencies are satisfactorily corrected.

501-5.3 Contractor QC testing. Not used.

a. Fine aggregate.

(1) Gradation. A sieve analysis shall be made at least twice daily in accordance with ASTM C136 from randomly sampled material taken from the discharge gate of storage bins or from the conveyor belt.

(2) Moisture content. If an electric moisture meter is used, at least two direct measurements of moisture content shall be made per week to check the calibration. If direct measurements are made in lieu of using an electric meter, two tests shall be made per day. Tests shall be made in accordance with ASTM C70 or ASTM C566.

(3) Deleterious substances. Fine aggregate as delivered to the mixer shall be tested for deleterious substances in fine aggregate for concrete as specified in paragraph 501-2.1b, prior to production of the control strip, and a minimum of every 30-days during production or more frequently as necessary to control deleterious substances.

b. Coarse Aggregate.

(1) Gradation. A sieve analysis shall be made at least twice daily for each size of aggregate. Tests shall be made in accordance with ASTM C136 from randomly sampled material taken from the discharge gate of storage bins or from the conveyor belt.

(2) Moisture content. If an electric moisture meter is used, at least two direct measurements of moisture content shall be made per week to check the calibration. If direct measurements are made in lieu of using an electric meter, two tests shall be made per day. Tests shall be made in accordance with ASTM C566.

(3) Deleterious substances. Coarse aggregate as delivered to the mixer shall be tested for deleterious substances in coarse aggregate for concrete as specified in paragraph 501-2.1c, prior to production of the control strip, and a minimum of every 30-days during production or more frequently as necessary to control deleterious substances.

c. Slump. One test shall be made for each sublot. Slump tests shall be performed in accordance with ASTM C143 from material randomly sampled from material discharged from trucks at the paving site. Material samples shall be taken in accordance with ASTM C172.

d. Air content. One test shall be made for each sublot. Air content tests shall be performed in accordance with ASTM C231 for gravel and stone coarse aggregate and ASTM C173 for slag or other porous coarse aggregate, from material randomly sampled from trucks at the paving site. Material samples shall be taken in accordance with ASTM C172.

e. Unit weight and Yield. One test shall be made for each sublot. Unit weight and yield tests shall be in accordance with ASTM C138. The samples shall be taken in accordance with ASTM C172 and at the same time as the air content tests.

f. Temperatures. Temperatures shall be checked at least four times per lot at the job site in accordance with ASTM C1064.

g. Smoothness for Contractor Quality Control.

The Contractor shall perform smoothness testing in transverse and longitudinal directions daily to verify that the construction processes are producing pavement with variances less than ¼ inch in 12 feet, identifying areas that may pond water which could lead to hydroplaning of aircraft. If the smoothness criteria is not met, appropriate changes and corrections to the construction process shall be made by the Contractor before construction continues

The Contractor may use a 12-foot (3.7 m) “straightedge, a rolling inclinometer meeting the requirements of ASTM E2133 or rolling external reference device that can simulate a 12-foot (3.7m) straightedge approved by the RPR. Straight-edge testing shall start with one-half the length of the straightedge at the edge of pavement section being tested and then moved ahead one-half the length of the straightedge for each successive measurement. Testing shall be continuous across all joints. The surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between the two high points. If the rolling inclinometer or external reference device is used, the data may be evaluated using either the FAA profile program, ProFAA, or FHWA profile program ProVal, using the 12-foot straightedge simulation function.

Smoothness readings shall not be made across grade changes or cross slope transitions. The transition between new and existing pavement shall be evaluated separately for conformance with the plans.

(1) Transverse measurements. Transverse measurements shall be taken for each day’s production placed. Transverse measurements shall be taken perpendicular to the pavement centerline each 50 feet (15 m) or more often as determined by the RPR. The joint between lanes shall be tested separately to facilitate smoothness between lanes.

(2) Longitudinal measurements. Longitudinal measurements shall be taken for each day's production placed. Longitudinal tests shall be parallel to the centerline of paving; at the center of paving lanes when widths of paving lanes are less than 20 feet (6 m); and at the third points of paving lanes when widths of paving lanes are 20 ft (6 m) or greater. When placement abuts previously placed material the first measurement shall start with one half the length of the straight edge on the previously placed material.

Deviations on the final surface course in either the transverse or longitudinal direction that will trap water greater than 1/4 inch (6 mm) shall be corrected with diamond grinding per paragraph 501-4.19f or by removing and replacing the surface course to full depth. Grinding shall be tapered in all directions to provide smooth transitions to areas not requiring grinding. All areas in which diamond grinding has been performed shall be subject to the final pavement thickness tolerances specified in paragraph 501-6.6.

Control charts shall be kept to show area of each day's placement and the percentage of corrective grinding required. Corrections to production and placement shall be initiated when corrective grinding is required. If the Contractor's machines and/or methods produce significant areas that need corrective actions in excess of 10 percent of a day's production, production shall be stopped until corrective measures are implemented by the Contractor.

h. Grade. Grade will be evaluated prior to and after placement of the concrete surface.

Measurements will be taken at appropriate gradelines (as a minimum at center and edges of paving lane) and longitudinal spacing as shown on cross-sections and plans. The final surface of the pavement will not vary from the gradeline elevations and cross-sections shown on the plans by more than 1/2 inch (12 mm) vertically and 0.1 feet (30 mm) laterally. The documentation will be provided by the Contractor to the RPR within 48 hours.

Areas with humps or depression that that exceed grade or smoothness and that retain water on the surface must be ground off provided the course thickness after grinding is not more than 1/2 inch (12 mm) less than the thickness specified on the plans. If these areas cannot be corrected with grinding then the slabs that are retaining water must be removed and replaced in accordance with paragraph 501-4.19d. Grinding shall be in accordance with paragraph 501-4.19f. All corrections will be at the Contractors expense.

501-5.4 Control charts. The Contractor shall maintain linear control charts for fine and coarse aggregate gradation, slump, and air content. The Contractor shall also maintain a control chart plotting the coarseness factor/workability factor from the combined gradations in accordance with paragraph 501-2.1d.

Control charts shall be posted in a location satisfactory to the RPR and shall be kept up to date at all times. As a minimum, the control charts shall identify the project number, the contract item number, the test number, each test parameter, the Action and suspension Limits, or Specification limits, applicable to each test parameter, and the Contractor's test results. The Contractor shall use the control charts as part of a process control system for identifying potential problems and assignable causes before they occur. If the Contractor's projected data during production indicates a potential problem and the Contractor is not taking satisfactory corrective action, the RPR may halt production or acceptance of the material.

a. Fine and coarse aggregate gradation. The Contractor shall record the running average of the last five gradation tests for each control sieve on linear control charts. Superimposed on the control charts shall be the action and suspension limits. Gradation tests shall be performed by the Contractor per ASTM C136. The Contractor shall take at least two samples per lot to check the final gradation. Sampling shall be per ASTM D75 from the flowing aggregate stream or conveyor belt.

b. Slump and air content. The Contractor shall maintain linear control charts both for individual measurements and range (that is, difference between highest and lowest measurements) for slump and air content in accordance with the following Action and Suspension Limits.

c. Combined gradation. The Contractor shall maintain a control chart plotting the coarseness factor and workability factor on a chart in accordance with paragraph 501-2.1d.

Control Chart Limits[1]

Control Parameter	Individual Measurements	
	Action Limit	**Suspension Limit**
Gradation[2]	*[3]	*[3]
Coarseness Factor (CF)	±3.5	±5
Workability Factor (WF)	±2	±3
Slump	+0.5 to -1 inch (+13 to -25 mm)	+1 to -1.5 inch (+25 to -38 mm)
Air Content	±1.5%	±2.0%

[1] Control charts shall developed and maintained for each control parameter indicated.

[2] Control charts shall be developed and maintained for each sieve size.

[3] Action and suspension limits shall be determined by the Contractor.

