

CITY OF HOUSTON



George Bush Intercontinental ~ William P. Hobby ~ Ellington Airport

Sylvester Turner

Mayor

Mario C. Diaz Director of Aviation

June 8, 2020

SUBJECT: Addendum No. 1

- **REFERENCE:** Invitation to Bid (ITB) Solicitation No. H27-RR770B-2020-011; PN 770B Runway 17-35 Demolition at William P. Hobby Airport
- To: All Prospective Respondent

This Addendum is being issued to add the following documents to the Project Manual:

- I. Site Work (FAA Specifications)
- II. 100% Plans for Construction
- III. 100% Construction Safety and Phasing Plan

When issued, Addendum shall automatically become part of the solicitation documents and shall supersede any previous specification(s) and/or provision(s) in conflict with the Addendum. Addendum will be incorporated into the Agreement as applicable. It is the responsibility of the bidder(s) to ensure that it has obtained all such letter(s). By submitting a bid on this project, bidder(s) shall be deemed to have received all Addendum and to have incorporated them into their bid.

If further clarification is needed regarding this solicitation, please contact Al Oracion, Sr. Procurement Specialist, via email at <u>Alfredo.Oracion@houstontx.gov</u>.

DS W

Cathy Vander Plaats

Cathy² Wander Plaats Procurement Officer Houston Airport System

DocuSianed by:

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 10 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:

FAA TECHNICAL SPECIFICATIONS C-100-3

- 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 ltem, as well as any additional QC tests that the Contractor deems necessary to adequately control production and/or construction processes.

FAA TECHNICAL SPECIFICATIONS C-100-4 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.

FAA TECHNICAL SPECIFICATIONS C-100-5 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. Contractor Quality Control Program (CQCP) is for the personnel, tests, facilities and documentation required to implement the CQCP. The CQCP will be paid as a lump sum with the following schedule of partial payments:

a. With first pay request, 25% with approval of CQCP and completion of the Quality Control (QC)/Quality Assurance (QA) workshop.

b. When 25% or more of the original contract is earned, an additional 25%.

c. When 50% or more of the original contract is earned, an additional 20%.

d. When 75% or more of the original contract is earned, an additional 20%

e. After final inspection and acceptance of project, the final 10%.

BASIS OF PAYMENT

100-14 Payment will be made under:

Item C-100 Contractor Quality Control Program (CQCP)

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-901 shall 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 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.

102-2.5 Erosion Control Sediment Logs. Sediment logs shall be 12 inches in diameter, made with 99.9% weed-free wheat, oat, barley, or rice straw, compressed inside tubular polypropylene netting, with both ends tied shut. Sediment logs shall weigh a minimum of 3 pounds per foot of length.

102-2.5 Stabilized Construction Exits. Stabilized construction exits shall meet the requirements of Section 01575.

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.

FAA TECHNICAL SPECIFICATIONS C-102-2 **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 sediment control logs. The sediment logs shall be installed with wooden or metal stakes placed at a maximum of 48 inches on center and driven into the ground a minimum of 24 inches, with less than 2 inches protruding above the log. Individual sediment log segments shall be tightly adjoined or overlapped a minimum of 5 feet. The Contractor shall remove and dispose of silt that accumulates during construction and prior to establishment of permanent erosion control. The sediment control logs shall be maintained in good working condition until permanent erosion control is established. Sediment control logs shall be removed upon approval of the RPR.

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 the square yard (square meter).
- **b.** Installation and removal of silt fence will be measured by the linear foot (meter).
- **c.** Installation and removal of erosion control sediment logs will be measured by the linear foot (meter).
- d. Installation and removal of stabilized construction exits will be measured per each.

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 for under:

Item C-102-5.1a Temporary seeding and mulching - per square yard (square meter)

Item C-102-5.1b Installation and removal of erosion control sediment logs - per linear foot (meter)

Item C-102-5.1d Installation and removal of stabilized construction exits - per each

Where other directed work falls within the specifications for a work item that has a contract price, the units of work shall be measured and paid for at the contract unit price bid for the various items.

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 limited to 10 percent of the total project cost.

105-3 Posted notices. Prior to commencement of construction activities, the Contractor must post the following documents in a prominent and accessible place where they may be easily viewed by all employees of the prime Contractor and by all employees of subcontractors engaged by the prime Contractor: Equal Employment Opportunity (EEO) Poster "Equal Employment Opportunity is the Law" in accordance with the Office of Federal Contract Compliance Programs Executive Order 11246, as amended; Davis Bacon Wage Poster (WH 1321) - DOL "Notice to All Employees" Poster; and Applicable Davis-Bacon Wage Rate Determination. These notices must remain posted until final acceptance of the work by the Owner.

105-4 Engineer/RPR field office. The Contractor shall provide dedicated space for the use of the field 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 in accordance with local building codes. The field office shall additionally meet the requirements contained in Section 01505.

METHOD OF MEASUREMENT

105-5 Basis of measurement and payment. Based upon the contract lump sum price for "Mobilization" partial payments will be allowed as follows:

- a. With first pay request, 25%.
- **b.** When 25% or more of the original contract is earned, an additional 25%.
- c. When 50% or more of the original contract is earned, an additional 40%.

d. After Final Inspection, Staging area clean-up and delivery of all Project Closeout materials as required by Section 90, paragraph 90-11, *Contractor Final Project Documentation*, the final 10%.

BASIS OF PAYMENT

105-6 Payment will be made under:

Item C-105 Mobilization – per 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.

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

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. A second saw cut shall be made at 12 inches to 18 inches away from the pavement to remain, so that the majority of the pavement may be removed without damage. 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. 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. Asphalt pavement to be removed shall be cut to the full depth of the asphalt pavement around the perimeter of the area to be removed.

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 1/4 inch (6 mm). Any excess joint or crack sealer shall be removed from the pavement surface.

Wider cracks (over 1-1/2 inch wide (38 mm)), along with soft or sunken spots, indicate that the pavement or the pavement base should be repaired or replaced as stated below.

Cracks and joints may be filled with a mixture of emulsified asphalt and aggregate. The aggregate shall consist of limestone, volcanic ash, sand, or other material that will cure to form a hard substance. The combined gradation shall be as shown in the following table.

Sieve Size	Percent Passing
No. 4 (4.75 mm)	100
No. 8 (2.36 mm)	90-100
No. 16 (1.18 mm)	65-90
No. 30 (600 µm)	40-60
No. 50 (300 µm)	25-42
No. 100 (150 µm)	15-30
No. 200 (75 µm)	10-20

Gradation

Up to 3% cement can be added to accelerate the set time. The mixture shall not contain more than 20% natural sand without approval in writing from the RPR.

The proportions of asphalt emulsion and aggregate shall be determined in the field and may be varied to facilitate construction requirements. Normally, these proportions will be approximately one part asphalt emulsion to five parts aggregate by volume. The material shall be poured or placed into the joints or cracks and compacted to form a voidless mass. The joint or crack shall be filled to within +0 to -1/8 inches (+0 to -3 mm) of the surface. Any material spilled outside the width of the joint shall be removed from the pavement surface prior to constructing the overlay. Where concrete overlays are to be constructed, only the excess joint material on the pavement surface and vegetation in the joints need to be removed.

101-3.3 Removal of Foreign Substances/contaminates prior to seal-coat and/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.

Chemicals, high-pressure water, 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 highpressure 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. Existing asphalt pavements to be treated with a surface treatment shall be prepared as follows:

a. Patch asphalt pavement surfaces that have been softened by petroleum derivatives or have failed due to any other cause. Remove damaged pavement to the full depth of the damage and replace with new asphalt pavement similar to that of the existing pavement.

b. Repair joints and cracks in accordance with paragraph 101-3.2.

c. Remove oil or grease that has not penetrated the asphalt pavement by scrubbing with a detergent and washing thoroughly with clean water. After cleaning, treat these areas with an oil spot primer.

d. Clean pavement surface immediately prior to placing the surface treatment so that it is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film.

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. (Not Used)

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 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. Following routing, 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.

101-3.10 Removal of Pipe and other Buried Structures. (Not Used)

101-3.11 Removal of Electrical Conduit, Duct Banks, and other Buried Structures.

a. Removal of Existing Electrical Conduits and Duct Banks. Remove the electrical conduits and duct banks as indicated on the plans. The conduit material and concrete, if present, shall be legally disposed of off-site in a timely manner following removal. Trenches shall be backfilled with material equal to or better in quality than adjacent embankment. Trenches under paved areas must be compacted to 95% of ASTM D698.

b. Removal of Electrical Manholes and Light Base Cans. Where indicated on the plans or as directed by the RPR, electrical manholes, light base cans, and surrounding concrete shall be removed and legally disposed of off-site in a timely fashion after removal. Excavations after removal shall be backfilled with material equal or better in quality than adjacent embankment. Voids shall be backfilled with material equal to or better in quality than adjacent embankment. Trenches under paved areas must be compacted to 95% of ASTM D698.

c. Removal of Lighting Fixtures. Light fixtures shall be removed and stockpiled as shown on the drawings. Light fixtures removed shall be handled gently to avoid damage. Airport staff shall have the right to review all lighting fixtures and select those they wish to retain. Any products the airport does not wish to retain must be disposed of legally offsite by the contractor in a timely manner. Stockpile location shall be determined by the RPR.

d. Removal of Existing Signage. Existing signage shall be removed as shown on the contract drawings. Removal of a sign includes the above ground sign cabinet, concrete foundation and base can, any grounding elements, and any other ancillary items associated with the sign installation. Backfill of the void created by the sign foundation shall be with material equal or better in quality than adjacent embankment.

e. Removal of Existing Navigational Aids. Existing navigation aids shall be removed as shown on the contract drawings. These include the Runway 17 VASI (4 boxes and a control panel), Runway 35 PAPI (4 boxes and a control panel), and the Runway 35 REIL (2 boxes and a control panel). The equipment to be removed shall be turned over to the owner as noted on the contract drawings. Backfill of the void created by any foundation removals shall be with material equal or better in quality than adjacent embankment.

f. Removal of Existing Cable. All cable removed from trench, conduit, or duct bank as a part of this project shall be disposed of legally offsite by the contractor in a timely fashion.

METHOD OF MEASUREMENT

101-4.1 Pavement removal. The unit of measurement for pavement removal shall be the number of square yards (square meters) removed by the Contractor. Any pavement removed outside the limits of removal because the pavement was damaged by negligence on the part of the Contractor shall not be included in the measurement for payment. No direct measurement or payment shall be made for saw cutting. Saw cutting shall be incidental to pavement removal. No separate measurement will be made for removal of base and/or subbase course(s) indicated in the individual pay items. All hauling and disposal off-site 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 or disposal on any part of the work.

101-4.2 Joint and crack repair. The unit of measurement for joint and crack repair shall be the linear foot (meter) of joint.

101-4.3 Removal of Foreign Substances/contaminates. The unit of measurement for foreign Substances/contaminates removal shall be the square foot (meter).

101-4.4 Removal of Existing Pavement Markings. The unit of measurement for removing existing pavement markings shall be the number of square feet (square meters) removed by the Contractor on existing pavement surfaces to remain. No measurement will be made of pavement markings removed on pavements to be demolished. No separate measurement will be made for the fog seal or seal coat applied to block out areas where existing markings were removed.

101-4.5 Removal of Electrical Conduit, Duct Banks, and other Buried Structures. Measurement for removal of existing fixtures and their associated base cans shall be on a pereach basis, and shall include the fixture, base can, concrete anchor, and any cabling within the base can, in addition to the backfill of the void created by the demolition to proposed grade.

Removal of electrical conduit, duct banks, cabling and other buried structures shall be by the linear foot. The linear foot cost shall include removal of all material associated with the conduit/duct and cable regardless of the size, including any concrete encasement, and the backfill of the void created by the conduit/duct installation. The price per each or per foot shall be full compensation for all labor, equipment, tools, and incidentals necessary to complete this item in accordance with paragraph 100-3.2. In locations where the conduit enters under pavement that is to remain, the conduit shall be capped and have a pull string installed. This work shall be incidental to the termination of the demolition of the conduit.

Removal of navigational aids shall be paid on a lump sum basis. The lump sum cost shall include removal of all above ground navigational aid equipment and storage at location of RPR's choosing for owner to take possession, the removal of all concrete foundations, grounding, and any ancillary power supply infrastructure associated at the aid installation site. Backfill of the void created by the foundations shall be included in the lump sum cost.

Removal of airfield signage shall be paid on a per-each basis. The cost shall include the removal of all above ground signage elements, the removal of the concrete foundation including the base can, any grounding elements or other associated items integral to the signage installation. Backfill of the sign foundation void shall be included in the line item cost.

Removal of airfield electrical structures, such as handholes or other buried structures, shall be on a per-each basis. The cost shall include the removal of the concrete structure, and any grounding elements or other associated items integral to the structure installation. Backfill of the structure void once demolished shall be included in the line item cost.

BASIS OF PAYMENT

100-5.1 Payment. Payment shall be made at contract unit price for the unit of measurement as specified above. This price 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, 15" Portland Cement Concrete Pavement w/ 6" Cement Treated Base Course - per square yard (square meter)
Item P-101-5.2	Pavement Removal,14" Reinforced Portland Cement Concrete Pavement, w/ 7" Cement Treated Base Course - per square yard (square meter)
Item P-101-5.3	Pavement Removal, 3"-5" Polymer Modified Asphalt Cement Pavement, w/ 6" Portland Cement Concrete Pavement - per square yard (square meter)
Item P-101-5.4	Pavement Removal, 12.5" Polymer Modified Asphalt Cement Pavement, w/ 5.5" Portland Cement Concrete Pavement - per square yard (square meter)
ltem P-101-5.5	Pavement Removal, 3"-5" Polymer Modified Asphalt Cement Pavement, w/ Rubberized Asphalt Cement Concrete Pavement and Cement Treated Base Course - per square yard (square meter)

FAA TECHNICAL SPECIFICATIONS P-101-5

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Item P-101-5.6	Pavement Removal, 2.5"-9" Polymer Modified Asphalt Cement Pavement, w/ 16" Portland Cement Concrete Pavement and 3"-8" Stabilized Sand or Shell Base Course - per square yard (square meter)
Item P-101-5.7	Pavement Removal, 15" Portland Cement Concrete Pavement, w/ 6" Cement Treated Base Course - per square yard (square meter)
Item P-101-5.8	Pavement Removal, 4" Polymer Modified Asphalt Cement Pavement, w/ Stress-Absorbing Membrane Interlayer and 10" Cement Treated Base Course - per square yard (square meter)
Item P-101-5.9	Pavement Removal, 12" Portland Cement Concrete Pavement, w/ 2" Asphalt Stabilized Crushed Portland Cement Concrete - per

- Item P-101-5.10 Pavement Removal, Unknown Taxiway G1 Surface and Base per
- Item P-101-5.11 Pavement Removal, Unknown Blast Pad Surface and Base per square yard (square meter)
- Item P-101-5.12 Joint and crack repair per linear foot (meter)
- Item P-101-5.13 Removal of Foreign Substances/contaminates per square foot (square meter)
- Item P-101-5.14 Removal of Existing Pavement Markings per square foot (square meter)
- Item P-100-5.15 Removal of Elevated Light and Associated Base Can Per Each
- Item P-100-5.16 Removal of In-Pavement Light and Associated Base Can Per Each
- Item P-100-5.17 Removal of Electrical Conduit or Duct Per Linear Foot
- Item P-100-5.18 Removal of Electrical Cable Per Linear Foot
- Item P-100-5.19 Removal of Airfield Sign and Foundation Per Each
- Item P-100-5.20 Removal of Airfield Navigational Aids Per Lump Sum
- Item P-100-5.21 Removal of Lighting Fixture from Base Can to Remain Per Each
- Item P-100-5.22 Removal of Airfield Electrical Structure Per Each

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

FAA TECHNICAL SPECIFICATIONS P-101-6

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.

FAA TECHNICAL SPECIFICATIONS P-152-1

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.

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 cubic yard (per cubic meter) for unclassified excavation. 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 D 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 $\pm 2\%$ 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 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 D 698.

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 sodding in accordance with Item T-904.

The in-place field density shall be determined in accordance with ASTM D 6938 using Procedure A, the direct transmission method, and ASTM D 6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D 6938. The RPR shall perform all density tests. 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.

152-2.9 Proof rolling. (Not used)

152-2.10 Compaction requirements. 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 $\pm 2\%$ 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 $\frac{34}{4}$ inch (19.0 mm) sieve, follow the 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 3,000 S.Y. of subgrade. All quality assurance testing shall be done by the RPR.

The in-place field density shall be determined in accordance with 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. 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 Measurement for payment specified by the cubic yard (cubic meter) shall be computed by the average end areas of design cross sections. The end area is that bound by the original ground line established by field cross-sections and the final theoretical pay line established by cross-sections shown on the plans, subject to verification by the RPR.

152-3.1 The quantity of unclassified excavation to be paid for shall be the number of cubic yards (cubic meters) measured in its original position. Measurement shall not include the quantity of materials excavated without authorization beyond normal slope lines, or the quantity of material used for purposes other than those directed.

152-3.2 The quantity of embankment in place shall be the number of cubic yards (cubic meters) measured in its final position.

BASIS OF PAYMENT

152-4.1 Unclassified excavation payment shall be made at the contract unit price per cubic yard (cubic meter). This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

152-4.2 For embankment in place, payment shall be made at the contract unit price per cubic yard (cubic meter). This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-152-4.1	Unclassified Excavation - per cubic yard (cubic meter)
Item P-152-4.2	Embankment in place - per cubic yard (cubic meter)

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
0.4	

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

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ITEM P-153 CONTROLLED LOW-STRENGTH MATERIAL (CLSM)

DESCRIPTION

153-1.1 This item shall consist of furnishing, transporting, and placing a controlled low-strength material (CLSM) as flowable backfill in trenches or at other locations shown on the plans or as directed by the Resident Project Representative (RPR).

MATERIALS

153-2.1 Materials.

a. Cement. Cement shall conform to the requirements of ASTM C150 Type I/II.

b. Fly ash. Fly ash shall conform to ASTM C618, Class C or F.

c. Fine aggregate (sand). Fine aggregate shall conform to the requirements of ASTM C33 except for aggregate gradation. Any aggregate gradation which produces the specified performance characteristics of the CLSM and meets the following requirements, will be accepted.

Sieve Size	Percent Passing by weight
3/4 inch (19.0 mm)	100
No. 200 (75 µm)	0 - 12

d. 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.

MIX DESIGN

153-3.1 Proportions. The Contractor shall submit, to the RPR, a mix design including the proportions and source of aggregate, fly ash, cement, water, and approved admixtures. No CLSM mixture shall be produced for payment until the RPR has given written approval of the proportions. The proportions shall be prepared by a laboratory and shall remain in effect for the duration of the project. The proportions shall establish a single percentage or weight for aggregate, fly ash, cement, water, and any admixtures proposed. Laboratory costs are incidental to this item.

a. Compressive strength. CLSM shall be designed to achieve a 28-day compressive strength of 100 to 200 psi (690 to 1379 kPa) when tested in accordance with ASTM D4832, with no significant strength gain after 28 days.

b. Consistency. Design CLSM to achieve a consistency that will produce an approximate 8inch (200 mm) diameter circular-type spread without segregation. CLSM consistency shall be determined per ASTM D6103.

CONSTRUCTION METHODS

153-4.1 Placement.

a. Placement. CLSM may be placed by any reasonable means from the mixing unit into the space to be filled. Agitation is required during transportation and waiting time. Placement shall be performed so structures or pipes are not displaced from their final position and

FAA TECHNICAL SPECIFICATIONS P-153-1 intrusion of CLSM into unwanted areas is avoided. The material shall be brought up uniformly to the fill line shown on the plans or as directed by the RPR. Each placement of CLSM shall be as continuous an operation as possible. If CLSM is placed in more than one lift, the base lift shall be free of surface water and loose foreign material prior to placement of the next lift.

b. Contractor Quality Control. The Contractor shall collect all batch tickets to verify the CLSM delivered to the project conforms to the mix design. The Contractor shall verify daily that the CLSM is consistent with 153-3.1a and 153-3.1b. Adjustments shall be made as necessary to the proportions and materials as needed. The Contractor shall provide all batch tickets to the RPR.

c. Limitations of placement. CLSM shall not be placed on frozen ground. Mixing and placing may begin when the air or ground temperature is at least $35^{\circ}F$ (2°C) and rising. Mixing and placement shall stop when the air temperature is $40^{\circ}F$ (4°C) and falling or when the anticipated air or ground temperature will be $35^{\circ}F$ (2°C) or less in the 24-hour period following proposed placement. At the time of placement, CLSM shall have a temperature of at least $40^{\circ}F$ (4°C).

153-4.2 Curing and protection

a. Curing. The air in contact with the CLSM shall be maintained at temperatures above freezing for a minimum of 72 hours. If the CLSM is subjected to temperatures below 32°F (0°C), the material may be rejected by the RPR if damage to the material is observed.

b. Protection. The CLSM shall not be subject to loads and shall remain undisturbed by construction activities for a period of 48 hours or until a compressive strength of 15 psi (105 kPa) is obtained. The Contractor shall be responsible for providing evidence to the RPR that the material has reached the desired strength. Acceptable evidence shall be based upon compressive tests made in accordance with paragraph 153-3.1a.

153-4.3 Quality Assurance (QA) Acceptance. CLSM QA acceptance shall be based upon batch tickets provided by the Contractor to the RPR to confirm that the delivered material conforms to the mix design.

METHOD OF MEASUREMENT

153-5.1 Measurement.

No separate measurement for payment shall be made for controlled low strength material (CLSM). CLSM shall be considered necessary and incidental to the work of this Contract.

BASIS OF PAYMENT

153-6.1 Payment.

No payment will be made separately or directly for controlled low strength material (CLSM). CLSM shall be considered necessary and incidental to the work of this Contract.

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

FAA TECHNICAL SPECIFICATIONS P-153-2

ASTM International (ASTM)

ASTM C33	Standard Specification for Concrete Aggregates
ASTM C150	Standard Specification for Portland Cement
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C595	Standard Specification for Blended Hydraulic Cements
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D4832	Standard Test Method for Preparation and Testing of Controlled Low-Strength Material (CLSM) Test Cylinders
ASTM D6103	Flow Consistency of Controlled Low Strength Material (CLSM)

END OF ITEM P-153

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ITEM P-608 EMULSIFIED ASPHALT SEAL COAT

DESCRIPTION

608-1.1 This item shall consist of the application of a emulsified asphalt surface treatment composed of an emulsion of natural and refined asphalt materials, water and a polymer additive, for taxiways and runways with the application of a suitable aggregate to maintain adequate surface friction; and airfield secondary and tertiary pavements including low-speed taxiways, shoulders, overruns, roads, parking areas, and other general applications with or without aggregate applied as designated on the plans. The terms seal coat, asphalt sealer, and asphalt material are interchangeable throughout this specification. The term emulsified asphalt means an emulsion of natural and refined asphalt materials.

MATERIALS

608-2.1 Aggregate. The aggregate material shall be a dry, clean, dust and dirt free, sound, durable, angular shaped manufactured specialty sand, such as that used as an abrasive, with a Mohs hardness of 6 to 8. The Contractor shall submit the specialty sand manufacturer's technical data and a manufacturer's Certificate of Analysis (COA) indicating that the specialty sand meets the requirements of the specification to the RPR prior to start of construction. The sand must be approved for use by the RPR and shall meet the following gradation limits when tested in accordance with ASTM C136 and ASTM C117:

Sieve Designation (square openings)	Individual Percentage Retained by Weight
No. 10 (2.00 mm)	0
No. 14 (1.41 mm)	0-4
No. 16 (1.18 mm)	0-8
No. 20 (850 μm)	0-35
No. 30 (600 μm)	20-50
No. 40 (425 μm)	10-45
No. 50 (300 μm)	0-20
No. 70 (212 μm)	0-5
No. 100 (150 μm)	0-2
No. 200 (75 μm)	0-2

Locally available sand or abrasive material that is slightly outside of the gradation requirements may be approved by the RPR with concurrence by the seal coat manufacturer for the use of locally available sand or abrasive material. The RPR and manufacturer's field representative should verify acceptance during application of Control strips indicated under paragraph 608-3.2. The Contractor shall provide a certification showing particle size analysis and properties of the material delivered for use on the project. The Contractor's certification may be subject to verification by testing the material delivered for use on the project.

608-2.2 Asphalt Emulsion. The asphalt emulsion shall meet the properties in the following table:

		-
Properties	Specification	Limits
Viscosity, Saybolt Furol at 77°F (25°C)	ASTM D7496	20 – 100 seconds
Residue by Distillation or Evaporation	ASTM D6997 or ASTM D6934	57% minimum
Sieve Test	ASTM D6933	0.1% maximum
24-hour Stability	ASTM D6930	1% maximum
5-day Settlement Test	ASTM D6930	5.0% maximum
Particle Charge ¹	ASTM D7402	Positive 6.5 maximum pH

Concentrated Asphalt Emulsion Properties

¹ pH may be used in lieu of the particle charge test which is sometimes inconclusive in slow setting, asphalt emulsions.

The asphalt material base residue shall contain not less than 20% gilsonite, or uintaite and shall not contain any tall oil pitch or coal tar material and shall contain no less than one percent (1%) polymer.

Properties	Specification	Limits
Viscosity at 275°F (135°C)	ASTM D4402	1750 cts maximum
Solubility in 1, 1, 1 trichloroethylene	ASTM D2042	97.5% minimum
Penetration	ASTM D5	50 dmm maximum
Asphaltenes	ASTM D2007	15% minimum
Saturates	ASTM D2007	15% maximum
Polar Compounds	ASTM D2007	25% minimum
Aromatics	ASTM D2007	15% minimum

The asphalt emulsion, when diluted in the volumetric proportion of two parts concentrated asphalt material to one part hot water shall have the following properties:

Properties	Specification	Limits		
In Ready-to-Apply Form, two parts concentrate to one part water, by volume				
Viscosity, Saybolt Furol at 77°F (25°C)	ASTM D7496	5 – 50 seconds		
Residue by Distillation or Evaporation	ASTM D6997 or ASTM D6934	38% minimum		
Pumping Stability ¹		Pass		

¹ Pumping stability is tested by pumping one pint (475 ml) of seal coat diluted one (1) part concentrate to one (1) part water, at 77°F (25°C), through a 1/4-inch (6 mm) gear pump operating 1750 rpm for 10 minutes with no significant separation or coagulation.

The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the emulsified asphalt delivered to the project. If the asphalt emulsion is diluted at other than the manufacturer's facility, the Contractor shall provide a supplemental COA from an independent laboratory verifying the asphalt emulsion properties.

The COA shall be provided to and approved by the RPR before the emulsified asphalt is applied. The furnishing of the vendor's certified test report for the asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

The asphalt material storage and handling temperature shall be between $50^{\circ}F - 160^{\circ}F$ ($10^{\circ}C - 70^{\circ}C$) and the material shall be protected from freezing, or whenever outside temperature drops below $40^{\circ}F$ ($4^{\circ}C$) for prolonged time periods.

Contractor shall provide a list of airport pavement projects, exposed to similar climate conditions, where this product has been successfully applied within at least 5 years of the project.

608-2.3 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. Water used in making and diluting the emulsion shall be potable, with a maximum hardness of 90ppm calcium and 15ppm magnesium; deleterious iron, sulfates, and phosphates maximum 7ppm, and less than 1ppm of organic byproducts. Water shall be a minimum of 140°F (60°C) prior to adding to emulsion.

608-2.4 Polymer. The polymer shall meet the properties in the following table:

Properties	Limits
Solids Content	47% to 65%,
	Percent by Weight
Weight	8.0 to 9.0 pounds/gallon (1.07 to 1.17 kg/L)
рН	3.0 to 8.0
Particle Charge	Nonionic/Cationic
Mechanical Stability	Excellent
Film Forming Temperature, °C	+5°C, minimum
Tg, °C	22°C, maximum
The manufacturer shall provide a copy of the Certificate of Analysis (COA) for the polymer used in the seal coat; and the Contractor shall include the COA with the emulsified asphalt COA when submitting to the RPR.

608-2.5 Seal Coat with Aggregate. The Contractor shall submit friction test data from no less than one of the airport projects identified under 608-2.2. The test data must be from the same project and include technical details on application rates, aggregate rates, and point of contact at the airport to confirm use and success of sealer with aggregate.

Friction test data in accordance with AC 150/5320-12, at 40 or 60 mph (65 or 95 km/h) wet, must include as a minimum; the friction value prior to sealant application; two values, between 24 and 96 hours after application, with a minimum of 24 hours between tests; and one value between 180 days and 360 days after the application. The results of the tests between 24 and 96 hours shall indicate friction is increasing at a rate to obtain similar friction value of the pavement surface prior to application, and the long-term test shall indicate no apparent adverse effect with time relative to friction values and existing pavement surface.

Seal coat material submittal without required friction performance will not be approved. Friction tests performed on this project cannot be used as a substitute of this requirement.

COMPOSITION AND APPLICATION RATE

608-3.1 Application Rate. The approximate amounts of materials per square yard (square meter) for the asphalt surface treatment shall be as provided in the table for the treatment area(s) at the specified dilution rate(s) as noted on the plans. The actual application rates will vary within the range specified to suit field conditions and will be recommended by the manufacturer's representative and approved by the RPR from the test area/sections evaluation.

Dilution	Quantity of Emulsion	Quantity of Aggregate
Rate	gal/yd ² (l/m ²)	Ib/yd ² (kg/m ²)
2:1	0.08-0.17 (0.36-0.77)	0.20-0.50 (0.11-0.27)

Application Rate

608-3.2 Control areas and control strips. Prior to full application, the control strip must be accepted by the RPR. The surface preparation, personnel, equipment, and method of operation used on the test area(s) and control strip(s) shall be the same as used on the remainder of the work.

A qualified manufacturer's representative shall be present in the field to assist the Contractor in applying control areas and/or control strips to determine the appropriate application rate of both emulsion and aggregate to be approved by the RPR.

A test area(s) and control strip(s) shall be applied for each differing asphalt pavement surface identified in the project. The test area(s) and control strip(s) shall be used to determine the material application rate(s) of both emulsion and sand prior to full production.

a. For taxiway, taxilane and apron surfaces. Prior to full application, the Contractor shall place test areas at varying application rates as recommended by the Contractor's manufacturer's representative to determine appropriate application rate(s). The test areas will be located on

representative section(s) of the pavement to receive the asphalt surface treatment designated by the RPR.

b. For runway and high-speed exit taxiway surfaces. Prior to full application, the Contractor shall place a series of control strips a minimum of 300 feet (90 m) long by 12 feet (3.6 m) wide, or width of anticipated application, whichever is greater, at varying application rates as recommended by the manufacturer's representative and acceptable to the RPR to determine appropriate application rate(s). The control strips should be separated by a minimum of 200 feet between control strips. The area to be tested will be located on a representative section of the pavement to receive the asphalt surface treatment designated by the RPR. The control strips should be placed under similar field conditions as anticipated for the actual application. The skid resistance of the existing pavement shall be determined for each control strip with a continuous friction measuring equipment (CFME). The skid resistance of existing pavement can be immediately adjacent to the control strip or at the same location as the control strip if testing prior to application. The Contractor may begin testing the skid resistance of runway and high-speed exit taxiway control strips after application of the asphalt surface treatment has fully cured, generally 8 to 36 hours after application of the control strips depending on site and environmental conditions. Aircraft shall not be permitted on the runway or high speed exit taxiway control strips until such time as the Contractor validates that its surface friction meets the maintenance planning friction levels in AC 150/5320-12, Table 3-2 when tested at speeds of 40 and 60 mph (65 and 95 km/h) wet with approved CFME.

If the control strip should prove to be unsatisfactory, necessary adjustments to the application rate, placement operations, and equipment shall be made. Additional control strips shall be placed and additional skid resistance tests performed and evaluated. Full production shall not begin without the RPR's approval of an appropriate application rate(s). Acceptable control strips shall be paid for in accordance with paragraph 608-8.1.

CONSTRUCTION METHODS

608-4.1 Worker safety. The Contractor shall obtain a Safety Data Sheet (SDS) for both the asphalt emulsion product and sand and require workmen to follow the manufacturer's recommended safety precautions.

608-4.2 Weather limitations. The asphalt emulsion shall be applied only when the existing pavement surface is dry and when the weather is not foggy, rainy, or when the wind velocity will prevent the uniform application of the material. No material shall be applied in strong winds that interfere with the uniform application of the material(s), or when dust or sand is blowing or when rain is anticipated within eight (8) hours of application completion. The atmospheric temperature and the pavement surface temperature shall both be at, or above 60°F (16°C) and rising. Seal coat shall not be applied when pavement temperatures are expected to exceed 130°F within the subsequent 72 hours if traffic will be opened on pavement within those 72 hours. During application, account for wind drift. Cover existing buildings, structures, runway edge lights, taxiway edge lights, informational signs, retro-reflective marking and in-pavement duct markers as necessary to protect against overspray before applying the emulsion. Should emulsion get on any light or marker fixture, promptly clean the fixture. If cleaning is not satisfactory to the RPR, the Contractor shall replace any light, sign or marker with equivalent equipment at no cost to the Owner.

608-4.3 Equipment and tools. The Contractor shall furnish all equipment, tools, and machinery necessary for the performance of the work.

a. Pressure distributor. The emulsion shall be applied with a manufacturer-approved computer rate-controlled asphalt distributor. The equipment shall be in good working order and contain no contaminants or diluents in the tank. Spray bar tips must be clean, free of burrs, and of a size to maintain an even distribution of the emulsion. Any type of tip or pressure source is suitable that will maintain predetermined flow rates and constant pressure during the application process with application speeds under eight (8) miles per hour (13 km per hour) or seven hundred (700) feet per minute (213 m per minute). The equipment will be tested under pressure for leaks and to ensure proper set-up before use. The Contractor will provide verification of truck set-up (via a test-shot area), including but not limited to, nozzle tip size appropriate for application per nozzle manufacturer, spray-bar height and pressure and pump speed appropriate for the viscosity and temperature of sealer material, evidence of triple-overlap spray pattern, lack of leaks, and any other factors relevant to ensure the truck is in good working order before use.

The distributor truck shall be equipped with a 12-foot (3.7-m), minimum, spray bar with individual nozzle control. The distributor truck shall be capable of specific application rates in the range of 0.05 to 0.25 gallons per square yard (0.15 to 0.80 liters per square meter). These rates shall be computer-controlled rather than mechanical. The distributor truck shall have an easily accessible thermometer that constantly monitors the temperature of the emulsion, and have an operable mechanical tank gauge that can be used to cross-check the computer accuracy.

The distributor truck shall effectively heat and mix the material to the required temperature prior to application in accordance with the manufacturer's recommendations.

The distributor shall be equipped with a hand sprayer to spray the emulsion in areas not accessible to the distributor truck.

b. Aggregate spreader. The asphalt distributor truck will be equipped with an aggregate spreader mounted to the distributor truck that can apply sand to the emulsion in a single pass operation without driving through wet emulsion. The aggregate spreader shall be equipped with a variable control system capable of uniformly distributing the sand at the specified rate at varying application widths and speeds. The aggregate spreader must be adjusted to produce an even and accurate application of specified aggregate. Prior to any seal coat application, the aggregate spreader will be calibrated onsite to ensure acceptable uniformity of spread. The RPR will observe the calibration and verify the results. The aggregate spreader will be re-calibrated each time the aggregate rate is changed either during the application of test strips or production. The Contractor may consult the seal coat manufacturer representative for procedure and guidance. The sander shall have a minimum hopper capacity of 3,000 pounds (1361 kg) of sand. Push-type hand sanders will be allowed for use around lights, signs and other obstructions, if necessary.

c. Power broom/blower. A power broom and/or blower shall be provided for removing loose material from the surface to be treated.

d. Equipment calibration. Asphalt distributors must be calibrated within the same construction season in accordance with ASTM D2995. The Contractor must furnish a current calibration certification for the asphalt distributor truck from any State or other agency as approved by the RPR.

608-4.4 Preparation of asphalt pavement surfaces. Clean pavement surface immediately prior to placing the seal coat so that it is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film. Remove oil or grease from the asphalt pavement by scrubbing with a detergent, washing thoroughly with clean water, and then treat these areas with a spot primer. Any additional surface preparation, such as crack repair, shall be in accordance with Item P-101, paragraph 101-3.6.

FAA TECHNICAL SPECIFICATIONS P-608-6 **608-4.5 Emulsion mixing.** The application emulsion shall be obtained by blending asphalt material concentrate, water and polymer, if specified. Always add heated water to the asphalt material concentrate, never add asphalt material concentrate to heated water. Mix one part heated water to two parts asphalt material concentrate, by volume.

Add 1% polymer, by volume, to the emulsion mix. If the polymer is added to the emulsion mix at the plant, submit weight scale tickets to the RPR. As an option, the polymer may be added to the emulsion mix at the job site provided the polymer is added slowly while the asphalt distributor truck circulating pump is running. The mix must be agitated for a minimum of 15 minutes or until the polymer is mixed to the satisfaction of the RPR.

608-4.6 Application of asphalt emulsion. The asphalt emulsion shall be applied using a pressure distributor upon the properly prepared, clean and dry surface at the application rate recommended by the manufacturer's representative and approved by the RPR from the test area/sections evaluation for each designated treatment area. The asphalt emulsion should be applied at a temperature between 130°F (54°C) and 160°F (70°C) or in accordance with the manufacturer's recommendation.

If low spots and depressions greater than 1/2 inch (12 mm) in depth in the pavement surface cause ponding or puddling of the applied materials, the pavement surface shall be lightly broomed with a broom or brush type squeegee until the pavement surface is free of any pools of excess material.

During all applications, the surfaces of adjacent structures shall be protected to prevent their being spattered or marred.

608-4.7 Application of aggregate material. Immediately following the application of the asphalt emulsion, friction sand at the rate recommended by the manufacturer's representative and approved by the RPR from the test area/sections evaluation for each designated application area, shall be spread uniformly over the asphalt emulsion in a single-pass operation simultaneous with the sealer application. The aggregate shall be spread to the same width of application as the asphalt material and shall not be applied in such thickness as to cause blanketing.

Sprinkling of additional aggregate material, and spraying additional asphalt material over areas that show up having insufficient cover or bitumen, shall be done by hand whenever necessary. In areas where hand work is necessitated, the sand shall be applied before the sealant begins to break.

Minimize aggregate from being broadcast and accumulating on the untreated pavement adjacent to an application pass. Prior to the next application pass, the Contractor shall clean areas of excess or loose aggregate and remove from project site.

QUALITY CONTROL (QC)

608-5.1 Manufacturer's representation. The manufacturer's representative knowledgeable of the material, procedures, and equipment described in the specification is responsible to assist the Contractor and RPR in determining the appropriate application rates of the emulsion and aggregate, as well as recommendations for proper preparation and start-up of seal coat application. Documentation of the manufacturer representative's experience and knowledge for applying the seal coat product shall be furnished to the RPR a minimum of 10 work days prior to placement of the control strips. The cost of the manufacturer's representative shall be included in the Contractor's bid price.

608-5.2 Contractor qualifications. The Contractor shall provide documentation to the RPR that the seal coat Contractor is qualified to apply the seal coat, including personnel, and equipment, and has made at least three (3) applications similar to this project in the past two (2) years.

MATERIAL ACCEPTANCE

608-6.1 Application rate. The rate of application of the asphalt emulsion shall be verified at least twice per day.

608-6.2 Friction tests. Friction tests in accordance with AC 150/5320-12, Measurement, Construction, and Maintenance of Skid-Resistant Airport Pavement Surfaces, shall be performed on all runway and high-speed taxiways that received a seal coat. Each test includes performing friction tests at 40 mph and 60 mph (65 or 95 km/h) both wet, 15 feet (4.5 m) to each side of runway centerline with approved continuous friction measuring equipment (CFME). The Contractor shall coordinate testing with the RPR and provide the RPR a written report of friction test results. The RPR shall be present for testing.

METHOD OF MEASUREMENT

608-7.1 Asphalt surface treatment. The quantity of asphalt surface treatment shall be measured by the square yards of material applied in accordance with the plans and specifications and accepted by the RPR.

The Contractor must furnish the RPR with the certified weigh bills when materials are received for the asphalt material used under this contract. The Contractor must not remove material from the tank car or storage tank until initial amounts and temperature measurements have been verified.

BASIS OF PAYMENT

608-8.1 Payment shall be made at the contract unit price per square yard for the asphalt surface treatment applied and accepted by the RPR, and the contract unit price per lump sum for runway friction testing. This price shall be full compensation for all surface preparation, furnishing all materials, delivery and application of these materials, for all labor, equipment, tools, and incidentals necessary to complete the item, and any costs associated with furnishing a qualified manufacturer's representative to assist with control strips.

Payment will be made under:

Item P-608-8.1 Asphalt Surface Treatment – per square yard

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 C117 Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing

ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D5	Standard Test Method for Penetration of Asphalt Materials
ASTM D244	Standard Test Methods and Practices for Emulsified Asphalts
ASTM D2007	Standard Test Method for Characteristic Groups in Rubber Extender and Processing Oils and Other Petroleum-Derived Oils by the Clay-Gel Absorption Chromatographic Method
ASTM D2042	Standard Test Method for Solubility of Asphalt Materials in Trichloroethylene
ASTM D2995	Standard Practice for Estimating Application Rate of Bituminous Distributors
ASTM D4402	Standard Test Method for Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer
ASTM D5340	Standard Test Method for Airport Pavement Condition Index Surveys
Advisory Circulars (AC)	
AC 150/5320-12	Measurement, Construction, and Maintenance of Skid-Resistant Airport Pavement Surfaces
AC 150/5320-17	Airfield Pavement Surface Evaluation and Rating (PASER) Manuals
AC 150/5380-6	Guidelines and Procedures for Maintenance of Airport Pavements

END OF ITEM P-608

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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.

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
³ ⁄4 inch (19 mm)	67
1⁄2 inch (12.5 mm)	7

Coarse Aggregate Grading Requirements

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 I/II.

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 D1751 or 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 Welded Steel Wire Fabric conforming to the requirements of ASTM A1064.

610-2.11 Materials for curing concrete. Curing materials shall be White-pigmented Liquid Membrane-Forming Compound, conforming to ASTM C309, Type 2, Class B.

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.

FAA TECHNICAL SPECIFICATIONS P-610-3 **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. 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 85°F (30 °C), 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; 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.

BASIS OF PAYMENT

610-6.1 Concrete shall be considered incidental and no separate payment shall be made.

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
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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

END OF ITEM P-610

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.

Paint			Gla	ass Beads	
Туре	Color	Fed Std. 595 Number	Application Rate Maximum	Туре	Application Rate Minimum
Ι	Yellow*	33538 or 33655	90 ft²/gal (2.8 m²/l)		7 lb/gal (1.2 kg/l)
I	White	37925	90 ft²/gal (2.8 m²/l)		7 lb/gal (1.2 kg/l)
I	Red	31136	90 ft²/gal (2.8 m²/l)	I	5 lb/gal (1.0 kg/l)
I	Black	37038	90 ft²/gal (2.8 m²/l)	N/A	N/A

Table 1. Marking Materials

*Omit glass beads on taxiway edge markings

a. Paint. Paint shall be waterborne in accordance with the requirements of this paragraph. Paint colors shall comply with Federal Standard No. 595.

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, Types I and III.

Glass beads for red paint shall meet the requirements for Type I, Gradation A.

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.

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 30 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:

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)

Marking Dimensions and Spacing Tolerance

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 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.

Motorial	Retro-reflectance mcd/m²/lux			
Wateria	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	

Minimum Retro-Reflectance Values

¹Prior to remarking determine if removal of contaminants on markings will restore retro-reflectance

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

620-4.1a The quantity of surface preparation shall be measured by the number of square feet (square meters) for each type of surface preparation specified in paragraph 620-3.3.

620-4.1b The quantity of markings shall be paid for shall be measured by the number of square feet (square meters) of painting.

620-4.1c The quantity of reflective media shall be paid for by the number of pounds (km) of reflective media.

P-620-5.4d The quantity of temporary markings to be paid for shall be the number of square feet (square meters) of painting performed in accordance with the specifications and accepted by the RPR. Temporary marking includes surface preparation, application and complete removal of the temporary marking.

BASIS OF PAYMENT

620-5.1 This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item complete in place and accepted by the RPR in accordance with these specifications.

620-5.1a Payment for surface preparation shall be made at the contract price for the number of square feet (square meters) for each type of surface preparation specified in paragraph 620-3.3.

620-5.2b Payment for markings shall be made at the contract price for the number of square feet (square meters) of painting.

620-5.3c Payment for reflective media shall be made at the contract unit price for the number of pounds (km) of reflective media.

620-5.4d Payment for temporary markings shall be made at the contract price for the number of square feet (square meters) of painting. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-620-5.1a	Surface Preparation - per square foot (square meter)
ltem P-620-5.2b	Marking - per square foot (square meter)
ltem P-620-5.3c	Reflective Media, TT-B-1325D Type I - per pound (km)
ltem P-620-5.3d	Reflective Media, TT-B-1325D Type III - per pound (km)
ltem P-620-5.4e	Temporary runway and taxiway marking - per square foot

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

Houston, Texas	Runway 17-35 Demolition HOU/Project No. 770
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	s (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

1325D	
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 D-900 UNDERGROUND STORMWATER STORAGE FACILITY

DESCRIPTION

900-1.1 This item shall consist of designing, furnishing, and installing an underground stormwater storage facility within the footprint indicated by the schematic drawings appended to the construction plan set.

DESIGN

900-2.1 Engineering design. Contractor shall furnish fully engineered construction drawings, signed and sealed by a Professional Engineer licensed in the state of Texas, employed by a firm registered in the State of Texas, and authorized in the State of Texas to perform engineering design work. The design shall include all drawings, calculations, and specifications to produce a fully functional stormwater storage solution, with the inflow and outflow connected to the airport's storm drainage system. The design shall consider the presence of existing underground utilities and make provisions to avoid and/or relocate them as necessary. The design shall include connection(s) to the existing storm drainage system as required to produce a fully functional facility.

900-2.2 Design Criteria. All improvements shall meet the requirements of FAA Advisory Circulars 150/5300-13A, 150/5370-10H, 150/5200-33, 150/5320-5D and all other FAA criteria. All portions of the stormwater storage facility shall be designed to accommodate the most demanding aircraft wheel loads, based upon the currently approved forecast fleet mix at the William P. Hobby Airport. All proposed improvements must also comply with the Houston Airport System Design Standards Manual.

900-2.3 Permitting. Contractor shall submit plans and specifications for permitting through the Houston Airport System Building Standards Group and Tenant Improvement Project, and Harris County Flood Control District permit processes. All comments on the design must be cleared by the Contractor prior to beginning construction of the underground stormwater storage facility.

CONFIGURTION

900-3.1 Materials. All materials shall comply with the requirements of FAA AC 150/5370-10H, Standard Specifications for Construction of Airports. Stormwater collection chambers shall be corrugated wall polypropylene chambers intended for the collection, detention, and/or retention of stormwater runoff and meet the requirements of ASTM F 2418.

900-3.2 Instrumentation. The underground stormwater storage facility shall be equipped with the capability to monitor the level of stormwater within the storage cells and detect when outflow occurs. The monitor shall report data to a remote panel mounted in the Airport Operations Center (AOC).

900-3.3 Impact on other Facilities. The configuration and materials used for the underground stormwater storage facility shall have no negative impacts on other airport or FAA facilities, especially pavements, lights, and navigational aids. The configuration shall be such that no saturated areas or ponded water are present, and the facility shall not create a bird attractant.

METHOD OF MEASUREMENT

900-4.1 Measurement of the underground stormwater storage facility shall be by the lump sum, including the engineering design, permitting, materials, labor, backfill, compaction, installation, and all other work required to produce a fully functioning facility, including all power and communications cables for monitoring the level and outflow status of the storage cells.

BASIS OF PAYMENT

900-5.1 Payment for the Underground Stormwater Storage Facility shall be at the lump sum unit price. The lump sum unit price shall be full compensation for the engineering design, permitting, materials, labor, backfill, compaction, installation, and all other work required to produce a fully functioning facility, including all power and communications cables for monitoring the level and outflow status of the storage cells. Payment for excavation shall be made under Item P-152.

Payment will be made under:

Item D-900-5.1 Underground Stormwater Storage Facility - per lump sum

REFERENCES

ASTM F 2418-19	Standard Specification for Polypropylene (PP) Corrugated Wall Stormwater Collection Chambers
FAA Advisory Circular AC 150/5300-13A, Change 1	Airport Design
FAA Advisory Circular AC 150/5370-10H	Standard Specifications for Construction of Airports
FAA Advisory Circular AC 150/5370-2	Operational Safety on Airports During Construction
FAA Advisory Circular AC 150/5200-33	Hazardous Wildlife Attractants on or Near Airports
FAA Advisory Circular AC 150/5320-5D	Airport Drainage Design

ITEM T-904 SODDING

DESCRIPTION

904-1.1 This item shall consist of furnishing, hauling, and placing approved live sod on prepared areas in accordance with this specification at the locations shown on the plans or as directed by the RPR.

MATERIALS

904-2.1 Sod. Sod furnished by the Contractor shall have a good cover of living or growing Bermuda grass. This shall be interpreted to include grass that is seasonally dormant during the cold or dry seasons and capable of renewing growth after the dormant period. All sod shall be obtained from areas where the soil is reasonably fertile and contains a high percentage of loamy topsoil. Sod shall be cut or stripped from living, thickly matted turf relatively free of weeds or other undesirable foreign plants, large stones, roots, or other materials that might be detrimental to the development of the sod or to future maintenance. At least 70% of the plants in the cut sod shall be composed of Bermuda grass, and any vegetation more than 6 inches (150 mm) in height shall be mowed to a height of 3 inches (75 mm) or less before sod is lifted. Sod, including the soil containing the roots and the plant growth showing above, shall be cut uniformly to a thickness not less than that stated in the special provisions.

Bermuda grass sod shall be provided in 30-inch wide rolls and reinforced with a mesh net under the grass.

904-2.2 Lime. Not required.

904-2.3 Fertilizer. Fertilizer shall be standard commercial fertilizers supplied separately or in mixtures containing the percentages of total nitrogen, available phosphoric acid, and water-soluble potash. They shall be applied at the rate and to the depth specified and shall meet the requirements of applicable state laws. They shall be furnished in standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon. No cyanamide compounds or hydrated lime shall be permitted in mixed fertilizers.

The fertilizers may be supplied in one of the following forms:

- **a.** A dry, free-flowing fertilizer suitable for application by a common fertilizer spreader;
- b. A finely-ground fertilizer soluble in water, suitable for application by power sprayers; or
- c. A granular or pellet form suitable for application by blower equipment.

Fertilizers shall be 16-4-8 slow release commercial fertilizer and shall be spread at the rate of 7 lbs. per 1,000 square feet

904-2.4 Water. The water shall be sufficiently free from oil, acid, alkali, salt, or other harmful materials that would inhibit the growth of grass.

904-2.5 Soil for repairs. The soil for fill and topsoiling of areas to be repaired shall be at least of equal quality to that which exists in areas adjacent to the area to be repaired. The soil shall be relatively free from large stones, roots, stumps, or other materials that will interfere with

FAA TECHNICAL SPECIFICATIONS T-904-1 subsequent sowing of seed, compacting, and establishing turf, and shall be approved by the RPR before being placed.

904-2.6. Biodegradable Landscape Stakes. Biodegradable landscape stakes shall be 6 inches in length and capable of holding sod strips in place and penetrating the ground without breaking. The stakes shall be 100% biodegradable and comply with ASTM D6400.

CONSTRUCTION METHODS

904-3.1 General. Areas to be solid, strip, or spot sodded shall be shown on the plans. Areas requiring special ground surface preparation such as tilling and those areas in a satisfactory condition that are to remain undisturbed shall also be shown on the plans.

Suitable equipment necessary for proper preparation of the ground surface and for the handling and placing of all required materials shall be on hand, in good condition, and shall be approved by the RPR before the various operations are started. The Contractor shall demonstrate to the RPR before starting the various operations that the application of required materials will be made at the specified rates.

904-3.2 Preparing the ground surface. After grading of areas has been completed and before applying fertilizer and limestone, areas to be sodded shall be raked or otherwise cleared of stones larger than 2 inches (50 mm) in any diameter, sticks, stumps, and other debris which might interfere with sodding, growth of grasses, or subsequent maintenance of grass-covered areas. If any damage by erosion or other causes occurs after grading of areas and before beginning the application of fertilizer and ground limestone, the Contractor shall repair such damage. This may include filling gullies, smoothing irregularities, and repairing other incidental damage.

904-3.3 Applying fertilizer and ground limestone. Following ground surface preparation, fertilizer shall be uniformly spread at a rate which will provide not less than the minimum quantity of each fertilizer ingredient, as stated in the special provisions. If use of ground limestone is required, it shall then be spread at a rate that will provide not less than the minimum quantity stated in the special provisions. These materials shall be incorporated into the soil to a depth of not less than 2 inches (50 mm) by discing, raking, or other suitable methods. Any stones larger than 2 inches (50 mm) in any diameter, large clods, roots, and other litter brought to the surface by this operation shall be removed.

904-3.4 Obtaining and delivering sod. After inspection and approval of the source of sod by the RPR, the sod shall be cut with approved sod cutters to such a thickness that after it has been transported and placed on the prepared bed, but before it has been compacted, it shall have a uniform thickness of not less than 2 inches (50 mm). Sod sections or strips shall be cut in uniform widths, not less than 30 inches (750 mm), and in lengths of not less than 18 inches (0.5 m), but of such length as may be readily lifted without breaking, tearing, or loss of soil. Where strips are required, the sod must be rolled without damage with the grass folded inside. The Contractor may be required to mow high grass before cutting sod.

The sod shall be transplanted within 24 hours from the time it is stripped, unless circumstances beyond the Contractor's control make storing necessary. In such cases, sod shall be stacked, kept moist, and protected from exposure to the air and sun and shall be kept from freezing. Sod shall be cut and moved only when the soil moisture conditions are such that favorable results can be expected. Where the soil is too dry, approval to cut sod may be granted only after it has been watered sufficiently to moisten the soil to the depth the sod is to be cut.

904-3.5 Laying sod. Sodding shall be performed only during the seasons when satisfactory results can be expected. Frozen sod shall not be used and sod shall not be placed upon frozen soil. Sod may be transplanted during periods of drought with the approval of the RPR, provided the sod bed is watered to moisten the soil to a depth of at least 4 inches (100 mm) immediately prior to laying the sod.

The sod shall be moist and shall be placed on a moist earth bed. Pitch forks shall not be used to handle sod, and dumping from vehicles shall not be permitted. The sod shall be carefully placed by hand, edge to edge and with staggered joints, in rows at right angles to the slopes, commencing at the base of the area to be sodded and working upward. The sod shall immediately be pressed firmly into contact with the sod bed by tamping or rolling with approved equipment to provide a true and even surface and ensure knitting without displacement of the sod or deformation of the surfaces of sodded areas. Where the sod may be displaced during sodding operations, the workmen, when replacing it, shall work from ladders or treaded planks to prevent further displacement. Screened soil of good quality shall be used to fill all cracks between sods. The quantity of the fill soil shall not cause smothering of the grass. Where the grades are such that the flow of water will be from paved surfaces across sodded areas, the surface of the soil in the sod after compaction shall be set approximately one inch (25 mm) below the pavement edge. Where the flow will be over the sodded areas and onto the paved surfaces around manholes and inlets, the surface of the soil in the sod after compaction shall be set approximately one inch (25 mm) below the pavement edge.

On slopes steeper than one (1) vertical to 2-1/2 horizontal and in v-shaped or flat-bottom ditches or gutters, the sod shall be pegged with wooden pegs not less than 12 inches (300 mm) in length and have a cross-sectional area of not less than 3/4 sq inch (18 sq mm). The pegs shall be driven flush with the surface of the sod.

Sod strips shall be stapled with 6-inch long minimum biodegradable sod stakes at sufficient frequency to prevent displacement by jet blast. As a minimum each edge of the sod strips shall be staked every four feet, or more frequently in areas subjected to jet blast, or as directed by the RPR.

904-3.6 Watering. Adequate water and watering equipment must be on hand before sodding begins, and sod shall be kept moist until it has become established and its continued growth assured. In all cases, watering shall be done in a manner that will avoid erosion from the application of excessive quantities and will avoid damage to the finished surface.

904-3.7 Establishing turf. The Contractor shall provide general care for the sodded areas as soon as the sod has been laid and shall continue until final inspection and acceptance of the work. All sodded areas shall be protected against traffic or other use by warning signs or barricades approved by the RPR. The Contractor shall mow the sodded areas with approved mowing equipment, depending upon climatic and growth conditions and the needs for mowing specific areas. Weeds or other undesirable vegetation shall be mowed and the clippings raked and removed from the area.

904-3.8 Repairing. When the surface has become gullied or otherwise damaged during the period covered by this contract, the affected areas shall be repaired to re-establish the grade and the condition of the soil, as directed by the RPR, and shall then be sodded as specified in paragraph 904-3.5.

METHOD OF MEASUREMENT

904-4.1 This item shall be measured on the basis of the area in square yards (square meters) of the surface covered with sod and accepted.

BASIS OF PAYMENT

904-5.1 This item will be paid for on the basis of the contract unit price per square yard (square meter) for sodding, which price shall be full compensation for all labor, equipment, material, staking, and incidentals necessary to satisfactorily complete the items as specified.

Payment will be made under:

Item T-904-5.1 Sodding - per square yard (square meter)

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 C602 Standard Specification for Agricultural Liming Materials

Advisory Circulars (AC)

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

FAA/United States Department of Agriculture

Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM T-904

ITEM T-905 TOPSOIL

DESCRIPTION

905-1.1 This item shall consist of preparing the ground surface for topsoil application, removing topsoil from designated stockpiles or areas to be stripped on the site or from approved sources off the site, and placing and spreading the topsoil on prepared areas in accordance with this specification at the locations shown on the plans or as directed by the RPR.

MATERIALS

905-2.1 Topsoil. Topsoil shall be the surface layer of soil with no admixture of refuse or any material toxic to plant growth, and it shall be reasonably free from subsoil and stumps, roots, brush, stones (2 inches (50 mm) or more in diameter), and clay lumps or similar objects. Brush and other vegetation that will not be incorporated with the soil during handling operations shall be cut and removed. Ordinary sod and herbaceous growth such as grass and weeds are not to be removed but shall be thoroughly broken up and intermixed with the soil during handling operations. Heavy sod or other cover, which cannot be incorporated into the topsoil by discing or other means, shall be removed. The topsoil or soil mixture, unless otherwise specified or approved, shall have a pH range of approximately 5.5 pH to 7.6 pH, when tested in accordance with the methods of testing of the Association of Official Agricultural Chemists in effect on the date of invitation of bids. The organic content shall be not less than 3% nor more than 20% as determined by the wet-combustion method (chromic acid reduction). There shall be not less than 20% nor more than 80% of the material passing the 200 mesh (75 μ m) sieve as determined by the wash test in accordance with ASTM C117.

Natural topsoil may be amended by the Contractor with approved materials and methods to meet the above specifications.

905-2.2 Inspection and tests. Within 10 days following acceptance of the bid, the RPR shall be notified of the source of topsoil to be furnished by the Contractor. The topsoil shall be inspected to determine if the selected soil meets the requirements specified and to determine the depth to which stripping will be permitted. At this time, the Contractor may be required to take representative soil samples from several locations within the area under consideration and to the proposed stripping depths, for testing purposes as specified in paragraph 905-2.1.

CONSTRUCTION METHODS

905-3.1 General. Areas to be topsoiled shall be shown on the plans. If topsoil is available on the site, the location of the stockpiles or areas to be stripped of topsoil and the stripping depths shall be shown on the plans.

Suitable equipment necessary for proper preparation and treatment of the ground surface, stripping of topsoil, and for the handling and placing of all required materials shall be on hand, in good condition, and approved by the RPR before the various operations are started.

905-3.2 Preparing the ground surface. Immediately prior to dumping and spreading the topsoil on any area, the surface shall be loosened by discs or spike-tooth harrows, or by other means approved by the RPR, to a minimum depth of 2 inches (50 mm) to facilitate bonding of the topsoil to the covered subgrade soil. The surface of the area to be topsoiled shall be cleared of all stones

FAA TECHNICAL SPECIFICATIONS T-905-1 larger than 2 inches (50 mm) in any diameter and all litter or other material which may be detrimental to proper bonding, the rise of capillary moisture, or the proper growth of the desired planting. Limited areas, as shown on the plans, which are too compact to respond to these operations shall receive special scarification.

Grades on the area to be topsoiled, which have been established by others as shown on the plans, shall be maintained in a true and even condition. Where grades have not been established, the areas shall be smooth-graded and the surface left at the prescribed grades in an even and compacted condition to prevent the formation of low places or pockets where water will stand.

905-3.3 Obtaining topsoil. Prior to the stripping of topsoil from designated areas, any vegetation, briars, stumps and large roots, rubbish or stones found on such areas, which may interfere with subsequent operations, shall be removed using methods approved by the RPR. Heavy sod or other cover, which cannot be incorporated into the topsoil by discing or other means shall be removed.

When suitable topsoil is available on the site, the Contractor shall remove this material from the designated areas and to the depth as directed by the RPR. The topsoil shall be spread on areas already tilled and smooth-graded, or stockpiled in areas approved by the RPR. Any topsoil stockpiled by the Contractor shall be rehandled and placed without additional compensation. Any topsoil that has been stockpiled on the site by others, and is required for topsoil purposes, shall be removed and placed by the Contractor. The sites of all stockpiles and areas adjacent thereto which have been disturbed by the Contractor shall be graded if required and put into a condition acceptable for seeding.

When suitable topsoil is secured off the airport site, the Contractor shall locate and obtain the supply, subject to the approval of the RPR. The Contractor shall notify the RPR sufficiently in advance of operations in order that necessary measurements and tests can be made. The Contractor shall remove the topsoil from approved areas and to the depth as directed. The topsoil shall be hauled to the site of the work and placed for spreading, or spread as required. Any topsoil hauled to the site of the work and stockpiled shall be rehandled and placed without additional compensation.

905-3.4 Placing topsoil. The topsoil shall be evenly spread on the prepared areas to a uniform depth of 2 inches (50 mm) after compaction, unless otherwise shown on the plans or stated in the special provisions. Spreading shall not be done when the ground or topsoil is frozen, excessively wet, or otherwise in a condition detrimental to the work. Spreading shall be carried on so that turfing operations can proceed with a minimum of soil preparation or tilling.

After spreading, any large, stiff clods and hard lumps shall be broken with a pulverizer or by other effective means, and all stones or rocks (2 inches (50 mm) or more in diameter), roots, litter, or any foreign matter shall be raked up and disposed of by the Contractor. after spreading is completed, the topsoil shall be satisfactorily compacted by rolling with a cultipacker or by other means approved by the RPR. The compacted topsoil surface shall conform to the required lines, grades, and cross-sections. Any topsoil or other dirt falling upon pavements as a result of hauling or handling of topsoil shall be promptly removed.

METHOD OF MEASUREMENT

905-4.1 Topsoil obtained on the site shall be measured by the number of cubic yards (cubic meters) of topsoil measured in its original position and stripped or excavated. Topsoil stockpiled by others and removed for topsoil by the Contractor shall be measured by the number of cubic

yards (cubic meters) of topsoil measured in the stockpile. Topsoil shall be measured by volume in cubic yards (cubic meters) computed by the method of end areas.

905-4.2 Topsoil obtained off the site shall be measured by the number of cubic yards (cubic meters) of topsoil measured in its original position and stripped or excavated. Topsoil shall be measured by volume in cubic yards (meters) computed by the method of end areas.

BASIS OF PAYMENT

905-5.1 Payment will be made at the contract unit price per cubic yard (cubic meter) for topsoil (obtained on the site). This price shall be full compensation for furnishing all materials and for all preparation, placing, and spreading of the materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

905-5.2 Payment will be made at the contract unit price per cubic yard (cubic meter) for topsoil (obtained off the site). This price shall be full compensation for furnishing all materials and for all preparation, placing, and spreading of the materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item T-905-5.1 Topsoil (Furnished from Off-Site) - per cubic yard (cubic meter)

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 C117 Materials Finer than 75 μ m (No. 200) Sieve in Mineral Aggregates by Washing

Advisory Circulars (AC)

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

FAA/United States Department of Agriculture

Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM T-905

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ITEM T-900 TEMPORARY IRRIGATION SYSTEM

900.1 Description

This item shall consist of all materials, labor, equipment, tools, and incidentals necessary to perform the work of providing a temporary irrigation system installation as specified in this section.

The Specifications indicate and specify a complete and efficient irrigation system which will operate in accordance with the specified equipment manufacturer's recommendations and with state and local codes and regulations. Items not specified, but found to be necessary for a complete system, shall be furnished under this Contract.

The irrigation system will be temporary. All pipes are to be laid above ground, except where crossing active airfield pavement or otherwise not possible. All above ground lines will be placed as unobtrusively as possible. Existing storm drain pipes may be used for underground pavement crossings, however Owner makes no representation as to their condition or suitability for use. If inlet or manhole covers must be left open, Contractor shall provide adequate and substantial barriers to identify the potential hazard.

In areas where it is not possible or practical to extend the temporary system, supplemental water shall be provided by truck watering or hand watering (e.g., hose, gator bag). All water used shall be metered and paid for under a separate bid item.

No irrigation pipes shall be laid within the Runway Safety Area (RSA) or Taxiway Safety Area (TSA). System must provide nozzles capable of shooting up to 150 feet from edge of RSA to water grass and sod within RSA.

There are multiple phases in this project. The contractor will be required to mobilize and install temporary irrigation systems multiple times within the duration of the project.

A. Scope of Work

Design and install a complete and efficient landscape irrigation system which will operate in accordance with the specified equipment manufacturer's recommendations and with state and local codes and regulations. The irrigation system will include:

- 1. Temporary meter, backflow prevention, valves.
- 2. Rotors or rotary nozzles for seeded revegetation areas. For sloping bank areas, install irrigation at the top of the bank and spray down on to the slope.
- 3. All other elements necessary to provide a fully functioning and efficient irrigation system.

Temporary irrigation will be kept in place until vegetation is established, and then removed by Contractor.

B. Qualification of Installer

A Texas-licensed landscape irrigator in good standing, approved by the Owner or his agent, with a minimum of 5 years continuous experience in designing and installing systems of this type, and who is regularly engaged in installing landscape irrigation systems shall be employed by contractor for this Work.

900.2 Permits and Inspections

The Contractor shall obtain necessary permits, tests, and inspections, and pay any related fees and taxes required by governing agencies, including cost of meter(s).

900.3 Submittals

The submittal requirements for this specification item shall include:

- 1. Copy of Irrigator's license issued by the Texas Commission on Environmental Quality (TCEQ).
- Per State of Texas code (Title 30, Texas Administrative Code, Chapter 344, Rules for Landscape Irrigation) the Contractor shall provide the Owner with a watering schedule. This schedule shall be a chart listing zone number, zone flow (gpm), run time (minutes/month), type of vegetation irrigated per zone and type of emission device per zone
- 3. In the event of mandated watering restrictions, provide a completed variance request approved by Local Municipality.
- 4. As-built irrigation plan showing all emission devices, valves, controller, backflow prevention device, and sized pipes.
- 5. Completed irrigation system maintenance checklist (Attachment A). The first sheet of Attachment A is due after the irrigation system is completed, during time of inspection with Owner. The second sheet of Attachment A is due yearly, in the spring when the system is reinitiated during the extended landscape maintenance period. If accepted grass stand is established in less than a year second sheet of Attachment A shall not be required.

900.4 Damage to Property

- A. Repair or replace any property damage inflicted in the course of the irrigation installation, without additional charge and before final payment. Included are damages to building, paving, structures, equipment, piping, pipe covering, utilities, sewers, walls, signs, sidewalks and landscaping.
- B. The Irrigation Installer is responsible for damage caused by leaks in the piping systems and shall make repairs without charge.

900.5 Existing Conditions

- A. Field verify all existing site conditions. By bidding this Work, the Contractor acknowledges that they have satisfied themselves as to the nature of the Work and to the quality of surface and subsurface materials and obstacles insofar as this data is reasonably ascertainable from a site inspection. Failure of the Contractor to acquaint themselves with the available information will not relieve their responsibility of proper estimation of the difficulty or cost of successful performance of the Work.
- B. Contractor shall locate all utilities in work area before installation. Any damage to existing utilities occurring during irrigation installation requiring repair or replacement shall be the Contractor's responsibility. This replacement clause extends to existing trees and other landscape materials proposed for preservation.
- C. Verify water supply static pressure and volume as adequate before system installation. Report inadequacies immediately to the Owner or Irrigation Designer of record for resolution. In cases of high pressure, pressure reduction equipment shall be used.

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- D. The irrigation installation shall account for elevation changes on the site as part of pressure considerations.
- E. Irrigation layout shall account for slope on a site. Pipes should run perpendicular to a slope where possible. For temporary irrigation systems, above ground pipes should be secured to slopes every 10 feet in a manner that does not create a safety hazard. Stake temporary, above ground lateral pipes at end points.
- F. Determine and verify the location and size of the irrigation meter to be used for this project. Contractor is responsible for the tap, for following state and municipal regulations regarding connection to the water supply, and for obtaining all required permits and inspections.

900.6 Materials

Provide all equipment and materials necessary to complete work.

- A. Pipe and Tube
 - 1. Irrigation lines: Irrigation lines may be aluminum, PVC, or polyethylene intended for use in agricultural irrigation systems.
 - 2. Velocity: The irrigation system must be designed and installed so that the flow of water in the pipe will not exceed a velocity of five (5) feet per second.
- B. Connections
 - 1. Connections shall be suitable for the type of pipe and fittings being utilized and shall not leak.
- C. Valves: A sufficient number of valves shall be provided to adequately control the system in an efficient manner.
- D. Backflow Prevention Devices
 - 1. Provide a Double Check Backflow Prevention (DCA) or Reduced Pressure Backflow Prevention Device (RPZ) as required by the local water utility.
- M. Pressure Regulation
 - 1. The irrigation system shall be designed and installed to operate within adequate pressure conditions. Available static pressure shall be determined by the Contractor before installation.
 - 2. If available static pressure is excessive, the Contractor shall install pressure reducing valve.
- N. Water

The contractor is responsible for identifying and obtaining adequate sources of water, and for obtaining taps and meters.

900.7 Construction/Maintenance Methods

Provide all construction equipment and methods required to complete work.

A. System Design and Layout

- 1. Water Supply: Verify location and source of the water meter or tap for irrigation. Perform tests as needed to verify the pressure and volume are adequate to run the system as designed and with full, even and complete coverage. When necessary, supplemental water, in addition to the permanent and/or temporary sources, can be provided via water truck or other. This may be needed during times of mandatory water restrictions to provide sufficient water to the landscape.
- 2. Standard Installation: Perform all Work and provide material in accordance with the local codes and ordinances in force at the job site. Where provisions of these Specifications exceed such requirements, these specifications shall govern.
- B. Layout
 - 1. Installer is responsible for locating valves, piping and fittings relative to existing conditions as the Drawings may show schematic layout only.
 - 2. If a discrepancy in the size and shape of areas to be watered becomes apparent in the Drawings at the time of installation, such discrepancy shall be discussed with the Irrigation designer or Engineer before commencement of the installation.
 - 3. Work shall not proceed until design changes have been approved.
 - 4. All materials shall be installed in strict accordance to the manufacturer's installation specifications.
 - 5. The maximum spacing between emission devices must not exceed the radius of throw recommended by the manufacturer.
- C. Pipe Fitting and Assembly
 - 1. Keep ends of pipe securely closed when Work is not in operation to prevent water and other matter from entering the lines.
 - 2. The routing of the pressure supply lines shall avoid large tree roots and other existing items. Deviate where necessary and install lines to provide coverage without off-setting assemblies from pressure supply lines.
 - 3. Piping Installation:
 - (a) General. The Installer is responsible for being familiar with any and all methods of assemblage, joining and installation of various types of pipe to be used. Adhere in strict accordance with the manufacturer's recommendations.
- D. Backflow Prevention Devices
 - 1. Install backflow prevention device as per requirements of Uniform Plumbing Code and Local Municipality Requirements. Provide testing and coordinate inspection of the backflow preventer as required by state statute and as per local municipal requirements.
- E. Emission Devices
 - 1. Spray heads shall be capable of providing uniform and adequate coverage of the area to be reestablished.
 - 2. Sprinklers shall not directly overspray onto non-irrigated areas (e.g., runways and taxiways).
 - 3. All emission devices shall be installed, where applicable, in plumb position, with proper spacing and in locations shown on the plans provided by the Contractor.

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- F. Watering Schedule
 - 1. Contractor shall provide the Engineer with a chart listing information for each zone, including precipitation rate, gallons per minute (gpm), and run time for each season.
- G. Inspection, Testing and Approval
 - 1. Do not enclose or cover any Work until it has been inspected, tested and approved per local codes. Where required, contact the Engineer to arrange an inspection.
 - 2. Hydrostatic Piping Test:
 - (a) In the presence of the Engineer hydrostatically test the mainline piping system. Test to a minimum psi of 100. Test period shall not be less than 4 hours. Pipe may be tested in sections to expedite the work.
 - (b) Test is acceptable if no leakage occurs during test period.
 - (c) Repair all leaks and retest system for another 4-hour period if necessary. Continue this procedure until all leaks are repaired.
 - 3. Operation Test:
 - (a) After all equipment is installed, test the system for coverage, flow and pressure in the presence of the Owner.
 - (b) Test is acceptable if system operates satisfactorily, with adequate pressure and flow and if all irrigated areas are receiving proper coverage with no overspray onto pavement or buildings.
 - (c) After all required adjustments are made, coordinate with Engineer to obtain an inspection by a Local Municipality Irrigation Inspector, if required.
 - 4. Final Acceptance:
 - (a) Final Acceptance may be given when all punchlist items are satisfactorily completed and, if required, a Local Municipality Irrigation Inspector has approved the job (with all comments acceptable addressed).
- H. Cleanup
 - 1. Maintain a clean work area during the progress of the Work within reasonable limits of the installation area. Periodically remove all rubbish, debris, etc., from Work site and dispose legally.
 - 2. Upon completion of the Work, remove all construction and installation equipment from the premises; make ground surface level where it has been affected by irrigation system installation; and remove excess materials, rubbish and debris.
 - 3. Immediately replace and thoroughly hand water any plant material and groundcover which may be displaced during installation.

900.8 Measurement

- A. Work and acceptable material for "Temporary Irrigation System" will be measured as a complete system in working order with all the elements necessary to efficiently provide water for reestablishment of vegetation.
- B. Water used in the system and for any truck irrigation of grass and sod shall be from a metered stand pipe. Payment for water shall be separately and be paid for by the gallon.

900.9 Payment

The work performed will be paid for at the unit price bid for "Temporary Irrigation System", which price shall be full compensation for designing, furnishing and installing all components; flushing and testing waterlines; furnishing and operating equipment; disassembly and complete removal; and labor, tools, incidentals and subsequent removal of system

This project is phased. Contractor will be required to provide a temporary irrigation system at the end of each phase and keep it in place until an acceptable stand of grass is established for that phase. Therefore, there will be multiple mobilizations for Contractor's irrigation sub-contractor.

The work will comprise duration up to and including the project Substantial Completion and through to the end of the Extended Maintenance Period(s).

Payment will be made under:

Item T-900-9.1	Temporary Irrigation system installations and removal - per Lump Sum
Item T-900-9.2	Water for irrigation – per one-thousand gallons

END OF ITEM T-900
ITEM L-100 MODIFICATIONS TO ALCMS EQUIPMENT

DESCRIPTION

100-1.1 This work shall include the modifications to the existing Airport Lighting Control and Monitoring System (ALCMS) and Touchscreen Panels located in the Air Traffic Control Tower (2 nodes), and North (1) and South (1) Airfield Lighting Vaults, and Maintenance Facility (1) to incorporate the reconfigured airfield geometry for the removal of Runway 17-35, and Taxiways G1, G2, and G3, as well as updating all related presets for the removal of the Runway 17-35 edge lighting circuit. This specification includes modifications to these circuits, all labor, programming, modifications to graphic screens, and all other work required to fully integrate the revised airfield lighting circuits into the ALCMS.

Contractor shall assist in completing all work to upgrade the ALCMS system.

100-1.2 SHOP DRAWINGS

Contractor shall submit shop drawings for approval by the Engineer, prior to implementing any software changes or installing any equipment. Proposed software changes shall be submitted to Airport Operations and the ATCT supervisor for approval independent of the Engineer. Contractor shall put his shop drawing check stamp on all shop drawings submitted for approval.

100-1.3 AS BUILT DRAWINGS

The Contractor shall, at all times, maintain a complete accurate and up to date set of as built drawings. These as built drawings shall be available to the Engineer at all times for his review. At the completion of the contract, the Contractor shall submit two (2) clean, legible and complete sets of as built drawings and O&M documentation to the Airport prior to his final request for payment.

100-1.4 CODES, PERMITS, FEES

- a. The Contractor is presumed to be knowledgeable of national and local code requirements. If he believes any requirement of the drawings or specifications is not in conformance with code or other applicable requirements, he shall so notify the Engineer before the work is installed. The decision of the Engineer in interpreting the drawings and specifications and code requirements relating thereto for a specific application under this contract shall be considered final.
- b. The Contractor shall give all necessary notices, obtain all permits, and pay all inspection and other fees required by governmental authorities having jurisdiction over the work under this contract. Receipt of all required approvals, clearances, and certificates by the Owner shall be a prerequisite to acceptance and final payment for the work.

100-1.5 MATERIALS AND WORKMANSHIP

Materials furnished shall be new, shall be undamaged when installed, and shall conform to all established and applicable standards and test requirements of Underwriters Laboratories (U.L.), National Electrical Manufacturers Association (NEMA), and American National Standards Institute (ANSI), and the Institute of Electrical and Electronics Engineers (IEEE).

100-1.6 PROJECT COORDINATION

The ALCMS Manufacturer shall provide an experienced and qualified Engineering, Sales and Service staff to support the contractor and airport throughout the installation and life of the system.

The project shall follow this basic cycle of events:

	Milestone	Description
1.	Submittal	The ALCMS Manufacturer shall submit
		ALCMS equipment specifications to the
		contractor.
2.	Submittal Review and	Submittal is reviewed by the contractor, airport,
	Approval	and engineer(s).
3.	Production Release	The ALCMS Manufacturer shall release
		approved system to manufacturing.
4.	Demo CD	The ALCMS Manufacturer shall send to the
	35% Software Completion	contractor, airport, and engineers a Demo CD
		of the planned layout of the touchscreen that
		will be used for the control of the ALCMS
		system.
5.	Production	System is manufactured.
_	D. Lating Trating	
6.	Production Testing	System is tested by the ALCIVIS Manufacturer.
7	Fastan (Associations	System is available for Eastery Assertance
1.		System is available for Factory Acceptance
	Testing	
Q	Shinmont of system	Approved system is shipped to installation site
0.	Shipheni or system	
9	Installation	Contractor installs any necessary equipment
.		and completes external wiring.
10.	Commissioning	The ALCMS Manufacturer shall arrive at
		installation site to complete commissioning of
		system and verify contractor installation and
		wiring.
11.	System Readiness Check	The ALCMS Manufacturer shall perform a
		system readiness check to verify proper
		operation of all equipment prior to cut over.
12.	System Cut-over	The ALCMS Manufacturer and Contractor shall
	-	cut over the new system and bring it on-line
		and operational.

13.	System Acceptance Testing	System is available for System Acceptance Testing (SAT) which shall be witnessed the by airport/owner and/or engineer.
14.	Manuals / As-Built drawings	The ALCMS Manufacturer shall issue operator manuals, maintenance manuals and ATC manuals and final as-built drawings.
15.	On-Site Training	The ALCMS Manufacturer shall complete on- site training of maintenance, Operations, and ATC personnel.
16.	Final Owner Acceptance	Upon completion of all contractual requirements, system is accepted in writing by the airport/owner.
17.	Warranty and Support	The ALCMS Manufacturer shall provide warranty and support per the contractual requirements.

