ST. PETE-CLEARWATER INTERNATIONAL AIRPORT

PROJECT MANUAL

FOR

PIE Runway 18-36 Pavement Maintenance

July 21, 2022

PROJECT NUMBER: TBD

Prepared By

Kimley»Horn

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APPENDIX A

GENERAL PROVISIONS

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Section 10 Definition of Terms

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

Paragraph Number	Term	Definition
10-01	**AASHTO**	The American Association of State Highway and Transportation Officials.
10-02	**Access Road**	The right-of-way, the roadway and all improvements constructed thereon connecting the airport to a public roadway.
~~**10-03**~~	~~**Advertisement**~~	~~A public announcement, as required by local law, inviting bids for work to be performed and materials to be furnished.~~
10-04	**Airport**	Airport means an area of land or water which is used or intended to be used for the landing and takeoff of aircraft; an appurtenant area used or intended to be used for airport buildings or other airport facilities or rights of way; airport buildings and facilities located in any of these areas, and a heliport.
~~**10-05**~~	~~**Airport Improvement Program (AIP)**~~	~~A grant-in-aid program, administered by the Federal Aviation Administration (FAA).~~
10-06	**Air Operations Area (AOA)**	The term air operations area (AOA) shall mean any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operation area shall include such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiway, or apron.
10-07	**Apron**	Area where aircraft are parked, unloaded or loaded, fueled and/or serviced.
10-08	**ASTM International (ASTM)**	Formerly known as the American Society for Testing and Materials (ASTM).
10-09	**Award**	The Owner's notice to the successful Contractor of the acceptance of the submitted bid.
~~**10-10**~~	~~**Bidder**~~	~~Any individual, partnership, firm, or corporation, acting directly or through a duly authorized representative, who submits a proposal for the work contemplated.~~
10-11	**Building Area**	An area on the airport to be used, considered, or intended to be used for airport buildings or other airport facilities or rights-of-

Paragraph Number	Term	Definition
		way together with all airport buildings and facilities located thereon.
10-12	**Calendar Day**	Every day shown on the calendar.
10-13	**Certificate of Analysis (COA)**	The COA is the manufacturer's Certificate of Compliance (COC) including all applicable test results required by the specifications.
10-14	**Certificate of Compliance (COC)**	The manufacturer's certification stating that materials or assemblies furnished fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer's authorized representative.
10-15	**Change Order**	A written order to the Contractor covering changes in the plans, specifications, or proposal quantities and establishing the basis of payment and contract time adjustment, if any, for work within the scope of the contract and necessary to complete the project.
10-16	**Contract**	A written agreement between the Owner and the Contractor that establishes the obligations of the parties including but not limited to performance of work, furnishing of labor, equipment and materials and the basis of payment. The awarded contract includes but may not be limited to: Advertisement, Contract form, Proposal, Performance bond, payment bond, General provisions, certifications and representations, Technical Specifications, Plans, Supplemental Provisions, standards incorporated by reference and issued addenda.
10-17	**Contract Item (Pay Item)**	A specific unit of work for which a price is provided in the contract.
10-18	**Contract Time**	The number of calendar days or working days, stated in the proposal, allowed for completion of the contract, including authorized time extensions. If a calendar date of completion is stated in the proposal, in lieu of a number of calendar or working days, the contract shall be completed by that date.
10-19	**Contractor**	The individual, partnership, firm, or corporation primarily liable for the acceptable performance of the work contracted and for the payment of all legal debts pertaining to the work who acts directly or through lawful agents or employees to complete the contract work.
10-20	**Contractors Quality Control (QC) Facilities**	The Contractor's QC facilities in accordance with the Contractor Quality Control Program (CQCP).
10-21	**Contractor Quality Control Program (CQCP)**	Details the methods and procedures that will be taken to assure that all materials and completed construction required by the contract conform to contract plans, technical specifications and

Paragraph Number	Term	Definition
		other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors.
10-22	**Control Strip**	A demonstration by the Contractor that the materials, equipment, and construction processes results in a product meeting the requirements of the specification.
10-23	**Construction Safety and Phasing Plan (CSPP)**	The overall plan for safety and phasing of a construction project developed by the airport operator, or developed by the airport operator's consultant and approved by the airport operator. It is included in the invitation for bids and becomes part of the project specifications.
10-24	**Drainage System**	The system of pipes, ditches, and structures by which surface or subsurface waters are collected and conducted from the airport area.
10-25	**Engineer**	The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for engineering, inspection, and/or observation of the contract work and acting directly or through an authorized representative.
10-26	**Equipment**	All machinery, together with the necessary supplies for upkeep and maintenance; and all tools and apparatus necessary for the proper construction and acceptable completion of the work.
10-27	**Extra Work**	An item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, but which is found by the Owner's Engineer or Resident Project Representative (RPR) to be necessary to complete the work within the intended scope of the contract as previously modified.
10-28	**FAA**	The Federal Aviation Administration. When used to designate a person, FAA shall mean the Administrator or their duly authorized representative.
10-29	**Federal Specifications**	The federal specifications and standards, commercial item descriptions, and supplements, amendments, and indices prepared and issued by the General Services Administration.
10-30	**Force Account**	**a.** Contract Force Account - A method of payment that addresses extra work performed by the Contractor on a time and material basis. **b.** Owner Force Account - Work performed for the project by the Owner's employees.
10-31	**Intention of Terms**	Whenever, in these specifications or on the plans, the words "directed," "required," "permitted," "ordered," "designated," "prescribed," or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the Engineer and/or Resident Project Representative (RPR) is intended; and similarly, the

Paragraph Number	Term	Definition
		words “approved,” “acceptable,” “satisfactory,” or words of like import, shall mean approved by, or acceptable to, or satisfactory to the Engineer and/or RPR, subject in each case to the final determination of the Owner. Any reference to a specific requirement of a numbered paragraph of the contract specifications or a cited standard shall be interpreted to include all general requirements of the entire section, specification item, or cited standard that may be pertinent to such specific reference.
10-32	**Lighting**	A system of fixtures providing or controlling the light sources used on or near the airport or within the airport buildings. The field lighting includes all luminous signals, markers, floodlights, and illuminating devices used on or near the airport or to aid in the operation of aircraft landing at, taking off from, or taxiing on the airport surface.
10-33	**Major and Minor Contract Items**	A major contract item shall be any item that is listed in the proposal, the total cost of which is equal to or greater than 20% of the total amount of the award contract. All other items shall be considered minor contract items.
10-34	**Materials**	Any substance specified for use in the construction of the contract work.
10-35	**Modification of Standards (MOS)**	Any deviation from standard specifications applicable to material and construction methods in accordance with FAA Order 5300.1.
10-36	**Notice to Proceed (NTP)**	A written notice to the Contractor to begin the actual contract work on a previously agreed to date. If applicable, the Notice to Proceed shall state the date on which the contract time begins.
10-37	**Owner**	The term “Owner” shall mean the party of the first part or the contracting agency signatory to the contract. Where the term “Owner” is capitalized in this document, it shall mean airport Sponsor only. The Owner for this project is **St. Pete-Clearwater International Airport (PIE)**.
10-38	Passenger Facility Charge (PFC)	Per 14 Code of Federal Regulations (CFR) Part 158 and 49 United States Code (USC) § 40117, a PFC is a charge imposed by a public agency on passengers enplaned at a commercial service airport it controls.
10-39	**Pavement Structure**	The combined surface course, base course(s), and subbase course(s), if any, considered as a single unit.
10-40	**Payment bond**	The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will pay in full all bills and accounts for materials and labor used in the construction of the work.

Paragraph Number	Term	Definition
10-41	**Performance bond**	The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will complete the work in accordance with the terms of the contract.
10-42	**Plans**	The official drawings or exact reproductions which show the location, character, dimensions and details of the airport and the work to be done and which are to be considered as a part of the contract, supplementary to the specifications. Plans may also be referred to as 'contract drawings.'
10-43	**Project**	The agreed scope of work for accomplishing specific airport development with respect to a particular airport.
10-44	**Proposal**	The written offer of the Contractor (when submitted on the approved proposal form) to perform the contemplated work and furnish the necessary materials in accordance with the provisions of the plans and specifications.
10-45	**Proposal guaranty**	The security furnished with a proposal to guarantee that the Contractor will enter into a contract if their own proposal is accepted by the Owner.
10-46	**Quality Assurance (QA)**	Owner's responsibility to assure that construction work completed complies with specifications for payment.
10-47	**Quality Control (QC)**	Contractor's responsibility to control material(s) and construction processes to complete construction in accordance with project specifications.
10-48	**Quality Assurance (QA) Inspector**	An authorized representative of the Engineer and/or Resident Project Representative (RPR) assigned to make all necessary inspections, observations, tests, and/or observation of tests of the work performed or being performed, or of the materials furnished or being furnished by the Contractor.
10-49	**Quality Assurance (QA) Laboratory**	The official quality assurance testing laboratories of the Owner or such other laboratories as may be designated by the Engineer or RPR. May also be referred to as Engineer's, Owner's, or QA Laboratory.
10-50	**Resident Project Representative (RPR)**	The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for all necessary inspections, observations, tests, and/or observations of tests of the contract work performed or being performed, or of the materials furnished or being furnished by the Contractor, and acting directly or through an authorized representative.
10-51	**Runway**	The area on the airport prepared for the landing and takeoff of aircraft.

Paragraph Number	Term	Definition
10-52	**Runway Safety Area (RSA)**	A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft. See the construction safety and phasing plan (CSPP) for limits of the RSA.
10-53	**Safety Plan Compliance Document (SPCD)**	Details how the Contractor will comply with the CSPP.
10-54	**Specifications**	A part of the contract containing the written directions and requirements for completing the contract work. Standards for specifying materials or testing which are cited in the contract specifications by reference shall have the same force and effect as if included in the contract physically.
~~**10-55**~~	~~**Sponsor**~~	~~A Sponsor is defined in 49 USC § 47102(24) as a public agency that submits to the FAA for an AIP grant; or a private Owner of a public-use airport that submits to the FAA an application for an AIP grant for the airport.~~
10-56	**Structures**	Airport facilities such as bridges; culverts; catch basins, inlets, retaining walls, cribbing; storm and sanitary sewer lines; water lines; underdrains; electrical ducts, manholes, handholes, lighting fixtures and bases; transformers; navigational aids; buildings; vaults; and, other manmade features of the airport that may be encountered in the work and not otherwise classified herein.
10-57	**Subgrade**	The soil that forms the pavement foundation.
10-58	**Superintendent**	The Contractor's executive representative who is present on the work during progress, authorized to receive and fulfill instructions from the RPR, and who shall supervise and direct the construction.
10-59	**Supplemental Agreement**	A written agreement between the Contractor and the Owner that establishes the basis of payment and contract time adjustment, if any, for the work affected by the supplemental agreement. A supplemental agreement is required if: (1) in scope work would increase or decrease the total amount of the awarded contract by more than 25%: (2) in scope work would increase or decrease the total of any major contract item by more than 25%; (3) work that is not within the scope of the originally awarded contract; or (4) adding or deleting of a major contract item.
10-60	**Surety**	The corporation, partnership, or individual, other than the Contractor, executing payment or performance bonds that are furnished to the Owner by the Contractor.
10-61	**Taxilane**	A taxiway designed for low speed movement of aircraft between aircraft parking areas and terminal areas.
10-62	**Taxiway**	The portion of the air operations area of an airport that has been designated by competent airport authority for movement of

Paragraph Number	Term	Definition
		aircraft to and from the airport's runways, aircraft parking areas, and terminal areas.
10-63	**Taxiway/Taxilane Safety Area (TSA)**	A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an aircraft. See the construction safety and phasing plan (CSPP) for limits of the TSA.
10-64	**Work**	The furnishing of all labor, materials, tools, equipment, and incidentals necessary or convenient to the Contractor's performance of all duties and obligations imposed by the contract, plans, and specifications.
10-65	**Working day**	A working day shall be any day other than a legal holiday, Saturday, or Sunday on which the normal working forces of the Contractor may proceed with regular work for at least six (6) hours toward completion of the contract. When work is suspended for causes beyond the Contractor's control, it will not be counted as a working day. Saturdays, Sundays and holidays on which the Contractor's forces engage in regular work will be considered as working days.
10-66	**Owner Defined terms**	***Advisory Circular (AC) - A document issued by the FAA containing informational material and guidance. When referred to in the drawings (plans) and specifications, advisory circulars shall have the same force as supplemental specifications.*** ***Certification - When "certification" is used to describe that which is to be submitted for approval from the Contractor, jointly with a supplier or by himself for his own materials, whether manufactured or purchased by the Contractor, will be construed to mean compliance in individual or completed form with the drawings (plans), specifications and/or intent of the design.*** ***Awarded Contract - The written agreement between the Owner and Contractor, covering the work to be performed. The awarded Contract shall include, but is not limited to: The Contract Form; The Proposal; The Performance Bond and Payment Bond; any required insurance certificates; The General Provisions; The General Requirements, The Special Provisions; The Specifications; Standard Forms; The Drawings (Plans), Change Orders, Terms and Conditions, and agreements which are required to complete the construction of the work in an acceptable manner, including authorized extensions thereof, all of which constitute one instrument.***

Paragraph Number	Term	Definition
		Special Provisions - The specific clauses setting forth conditions or requirements peculiar to the project under consideration. ***Subcontractor - The pre-qualified (where required) individual, partnership or corporation, or a combination thereof, undertaking the execution of a part of the work under the terms of the Contract, by virtue of an agreement with the contractor approved by the Owner.***

END OF SECTION 10

Section 20 Proposal Requirements and Conditions

20-01 Advertisement (Notice to Bidders). ***Is an official published advertisement, also known as Invitation To Bid (ITB), that states the time and place for submitting sealed proposals; a description of the proposed work; instructions to bidders as to obtaining proposal forms, plans, and specifications; proposal guaranty required; and the Owner's right to reject any and all bids.***

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

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

Each bidder shall furnish the Owner satisfactory evidence of their financial responsibility. Evidence of financial responsibility, unless otherwise specified, shall consist of a confidential statement or report of the bidder's financial resources and liabilities as of the last calendar year or the bidder's last fiscal year. Such statements or reports shall be certified by a public accountant. At the time of submitting such financial statements or reports, the bidder shall further certify whether their financial responsibility is approximately the same as stated or reported by the public accountant. If the bidder's financial responsibility has changed, the bidder shall qualify the public accountant's statement or report to reflect the bidder's true financial condition at the time such qualified statement or report is submitted to the Owner.

Unless otherwise specified, a bidder may submit evidence that they are prequalified with the State Highway Division and are on the current "bidder's list" of the state in which the proposed work is located. Evidence of State Highway Division prequalification may be submitted as evidence of financial responsibility in lieu of the certified statements or reports specified above.

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

Mobilization is limited to **10** percent of the total project cost.

A prebid conference is required on this project to discuss as a minimum, the following items: material requirements; submittals; Quality Control/Quality Assurance requirements; the construction safety and phasing plan including airport access and staging areas; and unique airfield paving construction requirements.

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

a. Failure to comply with any prequalification regulations of the Owner, if such regulations are cited, or otherwise included, in the proposal as a requirement for bidding.

b. Failure to pay, or satisfactorily settle, all bills due for labor and materials on former contracts in force with the Owner at the time the Owner issues the proposal to a prospective Contractor.

~~**c.** Documented record of Contractor default under previous contracts with the Owner.~~

~~**d.** Documented record of unsatisfactory work on previous contracts with the Owner.~~

20-05 Interpretation of estimated proposal quantities. An estimate of quantities of work to be done and materials to be furnished under these specifications is given in the proposal. It is the result of careful calculations and is believed to be correct. It is given only as a basis for comparison of proposals and the award of the contract. The Owner does not expressly, or by implication, agree that the actual quantities involved will correspond exactly therewith; nor shall the Contractor plead misunderstanding or deception because of such estimates of quantities, or of the character, location, or other conditions pertaining to the work. Payment to the Contractor will be made only for the actual quantities of work performed or materials furnished in accordance with the plans and specifications. ***The Contractor shall verify all quantities as noted in the plans prior to ordering material or equipment. No additional compensation shall be made for stored materials, re-stocking fees or other fees associated with errors in quantity calculations.*** It is understood that the quantities may be increased or decreased as provided in the Section 40, paragraph 40-02, Alteration of Work and Quantities, without in any way invalidating the unit bid prices.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

20-11 Delivery of proposal. ***Delivery of proposal shall comply with the ITB.***

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

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

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

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

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

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

20-15 Discrepancies and Omissions. A Bidder who discovers discrepancies or omissions with the project bid documents shall immediately notify the Owner's Engineer of the matter. A bidder that has doubt as to the true meaning of a project requirement may submit to the Owner's Engineer a written request for interpretation**.** no later than 10 days prior to bid opening.

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

END OF SECTION 20

Section 30 Award and Execution of Contract

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

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

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

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

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

30-02 Award of contract. The award of a contract, if it is to be awarded, shall be made within **180** calendar days of the date specified for publicly opening proposals, unless otherwise specified herein.

Basis of award shall comply with the ITB.

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

The Owner shall evaluate the bids and award this contract based on the lowest responsive price for the base bid.

Unless otherwise specified in this subsection, no award shall be made until the FAA has concurred in the Owner's recommendation to make such award and has approved the Owner's proposed contract to the extent that such concurrence and approval are required by 49 CFR Part 18.

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

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

30-05 Requirements of contract bonds. At the time of the execution of the contract, the successful bidder shall furnish the Owner a surety bond or bonds that have been fully executed by the bidder and the surety guaranteeing the performance of the work and the payment of all legal debts that may be incurred

by reason of the Contractor's performance of the work. The surety and the form of the bond or bonds shall be acceptable to the Owner. Unless otherwise specified in this subsection, the surety bond or bonds shall be in a sum equal to the full amount of the contract.

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

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

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

END OF SECTION 30

Section 40 Scope of Work

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

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

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

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

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

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

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

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

When determined by the RPR to be in the Owner's best interest, the RPR may order the Contractor to proceed with extra work as provided in Section 90, paragraph 90-05, *Payment for Extra Work*. Extra work that is necessary for acceptable completion of the project, but is not within the general scope of the work

~~covered by the original contract shall be covered by a supplemental agreement as defined in Section 10, paragraph 10-59, *Supplemental Agreement*.~~

~~If extra work is essential to maintaining the project critical path, RPR may order the Contractor to commence the extra work under a Time and Material contract method. Once sufficient detail is available to establish the level of effort necessary for the extra work, the Owner shall initiate a change order or supplemental agreement to cover the extra work.~~

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

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

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

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

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

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

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

Except as provided in Section 40, paragraph 40-07, *Rights in and Use of Materials Found in the Work*, it is intended that all existing materials or structures that may be encountered (within the lines, grades, or

grading sections established for completion of the work) shall be used in the work as otherwise provided for in the contract and shall remain the property of the Owner when so used in the work.

40-07 Rights in and use of materials found in the work. Should the Contractor encounter any material such as (but not restricted to) sand, stone, gravel, slag, or concrete slabs within the established lines, grades, or grading sections, the use of which is intended by the terms of the contract to be embankment, the Contractor may at their own option either:

a. Use such material in another contract item, providing such use is approved by the RPR and is in conformance with the contract specifications applicable to such use; or,

b. Remove such material from the site, upon written approval of the RPR; or

c. Use such material for the Contractor's own temporary construction on site; or,

d. Use such material as intended by the terms of the contract.

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

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

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

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

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

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

END OF SECTION 40

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Section 50 Control of Work

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

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

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

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

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

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

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

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

or testing, and cited ACs; plans shall govern over cited standards for materials or testing and cited ACs. If any paragraphs contained in the Special Provisions conflict with General Provisions or Technical Specifications, the Special Provisions shall govern.

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

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

50-04 List of Special Provisions. Refer to Invitation to Bid.

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

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

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

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

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

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

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

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

Copies of survey notes will be provided to the RPR for each area of construction and for each placement of material as specified to allow the RPR to make periodic checks for conformance with plan grades, alignments and grade tolerances required by the applicable material specifications. Surveys will be provided to the RPR prior to commencing work items that cover or disturb the survey staking. Survey(s) and notes shall be provided in the following format(s): ***AutoCAD 2018 or higher and two hard copy plans 22x34 signed and sealed by a licensed land surveyor.***

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

Construction Staking and Layout includes but is not limited to:

a. Clearing and Grubbing perimeter staking

b. Rough Grade slope stakes at 100-foot (30-m) stations

c. Drainage Swales slope stakes and flow line blue tops at 50-foot (15-m) stations

Subgrade blue tops at 25-foot (7.5-m) stations and 25-foot (7.5-m) offset distance (maximum) for the following section locations:

a. Runway – minimum five (5) per station

b. Taxiways – minimum three (3) per station

c. Holding apron areas – minimum three (3) per station

d. Roadways – minimum three (3) per station

Base Course blue tops at 25-foot (7.5-m) stations and 25-foot (7.5-m) offset distance (maximum) for the following section locations:

a. Runway – minimum five (5) per station

b. Taxiways – minimum three (3) per station

c. Holding apron areas – minimum three (3) per station

Pavement areas:

a. Edge of Pavement hubs and tacks (for stringline by Contractor) at 100-foot (30-m) stations.

b. Between Lifts at 25-foot (7.5-m) stations for the following section locations:

(1) Runways – each paving lane width

(2) Taxiways – each paving lane width

(3) Holding areas – each paving lane width

c. After finish paving operations at 50-foot (15-m) stations:

(1) All paved areas – Edge of each paving lane prior to next paving lot

d. Shoulder and safety area blue tops at 50-foot (15-m) stations and at all break points with maximum of 50-foot (15-m) offsets.

e. Fence lines at 100-foot (30-m) stations minimum.

f. Electrical and Communications System locations, lines and grades including but not limited to duct runs, connections, fixtures, signs, lights, Visual Approach Slope Indicators (VASIs), Precision

Approach Path Indicators (PAPIs), Runway End Identifier Lighting (REIL), Wind Cones, Distance Markers (signs), pull boxes and manholes.

g. Drain lines, cut stakes and alignment on 25-foot (7.5-m) stations, inlet and manholes.

h. Painting and Striping layout (pinned with 1.5 inch PK nails) marked for paint Contractor. (All nails shall be removed after painting).

i. Laser, or other automatic control devices, shall be checked with temporary control point or grade hub at a minimum of once per 400 feet (120 m) per pass (that is, paving lane).

The establishment of Survey Control and/or reestablishment of survey control shall be by a State Licensed Land Surveyor.

Controls and stakes disturbed or suspect of having been disturbed shall be checked and/or reset as directed by the RPR without additional cost to the Owner.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

If, however, the inspection discloses any work, in whole or in part, as being unsatisfactory, the RPR will notify the Contractor ***(punch list items)*** and the Contractor shall correct the unsatisfactory work. ***The punch list items shall be corrected by the Contractor within 30 calendar days and prior to any request for final inspection or acceptance.*** Upon correction of the work, another inspection will be made which shall constitute the final inspection, provided the work has been satisfactorily completed. In such event, the RPR will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of final inspection.

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

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

~~**50-17 Value Engineering Cost Proposal.**~~

~~The provisions of this paragraph will apply only to contracts awarded to the lowest bidder pursuant to competitive bidding.~~

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

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

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

~~a. A description of both existing contract requirements for performing the work and the proposed changes, with a discussion of the comparative advantages and disadvantages of each.~~

~~b. An itemization of the contract requirements that must be changed if the proposal is adopted.~~

~~c. A detailed estimate of the cost of performing the work under the existing contract and under the proposed changes.~~

~~d. A statement of the time by which a change order adopting the proposal must be issued.~~

~~e. A statement of the effect adoption of the proposal will have on the time for completion of the contract.~~

~~f. The contract items of work affected by the proposed changes, including any quantity variation attributable to them.~~

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

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

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

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

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

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

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

50-18 RETEST OF WORK. When as provided for in the Contract documents, the Owner performs sampling tests of the work and the tests show a failure to meet the requirements of the Contract documents, the expense of retesting, after reworking or substitution by the Contractor will be at the expense of the Contractor and such costs will be deducted from the payments otherwise due to the Contractor.

50-19 CORRECTION OF WORK AFTER FINAL PAYMENT. Neither the final certificate, nor payment, nor any provision in the Contract documents shall relieve the Contractor of responsibility for faulty materials or workmanship and, unless otherwise specified, he shall remedy any defect due

thereto and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from date of final acceptance.

The Owner shall give notice of observed defects with reasonable promptness. Wherever the word "acceptance" occurs, it shall be understood to mean final acceptance.

50-20 WARRANTY AND GUARANTEE. The Contractor warrants to the Owner that all materials furnished under this Contract shall be new unless otherwise specified and that all Work, including without limitation all materials, will be of good quality, free from faults and defects and in conformance with contract requirements. Any work not so conforming to these standards may be considered defective.

If, within one year after the date of final acceptance of the Work, or within such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract, any of the Work is found to be defective or not in accordance with Contract requirements, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so.

The obligations of the Contractor in this paragraph entitled WARRANTY AND GUARANTEE shall be in addition to and not in limitation of any obligations imposed upon him by special guarantees required by the contract or otherwise prescribed by law.

END OF SECTION 50

Section 60 Control of Materials

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

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

Contractor shall supply steel and manufactured products that conform to the Buy American provisions established under 49 USC Section 50101 as follows: "Steel products must be 100% U.S. domestic product. Preference shall be given to products that are 100% manufactured and assembled in the U.S. Manufactured products not meeting the 100% U.S. domestic preference may only be used on the project if the Owner has officially granted a permissible waiver to Buy American Preferences. Submittals for all manufactured products must include certification of compliance with Buy American requirements as established under 49 USC Section 50101. Submittal must include sufficient information to confirm compliance or submittal will be returned with no action."

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

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

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

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

The testing organizations performing on-site quality assurance field tests shall have copies of all referenced standards on the construction site for use by all technicians and other personnel. Unless otherwise designated, samples for quality assurance will be taken by a qualified representative of the RPR. All materials being used are subject to inspection, test, or rejection at any time prior to or during incorporation into the work. Copies of all tests will be furnished to the Contractor's representative at their request after review and approval of the RPR. ***In the event that any tests show a failure to meet the requirements of the Contract Documents, the expense of retesting, after substitution or modification, shall be paid by the Contractor. The Contractor shall furnish the required samples without charge and shall give sufficient notification of the placing of orders for materials to permit testing.***

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

The Contractor shall employ a Quality Control (QC) testing organization to perform all Contractor required QC tests in accordance with Item C-100 Contractor Quality Control Program (CQCP). ***Final quality control report shall be delivered in an electronic PDF format.***

60-03 Certification of compliance/analysis (COC/COA). The RPR may permit the use, prior to sampling and testing, of certain materials or assemblies when accompanied by manufacturer's COC stating that such materials or assemblies fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer. Each lot of such materials or assemblies delivered to the work must be accompanied by a certificate of compliance in which the lot is clearly identified. The COA is the manufacturer's COC and includes all applicable test results. ***Certification alone will not relieve the Contractor from his responsibility to provide materials that comply fully with the provisions of these specifications and that acceptable to the Engineer.***

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

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

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

a. Conformance to the specified performance, testing, quality or dimensional requirements; and,

b. Suitability of the material or assembly for the use intended in the contract work.

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

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

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

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

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

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

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

It is understood and agreed that the Owner shall have the right to retest any material that has been tested and approved at the source of supply after it has been delivered to the site. The RPR shall have the right to

reject only material which, when retested, does not meet the requirements of the contract, plans, or specifications.

60-05 Engineer/ Resident Project Representative (RPR) field office. The Contractor shall provide dedicated space for the use of the engineer, RPR, and inspectors, as a field office for the duration of the project. This space shall be located conveniently near the construction and shall be separate from any space used by the Contractor. The Contractor shall furnish water, sanitary facilities, heat, air conditioning, and electricity ***and other amenities as described in Item M-106.***

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

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

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

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

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

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

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

END OF SECTION 60

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Section 70 Legal Regulations and Responsibility to Public

70-01 Laws to be observed. The Contractor shall keep fully informed of all federal and state laws, all local laws, ordinances, and regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the work, or which in any way affect the conduct of the work. The Contractor shall at all times observe and comply with all such laws, ordinances, regulations, orders, and decrees; and shall protect and indemnify the Owner and all their officers, agents, or servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by the Contractor or the Contractor's employees.

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

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

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

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

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

~~**70-05 Federal Participation**. The United States Government has agreed to reimburse the Owner for some portion of the contract costs. The contract work is subject to the inspection and approval of duly authorized representatives of the FAA Administrator. No requirement of this contract shall be construed~~

~~as making the United States a party to the contract nor will any such requirement interfere, in any way, with the rights of either party to the contract.~~

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

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

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

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

70-08 Construction Safety and Phasing Plan (CSPP). The Contractor shall complete the work in accordance with the approved Construction Safety and Phasing Plan (CSPP) developed in accordance with AC 150/5370-2, Operational Safety on Airports During Construction. The CSPP is ***made part of the Project Manual.*** ~~on sheet(s) [___] of the project plans.~~

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

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

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

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

Work that is to remain in place which is damaged or defaced by reasons of work performed under this Contract, shall be restored at no additional cost to the Owner.

Items removed, indicated to be salvaged for Owner or reused in new work, which are damaged beyond repair, shall be replaced with equal new materials under this Contract at no additional cost to the Owner.

Existing pavement or other existing work not specified for removal which is temporarily removed, damaged or in any way disturbed or altered by work under this Contract shall be repaired, patched, or replaced to the complete satisfaction of the RPR at no additional cost to the Owner.

Where it is necessary to cut, alter, remove, or temporarily remove and replace existing property or equipment, the cost shall be included in the Contract price for the item creating such work.

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

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

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

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

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

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

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

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

70-14 Contractor's responsibility for work. Until the RPR's final written acceptance of the entire completed work, excepting only those portions of the work accepted in accordance with Section 50, paragraph 50-14, *Partial Acceptance*, the Contractor shall have the charge and care thereof and shall take every precaution against injury or damage to any part due to the action of the elements or from any other

cause, whether arising from the execution or from the non-execution of the work. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of the work occasioned by any of the above causes before final acceptance and shall bear the expense thereof except damage to the work due to unforeseeable causes beyond the control of and without the fault or negligence of the Contractor, including but not restricted to acts of God such as earthquake, tidal wave, tornado, hurricane or other cataclysmic phenomenon of nature, or acts of the public enemy or of government authorities.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Any displaced or relocated FAA facility or cables due to construction will require a signed and executed reimbursable agreement between the Owner and the FAA Tech Ops Division.

The splicing of cables is not be an acceptable form of repair for certain projects. If any FAA cables are damaged, the Contractor shall replace the cables in their entirety.

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

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

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

70-18 No waiver of legal rights. Upon completion of the work, the Owner will expeditiously make final inspection and notify the Contractor of final acceptance. Such final acceptance, however, shall not

preclude or stop the Owner from correcting any measurement, estimate, or certificate made before or after completion of the work, nor shall the Owner be precluded or stopped from recovering from the Contractor or their surety, or both, such overpayment as may be sustained, or by failure on the part of the Contractor to fulfill their obligations under the contract. A waiver on the part of the Owner of any breach of any part of the contract shall not be held to be a waiver of any other or subsequent breach.

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

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

In the event of conflict between Federal, State or local laws, codes, ordinances, rules and regulations concerning pollution control, the most restrictive applicable ones shall apply.

The Contractor shall pay special attention to the pollution control requirements of the several specifications. Work items, which may cause excessive pollution and shall be closely controlled by the Contractor, are:

a) Clearing, grubbing, burning or other disposal.

b) Stripping, excavation, and embankment.

c) Drainage and ditching.

d) Aggregate production, handling and placing.

e) Cement, lime or other stabilization.

f) Concrete and bituminous materials handling, production and paving.

g) Seeding, fertilizing, mulching and use of herbicides or insecticides.

h) Contractor's own housekeeping items; haul roads; sanitary facilities; water supply; equipment fueling, servicing and cleaning; job clean up and disposal.

When the Contractor submits his tentative progress schedule in accordance with PROSECUTION and PROGRESS, Section 80, he shall also submit for acceptance of the Owner, his schedules for accomplishment of temporary and permanent erosion control work, as are applicable for clearing, grading, structures at water courses, construction, and paving, and his proposed methods of erosion control on haul roads and borrow pits and his plan for disposal of waste materials. No work shall be started until the erosion control schedules and methods of operations have been accepted by the Owner.

All bituminous and portland cement concrete proportioning plants shall meet state requirements.

The following listed stipulations shall apply to this Contract unless more restrictive ones are specified by the plans, special provisions, laws, codes, ordinances, etc. Cost of pollution control shall be incidental to the appropriate work items unless otherwise specified.

1. Control of Water Pollution and Siltation.

(a) All work of water pollution and siltation control is subject to inspection by the local and/or state governmental enforcing agent.

(b) All applicable regulations of fish and wildlife agencies and statutes relating to the prevention and abatement of pollution shall be complied with in the performance of the Contract.

(c) Construction operations shall be conducted in such manner as to reduce erosion to the practicable minimum and to prevent damaging siltation of water courses, streams, lakes or reservoirs. The surface area of erodible land, either on or off the airport site, exposed to the elements by clearing, grubbing or grading operations, including gravel pits, waste or disposal areas and haul roads, at any one time, for this Contract, shall be subject to approval of the Owner and the duration of such exposure prior to final trimming and finishing of the areas shall be held to the minimum practical. The Owner shall have full authority to order the suspension of grading and other operations pending adequate and proper performance of finishing and maintenance work or to restrict the trimming of erodible land exposed to the elements.

(d) Materials used for permanent erosion control measures shall meet the requirements of the applicable specifications. Gravel or stone, consisting of durable particles of rock and containing only negligible quantities of fines, shall be used for construction pads, haul roads and temporary roads in or across streams.

(e) Where called for on the plans, a stilling basin shall be constructed to prevent siltation in the stream from construction operations.

(f) The disturbance of lands and waters that are outside the limits of construction as staked is prohibited, except as found necessary and approved by the Owner.

(g) The Contractor shall conduct his work in such manner as to prevent the entry of fuels, oils, bituminous materials, chemicals, sewage or other harmful materials into streams, rivers, lakes or reservoirs.

(h) Water from aggregate washing or other operations containing sediment shall be treated by filtration, by use of a settling basin or other means to reduce the sediment content to a level acceptable to the local and/or state governmental enforcing agent.

(i) All waterways shall be cleared as soon as practicable of falsework, piling, debris or other obstructions placed during construction operations and not a part of the finished work. Care shall be taken during construction and removal of such barriers to minimize the muddying of a stream.

(j) The Contractor shall care for the temporary erosion and siltation control measures during the period that the temporary measures are required and for the permanent erosion control measures until the Contract has been completed and accepted. Such care shall consist of the repair of areas damaged by erosion, wind, fire or other causes.

(k) Permanent and temporary erosion control work that is damaged due to the Contractor's operations or where the work required is attributed to the Contractor's negligence, carelessness, or failure to install permanent controls at the proper time, shall be repaired at the Contractor's expense.

2. Control of Other Air Pollutants.

(b) Grading areas shall be kept at proper moisture conditions.

(c) Sand or dust blows shall be temporarily mulched, with or without seeding, or otherwise controlled with stabilizing agents.

(d) Temporary roads, haul roads, traffic or work areas shall be stabilized with dust palliative, penetration asphalt, or wood chips or other approved measures to prevent dust pollution.

(e) Cements, fertilizers, chemicals, volatiles, etc., shall be stored in proper containers or with proper coverings to prevent accidental discharge into the air.

(f) Aggregate bins, cement bins, and dry material batch trucks shall be properly covered to prevent loss of material to the air.

(g) Drilling, grinding and sand blasting apparatus shall be equipped with water, chemical, or vacuum dust controlling systems.

(h) Applications of chemicals and bitumens shall be held to recommended rates.

(i) Bituminous mixing plants shall be equipped with dust collectors as noted in the specifications.

(j) Quarrying, batching, and mixing operations and the transfer of materials between trucks, bins, or stockpiles shall be properly controlled to minimize dust diffusion.

(k) When necessary, certain operations shall be delayed until proper wind or climatic conditions exist to dissipate or inhibit potential pollutants to the satisfaction of the Owner.

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

Should the Contractor encounter, during their operations, any building, part of a building, structure, or object that is incongruous with its surroundings, the Contractor shall immediately cease operations in that location and notify the RPR. The RPR will immediately investigate the Contractor's finding and the Owner will direct the Contractor to either resume operations or to suspend operations as directed.Should the Owner order suspension of the Contractor's operations in order to protect an archaeological or historical finding, or order the Contractor to perform extra work, such shall be covered by an appropriate contract change order or supplemental agreement as provided in Section 40, paragraph 40-04, *Extra Work,* and Section 90, paragraph 90-05, *Payment for Extra Work*. If appropriate, the contract change order or supplemental agreement shall include an extension of contract time in accordance with Section 80, paragraph 80-07, *Determination and Extension of Contract Time*.

70-21 Insurance Requirements. Refer to the ITB for insurance requirements.

END OF SECTION 70

Section 80 Execution and Progress

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

The Contractor shall perform, with his organization, an amount of work equal to at least **35** percent of the total contract cost.

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

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

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

80-02 Notice to proceed (NTP). The Owners notice to proceed will state the date on which contract time commences. The Contractor is expected to commence project operations within 14 days of the NTP date. The Contractor shall notify the RPR at least `24 hours` in advance of the time contract operations begins. The Contractor shall not commence any actual operations prior to the date on which the notice to proceed is issued by the Owner.

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

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

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

The project schedule shall be prepared as a network diagram in Critical Path Method (CPM), Program Evaluation and Review Technique (PERT), or other format, or as otherwise specified. It shall include information on the sequence of work activities, milestone dates, and activity duration. The schedule shall show all work items identified in the project proposal for each work area and shall include the project start date and end date.

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

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

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

When the contract work requires the Contractor to work within an AOA of the airport on an intermittent basis (intermittent opening and closing of the AOA), the Contractor shall maintain constant communications as specified; immediately obey all instructions to vacate the AOA; and immediately obey all instructions to resume work in such AOA. Failure to maintain the specified communications or to obey instructions shall be cause for suspension of the Contractor's operations in the AOA until satisfactory conditions are provided. The areas of the AOA identified in the Construction Safety Phasing Plan (CSPP) and as listed below, cannot be closed to operating aircraft to permit the Contractor's operations on a continuous basis and will therefore be closed to aircraft operations intermittently as ***indicated on the plans*** ~~as follows:~~

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

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

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

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

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

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

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

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

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

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

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

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

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

In the event that the Contractor is ordered by the Owner, in writing, to suspend work for some unforeseen cause not otherwise provided for in the contract and over which the Contractor has no control, the Contractor may be reimbursed for actual money expended on the work during the period of shutdown. No allowance will be made for anticipated profits. The period of shutdown shall be computed from the effective date of the written order to suspend work to the effective date of the written order to resume the work. Claims for such compensation shall be filed with the RPR within the time period stated in the RPR's order to resume work. The Contractor shall submit with their own claim information substantiating

the amount shown on the claim. The RPR will forward the Contractor's claim to the Owner for consideration in accordance with local laws or ordinances. No provision of this article shall be construed as entitling the Contractor to compensation for delays due to inclement weather or for any other delay provided for in the contract, plans, or specifications.

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

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

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

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

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

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

The maximum construction time allowed for ~~Schedules [___]~~ ***the entire project*** will be the sum of the time allowed for individual schedules but not more than ~~[___] days~~ ***the total contract time specified in the contract documents.*** Permitting the Contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a wavier on the part of the Owner of any of its rights under the contract. ***Liquidated damages will be assessed as provided in the bid submittal form.***

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

a. Fails to begin the work under the contract within the time specified in the Notice to Proceed, or

b. Fails to perform the work or fails to provide sufficient workers, equipment and/or materials to assure completion of work in accordance with the terms of the contract, or

c. Performs the work unsuitably or neglects or refuses to remove materials or to perform anew such work as may be rejected as unacceptable and unsuitable, or

d. Discontinues the execution of the work, or

e. Fails to resume work which has been discontinued within a reasonable time after notice to do so, or

f. Becomes insolvent or is declared bankrupt, or commits any act of bankruptcy or insolvency, or

g. Allows any final judgment to stand against the Contractor unsatisfied for a period of 10 days, or

h. Makes an assignment for the benefit of creditors, or

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

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

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

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

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

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

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

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

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

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

END OF SECTION 80

Section 90 Measurement and Payment

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

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

Unless otherwise specified, longitudinal measurements for area computations will be made horizontally, and no deductions will be made for individual fixtures (or leave-outs) having an area of 9 square feet (0.8 square meters) or less. Unless otherwise specified, transverse measurements for area computations will be the neat dimensions shown on the plans or ordered in writing by the RPR.

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

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

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

Measurement and Payment Terms

Term	Description
Excavation and Embankment Volume	In computing volumes of excavation, the average end area method will be used unless otherwise specified.
Measurement and Proportion by Weight	The term “ton” will mean the short ton consisting of 2,000 pounds (907 km) avoirdupois. All materials that are measured or proportioned by weights shall be weighed on accurate, independently certified scales by competent, qualified personnel at locations designated by the RPR. If material is shipped by rail, the car weight may be accepted provided that only the actual weight of material is paid for. However, car weights will not be acceptable for material to be passed through mixing plants. Trucks used to haul material being paid for by weight shall be weighed empty daily at such times as the RPR directs, and each truck shall bear a plainly legible identification mark.
Measurement by Volume	Materials to be measured by volume in the hauling vehicle shall be hauled in approved vehicles and measured therein at the point of delivery. Vehicles for this purpose may be of any size or type acceptable for the materials hauled, provided that the body is of such

Term	Description
	shape that the actual contents may be readily and accurately determined. All vehicles shall be loaded to at least their water level capacity, and all loads shall be leveled when the vehicles arrive at the point of delivery.
Asphalt Material	Asphalt materials will be measured by ~~the gallon (liter) or~~ ton (kg). ~~When measured by volume, such volumes will be measured at 60°F (16°C) or will be corrected to the volume at 60°F (16°C) using ASTM D1250 for asphalts.~~ Net certified scale weights or weights based on certified volumes in the case of rail shipments will be used as a basis of measurement, subject to correction when asphalt material has been lost from the car or the distributor, wasted, or otherwise not incorporated in the work. When asphalt materials are shipped by truck or transport, net certified weights by volume, subject to correction for loss or foaming, will be used for computing quantities.
Cement	Cement will be measured by the ton (kg) or hundredweight (km).
Structure	Structures will be measured according to neat lines shown on the plans or as altered to fit field conditions.
Timber	Timber will be measured by the thousand feet board measure (MFBM) actually incorporated in the structure. Measurement will be based on nominal widths and thicknesses and the extreme length of each piece.
Plates and Sheets	The thickness of plates and galvanized sheet used in the manufacture of corrugated metal pipe, metal plate pipe culverts and arches, and metal cribbing will be specified and measured in decimal fraction of inch.
Miscellaneous Items	When standard manufactured items are specified such as fence, wire, plates, rolled shapes, pipe conduit, etc., and these items are identified by gauge, unit weight, section dimensions, etc., such identification will be considered to be nominal weights or dimensions. Unless more stringently controlled by tolerances in cited specifications, manufacturing tolerances established by the industries involved will be accepted.
Scales	Scales must be tested for accuracy and serviced before use. Scales for weighing materials which are required to be proportioned or measured and paid for by weight shall be furnished, erected, and maintained by the Contractor, or be certified permanently installed commercial scales. Platform scales shall be installed and maintained with the platform level and rigid bulkheads at each end. Scales shall be accurate within 0.5% of the correct weight throughout the range of use. The Contractor shall have the scales checked under the observation of the RPR before beginning work and at such other times as requested. The intervals shall be uniform in spacing throughout the graduated or marked length of the beam or dial and shall not exceed 0.1% of the nominal rated capacity of the scale, but not less than one pound (454 grams). The use of spring balances will not be permitted. In the event inspection reveals the scales have been “overweighing” (indicating more than correct weight) they will be immediately adjusted. All materials received subsequent to the last previous correct weighting-accuracy test will be reduced by the percentage of error in excess of 0.5%. In the event inspection reveals the scales have been under-weighing (indicating less than correct weight), they shall be immediately adjusted. No additional payment to the Contractor will be allowed for materials previously weighed and recorded.

Term	Description
	Beams, dials, platforms, and other scale equipment shall be so arranged that the operator and the RPR can safely and conveniently view them. Scale installations shall have available ten standard 50-pound (2.3 km) weights for testing the weighing equipment or suitable weights and devices for other approved equipment. All costs in connection with furnishing, installing, certifying, testing, and maintaining scales; for furnishing check weights and scale house; and for all other items specified in this subsection, for the weighing of materials for proportioning or payment, shall be included in the unit contract prices for the various items of the project.
Rental Equipment	Rental of equipment will be measured by time in hours of actual working time and necessary traveling time of the equipment within the limits of the work. Special equipment ordered in connection with extra work will be measured as agreed in the change order or supplemental agreement authorizing such work as provided in paragraph 90-05 *Payment for Extra Work.*
Pay Quantities	When the estimated quantities for a specific portion of the work are designated as the pay quantities in the contract, they shall be the final quantities for which payment for such specific portion of the work will be made, unless the dimensions of said portions of the work shown on the plans are revised by the RPR. If revised dimensions result in an increase or decrease in the quantities of such work, the final quantities for payment will be revised in the amount represented by the authorized changes in the dimensions.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

It is understood and agreed that the Contractor shall not be entitled to demand or receive partial payment based on quantities of work in excess of those provided in the proposal or covered by approved change

orders or supplemental agreements, except when such excess quantities have been determined by the RPR to be a part of the final quantity for the item of work in question.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

90-10 Construction warranty.

a. In addition to any other warranties in this contract, the Contractor warrants that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, workmanship, or design furnished, or performed by the Contractor or any subcontractor or supplier at any tier.

b. This warranty shall continue for a period of one year from the date of final acceptance of the work, except as noted. If the Owner takes possession of any part of the work before final acceptance, this warranty shall continue for a period of one year from the date the Owner takes possession. However, this will not relieve the Contractor from corrective items required by the final acceptance of the project work. ~~Light Emitting Diode emitting diode (LED) light fixtures with the exception of obstruction lighting, must be warranted by the manufacturer for a minimum of four (4) years after date of installation inclusive of all electronics.~~

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

k. Security for Construction Warranty.

l. Equipment commissioning documentation submitted, if required.

END OF SECTION 90

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APPENDIX B

TECHNICAL SPECIFICATIONS

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ST. PETE-CLEARWATER INTERNATIONAL AIRPORT

TECHNICAL SPECIFICATIONS

FOR

PIE Runway 18-36 Pavement Maintenance

July 21, 2022

PROJECT NUMBER: TBD

Prepared By

Kimley»Horn

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ITEM ERRATA-1 TECHNICAL SPECIFICATION ERRATA SHEET

Note: The technical specifications listed below have been modified from the Standard Federal Aviation Administration Advisory Circular (FAA AC) 150/5370-10H, Standard Specifications for Construction of Airports, dated 12/21/2018.

Text that has been deleted is shown using strikethrough. (e.g., ~~Sample Text~~)

Text that has been added is shown as bold and italicized: (e.g., ***Sample Text***)

Section	Title
C-100	CONTRACTOR QUALITY CONTROL PROGRAM (CQCP)
C-102	TEMPORARY AIR AND WATER POLLUTION, SOIL EROSION AND SILTATION CONTROL
C-105	MOBILIZATION
C-110	METHOD OF ESTIMATING PERCENTAGE OF MATERIAL WITHIN SPECIFICATION LIMITS (PWL)
P-101	PREPARATION/REMOVAL OF EXISTING PAVEMENTS
P-153	CONTROLED LOW-STRENGTH MATERIAL (CLSM)
P-401	ASPHALT MIX PAVEMENT
P-603	EMULSIFIED ASPHALT TACK COAT
P-605	JOINT SEALANTS FOR PAVEMENTS
P-606	ADHESIVE COMPOUNDS, TWO-COMPONENT FOR SEALING WIRE AND LIGHTS IN PAVEMENT
P-608	EMULSIFIED ASPHALT SEAL COAT
P-610	CONCRETE FOR MISCELLANEOUS STRUCTURES
P-620	RUNWAY AND TAXIWAY MARKING
P-621	SAW-CUT GROOVES
L-108	UNDERGROUND POWER CABLE FOR AIRPORTS
L-125	INSTALLATION OF AIRPORT LIGHTING SYSTEMS

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Item C-100 Contractor Quality Control Program (CQCP)

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

The Contractor shall establish a CQCP that will:

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

b. Provide for the production of acceptable quality materials.

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

d. Document the CQCP process.

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

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

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

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

b. Discussion of the QA program.

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

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

e. Establishment of the overall QC culture.

100-2 Description of program.

a. General description. The Contractor shall establish a CQCP to perform QC inspection and testing of all items of work required by the technical specifications, including those performed by subcontractors. The CQCP shall ensure conformance to applicable specifications and plans with respect to materials, off-

site fabrication, workmanship, construction, finish, and functional performance. The CQCP shall be effective for control of all construction work performed under this Contract and shall specifically include surveillance and tests required by the technical specifications, in addition to other requirements of this section and any other activities deemed necessary by the Contractor to establish an effective level of QC.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

a. Specification item number

b. Item description

c. Description of submittal

d. Specification paragraph requiring submittal

e. Scheduled date of submittal

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

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

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

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

100-7 Contractor QC testing facility.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(1) Technical specification item number and description

(2) Compliance with approved submittals

(3) Proper storage of materials and equipment

(4) Proper operation of all equipment

(5) Adherence to plans and technical specifications

(6) Summary of any necessary corrective actions

(7) Safety inspection.

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

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

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

(1) Technical specification item number and description

(2) Test designation

(3) Location

(4) Date of test

(5) Control requirements

(6) Test results

(7) Causes for rejection

(8) Recommended remedial actions

(9) Retests

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

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

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

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

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

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

100-12 Noncompliance.

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

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

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

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

METHOD OF MEASUREMENT

100-13 Basis of measurement and payment. 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:~~

There shall be no separate measurement for Contractor Quality Control Program.

BASIS OF PAYMENT

100-14 Payment will be made under:

There shall be no separate payment for the Contractor Quality Control Program. All costs shall be incidental to the items requiring Contractor Quality Control Program.

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.

102-1.2 Any permits which the Owner has obtained for any purpose such as NPDES, etc., does not include nor cover the Contractor's haul routes, equipment access points, staging areas, office compounds, materials stockpiles, blending and batch plant areas and operations or other project related activity areas outside the project limits or off site.

102-1.3 The Contractor shall prepare all required documentation, pay all fees and perform all services and work necessary to obtain all permits and approvals from any and all local, state and federal regulatory agencies for the Contractor's staging, stockpile, blending and batch plant areas and operations. The cost of all permitting shall be subsidiary to other items of work.

102-1.4 The Contractor shall develop a Pollution Prevention Plan to conform to the Contractor's activities on this project. The plan shall be in strict compliance with the National Pollutant Discharge Elimination System (NPDES) permit issued or approved by the U.S. Environmental Protection Agency (EPA) pursuant to 40 CFR Part 122.6. The Plan shall address all measures to dispose of, control, or prevent the discharge of solid, hazardous and sanitary wastes to the waters of the U.S. The plan shall include procedures to control offsite tracking of soil by vehicles and construction equipment and procedures for cleanup and reporting of non-storm water discharges such as contaminated groundwater or accidental spills.

The Contractor shall also be required to submit written documentation that all required permits have been obtained to the RPR/Engineer prior to start up of construction activities.

102-1.5 Any permanent or temporary fuel storage tank that will be located on airport property for the Contractor's use for longer than a period of twelve months shall be permitted through the authority(s) having jurisdiction. Additionally, permanent containment features as required by law shall be constructed for each fuel storage tank.

MATERIALS

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

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

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

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

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

102-2.6 Other. All other materials shall meet commercial grade standards and shall be approved by the RPR before being incorporated into the project.

102-2.7 SILT BARRIERS AND HAY BALES. The silt fence and hay bales shall conform to the FDOT Standard Index Number 102.

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~~ ***Contractor with review by the RPR and Engineer*** shall be responsible for assuring compliance to the extent that construction practices, construction operations, and construction work are involved. ***This does not relieve the Contractor from having the total responsibility for the prevention, control and abatement of erosion and water pollution during the project.***

102-3.2 Schedule. Prior to the start of construction, the Contractor shall submit ***a Pollution Control Plan including and*** 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.

Required methods of controlling dust and other air pollutants will include but are not limited to:

Exposing the minimum area of erodible earth.

Applying temporary mulch with or without seeding.

Using water sprinkler trucks.

Using covered haul trucks.

The Contactor shall provide equipment wash out areas and these areas will be constructed and protected as to prevent any discharge of silt, waste concrete, fuels, lubricants and other harmful materials into nearby impoundments, ponds or surface water drainage system.

The Contactor shall periodically inspect the pollution control features and immediately after each rainfall and at least daily during prolonged rainfall and immediately correct any deficiencies.

The Contractor shall also remove all temporary erosion/pollution control facilities and restore those sites. This work will include the repair of any trenching for silt fence, removal of silt build-up, the removal of fencing, barriers, silt bales and the associated stakes and appurtenances and seeding and mulching or sodding to restore those areas. All new or existing inlets, catch basins, manholes etc. including connecting pipes shall be cleaned and flushed by the Contractor.

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. ***Temporary erosion and sedimentation control shall not be removed until permanent vegetation has been established.***

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.** Temporary slope drains will be measured by the linear foot (meter).~~

~~**c.** Temporary benches, dikes, dams, and sediment basins will be measured by the cubic yard (cubic meter) of excavation performed, including necessary cleaning of sediment basins, and the cubic yard (cubic meter) of embankment placed as directed by the RPR.~~

~~**d.** All fertilizing will be measured by the ton (kg).~~

e. Installation and removal of silt fence will be measured by the `linear foot`.