501-5.5 Corrective action at Suspension Limit. The CQCP shall indicate that appropriate action shall be taken when the process is believed to be out of control. The CQCP shall detail what action will be taken to bring the process into control and shall contain sets of rules to gauge when a process is out of control. As a minimum, a process shall be deemed out of control and corrective action taken if any one of the following conditions exists.

a. Fine and coarse aggregate gradation. When two consecutive averages of five tests are outside of the suspension limits, immediate steps, including a halt to production, shall be taken to correct the grading.

b. Coarseness and Workability factor. When the CF or WF reaches the applicable suspension limits, the Contractor, immediate steps, including a halt to production, shall be taken to correct the CF and WF.

c. Fine and coarse aggregate moisture content. Whenever the moisture content of the fine or coarse aggregate changes by more than 0.5%, the scale settings for the aggregate batcher and water batcher shall be adjusted.

d. Slump. The Contractor shall halt production and make appropriate adjustments whenever:

(1) one point falls outside the Suspension Limit line for individual measurements

OR

(2) two points in a row fall outside the Action Limit line for individual measurements.

d. Air content. The Contractor shall halt production and adjust the amount of air-entraining admixture whenever:

(1) one point falls outside the Suspension Limit line for individual measurements

OR

(2) two points in a row fall outside the Action Limit line for individual measurements.

MATERIAL ACCEPTANCE

501-6.1 Quality Assurance (QA) Acceptance sampling and testing. All acceptance sampling and testing necessary to determine conformance with the requirements specified in this section, with the exception of coring for thickness determination, will be performed by the RPR. The Contractor shall provide adequate facilities for the initial curing of beams. The Contractor shall bear the cost of providing initial curing facilities and coring and filling operations, per paragraph 501-6.5b(1).

The samples will be transported while in the molds. The curing, except for the initial cure period, will be accomplished using the immersion in saturated lime water method. During the 24 hours after molding, the temperature immediately adjacent to the specimens must be maintained in the range of 60° to 80°F (16° to 27°C), and loss of moisture from the specimens must be prevented. The specimens may be stored in tightly constructed wooden boxes, damp sand pits, temporary buildings at construction sites, under wet burlap in favorable weather, or in heavyweight closed plastic bags, or using other suitable methods, provided the temperature and moisture loss requirements are met.

501-6.2 Quality Assurance (QA) testing laboratory. Quality assurance testing organizations performing these acceptance tests will be accredited in accordance with ASTM C1077. The quality assurance laboratory accreditation must be current and listed on the accrediting authority's website. All test methods required for acceptance sampling and testing must be listed on the lab accreditation. A copy of the laboratory's current accreditation and accredited test methods will be submitted to the RPR prior to start of construction.

501-6.3 Lot size. Concrete will be accepted for strength and thickness on a lot basis. A lot will consist of a day's production not to exceed 2,000 cubic yards (1530 cubic meters). Each lot will be divided into approximately equal sublots with individual sublots between 400 to 600 cubic yards. Where three sublots are produced, they will constitute a lot. Where one or two sublots are produced, they will be incorporated into the previous or next lot. Where more than one plant is simultaneously producing concrete for the job, the lot sizes will apply separately for each plant.

501-6.4 Partial lots. When operational conditions cause a lot to be terminated before the specified number of tests have been made for the lot or for overages or minor placements to be considered as partial lots, the following procedure will be used to adjust the lot size and the number of tests for the lot.

Where three sublots have been produced, they will constitute a lot. Where one or two sublots have been produced, they will be incorporated into the next lot or the previous lot and the total number of sublots will be used in the acceptance criteria calculation, that is, n=5 or n=6.

501-6.5 Acceptance Sampling and Testing.

a. Strength.

(1) Sampling. One sample will be taken for each sublot from the concrete delivered to the job site. Sampling locations will be determined by the RPR in accordance with random sampling procedures contained in ASTM D3665. The concrete will be sampled in accordance with ASTM C172.

(2) Test Specimens. The RPR will be responsible for the casting, initial curing, transportation, and curing of specimens in accordance with ASTM C31. Two (2) specimens will be made from each sample and slump, air content, unit weight, and temperature tests will be conducted for each set of strength specimens. Within 24 to 48 hours, the samples will be transported from the field to the laboratory while in the molds. Samples will be cured in saturated lime water.

The strength of each specimen will be determined in accordance with ASTM C78. The strength for each sublot will be computed by averaging the results of the two test specimens representing that sublot.

(3) Acceptance. Acceptance of pavement for strength will be determined by the RPR in accordance with paragraph 501-6.6b(1). All individual strength tests within a lot will be checked for outliers in accordance with ASTM E178, at a significance level of 5%. Outliers will be discarded and the remaining test values will be used to determine acceptance in accordance with paragraph 501-6.5b.

b. Pavement thickness.

(1) Sampling. One core will be taken by the Contractor for each sublot in the presence of the RPR. Sampling locations will be determined by the RPR in accordance with random sampling procedures contained in ASTM D3665. Areas, such as thickened edges, with planned variable thickness, will be excluded from sample locations.

Cores shall be a minimum 4 inch (100 mm) in diameter neatly cut with a core drill. The Contractor will furnish all tools, labor, and materials for cutting samples and filling the cored hole. Core holes will be filled by the Contractor with a non-shrink grout approved by the RPR within one day after sampling.

(2) Testing. The thickness of the cores will be determined by the RPR by the average caliper measurement in accordance with ASTM C174. Each core shall be photographed and the photograph included with the test report.

(3) Acceptance. Acceptance of pavement for thickness will be determined by the RPR in accordance with paragraph 501-6.6.

501-6.6 Acceptance criteria.

a. General. Acceptance will be based on the following characteristics of the completed pavement discussed in paragraph 501-6.5b:

(1) Strength

(2) Thickness

(3) Grade

(4) Profilograph smoothness. Not used.

(5) Adjustments for repairs

Acceptance for strength, thickness, and grade, will be based on the criteria contained in accordance with paragraph 501-6.6b(1), 501-6.6b(2), and 501-6.6b(3), respectively.

Production quality must achieve 90 PWL or higher to receive full payment.

Strength and thickness will be evaluated for acceptance on a lot basis using the method of estimating PWL. Production quality must achieve 90 PWL or higher to receive full pavement. The PWL will be determined in accordance with procedures specified in Item C-110.

The lower specification tolerance limit (L) for strength and thickness will be:

Lower Specification Tolerance Limit (L)

Strength	0.93 × strength specified in paragraph 501-3.3
Thickness	Lot Plan Thickness in inches, - 0.50 in

b. Acceptance criteria.

(1) Strength. If the PWL of the lot equals or exceeds 90%, the lot will be acceptable. Acceptance and payment for the lot will be determined in accordance with paragraph 501-8.1.

(**2) Thickness.** If the PWL of the lot equals or exceeds 90%, the lot will be acceptable. Acceptance and payment for the lot will be determined in accordance with paragraph 501-8.1.

(3) Grade. The final finished surface of the pavement of the completed project will not vary from the gradeline elevations and cross-sections shown on the plans by more than 1/2 inch (12 mm) vertically or 0.1 feet (30 mm) laterally. The documentation, stamped and signed by a licensed surveyor shall be in accordance with paragraph 501-5.3h. Payment for sublots that do not meet grade for over 25% of the sublot shall reduced by 5% and not be more than 95%.

(4) Profilograph roughness for QA Acceptance. Not used.

(5) Adjustments for repair. Sublots with spall repairs, crack repairs, or partial panel replacement, will be limited to no more than 95% payment.

(6)Adjustment for grinding. For sublots with grinding over 25% of a sublot, payment will be reduced 5%.

METHOD OF MEASUREMENT

501-7.1 Concrete pavement shall be measured by lump sum of reinforced pavement as specified in-place, completed and accepted.

BASIS OF PAYMENT

501-8.1 Payment. Payment for concrete pavement meeting all acceptance criteria as specified in paragraph 501-6.6. Acceptance Criteria shall be based on results of strength and thickness tests. Payment for acceptable lots of concrete pavement shall be adjusted in accordance with paragraph 501-8.1a for strength and thickness; 501-8.1b for repairs; 501-8.1c for grinding; and 501-8.1d for smoothness, subject to the limitation that:

The total project payment for concrete pavement shall not exceed **100** percent of the product of the contract unit price and the total **lump sum amount** of concrete pavement used in the accepted work (See Note 1 under the Price Adjustment Schedule table below).

Payment shall be full compensation for all labor, materials, tools, equipment, and incidentals required to complete the work as specified herein and on the drawings.

a. Basis of adjusted payment. The pay factor for each individual lot shall be calculated in accordance with the Price Adjustment Schedule table below. A pay factor shall be calculated for both strength and thickness. The lot pay factor shall be the higher of the two values when calculations for both strength and thickness are 100% or higher. The lot pay factor shall be the product of the two values when only one of the calculations for either strength or thickness is 100% or higher. The lot pay factor shall be the lower of the two values when calculations for both strength and thickness are less than 100%.