100-1.07 CONTRACTOR INSTALLATION REQUIREMENTS

- a. The installing contractor shall be responsible for the physical installation of all associated ALCMS components. At a minimum, this includes modifications to the Constant Current Regulators (CCRs) and the wiring from any regulators being tagged as "spare" between the vault conduit entrances and the regulators.
 - (1) The Contractor shall furnish, install, relocate, connect and test all equipment, equipment accessories, conduit cables, wires, buses, grounds and support necessary to insure a complete and operable electrical distribution facility for the airport lighting system as specified in the submittal package.
 - (2) The equipment installation and mounting shall comply with the requirements of the National Electrical Code and local code agency having jurisdiction.

100-1.08 WIRE AND CONNECTIONS

- a. The Contractor shall make all necessary electrical connections at each location in accordance with the ALCMS manufacturer's wiring diagrams.
- b. All wires called out in the drawings associated with equipment that is to be controlled or monitored should be pulled, terminated and dressed at the appropriate terminal blocks and at the associated equipment.
- c. The Contractor shall leave sufficient extra wire length on each control/monitoring lead to make future changes in connections at the terminal block.

100-1.09 MARKING AND LABELING

All equipment, control wires, terminal blocks, etc., shall be tagged, marked or labeled as specified below:

a. Wire Identification: The Contractor shall furnish and install labels or identifying tags on all control wires at the point where they connect to the control equipment or to the terminal blocks.

FAA TECHNICAL SPECIFICATIONS L-100-3

- b. Wire labels, if used, shall be of the self-sticking, pre-printed type and of the manufacturer's recommended size for the wire involved. Identification markings designated in the plans shall be followed.
- c. Tags, if used, shall be nonferrous metal or plastic. Each tag shall be securely tied to the proper wire by a nonmetallic cord or plastic wire tie.

100-1.10 INSTALLATION OF DATA CABLES

- a. The Contractor shall install, terminate and test all data cables required for the project as shown on the Manufacturer Drawings. This includes all of the following components: Data cables, terminal cabinets and jumper cables.
- b. All associated data cables shall be tested upon completion of the cable installation and termination of connectors.
- c. Tests shall include verification of point-point continuity of each wire.
- d. All test data shall be recorded and included in a test report that shall be submitted to the airport / owner for approval.
- e. Commissioning of the system shall not begin until all test reports are submitted and approved and a copy provided to ALCMS Manufacturer.

100-1.11 CONTRACTOR POWER-UP AND INITIAL TESTING

The Contractor shall perform the following power-up and commissioning tasks:

- a. Power up all assemblies.
- b. Verify communication is established between all assemblies.
- c. Initiate lighting commands from Tower Touchscreen and verify proper control operations are being executed at the Vault assembly.
- d. Test monitoring feedback to verify proper wiring and operation.

Inform ALCMS manufacturer in writing all mentioned power up tests are complete.

100-1.12 ALCMS MANUFACTURER PLC COMMISSIONING

The ALCMS Manufacturer shall perform the following installation and commissioning tasks:

- a. Verify Contractor connections including power, control and monitoring.
- b. Verify proper labeling of equipment.
- c. Verify communication connections.
- d. Perform system testing including control, monitoring and diagnostics.

- e. Training on ALCMS related equipment.
- f. Perform System Acceptance Testing (SAT).

100-1.13 SYSTEM ACCEPTANCE TEST (SAT)

Following the final installation and commissioning of the system, the ALCMS Manufacturer shall perform a demonstration of the system performance. This demonstration shall include the following:

- a. Lighting control functions
- b. Monitoring functions
- c. Alarm functions
- d. Print and Display functions

The ALCMS Manufacturer shall develop a SAT test plan in accordance with the specifications and issue this to the contractor for approval from the airport engineer.

The SAT shall be witnessed by owner representatives, the contractor and the engineer.

100-1.14 AS-INSTALLED DRAWINGS

- a. The ALCMS Manufacturer shall provide six (6) hard copies of As-Installed drawings after system acceptance. The As-Installed drawings shall include the following information:
 - (1) System Block Diagram (1-line drawings)
 - (2) System External Wiring Diagrams
 - (3) Assembly Drawings
 - (4) Assembly Wiring Diagrams
- b. The As-Installed drawings shall be 11" X 17" in size and shall be spiral bound or supplied in 3ring binders. The cover of each binder shall be labeled with all project-related information.

100-1.15 ON-SITE TRAINING

- a. The ALCMS manufacturer shall provide to the contractor a final training course syllabus and training schedule thirty (30) days before on-site training.
- b. Any audio/video recordings of training classes described herein are the sole responsibility of the contractor. Coordination of the video recording must be organized by the Contractor and approved by the engineer.
- c. All training sessions shall be held in a facility provided by the airport. This facility should have tables, chairs, projection screen and sufficient space to lay out manuals and drawings.
- d. The ALCMS manufacturer shall provide all required visual aids and projectors.

100-1.16 AIR TRAFFIC CONTROLLER TRAINING

- a. The ALCMS manufacturer shall provide two (2), 1 hour User Training Class for Air Traffic Control (ATC) personnel.
- b. ATC Training coordinator should be present for both classes and shall be the responsible for training remaining personnel not able to attend these classes.
- c. This training shall include discussion and review of the following:
 - (1) PLC General System Overview
 - (2) Touchscreen Operations
 - (3) Using the Control System (GUI)
 - (4) Command and Control Sequences
- d. Training classes for ATC personnel should be limited to a maximum of 4-6 people per class.
- e. Air Traffic Control should designate a training coordinator that shall be responsible for scheduling and organizing on-site training for their personnel. In addition, this coordinator shall be responsible for training other personnel that were absent or unable to attend the training sessions.
- f. Any additional training beyond contract requirements shall be the responsibility of the ATC training coordinator to complete.

100-1.17 MAINTENANCE TRAINING

- a. The ALCMS manufacturer shall provide two (2), 1-hour training class for maintenance personnel. This training shall include discussion and review of the following:
 - (1) System Block Diagram
 - (2) System Assemblies and Wiring Diagrams
 - (3) Touchscreen Operation
 - (4) Graphical User Interface (GUI) Screens
 - (5) Implementing Airfield Lighting Changes
- b. Training classes for maintenance personnel should be limited to a maximum of 4-6 people per class.
- c. Maintenance should designate a training coordinator that shall be responsible for scheduling and organizing on-site training for their personnel. In addition, this coordinator shall be responsible for training other personnel that were absent or unable to attend the training sessions.
- d. Any additional training beyond contract requirements shall be the responsibility of the training coordinator to complete.

100-1.18 OWNER SYSTEM ACCEPTANCE AND WARRANTY START DATE

Upon successful completion of the SAT and on-site training the owner shall issue the ALCMS Manufacturer a written notice of system acceptance within five (5) working days.

The date the final acceptance letter is received or five (5) days following successful completion of the SAT (whichever occurs first) represents the start of the warranty period. Please refer to the Warranty section for more information regarding the ALCMS warranty guarantee.

100-1.19 SYSTEM WARRANTY

All equipment shall be warranted against defects in workmanship, hardware and software for a period of one (1) year from initial operation of the system but not more than eighteen (18) months from the manufacturer's shipment of the system.

During this time period the ALCMS manufacturer shall provide all parts, labor and technical support with the following conditions:

- a. The manufacturer shall correct by repair or replacement, at its option, equipment or parts which fail because of mechanical, electrical or physical defects, provided that the goods have been properly handled and stored prior to installation, properly installed and properly operated after installation, provided further that Buyer gives manufacturer written notice of such defects after delivery of the goods to Buyer.
- b. The manufacturer may examine any goods upon which a claim is made in the same condition as when defect therein is discovered and may require the return of the goods to establish any claim.
- c. The manufacturer's liability under no circumstances shall exceed the contract price of goods claimed to be defective.
- d. Any returns under this guarantee are to be on a transportation charge prepaid basis. For products not manufactured by, but sold by the manufacturer, warranty is limited to that extended by the original manufacturer.

100-1.20 SYSTEM SERVICE AND SUPPORT

a. The ALCMS Manufacturer shall provide technical assistance and support during the warranty period.

EQUIPMENT AND MATERIALS

100-2.1 GENERAL

Contractor shall submit shop drawings for approval by the Engineer, prior to implementing any software changes. Proposed software changes shall be submitted to Airport Operations and the ATCT supervisor for approval independent of the Engineer. Contractor shall put his shop drawing check stamp on all shop drawings submitted for approval.

100-2.2 EXISTING AIRFIELD LIGHTING CONTROL AND MONITORING SYSTEM (ALCMS)

The existing ALCMS as manufactured by Liberty Airport Systems (Contact person: Tim Winkelman 614-573-8283) shall be updated by the manufacturer to accurately reflect the new geometry of airport runways and taxiways. Consideration shall be given to the control of the airfield lighting system during the transition and provisions shall be made to operate the system manually during this time if necessary.

100-2.3 CONSTANT CURRENT REGULATORS

Modifications to the existing Runway 17-35 Runway Edge Lighting Regulator is required as a part of this project. Replacing the existing name plate on the regulator in kind with a new plate reading "SPARE" will be incidental to work that occurs in the vault as a part of this project.

CONSTRUCTION METHODS

100-3.1 AIRFIELD LIGHTING TOUCHSCREEN MODIFICATIONS

The existing ALCMS system consists of a touchscreen in the Air Traffic Control Tower (2 nodes), Airfield Lighting Vault (1 node each at North and South Vaults) and Airfield Maintenance (1 node). The system is PLC based and software controlled. The system will be updated at all locations by the system manufacturer under this Contract.

All work required by the Contractor to obtain temporary work badges and escorting duties for Liberty Airport Systems (or their affiliate) technicians associated with this work item shall be considered as work necessary to complete the installation.

100-3.2 CONTRACTOR SUPPORT

The Contractor shall support the manufacturer with the system commissioning. Effort to include escorting, installing equipment, terminations, badging, fees and any incidental required to complete the work.

METHOD OF MEASUREMENT

100-4.1 VENDOR ELEMENT. Airfield Lighting Control and Monitoring System Modifications furnished and installed as required by the drawings and these specifications shall be measured for payment as part of this specification.

100-4.2 CONTRACTOR ELEMENT. Measurement shall include work by the Contractor to assist vendor with the system commissioning. Effort to include escorting, installing equipment, terminations, badging, fees and any incidental required to complete the work. Contractor shall also tag existing Runway 17-35 Regulator as 'Spare' as a part of the support of this line item, with a similar placard/plate as the existing regulators in the vault.

BASIS OF PAYMENT

100-5.1 Payment shall be made from the Allowance price for the complete and accepted ALCMS Modifications for the vendor equipment.

Payment shall be made under separate line item for the contractor's effort to complete the ALCMS installation; this price shall be full compensation for all services and items included in the designated item, including but not limited to: preparation, assembly, delivery, transportation, and installation of materials and equipment, labor, equipment, tools, and incidentals necessary to facilitate the installation of a working system.

Payment shall be made under:

Project Item L-100-5.1	Modifications to ALCMS Equipment - Per Lump Sum
Project Item L-100-5.2	Contractor Support of ALCMS Installation - Per Lump Sum

END OF ITEM L-100

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ITEM L-108 UNDERGROUND POWER CABLE FOR AIRPORTS

DESCRIPTION

108-1.1 This item shall consist of furnishing and installing power cables that are direct buried and furnishing and/or installing power cables within conduit or duct banks per these specifications at the locations shown on the plans. It includes excavation and backfill of trench for direct-buried cables only. Also included are the installation of counterpoise wires, ground wires, ground rods and connections, cable splicing, cable marking, cable testing, and all incidentals necessary to place the cable in operating condition as a completed unit to the satisfaction of the RPR. This item shall not include the installation of duct banks or conduit, trenching and backfilling for duct banks or conduit, or furnishing or installation of cable for FAA owned/operated facilities.

EQUIPMENT AND MATERIALS

108-2.1 General.

a. Airport lighting equipment and materials covered by advisory circulars (AC) shall be approved under the Airport Lighting Equipment Certification Program per AC 150/5345-53, current version.

b. All other equipment and materials covered by other referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification, when requested by the RPR.

c. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications. Materials supplied and/or installed that do not comply with these specifications shall be removed (when directed by the RPR) and replaced with materials that comply with these specifications at the Contractor's cost.

d. All materials and equipment used to construct this item shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete any non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment to which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in the project that may accrue directly or indirectly from late submissions or resubmissions of submittals.

e. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be electronically submitted in pdf format. The RPR reserves the right to reject any and all equipment, materials, or procedures that do not meet the system design and the standards and codes, specified in this document.

f. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for at least twelve (12) months from the date of final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner. The Contractor shall maintain a minimum insulation resistance in accordance with paragraph 108-3.10e with isolation transformers connected in new circuits and new segments of existing circuits through the end of

FAA TECHNICAL SPECIFICATIONS L-108-1 the contract warranty period when tested in accordance with AC 150/5340-26, *Maintenance Airport Visual Aid Facilities*, paragraph 5.1.3.1, Insulation Resistance Test.

108-2.2 Cable. Underground cable for airfield lighting facilities (runway and taxiway lights and signs) shall conform to the requirements of AC 150/5345-7, Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits latest edition. Conductors for use on 6.6 ampere primary airfield lighting series circuits shall be single conductor, seven strand, #8 American wire gauge (AWG), L-824 Type C, 5,000 volts, non-shielded, with cross-linked polyethylene insulation. L-824 conductors for use on the L-830 secondary of airfield lighting series circuits shall be sized in accordance with the manufacturer's recommendations. All other conductors shall comply with FAA and National Electric Code (NEC) requirements. Conductor sizes noted above shall not apply to leads furnished by manufacturers on airfield lighting transformers and fixtures.

Wire for electrical circuits up to 600 volts shall comply with Specification L-824 and/or Commercial Item Description A-A-59544A and shall be type THWN-2, 75°C for installation in conduit and RHW-2, 75°C for direct burial installations. Conductors for parallel (voltage) circuits shall be type and size and installed in accordance with NFPA-70, National Electrical Code.

Unless noted otherwise, all 600-volt and less non-airfield lighting conductor sizes are based on a 75°C, THWN-2, 600-volt insulation, copper conductors, not more than three single insulated conductors, in raceway, in free air. The conduit/duct sizes are based on the use of THWN-2, 600-volt insulated conductors. The Contractor shall make the necessary increase in conduit/duct sizes for other types of wire insulation. In no case shall the conduit/duct size be reduced. The minimum power circuit wire size shall be #12 AWG.

Conductor sizes may have been adjusted due to voltage drop or other engineering considerations. Equipment provided by the Contractor shall be capable of accepting the quantity and sizes of conductors shown in the Contract Documents. All conductors, pigtails, cable step-down adapters, cable step-up adapters, terminal blocks and splicing materials necessary to complete the cable termination/splice shall be considered incidental to the respective pay items provided.

Cable type, size, number of conductors, strand and service voltage shall be as specified in the Contract Document.

108-2.3 Bare copper wire (counterpoise, bare copper wire ground and ground rods). Wire for counterpoise or ground installations for airfield lighting systems shall be No. 6 AWG bare solid copper wire for counterpoise and/or No. 6 AWG insulated stranded for grounding bond wire per ASTM B3 and ASTM B8, and shall be bare copper wire. For voltage powered circuits, the equipment grounding conductor shall comply with NEC Article 250.

Ground rods shall be sectional copper-clad steel. The ground rods shall be of the length and diameter specified on the plans, but in no case be less than 10 feet (2.54 m) long and 3/4 inch (19 mm) in diameter.

108-2.4 Cable connections. In-line connections or splices of underground primary cables shall be of the type called for on the plans, and shall be one of the types listed below. No separate payment will be made for cable connections.

a. The cast splice. Not used.

b. The field-attached plug-in splice. Field attached plug-in splices shall be installed as shown on the plans. The Contractor shall determine the outside diameter of the cable to be spliced and furnish appropriately sized connector kits and/or adapters. Tape shall be in accordance with the manufacturer's requirements. Primary Connector Kits manufactured by Amerace, "Super Kit", Integro "Complete Kit", or approved equal is acceptable.

FAA TECHNICAL SPECIFICATIONS L-108-2

- c. The factory-molded plug-in splice. Not used.
- d. The taped or heat-shrink splice. Not used.

108-2.5 Splicer qualifications. Every airfield lighting cable splicer shall be qualified in making airport cable splices and terminations on cables rated at or above 5,000 volts AC. The Contractor shall submit to the RPR proof of the qualifications of each proposed cable splicer for the airport cable type and voltage level to be worked on. Cable splicing/terminating personnel shall have a minimum of three (3) years continuous experience in terminating/splicing medium voltage cable.

108-2.6 Concrete. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

108-2.7 Flowable backfill. Flowable material used to backfill trenches for power cable trenches shall conform to the requirements of Item P-153, Controlled Low Strength Material.

108-2.8 Cable identification tags. Cable identification tags shall be made from a non-corrosive material with the circuit identification stamped or etched onto the tag. The tags shall be of the type as detailed on the plans.

108-2.9 Tape. Electrical tapes shall be Scotch[™] Electrical Tapes –Scotch[™] 88 (1-1/2 inch (38 mm) wide) and Scotch[™] 130C[®] linerless rubber splicing tape (2-inch (50 mm) wide), as manufactured by the Minnesota Mining and Manufacturing Company (3M[™]), or an approved equivalent.

108-2.10 Electrical coating. Electrical coating shall be Scotchkote[™] as manufactured by 3M[™], or an approved equivalent.

108-2.11 Existing circuits. Whenever the scope of work requires connection to an existing circuit, the existing circuit's insulation resistance shall be tested, in the presence of the RPR. The test shall be performed per this item and prior to any activity that will affect the respective circuit. The Contractor shall record the results on forms acceptable to the RPR. When the work affecting the circuit is complete, the circuit's insulation resistance shall be checked again, in the presence of the RPR. The Contractor shall record the results on forms acceptable to the RPR. The second reading shall be equal to or greater than the first reading or the Contractor shall make the necessary repairs to the existing circuit to bring the second reading above the first reading. All repair costs including a complete replacement of the L-823 connectors, L-830 transformers and L-824 cable, if necessary, shall be borne by the Contractor. All test results shall be submitted in the Operation and Maintenance (O&M) Manual.

108-2.12 Detectable warning tape. Plastic, detectable, American Public Works Association (APWA) Red (electrical power lines, cables, conduit and lighting cable) with continuous legend tape shall be polyethylene film with a metalized foil core and shall be 3-6 inches (75-150 mm) wide. Detectable tape is incidental to the respective bid item. Detectable warning tape for communication cables shall be orange. Detectable warning tape color code shall comply with the APWA Uniform Color Code.

CONSTRUCTION METHODS

108-3.1 General. The Contractor shall install the specified cable at the approximate locations indicated on the plans. Unless otherwise shown on the plans, all cable required to cross under pavements expected to carry aircraft loads shall be installed in concrete encased duct banks. Cable shall be run without splices, from fixture to fixture.

Cable connections between lights will be permitted only at the light locations for connecting the underground cable to the primary leads of the individual isolation transformers. The Contractor shall be responsible for providing cable in continuous lengths for home runs or other long cable runs without connections unless otherwise authorized in writing by the RPR or shown on the plans.

Cable circuit identification markers shall be installed on both sides of the L-823 connectors installed and on both sides of slack loops where a future connector would be installed.

Provide not less than 3 feet (1 m) of cable slack on each side of all connections, isolation transformers, light units, and at points where cable is connected to field equipment. Where provisions must be made for testing or for future above grade connections, provide enough slack to allow the cable to be extended at least one foot (30 cm) vertically above the top of the access structure. This requirement also applies where primary cable passes through empty light bases, junction boxes, and access structures to allow for future connections, or as designated by the RPR.

Primary airfield lighting cables installed shall have cable circuit identification markers attached on both sides of each L-823 connector and on each airport lighting cable entering or leaving cable access points, such as manholes, hand holes, pull boxes, junction boxes, etc. Markers shall be of sufficient length for imprinting the cable circuit identification legend on one line, using letters not less than 1/4 inch (6 mm) in size. The cable circuit identification shall match the circuits noted on the construction plans.

108-3.2 Installation in duct banks or conduits. This item includes the installation of the cable in duct banks or conduit per the following paragraphs. The maximum number and voltage ratings of cables installed in each single duct or conduit, and the current-carrying capacity of each cable shall be per the latest version of the National Electric Code, or the code of the local agency or authority having jurisdiction.

The Contractor shall make no connections or splices of any kind in cables installed in conduits or duct banks.

Unless otherwise designated in the plans, where ducts are in tiers, use the lowest ducts to receive the cable first, with spare ducts left in the upper levels. Check duct routes prior to construction to obtain assurance that the shortest routes are selected and that any potential interference is avoided.

Duct banks or conduits shall be installed as a separate item per Item L-110, Airport Underground Electrical Duct Banks and Conduit. The Contractor shall run a mandrel through duct banks or conduit prior to installation of cable to ensure that the duct bank or conduit is open, continuous and clear of debris. The mandrel size shall be compatible with the conduit size. The Contractor shall swab out all conduits/ducts and clean light bases, manholes, etc., interiors immediately prior to pulling cable. Once cleaned and swabbed, the light bases and all accessible points of entry to the duct/conduit system shall be kept closed except when installing cables. Cleaning of ducts, light bases, manholes, etc., is incidental to the pay item of the item being cleaned. All raceway systems left open, after initial cleaning, for any reason shall be re-cleaned at the Contractor's expense. The Contractor shall verify existing ducts proposed for use in this project as clear and open. The Contractor shall notify the RPR of any blockage in the existing ducts.

The cable shall be installed in a manner that prevents harmful stretching of the conductor, damage to the insulation, or damage to the outer protective covering. The ends of all cables shall be sealed with moisture-seal tape providing moisture-tight mechanical protection with minimum bulk, or alternately, heat shrinkable tubing before pulling into the conduit and it shall be left sealed until

FAA TECHNICAL SPECIFICATIONS L-108-4 connections are made. Where more than one cable is to be installed in a conduit, all cable shall be pulled in the conduit at the same time. The pulling of a cable through duct banks or conduits may be accomplished by hand winch or power winch with the use of cable grips or pulling eyes. Maximum pulling tensions shall not exceed the cable manufacturer's recommendations. A non-hardening cable-pulling lubricant recommended for the type of cable being installed shall be used where required.

The Contractor shall submit the recommended pulling tension values to the RPR prior to any cable installation. If required by the RPR, pulling tension values for cable pulls shall be monitored by a dynamometer in the presence of the RPR. Cable pull tensions shall be recorded by the Contractor and reviewed by the RPR. Cables exceeding the maximum allowable pulling tension values shall be removed and replaced by the Contractor at the Contractor's expense.

The manufacturer's minimum bend radius or NEC requirements (whichever is more restrictive) shall apply. Cable installation, handling and storage shall be per manufacturer's recommendations.

Cable shall not be dragged across base can or manhole edges, pavement or earth. When cable must be coiled, lay cable out on a canvas tarp or use other appropriate means to prevent abrasion to the cable jacket.

108-3.3 Installation of direct-buried cable in trenches. Not used.

108-3.4 Cable markers for direct-buried cable. Not used.

108-3.5 Splicing. Connections of the type shown on the plans shall be made by experienced personnel regularly engaged in this type of work and shall be made as follows:

a. Cast splices. Not used.

b. Field-attached plug-in splices. These shall be assembled per the manufacturer's instructions. These splices shall be made by plugging directly into mating connectors. The joint where the connectors come together shall be finished by one of the following methods: (1) wrapped with at least one layer of rubber or synthetic rubber tape and one layer of plastic tape, one-half lapped, extending at least 1-1/2 inches (38 mm) on each side of the joint or (2) On connector kits equipped with water seal flap; roll-over water seal flap to sealing position on mating connector.

c. Factory-molded plug-in splices. Not used.

d. Taped or heat-shrink splices. Not used.

e. Assembly. Surfaces of equipment or conductors being terminated or connected shall be prepared in accordance with industry standard practice and manufacturer's recommendations. All surfaces to be connected shall be thoroughly cleaned to remove all dirt, grease, oxides, nonconductive films, or other foreign material. Paints and other nonconductive coatings shall be removed to expose base metal. Clean all surfaces at least 1/4 inch (6.4 mm) beyond all sides of the larger bonded area on all mating surfaces. Use a joint compound suitable for the materials used in the connection. Repair painted/coated surface to original condition after completing the connection.

108-3.6 Bare counterpoise wire installation for lightning protection and grounding. If shown on the plans or included in the job specifications, bare solid #6 AWG copper counterpoise wire shall be installed for lightning protection of the underground cables. The RPR shall select one of two methods of lightning protection for the airfield lighting circuit based upon sound engineering practice and lightning strike density.

FAA TECHNICAL SPECIFICATIONS L-108-5 **a. Equipotential.** The counterpoise size is as shown on the plans. The equipotential method is applicable to all airfield lighting systems; i.e. runway, taxiway, apron – touchdown zone, centerline, edge, threshold and approach lighting systems. The equipotential method is also successfully applied to provide lightning protection for power, signal and communication systems. The light bases, counterpoise, etc – all components - are bonded together and bonded to the vault power system ground loop/electrode.

Counterpoise wire shall be installed in the same trench for the entire length of buried cable, conduits and duct banks that are installed to contain airfield cables. The counterpoise is centered over the cable/conduit/duct to be protected.

The counterpoise conductor shall be installed no less than 8 inches (200 mm) minimum or 12 inches (300 mm) maximum above the raceway or cable to be protected, except as permitted below:

(1) The minimum counterpoise conductor height above the raceway or cable to be protected shall be permitted to be adjusted subject to coordination with the airfield lighting and pavement designs.

(2) The counterpoise conductor height above the protected raceway(s) or cable(s) shall be calculated to ensure that the raceway or cable is within a 45-degree area of protection, (45 degrees on each side of vertical creating a 90 degree angle).

The counterpoise conductor shall be bonded to each metallic light base, mounting stake, and metallic airfield lighting component.

All metallic airfield lighting components in the field circuit on the output side of the constant current regulator (CCR) or other power source shall be bonded to the airfield lighting counterpoise system.

All components rise and fall at the same potential; with no potential difference, no damaging arcing and no damaging current flow.

See AC 150/5340-30, Design and Installation Details for Airport Visual Aids and NFPA 780, Standard for the Installation of Lightning Protection Systems, Chapter 11, for a detailed description of the Equipotential Method of lightning protection.

Reference FAA STD-019E, Lightning and Surge Protection, Grounding Bonding and Shielding Requirements for Facilities and Electronic Equipment, Part 4.1.1.7.

b. Isolation. Not used.

c. Common Installation requirements. When a metallic light base is used, the grounding electrode shall be bonded to the metallic light base or mounting stake with a No. 6 AWG bare, annealed or soft drawn, solid copper conductor.

Grounding electrodes may be rods, ground dissipation plates, radials, or other electrodes listed in the NFPA 70 (NEC) or NFPA 780.

Where raceway is installed by the directional bore, jack and bore, or other drilling method, the counterpoise conductor shall be permitted to be installed concurrently with the directional bore, jack and bore, or other drilling method raceway, external to the raceway or sleeve.

The counterpoise wire shall also be exothermically welded to ground rods installed as shown on the plans but not more than 500 feet (150 m) apart around the entire circuit. The counterpoise system shall be continuous and terminate at the transformer vault or at the power source. It shall be securely attached to the vault or equipment external ground ring or other made electrodegrounding system. The connections shall be made as shown on the plans and in the specifications.

Where an existing airfield lighting system is being extended or modified, the new counterpoise conductors shall be interconnected to existing counterpoise conductors at each intersection of the new and existing airfield lighting counterpoise systems.

d. Parallel Voltage Systems. Provide grounding and bonding in accordance with NFPA 70, National Electrical Code.

108-3.7 Counterpoise installation above multiple conduits and duct banks. Counterpoise wires shall be installed above multiple conduits/duct banks for airfield lighting cables, with the intent being to provide a complete area of protection over the airfield lighting cables. When multiple conduits and/or duct banks for airfield cable are installed in the same trench, the number and location of counterpoise wires above the conduits shall be adequate to provide a complete area of protection.

Where duct banks pass under pavement to be constructed in the project, the counterpoise shall be placed above the duct bank. Reference details on the construction plans.

108-3.8 Counterpoise installation at existing duct banks. When airfield lighting cables are indicated on the plans to be routed through existing duct banks, the new counterpoise wiring shall be terminated at ground rods at each end of the existing duct bank where the cables being protected enter and exit the duct bank. The new counterpoise conductor shall be bonded to the existing counterpoise system.

108-3.9 Exothermic bonding. Bonding of counterpoise wire shall be by the exothermic welding process or equivalent method accepted by the RPR. Only personnel experienced in and regularly engaged in this type of work shall make these connections.

Contractor shall demonstrate to the satisfaction of the RPR, the welding kits, materials and procedures to be used for welded connections prior to any installations in the field. The installations shall comply with the manufacturer's recommendations and the following:

a. All slag shall be removed from welds.

b. Using an exothermic weld to bond the counterpoise to a lug on a galvanized light base is not allowed unless the base has been specially modified. Consult the manufacturer's installation directions for proper methods of bonding copper wire to the light base. See AC 150/5340-30 for galvanized light base exception.

c. If called for in the plans, all buried copper and weld material at weld connections shall be thoroughly coated with 6 mm of 3M[™] Scotchkote[™], or approved equivalent, or coated with coal tar Bitumastic® material to prevent surface exposure to corrosive soil or moisture.

108-3.10 Testing. The Contractor shall furnish all necessary equipment and appliances for testing the airport electrical systems and underground cable circuits before and after installation. The Contractor shall perform all tests in the presence of the RPR. The Contractor shall demonstrate the electrical characteristics to the satisfaction of the RPR. All costs for testing are incidental to the respective item being tested. For phased projects, the tests must be completed by phase. The Contractor must maintain the test results throughout the entire project as well as during the warranty period that meet the following:

a. Earth resistance testing methods shall be submitted to the RPR for approval. Earth resistance testing results shall be recorded on an approved form and testing shall be performed in the presence of the RPR. All such testing shall be at the sole expense of the Contractor.

b. Should the counterpoise or ground grid conductors be damaged or suspected of being damaged by construction activities the Contractor shall test the conductors for continuity with a low resistance ohmmeter. The conductors shall be isolated such that no parallel path exists and tested for continuity. The RPR shall approve of the test method selected. All such testing shall be at the sole expense of the Contractor.

After installation, the Contractor shall test and demonstrate to the satisfaction of the RPR the following:

c. That all affected lighting power and control circuits (existing and new) are continuous and free from short circuits.

d. That all affected circuits (existing and new) are free from unspecified grounds.

e. That the insulation resistance to ground of all new non-grounded high voltage series circuits or cable segments is not less than 50 megohms. Verify continuity of all series airfield lighting circuits prior to energization.

f. That the insulation resistance to ground of all new non-grounded conductors of new multiple circuits or circuit segments is not less than 100 megohms.

g. That all affected circuits (existing and new) are properly connected per applicable wiring diagrams.

h. That all affected circuits (existing and new) are operable. Tests shall be conducted that include operating each control not less than 10 times and the continuous operation of each lighting and power circuit for not less than 1/2 hour.

i. That the impedance to ground of each ground rod does not exceed 25 ohms prior to establishing connections to other ground electrodes. The fall-of-potential ground impedance test shall be used, as described by American National Standards Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) Standard 81, to verify this requirement. As an alternate, clamp-on style ground impedance test meters may be used to satisfy the impedance testing requirement. Test equipment and its calibration sheets shall be submitted for review and approval by the RPR prior to performing the testing.

Two copies of tabulated results of all cable tests performed shall be supplied by the Contractor to the RPR. Where connecting new cable to existing cable, insulation resistance tests shall be performed on the new cable prior to connection to the existing circuit.

There are no approved "repair" procedures for items that have failed testing other than complete replacement.

METHOD OF MEASUREMENT

108-4.1 Cable or counterpoise wire installed in trench, duct bank or conduit shall be measured by the number of linear feet (meters) installed and grounding connectors, and trench marking tape ready for operation, and accepted as satisfactory. Separate measurement shall be made for each cable or counterpoise wire installed in trench, duct bank or conduit. The measurement for this item shall not include additional quantities required for slack. Cable and counterpoise slack is considered incidental to this item and is included in the Contractor's unit price. No separate measurement or payment will be made for cable or counterpoise slack. Heat shrink shall not be used on cable connections.

108-4.2 No separate payment will be made for ground rods.

FAA TECHNICAL SPECIFICATIONS L-108-8

BASIS OF PAYMENT

108-5.1 Payment will be made at the contract unit price for cable and equipment ground installed in duct bank or conduit, or for counterpoise installed above conduit, in place by the Contractor and accepted by the RPR. This price shall be full compensation for furnishing all materials and for all preparation and installation of these materials, and for all labor, equipment, tools, and incidentals, including ground rods and ground connectors and trench marking tape, necessary to complete this item.

Payment will be made under:

Item L-108-5.1	No. 8 AWG, 5 kV, L-824C Cable, Installed in Duct Bank or Conduit - per liner foot
Item L-108-5.2	No. 6 AWG, Solid, Bare Copper Counterpoise Wire, Installed Above Conduit - per linear foot

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 150/5340-26	Maintenance of Airport Visual Aid Facilities
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-53	Airport Lighting Equipment Certification Program

Commercial Item Description

	A-A-59544A	Cable and Wire, Electrical (Power, Fixed Installation)
	A-A-55809	Insulation Tape, Electrical, Pressure-Sensitive Adhesive, Plastic
ASTM	International (ASTM)	
	ASTM B3	Standard Specification for Soft or Annealed Copper Wire
	ASTM B8	Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
	ASTM B33	Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes
	ASTM D4388	Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes
Mil Spec		
	MIL-PRF-23586F	Performance Specification: Sealing Compound (with Accelerator), Silicone Rubber, Electrical

MIL-I-24391 Insulation Tape, Electrical, Plastic, Pressure Sensitive

National Fire Protection Association (NFPA)

NFPA-70 National Electrical Code (NEC)

NFPA-780 Standard for the Installation of Lightning Protection Systems

American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE)

ANSI/IEEE STD 81 IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System

Federal Aviation Administration Standard

FAA STD-019E Lightning and Surge Protection, Grounding Bonding and Shielding Requirements for Facilities and Electronic Equipment

END OF ITEM L-108

ITEM L-110 AIRPORT UNDERGROUND ELECTRICAL DUCT BANKS AND CONDUITS

DESCRIPTION

110-1.1 This item shall consist of underground electrical conduits and duct banks (single or multiple conduits encased in concrete or buried in sand) installed per this specification at the locations and per the dimensions, designs, and details shown on the plans. This item shall include furnishing and installing of all underground electrical duct banks and individual and multiple underground conduits. It shall also include all turfing trenching, backfilling, removal, and restoration of any paved or turfed areas; concrete encasement, mandrelling, pulling lines, duct markers, plugging of conduits, and the testing of the installation as a completed system ready for installation of cables per the plans and specifications. This item shall also include furnishing and installing conduits and all incidentals for providing positive drainage of the system. Verification of existing ducts is incidental to the pay items provided in this specification.

EQUIPMENT AND MATERIALS

110-2.1 General.

a. All equipment and materials covered by referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when requested by the RPR.

b. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide <u>materials</u> per these specifications and acceptable to the RPR. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the RPR and replaced with materials, that comply with these specifications, at the Contractor's cost.

c. All materials and equipment used to construct this item shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in project that accrue directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be electronically submitted in pdf format, tabbed by specification section. The RPR reserves the right to reject any and all equipment, materials or procedures that do not meet the system design and the standards and codes specified in this document.

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

110-2.2 Steel conduit. Rigid galvanized steel (RGS) conduit and fittings shall be hot dipped galvanized inside and out and conform to the requirements of Underwriters Laboratories Standards 6, 514B, and 1242. All RGS conduits or RGS elbows installed below grade, in concrete, permanently wet locations or other similar environments shall be painted with a 10-mil thick coat of asphaltum sealer or shall have a factory-bonded polyvinyl chloride (PVC) cover. Any exposed galvanizing or steel shall be coated with 10 mils of asphaltum sealer. When using PVC coated RGS conduit, care shall be exercised not to damage the factory PVC coating. Damaged PVC coating shall be repaired per the manufacturer's written instructions. In lieu of PVC coated RGS, corrosion wrap tape shall be permitted to be used where RGS is in contact with direct earth."

110-2.3 Plastic conduit. Plastic conduit and fittings-shall conform to the following requirements:

- UL 514B covers W-C-1094-Conduit fittings all types, classes 1 thru 3 and 6 thru 10
- UL 514C covers W-C-1094- all types, Class 5 junction box and cover in plastic (PVC).
- UL 651 covers W-C-1094-Rigid PVC Conduit, types I and II, Class 4.
- UL 651A covers W-C-1094-Rigid PVC Conduit and high-density polyethylene (HDPE) Conduit type III and Class 4.

Underwriters Laboratories Standards UL-651 and Article 352 of the current National Electrical Code shall be one of the following, as shown on the plans:

a. Type I–Schedule 40 and Schedule 80 PVC suitable for underground use either direct-buried or encased in concrete.

b. Type II–Schedule 40 PVC suitable for either above ground or underground use.

c. Type III – Schedule 80 PVC suitable for either above ground or underground use either direct-buried or encased in concrete.

d. Type III –HDPE pipe, minimum standard dimensional ratio (SDR) 11, suitable for placement with directional boring under pavement.

The type of solvent cement shall be as recommended by the conduit/fitting manufacturer.

110-2.4 Split conduit. Split conduit shall be pre-manufactured for the intended purpose and shall be made of steel or plastic.

110-2.5 Conduit spacers. Conduit spacers shall be prefabricated interlocking units manufactured for the intended purpose. They shall be of double wall construction made of high grade, high density polyethylene complete with interlocking cap and base pads. They shall be designed to accept No. 4 reinforcing bars installed vertically.

110-2.6 Concrete. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

110-2.7 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another RPR approved third party certification program. Precast concrete structures shall conform to ASTM C478.

110-2.8 Flowable backfill. Flowable material used to back fill conduit and duct bank trenches shall conform to the requirements of Item P-153, Controlled Low Strength Material.

110-2.9 Detectable warning tape. Plastic, detectable, American Public Works Association (APWA) red (electrical power lines, cables, conduit and lighting cable), orange (telephone/fiber optic cabling) with continuous legend magnetic tape shall be polyethylene film with a metallized

FAA TECHNICAL SPECIFICATIONS L-110-2 foil core and shall be 3-6 inches (75-150 mm) wide. Detectable tape is incidental to the respective bid item.

CONSTRUCTION METHODS

110-3.1 General. The Contractor shall install underground duct banks and conduits at the approximate locations indicated on the plans. The RPR shall indicate specific locations as the work progresses, if required to differ from the plans. Duct banks and conduits shall be of the size, material, and type indicated on the plans or specifications. Where no size is indicated on the plans or in the specifications, conduits shall be not less than 2 inches (50 mm) inside diameter or comply with the National Electrical Code based on cable to be installed, whichever is larger. All duct bank and conduit lines shall be laid so as to grade toward access points and duct or conduit ends for drainage. Unless shown otherwise on the plans, grades shall be at least 3 inches (75 mm) per 100 feet (30 m). On runs where it is not practicable to maintain the grade all one way, the duct bank and conduit lines shall be graded from the center in both directions toward access points or conduit ends, with a drain into the storm drainage system. Pockets or traps where moisture may accumulate shall be avoided. Under pavement, the top of the duct bank shall not be less than 18 inches (0.5 m) below the subgrade; in other locations, the top of the duct bank or underground conduit shall be be not less than 18 inches (0.5 m) below finished grade.

The Contractor shall mandrel each individual conduit whether the conduit is direct-buried or part of a duct bank. An iron-shod mandrel, not more than 1/4 inch (6 mm) smaller than the bore of the conduit shall be pulled or pushed through each conduit. The mandrel shall have a leather or rubber gasket slightly larger than the conduit hole.

The Contractor shall swab out all conduits/ducts and clean base can, manhole, pull boxes, etc., interiors immediately prior to pulling cable. Once cleaned and swabbed the light bases, manholes, pull boxes, etc., and all accessible points of entry to the duct/conduit system shall be kept closed except when installing cables. Cleaning of ducts, base cans, manholes, etc., is incidental to the pay item of the item being cleaned. All raceway systems left open, after initial cleaning, for any reason shall be recleaned at the Contractor's expense. All accessible points shall be kept closed when not installing cable. The Contractor shall verify existing ducts proposed for use in this project as clear and open. The Contractor shall notify the RPR of any blockage in the existing ducts.

For pulling the permanent wiring, each individual conduit, whether the conduit is direct-buried or part of a duct bank, shall be provided with a 200-pound (90 kg) test polypropylene pull rope. The ends shall be secured and sufficient length shall be left in access points to prevent it from slipping back into the conduit. Where spare conduits are installed, as indicated on the plans, the open ends shall be plugged with removable tapered plugs, designed for this purpose.

All conduits shall be securely fastened in place during construction and shall be plugged to prevent contaminants from entering the conduits. Any conduit section having a defective joint shall not be installed. Ducts shall be supported and spaced apart using approved spacers at intervals not to exceed 5 feet (1.5 m).

Unless otherwise shown on the plans, concrete encased duct banks shall be used when crossing under pavements expected to carry aircraft loads, such as runways, taxiways, taxilanes, ramps and aprons. When under paved shoulders and other paved areas, conduit and duct banks shall be encased using flowable fill for protection.

All conduits within concrete encasement of the duct banks shall terminate with female ends for ease in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

FAA TECHNICAL SPECIFICATIONS L-110-3 Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored.

Trenches for conduits and duct banks may be excavated manually or with mechanical trenching equipment unless in pavement, in which case they shall be excavated with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of shoulder surface is disturbed. Blades of graders shall not be used to excavate the trench.

When rock is encountered, the rock shall be removed to a depth of at least 3 inches (75 mm) below the required conduit or duct bank depth and it shall be replaced with bedding material of earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch (6.3 mm) sieve. Flowable backfill may alternatively be used

Underground electrical warning (Caution) tape shall be installed in the trench above all underground duct banks and conduits in unpaved areas. Contractor shall submit a sample of the proposed warning tape for approval by the RPR. If not shown on the plans, the warning tape shall be located 6 inches above the duct/conduit or the counterpoise wire if present.

Joints in plastic conduit shall be prepared per the manufacturer's recommendations for the particular type of conduit. Plastic conduit shall be prepared by application of a plastic cleaner and brushing a plastic solvent on the outside of the conduit ends and on the inside of the couplings. The conduit fitting shall then be slipped together with a quick one-quarter turn twist to set the joint tightly. Where more than one conduit is placed in a single trench, or in duct banks, joints in the conduit shall be staggered a minimum of 2 feet (60 cm).

Changes in direction of runs exceeding 10 degrees, either vertical or horizontal, shall be accomplished using manufactured sweep bends.

Whether or not specifically indicated on the drawings, where the soil encountered at established duct bank grade is an unsuitable material, as determined by the RPR, the unsuitable material shall be removed per Item P-152 and replaced with suitable material. Additional duct bank supports shall be installed, as approved by the RPR.

All excavation shall be unclassified and shall be considered incidental to Item L-110. Dewatering necessary for duct installation, and erosion per federal, state, and local requirements is incidental to Item L-110.

Unless otherwise specified, excavated materials that are deemed by the RPR to be unsuitable for use in backfill or embankments shall be removed and disposed of offsite.

Any excess excavation shall be filled with suitable material approved by the RPR and compacted per Item P-152.

It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Where existing active cables) cross proposed installations, the Contractor shall ensure that these cables are adequately protected. Where crossings are unavoidable, no splices will be allowed in the existing cables, except as specified on the plans. Installation of new cable where such crossings must occur shall proceed as follows:

a. Existing cables shall be located manually. Unearthed cables shall be inspected to assure absolutely no damage has occurred

b. Trenching, etc., in cable areas shall then proceed with approval of the RPR, with care taken to minimize possible damage or disruption of existing cable, including careful backfilling in area of cable.

In the event that any previously identified cable is damaged during the course of construction, the Contractor shall be responsible for the complete repair.

110-3.2 Duct banks. Unless otherwise shown in the plans, duct banks shall be installed so that the top of the concrete envelope is not less than 18 inches (0.5 m) below the bottom of the base or stabilized base course layers where installed under runways, taxiways, aprons, or other paved areas, and not less than 18 inches (0.5 m) below finished grade where installed in unpaved areas.

Unless otherwise shown on the plans, duct banks under paved areas shall extend at least 3 feet (1 m) beyond the edges of the pavement or 3 feet (1 m) beyond any under drains that may be installed alongside the paved area. Trenches for duct banks shall be opened the complete length before concrete is placed so that if any obstructions are encountered, provisions can be made to avoid them. Unless otherwise shown on the plans, all duct banks shall be placed on a layer of concrete not less than 3 inches (75 mm) thick prior to its initial set. The Contractor shall space the conduits not less than 3 inches (75 mm) apart (measured from outside wall to outside wall). All such multiple conduits shall be placed using conduit spacers applicable to the type of conduit. As the conduit laying progresses, concrete shall be placed around and on top of the conduits not less than 3 inches (75 mm) thick unless otherwise shown on the plans. All conduits shall terminate with female ends for ease of access in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

Conduits forming the duct bank shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches (150 mm) to anchor the assembly into the earth prior to placing the concrete encasement. For this purpose, the spacers shall be fastened down with locking collars attached to the vertical bars. Spacers shall be installed at 5-foot (1.5-m) intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the RPR for review prior to use.

When specified, the Contractor shall reinforce the bottom side and top of encasements with steel reinforcing mesh or fabric or other approved metal reinforcement. When directed, the Contractor shall supply additional supports where the ground is soft and boggy, where ducts cross under roadways, or where shown on the plans. Under such conditions, the complete duct structure shall be supported on reinforced concrete footings, piers, or piles located at approximately 5-foot (1.5-m) intervals.

All pavement surfaces that are to have ducts installed therein shall be neatly saw cut to form a vertical face. All excavation shall be included in the contract with price for the duct.

Install a plastic, detectable, color as noted, 3 to 6 inches (75 to 150 mm) wide tape, 8 inches (200 mm) minimum below grade above all underground conduit or duct lines not installed under pavement. Utilize the 3-inch (75-mm) wide tape only for single conduit runs. Utilize the 6-inch (150-mm) wide tape for multiple conduits and duct banks. For duct banks equal to or greater than 24 inches (600 mm) in width, utilize more than one tape for sufficient coverage and identification of the duct bank as required.

When existing cables are to be placed in split duct, encased in concrete, the cable shall be carefully located and exposed by hand tools. Prior to being placed in duct, the RPR shall be notified so that he may inspect the cable and determine that it is in good condition. Where required, split duct shall be installed as shown on the drawings or as required by the RPR.

110-3.3 Conduits without concrete encasement. Trenches for single-conduit lines shall be not less than 6 inches (150 mm) nor more than 12 inches (300 mm) wide. The trench for 2 or more conduits installed at the same level shall be proportionately wider. Trench bottoms for conduits without concrete encasement shall be made to conform accurately to grade so as to provide uniform support for the conduit along its entire length.

FAA TECHNICAL SPECIFICATIONS L-110-5 Unless otherwise shown on the plans, a layer of fine earth material, at least 4 inches (100 mm) thick (loose measurement) shall be placed in the bottom of the trench as bedding for the conduit. The bedding material shall consist of soft dirt, sand or other fine fill, and it shall contain no particles that would be retained on a 1/4-inch (6.3 mm) sieve. The bedding material shall be tamped until firm. Flowable backfill may alternatively be used.

Unless otherwise shown on plans, conduits shall be installed so that the tops of all conduits within the Airport's secured area where trespassing is prohibited are at least 18 inches (0.5 m) below the finished grade. Conduits outside the Airport's secured area shall be installed so that the tops of the conduits are at least 24 inches (60 cm) below the finished grade per National Electric Code (NEC), Table 300.5.

When two or more individual conduits intended to carry conductors of equivalent voltage insulation rating are installed in the same trench without concrete encasement, they shall be spaced not less than 3 inches (75 mm) apart (measured from outside wall to outside wall) in a horizontal direction and not less than 6 inches (150 mm) apart in a vertical direction. Where two or more individual conduits intended to carry conductors of differing voltage insulation rating are installed in the same trench without concrete encasement, they shall be placed not less than 3 inches (75 mm) apart (measured from outside wall to outside wall) in a horizontal direction and not less than 4 inches (75 mm) apart (measured from outside wall to outside wall) in a horizontal direction and lot less than 6 inches (150 mm) apart in a vertical direction.

Trenches shall be opened the complete length between normal termination points before conduit is installed so that if any unforeseen obstructions are encountered, proper provisions can be made to avoid them.

Conduits shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches (150 mm) to anchor the assembly into the earth while backfilling. For this purpose, the spacers shall be fastened down with locking collars attached to the vertical bars. Spacers shall be installed at 5-foot (1.5-m) intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the RPR for review prior to use.

110-3.4 Markers. The location of each end and of each change of direction of conduits and duct banks shall be marked by a concrete slab marker 2 feet (60 cm) square and 4 - 6 inches (100 - 150 mm) thick extending approximately one inch (25 mm) above the surface. The markers shall also be located directly above the ends of all conduits or duct banks, except where they terminate in a junction/access structure or building. Each cable or duct run from a line of lights and signs to the equipment vault must be marked at approximately every 200 feet (61 m) along the cable or duct run, with an additional marker at each change of direction of cable or duct run.

The Contractor shall impress the word "DUCT" or "CONDUIT" on each marker slab. Impression of letters shall be done in a manner, approved by the RPR, for a neat, professional appearance. All letters and words must be neatly stenciled. After placement, all markers shall be given one coat of high-visibility orange paint, as approved by the RPR. The Contractor shall also impress on the slab the number and size of conduits beneath the marker along with all other necessary information as determined by the RPR. The letters shall be 4 inches (100 mm) high and 3 inches (75 mm) wide with width of stroke 1/2 inch (12 mm) and 1/4 inch (6 mm) deep or as large as the available space permits. Furnishing and installation of duct markers is incidental to the respective duct pay item.

110-3.5 Backfilling for conduits. For conduits, 8 inches (200 mm) of sand, soft earth, or other fine fill (loose measurement) shall be placed around the conduits ducts and carefully tamped around and over them with hand tampers. The remaining trench shall then be backfilled and

compacted per Item P-152 except that material used for back fill shall be select material not larger than 4 inches (100 mm) in diameter.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during back filling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the RPR.

110-3.6 Backfilling for duct banks. After the concrete has cured, the remaining trench shall be backfilled and compacted per Item P-152 "Excavation and Embankment" except that the material used for backfill shall be select material not larger than 4 inches (100 mm) in diameter. In addition to the requirements of Item P-152, where duct banks are installed under pavement, one moisture/density test per lift shall be made for each 250 linear feet (76 m) of duct bank or one work period's construction, whichever is less.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during backfilling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the RPR.

110-3.7 Restoration. Where sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by the work shall be restored to its original condition. The restoration shall include sodding and seeding shown on the plans. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance. All restoration shall be considered incidental to the respective L-110 pay item. Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD), and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

110-3.8 Ownership of removed cable. Removed cable shall be disposed of properly off site at no cost to the owner.

METHOD OF MEASUREMENT

110-4.1 Underground conduits and duct banks shall be measured by the linear feet of conduits and duct banks installed, including encasement, locator tape, trenching and backfill with designated material, and restoration, the termination at the drainage structure, all measured in place, completed, and accepted. Separate measurement shall be made for the various types and sizes.

BASIS OF PAYMENT

110-5.1 Payment will be made at the contract unit price per linear foot for each type and size of conduit and duct bank completed and accepted, including trench and backfill with the designated material. Furnishing all materials for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item per the provisions and intent of the plans and specifications is included herein.

Payment will be made under:

Item L-110-5.1	Direct Buried 1-Way, 2" PVC Conduit - Installed in Turf - per linear foot
Item L-110-5.2	Concrete Encased, 1-Way, 2" PVC Conduit, Installed in Concrete - per linear foot

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 Circular (AC)

AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-53	Airport Lighting Equipment Certification Program

ASTM International (ASTM)

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

National Fire Protection Association (NFPA)

NFPA-70 National Electrical Code (NEC)

Underwriters Laboratories (UL)

UL Standard 6	Electrical Rigid Metal Conduit - Steel
UL Standard 514B	Conduit, Tubing, and Cable Fittings
UL Standard 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
UL Standard 1242	Electrical Intermediate Metal Conduit Steel
UL Standard 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
UL Standard 651A	Type EB and A Rigid PVC Conduit and HDPE Conduit

END OF ITEM L-110

ITEM L-115 ELECTRICAL MANHOLES AND JUNCTION STRUCTURES

DESCRIPTION

115-1.1 This item shall consist of electrical junction structures (hand holes, pull boxes, junction cans, etc.) installed per this specification, at the indicated locations and conforming to the lines, grades and dimensions shown on the plans or as required by the RPR. This item shall include the installation of each electrical manhole and/or junction structures with all associated excavation, backfilling, sheeting and bracing, concrete, reinforcing steel, appurtenances, testing, dewatering and restoration of surfaces to the satisfaction of the RPR.

EQUIPMENT AND MATERIALS

115-2.1 General.

a. All equipment and materials covered by referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when so requested by the RPR.

b. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications. Materials supplied and/or installed that do not comply with these specifications shall be removed (when directed by the RPR) and replaced with materials that comply with these specifications at the Contractor's cost.

c. All materials and equipment used to construct this item shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete any non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment to which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in the project that may accrue directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be electronically submitted in pdf format, tabbed by specification section. The RPR reserves the right to reject any and all equipment, materials or procedures that do not meet the system design and the standards and codes, specified in this document.

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

115-2.2 Concrete structures. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures. Cast-in-place concrete structures shall be as shown on the plans.

115-2.3 Precast concrete structures. Not used.

115-2.4 Junction boxes. Junction boxes shall be L-867 Class 1 (non-load bearing) or L-868 Class 1 (load bearing) airport light bases that are encased in concrete. The light bases shall have a L-894 blank cover, gasket, and stainless steel hardware. All bolts, studs, nuts, lock washers, and other similar fasteners used for the light fixture assemblies must be fabricated from 316L (equivalent to EN 1.4404), 18-8, 410, or 416 stainless steel. If 18-8, 410, or 416 stainless steel is utilized it shall be passivated and be free from any discoloration. Steel covers shall be 3/8-inch thickness for L-867 and 3/4-inch thickness for L-868 base cans.. All junction boxes shall be provided with both internal and external ground lugs.

115-2.5 Mortar. The mortar shall be composed of one part of cement and two parts of mortar sand, by volume. The cement shall be per the requirements in ASTM C150, Type I. The sand shall be per the requirements in ASTM C144. Hydrated lime may be added to the mixture of sand and cement in an amount not to exceed 15% of the weight of cement used. The hydrated lime shall meet the requirements of ASTM C206. Water shall be potable, reasonably clean and free of oil, salt, acid, alkali, sugar, vegetable, or other substances injurious to the finished product.

115-2.6 Concrete. All concrete used in structures shall conform to the requirements of Item P-610, Concrete for Miscellaneous Structures.

115-2.7 Frames and covers. Not used.

115-2.8 Ladders. Not used.

115-2.9 Reinforcing steel. Not used.

115-2.10 Bedding/special backfill. Bedding or special backfill shall be as shown on the plans.

115-2.11 Flowable backfill. Flowable material used to backfill shall conform to the requirements of Item P-153, Controlled Low Strength Material.

115-2.12 Cable trays. Not used.

115-2.13 Plastic conduit. Plastic conduit shall comply with Item L-110, Airport Underground Electrical Duct Banks and Conduits.

115-2.14 Conduit terminators. Conduit terminators shall be pre-manufactured for the specific purpose and sized as required or as shown on the plans.

115-2.15 Pulling-in irons. Not used.

115-2.16 Ground rods. Ground rods shall be sectional copper clad steel. The ground rods shall be of the length and diameter specified on the plans, but in no case shall they be less than 10 feet long nor less than 3/4 inch in diameter.

CONSTRUCTION METHODS

115-3.1 Unclassified excavation. It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Damage to utility lines, through lack of care in excavating, shall be repaired or replaced to the satisfaction of the RPR without additional expense to the Owner.

The Contractor shall perform excavation for structures and structure footings to the lines and grades or elevations shown on the plans or as staked by the RPR. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown.

All excavation shall be unclassified and shall be considered incidental to Item L-115. Dewatering necessary for structure installation and erosion per federal, state, and local requirements is incidental to Item L-115.

Boulders, logs and all other objectionable material encountered in excavation shall be removed. All rock and other hard foundation material shall be cleaned of all loose material and cut to a firm surface either level, stepped or serrated, as directed by the RPR. All seams, crevices, disintegrated rock and thin strata shall be removed. When concrete is to rest on a surface other than rock, special care shall be taken not to disturb the bottom of the excavation. Excavation to final grade shall not be made until just before the concrete or reinforcing is to be placed.

The Contractor shall provide all bracing, sheeting and shoring necessary to implement and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheeting and shoring shall be included in the unit price bid for the structure.

Unless otherwise provided, bracing, sheeting and shoring involved in the construction of this item shall be removed by the Contractor after the completion of the structure. Removal shall be effected in a manner that will not disturb or mar finished masonry. The cost of removal shall be included in the unit price bid for the structure.

After each excavation is completed, the Contractor shall notify the RPR. Structures shall be placed after the RPR has approved the depth of the excavation and the suitability of the foundation material.

Prior to installation the Contractor shall provide a minimum of 6 inches (150 mm) of sand or a material approved by the RPR as a suitable base to receive the structure. The base material shall be compacted and graded level and at proper elevation to receive the structure in proper relation to the conduit grade or ground cover requirements, as indicated on the plans.

115-3.2 Concrete structures. Not used.

115-3.3 Precast unit installations. Not used.

115-3.4 Placement and treatment of castings, frames and fittings. Not used.

115-3.5 Installation of ladders. Not used.

115-3.6 Removal of sheeting and bracing. Not used.

115-3.7 Backfilling. After a structure has been completed, the area around it shall be backfilled in horizontal layers not to exceed 6 inches (150 mm) in thickness measured after compaction to the density requirements in Item P-152. Each layer shall be deposited all around the structure to approximately the same elevation. The top of the fill shall meet the elevation shown on the plans or as directed by the RPR.

Backfill shall not be placed against any structure until approval is given by the RPR. In the case of concrete, such approval shall not be given until tests made by the laboratory under supervision of the RPR establish that the concrete has attained sufficient strength to provide a factor of safety against damage or strain in withstanding any pressure created by the backfill or the methods used in placing it.

Where required, the RPR may direct the Contractor to add, at his own expense, sufficient water during compaction to assure a complete consolidation of the backfill. The Contractor shall be responsible for all damage or injury done to conduits, duct banks, structures, property or persons due to improper placing or compacting of backfill.

115-3.8 Connection of duct banks. To relieve stress of joint between concrete-encased duct banks and structure walls, reinforcement rods shall be placed in the structure wall and shall be formed and tied into duct bank reinforcement at the time the duct bank is installed.

115-3.9 Grounding. Not used.

115-3.10 Cleanup and repair. After erection of all galvanized items, damaged areas shall be repaired by applying a liquid cold-galvanizing compound per MIL-P-21035. Surfaces shall be prepared and compound applied per the manufacturer's recommendations.

Prior to acceptance, the entire structure shall be cleaned of all dirt and debris.

115-3.11 Restoration. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt and rubbish from the site. The Contractor shall restore all disturbed areas equivalent to or better than their original condition. All sodding, grading and restoration shall be considered incidental to the respective Item L-115 pay item.

The Contractor shall grade around structures as required to provide positive drainage away from the structure.

Areas with special surface treatment, such as roads, sidewalks, or other paved areas shall have backfill compacted to match surrounding areas, and surfaces shall be repaired using materials comparable to original materials.

Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD), and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

After all work is completed, the Contractor shall remove all tools and other equipment, leaving the entire site free, clear and in good condition.

115-3.12 Inspection. Prior to final approval, the electrical structures shall be thoroughly inspected for conformance with the plans and this specification. Any indication of defects in materials or workmanship shall be further investigated and corrected. The earth resistance to ground of each ground rod shall not exceed 25 ohms. Each ground rod shall be tested using the fall-of-potential ground impedance test per American National Standards Institute / Institute of Electrical and Electronic Engineers (ANSI/IEEE) Standard 81. This test shall be performed prior to establishing connections to other ground electrodes.

115-3.13 Manhole elevation adjustments. Not used.

115-3.14 Duct extension to existing ducts. Where existing concrete encased ducts are to be extended, the duct extension shall be concrete encased plastic conduit. The fittings to connect the ducts together shall be standard manufactured connectors designed and approved for the purpose. The duct extensions shall be installed according to the concrete encased duct detail and as shown on the plans.

METHOD OF MEASUREMENT

115-4.1 Electrical manholes and junction structures shall be measured by each unit completed in place and accepted. The following items shall be included in the price of each unit: All required excavation and dewatering; sheeting and bracing; all required backfilling with on-site materials;

restoration of all surfaces and finished grading and turfing; all required connections; temporary cables and connections; and ground rod testing

115-4.2 Manhole elevation adjustments shall be measured by the completed unit installed, in place, completed, and accepted. Separate measurement shall not be made for the various types and sizes.

115-4.3 All base can and conduit tie-in installations shall be measured by the completed unit installed, in place, and accepted with all ancillary items such as grounding elements, a steel cover, and the required hardware for all elements to be appropriately affixed.

115-4.4 Conduit tie-ins to base cans will require core-drilling of the concrete anchor of the base can, as well as the steel base can itself. In locations where a new base can is installed over an existing conduit, the conduit repair and connection to the base can is incidental to the base can installation.

BASIS OF PAYMENT

115-5.1 The accepted quantity of electrical manholes and junction structures will be paid for at the Contract unit price per each, complete and in place. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling and placing of the materials, furnishing and installation of appurtenances and connections to duct banks and other structures as may be required to complete the item as shown on the plans and for all labor, equipment, tools and incidentals necessary to complete the structure.

Payment will be made under:

Item L-115-5.1	Tie Proposed Conduit to Existing L-867 Base Can – per each
Item L-115-5.2	Tie Proposed L-867 Base Can to Existing Conduit – per each
Item L-115-5.3	Install New L-867 Base Can with Steel Cover – per each

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 National Standards Institute / Insulated Cable Engineers Association (ANSI/ICEA)

ANSI/IEEE STD 81	IEEE Guide for Measuring Earth Resistivity, Ground Impedance,
	and Earth Surface Potentials of a Ground System

Advisory Circular (AC)

AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport
	Lighting Circuits

- AC 150/5345-26 Specification for L-823 Plug and Receptacle, Cable Connectors
- AC 150/5345-42 Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories
- AC 150/5340-30 Design and Installation Details for Airport Visual Aids
- AC 150/5345-53 Airport Lighting Equipment Certification Program

Commercial Item Description (CID)

A-A 59544	Cable and Wire, Electrical (Power, Fixed Installation)
ASTM International (ASTM)	
ASTM A27	Standard Specification for Steel Castings, Carbon, for General Application
ASTM A47	Standard Specification for Ferritic Malleable Iron Castings
ASTM A48	Standard Specification for Gray Iron Castings
ASTM A123	Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products
ASTM A283	Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
ASTM A536	Standard Specification for Ductile Iron Castings
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A897	Standard Specification for Austempered Ductile Iron Castings
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C206	Standard Specification for Finishing Hydrated Lime
FAA Engineering Brief (EB)	
EB #83	In Pavement Light Fixture Bolts
Mil Spec	
MIL-P-21035	Paint High Zinc Dust Content, Galvanizing Repair
National Fire Protection Asso	ociation (NFPA)
NFPA-70	National Electrical Code (NEC)

END OF ITEM L-115

ITEM L-120 TEMPORARY ELECTRICAL WORK AND GENERAL ELECTRICAL SAFETY REQUIREMENTS

DESCRIPTION

120-1.1 PURPOSE

(a) Temporary wiring will be required during specific phases of the project to maintain airfield operations on a daily basis. The Contractor shall refer to the Contract Drawings for phasing requirements.

(b) The Contractor shall be responsible for installation and maintenance of all temporary lighting during the life of the contract. All necessary fixtures, wire, transformers, bases, etc., shall be furnished by the Contractor. All setup and removal, all circuit cut-ins, all repairs to damaged items and all other necessary functions to maintain temporary lighting as required above shall be performed by the Contractor as directed by the Engineer.

(c) The Contractor is solely responsible for all issues related to the safety program and guidelines and implementation of such programs and guidelines necessary to protect aircraft, passengers, crews, the general public, all workers and vehicles involved in their daily tasks.

120-1.2 FAA ADVISORY CIRCULARS

All applicable requirements of the below listed advisory circulars (latest version), standards and related reading shall be compiled with:

- 1. FAA AC 150/5200-18, Airport Safety Self-Inspection
- 2. FAA AC 150/5210-5, Painting. Marking and Lighting of Vehicles
- 3. FAA AC 150/5340-18, Standards for Airport Sign Systems
- 4. FAA AC 150/5340-26, Maintenance of Airport Visual Aid Facilities
- 5. FAA AC 150/5340-30, Design and Installation Details for Airport Visual Aids
- 6. FAA AC 150/5370-2, Operational Safety On Airports During Construction
- 7. Occupational Safety and Health Standards for the construction industry 29 CFR Part 1926/1910

The Contractor is responsible for obtaining and using the latest edition of the referenced documents. This list is not all inclusive but is offered as a convenience to the Contractor.

120-1.3 GENERAL SAFETY PROVISIONS

A. Contractor shall take safety and health measures in performing work under this contract. Contractor shall meet with the engineer to develop a mutual understanding relative to administration of the safety plan. Contractor is subject to applicable federal, state and local laws, regulations, ordinances, codes and orders relating to safety and health in effect on the date of this contract. Attention is invited to the regulations issued by the Secretary

> FAA TECHNICAL SPECIFICATIONS L-120-1

of Labor pursuant to the Contract Work Hours and Safety Standards Act and the Safety and Health Regulations for Construction. Contractor shall comply with the Secretary's Regulations as applicable and shall comply with specific requirements stated.

- B. As a minimum work place safety shall comply with NFPA 70E Standard for Electrical Safety Requirements for Employee Work Places, OSHA, federal, state and local requirements. Where a conflict in code requirements occurs the most stringent requirement shall govern.
- C. During the performance of work under this contract, the Contractor shall comply with procedures prescribed for control and safety of persons visiting the project site.
- D. Contractor is responsible for the Contractor's personnel and for familiarizing each of his Subcontractors with safety requirements.
- E. Contractor shall advise the Engineer of any special safety restrictions established so that Owner personnel can be notified of these restrictions.
- F. Contractor shall note that comprehensive as-built drawings of the circuiting are not available for the airfield or the construction area. As a result, impacted circuits shall be traced and mapped for effective temporary cabling installations. The contractor shall document the circuit routing and turn over to the resident engineer for review as a part of temporary cabling installation and operations.

120-1.4 FIRE PREVENTION AND PROTECTION

- A. Burning trash, brush or wood on the project site will not be permitted.
- B. Flammable liquids shall be stored and handled in accordance with NFPA 30, Flammable and Combustible Liquids Code and NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages.
- C. Open fires and salamanders will not be permitted in construction areas.
- D. During operations involving possible fire hazard, the Contractor shall notify the Engineer and not proceed until clearance is obtained in writing.

120-1.5 ELECTRICAL SAFETY CODES

Recommendations of codes shall be followed in regard to electrical safety:

- A. National Electrical Code (NEC), NFPA 70 Covers electrical wiring and equipment installed within, or on buildings and other premises.
- B. National Electrical Manufacturers Association (NEMA) Standards cover electrical power equipment including standard ratings, performance, testing, manufacturing, and marking.
- C. Electronic Industries Association (EIA) Standards cover electronic equipment and components.
- D. Insulated Powers Cable Engineers Association (IPCEA) Standards cover insulated power, control and communication cable.
- E. Institute of Electrical and Electronic Engineers, Inc. (IEEE) Standards consist of technical reports, and testing procedures generally used in electrical power generation, distribution and utilization.
- F. National Electrical Safety Code, ANSI C2 Safety requirements for working with and around electrical equipment.
- G. Standard for Electrical Safety Requirements for Employee Work Spaces, NFPA 70E -Covers protection of personnel from installation, safety related work practices, maintenance and special equipment requirements. Covers all aspects of electrical safety in the work place.

120-1.6 SWITCHING

Electrical switching required for clearance to work on equipment operating from electrical circuits will be performed only by Owner personnel authorized as safety operators for the specific equipment.

120-1.7 OTHER SAFETY REQUIREMENTS

- A. Temporary wiring shall comply with NEC. Indiscriminate use of extension cords, portable cable or junction boxes creating tripping hazards as well as overloaded circuits will not be permitted.
- B. Unplug portable electrical hand tools when not in use. Inadvertent operation of equipment can take place if it is left plugged into an energized receptacle, and thereby create a hazard.
- C. Before maintaining or repairing any electrical equipment, it shall be disconnected from the power source.
- D. Do not use any equipment that has frayed cords or three-wire plugs that have had the grounding prongs removed. Faulty equipment and tools shall be repaired by qualified electrical personnel.
- E. Do not use metal ladders when working on electrical equipment.

120-1.8 SAFETY TAGGING AND LOCKOUT

No one may work on an energized circuit without written permission from the Contractor's Project Manager. The Contractor's Project Manager shall review the circumstances and the necessary safety precautions with the Engineer prior to giving permission for the "hot" work. The Contractor assumes all liability in connection with any work on energized circuits.

No one may disconnect or cause to be disconnected any electrical circuit before permission is requested from and granted by the Engineer.

Identification markings on light and power circuits shall not be relied on for established safe work conditions. Always verify the proper safe "de-energized" conditions with properly operating test equipment.

Before any circuit supplying radar, ILS, weather, runway/taxiway lighting equipment or any other equipment is disconnected, permission must first be granted by the Engineer. After permission is granted, the following requirements must be compiled with.

As a minimum, LOCK/TAG/TRY procedure shall comply with the Owner's requirements and NFPA 70E.

FAA TECHNICAL SPECIFICATIONS L-120-3 Work shall not commence on any circuit until:

- 1. The circuit is correctly identified in the presence of the Electrical Contractor's Superintendent or Foreman, Airport Electrical Maintenance Manager, or authorized representative, and Engineer.
- 2. After identity of the circuit is established, Electrical Maintenance Manager or authorized representative shall be notified, and the circuit disconnected. The time and date shall be recorded by the Engineer.
- 3. The switch shall be locked in the open position or opened in a manner, which will prevent accidental restoration.
- 4. The circuit shall be tagged with an approval red warning tag by the Electrical Contractor's Superintendent. The tag shall state, the Company's name, the Electricians name responsible for the disconnection, date and time and the project name and bid package number.

Restoration shall be accomplished, and tags removed, only by the Electrical Contractor's Superintendent in the presence of the Electrical Maintenance Manager, or Engineer.

The Engineer shall record time, date and operational status of circuit after restoration.

Electrical circuits and apparatus shall be operated at these facilities only by qualified and authorized personnel.

No circuit shall be disconnected or unplugged before color code identification by taping.

No circuit shall be disconnected at power source before proper safety precautions are taken to prevent accidental restoration

When possible, circuits shall be restored by the same person who disconnected the circuit. When not possible, the Electrical Maintenance Manager or authorized representative shall perform restoration.

CONSTRUCTION METHODS

- (a) General. The Contractor shall install temporary runway or taxiway light fixtures, cable, and connectors at the approximate locations as shown on the plans, or as directed by the Engineer. The Engineer shall indicate specific locations.
- (b) Splicing methods and materials shall be subject to the joint approval of the cable manufacturer and the Engineer. Splicing methods and materials shall be the prime recommendation of the cable manufacturer. The Contractor shall submit copies of detailed splicing instructions to the Engineer for approval and shall use the approved methods and materials for all splicing work.
- (c) Airfield cable installed on the surface shall be protected by the Contractor. In areas where the Contractor's equipment or other vehicular traffic may be crossing, the Contractor shall provide protection to the cable in these areas in order to prevent damage to the cables.

METHOD OF MEASUREMENT

120-4.1 Temporary cabling shall be measured for payment as a linear footage of cable installed, to include furnishing and providing all materials to maintain the existing lighting circuits during the demolition operations. Materials include, but not limited to, base plates, conduit, cable, sand bags, break out rings, L-823 connectors, isolation transformer, frangible coupling, bolts, anchor bolts, light fixtures, conduit straps, timber and all labor and incidentals to complete the operation. This measurement shall include all measures required to maintain new or existing permanently installed fixtures for the duration of the project.

120-4.2 As noted in 120-1.3.F, as-built information for the airfield is not available regarding the circuiting. The contractor shall trace circuits impacted by construction – as shown on the Airfield Lighting Legend Sheet in the contract documents – such that effective jumpering can be completed for those construction phases requiring temporary cabling. Payment shall be made on a lump sum for all tracing efforts of noted circuits, and an as-built of the "pre-construction" condition shall be provided to the resident engineer for documentation prior to jumpering being completed for each phase.

BASIS OF PAYMENT

120-5.1 Payment will be made at the contract lump sum price for temporary lighting installed in place and accepted by the Engineer. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, restoration of the site around each light as shown on the Plans and for all labor, equipment, tools and incidentals necessary to complete this item.

Payment will be made under:

Item L-120-5.1	Temporary Lighting Cable	- per Linear Foot
Item L-120-5.2	Circuit Investigation and Tracing	- per Lump Sum

END OF ITEM L-120

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ITEM L-125 INSTALLATION OF AIRPORT LIGHTING SYSTEMS

DESCRIPTION

125-1.1 This item shall consist of airport lighting systems furnished and installed in accordance with this specification, the referenced specifications, and the applicable advisory circulars (ACs). The systems shall be installed at the locations and in accordance with the dimensions, design, and details shown in the plans. This item shall include the furnishing of all equipment, materials, services, and incidentals necessary to place the systems in operation as completed units to the satisfaction of the RPR.

EQUIPMENT AND MATERIALS

125-2.1 General.

a. Airport lighting equipment and materials covered by Federal Aviation Administration (FAA) specifications shall be certified under the Airport Lighting Equipment Certification Program in accordance with AC 150/5345-53, current version. FAA certified airfield lighting shall be compatible with each other to perform in compliance with FAA criteria and the intended operation. If the Contractor provides equipment that does not performs as intended because of incompatibility with the system, the Contractor assumes all costs to correct the system for to operate properly.

b. Manufacturer's certifications shall not relieve the Contractor of their responsibility to provide materials in accordance with these specifications and acceptable to the RPR. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the RPR and replaced with materials, which do comply with these specifications, at the sole cost of the Contractor.

c. All materials and equipment used shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Clearly mark each copy to identify pertinent products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be clearly made with arrows or circles (highlighting is not acceptable). The Contractor shall be responsible for delays in the project accruing directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be submitted in electronic PDF format, tabbed by specification section. The RPR reserves the right to reject any or all equipment, materials or procedures, which, in the RPR's opinion, does not meet the system design and the standards and codes, specified herein.

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

EQUIPMENT AND MATERIALS

125-2.2 Conduit/Duct. Conduit shall conform to Specification Item L-110 Airport Underground Electrical Duct Banks and Conduits.

125-2.3 Cable and Counterpoise. Cable and Counterpoise shall conform to Item L-108 Underground Power Cable for Airports.

125-2.4 Tape. Rubber and plastic electrical tapes shall be Scotch Electrical Tape Numbers 23 and 88 respectively, as manufactured by 3M Company or an approved equal.

125-2.5 Cable Connections. Cable Connections shall conform to Item L-108 Installation of Underground Cable for Airports.

125-2.6 Retroreflective Markers. Retroreflective markers shall be type L-853 and shall conform to the requirements of AC 150/5345-39..

125-2.7 Runway and Taxiway Lights. Runway and taxiway lights shall conform to the requirements of AC 150/5345-46. Lamps shall be of size and type indicated, or as required by fixture manufacturer for each lighting fixture required under this contract. Filters shall be of colors conforming to the specification for the light concerned or to the standard referenced.

Туре	Class	Mode	Style	Option	Base	Filter	Transformer	Notes
L-852C	2	1	2/3	5 (2 plugs / lamps)	L-868 Existing	Green/ Green	65W	
L-852D	2	1	2/3	5 (2 plugs / lamps)	L-868 Existing	Green/ Green	65W	
L-861T	2	1	n/a	n/a	L-867 New	Blue	45W	14" Tall

125-2.8 Runway and Taxiway Signs. Runway and Taxiway Guidance Signs should conform to the requirements of AC 150/5345-44.

125-2.9 Runway End Identifier Light (REIL). Not required.

125-2.10 Precision Approach Path Indicator (PAPI). Not required.

125-2.11 Circuit Selector Cabinet. Not required.

125-2.12 Light Base and Transformer Housings. Light Base and Transformer Housings should conform to the requirements of AC 150/5345-42. Light bases shall be Type L-867 and L-868, Class 1A, Size B, and shall be provided as indicated or as required to accommodate the fixture or device installed thereon. Base plates, cover plates, and adapter plates shall be provided to accommodate various sizes of fixtures.

125-2.13 Isolation Transformers. Isolation Transformers shall be Type L-830, size as required for each installation. Transformer shall conform to AC 150/5345-47.

125-2.14 Signage. Signage modifications shall be per plan. New sign panels shall be procured from the vendor of the existing airfield signage (Lumacurve/Standard Signs) to ensure compatibility of elements. Signs are size 2 and shall be procured with the messaging shown on the plans.

INSTALLATION

125-3.1 Installation. The Contractor shall furnish, install, connect and test all equipment, accessories, conduit, cables, wires, buses, grounds and support items necessary to ensure a complete and operable airport lighting system as specified here and shown in the plans.

The equipment installation and mounting shall comply with the requirements of the National Electrical Code and state and local code agencies having jurisdiction.

The Contractor shall install the specified equipment in accordance with the applicable advisory circulars and the details shown on the plans.

125-3.2 Testing. All lights shall be fully tested by continuous operation for not less than 24 hours as a completed system prior to acceptance. The test shall include operating the constant current regulator in each step not less than 10 times at the beginning and end of the 24-hour test. The fixtures shall illuminate properly during each portion of the test.

125-3.3 Shipping and Storage. Equipment shall be shipped in suitable packing material to prevent damage during shipping. Store and maintain equipment and materials in areas protected from weather and physical damage. Any equipment and materials, in the opinion of the RPR, damaged during construction or storage shall be replaced by the Contractor at no additional cost to the owner. Painted or galvanized surfaces that are damaged shall be repaired in accordance with the manufacturer's recommendations.

125-3.4 Elevated and In-pavement Lights. Water, debris, and other foreign substances shall be removed prior to installing fixture base and light.

A jig or holding device shall be used when installing each light fixture to ensure positioning to the proper elevation, alignment, level control, and azimuth control. Light fixtures shall be oriented with the light beams parallel to the runway or taxiway centerline and facing in the required direction. The outermost edge of fixture shall be level with the surrounding pavement. Surplus sealant or flexible embedding material shall be removed. The holding device shall remain in place until sealant has reached its initial set.

125-3.5 Spare fixtures. The Contractor shall supply spare lighting fixtures as part of the project. Spare fixture shall include fixture assembly, stem, L-823 connector and frangible coupling. Fixture assemblies shall be turned over to the airport and stored at a location as directed by the Resident Engineer. Total quantity of fixtures to be supplied is 10% of each light fixture type (e.g. L-861T, L-852C, L-852D) unless otherwise listed on the Contract Drawings.

125-3.6 Steel Covers. Steel covers shall be load bearing 3/4" thick FAA approved covers for L-868B base cans, and 3/8" thick FAA approved covers for L-867B base cans.

METHOD OF MEASUREMENT

125-4.1 Reflective markers will be measured by the number installed as completed units in place, ready for operation, and accepted by the RPR. Steel cover plates will be measured by the number of base plates installed and approved by the RPR, including all ancillary items such as grounding and bolting hardware. Should any cable connections be required as a part of the steel cover plate installation, that cable connection shall be incidental to the steel plate installation.