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 ***and*** will be paid for under:

Item C-102-1 Silt fence – per Linear Foot

~~***Item C-102-2 Soil tracking prevention device – per Each***~~

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

~~Item C-102-5.1b Temporary slope drains - per linear foot (meter)~~

~~Item C-102-5.1c Temporary benches, dikes, dams and sediment basins - per cubic yard (cubic meter)~~

~~Item C-102-5.1d Fertilizing - per ton (kg)~~

~~Item C-102-5.1e Installation and removal of silt fence [per linear feet (meter)] [lump sum]~~

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

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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. ***This item also consists of the preparatory work and operations in mobilizing for beginning work on the project, including, but not limited to, those operations necessary for the safe movement of personnel, equipment, permitting and permitting fees, badging and driver training, supplies and incidentals to the project site. For the establishment by the Contractor of staging areas, field offices, temporary fence, temporary gates, temporary culverts for site access, construction signage, all utilities, safety equipment and first aid supplies, sanitary and other facilities, as required by these Specifications, and State and local laws and regulations including the submittal of a NPDES Notice of Intent and Storm Water Pollution Prevention Plan, if required. The preparation, submittal and approval of initial project schedule, quality control plan, construction sequencing plan, shop drawings and the completion of all staging area requirements, the ordering of required material and the cost to establish, maintain and restore to the existing condition, including seed and mulch, of the Contractor staging area and sodding of disturbed grass areas outside of the limits of construction shall also be included in this item.***

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. ***Additional amenities for the field office are provided in Item M-106.***~~

105-5 The costs of bonds and any required insurance and other preconstruction expense, including badging for all Contractor personnel, necessary for the start of the work, excluding the cost of construction materials, shall be included in this Item.

105-6 This item of work will also include any other item or items of work shown, implied or required for the completion of the project that are not directly paid for under other pay items.

105-7 DEMOBILIZATION. The Contractor shall completely de-mobilize all equipment, vehicles, materials, offices, and waste within 30 days of final acceptance. Remaining retainage will not be released until all deficient work is corrected and the Contractor has completely demobilized from the project site.

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:~~ ***Measurement of the item, Mobilization, as specified herein will be on a lump sum basis.***

BASIS OF PAYMENT

105-6 ***The work and incidental costs covered under this item will be paid for at the Contract lump sum price for the item of Mobilization. No additional payment will be made for demobilization and/or remobilization due to project shutdowns or suspensions of the work identified in the project documents. No payment for any percentage of construction mobilization shall be made until the Contractor's initial project schedule, Safety Plan Compliance Document (SPCD)and quality control plan are approved by the RPR.***

Payment will be made under:

Item C-105-1 Mobilization - ***per Lump Sum***

Partial payments for Mobilization will be made therefore in accordance with the following:

PERCENT OF CONTRACT AMOUNT EARNED*	ALLOWABLE PERCENT OF LUMP SUM PRICE FOR THE ITEM**
0%	0%
5%	10%
10%	25%
25%	50%
50%	75%
75%	90%
100%	100%

**** The Percent of Contract Amount Earned shall equal the work completed to date, including the total of all previous mobilization plus or minus work completed associated with any executed Change Orders, if any, divided by the Total Original Contract Amount plus or minus the Total Executed Change Order Amounts, if any.***

The standard retainage, as herein specified will be applied to these allowances. Partial payments made on this item shall in no way act to preclude or limit any of the provisions for partial payments otherwise provided for by the Contract.

In the event the contract completion date is extended or additional work is added to the project, no additional payment will be made for the mobilization unless otherwise addressed by change order.

REFERENCES

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

Office of Federal Contract Compliance Programs (OFCCP)

Executive Order 11246, as amended

EEOC-P/E-1 – Equal Employment Opportunity is the Law Poster

United States Department of Labor, Wage and Hour Division (WHD)

WH 1321 – Employee Rights under the Davis-Bacon Act Poster

END OF ITEM C-105

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Item C-110 Method of Estimating Percentage of Material Within Specification Limits (PWL)

110-1 General. When the specifications provide for acceptance of material based on the method of estimating percentage of material within specification limits (PWL), the PWL will be determined in accordance with this section. All test results for a lot will be analyzed statistically to determine the total estimated percent of the lot that is within specification limits. The PWL is computed using the sample average (X) and sample standard deviation (S_n) of the specified number (n) of sublots for the lot and the specification tolerance limits, L for lower and U for upper, for the particular acceptance parameter. From these values, the respective Quality index, Q_L for Lower Quality Index and/or Q_U for Upper Quality Index, is computed and the PWL for the lot for the specified n is determined from Table 1. All specification limits specified in the technical sections shall be absolute values. Test results used in the calculations shall be to the significant figure given in the test procedure.

There is some degree of uncertainty (risk) in the measurement for acceptance because only a small fraction of production material (the population) is sampled and tested. This uncertainty exists because all portions of the production material have the same probability to be randomly sampled. The Contractor's risk is the probability that material produced at the acceptable quality level is rejected or subjected to a pay adjustment. The Owner's risk is the probability that material produced at the rejectable quality level is accepted.

It is the intent of this section to inform the Contractor that, in order to consistently offset the Contractor's risk for material evaluated, production quality (using population average and population standard deviation) must be maintained at the acceptable quality specified or higher. In all cases, it is the responsibility of the Contractor to produce at quality levels that will meet the specified acceptance criteria when sampled and tested at the frequencies specified.

110-2 Method for computing PWL. The computational sequence for computing PWL is as follows:

a. Divide the lot into n sublots in accordance with the acceptance requirements of the specification.

b. Locate the random sampling position within the sublot in accordance with the requirements of the specification.

c. Make a measurement at each location, or take a test portion and make the measurement on the test portion in accordance with the testing requirements of the specification.

d. Find the sample average (X) for all sublot test values within the lot by using the following formula:

$$\mathbf{X = (x_1 + x_2 + x_3 + \ldots x_n) / n}$$

Where: X = Sample average of all sublot test values within a lot

$x_1, x_2, \ldots x_n$ = Individual sublot test values

n = Number of sublot test values

e. Find the sample standard deviation (S_n) by use of the following formula:

$$S_n = [(d_1^2 + d_2^2 + d_3^2 + \ldots d_n^2)/(n-1)]^{1/2}$$

Where: S_n = Sample standard deviation of the number of sublot test values in the set

$d_1, d_2, \ldots d_n$ = Deviations of the individual sublot test values $x_1, x_2, \ldots$ from the average value X

that is: $d_1 = (x_1 - X)$, $d_2 = (x_2 - X) \ldots d_n = (x_n - X)$

n = Number of sublot test values

f. For single sided specification limits (i.e., L only), compute the Lower Quality Index Q_L by use of the following formula:

$$Q_L = (X - L) / S_n$$

Where: L = specification lower tolerance limit

Estimate the percentage of material within limits (PWL) by entering Table 1 with Q_L, using the column appropriate to the total number (n) of measurements. If the value of Q_L falls between values shown on the table, use the next higher value of PWL.

g. For double-sided specification limits (i.e., L and U), compute the Quality Indexes Q_L and Q_U by use of the following formulas:

$$Q_L = (X - L) / S_n$$
and
$$Q_U = (U - X) / S_n$$

Where: L and U = specification lower and upper tolerance limits

Estimate the percentage of material between the lower (L) and upper (U) tolerance limits (PWL) by entering Table 1 separately with Q_L and Q_U, using the column appropriate to the total number (n) of measurements, and determining the percent of material above P_L and percent of material below P_U for each tolerance limit. If the values of Q_L fall between values shown on the table, use the next higher value of P_L or P_U. Determine the PWL by use of the following formula:

$$PWL = (P_U + P_L) - 100$$

Where: P_L = percent within lower specification limit

P_U = percent within upper specification limit

EXAMPLE OF PWL CALCULATION

Project: Example Project

Test Item: Item P-401, Lot A.

A. PWL Determination for Mat Density.

1. Density of four random cores taken from Lot A.

A-1 = 96.60

A-2 = 97.55

A-3 = 99.30

A-4 = 98.35

n = 4

2. Calculate average density for the lot.

$X = (x_1 + x_2 + x_3 + . . . x_n) / n$

$X = (96.60 + 97.55 + 99.30 + 98.35) / 4$

X = 97.95% density

3. Calculate the standard deviation for the lot.

$S_n = [((96.60 - 97.95)^2 + (97.55 - 97.95)^2 + (99.30 - 97.95)^2 + (98.35 - 97.95)^2)) / (4 - 1)]^{1/2}$

$S_n = [(1.82 + 0.16 + 1.82 + 0.16) / 3]^{1/2}$

$S_n = 1.15$

4. Calculate the Lower Quality Index Q_L for the lot. (L=96.3)

$Q_L = (X - L) / S_n$

$Q_L = (97.95 - 96.30) / 1.15$

$Q_L = 1.4348$

5. Determine PWL by entering Table 1 with Q_L= 1.44 and n= 4.

PWL = 98

B. PWL Determination for Air Voids.

1. Air Voids of four random samples taken from Lot A.

A-1 = 5.00

A-2 = 3.74

A-3 = 2.30

A-4 = 3.25

2. Calculate the average air voids for the lot.

$X = (x_1 + x_2 + x_3 . . . n) / n$

$X = (5.00 + 3.74 + 2.30 + 3.25) / 4$

X = 3.57%

3. Calculate the standard deviation S_n for the lot.

$S_n = [((3.57 - 5.00)^2 + (3.57 - 3.74)^2 + (3.57 - 2.30)^2 + (3.57 - 3.25)^2) / (4 - 1)]^{1/2}$

$S_n = [(2.04 + 0.03 + 1.62 + 0.10) / 3]^{1/2}$

$S_n = 1.12$

4. Calculate the Lower Quality Index Q_L for the lot. (L= 2.0)

$Q_L = (X - L) / S_n$

$Q_L = (3.57 - 2.00) / 1.12$

$Q_L = 1.3992$

5. Determine P_L by entering Table 1 with Q_L = 1.41 and n = 4.

$P_L = 97$

6. Calculate the Upper Quality Index Q_U for the lot. (U= 5.0)

$Q_U = (U - X) / S_n$

$Q_U = (5.00 - 3.57) / 1.12$

$Q_U = 1.2702$

7. Determine P_U by entering Table 1 with $Q_U = 1.29$ and n = 4.

$P_U = 93$

8. Calculate Air Voids PWL

$PWL = (P_L + P_U) - 100$

$PWL = (97 + 93) - 100 = 90$

EXAMPLE OF OUTLIER CALCULATION (REFERENCE ASTM E178)

Project: Example Project

Test Item: Item P-401, Lot A.

A. Outlier Determination for Mat Density.

1. Density of four random cores taken from Lot A arranged in descending order.

A-3 = 99.30

A-4 = 98.35

A-2 = 97.55

A-1 = 96.60

2. From ASTM E178, Table 1, for n=4 an upper 5% significance level, the critical value for test criterion = 1.463.

3. Use average density, standard deviation, and test criterion value to evaluate density measurements.

a. For measurements greater than the average:

If (measurement - average)/(standard deviation) is less than test criterion, then the measurement is not considered an outlier.

For A-3, check if (99.30 - 97.95) / 1.15 is greater than 1.463.

Since 1.174 is less than 1.463, the value is not an outlier.

b. For measurements less than the average:

If (average - measurement)/(standard deviation) is less than test criterion, then the measurement is not considered an outlier.

For A-1, check if (97.95 - 96.60) / 1.15 is greater than 1.463.

Since 1.435 is less than 1.463, the value is not an outlier.

Note: In this example, a measurement would be considered an outlier if the density were:

Greater than (97.95 + 1.463 × 1.15) = 99.63%

OR

less than (97.95 - 1.463 × 1.15) = 96.27%.

Table 1. Table for Estimating Percent of Lot Within Limits (PWL)

Percent Within Limits (P_L and P_U)	Positive Values of Q (Q_L and Q_U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4717	1.4829	1.4914
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653
87	1.0597	1.1100	1.1173	1.1192	1.1199	1.1204	1.1208	1.1212
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794	1.0791	1.0789
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399	1.0389	1.0382
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015	1.0000	0.9990
83	0.9939	0.9900	0.9785	0.9715	0.9671	0.9643	0.9624	0.9610
82	0.9749	0.9600	0.9452	0.9367	0.9315	0.9281	0.9258	0.9241
81	0.9550	0.9300	0.9123	0.9025	0.8966	0.8928	0.8901	0.8882
80	0.9342	0.9000	0.8799	0.8690	0.8625	0.8583	0.8554	0.8533
79	0.9124	0.8700	0.8478	0.8360	0.8291	0.8245	0.8214	0.8192
78	0.8897	0.8400	0.8160	0.8036	0.7962	0.7915	0.7882	0.7858
77	0.8662	0.8100	0.7846	0.7716	0.7640	0.7590	0.7556	0.7531
76	0.8417	0.7800	0.7535	0.7401	0.7322	0.7271	0.7236	0.7211
75	0.8165	0.7500	0.7226	0.7089	0.7009	0.6958	0.6922	0.6896
74	0.7904	0.7200	0.6921	0.6781	0.6701	0.6649	0.6613	0.6587
73	0.7636	0.6900	0.6617	0.6477	0.6396	0.6344	0.6308	0.6282
72	0.7360	0.6600	0.6316	0.6176	0.6095	0.6044	0.6008	0.5982
71	0.7077	0.6300	0.6016	0.5878	0.5798	0.5747	0.5712	0.5686
70	0.6787	0.6000	0.5719	0.5582	0.5504	0.5454	0.5419	0.5394
69	0.6490	0.5700	0.5423	0.5290	0.5213	0.5164	0.5130	0.5105
68	0.6187	0.5400	0.5129	0.4999	0.4924	0.4877	0.4844	0.4820
67	0.5878	0.5100	0.4836	0.4710	0.4638	0.4592	0.4560	0.4537
66	0.5563	0.4800	0.4545	0.4424	0.4355	0.4310	0.4280	0.4257
65	0.5242	0.4500	0.4255	0.4139	0.4073	0.4030	0.4001	0.3980
64	0.4916	0.4200	0.3967	0.3856	0.3793	0.3753	0.3725	0.3705
63	0.4586	0.3900	0.3679	0.3575	0.3515	0.3477	0.3451	0.3432
62	0.4251	0.3600	0.3392	0.3295	0.3239	0.3203	0.3179	0.3161
61	0.3911	0.3300	0.3107	0.3016	0.2964	0.2931	0.2908	0.2892
60	0.3568	0.3000	0.2822	0.2738	0.2691	0.2660	0.2639	0.2624
59	0.3222	0.2700	0.2537	0.2461	0.2418	0.2391	0.2372	0.2358
58	0.2872	0.2400	0.2254	0.2186	0.2147	0.2122	0.2105	0.2093
57	0.2519	0.2100	0.1971	0.1911	0.1877	0.1855	0.1840	0.1829
56	0.2164	0.1800	0.1688	0.1636	0.1607	0.1588	0.1575	0.1566
55	0.1806	0.1500	0.1406	0.1363	0.1338	0.1322	0.1312	0.1304
54	0.1447	0.1200	0.1125	0.1090	0.1070	0.1057	0.1049	0.1042
53	0.1087	0.0900	0.0843	0.0817	0.0802	0.0793	0.0786	0.0781
52	0.0725	0.0600	0.0562	0.0544	0.0534	0.0528	0.0524	0.0521
51	0.0363	0.0300	0.0281	0.0272	0.0267	0.0264	0.0262	0.0260
50	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Percent Within Limits (P_L and P_U)	Negative Values of Q (Q_L and Q_U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
49	-0.0363	-0.0300	-0.0281	-0.0272	-0.0267	-0.0264	-0.0262	-0.0260
48	-0.0725	-0.0600	-0.0562	-0.0544	-0.0534	-0.0528	-0.0524	-0.0521
47	-0.1087	-0.0900	-0.0843	-0.0817	-0.0802	-0.0793	-0.0786	-0.0781
46	-0.1447	-0.1200	-0.1125	-0.1090	-0.1070	-0.1057	-0.1049	-0.1042
45	-0.1806	-0.1500	-0.1406	-0.1363	-0.1338	-0.1322	-0.1312	-0.1304
44	-0.2164	-0.1800	-0.1688	-0.1636	-0.1607	-0.1588	-0.1575	-0.1566
43	-0.2519	-0.2100	-0.1971	-0.1911	-0.1877	-0.1855	-0.1840	-0.1829
42	-0.2872	-0.2400	-0.2254	-0.2186	-0.2147	-0.2122	-0.2105	-0.2093
41	-0.3222	-0.2700	-0.2537	-0.2461	-0.2418	-0.2391	-0.2372	-0.2358
40	-0.3568	-0.3000	-0.2822	-0.2738	-0.2691	-0.2660	-0.2639	-0.2624
39	-0.3911	-0.3300	-0.3107	-0.3016	-0.2964	-0.2931	-0.2908	-0.2892
38	-0.4251	-0.3600	-0.3392	-0.3295	-0.3239	-0.3203	-0.3179	-0.3161
37	-0.4586	-0.3900	-0.3679	-0.3575	-0.3515	-0.3477	-0.3451	-0.3432
36	-0.4916	-0.4200	-0.3967	-0.3856	-0.3793	-0.3753	-0.3725	-0.3705
35	-0.5242	-0.4500	-0.4255	-0.4139	-0.4073	-0.4030	-0.4001	-0.3980
34	-0.5563	-0.4800	-0.4545	-0.4424	-0.4355	-0.4310	-0.4280	-0.4257
33	-0.5878	-0.5100	-0.4836	-0.4710	-0.4638	-0.4592	-0.4560	-0.4537
32	-0.6187	-0.5400	-0.5129	-0.4999	-0.4924	-0.4877	-0.4844	-0.4820
31	-0.6490	-0.5700	-0.5423	-0.5290	-0.5213	-0.5164	-0.5130	-0.5105
30	-0.6787	-0.6000	-0.5719	-0.5582	-0.5504	-0.5454	-0.5419	-0.5394
29	-0.7077	-0.6300	-0.6016	-0.5878	-0.5798	-0.5747	-0.5712	-0.5686
28	-0.7360	-0.6600	-0.6316	-0.6176	-0.6095	-0.6044	-0.6008	-0.5982
27	-0.7636	-0.6900	-0.6617	-0.6477	-0.6396	-0.6344	-0.6308	-0.6282
26	-0.7904	-0.7200	-0.6921	-0.6781	-0.6701	-0.6649	-0.6613	-0.6587
25	-0.8165	-0.7500	-0.7226	-0.7089	-0.7009	-0.6958	-0.6922	-0.6896
24	-0.8417	-0.7800	-0.7535	-0.7401	-0.7322	-0.7271	-0.7236	-0.7211
23	-0.8662	-0.8100	-0.7846	-0.7716	-0.7640	-0.7590	-0.7556	-0.7531
22	-0.8897	-0.8400	-0.8160	-0.8036	-0.7962	-0.7915	-0.7882	-0.7858
21	-0.9124	-0.8700	-0.8478	-0.8360	-0.8291	-0.8245	-0.8214	-0.8192
20	-0.9342	-0.9000	-0.8799	-0.8690	-0.8625	-0.8583	-0.8554	-0.8533
19	-0.9550	-0.9300	-0.9123	-0.9025	-0.8966	-0.8928	-0.8901	-0.8882
18	-0.9749	-0.9600	-0.9452	-0.9367	-0.9315	-0.9281	-0.9258	-0.9241
17	-0.9939	-0.9900	-0.9785	-0.9715	-0.9671	-0.9643	-0.9624	-0.9610
16	-1.0119	-1.0200	-1.0124	-1.0071	-1.0037	-1.0015	-1.0000	-0.9990
15	-1.0288	-1.0500	-1.0467	-1.0435	-1.0413	-1.0399	-1.0389	-1.0382
14	-1.0448	-1.0800	-1.0817	-1.0808	-1.0800	-1.0794	-1.0791	-1.0789
13	-1.0597	-1.1100	-1.1173	-1.1192	-1.1199	-1.1204	-1.1208	-1.1212
12	-1.0736	-1.1400	-1.1537	-1.1587	-1.1613	-1.1630	-1.1643	-1.1653
11	-1.0864	-1.1700	-1.1909	-1.1995	-1.2043	-1.2075	-1.2098	-1.2115
10	-1.0982	-1.2000	-1.2290	-1.2419	-1.2492	-1.2541	-1.2576	-1.2602
9	-1.1089	-1.2300	-1.2683	-1.2860	-1.2964	-1.3032	-1.3081	-1.3118
8	-1.1184	-1.2600	-1.3088	-1.3323	-1.3461	-1.3554	-1.3620	-1.3670
7	-1.1269	-1.2900	-1.3508	-1.3810	-1.3991	-1.4112	-1.4199	-1.4265
6	-1.1342	-1.3200	-1.3946	-1.4329	-1.4561	-1.4717	-1.4829	-1.4914
5	-1.1405	-1.3500	-1.4407	-1.4887	-1.5181	-1.5381	-1.5525	-1.5635
4	-1.1456	-1.3800	-1.4897	-1.5497	-1.5871	-1.6127	-1.6313	-1.6454
3	-1.1496	-1.4100	-1.5427	-1.6181	-1.6661	-1.6993	-1.7235	-1.7420
2	-1.1524	-1.4400	-1.6016	-1.6982	-1.7612	-1.8053	-1.8379	-1.8630
1	-1.1541	-1.4700	-1.6714	-1.8008	-1.8888	-1.9520	-1.9994	-2.0362

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 E178 Standard Practice for Dealing with Outlying Observations

END OF ITEM C-110

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ITEM M-102 MAINTENANCE OF TRAFFIC AND TEMPORARY CONSTRUCTION ITEMS

DESCRIPTION

102-1.1 This item consists of furnishing all labor, materials and equipment for maintenance of traffic and temporary construction items necessary for the safe and proper execution of work not otherwise included in other contract bid items. The Contractor will be expected to supply and utilize the items listed below and other items contained in the plans and specifications. Temporary construction items to be provided include, but are not limited to the following: flaggers, portable floodlighting, orange safety fence, steel plates for temporary covering of excavations and structures as required, construction barricades, and men and equipment as needed to keep all areas safe and free of debris.

MATERIALS

102-2.1 CONSTRUCTION BARRICADES. Construction barricades shall be constructed in accordance with the details shown in the plans and shall be placed in accordance with the phasing plans and phasing notes drawings. Barricades for taxiway closure shall extend the full width of pavement at the spacing shown on the plans.

102-2.2 PORTABLE FLOODLIGHTING. The Contractor shall provide portable light towers, if needed. The towers shall be trailer mounted, that can be folded for easy transport and storage. The towers shall contain a diesel generator to power a minimum 6000 watts and have fuel capacity to operate at full load for a minimum of 48 hours. It shall be designed to be weather proof. The towers shall be telescoping and capable of rotating over 360 degrees and shall have a minimum of 4-1000 watt metal halide floodlights.

105-2.3 STEEL PLATES. Steel plates of adequate size and thickness shall be furnished as necessary to cover temporary excavations, unfinished structures or surfaces requiring protection or for safety purposes. Plates shall be securely fastened down and shall be adequate to safely support any anticipated loadings to be imposed. Steel plates are required where the contractor's hauling operations are to cross existing buried utilities.

102-2.4 ORANGE SAFETY FENCE. The Contractor shall provide orange safety fence at the locations shown in the plans or as directed by the RPR. Orange safety fence shall be plastic, shall be secured to the ground with stakes no more than 10' apart, and shall be maintained in neat straight lines according to the plans. Safety fence shall not be installed within active runway and taxiway safety areas. The Contractor shall submit a sample of the material to be provided for approval by the Engineer.

102-2.5 MECHANICAL VACUUM SWEEPERS AND WATER TRUCKS. Cleaning and maintenance of all paved areas (using vacuum type mechanical sweepers) and dust control (using water trucks) as directed by the Owner's Authorized Representative throughout the project duration. Contractor shall submit a list of proposed equipment to the Owner's Authorized Representative prior to commencement of work.

102-2.6 EQUIPMENT. Red lights shall be placed on stationary equipment, materials, and other obstructions in areas which may be critical to aircraft ground movement as required. Hazardous areas, in which no part of an aircraft may enter, are indicated by use of barricades with alternate orange and white markings. These barricades are supplemented with orange flags a minimum of 20 by 20 inches square and made and installed so that they are always in the extended position and properly oriented. For nighttime use, the barricades shall be supplemented with red lights having a constant burn. The intensity of the lights and spacing for barricades, flags, and lights must be such to adequately define and delineate the hazardous area.

~~**102-2.7 PORTABLE LIGHTED RUNWAY CLOSURE MARKERS (CROSSES).** The Contractor shall supply and at the end of the project or when it is no longer required for this project, give to the Authority a pair (2) portable lighted runway closure markers (crosses). The markers shall be fully in compliance with FAA AC 150/5345-55, AC 150/5370-2 and NTSB Safety Recommendation A-03-05. They shall be easy to set up by one person and shall be visible 10-50 miles from the runway under VFR condition with selectable brightness levels and a photocell dimming for night operation. They shall be powered by a liquid-cooled diesel engine and be highway towable with a standard 2" hitch coupler on a DOT compliant trailer with rear hitch so that tandem towing of two units is possible. The light assembly shall have a two year warranty with a 3 year (3,000 hour) warranty on the engine.~~

~~Portable lighted runway closure markers are to be Hali-Brite RCM-D Runway Closure Markers with optional rear hitch or approved equal.~~

The Owner shall provide a ~~second~~ set of two (2) Runway Closure Markers. The Contractor is responsible for transport, set-up, fuel and maintenance of Owner supplied devices which shall be returned to the Owner in original or better operating condition and to the satisfaction of the RPR. The Contractor shall respond to calls for maintenance within 60 minutes of being notified that a runway closure marker is inoperable.

102-2.8 DEACTIVATION OF AIRFIELD LIGHTS, SIGNS AND MARKINGS. The Contractor shall deactivate or cover lights, signs, and markings that lead into a construction zone, are in a construction zone, or are in a closed portion of a runway as directed by the Engineer and/or described in the Contract Plans.

The Contractor shall provide a secured opaque material covering existing guidance signs and runway/taxiway lights which correspond with the with the required runway and taxiway closures as shown on the phasing plans. The Contractor shall submit to the Engineer, for review, materials to be used prior to installation.

102-2.10 TAXIWAY CLOSURE MARKER. The Contractor shall install temporary taxiway closure marker (s) at the location shown on the plans or as directed by the RPR. The Contractor shall submit to the Engineer, for approval, materials to be used prior to installation.

102-2.11 OTHER MISCELLANEOUS ITEMS. Any other items not listed herein but which are associated directly or indirectly with temporary construction related work shall, by reference, be included in the requirements of this specification. No additional payment will be made for any temporary construction related item not specifically listed herein. The Contractor shall be responsible for providing any and all items necessary to ensure a safe, secure and functioning project construction site.

CONSTRUCTION METHODS

102-3.1 CONSTRUCTION BARRICADES. Barricades shall be placed around each phase or sub phase of the work in accordance with the phasing plans and shall remain in place until completion of work in each phase. All locations shall be reviewed by the Engineer.

102-3.2 FLAGGERS. Flaggers shall be provided, as necessary, to control the Contractor's traffic during the prosecution of work (i.e., into and out of the secured air operations area (AOA), taxiway crossings, etc.). All Contractor vehicles or equipment that are required to cross active airfield pavement only shall do so under the direct control of a flaggers provided by the Contractor.

102-3.3 GATE GUARD. Gate Guard Attendant(s) shall be provided, as necessary, by the Contractor at locations indicated on the plans to control the Contractor's vehicles or equipment that are required to enter into the AOA during the prosecution of work.

102-3.4 PORTABLE FLOODLIGHTING. Portable floodlighting is required for construction during periods of limited visibility (i.e., nighttime). Illumination requirements shall be those contained in Paragraph 102-2.2. Aim lights away from active runways, approach/departure paths and in accordance with air traffic control tower requirements and direction.

102-3.5 PORTABLE RUNWAY CLOSURE MARKERS. The Owner shall provide portable lighted runway closure markers for their use during the project. The Contractor shall maintain the lighted runway closures and provide fuel to power the markers. The Contractor shall return the lighted runway closure markers to the Owner in the good working condition. ~~Closures of multiple runways will require four (4) runway closure markers. The markers shall be trailer mounted, lighted X that can be folded for easy transport and storage. The marker shall contain a diesel generator to power a minimum of 21 lights and have fuel capacity to operate at full load for a minimum of 48 hours. It shall be designed to be weather proof and to withstand winds of 40 MPH. It shall be visible for a distance of 3-5 miles VFR daytime and a minimum 6 miles VFR nighttime.~~

102-3.6 ACCESS CONTROL AREA, RUNWAY 22 END. Flagmen posted 24/7 during Phase 1 to control access to the RW 22 end as shown on the plans, with radios communicating with ATCT. Flagmen shall take training from Airport Operations prior to attending their post.

METHOD OF MEASUREMENT

102-4.1 Measurement of the item, Maintenance of Traffic, as specified herein will be on a lump sum basis.

BASIS OF PAYMENT

102-5.1 Payment will be made at the lump sum bid price for all Maintenance of Traffic and Temporary Construction Items needed for this project. This payment shall be full compensation for furnishing and maintaining all materials and labor for placing, adjusting/moving and removing, construction signs, taxiway closure marker(s), construction barricades and steel plates, providing flaggers, training, guard

shack attendents, orange fence, furnishing portable floodlighting, and for any other labor, materials, equipment, tools and incidentals necessary for temporary items required for construction of this work.
Cost of setting up the Runway Closure Markings, removing, moving, fuel, repair and maintenance is included in the respective items made at per each unit cost.

Payment for Maintenance of Traffic and Temporary Construction Items will be made in installments. The first payment of 10 percent of the lump sum price will be included in the first progress estimate following the initiation of construction work. The remaining 90 percent of the lump sum price will be included as installments in subsequent progress estimates. Each such installment will be determined based on the ratio of the total work completed to date of the total contract amount.

In the event the contract completion date is extended or additional work is added to the project, no additional payment will be made for the mobilization or maintenance of traffic unless otherwise addressed by change order.

Payment will be made under:

Item M-102-1	Maintenance of Traffic and Temporary Construction Items – per Lump Sum
Item M-102-2	Maintenance of Airport Supplied Runway Closure Marker – per each

END OF ITEM M-102

ITEM M-103 PROJECT SURVEY AND STAKEOUT

DESCRIPTION

103-1.1 GENERAL. Under this item, the Contractor shall do all necessary surveying and project stakeout required to construct all elements of the Project as shown on the Contract Drawings and specified in the Specifications. This shall include but not be limited to stakeout, layout and elevations for pavements, structures, forms and appurtenances as shown and required, consistent with the current practices and shall be performed by a State of Florida licensed professional land surveyor. The stakeout survey shall proceed immediately following the Notice to Proceed or as soon as authorized by the RPR in accordance with the phasing of the construction and shall be expeditiously progressed to completion in a manner and at a rate satisfactory to the RPR and/or Engineer. The Contractor shall keep the RPR fully informed as to the progress of the stakeout survey.

All survey work shall be provided under the direction of a State of Florida licensed professional land surveyor.

MATERIALS

103-2.1 All instruments, equipment, stakes and any other material necessary to perform the work satisfactorily shall be provided by the Contractor.

All stakes used shall be of a type approved by the RPR. It shall be the Contractor's responsibility to maintain these stakes in their proper position and location at all times.

CONSTRUCTION METHODS

103-3.1 The Contractor shall trim trees, brush, roots and other interfering objects, not inconsistent with the Contract Drawings, from survey lines in advance of all survey work to permit accurate and unimpeded work by his stakeout survey crews.

The exact position of all work shall be established from control points, baseline transit points or other points of similar nature which are shown on the Contract Drawings and/or modified by the Engineer. Prior to any layout of works to be constructed, the Contractor shall verify the location and accuracy of all control points provided in the plans. Any error, apparent discrepancy or absence in or of data shown or required for accurately accomplishing the stakeout survey shall be referred to the RPR and Engineer for interpretation or furnishing when such is observed or required.

The Contractor shall place two offset stakes or references at each centerline station and at such intermediate locations as the RPR may direct. From computations and measurements made by the Contractor, these stakes shall be clearly and legibly marked with the correct centerline station number, offset and cut or fill so as to permit the establishment of the exact centerline location and elevation during construction. If markings become faded or blurred for any reason, the markings shall be restored by the Contractor at the request of the RPR. He shall locate and place all cut, fill, slope, fine grade or other stakes and points, as the engineer may direct, for the proper progress of the work. All control points shall be properly guarded and flagged for easy identification.

Drainage structures shall be staked out by the Contractor at the locations and elevations shown on the Contract Drawings or specified by the Engineer through the RPR.

Reference points, baselines, stakes and benchmarks for stockpiles shall be established by the Contractor.

The Contractor shall be responsible for the accuracy of his work and shall maintain all reference points, stakes, etc., throughout the life of the Contract. Damaged or destroyed points, benchmarks or stakes, or any reference points made inaccessible by the progress of the construction, shall be replaced or transferred by the Contractor at no additional cost to the Owner. Any of the above points which may be destroyed or damaged shall be transferred by the Contractor before they are damaged or destroyed. All control points shall be referenced by ties to acceptable objects and recorded. Any alterations or revisions in the ties shall be so noted and the information furnished to the RPR immediately. All stakeout survey work shall be referenced to the centerlines shown on the Contract Drawings. All computations necessary to establish the exact position of the work from control points shall be made and preserved by the Contractor. All computations, survey notes and other records shall be made available to the RPR and/or Design Professional upon request and shall become the property of the Airport and delivered to the RPR no later than the date of acceptance of the Contract.

The Contractor shall furnish, at his expense, all horizontal and vertical control, all staking and layout of construction work called for on the plans. The RPR, Design Professional and Airport shall not be responsible for such work. However, the Airport and Design Professional reserve the right to check all said lines, grades, and measurements with their appointed surveyor. Should the Airport's surveyor detect errors in said lines, grades, and measurements, the Contractor shall pay for all said surveying costs and subsequent surveying costs performed to verify correction of errors found in said lines, grades and measurements. Definition of an error shall be a discrepancy of ¼" or more. In the case of a discrepancy between the technical specifications and this defined tolerance, the more severe tolerance shall govern.

During the progress of the construction work, the Contractor will be required to furnish all of the surveying and stakeout incidental to the proper location by line and grade for each phase of the work. For paving and any other operation requiring extreme accuracy, the Contractor will re-stake with pins or other acceptable hubs located directly adjacent to the work at a spacing directed by the RPR.

Any existing stakes, iron pins, survey monuments or other markers defining property lines which may be disturbed during construction shall be properly tied into fixed reference points before being disturbed and accurately reset in their proper position upon completion of the work.

Just prior to completion of the Contract, the Contractor shall reestablish, if necessary, and retie all control points as permanently as possible and to the satisfaction of the RPR.

103-3.2 PRE-CONSTRUCTION SURVEY. 14 calendar days prior to milling the Contractor shall submit to the Engineer his survey of the existing asphalt surfaces to the grid provided on the Paving Elevation Plans. This survey shall also provide elevations of the existing surfaces where new asphalt is to tie-in with existing asphalt.

103-3.3 POST-LEVELING SURVEY. ~~Within each phase,~~ after milling and prior to installation of the asphalt surface course, the milled surface shall be inspected by the RPR in the presence of the Contractor to determine the acceptability of the milled surface to receive the asphalt surface course. In the opinion of the RPR areas where delamination and/or scabbing is apparent will be identified and marked on the surface to receive additional milling. Such areas shall be re-milled to a slightly deeper depth to produce a sound and textured surface at no additional expense. In such areas a leveling course shall be installed to permit a subsequent uniform surface course lift to achieve final grade. Leveling material due to delamination and/or

scabbing shall be paid for under Item P-401-2.

Areas over milled due to the negligence of the Contractor and not as a result of correcting delamination and/or scabbing shall be built up with leveling material. In such areas a leveling course shall be installed to permit a subsequent uniform surface course lift to achieve final grade. In such cases, the grade correction costs shall be borne by the Contractor.

After all leveling material is installed ~~(per phase)~~ the Contractor shall prepare a Post-Leveling survey to the grid provided on the Paving Elevation Plans. The survey will provide elevations to the grid and delineate the limits of leveling due to delamination and/or scabbing. The survey shall be provided to the RPR 7 calendar days prior to installation of the asphalt surface and shall demonstrate that the prepared surface is ready to receive a uniform surface course that will achieve final grade.

103-3.4 AS-BUILT SURVEY. Upon completion of the work, after Substantial Completion and before Final Acceptance, the Contractor shall supply to the RPR a complete as-built survey of the entire project site including drainage structures and utilities. All survey points, including horizontal and vertical control, property corners, section corner and reference (hereinafter referred to as "survey point") shall be clearly marked and referenced prior to construction. These survey points must be sufficiently referenced so that they can be reestablished after construction if they are disturbed. All survey data shall be state plane coordinates, NAD 83 datum and NADV 88.

This as-built survey will be a complete topographic and physical features survey of the entire project site surrounded by the limits of construction plus and additional 10' beyond the limits of construction in all directions. Elevations shall be obtained on all rigid pavement joint intersections and ends. Elevations shall be obtained on all flexible pavement surfaces where final proposed surface grades are given on the plans. If any work is done outside the limits of construction for any reason, this limit of survey will be increased to include this area plus 25'. This survey shall be certified by a Florida Licensed Professional Land Surveyor as meeting the minimum Technical Standards for topographic surveys as set forth in chapter 21HH-6, Florida Administrative Code. The survey data must be supplied as a signed and sealed drawing (11" x 17" maximum size) at a reasonable scale and be electronically submitted in AutoCad on CD-ROM media. Signed and sealed copies of all field notes, sketches and calculations must be submitted concurrently with the as-built survey. Larger scale details shall be provided to clarify any complicated or complex areas. A separate point database file shall be electronically submitted in TXT or ASCII format, with each point on a single row with comma delimited columns with data ordered as follows: point number, northing, easting, elevation, description.

The as-built survey is to be supplied to the RPR for review and approval not more than thirty (30) calendar days after substantial completion for the project has been given. If the acceptable as-built survey is not supplied within the required time, the Airport reserves the right to perform the required survey and bill the Contractor for this work.

The as-built survey shall include all information needed to complete all project permit (i.e. SWFWMD, etc …) as required by the permits and/or agencies standard requirements. A minimum of six (6) signed and sealed copies of the as-built survey will be supplied to the Engineer and RPR.

METHOD OF MEASUREMENT

103-4.1 Payment will be made at the lump sum price bid for this item.

BASIS OF PAYMENT

103-5.1 The lump sum price bid shall include the cost of furnishing all labor, equipment, instruments and all other material necessary to satisfactorily complete the Project stakeout and as built survey. Seventy-five percent (75%) of this item will be paid based on the percentage of work paid for a month vs. the total project cost. The remaining twenty-five percent (25%) will be paid after the as-built survey has been given to the RPR and approved by the Engineer.

This item will not be increased or decreased base on changes to the total contract amount.

Payment will be made under:

Item M-103-1 Project Survey and Stakeout – per Lump Sum

END OF ITEM M-103

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ITEM M-104 SAFETY AND SECURITY

GENERAL

104-1.1 The provisions of the Construction Safety and Phasing Plan (CSPP) and associated procedures are applicable within the boundaries of the St. Pete-Clearwater International Airport. A complete understanding of all procedures and requirements contained therein is required to ensure safety during construction. *The Airport has completed a Construction Safety and Phasing Plan (CSPP), which is included in Appendices 2 of the Project Manual. It is required that the contractor comply with this CSPP at all times during the project. The contractor shall be required to submit for approval a Safety Plan Compliance Document (SPCD) which details how the Contractor will comply with the CSPP.* The SPCD shall be a stand-alone document prepared by the Contractor, responding to, not reiterating, the CSPP. This safety plan is a part of this Contract and deviations from the requirements established herein will be sufficient cause for Contract termination.

Required reference material associated with the CSPP includes:

FAA AC 150/5200-18C, Airport Safety Self-Inspection
FAA AC 150/5210-5D, Painting, Marking and Lighting of Vehicles Used on an Airport
FAA AC 150/5340-1L, Standards for Airport Markings
FAA AC 150/5370-2G, Operational Safety on Airports During Construction

These documents are available online at http://www.faa.gov/airports/resources/advisory_circulars or can be provided upon request.

CONTRACTOR SAFETY AND SECURITY OFFICER

104-2.1 CONTRACTOR SAFETY AND SECURITY OFFICER (CSSO). The Contractor shall appoint its on-site CSSO or other qualified individual(s) (as approved by the RPR) as its duly authorized representative to serve as Contractor Safety and Security Officer (CSSO) for the duration of the Contract. The CSSO shall thoroughly understand the safety and security requirements of the Contract, the necessity for them and shall have sufficient authority to implement its provisions without significant deviation. The Contractor shall notify the RPR in writing of the name of the individual(s) selected for the assignment.

The CSSO shall represent the Contractor on safety and security requirements compliance. The CSSO shall be especially knowledgeable regarding the requirements of FAA AC's 150/5200-18, Airport Self Inspection Guide and 150/5370-2 Operational Safety on Airports During Construction, latest edition.

CSSO and Contractor Security Office (CSO) shall have the same meaning and used interchangeably.

104-2.2 RESPONSIBILITIES OF THE CONTRACTOR SAFETY AND SECURITY OFFICER. Prior to the desired date for commencement of any work on the project, the CSSO shall accomplish the following:

a. Develop and submit in writing a detailed work sequence schedule with dates and times specified for all milestone events. This sequence schedule shall be subject to the review by the RPR and Engineer. To assure adequate time for coordination, this document shall be submitted at least one week

prior to the date of the notice-to-proceed. Commencement of work shall not be permitted until the Engineer has taken no exception to the SPCD.

b. Develop and submit in writing a detailed outline of the procedures to be followed to maintain safety and security of both Contractor operations and the integrity of airport landside and airside operations during the prosecution of contract work. This plan shall detail, in addition, the procedures to be followed in the event of an accident or fire involving Contractor personnel and the Contractor's efforts to maintain fire protection and security. These procedures shall be subject to the approval of the RPR and reflect any change as may be deemed necessary.

c. Conduct at least one meeting of all Contractor supervisory personnel prior to the start of contract work. The purpose of this meeting is to review the approved Work sequence schedule and safety and security procedures. Attendance at this meeting by the CSSO, all Contractor supervisory personnel and the RPR is mandatory. This meeting shall also be open to other employees of the Contractor and others as the RPR may deem appropriate. Minutes of this meeting shall be taken by the CSSO, copies provided to each supervisor and kept on file in the Contractor's construction office for periodic review and updating.

d. Develop a safety and security orientation program and provide a briefing for all employees of the Contractor and subcontractors that will be used on the project. A similar briefing will be given to new employees prior to their use on contract work. In addition, the CSSO shall be responsible for briefing, from time to time, all Contractor personnel on any changes to safety and security measures deemed necessary.

e. The Contractor shall prepare and submit a Safety Plan Compliance Document (SPCD), as required by FAA AC 150/5370-2G, Operational Safety on Airports During Construction, to the airport operator describing how it will comply with the requirements of the CSPP and supplying any details that could not be determined before contract award. The SPCD must include a certification statement by the contractor that indicates it understands the operational safety requirements of the CSPP and it asserts it will not deviate from 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) The Safety Plan Compliance Document (SPCD) should include a general statement by the construction contractor that he/she has read and will abide by the CSPP. In addition, the SPCD must include all supplemental information that could not be included in the CSPP prior to the contract award. The contractor statement should include the name of the contractor, the title of the project CSPP, the approval date of the CSPP, and a reference to any supplemental information (that is, "I , Name of Contractor , have read the Title of Project CSPP, approved on Date , and will abide by it as written and with the following additions as noted:"). The supplemental information in the SPCD should be written to match the format of the CSPP indicating each subject by corresponding CSPP subject number and title. If no supplemental information is necessary for any specific subject, the statement, "No supplemental information," should be written after the corresponding subject title. The SPCD should not duplicate information in the CSPP:

   i. **Coordination**. Discuss details of proposed safety meetings with the airport operator and with Contractor employees and subcontractors.

   ii. **Phasing**. Discuss proposed construction schedule elements, including:

1. Duration of each phase.
2. Daily start and finish of construction, including "night only" construction.
3. Duration of construction activities during:
    a. Normal runway operations.
    b. Closed runway operations.
4. Modified runway "Aircraft Reference Code" usage.

iii. **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.

iv. **Protection of NAVAIDs**. Discuss specific methods proposed to protect operating NAVAIDs.

v. **Contractor access**. Provide the following:

1. Details on how the contractor will maintain the integrity of the airport security fence (gate guards, daily log of construction personnel, and other).
2. Listing of individuals requiring driver training (for certificated airports and as requested).
3. Radio communications.
4. Types of radios and backup capabilities.
5. Who will be monitoring radios.
6. Whom to contact if the ATCT cannot reach the contractor's designated person by radio.
7. Details on how the contractor will escort material delivery vehicles.

vi. **Wildlife management**. Discuss the following:

1. Methods and procedures to prevent wildlife attraction.
2. Wildlife reporting procedures.

vii. **Foreign Object Debris (FOD) management**. Discuss equipment and methods for control of FOD, including construction debris and dust.

viii. **Hazardous material (HAZMAT) management**. Discuss equipment and methods for responding to hazardous spills.

ix. **Notification of construction activities**. Provide the following:

1. Contractor points of contact.
2. Contractor emergency contact.
3. 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.

x. **Inspection requirements**. Discuss daily (or more frequent) inspections and special inspection procedures.

xi. **Underground utilities**. Discuss proposed methods of identifying and protecting underground utilities.

xii. **Penalties**. Any penalties are identified in the CSPP.

xiii. **Special conditions**. Discuss proposed actions for each special condition identified in the CSPP.

xiv. **Runway and taxiway visual aids,** including marking, lighting, signs, and visual NAVAIDs. Discuss proposed visual aids including the following:

1. Equipment and methods for covering signage and airfield lights.

xv. **Marking and signs for access routes**. Discuss proposed methods of demarcating access routes for vehicle drivers.

xvi. **Hazard marking and lighting**. Discuss proposed equipment and methods for identifying excavation areas.

xvii. **Protection of runway and taxiway safety areas**, including object free areas, obstacle free zones, and approach/departure surfaces. Discuss proposed methods of identifying, demarcating, and protecting airport surfaces including:

1. Equipment and methods for maintaining Taxiway Safety Area standards.
2. Equipment and methods for separation of construction operations from aircraft operations, including details of barricades.

xviii. **Other limitations on construction** should be identified in the CSPP and should not require an entry in the SPCD.

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.

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. Contractor shall provide 24-hour coverage.

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 whenever active construction is taking place.

5) Conduct inspections sufficiently frequently to ensure construction personnel comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards.

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.

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.

8) The Contractor shall submit and receive approval of SPCD prior to issuance of Notice to Proceed.

CONSTRUCTION SEQUENCING

104-3.1 CONSTRUCTION SEQUENCE. The Contractor shall prepare a construction schedule and submit to the RPR at least one week prior to the pre-construction conference.

104-3.2 CLOSING RUNWAYS. The Contractor shall acquaint his supervisors and employees with the sequence of construction and its relationship to airport activity and aircraft operations that are inherent to this airport. No runway, taxiway, apron or airport roadway shall be closed without the written approval of the Owner, to enable necessary NOTAMS and/or advisories to airport fixed based operators (FBOs), tenants and users.

The Contractor shall contact the RPR a minimum of 48 Hours prior to any requested closing.

Any construction activity within 250 feet of the centerline of an active runway (runway safety area) or within 160 feet of the centerline of an active taxiway or apron (taxilane object free area) requires the closure of the affected area. These safety areas are shown within the Construction Safety and Phasing Plan.

The RPR will arrange for an inspection prior to return to service of any facility 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.

MARKING AND LIGHTING

104-4.1 The SPCD shall accurately describe the proper marking and lighting of areas on the airfield associated with the construction. This will include properly marking and lighting closed runways, taxiways, taxilanes, and aprons, the limits of construction, material storage areas, equipment storage areas, haul routes, parking areas and other areas defined as required for the Contractor's exclusive use. The Contractor shall erect and maintain around the perimeter of these areas suitable marking and warning devices visible for day and night use. Temporary barricades, flagging, and steady burn warning lights shall be required at critical access points. The type and location of marking and warning devices will be approved by the RPR.

Special emphasis shall be given to open trenches, excavations, heavy equipment marshalling areas, and stockpiled material located in the airport operations area, which shall be predominantly marked by the Contractor with flags and lighted by approved light units during hours of restricted visibility and darkness. All marking shall be in accordance with FAA Advisory Circular (AC) 150/5340-1L or latest edition.

TRAFFIC CONTROL

104-5.1 VEHICLE IDENTIFICATION. The Contractor shall establish and maintain a list of Contractor and subcontractor vehicles authorized to operate on the site. Contractor employee vehicles shall be restricted to the Contractor’s staging area and are not allowed in the Airport Operations Area (AOA) at any time. To be authorized to operate on the airport, each Contractor or subcontractor’s vehicle shall:

a. be marked/flagged, on both sides, for high daytime visibility and lighted for nighttime

operations. Vehicles that are not marked and/or lighted shall be escorted by a vehicle appropriately marked and/or lighted. Vehicles requiring escort shall be identified on the list.

b. be identified with the name and/or logo of the Contractor and be of sufficient size to be identified at a distance. Vehicles needing intermittent identification can be marked with tape or with commercially available magnetically attached markers. Vehicles that are not appropriately identified shall be escorted by a vehicle that conforms to this requirement. Vehicles requiring escort shall be identified on the list.

c. be operated in a manner that does not compromise the safety of either landside or airside airport operations. If, in the opinion of the RPR, any vehicle is operated in a manner not fully consistent with this requirement, the RPR has the right to restrict operation of the vehicle or prohibit its use on the airport.

104-5.2 ACCESS TO THE SITE OF CONSTRUCTION. The Contractor's access to the site shall be as shown on the Contract Layout Plan. No other access points shall be allowed unless approved by the RPR. All Contractor traffic authorized to enter the site shall be experienced in the route or guided by Contractor personnel. 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 flagman or traffic control person shall monitor and coordinate all Contractor traffic at the access gate with Airport 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 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 the RPR. In addition, the following requirements are applicable:

a. All Contractor traffic authorized to travel on the airport shall have been briefed as part of the Contractor's construction safety and security orientation program, be thoroughly familiar with the access procedures and route for travel or be escorted by personnel authorized by the Contractor Safety and Security Officer (CSSO).

b. The Contractor shall install work site identification signs at the authorized access point(s). If, in the opinion of the RPR, directional signs are needed for clarity, they shall be installed along the route authorized for access to each construction site.

c. Under no circumstance will Contractor personnel be permitted to drive their individually owned vehicles to any construction site on the airport. All vehicles must be parked in the area designated for employee parking and out of secured airport property.

d. In addition to the inspection and cleanup required at the end of each shift, the Contractor is responsible for the immediate cleanup of any debris generated along the construction site access route(s) as a result of construction related traffic or operations whether or not created by Contractor personnel.

104-5.3 MATERIAL SUPPLIERS. All material suppliers, subcontractors and visitors to the work site are obligated to follow the same safety and security operating procedures as the Contractor. All material suppliers shall make their deliveries using the same access points and routes as the Contractor and shall be advised of the appropriate delivery procedures at the time the materials order is placed. The Contractor shall not use the Airport address for any delivery but shall use the street address appropriate to

the location of the entrance of the work site. If it is not practical to conform to the vehicle identification requirements of Section 104-5.1 and the safety and security operations program requirements of Section 104-2.2, the Contractor shall be prepared to escort all suppliers, subcontractors and visitors while they are on the airport.

104-5.4 PERSONNEL IDENTIFICATION. All employees, agents, vendors, invitees, etc. of the Contractor or subcontractors requiring access to the construction site shall, conform to the Airport Security Program.

GENERAL SAFETY REQUIREMENTS

104-6.1 All Contractor vehicles that are authorized to operate on the airport outside of the designated construction area limits or haul routes as defined herein shall display in full view above the vehicle a flashing amber (yellow) dome-type light or a three-foot by three-foot, or larger, orange and white checkerbRPRd flag, each checkerbRPRd color being one-foot square. Vehicles must be under control of a Contractor mobile (two-way) radio operator (flagmen) monitoring the Airport frequency. Vehicle operators must be vigilant for conflict with any aircraft and give way to any operating aircraft.

All Contractor vehicles that are required to operate outside of the construction area limits as defined herein and cross active runways, taxiways, aprons, or runway approach clear zones shall do so under the direct control of a flagman who is monitoring the Airport frequency. Flagmen and two-way radios shall be furnished by the Contractor. All aircraft traffic on runways, taxiways and aprons shall have priority over Contractor's traffic.

Construction vehicles not in use for extended periods during the work day, or during nights and weekends (nonwork periods), shall be parked away from active runways, taxiways, and aprons in designated vehicle marshalling areas.

104-6.2 In order to protect all aircraft traffic, aviation related businesses, terminal apron areas, etc. from potential damage caused by foreign object debris (FOD) generated by construction activities, the Contractor shall provide a vacuum truck as required at the startup of construction to daily vacuum all pavements affected by construction. The vacuum truck shall remain on-site for the duration of the project and shall be available at the discretion of the Owner to vacuum pavement areas adjacent to the construction areas to ensure no FOD is present on pavements within 500 feet of any construction area. Protecting the aircraft, airport tenants, users, public, etc. against FOD is a critical safety issue, therefore the cost of the vacuum truck will be included in the cost established for this specification item.

CONSTRUCTION CONTROL

104-7.1 A primary and alternate responsible Contractor's representative shall be designated by the Contractor. The Contractor's representatives shall be available locally on a 24-hour basis. Names of the primary and alternate representative, including mobile phone number, shall be made available to the RPR by the Contractor. The Contractor shall ensure that the names and phone numbers are kept current and made available to the RPR.

CONSTRUCTION TECHNIQUES

104-8.1 Construction shall be planned and conducted throughout the project in such a manner as to allow the maintenance of completely safe airport operations. Every effort shall be made to reduce the impact of

construction activity on overall airport operations. To this end, the Contractor's activities shall be conducted in such a manner so as to preclude, except where absolutely required, open excavations, trenches, ditches and above ground obstacles such as booms on cranes or obstacle markers such as wooden saw horses. The primary responsibility for assuring that the safest possible construction techniques are followed rests with the Contractor Safety and Security Officer (CSSO).

