CHANGE ORDER
HILLSBOROUGH COUNTY AVIATION AUTHORITY

PROJECT:	Taxiway G Extension	**CHANGE ORDER No:**	2
		INITIATION DATE:	January 12, 2021
OWNER:	Hillsborough County Aviation Authority P.O. Box 22287 Tampa, Florida 33622-2287	**HCAA PROJECT Nos:**	6640 19
		FAA AIP No:	03-12-0079-004-2019
		FDOT FM Nos:	N/A
		CONTRACT DATE:	May 2, 2019
TO (Contractor):	Cobb Site Development, Inc. 401 South Sixth Avenue Wauchula, FL 33873		

You are directed to make the following changes in this Contract dated **May 2, 2019** by and between yourself and the Hillsborough County Aviation Authority, in accordance with its conditions. The Contract Documents shall apply to this Change Order. All terms and conditions of the Contract remain unchanged, except as they may be expressly modified by the terms of this Change Order. This Change Order addresses all adjustments to the Contract Sum and Contract Time for which the Contractor may be entitled with respect to the subject change work, including all labor, materials, equipment, services, overhead and profit necessary to accomplish the change work, which change work includes all items that are expressly identified in this Change Order, as well as all items that are reasonably inferable as being necessary or appropriate for the satisfactory completion of the subject change work by the Contractor. The total cost adjustment to the Contract Sum reflected in this Change Order, if any, includes all direct, indirect and impact costs resulting from the subject change, including, but not limited to, extended or unabsorbed home office overhead costs, extended general conditions and field overhead, extra equipment (whether operating or idle), costs relating to labor and equipment inefficiency, taxes, insurance costs, bonds, profit, interest and all other fees and costs for which the Contractor may have entitlement to under the Contract or otherwise, arising out of or relating to the change work that is the subject of this Change Order. In addition, this Change Order encompasses all time adjustments to the Contract Time, if any, relating to any delay, disruption, acceleration, interference, escalation, or other time related impacts for which the Contractor may be entitled under the Contract or otherwise, arising out of or relating to the change work that is the subject of this Change Order. In addition, this Change Order constitutes a full accord and satisfaction for all of the Contractor's outstanding extra work items, claims, overtime charges, changes to and/or interpretations of the Contract Documents with respect to the Contract. It is agreed and understood that the Contractor, by executing this Change Order, hereby waives all claims, through the date of this Change Order, with respect to the Work or the Project. This Change Order in no way relieves the Contractor from providing all outstanding obligations to the Owner under the Contract, including, but not limited to, close-out obligations, punch list items, warranty and correction of defective and non-conforming work.

Description: This Change Order No. 2 adds a new scope of work associated with the construction of the new Taxilane G2 per the drawings and specifications from RS&H. The start of the Work will be determined by a new Notice To Proceed and will have 105 calendar days to complete. Payment will be based on the unit rates & unit prices as identified in the Bid Schedule.

Attached are the following exhibits:
Exhibit A - Construction Plans dated December 4, 2020
Exhibit B - Technical Specifications identified as 100% Design Submittal
Exhibit C - Bid Schedule
Exhibit D - Owner's Allowances Page 01020-2

Attachments:

Not valid until signed by the Owner. Signature by the Contractor indicates final agreement herewith, including all adjustments in the Contract Sum and/or the Contract Time.

The original Contract Sum was	$	1,399,860.12
Net change by previously authorized Change Order	$	(8,364.27)
The Contract Sum prior to this Change Order was	$	1,391,495.85
The Amount of this Change Order is	$	236,493.19
The new Contract Sum including this Change Order will be	$	1,627,989.04

The Contract Time will be Increased ☒, Decreased ☐, Unchanged ☐, 105 days.

The Date of Substantial Completion as a result of this Change Order is revised to June 6, 2021.

The original D/W/MBE expectancy is 12.2%. The D/W/MBE expectancy as a result of this change order will be revised to 10.7%.

Issued and Approved by:

RS&H

Architect / Engineer

1715 N Westshore Blvd, Ste 600, Tampa, FL 33607

Address

DocuSigned by:
689E8EE1FE3A458...

By: David Gordon 1/26/2021

Date

Agreed To:

Cobb Site Development, Inc.

Contractor

401 S. 6th Ave Wauchula, Fl 33834

Address

DocuSigned by:
1E59E7AF52D4468...

By: Kyle Cobb 1/26/2021

Date

Reviewed:

Hillsborough County Aviation Authority

Owner

DocuSigned by:
82FC553FC742480...

By: Jeff Siddle, P.E. 1/25/2021

Date

V.P. of Facilities

Authorized:

Hillsborough County Aviation Authority

Owner

By: Gary Harrod Date

Chairman

Exhibit A

Peter O. Knight Airport

CONSTRUCTION PLANS
FOR
TAXILANE G2

HCAA No. 6640 19

Tampa International Airport

HILLSBOROUGH COUNTY AVIATION AUTHORITY

BOARD MEMBERS
GARY W. HARROD - CHAIRMAN
ROBERT I. WATKINS - VICE CHAIRMAN
BRIG. GENERAL CHIP DIEHL - TREASURER
CITY OF TAMPA MAYOR JANE CASTOR - SECRETARY
HILLSBOROUGH COUNTY COMMISSIONER
STACY WHITE - ASST. SECRETARY/TREASURER

CHIEF EXECUTIVE OFFICER
JOSEPH W. LOPANO

INDEX OF DRAWINGS

100% DESIGN SUBMITTAL

DECEMBER 4, 2020

NOTE:
DO NOT SCALE PRINTS
REPRODUCTION MAY CAUSE DISTORTION

RS&H No. 204-0001-056

CONSTRUCTION DATA

PRIME CONTRACTOR

MAJOR SUBCONTRACTORS AND/OR SUPPLIERS

WORK: COMMENCED _____ COMPLETED _____

COST: BID$_____ FINAL $_____

PROJECT ENGINEER/INSPECTORS:

ALL CONSTRUCTION PERFORMED UNDER THIS CONTRACT WAS COMPLETED IN SUBSTANTIAL CONFORMITY WITH THE DRAWINGS, NOTES AND SPECIFICATIONS CONTAINED IN THESE PLANS. ALL CHANGES FROM THE PLANS AS BID, HAVE BEEN NOTED TO THE BEST OF OUR KNOWLEDGE.

(CERTIFIED) _____ PROJECT ENGINEER _____ DATE

FEDERAL AVIATION ADMINISTRATION

APPROVED _____ DATE _____

FLORIDA DEPT. OF TRANSPORTATION

APPROVED _____ DATE _____

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

APPROVED _____ DATE _____

RS&H
RS&H, Inc.
1715 N. Westshore Boulevard, Suite 600
Tampa, Florida 33607-3999
813-289-5550
www.rsandh.com
FL Cert Nos. AAC001886 EB0005620 LCC00210

SUBMITTED DAVID A. GORDON, P.E. DATE _____
P. E. No. 82346

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM DESCRIPTION	UNIT	BID QUANTITY	CHANGE ORDERS					FINAL QUANTITY	REMARKS
				CCO #1	CCO #2	CCO #3	CCO #4	CCO #5		
GENERAL CONDITIONS										
C-102-1	TEMPORARY EROSION AND SEDIMENTATION CONTROL	LS	1							
C-103-1	SAFETY AND SECURITY	LS	1							
C-104-1	PROJECT SURVEY AND STAKEOUT	LS	1							
C-105-1	MOBILIZATION	LS	1							
C-106-1	MAINTENANCE OF TRAFFIC AND TEMPORARY CONSTRUCTION ITEMS	LS	1							
CIVIL										
P-152-1	UNCLASSIFIED EXCAVATION	CYD	400							
P-152-2	EMBANKMENT (IN-PLACE)	CYD	150							
P-152-3	TOPSOIL STRIPPING (4" THICK)	AC	0.9							
P-219-1	6" STABILIZED SUBGRADE (LBR 40)	SY	1,015							
P-403-1	4" RECYCLED CONCRETE AGGREGATE BASE COURSE	SY	950							
P-620-1	ASPHALT MIXTURE SURFACE COURSE	TN	150							
P-620-2	TAXILANE PAINTING (INCLUDES REFLECTIVE WITH GLASS BEADS AND NON-REFLECTIVE)	SF	500							
FL-160-1	SODDING	SY	3,460							
U-100-1	4" PVC WATERMAIN ADJUSTMENT (COMPLETE)	LS	1							
ELECTRICAL										
L-105-1	TEMPORARY AIRPORT LIGHTING SYSTEMS	LS	1							
L-108-1	NO. 8 AWG, 5KV, L-824, TYPE C CABLE, INSTALLED IN TRENCH, DUCT BANK OR CONDUIT	LF	800							
L-108-2	NO. 6 AWG, SOLID, BARE COUNTERPOISE WIRE, INSTALLED IN TRENCH, ABOVE THE DUCT BANK OR CONDUIT, INCLUDING GROUND RODS AND CONNECTIONS	LF	380							
L-110-1	REMOVE CONDUIT, DUCT BANK AND CABLE	LS	1							
L-110-2	NON-ENCASED ELECTRICAL CONDUIT, 1-WAY, 2-INCH	LF	335							
L-110-3	CONCRETE ENCASED ELECTRICAL DUCT BANK, 2-WAY, 2-INCH	LF	50							
L-125-1	L-861(T) ELEVATED TAXIWAY EDGE LIGHT ON NEW L-867B BASE CAN	EA	12							
L-125-2	L-853 RETROREFLECTIVE MARKER	EA	11							
L-125-3	UNLIT TAXIWAY END MARKER SIGN	EA	1							
L-125-4	RELOCATE EXISTING ELEVATED TAXIWAY EDGE LIGHT ON NEW L-867B BASE CAN	EA	2							

100% DESIGN SUBMITTAL

BY
REVISIONS
DATE

HILLSBOROUGH COUNTY
AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H, Inc.
1715 N. Westshore Blvd., Suite 800
Tampa, Florida 33607-5999
813.282.7275
www.rsandh.com
FL Certificate of Authorization
EB0008829 LC0000210

RS&H

Tampa International Airport

PROJECT NAME
TAXILANE G2

SHEET TITLE
SUMMMARY OF QUANTITIES

DESIGNED: DAG
DRAWN: SCB
CHECKED: SCS
HCAA NO.: 6640 19
JOB NO.: 204-0001-056
DATE: DECEMBER 4, 2020

G001
SHEET NO.:

SECURITY NOTES

1. IT IS INTENDED THAT THE CONTRACTOR SHALL COMPLY WITH ALL SECURITY REQUIREMENTS SPECIFIED HEREIN AND IN THE CONTRACT DOCUMENTS. THE PROJECT SUPERINTENDENT/SUPERVISOR SHALL BE REQUIRED TO FAMILIARIZE THEMSELVES WITH REQUIREMENTS OF OPERATING WITHIN AND AROUND THE AIRPORT AND APPLICABLE RULES AND REGULATIONS. THE SUPERINTENDENT/SUPERVISOR SHALL BE RESPONSIBLE FOR BRIEFING ALL CONTRACTOR PERSONNEL ON THESE REQUIREMENTS AND, FROM TIME TO TIME, OTHER SECURITY PROVISIONS ADOPTED BY HCAA. 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 CONSTRUCTION MANAGER. NO OTHER ACCESS POINTS SHALL BE ALLOWED UNLESS APPROVED BY HCAA AND DIRECTED BY THE CONSTRUCTION MANAGER. 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.

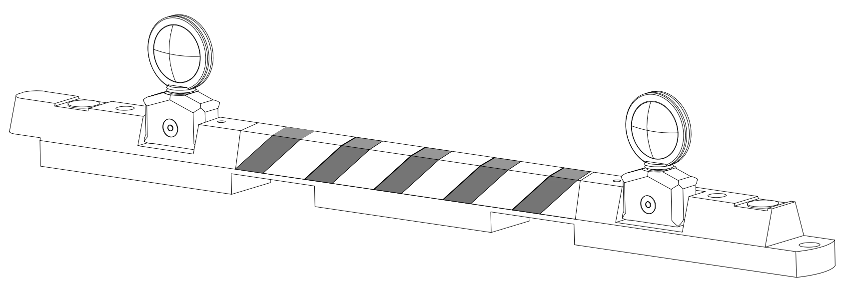
3. ALL CONTRACTOR'S MATERIAL ORDERS FOR DELIVERY TO THE SITE MUST BE ESCORTED BY THE CONTRACTOR. THIS WILL PRECLUDE DELIVERY TRUCKS FROM ENTERING INTO THE AIRPORT OR TAKING SHORT-CUTS THROUGH THE PERIMETER GATES AND ENTERING INTO AIRCRAFT OPERATIONS AREAS INADVERTENTLY.

4. THE CONTRACTOR ACCESS GATE DESIGNATED FOR USE MAY BE UTILIZED BY OTHER CONTRACTORS, HCAA STAFF, OR TENANTS 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.

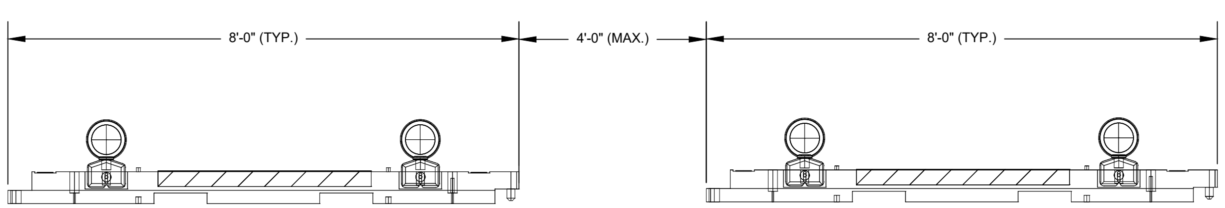
5. IDENTIFICATION OF PERSONNEL: AT THE CONSTRUCTION MANAGER'S DISCRETION, ALL EMPLOYEES OF THE CONTRACTOR OR SUBCONTRACTORS, REQUIRING ACCESS TO THE CONSTRUCTION SITE, ARE REQUIRED TO BE SUPPLIED WITH IDENTIFICATION BADGES TO BE WORN AT ALL TIMES WHILE WITHIN THE AREAS. BADGES SHALL BE SUPPLIED BY THE CONTRACTOR AND SHALL STATE "CONTRACTOR - TAXILANE G-2". BADGES CAN BE PLASTIC WALLET SIZE OR METAL PIN WITH A MINIMUM 2 1/2" DIAMETER AND MUST BE WORN ON OUTER GARMENTS SO AS TO BE CLEARLY VISIBLE. BADGING IS TO BE UNIFORM IN APPEARANCE AND SUFFICIENTLY DISTINCTIVE IN DESIGN OR COLOR TO CLEARLY IDENTIFY AN EMPLOYEE AS BEING ASSIGNED/ASSOCIATED WITH THIS CONTRACT. THE BADGE NUMBER SHALL BE PROMINENT FOR EASY IDENTIFICATION. BADGES ARE TO BE IDENTIFIED NUMERICALLY AND ISSUED INDIVIDUALLY TO WHOM IT IS ASSIGNED. BLOCKS OF NUMBERS CAN BE ASSIGNED TO SUBCONTRACTORS. SUPPLY, ISSUANCE AND CONTROL OF IDENTIFICATION BADGES SHALL BE THAT OF THE CONTRACTOR THROUGH THE SUPERINTENDENT. IN LIEU OF ISSUING BADGES, THE SUPERINTENDENT CAN REQUIRE THAT EACH EMPLOYEE WEAR AN OUTER GARMENT WITH THE COMPANY NAME, PROMINENTLY PLACED, SO THAT ALL PERSONNEL CAN BE IDENTIFIED AS BEING A MEMBER OF THIS GROUP.

6. IDENTIFICATION OF VEHICLES: THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN A LIST OF CONTRACTOR AND SUB-CONTRACTOR VEHICLES AUTHORIZED TO OPERATE ON THE SITE. VEHICLES SHALL DISPLAY A LARGE COMPANY SIGN ON BOTH SIDES OF THE VEHICLE. THE CONTRACTOR SHALL ISSUE TO THE CONSTRUCTION MANAGER, 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.

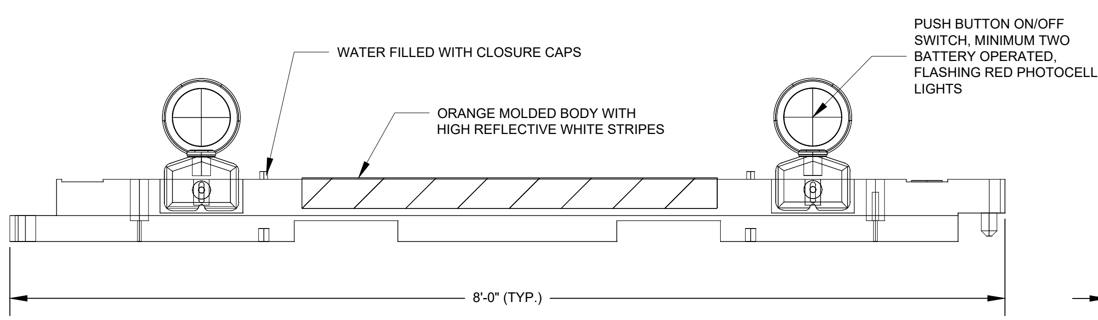
7. ALL ACCESS GATES SHALL BE NORMALLY CLOSED DURING CONSTRUCTION AND MANNED AT ALL TIMES WHILE GATE IS OPEN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO KEEP THE AIRPORT SECURED AT ALL TIMES DURING CONSTRUCTION.



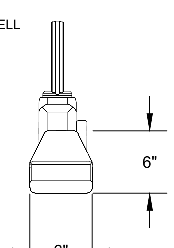
LOW-PROFILE BARRICADE
ISOMETRIC VIEW



BARRICADE SPACING



FRONT VIEW



SIDE VIEW

1 / G002 **LOW-PROFILE BARRICADE DETAIL**
NOT TO SCALE

SAFETY NOTES

1. THE CONTRACTOR SHALL ACQUAINT ITS SUPERVISORS AND EMPLOYEES OF THE AIRPORT ACTIVITY AND OPERATIONS THAT ARE INHERENT TO THIS ACTIVE AIRPORT AND SHALL CONDUCT ITS CONSTRUCTION ACTIVITIES TO CONFORM TO ALL ROUTINE REQUIREMENTS AND EMERGENCY AIR TRAFFIC REQUIREMENTS AND GUIDELINES ON SAFETY SPECIFIED IN THE CONTRACT DOCUMENTS.

2. ALL CONTRACTOR VEHICLES THAT ARE AUTHORIZED TO OPERATE ON THE AIRPORT OUTSIDE OF THE DESIGNATED CONSTRUCTION AREA LIMITS OR HAUL ROUTES AS SPECIFIED ON THE PLANS AND OR IN AREAS ADJACENT TO ACTIVE AIRCRAFT OPERATIONS AREA (AOA) SHALL DISPLAY IN FULL VIEW ABOVE THE VEHICLE A 3' X 3' OR LARGER ORANGE AND WHITE CHECKERBOARD FLAG, EACH CHECKERBOARD COLOR BEING 1' SQUARE AND A FLASHING AMBER (YELLOW) DOME-TYPE LIGHT, MOUNTED ON TOP OF THE VEHICLE AND OF SUCH INTENSITY TO CONFORM TO LOCAL CODES FOR MAINTENANCE AND EMERGENCY VEHICLES.

3. ANY VEHICLE OPERATING IN THE ACTIVE AOA DURING THE HOURS OF DARKNESS MUST BE EQUIPPED WITH A FLASHING AMBER (YELLOW) DOME-TYPE LIGHT AS PREVIOUSLY DESCRIBED.

4. NO RUNWAY, TAXIWAY, APRON OR AIRPORT ROADWAY SHALL BE CLOSED WITHOUT WRITTEN APPROVAL OF THE HILLSBOROUGH COUNTY AVIATION AUTHORITY (HCAA), TO ENABLE NECESSARY ADVISORIES TO AIRPORT SERVICE OR TENANTS. A MINIMUM OF 72 HOURS WRITTEN NOTICE OF REQUESTED CLOSING SHALL BE DIRECTED TO HCAA THROUGH THE CONSTRUCTION MANAGER.

5. ANY CONSTRUCTION ACTIVITY WITHIN 120 FEET OF AN ACTIVE RUNWAY CENTERLINE, 44.5 FEET FROM AN ACTIVE TAXIWAY EDGE OR OPEN EXCAVATION AREAS IN EXCESS OF 3 INCHES DEEP WITHIN THE ABOVE AREAS, WILL REQUIRE CLOSURE OF THE AFFECTED RUNWAY OR TAXIWAY, UNLESS OTHERWISE APPROVED BY THE AIRPORT. CLOSURE REQUIRES THE SAME PROVISIONS AS PARAGRAPH NO. 4 ABOVE.

6. OPEN FLAMES, WELDING OR TORCH-CUTTING OPERATIONS ARE PROHIBITED UNLESS ADEQUATE FIRE AND SAFETY PRECAUTIONS HAVE BEEN TAKEN, THE PROCEDURE IS APPROVED BY THE CONSTRUCTION MANAGER, AND A CUTTING AND WELDING PERMIT HAS BEEN ISSUED BY HCAA.

7. DEBRIS, WASTE AND LOOSE MATERIAL CAPABLE OF CAUSING DAMAGE TO AIRCRAFT LANDING GEARS, PROPELLERS OR BEING INGESTED INTO AIRCRAFT ENGINES SHALL NOT BE ALLOWED TO BE ON ACTIVE AIRCRAFT MOVEMENT AREA PAVEMENT OR ALONG HAUL ROUTES. THE CONTRACTOR SHALL REMOVE IT IMMEDIATELY AND CONTINUOUSLY DURING CONSTRUCTION BY MECHANICAL VACUUM SWEEPER OR OTHER APPROVED METHODS.

8. THE PROJECT SUPERINTENDENT/SUPERVISOR WILL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS. PRIOR TO THE COMMENCEMENT OF WORK, THE PROJECT SUPERINTENDENT/SUPERVISOR SHALL PROVIDE THE CONSTRUCTION MANAGER WITH AN OUTLINE OF A PROPOSED ACCIDENT AND FIRE PROTECTION PLAN FOR ALL WORK CONTEMPLATED UNDER THE CONTRACT AND CONDUCT AT LEAST ONE SAFETY MEETING EACH MONTH FOR EACH SHIFT AND REQUIRE THE ATTENDANCE OF ALL SUPERVISORS AT SUCH MEETINGS. COPIES OF THE MINUTES OF SAFETY MEETINGS SHALL BE KEPT ON FILE IN THE CONTRACTOR'S FIELD OFFICE AND BE MADE AVAILABLE UPON DEMAND BY THE CONSTRUCTION MANAGER.

9. THE EMERGENCY NUMBER TO CALL FOR ANY INCIDENT ON THE PROJECT OR AIRPORT SHALL BE 911, AND THE SITE IS PETER O. KNIGHT AIRPORT, UNLESS OTHERWISE NOTIFIED BY HCAA.

10. CONSTRUCTION DURING THE PROJECT MAY BE HALTED AT ANY TIME BY THE CONSTRUCTION MANAGER IF IT IS DETERMINED TO BE IN THE BEST INTEREST OF HCAA OR AIRPORT OPERATIONAL SAFETY, AND THE CONTRACTOR MAY BE DIRECTED TO REMOVE EQUIPMENT AND/OR EVACUATE THE SITE. NECESSARY EXTENSIONS IN CONTRACT TIME MAY BE GRANTED OR A STOP WORK ORDER WILL BE ISSUED DUE TO THESE DELAYS, HOWEVER, THERE WILL BE NO ADJUSTMENTS IN CONTRACT PRICE DUE TO THESE DELAYS.

11. THE CONTRACTOR IS FULLY RESPONSIBLE FOR AIRCRAFT AND AIRPORT OPERATIONAL SAFETY ASSOCIATED WITH CONSTRUCTION ACTIVITIES RELATIVE TO THE CONSTRUCTION PROJECT AT ALL TIMES.

12. THE PLANS AND SAFETY NOTES ARE NOT IN ANY WAY INTENDED TO IMPLY OR PROVIDE ANY DIRECTION REGARDING THE CONTRACTOR'S OWN CONSTRUCTION WORKFORCE SAFETY. THE CONTRACTOR'S SAFETY REQUIREMENTS/ACCOMMODATIONS ASSOCIATED WITH THE PROJECT CONSTRUCTION WORKFORCE IS SOLELY AND ENTIRELY THE RESPONSIBILITY OF THE CONTRACTOR.

BARRICADE NOTES

1. BARRICADES SHALL BE INSTALLED AT THE LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE CONSTRUCTION MANAGER AND AS REQUIRED BY THE CONTRACTOR TO PROTECT THE WORK AREA. THE PHASE DURING WHICH EACH BARRICADE IS TO REMAIN IN PLACE IS INDICATED BY THE PHASING DRAWINGS. BARRICADES SHALL BE INSTALLED AT THE BEGINNING OF EACH PHASE AND SHALL REMAIN IN PLACE THROUGHOUT THE PHASE. IF THE CONTRACTOR MUST TEMPORARILY REMOVE ANY OF THE BARRICADES (TO ALLOW CONSTRUCTION TRAFFIC TO TRAVEL INTO OR OUT OF THE CONSTRUCTION AREA, OR TO COMPLETE CONSTRUCTION AT THE PHASE BOUNDARY), THE CONTRACTOR SHALL PROVIDE A FLAGMAN TO PREVENT AIRCRAFT OR VEHICLE TRAFFIC FROM INADVERTENTLY TRAVELING INTO THE CONSTRUCTION AREA UNTIL THE BARRICADE IS REPLACED AT ITS ORIGINAL POSITION.

2. ALL BARRICADES SHALL EXTEND BEYOND THE EDGES OF PAVEMENT AND SHOULDER PAVEMENT BY 8'-0" OR AS DIRECTED BY THE CONSTRUCTION MANAGER.

3. ALL FLASHING RED LOW PROFILE BARRIER LIGHTS MUST REMAIN OPERABLE DURING PERIODS OF LOW VISIBILITY AND DARKNESS.

4. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MAINTENANCE OF BARRICADES INCLUDING LIGHTS DURING CONSTRUCTION. ALL LIGHTS SHALL BE KEPT IN OPERABLE CONDITION. SAND BAGS SHALL BE REPLACED WHEN EXHIBITING SIGNS OF DISINTEGRATION AND ANY LOOSE SAND FROM THE BAGS SHALL BE REMOVED FROM THE PAVEMENT SURFACE.

5. ALL LIGHT FIXTURES SHALL BE VERIFIED AS OPERATIONAL BY THE CONTRACTOR DAILY.

6. DETAIL OF LOW PROFILE BARRICADE SHOWN AS AN EXAMPLE. OTHER DETAILS OF LOW PROFILE BARRICADES (e.g. HALVED 6" SCH. 40 PVC PIPE) MAY BE APPROVED BY THE ENGINEER AND CONSTRUCTION MANAGER.

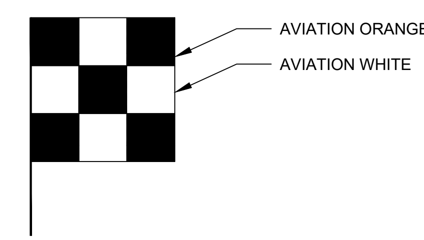
7. THE CONTRACTOR SHALL FURNISH, MAINTAIN, AND REMOVE THE BARRICADES AS DIRECTED BY THE CONSTRUCTION MANAGER. THE COST ASSOCIATED WITH THIS WORK SHALL BE INCLUDED IN THE C-106-1 MAINTENANCE OF TRAFFIC AND TEMPORARY CONSTRUCTION ITEMS PAY ITEM.

UNLIT TAXIWAY CLOSURE MARKER NOTES:

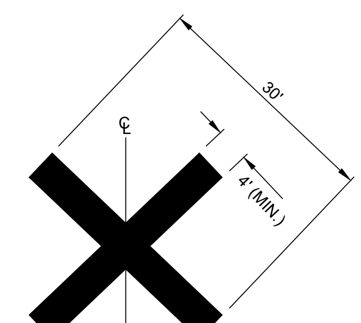
1. CONTRACTOR SHALL SUBMIT, TO THE ENGINEER, MATERIALS AND METHODS THAT WILL BE USED CONSTRUCT EACH UNLIT TAXIWAY CLOSURE MARKER. UNLIT TAXIWAY CLOSURE MARKERS MUST CONFORM TO AC 150/5370-2, LATEST EDITION AND AC 150/5340-1, LATEST EDITION.

2. UNLIT TAXIWAY CLOSURE MARKER SHALL BE YELLOW SUPPLEMENTED WITH REFLECTIVE YELLOW PAINT OR TAPE AND PROPERLY WEIGHTED TO THE PAVEMENT WITH YELLOW PAINTED SANDBAGS TO PREVENT DISLOCATION FROM WIND.

3. PAYMENT FOR UNLIT TAXIWAY CLOSURE MARKER PLACEMENT SHALL BE INCLUSIVE OF THE C-106-1 MAINTENANCE OF TRAFFIC AND TEMPORARY CONSTRUCTION ITEMS PAY ITEMS.



2 / G002 **CONSTRUCTION SAFETY FLAG**
SEE SAFETY NOTE 2 ON THIS SHEET FOR CONSTRUCTION SAFETY FLAG MOUNTING LOCATION REQUIREMENTS



3 / G002 **TAXIWAY CLOSURE MARKER (PATTERN C)**

100% DESIGN SUBMITTAL

BY	REVISIONS	DATE

HILLSBOROUGH COUNTY
AVIATION AUTHORITY
TAMPA, FLORIDA

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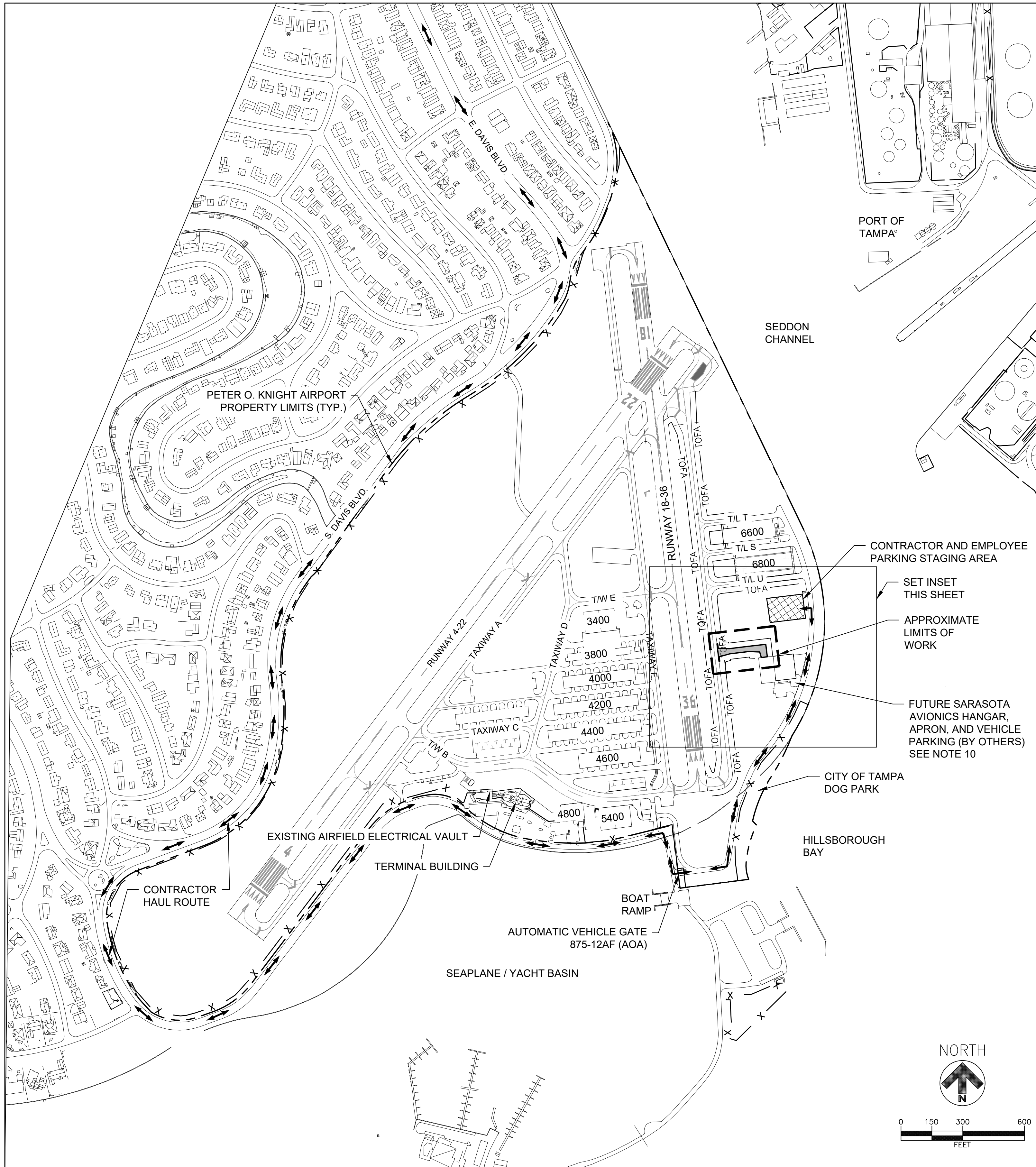
Tampa International Airport

PROJECT NAME
TAXILANE G2

SHEET TITLE
SAFETY AND SECURITY NOTES AND DETAILS

DESIGNED:	DAG
DRAWN:	SCB
CHECKED:	SCS
HCAA NO.:	6640 19
JOB NO.:	204-0001-056
DATE:	DECEMBER 4, 2020

G002
SHEET NO.:



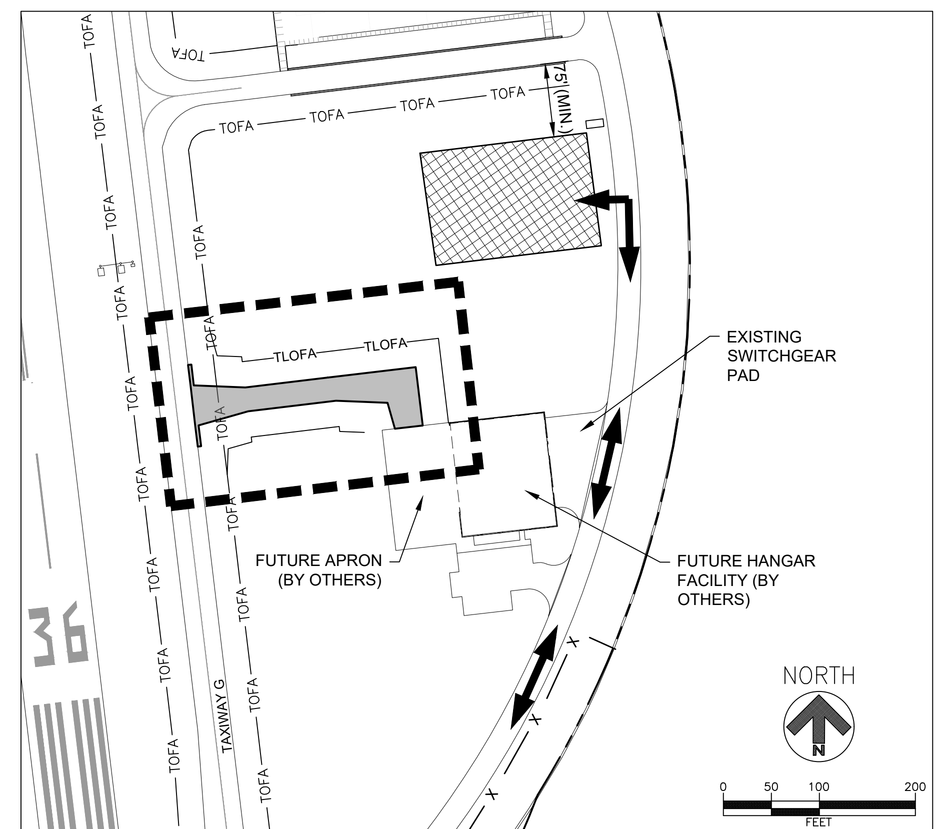
1 G003 **OVERALL CONTRACT LAYOUT PLAN**

LEGEND

- AIRPORT PROPERTY LIMITS
- CONTRACTOR'S HAUL ROUTE
- CONTRACTOR AND EMPLOYEE PARKING STAGING AREA
- APPROXIMATE LIMITS OF WORK
- X — EXISTING FENCE LINE
- TOFA — TAXIWAY OBJECT FREE AREA

CONTRACT LAYOUT PLAN NOTES

1. FOR GENERAL NOTES AND CONTRACTOR'S STAGING AREA NOTES, SEE SHEET G004.
2. FOR PHASING INFORMATION, SEE SHEET G005.
3. FOR THE WORK DETAILS ASSOCIATED WITH EACH WORK AREA, REFER TO THE "C" AND "E" SERIES SHEETS.
4. ACCESS TO THE SITE SHALL BE AS SHOWN ON THIS SHEET. THE CONTRACTOR SHALL NOT UTILIZE ALTERNATIVE ROUTES UNLESS PREVIOUSLY APPROVED BY THE CONSTRUCTION MANAGER.
5. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE OFF-SITE HAUL ROUTES (STATE HIGHWAYS, COUNTY ROADS OR CITY STREETS AS REQUIRED) WITH THE APPROPRIATE OWNER, GOVERNING THE JURISDICTION OVER THE AFFECTED ROUTE.
6. THE CONTRACTOR SHALL KEEP BOTH ON AND OFF SITE HAUL ROUTES CLEAN AND FREE OF DEBRIS AND DUST AT ALL TIMES. THE CONTRACTOR SHALL BE REQUIRED TO CLEAN HAUL ROUTES AS REQUIRED. VACUUM TRUCK/SWEEPER COMBO AND OPERATORS WILL REMAIN AT THE SITE UNTIL THE AREA IS ACCEPTED BY THE CONSTRUCTION MANAGER AND AIRPORT OPERATIONS FOR THE START OF AIRCRAFT OPERATIONS.
7. AT NO TIMES SHALL THE CONTRACTOR UTILIZE ACTIVE AIRFIELD PAVEMENTS FOR ON SITE HAUL ROUTES.
8. ACCESS TO AIRPORT PROPERTY IS THROUGH EXISTING AIRPORT GATES. GATES TO REMAIN CLOSED AND LOCKED WHEN NOT IN USE.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THE AIRPORT SECURE AT ALL TIMES DURING CONSTRUCTION.
10. WORK IN ADJACENT SITE MAY BE ON-GOING DURING CONSTRUCTION. CONTRACTOR TO COORDINATE WORK AS REQUIRED.