Runway and taxiway lights will be measured by the number of each type installed as completed units in place, including ancillary items such as new isolation transformer, gaskets as needed, hardware and grounding connections, ready for operation, and accepted by the RPR.

> FAA TECHNICAL SPECIFICATIONS L-125-3

Guidance signs message modifications will be measured by the number of each completed messages per sign cabinet, installed as completed units, in place, ready for operation, and accepted by the RPR. The existing guidance signs are LED-powered Lumacurve/Standard Signs, Size 2.

BASIS OF PAYMENT

125-5.1 Payment will be made at the Contract unit price for each complete base plate, runway or taxiway light, guidance sign panel modification, or reflective marker installed by the Contractor and accepted by the RPR. This payment will be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools and incidentals necessary to complete this item.

Payment will be made under:

L-125-5.1	Install New 3/8" Steel Plate on Existing L-867 Base Can - per each
L-125-5.2	Install New 3/4" Steel Plate on Existing L-868 Base Can - per each
L-125-5.3	Install New L-861T Taxiway Edge Light on New L-867 Base Can in Turf - per each
L-125-5.4	Install New L-861T Taxiway Edge Light on New L-867 Base Can in Concrete - per each
L-125-5.5	Install New L-852C/D Taxiway Centerline Light on Existing L-868 Base Can - per each
L-125-5.6	Procure and Install New Guidance Sign Panels – per each
L-125-5.7	Install New L-853 Type II Retroreflective Marker – per each

L-125-5.8 10% Spare Parts – per 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.

Advisory Circulars (AC)

AC 150/5340-18	Standards for Airport Sign Systems
AC 150/5340-26	Maintenance of Airport Visual Aid Facilities
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-5	Circuit Selector Switch
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-28	Precision Approach Path Indicator (PAPI) Systems

	AC 150/5345-39	Specification for L-853, Runway and Taxiway Retroreflective Markers
	AC 150/5345-42	Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories
	AC 150/5345-44	Specification for Runway and Taxiway Signs
	AC 150/5345-46	Specification for Runway and Taxiway Light Fixtures
	AC 150/5345-47	Specification for Series to Series Isolation Transformers for Airport Lighting Systems
	AC 150/5345-51	Specification for Discharge-Type Flashing Light Equipment
	AC 150/5345-53	Airport Lighting Equipment Certification Program
Engine	eering Brief (EB)	
	EB No. 67	Light Sources Other than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures

END OF ITEM L-125

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MAYOR SYLVESTER TURNER DISTRICT COUNCIL MEMBERS

AMY PECK JERRY DAVIS **ABBIE KAMIN** CAROLYN EVANS-SHABAZZ DAVE MARTIN TIFFANY THOMAS GREG TRAVIS KARLA CISNEROS **ROBERT GALLEGOS** EDWARD POLLARD MARTHA CASTEX-TATUM



PLANS FOR CONSTRUCTION

_____ OF _____

NON-STANDARD TAXIWAYS PROJECT **RUNWAY 17-35 DEMOLITION** AT THE WILLIAM P. HOBBY AIRPORT

PROJECT NO. 770

CIP NO _-___

= PREPARED BY =

JACOBS ENGINEERING GROUP INC.

LANDTECH, INC. * RODS SUBSURFACE UTILITY ENGINEERING, INC. * HVJ ASSOCIATES, INC.*RDM, INC.

JANUARY 24, 2020 100% DESIGN SUBMITTAL

MULLIAM P. HOBBY AIRPORT WILLIAM P. HOBBY AIRPORT HOUSTON TEXAS UNCOMPARING GROUP INC. BOOSTON, TEXAS TOTO? HOUSTON, TEXAS TOTO? HOUSTON, TEXAS PLE. FIRM F-2966				
REVIS	DATE BY			
NON-STANDARD TAXIWAYS PROJECT RUNWAY 17-35 DEMOLITION	COVER SHEET			
PROJECT MGR: DESIGNER:	RGS			
DRAWN BY: CHECKED BY:				
SCALE: DATE:	AS SHOWN JANUARY 24, 2020			
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APPROVED BY:	DATE:			
	CTOR PORT SYSTEM			
PROJECT NO: 770				
H.A.S. NO:	/Α			
N. SHEET NO:	/A			
G0.00				

CONTROLLER CHRIS B. BROWN COUNCIL MEMBERS AT-LARGE

MIKE KNOX DAVID W. ROBINSON MICHAEL KUBOSH LETITIA PLUMMER SALLIE ALCORN

			72	E3.05	AIRFIELD ELECTRICAL PLAN (5 OF 6)				RUNWAY 17-35 DEMOLITION - ESTIMATED QUANTITIES		
			73	E3.06	AIRFIELD ELECTRICAL PLAN (6 OF 6)		ITEM #	SPEC #	BASE LINIT SHORT TITLE	UNIT OF	ESTIMATED
DRAWING NO.	SHEET NO.	SHEET NAME	74	E3.07	AIRFIELD ELECTRICAL DETAILS		1	01410		MEASURE	QUANTITY
2	G1.00	INDEX AND QUANTITIES	75	E3.08	AIRFIELD ELECTRICAL DETAILS		2	01410		1.5	1
3	G2.01	CONTRACT LAYOUT PLAN	76	E3.09			3	01506	AIRPORT TEMPORARY CONTROLS	LS	1
4	G3.01	PHASING PLAN - GENERAL NOTES (1 OF 2)		E3.10			4	01555-1.04 A.	TRAFFIC CONTROL AND REGULATION, EXCLUDING FLAGMEN	LS	1
5	G3.02	PHASING PLAN - GENERAL NOTES (2 OF 2)					5	01555-1.04 B.	FLAGMEN	LS	1
6	G3.03	PHASING PLAN - PHASE 1 (1 OF 2)					6	C-100	CONTRACTOR QUALITY CONTROL PROGRAM (CQCP)	LS	1
7	G3.04	PHASING PLAN - PHASE 1 (2 OF 2)					7	C-102-5.1A	TEMPORARY SEEDING AND MULCHING	AC	32.5
8	G3.05	PHASING PLAN - PHASE 2 PHASING PLAN - PHASE 3				-	8	C-102-5.1C	INSTALLATION AND REMOVAL OF EROSION CONTROL SEDIMENT LOGS	LF	1,320
10	G3.07	PHASING PLAN - PHASE 4				-	9 10	C-102-5.1E		EA	10
11	G3.08	PHASING PLAN - PHASE 5				-	10	01145	STAND-BY TIME FOR LOW VISIBILITY OPERATIONS	HR	
12	G3.09	PHASING PLAN - PHASE 6 (1 OF 2)				-	12	D 101 5 1	PAVEMENT REMOVAL, 15" PORTLAND CEMENT CONCRETE PAVEMENT W/ 6" CEMENT TREATED	ev	4 104
13	G3.10	PHASING PLAN - PHASE 6 (2 OF 2)					12	F-101-3.1		51	4,104
14	G3.11	PHASING PLAN - PHASE 7					13	P-101-5.2	CEMENT REMOVAL, 14" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT, W/ 7"	SY	13,689
15	G3.12	PHASING PLAN - PHASE 8 (1 OF 2) PHASING PLAN - PHASE 8 (2 OF 2)					14	P-101-5.3	PAVEMENT REMOVAL, 3"-5" POLYMER MODIFIED ASPHALT CEMENT	SY	2,464
17	G3.13	PHASING PLAN - PHASE 9				-			PAVEMENT, W/ 6" PORTLAND CEMENT CONCRETE PAVEMENT PAVEMENT REMOVAL 12.5" POLYMER MODIFIED ASPHALT CEMENT PAVEMENT W/ 5.5"		· · · · · · · · · · · · · · · · · · ·
18	G4.01	SAFETY AND SECURITY DETAILS					15	P-101-5.4	PORTLAND CEMENT CONCRETE PAVEMENT	SY	20,645
19	C1.01	EROSION AND SEDIMENTATION CONTROL PLAN (1 OF 6)					16	P-101-5.5	PAVEMENT REMOVAL, 3"-5" POLYMER MODIFIED ASPHALT CEMENT PAVEMENT W/ RUBBERIZED ASPHALT CEMENT CONCRETE PAVEMENT AND CEMENT TREATED	SY	20.960
20	C1.02	EROSION AND SEDIMENTATION CONTROL PLAN (2 OF 6)							BASE COURSE		
21	C1.03	EROSION AND SEDIMENTATION CONTROL PLAN (3 OF 6)					17	P-101-5.6	PAVEMENT REMOVAL, 2.5"-9" POLYMER MODIFIED ASPHALT CEMENT PAVEMENT. W/ 16" PORTLAND CEMENT CONCRETE PAVEMENT AND 3"-8" STABILIZED SAND OR	SY	8.333
22	C1.04	EROSION AND SEDIMENTATION CONTROL PLAN (4 OF 6)							SHELL BASE COURSE		
23	C1.05	EROSION AND SEDIMENTATION CONTROL PLAN (6 OF 6)					18	P-101-5.7	PAVEMENT REMOVAL, 15" PORTLAND CEMENT CONCRETE PAVEMENT, W/ 6" CEMENT TREATED BASE COURSE	SY	12,327
25	C1.07	EROSION AND SEDIMENTATION CONTROL GENERAL NOTES					19	P-101-5.8	PAVEMENT REMOVAL, 4" POLYMER MODIFIED ASPHALT CEMENT PAVEMENT, W/	SY	4 147
26	C1.08	EROSION AND SEDIMENTATION CONTROL DETAILS				-		1 101 0.0	STRESS-ABSORBING MEMBRANE INTERLAYER AND 10" CEMENT TREATED BASE COURSE		.,
27	C2.01	CIVIL DEMOLITION PLAN (1 OF 6)					20	P-101-5.9	STABILIZED CRUSHED PORTLAND CEMENT CONCRETE PAVEMENT, W/ 2 ASPHALT	SY	2,643
28	C2.02	CIVIL DEMOLITION PLAN (2 OF 6)					21	P-101-5.10	PAVEMENT REMOVAL, UNKNOWN TAXIWAY G1 SURFACE AND BASE	SY	3,174
29	C2.03	CIVIL DEMOLITION PLAN (3 OF 6)				_	22	P-101-5.11	PAVEMENT REMOVAL, UNKNOWN BLAST PAD SURFACE AND BASE	SY	11,994
31	C2.05	CIVIL DEMOLITION PLAN (5 OF 6)				_	23	P-101-5.12	JOINT AND CRACK REPAIR		5,600
32	C2.06	CIVIL DEMOLITION PLAN (6 OF 6)				-	24	P-101-5.13	REMOVAL OF FOREIGN SUBSTANCES/CONTAMINATES	SF	58.300
33	C2.07	DEMOLITION DETAILS				-	26	P-101-5.15	REMOVAL OF ELEVATED LIGHT AND ASSOCIATED BASE CAN	EA	33
34	C3.01	PAVEMENT MARKING PLAN (1 OF 6)					27	P-101-5.16	REMOVAL OF IN-PAVEMENT LIGHT AND ASSOCIATED BASE CAN	EA	105
35	C3.02	PAVEMENT MARKING PLAN (2 OF 6)					28	P-101-5.17	REMOVAL OF ELECTRICAL CONDUIT OR DUCT	LF	22,000
38	C3.03	PAVEMENT MARKING PLAN (4 OF 6)					29	P-101-5.18	REMOVAL OF ELECTRICAL CABLE	LF	60,000
38	C3.05	PAVEMENT MARKING PLAN (5 OF 6)				_	30	P-101-5.19	REMOVAL OF AIRFIELD SIGN AND FOUNDATION	EA	45
39	C3.06	PAVEMENT MARKING PLAN (6 OF 6)				_	32	P-101-5.20	REMOVAL OF AIRFIELD NAVIGATIONAL ADS	FA	1
40	C3.07	PAVEMENT MARKING DETAILS					31	P-101-5.22	REMOVAL OF AIRFIELD ELECTRICAL STRUCTURE	EA	1
41	C4.01	TEMPORARY REFLECTOR PLAN (1 OF 6)					32	P-101-5.23	BACKFILL	CY	48,646
42	C4.02	TEMPORARY REFLECTOR PLAN (3 OF 6)					33	P-608-8.1	EMULSIFIED ASPHALT SEAL COAT	SY	40,400
44	C4.04	TEMPORARY REFLECTOR PLAN (4 OF 6)					34	P-620-5.1A	SURFACE PREPARATION	SF	26,400
45	C4.05	TEMPORARY REFLECTOR PLAN (5 OF 6)				-	35	P-620-5.2B		SF	27,200
46	C4.06	TEMPORARY REFLECTOR PLAN (6 OF 6)				_	30	P-620-5.3C	REFLECTIVE MEDIA, TT-B-1325D TYPE III	LB IB	1 200
47	C4.07	TEMPORARY REFLECTOR LOCATION CHART AND DETAIL				-	38	P-620-5.3E	TEMPORARY MARKINGS	SF	19,835
48	E1.00	AIRFIELD ELECTRICAL LIGHTING, SIGNAGE, ELECTRICAL LEGEND AND NOTES					39	T-904-5.1	SODDING	SY	167,124
50	E1.02	AIRFIELD ELECTRICAL PHASING PLAN - PHASE 1 (1 OF 2)					40	T-905-5.1	TOPSOIL (FURNISHED FROM OFF THE SITE)	CY	11,669
51	E1.03	AIRFIELD ELECTRICAL PHASING PLAN - PHASE 1 (2 OF 2)					41	T-900-9.1	TEMPORARY IRRIGATION SYSTEM INSTALLATIONS AND REMOVAL	LS	1
52	E1.04	AIRFIELD ELECTRICAL PHASING PLAN - PHASE 2				-	42	1-900-9.2		KGAL	37,500
53	E1.05	AIRFIELD ELECTRICAL PHASING PLAN - PHASE 3				-	43	L-100-5.1		15	1
54	E1.06	AIRFIELD ELECTRICAL PHASING PLAN - PHASE 4				_	45	L-108-5.1	NO. 8 AWG CABLE, INSTALLED IN TRENCH, DUCT BANK OR CONDUIT	LE	9,000
55	E1.07	AIRFIELD ELECTRICAL PHASING PLAN - PHASE 5 AIRFIELD ELECTRICAL PHASING PLAN - PHASE 6 (1 OF 2)					46	L-108-5.2	NO. 6 AWG, SOLID, BARE COPPER COUNTERPOISE WIRE, INSTALLED IN TRENCH	LF	4,100
57	E1.09	AIRFIELD ELECTRICAL PHASING PLAN - PHASE 6 (2 OF 2)					47	L-110-5.1	DIRECT BURIED 1-WAY, 2" PVC CONDUIT - INSTALLED IN TURF	LF	2,300
58	E1.10	AIRFIELD ELECTRICAL PHASING PLAN - PHASE 7					48	L-110-5.2	CONCRETE ENCASED 1-WAY, 2" PVC CONDUIT - INSTALLED IN CONCRETE	LF	1,800
59	E1.11	AIRFIELD ELECTRICAL PHASING PLAN - PHASE 8 (1 OF 2)					49	L-115-5.1	TIE PROPOSED CONDUIT TO EXISTING L-867 BASE CAN	EA	14
60	E1.12	AIRFIELD ELECTRICAL PHASING PLAN - PHASE 8 (2 OF 2)				-	50	L-115-5.2	I IE PROPOSED L-867 BASE CAN TO EXISTING CONDUIT	EA	22
61	E1.13	AIRFIELD ELECTRICAL PHASING PLAN - PHASE 9				-	52	L-110-5.3	TEMPORARY LIGHTING CABLE		20 000
63	E2.01	AIRFIELD ELECTRICAL DEMOLITION PLAN (2 OF 6)				F	53	L-120-5.2	CIRCUIT INVESTIGATION AND TRACING	LS	1
64	E2.02	AIRFIELD ELECTRICAL DEMOLITION PLAN (3 OF 6)					54	L-125-5.1	INSTALL NEW 3/8" STEEL PLATE ON EXISTING L-867 BASE CAN	EA	7
65	E2.04	AIRFIELD ELECTRICAL DEMOLITION PLAN (4 OF 6)					55	L-125-5.2	INSTALL NEW 3/4" STEEL PLATE ON EXISTING L-868 BASE CAN	EA	57
66	E2.05	AIRFIELD ELECTRICAL DEMOLITION PLAN (5 OF 6)					56	L-125-5.3	INSTALL NEW L-861T TAXIWAY EDGE LIGHT ON NEW L-867 BASE CAN IN TURF	EA	27
67	E2.06	AIRFIELD ELECTRICAL DEMOLITION PLAN (6 OF 6)				-	57	L-125-5.4	INSTALL NEW L-861T TAXIWAY EDGE LIGHT ON NEW L-867 BASE CAN IN CONCRETE	EA	25
68	E3.01	AIRFIELD ELECTRICAL PLAN (1 0F 6)				-	59	L-125-5.5	INSTALLINEW L-852C/D TAXIWAY CENTERLINE LIGHT ON EXISTING L-868 BASE CAN PROCLIRE AND INSTALL NEW GUIDANCE SIGN DANELS	IS	13
70	E3.02	AIRFIELD ELECTRICAL PLAN (3 OF 6)					60	L-125-5.7	INSTALL NEW L-853 TYPE II RETROREFLECTIVE MARKER	EA	173
71	E3.04	AIRFIELD ELECTRICAL PLAN (4 OF 6)					61	L-125-5.7	10% SPARE PARTS	LS	1
											·

HOLSTON AIR WILLIAM P. HOE HOUSTON JACOBS ENGINEER S995 ROGERS HOUSTON, TE JACOBS ENGINEER S995 ROGERS HOUSTON, TE JACOBS ENGINEER NO. DESCRIPTION	CRESSIEM BY ARPORT TEXAS OBSS: ING GROUP INC. IAGE ROAD SXAS TYO? 146000 BSS.COM BSS.COM BSS.COM DATE BY
NON-STANDARD TAXIWAYS PROJECT RUNWAY 17-35 DEMOLITION	SHEET INDEX / QUANTITIES
PROJECT MGR: DESIGNER: DRAWN BY: CHECKED BY: SCALE: DATE: JA	RGS RGS JINP AS SHOWN ANUARY 24, 2020
APPROVED BY: DIRECT HOUSTON AIRPO PROJECT NO: 77/ C.I.P. NO: N// H.A.S. NO: N//	DATE:

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GENERAL CONTRACT NOTES:

HAUL ROUTES: LOCATION OF HAUL ROUTES ON THE AIRPORT SITE SHALL BE AS SPECIFIED ON THE PLANS OR AS APPROVED BY THE OWNER'S REPRESENTATIVE IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE OFF-SITE HAUL ROUTES (STATE HIGHWAYS, COUNTY ROADS OR CITY STREETS) WITH THE APPROPRIATE OWNER WHO HAS JURISDICTION OVER THE AFFECTED ROUTE AND OBTAIN HAUL PERMITS NECESSARY AS REQUIRED BY THE LOCAL JURISDICTION. ON-SITE HAUL ROUTES SHALL BE MAINTAINED BY THE CONTRACTOR AND SHALL BE RESTORED TO THEIR ORIGINAL CONDITION UPON COMPLETION OF BEING USED AS A HAUL ROUTE. THE PRE- AND POST-CONSTRUCTION CONDITION OF ON-SITE HAUL ROUTES SHALL BE JOINTLY INSPECTED AND DETERMINED BY THE CONTRACTOR AND THE PROJECT RPR. FENCING, DRAINAGE, GRADING AND OTHER MISCELLANEOUS CONSTRUCTION REQUIRED TO CONSTRUCT TEMPORARY HAUL ROUTES OR ACCESS POINTS ON THE AIRPORT WILL BE THE CONTRACTOR'S TOTAL RESPONSIBILITY AND SHALL BE APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO THE WORK, ALL ON-SITE FAA ACCESS ROADS TO FAA FACILITIES SHALL REMAIN OPEN AND MAINTAINED AT ALL TIMES. PHOTOGRAPHS AND A VIDEO OF THE HAUL ROUTES SPECIFIED IN THE PLANS MUST BE PROVIDED BY THE CONTRACTOR BEFORE AND AFTER CONSTRUCTION TO THE OWNER'S REPRESENTATIVE. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO HAUL ROUTES RESULTING FROM CONSTRUCTION TRAFFIC AS DETERMINED BY THE PROJECT RPR. ANY SERVICE, ACCESS OR FAA ROADWAY CROSSED BY CONSTRUCTION TRAFFIC SHALL BE PROTECTED AGAINST DAMAGE AND ALL DAMAGE OCCURRING WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE WITH NO ADDITIONAL COMPENSATION OR CONTRACT TIME, ANY PAVEMENTS DAMAGED BY THE CONSTRUCTION EQUIPMENT SHALL BE REMOVED AND REPLACED TO AT LEAST 10 FEET ON EACH SIDE OF THE MOST EXTREME OUTER TIRE MARKS TO ENSURE ALL PAVEMENT TRAVERSED BY THE CONSTRUCTION EQUIPMENT IS REMOVED AND REPLACED

- AIRPORT
- TO THE OWNER

- OWNER

WASTE DISPOSAL & BORROW AREAS: CONCRETE AND ASPHALT RUBBLE AND EXCAVATION WASTE MATERIAL REMOVED FROM THE CONSTRUCTION AREA SHALL BE LEGALLY DISPOSED OF OFF THE AIRPORT PROPERTY, NO MATERIAL SHALL BE WASTED ON THE AIRPORT SITE UNLESS APPROVED BY THE AIRPORT. ANY ON-AIRPORT APPROVED WASTE AND DISPOSAL AREA SHALL BE SEEDED AND RESTORED IN A SMOOTH, GRADED AND DRAINABLE CONDITION AT NO ADDITIONAL COST TO THE OWNER. PRIOR TO DEMOLITION AND REMOVAL WORK BEGINS, THE CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION FROM THE SITE WHICH THEY PLAN TO DUMP WASTE MATERIAL AND PROVIDE IT TO THE

3. CONTRACTOR UTILITIES: STAGING AREAS DO NOT HAVE UTIUTIES. ANY UTILITIES REQUIRED BY THE CONTRACTOR SHALL BE COORDINATED WITH THE UTILITY COMPANIES AND SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AT NO ADDITIONAL COST

4. PROTECTION AND REPAIR OF DAMAGE TO EXISTING CABLES: ALL UNDERGROUND CABLE SHALL BE PROTECTED AND DAMAGES REPAIRED EXPEDITIOUSLY AT THE CONTRACTOR'S EXPENSE AT NO ADDITIONAL COST TO THE OWNER.

5. CONSTRUCTION LIMITS: ALL CONTRACTOR VEHICLES AND TRAFFIC SHALL REMAIN WITHIN THE DESIGNATED CONSTRUCTION LIMITS OR HAUL ROUTES. ABSOLUTELY NO CONTRACTOR VEHICLES WILL BE ALLOWED ON OTHER ACTIVE AIRFIELD OPERATIONS AREAS FLAGGERS SHALL BE PROVIDED AT ALL TIMES WHENEVER CONSTRUCTION ACCESS IS REQUIRED ACROSS AN ACTIVE RUNWAY OR TAXIWAY.

6. PERMITS: IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN AND PAY FOR ALL APPLICABLE PERMITS FOR CONSTRUCTION AND EQUIPMENT.

7. COORDINATION OF CONSTRUCTION ACTIVITIES: THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MAINTAINING CONSTANT COORDINATION BETWEEN THE SUBCONTRACTORS AND THE OWNER'S REPRESENTATIVE. ALL CONSTRUCTION ACTIVITIES PLANNED BY THE CONTRACTOR SHALL BE REVIEWED AND APPROVED BY THE RPR

EXCESS CONSTRUCTION MATERIALS: ALL ON SITE EXCESS AND/OR STORED MATERIAL SHALL BE REMOVED FROM AIRPORT PROPERTY AND DISPOSED OF.

9. UTILITIES: IT WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE AND PROTECT ANY PUBLIC UTILITIES THAT ARE IN OR ADJACENT TO THE WORK AREA. THE UTILITIES WILL BE FLAGGED ONE TIME BY THE VARIOUS UTILITY COMPANIES. THESE FLAGS SHALL BE PROTECTED AND MAINTAINED BY THE CONTRACTOR AT ALL TIMES. IF FLAGS ARE LOST OR REMOVED BY THE CONTRACTOR, THEY WILL BE FLAGGED AGAIN AT THE CONTRACTOR'S EXPENSE. ALL UTILITIES SHALL BE PROTECTED, AND DAMAGES REPAIRED EXPEDITIOUSLY, AT THE CONTRACTOR'S EXPENSE AT NO ADDITIONAL COST TO THE

10. EMPLOYEE PARKING: NO CONTRACTOR EMPLOYEE VEHICLES WILL BE ALLOWED WITHIN THE AOA AREA. CONTRACTOR EMPLOYEE PARKING SHALL BE IN THE AREAS DESIGNATED ON THE PLANS OR IN ANOTHER AREA DESIGNATED BY AIRPORT PERSONNEL

11. TEMPORARY DRAINAGE: THROUGHOUT THE COURSE OF CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE AND INSTALL ANY DRAINAGE PROVISIONS NECESSARY TO MAINTAIN POSITIVE (CONTINUOUS AND FLOWING) DRAINAGE AND NOT RESTRICT THE EXISTING DRAINAGE FLOW PATTERN. AT END OF PROJECT CONTRACTOR SHALL RESTORE ALL GRADES, PER DESIGN PLANS, AND REMOVE ALL TEMPORARY DRAINAGE PIPES AND FACIUTIES AT NO ADDITIONAL COST TO OWNER.

12. MATERIAL STOCKPILES: UNLESS OTHERWISE ALLOWED BY AIRPORT MANAGEMENT, NO MATERIAL STOCKPILES MAY REMAIN AFTER THE PROJECT IS COMPLETE.



AIRPORT SAFETY REQUIREMENTS

- THE CONTRACTOR SHALL ACQUAINT HIS SUPERVISORS AND EMPLOYEES WITH THE AIRPORT ACTIVITY AND OPERATIONS THAT ARE INHERENT TO THIS ACTIVE AIR CARRIER AIRPORT AND SHALL CONDUCT THE CONSTRUCTION ACTIVITIES TO CONFORM TO ALL ROUTINE AND EMERGENCY AIR TRAFFIC REQUIREMENTS AND GUIDELINES ON SAFETY AS SPECIFIED HEREIN.
- ALL CONTRACTOR VEHICLES THAT ARE AUTHORIZED TO OPERATE ON THE AIRPORT IN THE ACTIVE AIRPORT OPERATIONS AREA (AOA) SHALL DISPLAY IN FULL VIEW A FLASHING AMBER (YELLOW) DOME-TYPE LIGHT, AND/OR ABOVE THE VEHICLE, A 3' X 3' OR LARGER, ORANGE AND WHITE CHECKERBOARD FLAG, EACH CHECKERBOARD COLOR BEING 1-FOOT SQUARE, (SEE FAA AC 150/5210-5D) AND ESCORTED UNDER THE CONTROL OF HOU AIRPORT OPERATIONS. CONTRACTOR SHALL BE EQUIPPED WITH (TWO-WAY) AIRCRAFT FREQUENCY RADIO OPERATOR ON THE JOB AT ALL TIMES. ANY VEHICLE OPERATING IN THE ACTIVE AGA DURING THE HOURS OF DARKNESS SHALL BE EQUIPPED WITH A FLASHING AMBER (YELLOW) DOME LIGHT, MOUNTED ON TOP OF THE VEHICLE AND OF SUCH INTENSITY TO CONFORM TO LOCAL CODES FOR MAINTENANCE AND EMERGENCY VEHICLES
- ALL NON-RADIO EQUIPPED CONTRACTOR VEHICLES THAT ARE REQUIRED TO OPERATE ON OR ACROSS ACTIVE RUNWAYS, TAXIWAYS, APRONS, CRITICAL NAVAIDS AREAS, AND RUNWAY APPROACH AND PROTECTION ZONES, SHALL DO SO UNDER THE DIRECT CONTROL OF AN HOU OPERATIONS ESCORT VEHICLE. A MAXIMUM OF 4 VEHICLES PER ESCORT WILL BE PERMITTED, TWO HOU OPERATIONS ESCORTS SHALL BE REQUIRED FOR CONVOYS GREATER THAN 4 CONTRACTOR VEHICLES. ALL VEHICLES. OPERATORS. AND RADIO EQUIPMENT SHALL BE APPROVED BY WILLIAM P. HOBBY INTERNATIONAL AIRPORT. ALL VEHICLES SHALL BE MARKED AND LIGHTED AS DESCRIBED IN PARAGRAPH NO. 2 ABOVE
- NO RUNWAY, TAXIWAY, APRON, OR AIRPORT ROADWAY SHALL BE CLOSED WITHOUT WRITTEN APPROVAL OF AIRPORT OPERATIONS. TO ENABLE NECESSARY "NOTICES TO AIRMEN" (NOTAMS) OR ADVISORIES TO AIRPORT SERVICES OR TENANTS, A MINIMUM OF 72 HOURS WRITTEN NOTICE REQUESTING CLOSING SHALL BE DIRECTED TO AIRPORT OPERATIONS. PLEASE NOTE THAT RUNWAY CLOSURES ARE SERIOUS ISSUES AND SHALL BE MINIMIZED. THE ONLY RUNWAY CLOSURES ALLOWED WILL BE THOSE NOTED IN THE PHASING PLANS
- ANY CONSTRUCTION ACTIVITY WITHIN 250 FEET OF AN ACTIVE RUNWAY CENTER LINE OR 93 FEET FROM AN ACTIVE TAXIWAY CENTERLINE OR OPEN EXCAVATIONS IN EXCESS OF THREE INCHES DEEP AND SLOPES GREATER THAN 5% WITHIN THE ABOVE AREAS, WILL REQUIRE CLOSURE OF THE AFFECTED RUNWAY OR TAXIWAY, UNLESS OTHERWISE APPROVED BY WILLIAM P. HOBBY AIRPORT (HOU) OPERATIONS. CLOSURE REQUIRES THE SAME PROVISIONS AS PARAGRAPH NO. 4 ABOVE.
- DEBRIS, WASTE, AND LOOSE MATERIAL CAPABLE OF CAUSING DAMAGE TO AIRCRAFT LANDING GEARS, PROPELLERS, OR BEING INGESTED INTO JET ENGINES. SHALL NOT BE ALLOWED ON ACTIVE AIRCRAFT MOVEMENT AREAS. IF THESE MATERIALS ARE OBSERVED TO BE ON ACTIVE AIRCRAFT MOVEMENT AREAS, THEY SHALL BE REMOVED IMMEDIATELY AND/OR CONTINUOUSLY BY THE CONTRACTOR DURING CONSTRUCTION.
- THE CONTRACTOR WILL ARRANGE WITH HOLL OPERATIONS FOR INSPECTION PRIOR TO OPENING FOR AIRCRAFT LISE OF ANY RUNWAY OR TAXIWAY THAT HAS BEEN CLOSED FOR WORK, ON OR ADJACENT THERETO, OR THAT HAS BEEN USED FOR A CROSSING POINT OR HAUL ROUTE BY THE CONTRACTOR
- THE CONTRACTOR IS DIRECTED TO COMPLY WITH AND ACQUAINT HIS/HER EMPLOYEES WITH THE FOLLOWING SAFETY GUIDELINES, RELATED MATERIALS, AND FAA ADVISORY CIRCULARS:
- 150/5200-18C, OR LATEST EDITION, "AIRPORT SAFETY SELF INSPECTION"
- 150/5210-5D, OR LATEST EDITION, "PAINTING, MARKING & LIGHTING OF VEHICLES USED ON AN AIRPORT
- 150/5370-2G, OR LATEST EDITION, "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION"
- THESE DOCUMENTS AND RELATED REQUIREMENTS ARE CALLED OUT IN MORE DETAIL IN THE CONTRACT SPECIFICATIONS.
- THE CONTRACTOR IS HEREBY INFORMED THAT THERE ARE INSTALLED ON THE AIRPORT FAA NAVAIDS, NATIONAL WEATHER SERVICE FACILITIES; AIRFIELD LIGHTING SYSTEMS; ELECTRIC CARLES AND CONTROLS RELATING TO SUCH NAVAID AND FACILITIES. SUCH NAVAIDS, NATIONAL WEATHER SERVICE AND OTHER FACILITIES, AND ELECTRIC CARLES MUST BE FULLY PROTECTED DURING THE ENTIRE CONSTRUCTION TIME. WORK UNDER THIS CONTRACT CAN BE ACCOMPLISHED IN THE VICINITY OF THESE FACILITIES AND CABLES ONLY AT APPROVED PERIODS OF TIME.
- 10. APPROVAL IS SUBJECT TO WITHDRAWAL AT ANY TIME BECAUSE OF CHANGE IN THE WEATHER, EMERGENCY CONDITIONS ON THE EXISTING AIRFIELD AREAS, ANTICIPATION OF EMERGENCY CONDITIONS, AND FOR ANY OTHER REASON DETERMINED BY HOU OPERATIONS ACTING UNDER THE ORDERS AND INSTRUCTIONS OF THE OWNER AND THE DESIGNATED FAA REPRESENTATIVE. ANY INSTRUCTIONS TO THE CONTRACTOR TO CLEAR ANY GIVEN AREA, AT ANY TIME, BY HOU OPERATIONS, THE OWNER OR THE FAA CONTROL TOWER (BY RADIO OR OTHER MEANS) SHALL BE IMMEDIATELY EXECUTED. CONSTRUCTION WORK WILL COMMENCE IN THE CLEARED AREA ONLY WHEN ADDITIONAL INSTRUCTIONS ARE ISSUED BY THE ENGINEER
- 11. POWER AND CONTROL CABLES LEADING TO AND FROM ANY FAA NAVAIDS, NATIONAL WEATHER SERVICE AND OTHER FACILITIES, WILL BE MARKED IN THE FIELD BY THE LOCAL FAA AIRWAY FACILITIES SECTOR PERSONNEL BEFORE ANY WORK IN THEIR GENERAL VICINITY IS STARTED BY THE CONTRACTOR THEREAFTER THROUGH THE ENTIRE TIME OF THIS CONSTRUCTION, THE CONTRACTOR SHALL NOT ALLOW ANY CONSTRUCTION EQUIPMENT TO CROSS THESE CABLES WITHOUT FIRST PROTECTING THE CABLE WITH STEEL BOILER PLATE, OR SIMILAR STRUCTURAL DEVICES, ON THREE (3') FEET EITHER SIDE OF THE MARKED CABLE ROUTE. ALL EXCAVATION WITHIN THREE (3') FEET OF EXISTING CABLES SHALL BE ACCOMPLISHED BY NON-INTRUSIVE EXCAVATION ONLY
- 12. THE CONTRACTOR SHALL PROTECT FAA NAVAID, NATIONAL WEATHER SERVICE AND OTHER FACILITIES, AND CABLES AT ALL TIMES. ANY UNDERGROUND UTILITIES DISCOVERED DURING CONST. NOT SHOWN ON THE PLANS SHALL BE REPORTED TO HOU OPERATIONS IMMEDIATELY
- 13. THE CONTRACTOR SHALL IMMEDIATELY REPAIR AT HIS OWN EXPENSE, WITH IDENTICAL MATERIAL BY SKILLED WORKMEN, ANY UNDERGROUND CABLES SERVING FAA NAVAIDS, NATIONAL WEATHER SERVICE AND OTHER AIRPORT FACILITIES, WHICH ARE DAMAGED BY HIS WORKMEN, EQUIPMENT, OR WORK. PRIOR APPROVAL OF THE FAA MUST BE OBTAINED FOR THE MATERIALS, WORKMEN, TIME OF DAY OR NIGHT, METHOD OF REPAIRS, AND FOR ANY TEMPORARY OR PERMANENT REPAIRS THE CONTRACTOR PROPOSES TO MAKE TO ANY FAA NAVAID AND FACILITIES DAMAGED BY THE CONTRACTOR. PRIOR APPROVAL OF THE ENGINEER MUST BE OBTAINED FOR THE MATERIALS WORKMEN, TIME OF DAY OR NIGHT, AND FOR THE METHOD OF REPAIRS FOR ANY TEMPORARY OR PERMANENT REPAIRS THE CONTRACTOR PROPOSES TO MAKE TO ANY OTHER AIRPORT FACILITIES AND CABLES DAMAGED BY THE CONTRACTOR. SHOULD THE REPAIR REQUIRE SPLICING, IT SHALL BE SPLICED AT THE DISCRETION OF THE LOCAL FAA AIRWAY FACILITIES SECTOR MANAGER AS TO WHO SHALL PERFORM THE WORK. WHERE THE FAA PERFORMS THE WORK, IT SHALL BE AT THE CONTRACTOR'S EXPENSE NO WORK SHALL BE BACKFILLED OR COVERED PRIOR TO APPROVAL BY THE AIRWAY FACILITIES SECTOR MANAGER.
- CONSTRUCTION DURING THE PROJECT MAY BE HALTED AT ANY TIME BY THE OWNER, AND/OR AIRPORT OPERATIONS IF IT IS DETERMINED TO BE IN THE BEST INTEREST OF AIRPORT OPERATIONS OR SAFETY. THE CONTRACTOR MAY BE DIRECTED TO REMOVE EQUIPMENT AND/OR EVACUATE THE SITE IN ORDER TO ENABLE AIRCRAFT OPERATIONS FOR COMMERCIAL OR GENERAL AVIATION. NECESSARY EXTENSIONS IN CONTRACT TIME WILL BE GRANTED OR A STOP WORK ORDER WILL BE ISSUED DUE TO THESE DELAYS. HOWEVER, THERE WILL BE NO ADJUSTMENTS IN CONTRACT PRICE DUE TO THESE DELAYS. IN ADDITION TO THE ABOVE, THE FOLLOWING SPECIAL REQUIREMENTS WILL APPLY FOR NIGHT CONSTRUCTION
- A. A DAILY SAFETY AND PROGRESS MEETING SHALL BE HELD BETWEEN HOU OPERATIONS AND THE CONTRACTOR'S SUPERINTENDENT TO DISCUSS REQUIREMENTS FOR THE NEXT NIGHTTIME WORK PERIOD.
- THE CONTRACTOR SHALL INCORPORATE A SAFETY PLAN SPECIFIC TO NIGHTTIME CONSTRUCTION OPERATIONS IN THE SAFETY PLAN COMPLIANCE DOCUMENT(SPCD). AS WELL AS A CONTINGENCY PLAN TO ADDRESS CASES OF ABNORMAL FAILURES OR UNEXPECTED DISASTERS USING APPENDIX D OF AC 150/5370-2G AS A GUIDE
- TRUCK HAUL ROUTES ON THE AIRFIELD SHALL BE DELINEATED WITH LIGHTED BARRICADES. OTHER MEANS TO CLEARLY MARK THE ROUTES TO THE WORK SITE MAY BE APPROVED BY THE ENGINEER, AND/OR AIRPORT OPERATIONS.
- 15. THE CONTRACTOR SHALL ALSO SUBMIT A DESTRUCTIVE/INCLEMENT WEATHER PLAN TO SET FORTH GENERAL GUIDANCE AND INFORMATION FOR THE CONTRACTOR TO COORDINATE PREPAREDNESS PLANS WHEN DESTRUCTIVE WEATHER THREATENS THE WILLIAM P. HOBBY INTERNATIONAL AIRPORT ENVIRONMENT
- 16. ALL COMMUNICATION WITH THE AIRPORT TRAFFIC CONTROL TOWER OR OTHER ELEMENTS OF THE AIRPORT SHALL BE THROUGH HOU AIRPORT OPERATIONS
- 17. THE CONTRACTOR SHALL INSTALL ALL REQUIRED BARRICADES AT DESIGNATED PLAN LOCATIONS, HAVE ALL ACCESS GATES GUARDED AND LOCKABLE, HAVE ALL EQUIPMENT EITHER FLAGGED OR FITTED WITH FLASHING YELLOW DOME-TYPE LIGHTS ON TOP OF THE VEHICLES. ALL THESE ITEMS SHALL BE INTEGRATED AS A PART OF THE SAFETY PLAN COMPLIANCE DOCUMENT (SPCD). THE CONTRACTOR SHALL INSTALL THE COMPONENTS OF THE PLAN AT THE APPROPRIATE TIMES AS SPECIFIED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL INSPECT EVERY ASPECT OF THE SPCD ON AT LEAST A DAILY BASIS AND ENSURE ALL COMPONENTS ARE FUNCTIONING PROPERLY HOU OPERATIONS SHALL ALSO INSPECT THE SYSTEM DAILY AND IF ANY DEFICIENCIES ARE NOTED, THE CONTRACTOR SHALL IMMEDIATELY TAKE STEPS TO CORRECT ANY AND ALL DEFICIENCIES. THE CONTRACTOR SHALL VISUALLY CHECK BARRICADE FLASHING LIGHTS ON A DAILY BASIS, 60 MINUTES BEFORE SUNSET FOR PROPER OPERATIONS CONTRACTOR SHALL IMMEDIATELY REPLACE LIGHTS, BATTERIES, AND LAMPS AS DEEMED NECESSARY BY THE CONTRACTOR OR AIRPORT OPERATIONS. THE SYSTEM ELEMENTS TO BE INSPECTED AND DEFICIENCIES NOTED ARE AS FOLLOWS:
- BARRICADES SET PROPERLY AND ALL FLASHING WARNING LIGHTS OPERATING PROPERLY
- ALL CONTRACTOR PERSONNEL AND EQUIPMENT ACCESS GATES STAFFED AND SECURITY PROCEDURES IN PLACE.

- ALL EQUIPMENT OUTFITTED WITH FLASHING YELLOW DOME-TYPE LIGHTS
- CONTRACTOR USE OF UNAUTHORIZED AIRPORT ACCESS GATES CHECKED
- ILLUMINATED RUNWAY CLOSURE LIGHTS IN POSITION AND OPERATIONAL. A MINIMUM OF FOUR ARE REQUIRED FOR THE DURATION OF THE PROJECT.

ANY OF THE ABOVE SAFETY AND SECURITY ITEMS FOUND TO BE DEFICIENT AT THE BEGINNING OF THE DAY BY THE AIRPORT OPERATIONS STAFF WILL RESULT IN THAT DAY'S PRORATED SAFETY AND SECURITY BID ITEM LOST AND BEING DEDUCTED PERMANENTLY FROM THE CONTRACTOR'S EARNINGS. THE CONTRACTOR SHALL MAKE A CONCERTED EFFORT TO ENSURE ALL SAFETY AND SECURITY ITEMS ARE IN PROPER WORKING ORDER EACH DAY DUE TO THE HEIGHTENED SECURITY STATUS OF THE AIRPORT AND THE CONSIDERABLE LIABILITY ASSOCIATED WITH THE SAFETY AND SECURITY ELEMENTS REQUIRED FOR THE WORK.

- 18. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO ENSURE THE SAFETY OF OPERATING AIRCRAFT AS WELL AS HIS/HER OWN EQUIPMENT AND PERSONNEL SPECIAL CONSIDERATIONS SHOULD BE GIVEN TO FLIGHT SCHEDULES AND MISCELLANEOUS AIRCRAFT OPERATIONS. THE CONTRACTOR SHALL OBEY ALL INSTRUCTIONS AS TO ROUTES TO BE TAKEN BY EQUIPMENT TRAVELING WITHIN THE AIRPORT OPERATIONS AREA AND KEEP SUCH VEHICLES AND EQUIPMENT MARKED WITH THE SPECIFIED AIRPORT SAFETY FLAGS OR FLASHING YELLOW BEACONS. THE CONTRACTOR SHALL MAKE HIS OWN ESTIMATE OF ALL DIFFICULTIES TO BE ENCOUNTERED. EQUIPMENT NOT ACTUALLY IN OPERATION SHALL BE KEPT CLEAR OF LANDING AREAS. PERSONNEL SHALL NOT ENTER AREAS OF THE AIRPORT WHERE AIRCRAFT ARE OPERATING WITHOUT SPECIFIC PERMISSION. ALL EQUIPMENT SHALL REMAIN CLEAR OF ALL ACTIVE SAFETY AREAS AND OBJECT FREE AREAS
- 19. THE CONTRACTOR SHALL TAKE ALL STEPS TO PROTECT THE EXISTING RUNWAY AND TAXIWAY LIGHTS, UNDERGROUND CABLES AS WELL AS ALL COMMERCIAL AND AIRPORT UTILITIES DURING CONSTRUCTION IN ORDER TO ENSURE CONTINUOUS OPERATION OF LIGHTS AND NAVIGATIONAL AIDS WHEN NEEDED
- 20 MATERIALS STORED OR STOCKPILED ON THE AIRPORT SHALL BE SO PLACED AND THE WORK SHALL AT ALL TIMES BE SO CONDUCTED AS TO CAUSE NO GREATER OBSTRUCTION TO THE AIR AND GROUND TRAFFIC THAN IS CONSIDERED NECESSARY BY THE ENGINEER. STOCKPILED MATERIALS SHALL NOT BE STOCKPILED WITHIN RUNWAY SAFETY AREA (RSA), OBSTACLE FREE ZONE (OFZ) OR OBJECT FREE AREA (OFA) OF ANY OPERATIONAL RUNWAY. STOCKPILING MATERIAL GREATER THAN 3' IN THE AIRCRAFT OPERATIONS AREA (AOA) REQUIRES A 7460-1. IF APPROVED. STOCKPILED MATERIAL MUST BE PROPERLY MARKED AND IDENTIFIED.
- 21. THE CONTRACTOR SHALL ERECT AND MAINTAIN ALL NECESSARY BARRICADES, SIGNS, DANGER SIGNALS AND LIGHTS FOR THE PROTECTION OF THE WORK AND THE SAFETY OF THE PUBLIC FOR BOTH LAND AND AIR TRAFFIC IN ACCORDANCE WITH THE SPECIFICATIONS (AC 150/5370-2G, OR LATEST EDITION)
- 22. CLOSED RUNWAYS OR TAXIWAYS SHALL BE BARRICADED OFF AT ALL INTERSECTIONS WITH ACTIVE RUNWAYS OR TAXIWAYS. THE CONTRACTOR SHALL HAVE PERSONNEL ON CALL 24 HOURS PER DAY FOR EMERGENCY MAINTENANCE OF AIRPORT HAZARD LIGHTING AND BARRICADES.
- 23. HOU OPERATIONS AND THE HOUSTON AIRPORT SYSTEM (HAS) SHALL, AT ALL TIMES, HAVE COMPLETE JURISDICTION OVER THE SAFETY OF ALL AIRCRAFT OPERATIONS DURING THE WORK. WHEREVER THE SAFETY OF AIR TRAFFIC IS CONCERNED, THE DECISIONS OF THE AIRPORT DIRECTOR, OR HIS DESIGNATED REPRESENTATIVE, SHALL BE FINAL AS TO METHODS, PROCEDURES AND MEASURES USED
- 24. FOR ANY RESTRICTIONS TO AIRCRAFT OPERATIONS, THE HAS SHALL GIVE PROPER NOTICE TO THE NEAREST FAA FLIGHT SERVICE STATION PRIOR TO THE START OF WORK, AND FOR ANY SUBSEQUENT CHANGES NEEDED IN THE NOTAM WHICH MAY BE ISSUED DURING THE PERIOD OF WORK
- 25. THE CONTRACTOR SHALL CONTACT THE FAA TECHNICAL OPERATIONS. TO PROVIDE FIELD LOCATIONS OF EXISTING FACILITY CABLES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR NON-INTRUSIVE EXCAVATION TO LOCATE FAA CABLING, AND PROTECTION OF THOSE CABLES THROUGHOUT THE PROJECT.
- 26. UNDER NO CIRCUMSTANCES WILL THERE BE ANY MOVEMENT OF CONTRACTOR VEHICLES AND/OR EQUIPMENT ACROSS ANY LANDING AREA AT ANY TIME UNLESS UNDER ESCORT FROM AIRPORT OPERATIONS OR ONLY IF THE RUNWAY IS CLOSED.
- 27. ALL PERSONNEL OPERATING A VEHICLE WITHIN THE AOA SHALL OBTAIN ALL NECESSARY TRAINING AS REQUIRED BY AIRPORT OPERATIONS PERSONNEL
- 28. THE CONTRACTOR SHALL CONFINE HIS PERSONNEL, EQUIPMENT, OPERATIONS AND TRAVEL TO THE AREA WITHIN THE DEFINED WORK LIMITS SHOWN ON THE PLANS.
- 29. THE CONTRACTOR SHALL INFORM ALL CONSTRUCTION PERSONNEL AS TO THE PROPER ROUTES. SPEEDS AND PROCEDURES FOR TRANSPORTING EQUIPMENT AND MATERIALS TO THE CONSTRUCTION SITE; AND ALL RESTRICTIONS TO MOVEMENT OF EQUIPMENT OR PERSONNEL WITHIN THE AIR OPERATIONS AREA. ALL PERSONNEL SHALL BE ADVISED OF ANY CHANGES IN AIRPORT OPERATIONS ON A DAILY BASIS, AND MORE OFTEN IF NECESSARY, THAT MAY FURTHER RESTRICT THEIR MOVEMENT.
- 30. ACCESS OR HAUL ROUTES SHALL BE EXISTING ROADWAYS TO THE EXTENT THAT THEY ARE AVAILABLE. THE CONTRACTOR SHALL CORRECT ANY DAMAGE TO THE ROADS USED AND SHALL RESTORE THOSE ROADS TO THE SAME OR BETTER CONDITION AS THEY EXISTED PRIOR TO THE START OF WORK. THE CONTRACTOR MAY ESTABLISH ADDITIONAL HAUL OR ACCESS ROUTES AT HIS OWN EXPENSE AND RESPONSIBILITY IF APPROVED BY THE SPONSOR. UPON COMPLETION OF THE WORK, ANY ADDITIONAL ROADS SHALL EITHER BE LEFT OR GRADED AS DIRECTED SO THAT THEY DO NOT IMPEDE EXISTING DRAINAGE OR ACCESS ROUTES.
- 31. MEASURES SHALL BE ADOPTED TO PREVENT POTENTIAL POLLUTANTS FROM ENTERING ANY DRAINAGE SYSTEM OR WATERWAY. MATERIALS AND DEBRIS SHALL NOT BE STORED IN THE WORK AREA IN A MANNER THAT WOULD ALLOW THEM TO ENTER THE DRAINAGE SYSTEM AS A RESULT OF SPILLAGE, NATURAL RUNOFF OR FLOODING. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO IMMEDIATELY NOTIFY THE SPONSOR SHOULD THERE BE A SPILLAGE OF MATERIAL WHICH MIGHT CONTAMINATE THE DRAINAGE SYSTEM. IT SHALL ALSO BE THE CONTRACTOR'S RESPONSIBILITY TO REMOVE AND CLEAR UP SUCH SPILLAGE IN A MANNER ACCEPTABLE TO THE SPONSOR. MATERIAL SHALL BE SECURED SO THAT IT WILL NOT BE BLOWN BY THE WIND ONTO THE AIRFIELD SURFACES.
- 32. SPECIAL ATTENTION TO DUST CONTROL WILL BE REQUIRED WHEN EARTHWORK OR HAULING OPERATIONS ARE IN PROGRESS OR WHEN WIND AND WEATHER CONDITIONS CAUSE EXCESSIVE BLOWING OF DUST. IN THIS REGARD, THE CONTRACTOR SHALL APPLY WATER OR CALCIUM CHLORIDE SOLUTION TO THE AFFECTED SITES AS DIRECTED.
- 33. AS REQUIRED DURING THE DAY AND AT THE END OF EACH DAY, ANY TAXIWAY OR APRON WHICH IS NOT CLOSED TO AIRCRAFT AND WHICH HAS BEEN USED BY THE CONTRACTOR, SHALL BE CLEANED BY VACUUM SWEEPER TRUCK OR OTHER ACCEPTABLE METHODS APPROVED BY THE HAS. ALL EQUIPMENT SHALL BE STORED OR MOVED TO THE CONTRACTOR 'S STAGING AREAS. CONTRACTOR SHALL MAINTAIN A MINIMUM OR TWO FULLY FUNCTIONING VACUUM SWEEPER TRUCKS ON SITE AT ALL TIMES.
- 34. VEHICLES WITHIN THE AIRPORT SECURITY FENCE SHALL BE VISIBLY IDENTIFIABLE AS CONTRACTOR VEHICLES WHICH HAVE BEEN PROPERLY CLEARED FOR ENTRY (LOGO AND FLAGS ON AUTHORIZED EQUIPMENT AND VEHICLES WOULD BE ACCEPTABLE). VEHICLE LOGOS SHALL BE VISIBLE WITHIN 200' RANGE
- 35. CONSTRUCTION EQUIPMENT SHALL HAVE A MAXIMUM HEIGHT OF 12 FEET. STOCKPILED MATERIAL IN CONSTRUCTION AREAS WITHIN THE AOA SHALL BE A MAXIMUM HEIGHT OF 3 FEET AND OUTSIDE AOA A MAXIMUM HEIGHT OF 15 FEET UNLESS A 7460 HAS BEEN FILED AND APPROVED BY FAA
- 36. WHEN CONSTRUCTION PERSONNEL OR EQUIPMENT ARE REQUIRED TO BE WITHIN 250' OF A RUNWAY CENTERLINE DUE TO ASSOCIATED CONSTRUCTION OPERATIONS, THAT RUNWAY SHALL BE CLOSED TO ALL AIRCRAFT OPERATIONS.
- 37. THE CONTRACTOR SHALL PLAN THE WORK SO AS TO MINIMIZE THE EXTENT AND TIME OF AIRFIELD PAVEMENT CLOSURES. AREAS REQUIRING MINIMAL WORK SHALL BE COMPLETED AND RESTORED TO OPERATING STATUS AS SOON AS PRACTICAL WITHIN EACH PHASE OF WORK
- 38. THE CONTRACTOR SHALL SUBMIT THE SAFETY PLAN COMPLIANCE DOCUMENT (SPCD), AS REQUIRED IN THE PROJECT SPECIFICATIONS, TO THE ENGINEER FOR REVIEW AND APPROVAL BY THE AIRPORT PRIOR TO CONSTRUCTION COMMENCING.
- 39. CONSTRUCTION OVERNIGHT EQUIPMENT AREA

CONTRACTOR MAY STORE CONSTRUCTION EQUIPMENT ON AIRPORT PROPERTY AT THE END OF EACH DAY, NO EQUIPMENT OR MATERIAL WILL BE ALLOWED TO REMAIN WITHIN THE AOA (NOT IN OFA WHEN RUNWAY OR TAXIWAY IS OPEN) WHEN WORK IS NOT BEING PERFORMED. THE CONTRACTOR SHALL MAKE MODIFICATIONS WITHIN THE OVERNIGHT STAGING AREA WHEN DEEMED NECESSARY BY HOU OPERATIONS OR HAS PERSONNEL. UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL RESTORE AND RE-VEGETATE ALL OVERNIGHT STAGING AREAS TO ORIGINAL CONDITION. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO OVERALL PERFORMANCE OF THE WORK ASSOCIATED WITH THE PROJECT.

- 40. THE CONTRACTOR SHALL NOTIFY AIRPORT OPERATIONS SO THAT THEY MAY ADVISE AIRPORT RESCUE AND FIRE FIGHTING (ARFF) PERSONNEL SEVENTY-TWO (72) HOURS IN ADVANCE OF WATERLINES OR FIRE HYDRANTS THAT MUST BE DEACTIVATED AND/OR IF EMERGENCY ACCESS ROUTES MUST BE TEMPORARILY REROUTED OR BLOCKED.
- 41. ALL CONSTRUCTION PERSONNEL SHALL ATTEND A DAILY SAFETY BRIEFING PRIOR TO COMMENCING WORK FOR THE DAY. THESE MEETINGS SHALL BE MADE OPEN TO THE ENGINEER, OWNER, OWNER'S REPRESENTATIVE, AIRPORT OPERATIONS, AND ANY OTHER GOVERNING AUTHORITY THAT WOULD LIKE TO ATTEND, THERE WILL ALSO BE A MANDATORY WEEKLY CONSTRUCTION MEETING WITH AIRPORT OPERATIONS THAT MUST BE ATTENDED BY THE CONTRACTOR'S SENIOR FIELD STAFF, INCLUDING BUT NOT LIMITED TO SUPERINTENDENT(S) AND TEAM LEADERS. THE DATE AND TIME OF THE WEEKLY CONSTRUCTION MEETING WILL BE ESTABLISHED PRIOR TO THE START OF WORK
- 42. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ALL SHEETING. SHORING, AND BRACING IS DONE IN ACCORDANCE WITH CURRENT OSHA REGULATIONS AND REQUIREMENTS. SHEETING, SHORING, AND BRACING IS CONSIDERED TO BE AN INCIDENTAL PART OF THE WORK AND NO SEPARATE PAYMENT WILL BE ALLOWED, EXCEPT AS PROVIDED IN THE PROJECT MANUAL AND TECHNICAL SPECIFICATIONS



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JANUARY 24, 2020



APPROVED BY:	DATE:
DIRECTOR HOUSTON AIRPORT SYSTEM	
PROJECT NO:	
770B	
C.I.P. NO:	
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H.A.S. NO:	
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- 43. INSPECTIONS BY OPERATIONS PRIOR TO OPENING FOR AIRCRAFT USE AND THE DEPARTURE OF THE CONTRACTOR'S WORK CREWS, THE OWNER'S AUTHORIZED REPRESENTATIVE WILL ARRANGE FOR INSPECTION BY AIRPORT OPERATIONS OF ANY RUNWAY SAFETY AREA, TAXIWAY SAFETY AREA, OR APRON THAT HAS BEEN CLOSED FOR WORK, OR THAT HAS BEEN USED FOR A CROSSING POINT OR HAUL ROUTE BY THE CONTRACTOR. THESE AREAS MUST COMPLY WITH THE SAFETY REQUIREMENTS, DEFINED BY FEDERAL AVIATION REGULATIONS PART 139, AND INTERPRETED BY THE DESIGNATED OPERATION'S INSPECTOR, BEFORE PERMISSION FOR THE CONTRACTOR'S WORK CREWS TO DEPART WILL BE GRANTED. CONTRACTOR MUST REMAIN ON SITE UNTIL AIRPORT OPERATION'S INSPECTOR, BEFORE PERMISSION FOR THE CONTRACTOR'S WORK CREWS TO DEPART WILL BE GRANTED. CONTRACTOR MUST REMAIN ON SITE UNTIL AIRPORT OPERATIONS COMPLETES AN AIRFIELD LIGHTING INSPECTION. ELECTRICAL VAULTS MUST BE RETURNED TO SERVICE NO LESS THAN 1.5 HOURS BEFORE SUNSET. CONTRACTOR CANNOT LEAVE SITE UNTIL A LIGHT CHECK IS COMPLETED WITH AIRPORT OPERATIONS.
- 44. STOCKPILE EROSION AND DUST CONTROL STOCKPILED MATERIAL AND OPEN EXCAVATIONS SHALL BE TREATED IN SUCH A MANNER AS TO PREVENT MOVEMENT RESULTING FROM AIRCRAFT BLAST OR WIND CONDITIONS IN EXCESS OF 10 KNOTS. STOCKPILED MATERIALS SHALL NOT BE PERMITTED WITHIN THE MOVEMENT AREA. STOCKPILES NO MORE THAN 3 FEET HIGH IN THE MOVEMENT AREA OUTSIDE OF THE OBJECT FREE AREAS OF THE ACTIVE AND CLOSED RUNWAYS MUST COMPLY WITH OBSTRUCTION HEIGHT REQUIREMENTS AS PROVIDED IN PART 77.
- 45. ALL UNSUITABLE MATERIALS AND EXCESS EARTHWORK EXCAVATION SHALL BE DISPOSED OF OFFSITE ACCORDING TO LOCAL LAWS AND REGULATIONS. THE CONTRACTOR SHALL PROVIDE THE AIRPORT AND THE ENGINEER WITH DOCUMENTATION OF THE QUANTITY, LOCATION OF THE DISPOSAL SITE AND DOCUMENTATION OF CITY OR LOCAL GOVERNMENT ACCEPTANCE OF THOSE MATERIALS.
- 46. PRIOR TO COMMENCING WORK IN ANY AREA OF THE AOA, THE CONTRACTOR SHALL SUBMIT A WORK AUTHORIZATION NOTICE (WAN) TO HOU OPERATIONS FOR APPROVAL AT LEAST 72 HOURS IN ADVANCE. NO WORK IN A NEW AREA SHALL BE PERMITTED WITHOUT AN APPROVED WAN. IF PROPOSED WORK INCLUDES EXTENDED MOVEMENT AREA CLOSURES, ADDITIONAL ADVANCE NOTIFICATION TIME MAY BE REQUIRED. WANS WILL BE PRESENTED TO STAKEHOLDERS BY THE HAS PROJECT MANAGER ON TUESDAYS.
- 47. CONTRACTOR WILL REPAIR ALL DAMAGE TO EXISTING SERVICE ROADS AND OTHER PAVEMENTS CAUSED BY CONSTRUCTION OPERATIONS. THE CONDITION OF EXISTING PAVEMENTS SHALL BE PHOTOGRAPHICALLY DOCUMENTED BY THE CONTRACTOR PRIOR TO USAGE. IF DAMAGE OCCURS TO PAVEMENTS DURING THE COURSE OF THE PROJECT, IT WILL BE ASSUMED TO HAVE BEEN CAUSED BY THE CONTRACTOR'S CONSTRUCTION OPERATIONS. CRACKED CONCRETE PANELS WILL BE ENTIRELY REPLACED TO EXISTING JOINT LINES AND DAMAGED ASPHALT WILL BE REPAIRED WITH PLANT MIXED HOT MIXED ASPHALTIC CONCRETE. FAILED BASE COURSE SHALL BE REMOVED, REPLACED, AND RECOMPACTED.

SECURITY REQUIREMENTS

- <u>GENERAL INTENT</u>: IT IS INTENDED THAT THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE AIRPORT SECURITY PLAN AND WITH SECURITY REQUIREMENTS SPECIFIED HEREIN BY THE HOUSTON AIRPORT SYSTEM (HAS)/HOU OPERATIONS. THE CONTRACTOR SHALL DESIGNATE TO THE ENGINEER AND AIRPORT OPERATIONS, IN WRITING, THE NAME OF HIS "CONTRACTOR SECURITY AND SAFETY OFFICER (CSSO)". THE CSSO SHALL REPRESENT THE CONTRACTOR ON THE SECURITY REQUIREMENTS FOR THE CONTRACT.
- 2. CONTRACTOR PERSONNEL SECURITY ORIENTATION: THE CSSO SHALL BE RESPONSIBLE FOR BRIEFING ALL CONTRACTOR PERSONNEL ON SECURITY REQUIREMENTS. ALL NEW CONTRACTOR EMPLOYEES SHALL BE BRIEFED ON SECURITY REQUIREMENTS PRIOR TO WORKING IN THE CONSTRUCTION AREA. THE AIRPORT SHALL BRIEF AND/OR TRAIN CONSTRUCTION RELATED VEHICLE EQUIPMENT DRIVERS ON OPERATIONS WITHIN AN AIRPORTIAIRCRAFT ENVIRONMENT. HAS MANAGEMENT SHOULD PROVIDE PRINTED MATERIAL TO EACH VEHICLE OPERATOR THAT DEPICTS HAUL ROUTES, PROHIBITED MOVEMENT AREAS, AND DESCRIBES THE CONSEQUENCES FOR NON-COMPLIANCE WITH ESTABLISHED PROCEDURES. THE AIRPORT HAS IMPLEMENTED A ZERO TOLERANCE APPROACH TO DRIVING VIOLATIONS.
- 3. ACCESS TO THE SITE: CONTRACTOR'S ACCESS TO THE SITE SHALL BE AS SHOWN ON THE PLANS. NO OTHER ACCESS POINTS SHALL BE ALLOWED UNLESS APPROVED BY AIRPORT OPERATIONS, ALL CONTRACTOR TRAFFIC AUTHORIZED TO ENTER THE SITE SHALL BE EXPERIENCED IN THE ROUTE AND ESCORTED OR GUIDED BY AIRPORT OPERATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL TO AND FROM THE VARIOUS CONSTRUCTION AREAS ON THE SITE. AND FOR THE OPERATION AND SECURITY OF THE ACCESS GATE TO THE SITE, A CONTRACTOR'S FLAGGER OR TRAFFIC CONTROL TO AND FROM THE VARIOUS CONSTRUCTION AREAS ON THE SITE. AND FOR THE OPERATION AND SECURITY OF THE ACCESS GATE TO THE SITE, A CONTRACTOR'S FLAGGER OR TRAFFIC CONTROL PERSON SHALL MONITOR AND COORDINATE AIL CONTRACTOR TRAFFIC AT THE ACCESS GATE WITH SECURITY. THE CONTRACTOR'S FLAGGER OR TRAFFIC CONTROL PERSON SHALL MONITOR AND COORDINATE AIL CONTRACTOR TRAFFIC THE SITE SHALL BE LOCKED AND SECURITY. THE CONTRACTOR SHALL NOT PERMIT ANY UNAUTHORIZED CONSTRUCTION PERSONNEL OR TRAFFIC ANT THE ACCESS GATE WITH SECURED AT ALL TIMES WHEN NOT ATTENDED BY THE CONTRACTOR. IF THE CONTRACTOR CHOOSES TO LEAVE ANY ACCESS GATE OPEN, IT SHALL BE LOCKED AND SECURED AT ALL TIMES WHEN NOT ATTENDED BY THE CONTRACTOR. IF THE CONTRACTOR CHOOSES TO LEAVE ANY ACCESS GATE OPEN, IT SHALL BE ATTENDED BY CONTRACTOR PERSONNEL WHO ARE FAMILIAR WITH THE REQUIREMENTS OF THE AIRPORT OPERATIONS SECURITY PROGRAM. THE CONTRACTOR IS RESPONSIBLE FOR THE IMMEDIATE CLEANUP OF ANY DEBRIS DEPOSITED ALONG THE ACCESS ROUTE AS A RESULT OF HIS CONSTRUCTION TRAFFIC. DIRECTIONAL SIGNING FROM THE ACCESS GATE ALONG THE DELIVERY ROUTE TO THE STORAGE AREA, PLANT SITE OR WORK SITE SHALL BE AS DIRECTED BY AIRPORT OPERATIONS.
- 4. <u>MATERIALS DELIVERY TO THE SITE:</u> ALL CONTRACTOR'S MATERIAL ORDERS FOR DELIVERY TO THE WORK SITE WILL USE, AS A DELIVERY ADDRESS, THE STREET NAME ASSIGNED TO THE ACCESS POINT AT THE CONTRACTOR'S STAGING AREA PROVIDED AS SHOWN IN THE PROJECT PLANS. THE NAME "WILLIAM P. HOBBY INTERNATIONAL AIRPORT' SHALL NOT BE USED IN THE DELIVERY ADDRESS AT ANY TIME. THIS WILL PRECLUDE DELIVERY TRUCKS FROM ENTERING INTO THE TERMINAL COMPLEX, OR TAKING SHORT CUTS THROUGH THE PERIMETER GATES AND INADVERTENTLY ENTERING INTO AIRCRAFT OPERATIONS AREAS.
- 5. <u>CONSTRUCTION AREA LIMITS</u>: THE LIMITS OF CONSTRUCTION, MATERIAL STORAGE AREAS, PLANT SITE, EQUIPMENT STORAGE AREA, PARKING AREA AND OTHER AREAS DEFINED AS REQUIRED FOR THE CONTRACTOR'S EXCLUSIVE USE DURING CONSTRUCTION SHALL BE MARKED BY THE CONTRACTOR. THE CONTRACTOR SHALL ERECT AND MAINTAIN AROUND THE PERIMETER OF THESE AREAS SUITABLE FENCING, MARKING AND/OR WARNING DEVICES VISIBLE FOR DAY/NIGHT USE. TEMPORARY BARRICADES, FLAGGING AND FLASHING WARNING LIGHTS WILL BE REQUIRED AT CRITICAL ACCESS POINTS. THE TYPE OF MARKING AND WARNING DEVICES SHALL BE APPROVED BY AIRPORT OPERATIONS.
- 6. IDENTIFICATION PERSONNEL: ALL CONTRACTOR EMPLOYEES, SUBCONTRACTORS, AGENTS, VENDORS, INVITEES, ETC., REQUIRING ACCESS TO THE CONSTRUCTION SITE SHALL, IN ACCORDANCE WITH THE AIRPORT OPERATIONS SECURITY PROGRAM, BE REQUIRED TO DISPLAY AIRPORT ISSUED IDENTIFICATION OR BE UNDER AIRPORT-APPROVED AND BADGED ESCORT PERSONNEL. THESE BADGES WILL BE IDENTIFIED NUMERICALLY AND ISSUED TO INDIVIDUAL EMPLOYEES WITH A PERMANENT RECORD MAINTAINED ON EACH INDIVIDUAL TO WHOM A BADGE IS ISSUED. IN ADDITION, A \$55 NON-REFUNDABLE PROCESSING FEE WILL BE REQUIRED FOR EACH BADGE. THIS FEE MUST BE PAID BEFORE A BADGE IS ISSUED. NO BADGE WILL BE ISSUED TO ANY PERSON UNTIL A REVIEW OF THE REQUIRED PAPERWORK BY AIRPORT SECURITY AND ALL REQUIREMENTS ARE MET. PAPERWORK SHALL BE SUBMITTED A MINIMUM OF 24 HOURS BEFORE ISSUANCE OF A BADGE. THE CONTRACTOR IS RESPONSIBLE FOR PERSONNEL ATTENDING TRAINING AND COMPLETING SECURITY BADGE APPLICATIONS, WHICH WILL INCLUDE AIR /GROUND RADIO, TAXIWAY, AND AIRPORT FAMILIARIZATION. ESTIMATED TIME FOR COMPLETION IS TWO (2) HOURS. FLAGGERS MUST BE BADGED AND MOVEMENT TRAINING, PRIOR TO PERFORMING IN THAT CAPACITY ON AIRPORT PROPERTY. AT THE COMPLETION IS TWO (2) HOURS. FLAGGERS WILL BE RETURNED TO THE AIRPORT. A CHARGE OF \$50 PER BADGE WILL BE ASSESSED FOR ALL UNREPORT PROPERTY. AT THE COMPLETION OF THE CONTRACT ALL BADGES WILL BE RETURNED TO THE AIRPORT. A CHARGE OF \$50 PER BADGE WILL BE ASSESSED FOR ALL UNREPORT PROPERTY. AT THE COMPLETION TO THE CONSIDERED TO NOTE HE FLAGGER CLASSIFICATION SHALL BE SUBJECT TO THE SAMLE BE SOLDES SOLD THE FLAGGERS.
- 7. FINES: PAYMENT OF ALL FINES ASSESSED TO WILLIAM P. HOBBY INTERNATIONAL AIRPORT, DUE TO VIOLATIONS BY THE CONTRACTOR OF FAA/TSA SECURITY OR SAFETY REQUIREMENTS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE DEDUCTED FROM MONIES DUE THE CONTRACTOR.
- A. IF THE RESTRICTED AREA GATE IS FOUND TO BE OPEN OR UNLOCKED AND UNATTENDED, AIRPORT SECURITY POLICE AND/OR TRANSPORTATION SECURITY ADMINISTRATION MAY ISSUE THE CONTRACTOR A CITATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COURT COSTS AND IMPOSED FINES. IN ADDITION, A CHARGE OF UP TO \$10,000.00 MAY BE LEVIED BY THE HOUSTON AIRPORT SYSTEM AND/OR TRANSPORTATION SECURITY ADMINISTRATION FOR EACH VIOLATION SO DOCUMENTED AND UPON THE REQUEST FOR FINAL PAYMENT THE TOTAL OF ANY SUCH CHARGES WILL BE DEDUCTED FROM MONIES DUE THE CONTRACTOR.
- B. IN THE EVENT THE CONTRACTOR DEVIATES FROM THE IDENTIFIED CONSTRUCTION LIMITS AND / OR DESIGNATED HAUL ROUTES ONTO AN ACTIVE RUNWAY OR TAXIWAY THE CONTRACTOR WILL BE FINED \$1,000 PER OCCURRENCE WHICH WILL BE DEDUCTED FROM THE FINAL CONTRACT AMOUNT DUE THE CONTRACTOR. IN ADDITION TO FINES, A NOTICE OF VIOLATION (NOV) MAY BE ISSUED, WHICH MAY INCLUDE SUSPENSION OF WORK OR TERMINATION, DEPENDING ON THE LEVEL OF VIOLATION COMMITTED (SEE CSPP IN PROJECT MANUAL FOR MORE DETAIL).
- 3. A MINIMUM OF 48 HOURS IN ADVANCE OF ANY EXCAVATION OR BORINGS, THE CONTRACTOR SHALL CONTACT TEXAS ONE CALL (811) TO VERIFY ALL UNDERGROUND CABLE LOCATIONS IN THE VICINITY OF THE PROPOSED WORK:

CABLE OWNER	CONTACT PERSON	PHONE NUMBER
FEDERAL AVIATION ADMINISTRATION	DARREN CLARK	(713) 847-1430
HOUSTON AIRPORT SYSTEM (HAS)	MICHAEL POWERS, OPS MGR.	(281) 901-8724
HAS ELECTRICAL	DANNY BAUER	(713) 641-7782
HAS MAINTENANCE	RAJISH RAMOUTAR	(713) 641-7734

- 9. <u>REQUIREMENTS FOR CLOSING TAXIWAYS</u>: WHEN CONSTRUCTION PERSONNEL OR EQUIPMENT ARE WITHIN 93 FEET FROM ANY ACTIVE TAXIWAY CENTER LINE, THOSE AREAS WILL BE CLOSED TO ALL AIRCRAFT OPERATIONS UNLESS OTHERWISE INDICATED IN THE PHASING PLAN SHEETS OR AS APPROVED BY HOU OPERATIONS. DURING THE TIME ANY TAXIWAY OR PORTION THEREOF IS CLOSED, ITS ASSOCIATED LIGHTS SHALL BE DE-ENERGIZED, JUMPERED OUT OR AN ALTERNATIVE, AND HOU OPERATIONS APPROVED, LIGHT BLACKOUT METHOD EMPLOYED. THE ENTRANCES TO CLOSED TAXIWAYS SHALL BE BARRICADED WITH LOW PROFILE BARRICADES TO PREVENT AIRCRAFT FROM ENTERING UNUSABLE OR HAZARDOUS OPERATIONAL AREAS.
- 10. <u>RESPONSIBILITY FOR TEMPORARY LIGHTING AND MARKING:</u> THE CONTRACTOR WILL BE RESPONSIBLE FOR FURNISHING AND MAINTAIN ING THE NECESSARY BARRICADES AND HAZARD LIGHTING AS REQUIRED BY THE SPECIFICATIONS TO MARK CONSTRUCTION AREAS, HAZARDS. ETC. REFLECTORIZED ORANGE PLASTIC LOW-PROFILE WATER-FILLED BARRICADES WITH ATTACHED FLASHING RED LIGHTS FOR NIGHT USE ARE THE PREFERRED TYPE OF BARRICADE FOR USE ON THE AIRPORT. CONTRACTOR SHALL MAINTAIN BARRICADES VILL OF WATER TO PREVENT DISPLACEMENT BY JET BLAST AND IMMEDIATELY REPLACE ANY BARRICADE THAT LEAKS.
- 11. CONSTRUCTION ACTIVITY IN THE VICINITY OF NAVIGATIONAL AIDS: 72 HOURS PRIOR TO THE PRE-CONSTRUCTION CONFERENCE AND/OR CONSTRUCTION START, THE CONTRACTOR SHALL CONTACT THE HAS TO COORDINATE WITH THE LOCAL AIRWAY FACILITIES MANAGER. THEIR REPRESENTATIVE WILL MEET WITH THE CONTRACTOR TO IDENTIFY FAA FACILITIES AND FAA CABLES.

HOLSTON ALRRORT SYSTEM WILLIAM P. HOBBY AIRPORT HOUSTON TEXAS JACOBS ENGINEERING GROUP INC. S966 ROGERDALE ROAD HOUS TON: S966 ROGERDALE ROAD HOUS TON: S966 ROGERDALE ROAD TEXAS P.E. FIRM F-2966 REVISIONS NO. DESCRIPTION DATE BY				
NON-STANDARD TAXIWAYS PROJECT RUNWAY 17-35 DEMOLITION	PHASING PLAN - GENERAL NOTES (2 OF 2)			
PROJECT MGR: RGS DESIGNER: RGS DRAWN BY: RGS CHECKED BY: JINP SCALE: AS SHOWN DATE: JANUARY 24, 2020				
APPROVED BY: DATE:				
DIRECTOR HOUSTON AIRPORT SYSTEM PROJECT NO: 770B C.I.P. NO: N/A H.A.S. NO: N/A SHEET NO: G3.02				



1. WORK SHALL INCLUDE:

- 1.1. PLACEMENT OF LOW-PROFILE BARRICADES AS INDICATED ON THIS DRAWING AND SUBSEQUENT DRAWINGS.
- 1.2. DEMOLITION OF TAXIWAY G1 PAVEMENT;
- 1.3. REMOVAL OF PAVEMENT MARKINGS AS INDICATED;
- 1.4. APPLICATION OF SEAL COAT AND PAVEMENT MARKINGS;
- 1.5. PLACEMENT OF FILL MATERIAL;
- 1.6. PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
- 1.7. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
- 1.8. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 2. PAVEMENT CLOSURES ARE:
 - 2.1. TAXIWAY F, BETWEEN RUNWAY 17-35 AND TAXIWAY G.
 - 2.2. PORTIONS OF TAXIWAY G AS INDICATED.
- 3. ACCESS:
- 3.1. ENTER THROUGH GATE W10.
- 3.2. UTILIZE SERVICE ROAD TO ACCESS WORK AREA.
- 4. NAVAIDS IMPACTED:
- 4.1. NONE.
- 5. DURATION: 21 CALENDAR DAYS.







APPROVED BY:	DATE
DIRECTOR HOUSTON AIRPORT SYSTEM	
PROJECT NO:	
770B	
C.I.P. NO:	
N/A	
H.A.S. NO:	
N/A	
SHEET NO:	
G3.03	

LEGEND

	LIMITS OF WORK
	HAUL ROUTE
RSA	RUNWAY SAFETY AREA
OFA	RUNWAY OBJECT FREE AREA
OFA	TAXIWAY OBJECT FREE AREA
×	LIGHTED CLOSED RWY MARKING
	LOW-PROFILE BARRICADES
T	FLAGGER
	LOCALIZER CRITICAL AREA
	GLIDESLOPE CRITICAL AREA
	PRECISION OBJECT FREE ZONE
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0 100 (IN F	200 300



1. WORK SHALL INCLUDE:

- 1.1. PLACEMENT OF LOW-PROFILE BARRICADES AS INDICATED ON THIS DRAWING AND SUBSEQUENT DRAWINGS.
- 1.2. DEMOLITION OF TAXIWAY G1 PAVEMENT AND PART OF TAXIWAYS G2, G3
- 1.3. REMOVAL OF PAVEMENT MARKINGS AS INDICATED;
- 1.4. APPLICATION OF SEAL COAT AND PAVEMENT MARKINGS;
- 1.5. PLACEMENT OF FILL MATERIAL;
- 1.6. PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
- 1.7. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
- 1.8. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 2. PAVEMENT CLOSURES ARE:
 - 2.1. TAXIWAY G2.
 - 2.2. TAXIWAY G3.
- 2.3. PORTIONS OF TAXIWAY G AS INDICATED.
- 3. ACCESS:
- 3.1. ENTER THROUGH GATE W10.
- 3.2. UTILIZE SERVICE ROAD TO ACCESS WORK AREA.
- 4. NAVAIDS IMPACTED:
- 4.1. NONE.
- 5. DURATION: 21 CALENDAR DAYS.