METHOD OF MEASUREMENT

104-9.1 The item of Safety and Security shall be measured as a lump sum item when required and furnished for the life of the Contract.

BASIS OF PAYMENT

104-10.1 Payment shall be made for airport safety and security measures for personnel or materials related to this specification item and incidentally required to satisfy the specified objective(s) under item M-104-1 Safety and Security. This compensation shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

PARTIAL PAYMENTS. Partial payments will be made in accordance with the following:

Percentage of Original Contract Earned	Allowable Percent of the Lump Sum Price for the Item
5	15
15	20
25	25
50	50
75	75
100 (or Contract Completion)	100

Payment shall be made under:

Item M-104-1 Safety and Security – per Lump Sum

END OF ITEM M-104

ITEM M-105 NPDES PERMITTING

DESCRIPTION

105-1.1 GENERAL. The work specified under this item consists of the preparation of a Storm Water Pollution Prevention Plan (SWPPP), a Notice of Intent to Use Generic Permit for Storm Water Discharge from Large (disturb 5 or more acres of land) and Small (disturb between 1 and 5 acres) Construction Activities (NOI) and a Notice of Termination (NOT) in accordance with the Project Plans and Florida Department of Environmental Protection regulations as required pursuant the National Pollutant Discharge Elimination System (NPDES) storm water regulatory program.

EXECUTION

105-2.1 GENERAL. The Contractor is responsible for filing with the Florida Department of Environment Protection (FDEP) a National Pollutant Discharge Elimination System (NPDES) Notice of Intent (NOI) to use Generic Permit for Storm Water Discharge from Large and Small Construction Activities including preparation of a SWPPP with monitoring schedule and a Notice of Termination (NOT) upon completion of the project.

The Contractor shall be responsible for daily monitoring and upkeep of records to be maintained at the construction site or other approved locations at all times for inspection by the Airport and regulatory agency review. Any penalties assessed by regulatory agencies to the Airport related to the Contractor's work effort shall be paid by the Contractor.

105-2.2 STORM WATER POLLUTION PREVENTION PLAN (SWPPP). A SWPPP shall be prepared by the Contractor prior to filing the Notice of Intent. At a minimum, the SWPPP shall address the following:

a. **Site Description** – describe nature of the construction activity; describe sequence of major activities that disturb soils; estimate total site area and area expected to be disturbed by excavation, grading or other activities; a site map indicating drainage patterns and approximate slopes; name of the receiving water and aerial extent of wetlands on site.

b. **Sediment and Erosion Controls**

(1.) Stabilization Practices

(2.) Structural Practices

c. **Storm Water Management Measures**

(1.) Housekeeping/Best Management Practices (BMPs)

(a) Equipment Maintenance Areas

(b) Waste receptacles

(c) Wash down Areas

(d) Storage areas for hazardous materials

(e) Adequate sanitary facilities

d. **Maintenance** – Plans must include description of prompt and timely maintenance and repair procedures.

e. **Inspections** – Plans must provide that specified areas on the site (e.g. disturbed areas, material storage areas, structural control measures, and locations where vehicles enter and exit the site) are inspected by qualified personnel provided by the discharger a minimum of once every seven calendar days and within 24 hours after any storm event of greater than 0.25 inches. Inspection reports must have required data logged on them for each inspection.

The SWPPP must be prepared before submittal of the NOI and updated as appropriate. The SWPPP must provide for compliance with the terms and schedule of the plan beginning with the initiation of construction activities.

The SWPPP must be signed by the Contractor's authorized agent and one (1) copy provided to the Construction Manager. The Contractor must make the SWPPP available upon request to EPA and State or Local agencies. The EPA may notify the Contractor at any time that the plan does not meet one or more minimum requirements, then the Contractor has seven (7) days to change to plan and resubmit to EPA. Copies of all correspondence received from or sent to regulatory agencies shall be provided to the Engineer.

The Contractor must amend the plan, and resubmit to the Engineer for review, if it proves ineffective at minimizing pollutants and if there is a change in design, construction, operation or maintenance.

The plan must identify for each measure in the plan, the Contractors or subcontractors that will implement the measure. All Contractors and subcontractors must sign a certification statement demonstrating compliance with SWPPP requirements.

The Contractor is required to retain records or copies of all reports required by this permit, including SWPPP and records of all data used to complete the NOI for a period of three (3) years from the date of the final stabilization. A copy of all records shall also be provided to the HCAA upon completion of the project.

Notice of Termination shall be submitted by the Contractor to the EPA in two sets of circumstances:

a. After the site has undergone final stabilization (i.e. all soil disturbing activities are completed and a uniform perennial vegetative cover with a density of 70% for unpaved areas has been established or equivalent stabilization has been employed); or

b. When the Contractor has transferred operational control to the Airport and is no longer an operator for the site.

Electronic copies of the NPDES forms are available from the Florida Department of Environmental Protection at www.dep.state.fl.us.

105-2.3 FEES. The Contractor is responsible for all fees and costs associated with the preparation and filing with the Florida Department of Environment Protection of this requirement. The Contractor should check with the FDEP for the latest fee and filing requirements.

105-2.3 ADDITIONAL WORK INCLUDED IN THIS ITEM. Also included in this item is all work and costs required to prepare and submit the required permits, notices and plans, as well, construct, inspect and maintain the required pollution control devices not paid for under other items.

102-2.4 SCHEDULE AND CONSTRUCTION TIME. Due to the time required to prepare, submit and obtain approve of the require permit, the Contactor may need to begin this process before the notice to proceed is given. No increase in contract time will be made for delays in obtaining the required permit.

METHOD OF MEASUREMENT

105-3.1 There will be no measurement for payment for this item.

BASIS OF PAYMENT

105-4.1 There will be no direct or separate payment for this item, the cost of which is incidental to Item C-105-1 Mobilization.

END ITEM M-105

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ITEM M-109 SAW CUTTING

DESCRIPTION

109-1.1 This work shall consist of saw cutting the edge of existing Portland Cement and/or bituminous concrete pavements to provide a finished, neat edge, as shown on the Plans or as directed by the RPR.

EQUIPMENT

109-2.1 Saws shall be power-driven, self-propelled, wheel or track-mounted, and capable of cutting to a depth of at least three (3) inches in one pass. The Contractor shall make the necessary number of passes to cut through the Portland cement and/or bituminous concrete pavement. Multi-blade arbor saws shall be used to construct sealant reservoirs or pavement grooves.

CONSTRUCTION METHODS

109-3.1 The Contractor shall establish the line to be cut using chalk line or similar means in accordance with the details shown on the Plans or as directed by the RPR. The finished cut shall be true to line, smooth and vertical and shall not deviate from the established line more than 1/2-inch from side to side or end to end of the pavement being saw cut.

109-3.2 The existing paving material beyond the saw cut on the construction side shall be removed to the depth of the final cut and disposed of legally off Airport property. ~~The saw cut depth shall be full depth so that spalling or other breakage of the existing pavement along the bottom of the pavement does not occur.~~ If spalling or other breakage of the existing pavement along the bottom of the pavement does occur, the Contractor shall relocate the saw cut line to a point deeper in the existing pavement to remove completely any spalled or broken pavement so that the subbase under the existing pavement is not damaged and the new pavement can be constructed up against the existing pavement without either the new or existing pavement strength and pavement section being compromised.

109-3.3 All dust, chips, slurry, or waste material shall be carefully collected and removed from the site in accordance with the general safety requirements of the Contract and disposed of legally off the airport property.

METHOD OF MEASUREMENT

109-4.1 Saw cutting will not be measured for payment.

BASIS OF PAYMENT

109-5.1 No separate payment will be made for saw cutting. The cost of the work described in this Item shall be considered incidental to installation of the various other elements included in the project.

END OF ITEM M-109

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, ***hauling and disposal and stockpiling of demolished material*** and other miscellaneous items. The work shall be accomplished in accordance with these specifications and the applicable plans.

EQUIPMENT AND MATERIALS

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

CONSTRUCTION

101-3.1 Removal of existing pavement.

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

~~**a. Concrete pavement removal.** Full depth saw cuts shall be made perpendicular to the slab surface. The Contractor shall saw through the full depth of the slab including any dowels at the joint, removing the pavement and installing new dowels as shown on the plans and per the specifications. Where the perimeter of the removal limits is not located on the joint and there are no dowels present, the perimeter shall be saw cut the full depth of the pavement. The pavement inside the saw cut shall be removed by methods which will not cause distress in the pavement which is to remain in place. If the material is to be wasted on the airport site, it shall be reduced to a maximum size of **one cubic foot**. 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 ***depths at the locations shown on the plans. The underlying material adjacent to the edge of and under the existing pavement which is to remain in place shall be protected from damage or disturbance during removal operations and until placement of new pavement or shaped as shown on the drawings or as directed by the RPR. Any material under the portion of the pavement to remain in place, which is disturbed or loses its compaction shall be carefully removed and replaced with P-610 Structural Portland Cement Concrete at no additional cost to the Owner. The Contractor's removal operation shall not cause damage to cables, utility ducts, pipelines, or drainage structures under the pavement. Any damage shall be repaired at the Contractor's expense.*** ~~full depth of the asphalt pavement around the perimeter of the~~

~~area to be removed.~~ If the material is to be wasted on the airport site it shall be broken to a maximum size of **3** inches(~~mm~~).

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.

~~***c. Asphalt shoulder/service road/access road pavement. Full depth asphalt shoulder/service/access road pavement to be removed shall be cut to the depths at the locations shown on the plans. The underlying material adjacent to the edge of and under the existing pavement which is to remain in place shall be protected from damage or disturbance during removal operations and until placement of new pavement or shaped as shown on the drawings or as directed by the RPR. Any material under the portion of the concrete pavement to remain in place, which is disturbed or loses its compaction shall be carefully removed and replaced with P-610 Structural Portland Cement Concrete at no additional cost to the Owner. The Contractor's removal operation shall not cause damage to cables, utility ducts, pipelines, or drainage structures under the pavement. Concrete slabs that are damaged by under breaking shall be removed and replaced. Any damage shall be repaired at the Contractor's expense.***~~

d. General. In all cases of full depth pavement removal, the Contractor shall protect and preserve the existing underdrain pipes and clean outs that are to remain. There shall be no additional cost for protecting and preserving the existing underdrain system to remain.

101-3.2 Preparation of joints and cracks prior to overlay/surface treatment. Remove all vegetation and debris from cracks to a minimum depth of 1 inch (~~25 mm~~). If extensive vegetation exists, treat the specific area with a concentrated solution of a water-based herbicide approved by the RPR. Fill all cracks greater than 1/4 inch ~~(6 mm)~~ wide) with a crack sealant per ASTM D6690. The crack sealant, preparation, and application shall be compatible with the surface treatment/overlay to be used. To minimize contamination of the asphalt with the crack sealant, underfill the crack sealant a minimum of 1/8 inch (3 mm), not to exceed ¼ inch (6 mm). Any excess joint or crack sealer shall be removed from the pavement surface.

101-3.3 Removal of Foreign Substances/contaminates prior to overlay, *marking 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, ***refer to Item P-620 for paint removal*** ~~at least 90% of paint~~, and other foreign substances from the surface of the pavement. Areas that require removal are designated on the plans and as directed by the RPR in the field during construction.

High-pressure water may be used. ~~If chemicals are used, they shall comply with the state's environmental protection regulations~~. Removal methods used shall not cause major damage to the pavement, or to any structure or utility within or adjacent to the work area. Major damage is defined as changing the properties of the pavement, removal of asphalt causing the aggregate to ravel, or removing pavement over 1/8 inch (3 mm) deep. If it is deemed by the RPR that damage to the existing pavement is caused by operational error, such as permitting the application method to dwell in one location for too long, the Contractor shall repair the damaged area without compensation and as directed by the RPR.

Removal of foreign substances shall not proceed until approved by the RPR. Water used for high-pressure water equipment shall be provided by the Contractor at the Contractor's expense. No material shall be

deposited on the pavement shoulders. All wastes shall be disposed of ***off site*** in areas indicated in this specification ~~or shown on the plans~~.

101-3.4 Concrete spall or failed asphaltic concrete pavement repair.

~~a. Repair of concrete spalls in areas to be overlaid with asphalt.~~ ~~The Contractor shall repair all spalled concrete as shown on the plans or as directed by the RPR. The perimeter of the repair shall be saw cut a minimum of 2 inches (50 mm) outside the affected area and 2 inches (50 mm) deep. The deteriorated material shall be removed to a depth where the existing material is firm or cannot be easily removed with a geologist pick. The removed area shall be filled with asphalt mixture with aggregate sized appropriately for the depth of the patch. The material shall be compacted with equipment approved by the RPR until the material is dense and no movement or marks are visible. The material shall not be placed in lifts over 4 inches (100 mm) in depth. This method of repair applies only to pavement to be overlaid.~~

b. Asphalt pavement repair. The Contractor shall repair all spalled ***asphalt*** concrete as shown on the plans or as directed by the RPR. The failed areas shall be removed as specified in paragraph 101-3.1b. All failed material including surface, base course, subbase course, and subgrade shall be removed. Materials and methods of construction shall comply with the applicable sections of these specifications.

101-3.5 Cold milling. Milling shall be performed with a power-operated milling machine or grinder, capable of producing a uniform finished surface. The milling machine or grinder shall operate without tearing or gouging the underlaying surface. The milling machine or grinder shall be equipped with grade and slope controls, and a positive means of dust control. All millings shall be removed and disposed off Airport. If the Contractor mills or grinds deeper or wider than the plans specify, the Contractor shall replace the material removed with new material at the Contractor's Expense. ***All existing utility structures within the milling area shall be preserved and protected throughout construction. Any damage to the exiting utility structures shall be repaired at the cost of the Contractor. Where the limits of milled pavements abut pavement to remain, the contractor shall neatly sawcut, vertically to the specified depth of overlay in accordance with the details on the plans. In areas that become overmilled due to poor quality control, the Contractor fill with P-401 at no additional cost to the Owner.***

a. Patching. The milling machine shall be capable of cutting a vertical edge without chipping or spalling the edges of the remaining pavement and it shall have a positive method of controlling the depth of cut. ~~The RPR shall layout the area to be milled with a straightedge in increments of 1-foot (30 cm) widths. The area to be milled shall cover only the failed area.~~ Any excessive area that is milled because the Contractor doesn't have the appropriate milling machine, or areas that are damaged because of his negligence, shall be repaired by the Contractor at the Contractor's Expense.

b. Profiling, grade correction, or surface correction. The milling machine shall have a minimum width of 7 feet ~~(2 m)~~ and it shall be equipped with electronic grade control devices that will cut the surface to the grade specified. The tolerances shall be maintained within +0 inch and -1/4 inch ~~(+0 mm and -6mm)~~ of the specified grade. The machine must cut vertical edges and have a positive method of dust control. The machine must have the ability to remove the millings or cuttings from the pavement and load them into a truck. All millings shall be removed and disposed of off the airport.

At the completion of milling, the RPR shall examine the milled surface for scabbing or excessive smoothness. Such areas shall be scarified or re-mill to a slightly deeper depth to produce a sound and textured surface at no additional expense.

c. Clean-up. The Contractor shall sweep the milled surface daily and immediately after the milling until all residual materials are removed from the pavement surface. Prior to paving, the Contractor shall wet down the milled pavement and thoroughly sweep and/or blow the surface to remove loose residual

material. Waste materials shall be collected and removed from the pavement surface and adjacent areas by sweeping or vacuuming. Waste materials shall be removed and disposed off Airport property

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 in accordance with paragraph 101-3.4b.

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.** Prior to application of sealant material, clean and dry the joints of all scale, dirt, dust, old sealant, curing compound, moisture and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method used cleans the joint and does not damage the joint.~~

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

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

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

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

101-3.9.1 Preparation of Crack. Widen crack with router random 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 **]**.

101-3.9.4 Removal of Pipe and other Buried Structures.

a. Removal of Existing Pipe Material. [Remove the types of pipe as indicated on the plans. The pipe material 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 **[** D1557 **]** **[** D698 **]**. **[** Not used. **]** **]**

b. Removal of Inlets/Manholes. [Where indicated on the plans or as directed by the RPR, inlets and/or manholes 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. When under paved areas must be compacted to **[** 95% **]** of ASTM **[** D1557 **]** **[** D698 **]**, when outside of paved areas must be compacted to **[** 95% **]** of ASTM D698. **[** Not used. **]** **]**

c. Removal of **[**___**]**.

101-3.10. Subsurface Utility Locating. Quality Level A (locating – vertical utility location) at potential conflict locations as shown on the plans. Quality Levels refer to the ASCE/CI 38-02 Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, FDOT Plan Preparation Manual and Utility Accommodation Manual. Utility information is surveyed and processed to be delivered to the RPR.

METHOD OF MEASUREMENT

[101-4.1 Lump sum. No separate measurement for payment will be made. The work covered by this section shall be considered as a subsidiary obligation of the Contractor and covered under the other contract items. **]**

101-4.1 Pavement removal. The unit of measurement for ***full depth*** 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. Dowel bar installation shall be incidental to pavement removal.

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

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 Spalled and failed asphalt pavement repair.** The unit of measure for failed asphalt pavement repair shall be square foot (square meter).~~

~~**101-4.5 Concrete Spall Repair.** The unit of measure for concrete spall repair shall be the number of square feet (square meter). The location and average depth of the patch shall be determined and agreed upon by the RPR and the Contractor.~~

101-4.6 Cold milling. The unit of measure for cold milling shall be ***specified depth*** ~~inches~~ of milling per square yard ~~(square meter)~~. The location ~~and average depth of the~~ cold milling shall be ***approximately*** as shown on the plans ***and confirmed in the field by the Contractor based on finished pavement elevations relative to the existing pavement elevations. The RPR shall confirm the limits of milling prior to the work beginning***. If the initial cut does not correct the condition, the Contractor shall re-mill the area and will be paid for the total depth of milling. ***At the completion of milling, the RPR and Engineer shall examine the milled surface for scabbing or excessive smoothness. Such areas shall be re-mill to a slightly deeper depth to produce a sound and textured surface at no additional expense.***

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

~~***101-4.8 Subsurface Utility Locating. The unit of measurement for Subsurface Utility Locating shall be the number of test holes to locate the existing utility.***~~

BASIS OF PAYMENT

101-5.1 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. ~~***Full depth pavement removal thicknesses shown on the plans range from 10" to 24". Actual thickness may vary. The Contractor shall account for varying full depths in the unit cost of the bid. No additional compensation shall be made to the Contractor for full depth pavement removal for pavements having thicknesses greater than shown on the plans. Electrical cans and conduit (with or without encasement) within the limits of full depth pavement removal shall be considered incidental. Pavement tie-ins as shown on the contract drawings are considered incidental to full depth pavement removal.***~~

101-5.2 Crack repair. Payment shall be made at contract unit price per linear foot of crack repair. 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.

101-5.3 Bituminous Pavement Cold Milling. Payment shall be made at contract unit price per square yard of bituminous pavement milling. This price shall be full compensation for furnishing all materials and for all preparation, hauling, and off-site disposal of the material and for all labor, equipment, tools, and incidentals necessary to complete this item including off-site disposal of materials. The milling required for the installation and removal of temporary asphalt transitions ramps shall not be measured separately but shall be considered incidental to the overall paving operation.

Item P-101-1	***Bituminous Pavement Cold Milling (Up to 2.5" deep) – per Square Yard***
Item P-101-2	***Crack Repair – per Linear Foot***

~~[Item P-101-5.1 Pavement Removal - [Lump sum] [per square yard (square meter)]~~

~~Item P-101-5.2 Joint and Crack Repair - per linear foot (meter0~~

~~Item P-101-5.3 Removal of Foreign Substances/contaminates - per square foot (square meter)~~

~~Item P-101-5.4 Spalled and Failed Asphalt Pavement Repair - per square foot (square meter)~~

~~Item P-101-5.5 Concrete Spall Repair - per square foot (square meter)~~

~~Item P-101-5.6 Cold Milling – per square yard (square meter)]~~

~~Item P-101-5.7 Removal of Pipe and other Buried Structures - [Lump sum] [per each] [Not required.]~~

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

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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 **150** Type **I**.

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 8-inch (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 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°F (2°C) and rising. Mixing and placement shall stop when the air temperature is 40°F (4°C) and falling or when the anticipated air or ground temperature will be 35°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°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.

~~Payment will be made under:~~

~~Item P-153-6.1 Controlled low-strength material (CLSM) 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 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-401 ASPHALT MIX PAVEMENT

DESCRIPTION

401-1.1 This item shall consist of pavement courses composed of mineral aggregate and asphalt binder mixed in a central mixing plant and placed on a prepared base or stabilized course in accordance with these specifications and shall conform to the lines, grades, thicknesses, and typical cross-sections shown on the plans. Each course shall be constructed to the depth, typical section, and elevation required by the plans and shall be rolled, finished, and approved before the placement of the next course.

MATERIALS

401-2.1 Aggregate. Aggregates shall consist of crushed stone, crushed gravel, ~~crushed slag~~, screenings, natural sand, and mineral filler, as required. The aggregates should have no known history of detrimental pavement staining due to ferrous sulfides, such as pyrite. ***The Contractor shall provide certification that aggregates are free of ferrous sulfides***. Coarse aggregate is the material retained on the No. 4 (4.75 mm) sieve. Fine aggregate is the material passing the No. 4 (4.75 mm) sieve.

a. Coarse aggregate. Coarse aggregate shall consist of sound, tough, durable particles, free from films of matter that would prevent thorough coating and bonding with the asphalt material and free from organic matter and other deleterious substances. Coarse aggregate material requirements are given in the table below.

Coarse Aggregate Material Requirements

Material Test	Requirement	Standard
Resistance to Degradation	Loss: 40% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Clay lumps and friable particles	0.3% maximum	ASTM C142
Percentage of Fractured Particles	For pavements designed for aircraft gross weights of 60,000 pounds (27200 kg) or more: Minimum 75% by weight of particles with at least two fractured faces and 85% with at least one fractured face[1]	ASTM D5821
	For pavements designed for aircraft gross weights less than 60,000 pounds (27200 kg): Minimum 50% by weight of particles with at least two fractured faces and 65% with at least one fractured face[1]	
Flat, Elongated, or Flat and Elongated Particles	8% maximum, by weight, of flat, elongated, or flat and elongated particles at 5:1 [2]	ASTM D4791
~~Bulk density of slag [3]~~	~~Weigh not less than 70 pounds per cubic foot (1.12 Mg/cubic meter)~~	~~ASTM C29.~~

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

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

~~[3] Only required if slag is specified.~~

b. Fine aggregate. Fine aggregate shall consist of clean, sound, tough, durable, angular shaped particles produced by crushing stone, slag, or gravel and shall be free from coatings of clay, silt, or other objectionable matter. Natural (non-manufactured) sand may be used to obtain the gradation of the fine aggregate blend or to improve the workability of the mix. Fine aggregate material requirements are listed in the table below.

Fine Aggregate Material Requirements

Material Test	Requirement	Standard
Liquid limit	25 maximum	ASTM D4318
Plasticity Index	4 maximum	ASTM D4318
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 10% maximum using Sodium sulfate - or - 15% maximum using magnesium sulfate	ASTM C88
Clay lumps and friable particles	0.3% maximum	ASTM C142
Sand equivalent	45 minimum	ASTM D2419
Natural Sand	15% maximum by weight of total aggregate	ASTM D1073

c. Sampling. ASTM D75 shall be used in sampling coarse and fine aggregate.

401-2.2 Mineral filler. Mineral filler (baghouse fines) may be added in addition to material naturally present in the aggregate. Mineral filler shall meet the requirements of ASTM D242.

Mineral Filler Requirements

Material Test	Requirement	Standard
Plasticity Index	4 maximum	ASTM D4318

401-2.3 Asphalt binder. Asphalt binder shall conform to ASTM D6373 Performance Grade (PG) **76-22**.

Asphalt Binder PG Plus Test Requirements

Material Test	Requirement	Standard
Elastic Recovery	75% minimum	ASTM D6084

401-2.4 Anti-stripping agent. Any anti-stripping agent or additive (anti-strip) shall be heat stable and shall not change the asphalt binder grade beyond specifications. Anti-strip shall be an approved material of the Department of Transportation of the State in which the project is located.

COMPOSITION

401-3.1 Composition of mixture(s). The asphalt mix shall be composed of a mixture of aggregates, filler and anti-strip agent if required, and asphalt binder. The aggregate fractions shall be sized, handled in separate size groups, and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula (JMF).

401-3.2 Job mix formula (JMF) laboratory. The laboratory used to develop the JMF shall possess a current certificate of accreditation, listing D3666 from a national accrediting authority and all test methods required for developing the JMF; and be listed on the accrediting authority's website. A copy of

the laboratory's current accreditation and accredited test methods shall be submitted to the Resident Project Representative (RPR) prior to start of construction.

401-3.3 Job mix formula (JMF). No asphalt mixture shall be placed until an acceptable mix design has been submitted to the RPR for review and accepted in writing. The RPR's review shall not relieve the Contractor of the responsibility to select and proportion the materials to comply with this section.

When the project requires asphalt mixtures of differing aggregate gradations and/or binders, a separate JMF shall be submitted for each mix. Add anti-stripping agent to meet tensile strength requirements.

The JMF shall be prepared by an accredited laboratory that meets the requirements of paragraph 401-3.2. The asphalt mixture shall be designed using procedures contained in Asphalt Institute MS-2 Mix Design Manual, 7th Edition**.** Samples shall be prepared and compacted using the gyratory compactor in accordance with ASTM D6925.

Should a change in sources of materials be made, a new JMF must be submitted to the RPR for review and accepted in writing before the new material is used. After the initial production JMF has been approved by the RPR and a new or modified JMF is required for whatever reason, the subsequent cost of the new or modified JMF, including a new control strip when required by the RPR, will be borne by the Contractor.

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

The JMF shall be submitted in writing by the Contractor at least 30 days prior to the start of paving operations. The JMF shall be developed within the same construction season using aggregates proposed for project use.

The JMF shall be dated, and stamped or sealed by the responsible professional Engineer of the laboratory and shall include the following items as a minimum:

- Manufacturer's Certificate of Analysis (COA) for the asphalt binder used in the JMF in accordance with paragraph 401-2.3. Certificate of asphalt performance grade is with modifier already added, if used and must indicate compliance with ASTM D6373. For plant modified asphalt binder, certified test report indicating grade certification of modified asphalt binder.
- Manufacturer's Certificate of Analysis (COA) for the anti-stripping agent if used in the JMF in accordance with paragraph 401-2.4.
- Certified material test reports for the course and fine aggregate and mineral filler in accordance with paragraphs 401-2.1.
- Percent passing each sieve size for individual gradation of each aggregate cold feed and/or hot bin; percent by weight of each cold feed and/or hot bin used; and the total combined gradation in the JMF.
- Specific Gravity and absorption of each coarse and fine aggregate.
- Percent natural sand.
- Percent fractured faces.
- Percent by weight of flat particles, elongated particles, and flat and elongated particles (and criteria).
- Percent of asphalt.
- Number of ~~blows or~~ gyrations

- Laboratory mixing and compaction temperatures.
- Supplier-recommended field mixing and compaction temperatures.
- Plot of the combined gradation on a 0.45 power gradation curve.
- Graphical plots of air voids, voids in the mineral aggregate (VMA), and unit weight versus asphalt content. To achieve minimum VMA during production, the mix design needs to account for material breakdown during production.
- Tensile Strength Ratio (TSR).
- Type and amount of Anti-strip agent when used.
- Asphalt Pavement Analyzer (APA) results.
- Date the JMF was developed. Mix designs that are not dated or which are from a prior construction season shall not be accepted.

Table 1. Asphalt Design Criteria

Test Property	Value	Test Method
Number of ~~blows or~~ gyrations	75	
Air voids (%)	3.5	ASTM D3203
Percent voids in mineral aggregate (VMA), minimum	See Table 2	ASTM D6995
Tensile Strength Ratio (TSR)[1]	not less than 80 at a saturation of 70-80%	ASTM D4867
Asphalt Pavement Analyzer (APA)[2]	Less than 10 mm @ 4000 passes	AASHTO T340 at 250 psi hose pressure at 64°C test temperature

[1] Test specimens for TSR shall be compacted at 7 ± 1.0 % air voids. In areas subject to freeze-thaw, use freeze-thaw conditioning in lieu of moisture conditioning per ASTM D4867.

[2] AASHTO T340 at 100 psi hose pressure at 64°C test temperature may be used in the interim. If this method is used the required Value shall be less than 5 mm @ 8000 passes

The mineral aggregate shall be of such size that the percentage composition by weight, as determined by laboratory sieves, will conform to the gradation or gradations specified in Table 2 when tested in accordance with ASTM C136 and ASTM C117.

The gradations in Table 2 represent the limits that shall determine the suitability of aggregate for use from the sources of supply; be well graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve, or vice versa.

Table 2. Aggregate - Asphalt Pavements

Sieve Size	Percentage by Weight Passing Sieves		
	~~Gradation 1~~	Gradation 2	Gradation 3
1 inch (25.0 mm)	~~100~~	--	--
3/4 inch (19.0 mm)	~~90-100~~	100	--
1/2 inch (12.5 mm)	~~68-88~~	90-100	100
3/8 inch (9.5 mm)	~~60-82~~	72-88	90-100
No. 4 (4.75 mm)	~~45-67~~	53-73	58-78
No. 8 (2.36 mm)	~~32-54~~	38-60	40-60
No. 16 (1.18 mm)	~~22-44~~	26-48	28-48
No. 30 (600 µm)	~~15-35~~	18-38	18-38
No. 50 (300 µm)	~~9-25~~	11-27	11-27
No. 100 (150 µm)	~~6-18~~	6-18	6-18
No. 200 (75 µm)	~~3-6~~	3-6	3-6
Minimum Voids in Mineral Aggregate (VMA)[1]	~~14.0~~	15.0	16.0
Asphalt percent by total weight of mixture:			
Stone or gravel	~~4.5-7.0~~	5.0-7.5	5.5-8.0
~~Slag~~	~~5.0-7.5~~	~~6.5-9.5~~	~~7.0-10.5~~
Recommended Minimum Construction Lift Thickness	~~3 inch~~	2 inch	1 1/2 inch

Gradation 2 for runways, taxiways and apron.

Gradation 3 is intended for leveling courses. FAA approval is required for use in other locations.

[1]To achieve minimum VMA during production, the mix design needs to account for material breakdown during production.

The aggregate gradations shown are based on aggregates of uniform specific gravity. The percentages passing the various sieves shall be corrected when aggregates of varying specific gravities are used, as indicated in the Asphalt Institute MS-2 Mix Design Manual, 7th Edition.

401-3.4 Reclaimed asphalt pavement (RAP). RAP shall not be used.

401-3.5 Control Strip. Full production shall not begin until an acceptable control strip has been constructed and accepted in writing by the RPR**.** The Contractor shall prepare and place a quantity of asphalt according to the JMF. The underlying grade or pavement structure upon which the control strip is to be constructed shall be the same as the remainder of the course represented by the control strip.

The Contractor will not be allowed to place the control strip until the Contractor quality control program (CQCP), showing conformance with the requirements of paragraph 401-5.1, has been accepted, in writing, by the RPR.

The control strip will consist of at least 250 tons (227 metric tons) or 1/2 sublot, whichever is greater. The control strip shall be placed in two lanes of the same width and depth to be used in production with a longitudinal cold joint. The cold joint must be cut back in accordance with paragraph 401-4.14 using the same procedure that will be used during production. The cold joint for the control strip will be an exposed construction joint at least four (4) hours old or when the mat has cooled to less than 160°F (71°C). The equipment used in construction of the control strip shall be the same type, configuration and weight to be used on the project.

The control strip will be considered acceptable by the RPR if the gradation, asphalt content, and VMA are within the action limits specified in paragraph 401-5.5a; and Mat density, air voids, and joint density meet the requirements specified in paragraphs 401-6.2.

If the control strip is unacceptable, necessary adjustments to the JMF, plant operation, placing procedures, and/or rolling procedures shall be made and another control strip shall be placed. Unacceptable control strips shall be removed at the Contractor's expense.

Payment will only be made for an acceptable control strip in accordance with paragraph 401-8.1 using a lot pay factor equal to 100. ***Control strip is not required for leveling course.***

CONSTRUCTION METHODS

401-4.1 Weather limitations. The asphalt shall not be placed upon a wet surface or when the surface temperature of the underlying course is less than specified in Table 4. The temperature requirements may be waived by the RPR, if requested; however, all other requirements including compaction shall be met.

Table 4. Surface Temperature Limitations of Underlying Course

Mat Thickness	Base Temperature (Minimum)	
	°F	°C
3 inches (7.5 cm) or greater	40 [1]	4
Greater than 2 inches (50 mm) but less than 3 inches (7.5 cm)	45	7

401-4.2 Asphalt plant. Plants used for the preparation of asphalt shall conform to the requirements of American Association of State Highway and Transportation Officials (AASHTO) M156 including the following items.

a. Inspection of plant. The RPR, or RPR's authorized representative, shall have access, at all times, to all areas of the plant for checking adequacy of equipment; inspecting operation of the plant: verifying weights, proportions, and material properties; and checking the temperatures maintained in the preparation of the mixtures.

b. Storage bins and surge bins. The asphalt mixture stored in storage and/or surge bins shall meet the same requirements as asphalt mixture loaded directly into trucks. Asphalt mixture shall not be stored in storage and/or surge bins for a period greater than twelve (12) hours. If the RPR determines there is an excessive heat loss, segregation, or oxidation of the asphalt mixture due to temporary storage, temporary storage shall not be allowed.

401-4.3 Aggregate stockpile management. Aggregate stockpiles shall be constructed in a manner that prevents segregation and intermixing of deleterious materials. Aggregates from different sources shall be stockpiled, weighed and batched separately at the asphalt batch plant. Aggregates that have become segregated or mixed with earth or foreign material shall not be used.

A continuous supply of materials shall be provided to the work to ensure continuous placement.

401-4.4 Hauling equipment. Trucks used for hauling asphalt shall have tight, clean, and smooth metal beds. To prevent the asphalt from sticking to the truck beds, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other material approved by the RPR. Petroleum products shall not be used for coating truck beds. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary, to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers shall be securely fastened.

401-4.4.1 Material transfer vehicle (MTV). Material transfer vehicles ***are required. MTVs*** used to transfer the material from the hauling equipment to the paver, shall use a self-propelled, material transfer vehicle with a swing conveyor that can deliver material to the paver without making contact with the paver. The MTV shall be able to move back and forth between the hauling equipment and the paver providing material transfer to the paver, while allowing the paver to operate at a constant speed. The Material Transfer Vehicle will have remixing and storage capability to prevent physical and thermal segregation. ***Any damage to airport infrastructure from MTV use will be repaired by the Contractor and at the Contractor's expense.***

401-4.5 Asphalt pavers. Asphalt pavers shall be self-propelled with an activated heated screed, capable of spreading and finishing courses of asphalt that will meet the specified thickness, smoothness, and grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface. The asphalt paver shall be equipped with a control system capable of automatically maintaining the specified screed grade and elevation.

If the spreading and finishing equipment in use leaves tracks or indented areas, or produces other blemishes in the pavement that are not satisfactorily corrected by the scheduled operations, the use of such equipment shall be discontinued.

The paver shall be capable of paving to a minimum width specified in paragraph 401-4.12.

401-4.6 Rollers. The number, type, and weight of rollers shall be sufficient to compact the asphalt to the required density while it is still in a workable condition without crushing of the aggregate, depressions or other damage to the pavement surface. Rollers shall be in good condition, clean, and capable of operating at slow speeds to avoid displacement of the asphalt. All rollers shall be specifically designed and suitable for compacting asphalt concrete and shall be properly used. Rollers that impair the stability of any layer of a pavement structure or underlying soils shall not be used.

401-4.7 Density device. The Contractor shall have on site a density gauge during all paving operations in order to assist in the determination of the optimum rolling pattern, type of roller and frequencies, as well as to monitor the effect of the rolling operations during production paving. The Contractor shall supply a qualified technician during all paving operations to calibrate the gauge and obtain accurate density readings for all new asphalt. These densities shall be supplied to the RPR upon request at any time during construction. No separate payment will be made for supplying the density gauge and technician.

401-4.8 Preparation of asphalt binder. The asphalt binder shall be heated in a manner that will avoid local overheating and provide a continuous supply of the asphalt binder to the mixer at a uniform temperature. The temperature of unmodified asphalt binder delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles, but shall not exceed 325°F (160°C) when added to the aggregate. The temperature of modified asphalt binder shall be no more than 350°F (175°C) when added to the aggregate.

401-4.9 Preparation of mineral aggregate. The aggregate for the asphalt shall be heated and dried. The maximum temperature and rate of heating shall be such that no damage occurs to the aggregates. The temperature of the aggregate and mineral filler shall not exceed 350°F (175°C) when the asphalt binder is added. Particular care shall be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

401-4.10 Preparation of Asphalt mixture. The aggregates and the asphalt binder shall be weighed or metered and mixed in the amount specified by the JMF. The combined materials shall be mixed until the aggregate obtains a uniform coating of asphalt binder and is thoroughly distributed throughout the mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but not less than 25 seconds for batch plants. The wet mixing time for all plants shall be established by the Contractor, based on the procedure for determining the percentage of coated particles described in ASTM D2489, for each individual plant and for each type of aggregate used. The wet mixing time will be set to achieve 95% of coated particles. For continuous mix plants, the minimum mixing time shall be determined by dividing the weight of its contents at operating level by the weight of the mixture delivered per second by the mixer. The moisture content of all asphalt upon discharge shall not exceed 0.5%.

401-4.11 Application of Prime and Tack Coat. Immediately before placing the asphalt mixture, the underlying course shall be cleaned of all dust and debris.

A prime coat in accordance with Item P-602 shall be applied to aggregate base prior to placing the asphalt mixture.

A tack coat shall be applied in accordance with Item P-603 to all vertical and horizontal asphalt and concrete surfaces prior to placement of the first and each subsequent lift of asphalt mixture.

401-4.12 Laydown plan, transporting, placing, and finishing. Prior to the placement of the asphalt, the Contractor shall prepare a laydown plan with the sequence of paving lanes and width to minimize the number of cold joints; the location of any temporary ramps; laydown temperature; and estimated time of completion for each portion of the work (milling, paving, rolling, cooling, etc.). The laydown plan and any modifications shall be approved by the RPR.

Deliveries shall be scheduled so that placing and compacting of asphalt is uniform with minimum stopping and starting of the paver. Hauling over freshly placed material shall not be permitted until the material has been compacted, as specified, and allowed to cool to approximately ambient temperature. The Contractor, at their expense, shall be responsible for repair of any damage to the pavement caused by hauling operations.

Contractor shall survey each lift of asphalt surface course and certify to RPR that every lot of each lift meets the grade tolerances of paragraph 401-6.2d before the next lift can be placed.

Edges of existing asphalt pavement abutting the new work shall be saw cut and the cut off material and laitance removed. Apply a tack coat in accordance with P-603 before new asphalt material is placed against it.

The speed of the paver shall be regulated to eliminate pulling and tearing of the asphalt mat. Placement of the asphalt mix shall begin along the centerline of a crowned section or on the high side of areas with a one way slope unless shown otherwise on the laydown plan as accepted by the RPR. The asphalt mix

shall be placed in consecutive adjacent lanes having a minimum width of **12.5** feet (m) except where edge lanes require less width to complete the area. Additional screed sections attached to widen the paver to meet the minimum lane width requirements must include additional auger sections to move the asphalt mixture uniformly along the screed extension.

The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least one foot (30 cm); however, the joint in the surface top course shall be at the centerline of crowned pavements. Transverse joints in one course shall be offset by at least 10 feet (3 m) from transverse joints in the previous course. Transverse joints in adjacent lanes shall be offset a minimum of 10 feet (3 m).On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the asphalt may be spread and luted by hand tools.

The RPR may at any time, reject any batch of asphalt, on the truck or placed in the mat, which is rendered unfit for use due to contamination, segregation, incomplete coating of aggregate, or overheated asphalt mixture. Such rejection may be based on only visual inspection or temperature measurements. In the event of such rejection, the Contractor may take a representative sample of the rejected material in the presence of the RPR, and if it can be demonstrated in the laboratory, in the presence of the RPR, that such material was erroneously rejected, payment will be made for the material at the contract unit price.

Areas of segregation in the surface course, as determined by the RPR, shall be removed and replaced at the Contractor's expense. The area shall be removed by saw cutting and milling a minimum of the construction lift thickness as specified in paragraph 401-3.3, Table 2 for the approved mix design. The area to be removed and replaced shall be a minimum width of the paver and a minimum of 10 feet (3 m) long.

401-4.13 Compaction of asphalt mixture. After placing, the asphalt mixture shall be thoroughly and uniformly compacted by self-propelled rollers. The surface shall be compacted as soon as possible when the asphalt has attained sufficient stability so that the rolling does not cause undue displacement, cracking or shoving. The sequence of rolling operations and the type of rollers used shall be at the discretion of the Contractor. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Any surface defects and/or displacement occurring as a result of the roller, or from any other cause, shall be corrected at the Contractor's expense.

Sufficient rollers shall be furnished to handle the output of the plant. Rolling shall continue until the surface is of uniform texture, true to grade and cross-section, and the required field density is obtained. To prevent adhesion of the asphalt to the roller, the wheels shall be equipped with a scraper and kept moistened with water as necessary.

In areas not accessible to the roller, the mixture shall be thoroughly compacted with approved power tampers.

Any asphalt that becomes loose and broken, mixed with dirt, contains check-cracking, or in any way defective shall be removed and replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at the Contractor's expense. Skin patching shall not be allowed.

401-4.14 Joints. The formation of all joints shall be made to ensure a continuous bond between the courses and obtain the required density. All joints shall have the same texture as other sections of the course and meet the requirements for smoothness and grade.

The roller shall not pass over the unprotected end of the freshly laid asphalt except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course. The tapered edge shall be cut back to its full depth and width on a straight line to expose a vertical face prior to placing the adjacent lane. In both methods, all contact surfaces shall be coated with an asphalt tack coat before placing any fresh asphalt against the joint.

Longitudinal joints which have been left exposed for more than four (4) hours; the surface temperature has cooled to less than 175°F (80°C); or are irregular, damaged, uncompacted or otherwise defective shall be cut back with a cutting wheel or pavement saw a maximum of 3 inches (75 mm) to expose a clean, sound, uniform vertical surface for the full depth of the course. All cutback material and any laitance produced from cutting joints shall be removed from the project. Asphalt tack coat in accordance with P-603 shall be applied to the clean, dry joint prior to placing any additional fresh asphalt against the joint. The cost of this work shall be considered incidental to the cost of the asphalt.

401-4.15 Saw-cut grooving. Saw-cut grooves shall be provided as specified in Item P-621.

401-4.16 Diamond grinding. Diamond grinding shall be completed prior to pavement grooving. Diamond grinding shall be accomplished by sawing with saw blades impregnated with industrial diamond abrasive.

Diamond grinding shall be performed with a machine designed specifically for diamond grinding capable of cutting a path at least 3 feet (0.9 m) wide. The saw blades shall be 1/8-inch (3-mm) wide with a sufficient number of blades to create grooves between 0.090 and 0.130 inches (2 and 3.5 mm) wide; and peaks and ridges approximately 1/32 inch (1 mm) higher than the bottom of the grinding cut. The actual number of blades will be determined by the Contractor and depend on the hardness of the aggregate. Equipment or grinding procedures that cause ravels, aggregate fractures, spalls or disturbance to the pavement will not be permitted. Contractor shall demonstrate to the RPR that the grinding equipment will produce satisfactory results prior to making corrections to surfaces.Grinding will be tapered in all directions to provide smooth transitions to areas not requiring grinding. The slurry resulting from the grinding operation shall be continuously removed and the pavement left in a clean condition. The Contractor shall apply a surface treatment per P-608 to all areas that have been subject to grinding.

401-4.17 Nighttime paving requirements. The Contractor shall provide adequate lighting during any nighttime construction. A lighting plan shall be submitted by the Contractor and approved by the RPR prior to the start of any nighttime work. All work shall be in accordance with the approved CSPP and lighting plan.

If the Contractor places any out of specification mix in the project work area, the Contractor is required to remove it at its own expense, to the satisfaction of the RPR. If the Contractor has to continue placing non-payment HMA, as directed by the RPR, to make the surfaces safe for aircraft operations, the Contractor shall do so to the satisfaction of the RPR. It is the Contractor's responsibility to leave the facilities to be paved in a safe condition ready for aircraft operations. No consideration for extended closure time of the area being paved will be given. As a first order of work for the next paving shift, the Contractor shall remove all out of specification material and replace with approved material to the satisfaction of the Engineer. When the above situations occur, there will be no consideration given for additional construction time or payment for extra costs.

CONTRACTOR QUALITY CONTROL (CQC)

401-5.1 General. The Contractor shall develop a Contractor Quality Control Program (CQCP) in accordance with Item C-100. No partial payment will be made for materials without an approved CQCP.

401-5.2 Contractor quality control (QC) facilities. The Contractor shall provide or contract for testing facilities in accordance with Item C-100. The RPR shall be permitted unrestricted access to inspect the Contractor's QC facilities and witness QC activities. The RPR will advise the Contractor in writing of any noted deficiencies concerning the QC facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to be adversely affecting the test results, the incorporation of

the materials into the work shall be suspended immediately and will not be permitted to resume until the deficiencies are satisfactorily corrected.

401-5.3 Contractor QC testing. The Contractor shall perform all QC tests necessary to control the production and construction processes applicable to these specifications and as set forth in the approved CQCP. The testing program shall include, but not necessarily be limited to, tests for the control of asphalt content, aggregate gradation, temperatures, aggregate moisture, field compaction, and surface smoothness. A QC Testing Plan shall be developed as part of the CQCP.

a. Asphalt content. A minimum of two tests shall be performed per day in accordance with ASTM D6307 or ASTM D2172 for determination of asphalt content. When using ASTM D6307, the correction factor shall be determined as part of the first test performed at the beginning of plant production; and as part of every tenth test performed thereafter. The asphalt content for the day will be determined by averaging the test results.

b. Gradation. Aggregate gradations shall be determined a minimum of twice per day from mechanical analysis of extracted aggregate in accordance with ASTM D5444, ASTM C136, and ASTM C117.

c. Moisture content of aggregate. The moisture content of aggregate used for production shall be determined a minimum of once per day in accordance with ASTM C566.

d. Moisture content of asphalt. The moisture content shall be determined once per day in accordance with AASHTO T329 or ASTM D1461.

e. Temperatures. Temperatures shall be checked, at least four times per day, at necessary locations to determine the temperatures of the dryer, the asphalt binder in the storage tank, the asphalt at the plant, and the asphalt at the job site.

f. In-place density monitoring. The Contractor shall conduct any necessary testing to ensure that the specified density is being achieved. A nuclear gauge may be used to monitor the pavement density in accordance with ASTM D2950.

g. Smoothness for Contractor Quality Control.

The Contractor shall perform smoothness testing in transverse and longitudinal directions daily to verify that the construction processes are producing pavement with variances less than ¼ inch in 12 feet, identifying areas that may pond water which could lead to hydroplaning of aircraft. If the smoothness criteria is not met, appropriate changes and corrections to the construction process shall be made by the Contractor before construction continues

The Contractor may use a 12-foot (3.7 m) straightedge or a rolling inclinometer meeting the requirements of ASTM E2133. Straight-edge testing shall start with one-half the length of the straightedge at the edge of pavement section being tested and then moved ahead one-half the length of the straightedge for each successive measurement. Testing shall be continuous across all joints. The surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between the two high points. If the rolling inclinometer is used, the data may be evaluated using the FAA profile program, ProFAA, using the 12-foot straightedge simulation function.

Smoothness readings shall not be made across grade changes or cross slope transitions. The transition between new and existing pavement shall be evaluated separately for conformance with the plans.

(1) Transverse measurements. Transverse measurements shall be taken for each day's production placed. Transverse measurements shall be taken perpendicular to the pavement centerline each 50 feet (15 m) or more often as determined by the RPR. The joint between lanes shall be tested separately to facilitate smoothness between lanes.

(2) Longitudinal measurements. Longitudinal measurements shall be taken for each day's production placed. Longitudinal tests shall be parallel to the centerline of paving; at the center of paving lanes when widths of paving lanes are less than 20 feet (6 m); and at the third points of paving lanes when widths of paving lanes are 20 ft (6 m) or greater.

Deviations on the final surface course in either the transverse or longitudinal direction that will trap water greater than 1/4 inch (6 mm) shall be corrected with diamond grinding per paragraph 401-4.16 or by removing and replacing the surface course to full depth. Grinding shall be tapered in all directions to provide smooth transitions to areas not requiring grinding. All areas in which diamond grinding has been performed shall be subject to the final pavement thickness tolerances specified in paragraph 401-6.1d(3). Areas that have been ground shall be sealed with a surface treatment in accordance with Item P-608. To avoid the surface treatment creating any conflict with runway or taxiway markings, it may be necessary to seal a larger area.

Control charts shall be kept to show area of each day's placement and the percentage of corrective grinding required. Corrections to production and placement shall be initiated when corrective grinding is required. If the Contractor's machines and/or methods produce significant areas that need corrective actions in excess of 10 percent of a day's production, production shall be stopped until corrective measures are implemented by the Contractor.

h. Grade. Grade shall be evaluated daily to allow adjustments to paving operations when grade measurements do not meet specifications. As a minimum, grade shall be evaluated prior to and after the placement of the first lift and after placement of the surface lift.

Measurements will be taken at appropriate gradelines (as a minimum at center and edges of paving lane) and longitudinal spacing as shown on cross-sections and plans. The final surface of the pavement will not vary from the gradeline elevations and cross-sections shown on the plans by more than 1/2 inch (12 mm) vertically **.** The documentation will be provided by the Contractor to the RPR within 24 hours**.**

Areas with humps or depressions that exceed grade or smoothness criteria and that retain water on the surface must be ground off provided the course thickness after grinding is not more than 1/2 inch (12 mm) less than the thickness specified on the plans. Grinding shall be in accordance with paragraph 401-4.16.

The Contractor shall repair low areas or areas that cannot be corrected by grinding by removal of deficient areas to the depth of the final course plus ½ inch and replacing with new material. Skin patching is not allowed.

401-5.4 Sampling. When directed by the RPR, the Contractor shall sample and test any material that appears inconsistent with similar material being sampled, unless such material is voluntarily removed and replaced or deficiencies corrected by the Contractor. All sampling shall be in accordance with standard procedures specified.

401-5.5 Control charts. The Contractor shall maintain linear control charts for both individual measurements and range (i.e. difference between highest and lowest measurements) for aggregate gradation, asphalt content, and VMA. The VMA for each day will be calculated and monitored by the QC laboratory.

Control charts shall be posted in a location satisfactory to the RPR and kept current. As a minimum, the control charts shall identify the project number, the contract item number, the test number, each test parameter, the Action and Suspension Limits applicable to each test parameter, and the Contractor's test results. The Contractor shall use the control charts as part of a process control system for identifying

potential problems and assignable causes before they occur. If the Contractor's projected data during production indicates a problem and the Contractor is not taking satisfactory corrective action, the RPR may suspend production or acceptance of the material.

a. Individual measurements. Control charts for individual measurements shall be established to maintain process control within tolerance for aggregate gradation, asphalt content, and VMA. The control charts shall use the job mix formula target values as indicators of central tendency for the following test parameters with associated Action and Suspension Limits:

Control Chart Limits for Individual Measurements

Sieve	Action Limit	Suspension Limit
3/4 inch (19.0 mm)	±6%	±9%
1/2 inch (12.5 mm)	±6%	±9%
3/8 inch (9.5 mm)	±6%	±9%
No. 4 (4.75 mm)	±6%	±9%
No. 16 (1.18 mm)	±5%	±7.5%
No. 50 (300 µm)	±3%	±4.5%
No. 200 (75 µm)	±2%	±3%
Asphalt Content	±0.45%	±0.70%
Minimum VMA	-0.5%	-1.0%

b. Range. Control charts shall be established to control gradation process variability. The range shall be plotted as the difference between the two test results for each control parameter. The Suspension Limits specified below are based on a sample size of n = 2. Should the Contractor elect to perform more than two tests per lot, the Suspension Limits shall be adjusted by multiplying the Suspension Limit by 1.18 for n = 3 and by 1.27 for n = 4.

Control Chart Limits Based on Range

Sieve	Suspension Limit
1/2 inch (12.5 mm)	11%
3/8 inch (9.5 mm)	11%
No. 4 (4.75 mm)	11%
No. 16 (1.18 mm)	9%
No. 50 (300 µm)	6%
No. 200 (75 µm)	3.5%
Asphalt Content	0.8%

c. Corrective Action. The CQCP shall indicate that appropriate action shall be taken when the process is believed to be out of tolerance. The Plan shall contain rules to gauge when a process is out of control and detail what action will be taken to bring the process into control. As a minimum, a process shall be deemed out of control and production stopped and corrective action taken, if:

(1) One point falls outside the Suspension Limit line for individual measurements or range; or

(2) Two points in a row fall outside the Action Limit line for individual measurements.

401-5.6 QC reports. The Contractor shall maintain records and shall submit reports of QC activities daily , in accordance with Item C-100.

MATERIAL ACCEPTANCE

401-6.1 Acceptance sampling and testing. Unless otherwise specified, all acceptance sampling and testing necessary to determine conformance with the requirements specified in this section will be performed by the RPR at no cost to the Contractor except that coring as required in this section shall be completed and paid for by the Contractor. ***Coring of the in-place pavement which will be done by the Contractor, will include patching of the hole and delivery of cores to the RPR/Engineer or his agent for testing.***

a. Quality assurance (QA) testing laboratory. The QA testing laboratory performing these acceptance tests will be accredited in accordance with ASTM D3666. The QA laboratory accreditation will be current and listed on the accrediting authority's website. All test methods required for acceptance sampling and testing will be listed on the lab accreditation.

b. Lot size. A standard lot will be equal to one day's production divided into approximately equal sublots of between 400 to 600 tons. When only one or two sublots are produced in a day's production, the sublots will be combined with the production lot from the previous or next day.