Price Adjustment Schedule[1]

Percentage of Materials Within Specification Limits (PWL)	Lot Pay Factor (Percent of Contract Unit Price)
96 – 100	106
90 – 95	PWL + 10
75 – 90	0.5 PWL + 55
55 – 74	1.4 PWL – 12
Below 55	Reject[2]

[1] Although it is theoretically possible to achieve a pay factor of 106% for each lot, actual payment in excess of 100% shall be subject to the total project payment limitation specified in paragraph 501-8.1.

[2] The lot shall be removed and replaced unless, after receipt of FAA concurrence, the Owner and Contractor agree in writing that the lot will remain; the lot paid at 50% of the contract unit price; and the total project payment limitation reduced by the amount withheld for that lot.

For each lot accepted, the adjusted contract unit price shall be the product of the lot pay factor for the lot and the contract unit price. Payment shall be subject to the total project payment limitation specified in paragraph 501-8.1. Payment in excess of 100% for accepted lots of concrete pavement shall be used to offset payment for accepted lots of concrete pavement that achieve a lot pay factor less than 100%; except for rejected lots which remain in place and/or sublots with adjustments for repairs.

b. Adjusted payment for repairs. The PWL lot pay factor shall be reduced by 5% and be no higher than 95% for sublots which contain repairs in accordance with paragraph 501-4.19 on more than 20% of the slabs within the sublot. Payment factors greater than 100 percent for the strength and thickness cannot be used to offset adjustments for repairs.

c. Adjusted payment for grinding. The PWL lot pay factor shall be reduced by 5% and be no higher than 95% for sublots with grinding over 25% of a sublot.

d. Profilograph Roughness. Not used.

e. Payment. Payment shall be made under:

Item P-501-8.1 Concrete Pavement. Payment for the work specified in this section and designated in the Contract Documents shall include all materials, equipment, labor, and incidentals required to furnish and install complete in place and shall be included within the lump sum Contract Bid Amount.

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.

ASTM International (ASTM)

ASTM A184	Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

ASTM A704	Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
ASTM A706	Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A775	Standard Specification for Epoxy-Coated Steel Reinforcing Bars
ASTM A884	Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement
ASTM A934	Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM A996	Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement
ASTM A1035	Standard Specification for Deformed and Plain, Low-Carbon, Chromium, Steel Bars for Concrete Reinforcement
ASTM A1064	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM A1078	Standard Specification for Epoxy-Coated Steel Dowels for Concrete Pavement
ASTM C29	Standard Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate
ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C70	Standard Test Method for Surface Moisture in Fine Aggregate
ASTM C78	Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C114	Standard Test Methods for Chemical Analysis of Hydraulic Cement
ASTM C117	Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C123	Standard Test Method for Lightweight Particles in Aggregate
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates

ASTM C138	Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM C171	Standard Specification for Sheet Materials for Curing Concrete
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C173	Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method
ASTM C174	Standard Test Method for Measuring Thickness of Concrete Elements Using Drilled Concrete Cores
ASTM C227	Standard Test Method for Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method)
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C295	Standard Guide for Petrographic Examination of Aggregates for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C311	Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland Cement Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C566	Standard Test Method for Total Evaporable Moisture Content of Aggregates by Drying
ASTM C595	Standard Specification for Blended Hydraulic Cements
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C642	Standard Test Method for Density, Absorption, and Voids in Hardened Concrete
ASTM C666	Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
ASTM C685	Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C881	Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete
ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars

ASTM C1017	Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C1064	Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM C1157	Standard Performance Specification for Hydraulic Cement
ASTM C1260	Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM C1365	Standard Test Method for Determination of the Proportion of Phases in Portland Cement and Portland-Cement Clinker Using X-Ray Powder Diffraction Analysis
ASTM C1567	Standard Test Method for Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D1751	Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
ASTM D1752	Standard Specification for Preformed Sponge Rubber and Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM E178	Standard Practice for Dealing with Outlying Observations
ASTM E1274	Standard Test Method for Measuring Pavement Roughness Using a Profilograph
ASTM E2133	Standard Test Method for Using a Rolling Inclinometer to Measure Longitudinal and Transverse Profiles of a Traveled Surface

American Concrete Institute (ACI)

ACI 305R	Guide to Hot Weather Concreting
ACI 306R	Guide to Cold Weather Concreting
ACI 309R	Guide for Consolidation of Concrete

Advisory Circulars (AC)

AC 150/5320-6 Airport Pavement Design and Evaluation

Federal Highway Administration (FHWA)

HIPERPAV 3, version 3.2

Portland Concrete Association (PCA)

PCA Design and Control of Concrete Mixtures, 16th Edition

U.S. Army Corps of Engineers (USACE) Concrete Research Division (CRD)

CRD C662 Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials, Lithium Nitrate Admixture and Aggregate (Accelerated Mortar-Bar Method)

United States Air Force Engineering Technical Letter (ETL)

ETL 97-5 Proportioning Concrete Mixtures with Graded Aggregates for Rigid Airfield Pavements

END ITEM P-501

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Item P-605 Joint Sealants for Pavements

DESCRIPTION

605-1.1 This item shall consist of providing and installing a resilient and adhesive joint sealing material capable of effectively sealing joints in pavement; joints between different types of pavements; and cracks in existing pavement.

MATERIALS

605-2.1 Joint sealants. Joint sealant materials shall meet the requirements of ASTM D5893 Standard Specifications for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements.

Each lot or batch of sealant shall be delivered to the jobsite in the manufacturer's original sealed container. Each container shall be marked with the manufacturer's name, batch or lot number, the safe heating temperature, and shall be accompanied by the manufacturer's certification stating that the sealant meets the requirements of this specification.

605-2.2 Backer rod. The material furnished shall be a compressible, non-shrinking, non-staining, non-absorbing material that is non-reactive with the joint sealant in accordance with ASTM D5249. The backer-rod material shall be 25% ± 5 % larger in diameter than the nominal width of the joint.

605-2.3 Bond breaking tapes. Provide a bond breaking tape or separating material that is a flexible, non-shrinkable, non-absorbing, non-staining, and non-reacting adhesive-backed tape. The material shall have a melting point at least 5°F (3°C) greater than the pouring temperature of the sealant being used when tested in accordance with ASTM D789. The bond breaker tape shall be approximately 1/8 inch (3 mm) wider than the nominal width of the joint and shall not bond to the joint sealant.

CONSTRUCTION METHODS

605-3.1 Time of application. Joints shall be sealed as soon after completion of the curing period as feasible and before the pavement is opened to traffic, including construction equipment. The pavement temperature shall be 50°F (10°C) and rising at the time of application of the poured joint sealing material. Do not apply sealant if moisture is observed in the joint.

605-3.2 Equipment. Machines, tools, and equipment used in the performance of the work required by this section shall be approved before the work is started and maintained in satisfactory condition at all times. Submit a list of proposed equipment to be used in performance of construction work including descriptive data, **14** days prior to use on the project.

a. Tractor-mounted routing tool. Provide a routing tool, used for removing old sealant from the joints, of such shape and dimensions and so mounted on the tractor that it will not damage the sides of the joints. The tool shall be designed so that it can be adjusted to remove the old material to varying depths as required. The use of V-shaped tools or rotary impact routing devices will not be permitted. Hand-operated spindle routing devices may be used to clean and enlarge random cracks.

b. Concrete saw. Provide a self-propelled power saw, with water-cooled diamond or abrasive saw blades, for cutting joints to the depths and widths specified.

c. Sandblasting equipment. Sandblasting is not allowed

d. Waterblasting equipment. The Contractor must demonstrate waterblasting equipment including the pumps, hose, guide and nozzle size, under job conditions, before approval in accordance with paragraph 605-3.3. The Contractor shall demonstrate, in the presence of the RPR, that the method cleans the joint and does not damage the joint.

e. Hand tools. Hand tools may be used, when approved, for removing defective sealant from a crack and repairing or cleaning the crack faces. Hand tools should be carefully evaluated for potential spalling effects prior to approval for use.

f. Hot-poured sealing equipment. The unit applicators used for heating and installing ASTM D6690 joint sealant materials shall be mobile and shall be equipped with a double-boiler, agitator-type kettle with an oil medium in the outer space for heat transfer; a direct-connected pressure-type extruding device with a nozzle shaped for inserting in the joint to be filled; positive temperature devices for controlling the temperature of the transfer oil and sealant; and a recording type thermometer for indicating the temperature of the sealant. The applicator unit shall be designed so that the sealant will circulate through the delivery hose and return to the inner kettle when not in use.

g. Cold-applied, single-component sealing equipment. The equipment for installing ASTM D5893 single component joint sealants shall consist of an extrusion pump, air compressor, following plate, hoses, and nozzle for transferring the sealant from the storage container into the joint opening. The dimension of the nozzle shall be such that the tip of the nozzle will extend into the joint to allow sealing from the bottom of the joint to the top. Maintain the initially approved equipment in good working condition, serviced in accordance with the supplier's instructions, and unaltered in any way without obtaining prior approval. Small hand-held air-powered equipment (i.e., caulking guns) may be used for small applications.