APPROVED BY:	DATE	
DIRECTOR HOUSTON AIRPORT SYSTEM		
PROJECT NO:		
770B		
C.I.P. NO:		
N/A		
H.A.S. NO:		
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SHEET NO:		
G3.04		

LEGEND





1. WORK SHALL INCLUDE:

- 1.1. PAINTING RUNWAY CLOSURE MARKINGS OVER THE RUNWAY NUMERALS OF RUNWAY 17-35
- 1.2. PLACEMENT OF LOW-PROFILE BARRICADES AT ALL INTERSECTIONS WITH RUNWAY 17-35 AS INDICATED ON THIS DRAWING AND SUBSEQUENT DRAWINGS.
- 1.3. DEMOLITION OF RUNWAY 35 BLAST PAD PAVEMENT;
- 1.4. DEMOLITION OF RUNWAY 17-35 PAVEMENT WITHIN THE TAXIWAY E OBJECT FREE AREA (OFA);
- 1.5. REMOVAL OF RUNWAY 17-35 HOLDING POSITION SIGNS AND MARKINGS;
- 1.6. RELOCATION OF RUNWAY 13R-31L HOLDING POSITION SIGN AND MARKINGS;
- 1.7. REMOVAL OF RUNWAY AND TAXIWAY EDGE LIGHTS AS INDICATED;
- 1.8. REMOVAL AND APPLICATION OF PAVEMENT MARKINGS AS INDICATED;
- 1.9. PLACEMENT OF FILL MATERIAL;
- 1.10.PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
- 1.11. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
- 1.12. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 2. PAVEMENT CLOSURES ARE:
 - 2.1. RUNWAY 17-35 (PERMANENTLY);
 - 2.2. RUNWAY 13L-31R; AND
 - 2.3. TAXIWAY E, BETWEEN THE DE-ICING APRON AND RUNWAY 13R.
- 3. ACCESS:
 - 3.1. ENTER THROUGH GATE N35
- 3.2. UTILIZE TAXIWAY E TO ACCESS WORK AREA4. NAVAIDS IMPACTED:
- 4.1. NONE.
- 5. DURATION: 14 CALENDAR DAYS.

<u>LEGEND</u>

		LIMITS OF WORK	
Î Ê	-	HAUL ROUTE	
FA (T)	RSA	RUNWAY SAFETY AREA	PROJECT N
186 ⁻ O	OFA	RUNWAY OBJECT FREE AREA	DESIGNER: DRAWN BY
	OFA	TAXIWAY OBJECT FREE AREA	CHECKED E SCALE:
	×	LIGHTED CLOSED RWY MARKING	DATE:
		LOW-PROFILE BARRICADES	a) PC
	T	FLAGGER	
		LOCALIZER CRITICAL AREA	$\mathcal{M}_{\mathcal{I}}$
6.		GLIDESLOPE CRITICAL AREA	
7-		PRECISION OBJECT FREE ZONE	APPROVED
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	0 100	200 300	C.I.P. NO:
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(IN FEET)



G3.05

SHEET NO:

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V BOCK CONSTRUCTION	,
APPROVED BY:	DATE:
DIRECTOR HOUSTON AIRPORT SYSTEM	
PROJECT NO:	
770B	
C.I.P. NO:	
N/A	
H.A.S. NO:	
N/A	
SHEET NO:	
G3.06	





- 1. WORK SHALL INCLUDE:
 - 1.1. DEMOLITION OF RUNWAY 17-35 PAVEMENT WITHIN THE RUNWAY 13R-31L RSA;
 - 1.2. REMOVAL OF RUNWAY AND TAXIWAY EDGE LIGHTS AS INDICATED;
 - 1.3. REMOVAL OF RUNWAY 17 VASI (SOUTH PROJECTORS);
 - 1.4. REMOVAL AND APPLICATION OF PAVEMENT MARKINGS AS INDICATED;
 - 1.5. PLACEMENT OF FILL MATERIAL;
 - 1.6. PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
- 1.7. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
- 1.8. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 2. PAVEMENT CLOSURES ARE:
 - 2.1. RUNWAY 17-35 (PERMANENTLY);
 - 2.2. RUNWAY 13R-31L;
 - 2.3. TAXIWAYS F, M1, M3, AND Q.
- 3. ACCESS:
 - 3.1. ENTER THROUGH GATE W10
 - 3.2. UTILIZE SERVICE ROAD TO ACCESS WORK AREA
 - 3.3. PROVIDE FLAGGERS AT TAXIWAY G CROSSING
- 4. NAVAIDS IMPACTED:
- 4.1. RUNWAY 13R ILS OUT OF SERVICE (OTS); AND4.2. RUNWAY 31R ILS OTS.
- 5. DURATION:
 - 5.1. 10 CALENDAR DAYS.
 - 5.2. WORK IN THIS AREA WILL BE PERFORMED ON A 24 HOUR SCHEDULE.

	LIMITS OF WORK	
·	HAUL ROUTE	
RSA	RUNWAY SAFETY AREA	
OFA	RUNWAY OBJECT FREE AREA	
OFA	TAXIWAY OBJECT FREE AREA	
×	LIGHTED CLOSED RWY MARKING	
	LOW-PROFILE BARRICADES	
T	FLAGGER	
	LOCALIZER CRITICAL AREA	
	GLIDESLOPE CRITICAL AREA	
	PRECISION OBJECT FREE ZONE	
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HOUSTON AIRPORT SYSTEM

WILLIAM P. HOBBY AIRPORT

LEGEND



- BETWEEN RUNWAY 13R-31L RSA AND TAXIWAY



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APPROVED BY:	DATE:	
DIRECTOR HOUSTON AIRPORT SYSTEM		
PROJECT NO:		
770B		
C.I.P. NO:		
N/A		
H.A.S. NO:		
N/A		
SHEET NO:		
G3.08		



1. WORK SHALL INCLUDE:

- 1.1. DEMOLITION OF RUNWAY 17-35 PAVEMENT WITHIN THE TAXIWAY F OFA;
- 1.2. DEMOLITION OF RUNWAY 17-35 PAVEMENT BETWEEN TAXIWAY F OFA AND TAXIWAY H OFA;
- 1.3. DEMOLITION OF TAXIWAY G2 PAVEMENT;
- 1.4. REMOVAL OF RUNWAY 17-35 HOLDING POSITION SIGNS AND MARKINGS;
- 1.5. REMOVAL OF RUNWAY AND TAXIWAY EDGE LIGHTS AS INDICATED;
- 1.6. REMOVAL OF PAVEMENT MARKINGS AS INDICATED;
- 1.7. APPLICATION OF SEAL COAT AND PAVEMENT MARKINGS;
- 1.8. PLACEMENT OF FILL MATERIAL;
- 1.9. PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
- 1.10. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
- 1.11. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 2. PAVEMENT CLOSURES ARE:
 - 2.1. RUNWAY 17-35 (PERMANENTLY);
 - 2.2. TAXIWAY F.
- 3. ACCESS:
 - 3.1. ENTER THROUGH GATE W10
 - 3.2. UTILIZE SERVICE ROAD TO ACCESS WORK AREA
 - 3.3. PROVIDE FLAGGERS AT TAXIWAY G CROSSING
- 4. NAVAIDS IMPACTED:
- 4.1. RUNWAY 13R GLIDESLOPE OTS.
- 5. DURATION: 56 CALENDAR DAYS.



HAUL ROUTE	
RUNWAY SAFETY AREA	
OFA RUNWAY OBJECT FREE AREA	1
OFA TAXIWAY OBJECT FREE AREA	0
LIGHTED CLOSED RWY MARKING	
LOW-PROFILE BARRICADES	
FLAGGER	
— — — — LOCALIZER CRITICAL AREA	
GLIDESLOPE CRITICAL AREA	
PRECISION OBJECT FREE ZONE	2
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APPROVED BY:	DATE:
DIRECTOR HOUSTON AIRPORT SYSTEM	
PROJECT NO:	
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C.I.P. NO:	
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SHEET NO:	
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APPROVED BY:	DATE	
DIRECTOR HOUSTON AIRPORT SYSTEM		
PROJECT NO:		
770B		
C.I.P. NO:		
N/A		
H.A.S. NO:		
N/A		
SHEET NO:		
G3.10		



1. WORK SHALL INCLUDE:

- 1.1. DEMOLITION OF RUNWAY 17-35 PAVEMENT WITHIN THE TAXIWAY H OFA;
- 1.2. DEMOLITION OF RUNWAY 17-35 PAVEMENT BETWEEN THE TAXIWAY H OFA AND RUNWAY 4-22 RSA;
- 1.3. DEMOLITION OF TAXIWAY G3;
- 1.4. REMOVAL OF RUNWAY 17-35 HOLDING POSITION SIGNS AND MARKINGS;
- 1.5. REMOVAL OF RUNWAY AND TAXIWAY EDGE LIGHTS AS INDICATED;
- 1.6. REMOVAL OF RUNWAY GUARD LIGHTS AT RUNWAY 17-35 HOLDING POSITIONS;
- 1.7. REMOVAL OF PAVEMENT MARKINGS AS INDICATED;
- 1.8. APPLICATION OF SEAL COAT AND PAVEMENT MARKINGS;
- 1.9. PLACEMENT OF FILL MATERIAL;
- 1.10.PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
- 1.11. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
- 1.12. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 2. PAVEMENT CLOSURES ARE:
 - 2.2. RUNWAY 17-35 (PERMANENTLY);
 - 2.3. TAXIWAY H, BETWEEN RUNWAY 13R-31L AND TAXIWAY G;
 - 2.4. TAXIWAY H2;
 - 2.5. TAXIWAY G AT TAXIWAY H.
- ACCESS:
 - 3.1. ENTER THROUGH GATE W80
 - 3.2. UTILIZE SERVICE ROAD TO ACCESS WORK AREA
 - 3.3. PROVIDE FLAGGERS AT CONNECTOR TAXIWAY CROSSING
- 4. NAVAIDS IMPACTED:
- 4.1. NONE.
- DURATION: 42 CALENDAR DAYS.
- 6. SEASONAL RESTRICTION: AREA NOT AVAILABLE OCTOBER 1 THROUGH APRIL 30.

LEGEND

-Δ		LIMITS OF WORK	
		HAUL ROUTE	
	RSA	RUNWAY SAFETY AREA	PROJECT MGR: RGS
	OFA	RUNWAY OBJECT FREE AREA	DESIGNER: RGS DRAWN BY: RGS
	OFA	TAXIWAY OBJECT FREE AREA	CHECKED BY: JNP SCALE: AS SHOWN
	× .	LIGHTED CLOSED RWY MARKING	DATE: JANUARY 24, 2020
		LOW-PROFILE BARRICADES	A REPERTING
	T	FLAGGER	
		LOCALIZER CRITICAL AREA	62314 62314 62314 62314
		GLIDESLOPE CRITICAL AREA	Stoppopol
~		PRECISION OBJECT FREE ZONE	APPROVED BY: DATE:
		200 300	PROJECT NO: 770B C.I.P. NO: N/A
			N/A
	(IN F	EEI)	SHEET NO:



PROJECT MGR:	RGS
DESIGNER:	RGS
DRAWN BY:	RGS
CHECKED BY:	JNP
SCALE:	AS SHOWN
DATE:	JANUARY 24, 2020

G3.11





- 1. WORK SHALL INCLUDE:
- 1.1. DEMOLITION OF RUNWAY 17-35 PAVEMENT WITHIN THE RUNWAY 4-22 RSA;
- 1.2. REMOVAL OF RUNWAY 17-35 HOLDING POSITION SIGNS AND MARKINGS;
- 1.3. REMOVAL OF RUNWAY AND TAXIWAY EDGE LIGHTS AS INDICATED;
- 1.4. REMOVAL OF RUNWAY 35 PAPI PROJECTORS;
- 1.5. REMOVAL AND APPLICATION OF PAVEMENT MARKINGS AS INDICATED;
- 1.6. PLACEMENT OF FILL MATERIAL;
- 1.7. PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
- 1.8. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
- 1.9. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 2. PAVEMENT CLOSURES ARE:
 - 2.2. RUNWAY 17-35 (PERMANENTLY);
 - 2.3. RUNWAY 4-22 CLOSED;
 - 2.4. TAXIWAY K1 CLOSED; AND
 - 2.5. TAXIWAY G SOUTH OF TAXIWAY H.
- 3. ACCESS:
- 3.1. ENTER THROUGH GATE W80.
- 3.2. UTILIZE SERVICE ROAD, TAXIWAY K, AND RUNWAY 17-35 TO ACCESS WORK AREA
- 3.3. PROVIDE FLAGGERS AT TAXIWAY K CROSSING
- 4. NAVAIDS IMPACTED:
 - 4.1. ILS RUNWAY 4 OTS; AND
 - 4.2. ILS RUNWAY 22 OTS.
- 5. DURATION:
 - 5.1. 14 CALENDAR DAYS.
- 5.2. WORK IN THIS AREA WILL BE PERFORMED ON A 24 HOUR SCHEDULE.
- 6. SEASONAL RESTRICTION: AREA NOT AVAILABLE OCTOBER 1 THROUGH APRIL 30.



	LIMITS OF WORK	
·	HAUL ROUTE	
RSA	RUNWAY SAFETY AREA	PR
OFA	RUNWAY OBJECT FREE AREA	DE DR
OFA	TAXIWAY OBJECT FREE AREA	CH SC
×	LIGHTED CLOSED RWY MARKING	DA
	LOW-PROFILE BARRICADES	
T	FLAGGER	
	LOCALIZER CRITICAL AREA	R
	GLIDESLOPE CRITICAL AREA	
	PRECISION OBJECT FREE ZONE	AP
z		PR
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- 1. WORK SHALL INCLUDE:
 - 1.1. DEMOLITION OF RUNWAY 17-35 PAVEMENT BETWEEN RUNWAY 4-22 RSA AND TAXIWAYS K AND G;
 - 1.2. DEMOLITION OF THE RUNWAY 35 BLAST PAD PAVEMENT;
 - 1.3. REMOVAL OF RUNWAY 17-35 HOLDING POSITION SIGNS AND MARKINGS;
 - 1.4. REMOVAL OF RUNWAY AND TAXIWAY EDGE LIGHTS AS INDICATED;
 - 1.5. REMOVAL OF RUNWAY 35 REILS;
 - 1.6. REMOVAL AND APPLICATION OF PAVEMENT MARKINGS AS INDICATED;
 - 1.7. APPLICATION OF PAVEMENT MARKINGS;
 - 1.8. PLACEMENT OF FILL MATERIAL;
 - 1.9. PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
 - 1.10. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
 - 1.11. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 2. PAVEMENT CLOSURES ARE:
 - 2.2. RUNWAY 17-35 (PERMANENTLY);
 - 2.3. TAXIWAY K CLOSED BETWEEN TAXIWAY K1 AND RUNWAY 17;
 - 2.4. TAXIWAY G CLOSED BETWEEN RUNWAY 4 AND RUNWAY 35;
- 3. ACCESS:
 - 3.1. ENTER THROUGH GATE W80.
 - 3.2. UTILIZE SERVICE ROAD AND TAXIWAY K TO ACCESS WORK AREA
- 4. NAVAIDS IMPACTED:
- 4.1. RUNWAY 22 GLIDESLOPE OTS.
- 5. DURATION: 42 CALENDAR DAYS.
- 6. SEASONAL RESTRICTION: AREA NOT AVAILABLE OCTOBER 1 THROUGH APRIL 30.

<u>LEGEND</u>

— — — — I	IMITS OF WORK	
·	HAUL ROUTE	
RSA F	RUNWAY SAFETY AREA	PRO
OFA F	RUNWAY OBJECT FREE AREA	DES DRA
OFA 1	TAXIWAY OBJECT FREE AREA	CHE
X 1	IGHTED CLOSED RWY MARKING	DAT
	OW-PROFILE BARRICADES	
F F	LAGGER	
ı	OCALIZER CRITICAL AREA	A
(GLIDESLOPE CRITICAL AREA	
F	PRECISION OBJECT FREE ZONE	APP
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APPROVED BY:	DATE
DIRECTOR HOUSTON AIRPORT SYSTEM	
PROJECT NO:	
770B	
C.I.P. NO:	
N/A	
H.A.S. NO:	
N/A	
SHEET NO:	
G3.14	

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NOTES:

- 1. BARRICADES SEPARATING THE CONSTRUCTION AREA FROM THE EXISTING PAVEMENT SHALL CONTINUOUSLY CONNECTED END TO END WITH NO SPACING BETWEEN THEM.
- 2. ALL LINES OF BARRICADES SHALL BE ENDED WITH BARRICADES ANGLED AT 45° AWAY FROM AIRFIELD PAVEMENT.
- 3. BARRICADES SHALL NOT BE PLACED FURTHER THAN THREE FEET ONTO PAVEMENT FROM EXCAVATION EXCEPT AS SHOWN ON THE PLAN.
- 4. BARRICADE STRIPING SHALL BE ORANGE AND WHITE CONFORMING TO FAA AC 150/5370-2G OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION.
- 5. THE REQUIRED LIGHTS MUST BE RED AND FLASHING. INTENSITIES AND LUMINANCE MUST BE AT LEAST FIVE CANDELAS EFFECTIVE INTENSITY AND FLASH AT A RATE OF FROM 55 TO 160 FLASHES PER MINUTE.
- 6. LIGHTS MUST BE OPERATED BETWEEN SUNSET AND SUNRISE AND DURING PERIODS OF LOW VISIBILITY WHEN EVER THE AIRPORT IS OPEN FOR OPERATIONS.





NOTES:

- CONTRACTOR SHALL PLACE LIGHTED RUNWAY CLOSURE MARKER AT ACCORDANCE WITH THE PHASING PLANS. LIGHTED CLOSURE MARKER PAINTED NUMBER DESIGNATOR FOR EACH RUNWAY END, UNLESS OTH ALSO TEMPORARY DISCONNECT POWER OF RUNWAY LIGHTS AT VAULT TURNING ON AND CREATING A POTENTIAL RUNWAY INCURSION. FOLLO PROCEDURES.
- 2. THE CONTRACTOR SHALL MAINTAIN THE LIGHTED RUNWAY CLOSURE IN RUNWAY CLOSURE AND REMOVE AT END OF CLOSURE WHEN DIRECTE
- 3. LIGHTED RUNWAY CLOSURE MARKERS SHALL BE LIT 24/7.
- LIGHTED RUNWAY CLOSURE MARKERS SHALL MEET THE FOLLOWING F - FAA ADVISORY CIRCULAR AC 150/3545-55A, 'SPECIFICATION FOR L-89 TEMPORARY RUNWAY CLOSURE'
 - FAA ADVISORY CIRCULAR AC 150/5345-53D, 'AIRPORT LIGHTING EQU
 - FAA ENGINEERING BRIEF 67D, 'LIGHT SOURCES OTHER THAN INCANI OBSTRUCTION LIGHTING FIXTURES'



	HOUSION AIRPORT SYSTEM	
	WILLIAM P. HOBBY AIRPORT	
	HOUSTON TEXAS	
	JACOBS ENGINEERING GROUP INC. S900 ROGEROALE ROAD HOUSTON, TEXAS 77072 +1-832-351-6000 WWW JACOBS.COM TEXAS P.E. FIRM F-2966 REVISIONS NO. DESCRIPTION DATE BY	
WHITE LED LIGHT (TYP)	RD TAXIWAYS PROJECT 17-35 DEMOLITION D SECURITY DETAILS	
	NON-STANDAF RUNWAY SAFETY ANI	
EACH END OF CLOSED RUNWAY IN RS SHALL BE PLACED ON TOP OF THE HERWISE SHOWN. CONTRACTOR SHALL T TO PREVENT THE POSSIBILITY OF THEM OW APPLICABLE "LOCKOUT" - "TAG-OUT"	PROJECT MGR: RGS	
MARKERS UNTIL COMPLETION OF THE ED BY THE CONTRACTING OFFICER.	DESIGNER: RGS DRAWN BY: RGS CHECKED BY: JNP SCALE: AS SHOWN	
FAA STANDARDS: 93, LIGHTED VISUAL AID TO INDICATE	DATE: JANUARY 24, 2020	[
JIPMENT CERTIFICATION PROGRAM	Broad and a state of the state	
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KER DETAIL	BORDONAL CUSA	
	APPROVED BY: DATE:	•
	DIDPATAD	
	HOUSTON AIRPORT SYSTEM	
	PROJECT NO: 770B	
	C.I.P. NO:	
	H.A.S. NO:	
	N/A SHEET NO:	
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	G4.01	



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RGS DLC DLC RGS

DATE:



EROSION CONTROL NOTES

- 1. REFER TO C1.08 FOR EROSION CONTROL DETAILS.
- 2. THE CONTRACTOR SHALL SOD FIRST 10 FEET FROM REMAINING PAVEMENT SHOULDER EDGES.
- 3. REFER TO C1.07 FOR GENERAL NOTES AND SEQUENCE OF CONSTRUCTION.









LEGEND

INLET PROTECTION TILL AND SOD TOPSOIL AND SOD EXISTING STORM SEWER INLET EXISTING STORM MANHOLE

EXISTING STORM DRAIN PIPE













ROJECT NO:

I.P. NO

I.A.S. NO:

SHEET NO:

770B

N/A

N/A

C1.05



EROSION CONTROL NOTES

- 1. REFER TO C1.08 FOR EROSION CONTROL DETAILS.
- 2. THE CONTRACTOR SHALL SOD FIRST 10 FEET FROM REMAINING PAVEMENT SHOULDER EDGES.
- 3. REFER TO C1.07 FOR GENERAL NOTES AND SEQUENCE OF CONSTRUCTION.



LEGEND

INLET PROTECTION
TILL AND SOD
TOPSOIL AND SOD
EXISTING STORM SEWER INLET
EXISTING STORM MANHOLE
EXISTING STORM DRAIN PIPE





SHEET NO:

C1.06

GENERAL NOTES:

- THE IMPLEMENTATION OF THE EROSION CONTROL PLAN SHALL BE COORDINATED BY THE CONTRACTOR WITH THE PROJECT CONSTRUCTION SEQUENCING. CHANGES ARE TO BE REVIEWED AND APPROVED PRIOR TO IMPLEMENTATION
- 2. CONTRACTOR SHALL RESTORE ALL AREAS DISTRIBUTED WITHIN THE PROJECT LIMITS BY CONSTRUCTION WITH SOD. SEED. TOPSOIL. MULCH & MAT
- CONTRACTOR SHALL IMPLEMENT INLET PROTECTION DEVICES AT LOCATIONS SHOWN ON THE EROSION CONTROL PLANS TO KEEP KEEP SILT AND/OR EXCAVATED MATERIALS FROM ENTERING INTO THE STORM WATER INLETS.
- 4. DURING EXCAVATION PHASE OF THE PROJECT, CONTRACTOR SHALL SCHEDULE THE WORK IN SHORT SEGMENTS SO THAT EXCAVATED MATERIAL CAN BE QUICKLY HAULED AWAY FROM THE SITE AND TO PREVENT IT FROM STAYING UNCOLLECTED ON THE EXISTING PAVEMENT, ANY LOOSE EXCAVATED MATERIAL WHICH FALLS ON PAVEMENTS OR DRIVEWAYS SHALL BE SWEPT BACK INTO THE EXCAVATED AREA
- 5. CONTRACTOR SHALL CLEAN UP THE EXISTING STREET INTERSECTIONS AND DRIVEWAYS DAILY, AS NECESSARY, TO REMOVE ANY EXCESS MUD, SILT, OR ROCK TRACKED FROM THE EXCAVATED AREA
- 6 CONTRACTOR SHALL FOLLOW GOOD HOUSE KEEPING PRACTICES DURING THE CONSTRUCTION OF THE PROJECT, ALWAYS CLEANING UP DIRT AND LOOSE MATERIAL AS CONSTRUCTION PROGRESSES.
- 7. THE CONTRACTOR SHALL UTILIZE STABILIZED CONSTRUCTION EXITS IN CONJUNCTION WITH THE PROJECT PHASING AND CONTRACTOR HAUL ROUTES. NO SEPARATE PAY FOR STABILIZED CONSTRUCTION EXITS - INCIDENTAL TO THE APPLICABLE MAJOR WORK ITEM IN THE AREA
- 8. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING STOCKPILE AREAS AND PREVENTING ANY MATERIAL RUNOFF FROM THE DESIGNATED AREAS.
- 9. CONTRACTORS OPERATING CONSTRUCTION VEHICLES AND EQUIPMENT ON THE AIRPORT MUST BE PREPARED TO EXPEDITIOUSLY CONTAIN AND CLEAN-UP SPILLS RESULTING FROM FUEL, HYDRAULIC FLUID, OR OTHER CHEMICAL FLUID LEAKS. TRANSPORT AND HANDLING OF OTHER HAZARDOUS MATERIALS ON AN AIRPORT ALSO REQUIRES SPECIAL PROCEDURES. TO THAT END, THE CONTRACTOR IS REQUIRED TO DEVELOP AND IMPLEMENT SPILL PREVENTION AND RESPONSE PROCEDURES FOR VEHICLE OPERATIONS. THE CONTRACTOR SHALL INCORPORATE THESE PROCEDURES INTO THE SPCD. THIS INCLUDES MAINTENANCE OF APPROPRIATE MSDS DATA AND APPROPRIATE PREVENTION AND RESPONSE EQUIPMENT ON-SITE
- 10. THE CONTRACTOR SHALL IMPLEMENT AND MAINTAIN ACCEPTABLE SOIL EROSION AND SEDIMENT CONTROL MEASURES INCLUDING BEST MANAGEMENT PRACTICES (BMPS) IN CONFORMANCE WITH THE EROSION CONTROL TECHNICAL STANDARDS OF THE MOST CURRENT TPDES CGP
- 11. CONTRACTOR SHALL GRADE AND COMPACT THE AREA OF EROSION CONTROL BLANKET INSTALLATION AS DIRECTED IN THE PLANS. THE SEED-BED SHALL BE PREPARED BY LOOSENING THE TOP 2-3 INCHES MINIMUM OF SOIL AND SHALL BE UNIFORM & SMOOTH AND FREE FROM ROCKS, CLODS, VEGETATION OR OTHER OBJECTS. CONTRACTOR SHALL APPLY SEED TO SOIL SURFACE BEFORE INSTALLING BLANKET & DISTURBED AREAS SHALL BE RE-SEEDED
- 12. CONTRACTOR SHALL USE TURF REINFORCEMENT MATTING MATERIAL WHICH SHALL BE RATED 6.0 FT/SEC AND WITHSTAND A SHEAR STRESS OF 2.0 LB/SQ.FT.
- 13. CONTRACTOR TO INSPECT AND MAINTAIN THE AREAS LISTED BELOW AT LEAST ONCE EVERY FOURTEEN (14) CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM EVENT OF 0.5 INCHES OR GREATER.
- DISTURBED AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN FINALLY STABIL IZED
- AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION.
- STRUCTURAL CONTROL MEASURES
- LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE.
- 14. CONTRACTOR TO BE RESPONSIBLE TO MAINTAIN EXISTING DITCHES AND/OR CULVERTS FOR UNOBSTRUCTED DRAINAGE AT ALL TIMES. WHERE SODDING IS DISTURBED BY EXCAVATION ON BACKFILLING OPERATIONS, SUCH AREAS SHALL BE REPLACED BY SODDING. SLOPES 4:1 OR STEEPER SHALL BE REPLACED BY BLOCK SODDING
- 15. STABILIZATION OF DISTURBED GRADE, WHETHER BY SODDING OR EROSION CONTROL MATTING AND SEEDING WILL BE PAID FOR AT THE LIMITS SHOWN IN THESE PLANS. NO SEPARATE PAYMENT WILL BE MADE FOR ANY OTHER STABILIZATION NECESSARY FOR GROUND DISTURBED OUTSIDE THESE LIMITS, STABILIZED AREAS DISTURBED AGAIN IN LATER PHASES, AND GROUND DISTURBED FOR ACCESS TO THE WORK AREAS. THAT WORK SHALL BE CONSIDERED INCIDENTAL TO THE GENERAL EROSION AND SEDIMENTATION CONTROL

SEQUENCE OF CONSTRUCTION (SOC):

PHASE 1

- THIS PHASE IS CONSTRUCTED DURING THE RUNWAY DEMOLITION PERIOD.
- PROVIDE INLET PROTECTION FOR EXISTING INLETS. CONDUCT CLEARING, GRUBBING, PAVEMENT REMOVAL, & GRADING OPERATIONS.
- PROVIDE SODDING. PROVIDE TOPSOIL
- PROVIDE SEEDING AND EROSION CONTROL BLANKETS. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED
- PHASE 1 MEASURES TO REMAIN.

PHASE 2

- THIS PHASE IS CONSTRUCTED DURING THE RUNWAY DEMOLITION PERIOD.
- PROVIDE INLET PROTECTION FOR EXISTING INLETS.
- CONDUCT CLEARING, GRUBBING, PAVEMENT REMOVAL, & GRADING OPERATIONS.
- PROVIDE SODDING
- PROVIDE TOPSOIL
- PROVIDE SEEDING AND EROSION CONTROL BLANKETS.
- WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED.
- PHASE 2 MEASURES TO REMAIN.

PHASE 3

- THIS PHASE IS CONSTRUCTED DURING THE RUNWAY DEMOLITION PERIOD.
- PROVIDE INLET PROTECTION FOR EXISTING INLETS.
- CONDUCT CLEARING, GRUBBING, PAVEMENT REMOVAL, & GRADING OPERATIONS.
- PROVIDE SODDING.
- PROVIDE TOPSOIL
- PROVIDE SEEDING AND EROSION CONTROL BLANKETS.
- WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED.
- PHASE 3 MEASURES TO REMAIN.

PHASE 4

- THIS PHASE IS CONSTRUCTED DURING THE RUNWAY DEMOLITION PERIOD.
- PROVIDE INLET PROTECTION FOR EXISTING INLETS
- CONDUCT CLEARING, GRUBBING, PAVEMENT REMOVAL, & GRADING OPERATIONS.
- PROVIDE SODDING
- PROVIDE TOPSOIL
- PROVIDE SEEDING AND EROSION CONTROL BLANKETS
- WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED.
- PHASE 4 MEASURES TO REMAIN.

PHASE 5

- THIS PHASE IS CONSTRUCTED DURING THE RUNWAY DEMOLITION PERIOD.
- PROVIDE INLET PROTECTION FOR EXISTING INLETS.
- CONDUCT CLEARING, GRUBBING, PAVEMENT REMOVAL, & GRADING OPERATIONS
- PROVIDE SODDING.
- PROVIDE TOPSOIL
- PROVIDE SEEDING AND EROSION CONTROL BLANKETS.
- WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED
- PHASE 5 MEASURES TO REMAIN.

PHASE 6

- PROVIDE SODDING
- PROVIDE TOPSOIL
- PHASE 6 MEASURES TO REMAIN.

PHASE 7

- - PROVIDE SODDING
 - PROVIDE TOPSOIL

 - PHASE 7 MEASURES TO REMAIN.

PHASE 8

- PROVIDE SODDING.
- PROVIDE TOPSOIL
- PHASE 8 MEASURES TO REMAIN.

PHASE 9

- PROVIDE SODDING. PROVIDE TOPSOIL

PHASE 10

- PROVIDE SODDING.
- PROVIDE TOPSOIL

THIS PHASE IS CONSTRUCTED DURING THE RUNWAY DEMOLITION PERIOD. PROVIDE INLET PROTECTION FOR EXISTING INLETS. CONDUCT CLEARING, GRUBBING, PAVEMENT REMOVAL, & GRADING OPERATIONS.

PROVIDE SEEDING AND EROSION CONTROL BLANKETS. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED

THIS PHASE IS CONSTRUCTED DURING THE RUNWAY DEMOLITION PERIOD. PROVIDE INLET PROTECTION FOR EXISTING INLETS CONDUCT CLEARING, GRUBBING, PAVEMENT REMOVAL, & GRADING OPERATIONS.

PROVIDE SEEDING AND EROSION CONTROL BLANKETS. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED.

THIS PHASE IS CONSTRUCTED DURING THE RUNWAY DEMOLITION PERIOD. PROVIDE INLET PROTECTION FOR EXISTING INLETS. CONDUCT CLEARING, GRUBBING, PAVEMENT REMOVAL, & GRADING OPERATIONS.

PROVIDE SEEDING AND EROSION CONTROL BLANKETS. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED

THIS PHASE IS CONSTRUCTED DURING THE RUNWAY DEMOLITION PERIOD. PROVIDE INLET PROTECTION FOR EXISTING INLETS. CONDUCT CLEARING, GRUBBING, PAVEMENT REMOVAL, & GRADING OPERATIONS.

PROVIDE SEEDING AND EROSION CONTROL BLANKETS. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED. PHASE 9 MEASURES TO REMAIN.

THIS PHASE IS CONSTRUCTED DURING THE RUNWAY DEMOLITION PERIOD. PROVIDE INLET PROTECTION FOR EXISTING INLETS. CONDUCT CLEARING, GRUBBING, PAVEMENT REMOVAL, & GRADING OPERATIONS.

PROVIDE SEEDING AND EROSION CONTROL BLANKETS. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED PHASE 10 MEASURES TO REMAIN.







- 1. VEHICLE TRACKING CONTROL PADS SHALL BE INSTALLED AT EVERY ACCESS POINT TO SITE.
- 2. VEHICLE TRACKING CONTROL PADS SHALL CONSIST OF HARD, DENSE, DURABLE STONE, ANGULAR IN SHAPE AND RESISTANT TO WEATHERING, ROUNDED STONE OR BOULDERS WILL NOT BE ACCEPTABLE. THE STONES SHALL BE 3" WITH A MAXIMUM SIZE OF 6". THE STONE SHALL HAVE A SPECIFIC GRAVITY OF AT LEAST 2.6. CONTROL OF GRADATION WILL BE BY VISUAL INSPECTIONS.
- 3. ANY CRACKED OR DAMAGED CURB AND GUTTER AND SIDEWALK SHALL BE REPLACED BY PERMITTEE.

VEHICLE TRACKING CONTROL MAINTENANCE NOTES:

- VEHICLE TRACKING CONTROL SHALL BE INSPECTED DAILY. GRAVEL SURFACE SHALL BE CLEAN AND LOOSE ENOUGH TO RUT SLIGHTLY UNDER WHEEL LOADS AND CAUSE LOOSE GRAVEL TO DISLODGE MUD FROM TIRES. WHEN GRAVEL 1. BECOMES COMPACTED OR FILLED WITH SEDIMENT SO THAT THE DEFECTIVENESS OF THE PAD IS DIMINISHED, CONTRACTOR SHALL RIP, TURN OVER, OR OTHERWISE LOOSEN GRAVEL, PLACE ADDITIONAL NEW GRAVEL, OR REPLACE WITH NEW GRAVEL AS NECESSARY TO RESTORE EFFECTIVENESS.
- 2. VEHICLE TRACKING CONTROL SHALL BE REMOVED AT THE END OF CONSTRUCTION, THE GRAVEL MATERIAL REMOVED OR, IF APPROVED BY THE OWNER, USED ON SITE, AND THE AREA TOPSOILED, DRILL SEEDED AND CRIMP MULCHED OR OTHERWISE STABILIZED.





	WILLIAM P. HOBBY AIRPORT HOUSTON TEXAS JACOBS ENGINEERING GROUP INC. SUBGINEERING GROUP INC. TEXAS 77072 1:4:3:3:51:6000 TEXAS P.E. FIRM F-2966 REVISIONS NO. DESCRIPTION DATE BY
	NON-STANDARD TAXIWAYS PROJECT RUNWAY 17-35 DEMOLITION EROSION AND SEDIMENTATION CONTROL DETAILS
	PROJECT MGR: RGS DESIGNER: DLC DRAWN BY: DLC CHECKED BY: RGS SCALE: AS SHOWN DATE: JANUARY 24, 2020
5' FLEXTERRA HIGH PERFORMANCE-FLEXIBLE GROWTH MEDIUM HYDROMULCH, OR APPROVED EQUAL – EXISTING TOPSOIL	APPROVED BY: DATE: HOUSTON APPORT SYSTEM PROJECT NO: T70B CLIP. NO: N/A HA.S. NO: N/A SHEET NO: C11.08

HOLISTON AIRPORT SYSTEM
















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PAVEMENT DEMOLITION LEGEND



6" CEMENT TREATED BASE COURSE

14" REINFORCED PORTLAND CEMENT CONCRETE PAVEMENT 7" CEMENT TREATED BASE COURSE

12.5" POLYMER MODIFIED ASPHALT CENTER 5.5" PORTLAND CEMENT CONCRETE PAVEMENT 12.5" POLYMER MODIFIED ASPHALT CEMENT PAVEMENT

> 3-5" POLYMER MODIFIED ASHPALT CEMENT PAVEMENT RUBBERIZED ASPHALT CEMENT CONCRETE PAVEMENT CEMENT TREATED BASE COURSE

2.5-9" POLYMER MODIFIED ASHPALT CEMENT PAVEMENT 16" PORTLAND CEMENT CONCRETE PAVEMENT 3-8" STABILIZED SAND OR SHELL BASE COURSE

15" PORTLAND CEMENT CONCRETE PAVEMENT 6" CEMENT TREATED BASE COURSE

12" PORTLAND CEMENT CONCRETE PAVEMENT

CRUSHED AGGREGATE BASE COURSE

UNKNOWN TAXIWAY SURFACE







C2.06

12" PORTLAND CEMENT CONCRETE PAVEMENT 2" ASPHALT STABILIZED CRUSHED PCC



ASPHALT CEMENT PAVEMENT CRUSHED AGGREGATE BASE COURSE



UNKNOWN TAXIWAY SURFACE UNKNOWN TAXIWAY BASE



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GENERAL NOTES

- REFER TO SHEET C3.07 FOR PAVEMENT MARKING 1.
- CONTRACTOR SHALL SURVEY EXITING MARKING TO BE REPLACED PRIOR TO APPLICATION OF SEAL COAT.















GENERAL NOTES

- REFER TO SHEET C3.07 FOR PAVEMENT MARKING DETAILS.
 CONTRACTOR SHALL SURVEY EXITING MARKINGS TO BE REPLACED PRIOR TO APPLICATION OF SEAL COAT.















C4.02





TEMPORARY REFLECTOR NOTES

1. TOP OF REFLECTOR SHALL NOT BE HIGHER THAN 14". 2. REFLECTORS ON THE SAME LINE SEGMENT OR ARC ARE EVENLY SPACED.



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DATE

C4.03

LEGEND







C4.04



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MATCH LINE





C4.05



TEMPORARY REFLECTOR NOTES

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 TOP OF REFLECTOR SHALL NOT BE HIGHER THAN 14".
 REFLECTORS ON THE SAME LINE SEGMENT OR ARC ARE EVENLY SPACED.



REVISIONS NO. DESCRIPTION DATE

HOUSTON AIRFORT SYSTEM

<u>LEGEND</u>

- TEMPORARY REFLECTOR
 - _____ THEORETICAL EDGE OF PAVEMENT
 - © OBSCURE OR DISCONNECT TAXIWAY LIGHT
 - + EXISTING TAXIWAY LIGHT
 - + EXISTING RUNWAY LIGHT

NON-STANDARD TAXIWAYS PROJECT RUNWAY 17-35 DEMOLITION	TEMPORARY REFLECTOR PLAN (6 OF 6)				
PROJECT MGR: RGS DESIGNER: DLC DRAWN BY: DLC CHECKED BY: RGS SCALE: AS SHOWN DATE: JANIARY 24 2020					
REAL SCHALD					
APPROVED BY:	APPROVED BY: DATE:				
DIRECTOR HOUSTON AIRPORT SYSTEM					
PROJECT NO:					
C.I.P. NO:					
N/A H.A.S. NO:					
N.	/A				
	06				
64.00					



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Point Table				
Point #	Northing	Easting		
1	13805178.7921	3148861.8056		
2	13805161.4802	3148834.3138		
3	13805134.5372	3148816.1595		
4	13805102.5566	3148810.4377		
5	13805036.7647	3148813.7447		
6	13804970.9728	3148817.0517		
7	13804933.5889	3148831.2467		
8	13804911.5889	3148864.6390		
9	13804787.7964	3148889.2924		
10	13804767.5748	3148857.4910		
11	13804736.1048	3148836.7574		
12	13804698.9043	3148830.7271		
13	13804659.0051	3148832.7326		
14	13804619.1060	3148834.7381		
15	13804579.2068	3148836.7436		
16	13804551.5526	3148849.8576		
17	13804257.6877	3148921.2816		
18	13804267.9753	3148892.4441		
19	13804254.8565	3148864.7796		
20	13804226.0174	3148854.4964		

Point #	Northing	Easting	
21	13804176.0805	3148857.006	
22	13804045.0585	3148863.592	
23	13803914.0365	3148870.178	
24	13803864.0995	3148872.688	
25	13803819.7618	3148886.989	
26	13803788.5148	3148921.544	
27	13803778.7311	3148967.092	
28	13803683.8509	3148971.861	
29	13803669.5491	3148927.523	
30	13803634.9946	3148896.276	
31	13803589.4463	3148886.493	
32	13803539.5093	3148889.003	
33	13803421.7003	3148894.924	
34	13803253.9543	3148903.356	
35	13803086.2083	3148911.788	
36	13802918.4623	3148920.219	
37	13802750.7163	3148928.651	
38	13802673.3843	3148932.538	
39	13802596.0524	3148936.425	
40	13802518.7205	3148940.312	

Point Table					
Point #	Northing	Easting			
41	13802431.3637 3148944.703				
42	13802344.0069	3148949.0945			
43	13802256.6502	3148953.4855			
44	13802169.2934	3148957.8764			
45	13802131.8736	3148959.7573			
46	13802081.9366	3148962.2673			
47	13802046.4206	3148975.0204			
48	13802023.9750	3149005.3557			
49	13802022.1651	3149043.0487			
50	13801834.4369	3149026.3249			
51	13801800.3586	3148995.4847			
52	13801778.5896	3148982.4695			
53	13801753.4968	3148978.7761			
54	13801703.5599	3148981.2862			
55	13801676.2648	3148982.6582			
56	13801599.0327	3148986.5402			
57	13801521.8006	3148990.4222			
58	13801440.0553	3148994.5311			
59	13801358.3100	3148998.6400			
60	13801271.7810	3149002.9893			

Point Table					
Point #	Northing	Easting			
61	13801185.2519	3149007.3386			
62	13801098.7229	3149011.6879			
63	13801055.6750	3149013.8517			
64	13801012.6271	3149016.0155			
65	13800984.1578	3149025.8461			
66	13800955.6886	3149035.6768			
67	13800951.4010	3149037.9951			
68	13800948.0832	3149041.5658			
69	13800467.8774	3149081.8626			
70	13800467.9423	3149068.8701			
71	13800457.8392	3149060.7009			
72	13800428.5277	3149053.7745			
73	13800399.2162 3149046.8				
74	13800349.2792	3149049.3583			
75	13800210.0523	3149056.3564			
76	13800020.8884	3149065.8646			
77	13799831.7245	3149075.3728			
78	13799642.5606	3149084.8810			
79	79 13799503.3337 3149091.87				
80	13799453.3967	3149094.3892			

	Point Table					
Point #	Northing	Easting				
81	13799421.3749	3149104.7181				
82	13799398.8076	3149129.6742				
83	13799391.7417	3149162.5703				
84	13799393.5271	3149197.2423				
85	13799380.4465	3148937.8540				
86	13799390.7754	3148969.8759				
87	13799415.7314	3148992.4432				
88	13799448.6276	3148999.5090				
89	13799498.5646	3148996.9990				
90	13799637.7915	3148990.0008				
91	13799826.9554	3148980.4926				
92	13800016.1193 3148970.98					
93	13800205.2832 3148961.47					
94	13800344.5101	3148954.4780				
95	13800394.4471	3148951.9680				
96	13800436.6975	3148949.8443				
97	13800478.9479	3148947.7206				
98	13800521.1984	3148945.5969				
99	13800549.6676	3148935.7663				
100	13800578.1369	3148925.9356				

Point Table				
Point #	Northing	Easting		
101	13800582.4243	3148923.6174		
102	13800585.7421	3148920.0469		
103	13800817.1673	3148911.6466		
104	13800838.9400	3148924.6686		
105	13800864.0391	3148928.3642		
106	13800911.9787	3148925.9546		
107	13800959.9183	3148923.5449		
108	13801007.8580 3148921.13			
109	13801050.9059	3148918.9715		
110	13801093.9538	3148916.8077		
111	13801128.0723 3148908.80			
112	13801156.5743 3148882.296			
113	13801295.6887	3148874.1266		
114	13801320.6447	3148896.6939		
115	13801353.5409	3148903.7597		
116	13801435.2862	3148899.6509		
117	13801517.0315	3148895.5420		
118	13801552.5476	3148882.7889		
119	13801574.9932 3148852.453			
120	13801576.8030	576.8030 3148814.7607		

Point Table				
Point #	Northing	Easting		
121	13801803.8162	3148843.4988		
122	13801823.2628	3148861.0855		
123	13801845.0318	3148874.1007		
124	13801870.1245	3148877.7940		
125	13801920.0615	3148875.2839		
126	13801939.1388	3148874.3250		
127	13802008.1532	3148870.8561		
128	13802077.1675	3148867.3871		
129	13802164.5243	3148862.9962		
130	13802251.8811	3148858.6052		
131	13802339.2378	3148854.2143		
132	13802426.5946	3148849.8234		
133	13802513.9514	3148845.4324		
134	13802540.6225	3148836.8299		
135	13802567.2937	3148828.2273		
136	13802691.1485	3148822.0018		
137	13802718.5478	3148827.8866		
138	13802745.9472	3148833.7713		
139	13802913.6932	3148825.3397		
140	13803081.4392	3148816.9080		

	Point Table				
Point # Northing		Easting			
141	13803249.1852	3148808.4764			
142	13803416.9312	3148800.0447			
143	13803534.7402	3148794.1231			
144	13803584.6772	3148791.6131			
145	13803629.0149	3148777.3115			
146	13803660.2619	3148742.7570			
147	13803670.0456	3148697.2085			
148	13803764.9258	3148692.4394			
149	13803779.2276	3148736.7773			
150	13803813.7821	3148768.0243			
151	13803859.3304	3148777.8078			
152	13803909.2674	3148775.2977			
153	13804040.2894	3148768.7120			
154	13804221.2483	3148759.6162			
155	13804264.9634	3148757.4189			
156	13804308.6785	3148755.2216			
157	13804352.3936	3148753.0243			
158	13804396.1087	3148750.8270			
159	13804411.2397	3148747.0195			
160	13804423.7629	3148737.7130			

Point Table				
Point # Northing		Easting		
161	13804717.6278	3148666.2890		
162	13804707.3402	3148695.1264		
163	13804720.4591	3148722.7910		
164	13804749.2981	3148733.0741		
165	165 13804799.2351 3148730.564			
166	13804821.6000 3148729.4399			
167	13804893.9018	3148725.8057		
168 13804966.2037 31		3148722.1715		
169 13805031.9956		3148718.8645		
170	13805099.7974	3148715.4565		
171	13805136.7441	3148703.5386		
172	13805162.7833	3148674.7432		
173	13805170.9377	3148636.7860		









EXISTING	AIRFIELD ELECTRICAL LEGEND	AIRFIELD ELECTRICAL DEMOLITION LEGEND		
SYMBOL	DESCRIPTION		SYMBOL	DESCRIPTION
	EXISTING CONDUIT IN PAVEMENT OR TURF		-++++++-	EXISTING CONDUIT IN PAVEMENT TO BE REMOVED
	EXISTING POWER DUCTBANK		-++++++-	EXISTING CONDUIT TO BE REMOVED
	EXISTING POWER MANHOLE		++++	EXISTING ELECTRICAL CABLE REMOVAL WHERE CONDUIT IS TO REMAIN
Η	EXISTING HANDHOLE		×	EXISTING TAXIWAY EDGE LIGHT AND BASE CAN TO BE REMOVED
	EXISTING JUNCTION CAN		×	EXISTING RUNWAY EDGE LIGHT AND BASE CAN TO BE REMOVED
\oplus	EXISTING AIRFIELD LIGHT CAN		6	INSTALL NEW STEEL COVER ON EXISTING LIGHT CAN
	EXISTING AIRFIELD SIGN		<mark>(</mark> § _P	INSTALL NEW STEEL COVER ON EXISTING LIGHT CAN TO RETAIN CIRCUIT
			×	EXISTING AIRFIELD SIGN AND FOUNDATION TO BE REMOVED
			M	EXISTING AIRFIELD SIGN TO BE MODIFIED
			X X	EXISTING VASI AND PAPI TO BE REMOVED
			×	EXISTING RUNWAY END LIGHTS AND BASE CAN TO BE REMOVED
			×	EXISTING HANDHOLE TO BE REMOVED
			I	INSTALL CONDUIT END CAP AND PULL STRING ON ABANDONED DUCTBANK

AIRFIELD ELECTRICAL LEGEND							
SYMBOL	TYPE	DESCRIPTION	DIRECTION	COLOR			
O	L-861T	INSTALL ELEVATED TAXIWAY EDGE LIGHT IN CONCRETE PAVEMENT	OMNIDIRECTIONAL	BLUE			
•	L-861T	INSTALL ELEVATED TAXIWAY EDGE LIGHT IN TURF	OMNIDIRECTIONAL	BLUE			
۲	L-852 C/D	INSTALL IN-PAVEMENT TAXIWAY CENTERLINE LIGHT IN EXISTING PAVEMENT	BIDIRECTIONAL	GREEN-GREEN			
3	N/A	EXISTING 3/4" STEEL COVER ON EXISTING LIGHT CAN	N/A	N/A			
S _P	N/A	EXISTING 3/4" STEEL COVER ON EXISTING LIGHT CAN TO RETAIN CIRCUIT	N/A	N/A			
۵	L-867	INSTALL JUNCTION CAN AT LOCATION OF REMOVED SIGN TO RETAIN CIRCUIT	N/A	N/A			
M	L-858	INSTALL NEW AIRFIELD SIGN	N/A	N/A			
M	L-858	EXISTING AIRFIELD SIGN TO BE MODIFIED	N/A	N/A			
<u> </u>	N/A	INSTALL DIRECT BURIED IN TURF, 1-WAY 2" PVC	N/A	N/A			
— 1R —	N/A	INSTALL CONCRETE ENCASED 2" PVC CONDUIT IN SAW KERF TRENCH IN EXISTING PAVEMENT	N/A	N/A			
Ē	N/A	INSTALL COUNTERPOISE GROUND ROD, 3/4"X10' COPPER CLAD STEEL	N/A	N/A			
*	N/A	SPLICE NEW AIRFIELD LIGHTING CABLE TO EXISTING AIRFIELD LIGHTING CABLE AT THIS LOCATION	N/A	N/A			

ABBREVIATIONS

А	-	AMP
AFF	-	ABOVE FINISHED FLOOR
AFG	-	ABOVE FINISHED GRADE
BC	-	BARE COPPER
C	-	CONDUIT
CCR	-	CONSTANT CURRENT REGULATOR
CED	-	CONCRETE ENCASED DUCTBANK
ČKT	-	CIRCUIT
CM, COMM	-	COMMUNICATION
CONC	-	CONCRETE
DIA	-	DIAMETER
ELEC	-	ELECTRIC / ELECTRICAL
EQ	-	EQUAL
EXIST	-	EXISTING
FAA	-	FEDERAL AVIATION ADMINISTRATION
F.O.	-	FIBER OPTIC
GFI	-	GROUND FAULT INTERRUPTING
GND, G	-	GROUND, GREEN LIGHT
GRS	-	GALVANIZED RIGID STEEL CONDUIT
KV	-	KILOVOLTS
KW	-	KILOWATTS
L	-	LOW VOLTAGE
MH	-	MANHOLE
NIC	-	NOT IN CONTRACT
NO.	-	NUMBER
OFA	-	OBJECT FREE AREA
OTS	-	OUT OF SERVICE
OHP	-	OVERHEAD POWER
OHT	-	OVERHEAD TELEPHONE
Р	-	PHASE
PC	-	POINT OF CURVE
PT	-	POINT OF TANGENT
PVC	-	POLYVINYL CHLORIDE CONDUIT
PVMT	-	PAVEMENT
RE:	-	REFER TO
RGL, GL	-	RUNWAY GUARD LIGHT
R, R/W	-	RUNWAY, RED LIGHT, REINFORCED
RDR	-	RUNWAY DISTANCE DEMAINING
S	-	SEWER
SCH	-	SCHEDULE
SHI	-	SHEET
SP	-	SEPTIC TANK
SPA	-	SPACES
SIA	-	STATION
	-	
1, 1/VV	-	
ITP	-	
UG	-	
	-	
	-	
	-	
V W	-	
WC	-	WALL, WIKE, WHILE LIGHT (CLEAR)
	-	
	-	
vvr v	-	
I	-	

GENERAL NOTES:

- 1. ALL WORK, EQUIPMENT AND MATERIALS MUST COMPLY WITH FAA REQUIREMENTS, NFPA 70, ANSI C2, HOUSTON AIRPORT SYSTEM, AND THE CITY OF HOUSTON BUILDING CODE.
- 2. PROVIDE ALL LABOR, PARTS AND MATERIAL REQUIRED FOR A COMPLETE, PROPERLY WORKING ELECTRICAL LIGHTING AND SIGNAGE SYSTEM AS DESCRIBED AND INDICATED.
- ALL WORK SHALL BE PERFORMED DURING AIRPORT OPERATING CONDITIONS AND AS SCHEDULED BY HOUSTON AIRPORT SYSTEMS OPERATIONS. UNLESS OTHERWISE INDICATED, ALL SIGNS AND LIGHTING SYSTEMS SHALL BE READY FOR USE EVERY NIGHT AND FOR EVERY LOW VISIBILITY PERIOD EXCEPT AS SHOWN AS CLOSED IN THE PHASING DRAWINGS.
- 4. NOTIFY ENGINEER OF ANY SIGNIFICANT DIFFERENCES BETWEEN DRAWINGS AND FIELD CONDITIONS. DEVIATIONS, PARTICULARLY REGARDING CIRCUIT ROUTING, ARE ANTICIPATED AND WILL REQUIRE COORDINATION WITH THE RESIDENT PROJECT REPRESENTATIVE.
- 5. PROVIDE REINFORCING FOR CONCRETE ENCASED DUCTBANKS UNDER RUNWAY AND TAXIWAY PAVEMENT. EXTEND REINFORCEMENT 5' BEYOND OUTSIDE EDGE OF SHOULDER.
- 6. ALL REMOVED/DEMOLISHED ITEMS SHALL HAVE THEIR ASSOCIATED BASE CANS AND/OR FOUNDATIONS REMOVED AS WELL, BACKFILL OF THE VOID CREATED TO GRADE IS INCIDENTAL TO THE DEMOLITION ITEM.

CIRCUIT TABLE			
CIRCUIT ABBREVIATION ON PLANS	CIRCUIT COVERAGE	REGULATOR LOCATION	
TW D/E	TAXIWAY D AND E EDGE LIGHTS	NORTH VAULT	
TW G/F	TAXIWAY G, G1, G2, G3, AND F EDGE LIGHTS	NORTH VAULT	
TW H	TAXIWAY H EDGE LIGHTS	NORTH VAULT	
TW H CL	TAXIWAY H CENTERLINE LIGHTS	NORTH VAULT	
TW H CL (SMGCS)	TAXIWAY H CENTERLINE SMGCS LIGHTS	NORTH VAULT	
тwк	TAXIWAY K, K1, K2, R EDGE LIGHTS	SOUTH VAULT	
TW M	TAXIWAY M, M1, M3 EDGE LIGHTS	NORTH VAULT	
SC-NW	SIGN CIRCUIT - NORTHWEST QUADRANT	NORTH VAULT	
SC-SW	SIGN CIRCUIT - SOUTHWEST QUADRANT	SOUTH VAULT	
RGL-NW	RUNWAY GUARD LIGHTS - NORTHWEST QUADRANT	NORTH VAULT	
RGL-SW	RUNWAY GUARD LIGHTS - SOUTHWEST QUADRANT	SOUTH VAULT	
RW 17-35	RUNWAY 17-35 EDGE LIGHTS	NORTH VAULT	

HOLSTON AIRRORT SYSTE WILLIAM P. HOBBY AIRPORT HOUSTON TEX JACOBS ENGINEERING GROUP IN S965 ROGERDALE ROAD HUSTON, TEXAS 77072 +1-832-351-6000 WWJACOBS.COM TEXAS P.E. FIRM F-2966 REVISIONS NO. DESCRIPTION DATE					
STANDARD TAXIWAYS PROJECT RUNWAY 17-35 DEMOLITION	NRFIELD LIGHTING, SIGNAGE, ECTRICAL LEGEND AND NOTES				

NON	ELI
ROJECT MGR:	RGS
ESIGNER:	NBD
RAWN BY:	KWA
HECKED BY:	JAM
CALE:	AS SHOWN
ATE:	JANUARY 24, 2020
JAMES A. 119	MCDONALD 579 01.24.20
PPROVED BY:	DATE:
DIRE HOUSTON AIR	CTOR PORT SYSTEM
ROJECT NO:	
77	0B
C.I.P. NO:	
N	/A
I.A.S. NO:	
N	/A
HEET NO:	
E1.	.00

GENERAL NOTES:

- INFORMATION PROVIDED ON THE DRAWINGS FOR EXISTING UTILITIES, CABLES, DUCTS, MANHOLES, FIXTURES, ETC. ARE APPROXIMATE AND ARE NOT INTENDED TO PROVIDE EXACT LOCATIONS OR TYPE OF COMPONENT, AND SHOULD NOT BE SCALED FROM DRAWINGS. THE LOCATION OF MANHOLES, PULL BOXES, JUNCTION BOXES, ETC. ALONG WITH THE ROUTE (AND IDENTIFICATION) FOR CIRCUITS SHOWN ON THE DRAWINGS <u>SHALL</u> BE FIELD VERIFIED PRIOR TO CONSTRUCTION FOR - AT A MINIMUM - ALL CIRCUITS IDENTIFIED IN THE CIRCUIT TABLE ON SHEET E100.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY AND SATISFY HIMSELF/HERSELF AS 2. TO THE LOCATION OF ALL UNDERGROUND FACILITIES WITHIN THE AREA OF CONSTRUCTION. ANY EXISTING UTILITIES, CABLES, EQUIPMENT, DEVICES DAMAGED IN THE COURSE OF THIS CONTRACT SHALL BE IMMEDIATELY REPAIRED AT THE EXPENSE OF THE CONTRACTOR TO THE SATISFACTION OF THE OWNER.
- WHERE ANY ITEM IS FOUND TO BE LOCATED DIFFERENTLY THAN IS SHOWN ON THE 3. DRAWINGS, THE ACTUAL LOCATION SHALL BE IMMEDIATELY MEASURED AND RECORDED ON THE RECORD DRAWING, AND THE RPR SHALL BE NOTIFIED IMMEDIATELY
- EXISTING UTILITY LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCING ANY WORK. ANY INTERRUPTION OF UTILITY SERVICE SHALL BE COORDINATED AND APPROVED BY THE RPR PRIOR TO COMMENCING WORK
- CIRCUIT ROUTING IS SHOWN AS BELIEVED TO EXIST IN THE FIELD BASED ON RESEARCH AND FIELD INVESTIGATION. HOWEVER, MANY DEVIATIONS ARE EXPECTED DUE TO THE LACK OF AN COMPREHENSIVE AS-BUILT OF THE RUNWAY 17-35 AREA. AS SUCH, THE CONTRACTOR SHALL REQUEST OF THE CONSTRUCTION MANAGER IN WRITING FOR ALL RECORD DRAWINGS OF THE AREA IN CONSTRUCTION. THE CONTRACTOR SHALL REVIEW ALL RECORD DRAWINGS AND BECOME FAMILIAR WITH EXISTING CONDITIONS PRIOR TO ANY CONSTRUCTION.
- THE CONTRACTOR SHALL COORDINATE WITH DIG SAFE/TEXAS 811, FAA, HAS AND ANY 6. OTHER STAKEHOLDER EXPRESSING INTEREST PRIOR TO STARTING DEMOLITION OF THE ELECTRICAL INFRASTRUCTURE. CONTACTS FOR PERSONNEL AT EACH AGENCY SHOULD BE REQUESTED AT THE PRE-CONSTRUCTION MEETING.
- WORK SHALL CONFORM TO LOCAL HAS DESIGN REQUIREMENTS, FAA CRITERIA, AND ALL 7. LOCAL AND NATIONAL CODES
- REFER TO CIVIL DRAWINGS FOR CIVIL DEMOLITION, MARKING, LAYOUT AND ALL CIVIL DESIGN ITEMS, CIVIL INFORMATION SHOWN ON ELECTRICAL DRAWINGS IS FOR REFERENCE ONLY
- ANY UNSCHEDULED INTERRUPTION OF SERVICE TO ACTIVE LIGHTING CIRCUITS SHALL BE IMMEDIATELY REPAIRED BY THE CONTRACTOR, ANY DAMAGE TO EXISTING BASE CANS. CIRCUITS, OR EQUIPMENT CAUSED BY THE CONTRACTOR'S EQUIPMENT OR PERSONNEL SHALL BE PROMPTLY REPAIRED AT THE CONTRACTOR'S EXPENSE. ALL ACTIVE LIGHTING SYSTEMS FOR OPEN AIRCRAFT OPERATIONAL AREAS SHALL REMAIN READY FOR OPERATION DURING IFR WEATHER CONDITIONS AND FROM DUSK TO DAWN OR AS DIRECTED BY THE RPR
- CIRCUITS AND EQUIPMENT SHALL BE TAGGED AND LABELED. FURTHERMORE, THE CONTRACTOR SHALL VERIFY CIRCUIT ID TAGS FOR PRIMARY CIRCUITS THAT ARE BEING ACCESSED PRIOR TO MAKING ANY CHANGES TO THE CIRCUIT. IF THE CIRCUIT ID IS DIFFERENT FROM WHAT IS SHOWN ON THE CONTRACT DOCUMENTS, THE RPR SHALL BE NOTIFIED IMMEDIATELY.
- FOR EQUIPMENT NOTED TO BE REMOVED, THE CONTRACTOR SHALL COORDINATE WITH 11. THE RPR AND EITHER SALVAGE OR DISPOSE OF THE EQUIPMENT AT THE DISCRETION OF HAS MAINTENANCE
- THE CONTRACTOR SHALL MEGGER EACH EXISTING CIRCUIT PER SPECIFICATION L-108 12. AND PROVIDE THE READINGS IN WRITING TO THE RPR PRIOR TO COMMENCING WORK. AT THE COMPLETION OF THE PROJECT, ANY MEASUREMENTS NOT MEETING OR EXCEEDING THE PRE-CONSTRUCTION MEASUREMENTS SHALL REQUIRE THE CONTRACTOR TO LOCATE AND REPLACE CABLE/CONNECTORS OR ISOLATION TRANSFORMERS AS NECESSARY AT NO ADDITIONAL COST TO THE OWNER.
- THE CONTRACTOR SHALL NOT PERFORM MEGGER TESTING AT A VOLTAGE HIGHER THAN 13. WHAT IS STATED IN SPECIFICATION L-108.
- 14. THE CONTRACTOR SHALL MANUALLY LOCK-OUT EACH CIRCUIT AT THE LIGHT VAULTS WHEN WORK IS BEING PERFORMED ON THE CIRCUIT. THE CIRCUIT SHALL BE TAGGED AND THE CONTRACTOR'S NAME SHALL BE CLEARLY IDENTIFIED ON EACH TAG. THE CONTRACTOR SHALL HAVE A LOCK-OUT KIT ON SITE AT ALL TIMES. THE RPR SHALL BE NOTIFIED EACH TIME A CIRCUIT IS SECURED AND EACH TIME THE CIRCUIT IS RETURNED TO REMOTE CONTROL. THE CONTRACTOR WILL DESIGNATE ONE INDIVIDUAL IN WRITING WHO WILL BE RESPONSIBLE FOR LIGHTING VAULT ACCESS AND FOR LOCK-OUT/TAG-OUT PROCEDURES. THE CONTRACTOR SHALL PROVIDE DAILY COORDINATION WITH THE RPR FOR VAULT ACCESS AND CIRCUIT INTERRUPTION. WEATHER AND OTHER CONSIDERATIONS MAY PRECLUDE CIRCUIT INTERRUPTION.

LOCK-OUT SHALL BE COORDINATED WITH HAS MAINTENANCE STAFF AND MEET HAS

- THE CONTRACTOR SHALL CLEAN/SWAB OUT EXISTING DUCTS BEING USED. USE SEWER 15. TAPE TO CLEAR OBSTRUCTIONS WITHIN CONCRETE ENCASED DUCTS
- BASE CANS SHALL BE MADE OF GALVANIZED STEEL AND MEET THE REQUIREMENTS OF 16. FAA BASE CAN TYPES L-867 AND L-868. CLASS 1A AND SPECIFICATIONS L-115 AND L-125.
- THE CONTRACTOR SHALL CEASE PULLING THE MANDREL THROUGH CONDUIT IF IT DOES 17. NOT PULL FREELY. NOTIFY THE RPR WHERE THIS OCCURS.
- 1/4" BOLTS AND LARGER SHALL BE HEX HEAD. BOLTS SMALLER THAN 1/4" SHALL BE HEX 18.
- ANTI-SEIZE COMPOUND SHALL BE APPLIED TO ALL FRANGIBLE COUPLINGS, STAINLESS STEEL OR GALVANIZED THREADED CONNECTIONS AND BOLTS. ANTI-SEIZE COMPOUNDS THAT ARE COMPATIBLE WITH THE MATERIAL WITH WHICH IT COMES IN CONTACT WITH SHALL BE USED.

GENERAL NOTES (CONT.)

- 21. THE FIXTURE MOUNTING BOLTS SHALL BE EXTENDED THROUGH THE BASE CAN MOUNTING FLANGE INTO THE BASE CAN A MINIMUM OF 1/2" AND A MAXIMUM OF 1-1/2". THE BOLTS SHALL HAVE ENOUGH THREAD LENGTH SO THEY DO NOT SHOULDER OUT BEFORE THE FIXTURE IS SECURELY TIGHTENED.
- 22. NEW ISOLATION TRANSFORMERS AND PRIMARY CONNECTOR KITS SHALL BE INSTALLED WITH EACH INSTALLED FIXTURE. SEPARATE PAYMENT FOR CONNECTOR KITS WILL NOT BE MADE, THE INSTALLATION OF CONNECTOR KITS SHALL BE INCIDENTAL TO INSTALLATION OF CABLE
- 23. CONTRACTOR SHALL NOT INSTALL NEW CABLES IN EXISTING CONDUITS WHERE CIRCUITS ARE TO REMAIN. CONTRACTOR SHALL REMOVE EXISTING CABLE AND PULL EXISTING AND NEW CIRCUITS THROUGH THE CONDUIT AT THE SAME TIME. CABLE ROUTING WITHIN A DUCTBANK WAS NOT FIELD VERIFIED AND ON-GOING PROJECTS HAVE MODIFIED CIRCUITS, THEREFORE THE CONTRACTOR SHALL FIELD VERIFY CIRCUIT ROUTING PRIOR TO REMOVAL AND INSTALLATION OF CABLE. THE CONTRACTOR MAY BE REQUIRED TO REPLACE ADDITIONAL CABLE AS DIRECTED BY THE RPR.
- 24. WHERE NEW CABLES ARE SHOWN TO BE IN EXISTING DUCT, CIRCUITS TO BE REPLACED OR TAKEN OUT OF COMMISSION SHALL BE REMOVED AND DISPOSED OF. WHERE MULTIPLE CIRCUITS ARE SHOWN TO BE REPLACED IN A DUCT / DUCTBANK, IT IS PRESUMED ALL CABLES ARE IN A SINGLE DUCT. IF CABLES TO BE REPLACED ARE IN SEPARATE DUCTS WITH OTHER CABLES TO REMAIN, VERIFY REMOVAL OF THE OTHER CIRCUITS WITH THE RPR BEFORE PROGRESSING WITH CABLE REPLACEMENT. IF EMPTY DUCTS EXIST ALONG THE PROPOSED CABLE INSTALLATION ALIGNMENT, THE CONTRACTOR SHALL INSTALL CABLES IN SPARE DUCTS
- 25. THE CONTRACTOR SHALL MAINTAIN THE EXISTING COUNTERPOISE SYSTEM AND EXTEND IT WHERE NEW LIGHT BASES ARE TO BE INSTALLED WHERE POSSIBLE. THE RPR SHALL HAVE FINAL JUDGEMENT ON WHETHER THE COUNTERPOISE IN ANY LOCATION CAN BE PRESERVED / CONNECTED TO OR IF NEW COUNTERPOISE MUST BE INSTALLED
- THE CONTRACTOR PERFORMING SPLICING OF 5KV CABLE (AIRFIELD CABLE) SHALL BE 26. EXPERIENCED IN THE FIELD OF AIRFIELD ELECTRICAL CONSTRUCTION AND DEMOLITION, WITH A MINIMUM OF 3 YEARS EXPERIENCE AND TRAINING IN AIRFIELD CABLE SPLICING.

ELECTRICAL DEMOLITION NOTES:

- INSTALLED PERMANENTLY
- SUBMITTED TO THE RPR.
- PART OF THIS PROJECT

ELECTRICAL PHASING NOTES:

- CONTRACTOR.
- 2. RUNWAY 17-35 WILL BE DECOMMISSIONED AT THE START OF PHASE 2 OF CONSTRUCTION. AS A RESULT, ALL OF THE FOLLOWING ITEMS MUST OCCUR PRIOR TO, OR AT THE BEGINNING OF PHASE 2:
- REMOVAL OR COVERING OF ALL SIGNAGE PANELS REFERENCING RUNWAY 17-35 REMOVAL OF ALL RUNWAY GUARD LIGHTS PROTECTING RUNWAY 17-35 SAFETY AREA. RE-TAGGING OF THE RUNWAY 17-35 REGULATOR IN THE VAULT AS 'SPARE' COORDINATING WITH THE ALCMS VENDOR AND THE AIR TRAFFIC CONTROL TOWER TO ENSURE THAT THE EXISTING ALCMS WILL FUNCTION PROPERLY UNTIL THE UPDATED SYSTEM SOFTWARE IS INSTALLED,

- 3 SIGNAGE CIRCUITS).

- 8.

PRIOR TO THE START OF DEMOLITION. THE DEMOLITION CONTRACTOR SHALL COORDINATE WITH THE ELECTRICAL CONTRACTOR TO DETERMINE A METHOD TO PROTECT THE EXISTING COUNTERPOISE TO REMAIN AND TO MAKE THE COUNTERPOISE AVAILABLE FOR CONNECTION AFTER DEMOLITION IS COMPLETE.

2. PRIOR TO DEMOLITION, THE CONTRACTOR SHALL MEASURE COUNTERPOISE RESISTANCE BETWEEN ADJACENT CANS AT THE LIMITS OF DEMOLITION USING AN APPROVED METER. THE DATA SHALL BE RECORDED AND RESULTS SUBMITTED TO THE RPR. WHERE CONTINUITY IS NOT FOUND. THE RPR SHALL BE NOTIFIED.

3. PRIOR TO DEMOLITION, THE CONTRACTOR SHALL MEGGER ALL EXISTING CIRCUITS AND PROVIDE READINGS IN WRITING TO THE RPR

4. CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF EXISTING FIXTURES TO BE REMOVED AND FIXTURES TO REMAIN. ANY FIXTURES TO REMAIN THAT ARE DAMAGED DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL HAVE ENOUGH FIXTURES ON SITE SO THE SYSTEM CAN BE FULLY OPERATIONAL AT THE TIME OF SUBSTANTIAL COMPLETION.

WHERE FIXTURES ARE REMOVED AND FOUNDATIONS ARE TO REMAIN, THE CONTRACTOR SHALL INSTALL A 3/4" PIECE OF PLYWOOD SECURED WITH SIX BOLTS TO PREVENT DEBRIS FROM COLLECTING IN THE CAN PRIOR TO A NEW FIXTURE OR STEEL PLATE BEING

6. REMOVAL OF BASE CANS SHALL INCLUDE REMOVAL OF CONCRETE ANCHOR, CONDUIT, AND COUNTERPOISE WITHIN THE CONCRETE ANCHOR. CUT AND CAP CONDUIT AS REQUIRED. METHOD OF REMOVAL SHALL BE DETERMINED BY CONTRACTOR.

7. AFTER DEMOLITION IS COMPLETE. CONTRACTOR SHALL RETEST THE REMAINING COUNTERPOISE. ANY COUNTERPOISE FOUND NOT TO BE CONTINUOUS OR GREATER THAN 25 OHMS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. CONTRACTOR SHALL VERIFY COUNTERPOISE AND CONDUIT TO REMAIN HAS NOT BEEN DAMAGED ANYWHERE CONSTRUCTION TAKES PLACE. THE DATA SHALL BE RECORDED AND THE RESULTS

CONTRACTOR SHALL TURN OVER ALL REMOVED LIGHTS, SIGNS AND FIXTURES TO HAS MAINTENANCE FOR THEIR REVIEW. IF DIRECTED BY MAINTENANCE, ITEMS SHALL BE DISPOSED OF OFFSITE BY THE CONTRACTOR IN A TIMELY MANNER. THE AIRPORT RESERVES THE RIGHT TO RETAIN ANY AND ALL SIGNS AND LIGHT FIXTURES REMOVED AS A

1. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WORK WITH THE CIVIL DEMOLITION

DISCONNECTION OF POWER TO THE RUNWAY 17-35 RUNWAY EDGE LIGHTING CIRCUIT AND ALL NAVIGATIONAL AIDS SERVING RUNWAY 17-35 (PAPI, REIL, VASI).

SOME AIRFIELD LIGHTING CIRCUITS PASS THROUGH OR NEAR THE CONSTRUCTION AREA AND WILL REMAIN ENERGIZED DURING CONSTRUCTION. THE CONTRACTOR SHALL MAINTAIN THESE CIRCUITS IN THE VICINITY OF THE CONSTRUCTION AREA AND APPROPRIATE MARK/IDENTIFY THEM FOR ALL CONSTRUCTION STAFF (E.G. RUNWAY GUARD LIGHT AND

4. ALL JUMPERING SHOWN ON THE ELECTRICAL PHASING DRAWINGS IS SCHEMATIC IN NATURE AND INTENDED TO GENERALLY SHOW THE ROUTE BELIEVED TO BE REQUIRED TO MAINTAIN POWER TO LIGHTS IN AREAS NOT AFFECTED BY CONSTRUCTION. THE CONTRACTOR SHALL VERIFY THE EXISTING CIRCUIT ROUTING PRIOR TO MAKING ANY TEMPORARY CONNECTIONS FOR ALL JUMPERING ACTIVITIES AND DOCUMENT CIRCUIT ROUTING FINDINGS WITH THE

5. IT IS POSSIBLE THAT JUMPERING MAY BE REQUIRED OF CIRCUITS NOT SHOWN ON THE ELECTRICAL PHASING DRAWINGS DUE TO UNKNOWN FIELD CONDITIONS. THE RPR SHALL HAVE THE AUTHORITY TO DIRECT THE CONTRACTOR TO INSTALL TEMPORARY CABLE IN ORDER TO MAINTAIN POWER TO ANY AREA DEEMED NECESSARY

6. ALL DEMOLITION AND NEW CONSTRUCTION MUST BE COMPLETED AND FIELD ACCEPTED PRIOR TO CLOSURE OF A PHASE DURATION.

7. VARIOUS FAA CABLES PASS THROUGH THE WORK AREA. THESE CABLES SERVE FAA FACILITIES (NAVAIDS) WHICH SHALL REMAIN OPERATIONAL AND ARE CRITICAL FOR SAFE AIRPORT OPERATION. IT IS EXTREMELY IMPORTANT THAT DAMAGE TO THESE CABLES BE PREVENTED. CABLE LOCATIONS SHOWN ON THE DRAWINGS ARE BASED ON THE BEST INFORMATION AVAILABLE, BUT CANNOT BE COUNTED AS PRECISE. THE CONTRACTOR SHALL NOTIFY THE FAA TO REQUEST THAT ANY CABLES OR UTILITIES BE STAKED IN THE FIELD. AFTER FAA STAKES THE CABLES, THE CONTRACTOR SHALL USE HAND EXCAVATION TO LOCATE CABLES AND UTILITIES AS NEEDED.

AFTER CABLES AND UTILITIES ARE LOCATED, CONTRACTOR SHALL RECORD LOCATIONS AND CABLE PROPERTIES (CONTENTS/SERVICE) AND SHALL ACCURATELY MEASURE AND RECORD THE INFORMATION ON THE AS-BUILT DRAWINGS. CONTRACTOR SHALL USE EXTREME CAUTION TO AVOID DAMAGING FAA CABLES AND UTILITIES, AS ANY DAMAGE MAY NECESSITATE REPLACEMENT OF THE CABLE RUN AS A WHOLE AT FAA'S DISCRETION.



PROJECT MGR:	RGS
DESIGNER:	NBD
DRAWN BY:	KWA
CHECKED BY:	JAM
SCALE:	AS SHOWN
DATE:	JANUARY 24, 2020



PROVED BY:

DIRECTOR HOUSTON AIRPORT SYSTEM
PROJECT NO:
770B
C.I.P. NO:
N/A
H.A.S. NO:
N/A
SHEET NO:
E1.01



WORK SHALL INCLUDE:

- 1.1. PLACEMENT OF LOW-PROFILE BARRICADES AS INDICATED ON THIS DRAWING AND SUBSEQUENT DRAWINGS.
- 1.2. DEMOLITION OF TAXIWAY G1 PAVEMENT;
- 1.3. REMOVAL OF PAVEMENT MARKINGS AS INDICATED;
- 1.4. PLACEMENT OF FILL MATERIAL;
- 1.5. PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
- 1.6. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
- 1.7. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 2. PAVEMENT CLOSURES ARE:
 - 2.1. TAXIWAY F, BETWEEN RUNWAY 17-35 AND TAXIWAY G.
 - 2.2. PORTIONS OF TAXIWAY G AS INDICATED.

ACCESS: 3.

- 3.1. ENTER THROUGH GATE W10.
- 3.2. UTILIZE SERVICE ROAD TO ACCESS WORK AREA.
- 4. NAVAIDS IMPACTED:
- 4.1. NONE.
- SEE AIRFIELD ELECTRICAL DEMOLITION PLANS FOR DETAILS REGARDING ELECTRICAL JUMPER CABLES.



NON-STANDARD TAXIWAYS PROJE RUNWAY 17-35 DEMOLITION AIRFIELD ELECTRICAL

DATE:	JANUARY 24, 2020
SCALE:	AS SHOWN
CHECKED BY:	JAM
DRAWN BY:	KWA
DESIGNER:	NBD
PROJECT MGR:	RGS



LEGEND

	LIMITS OF WORK
RSA	RUNWAY SAFETY
OFA	RUNWAY OBJECT
OFA	TAXIWAY OBJECT
×	CLOSED RUNWAY
	LOW-PROFILE BAI
	LOCALIZER CRITIC



RUNWAY OBJECT FREE AREA TAXIWAY OBJECT FREE AREA CLOSED RUNWAY MARKING LOW-PROFILE BARRICADES LOCALIZER CRITICAL AREA GLIDESLOPE CRITICAL AREA ELECTRICAL JUMPER CABLE FAA POWER CONDUIT

RUNWAY SAFETY AREA







- 1. WORK SHALL INCLUDE:
- 1.1. PLACEMENT OF LOW-PROFILE BARRICADES AS INDICATED ON THIS DRAWING AND SUBSEQUENT DRAWINGS.
- 1.2. DEMOLITION OF TAXIWAY G1 PAVEMENT AND PART OF TAXIWAYS G2, G3
- 1.3. REMOVAL OF PAVEMENT MARKINGS AS INDICATED;
- 1.4. PLACEMENT OF FILL MATERIAL;
- 1.5. PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
- 1.6. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
- 1.7. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 2. PAVEMENT CLOSURES ARE:
 - 2.1. TAXIWAY G2 PERMANENT.
 - 2.2. TAXIWAY G3 PERMANENT.
 - 2.3. PORTIONS OF TAXIWAY G AS INDICATED.
- 3. ACCESS:
 - 3.1. ENTER THROUGH GATE W10.
 - 3.2. UTILIZE SERVICE ROAD TO ACCESS WORK AREA.
- 4. NAVAIDS IMPACTED:

- 4.1. NONE.
- 5. SEE AIRFIELD ELECTRICAL DEMOLITION PLANS FOR DETAILS REGARDING ELECTRICAL JUMPER CABLES.