2 G003 **CONTRACT LAYOUT PLAN DETAILS**

100% DESIGN SUBMITTAL

BY	REVISIONS	DATE

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H, Inc.
1715 N. Westshore Blvd., Suite 600
Tampa, Florida 33607-3999
813-289-5300
www.rsandh.com
FL Cert Nos. AAC001886 EB0005620 LC0000210

Tampa International Airport

PROJECT NAME: TAXILANE G2

SHEET TITLE: CONTRACT LAYOUT PLAN AND NOTES

DESIGNED: DAG
DRAWN: SCB
CHECKED: SCS

HCAA NO.: 6640 19
JOB NO.: 204-0001-056

DATE: DECEMBER 4, 2020

G003
SHEET NO.

GENERAL NOTES

1. HAUL ROUTES: LOCATION OF HAUL ROUTES ON THE AIRPORT SITE SHALL BE AS SPECIFIED ON THE PLANS OR AS APPROVED BY THE CONSTRUCTION MANAGER. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE OFF-SITE HAUL ROUTES (STATE HIGHWAYS, COUNTY ROADS OR CITY STREETS) WITH THE APPROPRIATE OWNER WHO HAS JURISDICTION OVER THE AFFECTED ROUTE. ON-SITE HAUL ROUTES SHALL BE MAINTAINED BY THE CONTRACTOR AND SHALL BE RESTORED TO THEIR ORIGINAL CONDITION UPON COMPLETION OF BEING USED AS A HAUL ROUTE. THE BEFORE AND AFTER CONDITION OF ON-SITE HAUL ROUTES SHALL BE JOINTLY INSPECTED AND CONDITION DETERMINED BY THE CONTRACTOR AND THE CONSTRUCTION MANAGER. FENCING, DRAINAGE, GRADING AND OTHER MISCELLANEOUS CONSTRUCTION REQUIRED TO CONSTRUCT TEMPORARY HAUL ROUTES OR ACCESS POINTS ON THE AIRPORT WILL BE THE CONTRACTOR'S TOTAL RESPONSIBILITY AND SHALL BE APPROVED BY THE CONSTRUCTION MANAGER PRIOR TO THE WORK. ALL ON-SITE FAA ACCESS ROADS TO FAA FACILITIES SHALL REMAIN OPEN AND MAINTAINED AT ALL TIMES. PHOTOGRAPHS AND A VIDEO OF THE HAUL ROUTES SPECIFIED BY THE PLANS MUST BE PROVIDED BY THE CONTRACTOR BEFORE AND AFTER CONSTRUCTION TO THE CONSTRUCTION MANAGER. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO HAUL ROUTES RESULTING FROM CONSTRUCTION TRAFFIC. HAUL ROADS ARE TO REMAIN CLEAN AT ALL TIMES. ALL COSTS ARE TO BE INCLUDED IN ITEM C-106-1.
2. ANY DAMAGE TO STATE, COUNTY, LOCAL OR AIRPORT FACILITY ROADWAYS CAUSED BY THE CONTRACTOR'S HAULING OR CONSTRUCTION EQUIPMENT SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE CONSTRUCTION MANAGER AT CONTRACTOR'S SOLE EXPENSE.
3. THE CONTRACTOR SHALL MAINTAIN AT ALL TIMES A SECURED AIR OPERATIONS AREA (AOA). THIS SHALL INCLUDE THE TEMPORARY FENCING AND NECESSARY ACCESS GATES. ACCESS GATES TO THE AOA LOCATIONS SHALL BE AS SHOWN ON THE PLANS, OR APPROVED BY CONSTRUCTION MANAGER. A SECURITY GUARD IS REQUIRED AT ALL TIMES WHEN AN ACCESS GATE IS IN USE. NO OTHER SITE ACCESS WILL BE ALLOWED. SECURITY GUARDS MUST UNDERGO A FINGERPRINT-BASED BACKGROUND CHECK AND OBTAIN A SIDA BADGE FROM HCAA. THE COST OF THE SIDA BADGE SHALL BE THE CONTRACTORS RESPONSIBILITY.
4. FOR MANUAL GATES ONLY, THE CONTRACTOR SHALL INSTALL ITS OWN LOCK AT EACH GATE AUTHORIZED FOR USE IN THIS CONTRACT. THE CONTRACTOR SHALL INSTALL ITS LOCK BY INTERLOCKING TO THE EXISTING HCAA LOCK ON THE GATE. THE CONTRACTOR SHALL PROVIDE 4 DUPLICATE KEYS FOR EACH LOCK TO THE CONSTRUCTION MANAGER. LOCK I.D. TAGS SHALL BE PLACED ON EACH LOCK BY THE CONTRACTOR WITH THE COMPANY NAME AND EMERGENCY CONTACT NUMBER INSCRIBED ON THE SURFACE. THIS REQUIREMENT SHALL NOT APPLY TO AUTOMATIC TYPE ACCESS CONTROLLED GATES.
5. THE CONTRACTOR'S VEHICLES AND EQUIPMENT SHALL BE RESTRICTED TO THE CONSTRUCTION LIMITS AND CONTRACTOR'S STAGING AREA ONLY. DESIGNATED PARKING FOR THE CONTRACTOR'S EMPLOYEES VEHICLES SHALL BE RESTRICTED TO THE CONTRACTORS STAGING AREA OR OTHER LOCATIONS IDENTIFIED BY THE CONSTRUCTION MANAGER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRANSPORTING ALL PERSONNEL BETWEEN THE STAGING AREA AND THE PROJECT WORK AREAS. OVERNIGHT EQUIPMENT STORAGE SHALL BE AT THE CONTRACTORS STAGING AREA ONLY.
6. LIMITS OF WORK SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR, ENGINEER, AND CONSTRUCTION MANAGER PRIOR TO BEGINNING WORK.
7. THERE ARE EXISTING UNDERGROUND UTILITIES IN THE PROJECT WORK AREA. LOCATION, ELEVATION, AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES AND OTHER FEATURES ARE SHOWN IN ACCORDANCE WITH THE BEST INFORMATION AVAILABLE AT TIME OF THE PREPARATION OF THESE PLANS BUT DO NOT PURPORT TO BE ABSOLUTELY ACCURATE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE EVERY UNDERGROUND UTILITY LOCATED, FLAGGED AND IDENTIFIED PRIOR TO CONSTRUCTION, AND AT A MINIMUM HAVE A SUNSHINE STATE "ONE CALL" PLACED (DIAL 811 OR 1-800-432-4770). HCAA TO BE NOTIFIED AS A PART OF THE "ONE CALL" PROCESS. ANY DAMAGE DONE TO ANY EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL IMMEDIATELY REPAIR ANY UTILITY DAMAGED BY HIS ACTIONS AT NO ADDITIONAL COST TO THE OWNER.
8. PROTECTION AND REPAIR OF DAMAGE TO EXISTING CABLES: LOCATION OF EXISTING FAA UNDERGROUND CABLES WILL BE FLAGGED ONE TIME BY THE LOCAL AIRWAY FACILITIES SECTOR OFFICE PERSONNEL IF APPLICABLE THROUGH COORDINATION WITH THE CONSTRUCTION MANAGER. THESE FLAGS SHALL BE PROTECTED AND MAINTAINED BY THE CONTRACTOR AT ALL TIMES. IF FLAGS ARE LOST OR REMOVED BY THE CONTRACTOR, THEY WILL BE FLAGGED AGAIN AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING UTILITY LOCATIONS ON NON-FAA UNDERGROUND CABLES. ALL UNDERGROUND CABLES SHALL BE PROTECTED AND DAMAGES REPAIRED EXPEDITIOUSLY AT NO ADDITIONAL COST TO THE OWNER.
9. CONSTRUCTION LIMITS: ALL CONTRACTOR VEHICLES AND TRAFFIC SHALL REMAIN WITHIN THE DESIGNATED CONSTRUCTION LIMITS OR HAUL ROUTES. ABSOLUTELY NO CONTRACTOR VEHICLES WILL BE ALLOWED ON OTHER AIRFIELD OPERATIONS AREAS.
10. NIGHTTIME CONSTRUCTION LIGHTING: WHEN NIGHT WORK IS PERMITTED OR REQUIRED, THE CONTRACTOR SHALL PROVIDE SUFFICIENT LIGHTING CAPABLE OF FULLY ILLUMINATING THE WORK AREA. THE CONTRACTOR SHALL COORDINATE THE DIRECTION AND ANGLE OF THE LIGHTS WITH THE CONSTRUCTION MANAGER TO PREVENT IMPAIRING THE VISION OF AIRCRAFT OPERATIONS AND THE FAA AIR TRAFFIC CONTROL TOWER.
11. REFER TO PROJECT MANUAL FOR PROJECT PERMITTING REQUIREMENTS.
12. ALL MATERIALS TO BE INSTALLED SHALL BE APPROVED BY THE ENGINEER AND THE CONSTRUCTION MANAGER PRIOR TO INSTALLATION.
13. WASTE DISPOSAL: ALL WASTE MATERIAL GENERATED AS PART OF CONSTRUCTION SHALL BE REMOVED FROM THE CONSTRUCTION AREA AND BE DISPOSED OF OFF-SITE IN A LEGAL MANNER. NO MATERIAL SHALL BE WASTED ON THE AIRPORT SITE.
14. ANY EXISTING TURF AREA DISTURBED OUTSIDE THE PROPOSED LIMITS OF GRADING, AS A RESULT OF THE CONTRACTOR'S WORK EFFORT SHALL BE SODDED AT THE CONSTRUCTION MANAGER'S DISCRETION IN ACCORDANCE WITH THE AIRPORT'S DESIGN STANDARDS AND CONTRACT SPECIFICATIONS AT THE CONTRACTOR'S EXPENSE. ANY SOD INSTALLED SHALL MATCH THE EXISTING SOD SPECIES.
15. THE CONTRACTOR SHALL PROVIDE A FULL-TIME ON-SITE SUPERVISOR FOR THE DURATION OF THE PROJECT. FOR OTHER SUPERVISOR REQUIREMENTS REFER TO THE PROJECT SPECIFICATIONS.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE STAKE-OUT OF THE PROJECT (I.E., LINE, GRADE, SLOPE STAKE, UTILITY RELOCATIONS OR ANY OTHER STAKE OUT THAT MAY BE REQUIRED TO COMPLETE THE PROJECT) IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. ANY AND ALL EXPENSES INCURRED FOR THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM C-104-1.
17. THE CONTRACTOR SHALL ENDEAVOR TO PROTECT PRIVATE PROPERTY. ANY DAMAGE CAUSED BY THE CONTRACTOR IN THE PERFORMANCE OF HIS WORK SHALL BE CORRECTED TO THE SATISFACTION OF THE CONSTRUCTION MANAGER AT NO ADDITIONAL COST TO THE OWNER.
18. THE CONTRACTOR SHALL COORDINATE THE WORK OF THIS PROJECT WITH THE CONSTRUCTION MANAGER, HCAA, ALL TENANTS, OTHER CONTRACTORS AND OTHER ON GOING PROJECTS AT THE SITE AS REQUIRED.
19. WORK AREA CLEANLINESS: THE CONTRACTOR'S WORK AND STAGING AREAS ARE IN VERY CLOSE PROXIMITY TO ACTIVE AIRCRAFT OPERATIONS. THE AIRCRAFT'S JET ENGINES ARE SUSCEPTIBLE TO INTAKE OF MATERIAL FROM PAVEMENT SURFACES WHICH COULD CAUSE DAMAGE TO THE AIRCRAFT. THE CONTRACTOR SHALL TAKE SPECIAL CARE TO ENSURE THE SITE IS CLEAN AND FREE OF DEBRIS AT ALL TIMES. UPON COMPLETION OF A DAY'S WORK, THE CONTRACTOR SHALL INSPECT ALL PAVEMENTS IN THE IMMEDIATE VICINITY OF THE DAY'S WORK AREA FOR DEBRIS PRIOR TO LEAVING THE SITE. ANY DEBRIS SHALL BE REMOVED FROM THE SITE. PAYMENT FOR THIS WORK SHOULD BE CONSIDERED INCIDENTAL TO THE PROJECT. NO ADDITIONAL COMPENSATION WILL BE MADE FOR CLEANING EFFORTS.

CONTRACTOR STAGING AREA NOTES

1. THE CONTRACTOR SHALL COORDINATE WITH THE CONSTRUCTION MANAGER DURING THE MOBILIZATION PHASE FOR ESTABLISHMENT OF A STAGING AREA. THE CONTRACTOR SHALL UTILIZE THIS LOCATION THROUGHOUT CONSTRUCTION.
2. THE CONTRACTOR SHALL TAKE CARE TO ENSURE THAT ALL EQUIPMENT AND MATERIALS LOCATED WITHIN THE CONTRACTOR'S STAGING AREA ARE LOCATED OUTSIDE OF ANY RUNWAY OR TAXIWAY OBJECT FREE AREAS.
3. IF REQUESTED BY THE CONTRACTOR, ADDITIONAL AREAS ADJACENT TO THE WORK SITE MAY BE MADE AVAILABLE FOR USE BY THE CONTRACTOR AS A STAGING AREA AT THE DISCRETION OF THE CONSTRUCTION MANAGER.
4. THE EXACT LOCATIONS AND DIMENSIONS OF THE STAGING AREA WILL BE CONFIRMED IN THE FIELD BY THE CONSTRUCTION MANAGER.
5. THE STAGING AREA LOCATION DOES NOT HAVE EXISTING UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING ANY UTILITIES REQUIRED FOR HIS OWN USE AND ANY UTILITIES REQUIRED WILL BE AT THE CONTRACTORS EXPENSE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE ALL ASSOCIATED UTILITY CONNECTIONS FOR THE STAGING AREA WITH THE LOCAL AUTHORITIES.
6. AT THE CONCLUSION OF CONSTRUCTION, AND BEFORE FINAL ACCEPTANCE, THE STAGING AREA AND EMPLOYEE PARKING AREA SHALL BE RESTORED TO THEIR PRE-CONSTRUCTION CONDITION. THE AREA SHALL BE GRADED TO DRAIN AS EXISTING AND SEEDED IF NECESSARY PER THE PROJECT DRAWINGS AND SPECIFICATIONS. COST SHALL BE CONSIDERED INCIDENTAL TO THE C-105-1 MOBILIZATION PAY ITEM. ANY DAMAGE DONE TO EXISTING FENCE, PAVEMENT, CURBS, ETC. AS A RESULT OF THE CONTRACTORS FORCES SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
7. NO STAGING ON ANY ACTIVE AIRFIELD PAVEMENTS OR ROADWAYS WILL BE ALLOWED AT ANY TIME.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING THEIR OWN FENCING, MAINTAINING EXISTING FENCING, AND SECURING THE STAGING AREA AS NECESSARY.

CONTRACTOR STAGING AREA NOTES

1. ANY EXISTING TURF AREA DISTURBED OUTSIDE THE LIMITS OF WORK, AS A RESULT OF THE CONTRACTOR'S WORK EFFORT SHALL BE SEEDED OR SODDED AT THE CONSTRUCTION MANAGER'S DISCRETION IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. COST FOR THE SITE RESTORATION SHALL BE INCLUDED IN THE C-105-1 MOBILIZATION PAY ITEM.

100% DESIGN SUBMITTAL

BY	REVISIONS	DATE

HILLSBOROUGH COUNTY
AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H, Inc.
1715 N. Westshore Blvd., Suite 600
Tampa, Florida 33607-3999
813-289-5550
www.rsandh.com
FL.Cert.Nos. AAC001886
EB0005620 LCC000210

Tampa International Airport

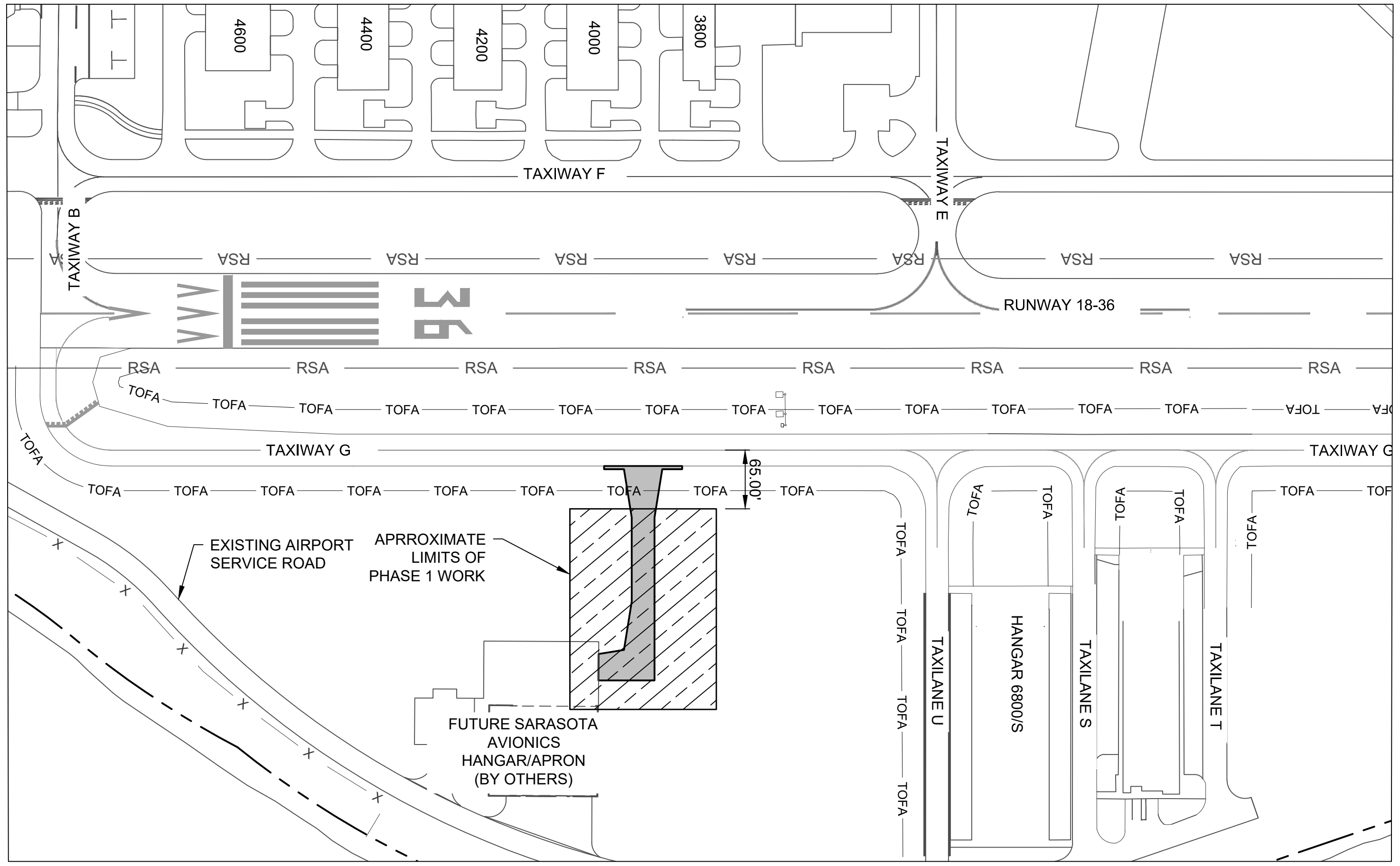
PROJECT NAME: TAXILANE G2

SHEET TITLE: GENERAL AND STAGING AREA NOTES

DESIGNED: DAG
DRAWN: SCB
CHECKED: SCS
HCAA NO.: 6640 19
JOB NO.: 204-0001-056
DATE: DECEMBER 4, 2020

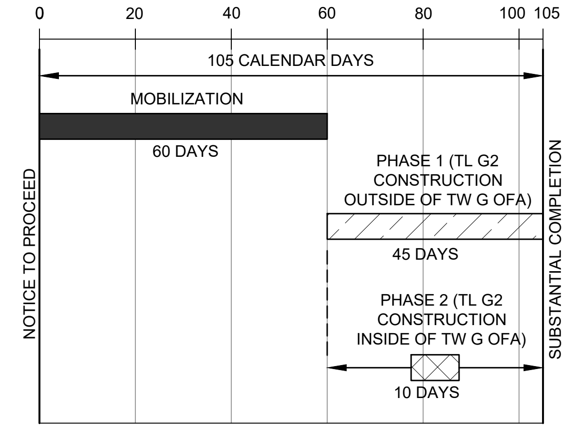
G004
SHEET NO.:

DocuSign Envelope ID: 3024EB8E-FC07-45C5-9FB6-06D745EB4935



1 G005 **PHASE 1 CONSTRUCTION**

CONSTRUCTION PHASING SCHEMATIC



PHASING NOTES

1. FOR CONTRACT LAYOUT PLANS AND ASSOCIATED NOTES, REFER TO SHEETS G003 AND G004.
2. PHASING PLAN INCLUDES A GRAPHICAL DEPICTION OF THE LIMITS OF WORK ASSOCIATED WITH EACH WORK AREA.
3. FOR THE WORK DETAILS ASSOCIATED WITH EACH WORK AREA, REFER TO THE "C" AND "E" SERIES SHEETS.
4. THE CONTRACTOR SHALL SUPPLY A COMPLETE AND DETAILED CONSTRUCTION SCHEDULE TO THE CONSTRUCTION MANAGER FOR REVIEW AND APPROVAL PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL NOT REVISE THE SCHEDULE WITHOUT THE WRITTEN APPROVAL OF THE CONSTRUCTION MANAGER.
5. THE DURATIONS INCLUDED FOR PHASING ARE CONSECUTIVE CALENDAR DAYS.
6. 48 HOUR'S NOTICE SHALL BE PROVIDED PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES TO ENSURE THAT APPROPRIATE NOTAMS ARE ISSUED.
7. WORK HOURS SHALL BE 7AM TO 7PM, MONDAY THRU FRIDAY, UNLESS OTHERWISE NOTED.

PHASING DESCRIPTIONS

THE PROJECT CONSISTS OF THREE (3) PHASES. DESCRIPTIONS OF EACH OF THE PHASES IDENTIFIED ARE AS FOLLOWS:

PHASE 0 - MOBILIZATION

THE CONTRACTOR SHALL UTILIZE THIS PHASE TO MOBILIZE FOR CONSTRUCTION. MOBILIZATION SHALL INCLUDE, BUT NOT LIMITED TO, THE DEVELOPMENT OF A COMPREHENSIVE CONSTRUCTION SCHEDULE, PREPARATION AND SUBMISSION OF ALL SHOP DRAWINGS FOR REVIEW AND APPROVAL, COORDINATION OF ANY PERMITTING REQUIREMENTS, ORDERING OF MATERIALS (SPECIAL ATTENTION SHALL BE PAID TO ITEMS WITH LONG LEAD TIMES), ETC. IT IS THE INTENT OF THIS PHASE TO PROVIDE THE CONTRACTOR WITH SUFFICIENT TIME TO COMPLETE ALL TASKS REQUIRED TO FULLY MOBILIZE BEFORE BREAKING GROUND ON THE CONSTRUCTION SITE. THE CONTRACTOR HAS 60 CONSECUTIVE CALENDAR DAYS FOR PHASE 0.

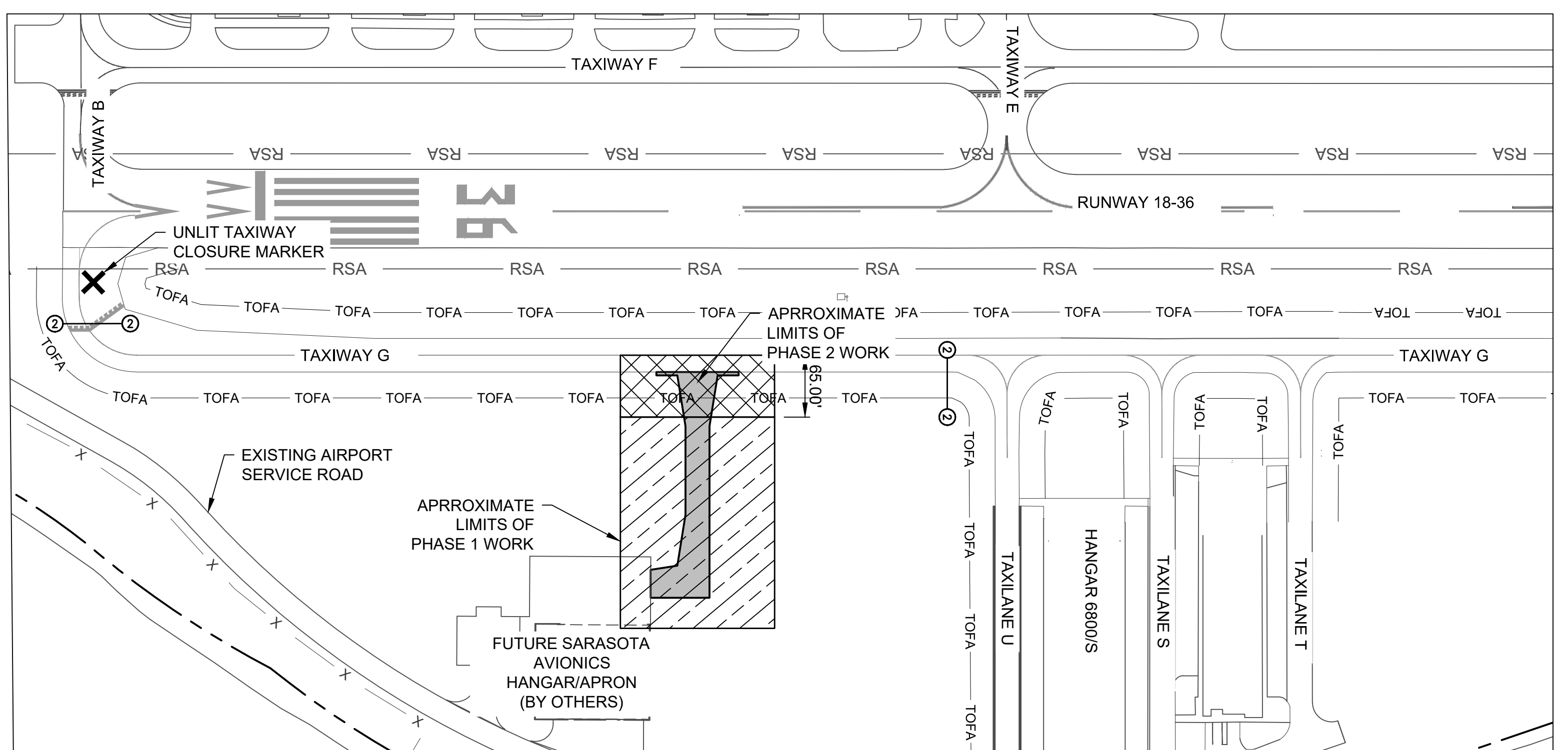
ADDITIONALLY, THE PRE-CONSTRUCTION CONFERENCE SHALL BE CONDUCTED DURING THIS PHASE TO FAMILIARIZE THE CONTRACTOR WITH THE PROJECT SITE, OPERATIONS REQUIREMENTS AND OTHER GENERAL PROJECT REQUIREMENTS.

PHASE 1 - TAXILANE G2 CONSTRUCTION (OUTSIDE TAXIWAY G OBJECT FREE AREA)

PHASE 1 CONSISTS OF ALL WORK REQUIRED TO COMPLETE THE CONSTRUCTION OF THE TAXIWAY G2 OUTSIDE THE LIMITS OF TAXIWAY G OFA INCLUDING DEMOLITION, EARTHWORK AND GRADING, PAVEMENT CONSTRUCTION, PAVEMENT MARKINGS, AND AIRFIELD ELECTRICAL WORK. PHASE 1 DURATION SHALL BEGIN 60 DAYS AFTER THE NOTICE TO PROCEED UNLESS A WRITTEN REQUEST IS MADE TO AND APPROVED BY THE CONSTRUCTION MANAGER. THE CONTRACTOR HAS 45 CONSECUTIVE CALENDAR DAYS FOR PHASE 1.

PHASE 2 - TAXILANE G2 CONSTRUCTION (WITHIN TAXIWAY G OBJECT FREE AREA)

PHASE 2 CONSISTS OF ALL WORK REQUIRED TO COMPLETE THE CONSTRUCTION OF TAXILANE G2 WITHIN THE LIMITS OF TAXIWAY G OFA INCLUDING DEMOLITION, EARTHWORK AND GRADING, PAVEMENT CONSTRUCTION, PAVEMENT MARKINGS, AND AIRFIELD ELECTRICAL WORK.. THE CONTRACTOR SHALL COORDINATE WITH THE AIRPORT FOR TSA ACCESS. THE CONTRACTOR HAS 10 CONSECUTIVE CALENDAR DAYS FOR PHASE 2. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER A MINIMUM OF 7 CALENDAR DAYS PRIOR TO BEGINNING WORK IN PHASE 2.



1 G005 **PHASE 2 CONSTRUCTION**

LEGEND

①—①	BARRICADE PHASE NUMBER
(hatched)	PHASE 1
(cross-hatched)	PHASE 2
— RSA —	RUNWAY SAFETY AREA
— TOFA —	TAXIWAY OBJECT FREE AREA
✕	UNLIT TAXIWAY CLOSURE MARKER. SEE NOTES AND DETAILS, SHEET G002.

GENERAL BARRICADE PLAN NOTES

1. FOR SAFETY AND SECURITY NOTES, SEE SHEET G002.
2. BARRICADE LOCATIONS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS FOR EACH PHASE. ULTIMATELY IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ALL PROPER SAFETY MEASURES ARE FOLLOWED DURING CONSTRUCTION, INCLUDING PROPER PLACEMENT AND LOCATION OF LOW PROFILE BARRICADES.
3. GUIDANCE SIGNS AND LIGHTING ASSOCIATED WITH THE TAXIWAY CLOSURE SHALL BE COVERED WITH OPAQUE MATERIAL TO PREVENT AIRCRAFT FROM INADVERTENTLY TAXIING ONTO THE CLOSED PAVEMENTS. MATERIAL SHALL BE APPROVED BY THE CONSTRUCTION MANAGER AND SHALL NOT DAMAGE THE SIGN OR FIXTURE SURFACES. COST SHALL BE INCLUDED IN COST FOR FURNISHING THE MATERIAL USED TO COVER GUIDANCE SIGNS AND LIGHTING SHALL BE INCIDENTAL TO ITEM L-105-1 TEMPORARY AIRFIELD LIGHTING SYSTEM.

NORTH

0 50 100 200 FEET

100% DESIGN SUBMITTAL

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H

Tampa International Airport

PROJECT NAME: TAXILANE G2

SHEET TITLE: CONSTRUCTION PHASING AND BARRICADE PLAN

DESIGNED:	DAG
DRAWN:	SCB
CHECKED:	SCS
HCAA NO.:	6640 19
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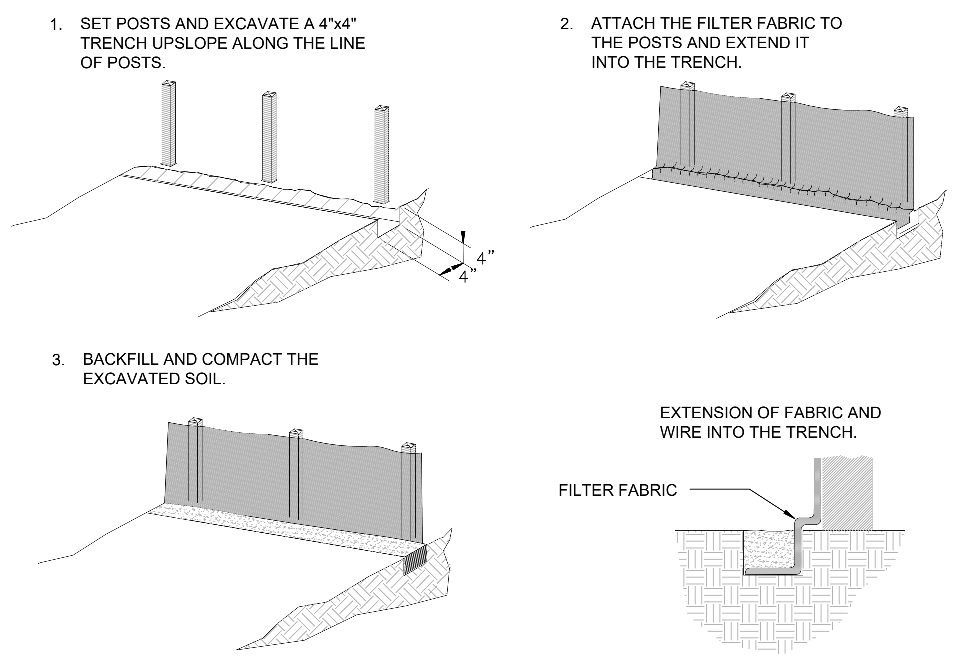
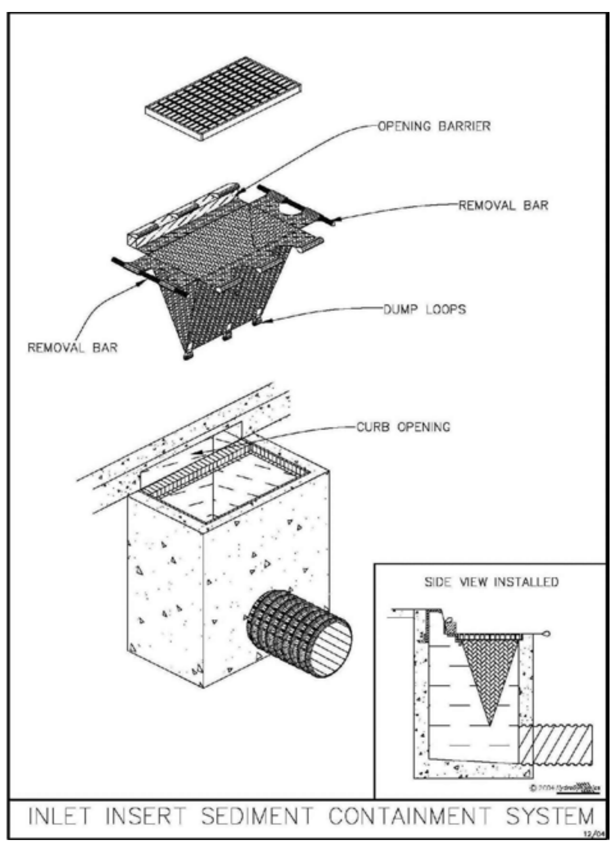
DATE:	DECEMBER 4, 2020

SHEET NO.: G005



1 G006 SILT FENCE CONSTRUCTION DETAILS

NTS



2 G006 TYPE 2 INLET PROTECTION SEDIMENT INSERT

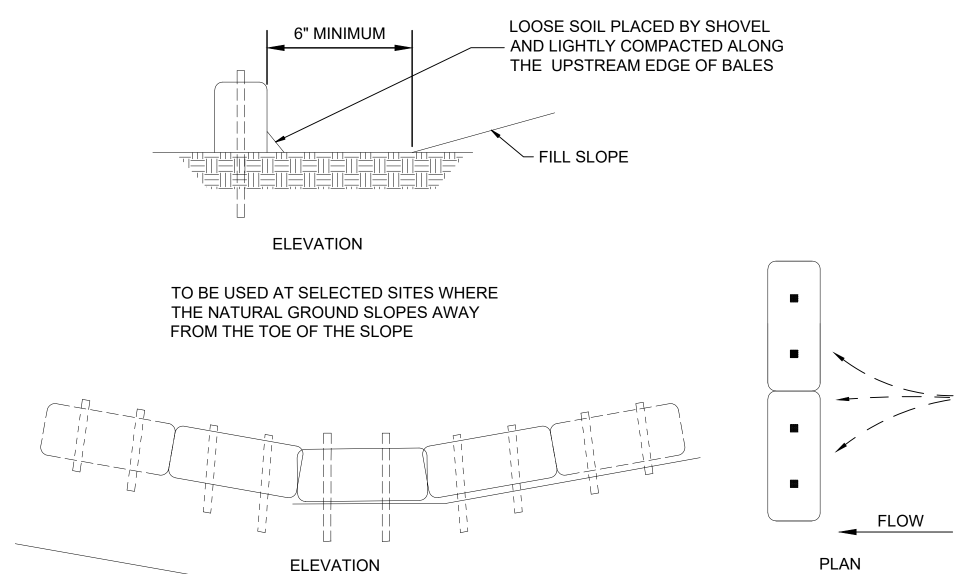
NTS

GENERAL EROSION CONTROL NOTES

1. THE PURPOSE OF EROSION CONTROL IS TO PREVENT POLLUTION OF BODIES OF WATER ON OR ADJACENT TO THE PROJECT SITE. IN ADDITION, EROSION CONTROL SHALL PREVENT DAMAGE TO ADJACENT PROPERTY, AIRPORT PROPERTY AND WORK IN PROGRESS.
2. ALL EROSION AND SILTATION MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN GRADING. CARE AND MAINTENANCE OF EROSION CONTROL MEASURES SHALL BE IN ACCORDANCE WITH DRAWINGS, TECHNICAL SPECIFICATIONS, APPROVED STORMWATER POLLUTION PREVENTION PLAN (SWPPP) OR AS DIRECTED BY THE CONSTRUCTION MANAGER.
3. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO INSPECT ALL EROSION CONTROL DEVICES PERIODICALLY AND AFTER EVERY RAINFALL. ANY NECESSARY REPAIRS OR CLEANUP TO MAINTAIN THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES SHALL BE MADE IMMEDIATELY.
4. CONTRACTOR IS RESPONSIBLE FOR STORM WATER POLLUTION PREVENTION PLAN (SWPPP).
5. ALL STREAM CROSSINGS AND STREAM DIVERSIONS REQUIRE ENVIRONMENTAL APPROVAL PRIOR TO ANY INSTREAM CONSTRUCTION.
6. CONTRACTOR SHALL SUBMIT AND RECEIVE APPROVAL ON THROUGH THE SHOP DRAWING SUBMITTAL PROCESS AN EROSION CONTROL AND DUST CONTROL PLAN PRIOR TO ANY LAND DISTURBING ACTIVITY. EROSION CONTROL PLAN SHALL INCLUDE PROPOSED LOCATION OF SILT FENCE, INLET/OUTLET PROTECTION, AND OTHER EROSION CONTROL MEASURES AS NECESSARY.
7. PAYMENT FOR EROSION CONTROL SHALL BE INCLUSIVE OF THE C-102-1 EROSION AND SEDIMENTATION CONTROL PAY ITEM. THERE SHALL BE NO SEPARATE MEASUREMENT OR PAYMENT FOR PLACEMENT, CARE, MAINTENANCE, REMOVAL AND SITE RESTORATION OF ANY EROSION CONTROL MATERIALS, EXCEPT AS NOTED FOR TURFING.