Where more than one plant is simultaneously producing asphalt for the job, the lot sizes will apply separately for each plant.

c. Asphalt air voids. Plant-produced asphalt will be tested for air voids on a sublot basis.

(1) Sampling. Material from each sublot shall be sampled in accordance with ASTM D3665. Samples shall be taken from material deposited into trucks at the plant or at the job site in accordance with ASTM D979. The sample of asphalt may be put in a covered metal tin and placed in an oven for not less than 30 minutes nor more than 60 minutes to maintain the material at or above the compaction temperature as specified in the JMF.

(2) Testing. Air voids will be determined for each sublot in accordance with ASTM D3203 for a set of compacted specimens prepared in accordance with ASTM D6925.

d. In-place asphalt mat and joint density. Each sublot will be tested for in-place mat and joint density as a percentage of the theoretical maximum density (TMD).

(1) Sampling. The Contractor will cut minimum 5 inch (125 mm) diameter samples in accordance with ASTM D5361. The Contractor shall furnish all tools, labor, and materials for cleaning, and filling the cored pavement. Laitance produced by the coring operation shall be removed immediately after coring, and core holes shall be filled within one day after sampling in a manner acceptable to the RPR.

(2) Bond. Each lift of asphalt shall be bonded to the underlying layer. If cores reveal that the surface is not bonded, additional cores shall be taken as directed by the RPR to determine the extent of unbonded areas. Unbonded areas shall be removed by milling and replaced at no additional cost as directed by the RPR.

(3) Thickness. Thickness of each lift of surface course will be evaluated by the RPR for compliance to the requirements shown on the plans after any necessary corrections for grade. Measurements of thickness will be made using the cores extracted for each sublot for density measurement. The maximum allowable deficiency at any point will not be more than 1/4 inch (6 mm) less than the thickness indicated for the lift. Average thickness of lift, or combined lifts, will not be less than

the indicated thickness. Where the thickness tolerances are not met, the lot or sublot shall be corrected by the Contractor at his expense by removing the deficient area and replacing with new pavement. The Contractor, at his expense, may take additional cores as approved by the RPR to circumscribe the deficient area.

(4) Mat density. One core shall be taken from each sublot. Core locations will be determined by the RPR in accordance with ASTM D3665. Cores for mat density shall not be taken closer than one foot (30 cm) from a transverse or longitudinal joint. The bulk specific gravity of each cored sample will be determined in accordance with ASTM D2726. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each sublot sample by the TMD for that sublot.

(5) Joint density. One core centered over the longitudinal joint shall be taken for each sublot that has a longitudinal joint. Core locations will be determined by the RPR in accordance with ASTM D3665. The bulk specific gravity of each core sample will be determined in accordance with ASTM D2726. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each joint density sample by the average TMD for the lot. The TMD used to determine the joint density at joints formed between lots will be the lower of the average TMD values from the adjacent lots.

401-6.2 Acceptance criteria.

a. General. Acceptance will be based on the implementation of the Contractor Quality Control Program (CQCP) and the following characteristics of the asphalt and completed pavements: air voids, mat density, joint density, grade and Profilograph roughness**.**

b. Air Voids and Mat density. Acceptance of each lot of plant produced material for mat density and air voids will be based on the percentage of material within specification limits (PWL). If the PWL of the lot equals or exceeds 90%, the lot will be acceptable. Acceptance and payment will be determined in accordance with paragraph 401-8.1.

c. Joint density. Acceptance of each lot of plant produced asphalt for joint density will be based on the PWL. If the PWL of the lot is equal to or exceeds 90%, the lot will be considered acceptable. If the PWL is less than 90%, the Contractor shall evaluate the reason and act accordingly. If the PWL is less than 80%, the Contractor shall cease operations and until the reason for poor compaction has been determined. If the PWL is less than 71%, the pay factor for the lot used to complete the joint will be reduced by five (5) percentage points. This lot pay factor reduction will be incorporated and evaluated in accordance with paragraph 401-8.1.

d. Grade. The final finished surface of the pavement shall be surveyed to verify that the grade elevations and cross-sections shown on the plans do not deviate more than 1/2 inch (12 mm) vertically .

Cross-sections of the pavement shall be taken at a minimum 50-foot longitudinal spacing and at all longitudinal grade breaks. Minimum cross-section grade points shall include grade at centerline, ± 10 feet of centerline , and edge of runway **or** taxiway pavement.

The survey and documentation shall be stamped and signed by a licensed surveyor. Payment for sublots that do not meet grade for over 25% of the sublot shall not be more than 95%.

e. Profilograph roughness for QA Acceptance. The final profilograph shall be the full length of the project to facilitate testing of roughness between lots. The Contractor, in the presence of the RPR shall perform a profilograph roughness test on the completed project with a profilograph meeting the requirements of ASTM E1274 or a Class I inertial profiler meeting ASTM E950. Data and results shall be provided within 48 hrs of profilograph roughness tests.

The pavement shall have an average profile index less than 15 inches per mile per 1/10 mile. The equipment shall utilize electronic recording and automatic computerized reduction of data to indicate “must grind” bumps and the Profile Index for the pavement using a 0.2-inch (5 mm) blanking band. The

bump template must span one inch (25 mm) with an offset of 0.4 inches (10 mm). The profilograph must be calibrated prior to use and operated by a factory or State DOT approved, trained operator. Profilograms shall be recorded on a longitudinal scale of one inch (25 mm) equals 25 feet (7.5 m) and a vertical scale of one inch (25 mm) equals one inch (25 mm). Profilograph shall be performed one foot right and left of project centerline and 15 feet (4.5 m) right and left of project centerline. Any areas that indicate "must grind" shall be corrected with diamond grinding per paragraph 401-4.16 or by removing and replacing full depth of surface course. as directed by the RPR. Where corrections are necessary, a second profilograph run shall be performed to verify that the corrections produced an average profile index of 15 inches per mile per 1/10 mile or less.

401-6.3 Percentage of material within specification limits (PWL). The PWL will be determined in accordance with procedures specified in Item C-110. The specification tolerance limits (L) for lower and (U) for upper are contained in Table 5.

Table 5. Acceptance Limits for Air Voids and Density

Test Property	Pavements Specification Tolerance Limits	
	L	**U**
Air Voids Total Mix (%)	2.0	5.0
Surface Course Mat Density (%)	92.8	-
Base Course Mat Density (%)	91.8	-
Joint density (%)	90.5	--

a. Outliers. All individual tests for mat density and air voids will be checked for outliers (test criterion) in accordance with ASTM E178, at a significance level of 5%. Outliers will be discarded, and the PWL will be determined using the remaining test values. The criteria in Table 5 is based on production processes which have a variability with the following standard deviations: Surface Course Mat Density (%), 1.20; Base Course Mat Density (%), 1.55; Joint Density (%), 1.8.

The Contractor should note that (1) 90 PWL is achieved when consistently producing a surface course with an average mat density of at least 94% with 1.20% or less variability, (2) 90 PWL is achieved when consistently producing a base course with an average mat density of at least 93.5% with 1.8% or less variability, and (3) 90 PWL is achieved when consistently producing joints with an average joint density of at least 91% with 1.8% or less variability.

401-6.4 Resampling pavement for mat density.

a. General. Resampling of a lot of pavement will only be allowed for mat density, and then, only if the Contractor requests same, in writing, within 48 hours after receiving the written test results from the RPR. A retest will consist of all the sampling and testing procedures contained in paragraphs 401-6.1d and 401-6.2b. Only one resampling per lot will be permitted.

(1) A redefined PWL will be calculated for the resampled lot. The number of tests used to calculate the redefined PWL will include the initial tests made for that lot plus the retests.

(2) The cost for resampling and retesting shall be borne by the Contractor.

b. Payment for resampled lots. The redefined PWL for a resampled lot will be used to calculate the payment for that lot in accordance with Table 6.

c. Outliers. Check for outliers in accordance with ASTM E178, at a significance level of 5%.

401-6.5 Leveling course. The leveling course is the first variable thickness lift placed to correct surface irregularities prior to placement of subsequent courses. The leveling course shall meet the aggregate gradation in Table 2, paragraph 401-3.3. The leveling course shall meet the requirements of paragraph 401-3.3, 401-6.2b for air voids, but shall not be subject to the density requirements of paragraph 401-6.2b for mat density and 401-6.2c for joint density. The leveling course shall be compacted with the same effort used to achieve density of the control strip. The leveling course shall not exceed the maximum lift thickness associated with each gradation in Table 2, paragraph 401-3.3.

METHOD OF MEASUREMENT

401-7.1 Measurement. Asphalt shall be measured by the number of tons ~~kg~~ of asphalt used in the accepted work. Batch weights or truck scale weights will be used to determine the basis for the tonnage.

BASIS OF PAYMENT

401-8.1 Payment. Payment for a lot of asphalt meeting all acceptance criteria as specified in paragraph 401-6.2 shall be made based on results of tests for mat density and air voids. Payment for acceptable lots shall be adjusted according to paragraph 401-8.1c for mat density and air voids; and paragraph 401-6.2c for joint density, subject to the limitation that:

a. The total project payment for plant mix asphalt pavement shall not exceed **100%** percent of the product of the contract unit price and the total number of tons (kg) of asphalt used in the accepted work.

b. The price shall be compensation for furnishing all materials, for all preparation, mixing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

c. Basis of adjusted payment. The pay factor for each individual lot shall be calculated in accordance with Table 6. A pay factor shall be calculated for both mat density and air voids. The lot pay factor shall be the higher of the two values when calculations for both mat density and air voids are 100% or higher. The lot pay factor shall be the product of the two values when only one of the calculations for either mat density or air voids is 100% or higher. The lot pay factor shall be the lower of the two values when calculations for both mat density and air voids are less than 100%. If PWL for joint density is less than 71% then the lot pay factor shall be reduced by 5% but be no higher than 95%.

For each lot accepted, the adjusted contract unit price shall be the product of the lot pay factor for the lot and the contract unit price. Payment shall be subject to the total project payment limitation specified in paragraph 401-8.1a. Payment in excess of 100% for accepted lots of asphalt shall be used to offset payment for accepted lots of asphalt pavement that achieve a lot pay factor less than 100%.

Payment for sublots which do not meet grade in accordance with paragraph 401-6.2d after correction for over 25% of the sublot shall be reduced by 5%.

Table 6. Price adjustment schedule[1]

Percentage of material within specification limits (PWL)	Lot pay factor (percent of contract unit price)
96 – 100	106
90 – 95	PWL + 10
75 – 89	0.5 PWL + 55
55 – 74	1.4 PWL – 12
Below 55	Reject [2]

[1] Although it is theoretically possible to achieve a pay factor of 106% for each lot, actual payment above 100% shall be subject to the total project payment limitation specified in paragraph 401-8.1a.

[2] The lot shall be removed and replaced. However, the RPR may decide to allow the rejected lot to remain. In that case, if the RPR and Contractor agree in writing that the lot shall not be removed, it shall be paid for at 50% of the contract unit price and the total project payment shall be reduced by the amount withheld for the rejected lot.

d. Profilograph Roughness. The Contractor will receive full payment when the profilograph average profile index is in accordance with paragraph 401-6.2e. When the final average profile index for the entire length of pavement does not exceed 15 inches per mile per 1/10 mile, payment will be made at the contract unit price for the completed pavement.

401-8.1 Payment.

Payment will be made under:

~~Item P-401-8.1 Asphalt [Surface] [Base] [Binder] [Leveling] Course - per ton (kg)~~

Item P-401-1 Hot Mixed Asphalt Pavement, Surface Course – per Ton

Item P-401-2 Hot Mixed Asphalt Pavement, Leveling Course – per Ton

REFERENCES

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

ASTM International (ASTM)

ASTM C29	Standard Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C127	Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM C566	Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D242	Standard Specification for Mineral Filler for Bituminous Paving Mixtures
ASTM D946	Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction
ASTM D979	Standard Practice for Sampling Asphalt Paving Mixtures
ASTM D1073	Standard Specification for Fine Aggregate for Asphalt Paving Mixtures
ASTM D1188	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
ASTM D2172	Standard Test Method for Quantitative Extraction of Bitumen from Asphalt Paving Mixtures
ASTM D1461	Standard Test Method for Moisture or Volatile Distillates in Asphalt Paving Mixtures
ASTM D2041	Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D2489	Standard Practice for Estimating Degree of Particle Coating of Bituminous-Aggregate Mixtures
ASTM D2726	Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures
ASTM D2950	Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods
ASTM D3203	Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
ASTM D3381	Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction
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
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4552	Standard Practice for Classifying Hot-Mix Recycling Agents

ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D4867	Standard Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures
ASTM D5361	Standard Practice for Sampling Compacted Asphalt Mixtures for Laboratory Testing
ASTM D5444	Standard Test Method for Mechanical Size Analysis of Extracted Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
ASTM D6084	Standard Test Method for Elastic Recovery of Bituminous Materials by Ductilometer
ASTM D6307	Standard Test Method for Asphalt Content of Hot Mix Asphalt by Ignition Method
ASTM D6373	Standard Specification for Performance Graded Asphalt Binder
ASTM D6752	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Automatic Vacuum Sealing Method
ASTM D6925	Standard Test Method for Preparation and Determination of the Relative Density of Hot Mix Asphalt (HMA) Specimens by Means of the SuperPave Gyratory Compactor.
ASTM D6926	Standard Practice for Preparation of Bituminous Specimens Using Marshall Apparatus
ASTM D6927	Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures
ASTM D6995	Standard Test Method for Determining Field VMA based on the Maximum Specific Gravity of the Mix (Gmm)
ASTM E11	Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves
ASTM E178	Standard Practice for Dealing with Outlying Observations
ASTM E1274	Standard Test Method for Measuring Pavement Roughness Using a Profilograph
ASTM E950	Standard Test Method for Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling Reference
ASTM E2133	Standard Test Method for Using a Rolling Inclinometer to Measure Longitudinal and Transverse Profiles of a Traveled Surface

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M156	Standard Specification for Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
AASHTO T329	Standard Method of Test for Moisture Content of Hot Mix Asphalt (HMA) by Oven Method

AASHTO T324	Standard Method of Test for Hamburg Wheel-Track Testing of Compacted Asphalt Mixtures
AASHTO T 340	Standard Method of Test for Determining the Rutting Susceptibility of Hot Mix Asphalt (APA) Using the Asphalt Pavement Analyzer (APA)

Asphalt Institute (AI)

Asphalt Institute Handbook MS-26, Asphalt Binder

Asphalt Institute MS-2 Mix Design Manual, 7th Edition

AI State Binder Specification Database

Federal Highway Administration (FHWA)

Long Term Pavement Performance Binder Program

Advisory Circulars (AC)

AC 150/5320-6	Airport Pavement Design and Evaluation

FAA Orders

5300.1	Modifications to Agency Airport Design, Construction, and Equipment Standards

Software

FAARFIELD

END OF ITEM P-401

ITEM P-603 EMULSIFIED ASPHALT TACK COAT

DESCRIPTION

603-1.1 This item shall consist of preparing and treating an asphalt or concrete surface with asphalt material in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

603-2.1 Asphalt materials. The asphalt material shall be an emulsified asphalt as specified in ASTM D3628 as an asphalt application for tack coat appropriate to local conditions. The emulsified asphalt shall not be diluted. The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the asphalt material to the Resident Project Representative (RPR) before the asphalt material is applied for review and acceptance. The furnishing of COA 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.

CONSTRUCTION METHODS

603-3.1 Weather limitations. The tack coat shall be applied only when the existing surface is dry and the atmospheric temperature is 50°F (10°C) or above; the temperature has not been below 35°F (2°C) for the 12 hours prior to application; and when the weather is not foggy or rainy. The temperature requirements may be waived when directed by the RPR.

603-3.2 Equipment. The Contractor shall provide equipment for heating and applying the emulsified asphalt material. 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 (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 to verify truck set-up (via a test-shot area), including but not limited to, nozzle tip size appropriate for application, spray-bar height and pressure and pump speed, 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 minimum 12-foot (3.7-m) spreader spray bar with individual nozzle control with computer-controlled application rates. 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. If the distributor is not equipped with an operable quick shutoff valve, the prime operations shall be started and stopped on building paper.

The distributor truck shall be equipped to effectively heat and mix the material to the required temperature prior to application as required. Heating and mixing shall be done in accordance with the manufacturer's recommendations. Do not overheat or over mix the material.

The distributor shall be equipped with a hand sprayer.

Asphalt distributors must be calibrated annually 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.

A power broom and/or power blower suitable for cleaning the surfaces to which the asphalt tack coat is to be applied shall be provided.

603-3.3 Application of emulsified asphalt material. The emulsified asphalt shall not be diluted. Immediately before applying the emulsified asphalt tack coat, the full width of surface to be treated shall be swept with a power broom and/or power blower to remove all loose dirt and other objectionable material.

The emulsified asphalt material shall be uniformly applied with an asphalt distributor at the rates appropriate for the conditions and surface specified in the table below. The type of asphalt material and application rate shall be approved by the RPR prior to application.

Emulsified Asphalt

Surface Type	Residual Rate, gal/SY (L/square meter)	Emulsion Application Bar Rate, gal/SY (L/square meter)
New asphalt	0.02-0.05 (0.09-0.23)	0.03-0.07 (0.13-0.32)
Existing asphalt	0.04-0.07 (0.18-0.32)	0.06-0.11 (0.27-0.50)
Milled Surface	0.04-0.08 (0.18-0.36)	.0.06-0.12 (0.27-0.54)
Concrete	0.03-0.05 (0.13-0.23)	0.05-0.08 (0.23-0.36)

After application of the tack coat, the surface shall be allowed to cure without being disturbed for the period of time necessary to permit drying and setting of the tack coat. This period shall be determined by the RPR. The Contractor shall protect the tack coat and maintain the surface until the next course has been placed. When the tack coat has been disturbed by the Contractor, tack coat shall be reapplied at the Contractor's expense.

603-3.4 Freight and waybills The Contractor shall submit waybills and delivery tickets, during progress of the work. Before the final statement is allowed, file with the RPR certified waybills and certified delivery tickets for all emulsified asphalt materials used in the construction of the pavement covered by the contract. Do not remove emulsified asphalt material from storage until the initial outage and temperature measurements have been taken. The delivery or storage units will not be released until the final outage has been taken.

METHOD OF MEASUREMENT

603-4.1 The emulsified asphalt material for tack coat shall be measured by the gallon. Volume shall be corrected to the volume at 60°F (16°C) in accordance with ASTM D1250. The emulsified asphalt material paid for will be the measured quantities used in the accepted work, provided that the measured quantities are not 10% over the specified application rate. Any amount of emulsified asphalt material more than 10% over the specified application rate for each application will be deducted from the

measured quantities, except for irregular areas where hand spraying of the emulsified asphalt material is necessary. Water added to emulsified asphalt will not be measured for payment.

BASIS OF PAYMENT

603.5-1 Payment shall be made at the contract unit price per gallon of emulsified asphalt material. This price shall be full compensation for furnishing all materials, for all preparation, delivery, and application of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-603-1 ~~5.1~~	Emulsified Asphalt Tack Coat - per gallon

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 D1250	Standard Guide for Use of the Petroleum Measurement Tables
ASTM D2995	Standard Practice for Estimating Application Rate and Residual Application Rate of Bituminous Distributors
ASTM D3628	Standard Practice for Selection and Use of Emulsified Asphalts

END ITEM P-603

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Item P-605 Joint Sealants for Pavements

DESCRIPTION

605-1.1 This item shall consist of providing and installing a resilient and adhesive joint sealing material capable of effectively sealing joints in pavement; joints between different types of pavements; and cracks in existing pavement.

~~***605-1.2 This item shall also consist of a resilient and adhesive joint sealing filler capable of effectively sealing joints in Portland Cement Concrete pavements and structures. The item shall consist of low modulus silicone sealant in accordance with this section for all concrete pavement.***~~

MATERIALS

605-2.1 Joint sealants. Joint sealant materials shall meet the requirements of ***ASTM D5893 and as specified or approved equal.***

Each lot or batch of sealant shall be delivered to the jobsite in the manufacturer's original sealed container. Each container shall be marked with the manufacturer's name, ***name of material, shelf life, storage instructions, mixing instructions,*** batch or lot number, the safe heating temperature, and shall be accompanied by the manufacturer's certification stating that the sealant meets the requirements of this specification.

The Joint Sealant Material used for sealing Portland Cement Concrete to Portland Cement Concrete joints and cracks as shown on the plans shall be cold applied, single component, non sag, Dow Corning 888 Silicone Joint Sealant or approved equal.

Silicone sealant (non-acid curing) material shall meet the requirements shown in Table 1.

TABLE 1 - NON-SAG SILICONE SEALANT REQUIREMENT

Test Method	*Test*	*Material Requirement*
As Supplied:		
ASTM 2202	*Flow, Maximum*	*0.2*
ASTM D 1475	*Specific Gravity*	*1.450 to 1.515*
ASTM C 1183	*Extrusion Rate*	*50 Min*
ASTM 679	*Tack-Free Time, Minutes*	*35 to 75*
Upon Complete Cure:		
ASTM D 2240	*Durometer (1)*	*15 to 25*
ASTM D 412, Die C	*Modulus, at 150% Elongation(1), psi, Maximum*	*45*
ASTM D 412, Die C	*Elongation(1), Minimum*	*1200*

ASTM D 5329	*Adhesion to Concrete, Minimum % Elongation*	*500*

Performance:

ASTM C 719[2]	*Movement, 10 Cycles at +100/-50%*	*No Failure*
ASTM D 793	*Accelerated Weathering at 5,000 Hours*	*No Cracks, Blisters or Bond Loss*

(1) Sample cured 7 days at 77 º F ±2 º F and 50 ±5% relative humidity. Proper joint design and proper joint preparation are necessary for maximum performance.
(2) Tested on random samples at least on a quarterly basis. The RPR/Engineer shall have additional tests performed in accordance with ASTM C 719 on random samples taken from material supplied to the work. Material not passing the test shall be removed and replaced at the Contractor's cost.

The Joint Sealant Material used for sealing Portland Cement Concrete to Asphalt Concrete Pavement joints as shown on the plans shall be cold applied, single component, self-leveling, Dow Corning 890-SL Silicone Joint Sealant or approved equal. Silicone sealant (non-acid curing) material shall meet the requirements shown in Table 2.

TABLE 2. SELF LEVELING SILICONE SEALANT REQUIREMENTS

Test Method	*Test*	*Materials Requirement*
As Supplied:		
ASTM D 1475	*Specific Gravity*	*1.26 to 1.34*
ASTM C 1183	*Extrusion Rate*	*50 Min*
CTM 0098	*Skin Over Time, Minutes, Maximum*	*60*
CTM 0208	*Non-Volatile Content, Minimum*	*96*
Upon Complete Cure:		
ASTM D 412, Die C (modified)	*Elongation[1], % Minimum*	*1400*
ASTM D 5329	*Joint modulus at 50% elongation[1], psi, Maximum*	*7*
	Joint modulus at 100% elongation[1], psi, Maximum	*8*
	Joint modulus at 150% elongation[1], psi, Maximum	*9*
ASTM D 5329	*Adhesion to Asphalt/Concrete [1] elongation*	*600 min.*
Performance:		
ASTM C 719	*Movement, 10 Cycles at +100/-50%*	*No Failure*
ASTM D 793	*Accelerated Weathering at 5,000 Hours*	*No Cracks, Blisters or Bond Loss*

[1]Sample cured 21 days at 77+-2°F and 50+-5% relative humidity. Proper joint design and preparation are necessary for maximum performance.

605-2.2 Backer rod. The material furnished shall be a compressible, non-shrinking, non-staining, non-absorbing material that is non-reactive with the joint sealant in accordance with ASTM D5249. The backer-rod material shall be 25% ± 5 % larger in diameter than the nominal width of the joint.

605-2.3 Bond breaking tapes. ***The backer rod shall be a non-moisture absorbing, closed cell polyethylene foam rod that is compatible with the seal material to act as a bond breaker. The backer rod shall be compatible with the sealant and no bond or reaction shall occur between the rod and the sealant. The backer rod shall be of sufficient size per the required joint opening to provide a tight seal that prevent sealant from flowing to the bottom of the joint.*** Provide a bond breaking tape or separating material that is a flexible, non-shrinkable, non-absorbing, non-staining, and non-reacting adhesive-backed tape. The material shall have a melting point at least 5°F (3°C) greater than the pouring temperature of the sealant being used when tested in accordance with ASTM D789. The bond breaker tape shall be approximately 1/8 inch (3 mm) wider than the nominal width of the joint and shall not bond to the joint sealant.

For installation of light cans, backup materials shall not be used between Items P 605 and P-606. Can installation shall be per advisory circular (AC) 150/5340-30.

CONSTRUCTION METHODS

605-3.1 Time of application. Joints shall be sealed as soon after completion of the curing period as feasible and before the pavement is opened to traffic, including construction equipment. The pavement temperature shall be 50°F (10°C) and rising at the time of application of the poured joint sealing material. Do not apply sealant if moisture is observed in the joint. ***When used with P-606, such as light can installation, P-605 shall not be applied until the P-606 has fully cured.***

605-3.2 Equipment. Machines, tools, and equipment used in the performance of the work required by this section shall be approved before the work is started and maintained in satisfactory condition at all times. ***The Contractor s***hall submit a list of proposed equipment to ***the RPR to be*** used in performance of construction work including descriptive data, 30 days prior to use on the project.

a. Tractor-mounted routing tool. Provide a routing tool, used for removing old sealant from the joints, of such shape and dimensions and so mounted on the tractor that it will not damage the sides of the joints. The tool shall be designed so that it can be adjusted to remove the old material to varying depths as required. The use of V-shaped tools or rotary impact routing devices will not be permitted. Hand-operated spindle routing devices may be used to clean and enlarge random cracks.

b. Concrete saw. Provide a self-propelled power saw, with water-cooled diamond or abrasive saw blades, for cutting joints to the depths and widths specified.

c. Sandblasting equipment. Sandblasting is not allowed.

d. Waterblasting equipment. The Contractor must demonstrate waterblasting equipment including the pumps, hose, guide and nozzle size, under job conditions, before approval in accordance with paragraph 605-3.3. The Contractor shall demonstrate, in the presence of the RPR, that the method cleans the joint and does not damage the joint.

e. Hand tools. Hand tools may be used, when approved, for removing defective sealant from a crack and repairing or cleaning the crack faces. Hand tools should be carefully evaluated for potential spalling effects prior to approval for use.

~~**f. Hot-poured sealing equipment.** The unit applicators used for heating and installing ASTM D6690 joint sealant materials shall be mobile and shall be equipped with a double-boiler, agitator-type kettle with an oil medium in the outer space for heat transfer; a direct-connected pressure-type extruding device with a nozzle shaped for inserting in the joint to be filled; positive temperature devices for controlling the temperature of the transfer oil and sealant; and a recording type thermometer for indicating the temperature of the sealant. The applicator unit shall be designed so that the sealant will circulate through the delivery hose and return to the inner kettle when not in use.~~

g. Cold-applied, single-component sealing equipment. The equipment for installing ASTM D5893 single component joint sealants shall consist of an extrusion pump, air compressor, following plate, hoses, and nozzle for transferring the sealant from the storage container into the joint opening. The dimension of the nozzle shall be such that the tip of the nozzle will extend into the joint to allow sealing from the bottom of the joint to the top. Maintain the initially approved equipment in good working condition, serviced in accordance with the supplier's instructions, and unaltered in any way without obtaining prior approval. Small hand-held air-powered equipment (i.e., caulking guns) may be used for small applications.

605-3.3 Preparation of joints. Pavement joints for application of material in this specification must be dry, clean of all scale, dirt, dust, curing compound, and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method cleans the joint and does not damage the joint.

a. Sawing. All joints shall be sawed in accordance with specifications and plan details. Immediately after sawing the joint, the resulting slurry shall be completely removed from joint and adjacent area by flushing with a jet of water, and by use of other tools as necessary.

b. Sealing. Immediately before sealing, the joints shall be thoroughly cleaned of all remaining laitance, curing compound, filler, protrusions of hardened concrete, old sealant and other foreign material from the sides and upper edges of the joint space to be sealed. Cleaning shall be accomplished by waterblaster as specified in paragraph 605-3.2. The newly exposed concrete joint faces and the pavement surface extending a minimum of 1/2 inch (12 mm) from the joint edge shall be sandblasted clean. ***Waterblasting*** ~~Sandblasting~~ shall be accomplished in a minimum of two passes. One pass per joint face with the nozzle held at an angle directly toward the joint face and not more than 3 inches (75 mm) from it. After final cleaning and immediately prior to sealing, blow out the joints with compressed air and leave them completely free of debris and water. The joint faces shall be surface dry when the seal is applied.

c. Backer Rod. When the joint opening is of a greater depth than indicated for the sealant depth, plug or seal off the lower portion of the joint opening using a backer rod in accordance with paragraph 605-2.2 to prevent the entrance of the sealant below the specified depth. Take care to ensure that the backer rod is placed at the specified depth and is not stretched or twisted during installation.

d. Bond-breaking tape. Where inserts or filler materials contain bitumen, or the depth of the joint opening does not allow for the use of a backup material, insert a bond-separating tape breaker in

accordance with paragraph 605-2.3 to prevent incompatibility with the filler materials and three-sided adhesion of the sealant. Securely bond the tape to the bottom of the joint opening so it will not float up into the new sealant.

605-3.4 Installation of sealants. Joints shall be inspected for proper width, depth, alignment, and preparation, and shall be approved by the RPR before sealing is allowed. Sealants shall be installed in accordance with the following requirements:

Silicone Joint Sealants. Joints shall be inspected for proper width, depth, alignment, and preparation, and shall be approved by the RPR before the Contractor begins sealing operations. A backer rod shall be installed as shown on the plans, prior to placement of the joint sealer. The sealant shall be applied in a continuous operation, with an approved mechanical device, and shall adhere to the concrete and be free of voids. The non self-leveling sealant shall then be tooled, with an appropriate tool, to produce a slightly concave surface approximately 1/4 inch below the pavement surface. Tooling shall be accomplished before a skin forms on the surface, usually within ten minutes of application. Tooling is not required for self-leveling sealant.

Immediately preceding, but not more than 50 feet (15 m) ahead of the joint sealing operations, perform a final cleaning with compressed air. Fill the joints from the bottom up to 1/8 inch ±1/16 inch (2 mm) below the top of pavement surface; or bottom of groove for grooved pavement. Remove and discard excess or spilled sealant from the pavement by approved methods. Install the sealant in such a manner as to prevent the formation of voids and entrapped air. In no case shall gravity methods or pouring pots be used to install the sealant material. Traffic shall not be permitted over newly sealed pavement until authorized by the RPR. When a primer is recommended by the manufacturer, apply it evenly to the joint faces in accordance with the manufacturer's instructions. Check the joints frequently to ensure that the newly installed sealant is cured to a tack-free condition within the time specified.

605-3.5 Inspection. The Contractor shall inspect the joint sealant for proper rate of cure and set, bonding to the joint walls, cohesive separation within the sealant, reversion to liquid, entrapped air and voids. Sealants exhibiting any of these deficiencies at any time prior to the final acceptance of the project shall be removed from the joint, wasted, and replaced as specified at no additional cost to the airport.

605-3.6 Clean-up. Upon completion of the project, remove all unused materials from the site and leave the pavement in a clean condition.

605-3.7 JOINT SEALANT LOCATIONS. All joints shall be sealed with the size and type joint shown on the project plans, as given in the project specifications or as directed by the RPR. At any location where two impervious materials are in contact and exposed to the environment, the joint between them is to be sealed. This shall include both "new material to new material" and "new material to old material" locations. All sealant materials and construction shall be approved by the Engineer.

605-3.8 WARRANTY. A representative of the joint sealant manufacturer (for all products used) shall visit the job site a sufficient number of times during the sealing operations and after the sealing is completed to certify that the joint sealant was installed in accordance with the manufacturer's recommended methods and procedures. The Contract shall provide a warranty on the material and installation furnished for a minimum of one (1) year from the date of final acceptance.

METHOD OF MEASUREMENT

605-4.1 ~~Joint sealing material shall be measured by the [gallon (liter)] [pound (kg)] [linear foot (meter)] of sealant in place, completed, and accepted.~~ ***No measurement will be***

made for direct payment of any joint sealants as the cost of the joint sealants shall be considered as subsidiary to the items requiring joint sealants.

BASIS OF PAYMENT

605-5.1 ~~Payment for joint sealing material shall be made at the contract unit price per [gallon (liter)][pound (kg)][linear foot (meter)]. The price shall be full compensation for furnishing all materials, for all preparation, delivering, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.~~ ***There will be no separate payment for Joint Sealants. All costs shall be incidental to the items requiring joint sealants.***

~~Payment will be made under:~~

~~Item P-605-5.1~~	~~Joint Sealing Filler, [per gallon (liter)][per pound (kg)][per linear foot (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 D789	Standard Test Method for Determination of Relative Viscosity of Polyamide (PA)
ASTM D5249	Standard Specification for Backer Material for Use with Cold- and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints
ASTM D5893	Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements

Advisory Circulars (AC)

AC 150/5340-30	Design and Installation Details for Airport Visual Aids

END ITEM P-605

ITEM P-606 ADHESIVE COMPOUNDS, TWO-COMPONENT FOR SEALING WIRE AND LIGHTS IN PAVEMENT

DESCRIPTION

606-1.1 This specification covers two types of material; a liquid suitable for sealing electrical wire in saw cuts in pavement and for sealing light fixtures or bases in pavement, and a paste suitable for embedding light fixtures in the pavement. Both types of material are two-component filled formulas with the characteristics specified in paragraph 606-2.4. Materials supplied for use with asphalt and/or concrete pavements must be formulated so they are compatible with the asphalt and/or concrete.

MATERIALS

606-2.1 Curing. When pre-warmed to 77°F (25°C), mixed, and placed in accordance with manufacturer's directions, the materials shall cure at temperatures of 45°F (7°C) or above without the application of external heat.

606-2.2 Storage. The adhesive components shall not be stored at temperatures over 86°F (30°C), unless otherwise specified by the manufacturer.

606-2.3 Caution. Installation, ***storage, handling*** and use shall be in accordance with the manufacturer's recommended procedures. Avoid prolonged or repeated contact with skin. In case of contact, wash with soap and flush with water. If taken internally, call doctor. Keep away from heat or flame. Avoid vapor. Use in well-ventilated areas. Keep in cool place. Keep away from children.

606-2.4 Characteristics. When mixed and cured in accordance with the manufacturer's directions, the materials shall have the following properties shown in Table 1.

Table 1. Property Requirements

Physical or Electrical Property	Minimum	Maximum	ASTM Method
Tensile			
Portland cement concrete	1,000 psi (70 kg/sq cm)		D 638
Asphalt concrete	500 psi (35 kg/sq cm)		
Elongation			
Portland cement concrete		See note [1]	D 638
Asphalt concrete	50%		D 638
Coef. of cub. exp. cu. cm/cu. cm/°C	0.00090	0.00120	D 1168
Coef. of lin. exp. cm/cm/°C	0.000030	0.000040	D 1168
Dielectric strength, short time test	350 volts/mil.		D 149
Arc resistance	125 sec		
Pull-off			
Adhesion to steel	1,000 psi (70 kg/sq cm)		
Adhesion to Portland cement concrete	200 psi (14 kg/sq cm)		
Adhesion to asphalt concrete	No test available.		
Adhesion to aluminum	250 psi		

[1] 20% or more (without filler) for formulations to be supplied for areas subject to freezing.

SAMPLING, INSPECTION, AND TEST PROCEDURES

606-3.1 Tensile properties. Tests for tensile strength and elongation shall be conducted in accordance with ASTM D638.

606-3.2 Expansion. Tests for coefficients of linear and cubical expansion shall be conducted in accordance with, Method B, except that mercury shall be used instead of glycerine. The test specimen shall be mixed in the proportions specified by the manufacturer, and cured in a glass tub approximately 2 inch (50 mm) long by 3/8 inch (9 mm) in diameter. The interior of the tube shall be precoated with a silicone mold release agent. The hardened sample shall be removed from the tube and aged at room temperature for one (1) week before conducting the test. The test temperature range shall be from 35°F (2°C) to 140°F (60°C).

606-3.3 Test for dielectric strength. Test for dielectric strength shall be conducted in accordance with ASTM D149 for sealing compounds to be furnished for sealing electrical wires in pavement.

606-3.4 Test for arc resistance. Test for arc resistance shall be conducted for sealing compounds to be furnished for sealing electrical wires in pavement.

606-3.5 Test for adhesion to steel. The ends of two smooth, clean, steel specimens of convenient size (1 inch by 1 inch by 6 inch) (25 mm by 25 mm by 150 mm) would be satisfactory when bonded together

with adhesive mixture and allowed to cure at room temperature for a period of time to meet formulation requirements and then tested to failure on a Riehle (or similar) tensile tester. The thickness of adhesive to be tested shall be 1/4 inch (6 mm).

606-3.6 Adhesion to Portland cement concrete

a. Concrete test block preparation. The aggregate grading shall be as shown in Table 2.

The coarse aggregate shall consist of crushed rock having a minimum of 75% of the particles with at least one fractured face and having a water absorption of not more than 1.5%. The fine aggregate shall consist of crushed sand manufactured from the same parent rock as the coarse aggregate. The concrete shall have a water-cement ratio of 5.5 gallons (21 liters) of water per bag of cement, a cement factor of 6, ±0.5, bags of cement per cubic yard (0.76 cubic meter) of concrete, and a slump of 2-1/2 inch (60 mm), ±1/2 inch (60 mm ±12 mm). The ratio of fine aggregate to total aggregate shall be approximately 40% by solid volume. The air content shall be 5.0%, ±0.5%, and it shall be obtained by the addition to the batch of an air-entraining admixture such as Vinsol® resin. The mold shall be of metal and shall be provided with a metal base plate.

Means shall be provided for securing the base plate to the mold. The assembled mold and base plate shall be watertight and shall be oiled with mineral oil before use. The inside measurement of the mold shall be such that several one inch (25 mm) by 2-inch (75 mm) by 3-inch (25 mm by 50 mm by 75 mm) test blocks can be cut from the specimen with a concrete saw having a diamond blade. The concrete shall be prepared and cured in accordance with ASTM C192.

Table 2. Aggregate for Bond Test Blocks

Type	Sieve Size	Percent Passing
Coarse Aggregate	3/4 inch (19.0 mm)	97 to 100
	1/2 inch (12.5 mm)	63 to 69
	3/8 inch (9.5 mm)	30 to 36
	No. 4 (4.75 mm)	0 to 3
Fine Aggregate	No. 4 (4.75 mm)	100
	No. 8 (2.36 mm)	82 to 88
	No. 16 (1.18 mm)	60 to 70
	No. 30 (600 µm)	40 to 50
	No. 50 (300 µm)	16 to 26
	No. 100 (150 µm)	5 to 9

b. Bond test. Prior to use, oven-dry the test blocks to constant weight at a temperature of 220°F to 230°F (104°C to 110°C), cool to room temperature, 73.4°F ±3°F (23°C ±1.6°C), in a desiccator, and clean the surface of the blocks of film or powder by vigorous brushing with a stiff-bristled fiber brush. Two test blocks shall be bonded together on the one inch by 3 inch (25 mm by 75 mm) sawed face with the adhesive mixture and allowed to cure at room temperature for a period of time to meet formulation requirements and then tested to failure in a Riehle (or similar) tensile tester. The thickness of the adhesive to be tested shall be 1/4 inch (6 mm).

606-3.7 Compatibility with asphalt mix. Test for compatibility with asphalt in accordance with ASTM D5329.

606-3.8 Adhesive compounds - Contractor's responsibility. The Contractor shall furnish the vendor's certified test reports for each batch of material delivered to the project. The report shall certify that the

material meets specification requirements and is suitable for use with **[** concrete **] [** asphalt concrete **]** pavements. The report shall be provided to and accepted by the Resident Project Representative (RPR) before use of the material. In addition, the Contractor shall obtain a statement from the supplier or manufacturer that guarantees the material for one year. The supplier or manufacturer shall furnish evidence that the material has performed satisfactorily on other projects.

606-3.9 Application. Adhesive shall be applied on a dry, clean surface, free of grease, dust, and other loose particles. The method of mixing and application shall be in strict accordance with the manufacturer's recommendations. When used with Item P-605, such as light can installation, Item P-605 shall not be applied until the Item P-606 has fully cured. The Contractor is required to schedule a manufacturer's representative to be present during the initial installation of the material to ensure the installation procedures are in accordance with the manufacturer's directions.

METHOD OF MEASUREMENT

606-4.1 ***No measurement will be made for direct payment of any adhesive compounds as the cost of the adhesive compounds shall be considered as subsidiary to the items requiring adhesive compound.*** ~~The adhesive compound shall be measured by the **[** pound (kg) **] [** gallon (l) **]** of adhesive as specified, in place, complete and accepted. When required in the installation of an in-runway lighting system or portion thereof, no measurement will be made for direct payment of adhesive, as the cost of furnishing and installing shall be considered as a subsidiary obligation in the completion of the installation.~~

BASIS OF PAYMENT

606-5.1 ***There will be no separate payment for adhesive compounds. All costs shall be incidental to the items requiring adhesive compounds.*** ~~Payment shall be made, where applicable, at the contract unit price per **[** pound (kg) **] [** gallon (l) **]** for the adhesive. This price shall be full compensation for furnishing all materials, and for all preparation, delivering, and application of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.~~

~~Item P-606-5.1 Adhesive Compound - per **[** pound (kg) **] [** gallon (l) **]**~~

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 C192	Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
ASTM D149	Standard Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies
ASTM D638	Standard Test Method for Tensile Properties of Plastics
ASTM D5329	Standard Test Methods for Sealants and Fillers, Hot-applied, for Joints and Cracks in Asphaltic and Portland Cement Concrete Pavements

END OF ITEM P-606

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:

Aggregate Material Gradation Requirements[1]

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

[1] 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:

Concentrated Asphalt Emulsion Properties

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

[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.

Tests on Residue from Distillation or Evaporation

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 one part concentrated asphalt material to one part hot water ***or*** two parts concentrated asphalt material to one part hot water shall have the following properties:

One-to-One Dilution Emulsion Properties

Properties	Specification	Limits
In Ready-to-Apply Form, one part 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	28.5% 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.

Two-to-One Dilution Emulsion 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°F - 160°F (10°C - 70°C) and the material shall be protected from freezing, or whenever outside temperature drops below 40°F (4°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.

A dilution rate of two (2) parts emulsified asphalt to one (1) part water shall be used for grooved, rough or course surfaces, or where the pavement is highly oxidized or badly cracked in the opinion of the RPR. A dilution rate of one (1) part emulsified asphalt to one (1) part water shall be used on all other surfaces as directed by the RPR.

Curing time will be impacted by temperature and humidity. Curing time, under recommended application conditions is generally 4-24 hours. Curing times may be extended with high humidity

conditions. The Contractor shall comply with curing times as recommended by the Manufacturer of the material.

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:

Polymer Properties

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)
pH	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.

Application Rate

Dilution Rate	Quantity of Emulsion gal/yd^2 (l/m^2)	Quantity of Aggregate lb/yd^2 (kg/m^2)
1:1	0.10-0.17 ~~(0.45-0.77)~~	0.20-0.50 ~~(0.11-0.27)~~
2:1	0.08-0.17 ~~(0.36-0.77)~~	0.20-0.50 ~~(0.11-0.27)~~

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.

c. Material performance for runway and high-speed taxiway projects. The Contractor shall submit to the Engineer friction tests, from previous airport projects which used the seal coat materials in a similar environment, in accordance with AC 150/5320-12, at 40 or 60 mph (65 or 95 km/h) wet, showing, as a minimum; friction value of pavement surface prior to sealant application; two values, tested between 24 and 96 hours after application, with a minimum of 24 hours between tests; and one value tested at no less than 180 days or greater than 360 days after the application. The results of the two 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. The Contractor shall submit to the Engineer a list of airports which meet the above requirements, as well as technical details on application rates, aggregate rates, and point of contact at these airports to confirm use and success of sealer with aggregate. Friction tests shall be submitted from no less than one of the airports on the list and each set of tests described above, must be from one project.

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.

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 130ºF 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.

a. New asphalt pavement surfaces. Allow new asphalt pavement surfaces to cure so that there is no concentration of oils on the surface. A period of at least 30 days at 70°F (21°C) daytime temperatures shall elapse between the placement of a hot mixed asphalt concrete surface course and the application of the surface treatment.

Perform a water-break-free test to confirm that the surface oils have degraded and dissipated. (Cast approximately one gallon (4 liters) of clean water out over the surface. The water should sheet out and wet the surface uniformly without crawling or showing oil rings.) If signs of crawling or oil rings are apparent on the pavement surface, additional time must be allowed for additional curing and retesting of the pavement surface prior to treatment.

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 `one part` **or** `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.

Pavement surfaces which have excessive runoff of seal coat due to excessive amount of material being applied or excessive surface grade shall be treated in two or more applications to the specified application rate at no additional cost to the Owner. Each additional application shall be performed after the prior application of material has penetrated into the pavement.

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. ***Asphalt surface treatment. No separate measurement shall be made for Asphalt Surface Treatment.*** ~~The quantity of asphalt surface treatment shall be measured by the square yards [square meters] 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 ***No separate payment shall be made for Asphalt Surface Treatment. Asphalt Surface Treatment is considered incidental to the work.*** ~~Payment shall be made at the contract unit price per square yard [square meter] 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, [including the friction testing and all work required to meet AC 150/5320-12,] and any costs associated with furnishing a qualified manufacturer's representative to assist with control strips.~~

~~[**608-8.2** Payment shall be made at the contract unit price per lump sum for friction testing and all work required to meet AC 150/5320-12.]~~

~~Payment will be made under:~~

~~Item P-608-8.1 Asphalt Surface Treatment - per square yard [square meter]~~

~~[Item P-608-8.2 Runway and High Speed Exit Taxiway Friction Testing - 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.

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

ITEM P-610 CONCRETE FOR MISCELLANEOUS STRUCTURES

DESCRIPTION

610-1.1 This item shall consist of concrete and reinforcement, as shown on the plans, prepared and constructed in accordance with these specifications. This specification shall be used for all concrete other than airfield pavement which are cast-in-place.

MATERIALS

610-2.1 General. Only approved materials, conforming to the requirements of these specifications, shall be used in the work. Materials may be subject to inspection and tests at any time during their preparation or use. The source of all materials shall be approved by the Resident Project Representative (RPR) before delivery or use in the work. Representative preliminary samples of the materials shall be submitted by the Contractor, when required, for examination and test. Materials shall be stored and handled to ensure preservation of their quality and fitness for use and shall be located to facilitate prompt inspection. All equipment for handling and transporting materials and concrete must be clean before any material or concrete is placed in them.

The use of pit-run aggregates shall not be permitted unless the pit-run aggregate has been screened and washed, and all fine and coarse aggregates stored separately and kept clean. The mixing of different aggregates from different sources in one storage stockpile or alternating batches of different aggregates shall not be permitted.

a. Reactivity. Fine aggregate and coarse aggregates to be used in all concrete shall have been tested separately within six months of the project in accordance with ASTM C1260. Test results shall be submitted to the RPR. The aggregate shall be considered innocuous if the expansion of test specimens, tested in accordance with ASTM C1260, does not exceed 0.08% at 14 days (16 days from casting). If the expansion either or both test specimen is greater than 0.08% at 14 days, but less than 0.20%, a minimum of 25% of Type F fly ash, or between 40% and 55% of slag cement shall be used in the concrete mix.

If the expansion is greater than 0.20% the aggregates shall not be used, and test results for other aggregates must be submitted for evaluation; ~~or aggregates that meet P-501 reactivity test requirements may be utilized.~~

610-2.2 Coarse aggregate. The coarse aggregate for concrete shall meet the requirements of ASTM C33 and the requirements of Table 4, Class Designation 5S; and the grading requirements shown below, as required for the project.

Coarse Aggregate Grading Requirements

Maximum Aggregate Size	ASTM C33, Table 3 Grading Requirements (Size No.)
1 1/2 inch (37.5 mm)	467 or 4 and 67
1 inch (25 mm)	57
¾ inch (19 mm)	67
½ inch (12.5 mm)	7

610-2.2.1 Coarse Aggregate susceptibility to durability (D) cracking. ***Aggregates that have a history of D-cracking shall not be 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 ASTM C150 - Type I

The chemical requirements for all cement types specified should meet suitable criteria for deleterious activity. Low alkali cements (less than 0.6% equivalent alkalies).

Total Alkalies (Na2O and K2O) of the cement secured for the production of concrete shall be independently verified in accordance with ASTM C114 or ASTM C1365.

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 13% 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 **1752.**

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 Grade 60 deformed bars conforming to the requirements of ASTM A615, ASTM A706, ASTM A775 & ASTM A934 and/or welded steel wire fabric conforming to the requirements of ASTM A1064.*** ~~Reinforcing shall consist of [___] conforming to the requirements of [___].~~

610-2.11 Materials for curing concrete. ***Curing materials shall conform to one or more of the following specifications:*** ~~Curing materials shall conform to [___].~~

Materials for Curing

Waterproof paper	**ASTM C171**
Clear or white Polyethylene Sheeting	**ASTM C171**
White-pigmented Liquid Membrane-Forming Compound, Type 2, Class B	**ASTM C309**

CONSTRUCTION METHODS

610-3.1 General. The Contractor shall furnish all labor, materials, and services necessary for, and incidental to, the completion of all work as shown on the drawings and specified here. All machinery and equipment used by the Contractor on the work, shall be of sufficient size to meet the requirements of the work. All work shall be subject to the inspection and approval of the RPR.

610-3.2 Concrete Mixture. The concrete shall develop a compressive strength of 4000 psi in 28 days as determined by test cylinders made in accordance with ASTM C31 and tested in accordance with ASTM C39. The concrete shall contain not less than 470 pounds of cementitious material per cubic yard ~~(280 kg per cubic meter)~~. The water cementitious ratio shall not exceed 0.45 by weight. The air content of the concrete shall be 5% +/- 1.2% as determined by ASTM C231 and shall have a slump of not more than 4 inches (100 mm) as determined by ASTM C143.

Concrete produced by a reputable local supplier of ready-mix or transit mix concrete designed for a minimum compressive strength as specified or as given in the project plans, may be used when approved by the Engineer. The Contractor shall submit the ready mix or transit mix design to the Engineer at least 30-days prior to use of concrete on the project.

610-3.3 Mixing. Concrete may be mixed at the construction site, at a central point, or wholly or in part in truck mixers. The concrete shall be mixed and delivered in accordance with the requirements of ASTM C94 or ASTM C685.

The concrete shall be mixed only in quantities required for immediate use. Concrete shall not be mixed while the air temperature is below 40°F (4°C) without the RPRs approval. If approval is granted for mixing under such conditions, aggregates or water, or both, shall be heated and the concrete shall be placed at a temperature not less than 50°F (10°C) nor more than 100°F (38°C). The Contractor shall be held responsible for any defective work, resulting from freezing or injury in any manner during placing and curing, and shall replace such work at his expense.

Retempering of concrete by adding water or any other material is not permitted.

The rate of delivery of concrete to the job shall be sufficient to allow uninterrupted placement of the concrete.

610-3.4 Forms. Concrete shall not be placed until all the forms and reinforcements have been inspected and approved by the RPR. Forms shall be of suitable material and shall be of the type, size, shape, quality, and strength to build the structure as shown on the plans. The forms shall be true to line and grade and shall be mortar-tight and sufficiently rigid to prevent displacement and sagging between supports. The surfaces of forms shall be smooth and free from irregularities, dents, sags, and holes. The Contractor shall be responsible for their adequacy.

The internal form ties shall be arranged so no metal will show in the concrete surface or discolor the surface when exposed to weathering when the forms are removed. All forms shall be wetted with water or with a non-staining mineral oil, which shall be applied immediately before the concrete is placed. Forms shall be constructed so they can be removed without injuring the concrete or concrete surface.

610-3.5 Placing reinforcement. All reinforcement shall be accurately placed, as shown on the plans, and shall be firmly held in position during concrete placement. Bars shall be fastened together at intersections. The reinforcement shall be supported by approved metal chairs. Shop drawings, lists, and bending details shall be supplied by the Contractor when required.

610-3.6 Embedded items. Before placing concrete, all embedded items shall be firmly and securely fastened in place as indicated. All embedded items shall be clean and free from coating, rust, scale, oil, or any foreign matter. The concrete shall be spaded and consolidated around and against embedded items. The embedding of wood shall not be allowed.

610-3.7 Concrete Consistency. The Contractor shall monitor the consistency of the concrete delivered to the project site; collect each batch ticket; check temperature; and perform slump tests on each truck at the project site in accordance with ASTM C143.

610-3.8 Placing concrete. All concrete shall be placed during daylight hours, unless otherwise approved. The concrete shall not be placed until the depth and condition of foundations, the adequacy of forms and falsework, and the placing of the steel reinforcing have been approved by the RPR. Concrete shall be placed as soon as practical after mixing, but in no case later than one (1) hour after water has been added to the mix. The method and manner of placing shall avoid segregation and displacement of the reinforcement. Troughs, pipes, and chutes shall be used as an aid in placing concrete when necessary. The concrete shall not be dropped from a height of more than 5 feet (1.5 m). Concrete shall be deposited as

nearly as practical in its final position to avoid segregation due to rehandling or flowing. Do not subject concrete to procedures which cause segregation. Concrete shall be placed on clean, damp surfaces, free from running water, or on a properly consolidated soil foundation.

610-3.9 Vibration. Vibration shall follow the guidelines in American Concrete Institute (ACI) Committee 309R, Guide for Consolidation of Concrete.

610-3.10 Joints. Joints shall be constructed as indicated on the plans.

610-3.11 Finishing. All exposed concrete surfaces shall be true, smooth, and free from open or rough areas, depressions, or projections. All concrete horizontal plane surfaces shall be brought flush to the proper elevation with the finished top surface struck-off with a straightedge and floated.

610-3.12 Curing and protection. All concrete shall be properly cured in accordance with the recommendations in American Concrete Institute (ACI) 308R, Guide to External Curing of Concrete. The concrete shall be protected from damage until project acceptance.

610-3.13 Cold weather placing. When concrete is placed at temperatures below 40°F (4°C), follow the cold weather concreting recommendations found in ACI 306R, Cold Weather Concreting.