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	LIMITS OF WORK
-	RUNWAY SAFETY AREA
-	RUNWAY OBJECT FREE AREA
-	TAXIWAY OBJECT FREE AREA
	CLOSED RUNWAY MARKING
	LOW-PROFILE BARRICADES
-	LOCALIZER CRITICAL AREA
-	GLIDESLOPE CRITICAL AREA
•	ELECTRICAL JUMPER CABLE
-	FAA POWER CONDUIT







RGS
NBD
KWA
JAM
AS SHOWN
JANUARY 24, 2020



N/A SHEET NO:

E1.03



- WORK SHALL INCLUDE:
- 1.1. PAINTING RUNWAY CLOSURE MARKINGS OVER THE RUNWAY NUMERALS OF RUNWAY 17-35
- 1.2. PLACEMENT OF LOW-PROFILE BARRICADES AT ALL INTERSECTIONS WITH RUNWAY 17-35 AS INDICATED ON THIS DRAWING AND SUBSEQUENT DRAWINGS.
- 1.3. DEMOLITION OF RUNWAY 35 BLAST PAD PAVEMENT;
 1.4. DEMOLITION OF RUNWAY 17-35 PAVEMENT WITHIN
- THE TAXIWAY E OBJECT FREE AREA (OFA); 1.5. REMOVAL OF RUNWAY 17-35 HOLDING POSITION MARKINGS;
- 1.6. REMOVAL OF RUNWAY AND TAXIWAY EDGE LIGHTS AS INDICATED;
- 1.7. REMOVAL OF PAVEMENT MARKINGS AS INDICATED;
- 1.8. PLACEMENT OF FILL MATERIAL;
- 1.9. PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
- 1.10. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
- 1.11. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 1.12. COVERING OF ALL SIGN PANELS REFERENCING RUNWAY 17-35.
- 1.13. DISABLE OR REMOVE ALL RUNWAY GUARD LIGHTS PROTECTING THE RUNWAY 17-35 ENVIRONMENT. CITCUIT MUST REMAIN POWERED WHEN WORK IS NOT ACTIVE ON CIRCUIT ELEMENTS.
- 1.14.INSTALLATION OF ALL TEMPORARY JUMPERS AS SHOWN.
- PAVEMENT CLOSURES ARE:
- 2.1. RUNWAY 17-35 (PERMANENTLY);
- 2.2. RUNWAY 13L-31R (PARTIAL); AND
- 2.3. TAXIWAY E, BETWEEN THE DE-ICING APRON AND RUNWAY 13R.
- 2.4. RUNWAY13R-31L (PARTIAL).
- 3. ACCESS:
 - 3.1. ENTER THROUGH GATE N35
 - 3.2. UTILIZE TAXIWAY E TO ACCESS WORK AREA
- NAVAIDS IMPACTED:
- 4.1. DISABLE POWER TO ALL NAVAIDS OF IMPACTED RUNWAYS.
- SEE AIRFIELD ELECTRICAL DEMOLITION PLANS FOR DETAILS REGARDING ELECTRICAL JUMPER CABLES.

LEGEND

	LIMITS OF WORK	
RSA	RUNWAY SAFETY AREA	
OFA	RUNWAY OBJECT FREE AREA	
OFA	TAXIWAY OBJECT FREE AREA	
×	CLOSED RUNWAY MARKING	
	LOW-PROFILE BARRICADES	
	LOCALIZER CRITICAL AREA	
	GLIDESLOPE CRITICAL AREA	
J J	ELECTRICAL JUMPER CABLE	
FAA	FAA POWER CONDUIT	
z		



PROJECT MGR:	RGS
DESIGNER:	NBD
DRAWN BY:	KWA
CHECKED BY:	JAM
SCALE:	AS SHOWN
DATE:	JANUARY 24, 2020







- 1. WORK SHALL INCLUDE:
 - 1.1. DEMOLITION OF TAXIWAY D PAVEMENT, BETWEEN TAXIWAY M AND RUNWAY 17-35;
 - 1.2. DEMOLITION OF RUNWAY 17-35 PAVEMENT OUTSIDE OF THE RUNWAY 13R-31L RUNWAY SAFETY AREA (RSA);
 - 1.3. REMOVAL OF RUNWAY 17-35 HOLDING POSITION SIGNS AND MARKINGS;
 - 1.4. REMOVAL OF RUNWAY AND TAXIWAY EDGE LIGHTS AS INDICATED;
 - 1.5. REMOVAL OF PAVEMENT MARKINGS AS INDICATED;
 - 1.6. PLACEMENT OF FILL MATERIAL;
 - 1.7. PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
 - 1.8. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
 - 1.9. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 2. PAVEMENT CLOSURES ARE:
 - 2.1. RUNWAY 17-35 (PERMANENTLY);
 - 2.2. TAXIWAY D, BETWEEN RUNWAY 13L-31R AND RUNWAY 13R-31L; AND
 - 2.3. TAXIWAY M, BETWEEN TAXIWAY M1 AND TAXIWAY D.
- 3. ACCESS:
 - 3.1. ENTER THROUGH GATE N35
 - 3.2. UTILIZE TAXIWAY D TO ACCESS WORK AREA
 - 3.3. ALL VEHICLES WILL REQUIRE ESCORTS BETWEEN WORK AREA AND GATE N35.
- 4. NAVAIDS IMPACTED:

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- 4.1. NONE.
- 5. SEE AIRFIELD ELECTRICAL DEMOLITION PLANS FOR DETAILS REGARDING ELECTRICAL JUMPER CABLES.

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	LIMITS OF WORK
_	RUNWAY SAFETY AREA
_	RUNWAY OBJECT FREE ARE
_	TAXIWAY OBJECT FREE ARE
	CLOSED RUNWAY MARKING
	LOW-PROFILE BARRICADES
_	LOCALIZER CRITICAL AREA
	GLIDESLOPE CRITICAL AREA
-	ELECTRICAL JUMPER CABLE
_	FAA POWER CONDUIT





HOUSTON AIR	METSVSTEM	
WILLIAM P. HC	BBY AIRPORT	
HOUSTON	TEXAS	
JACOBS ENGINEERING GROUP INC. 5995 ROGERDAL ROAD. 5995 ROGERDAL ROAD. 140-132-2351-6000 WWW.JACOBS.COM TEXAS P.E. FIRM F-2966		
REVIS	SIONS	
NO. DESCRIPTION	DATE BY	
NON-STANDARD TAXIWAYS PROJECT RUNWAY 17-35 DEMOLITION	AIRFIELD ELECTRICAL PHASING PLAN - PHASE 3	
PROJECT MGR: RGS		
DESIGNER: NBD		
CHECKED BY:	JAN	
SCALE:	AS SHOWN	
DATE:	JANUARY 24, 2020	
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PHASING NOTES

- 1. WORK SHALL INCLUDE:
 - 1.1. DEMOLITION OF RUNWAY 17-35 PAVEMENT WITHIN THE RUNWAY 13R-31L RSA;
 - 1.2. REMOVAL OF RUNWAY AND TAXIWAY EDGE LIGHTS AS INDICATED;
 - 1.3. REMOVAL OF PAVEMENT MARKINGS AS INDICATED;
 - 1.4. PLACEMENT OF FILL MATERIAL;
 - 1.5. PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
 - 1.6. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
 - 1.7. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 2. PAVEMENT CLOSURES ARE:
 - 2.1. RUNWAY 17-35 (PERMANENTLY);
 - 2.2. RUNWAY 13R-31L;
 - 2.3. TAXIWAYS F, M1, M3, AND Q.
- 3. ACCESS:
 - 3.1. ENTER THROUGH GATE W10
 - 3.2. UTILIZE SERVICE ROAD TO ACCESS WORK AREA
 - 3.3. PROVIDE FLAGGERS AT TAXIWAY G CROSSING
- 4. NAVAIDS IMPACTED:
- 4.1. RUNWAY 13R ILS OUT OF SERVICE (OTS); AND 4.2. RUNWAY 31R ILS OTS.
- 5. SEE AIRFIELD ELECTRICAL DEMOLITION PLANS FOR DETAILS REGARDING ELECTRICAL JUMPER CABLES.





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RUNWAY SAFETY AREA RUNWAY OBJECT FREE AREA TAXIWAY OBJECT FREE AREA CLOSED RUNWAY MARKING LOW-PROFILE BARRICADES LOCALIZER CRITICAL AREA GLIDESLOPE CRITICAL AREA ELECTRICAL JUMPER CABLE







PROJECT MGR:	RGS
DESIGNER:	NBD
DRAWN BY:	KWA
CHECKED BY:	JAM
SCALE:	AS SHOWN
DATE:	JANUARY 24, 2020



LEGEND

LIMITS OF WORK



1. WORK SHALL INCLUDE:

- 1.1. DEMOLITION OF RUNWAY 17-35 PAVEMENT, BETWEEN RUNWAY 13R-31L RSA AND TAXIWAY F OFA;
- 1.2. DEMOLITION OF CLOSED TAXIWAY PAVEMENT BETWEEN TAXIWAY G AND RUNWAY 17-35;;
- 1.3. REMOVAL OF RUNWAY AND TAXIWAY EDGE LIGHTS AS INDICATED;
- 1.4. REMOVAL OF PAVEMENT MARKINGS AS INDICATED;
- 1.5. PLACEMENT OF FILL MATERIAL;
- 1.6. PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
- 1.7. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
- 1.8. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 2. PAVEMENT CLOSURES ARE:
- 2.1. RUNWAY 17-35 (PERMANENTLY);.
- 3. ACCESS:
 - 3.1. ENTER THROUGH GATE W10
 - 3.2. UTILIZE SERVICE ROAD TO ACCESS WORK AREA
- 3.3. PROVIDE FLAGGERS AT TAXIWAY G CROSSING 4. NAVAIDS IMPACTED:
- 4.1. RUNWAY 13R GLIDESLOPE OTS
- 5. SEE AIRFIELD ELECTRICAL DEMOLITION PLANS FOR DETAILS REGARDING ELECTRICAL JUMPER CABLES.

LEGEND

•	LIMITS OF WORK
-	RUNWAY SAFETY AREA
-	RUNWAY OBJECT FREE AREA
-	TAXIWAY OBJECT FREE AREA
	CLOSED RUNWAY MARKING
	LOW-PROFILE BARRICADES
-	LOCALIZER CRITICAL AREA
-	GLIDESLOPE CRITICAL AREA
•	ELECTRICAL JUMPER CABLE
-	FAA POWER CONDUIT







PROJECT MGR:	RGS
DESIGNER:	NBD
DRAWN BY:	KWA
CHECKED BY:	JAM
SCALE:	AS SHOWN
DATE:	JANUARY 24, 2020

AIRFIELD





. WORK SHALL INCLUDE:

- 1.1. DEMOLITION OF RUNWAY 17-35 PAVEMENT WITHIN THE TAXIWAY F OFA;
- 1.2. REMOVAL OF RUNWAY 17-35 HOLDING POSITION SIGNS AND MARKINGS;
- 1.3. REMOVAL OF RUNWAY AND TAXIWAY EDGE LIGHTS AS INDICATED;
- 1.4. REMOVAL OF PAVEMENT MARKINGS AS INDICATED;
- 1.5. PLACEMENT OF FILL MATERIAL;
- 1.6. PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
- 1.7. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
- 1.8. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 1.9. INSTALLATION OF ALL TEMPORARY CIRCUIT JUMPERS AS SHOWN.
- 2. PAVEMENT CLOSURES ARE:
 - 2.1. RUNWAY 17-35 (PERMANENTLY);
 - 2.2. TAXIWAY F.
- 3. ACCESS:
 - 3.1. ENTER THROUGH GATE W10
 - 3.2. UTILIZE SERVICE ROAD TO ACCESS WORK AREA
- 3.3. PROVIDE FLAGGERS AT TAXIWAY G CROSSING NAVAIDS IMPACTED:
- 4.1. RUNWAY 13R GLIDESLOPE OTS.
- 5. SEE AIRFIELD ELECTRICAL DEMOLITION PLANS FOR DETAILS REGARDING ELECTRICAL JUMPER CABLES.







RUNWAY SAFETY AREA RUNWAY OBJECT FREE AREA TAXIWAY OBJECT FREE AREA CLOSED RUNWAY MARKING LOW-PROFILE BARRICADES LOCALIZER CRITICAL AREA GLIDESLOPE CRITICAL AREA ELECTRICAL JUMPER CABLE FAA POWER CONDUIT









JAMES A. MCDONA

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JANUARY 24, 2020

ATE:



1. WORK SHALL INCLUDE:

- 1.1. DEMOLITION OF RUNWAY 17-35 PAVEMENT WITHIN THE TAXIWAY F OFA;
- 1.2. REMOVAL OF RUNWAY 17-35 HOLDING POSITION SIGNS AND MARKINGS;
- 1.3. REMOVAL OF RUNWAY AND TAXIWAY EDGE LIGHTS AS INDICATED;
- 1.4. REMOVAL OF PAVEMENT MARKINGS AS INDICATED;
- 1.5. PLACEMENT OF FILL MATERIAL;
- 1.6. PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
- 1.7. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
- 1.8. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 1.9. INSTALLATION OF ALL TEMPORARY CIRCUIT JUMPERS AS SHOWN.
- 2. PAVEMENT CLOSURES ARE:
- 2.1. RUNWAY 17-35 (PERMANENTLY);
- 2.2. TAXIWAY F.
- 3. ACCESS:
- 3.1. ENTER THROUGH GATE W10
- 3.2. UTILIZE SERVICE ROAD TO ACCESS WORK AREA
- 3.3. PROVIDE FLAGGERS AT TAXIWAY G CROSSING4. NAVAIDS IMPACTED:
- 4.1. RUNWAY 13R GLIDESLOPE OTS.
- 5. SEE AIRFIELD ELECTRICAL DEMOLITION PLANS FOR DETAILS REGARDING ELECTRICAL JUMPER CABLES.

LEGEND

I	LIMITS OF WORK
	RUNWAY SAFETY AREA
	RUNWAY OBJECT FREE ARE
	TAXIWAY OBJECT FREE ARE
	CLOSED RUNWAY MARKING
	LOW-PROFILE BARRICADES
	LOCALIZER CRITICAL AREA
	GLIDESLOPE CRITICAL AREA
l	ELECTRICAL JUMPER CABLE
	FAA POWER CONDUIT







PROJECT MGR:	RGS
DESIGNER:	NBD
DRAWN BY:	KWA
CHECKED BY:	JAM
SCALE:	AS SHOWN
DATE:	JANUARY 24, 2020







1. WORK SHALL INCLUDE:

- 1.1. DEMOLITION OF RUNWAY 17-35 PAVEMENT WITHIN THE TAXIWAY H OFA;
- 1.2. DEMOLITION OF RUNWAY 17-35 PAVEMENT BETWEEN THE TAXIWAY H OFA AND RUNWAY 4-22 RSA;
- 1.3. DEMOLITION OF TAXIWAY G3;
- 1.4. REMOVAL OF RUNWAY 17-35 HOLDING POSITION SIGNS AND MARKINGS;
- 1.5. REMOVAL OF RUNWAY AND TAXIWAY EDGE LIGHTS AS INDICATED;
- 1.6. REMOVAL OF RUNWAY GUARD LIGHTS AT RUNWAY 17-35 HOLDING POSITIONS;
- 1.7. REMOVAL OF PAVEMENT MARKINGS AS INDICATED;
- 1.8. PLACEMENT OF FILL MATERIAL;
- 1.9. PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
- 1.10. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
- 1.11. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 1.12.INSTALLATION OF ALL TEMPORARY CIRCUIT
- JUMPERS AS SHOWN.
- 2. PAVEMENT CLOSURES ARE:
 - 2.1. RUNWAY 17-35 (PERMANENTLY);
 - 2.2. TAXIWAY H, BETWEEN RUNWAY 13R-31L AND TAXIWAY G;
 - 2.3. TAXIWAY H2;
 - 2.4. TAXIWAY G AT TAXIWAY H.
 - 2.5. TAXIWAY G3
- 3. ACCESS:
- 3.1. ENTER THROUGH GATE W80
- 3.2. UTILIZE SERVICE ROAD TO ACCESS WORK AREA
- 3.3. PROVIDE FLAGGERS AT CONNECTOR TAXIWAY CROSSING
- 4. NAVAIDS IMPACTED:
- 4.1. NONE.
- 5. SEE AIRFIELD ELECTRICAL DEMOLITION PLANS FOR DETAILS REGARDING ELECTRICAL JUMPER CABLES.

LEGEND

LIMITS OF WORK















WORK SHALL INCLUDE:

- 1.1. DEMOLITION OF RUNWAY 17-35 PAVEMENT WITHIN THE RUNWAY 4-22 RSA:
- 1.2. REMOVAL OF RUNWAY 17-35 HOLDING POSITION SIGNS AND MARKINGS;
- 1.3. REMOVAL OF RUNWAY AND TAXIWAY EDGE LIGHTS AS INDICATED;
- 1.4. REMOVAL OF PAVEMENT MARKINGS AS INDICATED;
- 1.5. PLACEMENT OF FILL MATERIAL;
- 1.6. PLACEMENT OF TOPSOIL AND SOD ON ALL DISTURBED AREAS;
- 1.7. WATERING AND MAINTENANCE OF SOD UNTIL ESTABLISHED; AND
- 1.8. ALL OTHER WORK WITHIN THE PHASE LIMITS.
- 2. PAVEMENT CLOSURES ARE:
 - 2.1. RUNWAY 17-35 (PERMANENTLY);
 - 2.2. RUNWAY 4-22 CLOSED;
 - 2.3. TAXIWAY K1 CLOSED; AND
 - 2.4. TAXIWAY G CLOSED SOUTH OF TAXIWAY H
- ACCESS (SEE FOLLOWING SHEET):
- 3.1. ENTER THROUGH GATE W80.
- 3.2. UTILIZE SERVICE ROAD, TAXIWAY K, AND RUNWAY17-35 TO ACCESS WORK AREA
- 4. NAVAIDS IMPACTED:
 - 4.1. ILS RUNWAY 4 OTS; AND
 - 4.2. ILS RUNWAY 22 OTS.
- SEE AIRFIELD ELECTRICAL DEMOLITION PLANS FOR DETAILS REGARDING ELECTRICAL JUMPER CABLES.





RUNWAY SAFETY AREA RUNWAY OBJECT FREE AREA TAXIWAY OBJECT FREE AREA CLOSED RUNWAY MARKING LOW-PROFILE BARRICADES LOCALIZER CRITICAL AREA GLIDESLOPE CRITICAL AREA ELECTRICAL JUMPER CABLE FAA POWER CONDUIT











	HOLSTON AIR WILLIAM P. HO HOUSTON JACOBS ENGINEER HOUSTON. 143238 WILLIAM P. HO HOUSTON. 143238 WILLIAM P. HO HOUSTON. 14328 WILLIAM P. HO HOUSTON HOUSTON TEXAS P.E. F. REVIS	INCRETINATION BBY AIRPORT TEXAS OBBSC RING GROUP INC. DALE ROAD EXASTROTS HOROOM IRM F-2896
	NON-STANDARD TAXIWAYS PROJECT RUNWAY 17-35 DEMOLITION	AIRFIELD ELECTRICAL PHASING PLAN - PHASE 8 (2 OF 2)
	PROJECT MGR: DESIGNER: DRAWN BY: CHECKED BY: SCALE: DATE:	RGS NBD KWA JAM AS SHOWN JANUARY 24, 2020
	JAMES A 119	MCDONALD 579
	APPROVED BY:	DATE:
200 300	PROJECT NO: C.I.P. NO: H.A.S. NO:	DB
T)	N/ SHEET NO: E1.	.12





	HOLINTON AIR	RORT SVSTEM
	WILLIAM P. HO	BBY AIRPORT TEXAS
	JACOB ENGINEE JACOBS ENGINEE HOUSTON, T +1:83:3 WWW.JAC TEXAS P.E. I NO. DESCRIPTION	DBSS RING GROUP INC. DALE ROAD EXAS 7707 51-6000 068.COM IRM F-2966
	NON-STANDARD TAXIWAYS PROJECT RUNWAY 17-35 DEMOLITION	AIRFIELD ELECTRICAL PHASING PLAN - PHASE 9
	PROJECT MGR: DESIGNER: DRAWN BY: CHECKED BY: SCALE: DATE:	RGS NBD KWA JAM AS SHOWN JANUARY 24, 2020
	JAMES A.	MCDONALD 579 601-224.200
z	APPROVED BY: HOUSTON AIR PROJECT NO: 77 C.I.P. NO:	
0 100 200 300 (IN FEET)	H.A.S. NO: H.A.S. NO: N/ SHEET NO: E1	.13



ELECTRICAL DEMOLITION NOTES

- CONTRACTOR TO CONFIRM CIRCUIT ROUTING PRIOR TO DEMOLITION. PROVIDE TEMPORARY CABLE JUMPERS AS REQUIRED TO MAINTAIN CIRCUIT INTEGRITY
- 2. ALL DEMOLITION OF RUNWAY, TAXIWAY AND GUIDANCE SIGNS SHALL INCLUDE REMOVAL OF LIGHT BASES, CABLE AND CONDUIT. CONTRACTOR SHALL COLLECT ALL ELEVATED AND IN-PAVEMENT LIGHTS, RGL CONTROL UNITS AND SIGN PANELS WHEN REMOVED. HAS SHALL SELECT EQUIPMENT TO BE TURNED OVER TO THE AIRPORT FOR STORAGE. CONTRACTOR TO DISPOSE OF ALL REMOVED EQUIPMENT NOT TURNED OVER TO AIRPORT FOR STORAGE.
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- 10. SEE SHEET E1.00 FOR AIRFIELD ELECTRICAL DEMOLITION LEGEND.





O. DESCRIPTION DATE

DEMOLITION PLAN 6) **PROJE(** -STANDARD TAXIWAYS PRO. RUNWAY 17-35 DEMOLITION ELECTRICAL [(1 OF 6 **AIRFIELD** NON

PROJECT MGR:	RGS
DESIGNER:	NBD
DRAWN BY:	KWA
CHECKED BY:	JAM
SCALE:	AS SHOWN
DATE:	JANUARY 24, 2020



PROJECT NO:
770B
C.I.P. NO:
N/A
H.A.S. NO:
N/A
SHEET NO:
E2.01


ELECTRICAL DEMOLITION NOTES 1. CONTRACTOR TO CONFIRM CIRCUIT ROUTING PRIOR TO DEMOLITION. PROVIDE TEMPORARY CABLE JUMPERS AS REQUIRED TO MAINTAIN CIRCUIT INTEGRITY.

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DIRECTOR HOUSTON AIRPORT SYSTEM
PROJECT NO:
770B
C.I.P. NO:
N/A
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E2.02





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DIRECTOR HOUSTON AIRPORT SYSTEM
PROJECT NO:
770B
C.I.P. NO:
N/A
H.A.S. NO:
N/A
SHEET NO:
E2.06







AIRFIELD ELECTRICAL NOTES

- 1. EXISTING AIRFIELD HAS A MIXTURE OF LED AND QUARTZ EDGE LIGHTS. ALL AFFECTED PROJECT AREAS HAVE QUARTZ EDGE LIGHTS. CONTRACTOR TO PROVIDE QUARTZ LAMPS TO PROJECT AREAS REQUIRING EDGE LIGHTS. ELEVATED LIGHT FIXTURES ARE TO BE A HEIGHT OF 14".
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- 7. SEE SHEET E1.00 FOR AIRFIELD ELECTRICAL LEGEND.
- 8. SEE SHEET E3.07 FOR REPANELING SIGN TABLE.
- 9. CONTRACTOR SHALL ENLIST MANUFACTURERS OF EXISTING AIRFIELD LIGHTING CONTROL AND MONITORING SYSTEM (ALCMS) TO PERFORM GRAPHICAL CHANGES AS REQUIRED. SEE SPECIFICATIONS FOR DETAILS.



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PROJECT MGR:	RGS
DESIGNER:	NBD
DRAWN BY:	KWA
CHECKED BY:	JAM
SCALE:	AS SHOWN
DATE:	JANUARY 24, 2020





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PROJECT MGF DESIGNER: NBD DRAWN BY KWA CHECKED BY: JAM SCALE: AS SHOWN JANUARY 24, 2020 DATE:





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CONCRETE NOTE: CONCRETE FOR BACKFILL, SIGN PADS AND BASE CANS IN THE RUNWAY/TAXIWAY SAFETY AREAS, IN EXISTING PAVEMENT OR IN AREAS OTHERWISE INDICATED IN THE DETAILS AND DRAWINGS SHALL CONFORM TO THE REQUIREMENTS OF FAA SPECIFICATION P-610. A CONCRETE MIX DESIGN SHALL BE SUBMITTED AND APPROVED BEFORE COMMENCEMENT OF WORK.



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NON-STANDARD TAXIWAYS PROJECT RUNWAY 17-35 DEMOLITION	AIRFIELD ELECTRICAL DETAILS
PROJECT MGR: DESIGNER: DRAWN BY: CHECKED BY: SCALE: DATE:	RGS NBD KWA JAM AS SHOWN JANUARY 24, 2020

JANES A MCDONALD 119579
APPROVED BY: DATE:
DIRECTOR
HOUSTON AIRPORT SYSTEM
PROJECT NO:
770B
C.I.P. NO:
N/A
H.A.S. NO:
N/A
SHEET NO:
E3.08



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Runway 17-35 Demolition

Houston Airport System

Construction Safety and Phasing Plan

August 23, 2019

Project No. 770





Runway 17-35 Demolition

Project No:	WFXP5000
Document Title:	Construction Safety and Phasing Plan
Revision:	1
Date:	August 23, 2019
Client Name:	Houston Airport System
Client No:	Project No. 770
Project Manager:	Tex Schmidt
Author:	Jarrod Parker
File Name:	H:\Job\WFXP5000 - HOU Non-Standard Taxiway\800 DELIVERABLES\850 Report\95 Percent Submittal\CSPP\001_Non-Standard Taxiways - Overall CSPP - 95 Percent R1.docx

Jacobs Engineering Group Inc.

777 Main Street Fort Worth, Texas 76102 United States T +1.817.735.6000 F +1.817.735.6148 www.jacobs.com

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Revision	Date	Description	Ву	Review	Approved
0	7/18/2019	65% Design Review	Jarrod Parker	Tex Schmidt	Jeff Toner
1	8/23/2019	95% Design Submittal	Jarrod Parker	Tex Schmidt	Jeff Toner
2	11/19/2019	Incorporated SRA Comments	Tex Schmidt	Jarrod Parker	Jeff Toner
3	1/10/2020	Incorporated comments from Johnathan Limb	Tex Schmidt	Jarrod Parker	Jeff Toner

Document history and status



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- Appendix B. 2015 Airport Layout Plan
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- Appendix D. CSPP Drawings
- Appendix E. Safety and Security Notes
- Appendix F. Houston Airport System, Tenant Violations Offenses, Charging Instrument, Due Process Provisions29



The purpose of this report is to provide design information related to the Runway 17-35 Demolition project at the William P. Hobby Airport in Houston, Texas. Elements of the design and information contained in this report rely upon information provided by the Houston Airport System (HAS):

- AutoCAD background files provided by the HAS Airport Spatial Information System (ASIS), consisting of planimetric and subsurface utility information; and
- Houston Airport System Asset Condition Assessment, Volume III, William P. Hobby Airport Airside Pavements Final Report, prepared by Applied Pavement Technology, Inc, June 2014.

Any warranty/guarantee (expressed or implied) to the data, observations and findings in the report is excluded to the extent permitted by law. This report must be read in its entirety, and excerpts are not representative of the findings. The report has been prepared exclusively for the Houston Airport System and no liability is accepted for any use or reliance on the report by third parties.



Executive Summary

Project Description

An FAA national safety initiative known as the Runway Incursion Mitigation (RIM) program has identified airport risk factors that might contribute to runway incursions at the William P. Hobby Airport in Houston, Texas (HOU). Runway incursions occur when an aircraft, vehicle, or person enters the protected area of an airport designated for aircraft landings and take offs. Risk factors that contribute to runway incursions may include unclear taxiway markings, airport signage, and more complex issues such as the runway or taxiway layout. Through RIM, the FAA is focusing on reducing runway incursions by addressing risks at specific locations at airports that have a history of runway incursions.

The Overall Development Objective (ODO) of this project is to eliminate certain areas of non-standard geometry currently existing on the William P. Hobby Airport (HOU) that have been designated by the FAA's RIM program as "Hot Spots". A hot spot is defined by the FAA as a location on an airport movement area with a history of potential risk of collision or runway incursion, and where heightened attention by pilots and drivers is necessary. Airfield geometry has been identified as a primary contributing factor for runway incursions.

The Houston Airport System (HAS) and the Federal Aviation Administration (FAA) explored a variety of alternatives to improve airfield geometry at HOU and selected Alternative 6B as the preferred alternative.

Drawings of Alternative 6B are included in Appendix A, and include the following changes:

- Closure and removal of Runway 17-35;
- Realignment of Taxiways D, E, G, and K1;
- Removal of a portion of Taxiway M; and
- Closure and removal of segments of Taxiway G

This document addresses the first element of the ODO to be undertaken by HAS, the demolition of Runway 17-35. Subsequent elements will be addressed at a later date.

The Demolition of Runway 17-35 will include:

- 1. Demolition of the Runway 17-35 pavement, including blast pads;
- 2. Removal of existing Runway 17-35 edge lights and exit signs;
- 3. Removal of existing Runway 17-35 holding position markings, enhanced centerline marking, holding position sign, and Surface Painted Holding Position Signs (SPHPS) on all taxiway intersections with Runway 17-35 (Taxiways D, E, F, G2, G3, H, and K;
- 4. Remove existing holding position signs at intersections with Runway 13R-31L and Runway 4-22;
- 5. Remove existing Runway 17 VASIs and REILs;
- 6. Demolition of Taxiway D:
 - a. Pavement, between Taxiway M and Runway 17-35;
 - b. Taxiway edge lights between Taxiway M and Runway 17-35;
 - c. Reconfiguration of edge lights at Taxiway D intersection with Taxiway M;
- Installation of new medium intensity taxiway edge lights on Taxiway E, between the Runway 17-35 holding position markings and Runway 13;



- 8. Install new holding position markings, enhanced centerline markings, airfield signs, and Surface Painted Holding Position Signs (SPHPS) on Taxiway E, at the Runway 13L intersection;
- 9. Reconfigure taxiway edge lights, markings, and centerline markings on Taxiway F, between the Runway 17-35 holding position markings;
- 10. Demolition of Taxiways G1, G2, &G3 and remove edge lights and signs;
- 11. Removal of existing Runway Guard Lights on Taxiway H;
- 12. Reconfiguration of the Taxiway H edge lights;
- 13. Reconfiguration of Taxiway K1 edge lights;
- 14. Removal of Runway 17-35 Holding Position Signs and SPHPS on Taxiway K1;
- 15. Backfill of the removed pavement structure; and
- 16. Restoration (turfing) of all disturbed areas.

Construction Safety Phasing Plan

This Construction Safety and Phasing Plan (CSPP) was developed in accordance with Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5370-2G, *Operational Safety on Airports During Construction* for the Non-Standard Taxiways Project at William P. Hobby Airport (HOU). This AC also includes an outline for the Safety Plan Compliance Document (SPCD) to be completed by the contractor awarded the construction of this project.

Aviation safety is the primary consideration at airports, especially during construction. The airport operator's CSPP and the contractor's Safety Plan Compliance Document (SPCD) are the primary tools to ensure safety compliance when coordinating construction activities with airport operations. These documents identify all aspects of the construction project that pose a potential safety hazard to airport operations and outline respective mitigation procedures for each hazard. They must provide information necessary for the Airport Operations department to conduct airfield inspections and expeditiously identify and correct unsafe conditions during construction. All aviation safety provisions included within the project drawings, contract specifications, and other related documents must also be reflected in the CSPP and SPCD.

Safety Plan Compliance Document Requirements

The Contractor shall submit to the Owner's Representative in writing a detailed Safety Plan Compliance Document (SPCD) for the CSPP in accordance with AC 150/5370-2G. The SPCD shall include, but not be limited to, installation sequence of traffic control items, fence and gate installation, haul routes within the work zone, staging, storage and stockpile areas, pavement demolition and placement, electrical connectivity, NAVAIDs commissioning and decommissioning, lockout/tagout procedures, Foreign Object Debris (FOD) management plan, inclement weather management plans (i.e. tropical storm, hurricane, etc.) and activities associated with planned runway and taxiway closures. The SPCD shall be submitted at least 14 calendar days prior to the start of construction. No work may commence until the phase work plan is approved. The SPCD shall also contain the following:

1. A plan, by construction element and phase, for controlling construction equipment, personnel and vehicular movements in the AOA. The plan must include material haul roads. The plan shall detail the general requirements contained in the CSPP.

a. The Contractor shall provide a responsible safety coordinator whose duty shall be to direct all construction traffic near active runways, taxiways, aprons, haul roads, and highways. Paved surfaces shall always be kept clean and specifically must be kept free from all debris



that might damage aircraft. The Contractor shall ensure all traffic control and warning devices are properly placed, maintained and operational daily.

2. The SPCD shall discuss in detail any deviations or topics that require additional detail in the CSPP. Should the SPCD include substantive changes to the CSPP requested by the Contractor, the SPCD must be submitted 45 days prior to the start of work for the Airport to obtain approval of such changes from the FAA.

The SPCD should be written to match the format of the CSPP without duplicating information in the CSPP and should include all the supplemental information that could not be included in the CSPP prior to award of the construction contract. Additionally, the SPCD should include a general statement from the Contractor indicating they have read and will abide by the CSPP – the Contractor's statement shall include the name of the Contractor, title of the project, CSPP approval date, and any reference to supplemental information. For example:

I, <Name of Contractor's Contract Signee/Company Name>, have read the Non-Standard Taxiways Project CSPP, approved on <Date>, and will abide by it as written and with the following additions as noted: <Insert Supplemental Information>.

Communications Plan

The organizational chart on the following page outlines the primary points of contacts and expected flow of communication required throughout the execution of the project, CSPP and SPCD to ensure safe and efficient operations, coordination of construction activities, planned airfield closures and NAVAID outages.







1. Coordination (Section 2.5)

- a. Meetings Before and During Project
 - i. **Pre-Construction Meeting.** Prior to the start of any operation on the airfield, a pre-construction conference will be held. The purpose of the meeting is to review the work sequence schedule and safety, operational phasing, quality control/quality acceptance, and security procedures. Attendees will include the airport management and operations, program manager, project manager, engineer, and all contractor supervisory personnel. A basic outline of topics to be covered at this meeting include:
 - 1. Project Overview
 - 2. Roles and Responsibilities
 - 3. Communications Plan
 - 4. Airport Security and Badging
 - 5. Construction Safety Phasing Plan
 - 6. Safety Plan Compliance Document
 - 7. Construction CPM Baseline Schedule
 - 8. Construction Management and Quality Control Plan
 - 9. RFIs, Submittals / Shop Drawings, Field Orders
 - 10. Labor Requirements
 - 11. Civil Rights Requirement
 - 12. Submittal of Payment Requests
 - ii. **Construction Progress Meetings.** Construction Progress Meetings will be held on a weekly basis to address the following items:
 - 1. Operational Safety and Security
 - 2. NAVAIDs / FAA Facilities
 - 3. NOTAMs
 - 4. Quality Control / Quality Assurance
 - 5. Construction Progress / Schedule / 3-week lookahead
 - 6. Construction Issues
 - 7. Administrative Issues
- b. **Scope or Schedule Changes.** Changes in the scope or schedule of the project may necessitate revisions to the construction safety phasing plan (CSPP). Revisions to the CSPP may require review and approval by the airport, engineer, and/or FAA.
- c. Provisions for FAA Air Traffic Organization (ATO) Coordination. Coordination with the FAA ATO will be directed through the HAS Project Manager. Coordination will be made when scheduling airway facility shutdowns and/or restarts. The contractor shall coordinate with the HAS Project Manager regarding specific requirements related to shutdowns and/or restarts.



2. Phasing (Section 2.6)

- a. Phase 1. Work will include:
 - i. Placement of low-profile barricades as indicated on the drawings.
 - ii. Demolition of Taxiway G1, G2, and G3 pavement.
 - iii. Removal of pavement markings as indicated on the drawings.
 - iv. Application of seal coat and pavement markings.
 - v. Placement of fill material.
 - vi. Placement of topsoil and sod on all disturbed areas.
 - vii. Watering and maintenance of sod until established.
 - viii. All other work within the phase limits.
- b. Phase 2. Work will include:
 - i. Painting runway closure markings over the runway numerals of Runway 17-35.
 - ii. Placement of low-profile barricades at all intersections of Runway 17-35 as indicated on the drawings.
 - iii. Demolition of Runway 17 blast pad pavement.
 - iv. Demolition of Runway 17-35 pavement within the Taxiway E Object Free Area.
 - v. Removal of Runway 17-35 holding position signs and markings.
 - vi. Removal of runway and taxiway edge lights as indicated in the drawings.
 - vii. Removal and application of pavement markings as indicated in the drawings.
 - viii. Placement of fill material.
 - ix. Placement of topsoil and sod on all disturbed areas.
 - x. Watering and maintenance of sod until established.
 - xi. All other work within the phase limits.
- c. Phase 3. Work will include:
 - i. Demolition of Taxiway D pavement between Taxiway M and Runway 17-35.
 - ii. Demolition of Runway 17-35 pavement outside of Runway 13R-31L runway safety area.
 - iii. Removal of Runway 17-35 holding position signs and markings.
 - iv. Removal of runway and taxiway edge lights as indicated in the drawings.
 - v. Removal of Runway 17 VASI (north projectors)
 - vi. Removal and application of pavement markings as indicated in the drawings.
 - vii. Placement of fill material.
 - viii. Placement of topsoil and sod on all disturbed areas.
 - ix. Watering and maintenance of sod until established.
 - x. All other work within the phase limits.
- d. Phase 4. Work will include:
 - i. Demolition of Runway 17-35 pavement within Runway 13R-31L runway safety area.
 - ii. Removal of runway and taxiway edge light as indicated in the drawings.
 - iii. Removal of Runway 17 VASI (south projectors)
 - iv. Removal and application of pavement markings as indicated in the drawings.
 - v. Placement of fill material.
 - vi. Placement of topsoil and sod on all disturbed areas.
 - vii. Watering and maintenance of sod until established.
 - viii. All other work within the phase limits.



- e. **Phase 5**. Work will include:
 - i. Demolition of Runway 17-35 Pavement between Runway 13R-31L Runway Safety Area and Taxiway F Object Free Area.
 - ii. Demolition of closed taxiway pavement between Taxiway G and Runway 17-35
 - iii. Removal of runway and taxiway edge light as indicated in the drawings.
 - iv. Removal of pavement markings as indicated in the drawings.
 - v. Placement of fill material.
 - vi. Placement of topsoil and sod on all disturbed areas.
 - vii. Watering and maintenance of sod until established.
 - viii. All other work within the phase limits.
- f. **Phase 6.** Work will include:
 - i. Demolition of Runway 17-35 pavement within the Taxiway F Object Free Area.
 - ii. Demolition of Runway 17-35 pavement between Taxiway F Object Free Area and Taxiway H Object Free Area.
 - iii. Demolition of Taxiway G2 pavement.
 - iv. Removal of Runway 17-35 holding position signs and markings.
 - v. Removal of runway and taxiway edge light as indicated in the drawings.
 - vi. Removal of pavement markings as indicated in the drawings.
 - vii. Application of seal coat and pavement markings.
 - viii. Placement of fill material.
 - ix. Placement of topsoil and sod on all disturbed areas.
 - x. Watering and maintenance of sod until established.
 - xi. All other work within the phase limits.
- g. Phase 7. Work will include:
 - i. Demolition of Runway 17-35 pavement with Taxiway H Object Free Area.
 - ii. Demolition of Runway 17-35 pavement between Taxiway H Object Free Area and Runway 4-22 safety area.
 - iii. Demolition of Taxiway G3.
 - iv. Removal of Runway 17-35 holding position signs and markings.
 - v. Removal of runway and taxiway edge light as indicated in the drawings.
 - vi. Removal of runway guard lights at Runway 17-35 holding positions
 - vii. Removal of pavement markings as indicated in the drawings.
 - viii. Application of seal coat and pavement markings.
 - ix. Placement of fill material.
 - x. Placement of topsoil and sod on all disturbed areas.
 - xi. Watering and maintenance of sod until established.
 - xii. All other work within the phase limits.
- h. Phase 8. Work will include:
 - i. Demolition of Runway 17-35 pavement within the Runway 4-22 safety area.
 - ii. Removal of Runway 17-35 holding position signs and markings.
 - iii. Removal of runway and taxiway edge light as indicated in the drawings.
 - iv. Removal and application of pavement markings as indicated in the drawings.
 - v. Placement of fill material.
 - vi. Placement of topsoil and sod on all disturbed areas.
 - vii. Watering and maintenance of sod until established.



- viii. Removal of RW 35 PAPI projectors.
- ix. All other work within the phase limits.
- i. **Phase 9.** Work will include:
 - i. Demolition of Runway 17-35 pavement between Runway 4-22 safety area and Taxiways K and G.
 - ii. Demolition of Runway 35 blast pad pavement.
 - iii. Removal of Runway 17-35 holding position signs and markings.
 - iv. Removal of runway and taxiway edge light as indicated in the drawings.
 - v. Removal of Runway 35 REILs.
 - vi. Removal and application of pavement markings as indicated in the drawings.
 - vii. Placement of fill material.
 - viii. Placement of topsoil and sod on all disturbed areas.
 - ix. Watering and maintenance of sod until established.
 - x. All other work within the phase limits.

Phase	Duration	Closure			
1	21 Calendar	Work Hours:			
	Days	No restrictions			
		Closures:			
		 Taxiway F between Runway 17-35 and Taxiway G, as indicated. Contractor shall coordinate activities 72 hours in advance through the HAS Project Manager with Airport Operations prior to entering the Air Operations Area (AOA). Contractor shall always monitor ATCT radio communication during construction activities. Access to site shall be via Gate W10. Contractor shall utilize the airfield service road from Gate W10. 			
		NAVAIDs Impacted:			
		None			
2	14 Calendar	Work Hours:			
	Days	No restrictions			
		Closures:			
		 Runway 17-35 (Permanently) Runway 13L-31R Taxiway E between the de-icing apron and Runway 13R. Contractor shall coordinate activities 72 hours in advance through the HAS Project Manager with Airport Operations prior to entering the Air Operations Area (AOA). Contractor shall always monitor ATCT radio communication during construction activities. Access to site shall be via Gate N35. Contractor shall utilize the 			

Table 1 - Areas Affected by Construction Activity



Phase	Duration	Closure		
		airfield service road from Gate N35 and Taxiway E.		
		NAVAIDs Impacted:		
		None		
3	21 Calendar	Work Hours:		
	Days	No restrictions		
		Closures:		
		 Runway 17-35 (Permanently) Taxiway D between Runway 13L-31R and Runway 13R-31L. Taxiway M between Taxiway M1 and Taxiway E Contractor shall coordinate activities 72 hours in advance through the HAS Project Manager with Airport Operations prior to entering the Air Operations Area (AOA). Contractor shall always monitor ATCT radio communication during construction activities. Access to site shall be via Gate N35. Contractor shall utilize the airfield service road from Gate N35 and Taxiway D. All vehicles will require escorts between the work area and Gate N35 		
		NAVAIDs Impacted:		
		None		
4	10 Calendar	Work Hours:		
	Days	24-hours per day until completed		
		Seasonal Restriction:		
		 Availability subject to restriction of FAA NAVAIDs moratorium during Thanksgiving, Christmas, and New Year's day holidays. 		
		Closures:		
		 Runway 17-35 (Permanently) Runway 13R-31L Taxiway F, Taxiway M1, Taxiway M3 and Taxiway Q Contractor shall coordinate activities 72 hours in advance through the HAS Project Manager with Airport Operations prior to entering the Air Operations Area (AOA). Contractor shall always monitor ATCT radio communication during construction activities. Access to site shall be via Gate W10. Contractor shall utilize the airfield service road from Gate W10. Flaggers will direct traffic across Taxiway G 		
		NAVAIDs Impacted:		
		Runway 13R ILS out of serviceRunway 31L ILS out of service		



Phase	Duration	Closure			
5	14 Calendar	Work Hours:			
	Days	No restrictions			
		Seasonal Restriction:			
		 Availability subject to restriction of FAA NAVAIDs moratorium during Thanksgiving, Christmas, and New Year's day holidays. 			
		Closures:			
		 Runway 17-35 (Permanently) Contractor shall coordinate activities 72 hours in advance through the HAS Project Manager with Airport Operations prior to entering the Air Operations Area (AOA). Contractor shall always monitor ATCT radio communication during construction activities. Access to site shall be via Gate W10. Contractor shall utilize the airfield service road from Gate W10. Flaggers will direct traffic across Taxiway G 			
		NAVAIDs Impacted:			
		Runway 13R Glideslope out of service			
6	56 Calendar	Work Hours:			
	Days	No restrictions			
		Seasonal Restriction:			
		 Availability subject to restriction of FAA NAVAIDs moratorium during Thanksgiving, Christmas, and New Year's day holidays. 			
		Closures:			
		 Runway 17-35 (Permanently) Taxiway F Contractor shall coordinate activities 72 hours in advance through the HAS Project Manager with Airport Operations prior to entering the Air Operations Area (AOA). Contractor shall always monitor ATCT radio communication during construction activities. Access to site shall be via Gate W10. Contractor shall utilize the airfield service road from Gate W10. Flaggers will direct traffic across Taxiway G 			
		NAVAIDs Impacted:			
		Runway 13R Glideslope out of service.			
7	42 Calendar Davs	Work Hours:			
	Dayo	No restrictions			
		Seasonal Restriction:			
		Area not available October 1 through April 30			



Phase	Duration	Closure		
		 Closures: Runway 17-35 (Permanently) Taxiway H between Runway 13R-31L and Taxiway G Taxiway H2 Taxiway G at Taxiway H Contractor shall coordinate activities 72 hours in advance through the HAS Project Manager with Airport Operations prior to entering the Air Operations Area (AOA). Contractor shall always monitor ATCT radio communication during construction activities. Access to site shall be via Gate W80. Contractor shall utilize the airfield service road from Gate W80. Flaggers will direct traffic across entrance taxiway to FBO. 		
		NAVAIDs Impacted:None		
8	14 Calendar Days	 Work Hours: 24-hours per day until completed Seasonal Restriction: Area not available October 1 through April 30 Closures: Runway 17-35 (Permanently) Runway 4-22 Taxiway K1 Taxiway G, south of Taxiway H Contractor shall coordinate activities 72 hours in advance through the HAS Project Manager with Airport Operations prior to entering the Air Operations Area (AOA). Contractor shall always monitor ATCT radio communication during construction activities. Access to site shall be via Gate W80. Contractor shall utilize the airfield service road from Gate W80, Taxiway K, and Taxiway K1. Flaggers K. NAVAIDs Impacted: Runway 4 ILS out of service Runway 22 ILS out of service 		
9	42 Calendar Days	 Work Hours: No restrictions Seasonal Restriction: Area not available October 1 through April 30 Closures: 		



Phase	Duration	Closure		
		 Runway 17-35 (Permanently) Taxiway K closed between Taxiway K1 and Runway 17. Taxiway G closed between Runway 4 and Runway 35 Contractor shall coordinate activities 72 hours in advance through the HAS Project Manager with Airport Operations prior to entering the Air Operations Area (AOA). Contractor shall always monitor ATCT radio communication during construction activities. Access to site shall be via Gate W80. Contractor shall utilize the airfield service road from Gate W80, Taxiway K. Flaggers are not required. 		
		NAVAIDs Impacted:		
		Runway 22 Glideslope out of service.		

- a. Mitigation of effects Lighted runway closure "X" markers, lighted low-profile barricades, taxiway closure markers, guidance sign covers, PVC edge light masks (daily / nightly closures) and temporary circuit jumpers (prolonged / continuous closures) will be utilized to notify users of runway and taxiway closures, as shown, or as required by Airport Operations. NOTAMs will be put in place for all closures and shall be coordinated 72 hours in advance with HAS Project Manager, Airport Operations and ATCT.
- b. Taxiway Safety Areas (TSA) and Object Free Areas (TOFA). Contractor shall not enter the TSA or TOFA of any active taxiway without prior coordination with the HAS Project Manager, Airport Operations staff and ATCT. The TSA and TOFA dimensions for taxiways are shown on the plan sheets and in the Table 2 below.
- c. Runway Safety Areas (RSA) and Runway Object Free Areas (ROFA). Contractor shall not enter the RSA of any active runway without prior coordination with the HAS Project Manager, under escort by Airport Operations staff and prior coordination with ATCT. The RSA dimensions for the Runways are shown on the plan sheets and in Table 3 below.

Taxiway	Airplane Design Group	TSA Width	TOFA Width
D	ADG-III	118 feet	186 feet
E	ADG-III	118 feet	186 feet
F	ADG-III	118 feet	186 feet
G	ADG-III	118 feet 186 feet	

able 2: Taxiv	vay Safety	and Obje	ect Free Areas
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Taxiway	Airplane Design Group	TSA Width	TOFA Width	
G2	ADG-III	118 feet	186 feet	
G3	ADG-III	118 feet	186 feet	
Н	ADG-III	118 feet	186 feet	
К	ADG-III	118 feet	186 feet	
М	ADG-III	118 feet	186 feet	
M1	ADG-III	118 feet	186 feet	

Table 3: Runway Safety and Object Free Areas

Runway	Aircraft Approach Category and Airplane Design Group	RSA Width	ROFA Width
13R-31L	C-111	500 feet	800 feet
13L-31R	B-II	150 feet	500 feet
17-35	B-II	150 feet	500 feet
4-22	C-III	500 feet	800 feet

3. Navigation Aid Protection (Section 2.8)

- a. The Contractor shall protect taxiway and runway edge lighting and guidance signs during construction and hauling activities.
- b. The project will result in the decommissioning and removal of VASIs, PAPIs, and REILs for Runway 17-35.
- c. Phase 4 will require Runway 13R ILS and Runway 31L ILS to be taken out of service. Contractor shall coordinate a minimum of 72 hours in advance with HAS Project Manager, Airport Operations, ATCT and FAA.



- d. Phase 5 will require Runway 13R Glideslope to be taken out of service. Contractor shall coordinate a minimum of 72 hours in advance with HAS Project Manager, Airport Operations, ATCT and FAA.
- e. Phase 6 will require Runway 13R Glideslope to be taken out of service. Contractor shall coordinate a minimum of 72 hours in advance with HAS Project Manager, Airport Operations, ATCT and FAA.
- f. Phase 8 will require Runway 4 ILS and Runway 22 ILS to be taken out of service. Contractor shall coordinate a minimum of 72 hours in advance with HAS Project Manager, Airport Operations, ATCT and FAA.

4. Contractor Access (Section 2.9)

- a. There are three (3) access gates called out on the plan sheets. The Contractor shall utilize all three (3) gates to limit crossing active pavements to minimize interference with aircraft operations. Gate W10 shall be utilized for Phases 1, 4, 5, and 6. Gate N35 shall be utilized for Phases 2 and 3. Gate W80 shall be utilized for Phases 7, 8, and 9. No other access gates shall be permitted for accessing the project site.
- b. The contractor shall always keep all gates locked or guarded, except for the brief period required for passage of authorized vehicles and equipment. The contractor must implement procedures in their SPCD to ensure that only authorized personnel and vehicles have access to the AOA and to prohibit "piggybacking" behind authorized vehicles.
- c. The contractor shall supply aviation band radios, set to a predetermined frequency, for all vehicles and equipment and to each flagman, and supervisory individual so that they may monitor ATCT and Airport Operations instructions. All communications with ATCT shall be through the designated airport operations escort.
 - i. The contractor shall monitor the common traffic advisory frequency
 - ii. Portable hand-held radios shall be provided to any employees that may be operating outside of their vehicles or equipment.
 - iii. The contractor shall be responsible for maintaining all radios at all time for the duration of the project.
- d. Location of Stockpiles Construction Material.
 - i. The Contractor shall not utilize more than one staging area at one time unless otherwise approved by the HAS Project Manager in advance of construction.
 - ii. Stockpiles will be allowed in the contractor's dedicated stockpile area.
 - iii. Stockpiles must be a minimum of 500 feet from the runway centerline, 160 feet from the taxiway centerline, and 30 feet from existing security fencing, edge lights and services road edge of pavements.



- iv. Stockpiles must be prominently marked and lighted during hours of restricted visibility or darkness.
- v. Stockpile heights shall be restricted to 3 feet within the AOA and 15 feet outside the AOA. Any stockpiles more than these heights shall require submission and approval of a 7460.
- vi. Stockpile materials that becomes a wildlife attractant or a FOD hazard shall be removed or relocated to a location acceptable to the HAS Project Manager and Airport Operations and in accordance with the Contractor's FOD Management Plan.
- e. Vehicle and Pedestrian Operations
 - i. All personnel and contractor vehicles shall remain within the construction area, along the designated haul route, or within the limits of the staging, storage and stockpile areas.
 - ii. All vehicles shall be identified with a flashing/rotating amber light, 3-foot by 3-foot square flag with 1-foot square orange and white checkered board pattern, and with company logos on both sides of the vehicle. Company logos shall be visible at a maximum distance of 200 feet. Flashing / rotating amber lights shall be in operation during night operations, inclement weather and low-visibility conditions.
 - iii. All construction site personnel shall always wear high visibility warning garments when working in the project area. Safety garments / vests shall be a minimum of Class II.
 - iv. Access to the job site shall be through the designated security gates and haul routes as shown on the plans.
 - v. No vehicle shall be within the AOA unless identified as described herein, is monitoring appropriate radio frequency, and under the escort of a designated airport operations escort in communication with ATCT.
 - vi. All construction vehicles shall be thoroughly inspected prior to entering the AOA and movement areas including safety checks of lights, horns, beacons, flags, and logos as well as checking tires, tail gates, etc. from loose debris, dirt, etc. in accordance with the contractors FOD management plan.
 - vii. It is the intent of the construction drawings to minimize interference to aircraft movement. In active portions of the AOA, the aircraft shall have the right-of-way.
 - viii. During the performance of this project, the airport runways, taxiways, taxilanes, and aircraft parking aprons shall remain in use by aircraft to the maximum extent possible. Contractor's work site shall be controlled to minimize disturbance to the airport operations. Aircraft shall always have the right of way over construction traffic.
 - ix. Construction equipment and vehicles shall not exceed 15 miles per hour within the AOA.
 - x. Contractor, at its own expense, shall repair any damaged pavements to equal or better condition because of the contractor's traffic and construction activities.
- e. Badging and Escort Requirements



- i. All contractor employees, subcontractors, agents, vendors, invitees, etc., requiring access to the construction site shall, in accordance with the airport operations security program, be required to display airport issued identification or be under airport-approved and badged escort personnel. These badges will be identified numerically and issued to individual employees with a permanent record maintained on each individual to whom a badge is issued. In addition, a \$55 non-refundable processing fee will be required for each badge. This fee must be paid before a badge is issued. No badge will be issued to any person until a review of the required paperwork by airport security and all requirements are met. Paperwork shall be submitted a minimum of 24 hours before issuance of a badge. The contractor is responsible for personnel attending training and completing security badge applications, which will include air /ground radio, taxiway, and airport familiarization. Estimated time for completion is two (2) hours.
- ii. Flaggers must be badged and must have successfully completed the airport flagger training instructed by airport operations, in addition to the regular badge and movement training, prior to performing in that capacity on airport property.
- iii. At the completion of the contract all badges will be returned to the airport. A charge of \$50 per badge will be assessed for all unreturned badges. Gate guards and escorts shall be considered under the flagger classification and shall be subject to the same requirements as flaggers.
- iv. All non-radio equipped contractor vehicles that are required to operate on or across active runways, taxiways, aprons, critical NAVAIDs areas, and runway approach and protection zones, shall do so under the direct control of an HOU operations escort vehicle. A maximum of 4 vehicles per escort will be permitted, two HOU operations escorts shall be required for convoys greater than 4 contractor vehicles.
- v. See Appendix D Safety and Security Notes for additional requirements.

5. Wildlife Management (Section 2.10)

- a. **Trash.** All trash shall be removed from the construction site daily. Food scraps shall be disposed of in a closed container.
- b. **Standing Water.** Standing water shall be removed from the construction site within 24 hours.
- c. **Tall Grass.** The Contractor shall be responsible for maintaining the staging area and parking areas free from tall grass.
- d. **Fencing and Gates.** The contractor shall immediately report any damage to gates or fences to the airport. The contractor shall be responsible for repairs to any gates or fences caused by negligence by the contractor.
- e. **Disruption of Wildlife Habitat.** In the event of a wildlife encounter within the AOA, the contractor shall immediately contact airport operations.



6. Foreign Object Debris (Section 2.11)

- a. The contractor shall sweep/vacuum pavements adjacent to work areas and access/haul routes continuously to keep pavement free of loose debris at all times. All closed pavement shall be cleaned to all debris and inspected for FOD prior to opening.
- b. Two fully-functioning vacuum sweepers shall be maintained on site at all times construction operations are under way.

7. Hazardous Material Management (Section 2.12)

- a. Ground Vehicle Fueling. If ground vehicle fueling occurs within the construction area or staging area, fuel tanks shall not be topped off and absorbent material shall be readily available for small spills. Contractor shall provide spill containment resources in accordance with the SPCD and local, state and federal laws. On airport fueling should be done in accordance with HAS regulations/codes, and as approved with coordinated sign off from the local jurisdiction (Fire Marshal).
- b. Fuel spills or leaks shall be cleaned up immediately. Fuel spills on airport property should follow HAS procedures, which requires that the HAS notification and response.
- c. The encounter of hazardous material is not anticipated, but if encountered, the contractor shall notify the HAS Project Manager and Airport Operations immediately of any potentially hazardous material.

8. Notification of Construction Activities (Section 2.13)

a. List of Responsible Representatives. The contractor shall provide a list of all points of contact responsible for project execution. The list shall contain names, telephone numbers, and alternate contacts as required. Please see Table 4 for the list of point of contacts involved during construction. Contractor shall follow the organization flow chart provided in this CSPP, or as amended during construction. All communications shall be directed through the HAS Project Manager.

Organization	Role	Point of Contact	Contact Info.
William P.	HAS Project Manager	Johnathan G.	<u>Johnathan.Limb@houstontx.gov</u>
Hobby Airport		Limb, P.E.	(907) 302-8398

Table 4: Points of Contact



Organization	Role	Point of Contact	Contact Info.
William P. Hobby Airport	HOU Safety Coordinator	Brian Mason	Brian.Mason@houstontx.gov (281) 901-9294
William P. Hobby Airport	HOU Project Mgr. (NOTAMs)	Michael Powers	Michael.Powers@houstontx.gov (281) 901-8724
William P. Hobby Airport	Construction Airspace Coordinator (7460 Notices of Construction)	Juan Pedracova	Juan.Pedracova@houstontx.gov 281-230-8915
William P. Hobby Airport	HOU Airside Operations	Ross Williamson	Ross.Williamson@houstontx.gov (713) 213-7354
William P. Hobby Airport	Ops 2	Ops 2	(713) 410-1978
William P. Hobby Airport	Ops 3	Ops 3	(713) 417-5710
Jacobs Engineering Group, Inc.	Project Manager	Robert "Tex" Schmidt	Tex.Schmidt@jacobs.com (817) 347-7807
Federal Aviation Administration	FAA Program Manager	Rodney Clark	Rodney.Clark@faa.gov 817-222-5659
Federal Aviation Administration	FAA HOU SSC Manager	Darren Clark	Darren.Clark@faa.gov 713-847-1430
Federal Aviation Administration	FAA, ATO Lead Planner, NAS	Moni Jacob	Moni.Jacob@faa.gov

- b. **Notices to Airmen (NOTAMS).** The airport shall initiate NOTAMS related to construction activity as appropriate. The contractor shall coordinate closures a minimum of 72 hours in advance to provide for timely initiation of NOTAMs.
- c. Emergency Notification Procedures. In a life-threatening emergency, the contractor shall call 911 immediately to initiate response. Notification to the HAS Project Manager, Airport Communications Center (ACC 713-845-6555) shall occur immediately after this. All non-life-threatening emergencies shall be reported to ACC to ensure immediate ARFF response.
- d. **Coordination with Aircraft Rescue and Fire Fighting (ARFF).** Contractor shall coordinate any construction activities requiring torching, welding, burning, etc. through the HAS Project Manager for approval by the ARFF Fire Chief.
 - i. Any welding activities on this project shall follow local codes and require a 1-hour


fire watch in accordance with Airport, FAA and ARFF safety rules, regulations and procedures. Any deactivation of water lines or hydrants, rerouting of access routes, or use of hazardous materials on the airfield shall not occur. However, if it does, the activities shall be coordinated through the HAS Project Manager and approved by the airport's ARFF personnel prior to execution of such activities.

- ii. Any affected ARFF emergency routes or alert locations shall be coordinated in advance with HAS Project Manager, Airport Operations and ARFF. Contractor shall always provide a minimum 20-foot space between barricades along an edge of pavement / shoulder closed to aircraft operations in support of maintaining ARFF access to the airfield during construction.
- iii. All construction activities shall be coordinated a minimum of 72 hours in advance of planned work.
- e. Notification to the FAA. The contractor shall ensure, through the HAS Project Manager that an aeronautical study (7460) is performed on all construction activities (stockpiles, equipment, temporary and permanent structures) through the HAS Project Manager and appropriate FAA regional or district officer prior to any construction activities.
 - i. No construction activities shall commence on this project without FAA approval of the CSPP, submission and approval of 7460s, and submission and approval of the Contractor's SPCD.
 - ii. Significant changes to the CSPP during construction may require resubmission of 7460s and revisions to the Contractor's SPCD. Any significant changes to the CSPP will require resubmittal to FAA for approval.

9. Inspection Requirements (Section 2.14)

- a. **Daily Inspections.** The contractor shall conduct daily inspections to ensure conformance with the CSPP. Contractor shall refer to and utilize Appendix D, Construction Project Daily Safety Inspection Checklist, of FAA AC 150/5370-2G included with and attached to this CSPP as Attachment C.
 - i. All personal shall be checked daily for proper identification and airport badges, safety vests, hard hats, foot, ear and eye protection, radio and cellular communication devices.
 - ii. All vehicles shall be checked daily for proper lighting, signage, markings, flagging, and ensure normal operation including working horns, lights, etc. All vehicles shall be inspected in accordance with the contractor's FOD management plan and as described in this CSPP.
 - iii. All barricades shall be checked by the contractor for signs of wear and tear daily and shall be repainted when deemed appropriate by Airport Operations. All barricades shall be water filled and checked daily. The condition of lighting units shall be checked daily. All light fixtures shall be verified in operating condition and good working order by the contractor daily, before the contractor always ceases operations for the day and during construction activities.
 - iv. All barricades shall be moved at least once each week and the contractor shall sweep accumulated debris and remove and dispose of the debris offsite at an



approved disposal facility in accordance with the contractor's FOD management plan. The barricades shall then be replaced at the appropriate location.

- v. All service road, apron, taxiway and runway pavements used for hauling and transporting operations, active or temporarily closed, shall be cleaned continuously, and prior to re-opening closed pavements, by the contractor using approved vacuum trucks.
- vi. In the event of forecasted severe weather, contractor shall inspect all active work areas to ensure that all work, temporary facilities, storage areas, and stockpiles are prepared and secured for high winds and/or flooding. A post event inspection shall be made to assess damage. Contractor will mobilize immediately to remove any debris and/or hazards to aircraft or vehicles.
- b. **Final Inspections.** Closed areas shall be inspected by the contractor and Airport Operations prior to opening to aircraft operation.
 - i. All dust, dirt and debris shall be removed from pavements in accordance with the contractor's FOD management plan. All service road, apron, taxiway and runway pavements used for hauling and transporting operations, active or temporarily closed, shall be cleaned continuously, and prior to re-opening closed pavements, by the contractor using approved vacuum trucks.
 - ii. All taxilane, taxiway and runway safety and Object Free Areas shall be free of debris and excavations in excess of 3-inches and grades more than 5% corrected prior to re-opening any closed pavements.

10. Underground Utilities (Section 2.15)

- a. Underground utilities otherwise not shown on the plans to be removed are not likely to be encountered during construction, however the contractor shall verify and locate all utility lines prior to the start of work.
- b. Any utilities encountered not shown on the plans shall be reported by the contractor to the HAS Project Manager and Airport Operations immediately such that the utility can be identified, logged and filed for later as-built and updates to the airport's utility master plan.
- c. The primary utility owners/operators are:
 - Houston Airport System: Storm drainage, airfield lighting, communications cables
 - City of Houston: Water and wastewater lines
 - FAA: NAVAIDs power, control, and communications cables
 - Shell Pipeline: Underground petroleum pipeline

11. Penalties (Section 2.16)

a. Any monetary penalties assessed due to actions by the contractor personnel will be the responsibility of the contractor.



- b. Penalties for non-compliance with airport safety procedures may include but are not limited to a warning, removal of driving privileges or loss of access to the AOA.
- c. Penalties for violation of the safety plan are summarized in Attachment H Houston Airport System, Tenant Violations – Offenses, Charging Instrument, Due Process Provisions.

12. Special Conditions (Section 2.17)

- a. In the event of an emergency (aircraft accident, security breach, etc.), the contractor shall immediately suspend all construction activities and vacate the construction and staging area as required by the airport.
- b. Work impacting FAA NAVAIDs may not proceed during the period from the Friday before the Thanksgiving Holiday through January 1, due to a national moratorium observed by FAA Technical Operations personnel.

13. Runway and Taxiway Visual Aids (Section 2.18)

- a. **General.** The closure of airfield pavements shall be clearly delineated by low profile barricades to create a barrier between the aircraft and vehicle movement areas and construction areas.
- b. **Lockout/Tagout.** Any electrical work shall be performed in accordance with the contractor's approved logout / tagout procedures provided in the SPCD and shall be coordinated 72 hours in advance with HAS Project Manager, Airport Operations, ATCT and Airport Electrical and Maintenance personnel.
- c. **Markings.** Temporary markings are not anticipated to be required. Any markings removed or damaged because of the Contractors activities shall be restored to their original condition at the expense of the contractor. Any markings required to be obliterated because of planned continuous closures shall be restored in accordance with FAA Specification P-620.
- d. Lighting and Visual NAVAIDS. The Contractor shall protect all runway, taxiway, taxilane, and apron edge lighting and guidance signs, and remain clear of the Glide Slope, ASOS, RTR-A and RTR-D critical areas during construction. The Contractor shall either remove and re-install, provide temporary coverings, or install temporary circuit jumpers and coverings of airfield signage and lighting as shown on the plans within and leading to closed pavements and shall be approved by HAS Project Manager and Airport Operations in advance of construction activities. Temporary circuit jumpers shall be installed in conduit, placed along the barricade lines on the pavement surface and secured, and shall be marked with electrical hazard warning tape.
- e. Signage. Temporary airfield guidance signage, other than construction access and haul



route signage, is not anticipated to be required for this project. Any guidance signs leading to closed pavements shall be de-energized and sign legends covered. Temporary orange construction signs with black lettering reading "CONSTRUCTION AHEAD" will be evaluated on a case-by-case basis by HAS and HOU Airport Operations. Signs will be located outside the taxiway safety limits and ahead of construction areas, so pilots can take timely action. Mandatory signs will take precedence over orange construction signs.

14. Access Routes – Markings and Signage (Section 2.19)

- a. Access to the job site shall be through the designated gates and haul routes as shown the plans.
 - i. A total of three (3) access gates are called out from which the Contractor can enter the airport. Access gates to specific work areas shall be strictly adhered to minimize crossing active airfield pavements.
 - ii. The Contractor may utilize more than one access gate at one time to limit crossing active pavements, minimize interference with aircraft operations, and facilitate construction in accordance with the individual work areas, approved schedule, phasing and sequence of construction operations.
- b. Sufficient barricades shall be placed end-to-end to create a barrier between the aircraft and vehicle movement areas and construction areas. A minimum 12-foot space along the edge of pavement / shoulder shall be provided to maintain ARFF access to the airfield and closed pavement areas.

15. Hazard Marking, Lighting and Signage (Section 2.20 & 2.21)

- a. Areas Impacted by Construction Operations.
 - i. Sufficient low-profile barricades with red flashing lighting shall be installed to delineate the work site. This is intended to prevent aircraft from entering the work site and to prevent construction personnel from entering areas open to aircraft.
 - ii. At a minimum, hazard markings and lighting shall be provided to identify open excavation and stockpiled material.
- b. All vehicles and equipment shall be identified flashing/rotating amber light beacon, 3 foot by 3-foot square flag with 1-foot square orange and white checkered board pattern, and with company logos on both sides of the vehicle. Flashing / rotating amber lights shall be in operation during night operations, inclement weather and low-visibility conditions.
- c. All tall equipment more than 12 feet and cranes shall be equipped with red obstruction lighting, in addition to the orange and white checked flags, and shall require submission and approval of a 7460. All cranes shall be lowered when not in operation.
- d. All construction site personnel shall always wear high visibility warning garments (min. Class II) when working in the project area.



e. Lighting equipment shall be provided to adequately illuminate the work area if the construction is to be performed during nighttime hours. Light towers shall be positioned and adjusted to aim away from ATCT cabs and active runways to prevent blinding effects. Nighttime hours of operation shall be defined as 1 hour before official sunset and 1 hour after official sunrise.

16. Protection Runway and Taxiway Areas, Zones and Surfaces (Section 2.22)

- a. Runway Safety Area (RSA). Work within the RSA of any Runway shall require closure of the runway. Elevated Lighted Runway Closure X's shall be placed at each end of the runway, on top of the runway designations, when the runway is closed to aircraft operations. Low-Profile Barricades and Taxiway Closure Markers shall be placed at the holding position on each taxiway connector that leads to a runway when the taxiway is closed, and the runway is active. No work shall be performed in the RSA when the runway is opened to aircraft operations. No equipment or stockpiles shall be permitted in the RSA when the runway is active and opened to aircraft operations.
- b. Runway Object Free Area (ROFA). The work site shall be delineated by barricades or other means approved by the airport. The contractor personnel shall be limited to the identified work areas. Work activities within the ROFA shall be limited and coordinated 72 hours in advance with HAS Project Manager, Airport Operations and ATCT. No equipment or stockpiles shall be permitted in the ROFA when the runway is active and opened to aircraft operations.
- c. Taxiway Safety Area (TSA). The work site adjacent to the TSA shall be delineated by barricades or other means approved by the airport. The contractor personnel shall be limited to the identified work areas. Work within the TSA shall require closure of the taxiway. No work shall be performed within the TSA when the taxiway is active and opened to aircraft operations. No equipment or stockpiles shall be permitted in the TSA when the taxiway is active and opened to aircraft operations.
- d. Taxiway Object Free Area (TOFA). The work site adjacent to the TOFA shall be delineated by barricades or other means approved by the airport. The contractor personnel shall be limited to the identified work areas. Work activities within the TOFA shall be limited and coordinated 72 hours in advance with Airport Operations and ATCT. No work shall be performed within the TOFA when the taxiway is active and opened to aircraft operations.
- e. **Obstacle Free Zone (OFZ).** The contractor staging areas, haul routes, and work sites are outside the OFZ. Haul routes shall be coordinated in advance with HAS Project Manager, Airport Operations and ATCT. The contractor personnel shall be limited to the identified work areas and shall cross through the OFZ unless under escort by Airport Operations and approval of ATCT. No penetrations of the OFZ shall be permitted when



the runway is active and opened to aircraft operations. In the event construction activities are required within the OFZ, contractor shall coordinate closure of the runway with HAS Project Manager, Airport Operations and ATCT a minimum of 72 hours in advance of planned construction activities.

f. **Approach and Departure Surfaces.** The contractor staging area, haul route, and work site are outside the approach and departure surfaces. No work shall be permitted with the approach or departure surfaces when the runway is active and opened to aircraft operations. No penetrations of the approach and departure surfaces shall be permitted. In the event construction activities are required within the approach / departure surfaces, contractor shall coordinate closure of the runway with HAS Project Manager, Airport Operations and ATCT a minimum of 72 hours in advance of planned construction activities.

17. Other Limitations on Construction (Section 2.23)

- a. Prohibitions
 - i. Construction equipment exceeding a height of 12 feet is prohibited unless a 7460-1 determination letter is issued for a taller equipment and approved by FAA.
 - ii. The use of open flames, torching or welding is not allowed unless approved in advance by ARFF Fire Chief.
 - iii. The use of explosives is not allowed.
 - iv. Work impacting Taxiway H, Runway 4-22, and Taxiway K (Phases 7, 8, and 9) may not occur during the period from October 1 through April 30, due to the persistence of low-visibility conditions requiring utilization of Category III instrument approach procedures on Runway 4 and Surface Movement Guidance Control System (SMGCS) operations on Taxiways K and H.
- b. Restrictions
 - i. All construction operations, hauling, and transporting across active runways shall be under control of a designated airport operations escort. All radio communications with ATCT shall be made by the designated airport operations escort.
 - ii. All construction activities shall be halted in the event weather conditions require SMGCS operations. Construction activity will be permitted to resume at such time weather conditions are favorable for normal airport operations.



Appendix A. Airport Diagram & Project Exhibit



18312



Appendix B. 2015 Airport Layout Plan





Appendix C. FAA AC 150/5370-2G



Advisory Circular

Subject: Operational Safety on Airports During Construction

Date: 12/13/2017 **Initiated By:** AAS-100 AC No: 150/5370-2G Change:

1 **Purpose.**

This AC sets forth guidelines for operational safety on airports during construction.

2 **Cancellation.**

This AC cancels AC 150/5370-2F, *Operational Safety on Airports during Construction*, dated September 29, 2011.

3 Application.

This AC assists airport operators in complying with Title 14 Code of Federal Regulations (CFR) Part 139, *Certification of Airports*. For those certificated airports, this AC provides one way, but not the only way, of meeting those requirements. The use of this AC is mandatory for those airport construction projects receiving funds under the Airport Improvement Program (AIP). See Grant Assurance No. 34, *Policies, Standards, and Specifications*. While we do not require non-certificated airports without grant agreements or airports using Passenger Facility Charge (PFC) Program funds for construction projects to adhere to these guidelines, we recommend that they do so to help these airports maintain operational safety during construction.

4 **Related Documents.**

ACs and Orders referenced in the text of this AC do not include a revision letter, as they refer to the latest version. <u>Appendix A</u> contains a list of reading material on airport construction, design, and potential safety hazards during construction, as well as instructions for obtaining these documents.

5 **Principal Changes.**

The AC incorporates the following principal changes:

1. Notification about impacts to both airport owned and FAA-owned NAVAIDs was added. See paragraph <u>2.13.5.3</u>, NAVAIDs.

- 2. Guidance for the use of orange construction signs was added. See paragraph <u>2.18.4.2</u>, Temporary Signs.
- 3. Open trenches or excavations may be permitted in the taxiway safety area while the taxiway is open to aircraft operations, subject to restrictions. See paragraph <u>2.22.3.4</u>, Excavations.
- 4. Guidance for temporary shortened runways and displaced thresholds has been enhanced. See <u>Figure 2-1</u> and <u>Figure 2-2</u>.
- 5. Figures have been improved and a new <u>Appendix F</u> on the placement of orange construction signs has been added.

Hyperlinks (allowing the reader to access documents located on the internet and to maneuver within this document) are provided throughout this document and are identified with underlined text. When navigating within this document, return to the previously viewed page by pressing the "ALT" and " \leftarrow " keys simultaneously.

Figures in this document are schematic representations and are not to scale.

6 Use of Metrics.

Throughout this AC, U.S. customary units are used followed with "soft" (rounded) conversion to metric units. The U.S. customary units govern.

7 Where to Find this AC.

You can view a list of all ACs at <u>http://www.faa.gov/regulations_policies/advisory_circulars/</u>. You can view the Federal Aviation Regulations at <u>http://www.faa.gov/regulations_policies/faa_regulations/</u>.

8 **Feedback on this AC.**

If you have suggestions for improving this AC, you may use the <u>Advisory Circular</u> <u>Feedback</u> form at the end of this AC.

ohn R. Dermody

Director of Airport Safety and Standards

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CHAPTER 1. PLANNING AN AIRFIELD CONSTRUCTION PROJECT

1.1 **Overview.**

Airports are complex environments, and procedures and conditions associated with construction activities often affect aircraft operations and can jeopardize operational safety. Safety considerations are paramount and may make operational impacts unavoidable. However, careful planning, scheduling, and coordination of construction activities can minimize disruption of normal aircraft operations and avoid situations that compromise the airport's operational safety. The airport operator must understand how construction activities and aircraft operations affect one another to be able to develop an effective plan to complete the project. While the guidance in this AC is primarily used for construction operations, the concepts, methods and procedures described may also enhance the day-to-day airport maintenance operations, such as lighting maintenance and snow removal operations.

1.2 **Plan for Safety.**

Safety, maintaining aircraft operations, and construction costs are all interrelated. Since safety must not be compromised, the airport operator must strike a balance between maintaining aircraft operations and construction costs. This balance will vary widely depending on the operational needs and resources of the airport and will require early coordination with airport users and the FAA. As the project design progresses, the necessary construction locations, activities, and associated costs will be identified and their impact to airport operations must be assessed. Adjustments are made to the proposed construction activities, often by phasing the project, and/or to airport operations to maintain operational safety. This planning effort will ultimately result in a project Construction Safety and Phasing Plan (CSPP). The development of the CSPP takes place through the following five steps:

1.2.1 Identify Affected Areas.

The airport operator must determine the geographic areas on the airport affected by the construction project. Some, such as a runway extension, will be defined by the project. Others may be variable, such as the location of haul routes and material stockpiles.

1.2.2 Describe Current Operations.

Identify the normal airport operations in each affected area for each phase of the project. This becomes the baseline from which the impact on operations by construction activities can be measured. This should include a narrative of the typical users and aircraft operating within the affected areas. It should also include information related to airport operations: the Aircraft Approach Category (AAC) and Airplane Design Group (ADG) of the airplanes that operate on each runway; the ADG and Taxiway Design Group (TDG)¹ for each affected taxiway; designated approach visibility minimums;

¹ Find Taxiway Design Group information in <u>AC 150/5300-13</u>, Airport Design.

available approach and departure procedures; most demanding aircraft; declared distances; available air traffic control services; airport Surface Movement Guidance and Control System (SMGCS) plan; and others. The applicable seasons, days and times for certain operations should also be identified as applicable.

1.2.3 <u>Allow for Temporary Changes to Operations.</u>

To the extent practical, current airport operations should be maintained during the construction. In consultation with airport users, Aircraft Rescue and Fire Fighting (ARFF) personnel, and FAA Air Traffic Organization (ATO) personnel, the airport operator should identify and prioritize the airport's most important operations. The construction activities should be planned, through project phasing if necessary, to safely accommodate these operations. When the construction activities cannot be adjusted to safely maintain current operations, regardless of their importance, then the operations must be revised accordingly. Allowable changes include temporary revisions to approach procedures, restricting certain aircraft to specific runways and taxiways, suspension of certain operations, decreased weights for some aircraft due to shortened runways, and other changes. An example of a table showing temporary operations versus current operations is shown in <u>Appendix E</u>.

1.2.4 <u>Take Required Measures to Revise Operations.</u>

Once the level and type of aircraft operations to be maintained are identified, the airport operator must determine the measures required to safely conduct the planned operations during the construction. These measures will result in associated costs, which can be broadly interpreted to include not only direct construction costs, but also loss of revenue from impacted operations. Analysis of costs may indicate a need to reevaluate allowable changes to operations. As aircraft operations and allowable changes will vary widely among airports, this AC presents general guidance on those subjects.