SILT FENCE NOTES

1. SILT FENCE SHALL BE INSTALLED AT THE PERIMETER OF ALL DISTURBED LAND AREAS. SILT FENCE SHALL NOT BE INSTALLED WITHIN RUNWAY SAFETY AREAS OR TAXIWAY OBJECT FREE AREAS WHILE THE AFFECTED RUNWAY AND/OR TAXIWAY IS OPEN.
2. SILT FENCE SEDIMENT BARRIER SHALL BE IN PLACE PRIOR TO GRADING.
3. SILT FENCE AND FILTER FABRIC MUST BE ENTRENCHED.
4. POST FOR SILT FENCES SHALL BE 2.5 X 2 INCH DIAMETER WOOD WITH A MINIMUM LENGTH OF 5 FEET.
5. POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AT THE BARRIER LOCATION AND DRIVEN SECURELY INTO THE GROUND (MIN. OF 12 INCHES).
6. SEDIMENT MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
7. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE SILT FENCE OR FILTER BARRIER IS NO LONGER REQUIRED SHALL BE DRESSED TO CONFORM WITH THE PROPOSED AND EXISTING GRADES, PREPARED AND SEEDED.
8. UNDER NO CIRCUMSTANCES SHOULD SILT FENCE BE CONSTRUCTED IN LIVE STREAMS.
9. SILT FENCE SHALL BE REMOVED UPON COMPLETION OF THE PROJECT OR WHEN NECESSARY PER THE APPROVED SWPPP.



ANCHOR BALES WITH TWO STAKES PER BALE TO BE USED AT SELECTED SITES WHERE THE NATURAL GROUND SLOPES TOWARD THE TOE OF THE SLOPE (TOS).

STAKES SHALL BE 2"X2"X4' WOOD

3 G006 UNPAVED DITCH PROTECTION

NTS

INLET PROTECTION NOTES

1. INLET PROTECTION SHALL BE PLACED AT ALL INLETS WITHIN THE PROJECT WORK AREA AND AT ALL INLETS DOWNSTREAM OF ANY DISTURBED LAND AREA.
2. INLET PROTECTION METHOD SHALL BE PER THE DETAIL SHOWN ON THIS SHEET. ALTERNATIVE METHODS MAY BE APPROVED THROUGH THE SHOP DRAWING SUBMITTAL PROCESS.
3. PAYMENT FOR INLET PROTECTION SHALL BE INCLUSIVE OF THE C-102-1 EROSION AND SEDIMENTATION CONTROL PAY ITEM.

SODDING NOTES

1. ANY DISTURBED AREA WHICH WILL NOT BE PAVED OR BUILT UPON SHALL BE SODDED IN ACCORDANCE WITH SPECIFICATION T-904. THIS INCLUDES ANY GRASS AREAS THAT HAVE BEEN DAMAGED BY USE OF THE STAGING AREA, HAUL ROUTES, LIMITS OF GRADING, AND ANY OTHER AREAS THAT HAVE BEEN DAMAGED OR DESTROYED (AS DETERMINED BY THE CONSTRUCTION MANAGER) BY THE CONSTRUCTION VEHICLES, EQUIPMENT OR OTHER RELATED ACTIVITIES. SODDING WITHIN THE LIMITS OF GRADING SHALL BE PAID FOR UNDER PAY ITEM T-904-1; SODDING FOR ALL OTHER AREAS INCLUDING THE STAGING AREA, HAUL ROUTES AND TEMPORARY PARKING AREAS SHALL BE PAID FOR UNDER TEMPORARY CONSTRUCTION ITEMS, C-106-1. REFER TO THE PAVING AND GRADING PLAN AND TYPICAL CROSS SECTIONS FOR THE LIMITS OF GRADING.

100% DESIGN SUBMITTAL

BY	REVISIONS	DATE

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H

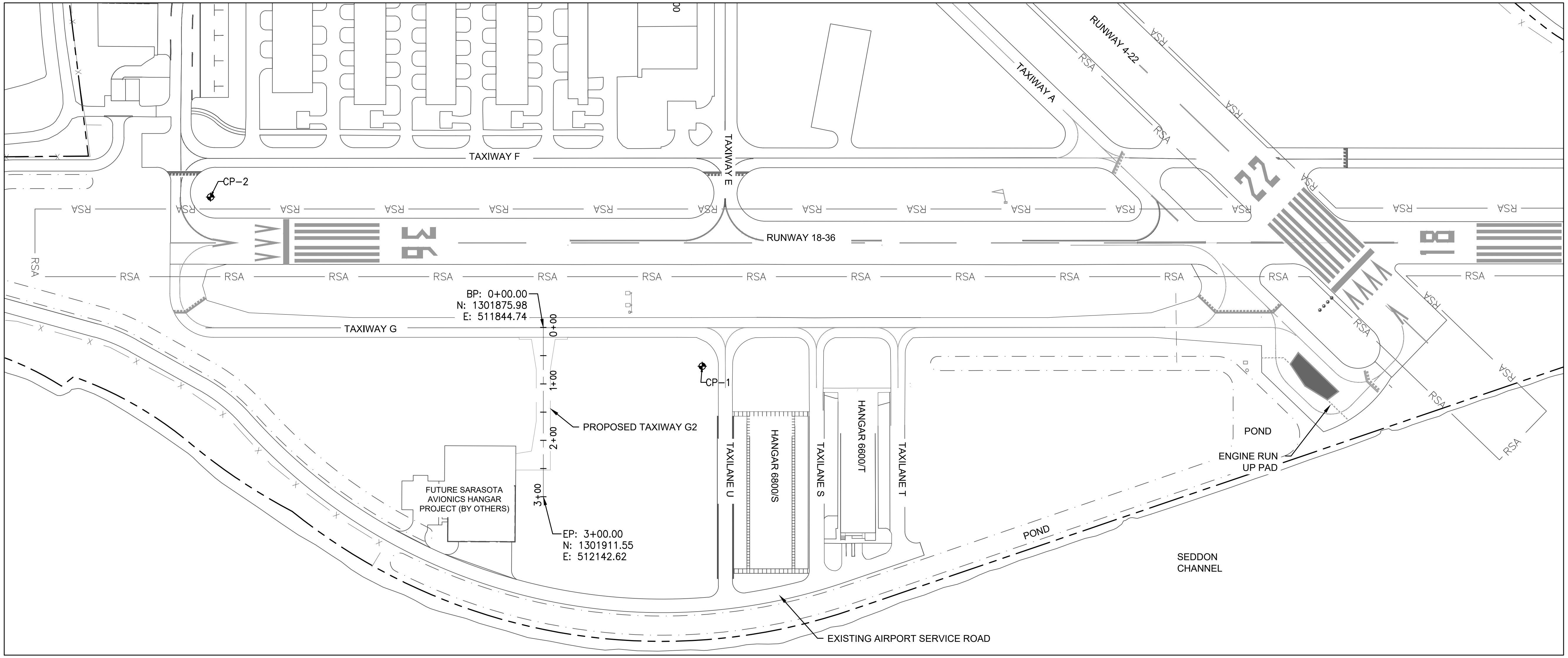
Tampa International Airport

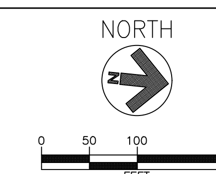
PROJECT NAME: TAXILANE G2

SHEET TITLE: EROSION AND SEDIMENTATION CONTROL NOTES AND DETAILS

DESIGNED:	DAG
DRAWN:	SCB
CHECKED:	SCS
HCAA NO.:	6640 19
JOB NO.:	204-0001-056
DATE:	DECEMBER 4, 2020

G006
SHEET NO.:





SURVEY NOTES

1. SURVEY CONDUCTED BY NORTHWEST SURVEYING, INC., OCTOBER 6, 2020.
2. THE COORDINATES SHOWN ARE GRID COORDINATES BASED ON THE FLORIDA WEST ZONE, TRANSVERSE MERCATOR STATE PLANE COORDINATE SYSTEM NAD83 (2011 ADJUSTMENT).
3. ELEVATIONS ARE BASED ON NAVD88 DATUM, DERIVED FROM NGS BENCHMARK, ELEVATION 4.68.

CONTROL POINT TABLE

POINT TABLE

POINT #	NAME	NORTHING	EASTING	ELEVATION	DESCRIPTION
513	CP-1	1302163.62	511879.70	6.77	SCIR
514	CP-2	1301263.01	511685.02	4.68	KNIGHTPORT

100% DESIGN SUBMITTAL

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H

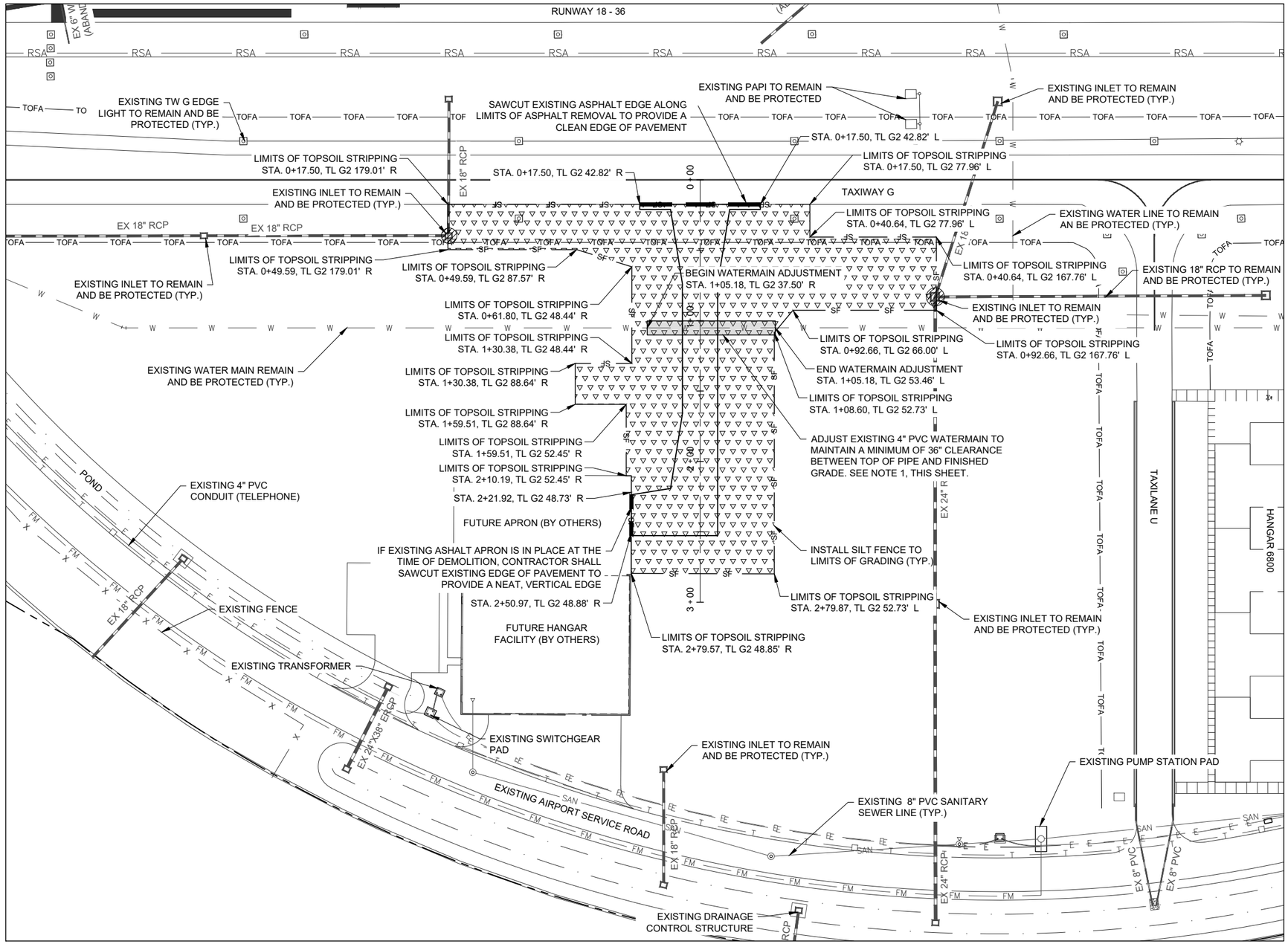
Tampa International Airport

PROJECT NAME: TAXILANE G2

SHEET TITLE: CONTROL PLAN AND ALIGNMENT LAYOUT PLAN

DESIGNED: DAG
DRAWN: SCB
CHECKED: SCS
HCAA NO.: 6640 19
JOB NO.: 204-0001-056
DATE: DECEMBER 4, 2020

G007
SHEET NO.



LEGEND

- AIRPORT PROPERTY LIMITS
- PROPOSED TAXILANE CENTERLINE/BASELINE
- RSA — EXISTING RUNWAY SAFETY AREA
- TOFA — EXISTING TAXIWAY OBJECT FREE AREA
- X — EXISTING FENCE
- EXISTING SWALE
- EXISTING INLET
- EXISTING DRAINAGE PIPE
- EXISTING HANDHOLE
- W — EXISTING 4" PVC WATER LINE
- W — EXISTING 4" PVC WATER LINE TO BE ADJUSTED, SEE NOTE 1, THIS SHEET
- SAWCUT EXISTING PAVEMENT TO PROVIDE A NEAT, CLEAN VERTICAL FACE
- TOPSOIL STRIPPING
- INLET PROTECTION. SEE NOTES AND DETAILS, SHEET G006
- SF — PROPOSED SILT FENCE. SEE NOTES AND DETAILS, SHEET G006

NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY LOCATION AND DEPTH OF EXISTING WATER MAIN PRIOR TO CONSTRUCTION. CONTRACTOR SHALL ADJUST EXISTING WATER MAIN TO PROVIDE A MINIMUM OF 36" OF VERTICAL CLEARANCE BETWEEN TOP OF PIPE AND FINISHED GROUND (PAVED OR UNPAVED). ALL WORK SHALL BE IN ACCORDANCE WITH TAMPA WATER DEPARTMENT TECHNICAL MANUAL REQUIREMENTS. COORDINATE ADJUSTMENT OF UTILITIES WITH THE CONSTRUCTION MANAGER AND ENGINEER PRIOR TO INITIATING WORK. COST FOR THIS WORK WILL BE INCLUDED IN ITEM U-100-1.
2. TOPSOIL STRIPPING SHALL CONSIST OF THE REMOVAL OF ALL TURF AND TOPSOIL IN ACCORDANCE WITH SPECIFICATION P-152 AND AS NECESSARY TO ENSURE THAT ALL UNDESIREABLE MATERIAL IS REMOVED TO THE LIMITS SHOWN IN THE PLANS. ANY EXCESS STRIPPINGS NOT USED IN ACCORDANCE WITH SPECIFICATION P-152 SHALL BE LEGALLY DISPOSED OF OFF AIRPORT PROPERTY.
3. THE CONTRACTOR SHALL CLEARLY DELINEATE THE LIMITS OF TOPSOIL STRIPPING IN THE FIELD FOR APPROVAL BY THE CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH REMOVAL. NO PAYMENT WILL BE MADE FOR ANY STRIPPING WHICH OCCURS BEYOND THE LIMITS SHOWN IN THE PLANS UNLESS APPROVAL IS GRANTED BY THE CONSTRUCTION MANAGER.
4. ALL ITEMS INDICATED AS "TO REMAIN" IN THE PLANS SHALL BE LEFT UNDISTURBED THROUGHOUT CONSTRUCTION AND SHALL BE PROTECTED FROM DAMAGE BY THE CONTRACTOR. ANY DAMAGE TO THESE ITEMS SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTOR'S EXPENSE.
5. ALL EXISTING STORMWATER DRAINAGE PIPES AND CITY-OWNED WATER PIPES, ELECTRICAL, COMMUNICATION, AND OTHER UTILITIES DEFINED IN THE PLANS SHALL REMAIN AND BE PROTECTED UNLESS OTHERWISE NOTED.
6. CONTRACTOR SHALL COORDINATE WITH AIRPORT PRIOR TO DEMOLITION AND REMOVAL OF ANY ITEMS, INCLUDING ALL WATER, SEWER, ELECTRIC AND OTHER UTILITIES. LOCATE AND TRACE CABLES SHOWN ON THE PLANS THAT ARE WITHIN THE LIMITS OF EARTH WORK AND PROTECT AT ALL TIMES. HAND EXCAVATE WITHIN 5' OF ALL IDENTIFIED CABLES.
7. THE CONTRACTOR SHALL NOT ENTER THE EXISTING RUNWAY SAFETY AREA (RSA) OR TAXIWAY OBJECT FREE AREA (TOFA) AT ANY TIME UNLESS IT HAS FIRST BEEN COORDINATED WITH THE CONSTRUCTION MANAGER.
8. REFER TO THE ELECTRICAL DEMOLITION E101 SHEET SERIES FOR ALL ELECTRICAL NOTES AND DETAILS.

THERE ARE EXISTING UNDERGROUND UTILITIES IN THE PROJECT WORK AREA. THE ENGINEER HAS MADE EVERY EFFORT TO SHOW THEIR APPROXIMATE LOCATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE EVERY UNDERGROUND UTILITY LOCATED, FLAGGED, AND IDENTIFIED PRIOR TO CONSTRUCTION. ANY DAMAGE DONE TO ANY EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL IMMEDIATELY REPAIR ANY UTILITY DAMAGED BY HIS ACTIONS WITH NO ADDITIONAL COMPENSATION.

100% DESIGN SUBMITTAL

BY	REVISIONS	DATE

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H, Inc.
1715 N. Westshore Blvd., Suite 600
Tampa, Florida 33607
813.289.8260
www.rsandh.com
FL Cert Nos. AAC001588
EB0000520 LC26000210

RS&H

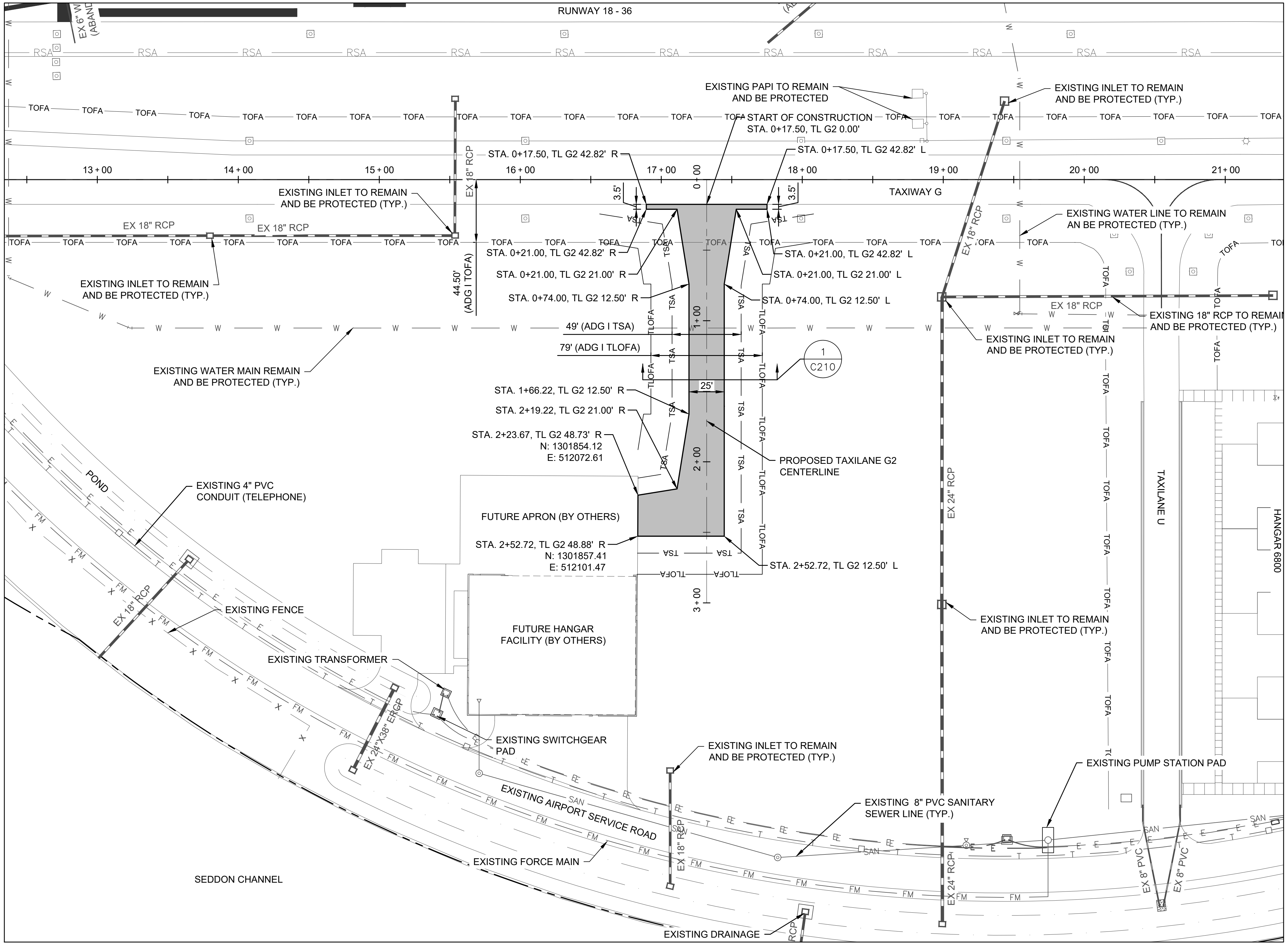
Tampa International Airport

PROJECT NAME: TAXILANE G2

SHEET TITLE: EXISTING CONDITIONS AND DEMOLITION PLAN

DESIGNED:	DAG
DRAWN:	JSA
CHECKED:	MRB
HCAA NO.:	6640 19
JOB NO.:	204-0001-056
DATE:	DECEMBER 4, 2020

SHEET NO.: C101



NORTH

0 20 40 80 FEET

LEGEND

- AIRPORT PROPERTY LIMITS
- PROPOSED TAXILANE CENTERLINE/BASELINE
- EXISTING TAXIWAY CENTERLINE
- RSA — EXISTING RUNWAY SAFETY AREA
- TLOFA — PROPOSED TAXILANE OBJECT FREE AREA
- TOFA — EXISTING TAXIWAY OBJECT FREE AREA
- X — EXISTING FENCE
- EXISTING SWALE
- EXISTING L-861T(L) ELEVATED TAXIWAY EDGE LIGHT
- EXISTING INLET
- EXISTING DRAINAGE PIPE
- EXISTING HANDHOLE
- E — EXISTING UNDERGROUND ELECTRIC LINE
- SAN — EXISTING SANITARY SEWER LINE
- FM — EXISTING SANITARY SEWER FORCE MAIN LINE
- T — EXISTING 4" PVC CONDUIT (TELEPHONE)
- W — EXISTING 4" PVC WATER LINE
- PROPOSED ASPHALT PAVEMENT

NOTES

1. THE CONTRACTOR SHALL NOT ENTER THE EXISTING TAXIWAY OBJECT FREE AREA (TOFA) AT ANY TIME UNLESS IT HAS FIRST BEEN COORDINATED WITH THE CONSTRUCTION MANAGER.
2. SEE SHEET C103 FOR PAVEMENT SECTION DETAILS

THERE ARE EXISTING UNDERGROUND UTILITIES IN THE PROJECT WORK AREA. THE ENGINEER HAS MADE EVERY EFFORT TO SHOW THEIR APPROXIMATE LOCATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE EVERY UNDERGROUND UTILITY LOCATED, FLAGGED, AND IDENTIFIED PRIOR TO CONSTRUCTION. ANY DAMAGE DONE TO ANY EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL IMMEDIATELY REPAIR ANY UTILITY DAMAGED BY HIS ACTIONS WITH NO ADDITIONAL COMPENSATION.

100% DESIGN SUBMITTAL

BY	REVISIONS	DATE

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H

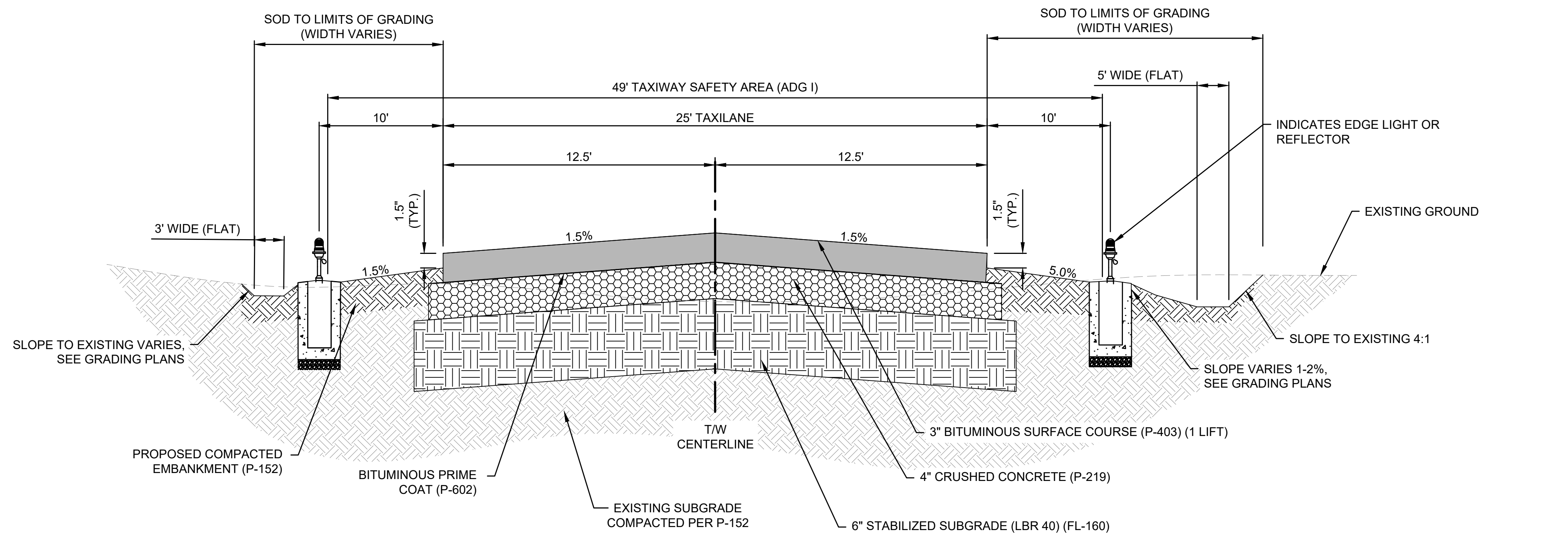
Tampa International Airport

PROJECT NAME: TAXILANE G2

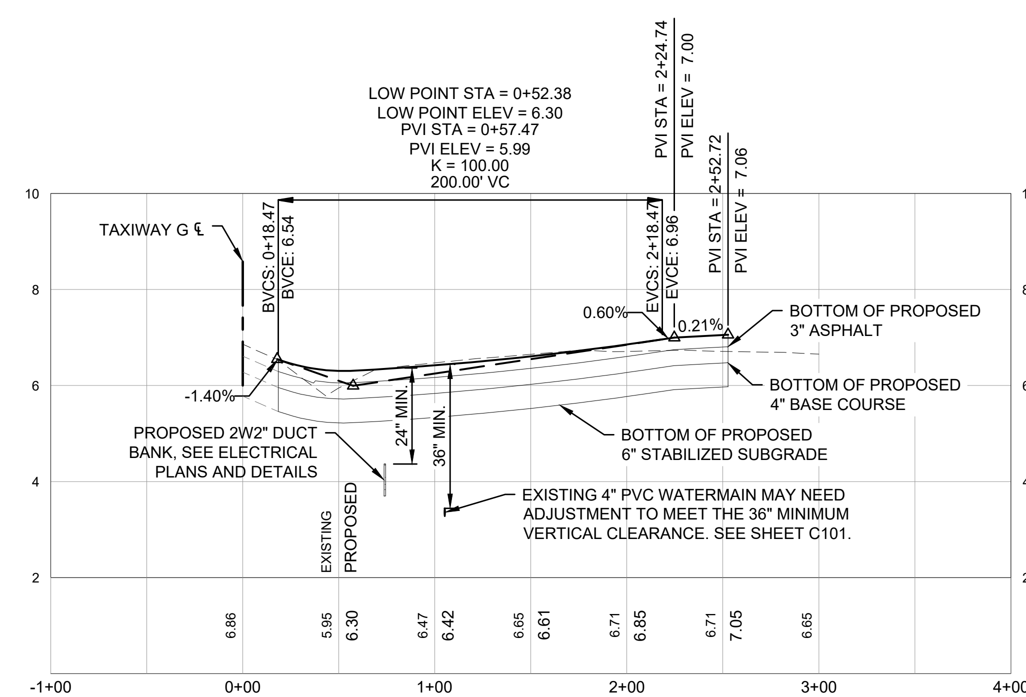
SHEET TITLE: GEOMETRY AND PAVING PLAN

DESIGNED:	DAG
DRAWN:	JSA
CHECKED:	MRB
HCAA NO.:	6640 19
JOB NO.:	204-0001-056
DATE:	DECEMBER 4, 2020

C102
SHEET NO.:



1 / C103 **TAXILANE "CROWNED" TYPICAL SECTION**
NTS



2 / C103 **TAXILANE G2 CENTERLINE PROFILE**

LEGEND

- △ POINT OF VERTICAL INTERSECTION
- — — — EXISTING GROUND
- ——— PROPOSED GROUND

GRAPHIC SCALE

HORIZONTAL: 0' 25' 50' 100'

VERTICAL: 0' 0.5' 1' 2'

100% DESIGN SUBMITTAL

BY | REVISIONS | DATE

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H, Inc.
1715 N. Westshore Blvd., Suite 600
Tampa, Florida 33607-3999
813-289-5300
www.rsandh.com
FL Cert Nos. AAC001886
EB0005620, LC0000210

RS&H

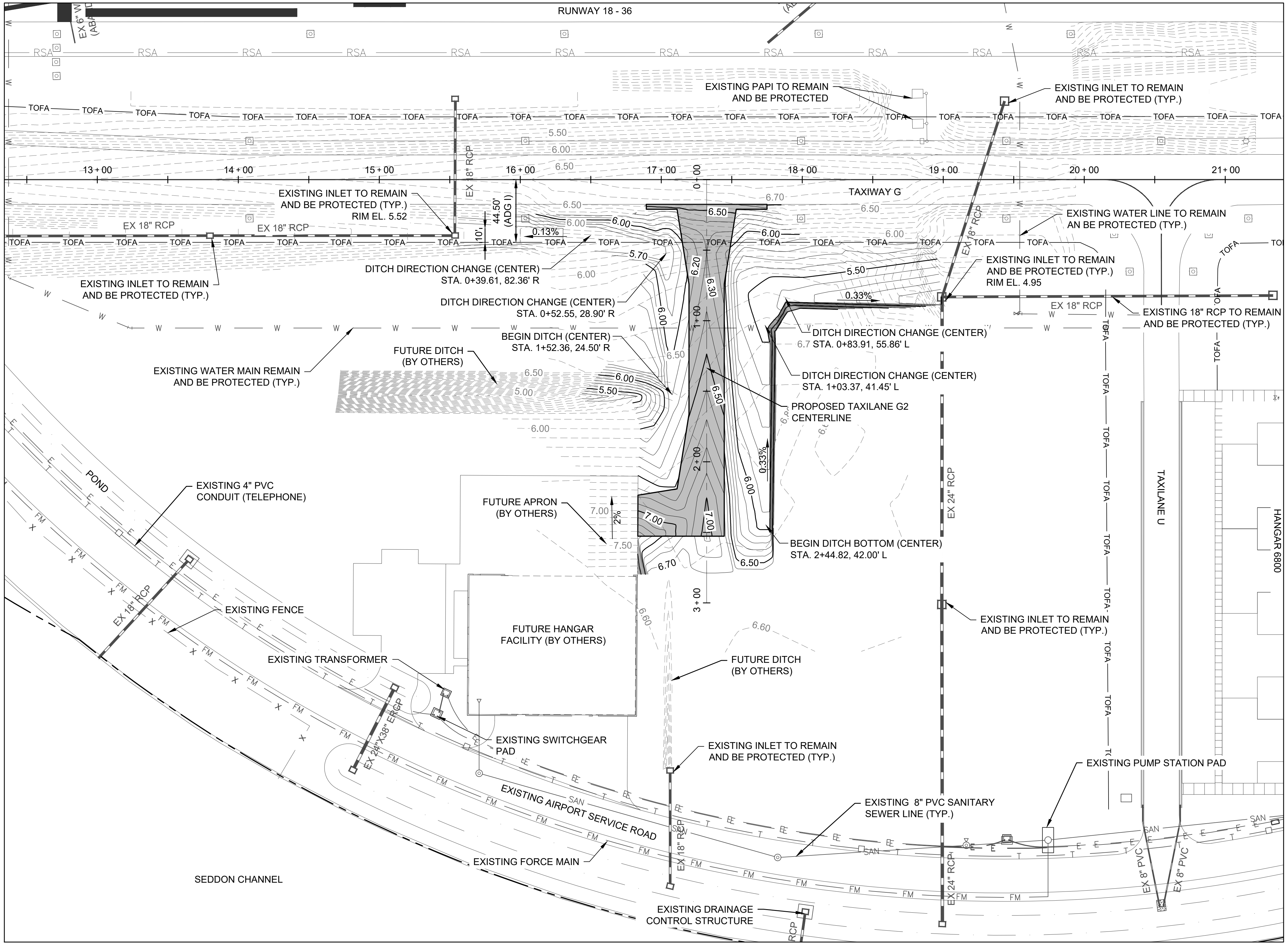
Tampa International Airport

PROJECT NAME: TAXILANE G2

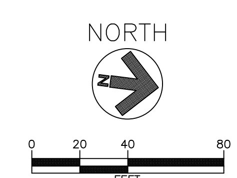
SHEET TITLE: TYPICAL PAVEMENT SECTION AND DETAILS AND CENTERLINE PROFILE

DESIGNED:	SCS
DRAWN:	SCB
CHECKED:	DAG
HCAA NO.:	6640 19
JOB NO.:	204-0001-056
DATE:	DECEMBER 4, 2020

SHEET NO.: C103



THERE ARE EXISTING UNDERGROUND UTILITIES IN THE PROJECT WORK AREA. THE ENGINEER HAS MADE EVERY EFFORT TO SHOW THEIR APPROXIMATE LOCATION. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE EVERY UNDERGROUND UTILITY LOCATED, FLAGGED, AND IDENTIFIED PRIOR TO CONSTRUCTION. ANY DAMAGE DONE TO ANY EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL IMMEDIATELY REPAIR ANY UTILITY DAMAGED BY HIS ACTIONS WITH NO ADDITIONAL COMPENSATION.