610-3.14 Hot weather placing. When concrete is placed in hot weather greater than 85ºF (30 ºC), follow the hot weather concreting recommendations found in ACI 305R, Hot Weather Concreting.

QUALITY ASSURANCE (QA)

610-4.1 Quality Assurance sampling and testing. Concrete for each day's placement will be accepted on the basis of the compressive strength specified in paragraph 610-3.2. The ***Contractor*** ~~RPR~~ will sample the concrete in accordance with ASTM C172; test the slump in accordance with ASTM C143; test air content in accordance with ASTM C231; make and cure compressive strength specimens in accordance with ASTM C31; and test in accordance with ASTM C39. The QA testing agency will meet the requirements of ASTM C1077.

The Contractor shall prepare six test specimens for each day's pour. The Contractor shall provide adequate facilities for the initial curing of cylinders. ***The Contractor shall retain three specimens for QC testing and deliver to the QA laboratory three specimens. QC and QA testing of the specimens shall occur at 3 days, 7 days and 28 days.***

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 [measured by the number of cubic yards (cubic meters) based on batch tickets of material [[measured by the number of square yards (square meters) based on the dimensions shown on the plans [[lump sum [[considered incidental and no separate measurement shall be made.]of concrete complete in place and accepted.~~ ***There shall be no separate measurement of the quantity of reinforced or unreinforced Concrete for Miscellaneous Structures used in the construction.***

BASIS OF PAYMENT

610-6.1 ~~Payment shall be made at the contract price [by the number of cubic yards (cubic meters) based on batch tickets of material][by the number of square yards (square meters)][lump sum][concrete shall be considered incidental and no separate payment shall be made.]~~This price shall be full compensation for furnishing all materials including reinforcement***, joint filler*** and embedded items and for all preparation, delivery, installation, and curing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item. ***There shall be no separate payment for the Concrete for Miscellaneous Structures, all costs including furnishing all materials including reinforcement and embedded items and for all preparation, delivery, installation, and curing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item shall be incidental to the items requiring P-610.***

~~Payment will be made under:~~

~~Item P-610-6.1~~	~~Concrete, [per cubic yards (cubic meters)][per square yards (square meters)][lump sum] [incidental to other work items]~~

REFERENCES

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

ASTM International (ASTM)

ASTM A184	Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A704	Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
ASTM A706	Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A775	Standard Specification for Epoxy-Coated Steel Reinforcing Bars
ASTM A884	Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement
ASTM A934	Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM A1064	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field

ASTM C33	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C114	Standard Test Methods for Chemical Analysis of Hydraulic Cement
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM C171	Standard Specification for Sheet Materials for Curing Concrete
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C311	Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C666	Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
ASTM C685	Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1017	Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM C1157	Standard Performance Specification for Hydraulic Cement
ASTM C1260	Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM C1365	Standard Test Method for Determination of the Proportion of Phases in Portland Cement and Portland-Cement Clinker Using X-Ray Powder Diffraction Analysis

ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D1751	Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types)
ASTM D1752	Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction

American Concrete Institute (ACI)

ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting
ACI 308R	Guide to External Curing of Concrete
ACI 309R	Guide for Consolidation of Concrete

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. ***Where applicable, The Contractor comply with best practices as published by the Innovative Pavement Research Foundation Report 01-G-002-05-1 title Airfield Markings Handbook, September 2008 unless otherwise approved by the Engineer.***

MATERIALS

620-2.1 Materials acceptance. The Contractor shall furnish manufacturer's certified test reports, for materials shipped to the project. The certified test reports shall include a statement that the materials meet the specification requirements. This certification along with a copy of the paint manufacturer's surface preparation; marking materials, including adhesion, flow promoting and/or floatation additive; and application requirements must be submitted and approved by the Resident Project Representative (RPR) prior to the initial application of markings. The reports can be used for material acceptance or the RPR may perform verification testing. The reports shall not be interpreted as a basis for payment. The Contractor shall notify the RPR upon arrival of a shipment of materials to the site. All material shall arrive in sealed containers that are easily quantifiable for inspection by the RPR.

620-2.2 Marking materials.

Table 1. Marking Materials

Paint[1]				Glass Beads[2]	
Type	**Color**	**Fed Std. 595 Number**	**Application Rate Maximum**	**Type**	**Application Rate Minimum**
II	White	**37925**	115 ft^2/gal	I	7 lb/gal
II	Red	**31136**	115 ft^2/gal	I	5 lb/gal
II	Yellow	**33538 or 33655**	115 ft^2/gal	I	7 lb/gal
II	Black	**37038**	115 ft^2/gal	N/A	N/A
II	Pink	**1 part 31136 to 2 parts 37925**	115 ft^2/gal	I	5 lb/gal
II	Green	**34108**	115 ft^2/gal	I	7 lb/gal

[1] See paragraph 620-2.2a

[2] See paragraph 620-2.2b

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

Black outlining is required for this project unless shown otherwise by the Project Plans.

Waterborne. Paint shall meet the requirements of Federal Specification TT-P-1952F,Type II. 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.

~~**[Epoxy.** Paint shall be a two component, minimum 99% solids type system conforming to the following:~~

~~**(1) Pigments.** Component A. Percent by weight.~~

~~**(a) White:**~~

- ~~Titanium Dioxide, ASTM D476, type II shall be 18% minimum (16.5% minimum at 100% purity).~~

~~**(b) Yellow and Colors:**~~

- ~~Titanium Dioxide, ASTM D476, type II shall be 14 to 17%.~~
- ~~Epoxy resin shall be 75 to 79%.~~
- ~~Organic yellow, other colors, and tinting as required to meet color standard.~~

~~**(2) Epoxy content.** Component A. The weight per epoxy equivalent, when tested in accordance with ASTM D1652 shall be the manufacturer's target ±50.~~

~~**(3) Amine number.** Component B. When tested in accordance with ASTM D2074 shall be the manufacturer's target ±50.~~

~~**(4) Prohibited materials.** The manufacturer shall certify that the product does not contain mercury, lead, hexavalent chromium, halogenated solvents, nor any carcinogen as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant federal regulations.~~

~~**(5) Daylight directional reflectance.**~~

~~**(a) White:** The daylight directional reflectance of the white paint shall not be less than 75% (relative to magnesium oxide), when tested in accordance with ASTM E2302.~~

~~**(b) Yellow:** The daylight directional reflectance of the yellow paint shall not be less than 55% (relative to magnesium oxide), when tested in accordance with ASTM E2302. The x and y values shall be consistent with the federal Hegman yellow color standard chart for traffic yellow standard 33538, or shall be consistent with the tolerance listed below:~~

~~x .462 x .470 x .479 x .501~~

x .462	x .470	x .479	x .501
y .438	y .455	y .428	y .452

(6) Accelerated weathering.

(a) Sample preparation. Apply the paint at a wet film thickness of 0.013-inch (0.33 mm) to four 3 × 6-inch (8 × 15 cm) aluminum panels prepared as described in ASTM E2302. Air dry the sample 48 hours under standard conditions.

(b) Testing conditions. Test in accordance with ASTM G154 using both Ultra Violet (UV-B) Light and condensate exposure, 72 hours total, alternating four (4) hour UV exposure at 140°F (60°C), and four (4) hours condensate exposure at 104°F (40°C).

(c) Evaluation. Remove the samples and condition for 24 hours under standard conditions. Determine the directional reflectance and color match using the procedures in paragraph 5 above. Evaluate for conformance with the color requirements.

(7) Volatile organic content. Determine the volatile organic content in accordance with 40 CFR Part 60 Appendix A, Method 24.

(8) Dry opacity. Use ASTM E2302. The wet film thickness shall be 0.015 inch (0.38 mm). The minimum opacity for white and colors shall be 0.92.

(9) Abrasion resistance. Subject the panels prepared in paragraph 620-2.2b(6) to the abrasion test in accordance with ASTM D968, Method A, except that the inside diameter of the metal guide tube shall be from 0.747 to 0.750 inch (18.97 to 19.05 mm). Five liters (17.5 lb (7.94 kg)) of unused sand shall be used for each test panel. The test shall be run on two test panels Both baked and weathered paint films shall require not less than 150 liters (525 lbs (239 kg)) of sand for the removal of the paint films.

(10) Hardness, shore. Hardness shall be at least 80 when tested in accordance with ASTM D2240. **|**

| Methacrylate. Paint shall be a two component, minimum 99% solids-type system conforming to the following:

(1) Pigments. Component A. Percent by weight.

(a) White:

- Titanium Dioxide, ASTM D476, type II shall be 10% minimum.
- Methacrylate resin shall be 18% minimum.

(b) Yellow and Colors:

- Titanium Dioxide, ASTM D476, type II shall be 1% minimum. Organic yellow, other colors, and tinting as required to meet color standard.

- Methacrylate resin shall be 18% minimum.

(2) Prohibited materials. The manufacturer shall certify that the product does not contain mercury, lead, hexavalent chromium, halogenated solvents, nor any carcinogen as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant federal regulations.

(3) Daylight directional reflectance:

(a) White: The daylight directional reflectance of the white paint shall not be less than 80% (relative to magnesium oxide), when tested in accordance with ASTM E2302.

(b) Yellow: The daylight directional reflectance of the yellow paint shall not be less than 55% (relative to magnesium oxide), when tested in accordance with ASTM E2302. The x and y values shall be consistent with the federal Hegman yellow color standard chart for traffic yellow standard 33538, or shall be consistent with the tolerance listed below:

x .462	x .470	x .479	x .501
y .438	y .455	y .428	y .452

(4) Accelerated weathering.

(a) Sample preparation. Apply the paint at a wet film thickness of 0.013-inch (0.33 mm) to four 3 × 6-inch (8 × 15 cm) aluminum panels prepared as described in ASTM E2302. Air dry the sample 48 hours under standard conditions.

(b) Testing conditions. Test in accordance with ASTM G154 using both Ultra Violet (UV-B) Light and condensate exposure, 72 hours total, alternating four (4) hour UV exposure at 140°F (60°C), and four (4) hours condensate exposure at 104°F (40°C).

(c) Evaluation. Remove the samples and condition for 24 hours under standard conditions. Determine the directional reflectance and color match using the procedures in paragraph 3 above. Evaluate for conformance with the color requirements.

(5) Volatile organic content. Determine the volatile organic content in accordance with 40 CFR Part 60 Appendix A, Method 24.

(6) Dry opacity. Use ASTM E2302. The wet film thickness shall be 0.015 inch (0.38 mm). The minimum opacity for white and colors shall be 0.92.

(7) Abrasion resistance. Subject the panels prepared in paragraph 620-2.2c(4) to the abrasion test in accordance with ASTM D968, Method A, except that the inside diameter of the metal guide tube shall be from 0.747 to 0.750 inch (18.97 to 19.05 mm). Five liters (17.5 lb (7.94 kg)) of unused sand shall be used for each test panel. The test shall be run on two test panels Both baked and weathered paint films shall require not less than 150 liters (525 lbs (239 kg) of sand for the removal of the paint films.

(8) Hardness, shore. Hardness shall be at least 60 when tested in accordance with ASTM D2240.

(9) Additional requirements for methacrylate splatter profiled pavement marking. Pavement markings of this type shall comply with all above requirements for methacrylate paint, except as noted below:

(a) The thickness of the marking will be irregular ranging from 0.000 to 0.250 inches (0.00 to 6.4 mm), applied in a splatter pattern which comprises a minimum of 80% of the visible line (when traveling at 5 mph the line appears to be solid.).

(b) The hardness shall be 48 Shore D minimum. **|**

| Solvent-Base. Paint shall meet the requirements of Commercial Item Description **|** A-A-2886B Type I, Type II, and Type III **|. |**

| Preformed Thermoplastic Airport Pavement Markings. Markings must be composed of ester modified resins in conjunction with aggregates, pigments, and binders that have been factory produced as a finished product. The material must be impervious to degradation by aviation fuels, motor fuels, and lubricants.

(1) The markings must be able to be applied in temperatures as low as 35°F without any special storage, preheating, or treatment of the material before application.

(a) The markings must be supplied with an integral, non-reflectorized black border.

(2) Graded glass beads.

(a) The material must contain a minimum of 30% intermixed graded glass beads by weight. The intermixed beads shall conform to Federal Specification TT-B-1325D, Type I, gradation A and Federal Specification TT-B-1325D, Type IV.

(b) The material must have factory applied coated surface beads in addition to the intermixed beads at a rate of one (1) lb (0.45 kg) (±10%) per 10 square feet (1 sq m). These factory-applied coated surface beads shall have a minimum of 90% true spheres, minimum refractive index of 1.50, and meet the following gradation.

Preformed Thermoplastic Bead Gradation

Size Gradation		Retained, %	Passing, %
U.S. Mesh	µm		
12	1700	0 - 2	98 - 100
14	1400	0 - 3.5	96.5 - 100
16	1180	2 - 25	75 - 98
18	1000	28 - 63	37 - 72
20	850	63 - 72	28 - 37
30	600	67 - 77	23 - 33
50	300	89 - 95	5 - 11
80	200	97 - 100	0 - 3

(3) Heating indicators. The material manufacturer shall provide a method to indicate that the material has achieved satisfactory adhesion and proper bead embedment during application and that the installation procedures have been followed.

(4) Pigments. Percent by weight.

(a) White:

- Titanium Dioxide, ASTM D476, type II shall be 10% minimum.

(b) Yellow and Colors:

- Titanium Dioxide, ASTM D476, type II shall be 1% minimum.
- Organic yellow, other colors, and tinting as required to meet color standard.

(5) Prohibited materials. The manufacturer shall certify that the product does not contain mercury, lead, hexavalent chromium, halogenated solvents, nor any carcinogen as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant federal regulations.

(6) Daylight directional reflectance.

(a) White: The daylight directional reflectance of the white paint shall not be less than 75% (relative to magnesium oxide), when tested in accordance with ASTM E2302.

(b) Yellow: The daylight directional reflectance of the yellow paint shall not be less than 45% (relative to magnesium oxide), when tested in accordance with ASTM E2302. The x and y values shall be consistent with the federal Hegman yellow color standard chart for traffic yellow standard 33538, or shall be consistent with the tolerance listed below:

x .462	x .470	x .479	x .501
y .438	y .455	y .428	y .452

(7) Skid resistance. The surface, with properly applied and embedded surface beads, must provide a minimum resistance value of 45 BPN when tested according to ASTM E303.

(8) Thickness. The material must be supplied at a nominal thickness of 65 mil (1.7 mm).

(9) Environmental resistance. The material must be resistant to deterioration due to exposure to sunlight, water, salt, or adverse weather conditions and impervious to aviation fuels, gasoline, and oil.

(10) Retroreflectivity. The material, when applied in accordance with manufacturer's guidelines, must demonstrate a uniform level of nighttime retroreflection when tested in accordance to ASTM E1710.

(11) Packaging. Packaging shall protect the material from environmental conditions until installation.

(12) Preformed thermoplastic airport pavement marking requirements.

(a) The markings must be a resilient thermoplastic product with uniformly distributed glass beads throughout the entire cross-sectional area. The markings must be resistant to the detrimental effects of aviation fuels, motor fuels and lubricants, hydraulic fluids, deicers, anti-icers, protective coatings, etc. Lines, legends, and symbols must be capable of being affixed to asphalt and/or Portland cement concrete pavements by the use of a large radiant heater. Colors shall be available as required.

(b) The markings must be capable of conforming to pavement contours, breaks, and faults through the action of airport traffic at normal pavement temperatures. The markings must be capable of fully conforming to grooved pavements, including pavement grooving per advisory circular (AC) 150/5320-12, current version. The markings shall have resealing characteristics, such that it is capable of fusing with itself and previously applied thermoplastics when heated with a heat source per manufacturer's recommendation.

(c) Multicolored markings must consist of interconnected individual pieces of preformed thermoplastic pavement marking material, which through a variety of colors and patterns, make up the desired design. The individual pieces in each large marking segment (typically more than 20 feet (6 m) long) must be factory assembled with a compatible material and interconnected so that in the field it is not necessary to assemble the individual pieces within a marking segment. Obtaining multicolored effect by overlaying materials of different colors is not acceptable due to resulting inconsistent marking thickness and inconsistent application temperature in the marking/substrate interface.

(d) The marking material must set up rapidly, permitting the access route to be re-opened to traffic after application.

(e) The marking material shall have an integral color throughout the thickness of the marking material.]

—]

b. Reflective media. Glass beads for white and yellow paint shall meet the requirements for Federal Specification TT-B-1325D Type I, Gradation A. Glass beads for red and pink 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.

620-2.3 Biocide Additive. A biocide additive will be required to be included at the time of manufacture that resists algae growth on the coating. Biocide shall meet or exceed that of Safety Coatings of Foley, Alabama. The Contractor shall submit biocide data to the Engineer for prior approval. Mixing concentrations shall be in accordance with the paint manufacturer's recommendations and shall not, in any way, diminish the warranty of the 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 ***be designed so as to*** apply markings of uniform cross-sections and clear-cut edges without running or spattering ~~and without over spray.~~ ***within the limits for straightness set forth herein. Refer to paragraph 620-3.5 for application.*** The marking equipment for both paint and beads shall be calibrated daily.

Suitable adjustments shall be provided on the sprayer(s) of a single machine or by furnishing additional equipment for painting the width required.

The Contractor shall provide the necessary airfield stencils that have been approved by the Owner to paint the surface painted signs and taxiway location signs as indicated in the plans.

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. ***Extreme care shall be taken not to damage the pavement.*** 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.

Markings to be removed and repainted shall be dry and free from dirt, grease, oil, laitance, or other foreign material that would reduce the bond between the new paint and the existing paint. The areas to be painted shall be cleaned by pressure washing or by other methods approved by the Engineer, as required to remove all dirt, laitance, and loose materials.

Prior to each working day, the Contractor shall calibrate the application equipment and provide evidence of that calibration to the RPR. Twice daily, or as directed by the RPR, the Contractor shall test the day's production for thickness and reflectivity. All testing results shall be provided to the RPR/Engineer at the end of each day's production.

620-3.4 Layout of markings. The proposed markings shall be laid out in advance of the paint application. ***The Contractor shall provide an experienced technician to supervise the location, alignment, layout, dimensions, and application of the paint. Prior to the markings being laid out in the field, the Contractor and marking Subcontractor shall attend a pre-activity meeting with the Airport, RPR and Engineer.*** 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:

Marking Dimensions and Spacing Tolerance

Dimension and Spacing	Tolerance
36 inch (910 mm) or less	±1/2 inch (12 mm)
greater than 36 inch to 6 feet (910 mm to 1.85 m)	±1 inch (25 mm)
greater than 6 feet to 60 feet (1.85 m to 18.3 m)	±2 inch (50 mm)
greater than 60 feet (18.3 m)	±3 inch (76 mm)

The paint shall be mixed in accordance with the manufacturer's instructions and applied to the pavement with a marking machine at the rate shown in Table 1. The addition of thinner will not be permitted. ***Subject to the overall scheduling requirements, the Contractor shall allow the maximum time to elapse after paving to allow the asphalt to oxidize prior to any permanent painting.***

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.

Where shown on the plans, a layer (one coat) of temporary paint without glass beads shall be applied twenty-four (24) hours after placement of bituminous pavements to allow the prompt re-opening of pavements to aircraft traffic. However, the paint shall not bleed, curl, or discolor when applied. A permanent layer of paint with glass beads shall be applied at the end of the project on top of the temporary markings layer. Black outline shall not be applied for temporary paint.

620-3.6 Application--preformed thermoplastic airport pavement markings.

Preformed thermoplastic pavement markings not used.

620-3.7 Control strip. Prior to the full application of airfield markings, the Contractor shall prepare a control strip in the presence of the RPR. The Contractor shall demonstrate the surface preparation method and all striping equipment to be used on the project. The marking equipment must achieve the prescribed application rate of paint and population of glass beads (per Table 1) that are properly embedded and evenly distributed across the full width of the marking. Prior to acceptance of the control strip, markings must be evaluated during darkness to ensure a uniform appearance. ***Thickness shall be in the range of 12-18 mil and reflectivity measurement shall comply with paragraph 620-2.2***

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.

Retroreflectivity shall be measured by a portable retroreflectometer according to ASTM E1710 and the practices in ASTM D7585 shall be followed for taking retroreflectivity readings with a portable retroreflectometer and computing measurement averages. A vehicle-mounted retroreflectometer may also be used. The Contractor shall provide the necessary equipment and measure the retroreflectivity in the presence of the RPR

Minimum Retro-Reflectance Values

Material	Retro-reflectance mcd/m²/lux		
	White	Yellow	Red
Initial Type I	300	175	35
~~Initial Type III~~	~~600~~	~~300~~	~~35~~
~~Initial Thermoplastic~~	~~225~~	~~100~~	~~35~~
All materials, remark when less than[1]	100	75	10

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

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.

620-3.10 Application on Asphalt Surfaces. The surface to receive final markings shall be prepared in accordance with the manufacturer's recommendations using an acceptable method approved by the Engineer. Application of final markings shall be independent of temporary markings.

620-3.11 Temporary Markings. Before pavement is opened to aircraft traffic, the Contractor shall apply temporary markings on a prepared surface. The surface to receive temporary markings shall be prepared in accordance with the manufacture's recommendations using an acceptable method approved by the Engineer. Temporary markings shall be applied as one coat at 50% of the application rate provided in Table 1 with no glass beads.

620-3.12 Surfaces to receive new markings. The Contractor shall not apply new markings over newly applied paint. For example, black borders shall not be applied the full width of the marking, then apply yellow markings to achieve black border requirements.

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 **]** **[** lump sum **]**.~~

~~**620-4.1b** The quantity of markings shall be paid for shall be measured **[** by the number of square feet (square meters) of painting **]** **[** by lump sum **]**.~~

~~**620-4.1c** The quantity of reflective media shall be paid for by **[** the number of pounds (km) **]** **[** lump sum **]** of reflective media.~~

~~**620-4.1d** | The quantity of temporary markings to be paid for shall be | the number of square feet (square meters) of painting || lump sum price | performed in accordance with the specifications and accepted by the RPR. Temporary marking includes surface preparation, application and complete removal of the temporary marking. || Temporary markings not required. |~~

~~| **620-4.1e** The quantity of preformed markings to be paid for shall be | the number of square feet (square meters) of preformed markings || lump sum | |.~~

620-4.1 The quantity of runway and taxiway markings to be paid for shall be the number of square feet of painting including reflective media performed and installed in accordance with the specifications and accepted by the RPR/Engineer. The quantity of runway and taxiway paint removal shall be paid for by the number of square feet removed and accepted by the RPR/Engineer. Measurement of markings removed and installed shall occur in the presence of both the Contractor and RPR/Engineer.

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.~~

620-5.1 Payment shall be made at the respective contract price per square foot for runway and taxiway painting. Payment shall be made at the respective contract price per square feet for runway and taxiway paint removal. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, reflective media, testing, layout, surface cleaning and incidentals necessary to complete the item.

Payment will be made under:

Item P-620-1 Permanent Runway and Taxiway Painting with Type I Glass Beads (Yellow, White, Red) – per Square Foot

Item P-620-2 Permanent Runway and Taxiway Painting with No Glass Beads (Black) – per Square Foot

Item P-620-3 Temporary Runway and Taxiway Painting with No Glass Beads (White) – per Square Foot

Item P-620-4 Runway and Taxiway Paint Removal – per Square Foot

~~**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 || lump sum |.~~

620-5.2b Payment for markings shall be made at the contract price for [the number of square feet (square meters) of painting and the number of pounds (km) of reflective media]| by the number of square feet (square meters) of painting]| by lump sum].

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

620-5.4d Payment for temporary markings shall be made at the contract price for [the number of square feet (square meters) of painting]| lump sum price]. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item. [Temporary markings are not required.]

[**620-5.5e** Payment for preformed markings shall be made at the contract price for [the number of square feet (square meters) of preformed markings]| lump sum price].]

Payment will be made under:

Item P-620-5.1a	Surface Preparation [per square foot (square meter)]| lump sum]
Item P-620-5.2b	Marking [per square foot (square meter)]| lump sum]
Item P-620-5.3c	Reflective Media [per pound (km)]| lump sum]
Item P-620-5.4d	Temporary runway and taxiway marking [per square foot]| per square meter]| lump sum].
[Item 620-5.5e	Preformed markings per [the number of square feet (square meters) of preformed markings]| lump sum price].]

REFERENCES

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

ASTM International (ASTM)

ASTM D476	Standard Classification for Dry Pigmentary Titanium Dioxide Products
ASTM D968	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D1652	Standard Test Method for Epoxy Content of Epoxy Resins
ASTM D2074	Standard Test Method for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method
ASTM D2240	Standard Test Method for Rubber Property - Durometer Hardness
ASTM D7585	Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments

ASTM E303	Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
ASTM E1710	Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer
ASTM E2302	Standard Test Method for Measurement of the Luminance Coefficient Under Diffuse Illumination of Pavement Marking Materials Using a Portable Reflectometer
ASTM G154	Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

Code of Federal Regulations (CFR)

40 CFR Part 60, Appendix A-7, Method 24
Determination of volatile matter content, water content, density, volume solids, and weight solids of surface coatings

29 CFR Part 1910.1200 Hazard Communication

Federal Specifications (FED SPEC)

FED SPEC TT-B-1325D Beads (Glass Spheres) Retro-Reflective

FED SPEC TT-P-1952F Paint, Traffic and Airfield Marking, Waterborne

FED STD 595 Colors used in Government Procurement

Commercial Item Description

A-A-2886B Paint, Traffic, Solvent Based

Advisory Circulars (AC)

AC 150/5340-1 Standards for Airport Markings

AC 150/5320-12 Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces

END OF ITEM P-620

ITEM P-621 SAW-CUT GROOVES

DESCRIPTION

621-1.1 This item consists of constructing saw-cut grooves to minimize hydroplaning during wet weather, providing a skid resistant surface in accordance with these specifications and at the locations shown on the plans, or as directed by the Resident Project Representative (RPR).

CONSTRUCTION METHODS

621-2.1 Procedures. The Contractor shall submit to the RPR the grooving sequence and method of placing guide lines to control grooving operation. Transverse grooves saw-cut in the pavement must form a 1/4 inch (+1/16 inch, -0 inch) wide by 1/4 inch (±1/16 inch) deep by 1-1/2 inch (-1/8 inch, +0 inch) center-to-center configuration. The grooves must be continuous for the entire runway length. They must be saw-cut transversely (perpendicular to centerline) in the runway and high-speed taxiway pavement to not less than 10 feet (~~3m~~) from the runway pavement edge to allow adequate space for equipment operation.

The saw-cut grooves must meet the following tolerances. The tolerances apply to each day's production and to each piece of grooving equipment used for production. The Contractor is responsible for all controls and process adjustments necessary to meet these tolerances. The Contractor shall routinely spot check for compliance each time the equipment aligns for a grooving pass.

a. Alignment tolerance. The grooves shall not vary more than ±1-1/2 inch (38 mm) in alignment for 75 feet (23 m) along the runway length, allowing for realignment every 500 feet (150 m) along the runway length.

b. Groove tolerance.

(1) Depth. The standard depth is 1/4 inch (6 mm). At least 90% of the grooves must be at least 3/16 inch (5 mm), at least 60% of the grooves must be at least 1/4 inch (6 mm), and not more than 10% of the grooves may exceed 5/16 inch (8 mm).

(2) Width. The standard width is 1/4 inch (6 mm). At least 90% of the grooves must be at least 3/16 inch (5 mm), at least 60% of the grooves must be at least 1/4 inch (6 mm), and not more than 10% of the grooves may exceed 5/16 inch (8 mm).

(3) Center-to-center spacing. The standard spacing is 1-1/2 inch (38 mm). Minimum spacing 1-3/8 inch (34 mm). Maximum spacing 1-1/2 inch (38 mm).

Saw-cut grooves must not be closer than 3 inches (8 cm) or more than 9 inches (23 cm) from transverse joints in concrete pavements. Grooves must not be closer than 6 inches (150 mm) and no more than 18 inches (0.5 m) from in-pavement light fixtures. Grooves may be continued through longitudinal construction joints. Where neoprene compression seals have been installed and the compression seals are recessed sufficiently to prevent damage from the grooving operation, grooves may be continued through the longitudinal joints. Where neoprene compression seals have been installed and the compression seals are not recessed sufficiently to prevent damage from the grooving operation, grooves must not be closer than 3 inches (8 cm) or more than 5 inches (125 mm) from the longitudinal joints. Where lighting cables are installed, grooving through longitudinal or diagonal saw kerfs shall not be allowed.

621-2.2 Environmental requirements. Grooving operations will not be permitted when freezing conditions prevent the immediate removal of debris and/or drainage of water from the grooved area. Discharge and disposal of waste slurry shall be the Contractor's responsibility ***and shall conform to all project permit requirements.***

621-2.3 Control strip. Groove a control strip in an area of the pavement outside of the trafficked area, as approved by the RPR. The area shall be **20** feet long by two lanes wide. Demonstrate the setup and alignment process, the grooving operation, and the waste slurry disposal.

621-2.4 Existing pavements. Bumps, depressed areas, bad or faulted joints, and badly cracked and/or spalled areas in the pavement shall not be grooved until such areas are adequately repaired or replaced.

621-2.5 New pavements. New asphalt and Portland cement concrete pavements shall be allowed to cure for a minimum of 30 days before grooving, to allow the material to become stable enough to prevent closing of the grooves under normal use. All grade corrections must be completed prior to grooving. Spalling along or tearing or raveling of the groove edges shall not be allowed. ***If it can be demonstrated that grooves are stable with no spalling along or tearing or raveling of the groove edges, then grooving sooner than the specified duration may be permitted with the approval of the Engineer.***

621-2.6 Grooving machine. Provide a grooving machine that is power driven, self-propelled, specifically designed and manufactured for pavement grooving, and has a self-contained and integrated continuous slurry vacuum system as the primary method for removing waste slurry. The grooving machine shall be equipped with diamond-saw cutting blades, and capable of making at least 18 inches (0.5 m) in width of multiple parallel grooves in one pass of the machine. Thickness of the cutting blades shall be capable of making the required width and depth of grooves in one pass of the machine. The cutting head shall not contain a mixture of new and worn blades or blades of unequal wear or diameter. Match the blade type and configuration with the hardness of the existing airfield pavement. The wheels on the grooving machine shall be of a design that will not scar or spall the pavement. Provide the machine with devices to control depth of groove and alignment.

621-2.7 Water supply. Water for the grooving operation shall be provided by the Contractor.

621-2.8 Clean-up. During and after installation of saw-cut grooves, the Contractor must remove from the pavement all debris, waste, and by-products generated by the operations to the satisfaction of the RPR. Cleanup of waste material must be continuous during the grooving operation. Flush debris produced by the machine to the edge of the grooved area or pick it up as it forms. The dust coating remaining shall be picked up or flushed to the edge of the area if the resultant accumulation is not detrimental to the vegetation or storm drainage system. Accomplish all flushing operations in a manner to prevent erosion on the shoulders or damage to vegetation. Waste material must be disposed of in an approved manner. Waste material must not be allowed to enter the airport storm sewer system. The Contractor must dispose of these wastes in strict compliance with all applicable state, local, and federal environmental statutes and regulations

621-2.9 Repair of damaged pavement. Grooving must be stopped and damaged pavement repaired at the Contractor's expense when directed by the RPR.

ACCEPTANCE

621-3.1 Acceptance testing. Grooves will be accepted based on results of zone testing. All acceptance testing necessary to determine conformance with the groove tolerances specified will be performed by the RPR.

Instruments for measuring groove width and depth must have a range of at least 0.5 inch (12 mm) and a resolution of at least 0.005 inch (0.13 mm). Gauge blocks or gauges machined to standard grooves width, depth, and spacing may be used.

Instruments for measuring center-to-center spacing must have a range of at least 3 inches (8 cm) and a resolution of at least 0.02 inch (0.5 mm).

The RPR will measure grooves in five zones across the pavement width. Measurements will be made at least three times during each day's production. Measurements in all zones will be made for each cutting head on each piece of grooving equipment used for each day's production.

The five zones are as follows:

Zone 1	Centerline to 5 feet (1.5 m) left or right of the centerline.
Zone 2	5 feet (1.5 m) to 25 feet (7.5 m) left of the centerline.
Zone 3	5 feet (1.5 m) 25 feet (7.5 m) right of the centerline.
Zone 4	25 feet (7.5 m) to edge of grooving left of the centerline.
Zone 5	25 feet (7.5 m) to edge of grooving right of the centerline.

At a random location within each zone, five consecutive grooves sawed by each cutting head on each piece of grooving equipment will be measured for width, depth, and spacing. The five consecutive measurements must be located about the middle blade of each cutting head ±4 inches (100 mm). Measurements will be made along a line perpendicular to the grooves.

- Width or depth measurements less than 0.170 inch (4 mm) shall be considered less than 3/16 inch (5 mm).
- Width or depth measurements more than 0.330 inch (8 mm) shall be considered more than 5/16 inch (8 mm).
- Width or depth measurements more than 0.235 inch (6 mm) shall be considered more than 1/4 inch (6 mm).

Production must be adjusted when more than one groove on a cutting head fails to meet the standard depth, width, or spacing in more than one zone.

METHOD OF MEASUREMENT

621-4.1 The quantity of grooving to be paid for shall be the number of square yards (square meters) of grooving performed in accordance with the specifications and accepted by the RPR per paragraph 621-3.1.

BASIS OF PAYMENT

621-5.1 Payment for saw-cut grooving. Payment for saw-cut grooving will be made at the contract unit price per square yard (square meter) for saw-cut grooving. This price shall be full compensation for

furnishing all materials, and for all preparation, delivering, and application of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-621-1 Pavement Grooving – per Square Yard

~~Item P-621-5.1 Grooving, unit price 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.

Advisory Circulars (AC)

AC 150/5320-12 Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces

END OF ITEM P-621

ITEM L-100 ELECTRICAL GENERAL REQUIREMENTS

DESCRIPTION

100-1.1 SCOPE. This Item includes furnishing and installing all material, equipment and apparatus, and all labor, tools, services and equipment required for the following:

a. ***Adjustments to existing Runway 18-36 edge lights and centerline lights to new finish grade.***

Installation shall be in accordance with Specifications FAA-C-1217 and FAA-C-1391, except as specified herein. Perform all work not included in the FAA Specifications in accordance with the National Electrical Code, applicable local and Sarasota Manatee Airport Authority (SMAA) standards and regulations.

100-1.2 RELATED DOCUMENTS. The General Provisions of the Contract, including General and Special Conditions, apply to work specified in this Item.

~~**a.** See 060 SUPPLEMENTAL CONDITIONS for liquidated damages and the sequence of construction.~~

~~**b.** See Item P-151, *Clearing and Grubbing* for specifics of demolition and adjustment of existing facilities.~~

c. Conflicts between Drawing and Specifications (Contract Documents) and between Contract Documents and references within the Contract Documents: Prospective Contractors shall, as part of their proposals, enumerate, identify and list conflicts they find to exist within the Contract Documents, and between these Documents and the rules, regulations, standards and codes of the authority having jurisdiction (Aviation Department, City, County, etc.), local Utility companies and local, County or State governing bodies.

100-1.3 SPECIFICATIONS AND STANDARDS. As a supplement to the installation requirements of this item, the following standard specifications and regulations of the issues in effect on the date of this solicitation are incorporated herein by reference and are made a part hereof for electrical work and installation and splicing of underground cables.

NEC	The latest adopted edition of the National Electrical Code
FAA-STD-019	*Lightning Protection, Grounding, Bonding and Shielding Requirements for Facilities*
FAA-C-1217	*Electrical Work, Interior*
FAA-C-1391	*Installation and Splicing of Underground Cables*
Utility Company Rules and Regulations	FPL
Local Governing Bodies' Codes and Regulations	St. Pete-Clearwater International Airport

100-1.4 AIRFIELD LIGHTING SYSTEM SWITCHOVER BETWEEN CONSTRUCTION STAGES. At each stage switchover and prior to the end of every work shift, the Contractor shall test and

operate the effected airfield lighting and miscellaneous power circuits early enough, prior to their need, as required to verify correct operation to Airport Operations.

100-1.5 SPARE FIXTURE INVENTORY REPLACEMENT. If the use of Airport supplied spare parts is coordinated with the Airport, the Contractor shall replace spares or salvaged lighting items that the Contractor uses or damages during construction so that at the end of the project, the stipulated number (minimum) of good working spares shall be delivered to the Owner.

100-1.6 AIRFIELD LIGHTING SYSTEM OPERATIONAL TESTS. Prior to the end of every work shift, the Contractor shall test and operate the effected airfield lighting and miscellaneous power circuits early enough, prior to their need, as required to verify correct operation to the Engineer and Airport Operations.

~~**100-1.7 OPERATING AND MAINTENANCE INSTRUCTIONS:**~~

~~**a.** At the completion of the project, at such time as designated by the Engineer, an operational and maintenance instruction period for Owner shall take place. The Contractor shall have present during this entire period his superintendent, foremen of various portions of the project, and manufacturer's service representatives (factory trained) for all equipment requiring periodic maintenance. All operational and maintenance instructions shall be presented under direct supervision of the Engineer. Prior to the O&M instruction period, all systems shall be started up and inspected by the Contractor, and shall be fully operational.~~

~~**b.** Contractor shall provide sign-in sheet and shall be responsible for having all present parties sign in. After instruction is complete and accepted by Owner, Contractor shall provide Owner a letter indicating that the instructions have been accepted and Owner shall sign same. Provide line items for each system demonstrated. Both parties shall initial each item. Copies shall be sent to the Engineer.~~

~~**c.** Unless otherwise specifically trained as such by the manufacturer, the Contractor's personnel do not qualify as factory trained representatives.~~

~~**100-1.8 OPERATING AND MAINTENANCE MANUALS:**~~

~~**a.** The contractor shall prepare and submit Operation and Maintenance (O&M) Manuals for mechanical systems provided under this contract. Comply with General Requirements for procedures and requirements for preparation and submittal of manuals.~~

~~**b.** Manual binder shall have permanent lettering of a contrasting color. Information to be included on the binder is as follows:~~

~~The front cover shall be lettered as follows:~~

~~ELECTRICAL~~

~~OPERATION AND MAINTENANCE MANUAL~~

~~(PROJECT NAME)~~

~~(CITY AND STATE)~~

~~(YEAR)~~

~~OWNER:~~	~~(NAME)~~
~~ELECTRICAL ENGINEER:~~	~~(NAME)~~
~~MECHANICAL ENGINEER:~~	~~(NAME)~~
~~GENERAL CONTRACTOR:~~	~~(NAME)~~
~~ELECTRICAL CONTRACTOR:~~	~~(NAME)~~
~~MECHANICAL CONTRACTOR:~~	~~(NAME)~~

~~The spine shall be lettered as follows:~~

~~ELECTRICAL~~

~~O&M MANUAL~~

~~(PROJECT NAME)~~

~~**c.** Provide a master index at beginning of Manual showing items included. Use plastic tab indexes for sections of Manual.~~

~~**d.** Cover section shall consist of name, address, and phone number of Project Engineer, General Contractor, Electrical and/or Mechanical Engineer, Electrical and/or Mechanical Contractor and all Electrical and/or Mechanical Sub-Contractors.~~

~~**e.** Provide a separate section for each section of the specifications. Provide index for each section listing equipment included. Include all items specified in the L-Series Sections. Provide a list of equipment suppliers with address and phone number.~~

~~**f.** Include in each section a copy of the approved submittal, followed by descriptive literature (manufacturer's O&M data) of each manufactured item. Literature shall show all information listed below, and any data not relevant to the specific equipment installed shall be lined out. Data sheets shall be original or very clear photocopies.~~

~~**g.** One (1) copy of the manual shall be submitted for review and approval by the Engineer. After approval, submit three (3) copies of the manual to the Owner for approval unless otherwise directed by Division 1 requirements. Information to be included in the manual:~~

(1) ~~Description of function, normal operating characteristics and limitations, performance curves, engineering data and tests, and complete nomenclature and commercial numbers of all replaceable parts.~~

(2) ~~Manufacturer's printed operating procedures to include start-up, break-in, routing and normal operating instructions; regulation, control, stopping shut-down, and emergency instructions; and summer and winter operating instructions.~~

(3) ~~Maintenance procedures for routine preventative maintenance and troubleshooting; disassembly, repair, and reassembly; aligning and adjusting instructions.~~

(4) ~~Servicing instructions and lubrication charts and schedules.~~

(5) ~~Schematic control diagrams (as-built status) for each automatic control system. Mark correct operating setting for each control instrument on these diagrams.~~

(6) ~~Electrical Equipment Test Results: CCR tests, cable megger tests. Also see L-100a for additional testing.~~

(7) ~~Test records and certifications.~~

(8) ~~Instruction period checklist.~~

(9) ~~Warranty information.~~

(10) ~~ALCMS Owner Acceptance Report~~

(11) ~~Factory startup certification sheets~~

EQUIPMENT AND MATERIALS

100-2.1 GENERAL

a. Airport lighting equipment and materials covered by advisory circulars (ACs) must be certified and listed in AC 150/5345-53, Airport Lighting Equipment Certification Program, current edition.

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 Engineer.

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.

100-2.2 EQUIPMENT. Conduits, conduit fittings, conductors, connectors, boxes, wiring devices, panelboards, and circuit breakers shall meet requirements of Specification FAA-C-1217.

~~**100-2.3 CONDUIT, EXTERIOR**. Conduits in concrete slabs, in block walls or exterior exposed shall be rigid galvanized steel (RGS). Conduits run on the exterior of the building above or below the grade for the earth grounding system shall be rigid zinc-coated steel. Radius of bends in RGS shall be minimum 12 nominal pipe diameters. Rigid galvanized steel conduit run in concrete or below slab on grade, or in the ground, shall be field wrapped or shall have factory-applied coating as required in Specification FAA-C-1217. Field-made joints, fittings, abrasions and holidays shall be coated or wrapped with material equal to the original coating or wrapping.~~

~~**100-2.4 CONDUIT, UNDERGROUND**. Conduits run underground are specified in Item L-110, *Airport Underground Electrical Duct Banks and Conduits* of these specifications.~~

~~**100-2.5 600 VOLT WIRE**. 600V cable shall be as specified in Item L-108, *Underground Power Cable for Airports.*~~

~~**100-2.6 CONDUIT FITTINGS**. Each conduit and nipple entrance to junction boxes, panelboards, disconnect switches, duct, raceway, equipment cabinets, and other such electrical enclosures shall be fitted with double locknuts (one each side of metal penetrated) and insulating bushing. Bushings on 1-1/4 inch and larger conduits shall be insulated metallic, type OZ/Gedney Cat. No. IBC Series, or equal; bushings for 3/4 inch and 1 inch shall be plastic insulated T&B rated for 150 °C, or equal. All openings where conduits enter junction boxes, other enclosures and shelters shall be sealed weathertight. The conduit shall be capped, if left empty, or sealed with Duceseal, or equal, around the conductors for exterior conduits.~~

~~**100-2.7 CONCRETE-ENCASED DUCT**. Concrete-encased PVC duct shall be provided with a 3-inch minimum encasement with spacing between conduits as detailed on the plans. Concrete shall be colored red or shall be provided with a vinyl warning tape as detailed on the plans and specified in Item L-110, *Airport Underground Electrical Duct Banks and Conduits*.~~

~~**100-2.8 CONCRETE DUCT MARKERS**. Markers shall be as specified in Item L-110, *Airport Underground Electrical Duct Banks and Conduits*.~~

~~**100-2.9 CONCRETE HANDHOLES AND JUNCTION STRUCTURES**. Handholes and junction structures shall be as specified in Item L-115, *Electrical Handholes and Junction Structures* and as detailed on drawings.~~

100-2.10 LIGHT BASES AND TRANSFORMER HOUSING. Bases and covers shall be specified in item L-125, *Installation of Airport Lighting Systems* and as detailed on drawings.

100-2.11 OTHER ELECTRICAL EQUIPMENT. Cutouts, relays, terminal blocks, transfer relays, circuit breakers, and all other regularly used commercial items of electrical equipment not covered by FAA equipment specifications shall conform to the applicable rulings and standards of the Institute of Electrical and Electronic Engineers (IEEE) or the National Electrical Manufacturers Association (NEMA). When specified, test reports from a testing laboratory indicating that the equipment meets the specifications shall be supplied. In all cases, equipment shall be new and a first-grade product. This equipment shall be supplied in the quantities required for the specific project and shall incorporate the electrical and mechanical characteristics specified in the specification and plans.

CONSTRUCTION METHODS

100-3.1 EXISTING UTILITIES. Prior to any excavation or trenching, provide utility locator and verify any existing cables and utilities which will be crossed by the trench. Ensure these utilities are permanently disconnected if they are going to be demolished. The existing service lines shall be exposed by hand-digging in those areas that will be crossed and shall be protected from any possible damage. If any damage occurs, it shall be the Contractor's responsibility to immediately repair such damage with materials and methods approved by the Owner and in compliance with applicable codes and standards, at no additional cost to the Owner.

100-3.2 DEMOLITION AND SALVAGE.

~~**a. Demolition.** Removal of indicated portions of the airfield lighting system serving portions of the apron:~~

~~**(1)** Remove indicated power cables from conduits and ducts.~~

~~**(2)** Demolish indicated conduits, ducts, handholes and concrete light and sign bases per the requirements of Item P-151, *Clearing and Grubbing*. Elements covered shall include the intent, but not be limited to the specific elements, of the following:~~
~~**(a)** Underground conduits and duct banks, both concrete encased and direct earth buried.~~
~~**(b)** Underground electrical concrete structures including manholes and handholes of varying sizes.~~
~~**(c)** Sign and light concrete encased bases and miscellaneous concrete footings.~~

~~**(3)** Remove demolished material from site and dispose of according to local regulations.~~

~~**(4)** Provide backfill meeting the requirements of P-152, *Excavation and Embankment*. Unless otherwise required for general Civil excavation and embankment, replacement backfill and paving repair shall be incidental to the demolition item.~~

b. Salvage. Removal and salvage of airfield electrical elements is included under this Item shall include the intent, but not be limited to the specific elements, of the following:

(1) Light fixtures and isolation transformers.

(2) Sign panels.

(3) Salvageable material and equipment slated for reinstallation including indicated signs, panels and lights shall be stored securely for reinstallation as noted on drawings.

(4) Salvageable material and equipment not slated for reinstallation, and deemed salvageable by the Airport shall be removed and salvaged to the Airport as directed by appropriate Airport personnel.

(5) All lights and signs deemed non-salvageable by the Airport and isolation transformers (which are not slated for reinstallation) shall become the property of the Contractor and shall be removed from the site.

~~**100-3.3 CIRCUIT BREAKERS**. Panelboard-mounted circuit breakers and other similar items shall be furnished and installed at the locations shown in the plans.~~

~~**100-3.4 CONDUCTORS.** Installation of underground 5 kV conductors is specified in Item L-108 of these specifications.~~

~~**100-3.5 GROUNDING**. All metal support structures and metal enclosures shall be grounded in accordance with the requirements of the Specifications FAA-C-1217, FAA-C-1391, and FAA-STD-019, and as indicated on the drawings.~~

~~**100-3.6 GROUND RODS**. Grounding rods shall be 3/4-inch diameter by 10 feet long copper-jacketed steel. Grounding connections shall be by the exothermic weld process, Cadweld or equal. Extruded, drawn or stamped-type ground clamps will not be acceptable unless otherwise noted. The resistance to ground shall not exceed 25 ohms.~~

~~**100-3.7 GROUND CONDUCTORS**. Equipment grounding conductors shall be insulated copper, except where shown on the project drawings to be bare, and sized as shown on the project drawings; and all grounds will be shown in accordance with Article 250-95 of the National Electrical Code and with FAA-STD-019. Attachment of wire to supports, boxes, etc., shall be accomplished using approved ground lug attached with a separate stainless steel screw, lock washer and nut. Screws used for support of the electrical enclosure shall not be used for connection of the ground wire. Pipe straps shall not be used for ground purposes.~~

~~**COLOR CODING OF GROUND CONDUCTORS**~~

~~TYPE OF GROUND CONDUCTOR~~	~~COLOR OF INSULATION~~
~~Grounding Electrode Conductor~~	~~Bare - No Insulation~~
~~Equipment Grounding Conductor~~	~~Green (safety)~~
~~*Multipoint Ground (Frame)~~	~~Green with bright orange tracer~~
~~*Signal Ground~~	~~Green with bright yellow tracer~~

~~*Where these cables are concealed and not color coded, an exposed portion of the cable and each end of the cable for a minimum length of 2 feet shall be color coded with green tape overlaid with a bright orange~~

~~or yellow to form a tracer. Where routed through raceways or wireways, the color coding shall be such that by removing or opening any one cover, the coding will be visible. Where conductors are routed through cable trays, color coding shall be accomplished at intervals not exceeding 3 feet.~~

~~The multi-ground system supplements but does not replace the equipment grounding conductor required by the National Electrical Code.~~

~~Each of these separate ground conductors is insulated in order to keep it distinct and not allow contact with any other conductor.~~

~~Electrical continuity of cable armor or shield shall be maintained. Grounding of the cable armor or shield shall be required at all terminations and shall be accomplished by connecting a #6 AWG solid bare copper wire to the cable armor or shield by means of a compression-type ground clamp installed within the terminating enclosure. Armor or shield ground wire shall be connected to the ground electrode conductor using split bolt connector, Burndy or equal. Grounding of direct earth burial (DEB) armored power and shielding control cable shall be at each end in accordance with FAA-C-1391.~~

~~100-3.8~~ **~~IDENTIFICATION~~**~~. Handhole, manhole, fixture and sign identification shall be as detailed on the drawings and as indicated in the associated "L" series Items. Cable tagging and markers shall be identified as per FAA-C-1391, Sections 3.5.1 and 2.~~

100-3.9 NOTIFICATION OF TESTING. The Contractor shall notify the project Resident Engineer (RE) and the owner (SAT) a minimum of 48 hours in advance of system, or partial system, testing, including but not limited to, installed cable megger testing, operational testing of any modified lighting circuit and fixture and signs photometric testing.

100-3.10 TESTING AND SUBMITTALS. Equipment and materials list and shop drawings shall be submitted as per FAA-C-1217, Section 5.1. Testing shall be required and performed as per FAA-C-1217, Section 5.3 and FAA-C-1391, Section 4. The Contractor shall be responsible for repairs or replacement of any cable found defective after installation.

The Contractor shall secure the services of an independent testing service to test the installed airfield lighting and miscellaneous power cables prior to the start of and at the completion of this project. The results of the testing shall be provided to the Owner and ***Engineer*** ~~Construction Manager~~ for review and acceptance. The Contractor shall be responsible for repairs or replacement of any cable found defective after installation.

The Contractor shall provide testing of the new, installed airfield lighting fixtures and new, installed signs per Table below.

Installation tests in addition to all tests contained in other L-Series Items shall be provided as follows:

Item	Test Required	Mfgr's Rep. Present?
~~5 kV Rated Airfield Lighting and Power Cables (On the Reel, Not Including Equipment for Contractor Quality Control. May be deleted per coordination with Engineer).~~	~~Megger check to 2.0 times nominal system rated voltage prior to installation. Values of insulation resistance for each reel shall be noted and given to the Construction Manager/ Owner for acceptance. It is expected that the readings will be greater than 1000 megohms (1 gigohm).~~	~~No~~
~~5 kV Rated Airfield Lighting and Power Cables (Installed in This Project)~~	~~Megger check at 1000 volts at the completion of installation. Test every circuit for conductor-to-ground and conductor-to-conductor (between circuits) insulation resistance. Test results shall be tabulated and given to the Construction Manager/Owner for acceptance. It is required that the readings be greater than 100 megohms.~~	~~No~~
~~5 kV Rated Airfield Lighting and Power Cables (All Circuits Modified in This Project, Emanating from any Lighting Vault)~~	~~Megger check at 1000 volts prior to the start of and at the completion of installation. Test every circuit for conductor-to-ground and conductor-to-conductor (between circuits) insulation resistance. Test results shall be tabulated and given to the Construction Manager/Owner for acceptance.~~	~~No~~
~~5 kV and 600 Volt and Multi-pair Cables~~	~~Continuous-tape pull tension readings for each section of cable shall be provided to the Construction Manager for review.~~	~~No~~
Bases	All in-pavement lighting cans shall be fitted in accordance with FAA Advisory Circulars such that the base of the fitting, when installed, shall be level with the surrounding surface. Alignment jigs as supplied by Jaquith Industries, Inc. (or equal) shall be used to ensure the can is aligned in such a way that no portion of the can shall be above the level of the surrounding surface and the can is geometrically positioned such that when the fitting is installed, the light beam will be directed in accordance with the appropriate advisory circulars for that type of fitting and its location.	No
Airfield Signs and Light Fixture (Testing prior to installation is for Contractor Quality Control. May be deleted per coordination with Engineer).	Each sign or light fixture will be carefully examined prior to installation to ensure that lenses, where required, have been fitted, no signs of physical damage to the fittings exist and the lamps are working by connecting the fittings' electrical leads to a DC voltage source not exceeding 6 volts, such as a motorcycle battery. Any failures are to be reported to the Construction Manager or Owner. The fittings, when installed, shall be torqued to manufacturer's and FAA requirements and noted.	No

METHOD OF MEASUREMENT

100-3.11 No separate measurement shall be made for this item.

BASIS OF PAYMENT

100-3.12 No separate payment shall be made for this item. All work described in this item is considered incidental to the project.