1.2.5 <u>Manage Safety Risk.</u>

The FAA is committed to incorporating proactive safety risk management (SRM) tools into its decision-making processes. FAA Order 5200.11, *FAA Airports (ARP) Safety Management System (SMS)*, requires the FAA to conduct a Safety Assessment for certain triggering actions. Certain airport projects may require the airport operator to provide a Project Proposal Summary to help the FAA determine whether a Safety Assessment is required prior to FAA approval of the CSPP. The airport operator must coordinate with the appropriate FAA Airports Regional or District Office early in the development of the CSPP to determine the need for a Safety Risk Assessment. If the FAA requires an assessment, the airport operator must at a minimum:

- 1. Notify the appropriate FAA Airports Regional or District Office during the project "scope development" phase of any project requiring a CSPP.
- 2. Provide documents identified by the FAA as necessary to conduct SRM.
- 3. Participate in the SRM process for airport projects.
- 4. Provide a representative to participate on the SRM panel.

5. Ensure that all applicable SRM identified risks elements are recorded and mitigated within the CSPP.

1.3 **Develop a Construction Safety and Phasing Plan (CSPP).**

Development of an effective CSPP will require familiarity with many other documents referenced throughout this AC. See <u>Appendix A</u> for a list of related reading material.

1.3.1 List Requirements.

A CSPP must be developed for each on-airfield construction project funded by the Airport Improvement Program (AIP) or located on an airport certificated under Part 139. For on-airfield construction projects at Part 139 airports funded without AIP funds, the preparation of a CSPP represents an acceptable method the certificate holder may use to meet Part 139 requirements during airfield construction activity. As per FAA Order 5200.11, projects that require Safety Assessments do not include construction, rehabilitation, or change of any facility that is entirely outside the air operations area, does not involve any expansion of the facility envelope and does not involve construction equipment, haul routes or placement of material in locations that require access to the air operations area, increase the facility envelope, or impact line-of-sight. Such facilities may include passenger terminals and parking or other structures. However, extraordinary circumstances may trigger the need for a Safety Assessment and a CSPP. The CSPP is subject to subsequent review and approval under the FAA's Safety Risk Management procedures (see paragraph <u>1.2.5</u>).

1.3.2 Prepare a Safety Plan Compliance Document (SPCD).

The Safety Plan Compliance Document (SPCD) details how the contractor will comply with the CSPP. Also, it will not be possible to determine all safety plan details (for example specific hazard equipment and lighting, contractor's points of contact, construction equipment heights) during the development of the CSPP. The successful contractor must define such details by preparing an SPCD that the airport operator reviews for approval prior to issuance of a notice-to-proceed. The SPCD is a subset of the CSPP, similar to how a shop drawing review is a subset to the technical specifications.

1.3.3 Assume Responsibility for the CSPP.

The airport operator is responsible for establishing and enforcing the CSPP. The airport operator may use the services of an engineering consultant to help develop the CSPP. However, writing the CSPP cannot be delegated to the construction contractor. Only those details the airport operator determines cannot be addressed before contract award are developed by the contractor and submitted for approval as the SPCD. The SPCD does not restate nor propose differences to provisions already addressed in the CSPP.

1.4 Who Is Responsible for Safety During Construction?

1.4.1 <u>Establish a Safety Culture.</u>

Everyone has a role in operational safety on airports during construction: the airport operator, the airport's consultants, the construction contractor and subcontractors, airport users, airport tenants, ARFF personnel, Air Traffic personnel, including Technical Operations personnel, FAA Airports Division personnel, and others, such as military personnel at any airport supporting military operations (e.g. national guard or a joint use facility). Close communication and coordination between all affected parties is the key to maintaining safe operations. Such communication and coordination should start at the project scoping meeting and continue through the completion of the project. The airport operator and contractor should conduct onsite safety inspections throughout the project and immediately remedy any deficiencies, whether caused by negligence, oversight, or project scope change.

1.4.2 <u>Assess Airport Operator's Responsibilities.</u>

An airport operator has overall responsibility for all activities on an airport, including construction. This includes the predesign, design, preconstruction, construction, and inspection phases. Additional information on the responsibilities listed below can be found throughout this AC. The airport operator must:

1.4.2.1	Develop a CSPP that complies with the safety guidelines of <u>Chapter 2</u> ,
	Construction Safety and Phasing Plans, and Chapter 3, Guidelines for
	Writing a CSPP. The airport operator may develop the CSPP internally or
	have a consultant develop the CSPP for approval by the airport operator.
	For tenant sponsored projects, approve a CSPP developed by the tenant or
	its consultant.

- 1.4.2.2 Require, review and approve the SPCD by the contractor that indicates how it will comply with the CSPP and provides details that cannot be determined before contract award.
- 1.4.2.3 Convene a preconstruction meeting with the construction contractor, consultant, airport employees and, if appropriate, tenant sponsor and other tenants to review and discuss project safety before beginning construction activity. The appropriate FAA representatives should be invited to attend the meeting. See <u>AC 150/5370-12</u>, *Quality Management for Federally Funded Airport Construction Projects*. (Note "FAA" refers to the Airports Regional or District Office, the Air Traffic Organization, Flight Standards Service, and other offices that support airport operations, flight regulations, and construction/environmental policies.)
- 1.4.2.4 Ensure contact information is accurate for each representative/point of contact identified in the CSPP and SPCD.
- 1.4.2.5 Hold weekly or, if necessary, daily safety meetings with all affected parties to coordinate activities.
- 1.4.2.6 Notify users, ARFF personnel, and FAA ATO personnel of construction and conditions that may adversely affect the operational safety of the airport via Notices to Airmen (NOTAM) and other methods, as appropriate. Convene a meeting for review and discussion if necessary.
- 1.4.2.7 Ensure construction personnel know applicable airport procedures and changes to those procedures that may affect their work.
- 1.4.2.8 Ensure that all temporary construction signs are located per the scheduled list for each phase of the project.
- 1.4.2.9 Ensure construction contractors and subcontractors undergo training required by the CSPP and SPCD.
- 1.4.2.10 Ensure vehicle and pedestrian operations addressed in the CSPP and SPCD are coordinated with airport tenants, the airport traffic control tower (ATCT), and construction contractors.
- 1.4.2.11 At certificated airports, ensure each CSPP and SPCD is consistent with Part 139.

- 1.4.2.12 Conduct inspections sufficiently frequently to ensure construction contractors and tenants comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards.
- 1.4.2.13 Take immediate action to resolve safety deficiencies.
- 1.4.2.14 At airports subject to 49 CFR Part 1542, *Airport Security*, ensure construction access complies with the security requirements of that regulation.
- 1.4.2.15 Notify appropriate parties when conditions exist that invoke provisions of the CSPP and SPCD (for example, implementation of low-visibility operations).
- 1.4.2.16 Ensure prompt submittal of a Notice of Proposed Construction or Alteration (Form 7460-1) for conducting an aeronautical study of potential obstructions such as tall equipment (cranes, concrete pumps, other), stock piles, and haul routes. A separate form may be filed for each potential obstruction, or one form may be filed describing the entire construction area and maximum equipment height. In the latter case, a separate form must be filed for any object beyond or higher than the originally evaluated area/height. The FAA encourages online submittal of forms for expediency at <u>https://oeaaa.faa.gov/oeaaa/external/portal.jsp</u>. The appropriate FAA Airports Regional or District Office can provide assistance in determining which objects require an aeronautical study.
- 1.4.2.17 Ensure prompt transmission of the Airport Sponsor Strategic Event Submission, FAA Form 6000-26, located at <u>https://oeaaa.faa.gov/oeaaa/external/content/AIRPORT_SPONSOR_STR</u> <u>ATEGIC_EVENT_SUBMISSION_FORM.pdf</u>, to assure proper coordination for NAS Strategic Interruption per Service Level Agreement with ATO.
- 1.4.2.18 Promptly notify the FAA Airports Regional or District Office of any proposed changes to the CSPP prior to implementation of the change. Changes to the CSPP require review and approval by the airport operator and the FAA. The FAA Airports Regional or District office will determine if further coordination within the FAA is needed. Coordinate with appropriate local and other federal government agencies, such as Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), Transportation Security Administration (TSA), and the state environmental agency.
- 1.4.3 <u>Define Construction Contractor's Responsibilities.</u> The contractor is responsible for complying with the CSPP and SPCD. The contractor must:

- 1.4.3.1 Submit a Safety Plan Compliance Document (SPCD) to the airport operator describing how it will comply with the requirements of the CSPP and supply any details that could not be determined before contract award. The SPCD must include a certification statement by the contractor, indicating an understanding of the operational safety requirements of the CSPP and the assertion of compliance with the approved CSPP and SPCD unless written approval is granted by the airport operator. Any construction practice proposed by the contractor that does not conform to the CSPP and SPCD may impact the airport's operational safety and will require a revision to the CSPP and SPCD and re-coordination with the airport operator and the FAA in advance.
- 1.4.3.2 Have available at all times copies of the CSPP and SPCD for reference by the airport operator and its representatives, and by subcontractors and contractor employees.
- 1.4.3.3 Ensure that construction personnel are familiar with safety procedures and regulations on the airport. Provide a point of contact who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport. Many projects will require 24-hour coverage.
- 1.4.3.4 Identify in the SPCD the contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD during construction. At least one of these employees must be on-site when active construction is taking place.
- 1.4.3.5 Conduct sufficient inspections to ensure construction personnel comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards.
- 1.4.3.6 Restrict movement of construction vehicles and personnel to permitted construction areas by flagging, barricading, erecting temporary fencing, or providing escorts, as appropriate, and as specified in the CSPP and SPCD.
- 1.4.3.7 Ensure that no contractor employees, employees of subcontractors or suppliers, or other persons enter any part of the air operations area (AOA) from the construction site unless authorized.
- 1.4.3.8 Ensure prompt submittal through the airport operator of Form 7460-1 for the purpose of conducting an aeronautical study of contractor equipment such as tall equipment (cranes, concrete pumps, and other equipment), stock piles, and haul routes when different from cases previously filed by the airport operator. The FAA encourages online submittal of forms for expediency at <u>https://oeaaa.faa.gov/oeaaa/external/portal.jsp</u>.

- 1.4.3.9 Ensure that all necessary safety mitigations are understood by all parties involved, and any special requirements of each construction phase will be fulfilled per the approved timeframe.
- 1.4.3.10 Participate in pre-construction meetings to review construction limits, safety mitigations, NOTAMs, and understand all special airport operational needs during each phase of the project.
- 1.4.4 Define Tenant's Responsibilities.

If planning construction activities on leased property, Airport tenants, such as airline operators, fixed base operators, and FAA ATO/Technical Operations sponsoring construction are strongly encouraged to:

- 1. Develop, or have a consultant develop, a project specific CSPP and submit it to the airport operator. The airport operator may forgo a complete CSPP submittal and instead incorporate appropriate operational safety principles and measures addressed in the advisory circular within their tenant lease agreements.
- 2. In coordination with its contractor, develop an SPCD and submit it to the airport operator for approval issued prior to issuance of a Notice to Proceed.
- 3. Ensure that construction personnel are familiar with safety procedures and regulations on the airport during all phases of the construction.
- 4. Provide a point of contact of who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport.
- 5. Identify in the SPCD the contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD during construction. At least one of these employees must be on-site when active construction is taking place.
- 6. Ensure that no tenant or contractor employees, employees of subcontractors or suppliers, or any other persons enter any part of the AOA from the construction site unless authorized.
- 7. Restrict movement of construction vehicles to construction areas by flagging and barricading, erecting temporary fencing, or providing escorts, as appropriate, as specified in the CSPP and SPCD.
- 8. Ensure prompt submittal through the airport operator of Form 7460-1 for conducting an aeronautical study of contractor equipment such as tall equipment (cranes, concrete pumps, other), stock piles, and haul routes. The FAA encourages online submittal of forms for expediency at https://oeaaa.faa.gov/oeaaa/external/portal.jsp.
- 9. Participate in pre-construction meetings to review construction limits, safety mitigations, NOTAMs, and understand all special airport operational needs during each phase of the project.

CHAPTER 2. CONSTRUCTION SAFETY AND PHASING PLANS

2.1 **Overview.**

Aviation safety is the primary consideration at airports, especially during construction. The airport operator's CSPP and the contractor's Safety Plan Compliance Document (SPCD) are the primary tools to ensure safety compliance when coordinating construction activities with airport operations. These documents identify all aspects of the construction project that pose a potential safety hazard to airport operations and outline respective mitigation procedures for each hazard. They must provide information necessary for the Airport Operations department to conduct airfield inspections and expeditiously identify and correct unsafe conditions during construction. All aviation safety provisions included within the project drawings, contract specifications, and other related documents must also be reflected in the CSPP and SPCD.

2.2 Assume Responsibility.

Operational safety on the airport remains the airport operator's responsibility at all times. The airport operator must develop, certify, and submit for FAA approval each CSPP. It is the airport operator's responsibility to apply the requirements of the FAA approved CSPP. The airport operator must revise the CSPP when conditions warrant changes and must submit the revised CSPP to the FAA for approval. The airport operator must also require and approve a SPCD from the project contractor.

2.3 **Submit the CSPP.**

Construction Safety and Phasing Plans should be developed concurrently with the project design. Milestone versions of the CSPP should be submitted for review and approval as follows. While these milestones are not mandatory, early submission will help to avoid delays. Submittals are preferred in 8.5×11 inch or 11×17 inch format for compatibility with the FAA's Obstruction Evaluation / Airport Airspace Analysis (OE / AAA) process.

2.3.1 <u>Submit an Outline/Draft.</u>

By the time approximately 25% to 30% of the project design is completed, the principal elements of the CSPP should be established. Airport operators are encouraged to submit an outline or draft, detailing all CSPP provisions developed to date, to the FAA for review at this stage of the project design.

2.3.2 <u>Submit a CSPP.</u>

The CSPP should be formally submitted for FAA approval when the project design is 80 percent to 90 percent complete. Since provisions in the CSPP will influence contract costs, it is important to obtain FAA approval in time to include all such provisions in the procurement contract.

2.3.3 <u>Submit an SPCD.</u>

The contractor should submit the SPCD to the airport operator for approval to be issued prior to the Notice to Proceed.

2.3.4 <u>Submit CSPP Revisions.</u>

All revisions to a previously approved CSPP must be re-submitted to the FAA for review and approval/disapproval action.

2.4 **Meet CSPP Requirements.**

- 2.4.1 To the extent possible, the CSPP should address the following as outlined in <u>Chapter 3</u>, <u>Guidelines for Writing a CSPP</u>. Details that cannot be determined at this stage are to be included in the SPCD.
 - 1. Coordination.
 - a. Contractor progress meetings.
 - b. Scope or schedule changes.
 - c. FAA ATO coordination.
 - 2. Phasing.
 - a. Phase elements.
 - b. Construction safety drawings.
 - 3. Areas and operations affected by the construction activity.
 - a. Identification of affected areas.
 - b. Mitigation of effects.
 - 4. Protection of navigation aids (NAVAIDs).
 - 5. Contractor access.
 - a. Location of stockpiled construction materials.
 - b. Vehicle and pedestrian operations.
 - 6. Wildlife management.
 - a. Trash.
 - b. Standing water.
 - c. Tall grass and seeds.
 - d. Poorly maintained fencing and gates.
 - e. Disruption of existing wildlife habitat.
 - 7. Foreign Object Debris (FOD) management.
 - 8. Hazardous materials (HAZMAT) management.
 - 9. Notification of construction activities.

- a. Maintenance of a list of responsible representatives/ points of contact.
- b. NOTAM.
- c. Emergency notification procedures.
- d. Coordination with ARFF Personnel.
- e. Notification to the FAA.
- 10. Inspection requirements.
 - a. Daily (or more frequent) inspections.
 - b. Final inspections.
- 11. Underground utilities.
- 12. Penalties.
- 13. Special conditions.
- 14. Runway and taxiway visual aids. Marking, lighting, signs, and visual NAVAIDs.
 - a. General.
 - b. Markings.
 - c. Lighting and visual NAVAIDs.
 - d. Signs, temporary, including orange construction signs, and permanent signs.
- 15. Marking and signs for access routes.
- 16. Hazard marking and lighting.
 - a. Purpose.
 - b. Equipment.
- 17. Work zone lighting for nighttime construction (if applicable).
- 18. Protection of runway and taxiway safety areas, object free areas, obstacle free zones, and approach/departure surfaces.
 - a. Runway Safety Area (RSA).
 - b. Runway Object Free Area (ROFA).
 - c. Taxiway Safety Area (TSA). Provide details for any adjustments to Taxiway Safety Area width to allow continued operation of smaller aircraft. See paragraph <u>2.22.3</u>.
 - d. Taxiway Object Free Area (TOFA). Provide details for any continued aircraft operations while construction occurs within the TOFA. See paragraph <u>2.22.4</u>.
 - e. Obstacle Free Zone (OFZ).
 - f. Runway approach/departure surfaces.
- 19. Other limitations on construction.
 - a. Prohibitions.

b. Restrictions.

- 2.4.2 The Safety Plan Compliance Document (SPCD) should include a general statement by the construction contractor that he/she has read and will abide by the CSPP. In addition, the SPCD must include all supplemental information that could not be included in the CSPP prior to the contract award. The contractor statement should include the name of the contractor, the title of the project CSPP, the approval date of the CSPP, and a reference to any supplemental information (that is, "I, (Name of Contractor), have read the (Title of Project) CSPP, approved on (Date), and will abide by it as written and with the following additions as noted:"). The supplemental information in the SPCD should be written to match the format of the CSPP indicating each subject by corresponding CSPP subject number and title. If no supplemental information," should be written after the corresponding subject title. The SPCD should not duplicate information in the CSPP:
 - 1. Coordination. Discuss details of proposed safety meetings with the airport operator and with contractor employees and subcontractors.
 - 2. Phasing. Discuss proposed construction schedule elements, including:
 - a. Duration of each phase.
 - b. Daily start and finish of construction, including "night only" construction.
 - c. Duration of construction activities during:
 - i. Normal runway operations.
 - ii. Closed runway operations.
 - iii. Modified runway "Aircraft Reference Code" usage.
 - 3. Areas and operations affected by the construction activity. These areas and operations should be identified in the CSPP and should not require an entry in the SPCD.
 - 4. Protection of NAVAIDs. Discuss specific methods proposed to protect operating NAVAIDs.
 - 5. Contractor access. Provide the following:
 - a. Details on how the contractor will maintain the integrity of the airport security fence (gate guards, daily log of construction personnel, and other).
 - b. Listing of individuals requiring driver training (for certificated airports and as requested).
 - c. Radio communications.
 - i. Types of radios and backup capabilities.
 - ii. Who will be monitoring radios.
 - iii. Who to contact if the ATCT cannot reach the contractor's designated person by radio.

- d. Details on how the contractor will escort material delivery vehicles.
- 6. Wildlife management. Discuss the following:
 - a. Methods and procedures to prevent wildlife attraction.
 - b. Wildlife reporting procedures.
- 7. Foreign Object Debris (FOD) management. Discuss equipment and methods for control of FOD, including construction debris and dust.
- 8. Hazardous Materials (HAZMAT) management. Discuss equipment and methods for responding to hazardous spills.
- 9. Notification of construction activities. Provide the following:
 - a. Contractor points of contact.
 - b. Contractor emergency contact.
 - c. Listing of tall or other requested equipment proposed for use on the airport and the timeframe for submitting 7460-1 forms not previously submitted by the airport operator.
 - d. Batch plant details, including 7460-1 submittal.
- 10. Inspection requirements. Discuss daily (or more frequent) inspections and special inspection procedures.
- 11. Underground utilities. Discuss proposed methods of identifying and protecting underground utilities.
- 12. Penalties. Penalties should be identified in the CSPP and should not require an entry in the SPCD.
- 13. Special conditions. Discuss proposed actions for each special condition identified in the CSPP.
- 14. Runway and taxiway visual aids. Including marking, lighting, signs, and visual NAVAIDs. Discuss proposed visual aids including the following:
 - a. Equipment and methods for covering signage and airfield lights.
 - b. Equipment and methods for temporary closure markings (paint, fabric, other).
 - c. Temporary orange construction signs.
 - d. Types of temporary Visual Guidance Slope Indicators (VGSI).
- 15. Marking and signs for access routes. Discuss proposed methods of demarcating access routes for vehicle drivers.
- 16. Hazard marking and lighting. Discuss proposed equipment and methods for identifying excavation areas.
- 17. Work zone lighting for nighttime construction (if applicable). Discuss proposed equipment, locations, aiming, and shielding to prevent interference with air traffic control and aircraft operations.
- 18. Protection of runway and taxiway safety areas, object free areas, obstacle free zones, and approach/departure surfaces. Discuss proposed methods of identifying, demarcating, and protecting airport surfaces including:
 - a. Equipment and methods for maintaining Taxiway Safety Area standards.
 - b. Equipment and methods to ensure the safe passage of aircraft where Taxiway Safety Area or Taxiway Object Free Area standards cannot be maintained.
 - c. Equipment and methods for separation of construction operations from aircraft operations, including details of barricades.
- 19. Other limitations on construction should be identified in the CSPP and should not require an entry in the SPCD.

2.5 **Coordination.**

Airport operators, or tenants responsible for design, bidding and conducting construction on their leased properties, should ensure at all project developmental stages, such as predesign, prebid, and preconstruction conferences, they capture the subject of airport operational safety during construction (see <u>AC 150/5370-12</u>, *Quality Management for Federally Funded Airport Construction Projects*). In addition, the following should be coordinated as required:

2.5.1 Progress Meetings.

Operational safety should be a standing agenda item for discussion during progress meetings throughout the project developmental stages.

2.5.2 <u>Scope or Schedule Changes.</u>

Changes in the scope or duration at any of the project stages may require revisions to the CSPP and review and approval by the airport operator and the FAA (see paragraph 1.4.2.17).

2.5.3 FAA ATO Coordination.

Early coordination with FAA ATO is highly recommended during the design phase and is required for scheduling Technical Operations shutdowns prior to construction. Coordination is critical to restarts of NAVAID services and to the establishment of any special procedures for the movement of aircraft. Formal agreements between the airport operator and appropriate FAA offices are recommended. All relocation or adjustments to NAVAIDs, or changes to final grades in critical areas, should be coordinated with FAA ATO and may require an FAA flight inspection prior to restarting the facility. Flight inspections must be coordinated and scheduled well in advance of the intended facility restart. Flight inspections may require a reimbursable agreement between the airport operator and FAA ATO. Reimbursable agreements should be coordinated a minimum of 12 months prior to the start of construction. (See paragraph <u>2.13.5.3.2</u> for required FAA notification regarding FAA-owned NAVAIDs.)

2.6 **Phasing.**

Once it has been determined what types and levels of airport operations will be maintained, the most efficient sequence of construction may not be feasible. In this case, the sequence of construction may be phased to gain maximum efficiency while allowing for the required operations. The development of the resulting construction phases should be coordinated with local Air Traffic personnel and airport users. The sequenced construction phases established in the CSPP must be incorporated into the project design and must be reflected in the contract drawings and specifications.

2.6.1 <u>Phase Elements.</u>

For each phase the CSPP should detail:

- Areas closed to aircraft operations.
- Duration of closures.
- Taxi routes and/or areas of reduced TSA and TOFA to reflect reduced ADG use.
- ARFF access routes.
- Construction staging, disposal, and cleanout areas.
- Construction access and haul routes.
- Impacts to NAVAIDs.
- Lighting, marking, and signing changes.
- Available runway length and/or reduced RSA and ROFA to reflect reduced ADG use.
- Declared distances (if applicable).
- Required hazard marking, lighting, and signing.
- Work zone lighting for nighttime construction (if applicable).
- Lead times for required notifications.

2.6.2 <u>Construction Safety Drawings.</u>

Drawings specifically indicating operational safety procedures and methods in affected areas (i.e., construction safety drawings) should be developed for each construction phase. Such drawings should be included in the CSPP as referenced attachments and should also be included in the contract drawing package.

2.7 Areas and Operations Affected by Construction Activity.

Runways and taxiways should remain in use by aircraft to the maximum extent possible without compromising safety. Pre-meetings with the FAA ATO will support operational simulations. See <u>Appendix E</u> for an example of a table showing temporary operations versus current operations. The tables in <u>Appendix E</u> can be useful for coordination among all interested parties, including FAA Lines of Business.

2.7.1 Identification of Affected Areas.

Identifying areas and operations affected by the construction helps to determine possible safety problems. The affected areas should be identified in the construction safety drawings for each construction phase. (See paragraph 2.6.2.) Of particular concern are:

2.7.1.1 Closing, or Partial Closing, of Runways, Taxiways and Aprons, and Displaced Thresholds.

When a runway is partially closed, a portion of the pavement is unavailable for any aircraft operation, meaning taxiing, landing, or takeoff in either direction on that pavement is prohibited. A displaced threshold, by contrast, is established to ensure obstacle clearance and adequate safety area for landing aircraft. The pavement prior to the displaced threshold is normally available for take-off in the direction of the displacement and for landing and takeoff in the opposite direction. Misunderstanding this difference, may result in issuance of an inaccurate NOTAM, and can lead to a hazardous condition.

2.7.1.1.1 <u>Partially Closed Runways.</u>

The temporarily closed portion of a partially closed runway will generally extend from the threshold to a taxiway that may be used for entering and exiting the runway. If the closed portion extends to a point between taxiways, pilots will have to back-taxi on the runway, which is an undesirable operation. See <u>Figure 2-1</u> for a desirable configuration.

2.7.1.1.2 <u>Displaced Thresholds.</u>

Since the portion of the runway pavement between the permanent threshold and a standard displaced threshold is available for takeoff and for landing in the opposite direction, the temporary displaced threshold need not be located at an entrance/exit taxiway. See <u>Figure 2-2</u>.

- 2.7.1.2 Closing of aircraft rescue and fire fighting access routes.
- 2.7.1.3 Closing of access routes used by airport and airline support vehicles.
- 2.7.1.4 Interruption of utilities, including water supplies for fire fighting.
- 2.7.1.5 Approach/departure surfaces affected by heights of objects.
- 2.7.1.6 Construction areas, storage areas, and access routes near runways, taxiways, aprons, or helipads.



Figure 2-1. Temporary Partially Closed Runway



Figure 2-2. Temporary Displaced Threshold

Note: See paragraph 2.18.2.5.

2.7.2 <u>Mitigation of Effects.</u>

Establishment of specific procedures is necessary to maintain the safety and efficiency of airport operations. The CSPP must address:

- 2.7.2.1 Temporary changes to runway and/or taxi operations.
- 2.7.2.2 Detours for ARFF and other airport vehicles.
- 2.7.2.3 Maintenance of essential utilities.
- 2.7.2.4 Temporary changes to air traffic control procedures. Such changes must be coordinated with the ATO.

2.8 Navigation Aid (NAVAID) Protection.

Before commencing construction activity, parking vehicles, or storing construction equipment and materials near a NAVAID, coordinate with the appropriate FAA ATO/Technical Operations office to evaluate the effect of construction activity and the required distance and direction from the NAVAID. (See paragraph 2.13.5.3.) Construction activities, materials/equipment storage, and vehicle parking near electronic NAVAIDs require special consideration since they may interfere with signals essential to air navigation. If any NAVAID may be affected, the CSPP and SPCD must show an understanding of the "critical area" associated with each NAVAID and describe how it will be protected. Where applicable, the operational critical areas of NAVAIDs should be graphically delineated on the project drawings. Pay particular attention to stockpiling material, as well as to movement and parking of equipment that may interfere with line of sight from the ATCT or with electronic emissions. Interference from construction equipment and activities may require NAVAID shutdown or adjustment of instrument approach minimums for low visibility operations. This condition requires that a NOTAM be filed (see paragraph 2.13.2). Construction activities and materials/equipment storage near a NAVAID must not obstruct access to the equipment and instruments for maintenance. Submittal of a 7460-1 form is required for construction vehicles operating near FAA NAVAIDs. (See paragraph 2.13.5.3.)

2.9 **Contractor Access.**

The CSPP must detail the areas to which the contractor must have access, and explain how contractor personnel will access those areas. Specifically address:

2.9.1 Location of Stockpiled Construction Materials.

Stockpiled materials and equipment storage are not permitted within the RSA and OFZ, and if possible should not be permitted within the Object Free Area (OFA) of an operational runway. Stockpiling material in the OFA requires submittal of a 7460-1 form and justification provided to the appropriate FAA Airports Regional or District Office for approval. The airport operator must ensure that stockpiled materials and equipment adjacent to these areas are prominently marked and lighted during hours of restricted visibility or darkness. (See paragraph <u>2.18.2</u>.) This includes determining and

verifying that materials are stabilized and stored at an approved location so as not to be a hazard to aircraft operations and to prevent attraction of wildlife and foreign object damage from blowing or tracked material. See paragraphs 2.10 and 2.11.

2.9.2 <u>Vehicle and Pedestrian Operations.</u>

The CSPP should include specific vehicle and pedestrian requirements. Vehicle and pedestrian access routes for airport construction projects must be controlled to prevent inadvertent or unauthorized entry of persons, vehicles, or animals onto the AOA. The airport operator should coordinate requirements for vehicle operations with airport tenants, contractors, and the FAA air traffic manager. In regard to vehicle and pedestrian operations, the CSPP should include the following, with associated training requirements:

2.9.2.1 **Construction Site Parking.**

Designate in advance vehicle parking areas for contractor employees to prevent any unauthorized entry of persons or vehicles onto the AOA. These areas should provide reasonable contractor employee access to the job site.

2.9.2.2 Construction Equipment Parking.

Contractor employees must park and service all construction vehicles in an area designated by the airport operator outside the OFZ and never in the safety area of an active runway or taxiway. Unless a complex setup procedure makes movement of specialized equipment infeasible, inactive equipment must not be parked on a closed taxiway or runway. If it is necessary to leave specialized equipment on a closed taxiway or runway at night, the equipment must be well lighted. Employees should also park construction vehicles outside the OFA when not in use by construction personnel (for example, overnight, on weekends, or during other periods when construction is not active). Parking areas must not obstruct the clear line of sight by the ATCT to any taxiways or runways under air traffic control nor obstruct any runway visual aids, signs, or navigation aids. The FAA must also study those areas to determine effects on airport design criteria, surfaces established by 14 CFR Part 77, Safe, Efficient Use, and Preservation of the Navigable Airspace (Part 77), and on NAVAIDs and Instrument Approach Procedures (IAP). See paragraph 2.13.1 for further information.

2.9.2.3 Access and Haul Roads.

Determine the construction contractor's access to the construction sites and haul roads. Do not permit the construction contractor to use any access or haul roads other than those approved. Access routes used by contractor vehicles must be clearly marked to prevent inadvertent entry to areas open to airport operations. Pay special attention to ensure that if construction traffic is to share or cross any ARFF routes that ARFF right of way is not impeded at any time, and that construction traffic on haul roads does not interfere with NAVAIDs or approach surfaces of operational runways. Address whether access gates will be blocked or inoperative or if a rally point will be blocked or inaccessible.

- 2.9.2.4 Marking and lighting of vehicles in accordance with <u>AC 150/5210-5</u>, *Painting, Marking, and Lighting of Vehicles Used on an Airport.*
- 2.9.2.5 Description of proper vehicle operations on various areas under normal, lost communications, and emergency conditions.
- 2.9.2.6 Required escorts.
- 2.9.2.7 **Training Requirements for Vehicle Drivers to Ensure Compliance** with the Airport Operator's Vehicle Rules and Regulations.

Specific training should be provided to vehicle operators, including those providing escorts. See <u>AC 150/5210-20</u>, *Ground Vehicle Operations on Airports*, for information on training and records maintenance requirements.

2.9.2.8 Situational Awareness.

Vehicle drivers must confirm by personal observation that no aircraft is approaching their position (either in the air or on the ground) when given clearance to cross a runway, taxiway, or any other area open to airport operations. In addition, it is the responsibility of the escort vehicle driver to verify the movement/position of all escorted vehicles at any given time. At non-towered airports, all aircraft movements and flight operations rely on aircraft operators to self-report their positions and intentions. However, there is no requirement for an aircraft to have radio communications. Because aircraft do not always broadcast their positions or intentions, visual checking, radio monitoring, and situational awareness of the surroundings is critical to safety.

2.9.2.9 **Two-Way Radio Communication Procedures.**

2.9.2.9.1 <u>General.</u>

The airport operator must ensure that tenant and construction contractor personnel engaged in activities involving unescorted operation on aircraft movement areas observe the proper procedures for communications, including using appropriate radio frequencies at airports with and without ATCT. When operating vehicles on or near open runways or taxiways, construction personnel must understand the critical importance of maintaining radio contact, as directed by the airport operator, with:

- 1. Airport operations
- 2. ATCT

- 3. Common Traffic Advisory Frequency (CTAF), which may include UNICOM, MULTICOM.
- 4. Automatic Terminal Information Service (ATIS). This frequency is useful for monitoring conditions on the airport. Local air traffic will broadcast information regarding construction related runway closures and "shortened" runways on the ATIS frequency.
- 2.9.2.9.2 <u>Areas Requiring Two-Way Radio Communication with the ATCT.</u> Vehicular traffic crossing active movement areas must be controlled either by two-way radio with the ATCT, escort, flagman, signal light, or other means appropriate for the particular airport.
- 2.9.2.9.3 Frequencies to be Used.

The airport operator will specify the frequencies to be used by the contractor, which may include the CTAF for monitoring of aircraft operations. Frequencies may also be assigned by the airport operator for other communications, including any radio frequency in compliance with Federal Communications Commission requirements. At airports with an ATCT, the airport operator will specify the frequency assigned by the ATCT to be used between contractor vehicles and the ATCT.

- 2.9.2.9.4 Proper radio usage, including read back requirements.
- 2.9.2.9.5 Proper phraseology, including the International Phonetic Alphabet.
- 2.9.2.9.6 Light Gun Signals.

Even though radio communication is maintained, escort vehicle drivers must also familiarize themselves with ATCT light gun signals in the event of radio failure. See the FAA safety placard "Ground Vehicle Guide to Airport Signs and Markings." This safety placard may be downloaded through the Runway Safety Program Web site at <u>http://www.faa.gov/airports/runway_safety/publications/</u> (see "Signs & Markings Vehicle Dashboard Sticker") or obtained from the FAA Airports Regional Office.

2.9.2.10 Maintenance of the secured area of the airport, including:

2.9.2.10.1 Fencing and Gates.

Airport operators and contractors must take care to maintain security during construction when access points are created in the security fencing to permit the passage of construction vehicles or personnel. Temporary gates should be equipped so they can be securely closed and locked to prevent access by animals and unauthorized people. Procedures should be in place to ensure that only authorized persons and vehicles have access to the AOA and to prohibit "piggybacking" behind another person or vehicle. The Department of Transportation (DOT) document DOT/FAA/AR- 00/52, *Recommended Security Guidelines for Airport Planning and Construction*, provides more specific information on fencing. A copy of this document can be obtained from the Airport Consultants Council, Airports Council International, or American Association of Airport Executives.

2.9.2.10.2 <u>Badging Requirements.</u>

Airports subject to 49 CFR Part 1542, *Airport Security*, must meet standards for access control, movement of ground vehicles, and identification of construction contractor and tenant personnel.

2.10 Wildlife Management.

The CSPP and SPCD must be in accordance with the airport operator's wildlife hazard management plan, if applicable. See <u>AC 150/5200-33</u>, *Hazardous Wildlife Attractants On or Near Airports*, and CertAlert 98-05, *Grasses Attractive to Hazardous Wildlife*. Construction contractors must carefully control and continuously remove waste or loose materials that might attract wildlife. Contractor personnel must be aware of and avoid construction activities that can create wildlife hazards on airports, such as:

2.10.1 <u>Trash.</u>

Food scraps must be collected from construction personnel activity.

2.10.2 Standing Water.

2.10.3 <u>Tall Grass and Seeds.</u>

Requirements for turf establishment can be at odds with requirements for wildlife control. Grass seed is attractive to birds. Lower quality seed mixtures can contain seeds of plants (such as clover) that attract larger wildlife. Seeding should comply with the guidance in <u>AC 150/5370-10</u>, *Standards for Specifying Construction of Airports*, Item T-901, Seeding. Contact the local office of the United Sates Department of Agriculture Soil Conservation Service or the State University Agricultural Extension Service (County Agent or equivalent) for assistance and recommendations. These agencies can also provide liming and fertilizer recommendations.

2.10.4 <u>Poorly Maintained Fencing and Gates.</u> See paragraph 2.9.2.10.1.

2.10.5 Disruption of Existing Wildlife Habitat.

While this will frequently be unavoidable due to the nature of the project, the CSPP should specify under what circumstances (location, wildlife type) contractor personnel should immediately notify the airport operator of wildlife sightings.

2.11 Foreign Object Debris (FOD) Management.

Waste and loose materials, commonly referred to as FOD, are capable of causing damage to aircraft landing gears, propellers, and jet engines. Construction contractors must not leave or place FOD on or near active aircraft movement areas. Materials capable of creating FOD must be continuously removed during the construction project. Fencing (other than security fencing) or covers may be necessary to contain material that can be carried by wind into areas where aircraft operate. See <u>AC 150/5210-24</u>, *Foreign Object Debris (FOD) Management*.

2.12 Hazardous Materials (HAZMAT) Management.

Contractors operating construction vehicles and equipment on the airport must be prepared to expeditiously contain and clean-up spills resulting from fuel or hydraulic fluid leaks. Transport and handling of other hazardous materials on an airport also requires special procedures. See <u>AC 150/5320-15</u>, *Management of Airport Industrial Waste*.

2.13 Notification of Construction Activities.

The CSPP and SPCD must detail procedures for the immediate notification of airport users and the FAA of any conditions adversely affecting the operational safety of the airport. It must address the notification actions described below, as applicable.

2.13.1 List of Responsible Representatives/points of contact for all involved parties, and procedures for contacting each of them, including after hours.

2.13.2 <u>NOTAMs.</u>

Only the airport operator may initiate or cancel NOTAMs on airport conditions, and is the only entity that can close or open a runway. The airport operator must coordinate the issuance, maintenance, and cancellation of NOTAMs about airport conditions resulting from construction activities with tenants and the local air traffic facility (control tower, approach control, or air traffic control center), and must either enter the NOTAM into NOTAM Manager, or provide information on closed or hazardous conditions on airport movement areas to the FAA Flight Service Station (FSS) so it can issue a NOTAM. The airport operator must file and maintain a list of authorized representatives with the FSS. Refer to <u>AC 150/5200-28</u>, *Notices to Airmen (NOTAMs) for Airport Operators*, for a sample NOTAM form. Only the FAA may issue or cancel NOTAMs on shutdown or irregular operation of FAA owned facilities. Any person having reason to believe that a NOTAM is missing, incomplete, or inaccurate must notify the airport operator. See paragraph <u>2.7.1.1</u> about issuing NOTAMs for partially closed runways versus runways with displaced thresholds.

2.13.3 Emergency notification procedures for medical, fire fighting, and police response.

2.13.4 Coordination with ARFF.

The CSPP must detail procedures for coordinating through the airport sponsor with ARFF personnel, mutual aid providers, and other emergency services if construction requires:

- 1. The deactivation and subsequent reactivation of water lines or fire hydrants, or
- 2. The rerouting, blocking and restoration of emergency access routes, or
- 3. The use of hazardous materials on the airfield.

2.13.5 Notification to the FAA.

2.13.5.1 **Part 77.**

Any person proposing construction or alteration of objects that affect navigable airspace, as defined in Part 77, must notify the FAA. This includes construction equipment and proposed parking areas for this equipment (i.e., cranes, graders, other equipment) on airports. FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, can be used for this purpose and submitted to the appropriate FAA Airports Regional or District Office. See <u>Appendix A</u> to download the form. Further guidance is available on the FAA web site at <u>oeaaa.faa.gov</u>.

2.13.5.2 **Part 157.**

With some exceptions, Title 14 CFR Part 157, *Notice of Construction, Alteration, Activation, and Deactivation of Airports*, requires that the airport operator notify the FAA in writing whenever a non-Federally funded project involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; or the deactivation or abandoning of an entire airport. Notification involves submitting FAA Form 7480-1, Notice of Landing Area Proposal, to the nearest FAA Airports Regional or District Office. See <u>Appendix A</u> to download the form.

2.13.5.3 NAVAIDs.

For emergency (short-notice) notification about impacts to both airport owned and FAA owned NAVAIDs, contact: 866-432-2622.

2.13.5.3.1 Airport Owned/FAA Maintained.

If construction operations require a shutdown of 24 hours or greater in duration, or more than 4 hours daily on consecutive days, of a NAVAID owned by the airport but maintained by the FAA, provide a 45-day minimum notice to FAA ATO/Technical Operations prior to facility shutdown, using Strategic Event Coordination (SEC) Form 6000.26 contained within FAA Order 6000.15, *General Maintenance Handbook for National Airspace System (NAS) Facilities*.

2.13.5.3.2 FAA Owned.

- 1. The airport operator must notify the appropriate FAA ATO Service Area Planning and Requirements (P&R) Group a minimum of 45 days prior to implementing an event that causes impacts to NAVAIDs, using SEC Form 6000.26.
- 2. Coordinate work for an FAA owned NAVAID shutdown with the local FAA ATO/Technical Operations office, including any necessary reimbursable agreements and flight checks. Detail procedures that address unanticipated utility outages and cable cuts that could impact FAA NAVAIDs. Refer to active Service Level Agreement with ATO for specifics.

2.14 **Inspection Requirements.**

2.14.1 Daily Inspections.

Inspections should be conducted at least daily, but more frequently if necessary to ensure conformance with the CSPP. A sample checklist is provided in <u>Appendix D</u>, <u>Construction Project Daily Safety Inspection Checklist</u>. See also <u>AC 150/5200-18</u>, *Airport Safety Self-Inspection*. Airport operators holding a Part 139 certificate are required to conduct self-inspections during unusual conditions, such as construction activities, that may affect safe air carrier operations.

2.14.2 Interim Inspections.

Inspections should be conducted of all areas to be (re)opened to aircraft traffic to ensure the proper operation of lights and signs, for correct markings, and absence of FOD. The contractor should conduct an inspection of the work area with airport operations personnel. The contractor should ensure that all construction materials have been secured, all pavement surfaces have been swept clean, all transition ramps have been properly constructed, and that surfaces have been appropriately marked for aircraft to operate safely. Only if all items on the list meet with the airport operator's approval should the air traffic control tower be notified to open the area to aircraft operations. The contractor should be required to retain a suitable workforce and the necessary equipment at the work area for any last minute cleanup that may be requested by the airport operator prior to opening the area.

2.14.3 Final Inspections.

New runways and extended runway closures may require safety inspections at certificated airports prior to allowing air carrier service. Coordinate with the FAA Airport Certification Safety Inspector (ACSI) to determine if a final inspection will be necessary.

2.15 Underground Utilities.

The CSPP and/or SPCD must include procedures for locating and protecting existing underground utilities, cables, wires, pipelines, and other underground facilities in excavation areas. This may involve coordinating with public utilities and FAA ATO/Technical Operations. Note that "One Call" or "Miss Utility" services do not include FAA ATO/Technical Operations.

2.16 **Penalties.**

The CSPP should detail penalty provisions for noncompliance with airport rules and regulations and the safety plans (for example, if a vehicle is involved in a runway incursion). Such penalties typically include rescission of driving privileges or access to the AOA.

2.17 **Special Conditions.**

The CSPP must detail any special conditions that affect the operation of the airport and will require the activation of any special procedures (for example, low-visibility operations, snow removal, aircraft in distress, aircraft accident, security breach, Vehicle / Pedestrian Deviation (VPD) and other activities requiring construction suspension/resumption).

2.18 **Runway and Taxiway Visual Aids.**

This includes marking, lighting, signs, and visual NAVAIDs. The CSPP must ensure that areas where aircraft will be operating are clearly and visibly separated from construction areas, including closed runways. Throughout the duration of the construction project, verify that these areas remain clearly marked and visible at all times and that marking, lighting, signs, and visual NAVAIDs that are to continue to perform their functions during construction remain in place and operational. Visual NAVAIDs that are not serving their intended function during construction must be temporarily disabled, covered, or modified as necessary. The CSPP must address the following, as appropriate:

2.18.1 General.

Airport markings, lighting, signs, and visual NAVAIDs must be clearly visible to pilots, not misleading, confusing, or deceptive. All must be secured in place to prevent movement by prop wash, jet blast, wing vortices, and other wind currents and constructed of materials that will minimize damage to an aircraft in the event of inadvertent contact. Items used to secure such markings must be of a color similar to the marking.

2.18.2 Markings.

During the course of construction projects, temporary pavement markings are often required to allow for aircraft operations during or between work periods. During the design phase of the project, the designer should coordinate with the project manager, airport operations, airport users, the FAA Airports project manager, and Airport Certification Safety Inspector for Part 139 airports to determine minimum temporary markings. The FAA Airports project manager will, wherever a runway is closed, coordinate with the appropriate FAA Flight Standards Office and disseminate findings to all parties. Where possible, the temporary markings on finish grade pavements should be placed to mirror the dimensions of the final markings. Markings must be in compliance with the standards of <u>AC 150/5340-1</u>, *Standards for Airport Markings*, except as noted herein. Runways and runway exit taxiways closed to aircraft operations are marked with a yellow X. The preferred visual aid to depict temporary runway closure is the lighted X signal placed on or near the runway designation numbers. (See paragraph <u>2.18.2.1.2</u>.)

2.18.2.1 **Closed Runways and Taxiways.**

2.18.2.1.1 <u>Permanently Closed Runways.</u>

For runways, obliterate the threshold marking, runway designation marking, and touchdown zone markings, and place an X at each end and at 1,000-foot (300 m) intervals. For a multiple runway environment, if the lighted X on a designated number will be located in the RSA of an adjacent active runway, locate the lighted X farther down the closed runway to clear the RSA of the active runway. In addition, the closed runway numbers located in the RSA of an active runway must be marked with a flat yellow X.

2.18.2.1.2 <u>Temporarily Closed Runways.</u>

For runways that have been temporarily closed, place an X at each end of the runway directly on or as near as practicable to the runway designation numbers. For a multiple runway environment, if the lighted X on a designated number will be located in the RSA of an adjacent active runway, locate the lighted X farther down the closed runway to clear the RSA of the active runway. In addition, the closed runway numbers located in the RSA of an active runway must be marked with a flat yellow X. See <u>Figure 2-3</u>. See also paragraph 2.18.3.3.

2.18.2.1.3 Partially Closed Runways and Displaced Thresholds.

When threshold markings are needed to identify the temporary beginning of the runway that is available for landing, the markings must comply with <u>AC 150/5340-1</u>. An X is not used on a partially closed runway or a runway with a displaced threshold. See paragraph <u>2.7.1.1</u> for the difference between partially closed runways and runways with displaced thresholds. Because of the temporary nature of threshold displacement due to construction, it is not necessary to re-adjust the existing runway centerline markings to meet standard spacing for a runway with a visual approach. Some of the requirements below may be waived in the cases of low-activity airports and/or short duration changes that are measured in days rather than weeks. Consider whether the presence of an airport traffic

control tower allows for the development of special procedures. Contact the appropriate FAA Airports Regional or District Office for assistance.



Figure 2-3. Markings for a Temporarily Closed Runway

- 1. **Partially Closed Runways.** Pavement markings for temporary closed portions of the runway consist of a runway threshold bar, runway designation, and yellow chevrons to identify pavement areas that are unsuitable for takeoff or landing (see <u>AC 150/5340-1</u>). Obliterate or cover markings prior to the moved threshold. Existing touchdown zone markings beyond the moved threshold may remain in place. Obliterate aiming point markings. Issue appropriate NOTAMs regarding any nonstandard markings. See Figure 2-4.
- 2. Displaced Thresholds. Pavement markings for a displaced threshold consist of a runway threshold bar, runway designation, and white arrowheads with and without arrow shafts. These markings are required to identify the portion of the runway before the displaced threshold to provide centerline guidance for pilots during approaches, takeoffs, and landing rollouts from the opposite direction. See <u>AC 150/5340-1</u>. Obliterate markings prior to the displaced threshold. Existing touchdown zone markings beyond the displaced threshold may remain in place. Obliterate aiming point markings. Issue appropriate NOTAMs regarding any nonstandard markings. See Figure 2-2.

2.18.2.1.4 <u>Taxiways.</u>

1. **Permanently Closed Taxiways.** <u>AC 150/5300-13</u> *Airport Design,* notes that it is preferable to remove the pavement, but for pavement that is to remain, place an X at the entrance to both ends of the closed section. Obliterate taxiway centerline markings, including runway leadoff lines, leading to the closed taxiway. See <u>Figure 2-4</u>.

Figure 2-4. Temporary Taxiway Closure



2. **Temporarily Closed Taxiways.** Place barricades outside the safety area of intersecting taxiways. For runway/taxiway intersections, place an X at the entrance to the closed taxiway from the runway. If the taxiway will be closed for an extended period, obliterate taxiway centerline markings, including runway leadoff lines and taxiway to taxiway turns, leading to the closed section. Always obliterate runway lead-off lines for high speed exits, regardless of the duration of the closure. If the centerline markings will be reused upon reopening the taxiway, it is preferable to paint over the marking. This will result in less damage to the pavement when the upper layer of paint is ultimately removed. See Figure 2-4.

2.18.2.1.5 <u>Temporarily Closed Airport.</u> When the airport is closed temporarily, mark all the runways as closed.

- 2.18.2.2 If unable to paint temporary markings on the pavement, construct them from any of the following materials: fabric, colored plastic, painted sheets of plywood, or similar materials. They must be properly configured and appropriately secured to prevent movement by prop wash, jet blast, or other wind currents. Items used to secure such markings must be of a color similar to the marking.
- 2.18.2.3 It may be necessary to remove or cover runway markings, including but not limited to, runway designation markings, threshold markings, centerline markings, edge stripes, touchdown zone markings and aiming point markings, depending on the length of construction and type of activity at the airport. When removing runway markings, apply the same treatment to areas between stripes or numbers, as the cleaned area will appear to pilots as a marking in the shape of the treated area.
- 2.18.2.4 If it is not possible to install threshold bars, chevrons, and arrows on the pavement, "temporary outboard white threshold bars and yellow arrowheads", see <u>Figure 2-5</u>, may be used. Locate them outside of the runway pavement surface on both sides of the runway. The dimensions must be as shown in <u>Figure 2-5</u>. If the markings are not discernible on grass or snow, apply a black background with appropriate material over the ground to ensure they are clearly visible.
- 2.18.2.5 The application rate of paint to mark a short-term temporary runway and taxiway markings may deviate from the standard (see Item P-620, "Runway and Taxiway Painting," in <u>AC 150/5370-10</u>), but the dimensions must meet the existing standards. When applying temporary markings at night, it is recommended that the fast curing, Type II paint be used to help offset the higher humidity and cooler temperatures often experienced at night. Diluting the paint will substantially increase cure time and is not recommended. Glass beads are not recommended for temporary markings. Striated markings may also be used for certain temporary markings. <u>AC</u>

<u>150/5340-1</u>, *Standards for Airport Markings*, has additional guidance on temporary markings.



Figure 2-5. Temporary Outboard White Threshold Bars and Yellow Arrowheads

2.18.3 Lighting and Visual NAVAIDs.

This paragraph refers to standard runway and taxiway lighting systems. See below for hazard lighting. Lighting installation must be in conformance with AC 150/5340-30, Design and Installation Details for Airport Visual Aids, and fixture design in conformance with AC 150/5345-50, Specification for Portable Runway and Taxiway Lights. When disconnecting runway and taxiway lighting fixtures, disconnect the associated isolation transformers. See AC 150/5340-26, Maintenance of Airport Visual Aid Facilities, for disconnect procedures and safety precautions. Alternately, cover the light fixture in such a way as to prevent light leakage. Avoid removing the lamp from energized fixtures because an excessive number of isolation transformers with open secondaries may damage the regulators and/or increase the current above its normal value. Secure, identify, and place any above ground temporary wiring in conduit to prevent electrocution and fire ignition sources. Maintain mandatory hold signs to operate normally in any situation where pilots or vehicle drivers could mistakenly be in that location. At towered airports certificated under Part 139, holding position signs are required to be illuminated on open taxiways crossing to closed or inactive runways. If the holding position sign is installed on the runway circuit for the closed runway, install a jumper to the taxiway circuit to provide power to the holding position sign for nighttime operations. Where it is not possible to maintain power to signs that would normally be operational, install barricades to exclude aircraft. Figure 2-1, Figure 2-2, Figure 2-3, and Figure 2-4 illustrate temporary changes to lighting and visual NAVAIDs.

2.18.3.1 **Permanently Closed Runways and Taxiways.**

For runways and taxiways that have been permanently closed, disconnect the lighting circuits.

2.18.3.2 Temporarily Closed Runways and New Runways Not Yet Open to Air Traffic.

If available, use a lighted X, both at night and during the day, placed at each end of the runway on or near the runway designation numbers facing the approach. (Note that the lighted X must be illuminated at all times that it is on a runway.) The use of a lighted X is required if night work requires runway lighting to be on. See <u>AC 150/5345-55</u>, *Specification for L-893*, *Lighted Visual Aid to Indicate Temporary Runway Closure*. For runways that have been temporarily closed, but for an extended period, and for those with pilot controlled lighting, disconnect the lighting circuits or secure switches to prevent inadvertent activation. For runways that will be opened periodically, coordinate procedures with the FAA air traffic manager or, at airports without an ATCT, the airport operator. Activate stop bars if available. <u>Figure 2-6</u> shows a lighted X by day. <u>Figure 2-7</u> shows a lighted X at night.





Figure 2-7. Lighted X at Night



2.18.3.3 **Partially Closed Runways and Displaced Thresholds.**

When a runway is partially closed, a portion of the pavement is unavailable for any aircraft operation, meaning taxiing and landing or taking off in either direction. A displaced threshold, by contrast, is put in place to ensure obstacle clearance by landing aircraft. The pavement prior to the displaced threshold is available for takeoff in the direction of the displacement, and for landing and takeoff in the opposite direction. Misunderstanding this difference and issuance of a subsequently inaccurate NOTAM can result in a hazardous situation. For both partially closed runways and displaced thresholds, approach lighting systems at the affected end must be placed out of service.

2.18.3.3.1 <u>Partially Closed Runways.</u>

Disconnect edge and threshold lights on that part of the runway at and behind the threshold (that is, the portion of the runway that is closed). Alternately, cover the light fixtures in such a way as to prevent light leakage. See Figure 2-1.

2.18.3.3.2 <u>Temporary Displaced Thresholds.</u>

Edge lighting in the area of the displacement emits red light in the direction of approach and yellow light (white for visual runways) in the opposite direction. If the displacement is 700 feet or less, blank out centerline lights in the direction of approach or place the centerline lights out of service. If the displacement is over 700 feet, place the centerline lights out of service. See <u>AC 150/5340-30</u> for details on lighting displaced thresholds. See <u>Figure 2-2</u>.

- 2.18.3.3.3 Temporary runway thresholds and runway ends must be lighted if the runway is lighted and it is the intended threshold for night landings or instrument meteorological conditions.
- 2.18.3.3.4 A temporary threshold on an unlighted runway may be marked by retroreflective, elevated markers in addition to markings noted in paragraph 2.18.2.1.3. Markers seen by aircraft on approach are green. Markers at the rollout end of the runway are red. At certificated airports, temporary elevated threshold markers must be mounted with a frangible fitting (see 14 CFR Part 139.309). At non-certificated airports, the temporary elevated threshold markings may either be mounted with a frangible fitting or be flexible. See <u>AC 150/5345-39</u>, *Specification for L-853, Runway and Taxiway Retroreflective Markers*.
- 2.18.3.3.5 Temporary threshold lights and runway end lights and related visual NAVAIDs are installed outboard of the edges of the full-strength pavement only when they cannot be installed on the pavement. They are installed with bases at grade level or as low as possible, but not more than 3 inch (7.6 cm) above ground. (The standard above ground height for airport lighting fixtures is 14 inches (35 cm)). When any portion of a base is above grade, place properly compacted fill around the base to minimize the rate of gradient change so aircraft can, in an emergency, cross at normal landing or takeoff speeds without incurring significant damage. See <u>AC 150/5370-10</u>.
- 2.18.3.3.6 Maintain threshold and edge lighting color and spacing standards as described in <u>AC 150/5340-30</u>. Battery powered, solar, or portable lights that meet the criteria in <u>AC 150/5345-50</u> may be used. These systems are intended primarily for visual flight rules (VFR) aircraft operations but may

be used for instrument flight rules (IFR) aircraft operations, upon individual approval from the Flight Standards Division of the applicable FAA Regional Office.

- 2.18.3.3.7 When runway thresholds are temporarily displaced, reconfigure yellow lenses (caution zone), as necessary, and place the centerline lights out of service.
- 2.18.3.3.8 Relocate the Visual Glide Slope Indicator (VGSI), such as Visual Approach Slope Indicator (VASI) and Precision Approach Path Indicator (PAPI); other airport lights, such as Runway End Identifier Lights (REIL); and approach lights to identify the temporary threshold. Another option is to disable the VGSI or any equipment that would give misleading indications to pilots as to the new threshold location. Installation of temporary visual aids may be necessary to provide adequate guidance to pilots on approach to the affected runway. If the FAA owns and operates the VGSI, coordinate its installation or disabling with the local ATO/Technical Operations Office. Relocation of such visual aids will depend on the duration of the project and the benefits gained from the relocation, as this can result in great expense. See FAA JO 6850.2, *Visual Guidance Lighting Systems*, for installation criteria for FAA owned and operated NAVAIDs.
- 2.18.3.3.9 Issue a NOTAM to inform pilots of temporary lighting conditions.

2.18.3.4 **Temporarily Closed Taxiways.**

If possible, deactivate the taxiway lighting circuits. When deactivation is not possible (for example other taxiways on the same circuit are to remain open), cover the light fixture in a way as to prevent light leakage.

2.18.4 Signs.

To the extent possible, signs must be in conformance with <u>AC 150/5345-44</u>, *Specification for Runway and Taxiway Signs*, and <u>AC 150/5340-18</u>, *Standard for Airport Sign Systems*.

2.18.4.1 **Existing Signs.**

Runway exit signs are to be covered for closed runway exits. Outbound destination signs are to be covered for closed runways. Any time a sign does not serve its normal function or would provide conflicting information, it must be covered or removed to prevent misdirecting pilots. Note that information signs identifying a crossing taxiway continue to perform their normal function even if the crossing taxiway is closed. For long term construction projects, consider relocating signs, especially runway distance remaining signs.

2.18.4.2 **Temporary Signs.**

Orange construction signs comprise a message in black on an orange background. Orange construction signs may help pilots be aware of changed conditions. The airport operator may choose to introduce these signs as part of a movement area construction project to increase situational awareness when needed. Locate signs outside the taxiway safety limits and ahead of construction areas so pilots can take timely action. Use temporary signs judiciously, striking a balance between the need for information and the increase in pilot workload. When there is a concern of pilot "information overload," the applicability of mandatory hold signs must take precedence over orange construction signs recommended during construction. Temporary signs must meet the standards for such signs in Engineering Brief 93, Guidance for the Assembly and Installation of Temporary Orange Construction Signs. Many criteria in AC 150/5345-44, Specification for Runway and Taxiway Signs, are referenced in the Engineering Brief. Permissible sign legends are:

- 1. CONSTRUCTION AHEAD,
- 2. CONSTRUCTION ON RAMP, and
- 3. RWY XX TAKEOFF RUN AVAILABLE XXX FT.

Phasing, supported by drawings and sign schedule, for the installation of orange construction signs must be included in the CSPP or SPCD.

2.18.4.2.1 <u>Takeoff Run Available (TORA) signs.</u>

Recommended: Where a runway has been shortened for takeoff, install orange TORA signs well before the hold lines, such as on a parallel taxiway prior to a turn to a runway hold position. See EB 93 for sign size and location.

2.18.4.2.2 Sign legends are shown in <u>Figure F-1</u>.

Note: See Figure E-1, Figure E-2, Figure E-3, Figure F-2, and Figure F-3 for examples of orange construction sign locations.

2.19 Marking and Signs for Access Routes.

The CSPP should indicate that pavement markings and signs for construction personnel will conform to <u>AC 150/5340-18</u> and, to the extent practicable, with the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD) and/or State highway specifications. Signs adjacent to areas used by aircraft must comply with the frangibility requirements of <u>AC 150/5220-23</u>, *Frangible Connections*, which may require modification to size and height guidance in the MUTCD.

2.20 Hazard Marking, Lighting and Signing.

2.20.1 Hazard marking, lighting, and signing prevent pilots from entering areas closed to aircraft, and prevent construction personnel from entering areas open to aircraft. The CSPP must specify prominent, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles. Hazard marking and lighting must also be specified to identify open manholes, small areas under repair, stockpiled material, waste areas, and areas subject to jet blast. Also consider less obvious construction-related hazards and include markings to identify FAA, airport, and National Weather Service facilities cables and power lines; instrument landing system (ILS) critical areas; airport surfaces, such as RSA, OFA, and OFZ; and other sensitive areas to make it easier for contractor personnel to avoid these areas.

2.20.2 Equipment.

2.20.2.1 Barricades.

Low profile barricades, including traffic cones, (weighted or sturdily attached to the surface) are acceptable methods used to identify and define the limits of construction and hazardous areas on airports. Careful consideration must be given to selecting equipment that poses the least danger to aircraft but is sturdy enough to remain in place when subjected to typical winds, prop wash and jet blast. The spacing of barricades must be such that a breach is physically prevented barring a deliberate act. For example, if barricades are intended to exclude aircraft, gaps between barricades must be smaller than the wingspan of the smallest aircraft to be excluded; if barricades are intended to exclude vehicles, gaps between barricades must be smaller than the width of the excluded vehicles, generally 4 feet (1.2 meters). Provision must be made for ARFF access if necessary. If barricades are intended to exclude pedestrians, they must be continuously linked. Continuous linking may be accomplished through the use of ropes, securely attached to prevent FOD.

2.20.2.2 Lights.

Lights must be red, either steady burning or flashing, and must meet the luminance requirements of the State Highway Department. Batteries powering lights will last longer if lights flash. Lights must be mounted on barricades and spaced at no more than 10 feet (3 meters). Lights must be operated between sunset and sunrise and during periods of low visibility whenever the airport is open for operations. They may be operated by photocell, but this may require that the contractor turn them on manually during periods of low visibility during daytime hours.

2.20.2.3 **Supplement Barricades with Signs (for example) As Necessary.** Examples are "No Entry" and "No Vehicles." Be aware of the increased effects of wind and jet blast on barricades with attached signs.

2.20.2.4 Air Operations Area – General.

Barricades are not permitted in any active safety area or on the runway side of a runway hold line. Within a runway or taxiway object free area, and on aprons, use orange traffic cones, flashing or steady burning red lights as noted above, highly reflective collapsible barricades marked with diagonal, alternating orange and white stripes; and/or signs to separate all construction/maintenance areas from the movement area. Barricades may be supplemented with alternating orange and white flags at least 20 by 20 inch (50 by 50 cm) square and securely fastened to eliminate FOD. All barricades adjacent to any open runway or taxiway / taxilane safety area, or apron must be as low as possible to the ground, and no more than 18 inches high, exclusive of supplementary lights and flags. Barricades must be of low mass; easily collapsible upon contact with an aircraft or any of its components; and weighted or sturdily attached to the surface to prevent displacement from prop wash, jet blast, wing vortex, and other surface wind currents. If affixed to the surface, they must be frangible at grade level or as low as possible, but not to exceed 3 inch (7.6 cm) above the ground. Figure 2-8 and Figure 2-9 show sample barricades with proper coloring and flags.

Figure 2-8. Interlocking Barricades



Figure 2-9. Low Profile Barricades



2.20.2.5 Air Operations Area – Runway/Taxiway Intersections.

Use highly reflective barricades with lights to close taxiways leading to closed runways. Evaluate all operating factors when determining how to mark temporary closures that can last from 10 to 15 minutes to a much longer period of time. However, even for closures of relatively short duration, close all taxiway/runway intersections with barricades. The use of traffic cones is appropriate for short duration closures.

2.20.2.6 Air Operations Area – Other.

Beyond runway and taxiway object free areas and aprons, barricades intended for construction vehicles and personnel may be many different shapes and made from various materials, including railroad ties, sawhorses, jersey barriers, or barrels.

2.20.2.7 Maintenance.

The construction specifications must include a provision requiring the contractor to have a person on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades. The contractor must file the contact person's information with the airport operator. Lighting should be checked for proper operation at least once per day, preferably at dusk.

2.21 Work Zone Lighting for Nighttime Construction.

Lighting equipment must adequately illuminate the work area if the construction is to be performed during nighttime hours. Refer to <u>AC 150/5370-10</u> for minimum illumination levels for nighttime paving projects. Additionally, it is recommended that all support equipment, except haul trucks, be equipped with artificial illumination to safely

illuminate the area immediately surrounding their work areas. The lights should be positioned to provide the most natural color illumination and contrast with a minimum of shadows. The spacing must be determined by trial. Light towers should be positioned and adjusted to aim away from ATCT cabs and active runways to prevent blinding effects. Shielding may be necessary. Light towers should be removed from the construction site when the area is reopened to aircraft operations. Construction lighting units should be identified and generally located on the construction phasing plans in relationship to the ATCT and active runways and taxiways.

2.22 **Protection of Runway and Taxiway Safety Areas.**

Runway and taxiway safety areas, OFZs, OFAs, and approach surfaces are described in <u>AC 150/5300-13</u>. Protection of these areas includes limitations on the location and height of equipment and stockpiled material. An FAA airspace study may be required. Coordinate with the appropriate FAA Airports Regional or District Office if there is any doubt as to requirements or dimensions (see paragraph <u>2.13.5</u>) as soon as the location and height of materials or equipment are known. The CSPP should include drawings showing all safety areas, object free areas, obstacle free zones and approach departure surfaces affected by construction.

2.22.1 Runway Safety Area (RSA).

A runway safety area is the defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway (see <u>AC 150/5300-13</u>). Construction activities within the existing RSA are subject to the following conditions:

- 2.22.1.1 No construction may occur within the existing RSA while the runway is open for aircraft operations. The RSA dimensions may be temporarily adjusted if the runway is restricted to aircraft operations requiring an RSA that is equal to the RSA width and length beyond the runway ends available during construction. (See <u>AC 150/5300-13</u>). The temporary use of declared distances and/or partial runway closures may provide the necessary RSA under certain circumstances. Coordinate with the appropriate FAA Airports Regional or District Office to have declared distances information published, and appropriate NOTAMs issued. See <u>AC 150/5300-13</u> for guidance on the use of declared distances.
- 2.22.1.2 The airport operator must coordinate the adjustment of RSA dimensions as permitted above with the appropriate FAA Airports Regional or District Office and the local FAA air traffic manager and issue a NOTAM.
- 2.22.1.3 The CSPP and SPCD must provide procedures for ensuring adequate distance for protection from blasting operations, if required by operational considerations.

2.22.1.4 Excavations.

- 2.22.1.4.1 Open trenches or excavations are not permitted within the RSA while the runway is open. Backfill trenches before the runway is opened. If backfilling excavations before the runway must be opened is impracticable, cover the excavations appropriately. Covering for open trenches must be designed to allow the safe operation of the heaviest aircraft operating on the runway across the trench without damage to the aircraft.
- 2.22.1.4.2 Construction contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

2.22.1.5 **Erosion Control.**

Soil erosion must be controlled to maintain RSA standards, that is, the RSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and fire fighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

2.22.2 Runway Object Free Area (ROFA).

Construction, including excavations, may be permitted in the ROFA. However, equipment must be removed from the ROFA when not in use, and material should not be stockpiled in the ROFA if not necessary. Stockpiling material in the OFA requires submittal of a 7460-1 form and justification provided to the appropriate FAA Airports Regional or District Office for approval.

2.22.3 <u>Taxiway Safety Area (TSA).</u>

- 2.22.3.1 A taxiway safety area is a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway. (See <u>AC 150/5300-13</u>.) Since the width of the TSA is equal to the wingspan of the design aircraft, no construction may occur within the TSA while the taxiway is open for aircraft operations. The TSA dimensions may be temporarily adjusted if the taxiway is restricted to aircraft operations requiring a TSA that is equal to the TSA width available during construction. Give special consideration to TSA dimensions at taxiway turns and intersections. (see <u>AC 150/5300-13</u>).
- 2.22.3.2 The airport operator must coordinate the adjustment of the TSA width as permitted above with the appropriate FAA Airports Regional or District Office and the FAA air traffic manager and issue a NOTAM.

2.22.3.3 The CSPP and SPCD must provide procedures for ensuring adequate distance for protection from blasting operations.

2.22.3.4 Excavations.

- 1. Curves. Open trenches or excavations are not permitted within the TSA while the taxiway is open. Trenches should be backfilled before the taxiway is opened. If backfilling excavations before the taxiway must be opened is impracticable, cover the excavations appropriately. Covering for open trenches must be designed to allow the safe operation of the heaviest aircraft operating on the taxiway across the trench without damage to the aircraft.
- 2. Straight Sections. Open trenches or excavations are not permitted within the TSA while the taxiway is open for unrestricted aircraft operations. Trenches should be backfilled before the taxiway is opened. If backfilling excavations before the taxiway must be opened is impracticable, cover the excavations to allow the safe passage of ARFF equipment and of the heaviest aircraft operating on the taxiway across the trench without causing damage to the equipment or aircraft. In rare circumstances where the section of taxiway is indispensable for aircraft movement, open trenches or excavations may be permitted in the TSA while the taxiway is open to aircraft operations, subject to the following restrictions:
 - a. Taxiing speed is limited to 10 mph.
 - b. Appropriate NOTAMs are issued.
 - c. Marking and lighting meeting the provisions of paragraphs 2.18 and 2.20 are implemented.
 - d. Low mass, low-profile lighted barricades are installed.
 - e. Appropriate temporary orange construction signs are installed.
- 3. Construction contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

2.22.3.5 **Erosion control.**

Soil erosion must be controlled to maintain TSA standards, that is, the TSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft.

2.22.4 Taxiway Object Free Area (TOFA).

Unlike the Runway Object Free Area, aircraft wings regularly penetrate the taxiway object free area during normal operations. Thus, the restrictions are more stringent. Except as provided below, no construction may occur within the taxiway object free area while the taxiway is open for aircraft operations.

- 2.22.4.1 The taxiway object free area dimensions may be temporarily adjusted if the taxiway is restricted to aircraft operations requiring a taxiway object free area that is equal to the taxiway object free area width available. Give special consideration to TOFA dimensions at taxiway turns and intersections.
- 2.22.4.2 Offset taxiway centerline and edge pavement markings (do not use glass beads) may be used as a temporary measure to provide the required taxiway object free area. Where offset taxiway pavement markings are provided, centerline lighting, centerline reflectors, or taxiway edge reflectors are required. Existing lighting that does not coincide with the temporary markings must be taken out of service.
- 2.22.4.3 Construction activity, including open excavations, may be accomplished without adjusting the width of the taxiway object free area, subject to the following restrictions:
- 2.22.4.3.1 Taxiing speed is limited to 10 mph.
- 2.22.4.3.2 NOTAMs issued advising taxiing pilots of hazard and recommending reduced taxiing speeds on the taxiway.
- 2.22.4.3.3 Marking and lighting meeting the provisions of paragraphs <u>2.18</u> and <u>2.20</u> are implemented.
- 2.22.4.3.4 If desired, appropriate orange construction signs are installed. See paragraph <u>2.18.4.2</u> and <u>Appendix F</u>.
- 2.22.4.3.5 Five-foot clearance is maintained between equipment and materials and any part of an aircraft (includes wingtip overhang). If such clearance can only be maintained if an aircraft does not have full use of the entire taxiway width (with its main landing gear at the edge of the usable pavement), then it will be necessary to move personnel and equipment for the passage of that aircraft.
- 2.22.4.3.6 Flaggers furnished by the contractor must be used to direct and control construction equipment and personnel to a pre-established setback distance for safe passage of aircraft, and airline and/or airport personnel. Flaggers must also be used to direct taxiing aircraft. Due to liability issues, the airport operator should require airlines to provide flaggers for directing taxiing aircraft.

2.22.5 Obstacle Free Zone (OFZ).

In general, personnel, material, and/or equipment may not penetrate the OFZ while the runway is open for aircraft operations. If a penetration to the OFZ is necessary, it may be possible to continue aircraft operations through operational restrictions. Coordinate with the FAA through the appropriate FAA Airports Regional or District Office.

2.22.6 <u>Runway Approach/Departure Areas and Clearways.</u>

All personnel, materials, and/or equipment must remain clear of the applicable threshold siting surfaces, as defined in <u>AC 150/5300-13</u>. Objects that do not penetrate these surfaces may still be obstructions to air navigation and may affect standard instrument approach procedures. Coordinate with the FAA through the appropriate FAA Airports Regional or District Office.

2.22.6.1 Construction activity in a runway approach/departure area may result in the need to partially close a runway or displace the existing runway threshold. Partial runway closure, displacement of the runway threshold, as well as closure of the complete runway and other portions of the movement area also require coordination through the airport operator with the appropriate FAA air traffic manager (FSS if non-towered) and ATO/Technical Operations (for affected NAVAIDS) and airport users.

2.22.6.2 Caution About Partial Runway Closures.

When filing a NOTAM for a partial runway closure, clearly state that the portion of pavement located prior to the threshold is not available for landing and departing traffic. In this case, the threshold has been moved for both landing and takeoff purposes (this is different than a displaced threshold). There may be situations where the portion of closed runway is available for taxiing only. If so, the NOTAM must reflect this condition).

2.22.6.3 **Caution About Displaced Thresholds.**

Implementation of a displaced threshold affects runway length available for aircraft landing over the displacement. Depending on the reason for the displacement (to provide obstruction clearance or RSA), such a displacement may also require an adjustment in the landing distance available and accelerate-stop distance available in the opposite direction. If project scope includes personnel, equipment, excavation, or other work within the existing RSA of any usable runway end, do not implement a displaced threshold unless arrivals and departures toward the construction activity are prohibited. Instead, implement a partial closure.

2.23 **Other Limitations on Construction.**

The CSPP must specify any other limitations on construction, including but not limited to:

2.23.1 Prohibitions.

2.23.1.1	No use of tall equipment (cranes, concrete pumps, and so on) unless a
	7460-1 determination letter is issued for such equipment.

- 2.23.1.2 No use of open flame welding or torches unless fire safety precautions are provided and the airport operator has approved their use.
- 2.23.1.3 No use of electrical blasting caps on or within 1,000 feet (300 meters) of the airport property. See <u>AC 150/5370-10</u>.

2.23.2 <u>Restrictions.</u>

- 2.23.2.1 Construction suspension required during specific airport operations.
- 2.23.2.2 Areas that cannot be worked on simultaneously.
- 2.23.2.3 Day or night construction restrictions.
- 2.23.2.4 Seasonal construction restrictions.
- 2.23.2.5 Temporary signs not approved by the airport operator.
- 2.23.2.6 Grades changes that could result in unplanned effects on NAVAIDs.

CHAPTER 3. GUIDELINES FOR WRITING A CSPP

3.1 General Requirements.

The CSPP is a standalone document written to correspond with the subjects outlined in paragraph 2.4. The CSPP is organized by numbered sections corresponding to each subject listed in paragraph 2.4, and described in detail in paragraphs 2.5 - 2.23. Each section number and title in the CSPP matches the corresponding subject outlined in paragraph 2.4 (for example, 1. Coordination, 2. Phasing, 3. Areas and Operations Affected by the Construction Activity, and so on). With the exception of the project scope of work outlined in Section 2. Phasing, only subjects specific to operational safety during construction should be addressed.

3.2 **Applicability of Subjects.**

Each section should, to the extent practical, focus on the specific subject. Where an overlapping requirement spans several sections, the requirement should be explained in detail in the most applicable section. A reference to that section should be included in all other sections where the requirement may apply. For example, the requirement to protect existing underground FAA ILS cables during trenching operations could be considered FAA ATO coordination (Coordination, paragraph 2.5.3), an area and operation affected by the construction activity (Areas and Operations Affected by the Construction Activity, paragraph 2.7.1.4), a protection of a NAVAID (Protection of Navigational Aids (NAVAIDs), paragraph 2.8), or a notification to the FAA of construction activities (Notification of Construction Activities, paragraph 2.13.5.3.2). However, it is more specifically an underground utility requirement (Underground Utilities, paragraph 2.15). The procedure for protecting underground ILS cables during trenching operations should therefore be described in 2.4.2.11: "The contractor must coordinate with the local FAA System Support Center (SSC) to mark existing ILS cable routes along Runway 17-35. The ILS cables will be located by hand digging whenever the trenching operation moves within 10 feet of the cable markings." All other applicable sections should include a reference to 2.4.2.11: "ILS cables shall be identified and protected as described in 2.4.2.11" or "See 2.4.2.11 for ILS cable identification and protection requirements." Thus, the CSPP should be considered as a whole, with no need to duplicate responses to related issues.

3.3 **Graphical Representations.**

Construction safety drawings should be included in the CSPP as attachments. When other graphical representations will aid in supporting written statements, the drawings, diagrams, and/or photographs should also be attached to the CSPP. References should be made in the CSPP to each graphical attachment and may be made in multiple sections.

3.4 **Reference Documents.**

The CSPP must not incorporate a document by reference unless reproduction of the material in that document is prohibited. In that case, either copies of or a source for the referenced document must be provided to the contractor. Where this AC recommends references (e.g. as in paragraph <u>3.9</u>) the intent is to include a reference to the corresponding section in the CSPP, not to this Advisory Circular.

3.5 **Restrictions.**

The CSPP should not be considered as a project design review document. The CSPP should also avoid mention of permanent ("as-built") features such as pavements, markings, signs, and lighting, except when such features are intended to aid in maintaining operational safety during the construction.

3.6 **Coordination.**

Include in this section a detailed description of conferences and meetings to be held both before and during the project. Include appropriate information from <u>AC 150/5370-12</u>. Discuss coordination procedures and schedules for each required FAA ATO Technical Operations shutdown and restart and all required flight inspections.

3.7 Phasing.

Include in this section a detailed scope of work description for the project as a whole and each phase of work covered by the CSPP. This includes all locations and durations of the work proposed. Attach drawings to graphically support the written scope of work. Detail in this section the sequenced phases of the proposed construction. Include a reference to paragraph <u>3.8</u>, as appropriate.

3.8 Areas and Operations Affected by Construction.

Focus in this section on identifying the areas and operations affected by the construction. Describe corresponding mitigation that is not covered in detail elsewhere in the CSPP. Include references to paragraphs below as appropriate. Attach drawings as necessary to graphically describe affected areas and mechanisms proposed. See <u>Appendix F</u> for sample operational effects tables and figures.

3.9 NAVAID Protection.

List in this section all NAVAID facilities that will be affected by the construction. Identify NAVAID facilities that will be placed out of service at any time prior to or during construction activities. Identify individuals responsible for coordinating each shutdown and when each facility will be out of service. Include a reference to paragraph <u>3.6 for FAA ATO NAVAID shutdown, restart, and flight inspection coordination.</u> Outline in detail procedures to protect each NAVAID facility remaining in service from interference by construction activities. Include a reference to paragraph <u>3.14 for the</u> issuance of NOTAMs as required. Include a reference to paragraph 3.16 for the protection of underground cables and piping serving NAVAIDs. If temporary visual aids are proposed to replace or supplement existing facilities, include a reference to paragraph 3.19. Attach drawings to graphically indicate the affected NAVAIDS and the corresponding critical areas.

3.10 Contractor Access.

This will necessarily be the most extensive section of the CSPP. Provide sufficient detail so that a contractor not experienced in working on airports will understand the unique restrictions such work will require. Due to this extent, it should be broken down into subsections as described below:

3.10.1 Location of Stockpiled Construction Materials.

Describe in this section specific locations for stockpiling material. Note any height restrictions on stockpiles. Include a reference to paragraph 3.21 for hazard marking and lighting devices used to identify stockpiles. Include a reference to paragraph 3.11 for provisions to prevent stockpile material from becoming wildlife attractants. Include a reference to paragraph 3.12 for provisions to prevent stockpile material from becoming FOD. Attach drawings to graphically indicate the stockpile locations.