LEGEND

- AIRPORT PROPERTY LIMITS
- PROPOSED TAXILANE CENTERLINE/BASELINE
- EXISTING TAXIWAY CENTERLINE
- RSA — EXISTING RUNWAY SAFETY AREA
- TLOFA — EXISTING TAXILANE OBJECT FREE AREA
- TOFA — EXISTING TAXIWAY OBJECT FREE AREA
- X — EXISTING FENCE
- EXISTING SWALE
- EXISTING INLET
- EXISTING DRAINAGE PIPE
- EXISTING HANDHOLE
- E — EXISTING UNDERGROUND ELECTRIC LINE
- SAN — EXISTING SANITARY SEWER LINE
- FM — EXISTING SANITARY SEWER FORCE MAIN LINE
- T — EXISTING 4" PVC CONDUIT (TELEPHONE)
- W — EXISTING 4" PVC WATER LINE
- PROPOSED ASPHALT PAVEMENT
- X.X' — PROPOSED 0.5' CONTOUR
- X.X' — PROPOSED 0.1' CONTOUR
- X.X' — EXISTING 0.1' CONTOUR
- PROPOSED 0.5' CONTOUR

NOTES

1. MAINTENANCE OF DRAINAGE: THROUGHOUT THE COURSE OF CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING POSITIVE (I.E., CONTINUOUS AND FLOWING) DRAINAGE ON ALL DRAINAGE PIPES, SYSTEMS, DITCHES, AND OTHER ASSOCIATED DRAINAGE CHANNELS. TEMPORARY DRAINAGE PROVISIONS WILL BE REQUIRED FOR THE CONSTRUCTION OF ALL DRAINAGE RELATED ITEMS.
2. THE CONTRACTOR SHALL SEQUENCE THE WORK SO THAT AREAS OF STANDING WATER ARE NOT CREATED.
3. THE CONTRACTOR WILL BE REQUIRED TO CREATE AND SUBMIT A MAINTENANCE OF DRAINAGE PLAN TO THE ENGINEER AND THE OWNER FOR APPROVAL. THE MAINTENANCE OF DRAINAGE PLAN SHALL INCLUDE DRAINAGE PHASING PLANS, CONSTRUCTION PROCEDURES, ANY TEMPORARY REROUTING REQUIRED, INTENDED DURATIONS OF TEMPORARY DRAINAGE IN EACH AREA, AND ALL RELATED CONSTRUCTION ACTIVITIES REQUIRED FOR MAINTENANCE OF DRAINAGE.
4. THE CONTRACTOR SHALL ALSO HAVE A CONTINGENCY PLAN INCLUDED WITH THE MAINTENANCE OF DRAINAGE PLAN IN CASE OF A STORM EVENT THAT INDICATES HOW THE CONTRACTOR WILL ALLOW FOR THE INCREASED FLOW RATES DURING THE STORM EVENT. IT IS IMPORTANT THAT THE ACTIVE AIRFIELD AND AREAS UPSTREAM ARE NOT AFFECTED BY ANY TEMPORARY DRAINAGE PROVISIONS.
5. CONTRACTOR SHALL INSTALL SOD TO THE LIMITS OF GRADING. LIMITS OF GRADING COINCIDE WITH THE LIMITS OF TOPSOIL STRIPPING AS SHOWN ON THE DEMOLITION PLANS. NO PAYMENT WILL BE MADE FOR ANY SODDING WHICH OCCURS BEYOND THE LIMITS SHOWN IN THE PLANS UNLESS APPROVAL IS GRANTED BY THE CONSTRUCTION MANAGER.

100% DESIGN SUBMITTAL

BY | REVISIONS | DATE

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H, Inc. 1715 N. Westshore Blvd., Suite 600 Tampa, Florida 33607-3999

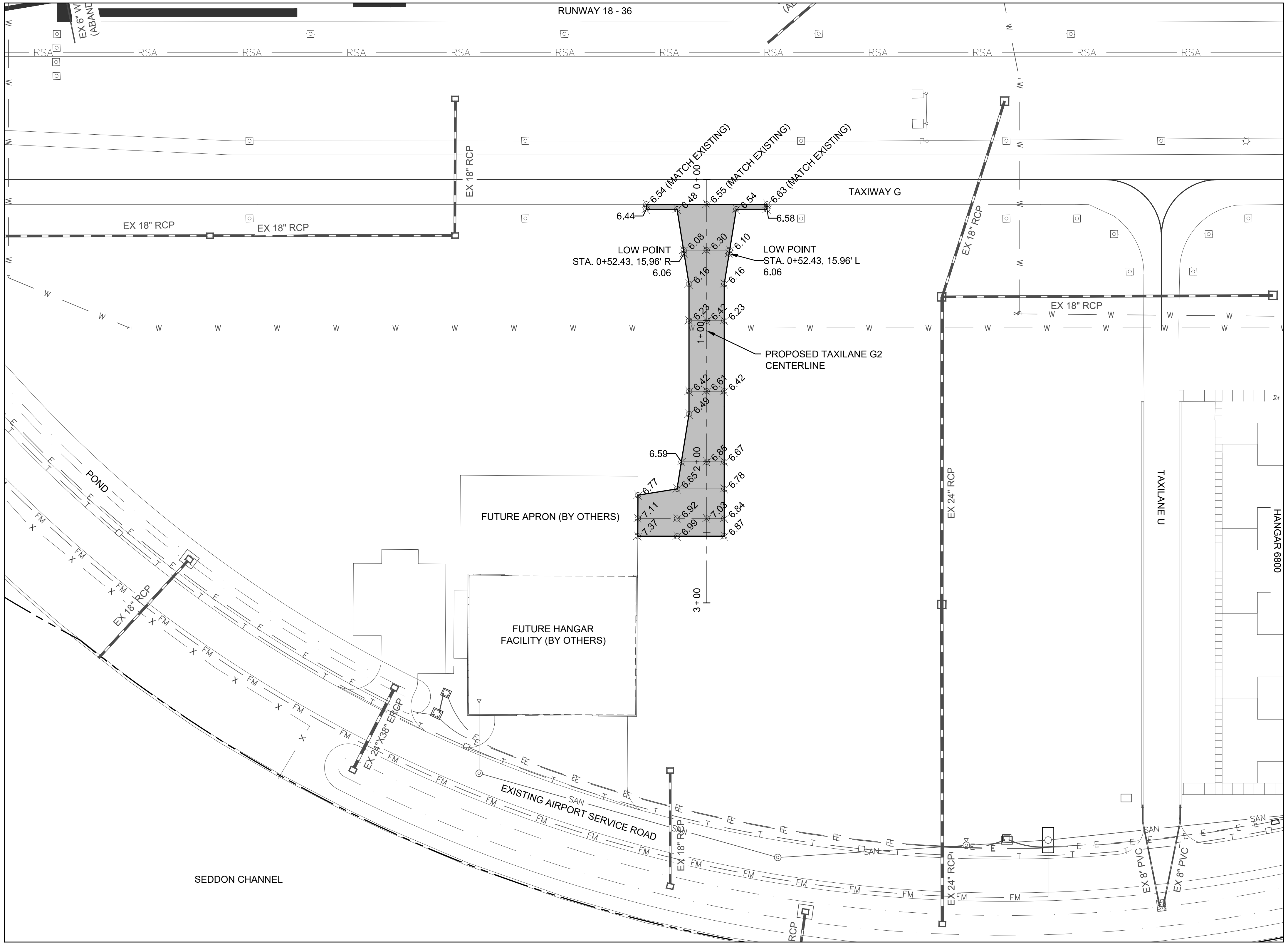
Tampa International Airport

PROJECT NAME: TAXILANE G2

SHEET TITLE: GRADING AND DRAINAGE PLAN

DESIGNED:	DAG
DRAWN:	JSA
CHECKED:	MRB
HCAA NO.:	6640 19
JOB NO.:	204-0001-056
DATE:	DECEMBER 4, 2020

SHEET NO.: C104



NORTH

0 20 40 80
FEET

LEGEND

- AIRPORT PROPERTY LIMITS
- PROPOSED TAXILANE CENTERLINE/BASELINE
- PROPOSED ASPHALT PAVEMENT
- X.XX PROPOSED PAVEMENT ELEVATION

100% DESIGN SUBMITTAL

BY	REVISIONS	DATE

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H

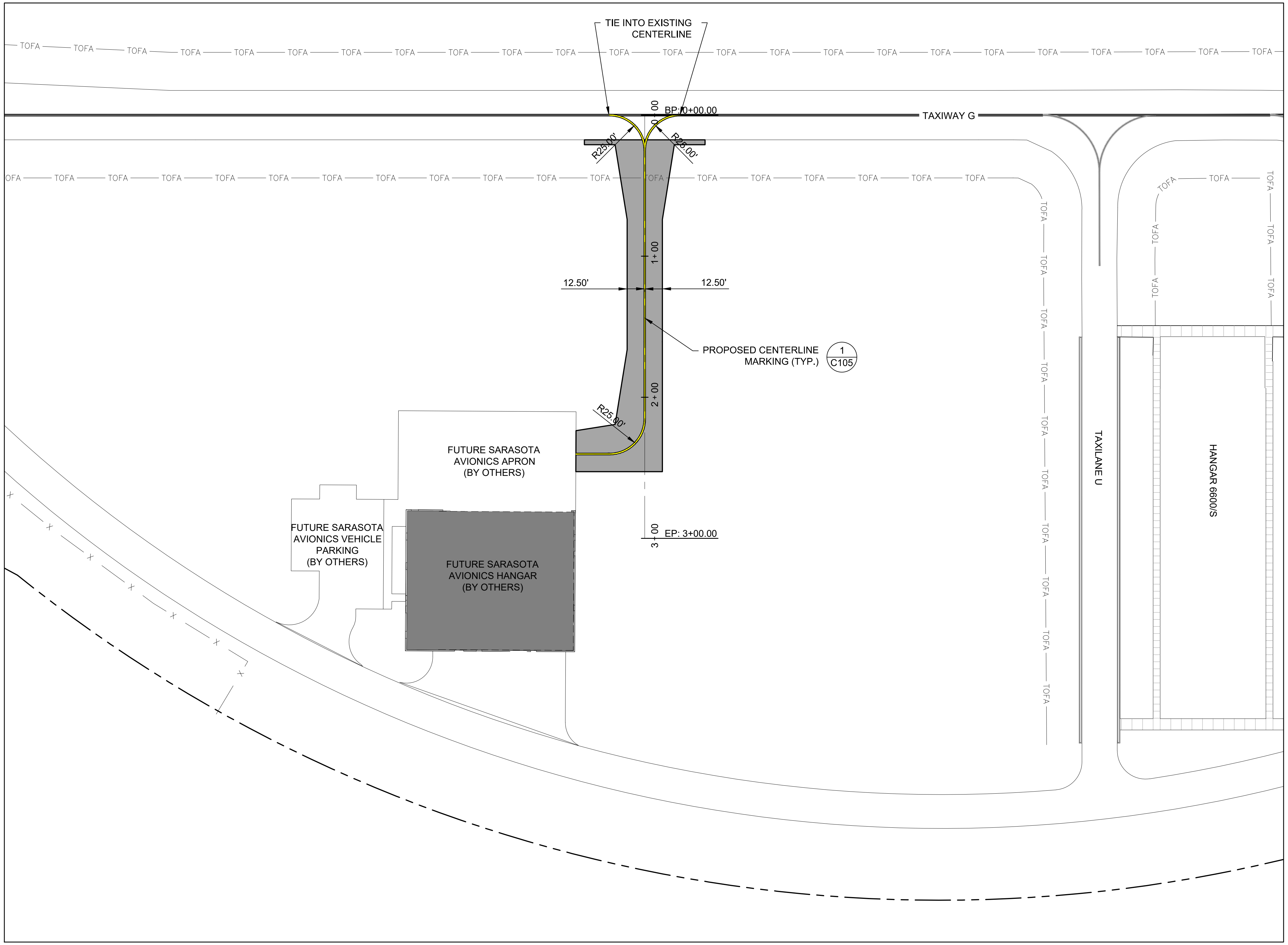
Tampa International Airport

PROJECT NAME: TAXILANE G2

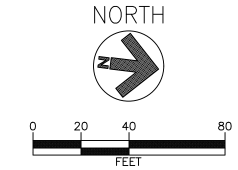
SHEET TITLE: SPOT ELEVATION PLAN

DESIGNED:	CND
DRAWN:	CND
CHECKED:	MRB
HCAA NO.:	6640 19
JOB NO.:	204-0001-056
DATE:	DECEMBER 4, 2020

C105
SHEET NO.:



1 / C106 **TAXILANE MARKING PLAN**



LEGEND

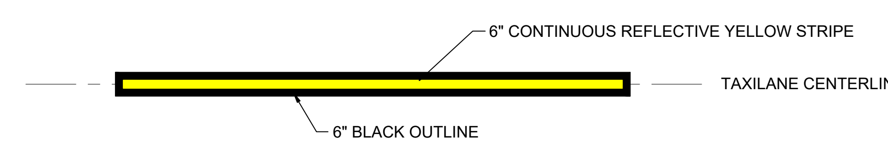
(shaded)	PROPOSED ASPHALT PAVEMENT
—— TOFA ——	TAXIWAY OBJECT FREE AREA

NOTES

1. THE CONTRACTOR SHALL NOT ENTER THE EXISTING TAXIWAY OBJECT FREE AREA (TOFA) AT ANY TIME UNLESS IT HAS FIRST BEEN COORDINATED WITH THE CONSTRUCTION MANAGER.
2. LIMITS OF PROPOSED PAVEMENT SHOWN ARE APPROXIMATE AND SHALL BE FIELD VERIFIED BY THE CONTRACTOR AND APPROVED BY THE CONSTRUCTION MANAGER.
3. ALL PAVEMENT MARKING SHALL BE IN CONFORMANCE WITH SPECIFICATION P-620 AND FAA ADVISORY CIRCULAR 150/5340-1 AND FDOT 14-60, LATEST EDITIONS.
4. ALL TAXIWAY MARKINGS SHALL BE AVIATION YELLOW, REFLECTIVE WITH A 6" NON-REFLECTIVE BLACK OUTLINE.
5. MECHANICAL SPRAYING OF MARKINGS IS REQUIRED. HAND SPRAYING OF MARKINGS IS NOT ALLOWED.
6. UNLESS OTHERWISE NOTED, ALL MARKINGS SHALL HAVE TWO (2) COATS OF PAINT, A FIRST COAT WHICH IS APPLIED WITHOUT REFLECTIVE BEADS AND A SECOND COAT WITH REFLECTIVE GLASS BEADS, TYPE I - GRADATION 'A'. SECOND COAT SHALL FULLY CONCEAL UNDERLYING PAVEMENT.
7. ALL PAINT SHALL BE SHALL MEET THE REQUIREMENTS SPECIFICATION P-620.
8. ALL PAVEMENT MARKINGS SHALL TIE TO EXISTING MARKINGS AT THE LIMITS OF CONSTRUCTION.
9. ALL DIMENSIONS SHOWN ARE TO CENTER OF YELLOW/WHITE MARKING.
10. MARKING INSTALLATION LIMITS SHALL BE LAID OUT BY A FLORIDA LICENSED SURVEYOR.

NOTE:

IT IS INTENDED FOR THIS SHEET TO BE PRINTED IN COLOR



2 / C106 **TAXILANE CENTERLINE MARKING**

100% DESIGN SUBMITTAL

DATE	REVISIONS	BY

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H, Inc.
1715 N. Westshore Blvd., Suite 600
Tampa, Florida 33607-3999
813-289-5550
www.rsandh.com
FL.Cert.Nos. AAC001886
EB0005620 LCC000210

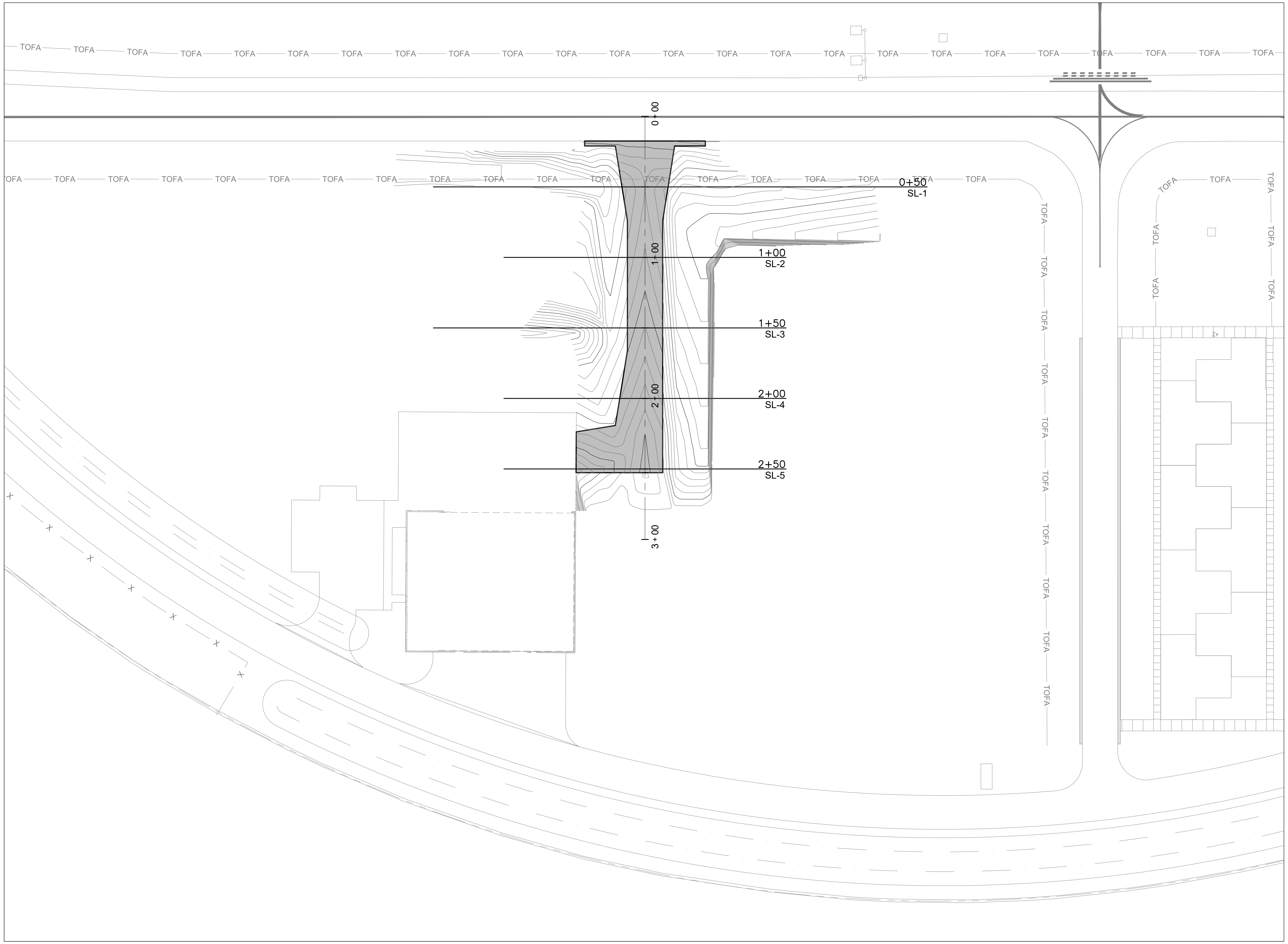
Tampa International Airport

PROJECT NAME: TAXILANE G2

SHEET TITLE: MARKING PLAN

DESIGNED:	SCS
DRAWN:	NRL
CHECKED:	DAG
HCAA NO.:	6640 19
JOB NO.:	204-0001-056
DATE:	DECEMBER 4, 2020

SHEET NO.: C106



NORTH

0 20 40 80
FEET

LEGEND

PROPOSED CONTOUR (0.1')
PROPOSED CONTOUR (0.5')

BY	REVISIONS	DATE

HILLSBOROUGH COUNTY
AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H, Inc.
1715 N. Westshore Blvd., Suite 600
Tampa, Florida 33607-3999
813-289-5550
www.rsandh.com
FL.Cert.Nos. AAC001886
EB0005620 LCC000210

Tampa International Airport

PROJECT NAME
TAXILANE G2

SHEET TITLE
CROSS SECTION KEY PLAN

DESIGNED: CND
DRAWN: CND
CHECKED: DAG
HCAA NO.: 6640 19
JOB NO.: 204-0001-056
DATE: DECEMBER 4, 2020

100% DESIGN SUBMITTAL

CX100
SHEET NO.:

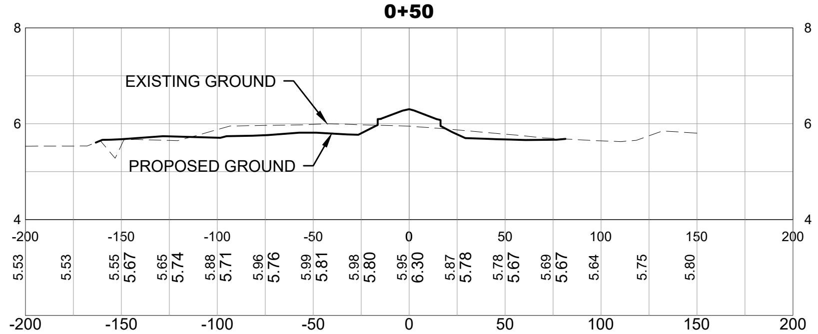
LEGEND

- EXISTING GRADE
- PROPOSED GRADE
- FUTURE GRADE (BY OTHERS)

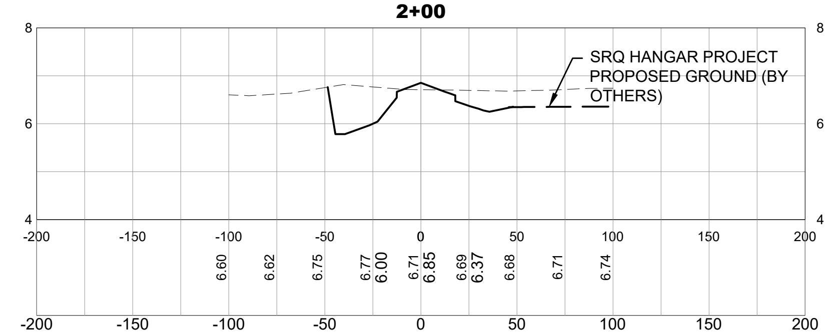
HORIZONTAL GRAPHIC SCALE
50' 25' 0 50'

VERTICAL GRAPHIC SCALE
2' 1' 0 2'

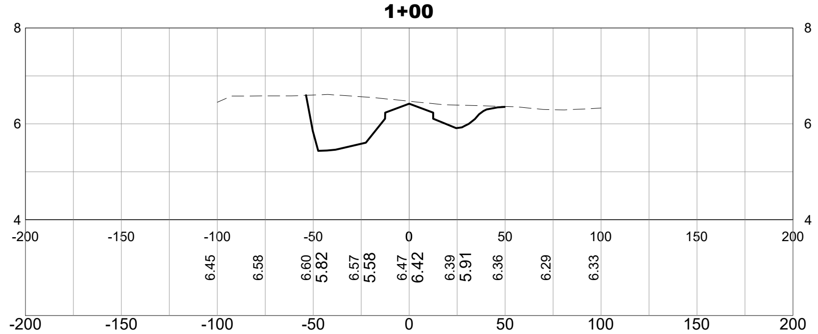
0+50



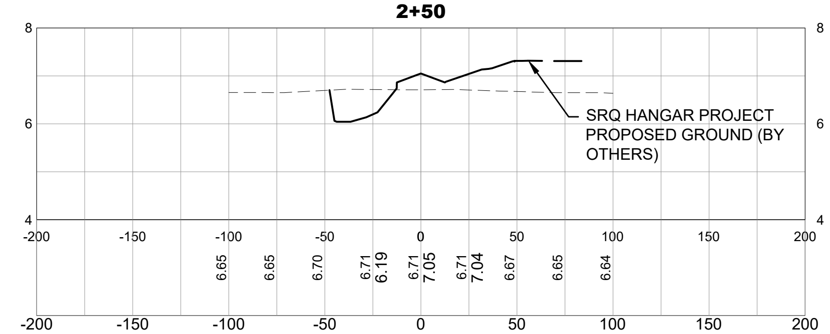
2+00



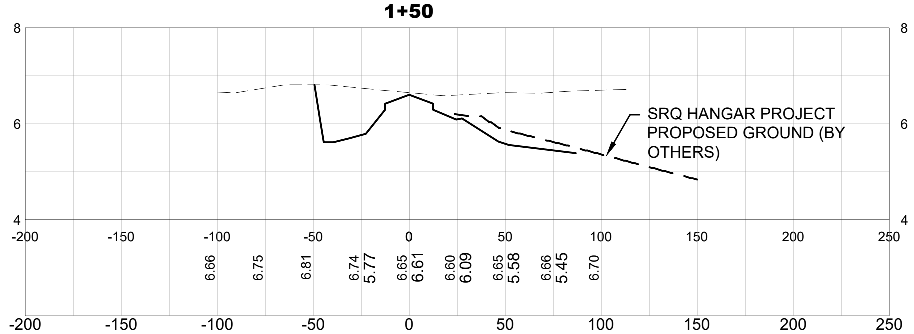
1+00



2+50



1+50



100% DESIGN SUBMITTAL

BY	REVISIONS	DATE

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

Tampa International Airport

PROJECT NAME: TAXILANE G2

SHEET TITLE: CROSS SECTIONS

DESIGNED: CND
DRAWN: CND
CHECKED: DAG

HCAA NO.: 6640 19
JOB NO.: 204-0001-056

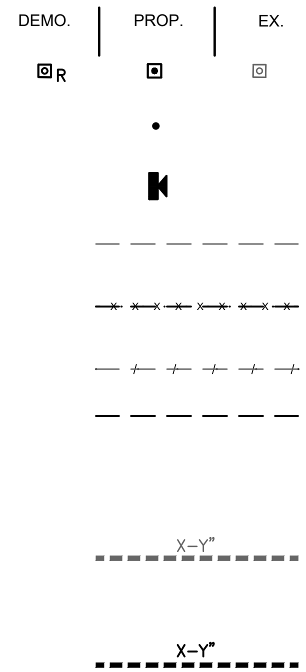
DATE: DECEMBER 4, 2020

SHEET NO.: CX101

GENERAL NOTES:

1. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE LATEST ADOPTED VERSION OF THE NATIONAL ELECTRICAL CODE, THE NATIONAL ELECTRICAL SAFETY CODE, FAA ADVISORY CIRCULARS AND ORDERS, AND APPLICABLE LOCAL BUILDING CODES, LAWS AND ORDINANCES.
2. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS, LICENSES, INSPECTIONS, FEES AND APPROVALS.
3. THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT TO REMOVE, RELOCATE, MODIFY AND INSTALL THE ELECTRICAL SYSTEMS AS INDICATED ON THE DRAWINGS. ITEMS NOT SHOWN BUT NECESSARY FOR COMPLETION OF THE WORK SHALL BE INCLUDED.
4. ALL ITEMS ARE NEW UNLESS SPECIFICALLY NOTED OTHERWISE. NEW MATERIALS SHALL BE U.L. LISTED.
5. ALL MATERIALS SCHEDULED FOR REMOVAL SUCH AS EXISTING LIGHTS, COVERS, TRANSFORMERS, ETC. WHICH ARE DEEMED SALVAGABLE BY THE AIRPORT SHALL BE DELIVERED TO THE LOCATION ON AIRPORT PROPERTY AS INDICATED BY THE OWNER'S REPRESENTATIVE. ALL NON-SALVAGEABLE MATERIALS REMOVED SUCH AS STRUCTURES, CONCRETE FOUNDATIONS, CABLE, CONDUIT, LIGHT BASES, ETC. SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED OF BY THE CONTRACTOR IN ACCORDANCE WITH APPICABLE LAWS AND ENVIRONMENTAL REGULATIONS.
6. THE LOCATIONS OF UTILITIES, DUCT BANKS AND CONDUITS SHOWN ON THE PLANS ARE APPROXIMATE AND SHALL NOT BE SCALED FOR EXACT LOCATIONS. NOT ALL UTILITIES MAY BE SHOWN. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE APPROPRIATE UTILITY/AGENCY PRIOR TO STARTING WORK FOR THE LOCATION OF EXISTING UTILITIES AND TO ALLOW THEM TIME TO PROPERLY LOCATE ALL UTILITIES. ANY INTERRUPTION OF AN EXISTING SYSTEM OR UTILITY SERVICE SHALL BE COORDINATED AND APPROVED BY THE AUTHORITY, AGENCY OR UTILTY HAVING JURSIDICTION.
7. ALL EXISTING SYSTEMS AND UTILITIES TO REMAIN SHALL BE PROTECTED FROM DAMAGE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGED SYSTEM OR UTILITY AND SHALL REPLACE OR MAKE REPAIRS IMMEDIATELY, AT THEIR OWN EXPENSE, IN ACCORDANCE WITH THE AUTHORITY, AGENCY OR UTILITY HAVING JURISDICTION. DAMAGED SYSTEMS OR UTILITIES SHALL BE IMMEDIATELY REPORTED TO THE OWNER'S REPRESENTATIVE.
8. THE CONTRACTOR SHALL UTILIZE A LOCATE SERVICE AS WELL AS HAVE A CABLE TRACER AVAILABLE TO LOCATE THE EXISTING CABLES. ALL EXCAVATION WITHIN FOUR FEET OF ANY UNDERGROUND UTILITY TO REMAIN SHALL BE PERFORMED BY HAND DIGGING METHODS.
9. THE IDENTITY AND ROUTING OF ALL CABLES SHOWN ON THE PLANS SHALL BE VERIFIED IN THE FIELD. ANY DISCREPANCY SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE AND RECORDED IN THE AS-BUILT DRAWINGS TO PROVIDE AN ACCURATE RECORD OF CONDITIONS. THESE PLANS DO NOT PURPORT TO SHOW ALL EXISTING CABLES AND CONCEALED UTILITIESWHICH WILL REQUIRE STAKE OUT PRIOR TO CONSTRUCTION. CONTRACTOR SHALL VERIFY EXISTING CIRCUIT ROUTING PRIOR TO COMMENCING WORK.
10. DEWATERING FOR THE INSTALLATION OF STRUCTURES, FOUNDATIONS, DUCT BANKS, AND CONDUIT IS INCIDENTAL TO THE RESPECTIVE PAY ITEM. THE CONTRACTOR SHALL BE RESPONSIBLE TO PAY FOR AND OBTAIN ANY AND ALL PERMITS REQUIRED FOR DEWATERING.
11. THE PROJECT PAY ITEMS ARE PROVIDED TO BE INCLUSIVE OF ALL WORK PERFORMED AS SHOWN IN THE PLANS. ALL WORK TO BE IDENTIFIED WITH A SPECIFIC PAY ITEM IS TO BE CONSIDERED REQUIRED WORK TO COMPLETE THE PROJECT AND IS TO BE SUBSIDIARY TO THE COST OF PROJECT PAY ITEMS PROVIDED.
12. ITEMS SHOWN SCREENED (LIGHT) ARE EXISTING ITEMS AND ITEMS SHOWN IN SOLID (BOLD) ARE ITEMS TO BE MODIFIED, REMOVED OR INSTALLED UNDER THIS CONTRACT UNLESS NOTED OTHERWISE.
13. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THAT ALL AIRFIELD LIGHTING CIRCUITS, EXCEPT THOSE THAT ARE SERVING CLOSED TAXIWAYS OR RUNWAYS, ARE OPERATIONAL USING TOWER AND/OR VAULT CONTROLS AT THE END OF EACH WORK DAY AND SHALL SO CERTIFY TO THE OWNER'S REPRESENTATIVE BEFORE LEAVING THE SITE EACH DAY. ALL INOPERABLE CIRCUITS REQUIRED FOR THE OPERATION OF THE AIRPORT SHALL BE IMMEDIATELY RESTORED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS, INCLUDING REPAIRS MADE BY AIRPORT PERSONNEL.
14. THE CONTRACTOR SHALL COORDINATE ALL WORK WITH THE SAFETY AND PHASING PLANS.
15. THE CONTRACTOR SHALL COMPLY WITH THE AIRPORT MAINTENANCE “LOCK-OUT/TAG-OUT” PROCEDURES AND NFPA 70E.
16. FOR EVERY LIGHT FIXTURE AND SIGN INSTALLED UNDER THIS CONTRACT THE CONTRACTOR SHALL OBTAIN THE EXACT LOCATION VIA SURVEY AND BE APPROVED BY THE OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION.
17. THE CONTRACTOR SHALL CONDUCT INSULATION RESISTANCE TO GROUND (MEGGER) TESTS ON EACH CIRCUIT AFFECTED BY THIS WORK BEFORE COMMENCING WORK ON THAT CIRCUIT. THE CONTRACTOR SHALL PREPARE AND PROVIDE TO THE OWNER'S REPRESENTATIVE A WRITTEN REPORT, BY CIRCUIT, OF THESE RESULTS. THE CONTRACTOR SHALL REPEAT THIS TEST ON EACH AFFECTED CIRCUIT AFTER COMPLETION OF THE WORK. RESULTS OF BOTH TESTS SHALL BE PROVIDED TO THE OWNER'S REPRESENTATIVE.

ELECTRICAL LEGEND:



L-861T(L) ELEVATED TAXIWAY EDGE LIGHT

L-853 TAXIWAY RETROREFLECTIVE MARKER

UNLIT END MARKER SIGN

EXISTING 2" PVC CONDUIT

REMOVE 2" PVC CONDUIT AND CABLE

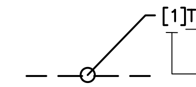
REMOVE CABLE, CONDUIT TO REMAIN

PROPOSED 2" PVC CONDUIT WITH #8, L-824, 5KV CABLE. SEE DETAILS FOR COUNTERPOISE AND GROUNDING REQUIREMENTS.

EXISTING CONCRETE ENCASED DUCT BANK
X= # OF CONDUITS
Y= SIZE OF CONDUITS

PROPOSED CONCRETE ENCASED DUCT BANK. SEE DETAILS FOR COUNTERPOISE AND GROUNDING REQUIREMENTS.
X= # OF CONDUITS
Y= SIZE OF CONDUITS

CIRCUIT IDENTIFICATION:



CIRCUIT IDENTIFICATION NOTES:
1. DARK TEXT INDICATES CABLE TO BE REMOVED FROM CONDUIT OR DUCT BANK ON ELECTRICAL DEMOLITION SHEETS AND CABLE TO BE PROVIDED ON AIRFIELD ELECTRICAL PLAN SHEET.
2. LIGHT TEXT INDICATES EXISTING CABLE TO REMAIN.
3. THE FOLLOWING ARE CIRCUIT IDENTIFICATIONS:
   PAPI CIRCUIT, 3 #6 AND 1 #6 GROUND (ALL 600V TYPE XLP)
   PAPI CONTROL CIRCUIT, 2 #10 AND 1 #10 GROUND (ALL 600V TYPE XLP)
   MINI POWER ZONE CIRCUIT, 2 #4 AND 1 #8 GROUND (ALL 600V TYPE XLP)
   REIL CIRCUIT, 3 #8 AND 1 #10 GROUND (ALL 600V TYPE XLP)

CIRCUIT SCHEDULE

CIRCUIT DESIGNATION	CIRCUIT DESCRIPTION	REGULATOR SIZE	NO. OF STEPS
TWY A	TAXIWAY A EDGE LIGHTS	15KW	3
18-36	RUNWAY 18-36 EDGE LIGHTS	7.5KW	3
4-22	RUNWAY 4-22 EDGE LIGHTS	10KW	3
TWY F	TAXIWAY F AND G EDGE LIGHTS	15KW	3
PAPI CIRCUIT	RUNWAY 18-36 PAPI, 240V, FED FROM MINI POWER ZONE, 3#6 AND #6 GND	-	-

ABBREVIATIONS

ADJ	ADJUSTABLE
ALCS	AIRFIELD LIGHTING CONTROL SYSTEM
AOA	AIRCRAFT OPERATIONS AREA
AWG	AMERICAN WIRE GAUGE
B	BASELINE
BSD	BARE SOFT DRAWN SOLID COPPER
C	CONDUIT
CONC	CONCRETE
CP	COUNTERPOISE
DIA	DIAMETER
DEB	DIRECT EARTH BURIED
DWG	DRAWING
E	EASTING
ELEV	ELEVATION
EOP	EDGE OF PAVEMENT
ES	EQUAL SPACES
EXIST	EXISTING
FAA	FEDERAL AVIATION ADMINISTRATION
GND	GROUND
GRS	GALVANIZED RIGID STEEL CONDUIT
HDD	HYDRAULIC DIRECTIONAL DRILLING
I/C	NUMBER OF CONDUCTORS/CONDUCTOR
ILS	INSTRUMENT LANDING SYSTEM
kV	KILOVOLT
LF	LINEAR FEET
LSUM	LUMP SUM
LT	LEFT
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MIN	MINIMUM
N	NORTHING
NAD	NORTH AMERICAN DATUM
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NOTAM	NOTICE TO AIRMEN
NTS	NOT TO SCALE
OFA	OBJECT FREE AREA
PCC	PORTLAND CEMENT CONCRETE
PG	PROPOSED GRADE
PI	POINT OF INTERSECTION
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
REIL	RUNWAY END IDENTIFIER LIGHT
ROFA	RUNWAY OBJECT FREE AREA
RPR	RESIDENT PROJECT REPRESENTATIVE
RW	RUNWAY
RPZ	RUNWAY PROTECTION ZONE
RSA	RUNWAY SAFETY AREA
RT	RIGHT
SCH	SCHEDULE
SGN	SIGN
SIDA	SECURITY IDENTIFICATION DISPLAY AREA
SS	STAINLESS STEEL
STA	STATION
STD	STANDARD
SW	SWITCH
T/L	TAXILANE
TW	TAXIWAY
TBR	TO BE REMOVED
TDZ	TOUCHDOWN ZONE
TSA	TAXIWAY SAFETY AREA
TYP.	TYPICAL
UG	UNDERGROUND ELECTRICAL DUCT
XFMR	TRANSFORMER

100% DESIGN SUBMITTAL

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

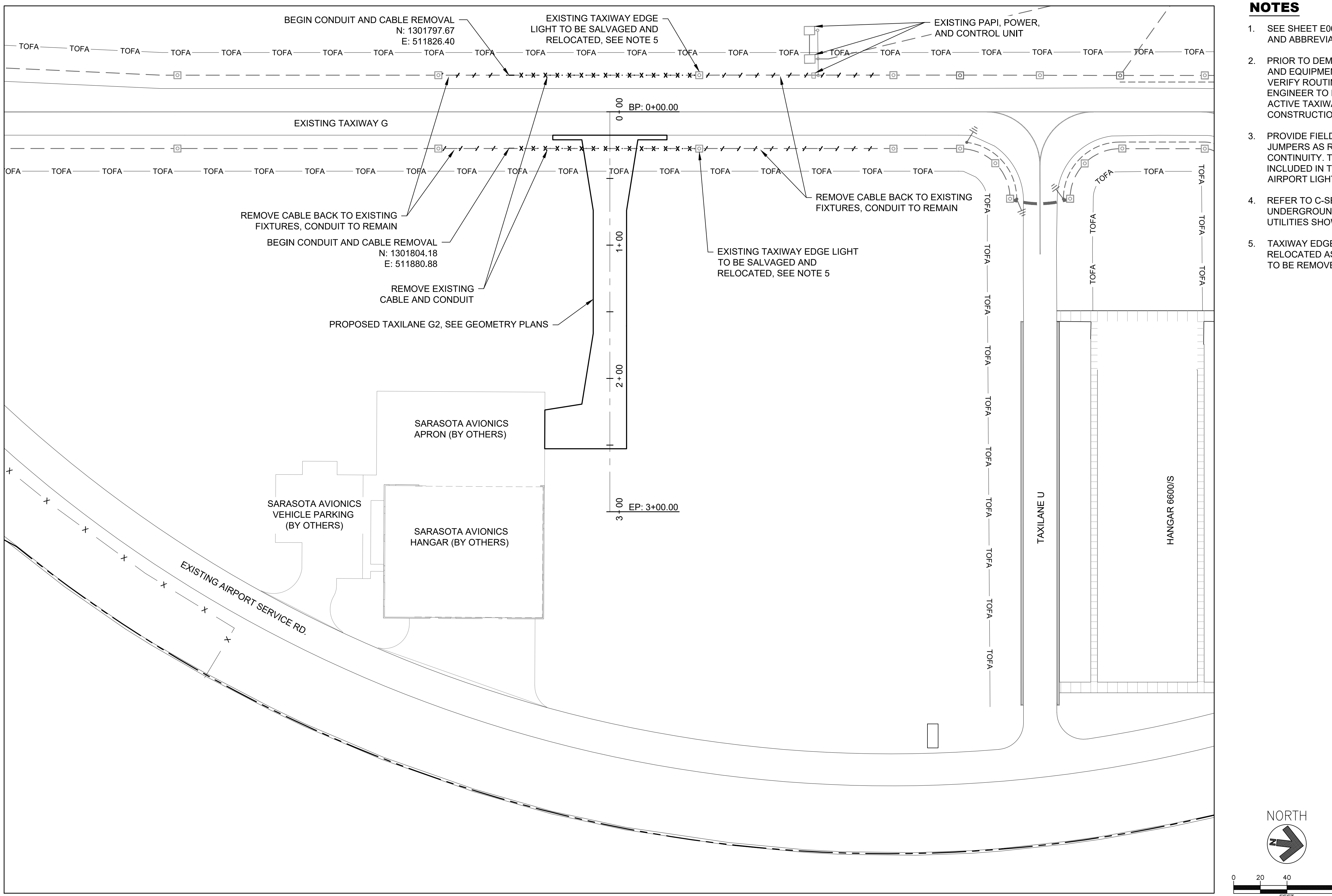
Tampa International Airport

PROJECT NAME: TAXILANE G2

SHEET TITLE: ELECTRICAL NOTES, LEGEND, AND ABBREVIATIONS

DESIGNED: SCS
DRAWN: SCB
CHECKED: DAG
HCAA NO.: 6640 19
JOB NO.: 204-0001-056
DATE: DECEMBER 4, 2020

SHEET NO.: E001



NOTES

1. SEE SHEET E001 FOR ELECTRICAL NOTES, LEGEND AND ABBREVIATIONS.
2. PRIOR TO DEMOLITION/MODIFICATION OF CIRCUITS AND EQUIPMENT, THE CONTRACTOR SHALL FIELD VERIFY ROUTING OF EXISTING CABLES WITH THE ENGINEER TO MAINTAIN CIRCUIT CONTINUITY FOR ACTIVE TAXIWAYS AND RUNWAYS OUTSIDE THE CONSTRUCTION AREA AT ALL TIMES.
3. PROVIDE FIELD SPLICE KITS AND TEMPORARY JUMPERS AS REQUIRED TO MAINTAIN CIRCUIT CONTINUITY. THE COST OF THIS WORK SHALL BE INCLUDED IN THE COST OF THE TEMPORARY AIRPORT LIGHTING SYSTEMS PAY ITEM.
4. REFER TO C-SERIES DRAWINGS FOR UNDERGROUND UTILITIES OTHER THAN ELECTRICAL UTILITIES SHOWN ON THE PLAN.
5. TAXIWAY EDGE LIGHT TO BE SALVAGED AND RELOCATED AS SHOWN ON SHEET E201. BASE CAN TO BE REMOVED.