605-3.3 Preparation of joints. Pavement joints for application of material in this specification must be dry, clean of all scale, dirt, dust, curing compound, and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method cleans the joint and does not damage the joint.

a. Sawing. All joints shall be sawed in accordance with specifications and plan details. Immediately after sawing the joint, the resulting slurry shall be completely removed from joint and adjacent area by flushing with a jet of water, and by use of other tools as necessary.

b. Sealing. Immediately before sealing, the joints shall be thoroughly cleaned of all remaining laitance, curing compound, filler, protrusions of hardened concrete, old sealant and other foreign material from the sides and upper edges of the joint space to be sealed. Cleaning shall be accomplished by sandblasting**,** tractor-mounted routing equipment**,** concrete saw **or**

waterblaster as specified in paragraph 605-3.2. The newly exposed concrete joint faces and the pavement surface extending a minimum of 1/2 inch (12 mm) from the joint edge shall be sandblasted clean. Sandblasting shall be accomplished in a minimum of two passes. One pass per joint face with the nozzle held at an angle directly toward the joint face and not more than 3 inches (75 mm) from it. After final cleaning and immediately prior to sealing, blow out the joints with compressed air and leave them completely free of debris and water. The joint faces shall be surface dry when the seal is applied.

c. Backer Rod. When the joint opening is of a greater depth than indicated for the sealant depth, plug or seal off the lower portion of the joint opening using a backer rod in accordance with paragraph 605-2.2 to prevent the entrance of the sealant below the specified depth. Take care to ensure that the backer rod is placed at the specified depth and is not stretched or twisted during installation.

d. Bond-breaking tape. Where inserts or filler materials contain bitumen, or the depth of the joint opening does not allow for the use of a backup material, insert a bond-separating tape breaker in accordance with paragraph 605-2.3 to prevent incompatibility with the filler materials and three-sided adhesion of the sealant. Securely bond the tape to the bottom of the joint opening so it will not float up into the new sealant.

605-3.4 Installation of sealants. Joints shall be inspected for proper width, depth, alignment, and preparation, and shall be approved by the RPR before sealing is allowed. Sealants shall be installed in accordance with the following requirements:

Immediately preceding, but not more than 50 feet (15 m) ahead of the joint sealing operations, perform a final cleaning with compressed air. Fill the joints from the bottom up to ¼ inch ±1/16 inch below the top of pavement surface; or bottom of groove for grooved pavement. Remove and discard excess or spilled sealant from the pavement by approved methods. Install the sealant in such a manner as to prevent the formation of voids and entrapped air. In no case shall gravity methods or pouring pots be used to install the sealant material. Traffic shall not be permitted over newly sealed pavement until authorized by the RPR. When a primer is recommended by the manufacturer, apply it evenly to the joint faces in accordance with the manufacturer's instructions. Check the joints frequently to ensure that the newly installed sealant is cured to a tack-free condition within the time specified.

605-3.5 Inspection. The Contractor shall inspect the joint sealant for proper rate of cure and set, bonding to the joint walls, cohesive separation within the sealant, reversion to liquid, entrapped air and voids. Sealants exhibiting any of these deficiencies at any time prior to the final acceptance of the project shall be removed from the joint, wasted, and replaced as specified at no additional cost to the airport.

605-3.6 Clean-up. Upon completion of the project, remove all unused materials from the site and leave the pavement in a clean condition.

METHOD OF MEASUREMENT

605-4.1 The work specified in this section shall be included as a lump sum within the Contract Bid Amount.

BASIS OF PAYMENT

605-5.1 Payment for the work specified in this section and designated in the Contract Documents shall include all materials, equipment, labor, and incidentals required to furnish and install complete in place and shall be included within the Contract Bid Amount.

Item P-605.5.1 Joint Sealing Filler, Lump Sum

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.

ASTM International (ASTM)

ASTM D789 Standard Test Method for Determination of Relative Viscosity of Polyamide (PA)

ASTM D5893 Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements

Advisory Circulars (AC)

AC 150/5340-30 Design and Installation Details for Airport Visual Aids

END ITEM P-605

Item P-610 Concrete for Miscellaneous Structures

DESCRIPTION

610-1.1 This item shall consist of concrete and reinforcement, as shown on the plans, prepared and constructed in accordance with these specifications. This specification shall be used for all concrete other than airfield pavement which are cast-in-place.

MATERIALS

610-2.1 General. Only approved materials, conforming to the requirements of these specifications, shall be used in the work. Materials may be subject to inspection and tests at any time during their preparation or use. The source of all materials shall be approved by the Resident Project Representative (RPR) before delivery or use in the work. Representative preliminary samples of the materials shall be submitted by the Contractor, when required, for examination and test. Materials shall be stored and handled to ensure preservation of their quality and fitness for use and shall be located to facilitate prompt inspection. All equipment for handling and transporting materials and concrete must be clean before any material or concrete is placed in them.

The use of pit-run aggregates shall not be permitted unless the pit-run aggregate has been screened and washed, and all fine and coarse aggregates stored separately and kept clean. The mixing of different aggregates from different sources in one storage stockpile or alternating batches of different aggregates shall not be permitted.

a. Reactivity. Fine aggregate and coarse aggregates to be used in all concrete shall have been tested separately within six months of the project in accordance with ASTM C1260. Test results shall be submitted to the RPR. The aggregate shall be considered innocuous if the expansion of test specimens, tested in accordance with ASTM C1260, does not exceed 0.08% at 14 days (16 days from casting). If the expansion either or both test specimen is greater than 0.08% at 14 days, but less than 0.20%, a minimum of 25% of Type F fly ash, or between 40% and 55% of slag cement shall be used in the concrete mix.

If the expansion is greater than 0.20%, the aggregates shall not be used, and test results for other aggregates must be submitted for evaluation; or aggregates that meet P-501 reactivity test requirements may be utilized.

610-2.2 Coarse aggregate. The coarse aggregate for concrete shall meet the requirements of ASTM C33 and the requirements of Table 4, Class Designation 5S; and the grading requirements shown below, as required for the project.

Coarse Aggregate Grading Requirements

Maximum Aggregate Size	ASTM C33, Table 3 Grading Requirements (Size No.)
1 1/2 inch (37.5 mm)	467 or 4 and 67
1 inch (25 mm)	57
¾ inch (19 mm)	67
½ inch (12.5 mm)	7

610-2.2.1 Coarse Aggregate susceptibility to durability (D) cracking. Not used.

610-2.3 Fine aggregate. The fine aggregate for concrete shall meet all fine aggregate requirements of ASTM C33.

610-2.4 Cement. Cement shall conform to the requirements of **C150** Type **II, IIA, III, or IIIA** as shown on the plans.

610-2.5 Cementitious materials.

a. Fly ash. Fly ash shall meet the requirements of ASTM C618, with the exception of loss of ignition, where the maximum shall be less than 6%. Fly ash shall have a Calcium Oxide (CaO) content of less than 15% and a total available alkali content less than 3% per ASTM C311. Fly ash produced in furnace operations using liming materials or soda ash (sodium carbonate) as an additive shall not be acceptable. The Contractor shall furnish the previous three most recent, consecutive ASTM C618 reports for each source of fly ash proposed in the concrete mix, and shall furnish each additional report as they become available during the project. The reports can be used for acceptance or the material may be tested independently by the RPR.

b. Slag cement (ground granulated blast furnace (GGBF)). Slag cement shall conform to ASTM C989, Grade 100 or Grade 120. Slag cement shall be used only at a rate between 25% and 55% of the total cementitious material by mass.