3.10.2 Vehicle and Pedestrian Operations.

While there are many items to be addressed in this major subsection of the CSPP, all are concerned with one main issue: keeping people and vehicles from areas of the airport where they don't belong. This includes preventing unauthorized entry to the AOA and preventing the improper movement of pedestrians or vehicles on the airport. In this section, focus on mechanisms to prevent construction vehicles and workers traveling to and from the worksite from unauthorized entry into movement areas. Specify locations of parking for both employee vehicles and construction equipment, and routes for access and haul roads. In most cases, this will best be accomplished by attaching a drawing. Quote from AC 150/5210-5 specific requirements for contractor vehicles rather than referring to the AC as a whole, and include special requirements for identifying HAZMAT vehicles. Quote from, rather than incorporate by reference, AC 150/5210-20 as appropriate to address the airport's rules for ground vehicle operations, including its training program. Discuss the airport's recordkeeping system listing authorized vehicle operators.

3.10.3 <u>Two-Way Radio Communications.</u>

Include a special section to identify all individuals who are required to maintain communications with Air Traffic (AT) at airports with active towers, or monitor CTAF at airports without or with closed ATCT. Include training requirements for all individuals required to communicate with AT. Individuals required to monitor AT frequencies should also be identified. If construction employees are also required to communicate by radio with Airport Operations, this procedure should be described in detail. Usage of vehicle mounted radios and/or portable radios should be addressed. Communication procedures for the event of disabled radio communication (that is, light
signals, telephone numbers, others) must be included. All radio frequencies should by identified (Tower, Ground Control, CTAF, UNICOM, ATIS, and so on).

3.10.4 <u>Airport Security.</u>

Address security as it applies to vehicle and pedestrian operations. Discuss TSA requirements, security badging requirements, perimeter fence integrity, gate security, and other needs. Attach drawings to graphically indicate secured and/or Security Identification Display Areas (SIDA), perimeter fencing, and available access points.

3.11 Wildlife Management.

Discuss in this section wildlife management procedures. Describe the maintenance of existing wildlife mitigation devices, such as perimeter fences, and procedures to limit wildlife attractants. Include procedures to notify Airport Operations of wildlife encounters. Include a reference to paragraph <u>3.10</u> for security (wildlife) fence integrity maintenance as required.

3.12 FOD Management.

In this section, discuss methods to control and monitor FOD: worksite housekeeping, ground vehicle tire inspections, runway sweeps, and so on. Include a reference to paragraph 3.15 for inspection requirements as required.

3.13 HAZMAT Management.

Describe in this section HAZMAT management procedures: fuel deliveries, spill recovery procedures, Safety Data Sheet (SDS), Material Safety Data Sheet (MSDS) or Product Safety Data Sheet (PSDS) availability, and other considerations. Any specific airport HAZMAT restrictions should also be identified. Include a reference to paragraph <u>3.10</u> for HAZMAT vehicle identification requirements. Quote from, rather than incorporate by reference, <u>AC 150/5320-15</u>.

3.14 Notification of Construction Activities.

List in this section the names and telephone numbers of points of contact for all parties affected by the construction project. We recommend a single list that includes all telephone numbers required under this section. Include emergency notification procedures for all representatives of all parties potentially impacted by the construction. Identify individual representatives – and at least one alternate – for each party. List both on-duty and off-duty contact information for each individual, including individuals responsible for emergency maintenance of airport construction hazard lighting and barricades. Describe procedures to coordinate immediate response to events that might adversely affect the operational safety of the airport (such as interrupted NAVAID service). Explain requirements for and the procedures for the issuance of Notices to Airmen (NOTAMs), notification to FAA required by 14 CFR Part 77 and Part 157 and in the event of affected NAVAIDs. For NOTAMs, identify an individual, and at least one alternate, responsible for issuing and cancelling each specific type of Notice to

Airmen (NOTAM) required. Detail notification methods for police, fire fighting, and medical emergencies. This may include 911, but should also include direct phone numbers of local police departments and nearby hospitals. Identify the E911 address of the airport and the emergency access route via haul roads to the construction site. Require the contractor to have this information available to all workers. The local Poison Control number should be listed. Procedures regarding notification of Airport Operations and/or the ARFF Department of such emergencies should be identified, as applicable. If airport radio communications are identified as a means of emergency notification of ARFF personnel, the latter including activities that affect ARFF water supplies and access roads. Identify the primary ARFF contact person and at least one alternate. If notification is to be made through Airport Operations, then detail this procedure. Include a method of confirmation from the ARFF department.

3.15 **Inspection Requirements.**

Describe in this section inspection requirements to ensure airfield safety compliance. Include a requirement for routine inspections by the resident engineer (RE) or other airport operator's representative and the construction contractors. If the engineering consultants and/or contractors have a Safety Officer who will conduct such inspections, identify this individual. Describe procedures for special inspections, such as those required to reopen areas for aircraft operations. Part 139 requires daily airfield inspections at certificated airports, but these may need to be more frequent when construction is in progress. Discuss the role of such inspections on areas under construction. Include a requirement to immediately remedy any deficiencies, whether caused by negligence, oversight, or project scope change.

3.16 Underground Utilities.

Explain how existing underground utilities will be located and protected. Identify each utility owner and include contact information for each company/agency in the master list. Address emergency response procedures for damaged or disrupted utilities. Include a reference to paragraph <u>3.14</u> for notification of utility owners of accidental utility disruption as required.

3.17 **Penalties.**

Describe in this section specific penalties imposed for noncompliance with airport rules and regulations, including the CSPP: SIDA violations, VPD, and others.

3.18 **Special Conditions.**

Identify any special conditions that may trigger specific safety mitigation actions outlined in this CSPP: low visibility operations, snow removal, aircraft in distress, aircraft accident, security breach, VPD, and other activities requiring construction suspension/resumption. Include a reference to paragraph <u>3.10</u> for compliance with airport safety and security measures and for radio communications as required. Include

a reference to paragraph <u>3.14</u> for emergency notification of all involved parties, including police/security, ARFF, and medical services.

3.19 Runway and Taxiway Visual Aids.

Include marking, lighting, signs, and visual NAVAIDS. Detail temporary runway and taxiway marking, lighting, signs, and visual NAVAIDs required for the construction. Discuss existing marking, lighting, signs, and visual NAVAIDs that are temporarily, altered, obliterated, or shut down. Consider non-federal facilities and address requirements for reimbursable agreements necessary for alteration of FAA facilities and for necessary flight checks. Identify temporary TORA signs or runway distance remaining signs if appropriate. Identify required temporary visual NAVAIDs such as REIL or PAPI. Quote from, rather than incorporate by reference, <u>AC 150/5340-1</u>, *Standards for Airport Markings; <u>AC 150/5340-18</u>, <i>Standards for Airport Sign Systems;* and <u>AC 150/5340-30</u>, as required. Attach drawings to graphically indicate proposed marking, lighting, signs, and visual NAVAIDs.

3.20 Marking and Signs for Access Routes.

Detail plans for marking and signs for vehicle access routes. To the extent possible, signs should be in conformance with the Federal Highway Administration MUTCD and/or State highway specifications, not hand lettered. Detail any modifications to the guidance in the MUTCD necessary to meet frangibility/height requirements.

3.21 Hazard Marking and Lighting.

Specify all marking and lighting equipment, including when and where each type of device is to be used. Specify maximum gaps between barricades and the maximum spacing of hazard lighting. Identify one individual and at least one alternate responsible for maintenance of hazard marking and lighting equipment in the master telephone list. Include a reference to paragraph <u>3.14</u>. Attach drawings to graphically indicate the placement of hazard marking and lighting equipment.

3.22 Work Zone Lighting for Nighttime Construction.

If work is to be conducted at night, specify all lighting equipment, including when and where each type of device is to be used. Indicate the direction lights are to be aimed and any directions that aiming of lights is prohibited. Specify any shielding necessary in instances where aiming is not sufficient to prevent interference with air traffic control and aircraft operations. Attach drawings to graphically indicate the placement and aiming of lighting equipment. Where the plan only indicates directions that aiming of lights is prohibited, the placement and positioning of portable lights must be proposed by the Contractor and approved by the airport operator's representative each time lights are relocated or repositioned.

3.23 **Protection of Runway and Taxiway Safety Areas.**

This section should focus exclusively on procedures for protecting all safety areas, including those altered by the construction: methods of demarcation, limit of access, movement within safety areas, stockpiling and trenching restrictions, and so on. Reference AC 150/5300-13, as required. Include a reference to paragraph 3.10 for procedures regarding vehicle and personnel movement within safety areas. Include a reference to paragraph 3.10 for material stockpile restrictions as required. Detail requirements for trenching, excavations, and backfill. Include a reference to paragraph 3.21 for hazard marking and lighting devices used to identify open excavations as required. If runway and taxiway closures are proposed to protect safety areas, or if temporary displaced thresholds and/or revised declared distances are used to provide the required Runway Safety Area, include a reference to paragraphs 3.14 and 3.19. Detail procedures for protecting the runway OFZ, runway OFA, taxiway OFA and runway approach surfaces including those altered by the construction: methods of demarcation, limit of cranes, storage of equipment, and so on. Quote from, rather than incorporate by reference, AC 150/5300-13, as required. Include a reference to paragraph 3.24 for height (i.e., crane) restrictions as required. One way to address the height of equipment that will move during the project is to establish a three-dimensional "box" within which equipment will be confined that can be studied as a single object. Attach drawings to graphically indicate the safety area, OFZ, and OFA boundaries.

3.24 **Other Limitations on Construction.**

This section should describe what limitations must be applied to each area of work and when each limitation will be applied: limitations due to airport operations, height (i.e., crane) restrictions, areas which cannot be worked at simultaneously, day/night work restrictions, winter construction, and other limitations. Include a reference to paragraph 3.7 for project phasing requirements based on construction limitations as required.

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APPENDIX A. RELATED READING MATERIAL

Obtain the latest version of the following free publications from the FAA on its Web site at <u>http://www.faa.gov/airports/</u>.

Number	Title and Description
AC 150/5200-28	Notices to Airmen (NOTAMs) for Airport Operators
	Guidance for using the NOTAM System in airport reporting.
<u>AC 150/5200-30</u>	Airport Field Condition Assessments and Winter Operations Safety
	Guidance for airport owners/operators on the development of an acceptable airport snow and ice control program and on appropriate field condition reporting procedures.
<u>AC 150/5200-33</u>	Hazardous Wildlife Attractants On or Near Airports
	Guidance on locating certain land uses that might attract hazardous wildlife to public-use airports.
<u>AC 150/5210-5</u>	Painting, Marking, and Lighting of Vehicles Used on an Airport
	Guidance, specifications, and standards for painting, marking, and lighting vehicles operating in the airport air operations areas.
<u>AC 150/5210-20</u>	<i>Ground Vehicle Operations to include Taxiing or Towing an Aircraft on Airports</i>
	Guidance to airport operators on developing ground vehicle operation training programs.
<u>AC 150/5300-13</u>	Airport Design
	FAA standards and recommendations for airport design. Establishes approach visibility minimums as an airport design parameter, and contains the Object Free area and the obstacle free-zone criteria.
AC 150/5210-24	Airport Foreign Object Debris (FOD) Management
	Guidance for developing and managing an airport foreign object debris (FOD) program

Table A-1. FAA Publications

Number	Title and Description
<u>AC 150/5320-15</u>	Management of Airport Industrial Waste
	Basic information on the characteristics, management, and regulations of industrial wastes generated at airports. Guidance for developing a Storm Water Pollution Prevention Plan (SWPPP) that applies best management practices to eliminate, prevent, or reduce pollutants in storm water runoff with particular airport industrial activities.
<u>AC 150/5340-1</u>	Standards for Airport Markings
	FAA standards for the siting and installation of signs on airport runways and taxiways.
<u>AC 150/5340-18</u>	Standards for Airport Sign Systems
	FAA standards for the siting and installation of signs on airport runways and taxiways.
<u>AC 150/5345-28</u>	Precision Approach Path Indicator (PAPI) Systems
	FAA standards for PAPI systems, which provide pilots with visual glide slope guidance during approach for landing.
<u>AC 150/5340-30</u>	Design and Installation Details for Airport Visual Aids
	Guidance and recommendations on the installation of airport visual aids.
<u>AC 150/5345-39</u>	Specification for L-853, Runway and Taxiway Retroreflective Markers
<u>AC 150/5345-44</u>	Specification for Runway and Taxiway Signs
	FAA specifications for unlighted and lighted signs for taxiways and runways.
<u>AC 150/5345-53</u>	Airport Lighting Equipment Certification Program
	Details on the Airport Lighting Equipment Certification Program (ALECP).
<u>AC 150/5345-50</u>	Specification for Portable Runway and Taxiway Lights
	FAA standards for portable runway and taxiway lights and runway end identifier lights for temporary use to permit continued aircraft operations while all or part of a runway lighting system is inoperative.
<u>AC 150/5345-55</u>	Specification for L-893, Lighted Visual Aid to Indicate Temporary Runway Closure

Number	Title and Description
<u>AC 150/5370-10</u>	Standards for Specifying Construction of Airports
	Standards for construction of airports, including earthwork, drainage, paving, turfing, lighting, and incidental construction.
<u>AC 150/5370-12</u>	Quality Management for Federally Funded Airport Construction Projects
EB 93	<i>Guidance for the Assembly and Installation of Temporary Orange</i> <i>Construction Signs</i>
FAA Order 5200.11	FAA Airports (ARP) Safety Management System (SMS)
	Basics for implementing SMS within ARP. Includes roles and responsibilities of ARP management and staff as well as other FAA lines of business that contribute to the ARP SMS.
FAA Certalert 98-05	Grasses Attractive to Hazardous Wildlife
	Guidance on grass management and seed selection.
FAA Form 7460-1	Notice of Proposed Construction or Alteration
FAA Form 7480-1	Notice of Landing Area Proposal
FAA Form 6000.26	National NAS Strategic Interruption Service Level Agreement, Strategic Events Coordination, Airport Sponsor Form

Obtain the latest version of the following free publications from the Electronic Code of Federal Regulations at <u>http://www.ecfr.gov/</u>.

Table A-2. Code of Federal Regulation

Number	Title
Title 14 CFR Part 77	Safe, Efficient Use and Preservation of the Navigable Airspace
Title 14 CFR Part 139	Certification of Airports
Title 49 CFR Part 1542	Airport Security

Obtain the latest version of the Manual on Uniform Traffic Control Devices from the Federal Highway Administration at <u>http://mutcd.fhwa.dot.gov/</u>.

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APPENDIX B. TERMS AND ACRONYMS

Table B-1. Terms and Acronyms

Term	Definition
Form 7460-1	Notice of Proposed Construction or Alteration. For on-airport projects, the form submitted to the FAA regional or airports division office as formal written notification of any kind of construction or alteration of objects that affect navigable airspace, as defined in 14 CFR Part 77, <i>Safe, Efficient Use, and Preservation of the Navigable Airspace</i> . (See guidance available on the FAA web site at https://oeaaa.faa.gov .) The form may be downloaded at https://www.faa.gov/airports/resources/forms/ , or filed electronically at: https://www.faa.gov .
Form 7480-1	Notice of Landing Area Proposal. Form submitted to the FAA Airports Regional Division Office or Airports District Office as formal written notification whenever a project without an airport layout plan on file with the FAA involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; or the deactivation or abandoning of an entire airport The form may be downloaded at <u>http://www.faa.gov/airports/resources/forms/</u> .
Form 6000-26	Airport Sponsor Strategic Event Submission Form
AC	Advisory Circular
ACSI	Airport Certification Safety Inspector
ADG	Airplane Design Group
AIP	Airport Improvement Program
ALECP	Airport Lighting Equipment Certification Program
ANG	Air National Guard
AOA	Air Operations Area, as defined in 14 CFR Part 107. Means a portion of an airport, specified in the airport security program, in which security measures are carried out. This area includes aircraft movement areas, aircraft parking areas, loading ramps, and safety areas, and any adjacent areas (such as general aviation areas) that are not separated by adequate security systems, measures, or procedures. This area does not include the secured area of the airport terminal building.
ARFF	Aircraft Rescue and Fire Fighting
ARP	FAA Office of Airports
ASDA	Accelerate-Stop Distance Available
AT	Air Traffic
ATCT	Airport Traffic Control Tower
ATIS	Automatic Terminal Information Service
АТО	Air Traffic Organization
Certificated Airport	An airport that has been issued an Airport Operating Certificate by the FAA under

Term	Definition
	the authority of 14 CFR Part 139, Certification of Airports.
CFR	Code of Federal Regulations
Construction	The presence of construction-related personnel, equipment, and materials in any location that could infringe upon the movement of aircraft.
CSPP	Construction Safety and Phasing Plan. The overall plan for safety and phasing of a construction project developed by the airport operator, or developed by the airport operator's consultant and approved by the airport operator. It is included in the invitation for bids and becomes part of the project specifications.
CTAF	Common Traffic Advisory Frequency
Displaced Threshold	A threshold that is located at a point on the runway other than the designated beginning of the runway. The portion of pavement behind a displaced threshold is available for takeoffs in either direction or landing from the opposite direction.
DOT	Department of Transportation
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FOD	Foreign Object Debris/Damage
FSS	Flight Service Station
GA	General Aviation
HAZMAT	Hazardous Materials
НМА	Hot Mix Asphalt
IAP	Instrument Approach Procedures
IFR	Instrument Flight Rules
ILS	Instrument Landing System
LDA	Landing Distance Available
LOC	Localizer antenna array
Movement Area	The runways, taxiways, and other areas of an airport that are used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading aprons and aircraft parking areas (reference 14 CFR Part 139).
MSDS	Material Safety Data Sheet
MUTCD	Manual on Uniform Traffic Control Devices
NAVAID	Navigation Aid
NAVAID Critical Area	An area of defined shape and size associated with a NAVAID that must remain clear and graded to avoid interference with the electronic signal.
Non-Movement Area	The area inside the airport security fence exclusive of the Movement Area. It is important to note that the non-movement area includes pavement traversed by aircraft.

Term	Definition
NOTAM	Notices to Airmen
Obstruction	Any object/obstacle exceeding the obstruction standards specified by 14 CFR Part 77, subpart C.
OCC	Operations Control Center
OE / AAA	Obstruction Evaluation / Airport Airspace Analysis
OFA	Object Free Area. An area on the ground centered on the runway, taxiway, or taxi lane centerline provided to enhance safety of aircraft operations by having the area free of objects except for those objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes. (See <u>AC 150/5300-13</u> for additional guidance on OFA standards and wingtip clearance criteria.)
OFZ	Obstacle Free Zone. The airspace below 150 ft (45 m) above the established airport elevation and along the runway and extended runway centerline that is required to be clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance protection for aircraft landing or taking off from the runway and for missed approaches. The OFZ is subdivided as follows: Runway OFZ, Inner Approach OFZ, Inner Transitional OFZ, and Precision OFZ. Refer to <u>AC 150/5300-13</u> for guidance on OFZ.
OSHA	Occupational Safety and Health Administration
OTS	Out of Service
P&R	Planning and Requirements Group
NPI	NAS Planning & Integration
PAPI	Precision Approach Path Indicator
PFC	Passenger Facility Charge
PLASI	Pulse Light Approach Slope Indicator
Project Proposal Summary	A clear and concise description of the proposed project or change that is the object of Safety Risk Management.
RA	Reimbursable Agreement
RE	Resident Engineer
REIL	Runway End Identifier Lights
RNAV	Area Navigation
ROFA	Runway Object Free Area
RSA	Runway Safety Area. A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway, in accordance with <u>AC 150/5300-13</u> .
SDS	Safety Data Sheet
SIDA	Security Identification Display Area
SMS	Safety Management System

Term	Definition
SPCD	Safety Plan Compliance Document. Details developed and submitted by a contractor to the airport operator for approval providing details on how the performance of a construction project will comply with the CSPP.
SRM	Safety Risk Management
SSC	System Support Center
Taxiway Safety Area	A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway, in accordance with <u>AC 150/5300-13</u> .
TDG	Taxiway Design Group
Temporary	Any condition that is not intended to be permanent.
Temporary Runway End	The beginning of that portion of the runway available for landing and taking off in one direction, and for landing in the other direction. Note the difference from a displaced threshold.
Threshold	The beginning of that portion of the runway available for landing. In some instances, the landing threshold may be displaced.
TODA	Takeoff Distance Available
TOFA	Taxiway Object Free Area
TORA	Takeoff Run Available. The length of the runway less any length of runway unavailable and/or unsuitable for takeoff run computations. See <u>AC 150/5300-13</u> for guidance on declared distances.
TSA	Taxiway Safety Area, or Transportation Security Administration
UNICOM	A radio communications system of a type used at small airports.
VASI	Visual Approach Slope Indicator
VGSI	Visual Glide Slope Indicator. A device that provides a visual glide slope indicator to landing pilots. These systems include precision approach path indicator (PAPI), visual approach slope indicator (VASI), and pulse light approach slope indicator (PLASI).
VFR	Visual Flight Rules
VOR	Very High Frequency Omnidirectional Radio Range
VPD	Vehicle / Pedestrian Deviation

APPENDIX C. SAFETY AND PHASING PLAN CHECKLIST

This appendix is keyed to <u>Chapter 2</u>. In the electronic version of this AC, clicking on the paragraph designation in the Reference column will access the applicable paragraph. There may be instances where the CSPP requires provisions that are not covered by the list in this appendix.

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

Coordination	Reference	Addressed?			Remarks			
		Yes	No	NA				
General Considerations								
Requirements for predesign, prebid, and preconstruction conferences to introduce the subject of airport operational safety during construction are specified.	<u>2.5</u>							
Operational safety is a standing agenda item for construction progress meetings.	<u>2.5</u>							
Scheduling of the construction phases is properly addressed.	<u>2.6</u>							
Any formal agreements are established.	<u>2.5.3</u>							
Areas and Operation	ons Affected by C	onstruction A	ctivity					
Drawings showing affected areas are included.	<u>2.7.1</u>							
Closed or partially closed runways, taxiways, and aprons are depicted on drawings.	<u>2.7.1.1</u>							
Access routes used by ARFF vehicles affected by the project are addressed.	<u>2.7.1.2</u>							
Access routes used by airport and airline support vehicles affected by the project are addressed.	2.7.1.3							
Underground utilities, including water supplies for firefighting and drainage.	2.7.1.4							

Table C-1. CSPP Checklist

Coordination	Reference	Addressed?		Remarks	
		Yes	No	NA	
Approach/departure surfaces affected by heights of temporary objects are addressed.	<u>2.7.1.5</u>				
Construction areas, storage areas, and access routes near runways, taxiways, aprons, or helipads are properly depicted on drawings.	<u>2.7.1</u>				
Temporary changes to taxi operations are addressed.	<u>2.7.2.1</u>				
Detours for ARFF and other airport vehicles are identified.	<u>2.7.2.2</u>				
Maintenance of essential utilities and underground infrastructure is addressed.	<u>2.7.2.3</u>				
Temporary changes to air traffic control procedures are addressed.	2.7.2.4				
	NAVAIDs				
Critical areas for NAVAIDs are depicted on drawings.	<u>2.8</u>				
Effects of construction activity on the performance of NAVAIDS, including unanticipated power outages, are addressed.	<u>2.8</u>				
Protection of NAVAID facilities is addressed.	<u>2.8</u>				
The required distance and direction from each NAVAID to any construction activity is depicted on drawings.	<u>2.8</u>				
Procedures for coordination with FAA ATO/Technical Operations, including identification of points of contact, are included.	<u>2.8, 2.13.1,</u> <u>2.13.5.3.1,</u> <u>2.18.1</u>				
	Contractor Acces	S			
The CSPP addresses areas to which contractor will have access and how	<u>2.9</u>				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
the areas will be accessed.					
The application of 49 CFR Part 1542 Airport Security, where appropriate, is addressed.	<u>2.9</u>				
The location of stockpiled construction materials is depicted on drawings.	<u>2.9.1</u>				
The requirement for stockpiles in the ROFA to be approved by FAA is included.	<u>2.9.1</u>				
Requirements for proper stockpiling of materials are included.	<u>2.9.1</u>				
Construction site parking is addressed.	<u>2.9.2.1</u>				
Construction equipment parking is addressed.	<u>2.9.2.2</u>				
Access and haul roads are addressed.	<u>2.9.2.3</u>				
A requirement for marking and lighting of vehicles to comply with <u>AC 150/5210-5</u> , <i>Painting, Marking</i> <i>and Lighting of Vehicles Used on an</i> <i>Airport</i> , is included.	<u>2.9.2.4</u>				
Proper vehicle operations, including requirements for escorts, are described.	<u>2.9.2.5, 2.9.2.6</u>				
Training requirements for vehicle drivers are addressed.	<u>2.9.2.7</u>				
Two-way radio communications procedures are described.	<u>2.9.2.9</u>				
Maintenance of the secured area of the airport is addressed.	<u>2.9.2.10</u>				
W	ildlife Manageme	ent			
The airport operator's wildlife management procedures are addressed.	<u>2.10</u>				

Coordination	Reference	Addressed?			Remarks
		Yes	No	NA	
Foreign	Dbject Debris Ma	nagement			
The airport operator's FOD management procedures are addressed.	<u>2.11</u>				
Hazardo	ous Materials Mai	nagement			
The airport operator's hazardous materials management procedures are addressed.	<u>2.12</u>				
Notificatio	on of Construction	n Activities			
Procedures for the immediate notification of airport user and local FAA of any conditions adversely affecting the operational safety of the airport are detailed.	<u>2.13</u>				
Maintenance of a list by the airport operator of the responsible representatives/points of contact for all involved parties and procedures for contacting them 24 hours a day, seven days a week is specified.	<u>2.13.1</u>				
A list of local ATO/Technical Operations personnel is included.	<u>2.13.1</u>				
A list of ATCT managers on duty is included.	<u>2.13.1</u>				
A list of authorized representatives to the OCC is included.	<u>2.13.2</u>				
Procedures for coordinating, issuing, maintaining and cancelling by the airport operator of NOTAMS about airport conditions resulting from construction are included.	<u>2.8, 2.13.2,</u> <u>2.18.3.3.9</u>				
Provision of information on closed or hazardous conditions on airport movement areas by the airport operator to the OCC is specified.	2.13.2				
Emergency notification procedures for medical, fire fighting, and police	2.13.3				

Coordination	Reference	Addressed?		Remarks	
		Yes	No	NA	
response are addressed.					
Coordination with ARFF personnel for non-emergency issues is addressed.	<u>2.13.4</u>				
Notification to the FAA under 14 CFR parts 77 and 157 is addressed.	<u>2.13.5</u>				
Reimbursable agreements for flight checks and/or design and construction for FAA owned NAVAIDs are addressed.	2.13.5.3.2				
Ins	pection Requirem	ients	-		
Daily and interim inspections by both the airport operator and contractor are specified.	<u>2.14.1, 2.14.2</u>				
Final inspections at certificated airports are specified when required.	<u>2.14.3</u>				
U	nderground Utilit	ties			
Procedures for protecting existing underground facilities in excavation areas are described.	<u>2.15</u>				
	Penalties				
Penalty provisions for noncompliance with airport rules and regulations and the safety plans are detailed.	<u>2.16</u>				
	Special Condition	IS	-		
Any special conditions that affect the operation of the airport or require the activation of any special procedures are addressed.	<u>2.17</u>				
Runway and Taxiway Visual Aid	s - Marking, Ligl	nting, Signs, a	nd Visu	ial NA	VAIDs
The proper securing of temporary airport markings, lighting, signs, and visual NAVAIDs is addressed.	<u>2.18.1</u>				
Frangibility of airport markings, lighting, signs, and visual NAVAIDs is specified.	<u>2.18.1, 2.18.3,</u> <u>2.18.4.2,</u> <u>2.20.2.4</u>				

Coordination	Reference	Addressed?		Remarks		
		Yes	No	NA		
The requirement for markings to be in compliance with <u>AC 150/5340-1</u> , <i>Standards for Airport Markings</i> , is specified.	<u>2.18.2</u>					
Detailed specifications for materials and methods for temporary markings are provided.	<u>2.18.2</u>					
The requirement for lighting to conform to <u>AC 150/5340-30</u> , <i>Design</i> and Installation Details for Airport Visual Aids; <u>AC 150/5345-50</u> , Specification for Portable Runway and Taxiway Lights; and <u>AC</u> <u>150/5345-53</u> , Airport Lighting Certification Program, is specified.	<u>2.18.3</u>					
The use of a lighted X is specified where appropriate.	<u>2.18.2.1.2,</u> <u>2.18.3.2</u>					
The requirement for signs to conform to <u>AC 150/5345-44</u> , Specification for Runway and Taxiway Signs; AC 50/5340-18, Standards for Airport Sign Systems; and <u>AC 150/5345-53</u> , Airport Lighting Certification Program, is specified.	<u>2.18.4</u>					
Marking a	and Signs For Acc	cess Routes				
The CSPP specifies that pavement markings and signs intended for construction personnel should conform to <u>AC 150/5340-18</u> and, to the extent practicable, with the MUTCD and/or State highway specifications.	<u>2.18.4.2</u>					
Hazard Marking and Lighting						
Prominent, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel, or vehicles are specified.	<u>2.20.1</u>					

Coordination	Reference	Addressed?		Remarks	
		Yes	No	NA	
Hazard marking and lighting are specified to identify open manholes, small areas under repair, stockpiled material, and waste areas.	<u>2.20.1</u>				
The CSPP considers less obvious construction-related hazards.	<u>2.20.1</u>				
Equipment that poses the least danger to aircraft but is sturdy enough to remain in place when subjected to typical winds, prop wash and jet blast is specified.	<u>2.20.2.1</u>				
The spacing of barricades is specified such that a breach is physically prevented barring a deliberate act.	<u>2.20.2.1</u>				
Red lights meeting the luminance requirements of the State Highway Department are specified.	<u>2.20.2.2</u>				
Barricades, temporary markers, and other objects placed and left in areas adjacent to any open runway, taxiway, taxi lane, or apron are specified to be as low as possible to the ground, and no more than 18 inch high.	<u>2.20.2.3</u>				
Barricades are specified to indicate construction locations in which no part of an aircraft may enter.	<u>2.20.2.3</u>				
Highly reflective barriers with lights are specified to barricade taxiways leading to closed runways.	<u>2.20.2.5</u>				
Markings for temporary closures are specified.	<u>2.20.2.5</u>				
The provision of a contractor's representative on call 24 hours a day for emergency maintenance of airport hazard lighting and barricades is specified.	2.20.2.7				

Coordination	Reference	Addressed?		Remarks	
		Yes	No	NA	
Work Zone Lig	hting for Nighttin	ne Constructio	on		
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.	2.21				
Protection of R	unway and Taxiw	yay Safety Are	as		ſ
The CSPP clearly states that no construction may occur within a safety area while the associated runway or taxiway is open for aircraft operations.	<u>2.22.1.1</u> , <u>2.22.3.1</u>				
The CSPP specifies that the airport operator coordinates the adjustment of RSA or TSA dimensions with the ATCT and the appropriate FAA Airports Regional or District Office and issues a local NOTAM.	<u>2.22.1.2,</u> <u>2.22.3.2</u>				
Procedures for ensuring adequate distance for protection from blasting operations, if required by operational considerations, are detailed.	<u>2.22.3.3</u>				
The CSPP specifies that open trenches or excavations are not permitted within a safety area while the associated runway or taxiway is open, subject to approved exceptions.	<u>2.22.1.4</u>				
Appropriate covering of excavations in the RSA or TSA that cannot be backfilled before the associated runway or taxiway is open is detailed.	<u>2.22.1.4</u>				
The CSPP includes provisions for prominent marking of open trenches and excavations at the construction site.	2.22.1.4				
Grading and soil erosion control to maintain RSA/TSA standards are	<u>2.22.3.5</u>				

Coordination	Reference	Addressed?		Remarks	
		Yes	No	NA	
addressed.					
The CSPP specifies that equipment is to be removed from the ROFA when not in use.	<u>2.22.2</u>				
The CSPP clearly states that no construction may occur within a taxiway safety area while the taxiway is open for aircraft operations.	2.22.3				
Appropriate details are specified for any construction work to be accomplished in a taxiway object free area.	<u>2.22.4</u>				
Measures to ensure that personnel, material, and/or equipment do not penetrate the OFZ or threshold siting surfaces while the runway is open for aircraft operations are included.	<u>2.22.4.3.6</u>				
Provisions for protection of runway approach/departure areas and clearways are included.	2.22.6				
Other Li	mitations on Con	struction			
The CSPP prohibits the use of open flame welding or torches unless adequate fire safety precautions are provided and the airport operator has approved their use.	<u>2.23.1.2</u>				
The CSPP prohibits the use of electrical blasting caps on or within 1,000 ft (300 m) of the airport property.	<u>2.23.1.3</u>				

APPENDIX D. CONSTRUCTION PROJECT DAILY SAFETY INSPECTION CHECKLIST

The situations identified below are potentially hazardous conditions that may occur during airport construction projects. Safety area encroachments, unauthorized and improper ground vehicle operations, and unmarked or uncovered holes and trenches near aircraft operating surfaces pose the most prevalent threats to airport operational safety during airport construction projects. The list below is one tool that the airport operator or contractor may use to aid in identifying and correcting potentially hazardous conditions. It should be customized as appropriate for each project including information such as the date, time and name of the person conducting the inspection.

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		

Table D-1. Potentially Hazardous Conditions

Item	Action Required (Describe)	No Action Required (Check)
approach zones.		
Improperly positioned or malfunctioning lights or unlighted airport hazards, such as holes or excavations, on any apron, open taxiway, or open taxi lane or in a related safety, approach, or departure area.		
Obstacles, loose pavement, trash, and other debris on or near AOA. Construction debris (gravel, sand, mud, paving materials) on airport pavements may result in aircraft propeller, turbine engine, or tire damage. Also, loose materials may blow about, potentially causing personal injury or equipment damage.		
Inappropriate or poorly maintained fencing during construction intended to deter human and animal intrusions into the AOA. Fencing and other markings that are inadequate to separate construction areas from open AOA create aviation hazards.		
Improper or inadequate marking or lighting of runways (especially thresholds that have been displaced or runways that have been closed) and taxiways that could cause pilot confusion and provide a potential for a runway incursion. Inadequate or improper methods of marking, barricading, and lighting of temporarily closed portions of AOA create aviation hazards.		
Wildlife attractants — such as trash (food scraps not collected from construction personnel activity), grass seeds, tall grass, or standing water — on or near airports.		
Obliterated or faded temporary markings on active operational areas.		
Misleading or malfunctioning obstruction lights. Unlighted or unmarked obstructions in the approach to any open runway pose aviation hazards.		

Item	Action Required (Describe)	No Action Required (Check)
Failure to issue, update, or cancel NOTAMs about airport or runway closures or other construction related airport conditions.		
Failure to mark and identify utilities or power cables. Damage to utilities and power cables during construction activity can result in the loss of runway / taxiway lighting; loss of navigation, visual, or approach aids; disruption of weather reporting services; and/or loss of communications.		
Restrictions on ARFF access from fire stations to the runway / taxiway system or airport buildings.		
Lack of radio communications with construction vehicles in airport movement areas.		
Objects, regardless of whether they are marked or flagged, or activities anywhere on or near an airport that could be distracting, confusing, or alarming to pilots during aircraft operations.		
Water, snow, dirt, debris, or other contaminants that temporarily obscure or derogate the visibility of runway/taxiway marking, lighting, and pavement edges. Any condition or factor that obscures or diminishes the visibility of areas under construction.		
Spillage from vehicles (gasoline, diesel fuel, oil) on active pavement areas, such as runways, taxiways, aprons, and airport roadways.		
Failure to maintain drainage system integrity during construction (for example, no temporary drainage provided when working on a drainage system).		

Item	Action Required (Describe)	No Action Required (Check)
Failure to provide for proper electrical lockout and tagging procedures. At larger airports with multiple maintenance shifts/workers, construction contractors should make provisions for coordinating work on circuits.		
Failure to control dust. Consider limiting the amount of area from which the contractor is allowed to strip turf.		
Exposed wiring that creates an electrocution or fire ignition hazard. Identify and secure wiring, and place it in conduit or bury it.		
Site burning, which can cause possible obscuration.		
Construction work taking place outside of designated work areas and out of phase.		

APPENDIX E. SAMPLE OPERATIONAL EFFECTS TABLE

E.1 **Project Description.**

Runway 15-33 is currently 7820 feet long, with a 500 foot stopway on the north end. This project will remove the stopway and extend the runway 1000 feet to the north and 500 feet to the south. Finally, the existing portion of the runway will be repaved. The runway 33 glide slope will be relocated. The new runway 33 localizer has already been installed by FAA Technical Operations and only needs to be switched on. Runway 15 is currently served only by a localizer, which will remain in operation as it will be beyond the future RSA. Appropriate NOTAMS will be issued throughout the project.

E.1.1 During Phase I, the runway 15 threshold will be displaced 1000 feet to keep construction equipment below the approach surface. The start of runway 15 takeoff and the departure end of runway 33 will also be moved 500 feet to protect workers from jet blast. Declared distances for runway 33 will be adjusted to provide the required RSA and applicable departure surface. Excavation near Taxiway G will require its ADG to be reduced from IV to III. See Figure E-1.



Figure E-1. Phase I Example

- **Note 1:** Where hold signs are installed on both sides of a taxiway, install the TORA sign on the left side of the taxiway before the final turn to the runway intersection.
- Note 2: Based on the declared distances for Runway 33 departures, the maximum equipment height in the construction area is 12.5 feet (500/40 = 12.5).

E.2 During Phase II, the runway 33 threshold will be displaced 1000 feet to keep construction equipment below the approach surface. The start of runway 33 takeoff and the departure end of runway 15 will also be moved 500 feet to protect workers from jet blast. Declared distances for runway 15 will be adjusted to provide the required RSA and applicable departure surface. See Figure E-2.



Figure E-2. Phase II Example

- **Note 1:** Where hold signs are installed on both sides of a taxiway, install the TORA sign on the left side of the taxiway before the final turn to the runway intersection.
- Note 2: Based on the declared distances for Runway 15 departures, the maximum equipment height in the construction area is 12.5 feet (500/40 = 12.5).

E.3 During Phase III, the existing portion of the runway will be repaved with Hot Mix Asphalt (HMA) and the runway 33 glide slope will be relocated. Construction will be accomplished between the hours of 8:00 pm and 5:00 am, during which the runway will be closed to operations.



Figure E-3. Phase III Example

Project		Runway 15-33 I	Extension and Repa	aving
Phase	Normal (Existing)	Phase I: Extend Runway 15 End	Phase II: Extend Runway 33 End	Phase III: Repave Runway
Scope of Work	N/A	Extend Runway 15-33 1,000 ft on north end with Hot Mix Asphaltic Concrete (HMA).	Extend Runway 15-33 500 ft on south end with Hot Mix Asphaltic Concrete (HMA).	Repave existing runway with HMA Relocate Runway 33 Glide Slope
Effects of Construction Operations	N/A	Existing North 500 ft closed	Existing South 500 ft closed	Runway closed between 8:00 pm and 5:00 am Edge lighting out of service
Construction Phase	N/A	Phase I (Anticipated)	Phase II (Anticipated)	Phase III (Anticipated)
Runway 15 Average Aircraft Operations	Carrier: 52 /day GA: 26 /day Military: 11 /day	Carrier: 40 /day GA: 26 /day Military: 0 /day	Carrier: 45 /day GA: 26 /day Military: 5 /day	Carrier: 45 / day GA: 20 / day Military: 0 /day
Runway 33 Average Aircraft Operations	Carrier: 40 /day GA: 18 /day Military: 10 /day	Carrier: 30 /day GA: 18 /day Military: 0 /day	Carrier: 25 /day GA: 18 /day Military: 5 /day	Carrier: 20 /day GA: 5 /day Military: 0 /day
Runway 15-33 Aircraft Category	C-IV	C-IV	C-IV	C-IV
Runway 15 Approach Visibility Minimums	1 mile	1 mile	1 mile	1 mile
Runway 33 Approach Visibility Minimums	³ ⁄4 mile	³ ⁄4 mile	³ ⁄4 mile	1 mile

Table E-1. Operational Effects Table

Note: Proper coordination with Flight Procedures group is necessary to maintain instrument approach procedures during construction.

Proje	ct	Runway 15-33 Extension and Repaving			ving
Phas	e	Normal (Existing)	Phase I: Extend Runway 15 End	Phase II: Extend Runway 33 End	Phase III: Repave Runway
Runway 15	TORA	7,820	7,320	8,320	9,320
Declared Distances	TODA	7,820	7,320	8,320	9,320
	ASDA	7,820	7,320	7,820	9,320
	LDA	7,820	6,820	7,820	9,320
Runway 33	TORA	7,820	7,320	8,320	9,320
Declared Distances	TODA	7,820	7,320	8,320	9,320
	ASDA	8,320	6,820	8,320	9,320
	LDA	7,820	6,820	7,820	9,320
Runwa	y 15	LOC only	LOC only	LOC only	LOC only
Approach		RNAV	RNAV	RNAV	RNAV
Proced	ures	VOR	VOR	VOR	VOR
Runwa	y 33	ILS	ILS	ILS	LOC only
Appro	ach	RNAV	RNAV	RNAV	RNAV
Proced	ures	VOR	VOR	VOR	VOR
Runwa NAVA	y 15 IDs	LOC	LOC	LOC	LOC
Runwa NAVA	y 33 IDs	ILS, MALSR	ILS, MALSR	ILS, MALSR	LOC, MALSR
Taxiway (G ADG	IV	III	IV	IV
Taxiway (G TDG	4	4	4	4
ATCT (hou	rs open)	24 hours	24 hours	24 hours	0500 - 2000
ARFF I	ndex	D	D	D	D

Project	Runway 15-33 Extension and Repaving			
Phase	Normal (Existing)	Phase I: Extend Runway 15 End	Phase II: Extend Runway 33 End	Phase III: Repave Runway
Special Conditions	Air National Guard (ANG) military operations	All military aircraft relocated to alternate ANG Base	Some large military aircraft relocated to alternate ANG Base	All military aircraft relocated to alternate ANG Base
Information for NOTAMs		Refer above for applicable declared distances. Taxiway G limited to 118 ft wingspan	Refer above for applicable declared distances.	Refer above for applicable declared distances. Airport closed 2000 – 0500. Runway 15 glide slope OTS.

Note: This table is one example. It may be advantageous to develop a separate table for each project phase and/or to address the operational status of the associated NAVAIDs per construction phase.

Complete the following chart for each phase to determine the area that must be protected along the runway and taxiway edges:

Table E-2. Runway	y and Taxiwa	ay Edge Protection
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Runway/Taxiway	Aircraft Approach Category* A, B, C, or D	Airplane Design Group* I, II, III, or IV	Safety Area Width in Feet Divided by 2*

*See <u>AC 150/5300-13</u> to complete the chart for a specific runway/taxiway.

Complete the following chart for each phase to determine the area that must be protected before the runway threshold:

Runway End Number	Airplane Design Group* I, II, III, or IV	Aircraft Approach Category* A, B, C, or D	Minimum Safety Area Prior to the Threshold*	Minimum Distance to Threshold Based on Required Approach Slope*	
			ft	ft	: 1
			ft	ft	: 1
			ft	ft	: 1
			ft	ft	:1

Table E-3. Protection Prior to Runway Threshold

*See <u>AC 150/5300-13</u> to complete the chart for a specific runway.

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APPENDIX F. ORANGE CONSTRUCTION SIGNS

Figure F-1. Approved Sign Legends

CONSTRUCTION AHEAD

CONSTRUCTION ON RAMP

RWY 4L TAKEOFF RUN AVAILABLE 9,780 FT


Figure F-2. Orange Construction Sign Example 1

Note: For proper placement of signs, refer to EB 93.



Figure F-3. Orange Construction Sign Example 2

Note: For proper placement of signs, refer to EB 93.

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Advisory Circular Feedback

If you find an error in this AC, have recommendations for improving it, or have suggestions for new items/subjects to be added, you may let us know by (1) mailing this form to Manager, Airport Engineering Division, Federal Aviation Administration ATTN: AAS-100, 800 Independence Avenue SW, Washington DC 20591 or (2) faxing it to the attention of the Office of Airport Safety and Standards at (202) 267-5383.

Subj	ect: AC 150/5370-2G	Date:	
Plea	ese check all appropriate line	items:	
	An error (procedural or type	ographical) has been noted in paragraph	n on page
	Recommend paragraph	on page	_ be changed as follows:
	In a future change to this A (Briefly describe what you way	C, please cover the following subject: <i>int added.)</i>	
	Other comments:		
	I would like to discuss the a	above. Please contact me at (phone nun	nber, email address).
Subr	mitted by:	Date:	

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Appendix D. CSPP Drawings



A CONTRACT SYSTEM	MILLIM P. HOBY APPORT	ACORE DOWNERS DORAGE DOWNERS DOWNERS DOWNERS DOWNERS DOWNERS TRAKE FL. FIRM 7:200 TRAKE FL. FIRM 7:200	REVISIONS 0. DESCRIPTION DATE BY			T:	LES M	275 PR0 NOLITION 201 107	VIXAT (7-35 DEI N - GENE 1 OF 2)	JAAUNATE Th YAWNUS IAJ9 ƏNIRA)	/Hd ∃ ∹NON		ROJECT MGR: RGS RESUMER: RGS REWIN DY: RGS HECKED BY: JNP	CALE: AS SHOWN ATE: AUGUST 26, 2010 PRELIMINARY	THESE DOCUMENTS REREASED FOR DESIGN REVIEW ONLY THEY WERE PAREPARED BY OR UNDER THE SUBFERVISION OF ROBERT SCHMIDT P.E. 02314	PPROVED BY: DATE:	
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Appendix E. Safety and Security Notes

GENERAL CONTRACT NOTES

- 1. HAUL ROUTES: LOCATION OF HAUL ROUTES ON THE AIRPORT SITE SHALL BE AS SPECIFIED ON THE PLANS OR AS APPROVED BY THE OWNER'S REPRESENTATIVE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE OFF-SITE HAUL ROUTES (STATE HIGHWAYS, COUNTY ROADS OR CITY STREETS) WITH THE APPROPRIATE OWNER WHO HAS JURISDICTION OVER THE AFFECTED ROUTE AND OBTAIN HAUL PERMITS NECESSARY AS REQUIRED BY THE LOCAL JURISDICTION. ON-SITE HAUL ROUTES SHALL BE MAINTAINED BY THE CONTRACTOR AND SHALL BE RESTORED TO THEIR ORIGINAL CONDITION UPON COMPLETION OF BEING USED AS A HAUL ROUTE. THE PRE- AND POST-CONSTRUCTION CONDITION OF ON-SITE HAUL ROUTES SHALL BE JOINTLY INSPECTED AND DETERMINED BY THE CONTRACTOR AND THE PROJECT RPR. FENCING, DRAINAGE, GRADING AND OTHER MISCELLANEOUS CONSTRUCTION REQUIRED TO CONSTRUCT TEMPORARY HAUL ROUTES OR ACCESS POINTS ON THE AIRPORT WILL BE THE CONTRACTOR'S TOTAL RESPONSIBILITY AND SHALL BE APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO THE WORK. ALL ON-SITE FAA ACCESS ROADS TO FAA FACILITIES SHALL REMAIN OPEN AND MAINTAINED AT ALL TIMES. PHOTOGRAPHS AND A VIDEO OF THE HAUL ROUTES SPECIFIED IN THE PLANS MUST BE PROVIDED BY THE CONTRACTOR BEFORE AND AFTER CONSTRUCTION TO THE OWNER'S REPRESENTATIVE. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO HAUL ROUTES RESULTING FROM CONSTRUCTION TRAFFIC AS DETERMINED BY THE PROJECT RPR. ANY SERVICE, ACCESS OR FAA ROADWAY CROSSED BY CONSTRUCTION TRAFFIC SHALL BE PROTECTED AGAINST DAMAGE AND ALL DAMAGE OCCURRING WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE WITH NO ADDITIONAL COMPENSATION OR CONTRACT TIME. ANY PAVEMENTS DAMAGED BY THE CONSTRUCTION EQUIPMENT SHALL BE REMOVED AND REPLACED TO AT LEAST 10 FEET ON EACH SIDE OF THE MOST EXTREME OUTER TIRE MARKS TO ENSURE ALL PAVEMENT TRAVERSED BY THE CONSTRUCTION EQUIPMENT IS REMOVED AND REPLACED.
- 2. WASTE DISPOSAL & BORROW AREAS: CONCRETE AND ASPHALT RUBBLE AND EXCAVATION WASTE MATERIAL REMOVED FROM THE CONSTRUCTION AREA SHALL BE LEGALLY DISPOSED OF OFF THE AIRPORT PROPERTY. NO MATERIAL SHALL BE WASTED ON THE AIRPORT SITE UNLESS APPROVED BY THE AIRPORT. ANY ON-AIRPORT APPROVED WASTE AND DISPOSAL AREA SHALL BE SEEDED AND RESTORED IN A SMOOTH, GRADED AND DRAINABLE CONDITION AT NO ADDITIONAL COST TO THE OWNER. PRIOR TO DEMOLITION AND REMOVAL WORK BEGINS, THE CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION FROM THE SITE WHICH THEY PLAN TO DUMP WASTE MATERIAL AND PROVIDE IT TO THE AIRPORT.
- 3. CONTRACTOR UTILITIES: STAGING AREAS DO NOT HAVE UTIUTIES. ANY UTILITIES REQUIRED BY THE CONTRACTOR SHALL BE COORDINATED WITH THE UTILITY COMPANIES AND SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
- 4. PROTECTION AND REPAIR OF DAMAGE TO EXISTING CABLES: ALL UNDERGROUND CABLE SHALL BE PROTECTED AND DAMAGES REPAIRED EXPEDITIOUSLY AT THE CONTRACTOR'S EXPENSE AT NO ADDITIONAL COST TO THE OWNER.
- 5. CONSTRUCTION LIMITS: ALL CONTRACTOR VEHICLES AND TRAFFIC SHALL REMAIN WITHIN THE DESIGNATED CONSTRUCTION LIMITS OR HAUL ROUTES. ABSOLUTELY NO CONTRACTOR VEHICLES WILL BE ALLOWED ON OTHER ACTIVE AIRFIELD OPERATIONS AREAS. FLAGGERS SHALL BE PROVIDED

AT ALL TIMES WHENEVER CONSTRUCTION ACCESS IS REQUIRED ACROSS AN ACTIVE RUNWAY OR TAXIWAY.

- 6. PERMITS: IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN AND PAY FOR ALL APPLICABLE PERMITS FOR CONSTRUCTION AND EQUIPMENT.
- 7. COORDINATION OF CONSTRUCTION ACTIVITIES: THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MAINTAINING CONSTANT COORDINATION BETWEEN THE SUBCONTRACTORS AND THE OWNER'S REPRESENTATIVE. ALL CONSTRUCTION ACTIVITIES PLANNED BY THE CONTRACTOR SHALL BE REVIEWED AND APPROVED BY THE RPR.
- 8. EXCESS CONSTRUCTION MATERIALS: ALL ON SITE EXCESS AND/OR STORED MATERIAL SHALL BE REMOVED FROM AIRPORT PROPERTY AND DISPOSED OF.
- 9. UTILITIES: IT WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE AND PROTECT ANY PUBLIC UTILITIES THAT ARE IN OR ADJACENT TO THE WORK AREA. THE UTILITIES WILL BE FLAGGED ONE TIME BY THE VARIOUS UTILITY COMPANIES. THESE FLAGS SHALL BE PROTECTED AND MAINTAINED BY THE CONTRACTOR AT ALL TIMES. IF FLAGS ARE LOST OR REMOVED BY THE CONTRACTOR, THEY WILL BE FLAGGED AGAIN AT THE CONTRACTOR'S EXPENSE. ALL UTILITIES SHALL BE PROTECTED, AND DAMAGES REPAIRED EXPEDITIOUSLY, AT THE CONTRACTOR'S EXPENSE AT NO ADDITIONAL COST TO THE OWNER.
- 10. EMPLOYEE PARKING: NO CONTRACTOR EMPLOYEE VEHICLES WILL BE ALLOWED WITHIN THE AOA AREA. CONTRACTOR EMPLOYEE PARKING SHALL BE IN THE AREAS DESIGNATED ON THE PLANS OR IN ANOTHER AREA DESIGNATED BY AIRPORT PERSONNEL
- 11. TEMPORARY DRAINAGE: THROUGHOUT THE COURSE OF CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE AND INSTALL ANY DRAINAGE PROVISIONS NECESSARY TO MAINTAIN POSITIVE (CONTINUOUS AND FLOWING) DRAINAGE AND NOT RESTRICT THE EXISTING DRAINAGE FLOW PATTERN. AT END OF PROJECT CONTRACTOR SHALL RESTORE ALL GRADES, PER DESIGN PLANS, AND REMOVE ALL TEMPORARY DRAINAGE PIPES AND FACIUTIES AT NO ADDITIONAL COST TO OWNER.
- 12. MATERIAL STOCKPILES: UNLESS OTHERWISE ALLOWED BY AIRPORT MANAGEMENT, NO MATERIAL STOCKPILES MAY REMAIN AFTER THE PROJECT IS COMPLETE.

AIRPORT SAFETY REQUIREMENTS

- 1. THE CONTRACTOR SHALL ACQUAINT HIS SUPERVISORS AND EMPLOYEES WITH THE AIRPORT ACTIVITY AND OPERATIONS THAT ARE INHERENT TO THIS ACTIVE AIR CARRIER AIRPORT AND SHALL CONDUCT THE CONSTRUCTION ACTIVITIES TO CONFORM TO ALL ROUTINE AND EMERGENCY AIR TRAFFIC REQUIREMENTS AND GUIDELINES ON SAFETY AS SPECIFIED HEREIN.
- 2. ALL CONTRACTOR VEHICLES THAT ARE AUTHORIZED TO OPERATE ON THE AIRPORT IN THE ACTIVE AIRPORT OPERATIONS AREA (AOA) SHALL DISPLAY IN FULL VIEW A FLASHING AMBER (YELLOW) DOME-TYPE LIGHT, AND/OR ABOVE THE VEHICLE, A 3' X 3' OR LARGER, ORANGE AND WHITE CHECKERBOARD FLAG, EACH CHECKERBOARD COLOR BEING 1-FOOT SQUARE, (SEE FAA AC 150/5210-5D) AND ESCORTED UNDER THE CONTROL OF HOU AIRPORT OPERATIONS. CONTRACTOR SHALL BE EQUIPPED WITH (TWO-WAY) AIRCRAFT FREQUENCY RADIO OPERATOR ON THE JOB AT ALL TIMES.

ANY VEHICLE OPERATING IN THE ACTIVE AOA DURING THE HOURS OF DARKNESS SHALL BE EQUIPPED WITH A FLASHING AMBER (YELLOW) DOME LIGHT, MOUNTED ON TOP OF THE VEHICLE AND OF SUCH INTENSITY TO CONFORM TO LOCAL CODES FOR MAINTENANCE AND EMERGENCY VEHICLES.

- 3. ALL NON-RADIO EQUIPPED CONTRACTOR VEHICLES THAT ARE REQUIRED TO OPERATE ON OR ACROSS ACTIVE RUNWAYS, TAXIWAYS, APRONS, CRITICAL NAVAIDS AREAS, AND RUNWAY APPROACH AND PROTECTION ZONES, SHALL DO SO UNDER THE DIRECT CONTROL OF AN HOU OPERATIONS ESCORT VEHICLE. A MAXIMUM OF 4 VEHICLES PER ESCORT WILL BE PERMITTED, TWO HOU OPERATIONS ESCORTS SHALL BE REQUIRED FOR CONVOYS GREATER THAN 4 CONTRACTOR VEHICLES. ALL VEHICLES, OPERATORS, AND RADIO EQUIPMENT SHALL BE APPROVED BY WILLIAM P. HOBBY INTERNATIONAL AIRPORT. ALL VEHICLES SHALL BE MARKED AND LIGHTED AS DESCRIBED IN PARAGRAPH NO. 2 ABOVE.
- 4. NO RUNWAY, TAXIWAY, APRON, OR AIRPORT ROADWAY SHALL BE CLOSED WITHOUT WRITTEN APPROVAL OF AIRPORT OPERATIONS. TO ENABLE NECESSARY "NOTICES TO AIRMEN" (NOTAMS) OR ADVISORIES TO AIRPORT SERVICES OR TENANTS, A MINIMUM OF 72 HOURS WRITTEN NOTICE REQUESTING CLOSING SHALL BE DIRECTED TO AIRPORT OPERATIONS. PLEASE NOTE THAT RUNWAY CLOSURES ARE SERIOUS ISSUES AND SHALL BE MINIMIZED. THE ONLY RUNWAY CLOSURES ALLOWED WILL BE THOSE NOTED IN THE PHASING PLANS.
- 5. ANY CONSTRUCTION ACTIVITY WITHIN 250 FEET OF AN ACTIVE RUNWAY CENTER LINE OR 93 FEET FROM AN ACTIVE TAXIWAY CENTERLINE OR OPEN EXCAVATIONS IN EXCESS OF THREE INCHES DEEP AND SLOPES GREATER THAN 5% WITHIN THE ABOVE AREAS, WILL REQUIRE CLOSURE OF THE AFFECTED RUNWAY OR TAXIWAY, UNLESS OTHERWISE APPROVED BY WILLIAM P. HOBBY AIRPORT (HOU) OPERATIONS. CLOSURE REQUIRES THE SAME PROVISIONS AS PARAGRAPH NO. 4 ABOVE.
- 6. DEBRIS, WASTE, AND LOOSE MATERIAL CAPABLE OF CAUSING DAMAGE TO AIRCRAFT LANDING GEARS, PROPELLERS, OR BEING INGESTED INTO JET ENGINES, SHALL NOT BE ALLOWED ON ACTIVE AIRCRAFT MOVEMENT AREAS. IF THESE MATERIALS ARE OBSERVED TO BE ON ACTIVE AIRCRAFT MOVEMENT AREAS, THEY SHALL BE REMOVED IMMEDIATELY AND/OR CONTINUOUSLY BY THE CONTRACTOR DURING CONSTRUCTION.
- 7. THE CONTRACTOR WILL ARRANGE WITH HOU OPERATIONS FOR INSPECTION PRIOR TO OPENING FOR AIRCRAFT USE OF ANY RUNWAY OR TAXIWAY THAT HAS BEEN CLOSED FOR WORK, ON OR ADJACENT THERETO, OR THAT HAS BEEN USED FOR A CROSSING POINT OR HAUL ROUTE BY THE CONTRACTOR.
- 8. THE CONTRACTOR IS DIRECTED TO COMPLY WITH AND ACQUAINT HIS/HER EMPLOYEES WITH THE FOLLOWING SAFETY GUIDELINES, RELATED MATERIALS, AND FAA ADVISORY CIRCULARS:
 - 150/5200-18C, OR LATEST EDITION, "AIRPORT SAFETY SELF INSPECTION"
 - 150/5210-5D, OR LATEST EDITION, "PAINTING, MARKING & LIGHTING OF VEHICLES USED ON AN AIRPORT"
 - 150/5370-2G, OR LATEST EDITION, "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION"

THESE DOCUMENTS AND RELATED REQUIREMENTS ARE CALLED OUT IN MORE DETAIL IN THE CONTRACT SPECIFICATIONS.

- 9. THE CONTRACTOR IS HEREBY INFORMED THAT THERE ARE INSTALLED ON THE AIRPORT FAA NAVAIDS, NATIONAL WEATHER SERVICE FACILITIES; AIRFIELD LIGHTING SYSTEMS; ELECTRIC CABLES AND CONTROLS RELATING TO SUCH NAVAID AND FACILITIES. SUCH NAVAIDS, NATIONAL WEATHER SERVICE AND OTHER FACILITIES, AND ELECTRIC CABLES MUST BE FULLY PROTECTED DURING THE ENTIRE CONSTRUCTION TIME. WORK UNDER THIS CONTRACT CAN BE ACCOMPLISHED IN THE VICINITY OF THESE FACILITIES AND CABLES ONLY AT APPROVED PERIODS OF TIME.
- 10. APPROVAL IS SUBJECT TO WITHDRAWAL AT ANY TIME BECAUSE OF CHANGE IN THE WEATHER, EMERGENCY CONDITIONS ON THE EXISTING AIRFIELD AREAS, ANTICIPATION OF EMERGENCY CONDITIONS, AND FOR ANY OTHER REASON DETERMINED BY HOU OPERATIONS ACTING UNDER THE ORDERS AND INSTRUCTIONS OF THE OWNER AND THE DESIGNATED FAA REPRESENTATIVE. ANY INSTRUCTIONS TO THE CONTRACTOR TO CLEAR ANY GIVEN AREA, AT ANY TIME, BY HOU OPERATIONS, THE OWNER OR THE FAA CONTROL TOWER (BY RADIO OR OTHER MEANS) SHALL BE IMMEDIATELY EXECUTED. CONSTRUCTION WORK WILL COMMENCE IN THE CLEARED AREA ONLY WHEN ADDITIONAL INSTRUCTIONS ARE ISSUED BY THE ENGINEER.
- 11. POWER AND CONTROL CABLES LEADING TO AND FROM ANY FAA NAVAIDS, NATIONAL WEATHER SERVICE AND OTHER FACILITIES, WILL BE MARKED IN THE FIELD BY THE LOCAL FAA AIRWAY FACILITIES SECTOR PERSONNEL BEFORE ANY WORK IN THEIR GENERAL VICINITY IS STARTED BY THE CONTRACTOR. THEREAFTER, THROUGH THE ENTIRE TIME OF THIS CONSTRUCTION, THE CONTRACTOR SHALL NOT ALLOW ANY CONSTRUCTION EQUIPMENT TO CROSS THESE CABLES WITHOUT FIRST PROTECTING THE CABLE WITH STEEL BOILER PLATE, OR SIMILAR STRUCTURAL DEVICES, ON THREE (3') FEET EITHER SIDE OF THE MARKED CABLE ROUTE. ALL EXCAVATION WITHIN THREE (3') FEET OF EXISTING CABLES SHALL BE ACCOMPLISHED BY NON-INTRUSIVE EXCAVATION ONLY.
- 12. THE CONTRACTOR SHALL PROTECT FAA NAVAID, NATIONAL WEATHER SERVICE AND OTHER FACILITIES, AND CABLES AT ALL TIMES. ANY UNDERGROUND UTILITIES DISCOVERED DURING CONST. NOT SHOWN ON THE PLANS SHALL BE REPORTED TO HOU OPERATIONS IMMEDIATELY.
- 13. THE CONTRACTOR SHALL IMMEDIATELY REPAIR AT HIS OWN EXPENSE, WITH IDENTICAL MATERIAL BY SKILLED WORKMEN, ANY UNDERGROUND CABLES SERVING FAA NAVAIDS, NATIONAL WEATHER SERVICE AND OTHER AIRPORT FACILITIES, WHICH ARE DAMAGED BY HIS WORKMEN, EQUIPMENT, OR WORK. PRIOR APPROVAL OF THE FAA MUST BE OBTAINED FOR THE MATERIALS, WORKMEN, TIME OF DAY OR NIGHT, METHOD OF REPAIRS, AND FOR ANY TEMPORARY OR PERMANENT REPAIRS THE CONTRACTOR PROPOSES TO MAKE TO ANY FAA NAVAID AND FACILITIES DAMAGED BY THE CONTRACTOR. PRIOR APPROVAL OF THE ENGINEER MUST BE OBTAINED FOR THE MATERIALS, WORKMEN, TIME OF DAY OR NIGHT, AND FOR THE METHOD OF REPAIRS FOR ANY TEMPORARY OR PERMANENT REPAIRS THE CONTRACTOR PROPOSES TO MAKE TO ANY OTHER AIRPORT FACILITIES AND CABLES DAMAGED BY THE CONTRACTOR. SHOULD THE REPAIR REQUIRE SPLICING, IT SHALL BE SPLICED AT THE DISCRETION OF THE LOCAL FAA AIRWAY FACILITIES SECTOR MANAGER AS TO WHO SHALL PERFORM THE WORK. WHERE THE FAA PERFORMS THE WORK, IT SHALL BE AT THE CONTRACTOR'S EXPENSE. NO WORK SHALL BE BACKFILLED OR COVERED PRIOR TO APPROVAL BY THE AIRWAY FACILITIES SECTOR MANAGER.
- 14. CONSTRUCTION DURING THE PROJECT MAY BE HALTED AT ANY TIME BY THE OWNER, AND/OR AIRPORT OPERATIONS IF IT IS DETERMINED TO BE IN THE BEST INTEREST OF AIRPORT OPERATIONS OR SAFETY. THE CONTRACTOR MAY BE DIRECTED TO REMOVE EQUIPMENT AND/OR EVACUATE THE SITE IN ORDER TO ENABLE AIRCRAFT OPERATIONS FOR COMMERCIAL OR GENERAL AVIATION.

NECESSARY EXTENSIONS IN CONTRACT TIME WILL BE GRANTED OR A STOP WORK ORDER WILL BE ISSUED DUE TO THESE DELAYS. HOWEVER, THERE WILL BE NO ADJUSTMENTS IN CONTRACT PRICE DUE TO THESE DELAYS. IN ADDITION TO THE ABOVE, THE FOLLOWING SPECIAL REQUIREMENTS WILL APPLY FOR NIGHT CONSTRUCTION:

- A. A DAILY SAFETY AND PROGRESS MEETING SHALL BE HELD BETWEEN HOU OPERATIONS AND THE CONTRACTOR'S SUPERINTENDENT TO DISCUSS REQUIREMENTS FOR THE NEXT NIGHTTIME WORK PERIOD.
- B. THE CONTRACTOR SHALL INCORPORATE A SAFETY PLAN SPECIFIC TO NIGHTTIME CONSTRUCTION OPERATIONS IN THE SAFETY PLAN COMPLIANCE DOCUMENT(SPCD), AS WELL AS A CONTINGENCY PLAN TO ADDRESS CASES OF ABNORMAL FAILURES OR UNEXPECTED DISASTERS USING APPENDIX D OF AC 150/5370-2G AS A GUIDE.
- C. TRUCK HAUL ROUTES ON THE AIRFIELD SHALL BE DELINEATED WITH LIGHTED BARRICADES. OTHER MEANS TO CLEARLY MARK THE ROUTES TO THE WORK SITE MAY BE APPROVED BY THE ENGINEER, AND/OR AIRPORT OPERATIONS.
- 15. THE CONTRACTOR SHALL ALSO SUBMIT A DESTRUCTIVE/INCLEMENT WEATHER PLAN TO SET FORTH GENERAL GUIDANCE AND INFORMATION FOR THE CONTRACTOR TO COORDINATE PREPAREDNESS PLANS WHEN DESTRUCTIVE WEATHER THREATENS THE WILLIAM P. HOBBY INTERNATIONAL AIRPORT ENVIRONMENT.
- 16. ALL COMMUNICATION WITH THE AIRPORT TRAFFIC CONTROL TOWER OR OTHER ELEMENTS OF THE AIRPORT SHALL BE THROUGH HOU AIRPORT OPERATIONS.
- 17. THE CONTRACTOR SHALL INSTALL ALL REQUIRED BARRICADES AT DESIGNATED PLAN LOCATIONS, HAVE ALL ACCESS GATES GUARDED AND LOCKABLE, HAVE ALL EQUIPMENT EITHER FLAGGED OR FITTED WITH FLASHING YELLOW DOME-TYPE LIGHTS ON TOP OF THE VEHICLES. ALL THESE ITEMS SHALL BE INTEGRATED AS A PART OF THE SAFETY PLAN COMPLIANCE DOCUMENT (SPCD). THE CONTRACTOR SHALL INSTALL THE COMPONENTS OF THE PLAN AT THE APPROPRIATE TIMES AS SPECIFIED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL INSPECT EVERY ASPECT OF THE SPCD ON AT LEAST A DAILY BASIS AND ENSURE ALL COMPONENTS ARE FUNCTIONING PROPERLY. HOU OPERATIONS SHALL ALSO INSPECT THE SYSTEM DAILY AND IF ANY DEFICIENCIES ARE NOTED, THE CONTRACTOR SHALL IMMEDIATELY TAKE STEPS TO CORRECT ANY AND ALL DEFICIENCIES. THE CONTRACTOR SHALL VISUALLY CHECK BARRICADE FLASHING LIGHTS ON A DAILY BASIS, 60 MINUTES BEFORE SUNSET FOR PROPER OPERATIONS. CONTRACTOR SHALL IMMEDIATELY REPLACE LIGHTS, BATTERIES, AND LAMPS AS DEEMED NECESSARY BY THE CONTRACTOR OR AIRPORT OPERATIONS. THE SYSTEM ELEMENTS TO BE INSPECTED AND DEFICIENCIES NOTED ARE AS FOLLOWS:
 - BARRICADES SET PROPERLY AND ALL FLASHING WARNING LIGHTS OPERATING PROPERLY.
 - ALL CONTRACTOR PERSONNEL AND EQUIPMENT ACCESS GATES STAFFED AND SECURITY PROCEDURES IN PLACE.
 - ALL EQUIPMENT OUTFITTED WITH FLASHING YELLOW DOME-TYPE LIGHTS.
 - CONTRACTOR USE OF UNAUTHORIZED AIRPORT ACCESS GATES CHECKED.
 - ILLUMINATED RUNWAY CLOSURE LIGHTS IN POSITION AND OPERATIONAL. A MINIMUM OF FOUR ARE REQUIRED FOR THE DURATION OF THE PROJECT.

ANY OF THE ABOVE SAFETY AND SECURITY ITEMS FOUND TO BE DEFICIENT AT THE BEGINNING OF THE DAY BY THE AIRPORT OPERATIONS STAFF WILL RESULT IN THAT DAY'S PRORATED SAFETY AND

SECURITY BID ITEM LOST AND BEING DEDUCTED PERMANENTLY FROM THE CONTRACTOR'S EARNINGS. THE CONTRACTOR SHALL MAKE A CONCERTED EFFORT TO ENSURE ALL SAFETY AND SECURITY ITEMS ARE IN PROPER WORKING ORDER EACH DAY DUE TO THE HEIGHTENED SECURITY STATUS OF THE AIRPORT AND THE CONSIDERABLE LIABILITY ASSOCIATED WITH THE SAFETY AND SECURITY ELEMENTS REQUIRED FOR THE WORK.

- 18. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO ENSURE THE SAFETY OF OPERATING AIRCRAFT AS WELL AS HIS/HER OWN EQUIPMENT AND PERSONNEL. SPECIAL CONSIDERATIONS SHOULD BE GIVEN TO FLIGHT SCHEDULES AND MISCELLANEOUS AIRCRAFT OPERATIONS. THE CONTRACTOR SHALL OBEY ALL INSTRUCTIONS AS TO ROUTES TO BE TAKEN BY EQUIPMENT TRAVELING WITHIN THE AIRPORT OPERATIONS AREA AND KEEP SUCH VEHICLES AND EQUIPMENT MARKED WITH THE SPECIFIED AIRPORT SAFETY FLAGS OR FLASHING YELLOW BEACONS. THE CONTRACTOR SHALL MAKE HIS OWN ESTIMATE OF ALL DIFFICULTIES TO BE ENCOUNTERED. EQUIPMENT NOT ACTUALLY IN OPERATION SHALL BE KEPT CLEAR OF LANDING AREAS. PERSONNEL SHALL NOT ENTER AREAS OF THE AIRPORT WHERE AIRCRAFT ARE OPERATING WITHOUT SPECIFIC PERMISSION. ALL EQUIPMENT SHALL REMAIN CLEAR OF ALL ACTIVE SAFETY AREAS AND OBJECT FREE AREAS.
- 19. THE CONTRACTOR SHALL TAKE ALL STEPS TO PROTECT THE EXISTING RUNWAY AND TAXIWAY LIGHTS, UNDERGROUND CABLES AS WELL AS ALL COMMERCIAL AND AIRPORT UTILITIES DURING CONSTRUCTION IN ORDER TO ENSURE CONTINUOUS OPERATION OF LIGHTS AND NAVIGATIONAL AIDS WHEN NEEDED.
- 20. MATERIALS STORED OR STOCKPILED ON THE AIRPORT SHALL BE SO PLACED AND THE WORK SHALL, AT ALL TIMES, BE SO CONDUCTED AS TO CAUSE NO GREATER OBSTRUCTION TO THE AIR AND GROUND TRAFFIC THAN IS CONSIDERED NECESSARY BY THE ENGINEER. STOCKPILED MATERIALS SHALL NOT BE STOCKPILED WITHIN RUNWAY SAFETY AREA (RSA), OBSTACLE FREE ZONE (OFZ) OR OBJECT FREE AREA (OFA) OF ANY OPERATIONAL RUNWAY. STOCKPILING MATERIAL GREATER THAN 3' IN THE AIRCRAFT OPERATIONS AREA (AOA) REQUIRES A 7460-1. IF APPROVED, STOCKPILED MATERIAL MUST BE PROPERLY MARKED AND IDENTIFIED.
- 21. THE CONTRACTOR SHALL ERECT AND MAINTAIN ALL NECESSARY BARRICADES, SIGNS, DANGER SIGNALS AND LIGHTS FOR THE PROTECTION OF THE WORK AND THE SAFETY OF THE PUBLIC FOR BOTH LAND AND AIR TRAFFIC IN ACCORDANCE WITH THE SPECIFICATIONS (AC 150/5370-2G, OR LATEST EDITION).
- 22. CLOSED RUNWAYS OR TAXIWAYS SHALL BE BARRICADED OFF AT ALL INTERSECTIONS WITH ACTIVE RUNWAYS OR TAXIWAYS. THE CONTRACTOR SHALL HAVE PERSONNEL ON CALL 24 HOURS PER DAY FOR EMERGENCY MAINTENANCE OF AIRPORT HAZARD LIGHTING AND BARRICADES.
- 23. HOU OPERATIONS AND THE HOUSTON AIRPORT SYSTEM (HAS) SHALL, AT ALL TIMES, HAVE COMPLETE JURISDICTION OVER THE SAFETY OF ALL AIRCRAFT OPERATIONS DURING THE WORK. WHEREVER THE SAFETY OF AIR TRAFFIC IS CONCERNED, THE DECISIONS OF THE AIRPORT DIRECTOR, OR HIS DESIGNATED REPRESENTATIVE, SHALL BE FINAL AS TO METHODS, PROCEDURES AND MEASURES USED.
- 24. FOR ANY RESTRICTIONS TO AIRCRAFT OPERATIONS, THE HAS SHALL GIVE PROPER NOTICE TO THE NEAREST FAA FLIGHT SERVICE STATION PRIOR TO THE START OF WORK, AND FOR ANY SUBSEQUENT CHANGES NEEDED IN THE NOTAM WHICH MAY BE ISSUED DURING THE PERIOD OF WORK.

- 25. THE CONTRACTOR SHALL CONTACT THE FAA TECHNICAL OPERATIONS, TO PROVIDE FIELD LOCATIONS OF EXISTING FACILITY CABLES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NON-INTRUSIVE EXCAVATION TO LOCATE FAA CABLING, AND PROTECTION OF THOSE CABLES THROUGHOUT THE PROJECT.
- 26. UNDER NO CIRCUMSTANCES WILL THERE BE ANY MOVEMENT OF CONTRACTOR VEHICLES AND/OR EQUIPMENT ACROSS ANY LANDING AREA AT ANY TIME UNLESS UNDER ESCORT FROM AIRPORT OPERATIONS OR ONLY IF THE RUNWAY IS CLOSED.
- 27. ALL PERSONNEL OPERATING A VEHICLE WITHIN THE AOA SHALL OBTAIN ALL NECESSARY TRAINING AS REQUIRED BY AIRPORT OPERATIONS PERSONNEL.
- 28. THE CONTRACTOR SHALL CONFINE HIS PERSONNEL, EQUIPMENT, OPERATIONS AND TRAVEL TO THE AREA WITHIN THE DEFINED WORK LIMITS SHOWN ON THE PLANS.
- 29. THE CONTRACTOR SHALL INFORM ALL CONSTRUCTION PERSONNEL AS TO THE PROPER ROUTES, SPEEDS AND PROCEDURES FOR TRANSPORTING EQUIPMENT AND MATERIALS TO THE CONSTRUCTION SITE; AND ALL RESTRICTIONS TO MOVEMENT OF EQUIPMENT OR PERSONNEL WITHIN THE AIR OPERATIONS AREA. ALL PERSONNEL SHALL BE ADVISED OF ANY CHANGES IN AIRPORT OPERATIONS ON A DAILY BASIS, AND MORE OFTEN IF NECESSARY, THAT MAY FURTHER RESTRICT THEIR MOVEMENT.
- 30. ACCESS OR HAUL ROUTES SHALL BE EXISTING ROADWAYS TO THE EXTENT THAT THEY ARE AVAILABLE. THE CONTRACTOR SHALL CORRECT ANY DAMAGE TO THE ROADS USED AND SHALL RESTORE THOSE ROADS TO THE SAME OR BETTER CONDITION AS THEY EXISTED PRIOR TO THE START OF WORK. THE CONTRACTOR MAY ESTABLISH ADDITIONAL HAUL OR ACCESS ROUTES AT HIS OWN EXPENSE AND RESPONSIBILITY IF APPROVED BY THE SPONSOR. UPON COMPLETION OF THE WORK, ANY ADDITIONAL ROADS SHALL EITHER BE LEFT OR GRADED AS DIRECTED SO THAT THEY DO NOT IMPEDE EXISTING DRAINAGE OR ACCESS ROUTES.
- 31. MEASURES SHALL BE ADOPTED TO PREVENT POTENTIAL POLLUTANTS FROM ENTERING ANY DRAINAGE SYSTEM OR WATERWAY. MATERIALS AND DEBRIS SHALL NOT BE STORED IN THE WORK AREA IN A MANNER THAT WOULD ALLOW THEM TO ENTER THE DRAINAGE SYSTEM AS A RESULT OF SPILLAGE, NATURAL RUNOFF OR FLOODING. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO IMMEDIATELY NOTIFY THE SPONSOR SHOULD THERE BE A SPILLAGE OF MATERIAL WHICH MIGHT CONTAMINATE THE DRAINAGE SYSTEM. IT SHALL ALSO BE THE CONTRACTOR'S RESPONSIBILITY TO REMOVE AND CLEAR UP SUCH SPILLAGE IN A MANNER ACCEPTABLE TO THE SPONSOR. MATERIAL SHALL BE SECURED SO THAT IT WILL NOT BE BLOWN BY THE WIND ONTO THE AIRFIELD SURFACES.
- 32. SPECIAL ATTENTION TO DUST CONTROL WILL BE REQUIRED WHEN EARTHWORK OR HAULING OPERATIONS ARE IN PROGRESS OR WHEN WIND AND WEATHER CONDITIONS CAUSE EXCESSIVE BLOWING OF DUST. IN THIS REGARD, THE CONTRACTOR SHALL APPLY WATER OR CALCIUM CHLORIDE SOLUTION TO THE AFFECTED SITES AS DIRECTED.
- 33. AS REQUIRED DURING THE DAY AND AT THE END OF EACH DAY, ANY TAXIWAY OR APRON WHICH IS NOT CLOSED TO AIRCRAFT AND WHICH HAS BEEN USED BY THE CONTRACTOR, SHALL BE CLEANED BY VACUUM SWEEPER TRUCK OR OTHER ACCEPTABLE METHODS APPROVED BY THE HAS. ALL

EQUIPMENT SHALL BE STORED OR MOVED TO THE CONTRACTOR 'S STAGING AREAS. CONTRACTOR SHALL MAINTAIN A MINIMUM OR TWO FULLY FUNCTIONING VACUUM SWEEPER TRUCKS ON SITE AT ALL TIMES.