100% DESIGN SUBMITTAL

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H

Tampa International Airport

PROJECT NAME: TAXILANE G2

SHEET TITLE: AIRFIELD ELECTRICAL DEMOLITION PLAN

DESIGNED:	SCS
DRAWN:	SCB
CHECKED:	DAG
HCAA NO.:	6640 19
JOB NO.:	204-0001-056
DATE:	DECEMBER 4, 2020

SHEET NO.: E101

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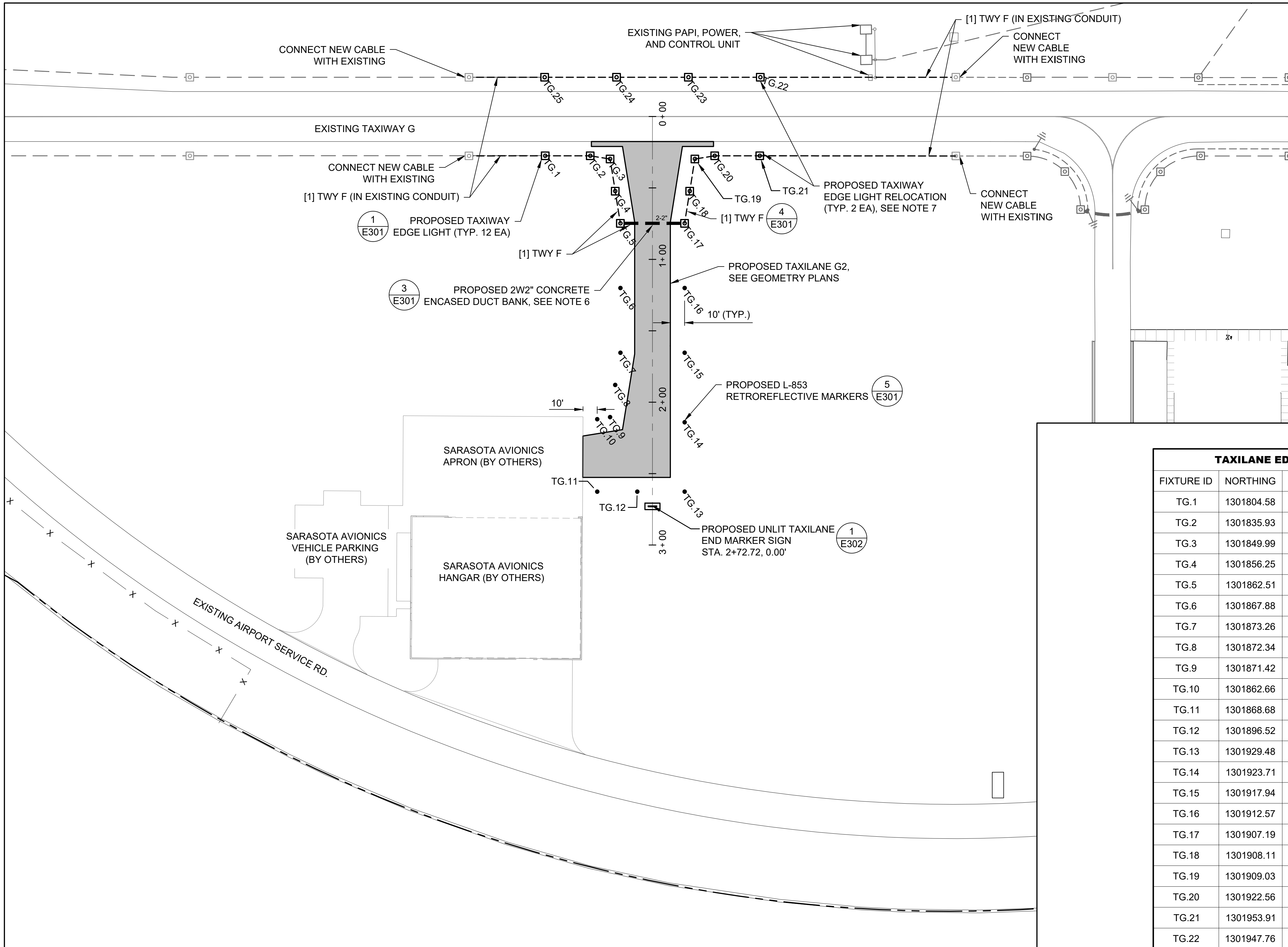

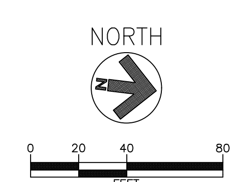

NOTES

1. SEE SHEET E001 FOR ELECTRICAL NOTES, LEGEND AND ABBREVIATIONS.
2. REFER TO C-SERIES DRAWINGS FOR UNDERGROUND UTILITIES OTHER THAN ELECTRICAL UTILITIES SHOWN ON THE PLAN.
3. ALL EDGE LIGHTS SHALL BE INSTALLED 10 FEET FROM THE EDGE OF PAVEMENT MARKING OR THE FULL STRENGTH PAVEMENT WHEN PAVEMENT MARKING IS NOT PRESENT.
4. ALL TAXILANE EDGE LIGHTS LOCATED ON STRAIGHT SECTIONS OF THE TAXIWAY SHALL BE LOCATED SUCH THAT A LINE BETWEEN LIGHTS ON OPPOSITE SIDES IS PERPENDICULAR TO THE CENTERLINE.
5. PROPOSED L-853 RETROREFLECTIVE TAXILANE MARKERS SHALL MEET THE REQUIREMENTS OF AC 150/5345-39. SEE SPECIFICATION L-125 INSTALLATION OF AIRPORT LIGHTING SYSTEMS.
6. ONE CONDUIT CONNECTS THE TWO TAXILANE EDGE LIGHT BASE CANS AND THE OTHER SERVES AS A SPARE. FOR SPARE CONDUIT, EXTEND APPROX. 2' BEYOND EDGE OF CONCRETE ENCASEMENT AND CAP, TYPICAL BOTH SIDES.
7. INDICATED TAXILANE EDGE LIGHT LOCATIONS WILL EACH USE AN EXISTING TAXILANE EDGE LIGHT FIXTURE ON A NEW BASE CAN. SEE ELECTRICAL DEMOLITION SHEET FOR TAXILANE EDGE LIGHT FIXTURE TO BE SALVAGED AND RELOCATED.

TAXILANE EDGE FIXTURE SCHEDULE

FIXTURE ID	NORTHING	EASTING	FIXTURE TYPE	BASE CAN
TG.1	1301804.58	511880.96	L-861(T)	L-867B
TG.2	1301835.93	511877.22	L-861(T)	L-867B
TG.3	1301849.99	511877.78	L-861(T)	L-867B
TG.4	1301856.25	511899.73	L-861(T)	L-867B
TG.5	1301862.51	511921.68	L-861(T)	L-867B
TG.6	1301867.88	511966.67	L-853	
TG.7	1301873.26	512011.66	L-853	
TG.8	1301872.34	512034.47	L-853	
TG.9	1301871.42	512057.27	L-853	
TG.10	1301862.66	512059.77	L-853	
TG.11	1301868.68	512110.20	L-853	
TG.12	1301896.52	512106.87	L-853	
TG.13	1301929.48	512102.94	L-858	
TG.14	1301923.71	512054.63	L-853	
TG.15	1301917.94	512006.33	L-853	
TG.16	1301912.57	511961.33	L-853	
TG.17	1301907.19	511916.34	L-861(T)	L-867B
TG.18	1301908.11	511893.54	L-861(T)	L-867B
TG.19	1301909.03	511870.73	L-861(T)	L-867B
TG.20	1301922.56	511866.87	L-861(T)	L-867B
TG.21	1301953.91	511863.13	L-861(T)	L-867B
TG.22	1301947.76	511808.45	L-861(T)	L-867B
TG.23	1301897.74	511814.43	L-861(T)	L-867B
TG.24	1301847.70	511820.41	L-861(T)	L-867B
TG.25	1301797.67	511826.40	L-861(T)	L-867B

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HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H

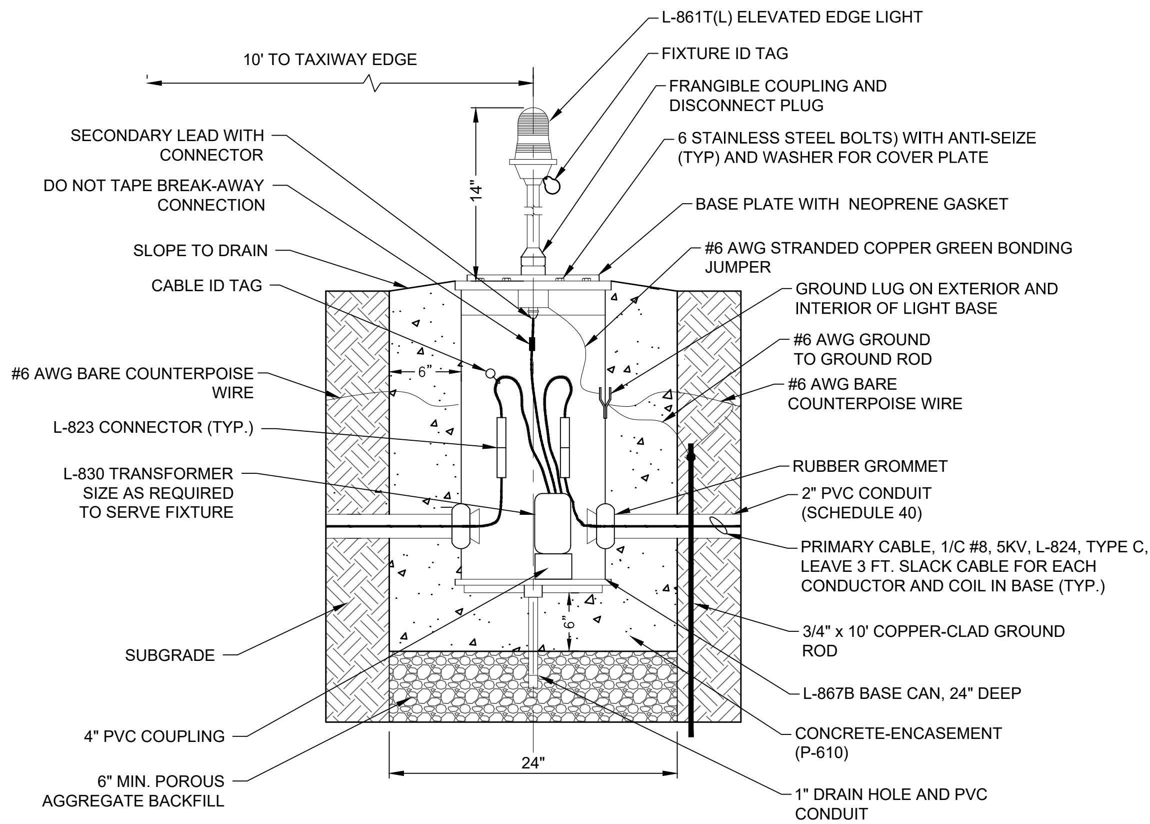
Tampa International Airport

PROJECT NAME: TAXILANE G2

SHEET TITLE: AIRFIELD ELECTRICAL PLAN

DESIGNED: SCS
DRAWN: SCB
CHECKED: DAG
HCAA NO.: 6640 19
JOB NO.: 204-0001-056
DATE: DECEMBER 4, 2020

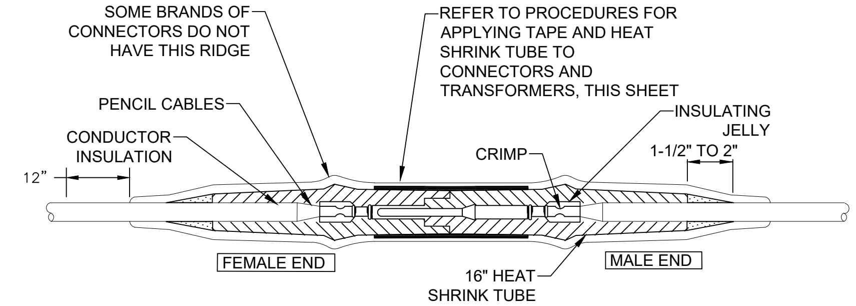
SHEET NO.: E201



ELEVATED EDGE LIGHT NOTES:

1. PROVIDE 3/4" X 10' GROUND ROD AT EACH LIGHT BASE. GROUND ROD SHALL BE BURIED A MINIMUM OF 12" BELOW GRADE. CONNECT 1-1/C, #6 BARE COPPER CABLE TO GROUND ROD WITH EXOTHERMIC WELD AND TO LIGHT BASE EXTERNAL LUG. PROVIDE PROPER CABLE CONNECTORS TO ALLOW CONNECTION OF MULTIPLE GROUNDING CABLES OR PROVIDE ADDITIONAL GROUND LUGS TO ENSURE ALL GROUNDING CABLES ARE CONNECTED PROPERLY.
2. THE LIGHT BASE DRAIN INSTALLATION SHALL BE CONSIDERED INCIDENTAL TO THE LIGHT BASE INSTALLATION AND SHALL BE INCLUDED IN THE PRICE OF THE LIGHT.
3. BASE PLATE BOLTS SHALL EXTEND THROUGH THE LIGHT BASE A MINIMUM OF 1/2".
4. CONDUIT ENTERING LIGHT BASE SHALL HAVE END BELL.

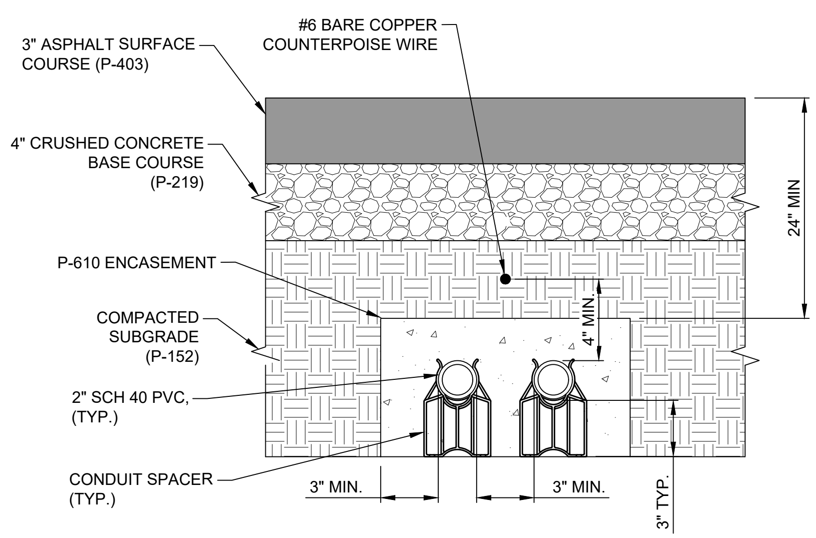
1 / E301 **TAXILANE EDGE LIGHT IN TURF DETAIL**



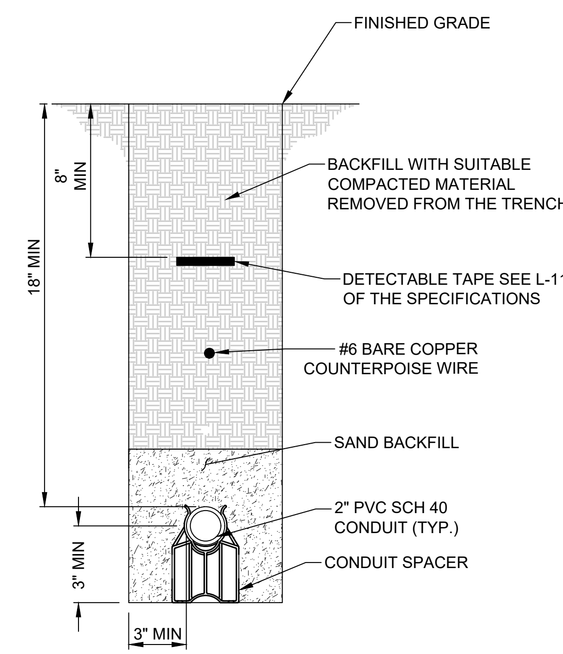
PROCEDURES FOR APPLYING TAPE AND HEAT SHRINK TUBE TO CONNECTORS AND TRANSFORMERS:

1. FIRST CLEAN AND DRY ALL AREAS TO BE TAPED AND OR SEALED WITH HEAT SHRINK TUBE USING CLEANING AND DRYING PADS SUPPLIED WITH HEAT SHRINK TUBE KIT. TYPICALLY 12" ON EACH SIDE OF A CONNECTION.
2. TAPE CONNECTION WITH 3/4" WIDE RUBBER TAPE, WITH MINIMUM OF 1-1/2" ON EACH SIDE OF CONNECTION FOR A MINIMUM OF 3" TOTAL. RUBBER TAPE SHALL BE APPLIED STICKY SIDE OUT AND AT LEAST HALF-LAPPED AND STRETCHED TO MANUFACTURER SPECIFICATIONS. COVER RUBBER TAPE WITH VINYL TAPE, STARTING AND FINISHING AT LEAST 1/2" BEFORE THE START AND AFTER THE END OF THE RUBBER TAPE, STICKY SIDE IN, AND AT LEAST HALF-LAPPED.
3. BUTT END OF CONNECTORS SHALL BE SEALED WITH 3/4" WIDE RUBBER TAPE, WITH MINIMUM OF 3/4" INCH ON EACH SIDE OF THE BUTT END OF THE CONNECTOR FOR A MINIMUM OF 1-1/2" TOTAL. RUBBER TAPE SHALL BE APPLIED STICKY SIDE OUT AND AT LEAST HALF-LAPPED AND STRETCHED TO MANUFACTURER SPECIFICATIONS. COVER RUBBER TAPE WITH VINYL TAPE, STARTING AND FINISHING AT LEAST 1/2" BEFORE THE START AND AFTER THE END OF THE RUBBER TAPE, STICKY SIDE IN, AND AT LEAST HALF-LAPPED. THERE IS NO NEED TO SEAL MOLDED CONNECTOR ENDS WITH TAPE BEFORE APPLYING HEAT SHRINK TUBE.
4. USE HEAT SHRINK TUBE, WHICH IS 16" LONG WITH INNER GLUE THE LAST 4" OF EACH END. CENTER OVER CONNECTION AND HEAT TO SHRINK TO MANUFACTURER SPECIFICATIONS.
5. AFTER HEAT SHRINK TUBE AND GLUE HAS COOLED, SEAL THE END OF THE SHRINK TUBE AND EXPOSED GLUES BY USING RUBBER AND VINYL TAPE. USE 3/4" WIDE RUBBER TAPE, WITH A MINIMUM OF 3/4" INCH ON EACH SIDE OF THE EXPOSED GLUE. RUBBER TAPE SHALL BE APPLIED STICKY SIDE OUT AND AT LEAST HALF-LAPPED AND STRETCHED TO MANUFACTURER SPECIFICATIONS. COVER RUBBER TAPE WITH VINYL TAPE STARTING AND FINISHING AT LEAST 1/2" BEFORE THE START AND AFTER THE END OF THE RUBBER TAPE, STICKY SIDE IN, AND AT LEAST HALF-LAPPED.

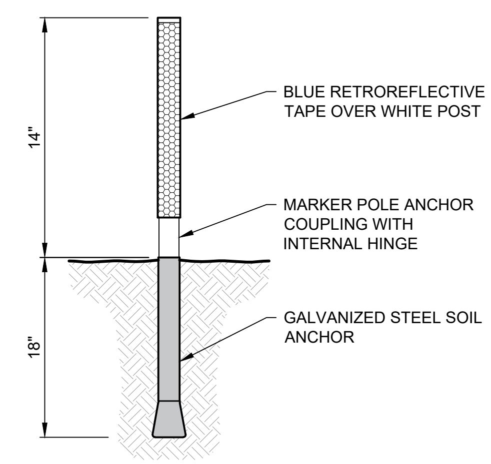
2 / E301 **L-823 CONNECTOR INSTALLATION DETAIL**



3 / E301 **2-WAY, 2" CONDUIT IN FULL-STRENGTH PAVEMENT DETAIL**



4 / E301 **1-WAY, 2" CONDUIT IN TURF DETAIL**



5 / E301 **RETROREFLECTIVE TAXIWAY EDGE MARKER**

100% DESIGN SUBMITTAL

BY	REVISIONS	DATE

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H, Inc.
1715 N. Westshore Blvd., Suite 600
Tampa, Florida 33607-3999
813-289-5300
www.rsandh.com
FL Cert.Nos. AAC001886
EB0005620 LC0000210

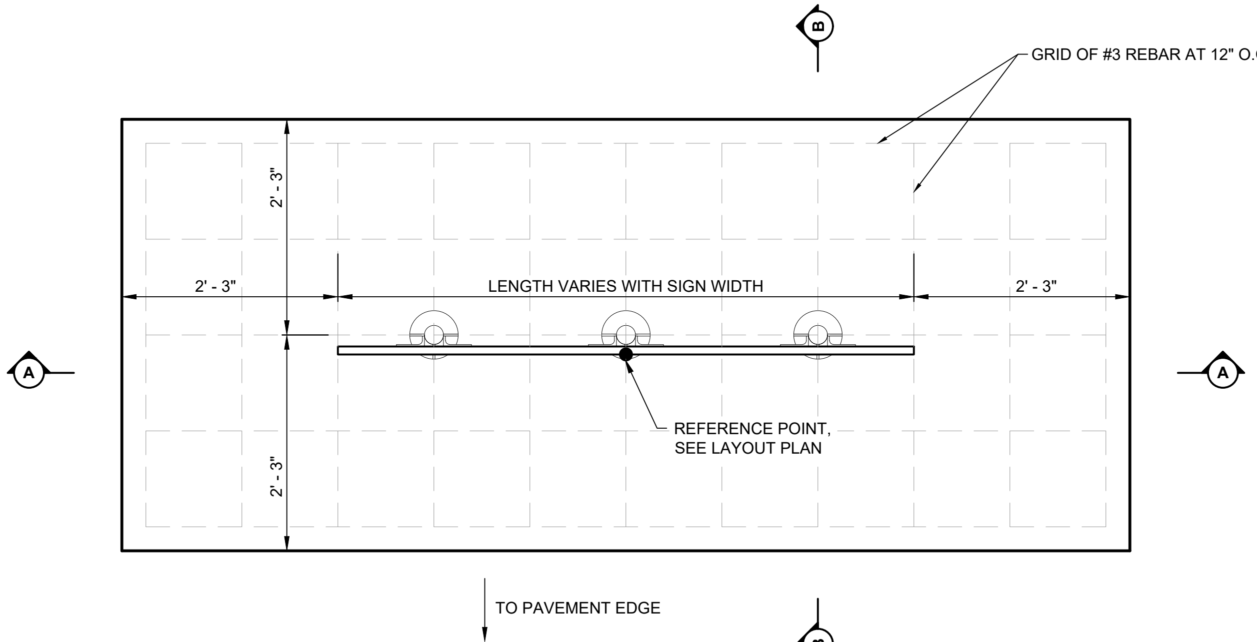
Tampa International Airport

PROJECT NAME: TAXILANE G2

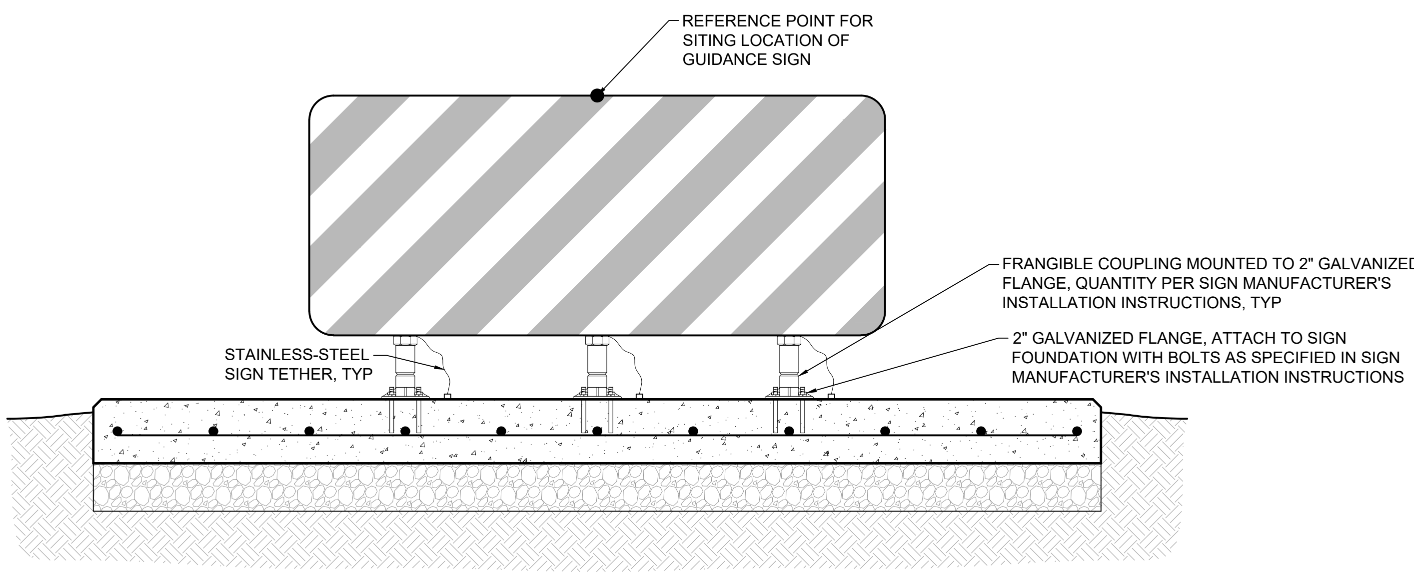
SHEET TITLE: AIRFIELD ELECTRICAL DETAILS (SHEET 1 OF 2)

DESIGNED:	SCS
DRAWN:	SCB
CHECKED:	CAT
HCAA NO.:	6640 19
JOB NO.:	204-0001-056
DATE:	DECEMBER 4, 2020

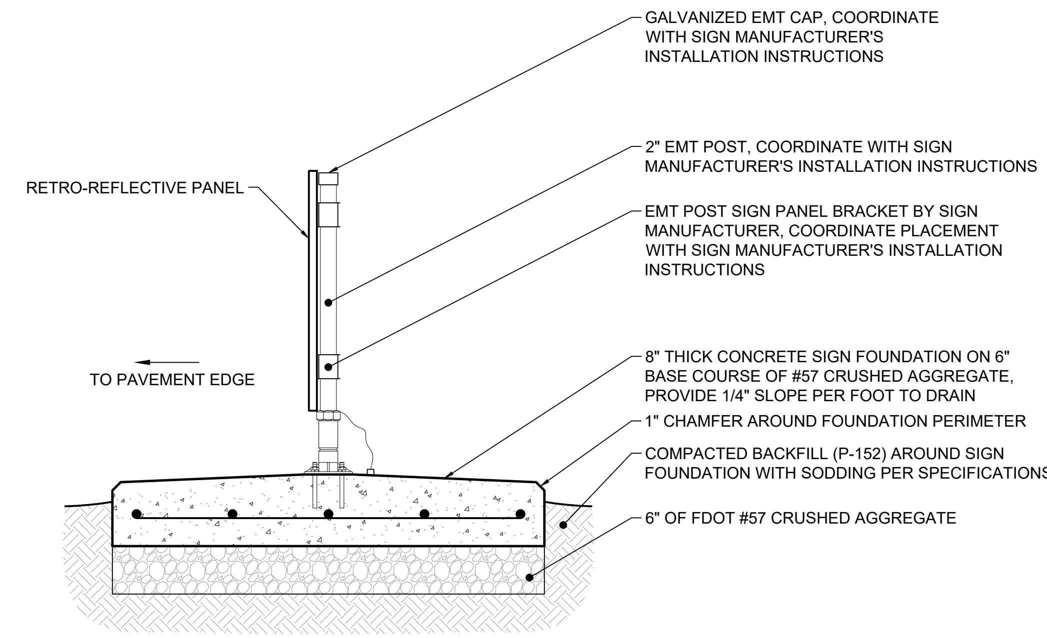
SHEET NO.: E301



PLAN VIEW



SECTION "A - A"



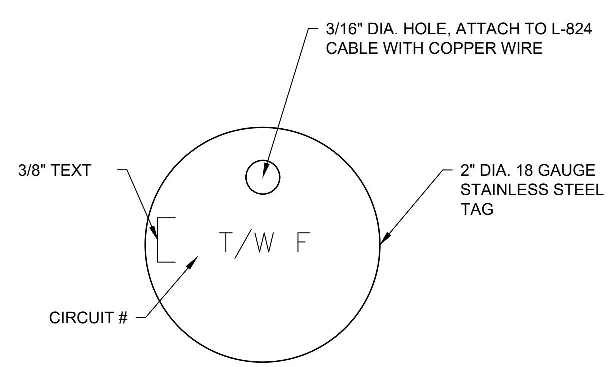
SECTION "B - B"

UNLIT END MARKER NOTES

1. THE DETAILS SHOWN ON THIS SHEET, PLUS ANY ADDITIONAL REQUIREMENTS ASSOCIATED WITH THE NON-ILLUMINATED GUIDANCE SIGN MANUFACTURER'S INSTALLATION INSTRUCTIONS, SHALL BE CONSIDERED INCIDENTAL TO THE NON-ILLUMINATED GUIDANCE SIGN PAY ITEM.

1
E302

UNLIT TAXILANE SIGN DETAIL

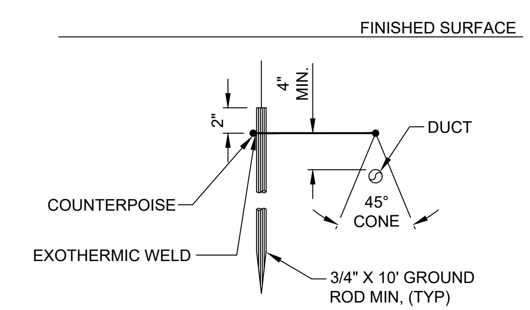


CABLE ID TAG NOTES:

1. COORDINATE WITH CONSTRUCTION MANAGER FOR FINAL CIRCUIT NAMING CONVENTION.

2
E302

CABLE ID TAG DETAIL



NOTES FOR CONDUIT NOT PARALLEL TO PAVEMENT:

1. CONNECTION TO GROUND RODS SHALL BE MADE USING EXOTHERMIC WELDS.
2. COUNTERPOISE SHALL BE INSTALLED 4" MINIMUM ABOVE THE CABLE OR CONDUIT AND AS REQUIRED BY BELOW.
3. LOCATION OF THE COUNTERPOISE SHALL BE CALCULATED TO ENSURE THAT THE CABLES AND/OR CONDUITS TO BE PROTECTED ARE WITHIN A 45° ZONE OF PROTECTION BELOW THE COUNTERPOISE.

3
E302

COUNTERPOISE / GROUND ROD INSTALLATION

100% DESIGN SUBMITTAL

BY	REVISIONS	DATE

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H

Tampa International Airport

PROJECT NAME: TAXILANE G2

SHEET TITLE: AIRFIELD ELECTRICAL DETAILS (SHEET 2 OF 2)

DESIGNED:	SCS
DRAWN:	SCB
CHECKED:	CAT
HCAA NO.:	6640 19
JOB NO.:	204-0001-056
DATE:	DECEMBER 4, 2020

SHEET NO.: E302

Exhibit B

Tampa International Airport

TAXILANE G2

TECHNICAL SPECIFICATIONS

HCAA PROJECT NO. 6640 19

RS&H PROJECT NUMBER 204-0001-056

100% DESIGN SUBMITTAL

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SPECIFICATIONS TABLE OF CONTENTS

TAXILANE G2

HCAA Project Number 6640 19

PETER O. KNIGHT AIRPORT
Hillsborough County, Florida

END OF SECTION

CHANGES TO STANDARD FAA SPECIFICATIONS

**Note: The following specification sections have been modified from FAA standards as specified in Advisory Circular 150/5370-10H, *Standard Specifications for Construction of Airports.*

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

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

Text that has been stricken shall be treated as if it is not shown. Text that has been added in bold italics shall be treated equivalently to any other information or requirements provided in the specifications. Information selected from choices provided in the standard specification is shown as normal text.

References to the "Resident Project Representative" or "RPR" shall be understood to mean the Authority's Construction Manager.

ITEM C-102 TEMPORARY AIR AND WATER POLLUTION, SOIL EROSION, AND SILTATION CONTROL

ITEM C-105 MOBILIZATION

ITEM P-152 EXCAVATION, SUBGRADE AND EMBANKMENT

ITEM P-219 RECYCLED CONCRETE AGGREGATE BASE COURSE

ITEM P-403 ASPHALT MIX PAVEMENT SURFACE COURSE

ITEM P-602 EMULSIFIED ASPHALT PRIME COAT

ITEM P-603 EMULSIFIED ASPHALT TACK COAT

ITEM P-610 CONCRETE FOR MISCELLANEOUS STRUCTURES

ITEM P-620 RUNWAY AND TAXIWAY MARKING

ITEM T-904 SODDING

ITEM L-108 UNDERGROUND POWER CABLE FOR AIRPORTS

ITEM L-110 AIRPORT UNDERGROUND ELECTRICAL DUCT BANKS AND CONDUITS

ITEM L-125 INSTALLATION OF AIRPORT LIGHTING SYSTEMS

The following specification sections have been added to supplement the FAA standards

ITEM C-103 SAFETY AND SECURITY

ITEM C-104 PROJECT SURVEY AND STAKEOUT

ITEM C-106 TEMPORARY CONSTRUCTION ITEMS

ITEM C-113 NPDES PERMITTING

ITEM P-099 FDOT STANDARD SPECIFICATIONS

ITEM P-109 SAWCUTTING

ITEM U-100 WATER DISTRIBUTION SYSTEM

ITEM L-105 MODIFICATION, REMOVAL, AND DEMOLITION OF AIRFIELD LIGHTING SYSTEMS

ITEM C-102 TEMPORARY AIR AND WATER POLLUTION, SOIL EROSION, AND SILTATION CONTROL

DESCRIPTION

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

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

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

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

MATERIALS

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

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

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

102-2.4 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.