610-2.6 Water. Water used in mixing or curing shall be from potable water sources. Other sources shall be tested in accordance with ASTM C1602 prior to use.

610-2.7 Admixtures. The Contractor shall submit certificates indicating that the material to be furnished meets all of the requirements indicated below. In addition, the RPR may require the Contractor to submit complete test data from an approved laboratory showing that the material to be furnished meets all of the requirements of the cited specifications. Subsequent tests may be made of samples taken by the RPR from the supply of the material being furnished or proposed for use on the work to determine whether the admixture is uniform in quality with that approved.

a. Air-entraining admixtures. Air-entraining admixtures shall meet the requirements of ASTM C260 and shall consistently entrain the air content in the specified ranges under field conditions. The air-entrainment agent and any water reducer admixture shall be compatible.

b. Water-reducing admixtures. Water-reducing admixture shall meet the requirements of ASTM C494, Type A, B, or D. ASTM C494, Type F and G high range water reducing admixtures and ASTM C1017 flowable admixtures shall not be used.

c. Other chemical admixtures. The use of set retarding, and set-accelerating admixtures shall be approved by the RPR. Retarding shall meet the requirements of ASTM C494, Type A, B, or D and set-accelerating shall meet the requirements of ASTM C494, Type C. Calcium chloride and admixtures containing calcium chloride shall not be used.

610-2.8 Premolded joint material. Premolded joint material for expansion joints shall meet the requirements of ASTM D1752**.**

610-2.9 Joint filler. The filler for joints shall meet the requirements of Item P-605, unless otherwise specified.

610-2.10 Steel reinforcement. Reinforcing shall consist of steel as listed on the plans and conforming to the requirements shown in the table below**.**

Steel Reinforcement

Reinforcing Steel	**ASTM A615, ASTM A706, ASTM A775, ASTM A934**
Welded Steel Wire Fabric	**ASTM A1064, ASTM A884**
Welded Deformed Steel Fabric	**ASTM A1064**
Bar Mats	**ASTM A184 or ASTM A704**

610-2.11 Materials for curing concrete. Curing materials shall conform to one or more of the types and standards listend in the table below.

Materials for Curing

Waterproof paper	**ASTM C171**
Clear or white Polyethylene Sheeting	**ASTM C171**
White-pigmented Liquid Membrane-Forming Compound, Type 2, Class B	**ASTM C309**

CONSTRUCTION METHODS

610-3.1 General. The Contractor shall furnish all labor, materials, and services necessary for, and incidental to, the completion of all work as shown on the drawings and specified here. All machinery and equipment used by the Contractor on the work, shall be of sufficient size to meet the requirements of the work. All work shall be subject to the inspection and approval of the RPR.

610-3.2 Concrete Mixture. The concrete shall develop a compressive strength of 4000 psi in 28 days as determined by test cylinders made in accordance with ASTM C31 and tested in accordance with ASTM C39. The concrete shall contain not less than 470 pounds of cementitious material per cubic yard (280 kg per cubic meter). The water cementitious ratio shall not exceed 0.45 by weight. The air content of the concrete shall be 5% +/- 1.2% as determined by ASTM C231 and shall have a slump of not more than 4 inches (100 mm) as determined by ASTM C143.

610-3.3 Mixing. Concrete may be mixed at the construction site, at a central point, or wholly or in part in truck mixers. The concrete shall be mixed and delivered in accordance with the requirements of ASTM C94 or ASTM C685.

The concrete shall be mixed only in quantities required for immediate use. Concrete shall not be mixed while the air temperature is below 40°F (4°C) without the RPRs approval. If approval is granted for mixing under such conditions, aggregates or water, or both, shall be heated and the concrete shall be placed at a temperature not less than 50°F (10°C) nor more than 100°F (38°C). The Contractor shall be held responsible for any defective work, resulting from freezing or injury in any manner during placing and curing, and shall replace such work at his expense.

Retempering of concrete by adding water or any other material is not permitted.

The rate of delivery of concrete to the job shall be sufficient to allow uninterrupted placement of the concrete.

610-3.4 Forms. Concrete shall not be placed until all the forms and reinforcements have been inspected and approved by the RPR. Forms shall be of suitable material and shall be of the type, size, shape, quality, and strength to build the structure as shown on the plans. The forms shall be true to line and grade and shall be mortar-tight and sufficiently rigid to prevent displacement and sagging between supports. The surfaces of forms shall be smooth and free from irregularities, dents, sags, and holes. The Contractor shall be responsible for their adequacy.

The internal form ties shall be arranged so no metal will show in the concrete surface or discolor the surface when exposed to weathering when the forms are removed. All forms shall be wetted with water or with a non-staining mineral oil, which shall be applied immediately before the concrete is placed. Forms shall be constructed so they can be removed without injuring the concrete or concrete surface.

610-3.5 Placing reinforcement. All reinforcement shall be accurately placed, as shown on the plans, and shall be firmly held in position during concrete placement. Bars shall be fastened together at intersections. The reinforcement shall be supported by approved metal chairs. Shop drawings, lists, and bending details shall be supplied by the Contractor when required.

610-3.6 Embedded items. Before placing concrete, all embedded items shall be firmly and securely fastened in place as indicated. All embedded items shall be clean and free from coating, rust, scale, oil, or any foreign matter. The concrete shall be spaded and consolidated around and against embedded items. The embedding of wood shall not be allowed.

610-3.7 Concrete Consistency. The Contractor shall monitor the consistency of the concrete delivered to the project site; collect each batch ticket; check temperature; and perform slump tests on each truck at the project site in accordance with ASTM C143.

610-3.8 Placing concrete. All concrete shall be placed during daylight hours, unless otherwise approved. The concrete shall not be placed until the depth and condition of foundations, the adequacy of forms and falsework, and the placing of the steel reinforcing have been approved by the RPR. Concrete shall be placed as soon as practical after mixing, but in no case later than one (1) hour after water has been added to the mix. The method and manner of placing shall avoid segregation and displacement of the reinforcement. Troughs, pipes, and chutes shall be used as an aid in placing concrete when necessary. The concrete shall not be dropped from a height of more than 5 feet (1.5 m). Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to rehandling or flowing. Do not subject concrete to procedures which cause segregation. Concrete shall be placed on clean, damp surfaces, free from running water, or on a properly consolidated soil foundation.

610-3.9 Vibration. Vibration shall follow the guidelines in American Concrete Institute (ACI) Committee 309R, Guide for Consolidation of Concrete.

610-3.10 Joints. Joints shall be constructed as indicated on the plans.

610-3.11 Finishing. All exposed concrete surfaces shall be true, smooth, and free from open or rough areas, depressions, or projections. All concrete horizontal plane surfaces shall be brought flush to the proper elevation with the finished top surface struck-off with a straightedge and floated.

610-3.12 Curing and protection. All concrete shall be properly cured in accordance with the recommendations in American Concrete Institute (ACI) 308R, Guide to External Curing of Concrete. The concrete shall be protected from damage until project acceptance.

610-3.13 Cold weather placing. When concrete is placed at temperatures below 40°F (4°C), follow the cold weather concreting recommendations found in ACI 306R, Cold Weather Concreting.

610-3.14 Hot weather placing. When concrete is placed in hot weather greater than 85ºF (30 ºC), follow the hot weather concreting recommendations found in ACI 305R, Hot Weather Concreting.

QUALITY ASSURANCE (QA)

610-4.1 Quality Assurance sampling and testing. Concrete for each day's placement will be accepted on the basis of the compressive strength specified in paragraph 610-3.2. The RPR will sample the concrete in accordance with ASTM C172; test the slump in accordance with ASTM C143; test air content in accordance with ASTM C231; make and cure compressive strength specimens in accordance with ASTM C31; and test in accordance with ASTM C39. The QA testing agency will meet the requirements of ASTM C1077.

The Contractor shall provide adequate facilities for the initial curing of cylinders.

610-4.2 Defective work. Any defective work that cannot be satisfactorily repaired as determined by the RPR, shall be removed and replaced at the Contractor's expense. Defective work includes, but is not limited to, uneven dimensions, honeycombing and other voids on the surface or edges of the concrete.

METHOD OF MEASUREMENT

610-5.1 Concrete shall be considered incidental and no separate measurement shall be made of concrete complete in place and accepted.