END OF ITEM L-100

ITEM L-108 UNDERGROUND POWER CABLE FOR AIRPORTS

DESCRIPTION

108-1.1 This item shall consist of ***~~making connections for temporary airfield lighting and adjusting the existing runway centerline and edge lights to finish grade as shown in the plans.~~*** ~~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 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. Conductors for use on 20 ampere primary airfield lighting series circuits shall be single conductor, seven strand, #6 AWG, L-824 **[** Type B, Type C **]**, 5,000 volts, non-shielded, with **[** ethylene propylene insulation, 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 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. A cast splice, employing a plastic mold and using epoxy resin equivalent to that manufactured by 3M™ Company, "Scotchcast" Kit No. 82-B, or an approved equivalent, used for potting the splice is acceptable ***only for temporary or emergency splices.***

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 or heat shrink tubing with integral sealant shall be in accordance with the manufacturer's requirements.~~ Primary Connector Kits ***shall be as shown on the plans.*** ~~manufactured by Amerace, "Super Kit", Integro "Complete Kit", or approved equal is acceptable.~~

c. The factory-molded plug-in splice. Specification for L-823 Connectors, Factory-Molded to Individual Conductors, is acceptable.

d. The taped or heat-shrink splice. ***Shall not be used on this project.*** ~~Taped splices employing field-applied rubber, or synthetic rubber tape covered with plastic tape is acceptable. The rubber tape should meet the requirements of ASTM D4388 and the plastic tape should comply with Military Specification MIL-I-24391 or Commercial Item Description A-A-55809. Heat shrinkable tubing shall be heavy-wall, self-sealing tubing rated for the voltage of the wire being spliced and suitable for direct-buried installations. The tubing shall be factory coated with a thermoplastic adhesive-sealant that will adhere to the insulation of the wire being spliced forming a moisture- and dirt-proof seal. Additionally, heat shrinkable tubing for multi-conductor cables, shielded cables, and armored cables shall be factory kits that are designed for the application. Heat shrinkable tubing and tubing kits shall be manufactured by Tyco Electronics/ Raychem Corporation, Energy Division, or approved equivalent.~~

In all the above cases, connections of cable conductors shall be made using crimp connectors using a crimping tool designed to make a complete crimp before the tool can be removed. All L-823/L-824 splices and terminations shall be made per the manufacturer's recommendations and listings.

All connections of counterpoise, grounding conductors and ground rods shall be made by the exothermic process or approved equivalent, except that a light base ground clamp connector shall be used for attachment to the light base. All exothermic connections shall be made per the manufacturer's recommendations and listings.

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. ***Refer to AC 150/5340-26, Maintenance of Airport Visual Aid Facilities, for safety practices for measuring insulation resistance.***

~~**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.

In addition to connectors being installed at individual isolation transformers, L-823 cable connectors for maintenance and test points shall be installed at locations 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 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. During cold weather, particular attention shall be paid to the manufacturer's minimum installation temperature. Cable shall not be installed when the temperature is at or below the manufacturer's minimum installation temperature. At the Contractor's option, the Contractor may submit a plan, for review by the RPR, for heated storage of the cable and maintenance of an acceptable cable temperature during installation when temperatures are below the manufacturer's minimum cable installation temperature.

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. Unless otherwise specified, the Contractor shall not use a cable plow for installing the cable. Cable shall be unreeled uniformly in place alongside or in the trench and shall be carefully placed along the bottom of the trench. The cable shall not be unreeled and pulled into the trench from one end. Slack cable sufficient to provide strain relief shall be placed in the trench in a series of S curves. Sharp bends or kinks in the cable shall not be permitted.

Where cables must cross over each other, a minimum of 3 inches (75 mm) vertical displacement shall be provided with the topmost cable depth at or below the minimum required depth below finished grade.

a. Trenching. Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored. Trenches for cables may be excavated manually or with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of surface is disturbed. Graders

shall not be used to excavate the trench with their blades. The bottom surface of trenches shall be essentially smooth and free from coarse aggregate. Unless otherwise specified, cable trenches shall be excavated to a minimum depth of 18 inches (0.5 m) below finished grade per NEC Table 300.5, except as follows:

- When off the airport or crossing under a roadway or driveway, the minimum depth shall be 36 inches (91 cm) unless otherwise specified.
- Minimum cable depth when crossing under a railroad track, shall be 42 inches (1 m) unless otherwise specified.

Dewatering necessary for cable installation, erosion and turbidity control, per Federal, state, and local requirements is incidental to its respective pay items as part of Item L-108. The cost of all excavation regardless of type of material encountered, shall be included in the unit price bid for the L-108 Item.

The Contractor shall excavate all cable trenches to a width not less than 6 inches (150 mm). Unless otherwise specified on the plans, all cables in the same location and running in the same general direction shall be installed in the same trench.

When rock is encountered, the rock shall be removed to a depth of at least 3 inches (75 mm) below the required cable 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 material may alternatively be used.

Duct bank or conduit markers temporarily removed for trench excavations shall be replaced as required.

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:

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

(2) 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 or replacement.

b. Backfilling. After the cable has been installed, the trench shall be backfilled. The first layer of backfill in the trench shall encompass all cables; be 3 inches (75 mm) deep, loose measurement; and shall be either earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch (6.3 mm) sieve. This layer shall not be compacted. The second layer shall be 5 inches (125 mm) deep, loose measurement, and shall contain no particles that would be retained on a one inch (25.0 mm) sieve. The remaining third and subsequent layers of backfill shall not exceed 8 inches (20 cm) of loose measurement and be excavated or imported material and shall not contain stone or aggregate larger than 4 inches (100 mm) maximum diameter.

The second and subsequent layers shall be thoroughly tamped and compacted to at least the density of the adjacent material. If the cable is to be installed in locations or areas where other compaction requirements are specified (under pavements, embankments, etc.) the backfill compaction shall be backfilled with controlled low strength material (CLSM) in accordance with P-153.

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 when turf is to be established over the trench, the backfilling shall be stopped at an appropriate depth consistent with the type of turfing operation

~~to be accommodated. A proper allowance for settlement shall also be provided. Any excess excavated material shall be removed and disposed of per the plans and specifications.~~

~~Underground electrical warning (caution) tape shall be installed in the trench above all direct-buried cable. Contractor shall submit a sample of the proposed warning tape for acceptance by the RPR. If not shown on the plans, the warning tape shall be located 6 inches (150 mm) above the direct-buried cable or the counterpoise wire if present. A 3-6 inch (75 - 150 mm) wide polyethylene film detectable tape, with a metalized foil core, shall be installed above all direct buried cable or counterpoise. The tape shall be of the color and have a continuous legend as indicated on the plans. The tape shall be installed 8 inches (200 mm) minimum below finished grade.~~

~~**c. Restoration.** Following restoration of all trenching near airport movement surfaces, the Contractor shall visually inspect the area for foreign object debris (FOD) and remove any that is found. Where soil and sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by work shall be restored to its original condition. The restoration shall include the sodding or seeding as shown on the plans. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance. When trenching is through paved areas, restoration shall be equal to existing conditions. If the cable is to be installed in locations or areas where other compaction requirements are specified (under pavements, embankments, etc.) the backfill compaction shall be backfilled with controlled low strength material (CLSM) in accordance with P-153. ***The contractor may substitute P-153 with P-610 at no additional cost with the approval of the Engineer.*** Restoration shall be considered incidental to the pay item of which it is a component part.~~

~~**108-3.4 Cable markers for direct-buried cable.** The location of direct buried circuits shall be marked by a concrete slab marker, 2 feet (60 cm) square and 4-6 inch (10 – 15 cm) thick, extending approximately one inch (25 mm) above the surface. Each cable run from a line of lights and signs to the equipment vault shall be marked at approximately every 200 feet (61 m) along the cable run, with an additional marker at each change of direction of cable run. All other direct-buried cable shall be marked in the same manner. Cable markers shall be installed directly above the cable. The Contractor shall impress the word "CABLE" and directional arrows on each cable marking slab. The letters shall be approximately 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. Stencils shall be used for cable marker lettering; no hand lettering shall be permitted.~~

~~At the location of each underground cable connection/splice, except at lighting units, or isolation transformers, a concrete marker slab shall be installed to mark the location of the connection/splice. The Contractor shall impress the word "SPLICE" on each slab. The Contractor also shall impress additional circuit identification symbols on each slab as directed by the RPR. All cable markers and splice markers shall be painted international orange. Paint shall be specifically manufactured for uncured exterior concrete. After placement, all cable or splice markers shall be given one coat of high-visibility aviation orange paint as approved by the RPR. Furnishing and installation of cable markers is incidental to the respective cable pay item.~~

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. These shall be made by using crimp connectors for jointing conductors. Molds shall be assembled, and the compound shall be mixed and poured per the manufacturer's instructions and to the satisfaction of the RPR. ***Cast splices shall be used for temporary or emergency splices only.***

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. ***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. Primary Connector Kits shall be***

as shown on the plans. ~~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 (2) Covered with heat shrinkable tubing with integral sealant extending at least 1-1/2 inches (38 mm) on each side of the joint or (3) 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.~~ ~~These 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. (2) Covered with heat shrinkable tubing with integral sealant extending at least 1-1/2 inches (38 mm) on each side of the joint. or (3) On connector kits so equipped with water seal flap; roll-over water seal flap to sealing position on mating connector.~~

d. Taped or heat-shrink splices. ***Shall not be used on this project.*** ~~A taped splice shall be made in the following manner:~~

~~Bring the cables to their final position and cut so that the conductors will butt. Remove insulation and jacket allowing for bare conductor of proper length to fit compression sleeve connector with 1/4 inch (6 mm) of bare conductor on each side of the connector. Prior to splicing, the two ends of the cable insulation shall be penciled using a tool designed specifically for this purpose and for cable size and type. Do not use emery paper on splicing operation since it contains metallic particles. The copper conductors shall be thoroughly cleaned. Join the conductors by inserting them equidistant into the compression connection sleeve. Crimp conductors firmly in place with crimping tool that requires a complete crimp before tool can be removed. Test the crimped connection by pulling on the cable. Scrape the insulation to assure that the entire surface over which the tape will be applied (plus 3 inches (75 mm) on each end) is clean. After scraping, wipe the entire area with a clean lint-free cloth. Do not use solvents.~~

~~Apply high-voltage rubber tape one-half lapped over bare conductor. This tape should be tensioned as recommended by the manufacturer. Voids in the connector area may be eliminated by highly elongating the tape, stretching it just short of its breaking point. The manufacturer's recommendation for stretching tape during splicing shall be followed. Always attempt to exactly half-lap to produce a uniform buildup. Continue buildup to 1-1/2 times cable diameter over the body of the splice with ends tapered a distance of approximately one inch (25 mm) over the original jacket. Cover rubber tape with two layers of vinyl pressure-sensitive tape one-half lapped. Do not use glyptol or lacquer over vinyl tape as they react as solvents to the tape. No further cable covering or splice boxes are required.~~

~~Heat shrinkable tubing shall be installed following manufacturer's instructions. Direct flame heating shall not be permitted unless recommended by the manufacturer. Cable surfaces within the limits of the heat-shrink application shall be clean and free of contaminates prior to application.~~

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.

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. Counterpoise size is as shown on the plans. The isolation method is an alternate method for use only with edge lights installed in turf and stabilized soils and raceways installed parallel to and adjacent to the edge of the pavement. NFPA 780 uses 15 feet to define "adjacent to".

The counterpoise conductor shall be installed halfway between the pavement edge and the light base, mounting stake, raceway, or cable being protected.

The counterpoise conductor shall be installed 8 inches (203 mm) minimum below grade. The counterpoise is not connected to the light base or mounting stake. An additional grounding electrode is required at each light base or mounting stake. The grounding electrode is bonded to the light base or mounting stake with a 6 AWG solid copper conductor.

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 Isolation Method of lightning protection.

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.

When a nonmetallic light base is used, the grounding electrode shall be bonded to the metallic light fixture or metallic base plate 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 ***outside*** the transformer vault or at the power source. It shall be securely attached to the vault or equipment external ground ring or other made electrode-grounding 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 measured 45 degrees each side of vertical.

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 recommended 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 100 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 ***There shall be no separate payment for work described under L-108. All work under L-108 is incidental to pay items under L-125.*** ~~The cost of all excavation, backfill, dewatering and restoration regardless of the type of material encountered shall be included in the unit price bid for the work.~~

~~**108-4.2** Cable or counterpoise wire installed in trench, duct bank or conduit shall be measured by the number of linear feet 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 include additional quantities required for slack.~~

BASIS OF PAYMENT

108-5.1 ***There shall be no separate payment for work described under L-108. All work under L-108 is incidental to pay items under L-125.*** ~~Payment will be made at the contract unit price for trenching, cable and bare counterpoise wire installed in trench (direct-buried), or cable and equipment ground installed in duct bank or 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~~	~~Trenching for direct-buried cable, 18-inch minimum depth - per linear foot (meter)~~
~~Item L-108-5.2~~	~~[No. 8 AWG][No. 6 AWG], [5 kV][600V], L-824, [Type C][Type B] Cable, Installed in Trench, Duct Bank or Conduit - per liner foot (meter)~~
~~Item L-108-5.3~~	~~No. [6][4][2] AWG, Solid, Bare Copper Counterpoise Wire, Installed [in Trench], [Above the Duct Bank or Conduit], Including Connections/Terminations - per linear foot (meter)~~
~~Item L-108-5.4~~	~~No. [6][4][2] AWG, [Bare][Insulated], Stranded Equipment [bonding][Ground], Installed in Duct Bank or Conduit – per linear foot (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.

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

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ITEM L-125 INSTALLATION OF AIRPORT LIGHTING SYSTEMS

DESCRIPTION

125-1.1 This item shall consist of airport lighting systems ~~***relocated or***~~ furnished and installed in accordance with this specification, the referenced specifications, and the applicable advisory circulars (ACs). ***Existing runway edge and centerline lights will be adjusted to new finish grade.*** 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. Not required.

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.

Lights

Type	**Class**	**Mode**	**Style**	**Option**	**Base**	**Filter**	**Transformer**	**Notes**
L-861T(L)	2	1	N/A	N/A	L-867B	Blue	20/25W	LED 14”
L-852T(L)	2	1	3		L-868B	Blue	20/25W	LED
L-862(L)	2	1	-	-	L-867B	W/W and W/Y	30/45W or 45W	14” tall LED
L-862E(L)	2	1	-	-	L-867B	R/G	30/45W or 45W	14” tall LED
L-850C(L)	2	1	2	-	L-868B	W/W and W/Y	30/45W or 45W	LED

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

Signs

Type	Size	Style	Class	Mode	Notes
L-858Y	2	2	1	3	
L-858R	2	2	1	3	
L-858L	2	2	1	3	

The nameplate required by FAA AC 150/5345-44 shall be made of metal with the data stamped into the metal nameplate.

125-2.9 Runway End Identifier Light (REIL). [The REIL fixtures shall meet the requirements of AC 150/5345-51, Type [L-849V][L-849I], Style [A][B][C][D][E][F].] [Not required.]

125-2.10 Precision Approach Path Indicator (PAPI). [The light units for the PAPI shall meet the requirements of AC 150/5345-28, Type [L-880][L-881], Style [A][B], Class [I][II].] [Not required.]

125-2.11 Circuit Selector Cabinet. The circuit selector cabinet shall meet the requirements of AC 150/5345-5, Type L-847, [one][two][three][four] circuit control [as indicated], Class [A, indoor][B, outdoor], Rating [1, for 6.6 amperes][2, for 20 amperes].

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 or L-868, Class 1A, Size B 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.

The Contractor is required to maintain an adequate supply of grade adjustment shims on the project site at all times.

All L-867 and L-868 bases shall remain in place.

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 Blank Covers. Blank covers shall be provided to facilitate the adjustment of light fixtures.

Gaskets, stainless steel hardware, bolts, studs, nuts, lock washers, and other fasteners shall be removed and reinstalled to achieve finished grade.

Covers used temporarily during construction/paving shall be turned over to Airport Maintenance at job completion, if requested by the Owner. Otherwise, Contractor shall dispose of all remaining covers off site.

125-2.15 Hardware. All bolts, nuts, washers and lock washers shall be stainless steel. Reinstall using Loctite® Threadlocker Blue 242, Permatex® Medium Strength Threadlocker Blue, or approved equal.

125-2.16 Plug And Receptacle Cable Connectors. L-823, Type I, Class A, meeting the requirements of FAA AC 150/5345-26, current edition.

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.

Runway centerline lights – The Contractor shall remove the fixture, spacer rings, and core to remove top section of each L-868 per the detail shown on the plan. Prior to installation of ¾" stainless steel blank cover, the Contractor shall record the elevation of the top of the base can. New top section and spacer rings shall be manufactured to achieve finish grade.

Runway edge lights – The Contractor shall remove the fixture, core, adjust can below finish grade, install stainless steel plate prior to paving.

Runway centerline and edge lights – Upon final paving, the Contractor shall locate the center of each can and make appropriate measures to achieve final adjustment to finish grade.

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.~~ ***Adjustments to*** Runway ~~and taxiway~~ lights will be measured by the number of each type ***adjusted*** ~~installed as completed units in place, ready for operation,~~ and accepted by the RPR. ***Existing runway edge and centerline lights will be adjusted to new finish grade.***

~~Guidance signs will be measured by the number of each type and size installed as completed units, in place, ready for operation, and accepted by the RPR.~~

~~Runway End Identifier Lights shall be measured by each system installed as a completed unit in place, ready for operation, and accepted by the RPR.~~

~~Precision Approach Path Indicator shall be measured by each system installed as a completed unit, in place, ready for operation, and accepted by the RPR. Abbreviated Precision Approach Path Indicator shall be measured by each system installed as a completed unit, in place, ready for operation, and accepted by the RPR.~~

BASIS OF PAYMENT

125-5.1 Payment will be made at the Contract unit price for each ***adjusted runway centerline and edge light.*** ~~or taxiway~~ light, ~~guidance sign, reflective marker, runway end identification light, precision approach path indicator, or abbreviated precision approach path indicator~~ installed by the Contractor and accepted by the RPR. This payment will be full compensation for furnishing all materials, ***including all new top sections, spacer rings, coring, stainless steel plates, connections, testing,*** 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:

Item L-125-1	***Adjust Existing Runway Edge Light L-867 to New Finish Grade – per Each***
Item L-125-2	***Adjust Existing Runway Centerline Light L-868 to New Finish Grade – per Each***
~~Item L-125-1~~	~~Remove Existing Light Fixture, Transformer, and Base Can -- per Each~~
~~Item L-125-2~~	~~L-861T(L) Elevated Taxiway Edge Light with Isolation Transformer and L-867B Base Can in Turf -- per Each~~
~~Item L-125-3~~	~~L-861T(L) Elevated Taxiway Edge Light with Isolation Transformer and L-867B Base Can in Pavement -- per Each~~
~~Item L-125-4~~	~~L-852T(L) In-Pavement Taxiway Edge Light with Isolation Transformer and L-868B Base Can in Pavement -- per Each~~
~~Item L-125-5~~	~~Remove Guidance Sign and Preserve Existing Concrete Pad and Base Can - Per Each~~

~~Item L-125-6 Remove Guidance Sign and Existing Concrete Pad and Base Can - Per Each~~

~~Item L-125-7 New Size 2, 1-Module Guidance Sign With New Isolation Transformer Installed On Existing Concrete Pad - Per Each~~

~~Item L-125-8 New Size 2, 2-Module Guidance Sign With New Isolation Transformer Installed On Existing Concrete Pad - Per Each~~

~~Item L-125-9 New Size 2, 3-Module Guidance Sign With New Isolation Transformer Installed On Existing Concrete Pad - Per Each~~

~~Item L-125-10 New Size 2, 4-Module Guidance Sign With New Isolation Transformer Installed On Existing Concrete Pad - Per Each~~

~~Item L-125-11 New Size 2, 2-Module Guidance Sign With New Base Can and New Isolation Transformer Installed On New Concrete Pad - Per Each~~

~~Item L-125-12 New Size 2, 3-Module Guidance Sign With New Base Can and New Isolation Transformer Installed On New Concrete Pad - 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 150/5340-18	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

Engineering 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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APPENDIX C

CONSTRUCTION SAFETY AND PHASING PLAN (CSPP)

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ST. PETE-CLEARWATER INTERNATIONAL AIRPORT

CONSTRUCTION SAFETY AND PHASING PLAN (CSPP)

FOR

PIE Runway 18-36 Pavement Maintenance

July 21, 2022

PROJECT NUMBER: TBD

Prepared By

Kimley»Horn

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CONSTRUCTION SAFETY AND PHASING PLAN (CSPP)
ST PETE-CLEARWATER INTERNATIONAL AIRPORT

PIE RUNWAY 18-36 PAVEMENT MAINTENANCE

INTRODUCTION

Aviation safety is the primary consideration at airports, especially during construction. The Airport Operator's Construction Safety and Phasing Plan (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 aspects of the construction project that pose a potential safety hazard to Airport operations and outline respective mitigation procedures for each hazard.

The CSPP sets forth benchmarks and requirements for the project to help ensure the highest levels of safety, security and efficiency at the Airport at the time of construction. Guideline requirements for the CSPP are developed from FAA Advisory Circular 150/5370-2G, *Operational Safety on Airports During Construction*. The CSPP is to be used by all personnel involved in the project. The CSPP covers the actions of not only the construction personnel and equipment, but also the action of inspection personnel and Airport staff.

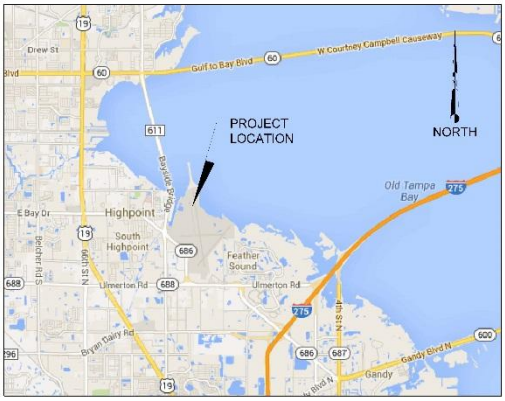
This document has been developed in order to minimize interruptions to Airport operations, reduce construction costs, and maximize the performance and safety of construction activity. Strict adherence to the provisions of the CSPP by all personnel assigned to or visiting the construction site is mandatory for construction projects at the Airport. **The Contractor will be required to submit a Safety Plan Compliance Document (SPCD) to the Airport describing how the Contractor will comply with the requirements set forth in this CSPP and the requirements set forth in AC 150/5370-2G.**

The SPCD shall detail how the Contractor will comply with the CSPP by detailing those means, methods, and /or programs that will be implemented during construction. These items will include but not be limited to:

- **Specifics hazard and safety equipment**
- **Construction lighting**
- **Construction equipment height**
- **Contractor emergency points of contact**
- **HAZMAT response procedures**
- **AOA access and escort programs**
- **Safety and security of the job site**
- **ARFF access routes (which shall remain open and unobstructed at all times)**

The SPCD must be submitted to the Airport for approval prior to issuance of the Notice to Proceed. In the event the Contractor's activities are found to be in non-compliance with the provisions of the CSPP or the SPCD, the Airport's Representative will direct the Contractor to immediately cease those operations which are in violation. In addition, a safety meeting will be conducted for the purpose of reviewing those provisions in the CSPP/SPCD which were violated. The Contractor will not be allowed to resume any construction operations until after the conclusion of the safety meeting and after all corrective actions required have been implemented by the Contractor and approved by the Airport's Representative.

PROJECT SCOPE



LOCATION MAP
N.T.S.

The overall project consists of, but is not limited to, maintenance of approximately 1,200' of Runway 18-36 asphalt pavement and maintenance of approximately 8,300' of Taxiway G asphalt pavement.

Runway 18-36 is 9,730' x 150' with 25' paved shoulders and currently has a 930' displaced threshold at the Runway 36 end. The runway also has paved blast pads of 200' and 395' for Runway 18-36, respectively. The existing runway pavement is bituminous asphalt. The existing Taxiway G pavement is bituminous asphalt. Mill and overlay of Taxiway G has been included in the project scope to potentially repair rutting that may arise due to the increase in operations on Taxiway G of aircraft over 100,000 lbs as part of this project.

The project consists of the mill and overlay of the existing bituminous asphalt pavement; adjustments to existing runway centerline and edge lights, pavement grooving, and pavement markings.

See **Appendix A** for the proposed construction elements and limits for this project. All work areas are indicated in the attached construction safety and phasing plan drawings contained in **Appendices B and C**.

CSPP REQUIREMENTS

Necessary construction locations and activities have been identified, and their impact to Airport operations has been assessed. The impact of work to Airport Operations Areas (AOA) is discussed in detail in Sections 1.0 through 18.0, and graphically depicted in the Safety and Phasing sheets provided in **Appendices B and C**. These sheets are from the drawing set issued to the contractor for construction.

1.0 COORDINATION.

1.1 Contractor Progress Meetings

Construction Progress Meetings will be held on a weekly basis, or as required, with minutes recorded and issued to all stakeholders. Attendees shall include but not be limited to the Resident Project Representative (RPR), Contractor Project Manager, Contractor Safety and Security Officer (CSSO), Airport Operations and FAA ATC Manager or representative. Items for discussion related to construction safety will include the following:

- ✈ Schedule of activities extended out for a 2-3 week period
- ✈ Impacts to Operations
- ✈ NOTAM's to be issued

- ✈ Quality control/quality assurance
- ✈ Administration items and pay applications
- ✈ Submittals
- ✈ RFI's
- ✈ Review of safety measures required and parties responsible for compliance
- ✈ Review of any changes in scope

1.2 Scope or Schedule Changes

If changes in scope or schedule are required at the request of the Airport or by unforeseen conditions, they shall be addressed accordingly, per contract requirements, and the CSPP will be updated to reflect the changes. Changes must be approved by the Airport.

1.3 FAA ATO Coordination

Air Traffic Operations (ATO) will coordinate with the FAA on all construction activities that impact operations on the Airport Operations Area (AOA). The AOA is defined as all areas used or intended to be used for aircraft operations, including active runways, aprons, taxiways, taxilanes, etc. This will be done on a weekly basis at the Construction Progress Meetings and as necessary throughout the project. Coordination will be with the following: Airport Management, Airport Operations and FAA Contacts.

2.0 PHASING

The sequence of construction and phasing for this project was developed in order to maintain the maximum efficiency of aircraft operations while maintaining safety and allowing for the required construction activities for this project. For each phase of the project the CSPP identifies the requirements of FAA AC 150/5370-2G, "Operational Safety on Airports during Construction". Per the AC, restrictions on construction have been placed on all construction within the runway safety area (RSA) of any runway. Additionally, these restrictions have been extended to the Obstacle Free Zone (OFZ) for an additional level of safety. The extra buffer was felt warranted because the existing RSA coincides with the edge of runway pavement for these two particular runways, and the extra space keeps construction personnel from working immediately adjacent to the active runway pavement.

- Areas Closed to Operations – Reference Section 2.1 Phasing Elements and **Appendix C**.

- Durations of Closures – Reference Section 2.1 Phasing Elements and **Appendix C**. Construction during some phases of the project shall be conducted at Night. Night work hours are between 11:00 PM and 5:00 AM, however these hours are open to approval or modification by the RPR.

- ARFF Access routes - Emergency Aircraft Rescue and Fire Fighting (ARFF) access in and around the site will be maintained by the Contractor, as required, for the duration of this project. Contractor must prominently mark open trenches and excavations within the construction site, with approval from Airport Operations, and light them with low profile barricades with red steady burn lights during hours of restricted visibility or darkness.

- Construction Staging Areas – See Contract Layout Plan contained in **Appendix A.** The construction documents depict staging area locations and general safety and security notes concerning use of the staging areas. Construction staging areas and Contractor employee parking areas are to remain outside of the Airport Operations Area (AOA).

- Construction Access and Haul Routes - Reference **Appendix A** for routing layouts. Haul routes will be confirmed by Airport Operations prior to the start of each phase. Applicable control along Contractor haul routes for both safety and security must be maintained at all times. This is especially important at those locations that require the Contractor to cross or move through active airfield surfaces. Reference Section 5.2, *Vehicle and pedestrian operations*, Section 15, *Marking and Signs for Access Routes*, and Section 17, *Protection of Safety Areas, Object Fee Areas, Obstacle Free Zones, and Approach/Departure Surfaces* of this document for additional information.

  The Contractor shall establish and maintain a list of Contractor and Subcontractor vehicles authorized to operate on the site. Contractor employee vehicles shall be restricted to the Contractor's staging area and are not allowed in the Airport Operations Area (AOA) at any time. To be authorized to operate on the Airport, each Contractor or Subcontractor's vehicle shall:

  a. be marked/flagged for high daytime visibility and lighted for nighttime operations. Vehicles that are not marked and/or lighted shall be escorted by a vehicle appropriately marked and/or lighted. Vehicles requiring escort shall be identified on the list.

  b. be identified with the name and/or logo of the Contractor and be of sufficient size to be identified at a distance. Vehicles needing intermittent identification may be marked with tape or with commercially available magnetically attached markers. Vehicles that are not appropriately identified shall be escorted by a vehicle that conforms to this requirement. Vehicles requiring escort shall be identified on the list.

  c. be operated in a manner that does not compromise the safety of either landside or airside Airport operations. If, in the opinion of the RPR any vehicle is operated in a manner not fully consistent with this requirement, the RPR has the right to restrict operation of the vehicle or prohibit its use on the Airport.

- Impacts to NAVAIDS – This project will require temporary deactivation of various NAVAID systems at PIE during construction. Any modifications or deactivations of NAVAID systems will be coordinated beforehand through ATCT, PIE Operations, and FAA.

- Lighting and Marking Changes – This project will include the adjustment of existing centerline and edge lighting and markings for Runway 18-36. Existing taxiway circuitry that is to remain during construction will be spliced with temporary jumpers to remain functional. All splices will be made in new or existing electrical junction

cans. Electrical design is in accordance with FAA Advisory Circular AC 150/5340-30J, “Design and Installation Details for Airport Visual Aids”, AC 150/5340-18F, “Standards for Airport Sign Systems”, and Engineering Brief No. 92A, Light Spacing Guidance for New Taxiway Fillet Geometry.

- Temporary markings will be required for the paving of Runway 18-36 and Taxiway G Phase 1 and Phase 2 of construction. Temporary markings will be applied and paid as permanent and will be designed in accordance with FAA Advisory Circular AC 150/5340-1L, “Standards for Airport Markings”, and Technical Specification Item P-620, “Runway and Taxiway Painting”.

- Required Hazard Marking and Lighting - Low profile barricades with steady burn red lights, closed runway and taxiway markings, signs, lighting and/or safety flag details and usage requirements. In addition, reference Section 15, *Marking and Signs for Access Routes*, Section 16, *Hazard Marking, Lighting and Signing*, and Section 17, *Protection of Safety Areas, Object Free Areas, Obstacle Free Zones, and Approach/Departure Surfaces* of this document for additional information.

- Proper marking and lighting of areas on the airfield associated with the construction shall be the responsibility of the Contractor and shall be described in the Contractor’s SPCD. This will include properly marking and lighting closed runways and taxiways, the limits of construction, material storage areas, equipment storage areas, haul routes, parking areas and other areas defined as required for the Contractor's exclusive use. The Contractor shall erect and maintain around the perimeter of these areas suitable marking and warning devices visible for day and night use. Temporary barricades, flagging, and flashing warning lights shall be required at critical access points. The type and location of marking and warning devices will be approved by the RPR.

- Special emphasis shall be given to open trenches, excavations, heavy equipment marshalling areas, and stockpiled material located in the Airport operations area, which shall be predominantly marked by the Contractor with flags and lighted by approved light units during hours of restricted visibility and darkness.

- Lead times for required notifications – The Contractor is required to coordinate this with the RPR and Airport Operations. Lead times for required notifications shall be established at the pre-construction meeting.

2.1 Phase Elements

2.1.1 PHASE 0 - MOBILIZATION

The Mobilization period will start with the commencement of Phase 0. Phase 0 includes Contractor's mobilization, haul route signage, equipment procurement, project schedule, quality control and safety plan, safety plan compliance document, staging area, construction permitting by the contractor, submittals, ordering of long-lead items.

2.1.2 PHASE 1

Phase 1 includes work within Runway 18-36 to prepare runway edge and centerline lights for adjustment, install asphalt leveling and surface courses, make final adjustments to runway edge lights, and install temporary markings.

PHASE 1 DESCRIPTION:

1. MOT Installation of barricades, signage, runway closure crosses, erosion control, and temporary airfield lighting and signage.
2. Remove runway edge and centerline light fixtures.
3. Extend runway edge light cans below proposed milling surfaces and install ¾" steel lid.
4. Remove runway centerline light base spacer rings, extenders, and top section and install ¾" steel lid.
5. Asphalt pavement milling/scarifying.
6. Install asphalt leveling and surface course.
7. Final adjustment of runway edge lights.
8. Profilograph, grinding, seal coating.
9. Install temporary markings.
10. Perform testing.
11. Remove MOT and re-open RW 18-36 for operations.

PHASE 1 AIRCRAFT MOVEMENT:

1. RW 18-36 shall be closed for the duration of Phase 1 except for crossings at intersections of TW A5/TW G and TW A4/TW F.
2. RW 4-22 shall remain operational with limitations. Due to the separation distance between RW 4-22 and Taxiway G centerlines, no operations by Group III aircraft on Runway 4-22 will be permitted by ATCT while aircraft are present on Taxiway G. Aircraft will need to be clear of Taxiway G in order to permit Group III operations on RW 4-22.

PHASE 1 LIMITS OF WORK:

1. Phase 1 work limits include the mid-section of RW 18-36 centered on the crossing of decommissioned RW 9-27.
2. Phase 1 work to be completed during work day hours.
3. Maximum equipment height permitted during Phase 1 work is 20 feet.
4. Phase 1 shall commence immediately following the completion of Phase 0, contractor's mobilization period.

2.1.3 PHASE 2

This phase includes work required to mill and overlay Taxiway G asphalt pavements. Phase 2A includes milling and overlaying of Taxiway G and installation of temporary markings. Phase 2B includes the application of final markings on Taxiway G after the curing of new asphalt.

PHASE 2A DESCRIPTION:

1. MOT installation.
2. Mill and overlay of asphalt pavements as directed by the RPR.
3. Install temporary markings.
4. Perform testing.
5. Remove MOT and reopen Taxiway G for operations.

PHASE 2A AIRCRAFT MOVEMENT:

1. Taxiways G, G1, G2, G3, and F will be closed for aircraft operations.
2. No departures will be allowed at Runway 22.
3. No arrivals will be allowed at Runway 4.
4. Runway 18-36 will be operational.

PHASE 2B DESCRIPTION:

1. MOT installation.
2. Install final markings.
3. Perform testing.
4. Remove MOT and reopen Taxiway G for operations.

PHASE 2B AIRCRAFT MOVEMENT:

1. Taxiways G, G1, G2, G3, and F will be closed for aircraft operations.
2. No departures will be allowed at Runway 22.
3. No arrivals will be allowed at Runway 4.
4. RW 18-36 will be operational.

PHASE 2 (PHASE 2A AND 2B) LIMITS OF WORK:

1. Phase 2 work limits include Taxiway G beginning approximately 250’ east of Runway 18-36 beyond the Runway Safety Area (RSA).
2. Phase 2 work to be completed during work day hours.
3. Maximum equipment height permitted during Phase 2 work is 20 feet.
4. Phase 2A will commence immediately following the completion of Phase 1.
5. Phase 2B will commence immediately following the completion of Phase 3C.

2.1.4 PHASE 3

Phase 3 includes final work within RW 18-36. Phase 3A includes the time required for curing of the asphalt and delivery of long lead items. Phase 3B includes the final installation of centerline lights. Phase 3C includes grooving of the runway pavement and installation of final markings on RW 18-36.

PHASE 3A DESCRIPTION:

This phase does not represent any work on the part of the contractor. The duration of this phase will permit the curing of asphalt and the delivery of long lead items. Phase 3A will commence immediately following the completion of Phase 2A.

PHASE 3A AIRCRAFT MOVEMENT:

1. There are no restrictions for aircraft movements during Phase 3A.

PHASE 3B DESCRIPTION:

1. MOT installation.
2. Locate and core runway centerline lights, install top can extenders, spacer rings and reinstall light fixture.
3. Perform testing.

PHASE 3B AIRCRAFT MOVEMENT:

1. It is intended that RW 18-36 be open for aircraft operations between 6:00 am and 11:00 pm (RW 18-36 to be closed for night work). Contractor specifically cautioned to manage the progression of work in a manner that permits the reopening of RW 18-36 each day at 6:00 am during Phase 3B. Airport Operations shall be notified by 4:00 am prior to 6:00 am the same day to inspect runway and work area to verify that the runway can be opened to aircraft traffic.
2. During nighttime closure, RW 18-36 will be closed except for aircraft crossings at intersections of TW A5/TW G and TW A4/TW F.
3. RW 4-22 will remain operational.

PHASE 3C DESCRIPTION:

1. MOT installation.
2. Final markings
3. Removal of MOT and reopening of RW 18-36 for aircraft operations.

PHASE 3C AIRCRAFT MOVEMENT:

1. It is intended that RW 18-36 be open for aircraft operations between 6:00 am and 11:00 pm (RW 18-36 to be closed for night work). Contractor specifically cautioned to manage the progression of work in a manner that permits the reopening of RW 18-36 each day at 6:00 am during Phase 3C. Airport Operations shall be notified by 4:00 am prior to 6:00 am the same day to inspect runway and work area to verify that the runway can be opened to aircraft traffic.
2. During nighttime closure, RW 18-36 will be closed except for aircraft crossings at intersections of TW A5/TW G and TW A4/TW F.
3. RW 4-22 will remain operational.

PHASE 3 (PHASE 3A, 3B, AND 3C) LIMITS OF WORK:

1. Phase 3 work limits include the mid-section of RW 18-36 centered on the crossing of decommissioned RW 9-27. Note that no work is anticipated for Phase 3A unless allowed by RPR.
2. Phases 3B and 3C work to be completed during specified night hours.
3. Maximum equipment height permitted during Phase 1 work is 20 feet.

4. Phase 3B shall commence upon availability of long lead items. Phase 3A shall begin 30 days after the completion of the asphalt surface installed under Phase 1.

2.2 Construction Safety Drawings – The project phasing and the detailed work areas or sub-work areas are provided in **Appendix C** at the end of this CSPP. Safety and Security Plans are provided in **Appendix B**.

2.3 Flexible Phasing – The drawings shown in **Appendix C** are approximate and are intended to be used as guidelines for the Contractor to develop his own construction phasing plan. The final construction phasing plan shall be submitted to the Engineer for approval prior to the start of construction.

3.0 AREAS AND OPERATIONS AFFECTED BY CONSTRUCTION

3.1 Identification of affected areas –

- Closing or partial closing of runways or taxiways – See all Phase Elements Section 2.1. Runway 18-36 will be closed during portions of this Project. Runway 4-22 will be restricted during portions of the Project.

- Closing of access routes used by Airport and airline support vehicles - See Phase Elements Section 2.1.

- Interruption of Utilities –
  No Interruption of utilities, including water supplies for ARFF, is expected. No utilities other than airfield electrical will be impacted by this project. Any proposed impacts to utilities that serve any Airport facility shall be properly coordinated, through the Airport Staff, with the appropriate Airport facility that is to be impacted; however, none are expected.

- Approach/departure surfaces affected by heights of objects –
  A form 7460 is still to be filed with the FAA for this project. After review of the determination of the 7460 process, the RPR will provide the determination information to the contractor. The contract plans and specifications call for the contractor to remove equipment and materials from restricted areas while airfield pavements are open. It is expected that NOTAMs will be required for this project since runways will be closed or restricted during this project.

- Construction Areas –
  These areas include the project work area, storage/stockpile areas, staging areas, and Contractor haul routes near active airfield surfaces. These areas are identified graphically in **Appendix A**.

3.2 Mitigation of effects -

This CSPP has established specific requirements and operational procedures necessary to maintain the safety and efficiency of Airport operations during the construction of this project. All coordination pertaining to Airport operations during construction will go through the RPR and Airport Operations. Any required NOTAM's to be issued will be sent through the RPR and issued by the Airport.

- Temporary changes to runway and/or taxi operations- The affected runways, and taxiways previously identified as having reduced access or identified as being closed entirely to aircraft traffic, will be barricaded by the use of low profile, lighted barricades placed as shown in **Appendix B**. In addition, required NOTAM's shall be issued on the various temporary changes to aircraft access through the affected areas.

- Detours for ARFF and other Airport vehicles - The project work-site shall remain open to all ARFF vehicles in emergency situations. The Contractor is

required to maintain access in and around the project work area for all ARFF vehicles. Proper routing of this traffic will be effectively communicated to all supervisory personnel involved in the construction project.

- Maintenance of essential utilities - The Contractor shall locate and/or arrange for the location of all the underground utilities. When an underground cable or utility is damaged due to the Contractor's negligence, the Contractor shall immediately repair the affected cable or utility at his/her own expense. Full coordination between Airport staff, field inspectors, and construction personnel will be exercised to ensure that all Airport power and control cables are fully protected prior to any excavation. Locations of cabling and other underground utilities will be marked prior to beginning excavation.

- Temporary changes to air traffic control procedures – Must be coordinated in advance with the FAA ATO.

4.0 PROTECTION OF NAVAIDS

NAVAID Critical areas have been included in the Construction Safety Plan in **Appendix A.** Construction activities will affect multiple NAVAIDs during this project. The Contractor shall clearly identify the limits of the critical area in the field. Materials/equipment storage, and vehicle parking near electronic NAVAIDs will not be allowed.

5.0 CONTRACTOR ACCESS

Contractor parking and equipment staging areas have been identified as the Contractor Staging Area and are graphically identified in the drawing set and in the Contract Layout Plan provided in **Appendix A**. No other access points shall be allowed unless approved by the RPR. All Contractor traffic authorized to enter the site shall be by the identified routes. 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 flagman or traffic control person shall monitor and coordinate all Contractor traffic at the access gate with Airport 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 badged Contractor personnel who are familiar with the requirements of the Airport 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 the RPR. In addition, the following requirements are applicable:

- All Contractor traffic authorized to travel on the Airport shall have been briefed as part of the Contractor's construction safety and security orientation program, be thoroughly familiar with the access procedures and route for travel, or be escorted by personnel authorized by the Contractor's CSSO.

- The Contractor shall install work-site identification signs at the authorized

access point(s). If, in the opinion of the RPR, directional signs are needed for clarity, they shall be installed along the route authorized for access to each construction site.

- Under no circumstance will Contractor personnel be permitted to drive their individually owned vehicles to any construction site on the Airport. All vehicles must be parked in the area designated for employee parking and outside of secured airport property.

- In addition to the inspection and cleanup required at the end of each shift, the Contractor is responsible for the immediate cleanup of any debris generated along the construction site access route(s) as a result of construction-related traffic or operations whether or not created by Contractor personnel.

5.1 Location of stockpiled construction materials - Stockpiled material shall be secured against displacement by aircraft engine and propeller blast and ambient winds. Stockpiled materials and equipment storage shall not be permitted within an active Runway Safety Area (RSA) or Obstacle Free Zone (OFZ) nor will it be permitted within the Object Free Area (OFA) of an active runway or taxiway. Maximum height of stockpiled material shall not exceed 40 feet mean sea level (MSL).

5.2 Vehicle and pedestrian operations

5.2.1 Contractor site parking

No employee vehicles shall be parked in the staging areas shown in the plans. Employees shall park personal vehicles off Airport property, and shall be transported to and from the work areas via Contractor's vehicles having permitted access to the AOA.

5.2.2 Construction equipment parking

Contractor employees must park and service all construction vehicles in an area designated by the Airport outside the OFA and never in the safety area of an active runway or taxiway. Unless a complex setup procedure makes movement of specialized equipment impossible, inactive equipment must not park 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 and approved by the RPR. Employees must also park construction vehicles outside of the OFA when not in use (i.e. overnight, on weekends, or during other periods when construction is not active). Parked equipment shall not obstruct the visibility of visual aids, signs, or navigational aids serving active runways and taxiways.

5.2.3 Access and haul roads

The approved access and haul roads are the only routes that are permitted to be used. The routes must be clearly marked to prevent inadvertent entry to areas open to Airport operations. The construction traffic on the haul route

must not interfere with NAVAIDS or the approach surfaces of any operational runway.

5.2.4 Marking and Lighting of vehicles

Marking and lighting of vehicles shall be in accordance with AC 150/5210-5D, Painting, Marking and Lighting of Vehicles Used on an Airport. All Contractor vehicles and mobile equipment operating in the AOA shall be identified by three-foot (3') square orange and white flags whenever such vehicle or equipment is operating on or about the AOA. Checkered orange and white squares shall be a minimum of 1-foot (1') square. The Contractor's name shall be clearly affixed on each side of such vehicles and equipment, all in accordance with current Airport requirements. During the hours between 30 minutes before sunset and 30 minutes after sunrise and at all times when visibility is impaired, vehicles and mobile equipment shall also be equipped with a flashing amber beacon light mounted on the top of the vehicle or equipment. Beacon lights shall provide:

- Three hundred and sixty degree azimuth coverage.
- Effective intensity in the horizontal plane not less than 40 or more than 400 candelas.
- Beam spread measured to 1/10 peak intensity extending from 10 degrees to 15 degrees above the horizontal. Sixty to ninety flashes per minute.

The Contractor shall establish and maintain a list of Contractor and Subcontractor vehicles authorized to operate on the site. Contractor employee vehicles shall be restricted to landside parking and are not allowed in the Airport Operations Area (AOA) at any time. To be authorized to operate on the Airport, each Contractor or Subcontractor's vehicle shall:

- be marked/flagged for high daytime visibility and lighted for nighttime operations. Vehicles that are not marked and/or lighted shall be escorted by a vehicle appropriately marked and/or lighted. Vehicles requiring escort shall be identified on the list.

- be identified with the name and/or logo of the Contractor and be of sufficient size to be identified at a distance. Vehicles needing intermittent identification may be marked with tape or with commercially available magnetically attached markers. Vehicles that are not appropriately identified shall be escorted by a vehicle that conforms to this requirement. Vehicles requiring escort shall be identified on the list.

- be operated in a manner that does not compromise the safety of either landside or airside Airport operations. If, in the opinion of the RPR, any vehicle is operated in a manner not fully consistent with this requirement, the RPR has the right to restrict operation of the vehicle or prohibit its use on the airport.

5.2.5 Vehicle Operations

All Contractor vehicles and mobile equipment not individually authorized by the Airport for independent operation in the AOA shall be operated under escort while in the AOA. The escort vehicle and its driver must be authorized by the Airport for escort duty and for operation within the AOA. If access to the construction, staging or storage sites requires the crossing of an active runway or taxiway, all vehicles shall be escorted across said runway or taxiway by an Airport escort vehicle.

No crane shall be allowed on the work site until the equipment and its intended operation are approved by Airport Operations. The Contractor shall provide the RPR and Airport Operations with not less than 72-hour advance written notice requesting crane access to the AOA. All cranes will be required to have a file 7460 a completed determination from the FAA.

When access is approved by the Airport, the tip of any crane boom shall be identified by the checkered orange and white flag described above and, if requested by the Airport or required by AC 150/5370-2G, by steady burn red obstruction lights. Cranes shall not be left unattended while erect and shall be lowered when not in operation.

5.2.6 Required Escorts

Contractor employees requiring access onto the AOA shall be required to obtain photo-type Contractor Security Identification Display Area (SIDA) identification badges from the Airport. Employees requiring SIDA badges shall be required to take a SIDA training class and pass a FBI criminal background check. All fees associated with obtaining a SIDA badge shall be paid for by the Contractor. Non-badged Contractor employees must be accompanied onto the AOA by a badged employee approved with escort and ramp driving privileges. Badges must be displayed on the outer garment at all times when on the AOA.

The Contractor shall be responsible for the actions of employees and Subcontractors. Personnel who do not abide by Airport rules and regulations are subject to prosecution.

All non-badged Contractor employees shall be within voice and visual range of a badged escort at all times when in the AOA.

5.2.7 Training

Authorization for unescorted access within the AOA requires employees to successfully complete the SIDA training through the Airport.

Authorization to operate a vehicle unescorted within the AOA requires the employee to successfully complete the movement area driver training through the Airport.

5.2.8 Radio Communication

Radio contact is required at all times while the Contractor has personnel and equipment in the active AOA. Radios shall be furnished by the Contractor and shall be capable of receiving St. Pete-Clearwater (PIE) Common Traffic Advisory Frequency (CTAF) – 118.3 when the Tower is closed and Ground Control Frequency – 121.9 at all other times. These frequencies shall be utilized when crossing active runways and taxiways including entering and exiting the designated construction area. Contractor may not cross active airfield pavement without escort from Airport Operations. Sufficient radios shall be on site and operating at all times so that instructions or communications may be dispatched to all crews and/or supervisors working in the active AOA.

Vehicle drivers must confirm by personal observations that no aircraft is approaching their position (either in the air or on the ground) prior to crossing a runway, taxiway, or any other area open to aircraft 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.

5.2.9 Airport Security

Contractor shall be responsible for the security of his equipment and materials. The Contractor shall be responsible for the security of all gates utilized by the Contractor. As directed by the Airport, locks shall be placed on each gate used by the Contractor. The locks must be marked in a manner showing company ownership and two sets of keys provided to the Airport. The gates shall be locked at all times or monitored by badged Contractor personnel. For joint use gates, the Contractor shall interlock to existing locks or chains to allow access by other contractors or agencies permitted to use the gate. If a lock is found unsecured, the company owning the lock is in violation of Airport Rules and Regulations. In addition, unauthorized entry to the AOA through the gates may result in the responsible party being cited for violating Airport Regulations.

The Federal Aviation Act of 1958, Section 901, 49 USC 1371, gives the FAA and Transportation Security Administration (TSA) authority to place a fine on any Airport found to be in breach of a security requirement.

The Contractor shall reimburse the Airport for the full amount of any fines placed on them due to negligence on the part of the Contractor or their Subcontractors. Fines may be placed on the Airport for such things as security gates being unlocked, fences torn down, and AOA not being properly secured. These are only examples of items causing fines and not limitations. There could be other related items.

It is the Contractor's responsibility to prevent any breach of security within his area of construction or any route of entry to area of construction.

All personnel having unescorted access to any security restricted area shall wear valid airport and contractor identification badges on their outer garments in such areas at all times to permit ready recognition by Airport Security. The Contractor's employees, whether issued Airport security badges or not, must have a valid governmental identification on their person at all times.

Failure to comply with these requirements will result in the employee being escorted off the AOA and fines may be imposed at the Contractor's expense.

Identification badges must be controlled at all times. When personnel are terminated, upon completion of the construction project, and/or when badges expire, the Contractor is responsible for returning identification badges to Airport Security. Before a new badge is issued to any person, their expired or invalid badge must be returned to Airport Security.

The Contractor shall certify to the Airport that such checks were conducted and are on file in the Contractor's office for inspection by the Federal Aviation Administration.

The Contractor will provide to the Airport a list of employees having access to the AOA. The Contractor is responsible for the direct supervision of their employees at all times while in such restricted areas.

Any person found within any security restricted area without proper identification shall be in violation of Federal law and the Airport Rules and Regulations. All such persons shall be escorted off the AOA and may be cited by the Airport. In addition, the person may have their identification badge revoked.

6.0 WILDLIFE MANAGEMENT

The Contractor shall comply with all applicable federal, state and local regulations regarding environmental protection and shall adhere to the following specific requirements.

6.1 Trash

Contractor shall maintain a clean site free from all food scraps and trash. Contractor shall identify the location of closed containers for the collection of food scraps and trash. Contractor will make arrangements for trash container removal from the project site on a daily basis and the staging area on a weekly basis. Daily inspections are required to insure compliance prior to leaving the jobsite.

6.2 Tall grass and seeds

Grass species and other varieties of plants attractive to hazardous wildlife are not to be used on the airport. Disturbed areas or areas in need of re-vegetating should not be planted with seed mixtures containing millet or any other large-seed producing grass.

6.3 Poorly maintained fencing and gates - See section 5.2.9 above.

6.4 Wildlife encounter – In the event of a wildlife encounter, Contractor shall immediately notify Airport Operations and the RPR.

6.5 Disruption of existing wildlife habitat - Not applicable to this project.

6.6 Site Drainage

Contractor needs to maintain work-site drainage at all times. Ponding water will not be allowed.

6.7 Standing Water

Water shall not be allowed to collect and pool for more than any single 24-hour period.

7.0 FOREIGN OBJECT DEBRIS (FOD) MANAGEMENT

Loose materials shall be removed from the active portion of the Air Operations Area (AOA), placed in protected areas, or otherwise secured to prevent dispersal into active portions of AOA. Debris shall be promptly removed from AOA whether generated by Contractor's operations or not. The Contractor shall exercise care in the transportation of materials within the AOA. Materials tracked or spilled in the AOA shall be removed immediately. When hauling, loading, grading, or when any of the Contractor's activities are likely to cause the deposit of loose materials in the AOA, it shall be immediately removed using powered vacuum sweepers, loaders, trucks, etc., or by hand as necessary.

8.0 HAZARDOUS MATERIALS (HAZMAT) MANAGEMENT

The Contractor shall prepare all required documentation, pay all fees and perform all services and work necessary to obtain all permits and approvals from any and all local, state, and federal regulatory agencies for the Contractor's staging, stockpile, blending and batch plant areas and operations. The Contractor shall develop a Pollution Prevention Plan to conform to the Contractor's activities on the project. The plan shall be in strict compliance with the National Pollutant Discharge Elimination System (NPDES) permit issued or approved by the U.S. Environmental Protection Agency (EPA) pursuant to 40 CFR Part 122.6. The plan shall address all measures to dispose of, control, or prevent the discharge of solid, hazardous and sanitary wastes to the waters of the U.S. The plan shall include procedures to control offsite tracking of soil by vehicles and construction equipment, and procedures for cleanup and reporting of non-storm water discharges such as contaminated groundwater or accident spills.

The Contractor shall take all necessary precautions to prevent spills or leaks of fuels, oils, greases, hydraulic fluids and other significant materials to comply with the requirements of the NPDES during project construction.

Should spills or leaks occur, the Contractor shall be fully and solely responsible for containment and cleanup, and shall report the spill immediately to Airport Operations/ARFF, and as soon as possible to the Engineer and/or RPR. Other notification requirements may

apply. This report shall be filed even if the spill does not reach surface waters, since wells in the area may be contaminated by spills that infiltrate to the ground water. The Contractor shall include the following minimum steps in his Best Management Practices and Pollution Prevention Plan:

8.1 Execute periodic cleaning to keep the work-site and adjacent properties free from accumulations of waste materials, rubbish, windblown debris, and dust resulting from construction operations.

8.2 Provide on-site containers for the collection of waste materials, debris and rubbish. Shield any containers holding significant materials such as oil, grease, oily rags, from entering the storm water systems.