- 34. VEHICLES WITHIN THE AIRPORT SECURITY FENCE SHALL BE VISIBLY IDENTIFIABLE AS CONTRACTOR VEHICLES WHICH HAVE BEEN PROPERLY CLEARED FOR ENTRY (LOGO AND FLAGS ON AUTHORIZED EQUIPMENT AND VEHICLES WOULD BE ACCEPTABLE). VEHICLE LOGOS SHALL BE VISIBLE WITHIN 200' RANGE.
- 35. CONSTRUCTION EQUIPMENT SHALL HAVE A MAXIMUM HEIGHT OF 12 FEET. STOCKPILED MATERIAL IN CONSTRUCTION AREAS WITHIN THE AOA SHALL BE A MAXIMUM HEIGHT OF 3 FEET AND OUTSIDE AOA A MAXIMUM HEIGHT OF 15 FEET UNLESS A 7460 HAS BEEN FILED AND APPROVED BY FAA.
- 36. WHEN CONSTRUCTION PERSONNEL OR EQUIPMENT ARE REQUIRED TO BE WITHIN 250' OF A RUNWAY CENTERLINE DUE TO ASSOCIATED CONSTRUCTION OPERATIONS, THAT RUNWAY SHALL BE CLOSED TO ALL AIRCRAFT OPERATIONS.
- 37. THE CONTRACTOR SHALL PLAN THE WORK SO AS TO MINIMIZE THE EXTENT AND TIME OF AIRFIELD PAVEMENT CLOSURES. AREAS REQUIRING MINIMAL WORK SHALL BE COMPLETED AND RESTORED TO OPERATING STATUS AS SOON AS PRACTICAL WITHIN EACH PHASE OF WORK.
- 38. THE CONTRACTOR SHALL SUBMIT THE SAFETY PLAN COMPLIANCE DOCUMENT (SPCD), AS REQUIRED IN THE PROJECT SPECIFICATIONS, TO THE ENGINEER FOR REVIEW AND APPROVAL BY THE AIRPORT PRIOR TO CONSTRUCTION COMMENCING.
- 39. CONSTRUCTION OVERNIGHT EQUIPMENT AREA:

CONTRACTOR MAY STORE CONSTRUCTION EQUIPMENT ON AIRPORT PROPERTY AT THE END OF EACH DAY. NO EQUIPMENT OR MATERIAL WILL BE ALLOWED TO REMAIN WITHIN THE AOA (NOT IN OFA WHEN RUNWAY OR TAXIWAY IS OPEN) WHEN WORK IS NOT BEING PERFORMED. THE CONTRACTOR SHALL MAKE MODIFICATIONS WITHIN THE OVERNIGHT STAGING AREA WHEN DEEMED NECESSARY BY HOU OPERATIONS OR HAS PERSONNEL. UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL RESTORE AND RE-VEGETATE ALL OVERNIGHT STAGING AREAS TO ORIGINAL CONDITION. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO OVERALL PERFORMANCE OF THE WORK ASSOCIATED WITH THE PROJECT.

- 40. THE CONTRACTOR SHALL NOTIFY AIRPORT OPERATIONS SO THAT THEY MAY ADVISE AIRPORT RESCUE AND FIRE FIGHTING (ARFF) PERSONNEL SEVENTY-TWO (72) HOURS IN ADVANCE OF WATERLINES OR FIRE HYDRANTS THAT MUST BE DEACTIVATED AND/OR IF EMERGENCY ACCESS ROUTES MUST BE TEMPORARILY REROUTED OR BLOCKED.
- 41. ALL CONSTRUCTION PERSONNEL SHALL ATTEND A DAILY SAFETY BRIEFING PRIOR TO COMMENCING WORK FOR THE DAY. THESE MEETINGS SHALL BE MADE OPEN TO THE ENGINEER, OWNER, OWNER'S REPRESENTATIVE, AIRPORT OPERATIONS, AND ANY OTHER GOVERNING AUTHORITY THAT WOULD LIKE TO ATTEND. THERE WILL ALSO BE A MANDATORY WEEKLY CONSTRUCTION MEETING WITH AIRPORT OPERATIONS THAT MUST BE ATTENDED BY THE CONTRACTOR'S SENIOR FIELD STAFF, INCLUDING BUT NOT LIMITED TO SUPERINTENDENT(S) AND TEAM LEADERS. THE DATE AND TIME OF THE WEEKLY CONSTRUCTION MEETING WILL BE ESTABLISHED PRIOR TO THE START OF WORK.

- 42. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ALL SHEETING, SHORING, AND BRACING IS DONE IN ACCORDANCE WITH CURRENT OSHA REGULATIONS AND REQUIREMENTS. SHEETING, SHORING, AND BRACING IS CONSIDERED TO BE AN INCIDENTAL PART OF THE WORK AND NO SEPARATE PAYMENT WILL BE ALLOWED, EXCEPT AS PROVIDED IN THE PROJECT MANUAL AND TECHNICAL SPECIFICATIONS.SECURITY REQUIREMENTS
- 43. INSPECTIONS BY OPERATIONS PRIOR TO OPENING FOR AIRCRAFT USE AND THE DEPARTURE OF THE CONTRACTOR'S WORK CREWS, THE OWNER'S AUTHORIZED REPRESENTATIVE WILL ARRANGE FOR INSPECTION BY AIRPORT OPERATIONS OF ANY RUNWAY SAFETY AREA, TAXIWAY SAFETY AREA, OR APRON THAT HAS BEEN CLOSED FOR WORK, OR THAT HAS BEEN USED FOR A CROSSING POINT OR HAUL ROUTE BY THE CONTRACTOR. THESE AREAS MUST COMPLY WITH THE SAFETY REQUIREMENTS, DEFINED BY FEDERAL AVIATION REGULATIONS PART 139, AND INTERPRETED BY THE DESIGNATED OPERATION'S INSPECTOR, BEFORE PERMISSION FOR THE CONTRACTOR'S WORK CREWS TO DEPART WILL BE GRANTED. CONTRACTOR MUST REMAIN ON SITE UNTIL AIRPORT OPERATIONS COMPLETES AN AIRFIELD LIGHTING INSPECTION. ELECTRICAL VAULTS MUST BE RETURNED TO SERVICE NO LESS THAN 1.5 HOURS BEFORE SUNSET. CONTRACTOR CANNOT LEAVE SITE UNTIL A LIGHT CHECK IS COMPLETED WITH AIRPORT OPERATIONS.
- 44. STOCKPILE EROSION AND DUST CONTROL STOCKPILED MATERIAL AND OPEN EXCAVATIONS SHALL BE TREATED IN SUCH A MANNER AS TO PREVENT MOVEMENT RESULTING FROM AIRCRAFT BLAST OR WIND CONDITIONS IN EXCESS OF 10 KNOTS. STOCKPILED MATERIALS SHALL NOT BE PERMITTED WITHIN THE MOVEMENT AREA. STOCKPILES NO MORE THAN 3 FEET HIGH IN THE MOVEMENT AREA OUTSIDE OF THE OBJECT FREE AREAS OF THE ACTIVE AND CLOSED RUNWAYS MUST COMPLY WITH OBSTRUCTION HEIGHT REQUIREMENTS AS PROVIDED IN PART 77.
- 45. ALL UNSUITABLE MATERIALS AND EXCESS EARTHWORK EXCAVATION SHALL BE DISPOSED OF OFFSITE ACCORDING TO LOCAL LAWS AND REGULATIONS. THE CONTRACTOR SHALL PROVIDE THE AIRPORT AND THE ENGINEER WITH DOCUMENTATION OF THE QUANTITY, LOCATION OF THE DISPOSAL SITE AND DOCUMENTATION OF CITY OR LOCAL GOVERNMENT ACCEPTANCE OF THOSE MATERIALS.
- 46. PRIOR TO COMMENCING WORK IN ANY AREA OF THE AOA, THE CONTRACTOR SHALL SUBMIT A WORK AUTHORIZATION NOTICE (WAN) TO HOU OPERATIONS FOR APPROVAL AT LEAST 72 HOURS IN ADVANCE. NO WORK IN A NEW AREA SHALL BE PERMITTED WITHOUT AN APPROVED WAN. IF PROPOSED WORK INCLUDES EXTENDED MOVEMENT AREA CLOSURES, ADDITIONAL ADVANCE NOTIFICATION TIME MAY BE REQUIRED. WANS WILL BE PRESENTED TO STAKEHOLDERS BY THE HAS PROJECT MANAGER ON TUESDAYS.
- 47. CONTRACTOR WILL REPAIR ALL DAMAGE TO EXISTING SERVICE ROADS AND OTHER PAVEMENTS CAUSED BY CONSTRUCTION OPERATIONS. THE CONDITION OF EXISTING PAVEMENTS SHALL BE PHOTOGRAPHICALLY DOCUMENTED BY THE CONTRACTOR PRIOR TO USAGE. IF DAMAGE OCCURS TO PAVEMENTS DURING THE COURSE OF THE PROJECT, IT WILL BE ASSUMED TO HAVE BEEN CAUSED BY THE CONTRACTOR'S CONSTRUCTION OPERATIONS. CRACKED CONCRETE PANELS WILL BE ENTIRELY REPLACED TO EXISTING JOINT LINES AND DAMAGED ASPHALT WILL BE REPAIRED WITH PLANT MIXED HOT MIXED ASPHALTIC CONCRETE. FAILED BASE COURSE SHALL BE REMOVED, REPLACED, AND RECOMPACTED.

SECURITY REQUIREMENTS

- 1. <u>GENERAL INTENT:</u> IT IS INTENDED THAT THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE AIRPORT SECURITY PLAN AND WITH SECURITY REQUIREMENTS SPECIFIED HEREIN BY THE HOUSTON AIRPORT SYSTEM (HAS)/HOU OPERATIONS. THE CONTRACTOR SHALL DESIGNATE TO THE ENGINEER AND AIRPORT OPERATIONS, IN WRITING, THE NAME OF HIS "CONTRACTOR SECURITY AND SAFETY OFFICER (CSSO)". THE CSSO SHALL REPRESENT THE CONTRACTOR ON THE SECURITY REQUIREMENTS FOR THE CONTRACT.
- 2. <u>CONTRACTOR PERSONNEL SECURITY ORIENTATION:</u> THE CSSO SHALL BE RESPONSIBLE FOR BRIEFING ALL CONTRACTOR PERSONNEL ON SECURITY REQUIREMENTS. ALL NEW CONTRACTOR EMPLOYEES SHALL BE BRIEFED ON SECURITY REQUIREMENTS PRIOR TO WORKING IN THE CONSTRUCTION AREA. THE AIRPORT SHALL BRIEF AND/OR TRAIN CONSTRUCTION RELATED VEHICLE EQUIPMENT DRIVERS ON OPERATIONS WITHIN AN AIRPORT/AIRCRAFT ENVIRONMENT. HAS MANAGEMENT SHOULD PROVIDE PRINTED MATERIAL TO EACH VEHICLE OPERATOR THAT DEPICTS HAUL ROUTES, PROHIBITED MOVEMENT AREAS, AND DESCRIBES THE CONSEQUENCES FOR NON-COMPLIANCE WITH ESTABLISHED PROCEDURES. THE AIRPORT HAS IMPLEMENTED A ZERO TOLERANCE APPROACH TO DRIVING VIOLATIONS.
- 3. ACCESS TO THE SITE: CONTRACTOR'S ACCESS TO THE SITE SHALL BE AS SHOWN ON THE PLANS. NO OTHER ACCESS POINTS SHALL BE ALLOWED UNLESS APPROVED BY AIRPORT OPERATIONS, ALL CONTRACTOR TRAFFIC AUTHORIZED TO ENTER THE SITE SHALL BE EXPERIENCED IN THE ROUTE AND ESCORTED OR GUIDED BY AIRPORT OPERATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL TO AND FROM THE VARIOUS CONSTRUCTION AREAS ON THE SITE. AND FOR THE OPERATION AND SECURITY OF THE ACCESS GATE TO THE SITE, A CONTRACTOR'S FLAGGER OR TRAFFIC CONTROL PERSON SHALL MONITOR AND COORDINATE AII CONTRACTOR TRAFFIC AT THE ACCESS GATE WITH SECURITY. THE CONTRACTOR SHALL NOT PERMIT ANY UNAUTHORIZED CONSTRUCTION PERSONNEL OR TRAFFIC ON THE SITE. ACCESS GATES TO THE SITE SHALL BE LOCKED AND SECURED AT ALL TIMES WHEN NOT ATTENDED BY THE CONTRACTOR. IF THE CONTRACTOR CHOOSES TO LEAVE ANY ACCESS GATE OPEN, IT SHALL BE ATTENDED BY CONTRACTOR PERSONNEL WHO ARE FAMILIAR WITH THE REQUIREMENTS OF THE AIRPORT OPERATIONS SECURITY PROGRAM. THE CONTRACTOR IS RESPONSIBLE FOR THE IMMEDIATE CLEANUP OF ANY DEBRIS DEPOSITED ALONG THE ACCESS ROUTE AS A RESULT OF HIS CONSTRUCTION TRAFFIC. DIRECTIONAL SIGNING FROM THE ACCESS GATE ALONG THE DELIVERY ROUTE TO THE STORAGE AREA, PLANT SITE OR WORK SITE SHALL BE AS DIRECTED BY AIRPORT OPERATIONS.
- 4. <u>MATERIALS DELIVERY TO THE SITE:</u> ALL CONTRACTOR'S MATERIAL ORDERS FOR DELIVERY TO THE WORK SITE WILL USE, AS A DELIVERY ADDRESS, THE STREET NAME ASSIGNED TO THE ACCESS POINT AT THE CONTRACTOR'S STAGING AREA PROVIDED AS SHOWN IN THE PROJECT PLANS. THE NAME "WILLIAM P. HOBBY INTERNATIONAL AIRPORT" SHALL NOT BE USED IN THE DELIVERY ADDRESS AT ANY TIME. THIS WILL PRECLUDE DELIVERY TRUCKS FROM ENTERING INTO THE TERMINAL COMPLEX OR TAKING SHORT CUTS THROUGH THE PERIMETER GATES AND INADVERTENTLY ENTERING INTO AIRCRAFT OPERATIONS AREAS.
- 5. <u>CONSTRUCTION AREA LIMITS:</u> THE LIMITS OF CONSTRUCTION, MATERIAL STORAGE AREAS, PLANT SITE, EQUIPMENT STORAGE AREA, PARKING AREA AND OTHER AREAS DEFINED AS REQUIRED FOR THE CONTRACTOR'S EXCLUSIVE USE DURING CONSTRUCTION SHALL BE MARKED BY THE CONTRACTOR. THE CONTRACTOR SHALL ERECT AND MAINTAIN AROUND THE PERIMETER OF THESE AREAS SUITABLE

FENCING, MARKING AND/OR WARNING DEVICES VISIBLE FOR DAY/NIGHT USE. TEMPORARY BARRICADES, FLAGGING AND FLASHING WARNING LIGHTS WILL BE REQUIRED AT CRITICAL ACCESS POINTS. THE TYPE OF MARKING AND WARNING DEVICES SHALL BE APPROVED BY AIRPORT OPERATIONS.

- 6. IDENTIFICATION PERSONNEL: ALL CONTRACTOR EMPLOYEES, SUBCONTRACTORS, AGENTS, VENDORS, INVITEES, ETC., REQUIRING ACCESS TO THE CONSTRUCTION SITE SHALL, IN ACCORDANCE WITH THE AIRPORT OPERATIONS SECURITY PROGRAM, BE REQUIRED TO DISPLAY AIRPORT ISSUED IDENTIFICATION OR BE UNDER AIRPORT-APPROVED AND BADGED ESCORT PERSONNEL. THESE BADGES WILL BE IDENTIFIED NUMERICALLY AND ISSUED TO INDIVIDUAL EMPLOYEES WITH A PERMANENT RECORD MAINTAINED ON EACH INDIVIDUAL TO WHOM A BADGE IS ISSUED. IN ADDITION, A \$55 NON-REFUNDABLE PROCESSING FEE WILL BE REQUIRED FOR EACH BADGE. THIS FEE MUST BE PAID BEFORE A BADGE IS ISSUED. NO BADGE WILL BE ISSUED TO ANY PERSON UNTIL A REVIEW OF THE REQUIRED PAPERWORK BY AIRPORT SECURITY AND ALL REQUIREMENTS ARE MET. PAPERWORK SHALL BE SUBMITTED A MINIMUM OF 24 HOURS BEFORE ISSUANCE OF A BADGE. THE CONTRACTOR IS RESPONSIBLE FOR PERSONNEL ATTENDING TRAINING AND COMPLETING SECURITY BADGE APPLICATIONS, WHICH WILL INCLUDE AIR /GROUND RADIO, TAXIWAY, AND AIRPORT FAMILIARIZATION. ESTIMATED TIME FOR COMPLETION IS TWO (2) HOURS. FLAGGERS MUST BE BADGED AND MUST HAVE SUCCESSFULLY COMPLETED THE AIRPORT FLAGGER TRAINING INSTRUCTED BY AIRPORT OPERATIONS, IN ADDITION TO THE REGULAR BADGE AND MOVEMENT TRAINING, PRIOR TO PERFORMING IN THAT CAPACITY ON AIRPORT PROPERTY. AT THE COMPLETION OF THE CONTRACT ALL BADGES WILL BE RETURNED TO THE AIRPORT. A CHARGE OF \$50 PER BADGE WILL BE ASSESSED FOR ALL UNRETURNED BADGES. GATE GUARDS AND ESCORTS SHALL BE CONSIDERED UNDER THE FLAGGER CLASSIFICATION AND SHALL BE SUBJECT TO THE SAME REQUIREMENTS AS FLAGGERS.
- 7. <u>FINES:</u> PAYMENT OF ALL FINES ASSESSED TO WILLIAM P. HOBBY INTERNATIONAL AIRPORT, DUE TO VIOLATIONS BY THE CONTRACTOR OF FAA/TSA SECURITY OR SAFETY REQUIREMENTS SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE DEDUCTED FROM MONIES DUE THE CONTRACTOR.
 - A. IF THE RESTRICTED AREA GATE IS FOUND TO BE OPEN OR UNLOCKED AND UNATTENDED, AIRPORT SECURITY POLICE AND/OR TRANSPORTATION SECURITY ADMINISTRATION MAY ISSUE THE CONTRACTOR A CITATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COURT COSTS AND IMPOSED FINES. IN ADDITION, A CHARGE OF UP TO \$10,000.00 MAY BE LEVIED BY THE HOUSTON AIRPORT SYSTEM AND/OR TRANSPORTATION SECURITY ADMINISTRATION FOR EACH VIOLATION SO DOCUMENTED AND UPON THE REQUEST FOR FINAL PAYMENT THE TOTAL OF ANY SUCH CHARGES WILL BE DEDUCTED FROM MONIES DUE THE CONTRACTOR.
 - B. IN THE EVENT THE CONTRACTOR DEVIATES FROM THE IDENTIFIED CONSTRUCTION LIMITS AND / OR DESIGNATED HAUL ROUTES ONTO AN ACTIVE RUNWAY OR TAXIWAY THE CONTRACTOR WILL BE FINED \$1,000 PER OCCURRENCE WHICH WILL BE DEDUCTED FROM THE FINAL CONTRACT AMOUNT DUE THE CONTRACTOR. IN ADDITION TO FINES, A NOTICE OF VIOLATION (NOV) MAY BE ISSUED, WHICH MAY INCLUDE SUSPENSION OF WORK OR TERMINATION, DEPENDING ON THE LEVEL OF VIOLATION COMMITTED (SEE CSPP IN PROJECT MANUAL FOR MORE DETAIL).
- 8. A MINIMUM OF 48 HOURS IN ADVANCE OF ANY EXCAVATION OR BORINGS, THE CONTRACTOR SHALL CONTACT TEXAS ONE CALL (811) TO VERIFY ALL UNDERGROUND CABLE LOCATIONS IN THE VICINITY OF THE PROPOSED WORK:
| CABLE OWNER | CONTACT PERSON | PHONE NUMBER |
|---------------------------------|--------------------------|----------------|
| FEDERAL AVIATION ADMINISTRATION | DARREN CLARK | (713) 847-1430 |
| HOUSTON AIRPORT SYSTEM (HAS) | MICHAEL POWERS, OPS MGR. | (281) 901-8724 |
| HAS ELECTRICAL | DANNY BAUER | (713) 641-7782 |
| HAS MAINTENANCE | RAJISH RAMOUTAR | (713) 641-7734 |

- 9. <u>REQUIREMENTS FOR CLOSING TAXIWAYS:</u> WHEN CONSTRUCTION PERSONNEL OR EQUIPMENT ARE WITHIN 93 FEET FROM ANY ACTIVE TAXIWAY CENTER LINE, THOSE AREAS WILL BE CLOSED TO ALL AIRCRAFT OPERATIONS UNLESS OTHERWISE INDICATED IN THE PHASING PLAN SHEETS OR AS APPROVED BY HOU OPERATIONS. DURING THE TIME ANY TAXIWAY OR PORTION THEREOF IS CLOSED, ITS ASSOCIATED LIGHTS SHALL BE DE-ENERGIZED, JUMPERED OUT OR AN ALTERNATIVE, AND HOU OPERATIONS APPROVED, LIGHT BLACKOUT METHOD EMPLOYED. THE ENTRANCES TO CLOSED TAXIWAYS SHALL BE BARRICADED WITH LOW PROFILE BARRICADES TO PREVENT AIRCRAFT FROM ENTERING UNUSABLE OR HAZARDOUS OPERATIONAL AREAS.
- 10. <u>RESPONSIBILITY FOR TEMPORARY LIGHTING AND MARKING:</u> THE CONTRACTOR WILL BE RESPONSIBLE FOR FURNISHING AND MAINTAIN ING THE NECESSARY BARRICADES AND HAZARD LIGHTING AS REQUIRED BY THE SPECIFICATIONS TO MARK CONSTRUCTION AREAS, HAZARDS. ETC. REFLECTORIZED ORANGE PLASTIC LOW-PROFILE WATER-FILLED BARRICADES WITH ATTACHED FLASHING RED LIGHTS FOR NIGHT USE ARE THE PREFERRED TYPE OF BARRICADE FOR USE ON THE AIRPORT. CONTRACTOR SHALL MAINTAIN BARRICADES FULL OF WATER TO PREVENT DISPLACEMENT BY JET BLAST AND IMMEDIATELY REPLACE ANY BARRICADE THAT LEAKS.
- 11. <u>CONSTRUCTION ACTIVITY IN THE VICINITY OF NAVIGATIONAL AIDS:</u> 72 HOURS PRIOR TO THE PRE-CONSTRUCTION CONFERENCE AND/OR CONSTRUCTION START, THE CONTRACTOR SHALL CONTACT THE HAS TO COORDINATE WITH THE LOCAL AIRWAY FACILITIES MANAGER. THEIR REPRESENTATIVE WILL MEET WITH THE CONTRACTOR TO IDENTIFY FAA FACILITIES AND FAA CABLES.



Appendix F. Houston Airport System, Tenant Violations – Offenses, Charging Instrument, Due Process Provisions



Operating Instruction

TITLE	OI Category I No. 05-03		
Process Provisions	Date Original Approved:	August 01, 2005	
Authorized Signature: 22 Mario C. Diaz, Director of Aviation	Revised Date:	February 1, 2016	

I. PURPOSE

- A. To explain the rationale of the system of enforcing compliance with various laws, ordinances, policies, procedures, rules and regulations of or pertaining to the Houston Airport System (HAS), including, but not limited to, the Airport Security Plan (ASP), Organization Policy & Procedures (OPPS), Airport Operating Procedures (AOP) and Airport Security Manual and/or Operating Instructions (O.I.).
- B. To identify the persons authorized to issue Notice(s) of Violation(s), which is the charging instrument in the Houston Airport System (HAS) for O.I. and other administrative violations.
- C. To identify violations, including, but not limited to the specific violations enumerated herein.
- D. To assign consequences to such violations.
- E. To provide a means of providing for due process to those charged.

II. POLICY BASIS

Title 49 Code of Federal Regulations Parts 1540 & 1542, Airport Security Plan, Title 14 Code of Federal Regulations Part 139, Chapter 9 of the City of Houston Code of Ordinances, Houston Airport System Operating Instruction 05-02

III. BACKGROUND

- A. HAS, along with various federal, state and local governmental bodies, including administrative bodies, has developed, and continues to develop, various laws, policies, procedures, rules and regulations that are deemed reasonable and necessary for the safe, efficient and secure operation of the Houston Airport System (HAS).
 - 1. At the Houston Airport System there are three enforcers of these laws, ordinances, policies, procedures, rules and regulations:
 - a. The Airport Operations and Airport Security Sections, as designated by the Airport General Manager, are the primary Sections responsible for enforcement of security, non-security, safety, and operations related laws, ordinances, policies, procedures, rules and regulations; and
 - b. Law Enforcement Officers-Law Enforcement Officers only have the authority to enforce criminal laws and not administrative or civil law nor the administrative or civil counterpart of any criminal law.
 - c. The Section Directors may designate those within their Sections who are authorized to enforce non-criminal and administrative violations, and/or the administrative or civil counterpart of any criminal law, i.e. issue Notices of Violation, by either name or by their operating title class, and any designated by operating title class shall include any and all of those becoming employed in

said operating title class after the date of designation, as well as, those in any operating title class that is named as a successor to a prior operating title class.

- d. The Airport General Manager, as he/she deems necessary, may designate any other section with the responsibility of the enforcement of security, non-security, safety, and operations related laws, ordinances, policies, procedures, rules and regulations.
- 2. The means of notifying an individual or an organization that they have violated an administrative or civil law, policy, procedure, rule and/or regulation is by means of issuing a charging instrument called an NOV or Notice of Violation. This form may be used for either issuing a warning or for formal charging. (See Attachment #1)
- 3. This O.I. provides periods of time and a procedure in which to file a contest and a procedure for a fair and impartial hearing.
- 4. Besides a general offense of violating a law, ordinance, policy, procedure, rule or regulation, specific offenses are listed herein so as to provide the HAS Community a clearer view of some of the areas that the Community needs to concentrate in resolving for the safety, security and efficiency of the HAS airports.
- 5. This O.I provides a procedure to follow the NOV from issuance through completion of the consequences and to allow for better tracking of the NOV history of each individual and sponsoring organization's sponsored individuals.
- 6. The title to any HAS position stated in this O.I. or any other O.I. related to ID Badging may be changed by posting the change in the public area at the main ID Badging Office at any HAS Airport affected thereby.

IV. POLICY APPLICABILITY

- A. This (O.I) applies to any person or entity who uses, desires to use, or should be using, the HAS Airport Security Section ID Badging system and/or Access Control System at any one or more of the HAS airports or facilities, employees of HAS who are governed by other HAS and City Of Houston ordinances, rules and regulations.
- B. This (O.I), by this paragraph, does hereby extend and apply O.I. 05-02 (Security Access Control System & ID Badging) to any person or entity who uses, desires to use, or should be using, the HAS Airport Security Section ID Badging system and/or Access Control System at any one or more of the HAS airports or facilities, employees of HAS who are governed by other HAS and City Of Houston ordinances, rules and regulations.
- C. This O.I. and O.I. 05.02 as applicable per airport, also applies to airline crews, airline mechanics and others who are allowed access to restricted or controlled areas based upon identification or access media issued by their employers (included in the definition of "HAS authorized ID Badges") and who are not otherwise required to possess an HAS issued ID Badge shall be required to submit to and undergo the same sanctions as if they had an HAS issued ID Badge and failure to submit to and undergo such sanctions for violations shall make them a trespasser after warning and subject to being so charged under the Penal Code of the State of Texas.
- D. This O.I. and O.I. 05.02 as applicable per airport, also applies to any individual who's employed at HAS owned, leased or controlled property for the purpose of providing any work, goods or services to HAS or any of its contractors, subcontractors, lessees, concessionaires, etc. and in so providing said work, goods

or services enters into any controlled or restricted area of such HAS owned, leased or controlled is required to obtain an HAS issued ID Badge. Individuals employed at all locations requiring a HAS ID badge shall be required to submit a completed HAS badge application to a HAS Badging Office prior to being authorized to work in a controlled or restricted area. These individuals may only be escorted after submitting a completed badge application to HAS Badging Office.

Individuals denied an HAS ID badge due to disqualifying criminal crimes and conditions prohibiting such issuance (O. I. 05-02 Attachment A) or have their HAS ID badge privileges suspended may not be employed or provide goods or services at any HAS owned, leased or controlled property including public areas. The individuals described in this subparagraph shall make them a trespasser after warning and subject to being so charged under the Penal Code of the State of Texas.

V. RESPONSIBILITY

- A. It is the responsibility of each individual and the tenant or other sponsoring entity and/or the party to whom they are providing work, goods or services, jointly and severally, to ensure that they and/or those sponsored or utilized by them are fully aware of the regulations, violations, penalties, and enforcement procedures contained in this (O.I), as well as, all other applicable laws, ordinances, rules and regulations, before starting work and/or providing work, goods or services at an HAS airport lack of knowledge or understanding is not an excuse nor a defense. It shall be the responsibility of all above mentioned are kept advised of all changes and revisions to the regulations, violations, penalties, and enforcement procedures contained in this (O.I) and other applicable laws, ordinances, rules and regulations.
- B. It is the responsibility, duty and obligation of each and every individual to whom an ID Badge is issued, to know the limitations of their access, the laws, ordinances, policies, procedures, rules and regulations governing access, safety and security at the HAS airports and to timely and faithfully carryout their duties and obligations to the same, including, but not limited to, obeying each and every law, policy, procedure, rule and regulation and to strictly avoid any violation(s) of the same and by acceptance and/or retention of an ID Badge they represent that they have complied with these responsibilities, duties and obligations.

VI. DEFINITIONS

- A. Wherever an "Attachment", "Form" or "Map" is referred to anywhere in this O.I., they are provided for your convenience only as a general assistance and do not constitute a legal description. The current "Attachment", "Form" or "Map" can be obtained from the HAS Airport Security Section.
- B. The use of bolding, italics, underlining or other means of emphasizing a word or words is merely an aid to bring that portion to the reader's attention and does not denigrate the status or importance of any other word, words, sentences or paragraphs nor reduce their being mandatory in nature where appropriate.
- C. Word and Phrase Definitions:
- <u>Airport Identification Badge (ID Badge)</u>: Any single identification media or combined identification media and access control media which is, and does always remain, the property of the Houston Airport System and is issued by HAS to provide identification, authorization, and access to restricted and/or controlled airport areas and other HAS facilities. Anytime the term "ID Badge" is used, it is referring to an ID Badge issued by HAS, Airport Security ID Badging, unless otherwise specifically noted. The term shall also include any medallions, etc. designated and authorized by HAS to be attached to the ID Badge.
- 2. <u>Airport General Manager</u>: Is the person designated as such by the Houston Airport System for each HAS Airport. The term "Airport General Manager" shall include the person designated by the Airport General

Manager or by the Director of Aviation as the Acting or Interim Airport General Manager, when the Airport General Manager is on leave (vacation, city business, sick leave, FMLA, etc.) or unable or unavailable to fulfill their normal duties.

- 3. <u>Airport Security Coordinator (ASC)</u>: The Primary Airport Security Coordinator is the person that occupies the position as defined in 49 Code of Federal Regulations (CFR) 1542.3 and as designated in the Airport Security Plan. The "Primary Airport Security Coordinator", as used herein, is the Airport Security Manager. The Airport Security Coordinator for ID Badging, if any, is the person who is the Head Supervisor for the ID Badging Section or any successor title thereto, i.e., it is the person that is the highest ranking individual for an ID Badging Office. The Airport Security Coordinator for the Security Section, if any, is the person holding that operational title.
- 4. <u>Airport Security Manager (ASM)</u>: Is the person so designated in that position by the General Manager of the airport. The term "Airport Security Manager" shall include the person designated by the Airport Security Manager as the Acting or Interim Airport Security Manager, when the Airport Security Manager is on leave (vacation, city business, sick leave, FMLA, etc.).
- 5. <u>Air Operations Area (AOA)</u>: A portion of an airport, specified in the airport security program, in which security measures specified in Part 1540 are carried out. This area includes aircraft movement areas, aircraft parking areas, loading ramps, and safety areas, for use by aircraft regulated under 49 Code of Federal Regulations (CFR) Part 1544 or 1546, and any adjacent areas (such as general aviation areas) that are not separated by adequate security systems, measures, or procedures. Portions of the AOA may concurrently have more restrictive and controlled designations. The AOA is more specifically delineated in attachments to the Airport's ASP.
- 6. <u>Airport Security Plan (ASP)</u>: An airport's security program developed for and approved by the Transportation Security Administration (TSA) under the provisions of 49 CFR Chapter XII Part 1542.101. The Airport Security Plan is sometimes referred to as the Airport's Security Program.
- 7. <u>Airport Tenant Security Program (ATSP)</u>: The agreement, if applicable, between the airport operator and an airport tenant that specifies the measures by which the tenant will perform security functions, and approved by TSA, under Part 1542.113 of 49 CFR Chapter XII.
- <u>Apron Areas/Ramps:</u> Any area at an HAS airport where aircraft operate or park without being under direct control of the Air Traffic Control Tower, excluding corporate hanger areas, Fixed Based Operator (FBO) areas, and general aviation areas. Access to apron areas is restricted for security/safety reasons as defined in TSA 49 CFR 1540 & 1542, 1544 and 1546 and/or other applicable laws, rules and regulations.
- 9. <u>Authorized ID Badge:</u> Includes not only HAS issued ID Badges, but also, the ID Badges and access media of airline crews, airline mechanics or others who are allowed access to restricted or controlled areas based upon identification or access media issued by their employers and who are not otherwise required to possess an HAS ID Badge.
- 10. <u>Authorized Signatory Authority:</u> Is a person authorized by an employer or sponsoring company, and approved by an HAS ID Badging Office, to sign forms, including but not limited to Security Clearance Requests, Badge Renewal Requests, Key Requests, and PIN Requests, for individuals employed by or being sponsored for an HAS ID Badge.
- 11. <u>Badging & Access Office:</u> The HAS Airport Security ID Badging & Access Office Section that is primarily responsible for reviewing, approving, issuing, accounting to TSA for, and/or governing authorized ID Badges, Keys, PIN's and other access media. This Office is also responsible for Criminal History Records Check (CHRC)s, other security background checks, designation, assigning and entry of access rights, programming and deprogramming ID Badges, PIN data, etc. into the HAS access control computer system. ID Badges, PIN's and other media are issued by the Badging & Access Office located

at each of the HAS airports. In addition to each permanent Badging & Access Office at each HAS airport, the HAS Airport Security Section may, from time to time, specially and/or temporarily designate other locations. Hours of operation may vary depending on staffing and other considerations. Other names for this Office are the ID Badging & Access Office and/or ID Badging Office and/or badging

- 12. <u>Company Offense:</u> An offense that is chargeable against an organization, as opposed to, or in addition to, an individual. In a company offense, the sanction shall be performed by the highest ranking officer, project manager, station manager, superintendent, division manager, substantial owner or other management person of a rank similar to the foregoing that is directly connected with the business, operation, or project of the charged organization for the Airport or HAS facility related to the business, operation or project.
- 13. <u>Controlled Areas</u>: Those areas controlled by card readers, key lock, PIN pad or other access control device. These areas include, but are not limited to, certain parking areas, certain restricted areas, secured areas, sterile areas, apron areas, SIDA areas, AOA or any other area as defined in this O.I. or other applicable law, rule, regulation, Airport Security Plan, Security Program, lease, contract, agreement or by signage as off-limits to anyone not authorized to be in that area.
- 14. Current Picture: A picture of the applicant which is clear enough and closes enough in appearance so that a reasonable person can readily conclude that the document with the picture and the person presenting the document with the picture as being their own picture are one and the same person.
- 15. <u>Disqualifying Condition</u>: A pattern of criminal intent or activity as evidence by arrest records or convictions, irrespective of the type of the criminal offense(s) alleged or time period as determined by the Airport Security Manager. Termination of Badging/Access Rights or similar thereto, any airport within the 10 year period prior to seeking badging at an HAS Airport. (The term "Airport "as used herein shall mean any airport in the world)
- 16. <u>Escort</u>: To accompany or monitor and physically/visually control the activities of an individual who does not have unescorted access authority into or within a TSA Regulated Area as defined in the ASP.
- 17. <u>Enforcement:</u> The Airport Security and Airport Operations Sections are responsible for enforcement of safety, security and non-security related offenses described in this Operating Instruction and associated O.I.s.
- 18. Faithfully: Without variance, completely, devotedly, dependably.
- 19. <u>HAS Airports</u>: All land and improvements which are owned, leased, controlled and/or operated by the City of Houston under the auspices of the Houston Airport System at, or in conjunction with and/or support of, any one or more of the City owned airports.
- 20. <u>Houston Airport System (HAS)</u>: City of Houston department responsible for operation of the City owned airports.
- 21. <u>I.D. Badge Application and/or Application:</u> Includes, but is not limited to, the Security Clearance Request form and the Security Clearance Renewal Request form, and any other application, clearance or request forms promulgated and used by HAS I.D. Badging Offices for the purpose of badging or issuance of access media.
- 22. <u>Immediately or Immediate or Timely:</u> Without delay, right there and then, time is of the essence, something to be accomplished before proceeding with other tasks, either business or personal.

- 23. I<u>mmediate Temporary Suspension</u>: An individual's badging rights are immediately suspended as a result of behavior and/or action(s) that creates an unreasonable risk which may diminish the reputation, or the safety and/or security of the HAS community.
- 24. Key Set Symbol: The code number stamped on a controlled key used for identification purposes.
- 25. <u>Media:</u> Includes ID Badges, keys, PIN Numbers and other equipment and devices for identification and/or access.
- 26. <u>Notice of Violation</u>: Written notice on a form, or in a format, designated by HAS Airport Security, officially charging an individual or entity with a violation of Security, or non-security, laws, ordinances, policies, procedures, rules or regulations or any other laws, ordinances, policies, procedures, rules or regulations, including, but not limited to the Airport Security Plan, Organization Policy & Procedures (OPPS), Airport Operating Procedures (A.O.P.), Airport Security Plan and/or Operating Instructions (O.I.).
- 27. <u>PIN Code:</u> Personal Identification Number, normally identifiable to just one person, but which may, under some circumstances, be issued to more than one person, but often identifiable to a specific group of similarly engaged persons, needing access through a PIN controlled portal and normally used for access to Controlled Areas not covered by conventional locks or card readers.
- 28. <u>Portal:</u> Any opening through which an individual or object can enter into a place or exit from a place; a portal may be controlled or uncontrolled; a portal includes, but is not limited to, doors, windows, baggage conveyor doors, doorways, cutouts in walls and floors, gates, openings in fences, docks, driveways into and out of a building or area, conveyor openings, construction openings, etc.
- 29. <u>Remedial Training</u>: Such training as may be required by HAS of any individual or entity receiving a Notice of Violation.
- 30. <u>Restricted Area</u>: Areas not otherwise classified and which requires a grant of permission to enter and remain in from either HAS or a person or entity having greater rights of possession and control of the area than the person seeking to enter or remain therein.
- 31. <u>Secured Area:</u> A portion of an airport, specified in the Airport Security Plan, in which certain security measures specified in Part 1542 of 49 CFR Chapter XII are carried out. This area is where aircraft operators and foreign air carriers that have a security program under Part 1544 or 1546 of 49 CFR Chapter XII enplane and deplane passengers and sort and load baggage and any adjacent areas that are not separated by adequate security measures. The Secured Area is more specifically delineated in attachments to the Airport's ASP.
- 32. Security Identification Display Area (SIDA): A portion of an airport, specified in the airport security program, in which security measures specified in Part 1542 are carried out. <u>The Secured Area is always a SIDA but a SIDA is not always a Secured Area; other areas of an airport besides the Secured Area may be defined as SIDA</u>. The Secured Identification Display Area is more specifically delineated in attachments to the Airport's ASP.
- 33. <u>SIDA Video</u>: Security training media, including, but not limited to, film, videotapes, web-pages, CDs, and DVDs, required by TSA 49 CFR 1542 to be viewed by all of those who are granted access to the (SIDA), and required by HAS for all badged individuals, whether receiving SIDA access or not, prior to exercising the privileges of their Airport ID Badges, keys, PIN's or other access media or IDs.
- 34. <u>Sponsor and/or Sponsoring Organization</u>: This term, jointly and severally, includes the badging applicant's employer (including an Aircraft Operator subject to 49 CFR Part 1544 and governmental agencies normally exempt under 49 CFR 1542.209(m)(1)) as well as any other person, including the

entity that such other person is employed by, who is authorized by HAS to and does execute an HAS Badge Application in the signature block designated for the Sponsoring Company information and signature. Commonly referred to as "employer"

- 35. <u>Station Manager</u>: This term means the person that is the individual that is the top person in charge of the day to day overall operations of a company or organization at an HAS airport on the date of the issuance of an NOV. It is an affirmative defense that an individual receiving an NOV is not the individual meeting the foregoing definition, however, any individual claiming this affirmative defense must provide a sworn statement naming the correct individual in his/her company or organization that meets this definition.
- 36. <u>Sterile Area:</u> A portion of an airport defined in the airport security program that provides passengers access to boarding aircraft and to which the access generally is controlled by TSA, or by an aircraft operator under Part 1544 of 49 CFR Chapter XII or a foreign air carrier under Part 1546 of 49 CFR Chapter XII, through the screening of persons and property.
- 37. <u>Transportation Security Administration (TSA)</u>: Division of the U.S. Department of Homeland Security responsible for administering Airport and other transportation venue Security Programs and/or its successor(s), if any, to one or more of its functions.
- 38. <u>Under-Badged:</u> An individual is under-badged for an area if the access rights granted by either the type of HAS I.D. Badge they have been issued or the access rights granted to that individual by HAS I.D. Badging is not of the level to permit the individual to be in or remain in an area without an escort.
- 39. <u>Violation</u>: The failure to, in whole or in part, strictly perform in a faithful and timely manner any duty or obligation, whether or not the duty or obligation is to do or not to do a general or specific matter imposed upon an HAS ID Badge holder by any federal, state or local, including Houston Airport System, law, ordinance, policy, procedure, rule or regulation.
- 40. <u>Inchoate Offense:</u> A type of crime completed by taking a punishable step towards the commission of another crime. The basic inchoate offenses are attempt, solicitation, and conspiracy.
- D. All other words and phrases, not specifically defined in this section or otherwise, in this O.I., shall be defined as is commonly used and understood at HAS airports by HAS Management -- the interpretation of the HAS Director of Aviation, in his/her sole discretion, shall be final.

VII. VIOLATIONS / OFFENSES / CONSEQUENCES

- A. The violation, a/k/a, offense, whether by act or omission, of any Federal, State or Local, law, ordinance, policy, procedure, rule or regulation or any part thereof, whether such violation is due to intentional, knowingly, reckless or negligent conduct or a combination thereof is an offense and may result in a consequence. All offenses covered by this O.I. are strict liability offenses, meaning that a certain state of mind, *mens reas*, is not an element of the offense, unless otherwise specifically stated. Each I.D. Badge holder is hereby personally charged with the duty and obligation to know all laws, ordinances, policies, procedures, rules and regulations concerning safety, conduct, and/or security at an HAS airport or other HAS controlled facility. Any offense that is not specifically listed below shall be a violation of this OI and shall bear the consequences set forth herein.
- B. Should any offense as committed, whether general or specific, cause or have the reasonable possibility of placing another person in danger of imminent bodily injury or death, or should the offense cause or have the reasonable possibility of placing property in danger of imminent damage in an amount greater than \$ 5,000.00, or should the offense or violation result in a TSA or FAA investigation being opened

and/or sanction imposed against HAS, or similar to a violation that resulted in a TSA or FAA investigation being opened and/or sanction being imposed against HAS within the immediately preceding three hundred sixty-five (365) calendar day period, then the offense may be enhanced by one (1) degree.

- C. An individual committing or attempting to engage in an inchoate offense, including, but not limited to, conspiracy, aiding and abetting (either before or after the substantive offense), misprision (failure to report a violation of which the individual has reasonable knowledge to believe has occurred), shall be considered the same as if they had committed the offense and shall bear the consequences set forth herein.
- D. A violator/offender is subject to the following sanctions, these sanctions are not exclusive, but are cumulative to other sanctions that may be imposed by other laws, ordinances, policies, procedures, rules and regulations -- the sanctions herein are mandatory and not subject to compromise, plea bargain, or reduction by a Hearing Panel/Hearing Officer or court:
- E. Time calculations-Violations remain on an individual's record for seven hundred thirty (730) consecutive calendar days. The days will be calculated from the date of the violation.
 - 1. Warning Notice: Can be given in the sole discretion of the person issuing the NOV. Two warnings in a three hundred sixty-five (365) consecutive calendar day period will result in the issuance of an NOV. For the NOV to be a Warning, the Issuer must, at the time of issuance, precede the Violation Details with "WARNING ONLY".
 - 2. Class I-1st Offense: The violator's employer shall be responsible to retrain and educate the violator of the policies, procedures and regulations to prevent future violations.
 - Class I-2nd Offense: Sanctions for a second Class I violation sustained or uncontested NOVs excluding Warning NOVs are that the violator and the violator's direct line supervisor must attend the viewings at the same time and must also pass the tests that the Airport Security Manager and/or the Airport Manager (ASM if security related and AM if non-security related) of that airport has determined is appropriate for the specific offense, unless it is a safety violation related to driving on the AOA, in which case the violator must watch and pass the tests on both the SIDA video and the Driving on the AOA video and/or such other prerequisites for driving on the AOA as may then be currently in force and effect. There will be a \$25.00 administrative fee for the testing of each NOV. The fee may be paid by either the Company or the individual (billed through rates and charges or directly at the badging office) who received the NOV. The fee is required to be made prior to the test being administered.
 - Class I-3rd Offense: Sustained or uncontested NOVs excluding Warning NOVs will result in a permanent loss of HAS ID Badge and Access Rights.
 - 3. Class II Offenses: May result in Immediate Temporary Suspension. Sustained or uncontested violations shall result in permanent loss of ID Badge and Access Rights at all HAS airports.
 - 4. Company Offense: An offense that is chargeable against an organization, as opposed to, or in addition to, an individual. In a company offense, the sanction shall be performed

by the highest ranking officer, project manager, station manager, superintendent, division manager, substantial owner or other management person of a rank similar to the foregoing that is directly connected with the business, operation, or project of the charged organization for the Airport or HAS facility related to the business, operation or project. The sponsoring organization must prepare and submit a plan, acceptable to the Airport Security Manager, in the event the offense is related to security, or acceptable to the Airport Manager, in the event the offense is related to other than security, at the airport where the NOV was issued, for preventing the violator and all other employees and/or sponsored individuals from violating the specific law, ordinance, policy, procedure, rule or regulation in the future. Such acceptable plan must be presented not later than the fourteenth (14th) calendar day from the date of the last day to file a Notice of Contest or from the date of the rendering of a decision by a Hearing Panel/Hearing Officer, whichever is later.

- F. For a 3rd violation of the same rule within 365 calendar days, by an Employer/Sponsoring Organization the head of security and/or safety for the Employer/Sponsoring Organization, and if no person is normally designated as such by the Employer/Sponsoring Organization, then an officer, project manager, station manager, superintendent, division manager, substantial owner or other management person of a rank similar to the foregoing of the Employer/Sponsoring Organization must prepare and submit a plan, acceptable to the Airport General Manager, or his/her designee, of the airport where the NOV was issued, for preventing the violator and all other employees and/or sponsored individuals from violating the specific law, ordinance, policy, procedure, rule or regulation in the future. Such acceptable plan must be presented not later than the fourteenth (14th) calendar day from the date of the last day to file a Notice of Contest or from the date of the rendering of a decision by a Hearing Panel/Hearing Officer, whichever is later.
- G. Sanctions time calculations:
 - 1. The violation sanctions for each violation will remain on an individual's record for seven hundred thirty (730) consecutive calendar days from the date of the violation.
 - 2. The accrual of three Class I violations, sustained or uncontested NOVs excluding Warning NOVs by any employee during a seven hundred thirty (730) consecutive day period will result in immediate suspension of and permanent loss of their HAS ID Badge and Access Rights.
 - 3. The accrual of one or more Class II violation, sustained or uncontested NOV by any employee will result in immediate suspension of and permanent loss of their HAS ID Badge and Access Rights.
- H. Offenses of Specific Violations:
 - 1. Offenses of Specific Violations are attached hereto as "Attachment #2" and incorporated herein by reference, the same as if recited verbatim herein.
 - 2. Other O.I.s can add additional Specific Violations without the need to amend this O.I.
 - 3. The violation of any law, ordinance, policy, procedure, rule or regulation that is not specifically set forth in this O.I. or any other O.I. as to the sanction level is treated as a violation in accordance with the structure set forth in section VII.D above, however, if the violation results in an injury to or puts an individual in imminent danger of bodily injury, then such offense can be enhanced one (1) offense level and accrue the appropriate sanction points and monetary penalties.

VIII. THE CHARGING INSTRUMENT

- A. As hereinabove stated, the administrative charging instrument for violations of this O.I. will be a Notice of Violation (NOV) by a person authorized pursuant to this O.I. to issue NOVs. The NOV will be on the form designated by the HAS Airport Security Section ID Badging Office. A copy of the current form is attached hereto as "Attachment # 1". The NOV form attached is for illustration purposes only.
- B. The following are the only required information on the NOV, the lack of which would render the instrument invalid:
 - 1. The date of the offense;
 - 2. The approximate time of the offense;
 - 3. The name and HAS ID Badge number of the issuing party;
 - 4. The signature of the issuing party; and
 - 5. A general description of the offense.
- C. Any other information requested on the form or placed upon the form is for the sole benefit of HAS and the presence or lack of presence thereof will not render the NOV invalid nor void nor voidable.
- D. NOVs shall bear a box for checking off the three (3) letter designation of the airport where the NOV is issued and shall bear a number that is specific to that particular NOV.
- E. An NOV determined to be invalid may be cured by issuance of a new and correct NOV; however, all dates for requesting hearings, etc. or compliance with sanctions shall then run from the date of issuance of the new and correct NOV.
- F. The issuer of the Notice of Violation (NOV) after properly and fully completing the NOV will:
 - 1. At time of issuance, provide the pink copy to the violator;
 - 2. Place the manila cardstock copy in their Section's records in the manner directed by their Section management not later than the end of the issuer's shift the same day as the date of issue -- each Section authorized to issue NOV's will develop a filing system within their Section for the retention and rapid recall of NOV's issued by those in that Section;
 - 3. Deliver the white and green copies to the HAS Airport Security Badging Office at the airport where the NOV was issued;
 - 4. The Badging Office will retain the white copy in their Centralized NOV file and will send the green copy to the offender's employer or sponsor's Authorized Signatory Authority;
 - 5. The Badging Office will, within 48 hours of receipt (or the next business day if the Badging Office is closed for more than 48 hours), enter the violation into the Access Control Computer System and/or any alternative computer system that may be developed and designated by the Airport Security Manager or his/her designee; and
 - 6. The individual issuing the NOV shall retain the yellow copy in their personal file for use at any hearing.

- 7. The person investigating the alleged violation and/or issuing the Notice of Violation will, at a minimum, contact the violator's Direct Line Supervisor and advise him/her of the alleged violation and subsequent investigation.
- G. Failure to perform any of the instructions contained immediately above, set forth in Section VIII.F, will not invalidate the charging instrument nor serve as the basis for the dismissal of the charged violation.
- H. In the event that the violator leaves the scene prior to completion of the NOV or refuses to sign and/or take delivery of the NOV, good and sufficient notice and service is complete upon delivery of the green copy to the offender's employer or sponsor's Authorized Signatory Authority along with a note that service was not possible on the violator at the time of issuance -- no explanation for the lack of service at time of issuance is required; however, any time limits start to run on the day of delivery to said employer or sponsor's Authorized Signatory Authority and any person listed with the ID Badging Office as an Authorized Signatory Authority may be served.
- I. If an offense is not witnessed by an authorized issuer of NOVs, an authorized issuer of NOVs may issue an NOV based upon the written statement of a direct witness or based upon a review of such documentation, including, but not limited to, video replays (including digital), photographs (including digital) and access control records or such other evidence, as they, in their sole discretion, conclude is probable cause to believe that an offense has taken place by one or more specific individuals.
- J. The Airport General Manager, or his/her designee, of the HAS Airport and/or other HAS facility where the offense occurred shall have the authority, in their sole discretion, to void any NOV issued by those under their line command. All voids must be in writing, signed by the individual making the void and shall state thereon the date and reason for the voiding and the writing shall be attached by the HAS Badging Office to the White copy of the NOV and retained. A voided NOV cannot be used for the enhancement of other violations.
- K. The Airport General Manager, or his/her designee, of an HAS Airport, and/or other HAS facility for which he/she is responsible, shall have authority to immediately suspend the HAS ID Badge of any person whom said Airport General Manager, or designee, deems, in his/her sole discretion, to be of imminent and/or continuing threat to the safety and/or security of the airport, meets disqualifying conditions, including, but not limited to, its assets (including, but not limited to, its reputation, employees, real (including improvements thereto) and personal property), tenants and concessionaires and/or their assets, contractors and/or their assets, airlines and their assets, the traveling public, the general public, dignitaries, the airport community, the airport and/or air transportation industry, the United States of America, the State of Texas and/or any of its political subdivisions, including, but not limited to the County of Harris and/or the City of Houston and/or their citizens and employees.
- L. The Airport General Manager, or his/her designee, shall also have the authority to, in his/her sole discretion, suspend any person not holding an HAS Authorized Badge from coming onto or remaining on HAS controlled property based on the same criteria as if they were an HAS ID Badge holder.

IX. CONTEST HEARING PROCESS

- A. All hearings held on an NOV shall be heard before a Hearing Panel of 1-3 Houston Airport System employees or a contracted Hearing Officer. The Airport General Manager or designee shall appoint a Hearing Panel/Hearing Officer for the airport wherein the NOV was issued. The appointed Hearing Panel members will be, at a minimum Pay grade 23 or higher. There shall not be any matter such as an arraignment or motion docket.
- B. A failure to file a Notice of Contest within fourteen (14) calendar days from the date of issue of the Notice of Violation shall constitute a plea of No Contest and acceptance of the consequence of having committed the violation.

- C. Hearings shall be restricted to the question of whether or not the alleged violator committed the offense. The records of the Houston Airport System shall be prima facie (the burden to prove the records are wrong are upon the person who claims they are wrong) evidence of the sustaining of or entry of no contest to a prior violation.
- D. There shall not be any hearing on any question of law, mitigation, probation or reduction of sanction. Any challenge as to questions of law shall be heard in a civil court of competent jurisdiction in Harris County, Texas, and such challenge must be filed by the alleged violator in such civil court not later than the thirtieth (30th) calendar day from the date the violation is sustained either by operation of rule or by written decision of the Hearing Panel/Hearing Officer. A challenge as to a question of law need not be proceeded by a Notice of Contest, the serving of a Citation and Petition shall be sufficient notice to HAS. HAS does hereby appoint the Assistant General Manager for Security as the agent upon which to serve process in, and only in, a challenge pursuant to this O.I.
- E. An entry of "No Contest" shall not require presentation to a Hearing Panel/Hearing Officer and shall be entered in the violator's records in the HAS Badging Office by an employee thereof.
- F. The following procedures will be the method of contesting a Notice of Violation by a holder of an authorized HAS ID Badge. The Notice of Contest challenging the factual validity that the violator committed a violation charged in the NOV must be made by the alleged violator or by their Authorized Signature Authority in writing, on a form available from the ID Badging Office, delivered to the Head Supervisor for ID Badging (or to his/her specific Designee for this purpose) by either hand delivery or receipted delivery. Delivery may not be made by e-mail or fax. A written receipt of delivery must be signed by the Head Supervisor for ID Badging (or by his/her specific Designee for this purpose) delivery to anyone else and acceptance by anyone else will not be effective delivery.
- G. The Contest Hearing shall be in person at an office or conference room made available to the Hearing Panel/Hearing Officer and attendance of the alleged violator's Authorized Signature Authority with the alleged violator(s) is mandatory and will be at a time and date set by the Head Supervisor for ID Badging or designee. There shall not be any resets for the convenience of the Authorized Signature Authority or for the alleged violator, unless such reset is requested in writing, delivered to the Head Supervisor for ID Badging (or to his/her specific Designee for this purpose) by either hand delivery or receipted delivery, not later than five (5) calendar days prior to the date of the Head Supervisor for ID Badging (or by his/her specific Designee for this purpose) delivery to anyone else and acceptance by anyone else will not be effective delivery. Failure to attend a scheduled Notice of Contest Hearing may result in a sustained verdict for the Notice of Violation being challenged. Any reset shall be at the discretion of the Hearing Panel/Hearing Officer.
- H. All consequences of an alleged violation shall be suspended until the Hearing Panel/Hearing Officer has issued a written ruling or the time has passed for the filing of a Notice of Contest. When the alleged violation is a 3rd offense, there may be an Immediate Temporary Suspension and the alleged violator may follow the process for contesting the Immediate Temporary Suspension listed in Section X below, entitled "CONTEST HEARING PROCESS Immediate Temporary Suspension".
- I. Any service required or desired to be made upon the alleged violator may be served directly upon the alleged violator or upon any Authorized Signatory Authority at his/her employer/sponsor.
- J. The alleged violator and HAS shall have the right to compel any individual holding an HAS airport ID Badge to appear at any hearing before a Hearing Panel/Hearing Officer and failure to appear may result in the issuance of an NOV to the individual who did not appear. To invoke this right, the alleged violator must file a Requested Compelled ID Badged Witness List with the Head Supervisor for ID Badging (or to his/her specific Designee for this purpose) by either hand delivery or receipted delivery, not later than ten (10) calendar days prior to the date of the Hearing. The individual being compelled shall be entitled to a

total fee of \$ 20.00; including mileage, for their attendance and said fees must be attached to the Requested Compelled ID Badged Witness List. Delivery may not be made by e-mail or fax. A written receipt of delivery must be signed by the Head Supervisor for ID Badging (or to his/her specific Designee for this purpose) – delivery to anyone else and acceptance by anyone else will not be effective delivery. Such compunction shall not be available for Contest of Immediate Temporary Suspension and it shall be incumbent on the alleged violator to produce his/her own witnesses.

- K. At any hearing, all of which are administrative in nature, the Hearing Panel/Hearing Officer hearing the matter shall review the details of the offense, receive the testimony of the alleged violator, the person issuing the NOV, witnesses called by the alleged violator and witnesses called by HAS, the testimony of the alleged violator's Authorized Signature Authority (ASA) (if desired by the alleged violator, the ASA or HAS), and shall, in their sole discretion, make all decisions regarding the factual nature of the testimony, including, but not limited to, the weight to be given to the testimony of any party or witness, whether or not to believe the testimony, in whole or in part, apply the facts as determined by the person hearing the matter, in their sole discretion, to the elements of the offense and render a decision in accordance other provisions of this O.I.
- L. Each side shall be allowed five (5) minutes for an opening statement, thirty (30) minutes for examination of witnesses (this time includes, direct, cross, redirect, re-cross and rebuttal examination) and each party shall be allowed ten (10) minutes for a closing statement/argument.
- M. The Hearing Panel/Hearing Officer hearing the matter shall, not later than 24 hours after the hearing, issue and start delivery to the alleged violator's Employer and/or Sponsoring Organization and to the Assistant General Manager of Security, a written decision on the form then presently in use, save and except for a Contest of Immediate Temporary Suspension, the decision for which will be issued and be delivered at the conclusion of the hearing.
- N. The ruling of the Hearing Panel/Hearing Officer hearing the matter need not be detailed nor technical; a simple statement along the lines of "After hearing was held on XX day of XXXX, 2XXX, the undersigned person(s) sitting as the Hearing Panel/Hearing Officer hearing the contest of NOV # XXXXX wherein the party alleged to have committed the violation of XXXXX XXXXXX finds that the charge in the NOV is (either sustained or overruled)." and the Hearing Panel/Hearing Officer shall sign and date the same and file the ruling with the appropriate ID Badging Office.
- O. Except as otherwise specifically stated, the burden of proof shall be upon HAS as to the ultimate question in each hearing; the ultimate question being did the alleged violator commit the offense.
- P. The standard of proof shall be preponderance of evidence.
- Q. All decisions as to matters of fact and applying the facts to the violated rule shall be in the sole discretion of the Hearing Panel/Hearing Officer.
- R. Formal rules of evidence shall not apply; copies of documents may be introduced providing that the Hearing Panel/Hearing Officer hearing the matter, in their sole discretion, after considering testimony and argument as to the trustworthiness or lack of trustworthiness of the copy, has been heard and considered.
- S. There shall not be any pre-hearing discovery allowed.
- T. At any hearing, whether an NOV is issued by Airport Security personnel or by Airport Operations personnel, the HAS representative, i.e., the person who shall present the case on behalf of HAS, shall be the person who wrote the NOV.
- U. In any and all hearings, either HAS or the alleged violator may invoke "the Rule", requiring that witnesses not be allowed to hear the testimony of other witnesses.

- V. In any and all hearings, all witnesses shall testify under oath or affirmation with penalty of perjury.
- W. All hearings shall be either voice or video (with voice) recorded. The Badging Office will retain the recordings, records and will be provided to either HAS or the alleged violator upon written request.
- X. There is not an automatic stay of sanctions when an individual appeals to a court of competent jurisdiction; the appealing party must seek and obtain injunctive relief for a stay.
- Y. An alleged violator may not be represented by any individual or organization other than himself/herself at any hearing, save and except for an Attorney at Law duly licensed in the State of Texas.
- Z. The decision of the Hearing Panel/Hearing Officer is final and non-appealable as to the facts and the sanctions imposed.

X. CONTEST HEARING PROCESS – Immediate Temporary Suspension

- A. In the event of an Immediate Temporary Suspension the same shall be timely contestable by Notice of Contest of Immediate Temporary Suspension, in writing, on the form available from the ID Badging Office and filed by the alleged violator or their Authorized Signature Authority with the ID Badging Office at the HAS Airport where the NOV was issued. A hearing, restricted solely as to the issue as to whether or not the continued presence of the alleged violator represents any level of danger to the airport or other individuals or entities at the airport shall be heard by the Airport General Manager of Security (or to his/her specific Designee for this purpose) not later than forty-eight (48) hours after the request for such a hearing is delivered to the ID Badging Office by either hand delivery or receipted delivery. Delivery may not be made by e-mail or fax. A written receipt of delivery must be signed by the Head Supervisor for ID Badging (or by his/her specific Designee for this purpose) delivery to anyone else and acceptance by anyone else will not be effective delivery.
- B. There shall not be any hearing on any question of law, mitigation, probation or reduction of sanction. Any challenge as to questions of law shall be heard in a civil court of competent jurisdiction in Harris County, Texas.
- C. Any service required or desired to be made upon the alleged violator may be served directly upon the alleged violator or upon any Authorized Signatory Authority at his/her employer/sponsor.
- D. When the alleged violation is a 3rd Class I violation there may be an immediate suspension. The alleged violator may be instructed to immediately surrender and deliver their ID Badge to the Head Supervisor for ID Badging, or his/her specific Designee for this purpose, and may be instructed to immediately thereafter remove themselves from HAS owned or lease property and any presence on HAS owned or lease property during the period of suspension, save and except for the specific purpose of arrival or departure from the HAS airport on a flight, shall be trespass after warning and the violator shall be subject to arrest. If it is necessary for the suspended party to visit their employer who is located on HAS owned or lease property at the employer's request, the suspended party must notify the Airport Communications Center's Security Dispatch at least sixty (60) minutes prior to coming upon HAS owned or lease property and must be and remain, at all times, under an escort, even in the public areas, from the employer. During this time the suspended party MAY NOT engage in any business on behalf of the employer or any other party -- the suspended party shall not be or remain on the HAS owned or leased property in excess of sixty (60) minutes.
- E. The Assistant General Manager of Security or Operations (or designee) will render a decision which will be issued at the conclusion of the hearing.
- F. The ruling of the party hearing a Contest of Immediate Temporary Suspension need not be detailed nor technical; a simple statement along the lines of "After hearing was held on XX day of XXXX, 2XXX, the

undersigned person hearing the Contest of Suspension due to NOV # XXXXX wherein the party alleged to have committed the violation of XXXXX XXXXXX finds (choose one of the following) (a) that the alleged violator presents an unreasonable risk and it is in the interest of the safety and/or security of the HAS community alleged violator be immediately suspended and the Immediate Temporary Suspension is sustained or (b) that the alleged violator does not present an unreasonable risk to the safety or security of the HAS community and the Immediate Temporary Suspension is overruled)." and the person hearing the matter shall sign the same.

- G. The burden of proof in a hearing on a Contest of Immediate Temporary Suspension shall be on the alleged violator to prove that the alleged violator's presence on HAS property does not present an unreasonable risk of safety and/or security of the HAS community.
- H. In, and only in, a Contest of Immediate Temporary Suspension the alleged violator, the alleged violator's employer and/or sponsor and the Assistant General Manager of Security and the Airport General Manager may, prior to the contest hearing, enter into an Agreed Order to remove the Immediate Temporary Suspension, subject to certain conditions being imposed upon the alleged violator and those conditions and the decision to enter into such an Agreed Order or not to enter into such an Agreed Order shall be in the sole discretion of HAS -- all of the foregoing parties must agree in order for there to be a valid Agreed Order and a lifting of the Immediate Temporary Suspension.
- I. All decisions as to matters of fact and applying the facts to the rule shall be in the sole discretion of the Assistant General Manager for Security (or designee).
- J. Formal rules of evidence shall not apply; copies of documents may be introduced providing that the Assistant General Manager of Security (or designee) hearing the matter, in their sole discretion, after considering testimony and argument as to the trustworthiness or lack of trustworthiness of the copy, has been heard and considered.
- K. HAS and/or the alleged violator may introduce written statements.
- L. An alleged violator may not be represented by any individual or organization other than himself/herself at any hearing, save and except for an Attorney at Law duly licensed in the State of Texas.
- M. The decision of the Assistant General Manager of Security is final and non-appealable as to the facts and the sanctions imposed.

XI. MISCELLANEOUS MATTERS

- A. Having an HAS ID Badge and/or access rights is not a right, but is a privilege, and persons so having such ID Badge and/or access rights are only entitled to the same for so long as they meet all qualifications, including, but not limited to, being employed with an authorized sponsor and not having been found to have committed a violation or violations which can result in the suspension of the ID Badge and/or access rights.
- B. In the event that acts or omissions could result in the issuance of an NOV for more than one offense and if an NOV is, in fact, issued for multiple offenses, all of the charged offenses may be adjudicated and accrue sanctions for each sustained violation; however, in any event, it shall not be a defense, nor a mitigating fact that an NOV could have been written for only one violation;
- C. The Airport General Manager, in his/her sole discretion, has the right to make reasonable and prudent changes, clarifications, modifications, additions and/or subtractions to this O.I. and to O.I. 05-02, provided that the changes do not result in the loss of any substantive rights to any individual or entity charged with a violation prior to the date of the changes, clarifications, modifications, additions and/or subtractions or within 30 calendar days of posting such revision in the I.D. Badging Office.

- D. In the event that any agency, department, or division named herein changes its name or its duties be assigned to another agency, department or division, such new name or the name of the successor/replacement agency, department or division shall be substituted in place of any such agency, department or division presently named herein and no amendment to this O.I. shall be required;
- E. In the event that any specifically enumerated law, ordinance, rule or regulation set forth herein shall be renumbered, modified or replaced, then the new number and/or law, ordinance, rule or regulation that, in the sole discretion of the Airport General Manager, deems to be appropriate for replacement of the present law, ordinance, rule or regulation shall be substituted in place thereof and no amendment to this O.I. shall be required, however, the replacement law, ordinance, rule or regulation so designated shall be posted in the ID Badging Office and shall be obtainable therefrom.
- F. Any and all violations listed within this document can be charged as company offense.

OI 05-03 Tenant Violations – Offenses, Charging Instrument, Due Process Provisions

ATTACHMENT # 1

Notice Of Violation Sample (FRONT)

Sample (Date of Issue:		(To Fit on Approx. 5 x 7.5) (I Houston Airport System		(Printer to Reduce to Fit)	
		NOTICE OF VIC	NOTICE OF VIOLATION		NO. XXXXXXXXX
 IAH	Date of Offense: _		Time:		am or pm
нои	Name of Offender				
 EFD	HAS Badge No.: _	Last	First Expires:	MI	. <u></u>
Badge Sponsoring Or	ganization:				
Supervisor's Name: _		Supervisor's Phone #:			
If Vehicle/Equipment	Involved: Type	Make	3	Plate or	ID Number
If No HAS Badge Driv	ver's License #:		State:	D/O/B:	
Offense Approximate	Location:				
Rule #:				S	IDA AOA STEF
Violation Details:				(Circ	le If Applicable)
·····					
	· · · .				·
Signature of Violator		Signature of Iss	suer Nar	me Printed	ID Badge No.

ATTACHMENT # 1

Notice Of Violation Sample (BACK)

YOU HAVE THE RIGHT TO CONTEST THIS NOV VIA A HEARING.

TO EXERCISE THIS RIGHT YOU MUST FILE A NOTICE OF CONTEST WITHIN FOURTEEN CALENDAR DAYS FROM THE DATE OF ISSUE OF THIS NOV.

Failure to file the Notice of Contest within the aforesaid time will forever bar you from contesting the NOV and a plea of "No Contest" shall be automatically entered into your records and you will be assessed the sanctions for such violation and you will accrue sanction points for possible enhancement in the event of further violations, etc.

An entry of "No Contest" shall not require presentation to a Hearing Panel/Hearing Officer and shall be entered in the violator's records in the HAS Badging Office by an employee thereof.

The following procedures will be the method of contesting a Notice of Violation by a holder of an authorized HAS ID Badge. The Notice of Contest challenging the factual validity that the violator committed the violation charged in the NOV must be made by the alleged violator in writing, on a form available from the ID Badging Office, delivered to the Head Supervisor for ID Badging (or to his/her specific Designee for this purpose) by either hand delivery or receipted delivery. All Notice of Contests must include a complete statement as to the basis of the appeal as well as any and all supporting documentation, including but not limited to witness statements. Delivery may not be made by e-mail or fax. A written receipt of delivery must be signed by the Head Supervisor for ID Badging (or by his/her specific Designee for this purpose) – delivery to anyone else and acceptance by anyone else will not be effective delivery.

In the event of an immediate HAS ID Media confiscation, the Airport General Manager, or his/her designee, will review the relevant circumstances to determine if the immediate confiscation should remain in effect or be over-ruled. This review will be completed and a ruling issued no later than the following two (2) business days. The alleged violator retains the option to file a Notice of Contest within fourteen (14) calendar days of the immediate confiscation.

At any hearing, all of which are administrative in nature, the Hearing Panel/Hearing Officer reviewing the matter shall review the Notice of Contest documentation, to include details of the offense, the written appeal statement of the alleged violator, any applicable written witness statements, the written report from the person issuing the NOV, and shall, in their sole discretion, make all decisions regarding the factual nature of the written statements, apply the facts as determined by the Hearing Panel/Hearing Officer reviewing the matter to the elements of the offense and render a decision in accordance with other provisions of this O.I.

The ID Badging Office will at time of filing of your Notice of Contest supply you with a copy of the hearing procedures and rules therefore. These procedures and rules are also set forth in an Operating Instruction (O.I.) of the Houston Airport System - your badge sponsor and/or employer should have a copy of the O.I., but you are personally responsible to make sure you are going by the most current version of the O.I.

Ol 05-03 Tenant Violations – Offenses, Charging Instrument, Due Process Provisions

ATTACHMENT #2

Violations:

CLASS I Notice of Violations:

- 1. Failure to display valid HAS approved identification and/or ID Badge or HAS authorized ID Badge that is appropriate for the airport and the area in the prescribed manner, for special management and security purposes, specifically authorized in writing by either the Airport Security Manager or Director of Operations;
- 2. Failure to challenge someone in a controlled or restricted area who is not properly displaying an ID badge;
- 3. Possession of an HAS ID Badge that is substantially damaged, broken, faded, illegible;
- 4. Using a portal in a manner that has not been specifically authorized by HAS;
- 5. Failure to follow picketing/solicitation procedures anywhere on the Airport;
- 6. Smoking in an area where smoking is unauthorized and/or unlawful;
- 7. Violation of the Ten Foot Clear Zone, i.e., having an asset, including a disposed or abandoned asset, located closer than 10 feet to the perimeter fence line in areas where a 10 feet or greater distance is required, either inside or outside of the fence line This may be a company offense for the company or organization whose assets are located in violation;
- 8. Failure to properly secure or dispose of Sensitive Security Information;
- 9. Displaying and/or using an ID Badge that has been reported lost, stolen, is expired or has been deactivated;
- 10. Failure to show an HAS authorized ID Badge appropriate for the airport and the area when challenged;
- 11. Piggybacking -- when one or more individuals, who are holders of an HAS ID Badge, follow another individual through a controlled access point without using their own ID Badge, Security Key or PIN Number (unless they are under proper escort procedures and have a legitimate need to move through that portal);

- 12. Tailgating --- when one or more individuals, who are not holders of an HAS authorized ID Badge, or are holders of an HAS authorized ID Badge but do not have it on their person, follows another HAS ID Badged individual through a controlled access point -- the HAS ID Badged individual who does have their ID Badge with them must ensure the portal is secure prior to moving away and challenge the person, peacefully attempt to get them to leave the area, immediately notify Airport Security Dispatch, 281-230-1300 IAH or 713-845-6555 HOU and EFD and assist Airport Operations Officers in attempting to locate the tailgater;
- 13. Failure to challenge a Piggybacker or Tailgater -- a HAS ID Badged individual must ensure the portal is secure prior to moving away and challenge someone who is piggybacking. They shall wait while the piggybacker exits and returns through the portal properly using their own ID Badge, Security Key or PIN Number, if the piggybacker refuses to so comply a HAS ID Badged Individual must attempt to obtain the piggybacker's name, but whether they can obtain the name or not they must immediately report the same to Airport Security Dispatch, 281-230-1300 IAH or 713-845-6555 HOU and EFD and assist Airport Operations Officers in attempting to locate the piggybacker;
- 14. Failure to secure or follow stop and wait procedures any portal: which is required to be secure if not in use for operational needs, including, but not limited to a vehicle gate, pedestrian gate, door, and/or other portal;
- 15. Failure to use the "timed override" door function at a controlled portal where or when required;
- 16. Violation of Escort Procedures -- the escorting of one or more individuals (on foot or in a vehicle) into a restricted or controlled area and not strictly following the procedures related to proper identification, vehicle signs, and/or the requirement to remain with the individual/vehicle being escorted. **Special Note #1** Individuals who have been issued an ID Badge but who do not have the badge in their possession (left it home, in vehicle, lost, etc.) may not be escorted through any security access point or in or into any restricted or controlled area -- to do so is an offense for both the escorter and the escortee. **Special Note #2** Individuals who have applied for, but have not yet been issued an HAS or HAS Authorized Badge, if even allowed at all in a restricted or controlled area, must be at all times escorted and remain under strict escort and control of the escorting party at all times they are in a restricted or controlled area.
- 17. Failure to properly store and/or secure TSA prohibited items in a secured, restricted, or sterile area;
- 18. Failure to obey airside traffic controls, postings, or devices;
- 19. The violation of any other law, ordinance, policy, procedure, rule or regulation related to HAS and its security, airside safety, life safety or operations, including but not limited to business and field operations;

- 20. Performance of any action in conflict with FAR Part 139, the Airport Certification Manual, and/or the AOA Driver Training program;
- 21. Failure to yield to an aircraft under either tow or taxiing;
- 22. Failure to yield to an emergency vehicle;
- 23. Operating a vehicle on the airside without airport authorization;
- 24. Conducting and/or permitting an unsafe fueling operation anywhere on the airport;
- 25. Failure to control, as opposed to failure to properly escort, personnel and equipment in a secured area ;
- 26. Failure to submit to or perform the requirements of sanctions, after the sanctions have become final under this O.I., within the time allotted in this O.I. -- is a separate offense;
- 27. Towing an excessive number of trailer devices;
- 28. Operating a ground vehicle on the airside without having required lights in proper working order and/or not having lights in operation;
- 29. Operating a ground vehicle on the airside without a valid driver's license;
- 30. Operating a vehicle on the airside without required markings;
- 31. Unauthorized vehicle on the Aircraft Operating Area;
- 32. Abandoning a disabled vehicle in a secure area;
- 33. Failure to report a "reportable" hazardous material spill anywhere on the airport;
- 34. Operating and/or permitting the operation, including the movement thereof, of improperly maintained fueling equipment anywhere on the Airport;
- 35. Improper cleanup and/or permitting improper cleanup of a hazardous material spill anywhere on the airport;

- 36. Failure to follow prescribed engine run-up procedures;
- 37. Operating a ground vehicle in the secured area in excess of posted or published speed limit, in a reckless/unsafe manner and/or in excess of a safe speed limit considering the conditions of traffic (including, but not limited to pedestrian, aircraft, equipment and/or vehicular), driving surface, weather conditions, and/or exigent circumstances and;
- 38. Failure to display appropriate company signage on both sides of a vehicle or displaying or attempting to use any other expired permissive vehicle media, on an unattended vehicle parked in a "No Parking", "Tow Away", "Restricted" parking area, SIDA or AOA;
- 39. Allowing an individual to begin work in a controlled or secured area prior to successfully completing and submitting the required HAS badge application and process even if under escort.

Class II Sanctions are:

Permanent loss of ID Badge and Access Rights at all HAS airports. Violators of a Class II violation are subject to Immediate Temporary Suspension.

CLASS II Notice of Violations:

- 40. Displaying, loaning and/or permitting use of an HAS authorized ID Badge, assigned keys or PIN Number to or by another individual;
- 41. Failure or refusal to fully, completely, timely and truthfully cooperate -- including appearing when and at the place designated, with an investigation, audit or a proceeding by or instituted by or flowing from the acts of any Division of HAS. Misrepresentation or falsification, including but not limited to, intentionally or knowingly or recklessly leaving off any relevant information on any document delivered to HAS ;
- 42. Failure to surrender an individual's own ID Badge upon termination of employment to the individual's employer/sponsor/HAS ID Badging Office, or failure to surrender ID Badge upon request to anyone authorized to issue an NOV or a Law Enforcement Officer;
- 43. Intentionally or knowingly interfering with or failure to follow legitimate instructions from an employee of or contractor to HAS Airport Security or Airport Operations in the performance of their official duties;
- 44. Use, duplicate, or reproduce media or keys or authorizing access to any controlled or restricted area without written permission from either the ID Badging Office or, if the access device is not under the control of the ID Badging Office, the owner of the access device;
- 45. The failure to immediately notify the HAS ID Badging Office of an arrest for an HAS listed disqualifying crime;
- 46. Displaying and/or using an ID Badge that is not the violator's own badge;
- 47. Intentionally physically forcing a secured portal open instead of using an ID badge, PIN pad, or key;
- 48. Sabotaging, damaging, destroying a security or life safety device or system or any portion thereof; or disabling, bypassing, removal or modifying a security or life safety device or system or any portion thereof, without written permission of the Airport Security Manager or Director of Operations, or his/her designee -- *the actual existence of a life safety emergency is exception to the enforcement of this subparagraph, however, the burden of proof of the actual existence of a life safety emergency is upon the alleged violator -- this offense may also be a company offense, if any supervisor for the company had any knowledge that such may be occurring;*

- 49. Causing a runway vehicle/pedestrian incursion and or entering the airside Movement Area without an Air Traffic Control Tower clearance and/or failure to obey instructions from the Air Traffic Control Tower;
- 50. Theft in any amount occurring upon HAS property;
- 51. Introducing or having a prohibited weapon or weapons (other than tools, knifes and other items that are essential and authorized for a work related purpose) or a firearm by an employee other than law enforcement officers and/or Security personnel specifically authorized to do so other in a restricted, secured or controlled area. Replicas or non-functional devices will be treated as prohibited weapons for the purpose of this policy.
- 52. Possession or consumption of alcoholic beverages or controlled substances on HAS property, other than by a person licensed or employed by a licensee in the course and scope of their employment for the beverage or controlled substance including if the violator is driving on the AOA, airside ramps and/or tug tunnels, or part of their primary work function involves driving in one or more of the foregoing areas and then offense is a Class II Violation;
- 53. Refusing, or failing to comply with a required inspection, search, or screening of an individual or an individual's accessible property.
- 54. An airline employee including, but not limited to, Flight Crew, Cabin Crew, mechanic or any other employee boarding or attempting to board an aircraft as a passenger or any individual not specifically designated or acting as an active crew member for that flight that accessed the sterile area through an access point other than a TSA screening checkpoint.