CONSTRUCTION REQUIREMENTS

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

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

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

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

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

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

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

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

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

102-3.4 Installation, maintenance and removal of silt fence. Silt fences shall extend a minimum of 16 inches (41 cm) and a maximum of 34 inches (86 cm) above the ground surface. Posts shall be set no more than 10 feet (3 m) on center. Filter fabric shall be cut from a continuous roll to the length required minimizing joints where possible. When joints are necessary, the fabric shall be spliced at a support post

with a minimum 12-inch (300-mm) overlap and securely sealed. A trench shall be excavated approximately 4 inches (100 mm) deep by 4 inches (100 mm) wide on the upslope side of the silt fence. The trench shall be backfilled and the soil compacted over the silt fence fabric. The Contractor shall remove and dispose of silt that accumulates during construction and prior to establishment of permanent erosion control. The fence shall be maintained in good working condition until permanent erosion control is established. Silt fence shall be removed upon approval of the RPR.

METHOD OF MEASUREMENT

102-4.1 ***Based upon the contract lump sum price for "Erosion and Sedimentation Control" partial payments will be allowed as follows:***

a. A negotiated percentage based on documentable costs will be paid with the first pay request. The amount will be negotiated between the Owner, Contractor and Engineer prior to the first pay request.

b. Each subsequent pay request will include equal payments derived as follows: 100% less the negotiated initial payment divided by the total duration of the project in months.

c. The final equal installment will be paid after final inspection and delivery of all project close-out materials as outlined in the Contract Documents is complete.

The Owner reserves the right to adjust the above payment schedule if agreed to by the Owner, Contractor and Engineer. Should a payment adjustment occur, the remaining Erosion and Sedimentation Control cost will be adjusted such that it is paid in equal installments spread over the remainder of the project duration.

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

BASIS OF PAYMENT

102-5.1 Accepted quantities of temporary water pollution, soil erosion, and siltation control work ordered by the RPR and measured as provided in paragraph 102-4.1 will be paid for under:

Item C-102-1 Temporary Erosion and Sedimentation Control – per lump sum

The price shall be full compensation for furnishing all materials, and for all preparation, erection, and installation of these materials, and for all labor equipment, tools, and incidentals necessary to complete the item.

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.

REFERENCES

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

Advisory Circulars (AC)

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

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

ASTM International (ASTM)

ASTM D6461 *Standard Specification for Silt Fence Materials*

United States Department of Agriculture (USDA)

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

END OF ITEM C-102

ITEM C-103 SAFETY AND SECURITY

GENERAL

103-1.1 The provisions of this safety and security plan and associated procedures are applicable within the boundaries of the Peter O. Knight Airport. A complete understanding of all procedures and requirements contained herein is required to ensure safety during construction. *The contractor shall be required to submit for approval a Safety and Security Plan which details how the contractor will maintain safety and security on the airfield during construction.* 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 this safety plan 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 150/5370-2G, 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

103-2.1 CONTRACTOR SAFETY AND SECURITY OFFICER (CSSO). The Contractor shall appoint its on-site Construction Superintendent or other qualified individual(s) 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 Construction Manager 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.

103-2.2 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 approval of the Construction Manager. To assure adequate time for coordination, this document shall be submitted at least one week prior to the date of the Pre-construction Conference.

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

Construction Manager 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 Construction Manager is mandatory. This meeting shall also be open to other employees of the Contractor and others as the Construction Manager 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. Submit a safety and security plan to the airport operator describing how it will maintain safety and security on the air operations area (AOA) during construction. The safety and security shall address the following elements:

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:
4. Normal runway operations.
5. Closed runway operations.
6. 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. **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.

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

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

xv. **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 separation of construction operations from aircraft operations, including methods of delineating object free areas.

1) Have available at all times copies of the safety and security plan for reference by the airport operator and its representatives, and by subcontractors and contractor employees.

2) 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.

3) Identify in the safety and security plan the contractor's on-site employees responsible for monitoring compliance with the safety and security plan during construction. At least one of these employees must be on-site whenever active construction is taking place.

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

5) 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 safety and security plan.

6) Ensure that no contractor employees, employees of subcontractors or suppliers, or other persons enter any part of the AOA from the construction site unless authorized.

7) The Contractor shall submit during the mobilization period and receive approval of the safety and security plan prior to beginning work on site.

CONSTRUCTION SEQUENCING

103-3.1 CONSTRUCTION SEQUENCE. The Contractor shall prepare a construction schedule and submit to the Construction Manager within 15 days from the date of award of the Contract.

103-3.2 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 construction activity shall occur within 60 feet of the centerline of an active runway (runway safety area) or within 44.5 feet of the centerline of an active taxiway or apron (taxilane object free area) requires the closure of the affected area. Relevant safety or object free areas are shown on the plans.

The Construction Manager 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

103-4.1 Proper marking and lighting of areas on the airfield associated with the construction shall be the responsibility of the Contractor and shall be described by the safety and security plan. 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 flashing warning lights shall be required at critical access points. The type and location of marking and warning devices will be approved by the Construction Manager.

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) 150/5340-1J or latest edition.

TRAFFIC CONTROL

103-5.1 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 employee parking area designated on the plans and are not allowed in the 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 could 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 Construction Manager, any vehicle is operated in a manner not fully consistent with this requirement, the Construction Manager has the right to restrict operation of the vehicle or prohibit its use on the airport.

103-5.2 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 Construction Manager. 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 Construction Manager. 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 Construction Manager, 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.

103-5.3 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 103-5.1 and the safety and security operations program requirements of Section 103-2.2, the Contractor shall be prepared to escort all suppliers, subcontractors and visitors while they are on the airport.

103-5.4 PERSONNEL IDENTIFICATION. All employees, agents, vendors, invitees, etc. of the Contractor or subcontractors requiring access to the construction site shall, conform to the safety and security plan.

GENERAL SAFETY REQUIREMENTS

103-6.1 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 parking areas.

CONSTRUCTION CONTROL

103-7.1 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, including phone number, shall be made available to the Construction Manager by the Contractor. The Contractor shall insure that the names and phone numbers are kept current and made available to the Construction Manager.

CONSTRUCTION TECHNIQUES

103-8.1 Construction shall be planned and conducted throughout this 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

103-10.1 Based upon the contract lump sum price for "Safety and Security" partial payments will be allowed as follows:

a. A negotiated percentage based on documentable costs will be paid with the first pay request. The amount will be negotiated between the Owner, Contractor and Engineer prior to the first pay request.

b. Each subsequent pay request will include equal payments derived as follows: 100% less the negotiated initial payment divided by the total duration of the project in months.

c. The final equal installment will be paid after final inspection and delivery of all project close-out materials as outlined in the Contract Documents is complete.

The Owner reserves the right to adjust the above payment schedule if agreed to by the Owner, Contractor and Engineer. Should a payment adjustment occur, the remaining Safety and Security cost will be adjusted such that it is paid in equal installments spread over the remainder of the project duration.

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

103-11.1. 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 C-103, 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.

Payment shall be made under:

Item C-103-1 Safety and Security - per lump sum

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

END OF ITEM C-103

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ITEM C-104 PROJECT STAKEOUT AND AS-BUILT SURVEY

DESCRIPTION

104-1.1 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 excavations, embankments, 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 Construction Manager 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 Construction Manager and/or Engineer. The Contractor shall keep the Construction Manager 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 or approved equal.

MATERIALS

104-2.1 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 Construction Manager. It shall be the Contractor's responsibility to maintain these stakes in their proper position and location at all times.

CONSTRUCTION METHODS

104-3.1 The Contractor shall trim trees, brush 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 Construction Manager and Engineer for interpretation or furnishing when such is observed or required.

The Contractor shall, at a minimum, place two offset stakes or references at 100-foot intervals at each centerline station and at such intermediate locations as the Construction Manager 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 Construction Manager. 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 thru the Construction Manager.

Alignments for installation of visual barriers (i.e., orange safety fence) along the runway/taxiway safety and object free areas shall be staked out by the Contractor at the locations shown on the Contract Drawings or as directed by the Construction Manager.

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. 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 Construction Manager 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 Construction Manager and/or Engineer upon request and shall become the property of the Owner and delivered to the Construction Manager 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 Construction Manager, Engineer and Owner shall not be responsible for such work. However, the Owner and Engineer reserve the right to check all said lines, grades, and measurements with their appointed surveyor. Should the Owner'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 Construction Manager.

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 Construction Manager.

104-3.2 The Contractor shall be required to submit cross sectional data to the Engineer prior to the Contractor submittal of the monthly application for payment so that the Engineer can verify the quantities of various earthwork and materials volumes for payment. All cross sectional data provided at any time

will be in AutoCAD V2016 or higher format only. No other formats will be accepted. If the data is submitted in another format other than AutoCAD, no earthwork or other materials volumes will be calculated and approved for payment. The earthwork shall include, but not be limited to, unclassified excavation, embankment, new or existing subbase courses, new or existing base courses, sand/asphalt subgrade, topsoil, etc.

104-3.3 AS-BUILT SURVEY. Upon completion of the work, after Substantial Completion and before Final Acceptance, the Contractor shall supply to the Construction Manager a complete as-built survey of the entire limits of the project, including repair limits. 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. Elevations shall be provided in NGVD 88 datum unless otherwise noted by the Construction Manager.

This as-built survey will be a complete physical features survey of the entire project site including, but not limited to, paved and unpaved areas affected by construction, utilities, drainage pipes and structures (including inverts), and airfield electrical features. Pavement spot elevations shall be provided on maximum 25' interval spacing longitudinally and sufficient lateral spacing to indicate changes in grade including centerline crown (if present) and edge of pavement. 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 10'. 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 5J-17, Florida Administrative Code. The survey data must be supplied as a signed and sealed drawing (11" x 17" maximum size) at a minimum scale of 1"=50' and be electronically submitted in AutoCAD V2016 or higher format only. 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, and description.

The as-built survey is to be supplied to the Construction Manager 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 Owner reserves the right to perform the required survey and bill the Contractor for this work.

METHOD OF MEASUREMENT

104-4.1 Payment will be made at the lump sum price bid for this item.

BASIS OF PAYMENT

104-5.1 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 the Construction Manager and approved.

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

Payment will be made under:

Item C-104-1 Project Survey and Stakeout – per lump sum

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 survey and stakeout unless otherwise addressed by change order.

END OF ITEM C-104

ITEM C-105 MOBILIZATION

105-1 Description. This item of work shall consist of, but is not limited to, work and operations necessary for the movement of personnel, equipment, material and supplies to and from the project site for work on the project except as provided in the contract as separate pay items.

105-2 Mobilization limit. Mobilization shall be limited to 10 percent of the total project cost.

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

105-4 Engineer/RPR field office. An Engineer/RPR field office is not required.

METHOD OF MEASUREMENT

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

a. A negotiated percentage based on documentable costs will be paid with the first pay request. The amount will be negotiated between the Owner, Contractor and Engineer prior to the first pay request.

b. Each subsequent pay request will include equal payments derived as follows: 100% less the negotiated initial payment divided by the total duration of the project in months.

c. The final equal installment will be paid after final inspection and delivery of all project close-out materials as outlined in the Contract Documents is complete.

The Owner reserves the right to adjust the above payment schedule if agreed to by the Owner, Contractor and Engineer. Should a payment adjustment occur, the remaining Safety and Security cost will be adjusted such that it is paid in equal installments spread over the remainder of the project duration.

BASIS OF PAYMENT

105-6 Payment will be made under:

Item C-105-1	Mobilization – per lump sum

REFERENCES

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

Office of Federal Contract Compliance Programs (OFCCP)

Executive Order 11246, as amended

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

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

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

END OF ITEM C-105

ITEM C-106 TEMPORARY CONSTRUCTION ITEMS

DESCRIPTION

106-1.1 This item consists of furnishing all labor, materials and equipment for temporary construction items necessary for the safe and proper execution of work and 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, steel plates for temporary covering of excavations and structures as required, temporary excavation shoring, construction barricades, signage coverings, test pitting, and men and equipment as needed to keep all areas free of debris.

MATERIALS AND PLACEMENT

106-2.1 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 Plan and Phasing Notes. The Contractor shall furnish, place and maintain temporary barricades as required and/or as directed by the Construction Manager. Contractor must provide enough barricades as required to segregate work areas from active aircraft and/or vehicular operations, with barricades spaced at 12 feet maximum, center to center. Barricades shall be low mass and easily collapsible. Also, the Contractor shall furnish suitable and sufficient direction and warning signs, orange flags, battery or solar powered red warning lights (at least 10 candelas for steady burning) of the type approved by the Construction Manager.

Lights, barricades, and other protective devices shall be relocated as required to conform to airport operations. The Contractor will not be paid separately for furnishing, placing, relocating and maintaining barricades, lights, danger signals, etc., and shall make due allowance in the bid, in the applicable items of work, to cover such non-productive costs.

106-2.2 PORTABLE FLOODLIGHTING. Portable floodlighting shall be provided, as required, for construction which occurs during nighttime operations. The Contractor shall provide sufficient units so that all work areas are illuminated to a level of 5 horizontal foot-candles. Back-up flood lighting shall be provided on-site. The lighting levels shall be calculated and measured in accordance with the current standards of the Illumination Engineering Society.

106-2.3 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.

106-2.4 ORANGE SAFETY FENCE. The Contractor shall provide orange safety fence at the locations shown in the plans. 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.

106-2.5 MECHANICAL VACUUM SWEEPERS. Cleaning and maintenance of all paved areas by the use of vacuum type mechanical sweepers will be required as directed by the Construction Manager or Airport Operations. The use of a power broom may be allow if it can remove all debris from the pavement surface without damage to surrounding area (i.e. parked aircraft or hangar buildings) by the throwing of rocks. The removal of dirt, sand, rocks and other debris from all active pavement areas within the work site or as used for haul routes is of the highest important and must be done continuously during construction. Also dust control by the use of water trucks or other methods will be as directed by the Construction Manager throughout the project duration. Contractor shall submit list of proposed equipment to the Construction Manager prior to commencement of work.

106-2.6 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.

106-2.7 SIGN AND LIGHT COVERS. The Contractor shall provide a secured opaque material covering existing guidance signs and runway/taxiway lights which correspond with the required runway and taxiway closures as shown the phasing plans. The Contractor shall submit to the Construction Manager, for approval, materials to be used prior to installation.

106-2.8 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.

SPECIAL CONSTRUCTION PERSONNEL

106-3.1 FLAGMEN. Flagmen 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) or along public traffic routes). All Contractor vehicles or equipment that are required to cross active airfield pavement only shall do so under the direct control of a competent flagman equipped with an aviation band radio monitoring the appropriate ATC frequency and with the approval of the Owner.

METHOD OF MEASUREMENT

106-4.1 Based upon the contract lump sum price for “Temporary Construction Items” partial payments will be allowed as follows:

a. A negotiated percentage based on documentable costs will be paid with the first pay request. The amount will be negotiated between the Owner, Contractor and Engineer prior to the first pay request.

b. Each subsequent pay request will include equal payments derived as follows: 100% less the negotiated initial payment divided by the total duration of the project in months.

c. The final equal installment will be paid after final inspection and delivery of all project close-out materials as outlined in the Contract Documents is complete.

The Owner reserves the right to adjust the above payment schedule if agreed to by the Owner, Contractor and Engineer. Should a payment adjustment occur, the remaining Maintenance of Traffic and Temporary Construction Items cost will be adjusted such that it is paid in equal installments spread over the remainder of the project duration.

BASIS OF PAYMENT

106-5.1 Payment will be made under:

Item C-106-1	Maintenance of Traffic and Temporary Construction Items – per lump sum

END OF ITEM C-106

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ITEM C-113 NPDES PERMITTING

DESCRIPTION

113-1.1 General. The work specified under this Section consists of the preparation of a stormwater Pollution Prevention Plan (SWPPP) and Notice of Intent (NOI) to Use NPDES Generic Permit for Stormwater Discharge from Large and Small Construction Activities to construct the improvements in accordance with the Construction Plans and Florida Department of Environmental Protection regulations.

EXECUTION

113-2.1 General. The Contractor is responsible for providing an Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Notice of Intent (NOI) to use general permit including preparation of a Stormwater Pollution Prevention Plan (SWPPP) and monitoring schedule.

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

113-2.2 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:

1. 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; estimate post-development runoff coefficient; a site map indicating drainage patterns and approximate slopes; name of the receiving water and aerial extent of wetlands on site.
2. Sediment and Erosion Controls
    a. Stabilization Practices
    b. Structural Practices
3. Stormwater Management Measures
    a. Housekeeping/Best Management Practices
        i. Equipment Maintenance Areas
        ii. Waste receptacles
        iii. Washdown Areas
        iv. Storage areas for hazardous materials
        v. Adequate sanitary facilities
4. Maintenance – Plans must include description of prompt and timely maintenance and repair procedures.
5. 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 all permittees. The permittee must make the SWPPP available upon request to EPA and State or Local agencies. The EPA may notify the permittee at any time that the plan does not meet one or more minimum requirements, then the permittee has 7 days to change to plan and resubmit to EPA.

The permittee must amend the plan if it approves 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 permittee 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 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:

1. 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
2. When the permittee has transferred operational control to another permittee and is no longer an operator for the site.

Electronic Copies of the NPDES forms are available from the Florida Department of Environmental Protection on the Internet at http://www.dep.state.fl.us/water/stormwater/npdes/permits_forms.htm.

METHOD OF MEASUREMENT

113-3.1 There will be no separate measurement for payment for this item.

BASIS OF PAYMENT

113-4.1 There will be no direct or separate payment for this item, the cost of which shall be incidental to Item C-105-1 Mobilization.

END ITEM C-113

ITEM P-099 FDOT STANDARD SPECIFICATIONS

DESCRIPTION

099-1.1 The construction details for various items of work as required by the Project Documents and/or shown on the Project Plans shall conform in their entirety to Divisions II and III of the Florida Department of Transportation Standard Specification for Road and Bridge Construction, latest edition (except as noted) including all FDOT Supplements and as modified hereinafter except as noted. The construction details contained in the Divisions, which are not required to accomplish the work set out in the Project Documents and/or shown on the Project Plans, will have no application to these specifications.

GENERAL

099-2.1 STANDARD SPECIFICATIONS AND DESIGN STANDARDS. These standard specifications can be obtained from the Florida Department of Transportation as follows:

Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition

And

Florida Department of Transportation Design Standards, For Design, Construction, Maintenance and Utility Operations on the State Highway System, latest edition

Florida Department of Transportation
Map and Publication
Sales Mail Station 12
605 Suwannee Street
Tallahassee, Florida 32399-0450
(850) 414-4050
Fax (850) 414-4915
http://www.dot.state.fl.us

The Contractor shall have at least one (1) copy of the standard specifications available at the project site at all times during construction.

099-2.2 CONFLICTS. In the event of any conflict(s) between the Contract Documents and the FDOT Standard Specifications or Design Standards, the precedence in resolving such conflict(s) shall be as follows:

a. Bidding and Contract Requirements, and Technical Specifications for this project as located in the Project Documents shall govern over FDOT Bid and Contract Requirements.

b. Greater quantities shall govern over lesser.

c. Higher quality and/or more stringent requirements as adjudged by the Engineer

shall govern over lessor.

099-2.3 GENERAL INTENT. The general intent in the use of the FDOT Standard Specifications and Design Standards is to simplify and standardize the construction of the project by allowing the Contractor to follow common construction practices and use readily available material, equipment and construction methods. The FDOT Standard Specifications are not to be used to modify or change the Project Contact Documents.

099-2.4 DEFINITIONS. The definitions of terms as used in the FDOT Standard Specifications shall be modified as follows:

a. Any reference to the "Engineer", "Engineer of Tests", or "Division of Tests", shall be understood to mean the Engineer of the Owner as stated in the Contract Documents or Owner.

b. Any reference to “Department”, “State of Florida Department of Transportation”, ”State” or “FDOT”, shall be understood to mean the Owner when referencing contractual requirements.

c. Definitions of terms as given in the Project Documents.

099-2.5 METHOD OF MEASUREMENT. Given that this project has a limited number of bid items, none of which are in the FDOT standard specification, all sections concerning the “method of measurement” shall be deleted. The method of measurement shall be as given in this section.

099-2.6 BASIS OF PAYMENT. Given that this project has a limited number of bid items, none of which are in the FDOT standard specification, all sections concerning the “basis of payment” shall be deleted. The “basis of payment” for all costs required to complete this project shall be included in the bid items as given in the Project Contact Documents.

099-2.7 WAIVER OF SPECIFICATION REQUIREMENTS. The Construction Manager with the approval of the Owner and Engineer may waive any standard specification requirement that does not apply to this project.

REQUIRED SPECIFICATIONS

099-3.1 PERTINENT SECTIONS. The following specification sections are most pertinent to this project:

FDOT Section	Description
121	Flowable Fill
160	Stabilizing

This is not a complete list and other sections may apply as required. Specification sections and design standards not specified above but cross-referenced in the above individual sections are also included herewith and made a part of these Contract Documents.

099-3.2 SECTION 121 FLOWABLE FILL. This will include the placement of excavatable flowable fill to backfill trenches for power cable trenches as designated to be concrete encased in the plans. No separate

measurement of payment shall be made for flowable fill, it shall be considered incidental to the items of work requiring it.

099-3.3 SECTION 160 STABILIZING. This section applies to the placement and compaction of a stabilized subgrade within the limits shown on the Plans. Testing requirements for Section 160 shall be modified such that a LOT is considered one day's production or 2,000 square yards, whichever is less.

The method of measurement shall be per square yard of 6" LBR 40 stabilized subgrade placed and compacted by the Contractor and accepted by the Construction Manager.

Payment will be made under:

Item No. FL-160-1 6" Stabilized Subgrade (LBR 40) – per square yard

This price shall be full compensation for furnishing all materials and for all labor, equipment, tools and incidentals, including layout, necessary to complete the item.

END OF ITEM P-099

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ITEM P-109 SAWCUTTING

DESCRIPTION

109-1.1 This work shall consist of sawcutting the edge of existing Portland cement and/or asphaltic concrete pavements to provide a uniform joint alignment in sound material, as shown on the Plans or as directed by the Construction Manager.

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. The use of a cutting wheel mounted on a roller, grader or similar equipment, or the use of pneumatically driven hand-held tools, will only be approved if the Contractor can demonstrate to the satisfaction of the Engineer that such equipment can consistently produce satisfactory results. Multi-blade arbor saws shall be used to construct sealant reservoirs.

CONSTRUCTION METHODS

109-3.1 The Contractor shall establish the line to be cut using chalkline or similar means in accordance with the details shown on the Plans or as directed by the Engineer. 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 sawcut.

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 Sawcutting will not be measured for payment.

BASIS OF PAYMENT

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

TESTING REQUIREMENTS

109-6.1 None.

END OF ITEM P-109

Item P-152 Excavation, Subgrade, and Embankment

DESCRIPTION

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

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

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

b. Drainage excavation. Drainage excavation shall consist of all excavation made for the primary purpose of drainage and includes drainage ditches, such as intercepting, inlet or outlet ditches; temporary levee construction; or any other type as shown on the plans.

c. Borrow excavation. Borrow excavation shall consist of approved material required for the construction of embankments or for other portions of the work in excess of the quantity of usable material available from required excavations. Borrow material shall be obtained from areas designated by the Resident Project Representative (RPR) within the limits of the airport property but outside the normal limits of necessary grading, or from areas outside the airport boundaries.

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

CONSTRUCTION METHODS

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

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

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

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

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

a. Blasting. Blasting shall not be allowed.

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

Digital terrain model (DTM) files of the existing surfaces, finished surfaces and other various surfaces were used to develop the design plans.

Existing grades on the design cross sections or DTM's, where they do not match the locations of actual spot elevations shown on the topographic map, were developed by computer interpolation from those spot elevations. Prior to disturbing original grade, Contractor shall verify the accuracy of the existing ground surface by verifying spot elevations at the same locations where original field survey data was obtained as indicated on the topographic map. Contractor shall recognize that, due to the interpolation process, the actual ground surface at any particular location may differ somewhat from the interpolated surface shown on the design cross sections or obtained from the DTM's. Contractor's verification of original ground surface, however, shall be limited to verification of spot elevations as indicated herein, and no adjustments will be made to the original ground surface unless the Contractor demonstrates that spot elevations shown are incorrect. For this purpose, spot elevations which are within 0.1 foot (30 mm) of the stated elevations for ground surfaces, or within 0.04 foot (12 mm) for hard surfaces (pavements, buildings, foundations, structures, etc.) shall be considered "no change". Only deviations in excess of these will be considered for adjustment of the original ground surface. If Contractor's verification identifies discrepancies in the topographic map, Contractor shall notify the RPR in writing at least two weeks before disturbance of existing grade to allow sufficient time to verify the submitted information and make adjustments to the design cross sections or DTM's. Disturbance of existing grade in any area shall constitute acceptance by the Contractor of the accuracy of the original elevations shown on the topographic map for that area.

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

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

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

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

b. Undercutting. Rock, shale, hardpan, loose rock, boulders, or other material unsatisfactory for safety areas, subgrades, roads, shoulders, or any areas intended for turf shall be excavated to a minimum depth of 12 inches (300 mm) below the subgrade or to the depth specified by the RPR. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be disposed off the airport. The cost is incidental to this item. This excavated material shall be paid for at the contract unit price per cubic yard (per cubic meter) for unclassified excavation. The excavated area shall be backfilled with suitable material obtained from the grading operations or borrow areas and compacted to specified densities. The necessary backfill will constitute a part of the embankment. Where rock cuts are made, backfill with select material. Any pockets created in the rock surface shall be drained in accordance with the details shown on the plans. Undercutting will be paid as unclassified excavation.

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

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

152-2.3 Borrow excavation. There are no borrow sources within the boundaries of the airport property. The Contractor shall locate and obtain borrow sources, subject to the approval of the RPR. The Contractor shall notify the RPR at least 15 days prior to beginning the excavation so necessary measurements and tests can be made by the RPR. All borrow pits shall be opened to expose the various strata of acceptable material to allow obtaining a uniform product. Borrow areas shall be drained and left in a neat, presentable condition with all slopes dressed uniformly. Borrow areas shall not create a hazardous wildlife attractant.

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

152-2.5 Preparation of cut areas or areas where existing pavement has been removed. In those areas

on which a subbase or base course is to be placed, the top 12 inches (300 mm) of subgrade shall be compacted to not less than 100 % of maximum density for non-cohesive soils, and 95% of maximum density for cohesive soils as determined by ASTM D1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

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

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

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

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

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

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

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

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

Earthwork operations shall be suspended at any time when satisfactory results cannot be obtained due to rain, freezing, or other unsatisfactory weather conditions in the field. Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material. Material shall not be

placed on surfaces that are muddy, frozen, or contain frost. The Contractor shall drag, blade, or slope the embankment to provide surface drainage at all times.

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

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

The contractor will take samples of excavated materials which will be used in embankment for testing and develop a Moisture-Density Relations of Soils Report (Proctor) in accordance with ASTM D1557. A new Proctor shall be developed for each soil type based on visual classification.

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

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

Rolling operations shall be continued until the embankment is compacted to not less than 100% of maximum density for non-cohesive soils, and 95% of maximum density for cohesive soils as determined by ASTM D1557. Under all areas to be paved, the embankments shall be compacted to a depth of 12” and to a density of not less than 98 percent of the maximum density as determined by ASTM D1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

On all areas outside of the pavement areas, no compaction will be required on the top 4 inches (100 mm) which shall be prepared for a ~~seedbed~~ ***sodbed*** in accordance with Item T-904.

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

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

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

When rock, concrete pavement, asphalt pavement, and other embankment material are excavated at

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

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

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

152-2.9 Proof rolling. Not Used.

152-2.10 Compaction requirements. The subgrade under areas to be paved shall be compacted to a depth of 12 inches (300 mm) and to a density of not less than 98 percent of the maximum dry density as determined by ASTM D1557. The subgrade in areas outside the limits of the pavement areas shall be compacted to a depth of 12 inches (300 mm) and to a density of not less than 95 percent of the maximum density as determined by ASTM D1557.

The material to be compacted shall be within ±2% of optimum moisture content before being rolled to obtain the prescribed compaction (except for expansive soils). When the material has greater than 30 percent retained on the ¾ inch (19.0 mm) sieve, follow the methods in ASTM D1557**.** Tests for moisture content and compaction will be taken at a minimum of 2,500 S.Y. of subgrade. All quality assurance testing shall be done by the Contractor's laboratory in the presence of the RPR, and density test results shall be furnished upon completion to the RPR for acceptance determination.

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

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

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

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

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

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

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

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

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

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

- **a. Smoothness.** The finished surface shall not vary more than +/- ½ inch (12 mm) when tested with a 12-foot (3.7-m) straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot (3.7-m) straightedge for the full length of each line on a 50-foot (15-m) grid.
- **b. Grade.** The grade and crown shall be measured on a 50-foot (15-m) grid and shall be within +/- 0.05 feet (15 mm) of the specified grade.

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

152-2.14 Topsoil. When topsoil is specified or required as shown on the plans or under Item T-905, it shall be salvaged from stripping or other grading operations. The topsoil shall meet the requirements of Item T-905. If, at the time of excavation or stripping, the topsoil cannot be placed in its final section of finished

construction, the material shall be stockpiled at approved locations. Stockpiles shall be located as shown on the plans and the approved CSPP, and shall not be placed on areas that subsequently will require any excavation or embankment fill. If, in the judgment of the RPR, it is practical to place the salvaged topsoil at the time of excavation or stripping, the material shall be placed in its final position without stockpiling or further re-handling.

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

Topsoil strippings produced on site from stripping operations may be reused on site as topsoil for the first 2" below proposed sod.

METHOD OF MEASUREMENT

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

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

152-3.3 The quantity of topsoil stripping shall be the number of acres, or fractions thereof, of topsoil stripped. Measurement shall not include the quantity of materials excavated without authorization beyond normal slope lines, or the quantity of material used for purposes other than those directed.

BASIS OF PAYMENT

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

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

152-4.3 For topsoil stripping, payment shall be made at the contract unit price per acre, or fractions thereof. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-152-1	Unclassified Excavation – per cubic yard
Item P-152-2	Embankment (In-Place) – per cubic yard
Item P-152-3	Topsoil Stripping (4" Thick) – per acre

REFERENCES

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

American Association of State Highway and Transportation Officials (AASHTO)

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

ASTM International (ASTM)

ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2700 kN-m/m^3))
ASTM D6938	Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

Advisory Circulars (AC)

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

Software

FAARFIELD – FAA Rigid and Flexible Iterative Elastic Layered Design

U.S. Department of Transportation

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

END OF ITEM P-152

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ITEM P-219 RECYCLED CONCRETE AGGREGATE BASE COURSE

DESCRIPTION

219-1.1 This item consists of a base course composed of recycled concrete aggregate, crushed to meet a particular gradation, constructed on a prepared course per these specifications and in conformity to the dimensions and typical cross-sections shown on the plans.

MATERIALS

219-2.1 Aggregate. Recycled concrete aggregate shall consist of cement concrete. The recycled concrete material shall be free of reinforcing steel and expansion material. Asphalt overlays and any full slab asphalt panels shall be removed from the concrete surface prior to removal and crushing.
Recycled concrete aggregate shall consist of at least 90%, by weight, cement concrete; virgin aggregates may be added to meet the 90% minimum concrete requirement. The remaining 10% may consist of the following materials:

Deleterious Materials

Material	Quantity
Wood	0.1% maximum
Brick, mica, schist, or other friable materials	4% maximum
Asphalt concrete	10% maximum
Total	10 % maximum

Recycled Concrete Aggregate Base Material Requirements

Material Test	Requirement	Standard
Coarse Aggregate		
Resistance to Degradation	Loss: 45% maximum	ASTM C131
Flat Particles, Elongated Particles, or Flat and Elongated Particles[1]	10% maximum, by weight, for fraction retained on the ½ inch (12.5mm) sieve and 10% maximum, by weight, for the fraction passing the 1/2-inch (12.5 mm) sieve	ASTM D4791
Clay lumps and friable particles	Less than or equal to 3 percent	ASTM C142
Fine Aggregate Portion		
Liquid limit	Less than or equal to 25	ASTM D4318
Plasticity Index	Not more than four (4)	ASTM D4318

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

The fine aggregate shall be produced by crushing stone, gravel, slag, or recycled concrete that meet the

requirements for wear and soundness specified for coarse aggregate. Fine aggregate may be added to produce the correct gradation.

Each source of recycled concrete aggregate shall meet the above requirements.

Recycled concrete aggregate shape depends on the characteristics of the recycled concrete, plant type, and plant operation speed. This may require a number of trial batches before crushed recycled concrete aggregate meeting the shape and gradation requirements can be produced.

219-2.2 Gradation requirements. The gradation (job mix) of the final mixture shall fall within the design range indicated in the following table, when tested per ASTM C117 and ASTM C136. The final gradation shall be continuously graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on an adjacent sieve or vice versa.

Gradation of Recycled Concrete Aggregate Base

Sieve Size	Percentage by Weight Passing Sieves	Contractor's Final Gradation	Job Mix Tolerances Percent
2 inch (50 mm)	100		--
1-1/2 inch (37.5 mm)	95 - 100		±5
1 inch (25.0 mm)	70 - 95		±8
3/4 inch (19.0 mm)	55 - 85		±8
No. 4 (4.75 mm)	30 - 60		±8
No. 30 (600 µm)	12 - 30		±5
No. 200 (75 µm)	0 - 10		±3

The job mix tolerances in the table shall be applied to the job mix gradation to establish a job control gradation band. The full tolerance still will apply if application of the tolerances results in a job control gradation band outside the design range.

219-2.3 Sampling and testing.

a. Aggregate base materials. The Contractor shall take samples of the aggregate base in accordance with ASTM D75 to verify initial aggregate base requirements and gradation. Material shall meet the requirements in paragraphs 219-2.1 and 219-2.2. This sampling and testing will be the basis for approval of the aggregate base quality requirements.

b. Gradation requirements. The Contractor shall take at least two aggregate base samples per day in the presence of the Resident Project Representative (RPR) to check the final gradation. Sampling shall be per ASTM D75. Material shall meet the requirements in paragraph 219-2.2. The lot will be consistent with the lot size used for density. The samples shall be taken from the in-place, un-compacted material at sampling points and intervals designated by the RPR.

219-2.4 Separation Geotextile. Not used.

CONSTRUCTION METHODS

219-3.1 Control Strip. The first half-day of construction shall be considered the control strip. The Contractor shall demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of the specification. The sequence and manner of rolling necessary to

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

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

219-3.2 Preparing underlying course. The underlying course shall be checked by the RPR before placing and spreading operations are started. Any ruts or soft yielding places caused by improper drainage conditions, hauling, or any other cause shall be corrected at the Contractor's expense before the base course is placed there. Material shall not be placed on frozen material.

To protect the existing layers and to ensure proper drainage, the spreading of the recycled concrete aggregate base course shall begin along the centerline of the pavement on a crowned section or on the greatest contour elevation of a pavement with a variable uniform cross slope.

219-3.3 Placement. The aggregate shall be placed and spread on the prepared underlying layer by spreader boxes or other devices as approved by the RPR, to a uniform thickness and width. The equipment shall have positive thickness controls to minimize the need for additional manipulation of the material. Dumping from vehicles that require re-handling shall not be permitted. Hauling over the uncompacted base course shall not be permitted.

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

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

219-3.4 Compaction. Immediately upon completion of the spreading operations, compact each layer of the base course, as specified, with approved compaction equipment. The number, type, and weight of rollers shall be sufficient to compact the material to the required density within the same day that the aggregate is placed on the subgrade.

The field density of each compacted lift of material shall be at least 100% of the maximum density of laboratory specimens prepared from samples of the subbase material delivered to the jobsite. The laboratory specimens shall be compacted and tested in accordance with ASTM D698. The moisture content of the material during placing operations shall be within ±2 percentage points of the optimum moisture content as determined by ASTM D698. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

219-3.5 Weather limitations. Material shall not be placed unless the ambient air temperature is at least

40°F (4°C) and rising. Work on base course shall not be conducted when the subgrade or subbase is wet or frozen or the base material contains frozen material.

219-3.6 Maintenance. The base course shall be maintained in a condition that will meet all specification requirements. When material has been exposed to excessive rain, snow, or freeze-thaw conditions, prior to placement of additional material, the Contractor shall verify that materials still meet all specification requirements. Equipment may be routed over completed sections of base course, provided that no damage results and the equipment is routed over the full width of the completed base course. Any damage resulting to the base course from routing equipment over the base course shall be repaired by the Contractor at their expense.

219-3.7 Surface tolerances. After the course has been compacted, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches (75 mm), reshaped and recompacted to grade until the required smoothness and accuracy are obtained and approved by the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense. The smoothness and accuracy requirements specified here apply only to the top layer when base course is constructed in more than one layer.

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

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

219-3.8 Acceptance sampling and testing for density. Recycled Concrete Aggregate base course shall be accepted for density and thickness on an area basis. Two tests shall be made for density and thickness for each day's production. Sampling locations will be determined on a random basis per ASTM D3665

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

Each area shall be accepted for density when the field density is at least 100% of the maximum density of laboratory specimens compacted and tested per ASTM D698. The in-place field density shall be determined per ASTM D1556 or ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938. If the specified density is not attained, the area represented by the failed test must be reworked and/or recompacted and two additional random tests made. This procedure shall be followed until the specified density is reached. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

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

METHOD OF MEASUREMENT

219-4.1 The quantity of recycled concrete aggregate base course will be determined by measurement of the number of square yards of material actually constructed and accepted as complying with the plans and specifications.