8.3 Remove waste materials, debris and rubbish from the site periodically and dispose of same at approved locations.

8.4 Conduct cleaning and disposal operations to comply with all local, state and federal codes, ordinances, regulations, and anti-pollution laws, including NPDES requirements. Prior to beginning work, prepare, and maintain on-site, a Disposal Plan for the satisfactory disposal of all waste materials and debris.

8.5 Stop the source of the spill immediately, remembering to follow personal safety and protective measures and requirements.

8.6 Contain the liquid until cleanup is complete using appropriate barriers.

8.7 Notify the fire department or other designated response team immediately if the spill is larger than can be cleaned using dry methods, or if the spill is not immediately and safely contained. Report possible ground water contamination immediately to the Airport, County and Health Department.

8.8 Use dry methods to clean up the spill if possible. Do not use emulsifiers or dispersant or wash the spill into surface or ground water.

8.9 Place the contaminated material from cleanup operations in sealed and labeled drums protected against storm, surface or ground water contact. Arrange for a properly licensed waste disposal firm to collect and dispose of the contaminated materials.

8.10 Provide documentary evidence, including test results as applicable, of successful cleanup and disposal of spills of significant or hazardous materials.

8.11 All disposal of waste materials, excess excavation and debris shall be offsite. Disposal locations are subject to approval by the RPR. Contractor shall be responsible for arranging for and obtaining off-site disposal areas, including payment for all costs associated with such disposal.

Should the Contractor encounter unlabeled drums, materials with evident petroleum contamination, or other potentially significant or hazardous materials, he shall immediately take measures to protect workers and nearby residents from exposure.

The Contractor shall notify RPR and the appropriate hazardous materials (Hazmat) response team. The RPR will issue instructions on proceeding or suspending construction after such notification.

9.0 NOTIFICATION OF CONSTRUCTION ACTIVITIES

9.1 Points of Contact

Contractor shall provide and maintain a list of names and phone numbers for all parties affected by the project. Include emergency notification procedures. List on-duty and off-duty contact information for each individual including those responsible for emergency maintenance of Airport construction hazard lighting and barricades.

9.2 NOTAMS

Construction NOTAMS shall be issued by the Airport. Construction causing runway or taxiway closures shall be kept to a minimum. Scheduled closures shall be discussed with the Airport representatives as far in advance as possible, but not less than Seventy-two (72) hours in advance.

9.3 Emergency Notification Procedures

All accidents causing personal injury or property damage shall be reported to the Airport immediately. The Contractor shall provide, at the site, such equipment and medical facilities as are necessary to supply first aid service to anyone who may be injured in connection with the performance of the work, whether on or adjacent to the site, which causes death, personal injury, or property damage, giving full details and statements of witnesses. In addition, if death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone to 911.

9.4 Coordination with ARFF Personnel

See section 9.3 above.

9.5 Notification to the FAA

9.5.1 FAR Part 77

Any person proposing construction or alteration of objects that affect navigable airspace as defined in Part 77 must notify the FAA. The Airport will file FAA Form 7460-01 for this project. *The FAA Airspace Number will be provided to the contractor when available*. No crane shall be allowed on the work-site until the equipment and its intended operation are approved by Airport Operations. The Contractor shall provide the RPR and Airport Operations, with not less than 72-hour advance written notice requesting crane access to the AOA.

9.5.2 NAVAIDS

9.5.2.1 Airport-Owned/FAA-Maintained. If construction operations require a shutdown of more than 24 hours 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.

9.5.2.1.1 FAA-Owned.

The Airport must notify the appropriate FAA ATC Service Area Planning and Requirements (P&R) Group a minimum of 45 days prior to impacting the NAVAIDS (impacts to FAA equipment covered by a reimbursable agreement (RA) do not have to be reported by the Airport operator).

Coordinate work for any FAA-owned NAVAID shutdown with FAA Technical Operations. This includes any activity that requires FAA equipment to be removed from service, including any necessary reimbursable agreements and flight checks. Detail procedures that address unanticipated utility outages and cable cuts that could impact FAA NAVAIDS. In addition, provide several days notice to schedule the actual shutdown.

10.0 INSPECTION REQUIREMENTS

10.1 Daily Inspections shall be conducted by the Contractor with the RPR using the **Construction Project Daily Inspection Checklist**.

10.2 Final Inspections

An inspection will be conducted with Airport Operations in attendance prior to opening any closed movement area to traffic.

11.0 UNDERGROUND UTILITIES

No underground utilities other than existing drainage and electrical items are expected to be impacted. It is the Contractor's responsibility to locate and flag all existing utilities in the area that are to be protected during construction.

12.0 PENALTIES

Contractor shall be responsible for compliance with Airport rules and regulations by all employees and Subcontractors. Penalties for non-compliance include the following:

- Failure to follow safety and/or security requirements (proper identification, escorting, controlling security gate access, unauthorized access to cross active movement areas) will require the violator and the direct supervisor to re-attend SIDA class. Second infraction will result in revoking the SIDA badge and denied access to the jobsite.

- Reimbursement for any fines incurred as a result of non-compliance. Fines as high as **$10,000.00** may be assessed for runway incursions, and as high as $11,000 for TSA violations.

13.0 SPECIAL CONDITIONS

During periods of severe weather conditions or other operational emergencies, the Airport may direct the Contractor to relinquish areas under construction and to prepare the areas for aircraft operations. See also Section 14.0, Runway and Taxiway Visual Aids. In this event the RPR or Airport Operations will so direct the Contractor to evacuate the area, and the RPR or Airport Operations will specify the limits of the area to be evacuated, the term of evacuation and the conditions governing the restoration work necessary to prepare the area for aircraft operation. The Contractor shall promptly and fully comply with the RPR or Airport Operation's directive. Should the directive entail a delay in the completion of the Contract or any defined subdivision of the contract, as determined by the RPR or Airport Operations, the Contractor may be granted an extension of time.

14.0 RUNWAY AND TAXIWAY VISUAL AIDS

14.1 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 props wash, jet blast, wing vortices, or wind currents and constructed of materials that would minimize damage to an aircraft in the event of inadvertent contact.

14.2 Closures

If the Contractor requires access to operational areas not delineated on the Construction Safety Plan Drawings(s), the Contractor shall participate in negotiations leading to the imposition of restrictions on Airport operations in the affected areas. The Contractor shall strictly abide by all conditions imposed by the Airport relating to his entry and use of such areas, and shall not enter these areas until granted temporary, conditional entry clearance by the Airport.

The Contractor may be required to pursue affected portions of the work on a continuous, 24-hour per day basis during construction of the various phases and sub-phases shown on the Plans and described in the Contract Documents (such as when runways or taxiways, service or access roadways, service gates are closed for operations or when hazards of any kind arise).

Prior to the commencement of any demolition or other work which will cause an interruption or modification to existing aircraft operations, the Contractor shall confer with, and obtain authorization from, the RPR and Airport Operations.

When the Contractor's operations require the closure of any runway, taxiway, roadway, service gate, walkway, etc., the Contractor shall notify the RPR and Airport Operations not less than 72 hours prior to need. No runway, taxiway, roadway, service gate, walkway, etc., shall be closed without prior permission from the RPR and Airport Operations.

14.2.1 Temporarily Closed Runways.

Contractor shall place a lighted Runway Closure Marker (RCM) at each end of the runway facing the approach. RCM's shall be provided by the contractor in accordance with AC 150/5345-55, AC 150/5370-2 and NTSB Safety Recommendation A-03-05.

14.2.2 Temporarily Closed Taxiways.

This project will require temporary and permanent runway and taxiway markings. Marking design is in accordance with FAA Advisory Circular (AC) AC 150/5340-1L, "Standards for Airport Markings", and Technical Specification Item P-620, "Runway and Taxiway Painting".

FAA Advisory Circular 150/5340-18F, “Standards for Airport Sign Systems”, will be followed to re-designate the taxiways within the project limits. These changes dictate that almost every existing sign within the project limits will need to be replaced or modified to meet the new designations.

Contractor shall place barricades outside the safety area of runway/taxiway intersections, leading to any closed section. If the centerline markings will be reused in the same location upon reopening the taxiway the markings shall be painted over.

14.2.3 Temporarily Closed Lighting and NAVAIDS.

Temporary lighting or NAVAID closures shall be coordinated with Airport Operations a minimum of 72 hours in advance.

15.0 MARKING AND SIGNS FOR ACCESS ROUTES

Contractor shall utilize existing service roads and/or airfield pavements, as identified in **Appendix A,** for access routes to the site. Contractor shall place signage along the route to prevent inadvertent entry to areas open to airport operations.

16.0 HAZARD MARKING, LIGHTING AND SIGNING

16.1 General

Hazard Marking, Lighting and Signing prevents aircraft from entering areas closed to aircraft, and prevents construction personnel from entering areas open to aircraft. Contractor shall comply with 16.2 and 16.3.

16.2 Equipment

Portable floodlighting shall be provided as required, for construction that must occur during nighttime operations. All work areas shall be illuminated to a level of five (5) horizontal footcandles calculated and measured in accordance with the current standards of the Illumination Engineering Society.

Red and blue lens, ground-mounted, taxiway marker lights, pavement markings, signs, lighted barricades and other measures shall be installed and maintained on a 24-hour basis by the Contractor to delineate construction areas available to the Contractor and limits of aircraft operational areas. At the conclusion of each working day, the Contractor shall verify that the temporary lighting systems are in proper operation and good working condition. Any necessary maintenance repairs shall be performed by the Contractor prior to leaving the site.

The detailed layout of marking, lights, signs, barricades and other measures and attendant operational procedures shall be inspected by the RPR and Airport Operations, and any necessary changes or modifications will be promptly implemented by the Contractor as directed. The revised installation will be reinspected and approved by Airport Operations before the Contractor may

commence any construction or any other work which revises operational procedures in each affected area.

Connections to power supply for all temporary lighting systems shall be performed by the Contractor under the direction of the RPR and Airport Maintenance Division. Maintenance of all temporary lighting systems shall be performed by the Contractor, including nighttime trouble shooting of temporary lighting connected to any airfield system.

Lights and signs for temporarily closed runways and taxiways shall be deactivated within the work area. Mandatory runway holding position signs shall remain lit when the runway is closed. If deactivation is not possible (for example, if other taxiways on the same circuit must remain open), temporary covering of lights and signs serving deactivated areas shall be required in a manner preventing light leakage. The method of temporary cover shall be approved by the Airport and /or RPR.

The Contractor shall be required to provide, maintain and install temporary lighting and signage systems for all the existing systems that are removed or deactivated during construction that are required to be in operation at the end of each work day.

16.3 Barricades

The Contractor shall install lighting, marking, Florida Department of Transportation (FDOT) Type II barricades, low-profile barricades, and lighted runway closure "X" equipment, signs, and other measures to delineate closed and hazardous areas during construction. The guidance and procedures provided by FAA AC 150/5340-1J, Standards for Airport Markings, shall be utilized and as depicted on the Plans. Steady burning red obstruction lights are required to supplement lighted barricades for nighttime use or highlight hazardous or potentially dangerous objects. The location of these lights shall be as shown on the Plans or as directed by the RPR and Airport Operations. Obstruction lights, FDOT Type II barricades, low-profile barricades and signs shall not be located within runway or taxiway safety areas when the runway or taxiway is open to air traffic.

Barricades will be placed around each phase or subphase of the work in accordance with the phasing plans, and shall remain in place until completion of work in each phase. All locations shall be approved by the RPR.

17.0 PROTECTION OF SAFETY AREAS, OBJECT FREE AREAS, OBSTACLE FREE ZONES AND APPROACH/DEPARTURE SURFACES

17.1 Runway Safety Area (RSA)

No Construction activity, personnel, equipment or materials shall be permitted in the safety area of any active runway or above the height restrictions described herein and as shown in the plans at any time. 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, subject to approval by the FAA ATC and the Airport.

17.2 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.

The following areas must be protected along the edges of an active Runway:

Runway	Aircraft Approach Category (ACC)	Airplane Design Group (ADG)	RSA Width (ft)	OFZ Width (ft)	ROFA Width (ft)	Approach Visibility minimum
18	D	V	500	400	800	200-1/2 Mile
36	D	V	500	400	800	200-3/4 Mile
4	B	II	150	400	500	989-1 ¼ Mile
22	B	II	150	400	500	Visual

17.3 Taxiway Safety Area (TSA)

No Construction activity, personnel, equipment or materials shall be permitted in the safety area of any active taxiway. 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, subject to approval by the FAA ATC and the Airport.

17.3.1 Excavations.

Open trenches or excavations are not permitted within the TSA while the taxiway is open. If possible, backfill trenches before the taxiway is opened. If the taxiway must be opened before excavations are backfilled, 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.

Construction contractors must use low profile barricades with steady burning red lights, and prominently mark open trenches and excavations at the construction site, as approved by the Airport operator, and light them during hours of restricted visibility or darkness.

17.3.2 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.

17.4 Taxiway Object Free Area (TOFA)

Construction activity, personnel, equipment or materials shall not be permitted within the Obstacle Free Area (OFA) of an active taxiway. Dimensions may be adjusted temporarily 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, subject to approval by the FAA ATC and the Airport.

The following areas must be protected along the edges of an active Taxiway:

Taxiway	ADG	TSA width (ft)	TOFA width (ft)
A	IV	171	243
A1	IV	171	243
A2	IV	171	243
A3	IV	171	243
A4	IV	171	243
A5	IV	171	243
A6	IV	171	243
A7	IV	171	243
F	IV	171	243
G	IV	171	243
G1	IV	171	243
G2	IV	171	243
G3	IV	171	243
G4	IV	171	243

17.5 Obstacle Free Zone (OFZ)

No Construction activity, personnel, equipment or materials shall be permitted in the Obstacle Free Zone (OFZ) of any runway. For Runway 4-22, the OFZ lies outside of the RSA and located at the distances indicated in the runway protection table in section 17.2.

17.6 Runway Approach/departure surfaces

Personnel, material and/or equipment must remain clear of the threshold siting surfaces while the runway is open for aircraft operations.

18.0 OTHER LIMITATIONS ON CONSTRUCTION

18.1 Burning or Blasting

There is no burning or blasting allowed on Airport property.

18.2 Restrictions

18.2.1 Construction suspension required during specific airport operations:

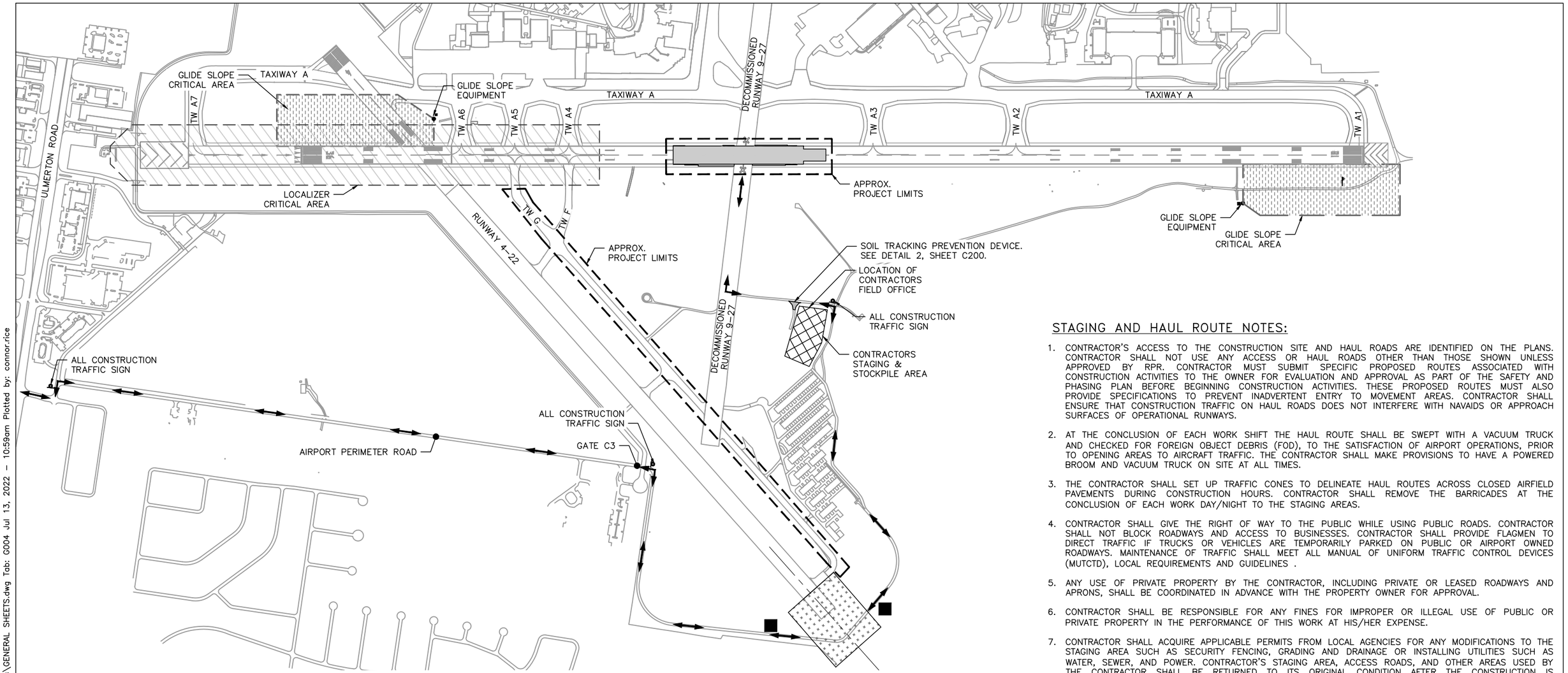
- Presidential visits
- Hurricane or disaster relief events

18.2.2 Areas that cannot be worked on simultaneously: progression of work shall be per Phasing Plans shown in **Appendix C.**

18.2.3 Day or night construction restrictions. See Phase Elements Section 2.0. In general, most work shall be during work day hours except for Phase 3.

18.2.4 Seasonal construction restrictions – Work affecting access to Terminal Gates or Ramps may not occur between November 15th and January 5th of any given Calendar Year.

APPENDIX A



NOTES:

1. CONTRACTOR TO PROVIDE FLAGMEN WITH AIRBAND RADIOS TUNED TO LOCAL ATCT FREQUENCY TO RESTRICT CONSTRUCTION TRAFFIC AND PERSONNEL WITHIN THE LIMITS OF THE ACCESS CONTROL AREA SHOWN DURING THE DURATION OF PHASE 1 ON A 24-HOUR PER DAY BASIS. FLAGMEN AND ACCESS CONTROL ARE INCIDENTAL TO ITEM M-102-1.

LEGEND

- RW 18-36 PAVING AREA
- CONTRACTORS STAGING & STOCKPILE AREA
- CONTROLLED ACCESS AREA
- HAUL ROUTE
- FLAGMEN
- APPROX. PROJECT LIMITS

STAGING AND HAUL ROUTE NOTES:

1. CONTRACTOR'S ACCESS TO THE CONSTRUCTION SITE AND HAUL ROADS ARE IDENTIFIED ON THE PLANS. CONTRACTOR SHALL NOT USE ANY ACCESS OR HAUL ROADS OTHER THAN THOSE SHOWN UNLESS APPROVED BY RPR. CONTRACTOR MUST SUBMIT SPECIFIC PROPOSED ROUTES ASSOCIATED WITH CONSTRUCTION ACTIVITIES TO THE OWNER FOR EVALUATION AND APPROVAL AS PART OF THE SAFETY AND PHASING PLAN BEFORE BEGINNING CONSTRUCTION ACTIVITIES. THESE PROPOSED ROUTES MUST ALSO PROVIDE SPECIFICATIONS TO PREVENT INADVERTENT ENTRY TO MOVEMENT AREAS. CONTRACTOR SHALL ENSURE THAT CONSTRUCTION TRAFFIC ON HAUL ROADS DOES NOT INTERFERE WITH NAVAIDS OR APPROACH SURFACES OF OPERATIONAL RUNWAYS.
2. AT THE CONCLUSION OF EACH WORK SHIFT THE HAUL ROUTE SHALL BE SWEPT WITH A VACUUM TRUCK AND CHECKED FOR FOREIGN OBJECT DEBRIS (FOD), TO THE SATISFACTION OF AIRPORT OPERATIONS, PRIOR TO OPENING AREAS TO AIRCRAFT TRAFFIC. THE CONTRACTOR SHALL MAKE PROVISIONS TO HAVE A POWERED BROOM AND VACUUM TRUCK ON SITE AT ALL TIMES.
3. THE CONTRACTOR SHALL SET UP TRAFFIC CONES TO DELINEATE HAUL ROUTES ACROSS CLOSED AIRFIELD PAVEMENTS DURING CONSTRUCTION HOURS. CONTRACTOR SHALL REMOVE THE BARRICADES AT THE CONCLUSION OF EACH WORK DAY/NIGHT TO THE STAGING AREAS.
4. CONTRACTOR SHALL GIVE THE RIGHT OF WAY TO THE PUBLIC WHILE USING PUBLIC ROADS. CONTRACTOR SHALL NOT BLOCK ROADWAYS AND ACCESS TO BUSINESSES. CONTRACTOR SHALL PROVIDE FLAGMEN TO DIRECT TRAFFIC IF TRUCKS OR VEHICLES ARE TEMPORARILY PARKED ON PUBLIC OR AIRPORT OWNED ROADWAYS. MAINTENANCE OF TRAFFIC SHALL MEET ALL MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCTD), LOCAL REQUIREMENTS AND GUIDELINES .
5. ANY USE OF PRIVATE PROPERTY BY THE CONTRACTOR, INCLUDING PRIVATE OR LEASED ROADWAYS AND APRONS, SHALL BE COORDINATED IN ADVANCE WITH THE PROPERTY OWNER FOR APPROVAL.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES FOR IMPROPER OR ILLEGAL USE OF PUBLIC OR PRIVATE PROPERTY IN THE PERFORMANCE OF THIS WORK AT HIS/HER EXPENSE.
7. CONTRACTOR SHALL ACQUIRE APPLICABLE PERMITS FROM LOCAL AGENCIES FOR ANY MODIFICATIONS TO THE STAGING AREA SUCH AS SECURITY FENCING, GRADING AND DRAINAGE OR INSTALLING UTILITIES SUCH AS WATER, SEWER, AND POWER. CONTRACTOR'S STAGING AREA, ACCESS ROADS, AND OTHER AREAS USED BY THE CONTRACTOR SHALL BE RETURNED TO ITS ORIGINAL CONDITION AFTER THE CONSTRUCTION IS COMPLETE AND ALL EQUIPMENT, TRAILERS, ETC. ARE REMOVED OFF THE AIRPORT PROPERTY. THE COST FOR THIS WORK SHALL BE INCLUDED IN THE BID UNIT PRICE FOR MOBILIZATION.
8. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING HIS/HER OWN UTILITIES, TEMPORARY FENCING, LIGHTING, AND OTHER ITEMS NECESSARY FOR THE STAGING AREA. COST FOR TEMPORARY UTILITIES AND LIGHTING SHALL BE INCLUDED IN THE BID UNIT PRICE FOR MOBILIZATION.
9. CONTRACTOR'S STAGING, STOCKPILING AND WORK AREAS SHALL BE CLEARLY MARKED AND LIGHTED FOR THE DURATION OF CONSTRUCTION. TEMPORARY LIGHTING SHALL BE PLACED IN A MANNER TO POINT AWAY FROM THE RUNWAY ENDS AND AIR TRAFFIC CONTROL TOWER. SEE ELECTRICAL NOTES (E001) FOR ADDITIONAL TEMPORARY LIGHTING REQUIREMENTS.
10. THE CONTRACTOR IS RESPONSIBLE FOR SECURING THEIR STOCKPILE AND STAGING AREAS, EQUIPMENT AND MATERIALS LOCATED ON AIRPORT PROPERTY.

REVISIONS:			
REV. NO	DATE	DESCRIPTION:	EOR

St. Pete-Clearwater International
TAMPA BAY THE EASY WAY

PIE RUNWAY 18-36
PAVEMENT MAINTENANCE

ST. PETE-CLEARWATER
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DATE:	JULY 2022

CONTRACT LAYOUT PLAN

G004

APPENDIX B

SAFETY NOTES

1. CONTRACTOR SHALL BE FAMILIAR WITH THE FOLLOWING FAA SAFETY PROVISIONS AND IMPLEMENT THESE REQUIREMENTS DURING CONSTRUCTION. THE LATEST COPIES OF THESE GUIDELINES CAN BE OBTAINED FROM THE ENGINEER OR ON-LINE AT (HTTP://WWW.FAA.GOV/REGULATIONS_POLICIES).
   - FAA ADVISORY CIRCULAR AC 150/5370-2G, "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION"
   - FAA ADVISORY CIRCULAR AC 150/5210-5D, "PAINTING, MARKING AND LIGHTING OF VEHICLES USED ON AN AIRPORT"
   - CODE OF FEDERAL REGULATIONS, 14 CFR PART 77, "SAFE EFFICENT USE AND PRESERVATION OF THE NAVIGABLE AIRSPACE"
   - FAA ADVISORY CIRCULAR 150/5210-24, "AIRPORT FOREIGN OBJECT DEBRIS (FOD) MANAGEMENT"
   - FAA ADVISORY CIRCULAR AC 150/5200-18C, "AIRPORT SAFETY SELF-INSPECTION"
   - AC 150/5200-33B – HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS
2. CONTRACTOR SHALL COMPLY WITH THE CONSTRUCTION SAFETY AND PHASING PLAN ASSOCIATED WITH THE CONSTRUCTION PROJECT AND ENSURE THAT CONSTRUCTION PERSONNEL ARE FAMILIAR WITH SAFETY PROCEDURES AND REGULATIONS ON THE AIRPORT.
3. CONTRACTOR SHALL 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.
4. CONTRACTOR SHALL PROVIDE A SAFETY OFFICER/CONSTRUCTION INSPECTOR FAMILIAR WITH AIRPORT SAFETY TO MONITOR CONSTRUCTION ACTIVITIES.
5. CONTRACTOR SHALL RESTRICT MOVEMENT OF CONSTRUCTION VEHICLES TO CONSTRUCTION AREAS BY FLAGGING AND BARRICADING, ERECTING TEMPORARY FENCING, OR PROVIDING ESCORTS, AS APPROPRIATE.
6. CONTRACTOR SHALL ENSURE THAT NO EMPLOYEES, EMPLOYEES OF SUBCONTRACTORS OR SUPPLIERS, OR OTHER PERSONS ENTER ANY PART OF THE AIR OPERATIONS AREAS (AOA) FROM THE CONSTRUCTION SITE UNLESS AUTHORIZED.
7. CONTRACTOR EMPLOYEES SHALL PARK AND SERVICE ALL CONSTRUCTION VEHICLES IN AN AREA DESIGNATED BY THE RPR OUTSIDE THE RUNWAY SAFETY AREAS (RSA) AND OBSTACLE FREE ZONE (OFZ) AND NEVER ON A CLOSED TAXIWAY OR RUNWAY. EMPLOYEES SHALL ALSO PARK CONSTRUCTION VEHICLES OUTSIDE THE OBJECT FREE AREA (OFA) WHEN NOT IN USE BY CONSTRUCTION PERSONNEL (E.G., OVERNIGHT, ON WEEKENDS, OR DURING OTHER PERIODS WHEN CONSTRUCTION IS NOT ACTIVE).
8. CONTRACTOR PERSONNEL ENGAGED IN ACTIVITIES INVOLVING UNESCORTED OPERATION ON AIRCRAFT MOVEMENT AREAS SHALL OBSERVE THE PROPER PROCEDURES FOR COMMUNICATIONS AND SHALL MONITOR ATC COMMUNICATIONS.
9. NO CONSTRUCTION MAY OCCUR CLOSER THAN 250 FEET FROM THE RUNWAY 18-36 CENTERLINE UNLESS THE RUNWAY IS CLOSED OR RESTRICTED TO AIRCRAFT OPERATIONS REQUIRING AN RSA THAT IS EQUAL TO THE RSA WIDTH AVAILABLE DURING CONSTRUCTION. NO CONSTRUCTION MAY OCCUR CLOSER THAN 250 FEET FROM RUNWAY 4-22 CENTERLINE UNLESS THE RUNWAY IS CLOSED OR RESTRICTED TO AIRCRAFT OPERATIONS REQUIRING AN OFZ THAT IS EQUAL TO THE WIDTH AVAILABLE DURING CONSTRUCTION.
10. CONTRACTOR SHALL PROMINENTLY MARK OPEN TRENCHES AND EXCAVATIONS AT THE CONSTRUCTION SITE WITH RED OR ORANGE FLAGS, AS APPROVED BY THE RPR, AND LIGHT THEM WITH RED LIGHTS DURING HOURS OF RESTRICTED VISIBILITY OR DARKNESS.
11. OPEN TRENCHES OR EXCAVATIONS ARE NOT PERMITTED WITHIN 250 FEET OF RUNWAY 18-36 CENTERLINE AND 250 FEET FROM THE THE RUNWAY 4-22 CENTERLINE WHILE THE RUNWAY IS OPEN. IF THE RUNWAY MUST BE OPENED BEFORE EXCAVATIONS ARE BACKFILLED, COVER THE EXCAVATIONS APPROPRIATELY. COVERINGS FOR OPEN TRENCHES OR EXCAVATIONS MUST BE OF SUFFICIENT STRENGTH TO SUPPORT THE WEIGHT OF THE HEAVIEST AIRCRAFT OPERATING ON THE RUNWAY.
12. EXCAVATIONS AND OPEN TRENCHES ARE NOT PERMITTED WITHIN THE TSA OF A TAXIWAY. COVERINGS FOR OPEN TRENCHES OR EXCAVATIONS MUST BE OF SUFFICIENT STRENGTH TO SUPPORT THE WEIGHT OF THE HEAVIEST AIRCRAFT OPERATING ON THE TAXIWAY AND APRON.
13. CONTRACTOR SHALL SEPARATE THE CONSTRUCTION SITE AND AREAS IN WHICH NO PART OF AN AIRCRAFT MAY ENTER BY USING LOW-PROFILE BARRICADES THAT ARE MARKED WITH DIAGONAL, ALTERNATING ORANGE AND WHITE STRIPES AND RED LIGHTS. BARRICADES MAY BE SUPPLEMENTED WITH ALTERNATING ORANGE AND WHITE FLAGS AT LEAST 3 FEET BY 3 FEET SQUARE AND MADE AND INSTALLED SO THEY ARE ALWAYS IN AN EXTENDED POSITION, PROPERLY ORIENTED, AND SECURELY FASTENED TO ELIMINATE JET ENGINE INGESTION. (SEE DETAILS ON SHEET G007)
14. STOCKPILED MATERIALS AND EQUIPMENT STORAGE ARE NOT PERMITTED WITHIN THE RSA AND OFZ OF AN OPERATIONAL RUNWAY OR WITHIN THE TOFA OF AN OPERATIONAL TAXIWAY. CONTRACTOR SHALL ENSURE THAT STOCKPILED MATERIALS AND EQUIPMENT ADJACENT TO THESE AREAS ARE PROMINENTLY MARKED AND LIGHTED DURING HOURS OF RESTRICTED VISIBILITY OR DARKNESS. THIS INCLUDES DETERMINING AND VERIFYING THAT MATERIALS ARE STORED AT AN APPROVED LOCATION TO PREVENT FOREIGN OBJECT DAMAGE AND ATTRACTION OF WILDLIFE.
15. CONTRACTOR MAY NOT USE OPEN-FLAME WELDING OR TORCHES UNLESS ADEQUATE FIRE SAFETY PRECAUTIONS ARE PROVIDED AND THE RPR HAS APPROVED THEIR USE.
16. WASTE AND LOOSE MATERIALS, COMMONLY REFERRED TO AS FOD, ARE CAPABLE OF CAUSING DAMAGE TO AIRCRAFT LANDING GEARS, PROPELLERS, AND JET ENGINES. CONTRACTOR SHALL NOT LEAVE OR PLACE FOD ON OR NEAR ACTIVE AIRCRAFT MOVEMENT AREAS. MATERIALS TRACKED ONTO THESE AREAS MUST BE CONTINUOUSLY REMOVED DURING CONSTRUCTION. CONTRACTOR SHALL ALSO CAREFULLY CONTROL AND CONTINUOUSLY REMOVE WASTE OR LOOSE MATERIALS THAT MIGHT ATTRACT WILDLIFE.
17. CONTRACTOR SHALL NOT CONDUCT ANY CONSTRUCTION ACTIVITY WITHIN NAVIGATIONAL AID RESTRICTED AREAS AND CRITICAL AREAS, WITHOUT PRIOR APPROVAL FROM THE LOCAL FAA AIRWAY FACILITIES SECTOR REPRESENTATIVE. NAVIGATIONAL AIDS INCLUDE INSTRUMENT LANDING SYSTEM COMPONENTS SUCH AS THE LOCALIZER, THE GLIDESLOPE, APPROACH LIGHTS, PAPIS, ETC. SUCH RESTRICTED AREAS ARE DEPICTED ON CONSTRUCTION PLANS.
18. ALL CONTRACTOR EQUIPMENT OPERATING IN THE AOA SHALL BE IDENTIFIED BY THREE-FOOT (3') SQUARE ORANGE AND WHITE FLAGS WHENEVER SUCH VEHICLE AND EQUIPMENT ARE OPERATING ON THE AOA. IN ADDITION, SUCH VEHICLES AND EQUIPMENT SHALL HAVE THE CONTRACTOR'S NAME CLEARLY AFFIXED ON EACH SIDE OF SUCH VEHICLES AND EQUIPMENT. DURING THE HOURS BETWEEN SUNSET AND SUNRISE AND AT ALL TIMES WHEN VISIBILITY IS IMPAIRED, VEHICLES AND MOBILE EQUIPMENT SHALL ALSO BE EQUIPPED WITH A REVOLVING YELLOW BEACON LIGHT MOUNTED ON THE TOP OF THE VEHICLE OR EQUIPMENT. BEACON LIGHTS SHALL PROVIDE:
    a. THREE HUNDRED AND SIXTY DEGREE AZIMUTH COVERAGE.
    b. EFFECTIVE INTENSITY IN THE HORIZONTAL PLANE NOT LESS THAN 40 OR MORE THAN 400 CANDELAS.
    c. BEAM SPREAD MEASURED TO 1/10 PEAK INTENSITY EXTENDING FROM 10 DEGREES TO 15 DEGREES ABOVE THE HORIZONTAL.
    d. SIXTY TO NINETY FLASHES PER MINUTE.
19. NO CRANE SHALL BE ALLOWED ON THE WORK SITE UNTIL THE EQUIPMENT AND ITS INTENDED OPERATION ARE APPROVED BY THE RPR. THE CONTRACTOR SHALL PROVIDE THE RPR WITH NOT LESS THAN 72-HOUR ADVANCE WRITTEN NOTICE REQUESTING CRANE ACCESS TO THE AOA.
20. WHEN ACCESS IS APPROVED BY THE RPR, THE TIP OF THE CRANE BOOM SHALL BE IDENTIFIED BY THE ORANGE AND WHITE FLAG AND BY RED OBSTRUCTION LIGHTS, CONFORMING TO FAA REQUIREMENTS.
21. CONTRACTOR SHALL HAVE RADIOS ON SITE AT ALL TIMES TO COMMUNICATE WITH THE AIR TRAFFIC CONTROL TOWER AND MONITOR AIRCRAFT ACTIVITIES. COST FOR RADIOS ARE INCIDENTAL TO MOBILIZATION.
22. DURING PERIODS OF SEVERE WEATHER CONDITIONS OR OTHER OPERATIONAL EMERGENCIES, THE RPR MAY DIRECT THE CONTRACTOR TO RELINQUISH AREAS UNDER CONSTRUCTION AND TO PREPARE THE AREAS FOR AIRCRAFT OPERATIONS. IN THIS EVENT THE RPR WILL SO DIRECT THE CONTRACTOR TO EVACUATE THE AREA AND THE RPR WILL SPECIFY THE LIMITS OF THE AREA TO BE EVACUATED, THE TERM OF EVACUATION AND THE CONDITIONS GOVERNING THE RESTORATION WORK NECESSARY TO PREPARE THE AREA FOR AIRCRAFT OPERATION. THE CONTRACTOR SHALL PROMPTLY AND FULLY COMPLY WITH THE RPR'S DIRECTIVE. SHOULD THE DIRECTIVE ENTAIL EXTRA WORK UNDER THE CONTRACT, AS DETERMINED BY THE RPR, THE CONTRACTOR WILL BE REIMBURSED FOR SUCH EXTRA WORK. SHOULD THE DIRECTIVE ENTAIL A DELAY IN THE COMPLETION OF THE CONTRACT OR ANY DEFINED SUBDIVISION OF THE CONTRACT, AS DETERMINED BY THE RPR, THE CONTRACTOR MAY BE GRANTED AN EXTENSION OF TIME.
23. VEHICULAR TRAFFIC SHALL NOT CROSS ACTIVE AIRCRAFT MOVEMENT AREAS (RUNWAYS, TAXIWAYS OR AIRCRAFT PARKING APRON) WITHOUT PRIOR APPROVAL, AND PROPER RADIO COMMUNICATIONS OR ESCORTS.
24. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACTIONS OF EMPLOYEES AND SUBCONTRACTORS. PERSONNEL WHO DO NOT ABIDE BY AIRPORT RULES AND REGULATIONS ARE SUBJECT TO PROSECUTION AND OR MONETARY FINES.
25. ALL ACCIDENTS CAUSING PERSONAL INJURY OR PROPERTY DAMAGE SHALL BE REPORTED TO THE RPR IMMEDIATELY. THE CONTRACTOR(S) SHALL PROVIDE, AT THE SITE, SUCH EQUIPMENT AND MEDICAL FACILITIES AS ARE NECESSARY TO SUPPLY FIRST AID SERVICE TO ANYONE WHO MAY BE INJURED IN CONNECTION WITH THE PERFORMANCE OF THE WORK, WHETHER ON OR ADJACENT TO THE SITE. IN ADDITION, IF DEATH OR SERIOUS INJURIES OR SERIOUS DAMAGES ARE CAUSED, THE ACCIDENT SHALL BE REPORTED IMMEDIATELY BY TELEPHONE TO 911 DISPATCH.
26. THE CONTRACTOR'S EMPLOYEES, MUST HAVE A VALID GOVERNMENTAL IDENTIFICATION ON THEIR PERSON AT ALL TIMES. FAILURE TO COMPLY WITH THESE REQUIREMENTS WILL RESULT IN THE EMPLOYEE BEING ESCORTED OFF THE AOA AND FINES MAY BE IMPOSED AT THE CONTRACTOR'S EXPENSE.
27. ANY DELAY IN CONSTRUCTION OF PROJECT DUE TO VIOLATION OF FEDERAL AND/OR AIRPORT REGULATIONS SHALL BE ABSORBED BY THE CONTRACTOR.
28. CONTRACTOR WILL NOT BE ALLOWED TO USE ANY OF THE EXISTING TAXIWAY OR RAMPS, OTHER THAN WHAT IS SPECIFICALLY, AUTHORIZED BY THE RPR.
29. CONTRACTOR IS REQUIRED TO MAINTAIN A POWER SWEEPER AND PERSONNEL CAPABLE OF OPERATING IT ON SITE AT ALL TIMES; AND SHALL CLEAN ALL WORK AREAS, HAUL ROUTES AND OTHER AIRPORT PAVEMENT AREAS CONTAINING DEBRIS AS A RESULT OF CONTRACTOR'S OPERATIONS.
30. CONTRACTOR IS REQUIRED TO HAVE A PERSON ON CALL 24-HOURS A DAY, 7 DAYS A WEEK FOR EMERGENCY MAINTENANCE OF AIRPORT HAZARD LIGHTING AND BARRICADES. CONTRACTOR MUST FILE THE CONTACT PERSON'S NAME WITH THE RPR.
31. CONTRACTOR SHALL PROVIDE AN EMERGENCY NOTIFICATION LIST (24-HOUR CONTACT LIST) WHICH IDENTIFIES THE PROJECT MANAGER AND ALL SUBCONTRACTOR SUPERVISORS/LEADS.
32. ALL TAXIWAY AND RUNWAY CLOSURE REQUESTS MUST BE SUBMITTED 72 HRS IN ADVANCE OF THE REQUESTED CLOSURE PERIOD. THE REQUEST MUST INDICATE THE AREAS NEEDED AND A SCHEDULE OF OPERATIONS AND TIME(S) REQUIRED FOR OPERATIONS WITHIN THE AREA.
33. ALL TAXIWAY AND RUNWAY REQUESTS ARE CONTINGENT ON REVIEW AND APPROVAL BY THE RPR AND WIND AND WEATHER AVAILABILITY. THE AIRPORT RESERVES THE RIGHT TO SHIFT ANY APPROVED CLOSURE PERIODS TO ALLEVIATE AIRCRAFT CONGESTION WHEN WEATHER CONDITIONS DICTATE.

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REV. NO	DATE	DESCRIPTION:	EOR

St. Pete-Clearwater International
TAMPA BAY THE EASY WAY

PIE RUNWAY 18-36
PAVEMENT MAINTENANCE

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DRAWN:	BJG
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CHECKED:	PPP
DATE:	JULY 2022

PROJECT SAFETY NOTES

G005

SECURITY NOTES

1. IT IS INTENDED THAT THE CONTRACTOR SHALL COMPLY WITH ALL SECURITY REQUIREMENTS SPECIFIED HEREIN AND IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL DESIGNATE TO THE RPR IN WRITING THE NAME OF ITS "CONTRACTOR SECURITY OFFICER" (CSO). THE CSO SHALL REPRESENT THE CONTRACTOR ON THE SECURITY REQUIREMENTS OF THE CONTRACT. THE CSO FOR THIS PROJECT MAY BE THE PROJECT SUPERINTENDENT/SUPERVISOR. THE CSO SHALL BE REQUIRED TO FAMILIARIZE THEMSELVES WITH REQUIREMENTS OF OPERATING WITHIN THE AIRFIELD AND APPLICABLE RULES AND REGULATIONS. THE CSO SHALL BE RESPONSIBLE FOR BRIEFING ALL CONTRACTOR PERSONNEL ON THESE REQUIREMENTS AND, FROM TIME TO TIME, OTHER SECURITY PROVISIONS ADOPTED BY PIE. ALL NEW CONTRACTOR EMPLOYEES SHALL BE BRIEFED ON THESE REQUIREMENTS PRIOR TO WORKING IN THE CONSTRUCTION AREA.

2. THE CONTRACTOR'S ACCESS TO THE SITE SHALL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE RPR. NO OTHER ACCESS POINTS SHALL BE ALLOWED UNLESS APPROVED BY PIE AND DIRECTED BY THE RPR. ALL CONTRACTOR TRAFFIC AUTHORIZED TO ENTER THE SITE SHALL BE EXPERIENCED IN THE ROUTE OR GUIDED BY CONTRACTOR PERSONNEL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL TO AND FROM THE VARIOUS CONSTRUCTION AREAS ON AIRPORT PROPERTY. DIRECTIONAL SIGNING AT THE ACCESS POINT AND ALONG THE DELIVERY ROUTE TO THE STORAGE AREA OR WORK SITE SHALL BE AS DIRECTED BY THE "OWNER'S AUTHORIZED REPRESENTATIVE" RPR.

3. ALL CONTRACTOR'S MATERIAL ORDERS FOR DELIVERY TO THE SITE MUST BE ESCORTED BY THE CONTRACTOR. THIS WILL PRECLUDE DELIVERY TRUCKS FROM ENTERING INTO THE AIRPORT OR TAKING SHORT-CUTS THROUGH THE PERIMETER GATES AND ENTERING INTO AIRPORT OPERATIONS AREAS INADVERTENTLY.

4. THE MATERIAL STORAGE AREA, EQUIPMENT STORAGE AREA, PARKING AREA AND OTHER AREAS DEFINED AS REQUIRED FOR THE CONTRACTOR'S EXCLUSIVE USE DURING CONSTRUCTION SHALL BE AS SHOWN ON THE PROJECT DRAWINGS OR AS DIRECTED BY THE RPR. THE CONTRACTOR MAY ERECT, MAINTAIN AND REMOVE AT COMPLETION OF THE PROJECT AROUND THE PERIMETER OF THESE AREA SUITABLE FENCING, MARKING AND/OR WARNING DEVICES VISIBLE FOR DAY/NIGHT USE.

5. THE CONTRACTOR ACCESS GATE DESIGNATED FOR USE MAY BE UTILIZED BY OTHER CONTRACTORS OR BY PIE STAFF DURING THIS PROJECT. THE CONTRACTOR IS REQUIRED TO COORDINATE ACCESS WITH ALL PARTIES. NO ADDITIONAL COMPENSATION SHALL BE MADE FOR ISSUES RELATED TO SITE ACCESS.

6. IDENTIFICATION OF PERSONNEL: ALL EMPLOYEES, AGENTS, VENDORS, INVITEES, ETC. OF THE CONTRACTOR OR SUBCONTRACTORS REQUIRING ACCESS TO THE PROJECT SITE OR STAGING AREA, IN ACCORDANCE WITH THE PIE SECURITY PROGRAM, WILL BE REQUIRED TO DISPLAY AIRPORT ISSUED IDENTIFICATION OR BE UNDER ESCORT BY PROPERLY BAGGED PERSONNEL. SUPERVISORS SHALL BE BADGED WITH A ST. PETE-CLEARWATER INTERNATIONAL SIDA BADGE. AT THE COMPLETION OF THE CONTRACT ALL BADGES WILL BE RETURNED TO THE AIRPORT OR A PER BADGE CHARGE WILL BE ASSESSED FOR ALL BADGES NOT RETURNED. AS PART OF THE BADGE APPLICATION PROCESS, EACH APPLICANT WILL BE FINGERPRINTED FOR USE IN AN FBI CRIMINAL RECORDS SEARCH. ANY PERSON WHOSE CRIMINAL RECORD REVEALS OFFENSES LISTED BY FAA AS DISQUALIFYING OFFENSES WILL BE DENIED A BADGE AND WILL BE PROHIBITED FROM UNESCORTED ACCESS TO THE PROJECT SITE. ALL REQUIRED PAPERWORK AND ID BADGE APPLICATIONS SHALL BE SUBMITTED A MINIMUM OF TWO (2) WEEKS BEFORE ISSUANCE OF ANY BADGE. CONTRACTOR PERSONNEL REQUIRING AIRPORT ISSUED BADGES ARE RESPONSIBLE FOR ATTENDING SIDA TRAINING AND COMPLETING SECURITY BADGE APPLICATIONS, WHICH WILL INCLUDE AIR/GROUND RADIO, TAXIWAY AND AIRPORT FAMILIARIZATION. THERE MAY BE A CHARGE FOR THE FBI BACKGROUND CHECK AND FINGERPRINTING PROCESS, THE COST OF WHICH SHALL BE INCIDENTAL TO ITEM M-101, MOBILIZATION. ALL EMPLOYEES, AGENTS, VENDORS, INVITEES, ETC. OF THE CONTRACTOR OR SUBCONTRACTORS HAVING ACCESS TO THE AOA UNDER ESCORT SHALL CONSPICUOUSLY WEAR EITHER SHIRT AND/OR HARD HAT THAT IDENTIFIES THE PERSON TO THE PROJECT AND EMPLOYER.

7. IDENTIFICATION OF VEHICLES: THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN A LIST OF CONTRACTOR AND SUB-CONTRACTOR VEHICLES AUTHORIZED TO OPERATE ON THE SITE. VEHICLE PERMITS SHALL BE ASSIGNED IN A MANNER IN WHICH TO ASSURE POSITIVE IDENTIFICATION OF THE UNIT AT ALL TIMES. IN LIEU OF ISSUING INDIVIDUAL PERMITS, THE CSO CAN REQUIRE EACH VEHICLE TO DISPLAY A LARGE COMPANY SIGN ON BOTH SIDES OF THE VEHICLE AND ISSUE TO THE RPR, A CURRENT LIST OF COMPANIES AUTHORIZED TO ENTER AND CONDUCT WORK ON THE AIRPORT. CONTRACTOR EMPLOYEE PERSONAL VEHICLES ARE NOT ALLOWED ON THE AIRFIELD AT ANY TIME.

8. THE CONTRACTOR SHALL COORDINATE HAUL ROUTE AND ACCESS OPERATIONS WITH ALL OTHER CONTRACTORS UTILIZING THE SAME ROUTES.

9. NO GATE IS TO BE LEFT UNATTENDED AT ANY TIME. GATES ARE TO BE CLOSED AND LOCKED WHEN NOT IN USE.

10. ALL ACCESS GATES SHALL BE CLOSED DURING CONSTRUCTION, UNLESS THE CONTRACTOR PROVIDES A FULL-TIME BONDED SECURITY GATE GUARD WHO IS TRAINED AND BADGED FOR ACCESS TO THE AOA. IT IS THE CONTRACTOR'S RESPONSIBILITY TO KEEP THE AIRPORT SECURED AT ALL TIMES DURING CONSTRUCTION.

11. CONTRACTOR PERSONNEL SECURITY ORIENTATION: THE CSO SHALL BE RESPONSIBLE FOR BRIEFING ALL CONTRACTOR PERSONNEL ON SECURITY REQUIREMENTS AS OUTLINED IN THE CONTRACT DOCUMENTS.

12. ACCESS TO THE SITE: CONTRACTOR'S ACCESS TO THE SITE SHALL BE AS SHOWN ON THE PLANS. NO OTHER ACCESS POINTS SHALL BE ALLOWED. THE CONTRACTOR IS RESPONSIBLE FOR IMMEDIATE CLEANUP OF ANY DEBRIS DEPOSITED ALONG ANY ROUTE USED AS A RESULT OF THEIR CONSTRUCTION TRAFFIC.

13. THE CONTRACTOR SHALL MAINTAIN A LIST OF ALL AUTHORIZED PROJECT PERSONNEL AND IT SHALL BE SUBMITTED TO PIE PRIOR TO BEGINNING WORK.

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REVISIONS:			
REV. NO	DATE	DESCRIPTION:	EOR

St. Pete-Clearwater International
TAMPA BAY THE EASY WAY

PIE RUNWAY 18-36
PAVEMENT MAINTENANCE

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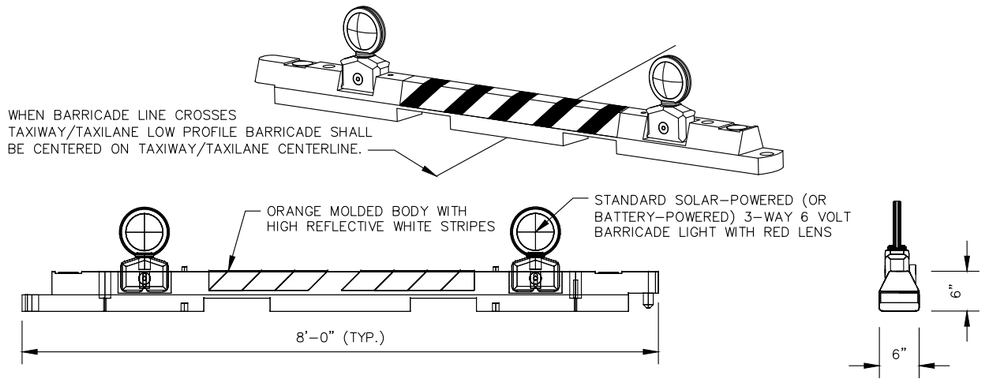
CHECKED:	PPP
DATE:	JULY 2022

PROJECT SECURITY NOTES

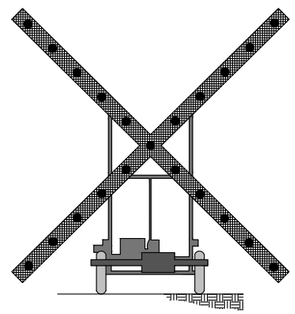
G006

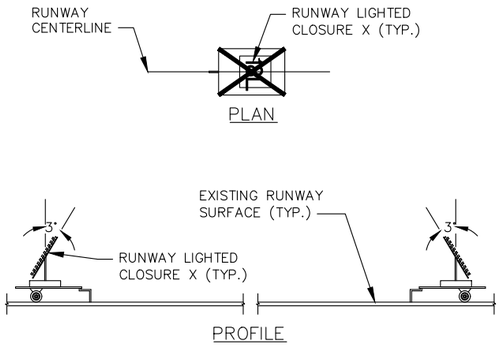


LOW PROFILE BARRICADE NOTES:

1. MAXIMUM TOTAL HEIGHT OF BARRICADES SHALL NOT BE MORE THAN 18 INCHES.
2. TYPICAL BARRICADE SHALL BE PLACED, ALONG THE LIMITS OF THE PHASES OF WORK, AS SHOWN IN THESE PLANS TO DELINEATE THE CONTRACTOR'S WORK AREAS AND CLOSED RUNWAYS/TAXIWAYS/TAXILANES.
3. BARRICADES SHALL EITHER BE WATERFILLED OR WEIGHTED WITH SANDBAGS TO SECURE AGAINST JET BLAST. SANDBAGS SHALL BE A MINIMUM OF 25 LBS. EACH WITH ONE WIGHTED ON EACH END.
4. ALL BARRICADES AND SANDBAGS SHALL BE CHECKED VISUALLY FOR SIGNS OF WEAR AND TEAR ON A DAILY BASIS. BARRICADES SHALL BE REPAINTED, INCLUDING REFLECTIVE STRIPES, AND SANDBAGS REPLACED WHEN DEEMED APPROPRIATE BY THE RPR. ALL LIGHT FIXTURES SHALL BE IN GOOD WORKING ORDER AND SHALL BE CHECKED BY THE CONTRACTOR ON A DAILY BASIS BEFORE THE CONTRACTOR CEASES OPERATIONS FOR THE DAY.
5. ALL BARRICADES SHALL BE MOVED AT LEAST ONCE EACH WEEK AND THE CONTRACTOR SHALL SWEEP THE ACCUMULATED DEBRIS AND REMOVE AND DISPOSE OF THE DEBRIS OFFSITE AT AN APPROVED DISPOSAL FACILITY. THE BARRICADES SHALL THEN BE REPLACED AT THE APPROPRIATE LOCATION.
6. CAUTION LIGHTS SHALL BE RED IN COLOR AND FLASHING DURING HOURS OF DARKNESS.
7. ALL LOW PROFILE BARRICADES ARE TO BE PLACED AT A MAXIMUM INTERVAL OF 4 FEET END TO END.
8. THE CONTRACTOR MAY SUBSTITUTE AN EQUAL LOW PROFILE BARRICADE APPROVED BY THE ENGINEER, GENERALLY CONFORMING TO THE ABOVE DETAILS, AND CONFORMING TO THE SPECIFICATIONS.
9. COST OF FURNISHING AND MAINTAINING BARRICADES SHALL BE INCLUDED IN THE CONTRACTORS BID UNIT COST FOR ITEM M-102-1 MAINTENANCE OF TRAFFIC AND TEMPORARY CONSTRUCTION ITEMS.