BASIS OF PAYMENT

610-6.1 Concrete shall be considered incidental and no separate payment shall be made. This price shall be full compensation for furnishing all materials including reinforcement and embedded items and for all preparation, delivery, installation, and curing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-610-6.1 Concrete, incidental to other work items

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.

ASTM International (ASTM)

ASTM A184	Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A704	Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
ASTM A706	Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A775	Standard Specification for Epoxy-Coated Steel Reinforcing Bars
ASTM A884	Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement
ASTM A934	Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM A1064	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C114	Standard Test Methods for Chemical Analysis of Hydraulic Cement
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM C171	Standard Specification for Sheet Materials for Curing Concrete
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C311	Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete

ASTM C618 Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

ASTM C666 Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing

ASTM C685 Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing

ASTM C989 Standard Specification for Slag Cement for Use in Concrete and Mortars

ASTM C1017 Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete

ASTM C1077 Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation

ASTM C1157 Standard Performance Specification for Hydraulic Cement

ASTM C1260 Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)

ASTM C1365 Standard Test Method for Determination of the Proportion of Phases in Portland Cement and Portland-Cement Clinker Using X-Ray Powder Diffraction Analysis

ASTM C1602 Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete

ASTM D1751 Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types)

ASTM D1752 Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction

American Concrete Institute (ACI)

ACI 305R Hot Weather Concreting

ACI 306R Cold Weather Concreting

ACI 308R Guide to External Curing of Concrete

ACI 309R Guide for Consolidation of Concrete

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Item P-620 Runway and Taxiway Marking

DESCRIPTION

620-1.1 This item shall consist of the preparation and painting of numbers, markings, and stripes on the surface of runways, taxiways, and aprons, in accordance with these specifications and at the locations shown on the plans, or as directed by the Resident Project Representative (RPR). The terms "paint" and "marking material" as well as "painting" and "application of markings" are interchangeable throughout this specification.

MATERIALS

620-2.1 Materials acceptance. The Contractor shall furnish manufacturer's certified test reports, for materials shipped to the project. The certified test reports shall include a statement that the materials meet the specification requirements. This certification along with a copy of the paint manufacturer's surface preparation; marking materials, including adhesion, flow promoting and/or floatation additive; and application requirements must be submitted and approved by the Resident Project Representative (RPR) prior to the initial application of markings. The reports can be used for material acceptance or the RPR may perform verification testing. The reports shall not be interpreted as a basis for payment. The Contractor shall notify the RPR upon arrival of a shipment of materials to the site. All material shall arrive in sealed containers that are easily quantifiable for inspection by the RPR.

620-2.2 Marking materials.

Table 1. Marking Materials

Paint				Glass Beads	
Type	Color	Fed Std. 595 Number	Application Rate Maximum	Type	Application Rate Minimum
I	White	37925	115 ft2/gal	I	7 lb/gal
I	Yellow	33538 or 33655	115 ft2/gal	I	7 lb/gal
I	Black	37038	115 ft2/gal	I	7 lb/gal
I	Red	31136	115 ft2/gal	I	7 lb/gal

a. Paint. Paint shall be in accordance with the requirements of this paragraph. Paint colors shall comply with Federal Standard No. 595. Type I. Waterborne. Paint shall meet the requirements of Federal Specification TT-P-1952F, Type I. The non-volatile portion of the vehicle for all paint types shall be composed of a 100% acrylic polymer as determined by infrared spectral analysis. The acrylic resin used for Type III shall be 100% cross linking acrylic as evidenced by infrared peaks at wavelengths 1568, 1624, and 1672 cm-l with intensities equal to those produced by an acrylic resin known to be 100% cross linking.

b. Reflective media. Glass beads for white and yellow paint shall meet the requirements for Federal Specification TT-B-1325D Type I, Gradation. Glass beads for red and pink paint shall meet the requirements for Type I, Gradation. Glass beads shall be treated with all compatible coupling agents recommended by the manufacturers of the paint and reflective media to ensure adhesion and embedment. Glass beads shall not be used in black and green paint. Type III glass beads shall not be used in red and pink paint.

c. Retroreflectivity shall be measured by a portable retroreflectometer according to ASTM E1710 and the practices in ASTM D7585 shall be followed for taking retroreflectivity readings with a portable

retroreflectometer and computing measurement averages. A vehicle-mounted retroreflectometer may also be used.

CONSTRUCTION METHODS

620-3.1 Weather limitations. Painting shall only be performed when the surface is dry, and the ambient temperature and the pavement surface temperature meet the manufacturer's recommendations in accordance with paragraph 620-2.1. Painting operations shall be discontinued when the ambient or surface temperatures does not meet the manufacturer's recommendations. Markings shall not be applied when the wind speed exceeds 10 mph unless windscreens are used to shroud the material guns. Markings shall not be applied when weather conditions are forecasts to not be within the manufacturers' recommendations for application and dry time.

620-3.2 Equipment. Equipment shall include the apparatus necessary to properly clean the existing surface, a mechanical marking machine, a bead dispensing machine, and such auxiliary hand-painting equipment as may be necessary to satisfactorily complete the job.

The mechanical marker shall be an atomizing spray-type or airless type marking machine with automatic glass bead dispensers suitable for application of traffic paint. It shall produce an even and uniform film thickness and appearance of both paint and glass beads at the required coverage and shall apply markings of uniform cross-sections and clear-cut edges without running or spattering and without over spray. The marking equipment for both paint and beads shall be calibrated daily.

620-3.3 Preparation of surfaces. Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance, or other contaminates that would reduce the bond between the paint and the pavement. Use of any chemicals or impact abrasives during surface preparation shall be approved in advance by the RPR. After the cleaning operations, sweeping, blowing, or rinsing with pressurized water shall be performed to ensure the surface is clean and free of grit or other debris left from the cleaning process.

a. Preparation of new pavement surfaces. The area to be painted shall be cleaned by broom, blower, water blasting, or by other methods approved by the RPR to remove all contaminants, including PCC curing compounds, minimizing damage to the pavement surface.

b. Preparation of pavement to remove existing markings. Existing pavement markings shall be removed by rotary grinding, water blasting, or by other methods approved by the RPR minimizing damage to the pavement surface. The removal area may need to be larger than the area of the markings to eliminate ghost markings. After removal of markings on asphalt pavements, apply a fog seal or seal coat to 'block out' the removal area to eliminate 'ghost' markings.

c. Preparation of pavement markings prior to remarking. Prior to remarking existing markings, loose existing markings must be removed minimizing damage to the pavement surface, with a method approved by the RPR. After removal, the surface shall be cleaned of all residue or debris.

Prior to the application of markings, the Contractor shall certify in writing that the surface is dry and free from dirt, grease, oil, laitance, or other foreign material that would prevent the bond of the paint to the pavement or existing markings. This certification along with a copy of the paint manufactures application and surface preparation requirements must be submitted to the RPR prior to the initial application of markings.

620-3.4 Layout of markings. The proposed markings shall be laid out in advance of the paint application. The locations of markings to receive glass beads shall be shown on the plans.

620-3.5 Application. A period of 10 days shall elapse between placement of surface course or seal coat and application of the permanent paint markings. Paint shall be applied at the locations and to the dimensions and spacing shown on the plans. Paint shall not be applied until the layout and condition of the surface has been approved by the RPR.

The edges of the markings shall not vary from a straight line more than 1/2 inch (12 mm) in 50 feet (15 m), and marking dimensions and spacing shall be within the following tolerances:

Marking Dimensions and Spacing Tolerance

Dimension and Spacing	Tolerance
36 inch (910 mm) or less	±1/2 inch (12 mm)
greater than 36 inch to 6 feet (910 mm to 1.85 m)	±1 inch (25 mm)
greater than 6 feet to 60 feet (1.85 m to 18.3 m)	±2 inch (50 mm)
greater than 60 feet (18.3 m)	±3 inch (76 mm)

The paint shall be mixed in accordance with the manufacturer's instructions and applied to the pavement with a marking machine at the rate shown in Table 1. The addition of thinner will not be permitted.

Glass beads shall be distributed upon the marked areas at the locations shown on the plans to receive glass beads immediately after application of the paint. A dispenser shall be furnished that is properly designed for attachment to the marking machine and suitable for dispensing glass beads. Glass beads shall be applied at the rate shown in Table 1. Glass beads shall not be applied to black paint or green paint. Glass beads shall adhere to the cured paint or all marking operations shall cease until corrections are made. Different bead types shall not be mixed. Regular monitoring of glass bead embedment and distribution should be performed.