BASIS OF PAYMENT

219-5.1 Payment shall be made at the contract unit price per square yard (square meter) for recycled concrete aggregate base course. This price shall be full compensation for furnishing all materials, for preparing and placing these materials, and for all labor, equipment tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-219-1	4” Recycled Concrete Aggregate Base Course - per square yard

REFERENCES

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

ASTM International (ASTM)

ASTM C29	Standard Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75 µm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregate
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2700 kN-m/m^3))
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D3665	Standard Practice for Random Sampling of Construction Materials

ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4643	Standard Test Method for Determination of Water (Moisture) Content of Soil by Microwave Oven Heating
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

END OF ITEM P-219

ITEM P-403 ASPHALT MIX PAVEMENT SURFACE COURSE

DESCRIPTION

403-1.1 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 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

403-2.1 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. 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 for surface, asphalt binder, and leveling course Loss: 50% maximum for base course	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	1.0 % 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 with a value of 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 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	1.0 % maximum	ASTM C142
Sand equivalent	45 minimum	ASTM D2419
Natural Sand	0 to 15% maximum by weight of total aggregate	ASTM D1073

c. Sampling. ASTM D75 shall be used in sampling coarse and fine aggregate, and ASTM C183 shall be used in sampling mineral filler.

403-2.2 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

403-2.3 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[1]

[1] Follow procedure B on RTFO aged binder.

403-2.4 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

403-3.1 Composition of mixture. The asphalt plant mix shall be composed of a mixture of well-graded aggregate, filler and anti-strip agent if required, and asphalt binder. The several 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).

403-3.2 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 listed on the accrediting authority's website. A copy of the

laboratory's current accreditation and accredited test methods shall be submitted to the RPR prior to start of construction.

403-3.3 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 403-3.2. 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 submitted 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 403-2.3. 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 403-2.4.
- Certified material test reports for the course and fine aggregate and mineral filler in accordance with paragraphs 403-2.1 and 403-2.2.
- 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 course 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 mixing and compaction temperatures.
- Plot of the combined gradation on the 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/gyrations	75	
Air voids (%)	3.5	ASTM D3203
Percent voids in mineral aggregate (VMA), minimum	See Table 2	ASTM D6995
TSR[1]	not less than **[** 80 **]** at a saturation of 70-80%	ASTM D4867
Asphalt Pavement Analyzer (APA)[2,3]	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

[3] Where APA not available, use Hamburg wheel test (AASHTO T 324) 10 mm@ 20,000 passes at 50°C.

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 Sieve**
1 inch (25.0 mm)	--
3/4 inch (19.0 mm)	100
1/2 inch (12.5 mm)	90-100
3/8 inch (9.5 mm)	72-88
No. 4 (4.75 mm)	53-73
No. 8 (2.36 mm)	38-60
No. 16 (1.18 mm)	26-48
No. 30 (600 µm)	18-38
No. 50 (300 µm)	11-27
No. 100 (150 µm)	6-18
No. 200 (75 µm)	3-6
Voids in Mineral Aggregate (VMA)[1]	15
Asphalt Percent:	
Stone or gravel	5.0-7.5
Slag	6.5-9.5
Recommended Minimum Construction Lift Thickness	2 inch

[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.

403-3.4 Reclaimed Asphalt Pavement (RAP). RAP shall not be used.

403-3.5 Control strip. A control strip is not required.

CONSTRUCTION METHODS

403-4.1 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)	
	Degrees F	Degrees C
3 inches (7.5 cm) or greater	40	4
Greater than 2 inches (50 mm) but less than 3 inches (7.5 cm)	45	7

403-4.2 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.

403-4.3 Aggregate stockpile management. Aggregate stockpiles shall be constructed in such a manner that prevents segregation and intermixing of deleterious materials. Aggregates from different sources shall be stockpiled, weighed and batched separately at the concrete batch plant. Aggregates that have become segregated or mixed with earth or foreign material shall not be used.

A continuous supply of materials shall be provided to the work to ensure continuous placement.

403-4.4 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.

403-4.4.1 Material transfer vehicle (MTV). A material transfer vehicle is not required.

403-4.5 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 401-4.11.

403-4.6 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, 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.

403-4.6.1 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 also supply a qualified technician during all paving operations to calibrate the density 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.

403-4.7 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 material to the mixer at a uniform temperature. The temperature of the 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.

403-4.8 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.

403-4.9 Preparation of asphalt mixture. The aggregates and the asphalt binder shall be weighed or metered and introduced into the mixer 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%.

403-4.10 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.

403-4.11 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 401-6.2e 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 1 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.

403-4.12 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**.**

403-4.13 Joints. The formation of all joints shall be made in such a manner as 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 are 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. An asphalt tack coat or other product approved by the RPR 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.

403-4.14 Saw-cut grooving. Saw-cut grooving is not required.

403-4.15 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 minimum of 55 to 60 blades per 12 inches (300 mm) of cutting head width; 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 causes ravels, aggregate fractures, spalls or disturbance to the pavement will not be permitted.

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.

403-4.16 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.

CONTRACTOR QUALITY CONTROL (CQC)

403-5.1 General. Not used.

403-5.2 Contractor quality control (QC) facilities. The Contractor shall provide or contract for testing facilities in accordance with ~~Item C-100~~ ***Section 01400***. 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.

403-5.3 Quality Control (QC) testing. The Contractor shall perform all QC tests necessary to control the production and construction processes applicable to these specifications.

a. Asphalt content. A minimum of ~~two~~ ***one*** 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 lot from mechanical analysis of extracted aggregate in accordance with ASTM D5444 and 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 ~~lot~~ ***day*** in accordance with ASTM C566.

d. Moisture content of asphalt. The moisture content of the asphalt shall be determined once per ~~lot~~ ***day*** in accordance with AASHTO T329 or ASTM D1461.

e. Temperatures. Temperatures shall be checked, at least four times per lot, 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, a rolling inclinometer meeting the requirements of ASTM E2133 or rolling external reference device that can simulate a 12-foot (3.7m) straightedge approved by the RPR. Straight-edge testing shall start with one-half the length of the straightedge at the edge of pavement section being tested and then moved ahead one-half the length of the straightedge for each successive measurement. Testing shall be continuous across all joints. The surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between the two high points. If the rolling inclinometer or external reference device is used, the data may be evaluated using 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 and between the start and stop of lanes place 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 will 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 will be parallel to the centerline of paving; at the center of paving lanes when widths of paving lanes are less than 20 feet (6 m); and at the third points of paving lanes when widths of paving lanes are 20 ft (6 m) or greater. When placement abuts previously placed material the first measurement shall start with one half the length of the straight edge on the previously placed material.

Deviations on the final surface course in either the transverse or longitudinal direction that will trap water greater than 1/4 inch (6 mm) shall be corrected with diamond grinding per paragraph 403-4.15 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 the placement of the first lift and then prior to 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 and 0.1 feet (30 mm) laterally. The documentation will be provided by the Contractor to the RPR by the end of the following working day.

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 403-4.15.

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.

403-5.4 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.

403-5.5 Control charts. The Contractor shall maintain linear control charts both for individual measurements and range (i.e., difference between highest and lowest measurements) for aggregate gradation, asphalt content, and VMA. The VMA for each day shall 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 JMF 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 for range shall be established to control process variability for the test parameters and Suspension Limits listed below. The range shall be computed for each lot 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
(n = 2)

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~~ ***Quality Control Plan*** shall indicate that appropriate action shall be taken when the process is believed to be out of tolerance. The Plan shall contain sets of 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.

403-5.6 Quality control (QC) reports. The Contractor shall maintain records and shall submit reports of QC activities daily, in accordance with the ~~CQCP~~ ***Quality Control Plan*** described in ~~Item C-100~~ ***Section 01400***.

MATERIAL ACCEPTANCE

403-6.1. Quality Assurance 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.

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 ***50 to 100*** 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 three 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 inches (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 which contains 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.

403-6.2 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.

b. Air voids. Acceptance of each lot of plant produced material for air voids will be based upon the average air void from the sublots. If the average air voids of the lot are equal to or greater than 2% and equal to or less than 5%, then the lot will be acceptable. If the average is below 2% or greater than 5%, the lot shall be removed and replaced at the Contractor's expense.

c. Mat density. Acceptance of each lot of plant produced material for mat density will be based on the average of all of the densities taken from the sublots. If the average mat density of the lot so established equals or exceeds 94%, the lot will be acceptable. If the average mat density of the lot is below 94%, the lot shall be removed and replaced at the Contractor's expense.

d. Joint density. Acceptance of each lot of plant produced asphalt for joint density will be based on the average of all of the joint densities taken from the sublots. If the average joint density of the lot so established equals or exceeds 92%, the lot will be acceptable. If the average joint density of the lot is less than 92%, the Contractor shall stop production and evaluate the method of compacting joints. Production may resume once the reason for poor compaction has been determined and appropriate measures have been taken to ensure proper compaction.

e. Grade. The final finished surface of the pavement of the completed project 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 or 0.1 feet (30 mm) laterally.

Cross-sections of the pavement shall be taken at a minimum ~~50~~ ***25***-foot ~~(15-m)~~ 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 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%.

403-6.3 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 403-6.1. Only one resampling per lot will be permitted.

(1) A redefined mat density will be calculated for the resampled lot. The number of tests used to calculate the redefined mat density 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 mat density for a resampled lot will be used to evaluate the acceptance of that lot in accordance with paragraph 403-6.2.

c. Outliers. Check for outliers in accordance with ASTM E178, at a significance level of 5%. Outliers will be discarded and density determined using the remaining test values.

METHOD OF MEASUREMENT

403-7.1 Measurement. Plant mix asphalt mix pavement shall be measured by the number of tons of asphalt pavement used in the accepted work. Recorded batch weights or truck scale weights will be used to determine the basis for the tonnage.

BASIS OF PAYMENT

403-8.1 Payment. Payment for a lot of asphalt mixture meeting all acceptance criteria as specified in paragraph 403-6.2 shall be made at the contract unit price per ton for asphalt. 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.

Payment will be made under:

Item P-403-1	Asphalt Mixture Surface 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 C183	Standard Practice for Sampling and the Amount of Testing of Hydraulic Cement

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 Bituminous Paving Mixtures
ASTM D1073	Standard Specification for Fine Aggregate for Bituminous Paving Mixtures
ASTM D1074	Standard Test Method for Compressive Strength of Bituminous Mixtures
ASTM D1461	Standard Test Method for Moisture or Volatile Distillates in Bituminous Paving Mixtures
ASTM D2041	Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D2172	Standard Test Method for Quantitative Extraction of Bitumen from 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 D4125	Standard Test Methods for Asphalt Content of Bituminous mixtures by the Nuclear Method
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 D5444	Standard Test Method for Mechanical Size Analysis of Extracted Aggregate
ASTM D5581	Standard Test Method for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus (6 inch-Diameter Specimen)
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
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 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 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)

MS-2	Mix Design Manual, 7th Edition
MS-26	Asphalt Binder Handbook AI State Binder Specification Database

FAA Orders

5300.1 Modifications to Agency Airport Design, Construction, and Equipment Standards

Federal Highway Administration (FHWA)

Long Term Pavement Performance Binder program

Software

FAARFIELD

END OF ITEM P-403

ITEM P-602 EMULSIFIED ASPHALT PRIME COAT

DESCRIPTION

602-1.1 This item shall consist of an application of emulsified asphalt material on the prepared base course in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

602-2.1 Emulsified Asphalt material. The emulsified asphalt material shall be as specified in ASTM D3628 for use as a prime coat appropriate to local conditions. The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the emulsified asphalt material. The COA shall be provided to and approved by the Resident Project Representative (RPR) before the emulsified asphalt material is applied. The furnishing of the COA for the emulsified 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

602-3.1 Weather limitations. The emulsified asphalt prime coat shall be applied only when the existing surface is dry; the atmospheric temperature is 50°F (10°C) or above, and 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.

602-3.2 Equipment. The equipment shall include a self-powered pressure asphalt material distributor and equipment for heating asphalt material.

Provide a distributor with pneumatic tires of such size and number that the load produced on the base surface does not exceed 65.0 psi (4.5 kg/sq cm) of tire width to prevent rutting, shoving or otherwise damaging the base, surface or other layers in the pavement structure. Design and equip the distributor to spray the asphalt material in a uniform coverage at the specified temperature, at readily determined and controlled rates from 0.05 to 1.0 gallons per square yard (0.23 to 4.5 L/square meter), with a pressure range of 25 to 75 psi (172.4 to 517.1 kPa) and with an allowable variation from the specified rate of not more than ±5%, and at variable widths. Include with the distributor equipment a separate power unit for the bitumen pump, full-circulation spray bars, tachometer, pressure gauges, volume-measuring devices, adequate heaters for heating of materials to the proper application temperature, a thermometer for reading the temperature of tank contents, and a hand hose attachment suitable for applying asphalt material manually to areas inaccessible to the distributor. Equip the distributor to circulate and agitate the asphalt material during the heating process. If the distributor is not equipped with an operable quick shutoff valve, the prime operations shall be started and stopped on building paper.

A power broom and power blower suitable for cleaning the surfaces to which the asphalt coat is to be applied shall be provided.

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.

602-3.3 Application of emulsified asphalt material. Immediately before applying the prime coat, the full width of the surface to be primed shall be swept with a power broom to remove all loose dirt and other objectionable material.

The asphalt emulsion material shall be uniformly applied with an asphalt distributor at the rate of 0.15 to 0.30 gallons per square yard (0.68 to 1.36 liters per square meter) depending on the base course surface texture. The type of asphalt material and application rate shall be approved by the RPR prior to application.

Following application of the emulsified asphalt material and prior to application of the succeeding layer of pavement, allow the asphalt coat to cure and to obtain evaporation of any volatiles or moisture. Maintain the coated surface until the succeeding layer of pavement is placed, by protecting the surface against damage and by repairing and recoating deficient areas. Allow the prime coat to cure without being disturbed for a period of at least 48 hours or longer, as may be necessary to attain penetration into the treated course. Furnish and spread sand to effectively blot up and cure excess asphalt material. The Contractor shall remove blotting sand prior to asphalt concrete lay down operations at no additional expense to the Owner. Keep traffic off surfaces freshly treated with asphalt material. Provide sufficient warning signs and barricades so that traffic will not travel over freshly treated surfaces.

602-3.4 Trial application rates. The Contractor shall apply a minimum of three lengths of at least 100 feet (30 m) for the full width of the distributor bar to evaluate the amount of emulsified asphalt material that can be satisfactorily applied with the equipment. Apply three different application rates of emulsified asphalt materials within the application range specified in paragraph 602-3.3. Other trial applications can be made using various amounts of material as directed by the RPR. The trial application is to demonstrate the equipment can uniformly apply the emulsified asphalt material within the rates specified and determine the application rate for the project.

602-3.5 Freight and waybills. The Contractor shall submit waybills and delivery tickets during the progress of the work. Before the final estimate 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

602-4.1 The emulsified asphalt material for prime coat will not be measured for payment.

BASIS OF PAYMENT

602-5.1 Payment for emulsified asphalt material for prime coat shall be included in the P-403 asphalt pavement pay item.

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 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 OF ITEM P-602

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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 not be measured for payment.

BASIS OF PAYMENT

603.5-1 Payment shall be included in the P-403 asphalt pavement pay item.

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-610 CONCRETE FOR MISCELLANEOUS STRUCTURES

DESCRIPTION

610-1.1 This item shall consist of concrete and reinforcement, as shown on the plans, prepared and constructed in accordance with these specifications. This specification shall be used for all concrete other than airfield pavement which are cast-in-place.

MATERIALS

610-2.1 General. Only approved materials, conforming to the requirements of these specifications, shall be used in the work. Materials may be subject to inspection and tests at any time during their preparation or use. The source of all materials shall be approved by the Resident Project Representative (RPR) before delivery or use in the work. Representative preliminary samples of the materials shall be submitted by the Contractor, when required, for examination and test. Materials shall be stored and handled to ensure preservation of their quality and fitness for use and shall be located to facilitate prompt inspection. All equipment for handling and transporting materials and concrete must be clean before any material or concrete is placed in them.

The use of pit-run aggregates shall not be permitted unless the pit-run aggregate has been screened and washed, and all fine and coarse aggregates stored separately and kept clean. The mixing of different aggregates from different sources in one storage stockpile or alternating batches of different aggregates shall not be permitted.

a. Reactivity. Fine aggregate and coarse aggregates to be used in all concrete shall have been tested separately within six months of the project in accordance with ASTM C1260. Test results shall be submitted to the RPR. The aggregate shall be considered innocuous if the expansion of test specimens, tested in accordance with ASTM C1260, does not exceed 0.08% at 14 days (16 days from casting). If the expansion either or both test specimen is greater than 0.08% at 14 days, but less than 0.20%, a minimum of 25% of Type F fly ash, or between 40% and 55% of slag cement shall be used in the concrete mix.

If the expansion is greater than 0.20%, the aggregates shall not be used, and test results for other aggregates must be submitted for evaluation; or aggregates that meet P-501 reactivity test requirements may be utilized.

610-2.2 Coarse aggregate. The coarse aggregate for concrete shall meet the requirements of ASTM C33 and the requirements of Table 4, Class Designation 5S; and the grading requirements shown below, as required for the project.

Coarse Aggregate Grading Requirements

Maximum Aggregate Size	ASTM C33, Table 3 Grading Requirements (Size No.)
1 1/2 inch (37.5 mm)	467 or 4 and 67
1 inch (25 mm)	57
¾ inch (19 mm)	67
½ inch (12.5 mm)	7

610-2.2.1 Coarse Aggregate susceptibility to durability (D) cracking. Not used.

610-2.3 Fine aggregate. The fine aggregate for concrete shall meet all fine aggregate requirements of ASTM C33.

610-2.4 Cement. Cement shall conform to the requirements of ASTM C150 Type I or II.

610-2.5 Cementitious materials.

a. Fly ash. Fly ash shall meet the requirements of ASTM C618, with the exception of loss of ignition, where the maximum shall be less than 6%. Fly ash shall have a Calcium Oxide (CaO) content of less than 15% and a total available alkali content less than 3% per ASTM C311. Fly ash produced in furnace operations using liming materials or soda ash (sodium carbonate) as an additive shall not be acceptable. The Contractor shall furnish the previous three most recent, consecutive ASTM C618 reports for each source of fly ash proposed in the concrete mix, and shall furnish each additional report as they become available during the project. The reports can be used for acceptance or the material may be tested independently by the RPR.

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

610-2.6 Water. Water used in mixing or curing shall be from potable water sources. Other sources shall be tested in accordance with ASTM C1602 prior to use.

610-2.7 Admixtures. The Contractor shall submit certificates indicating that the material to be furnished meets all of the requirements indicated below. In addition, the RPR may require the Contractor to submit complete test data from an approved laboratory showing that the material to be furnished meets all of the requirements of the cited specifications. Subsequent tests may be made of samples taken by the RPR from the supply of the material being furnished or proposed for use on the work to determine whether the admixture is uniform in quality with that approved.

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

b. Water-reducing admixtures. Water-reducing admixture shall meet the requirements of ASTM C494, Type A, B, or D. ASTM C494, Type F and G high range water reducing admixtures and ASTM C1017 flowable admixtures shall not be used.

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

610-2.8 Premolded joint material. Premolded joint material for expansion joints shall meet the requirements of ASTM 1751.

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 reinforcing steel and welded wire fabric conforming to the requirements of ASTM A615 and ASTM 1064.

610-2.11 Materials for curing concrete. Curing materials shall conform to ASTM C309.

CONSTRUCTION METHODS

610-3.1 General. The Contractor shall furnish all labor, materials, and services necessary for, and incidental to, the completion of all work as shown on the drawings and specified here. All machinery and equipment used by the Contractor on the work, shall be of sufficient size to meet the requirements of the work. All work shall be subject to the inspection and approval of the RPR.

610-3.2 Concrete Mixture. The concrete shall develop a compressive strength of 4000 psi in 28 days as determined by test cylinders made in accordance with ASTM C31 and tested in accordance with ASTM C39. The concrete shall contain not less than 470 pounds of cementitious material per cubic yard (280 kg per cubic meter). The water cementitious ratio shall not exceed 0.45 by weight. The air content of the concrete shall be 5% +/- 1.2% as determined by ASTM C231 and shall have a slump of not more than 4 inches (100 mm) as determined by ASTM C143.

610-3.3 Mixing. Concrete may be mixed at the construction site, at a central point, or wholly or in part in truck mixers. The concrete shall be mixed and delivered in accordance with the requirements of ASTM C94 or ASTM C685.

The concrete shall be mixed only in quantities required for immediate use. Concrete shall not be mixed while the air temperature is below 40°F (4°C) without the RPRs approval. If approval is granted for mixing under such conditions, aggregates or water, or both, shall be heated and the concrete shall be placed at a temperature not less than 50°F (10°C) nor more than 100°F (38°C). The Contractor shall be held responsible for any defective work, resulting from freezing or injury in any manner during placing and curing, and shall replace such work at his expense.

Retempering of concrete by adding water or any other material is not permitted.

The rate of delivery of concrete to the job shall be sufficient to allow uninterrupted placement of the concrete.

610-3.4 Forms. Concrete shall not be placed until all the forms and reinforcements have been inspected and approved by the RPR. Forms shall be of suitable material and shall be of the type, size, shape, quality,

and strength to build the structure as shown on the plans. The forms shall be true to line and grade and shall be mortar-tight and sufficiently rigid to prevent displacement and sagging between supports. The surfaces of forms shall be smooth and free from irregularities, dents, sags, and holes. The Contractor shall be responsible for their adequacy.

The internal form ties shall be arranged so no metal will show in the concrete surface or discolor the surface when exposed to weathering when the forms are removed. All forms shall be wetted with water or with a non-staining mineral oil, which shall be applied immediately before the concrete is placed. Forms shall be constructed so they can be removed without injuring the concrete or concrete surface.

610-3.5 Placing reinforcement. All reinforcement shall be accurately placed, as shown on the plans, and shall be firmly held in position during concrete placement. Bars shall be fastened together at intersections. The reinforcement shall be supported by approved metal chairs. Shop drawings, lists, and bending details shall be supplied by the Contractor when required.

610-3.6 Embedded items. Before placing concrete, all embedded items shall be firmly and securely fastened in place as indicated. All embedded items shall be clean and free from coating, rust, scale, oil, or any foreign matter. The concrete shall be spaded and consolidated around and against embedded items. The embedding of wood shall not be allowed.

610-3.7 Concrete Consistency. The Contractor shall monitor the consistency of the concrete delivered to the project site; collect each batch ticket; check temperature; and perform slump tests on each truck at the project site in accordance with ASTM C143.

610-3.8 Placing concrete. All concrete shall be placed during daylight hours, unless otherwise approved. The concrete shall not be placed until the depth and condition of foundations, the adequacy of forms and falsework, and the placing of the steel reinforcing have been approved by the RPR. Concrete shall be placed as soon as practical after mixing, but in no case later than one (1) hour after water has been added to the mix. The method and manner of placing shall avoid segregation and displacement of the reinforcement. Troughs, pipes, and chutes shall be used as an aid in placing concrete when necessary. The concrete shall not be dropped from a height of more than 5 feet (1.5 m). Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to rehandling or flowing. Do not subject concrete to procedures which cause segregation. Concrete shall be placed on clean, damp surfaces, free from running water, or on a properly consolidated soil foundation.

610-3.9 Vibration. Vibration shall follow the guidelines in American Concrete Institute (ACI) Committee 309R, Guide for Consolidation of Concrete.

610-3.10 Joints. Joints shall be constructed as indicated on the plans.

610-3.11 Finishing. All exposed concrete surfaces shall be true, smooth, and free from open or rough areas, depressions, or projections. All concrete horizontal plane surfaces shall be brought flush to the proper elevation with the finished top surface struck-off with a straightedge and floated.

610-3.12 Curing and protection. All concrete shall be properly cured in accordance with the recommendations in American Concrete Institute (ACI) 308R, Guide to External Curing of Concrete. The concrete shall be protected from damage until project acceptance.

610-3.13 Cold weather placing. When concrete is placed at temperatures below 40°F (4°C), follow the cold weather concreting recommendations found in ACI 306R, Cold Weather Concreting.

610-3.14 Hot weather placing. When concrete is placed in hot weather greater than 85ºF (30 ºC), follow the hot weather concreting recommendations found in ACI 305R, Hot Weather Concreting.

QUALITY ASSURANCE (QA)

610-4.1 Quality Assurance sampling and testing. Concrete for each day's placement will be accepted on the basis of the compressive strength specified in paragraph 610-3.2. The RPR will sample the concrete in accordance with ASTM C172; test the slump in accordance with ASTM C143; test air content in accordance with ASTM C231; make and cure compressive strength specimens in accordance with ASTM C31; and test in accordance with ASTM C39. The QA testing agency will meet the requirements of ASTM C1077.

The Contractor shall provide adequate facilities for the initial curing of cylinders.

610-4.2 Defective work. Any defective work that cannot be satisfactorily repaired as determined by the RPR, shall be removed and replaced at the Contractor's expense. Defective work includes, but is not limited to, uneven dimensions, honeycombing and other voids on the surface or edges of the concrete.

METHOD OF MEASUREMENT

610-5.1 Concrete shall be considered incidental and no separate measurement shall be made.

BASIS OF PAYMENT

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

REFERENCES

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

ASTM International (ASTM)

ASTM A184	Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A704	Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
ASTM A706	Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A775	Standard Specification for Epoxy-Coated Steel Reinforcing Bars
ASTM A884	Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement

ASTM A934	Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM A1064	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C114	Standard Test Methods for Chemical Analysis of Hydraulic Cement
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM C171	Standard Specification for Sheet Materials for Curing Concrete
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C311	Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C666	Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
ASTM C685	Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1017	Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete

ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM C1157	Standard Performance Specification for Hydraulic Cement
ASTM C1260	Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM C1365	Standard Test Method for Determination of the Proportion of Phases in Portland Cement and Portland-Cement Clinker Using X-Ray Powder Diffraction Analysis
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D1751	Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types)
ASTM D1752	Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction

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

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ITEM P-620 RUNWAY AND TAXIWAY MARKING

DESCRIPTION

620-1.1 This item shall consist of the preparation and painting of numbers, markings, and stripes on the surface of runways, taxiways, and aprons, in accordance with these specifications and at the locations shown on the plans, or as directed by the Resident Project Representative (RPR). The terms "paint" and "marking material" as well as "painting" and "application of markings" are interchangeable throughout this specification.

MATERIALS

620-2.1 Materials acceptance. The Contractor shall furnish manufacturer's certified test reports, for materials shipped to the project. The certified test reports shall include a statement that the materials meet the specification requirements. This certification along with a copy of the paint manufacturer's surface preparation; marking materials, including adhesion, flow promoting and/or floatation additive; and application requirements must be submitted and approved by the Resident Project Representative (RPR) prior to the initial application of markings. The reports can be used for material acceptance or the RPR may perform verification testing. The reports shall not be interpreted as a basis for payment. The Contractor shall notify the RPR upon arrival of a shipment of materials to the site. All material shall arrive in sealed containers that are easily quantifiable for inspection by the RPR.

620-2.2 Marking materials.

Table 1. Marking Materials

Paint[1]				Glass Beads[2]	
Type	**Color**	**Fed Std. 595 Number**	**Application Rate Maximum**	**Type**	**Application Rate Minimum**
Waterborne Type II	Yellow	33538 or 33655	115 ft^2/gal	I, Gradation A	7 lb/gal
Waterborne Type II	Black	37038	115 ft^2/gal	No beads	No beads

[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.

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.

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.

CONSTRUCTION METHODS

620-3.1 Weather limitations. Painting shall only be performed when the surface is dry, and the ambient temperature and the pavement surface temperature meet the manufacturer's recommendations in accordance with paragraph 620-2.1. Painting operations shall be discontinued when the ambient or surface temperatures does not meet the manufacturer's recommendations. Markings shall not be applied when the wind speed exceeds 10 mph unless windscreens are used to shroud the material guns. Markings shall not be applied when weather conditions are forecasts to not be within the manufacturers' recommendations for application and dry time.

620-3.2 Equipment. Equipment shall include the apparatus necessary to properly clean the existing surface, a mechanical marking machine, a bead dispensing machine, and such auxiliary hand-painting equipment as may be necessary to satisfactorily complete the job.

The mechanical marker shall be an atomizing spray-type or airless type marking machine with automatic glass bead dispensers suitable for application of traffic paint. It shall produce an even and uniform film thickness and appearance of both paint and glass beads at the required coverage and shall apply markings of uniform cross-sections and clear-cut edges without running or spattering and without over spray. The marking equipment for both paint and beads shall be calibrated daily.

620-3.3 Preparation of surfaces. Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance, or other contaminates that would reduce the bond between the paint and the pavement. Use of any chemicals or impact abrasives during surface preparation shall be approved in advance by the RPR. After the cleaning operations, sweeping, blowing, or rinsing with pressurized water shall be performed to ensure the surface is clean and free of grit or other debris left from the cleaning process.

a. Preparation of new pavement surfaces. The area to be painted shall be cleaned by broom, blower, water blasting, or by other methods approved by the RPR to remove all contaminants, including PCC curing compounds, minimizing damage to the pavement surface.

b. Preparation of pavement to remove existing markings. Existing pavement markings shall be removed by rotary grinding, water blasting, or by other methods approved by the RPR minimizing damage to the pavement surface. The removal area may need to be larger than the area of the markings to eliminate ghost markings. After removal of markings on asphalt pavements, apply a fog seal or seal coat to 'block out' the removal area to eliminate 'ghost' markings.

c. Preparation of pavement markings prior to remarking. Prior to remarking existing markings, loose existing markings must be removed minimizing damage to the pavement surface, with a method approved by the RPR. After removal, the surface shall be cleaned of all residue or debris.

Prior to the application of markings, the Contractor shall certify in writing that the surface is dry and free from dirt, grease, oil, laitance, or other foreign material that would prevent the bond of the paint to the pavement or existing markings. This certification along with a copy of the paint manufactures application and surface preparation requirements must be submitted to the RPR prior to the initial application of markings.

620-3.4 Layout of markings. The proposed markings shall be laid out in advance of the paint application. The locations of markings to receive glass beads shall be shown on the plans.

620-3.5 Application. A period of 30 days shall elapse between placement of surface course or seal coat and application of the permanent paint markings. Paint shall be applied at the locations and to the dimensions and spacing shown on the plans. Paint shall not be applied until the layout and condition of the surface has been approved by the RPR.

The edges of the markings shall not vary from a straight line more than 1/2 inch (12 mm) in 50 feet (15 m), and marking dimensions and spacing shall be within the following tolerances:

Marking Dimensions and Spacing Tolerance

Dimension and Spacing	Tolerance
36 inch (910 mm) or less	±1/2 inch (12 mm)
greater than 36 inch to 6 feet (910 mm to 1.85 m)	±1 inch (25 mm)
greater than 6 feet to 60 feet (1.85 m to 18.3 m)	±2 inch (50 mm)
greater than 60 feet (18.3 m)	±3 inch (76 mm)

The paint shall be mixed in accordance with the manufacturer's instructions and applied to the pavement with a marking machine at the rate shown in Table 1. The addition of thinner will not be permitted.

Glass beads shall be distributed upon the marked areas at the locations shown on the plans to receive glass beads immediately after application of the paint. A dispenser shall be furnished that is properly designed for attachment to the marking machine and suitable for dispensing glass beads. Glass beads shall be applied at the rate shown in Table 1. Glass beads shall not be applied to black paint or green paint. Glass beads shall adhere to the cured paint or all marking operations shall cease until corrections are made. Different bead types shall not be mixed. Regular monitoring of glass bead embedment and distribution should be performed.

620-3.6 Application--preformed thermoplastic airport pavement markings.
Preformed thermoplastic pavement markings not used.

620-3.7 Control strip. Prior to the full application of airfield markings, the Contractor shall prepare a control strip in the presence of the RPR. The Contractor shall demonstrate the surface preparation method and all striping equipment to be used on the project. The marking equipment must achieve the prescribed application rate of paint and population of glass beads (per Table 1) that are properly embedded and evenly distributed across the full width of the marking. Prior to acceptance of the control strip, markings must be evaluated during darkness to ensure a uniform appearance.

620-3.8 Retro-reflectance. Not used.

620-3.9 Protection and cleanup. After application of the markings, all markings shall be protected from damage until dry. All surfaces shall be protected from excess moisture and/or rain and from disfiguration by spatter, splashes, spillage, or drippings. The Contractor shall remove from the work area all debris, waste, loose reflective media, and by-products generated by the surface preparation and application operations to the satisfaction of the RPR. The Contractor shall dispose of these wastes in strict compliance with all applicable state, local, and federal environmental statutes and regulations.

METHOD OF MEASUREMENT

620-4.1a The quantity of markings (reflective and non-reflective) shall be paid for shall be measured by the number of square feet of painting**.**

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.

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

Payment will be made under:

Item P-620-1	Taxilane Painting (Includes Reflective with Glass Beads and Non-Reflective) - per square foot

REFERENCES

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

ASTM International (ASTM)

ASTM D476	Standard Classification for Dry Pigmentary Titanium Dioxide Products
ASTM D968	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D1652	Standard Test Method for Epoxy Content of Epoxy Resins
ASTM D2074	Standard Test Method for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method
ASTM D2240	Standard Test Method for Rubber Property - Durometer Hardness
ASTM D7585	Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments
ASTM E303	Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester

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

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ITEM T-904 SODDING

DESCRIPTION

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

MATERIALS

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

Sod species shall be Argentine Bahia grass provided in reasonably uniform strips of not less than 10-inches wide and 18-inches long. The sod shall be free of noxious weeds or other grasses and shall not contain any matter deleterious to its growth. Sod for this project shall be accompanied by certification from the State Department of Agriculture or appropriate certifying agency.

904-2.2 Lime. Not required.

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

a. A dry, free-flowing fertilizer suitable for application by a common fertilizer spreader;

b. A finely-ground fertilizer soluble in water, suitable for application by power sprayers; or

c. A granular or pellet form suitable for application by blower equipment.

Fertilizers ~~shall be **[ ]** commercial fertilizer and shall be spread at the rate of **[ ]**.~~ ***type and application rate shall be as recommended by the sod supplier to achieve the best results for the time of year, placement geography, and irrigation conditions.***

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

904-2.5 Soil for repairs. The soil for fill and topsoiling of areas to be repaired shall be at least of equal quality to that which exists in areas adjacent to the area to be repaired. The soil shall be relatively free

from large stones, roots, stumps, or other materials that will interfere with subsequent sowing of seed, compacting, and establishing turf, and shall be approved by the RPR before being placed.

CONSTRUCTION METHODS

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

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

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

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

904-3.4 Obtaining and delivering sod. After inspection and approval of the source of sod by the RPR, the sod shall be cut with approved sod cutters to such a thickness that after it has been transported and placed on the prepared bed, but before it has been compacted, it shall have a uniform thickness of not less than 2 inches (50 mm). Sod sections or strips shall be cut in uniform widths, not less than 10 inches (250 mm), and in lengths of not less than 18 inches (0.5 m), but of such length as may be readily lifted without breaking, tearing, or loss of soil. Where strips are required, the sod must be rolled without damage with the grass folded inside. The Contractor may be required to mow high grass before cutting sod.

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

904-3.5 Laying sod. Sodding shall be performed only during the seasons when satisfactory results can be expected. Frozen sod shall not be used and sod shall not be placed upon frozen soil. Sod may be

transplanted during periods of drought with the approval of the RPR, provided the sod bed is watered to moisten the soil to a depth of at least 4 inches (100 mm) immediately prior to laying the sod.

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

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

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

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

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

METHOD OF MEASUREMENT

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

BASIS OF PAYMENT

904-5.1 This item will be paid for on the basis of the contract unit price per square yard for sodding, which price shall be full compensation for all labor, equipment, material, staking, and incidentals necessary to

satisfactorily complete the items as specified.

Payment will be made under:

Item T-904-1	Sodding - per square yard

REFERENCES

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

ASTM International (ASTM)

ASTM C602	Standard Specification for Agricultural Liming Materials

Advisory Circulars (AC)

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

FAA/United States Department of Agriculture

Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM T-904

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ITEM U-100 WATER DISTRIBUTION SYSTEM

DESCRIPTION

U-100-1.1 The construction details for various items of work as required by the Contract Documents and/or shown on the Project Plans shall conform in their entirety to the City of Tampa water standard specifications latest edition and as modified hereinafter except as noted.

GENERAL

U-100-2.1 STANDARD SPECIFICATIONS. These standard specifications can be obtained from the City of Tampa. Electronic copies can be obtained from http://www.tampagov.net/

The Contractor shall have at least one (1) copy of the standard specifications available at the project site at all times during construction.

The construction must also conform to FAC Chapter 62-555 and Chapter 62-604 available online at http://www.dep.state.fl.us/water/rulesprog.htm#ww.

U-100-2.2 CONFLICTS. In the event of any conflict(s) between the Contract Documents and the City of Tampa Standard Specifications, the precedence in resolving such conflict(s) shall be as follows:

a. Bidding and Contract Requirements, and Technical Specifications for this project as located in the Project Documents shall govern over City of Tampa Bid and Contract Requirements.

b. Greater quantities shall govern over lesser.

c. Higher quality and/or more stringent requirements as adjudged by the Owner shall govern over lessor.

U-100-2.3 GENERAL INTENT. The general intent in the use of the City of Tampa Standard Specifications is to simplify and standardize the construction of the project by allowing the Contractor to follow common construction practices and use readily available material, equipment and construction methods. The City of Tampa Standard Specifications are not to be used to modify or change the Project Contact Documents.