1 / G007 LOW-PROFILE BARRICADE DETAIL
NOT TO SCALE

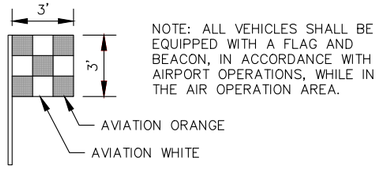




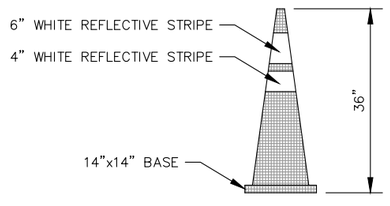
RUNWAY CLOSURE MARKER NOTES

1. THE AIRPORT SHALL PROVIDE UP TO TWO (2) LIGHTED X'S TO THE CONTRACTOR FOR THEIR USE IN THE EVENT OF A RUNWAY CLOSURE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE MARKERS FOR THE DURATION OF THE PROJECT INCLUDING, BUT NOT LIMITED TO, PROVIDING FUEL, OIL, FUELING, OIL CHANGES, BULBS, ETC.
2. MARKERS SHALL BE PLACED ON BOTH ENDS OF ANY RUNWAY REQUIRING TEMPORARY CLOSURE AND SHALL COVER THE RUNWAY NUMERALS, AS SHOWN ON THE PHASING PLANS AND IN ACCORDANCE WITH FAA AC 150/5370-2G.
3. MARKERS SHALL BE PLACED IMMEDIATELY WHEN THE RUNWAY IS CLOSED. THE CONTRACTOR SHALL REMOVE THE MARKERS WHEN DIRECTED BY THE RPR OR AIRPORT OPERATIONS, PRIOR TO REOPENING THE RUNWAY.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FUEL COSTS AND BATTERY OPERATIONS AND HAVE ADDITIONAL FUEL AVAILABLE TO ENSURE NO INTERRUPTION IN PERFORMANCE. THE CONTRACTOR SHALL CHECK THE FUEL LEVEL EVERY DAY AND ADD FUEL AS NECESSARY.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REFURBISHING THE MARKERS TO THEIR ORIGINAL CONDITION AT THE END OF THE PROJECT BEFORE RETURNING THEM TO THE AIRPORT.
6. ALL COSTS ASSOCIATED WITH SETTING UP, TRANSPORTING, MAINTAINING, AND REFURBISHING THE RUNWAY CLOSURE MARKERS SHALL BE INCLUDED IN THE LUMP SUM UNIT PRICE FOR ITEM M-102-2 MAINTENANCE OF AIRPORT SUPPLIED RUNWAY CLOSURE MARKER.

2 / G007 LIGHTED CLOSED RUNWAY MARKER
NOT TO SCALE



3 / G007 VEHICLE FLAG DETAIL
NOT TO SCALE



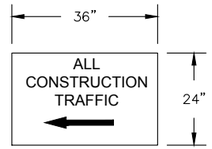
ORANGE TRAFFIC CONE NOTES:

1. TRAFFIC CONES SHALL BE PLACED AT A MAXIMUM INTERVAL OF 10 FEET ALONG ON-PAVEMENT HAUL ROUTES OR AS DETERMINED BY THE RPR.

4 / G007 ORANGE TRAFFIC CONE DETAIL
NOT TO SCALE

NOTES

1. SIGN BACKGROUND IS TO BE WHITE. SIGN LETTERING IS TO BE BLACK, MINIMUM HEIGHT OF 3", AND BE A BOLD LETTERING STYLE SIMILAR TO THE THE DETAIL SHOWN.
2. SIGN IS TO BE LOCATED HIGH ENOUGH TO ALLOW EASY VIEWING FROM ALL THE CONSTRUCTION VEHICLES ENTERING THE CONSTRUCTION SITE. TWO MOUNTING POLES ARE REQUIRED FOR EACH SIGN UNLESS APPROVED BY THE RPR.
3. SIGN PLACEMENT SHALL BE AS DIRECTED PER THE RPR.
4. ALL CONSTRUCTION TRAFFIC SIGNAGE SHALL BE INCLUDED AND IS INCIDENTAL TO PAY ITEM M-102-1.



5 / G007 CONSTRUCTION TRAFFIC SIGN
NOT TO SCALE

REVISIONS:			
REV. NO	DATE	DESCRIPTION:	EOR

PIE RUNWAY 18-36
PAVEMENT MAINTENANCE

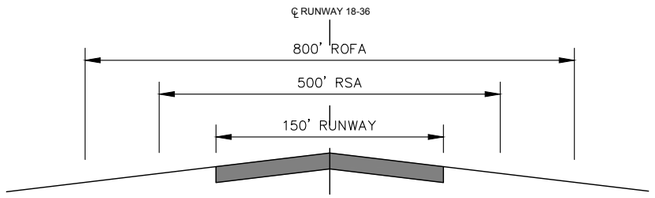
ST. PETE-CLEARWATER
INTERNATIONAL AIRPORT
CLEARWATER, FL

201 NORTH FRANKLIN STREET, SUITE 1400
TAMPA, FLORIDA 33602
PHONE: 813-620-1460
WWW.KIMLEY-HORN.COM CA 00000696

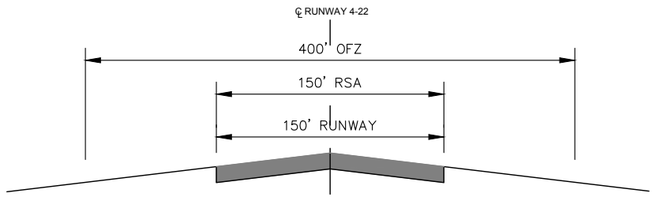
JOB NO:	
DRAWN:	BJG
DESIGN:	BJG
CHECKED:	PPP
DATE:	JULY 2022

PROJECT SAFETY AND MOT DETAILS

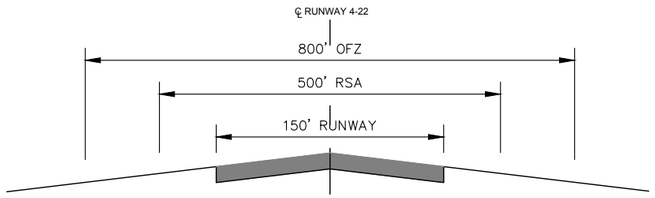
G007



1 G008 RUNWAY 18–36 – TYPICAL SECTION
SAFETY AREA AND OBJECT FREE AREA
NOT TO SCALE

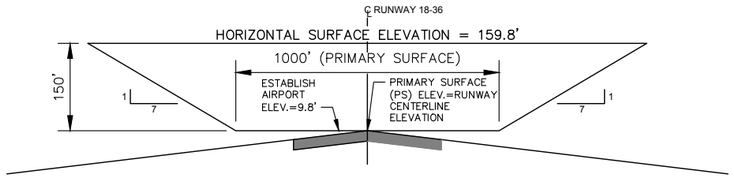


2 G008 RUNWAY 4–22 – TYPICAL SECTION
SAFETY AREA AND OBJECT FREE AREA
NOT TO SCALE

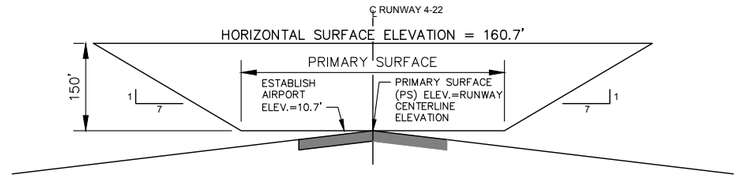


3 G008 RUNWAY 4–22 – TYPICAL SECTION (PHASE 1)
SAFETY AREA AND OBJECT FREE AREA
NOT TO SCALE

1. CONTRACTOR SHALL PARK ALL EQUIPMENT AND VEHICLE OUTSIDE THE OBJECT FREE AREA WHEN RUNWAY IS OPEN FOR AIRCRAFT OPERATIONS.
2. CONTRACTOR SHALL KEEP ALL PERSONNEL AND EQUIPMENT OUTSIDE THE RUNWAY SAFETY AREA (RSA), UNLESS APPROVED BY THE ENGINEER, WHEN RUNWAY IS OPEN FOR AIRCRAFT OPERATIONS.

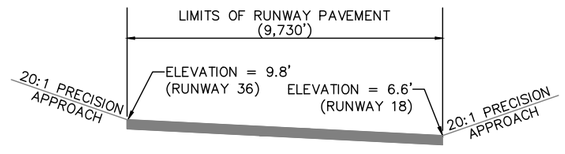


4 G008 RUNWAY 18–36 – TYPICAL SECTION
FAR PART 77 IMAGINARY SURFACES
NOT TO SCALE

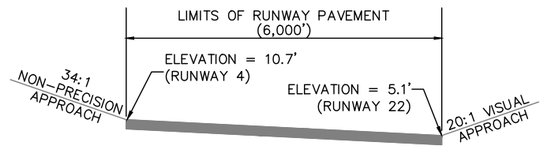


5 G008 RUNWAY 4–22 – TYPICAL SECTION
FAR PART 77 IMAGINARY SURFACES
NOT TO SCALE

1. NO OBJECT SHALL PENETRATE PART 77 SURFACES WHEN THE RUNWAY IS OPEN FOR AIRCRAFT OPERATIONS UNLESS PRIOR FAA APPROVAL IS OBTAINED.
2. THE OWNER WILL SUBMIT AN AIRSPACE CHECKLIST (FORM 7460–1) TO THE FAA 30 DAYS PRIOR TO NOTICE–TO–PROCEED WITH CONSTRUCTION INDICATING THE TYPE AND HEIGHT OF TEMPORARY EQUIPMENT THE CONTRACTOR WILL USE OR STORE IN THE AOA. THE CONTRACTOR SHALL PROVIDE THIS INFORMATION TO THE OWNER AT LEAST 60 DAYS PRIOR TO NOTICE–TO–PROCEED.
3. THE OWNER WILL SUBMIT AN AIRSPACE CHECKLIST (FORM 7460–1) TO THE FAA FOR APPROVAL OF ANY SPECIALTY EQUIPMENT SUCH AS CRANES OR EARTH MOVING EQUIPMENT THE CONTRACTOR WILL USE OR STORE IN THE AOA. MAXIMUM EQUIPMENT HEIGHT PERMITTED IS 20' UNLESS APPROVED BY AIRPORT OPERATIONS. THE CONTRACTOR SHALL PROVIDE THIS INFORMATION TO THE OWNER AT LEAST 75 DAYS PRIOR TO USE.



6 G008 RUNWAY 18–36 – PROFILE
FAR PART 77 IMAGINARY SURFACES
NOT TO SCALE



7 G008 RUNWAY 4–22 – PROFILE
FAR PART 77 IMAGINARY SURFACES
NOT TO SCALE

REVISIONS:			
REV. NO	DATE	DESCRIPTION:	EOR

PIE St. Pete-Clearwater International
TAMPA BAY THE EASY WAY

PIE RUNWAY 18-36
PAVEMENT MAINTENANCE

ST. PETE-CLEARWATER
INTERNATIONAL AIRPORT
CLEARWATER, FL

Kimley»Horn
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JOB NO:	
DRAWN:	BJG
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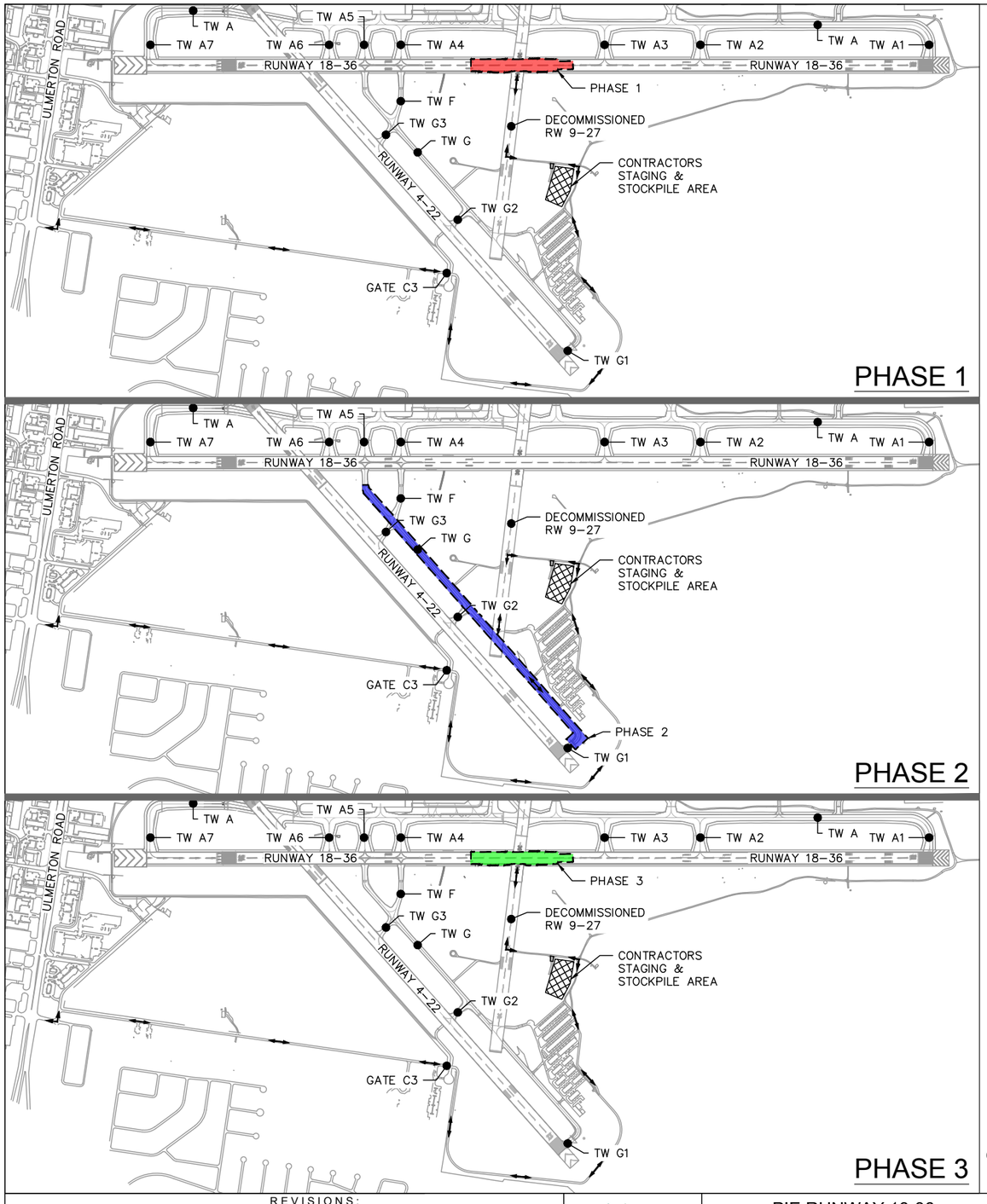
DATE:	JULY 2022

AIRSPACE SURFACE PROTECTION PLAN

G008

APPENDIX C



GENERAL PHASING NOTES:

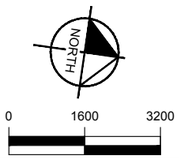
1. PHASING SHOWN IS BASED ON PIE OPERATIONAL REQUIREMENTS. CONTRACTOR TO SUPPLY DETAILED CONSTRUCTION PHASING PLAN, SCHEDULE, AND SAFETY PLAN COMPLIANCE DOCUMENT BEFORE ANY CONSTRUCTION IS PERMITTED.
2. WORK LISTED IN EACH PHASE DESCRIPTION IS APPROXIMATE – SEE ALL CONSTRUCTION DRAWINGS AND SPECIFICATIONS FOR COMPLETE DESCRIPTION OF WORK REQUIRED.
3. PRIOR TO THE COMMENCEMENT OF EACH PHASE, THE CONTRACTOR SHALL REVIEW THE PROPOSED LOCATION OF BARRICADES AND MOT DEVICES WITH THE RPR AND AIRPORT OPERATIONS.
4. A MINIMUM OF TWO–WEEKS PRIOR TO CLOSURE OF ANY AIRFIELD FACILITY, INCLUDING RUNWAYS, THE CONTRACTOR SHALL COORDINATE WITH THE RPR, AIRPORT OPERATIONS, AND ATCT FOR TEMPORARY COVERING OR DECOMMISSIONING OF AIRFIELD LIGHTING, SIGNAGE, AND NAVIGATIONAL AIDS.
5. LOCATION OF FLAGMEN SHOWN ON PLANS IS APPROXIMATE. FINAL LOCATIONS TO BE FIELD COORDINATED BY RPR AND AIRPORT OPERATIONS.
6. NIGHT WORK IS APPROXIMATELY 11:00 P.M. – 5:00 A.M. ACTUAL NIGHT WORK HOURS TO BE COORDINATED WITH RPR.
7. CONTRACTOR TO PERFORM SITE INVESTIGATION AND LOCATE ALL UTILITIES, INCLUDING AIRFIELD ELECTRICAL AND COMMUNICATIONS INFRASTRUCTURE, PRIOR TO START OF EACH PHASE OF WORK. CONTRACTOR TO COORDINATE WITH RPR, AIRPORT MAINTENANCE, AND AIRPORT OPERATIONS FOR ACCESS A MINIMUM OF TWO WEEKS PRIOR TO ENTERING EACH SUBSEQUENT WORK AREA.
8. DESCRIPTIONS OF WORK LISTED WITHIN EACH PHASE PLAN ARE INTENDED TO PROVIDE GENERAL GUIDANCE ON THE SCOPE OF WORK WITHIN EACH WORK AREA, AND ARE NOT TO BE CONSIDERED INCLUSIVE OF ALL WORK REQUIRED. SPECIFIC WORK ELEMENTS SHOWN IN OTHER SECTIONS OF THE PLANS SHALL REPRESENT THE CONTRACT SCOPE OF WORK.
9. TEMPORARY MARKINGS APPLIED NOT IN COMPLIANCE WITH AC 150/5340–1M (OR LATEST EDITION) WILL REQUIRE A NOTAM TO BE ISSUED REGARDING ANY NON–STANDARD MARKINGS. SPECIFICALLY, MARKINGS SPECIFIED WITHIN THESE PLANS TO BE APPLIED AT 50% APPLICATION RATE AND/OR WITHOUT GLASS BEADS SHALL REQUIRE A NOTAM. CONTRACTOR TO COORDINATE WITH RPR PRIOR TO REOPENING PAVEMENTS MARKED WITH NON–STANDARD TEMPORARY MARKINGS TO AIRCRAFT FOR ISSUANCE OF THE PROPER NOTAM BY AIRPORT OPERATIONS.

NOTE:

1. DUE TO THE SEPARATION DISTANCE BETWEEN RUNWAY 4–22 AND TAXIWAY G CENTERLINES, NO OPERATIONS BY GROUP III AIRCRAFT ON RUNWAY 4–22 WILL BE PERMITTED BY ATCT WHILE AIRCRAFT ARE PRESENT ON TAXIWAY G. AIRCRAFT WILL NEED TO BE CLEAR OF TAXIWAY G IN ORDER TO PERMIT GROUP III OPERATIONS ON RUNWAY 4–22.

LEGEND

- PHASE 1
- PHASE 2 (2A AND 2B)
- PHASE 3 (3A, 3B, AND 3C)
- HAUL ROUTE



REVISIONS:

REV. NO	DATE	DESCRIPTION:	EOR

PIE RUNWAY 18-36
PAVEMENT MAINTENANCE

ST. PETE-CLEARWATER
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JOB NO:	
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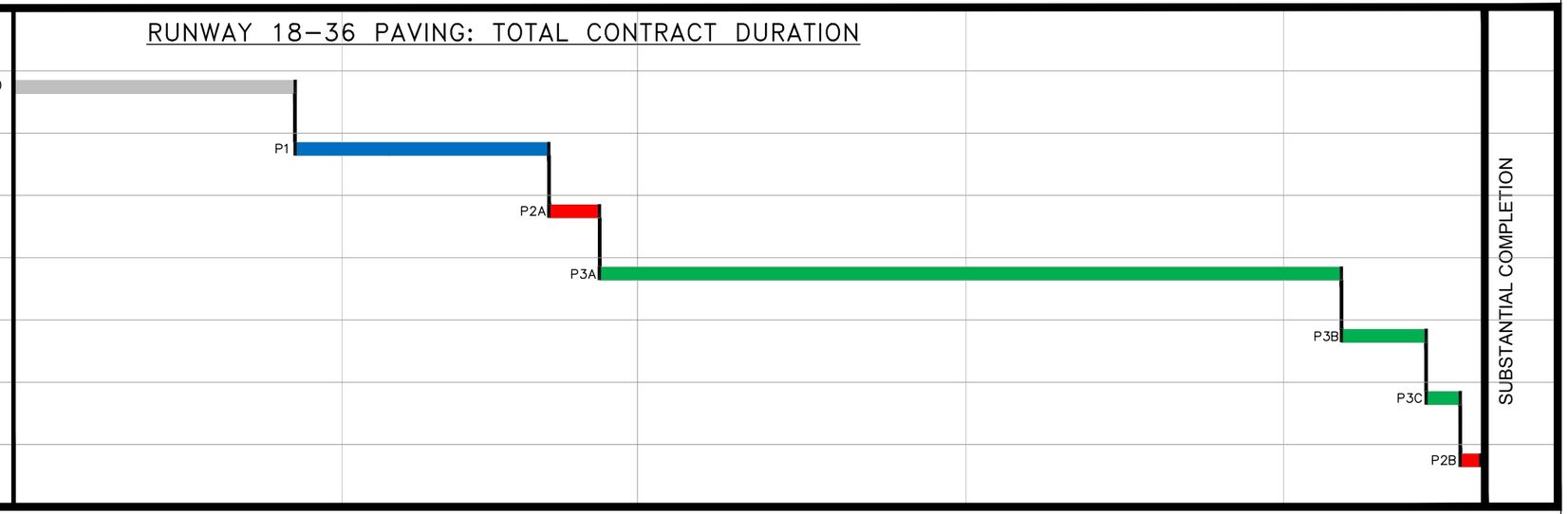
OVERALL PHASING PLAN

PH001

1	RUNWAY 18-36 PAVING		
2	PHASE 0: MOBILIZATION	30 days	P0
3	PHASE 1	27 days	P1
4	PHASE 2A	5 days	P2A
5	PHASE 3A	79 days	P3A
6	PHASE 3B	9 days	P3B
7	PHASE 3C	4 days	P3C
8	PHASE 2B	2 days	P2B



SCHEDULE NOTES:

1. DURATIONS SHOWN ARE REPRESENTED IN CONSECUTIVE CALENDAR DAYS.
2. THE SCOPE OF WORK ELEMENTS LISTED IN THESE PHASING PLANS IS NOT ALL INCLUSIVE. THE CONTRACTOR IS TO DEFINE ALL ELEMENTS OF WORK AND THE SCHEDULE FOR WORK PERFORMANCE TO BE PERFORMED DURING EACH PHASE AND SUB–PHASE IN THEIR DETAILED WORK PLAN/PROJECT SCHEDULE FOR COORDINATION WITH THE OWNER BEFORE BEGINNING ANY CONSTRUCTION WORK. THE RPR AND CONTRACTOR SHALL REVIEW THE SCHEDULING OF EACH PHASE TWO WEEKS PRIOR TO THE START OF EACH PHASE.

PHASING NOTES:

PHASE 0 – CONTRACTOR'S MOBILIZATION, HAUL ROUTE PREPARATION AND DELINEATION, EQUIPMENT PROCUREMENT, CONTRACTOR'S CPM SCHEDULE, CONTRACTOR'S QUALITY CONTROL PLAN (CQCP) AND SAFETY PLAN COMPLIANCE DOCUMENT (SPCD), STAGING AREA PREPARATION, CONSTRUCTION PERMITTING BY THE CONTRACTOR, CONTRACTOR SECURITY BADGING AND DRIVER TRAINING, SUBMITTALS AND SHOP DRAWINGS, ORDERING OF LONG–LEAD ITEMS, ETC.

PHASE 1 – THIS PHASE INCLUDES PREPARATION OF RUNWAY EDGE AND CENTERLINE LIGHTS FOR ADJUSTMENT, MILLING AND SCARIFYING OF ASPHALT SURFACES, INSTALLING AN ASPHALT LEVELING COURSE, INSTALLING ASPHALT SURFACE COURSE, FINAL ADJUSTMENT/INSTALLATION OF RUNWAY EDGE LIGHTS, AND TEMPORARY MARKINGS.

PHASE 2A – THIS PHASE INCLUDES MILLING AND OVERLAYING OF TAXIWAY G AND TEMPORARY MARKINGS.

PHASE 3A – THIS PHASE DOES NOT REPRESENT ANY WORK ON THE PART OF THE CONTRACTOR. THE DURATION OF THIS PHASE WILL PERMIT THE CURING OF ASPHALT AND THE DELIVERY OF LONG LEAD ITEMS.

PHASE 3B – THIS PHASE INCLUDES THE FINAL INSTALLATION OF THE RUNWAY CENTERLINE LIGHTS, CORING, INSTALLATION OF THE CAN EXTENSION, SPACER RINGS AND REINSTALLATION OF THE FIXTURES AND TESTING.

PHASE 3C – THIS PHASE INCLUDES THE GROOVING OF THE RUNWAY AND APPLICATION OF FINAL MARKINGS ON RUNWAY 18–36.

PHASE 2B – THIS PHASE INCLUDES THE APPLICATION OF FINAL MARKINGS ON TAXIWAY G.

REVISIONS:			
REV. NO	DATE	DESCRIPTION:	EOR

St. Pete-Clearwater International
TAMPA BAY THE EASY WAY

PIE RUNWAY 18-36
PAVEMENT MAINTENANCE

ST. PETE-CLEARWATER
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CLEARWATER, FL

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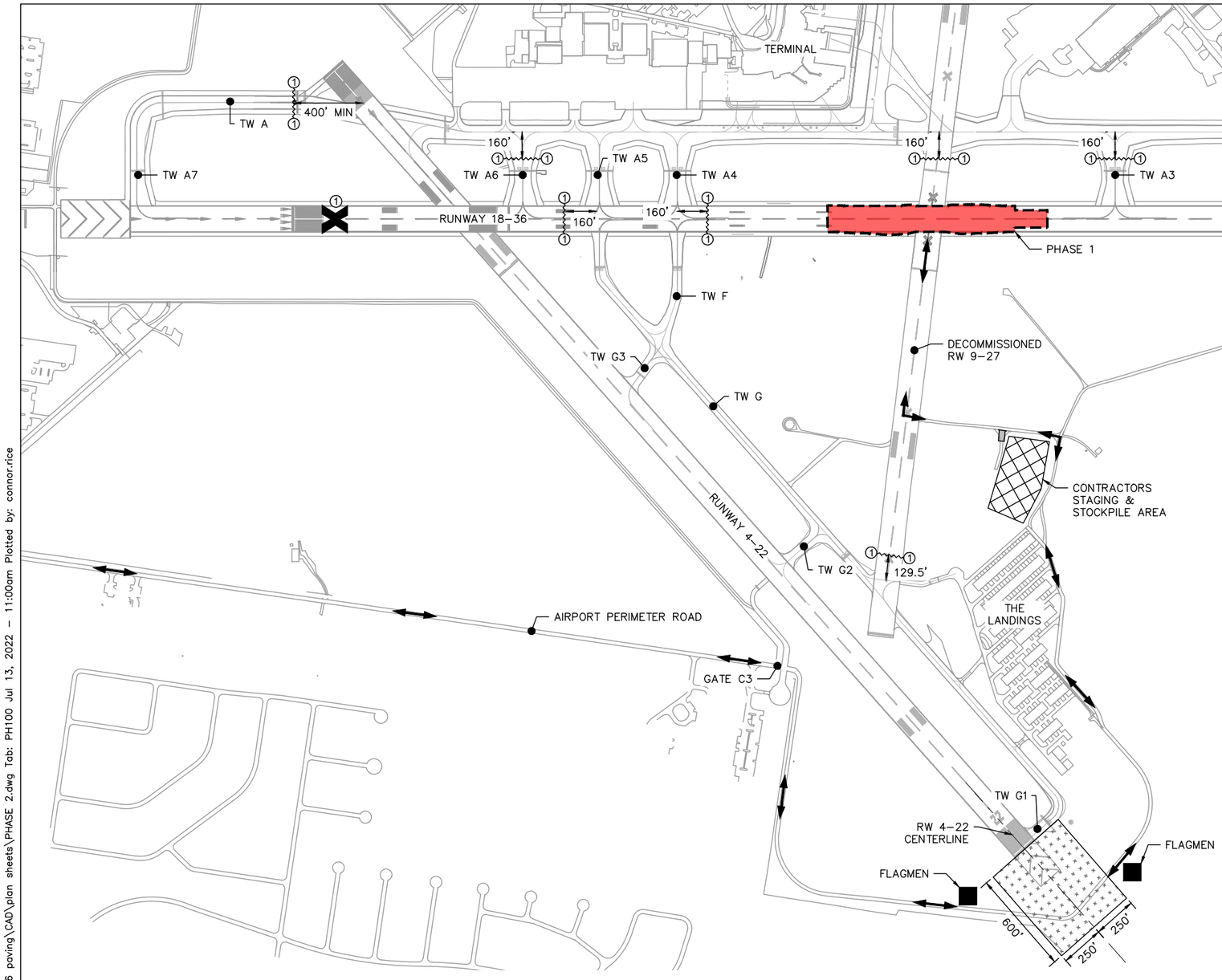
JOB NO:	
DRAWN:	BJG
DESIGN:	BJG
CHECKED:	PPP
DATE:	JULY 2022

PROJECT SCHEDULE

PH002



PHASE 1 DESCRIPTION:

1. MOT INSTALLATION OF BARRICADES, SIGNAGE, RUNWAY CLOSURE CROSSES, EROSION CONTROL, AND TEMPORARY AIRFIELD LIGHTING AND SIGNAGE
2. REMOVE RUNWAY EDGE AND CENTERLINE LIGHT FIXTURES
3. EXTEND RUNWAY EDGE LIGHT CANS BELOW PROPOSED MILLING SURFACES AND INSTALL 3/4" STEEL LID.
4. REMOVE RUNWAY CENTERLINE LIGHT BASE SPACER RINGS, EXTENDERS, AND TOP SECTION AND INSTALL 3/4" STEEL LID.
5. ASPHALT PAVEMENT MILLING/SCARIFYING
6. INSTALL ASPHALT LEVELING AND SURFACE COURSE
7. FINAL ADJUSTMENT OF RUNWAY EDGE LIGHTS
8. PROFILOGRAPH, GRINDING, SEAL COATING
9. INSTALL TEMPORARY MARKINGS
10. ALL TESTING AND REMOVAL OF MOT/REOPEN RUNWAY 18–36 FOR OPERATIONS

PHASE 1 AIRCRAFT MOVEMENTS:

1. RUNWAY 18–36 SHALL BE CLOSED FOR THE DURATION OF PHASE 1 EXCEPT FOR CROSSINGS AT INTERSECTION OF TW A5/TW G AND TW A4/TW F.
2. RUNWAY 4–22 SHALL REMAIN OPERATIONAL WITH LIMITATIONS.

PHASE 1 LIMITS OF WORK:

1. PHASE 1 LIMITS OF WORK ARE AS GENERALLY SHOWN.
2. PHASE 1 SHALL COMMENCE IMMEDIATELY FOLLOWING THE COMPLETION OF PHASE 0.
3. WORK SHALL BE DURING WORK DAY HOURS.

LEGEND

- PHASE 1
- HAUL ROUTE
- LOW PROFILE BARRICADES
- LIGHTED CLOSED RUNWAY MARKER
- CONTROLLED ACCESS AREA

NORTH

0 700 1400

NOTES:

1. CONTRACTOR TO PROVIDE FLAGMEN WITH AIRBAND RADIOS TUNED TO LOCAL ATCT FREQUENCY TO RESTRICT CONSTRUCTION TRAFFIC AND PERSONNEL WITHIN THE LIMITS OF THE ACCESS CONTROL AREA SHOWN DURING THE DURATION OF PHASE 1 ON A 24–HOUR PER DAY BASIS. FLAGMEN AND ACCESS CONTROL ARE INCIDENTAL TO ITEM M–102–1.
2. DUE TO THE SEPARATION DISTANCE BETWEEN RUNWAY 4–22 AND TAXIWAY G CENTERLINES, NO OPERATIONS BY GROUP III AIRCRAFT ON RUNWAY 4–22 WILL BE PERMITTED BY ATCT WHILE AIRCRAFT ARE PRESENT ON TAXIWAY G. AIRCRAFT WILL NEED TO BE CLEAR OF TAXIWAY G IN ORDER TO PERMIT GROUP III OPERATIONS ON RUNWAY 4–22. AIRPORT OPERATIONS SHALL FILE A NOTAM 72 HRS IN ADVANCE OF THE WORK.

REVISIONS:			
REV. NO	DATE	DESCRIPTION:	EOR

St. Pete-Clearwater International
TAMPA BAY THE EASY WAY

PIE RUNWAY 18-36
PAVEMENT MAINTENANCE

ST. PETE-CLEARWATER
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JOB NO:	
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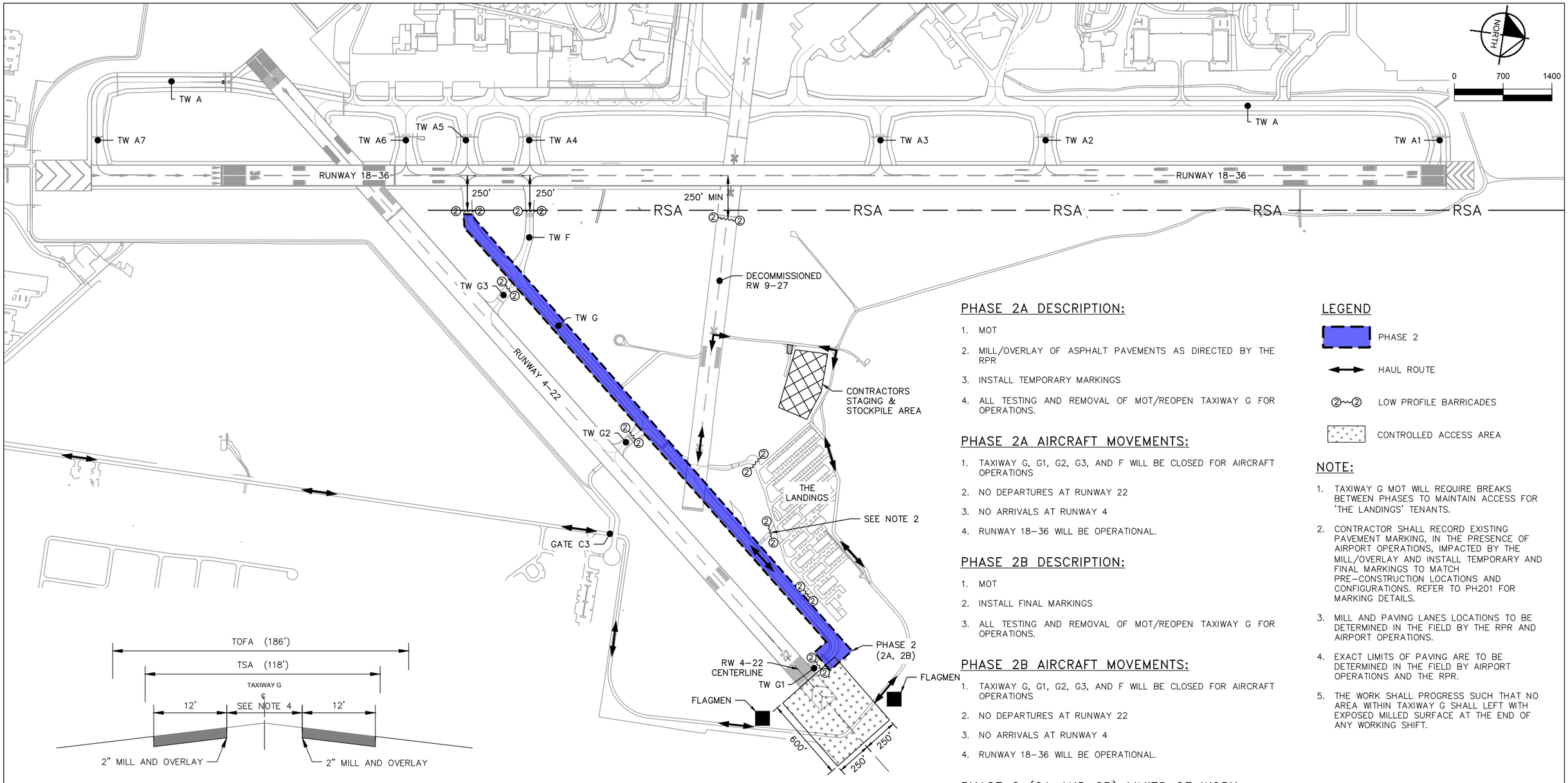
DATE:	JULY 2022

PHASING PLAN - PHASE 1

PH100



NOTE: CONTRACTOR TO PRESERVE EXISTING GRADES AND MAINTAIN POSITIVE DRAINAGE.

1 / PH200 TAXIWAY G – MILL AND OVERLAY TYPICAL SECTION

NOT TO SCALE – FOR REFERENCE ONLY

PHASE 2A DESCRIPTION:

1. MOT
2. MILL/OVERLAY OF ASPHALT PAVEMENTS AS DIRECTED BY THE RPR
3. INSTALL TEMPORARY MARKINGS
4. ALL TESTING AND REMOVAL OF MOT/REOPEN TAXIWAY G FOR OPERATIONS.

PHASE 2A AIRCRAFT MOVEMENTS:

1. TAXIWAY G, G1, G2, G3, AND F WILL BE CLOSED FOR AIRCRAFT OPERATIONS
2. NO DEPARTURES AT RUNWAY 22
3. NO ARRIVALS AT RUNWAY 4
4. RUNWAY 18–36 WILL BE OPERATIONAL.

PHASE 2B DESCRIPTION:

1. MOT
2. INSTALL FINAL MARKINGS
3. ALL TESTING AND REMOVAL OF MOT/REOPEN TAXIWAY G FOR OPERATIONS.

PHASE 2B AIRCRAFT MOVEMENTS:

1. TAXIWAY G, G1, G2, G3, AND F WILL BE CLOSED FOR AIRCRAFT OPERATIONS
2. NO DEPARTURES AT RUNWAY 22
3. NO ARRIVALS AT RUNWAY 4
4. RUNWAY 18–36 WILL BE OPERATIONAL.

PHASE 2 (2A AND 2B) LIMITS OF WORK:

1. PHASE 2 LIMITS OF WORK ARE AS GENERALLY SHOWN.
2. PHASE 2A SHALL COMMENCE IMMEDIATELY FOLLOWING THE COMPLETION OF PHASE 1.
3. PHASE 2B SHALL COMMENCE IMMEDIATELY FOLLOWING THE COMPLETION OF PHASE 3C.
4. WORK SHALL BE DURING WORK DAY HOURS.

LEGEND

- PHASE 2
- HAUL ROUTE
- LOW PROFILE BARRICADES
- CONTROLLED ACCESS AREA

NOTE:

1. TAXIWAY G MOT WILL REQUIRE BREAKS BETWEEN PHASES TO MAINTAIN ACCESS FOR 'THE LANDINGS' TENANTS.
2. CONTRACTOR SHALL RECORD EXISTING PAVEMENT MARKING, IN THE PRESENCE OF AIRPORT OPERATIONS, IMPACTED BY THE MILL/OVERLAY AND INSTALL TEMPORARY AND FINAL MARKINGS TO MATCH PRE–CONSTRUCTION LOCATIONS AND CONFIGURATIONS. REFER TO PH201 FOR MARKING DETAILS.
3. MILL AND PAVING LANES LOCATIONS TO BE DETERMINED IN THE FIELD BY THE RPR AND AIRPORT OPERATIONS.
4. EXACT LIMITS OF PAVING ARE TO BE DETERMINED IN THE FIELD BY AIRPORT OPERATIONS AND THE RPR.
5. THE WORK SHALL PROGRESS SUCH THAT NO AREA WITHIN TAXIWAY G SHALL LEFT WITH EXPOSED MILLED SURFACE AT THE END OF ANY WORKING SHIFT.

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TAMPA BAY THE EASY WAY

PIE RUNWAY 18-36
PAVEMENT MAINTENANCE

ST. PETE-CLEARWATER
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JOB NO:	
DRAWN:	BJG
DESIGN:	BJG
CHECKED:	PPP
DATE:	JULY 2022

PHASING PLAN - PHASE 2

PH200

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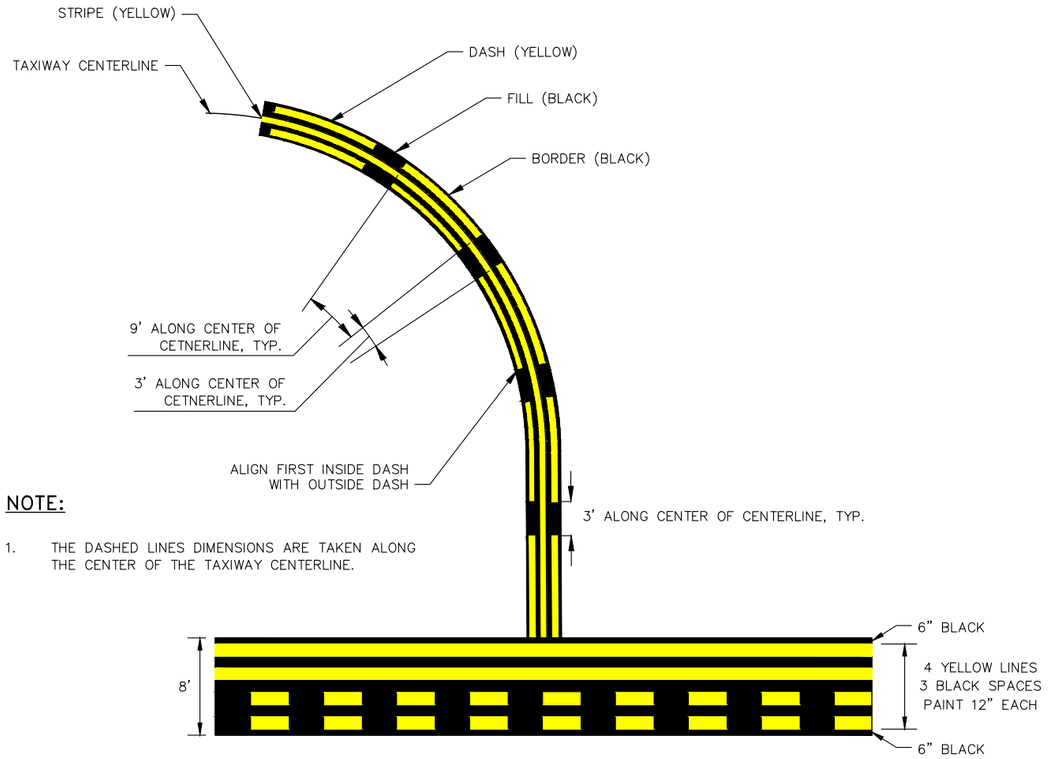
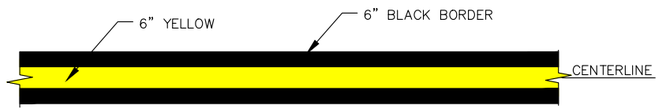


NOTE:

1. THE DASHED LINES DIMENSIONS ARE TAKEN ALONG THE CENTER OF THE TAXIWAY CENTERLINE.

1 / PH201 RESTORATION OF TAXIWAY G MARKINGS – ENHANCED TAXIWAY CENTERLINE MARKING

NOT TO SCALE – FOR REFERENCE ONLY

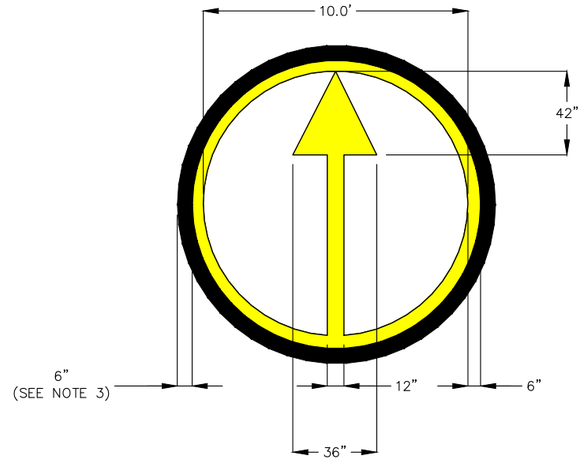


NOTES:

1. TAXIWAY CENTERLINE MARKING IS CONTINUOUS, UNLESS OTHERWISE INDICATED ON MARKING PLAN.

2 / PH201 RESTORATION OF TAXIWAY G MARKINGS – TAXIWAY/TAXILANE CENTERLINE MARKING

NOT TO SCALE – FOR REFERENCE ONLY



NOTES:

1. ARROW IS TO BE ALIGNED TOWARD THE FACILITY.
2. CIRCLE MAY BE BORDERED ON INSIDE AND OUTSIDE WITH 6" BLACK BAND IF NECESSARY FOR CONTRAST.

3 / PH201 RESTORATION OF TAXIWAY G MARKINGS – VOR RECEIVER CHECKPOINT MARKINGS

NOT TO SCALE – FOR REFERENCE ONLY

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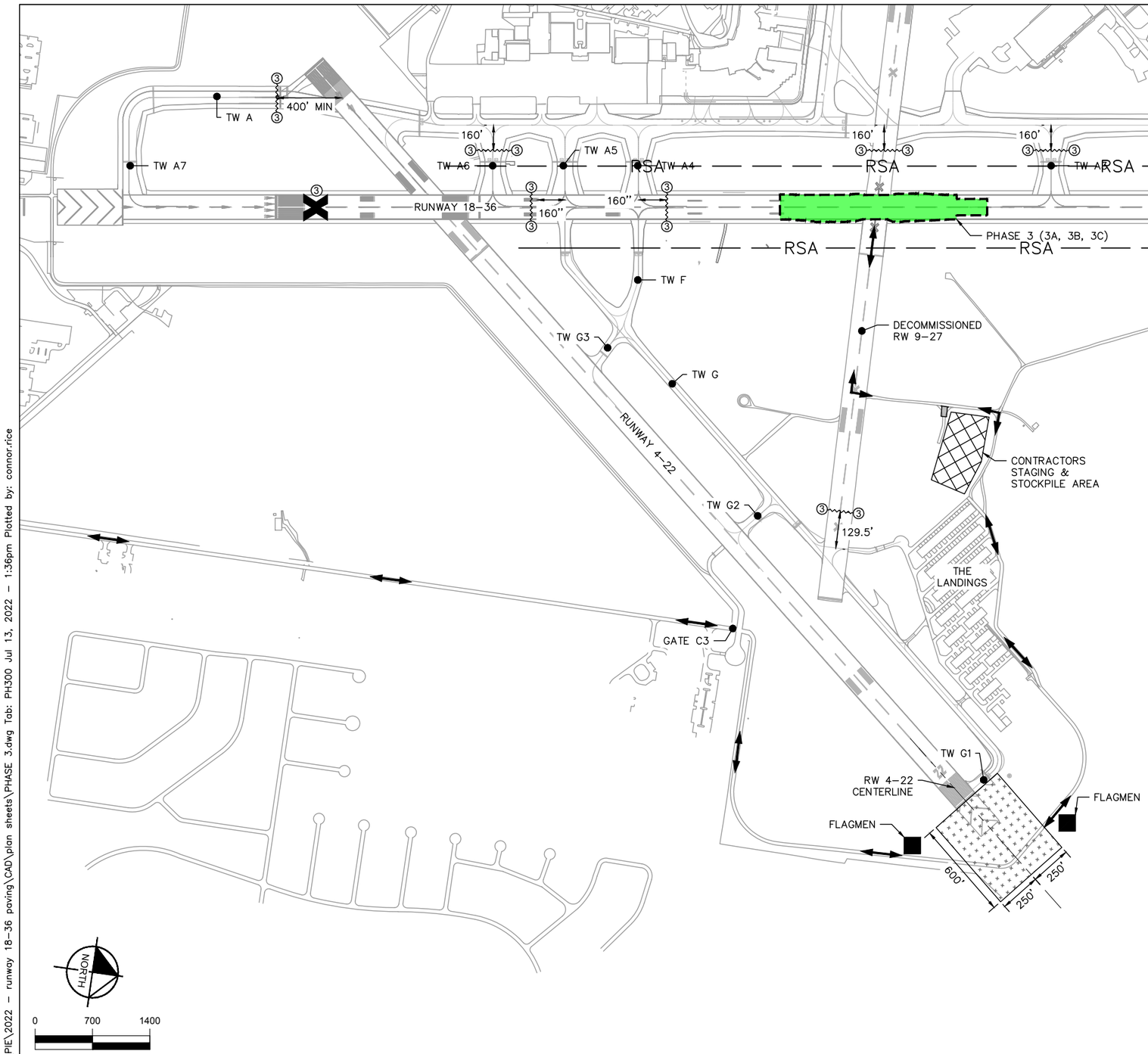
PHASE 2 MARKING DETAILS

PH201



PHASE 3A DESCRIPTION:

1. NO WORK WILL OCCUR DURING THIS PHASE UNLESS APPROVED BY THE AIRPORT AND THE RPR. THE DURATION OF THIS PHASE IS TO PERMIT THE DELIVERY OF LONG LEAD ITEMS.

PHASE 3A AIRCRAFT MOVEMENTS:

1. THERE ARE NO RESTRICTIONS FOR AIRCRAFT MOVEMENTS DURING PHASE 3A.

PHASE 3B DESCRIPTION:

1. INSTALL MOT
2. LOCATE AND CORE RUNWAY CENTERLINE LIGHTS, INSTALL TOP CAN EXTENDERS, SPACER RINGS AND REINSTALL LIGHT FIXTURE.
3. TESTING

PHASE 3B AIRCRAFT MOVEMENTS:

1. IT IS INTENDED THAT RUNWAY 18–36 BE OPEN FOR AIRCRAFT OPERATIONS BETWEEN THE HOURS OF 6:00AM AND 11:00PM (RUNWAY 18–36 CLOSED FOR NIGHT WORK). CONTRACTOR SPECIFICALLY CAUTIONED TO MANAGE THE PROGRESSION OF WORK IN A MANNER THAT PERMITS THE REOPENING OF RUNWAY 18–36 EACH DAY AT 6:00AM DURING PHASE 3B. AIRPORT OPERATIONS SHALL BE NOTIFIED BY 4:00AM PRIOR TO 6:00AM THE SAME DAY TO INSPECT RUNWAY AND WORK AREA TO VERIFY THAT THE RUNWAY CAN BE OPENED TO AIRCRAFT TRAFFIC.
2. DURING NIGHT CLOSURES, RW 18–36 WILL BE CLOSED TO AIRCRAFT EXCEPT FOR CROSSINGS AT INTERSECTION OF TW A5/TW G AND TW A4/TW F.
3. RUNWAY 4–22 WILL REMAIN OPERATIONAL.

PHASE 3C DESCRIPTION:

1. RUNWAY GROOVING
2. FINAL MARKINGS
3. REMOVAL OF MOT/REOPENING OF RUNWAY 18–36 FOR AIRCRAFT OPERATIONS

PHASE 3C AIRCRAFT MOVEMENTS:

1. IT IS INTENDED THAT RUNWAY 18–36 BE OPEN FOR AIRCRAFT OPERATIONS BETWEEN THE HOURS OF 6:00AM AND 11:00PM (RUNWAY 18–36 CLOSED FOR NIGHT WORK). CONTRACTOR SPECIFICALLY CAUTIONED TO MANAGE THE PROGRESSION OF WORK IN A MANNER THAT PERMITS THE REOPENING OF RUNWAY 18–36 EACH DAY AT 6:00AM DURING PHASE 3C. AIRPORT OPERATIONS SHALL BE NOTIFIED BY 4:00AM PRIOR TO 6:00AM THE SAME DAY TO INSPECT RUNWAY AND WORK AREA TO VERIFY THAT THE RUNWAY CAN BE OPENED TO AIRCRAFT TRAFFIC.
2. DURING NIGHT CLOSURES, RW 18–36 WILL BE CLOSED TO AIRCRAFT EXCEPT FOR CROSSINGS AT INTERSECTION OF TW A5/TW G AND TW A4/TW F.
3. RUNWAY 4–22 WILL REMAIN OPERATIONAL.

PHASE 3 (3A, 3B, AND 3C) LIMITS OF WORK:

1. PHASE 3 LIMITS OF WORK ARE AS GENERALLY SHOWN.
2. PHASE 3B AND 3C WORK WILL BE COMPLETED DURING SPECIFIED NIGHT HOURS.
3. PHASE 3B SHALL COMMENCE UPON AVAILABILITY OF LONG LEAD ITEMS. PHASE 3C SHALL BEGIN 30 DAYS AFTER THE COMPLETION OF THE ASPHALT SURFACE COURSE INSTALLED UNDER PHASE 1.

LEGEND

- PHASE 3
- HAUL ROUTE
- LOW PROFILE BARRICADES
- LIGHTED CLOSED RUNWAY MARKER
- CONTROLLED ACCESS AREA

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PHASING PLAN - PHASE 3

PH300

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