620-3.6 Application--preformed thermoplastic airport pavement markings.

Preformed thermoplastic pavement markings not used.

620-3.7 Control strip. Prior to the full application of airfield markings, the Contractor shall prepare a control strip in the presence of the RPR. The Contractor shall demonstrate the surface preparation method and all striping equipment to be used on the project. The marking equipment must achieve the prescribed application rate of paint and population of glass beads (per Table 1) that are properly embedded and evenly distributed across the full width of the marking. Prior to acceptance of the control strip, markings must be evaluated during darkness to ensure a uniform appearance.

620-3.8 Retro-reflectance. Reflectance shall be measured with a portable retro-reflectometer meeting ASTM E1710 (or equivalent). A total of 6 reading shall be taken over a 6 square foot area with 3 readings taken from each direction. The average shall be equal to or above the minimum levels of all readings which are within 30% of each other.

Minimum Retro-Reflectance Values

Material	Retro-reflectance mcd/m^2/lux		
	White	**Yellow**	**Red**
Initial Type I	300	175	35
Initial Type III	600	300	35
Initial Thermoplastic	225	100	35
All materials, remark when less than[1]	100	75	10

[1] 'Prior to remarking determine if removal of contaminants on markings will restore retro-reflectance][not used]

620-3.9 Protection and cleanup. After application of the markings, all markings shall be protected from damage until dry. All surfaces shall be protected from excess moisture and/or rain and from disfiguration by spatter, splashes, spillage, or drippings. The Contractor shall remove from the work area all debris, waste, loose reflective media, and by-products generated by the surface preparation and application operations to the satisfaction of the RPR. The Contractor shall dispose of these wastes in strict compliance with all applicable state, local, and federal environmental statutes and regulations.

METHOD OF MEASUREMENT

620-4.1 Lump Sum. No separate measurement for payment will be made. The work covered by this section shall be considered as a subsidiary obligation of the Contractor under the other contract items.

620-4.1a The quantity of surface preparation shall be included as a lump sum within the Contract Bid Amount.

620-4.1b The quantity of markings shall be included as a lump sum within the Contract Bid Amount.

620-4.1c The quantity of reflective media shall be included as a lump sum within the Contract Bid Amount.

620-4.1d The quantity of temporary markings to shall be included as a lump sum within the Contract Bid Amount.

620-4.1e Not used.

BASIS OF PAYMENT

620-5.1 Payment for the work specified in this section and designated in the Contract Documents shall include all materials, equipment, labor, and incidentals required to furnish and install complete in place and shall be included within the Contract Bid Amount. Payment shall be made as lump sum.

620-5.1a Payment for surface preparation shall include all materials, equipment, labor, and incidentals required to furnish and install complete in place and shall be included within the Contract Bid Amount as a lump sum.

620-5.2b Payment for markings shall include all materials, equipment, labor, and incidentals required to furnish and install complete in place and shall be included within the Contract Bid Amount as a lump sum..

620-5.3c Payment for reflective media shall include all materials, equipment, labor, and incidentals required to furnish and install complete in place and shall be included within the Contract Bid Amount as a lump sum.

620-5.4d Payment for temporary markings shall include all materials, equipment, labor, and incidentals required to furnish and install complete in place and shall be included within the Contract Bid Amount as a lump sum.

620-5.5e Not used.

Item P-620.5.1 Surface Preparation, Lump Sum

Item P-620.5.2 Markings, Lump Sum

Item P-620.5.3 Reflective Media, Lump Sum

Item P-620.5.4 Temporary Markings, Lump Sum

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.

ASTM International (ASTM)

ASTM D476	Standard Classification for Dry Pigmentary Titanium Dioxide Products
ASTM D968	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D1652	Standard Test Method for Epoxy Content of Epoxy Resins
ASTM D2074	Standard Test Method for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method
ASTM D2240	Standard Test Method for Rubber Property - Durometer Hardness
ASTM D7585	Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments
ASTM E303	Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
ASTM E1710	Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer
ASTM E2302	Standard Test Method for Measurement of the Luminance Coefficient Under Diffuse Illumination of Pavement Marking Materials Using a Portable Reflectometer

ASTM G154 Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

Code of Federal Regulations (CFR)

40 CFR Part 60, Appendix A-7, Method 24
Determination of volatile matter content, water content, density, volume solids, and weight solids of surface coatings

29 CFR Part 1910.1200 Hazard Communication

Federal Specifications (FED SPEC)

FED SPEC TT-B-1325D Beads (Glass Spheres) Retro-Reflective

FED SPEC TT-P-1952F Paint, Traffic and Airfield Marking, Waterborne

FED STD 595 Colors used in Government Procurement

Commercial Item Description

A-A-2886B Paint, Traffic, Solvent Based

Advisory Circulars (AC)

AC 150/5340-1 Standards for Airport Markings

AC 150/5320-12 Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces

END OF ITEM P-620

Item P-620 Runway and Taxiway Marking

DESCRIPTION

620-1.1 This item shall consist of the preparation and painting of numbers, markings, and stripes on the surface of runways, taxiways, and aprons, in accordance with these specifications and at the locations shown on the plans, or as directed by the Resident Project Representative (RPR). The terms "paint" and "marking material" as well as "painting" and "application of markings" are interchangeable throughout this specification.

MATERIALS

620-2.1 Materials acceptance. The Contractor shall furnish manufacturer's certified test reports, for materials shipped to the project. The certified test reports shall include a statement that the materials meet the specification requirements. This certification along with a copy of the paint manufacturer's surface preparation; marking materials, including adhesion, flow promoting and/or floatation additive; and application requirements must be submitted and approved by the Resident Project Representative (RPR) prior to the initial application of markings. The reports can be used for material acceptance or the RPR may perform verification testing. The reports shall not be interpreted as a basis for payment. The Contractor shall notify the RPR upon arrival of a shipment of materials to the site. All material shall arrive in sealed containers that are easily quantifiable for inspection by the RPR.

620-2.2 Marking materials.

Table 1. Marking Materials

Paint				Glass Beads	
Type	Color	Fed Std. 595 Number	Application Rate Maximum	Type	Application Rate Minimum
I	White	37925	115 ft2/gal	I	7 lb/gal
I	Yellow	33538 or 33655	115 ft2/gal	I	7 lb/gal
I	Black	37038	115 ft2/gal	I	7 lb/gal
I	Red	31136	115 ft2/gal	I	7 lb/gal

a. Paint. Paint shall be in accordance with the requirements of this paragraph. Paint colors shall comply with Federal Standard No. 595. Type I. Waterborne. Paint shall meet the requirements of Federal Specification TT-P-1952F, Type I. The non-volatile portion of the vehicle for all paint types shall be composed of a 100% acrylic polymer as determined by infrared spectral analysis. The acrylic resin used for Type III shall be 100% cross linking acrylic as evidenced by infrared peaks at wavelengths 1568, 1624, and 1672 cm-l with intensities equal to those produced by an acrylic resin known to be 100% cross linking.

b. Reflective media. Glass beads for white and yellow paint shall meet the requirements for Federal Specification TT-B-1325D Type I, Gradation. Glass beads for red and pink paint shall meet the requirements for Type I, Gradation. Glass beads shall be treated with all compatible coupling agents recommended by the manufacturers of the paint and reflective media to ensure adhesion and embedment. Glass beads shall not be used in black and green paint. Type III glass beads shall not be used in red and pink paint.

c. Retroreflectivity shall be measured by a portable retroreflectometer according to ASTM E1710 and the practices in ASTM D7585 shall be followed for taking retroreflectivity readings with a portable

retroreflectometer and computing measurement averages. A vehicle-mounted retroreflectometer may also be used.

CONSTRUCTION METHODS

620-3.1 Weather limitations. Painting shall only be performed when the surface is dry, and the ambient temperature and the pavement surface temperature meet the manufacturer's recommendations in accordance with paragraph 620-2.1. Painting operations shall be discontinued when the ambient or surface temperatures does not meet the manufacturer's recommendations. Markings shall not be applied when the wind speed exceeds 10 mph unless windscreens are used to shroud the material guns. Markings shall not be applied when weather conditions are forecasts to not be within the manufacturers' recommendations for application and dry time.

620-3.2 Equipment. Equipment shall include the apparatus necessary to properly clean the existing surface, a mechanical marking machine, a bead dispensing machine, and such auxiliary hand-painting equipment as may be necessary to satisfactorily complete the job.

The mechanical marker shall be an atomizing spray-type or airless type marking machine with automatic glass bead dispensers suitable for application of traffic paint. It shall produce an even and uniform film thickness and appearance of both paint and glass beads at the required coverage and shall apply markings of uniform cross-sections and clear-cut edges without running or spattering and without over spray. The marking equipment for both paint and beads shall be calibrated daily.

620-3.3 Preparation of surfaces. Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance, or other contaminates that would reduce the bond between the paint and the pavement. Use of any chemicals or impact abrasives during surface preparation shall be approved in advance by the RPR. After the cleaning operations, sweeping, blowing, or rinsing with pressurized water shall be performed to ensure the surface is clean and free of grit or other debris left from the cleaning process.

a. Preparation of new pavement surfaces. The area to be painted shall be cleaned by broom, blower, water blasting, or by other methods approved by the RPR to remove all contaminants, including PCC curing compounds, minimizing damage to the pavement surface.

b. Preparation of pavement to remove existing markings. Existing pavement markings shall be removed by rotary grinding, water blasting, or by other methods approved by the RPR minimizing damage to the pavement surface. The removal area may need to be larger than the area of the markings to eliminate ghost markings. After removal of markings on asphalt pavements, apply a fog seal or seal coat to 'block out' the removal area to eliminate 'ghost' markings.

c. Preparation of pavement markings prior to remarking. Prior to remarking existing markings, loose existing markings must be removed minimizing damage to the pavement surface, with a method approved by the RPR. After removal, the surface shall be cleaned of all residue or debris.

Prior to the application of markings, the Contractor shall certify in writing that the surface is dry and free from dirt, grease, oil, laitance, or other foreign material that would prevent the bond of the paint to the pavement or existing markings. This certification along with a copy of the paint manufactures application and surface preparation requirements must be submitted to the RPR prior to the initial application of markings.

620-3.4 Layout of markings. The proposed markings shall be laid out in advance of the paint application. The locations of markings to receive glass beads shall be shown on the plans.

620-3.5 Application. A period of 10 days shall elapse between placement of surface course or seal coat and application of the permanent paint markings. Paint shall be applied at the locations and to the dimensions and spacing shown on the plans. Paint shall not be applied until the layout and condition of the surface has been approved by the RPR.

The edges of the markings shall not vary from a straight line more than 1/2 inch (12 mm) in 50 feet (15 m), and marking dimensions and spacing shall be within the following tolerances:

Marking Dimensions and Spacing Tolerance

Dimension and Spacing	Tolerance
36 inch (910 mm) or less	±1/2 inch (12 mm)
greater than 36 inch to 6 feet (910 mm to 1.85 m)	±1 inch (25 mm)
greater than 6 feet to 60 feet (1.85 m to 18.3 m)	±2 inch (50 mm)
greater than 60 feet (18.3 m)	±3 inch (76 mm)

The paint shall be mixed in accordance with the manufacturer's instructions and applied to the pavement with a marking machine at the rate shown in Table 1. The addition of thinner will not be permitted.

Glass beads shall be distributed upon the marked areas at the locations shown on the plans to receive glass beads immediately after application of the paint. A dispenser shall be furnished that is properly designed for attachment to the marking machine and suitable for dispensing glass beads. Glass beads shall be applied at the rate shown in Table 1. Glass beads shall not be applied to black paint or green paint. Glass beads shall adhere to the cured paint or all marking operations shall cease until corrections are made. Different bead types shall not be mixed. Regular monitoring of glass bead embedment and distribution should be performed.

620-3.6 Application--preformed thermoplastic airport pavement markings.

Preformed thermoplastic pavement markings not used.

620-3.7 Control strip. Prior to the full application of airfield markings, the Contractor shall prepare a control strip in the presence of the RPR. The Contractor shall demonstrate the surface preparation method and all striping equipment to be used on the project. The marking equipment must achieve the prescribed application rate of paint and population of glass beads (per Table 1) that are properly embedded and evenly distributed across the full width of the marking. Prior to acceptance of the control strip, markings must be evaluated during darkness to ensure a uniform appearance.

620-3.8 Retro-reflectance. Reflectance shall be measured with a portable retro-reflectometer meeting ASTM E1710 (or equivalent). A total of 6 reading shall be taken over a 6 square foot area with 3 readings taken from each direction. The average shall be equal to or above the minimum levels of all readings which are within 30% of each other.

Minimum Retro-Reflectance Values

Material	Retro-reflectance mcd/m^2/lux		
	White	**Yellow**	**Red**
Initial Type I	300	175	35
Initial Type III	600	300	35
Initial Thermoplastic	225	100	35
All materials, remark when less than[1]	100	75	10

[1] 'Prior to remarking determine if removal of contaminants on markings will restore retro-reflectance][not used]

620-3.9 Protection and cleanup. After application of the markings, all markings shall be protected from damage until dry. All surfaces shall be protected from excess moisture and/or rain and from disfiguration by spatter, splashes, spillage, or drippings. The Contractor shall remove from the work area all debris, waste, loose reflective media, and by-products generated by the surface preparation and application operations to the satisfaction of the RPR. The Contractor shall dispose of these wastes in strict compliance with all applicable state, local, and federal environmental statutes and regulations.

METHOD OF MEASUREMENT

620-4.1 Lump Sum. No separate measurement for payment will be made. The work covered by this section shall be considered as a subsidiary obligation of the Contractor under the other contract items.

620-4.1a The quantity of surface preparation shall be included as a lump sum within the Contract Bid Amount.

620-4.1b The quantity of markings shall be included as a lump sum within the Contract Bid Amount.

620-4.1c The quantity of reflective media shall be included as a lump sum within the Contract Bid Amount.

620-4.1d The quantity of temporary markings to shall be included as a lump sum within the Contract Bid Amount.

620-4.1e Not used.

BASIS OF PAYMENT

620-5.1 Payment for the work specified in this section and designated in the Contract Documents shall include all materials, equipment, labor, and incidentals required to furnish and install complete in place and shall be included within the Contract Bid Amount. Payment shall be made as lump sum.

620-5.1a Payment for surface preparation shall include all materials, equipment, labor, and incidentals required to furnish and install complete in place and shall be included within the Contract Bid Amount as a lump sum.

620-5.2b Payment for markings shall include all materials, equipment, labor, and incidentals required to furnish and install complete in place and shall be included within the Contract Bid Amount as a lump sum..

620-5.3c Payment for reflective media shall include all materials, equipment, labor, and incidentals required to furnish and install complete in place and shall be included within the Contract Bid Amount as a lump sum.

620-5.4d Payment for temporary markings shall include all materials, equipment, labor, and incidentals required to furnish and install complete in place and shall be included within the Contract Bid Amount as a lump sum.

620-5.5e Not used.

Item P-620.5.1 Surface Preparation, Lump Sum

Item P-620.5.2 Markings, Lump Sum

Item P-620.5.3 Reflective Media, Lump Sum

Item P-620.5.4 Temporary Markings, Lump Sum

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.

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ASTM D476	Standard Classification for Dry Pigmentary Titanium Dioxide Products
ASTM D968	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D1652	Standard Test Method for Epoxy Content of Epoxy Resins
ASTM D2074	Standard Test Method for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method
ASTM D2240	Standard Test Method for Rubber Property - Durometer Hardness
ASTM D7585	Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments
ASTM E303	Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
ASTM E1710	Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer
ASTM E2302	Standard Test Method for Measurement of the Luminance Coefficient Under Diffuse Illumination of Pavement Marking Materials Using a Portable Reflectometer

ASTM G154 Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

Code of Federal Regulations (CFR)

40 CFR Part 60, Appendix A-7, Method 24
Determination of volatile matter content, water content, density, volume solids, and weight solids of surface coatings

29 CFR Part 1910.1200 Hazard Communication

Federal Specifications (FED SPEC)

FED SPEC TT-B-1325D Beads (Glass Spheres) Retro-Reflective

FED SPEC TT-P-1952F Paint, Traffic and Airfield Marking, Waterborne

FED STD 595 Colors used in Government Procurement

Commercial Item Description

A-A-2886B Paint, Traffic, Solvent Based

Advisory Circulars (AC)

AC 150/5340-1 Standards for Airport Markings

AC 150/5320-12 Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces

END OF ITEM P-620