U-100-2.4 DEFINITIONS. The definitions of terms as used in the City of Tampa Standard Specifications shall be modified as follows:

a. Any reference to the "Engineer," "Engineer of Tests," or "Division of Tests", it shall be understood to mean the Engineer of the Owner as stated in the Contract Documents or Owner.

b. Any reference to “City,” or “City of Tampa” it shall be understood to mean the Owner when referencing contractual requirements.

c. Definitions of terms as given in the Project Documents.

REQUIRED SPECIFICATIONS

U-100-3.1 PERTINENT SECTIONS. The following specification sections are most pertinent to this project:

Tampa Water Department Technical Manual

U-100-4.1 WAIVER OF SPECIFICATION REQUIREMENTS. The Owner's Representative with the approval of the Owner and Engineer may waive any standard specification requirement that does not apply to this project.

METHOD OF MEASUREMENT

U-100-5.1 Adjustment of the watermain shall not be measured for payment.

BASIS OF PAYMENT

U-100-6.1 Payment shall be made at the contract lump sum price for all work associated with adjustment of the existing watermain. This payment shall be full compensation for furnishing of all necessary materials and for all related labor equipment tools and incidentals.

Payment will be made under:

U-100-1	4" PVC Watermain Adjustment (Complete) – per lump sum

END OF ITEM U-100

Item L-105 Modification, Removal, and Demolition of Airfield Lighting Systems

GENERAL

105-1.1 Definitions.

a. Modification shall mean any change or rearrangement in the component parts, including structural, mechanical, electrical systems, or internal or external arrangements of existing equipment or structures.

b. Removal shall mean the dismantling of existing materials, components, equipment, and utilities. Removal of existing equipment, etc., shall be performed carefully to prevent damage to existing equipment. Removed items not to be reinstalled shall be delivered and turned over to airport maintenance, unless otherwise directed by the RPR, in which case these items shall be disposed of off airport property at the Contractor's expense.

c. Demolition shall mean the dismantling and disposal of existing materials, components, equipment, and utilities which cannot or will not be reused or which will have no salvage value, or which cannot be reused due to unrepairable damage caused by age, non-demolition related reasons, etc. All demolished items not designated to be turned over to the Owner shall be disposed of in a safe manner and at a location acceptable to the Owner.

105-1.2 General. All items to be turned over to the Owner shall be properly enclosed or boxed to protect the items from damage and transported by the Contractor to a location on the Owner's property, designated by the RPR and/or the Owner.

The installation and/or removal of lighting equipment may be critical to airport operations; therefore, the Contractor shall follow the work schedule established in the plans and specifications or as directed by the RPR. The system shall be installed in accordance with the National Electrical Code and/or local code requirements.

The Contractor shall provide temporary wiring as required to reconnect existing circuits to provide guidance for aircraft to pass through the construction areas on those taxiways/runways which must remain open. The Contractor shall check all temporary circuits before dark each day to assure that they are operational. In the event of failure, the Contractor shall immediately take steps to restore operation.

105-1.3 Condition of Existing Facilities. The Contractor shall verify the areas, conditions, and features necessary to tie into existing construction. This verification shall be done prior to submittal of shop drawings, fabrication or erection, construction or installation. The Contractor shall be responsible for the accurate tie-in of the new work to existing facilities.

Special attention is called to the fact that there may be conduit, cable, fixtures or other items in the existing systems which must be removed or relocated in order to perform the modification work. All conduit, wiring, boxes, etc., that do not comply with the contract documents shall be removed or corrected to comply with the contract documents. All unused conduit not removed shall be identified and a pull line shall be installed. The work shall include all removal and relocation required for completion of the modifications and the new construction.

105-1.4 Safety Requirements. The Contractor shall conduct alterations and removal operations in a manner that will ensure the safety of persons in accordance with the requirements of CFR 29 PART 1926 and 1910.

As a minimum, work place safety shall comply with NFPA 70E, OSHA, federal, state and local requirements.

Where a conflict occurs, the most stringent requirement shall govern.

The Contractor shall comply with the Construction Safety and Phasing Plan (CSPP).

105-1.5 Classification of Removed/Demolished Items. Existing materials and equipment indicated to be removed will be classified as "salvageable" and shall remain the property of the Owner or will be classified as "debris" and shall be disposed of legally off the airport.

Reusable salvaged items - Salvaged materials and equipment shall be reused in the work as described on the contract drawings, unless noted otherwise.

Retained salvaged items - Salvaged materials and equipment to be retained by the Owner but not reused in the work shall be turned over to the Owner at a site at the facility to be determined by the Owner. Retained salvaged items shall be stored on Owner property where indicated by the Owner.

Items classified as debris shall be legally disposed of off the airport property. The cost of such disposal shall be included in the cost of other items of work.

105-1.6 Temporary Protection. The Contractor shall provide and maintain the following requirements:

a. Protection of persons and property shall be provided throughout the progress of the work in accordance with the contract documents.

b. Provide temporary enclosures and partitions prior to starting modification and removal/demolition work. Such items shall protect existing materials, equipment, and other remaining building or system components from damage by weather and construction operations. Temporary enclosures shall isolate space utilized by equipment during construction, from dirt, dust, noise, and unauthorized entry.

c. Provide temporary exits, entrances, and protected passages where work prevents the use of existing facilities.

d. Provide weathertight temporary enclosures over and around openings to be made to existing exteriors of facilities prior to the start of work. The Contractor shall maintain such temporary enclosures until new construction will protect the interior of existing facilities from the elements.

e. Provide temporary exterior wall construction which will be designed and fabricated to resist an applied horizontal wind pressure of not less than 130 mph.

f. Provide temporary exterior roof construction which will be capable of supporting an applied vertical live load of not less than 200 psf, uniformly distributed over the entire roof area.

g. Design and fabricate temporary enclosures to maintain temperatures inside the existing facilities within a range of plus-or-minus 5 degrees F of normal operating conditions.

h. Provide temporary jet blast structures which will withstand the jet blast with a safety factor of 2.

i. Where elevated light fixtures have been removed and the base can is to remain for a new or reinstalled light fixture, a temporary 5/8-inch thick plywood cover shall be provided to keep debris from entering the base can.

j. Where elevated light fixtures have been removed and the base can is to remain without a fixture, a permanent 3/8-inch thick steel cover plate with new gasket, washers and stainless-steel bolts shall be provided.

k. Where in-pavement light fixtures and the top can sections have been removed and the bottom can section is to remain for a new or reinstalled light fixture, a temporary 5/8-inch thick plywood cover

and 1/8-inch thick mudplate shall be provided to allow for milling and paving operations.

l. Where in-pavement fixtures have been removed and the base can is to remain without a fixture, a permanent 3/4-inch thick steel cover plate with new gasket, locking washers and stainless-steel bolts shall be provided.

EXECUTION

105-2.1 Disconnecting Utilities. Prior to the start of work, the necessary utilities serving each area of modification, removal, or demolition will be shut off by the Owner and shall be disconnected and sealed by the Contractor, as required. Lockout/Tag/Try procedures shall be utilized in accordance with airport approved procedures.

Prior to the disconnection, interruption or removal of any circuit supplying power to an FAA owned and maintained facility, the Contractor must notify the local FAA or authorized representative 48 hours in advance and be granted permission.

105-2.2 Temporary Utility Services. The Contractor shall install temporary utility services in satisfactory operating condition before disconnecting existing utilities. Such temporary services shall be maintained during the period of construction and removed only after new permanent services have been tested and are in operation.

105-2.3 Temporary Airport Lighting Systems. The Contractor shall maintain the airport lighting systems during the various phases of the work as shown on the phasing plan(s) or as directed by the RPR. The Contractor shall be responsible for all temporary connections in the field or at the regulator necessary for operation of the circuits during construction. All existing electrical equipment and lighting systems shall be kept in operation, unless prior approval of the RPR has been received and as otherwise specified below and on the Drawings. The Contractor may use salvaged materials for temporary construction where required. The permission for temporary work and using salvaged materials shall be obtained from the RPR. Lighting for active runway and taxiway surfaces shall be maintained at all times. Temporary electrical fixtures and conductors are allowable when necessary, but shall be installed as follows:

a. Temporary lights shall be bolted to the pavement in a manner rendering the light stationery and allowing space for conductors to enter or exit and to be spliced.

b. When the above is not practical, lights shall be fastened to a weighted object adaptable for the purpose and of sufficient weight to inhibit movement by jet engine blast.

c. Temporary conductors supplying temporary lights shall be installed in a rigid galvanized steel conduit system and secured every five feet to prevent movement by jet engine blast. Conduit shall comply with Item L-110.

d. All joints or splices in temporary conductors shall have heat shrink tubing with integral sealant applied to secure mechanical and electrical connection and prevent water entry.

e. All plug-in connections shall have heat shrink tubing with integral sealant applied to prevent accidental disconnection and shall be color code taped to expedite quick, efficient disconnection and restoration.

f. Temporary airfield lighting and signage shall conform as closely as possible to permanent locations normally on the taxiway or runway and that shall guide aircraft in a safe path away from all possible accident prone areas.

Closed taxiways and runways shall be so marked in a manner acceptable to FAA and the Owner and said

marking shall be kept in acceptable condition. This item shall include, at the RPR's discretion the temporary removal or covering of airfield signage.

CAUTION: The series lighting circuit must always be complete before a regulator is energized. Normal circuit voltage is less than 5,000 volts, open circuit voltage can be more than 10,000 volts. All personnel shall be instructed to protect the integrity of the lighting circuit. Turn off, lock out and tag the constant current regulator at the vault before opening the circuit. Continuity of the circuit shall be checked before the regulator is reconnected and reenergized.

The installation and/or removal of lighting equipment may be critical to airport operations; therefore, the Contractor shall follow work schedules established in the plans and specifications or as directed by the RPR. The temporary system shall be installed in accordance with the contract documents, FAA Advisory Circulars and if applicable the National Electrical Code and/or local code requirements.

The Contractor shall provide temporary wiring as required to reconnect existing airfield lighting and signage to provide guidance for aircraft to pass through the construction areas on those taxiways/runways, which must remain open. Cable shall comply with Item L-108.

It shall be the Contractor's responsibility to determine that all airfield lighting circuits, except those that are serving closed taxiways or runways, are completely operational, using tower controls (if applicable), at the end of each work shift and shall so certify to the RPR before leaving the work site. Day shift report of system operation shall be at 4 p.m. Second shift report shall be 1 hour before dark. Any other shift shall report 1 hour prior to the need for airfield lighting or as determined by the RPR. Should bad weather cause poor visibility, the RPR may require additional status reports of system operability and may call for the operation of the lighting system at any time. In the event of lighting system failure, the Contractor shall immediately take the necessary steps to restore proper operation.

Whenever the scope of work requires connection to an existing circuit, the circuit's insulation resistance shall be tested, in the presence of the RPR. This test shall be performed in accordance with paragraph L-108-2.1f and L-108-2.11 prior to any activity affecting the respective circuit. The Contractor shall record the results. When the circuit is returned to its final condition, the circuit's insulation resistance shall be checked again in the presence of the RPR. The Contractor shall record the results. The second reading shall be equal to or greater than the first reading or the Contractor shall make the necessary repairs, to the 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, etc. if necessary, shall be borne by the Contractor. All test results shall be submitted in the Operation and Maintenance (O&M) Manual.

105-2.4 Removal Work. The Contractor shall not disturb the existing construction beyond that indicated or necessary for installation of new work. Temporary shoring and bracing for support of building components to prevent settlement or other movement shall be as indicated and as required to protect the work.

The Contractor shall provide protective measures to control accumulation and migration of dust and dirt in all areas of work, particularly those adjacent to occupied areas. The Contractor shall remove dust, dirt, and debris from the areas of work daily.

Where light fixtures are identified to be removed, the isolation transformers shall also be removed and included in the cost of the removal of the fixture.

105-2.5 Backfilling for Removal of Light Bases and Equipment Foundations. After a light base, structure or equipment foundation has been removed, the area around it shall be backfilled in horizontal layers not to exceed 6 inches in thickness measured after compaction to the density requirements in Item P-152. Each layer shall be deposited all around the structure to approximately the same elevation. The top of the

fill shall meet the elevation shown on the plans or as directed by the RPR.

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

Where light bases or equipment foundations have been removed from existing pavement to remain, the void shall be filled with P-610 concrete.

105-2.6 Salvageable Materials and Equipment. The Contractor shall remove all salvageable materials and equipment in a manner that will cause the least possible damage thereto. Removed items which are to be retained by the Owner shall be carefully handled, stored, and protected.

The Contractor shall provide identification tags on all items boxed or placed in containers, indicating the type, size, and quantity of materials.

DEMOLITION

105-3.1 Demolition Operations. Demolition operations shall be conducted to ensure the safe passage of persons to and from facilities occupied and used by the Owner and to prevent damage by falling debris or other cause to adjacent buildings, structures, and other facilities.

The sequence of operations shall be such that maximum protection from inclement weather will be provided for materials and equipment located in partially dismantled structures.

105-3.2 Maintaining Traffic. Demolition operations and removal of debris to disposal areas shall be conducted to ensure minimum interference with runways, taxiways, aprons, roads, streets, walks, and other facilities occupied and used by the Owner.

Streets, walks, runways, taxiways and other facilities occupied and used by the Owner shall not be closed or obstructed without written permission from the Owner.

105-3.3 Reference Standards Requirements. Demolition operations shall be conducted to ensure the safety of persons in accordance with ANSI A 10.6 Safety Requirements for Demolition.

Demolition shall be conducted in accordance with OSHA, state and local requirements.

DISPOSAL OF DEMOLISHED MATERIALS

105-4.1 General. The Contractor shall dispose of debris, rubbish, scrap, and other non-salvageable materials resulting from demolition operations. Demolished materials shall not be stored or disposed of on airport property.

105-4.2 Disposal of Debris. Materials classified as debris shall be transported from Owner property and legally disposed of at no additional cost to the Owner. Permits and fees for disposal shall be paid by the Contractor.

MODIFICATION WORK

105-5.1 General. Cutting, patching, repairing, and other modifications work shall be done by tradesman skilled in the particular trade or work required.

Where required to patch or extend existing construction, or both, such modifications shall match existing exposed surface materials in finish, color, texture, and pattern.

Salvaged items for reuse shall be as approved by the RPR and Owner.

METHOD OF MEASUREMENT

105-6.1 Temporary airport lighting systems will be measured for payment on a lump sum basis. Work for this item shall include temporary equipment, cables, conduit, and connections required to keep the airfield lighting systems operational during construction. This item shall also include the removal of the items when no longer needed and restoration to original conditions.

BASIS OF PAYMENT

105-7.1 Payment will be made at the contract lump sum price for temporary airport lighting systems. This price shall be full compensation for temporary jumpers, connections, conduit, and for all labor, equipment, tools, and incidentals necessary to complete this item in accordance with the provisions and intent of the plans and specifications.

Payment will be made under:

Item L-105-1	Temporary Airport Lighting Systems - per lump sum

END OF ITEM L-105

ITEM L-108 UNDERGROUND POWER CABLE FOR AIRPORTS

DESCRIPTION

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

EQUIPMENT AND MATERIALS

108-2.1 General.

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

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

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

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

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

f. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for at least twelve (12) months from the date of final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner. The Contractor shall maintain a minimum insulation resistance in accordance with paragraph 108-3.10e with isolation transformers connected in new circuits and new segments of existing circuits through the end of 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 C, 5,000 volts, non-shielded, with cross-linked polyethylene insulation. L-824 conductors for use on the L-830 secondary of airfield lighting series circuits shall be sized in accordance with the manufacturer's recommendations. All other conductors shall comply with FAA and National Electric Code (NEC) requirements. Conductor sizes noted above shall not apply to leads furnished by manufacturers on airfield lighting transformers and fixtures.

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

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

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

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

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

Ground rods shall be 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.

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 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. 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~~ ***FL-121 Flowable Fill***.

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

108-2.9 Tape. Electrical tapes shall be Scotch™ Electrical Tapes –Scotch™ 88 (1-1/2 inch (38 mm) wide) and Scotch™ 130C® linerless rubber splicing tape (2-inch (50 mm) wide), as manufactured by the

Minnesota Mining and Manufacturing Company (3M™), or an approved equivalent.

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

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

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

CONSTRUCTION METHODS

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

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

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.

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 to a minimum of 100 percent of ASTM D1557.

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 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 to a minimum of 100 percent of ASTM D1557. 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.

b. Field-attached plug-in splices. These shall be assembled per the manufacturer’s instructions. These splices shall be made by plugging directly into mating connectors. The joint where the connectors come together shall be finished by one of the following methods: (1) wrapped with at least one layer of rubber or synthetic rubber tape and one layer of plastic tape, one-half lapped, extending at least 1-1/2 inches (38 mm) on each side of the joint (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. 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 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 500 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 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 (meters) installed and grounding connectors, and trench marking tape ready for operation, and accepted as satisfactory. Separate measurement shall be made for each cable or counterpoise wire installed in trench, duct bank or conduit. The measurement for this item shall include additional quantities required for slack.

108-4.3 No separate payment will be made for ground rods.

BASIS OF PAYMENT

108-5.1 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-108-1	No. 8 AWG**,** 5 kV, L-824, Type C Cable, Installed in Trench, Duct Bank or Conduit - per liner foot
Item L-108-2	No. 6 AWG, Solid, Bare Copper Counterpoise Wire, Installed in Trench, Above the Duct Bank or Conduit, Including Connections/Terminations - per linear foot

REFERENCES

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

Advisory Circulars (AC)

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

Commercial Item Description

A-A-59544A	Cable and Wire, Electrical (Power, Fixed Installation)
A-A-55809	Insulation Tape, Electrical, Pressure-Sensitive Adhesive, Plastic

ASTM International (ASTM)

ASTM B3	Standard Specification for Soft or Annealed Copper Wire
ASTM B8	Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM B33	Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes
ASTM D4388	Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes

Mil Spec

MIL-PRF-23586F	Performance Specification: Sealing Compound (with Accelerator), Silicone Rubber, Electrical
MIL-I-24391	Insulation Tape, Electrical, Plastic, Pressure Sensitive

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)
NFPA-780	Standard for the Installation of Lightning Protection Systems

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

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

Federal Aviation Administration Standard

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

END OF ITEM L-108

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ITEM L-110 AIRPORT UNDERGROUND ELECTRICAL DUCT BANKS AND CONDUITS

DESCRIPTION

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

EQUIPMENT AND MATERIALS

110-2.1 General.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

110-2.9 Detectable warning tape. Plastic, detectable, American Public Works Association (APWA) red (electrical power lines, cables, conduit and lighting cable), orange (telephone/fiber optic cabling) with continuous legend magnetic tape shall be polyethylene film with a metallized foil core and shall be 3-6 inches (75-150 mm) wide. Detectable tape is incidental to the respective bid item.

CONSTRUCTION METHODS

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

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

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

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

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

Unless otherwise shown on the plans, concrete encased duct banks shall be used when crossing under pavements expected to carry aircraft loads, such as runways, taxiways, taxilanes, ramps and aprons. When

under paved shoulders and other paved areas, conduit and duct banks shall be encased using flowable fill for protection.

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

Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored.

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

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

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

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

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

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

All excavation shall be unclassified and shall be considered incidental to Item L-110. Dewatering necessary for duct installation, and erosion per federal, state, and local requirements is incidental to Item L-110. Unless otherwise specified, excavated materials that are deemed by the RPR to be unsuitable for use in backfill or embankments shall be removed and disposed of offsite.

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

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

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

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

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

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

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

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

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

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

Install a plastic, detectable, color as noted, 3 to 6 inches (75 to 150 mm) wide tape, 8 inches (200 mm)

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

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

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

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

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

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

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

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

110-3.4 Markers. The location of each end and of each change of direction of conduits and duct banks shall be marked by a concrete slab marker 2 feet (60 cm) square and 4 - 6 inches (100 - 150 mm) thick extending approximately one inch (25 mm) above the surface. The markers shall also be located directly

above the ends of all conduits or duct banks, except where they terminate in a junction/access structure or building. Each cable or duct run from a line of lights and signs to the equipment vault must be marked at approximately every 200 feet (61 m) along the cable or duct run, with an additional marker at each change of direction of cable or duct run.

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

110-3.5 Backfilling for conduits. For conduits, 8 inches (200 mm) of sand, soft earth, or other fine fill (loose measurement) shall be placed around the conduits ducts and carefully tamped around and over them with hand tampers. The remaining trench shall then be backfilled and compacted per Item P-152 except that material used for back fill shall be select material not larger than 4 inches (100 mm) in diameter.

Flowable backfill may alternatively be used.

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

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

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

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

Trenches shall not contain pools of water during backfilling operations.

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

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

110-3.7 Restoration. Where sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by the work shall be restored to its original condition. The restoration shall include sodding as shown on the plans. The Contractor shall be held responsible for

maintaining all disturbed surfaces and replacements until final acceptance. All restoration shall be considered incidental to the respective L-110 pay item. Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD), and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

110-3.8 Ownership of removed cable. Removed cable shall be legally disposed of off Airport property.

METHOD OF MEASUREMENT

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

110-4.2 Removal of conduit, duct banks, and cable will be measured for payment on a lump sum basis. Work for this item includes the removal of all underground cable and conduit as specified in the plans.

BASIS OF PAYMENT

110-5.1 Payment will be made at the contract unit price per linear foot for each type and size of conduit and duct bank completed and accepted, including trench and backfill with the designated material, and, for drain lines, the termination at the drainage structure. This price shall be full compensation for removal and disposal of existing duct banks and conduits as shown on the plans, furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item per the provisions and intent of the plans and specifications.

Payment will be made under:

Item L-110-1	Remove Conduit, Duct Bank, and Cable – per lump sum
Item L-110-2	Non-Encased Electrical Conduit, 1-Way, 2-Inch - per linear foot
Item L-110-3	Concrete Encased Electrical Duct Bank, 2-Way, 2-Inch - per linear foot

REFERENCES

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

Advisory Circular (AC)

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

ASTM International (ASTM)

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

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)

Underwriters Laboratories (UL)

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

END OF ITEM L-110

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ITEM L-125 INSTALLATION OF AIRPORT LIGHTING SYSTEMS

DESCRIPTION

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

EQUIPMENT AND MATERIALS

125-2.1 General.

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

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

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

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

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

EQUIPMENT AND MATERIALS

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

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

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

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

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

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

Lights

Type	Class	Mode	Style	Option	Base	Filter	Transformer	Notes
L-861T(L)	N/A	1	N/A	4	L-867B	Blue	L-830	14” Height
L-853	Type II	N/A	N/A	N/A	N/A	Blue	N/A	14” Height

125-2.8 Runway and Taxiway Signs. Runway and Taxiway Guidance Signs should conform to the requirements of AC 150/5345-44. ***Unlit taxiway end marker signs should conform to the requirements of AC 150/5340-18.***

Signs

Type	Size	Style	Class	Mode	Notes
L-858(C)	1	4	N/A	N/A	Single-sided

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

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

125-2.11 Circuit Selector Cabinet. Not used.

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, 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.

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.

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.

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. Taxiway lights will be measured by the number of each type installed as completed units in place, ready for operation, and accepted by the RPR. 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.

BASIS OF PAYMENT

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

Payment will be made under:

Item L-125-1 L-861(T) Elevated Taxiway Edge Light on New L-867B Base Can - per each

Item L-125-2 L-853 Retroreflective Marker – per each

Item L-125-3 Unlit Taxiway End Marker Sign – per each

Item L-125-4 Relocate Existing Elevated Taxiway Edge Light on New L-867B Base Can - 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

APPENDIX 1

GEOTECHNICAL REPORT

TIERRA

October 22, 2020

RS&H, Inc.
1715 N Westshore Blvd, Suite 500
Tampa, FL 33607

Attn: Mr. David Gordon, P.E.

RE: Report of Geotechnical Engineering Services
Peter O'Knight – New Taxiway G Extension
HCAA No. 6640 19A
Hillsborough County, Florida
Tierra Project No. 6511-20-108.001

Mr. Gordon:

Tierra, Inc. has completed the geotechnical engineering study for the above referenced project. The results of our field exploration program are presented in this report.

Should there be any questions regarding the report, please do not hesitate to contact our office at (813) 989-1354. Tierra would be pleased to continue providing geotechnical services throughout the implementation of the project. We look forward to working with you on this and future projects.

Respectfully Submitted,

TIERRA, INC.

Daniel R. Ruel, P.E.
Geotechnical Engineer
Florida License No. 82404

Kevin H. Scott, P.E.
Senior Geotechnical Engineer
Florida License No. 65514

7351 Temple Terrace Highway • Tampa, FL 33637
Phone (813) 989-1354 • Fax (813) 989-1355
Florida Certificate No. 6486

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PROJECT DESCRIPTION

Project Information

The project consists of designing a new taxiway extension (G2) connecting to the existing Taxiway G at Peter O'Knight Airport. This report has been developed to provide geotechnical support for the new taxiway design through California Bearing Ratio (CBR) tests, Standard Penetration Test (SPT) borings, and laboratory testing.

Scope of Services/Objective

The objective of our study was to obtain information concerning subsurface conditions at the project site in order to provide data to support the taxiway design. In order to meet the preceding objectives, we provided the following services:

1. Reviewed published soils and topographic information. This published information was obtained from the "Tampa, Florida" Florida Quadrangle Map published by the United States Geological Survey (USGS), as well as the Soil Survey of Hillsborough County, Florida, published by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS).

2. Executed a program of subsurface exploration consisting of two (2) Standard Penetration Test (SPT) borings performed to depths ranging from 35 to 40 feet below grade.

3. Collected bulk samples at two (2) locations for California Bearing Ratio (CBR) laboratory testing.

4. Visually classified the soil samples in the laboratory using the Unified Soil Classification System (USCS). Identified soil conditions at each boring and core location and performed laboratory testing on representative soil samples to confirm visual classification.

5. Collected groundwater level measurements.

6. Prepared this engineering report in accordance with the project Scope of Services and our proposal, which summarizes the course of study pursued, the field and laboratory data generated, subsurface conditions encountered, and our engineering evaluations in each of the pertinent topic areas.

The scope of our services did not include an environmental assessment for determining the presence or absence of wetlands or hazardous or toxic materials in the soil, bedrock, groundwater, or air, on or below or around this site. The scope of our services did not include determination of the potential for sinkhole activity. Any statements in this report or on the boring logs regarding odors, colors, unusual or suspicious items or conditions are strictly for the information of our client.

SUBSURFACE CONDITIONS

General Site Information

Based on a review of the "Tampa, Florida" United States Geological Survey (USGS) Quadrangle Map, the natural ground elevation at the project site is on the order of approximately +5 to +10 feet, National Geodetic Vertical Datum of 1929 (NGVD 29). Peter O'Knight Airport is located on Davis Islands in Tampa, Florida. Davis Islands were built from mud dredged from the bottom of Tampa Bay in the 1920's. Originally, Davis Islands consisted of three islands. However, one of the canals separating the islands was filled during the construction of the airport.

Hillsborough County Soil Survey

Based on a review of the Hillsborough County Soil Survey, it appears that there is one (1) primary soil-mapping unit noted within the project footprint. The general soil description is presented in the following paragraphs and table, as described in the Soil Survey.

St. Augustine – Urban Land Complex (Unit: 45) -

The St. Augustine component makes up 50 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy mine spoil or earthy fill. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 27 inches during July, August, September and October. Organic matter content in the surface horizon is about 2 percent.

SUMMARY OF USDA SOIL SURVEY								
HILLSBOROUGH COUNTY, FLORIDA								
USDA Map Symbol and Soil Name	**Depth**	**Soil Classification**		**Permeability (in/hr)**		**pH**	**Seasonal High Water Table**	
	(in)	**USCS**	**AASHTO**	**Low - High**			**Depth (feet)**	**Months**
(45) St. Augustine	0-3	SP, SP-SM	A-3	6.0	20.0	6.1-8.4	1.5-3.0	Jul-Oct
	3-80	SM, SP-SM	A-2-4, A-3	2.0	20.0	6.1-8.4		
Urbanland	*USDA does not provide soil data for urban land*							

RESULTS OF SUBSURFACE EXPLORATION

The soil boring and bulk soil collection locations were recorded in the field by a representative of Tierra using hand held Global Positioning System (GPS) equipment. The approximate locations are presented on the **Boring Location Plan** in **Appendix A**.

The SPT borings were performed with the use of a drill rig using Bentonite Mud drilling procedures. The soil sampling was performed in general accordance with ASTM test designation D-1586. The initial 6 feet of the SPT borings were manually augered to verify utility clearance. SPT resistance N-values were then taken continuously to a depth of 10 feet and at intervals of 5 feet thereafter to the boring termination depth. The results of the SPT borings performed are presented on the **Soil Profiles** sheet in **Appendix A**.

The soil strata encountered in the borings performed at the project site are summarized in the following table.

Stratum Number	Soil Description	USCS Symbol
1	Gray to Brown SAND to SAND with Silt	SP/SP-SM
2	Dark Green to Black Silty SAND	SM
3	Dark Green Clayey SAND	SC
4	Dark Green to Green Sandy CLAY	CL
5	Weathered Limestone with Calcareous Clay	--[1]
--[1] USCS nomenclature does not include a classification for natural limestone		

The subsurface soil stratification is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The soil profiles included in **Appendix A** should be reviewed for specific information at individual boring locations. These profiles include soil descriptions, stratifications, and penetration resistance values. The stratifications shown on the boring profiles represent the conditions only at the actual boring location. Variations did occur and should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual.

Groundwater Information

The groundwater table was measured at a depth of 4 to 10 feet below the ground surface within the two SPT borings performed. The encountered groundwater levels are presented adjacent to the soil profiles in **Appendix A**.

It should be noted that groundwater levels tend to fluctuate during periods of prolonged drought and extended rainfall and may be affected by man-made influences. In addition, a seasonal effect can also occur in which higher groundwater levels are normally recorded in rainy seasons.

EVALUATION AND RECOMMENDATIONS

Results of Soil Borings

The **Boring Location Plan and Soil Profiles** included in Appendix A should be reviewed for specific soil information at each location tested. The borings generally encountered very loose to medium dense sandy soils underlain by soft "bay bottom" silty sand. Both borings encountered approximately 15 feet of weight of hammer material (soft bay bottom) starting at depths of approximately 18 feet below surface level. Consolidation of the bay bottom material under increased stress will result in settlement over time. The airport should anticipate higher than normal maintenance (milling and resurfacing) in this area due to the presence of the soft bay bottom soils. Tierra recommends the design consider the use of a geosynthetic reinforcement, such as Mirafi RS 580i, in the design of the pavement section to reduce the potential impacts of settlement due to the presence of the soft bay bottom materials encountered in the borings.

California Bearing Ratio

Bulk samples were collected for California Bearing Ratio (CBR) testing at two (2) locations along the project site. The soils were collected from depths within two feet of the ground surface. The tests were performed in accordance with ASTM D-1883. The locations of the bulk sampling are presented on the **Boring Location Plan** in **Appendix A**. The results from the laboratory tests are provided in the following table and in **Appendix B**.

Test Number	Approximate State Plane Coordinates		Max CBR Values	CBR Average	CBR-1σ	Recommended Design CBR[(1)]
	Easting	Northing				
CBR-1	511919	1301884	37	35	32	32
CBR-2	512090	1301882	33			
[(1)] Design CBR provided is one standard deviation below the tested average as recommended in by the FAA's Airport Pavement Design and Evaluation.						

On-Site Suitability

The suitability of soil for reuse in the project should be evaluated against the project engineering fill requirements. Variations in the subsurface stratification should be expected between borings. All fill should be placed in accordance with the recommendations provided in this report and FAA Specifications.

In general, the sandy soil in Stratum 1 (SP/SP-SM) may be moved and used for grading purposes, site leveling, general engineering fill, and backfill in other areas, provided the fill is free of organic materials, clay, debris and/or other material deemed unsuitable for

construction. The subsurface soil conditions encountered are presented on the **Soil Profiles** sheet in **Appendix A**.

REPORT LIMITATIONS

The data contained in this report are opinions based on the site conditions and project layout described herein and further assume that the conditions observed in the exploratory and borings are representative of the subsurface conditions throughout the site, i.e., the subsurface conditions elsewhere on the site are the same as those disclosed by the borings. If, during construction, subsurface conditions different from those encountered in the exploratory borings are observed or appear to be present, we should be advised at once so that we can review these conditions and reconsider our recommendations where necessary.

This report was prepared for the exclusive use of RS&H and their client for evaluating the design of the project as it relates to the geotechnical aspects discussed herein. It should be made available to prospective contractors for information on factual data only and not as a warranty of subsurface conditions included in this report. Unanticipated pavement and soil conditions may require that additional expense be made to attain a properly constructed project. Therefore, some contingency fund is recommended to accommodate such potential extra costs.

APPENDIX A

Boring Location Plan & Soil Profiles

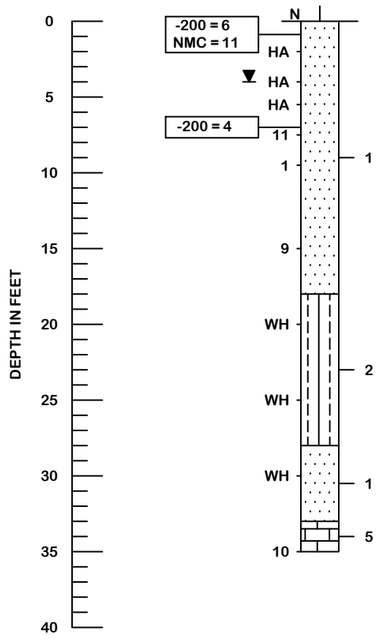
BORING LOCATION PLAN

0 200'

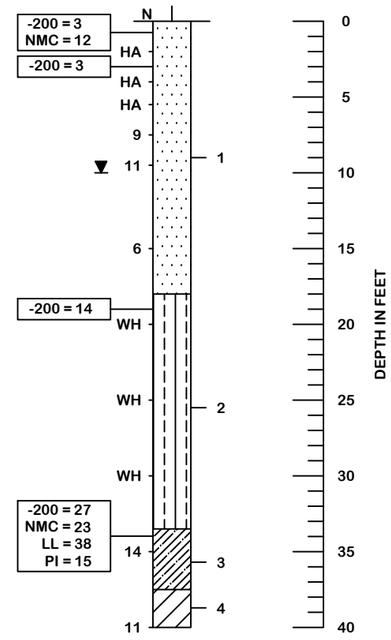
PLAN SCALE

SOIL PROFILES

BOR # B-1
EASTING 511919
NORTHING 1301884
DATE 10/1/2020
DRILLER D. STAKELIN
HAMMER AUTOMATIC
RIG D-25



BOR # B-2
EASTING 512090
NORTHING 1301882
DATE 10/1/2020
DRILLER D. STAKELIN
HAMMER AUTOMATIC
RIG D-25



LEGEND

1 GRAY TO BROWN SAND TO SAND WITH SILT (SP/SP-SM)

2 DARK GREEN TO BLACK SILTY SAND (SM)

3 DARK GREEN CLAYEY SAND (SC)

4 DARK GREEN TO GREEN SANDY CLAY (CL)

5 WEATHERED LIMESTONE WITH CALCAREUOS CLAY

APPROXIMATE LOCATION CBR

APPROXIMATE LOCATION OF SPT BORING

GROUNDWATER LEVEL ENCOUNTERED DURING INVESTIGATION

N — SPT N-VALUE IN BLOWS/FOOT FOR 12 INCHES OF PENETRATION (UNLESS OTHERWISE NOTED)

SP — UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2488) GROUP SYMBOL AS DETERMINED BY VISUAL REVIEW AND LABORATORY TESTING ON SELECTED SAMPLES FOR CONFIRMATION OF VISUAL REVIEW

HA — HAND AUGERED TO VERIFY UTILITY CLEARANCES

WH — FELL UNDER WEIGHT OF ROD AND HAMMER

-200 — PERCENT PASSING #200 SIEVE

NMC — NATURAL MOISTURE CONTENT (%)

LL — LIQUID LIMIT (%)

PI — PLASTICITY INDEX (%)

EASTING — EASTING COORDINATE REFERENCED TO THE FLORIDA STATE PLANE COORDINATE SYSTEM, FLORIDA WEST ZONE, N.A.D. 83 DETERMINED USING HAND-HELD GARMIN ETREX GPS EQUIPMENT WITH A REPORTED ACCURACY OF +/- 10 FEET

NORTHING — NORTHING COORDINATE REFERENCED TO THE FLORIDA STATE PLANE COORDINATE SYSTEM, FLORIDA WEST ZONE, N.A.D. 83 DETERMINED USING HAND-HELD GARMIN ETREX GPS EQUIPMENT WITH A REPORTED ACCURACY OF +/- 10 FEET

AUTOMATIC HAMMER	
GRANULAR MATERIALS-RELATIVE DENSITY	SPT (BLOWS/FT.)
VERY LOOSE	LESS THAN 3
LOOSE	3 TO 8
MEDIUM	8 TO 24
DENSE	24 TO 40
VERY DENSE	GREATER THAN 40
SILTS AND CLAYS CONSISTENCY	SPT (BLOWS/FT.)
VERY SOFT	LESS THAN 1
SOFT	1 TO 3
FIRM	3 TO 6
STIFF	6 TO 12
VERY STIFF	12 TO 24
HARD	GREATER THAN 24

DRAWN BY: SW
CHECKED BY: DRR
APPROVED BY: DRR
DATE: OCT 2020
ENGINEER OF RECORD: DANIEL R. RUEL, P.E.
FLORIDA LICENSE NO.: 82404

TIERRA
7351 Temple Terrace Highway
Tampa, Florida 33637
Phone: 813-989-1354 Fax: 813-989-1355
FL Cert. No.: 6486

SCALE: NOTED
PROJECT NUMBER: 6511-20-108-01

GEOTECHNICAL ENGINEERING SERVICES
PETER O'KNIGHT - TAXIWAY G EXTENSION
HILLSBOROUGH COUNTY, FLORIDA

SHEET 1

APPENDIX B

CBR Test Results

TIERRA INC.

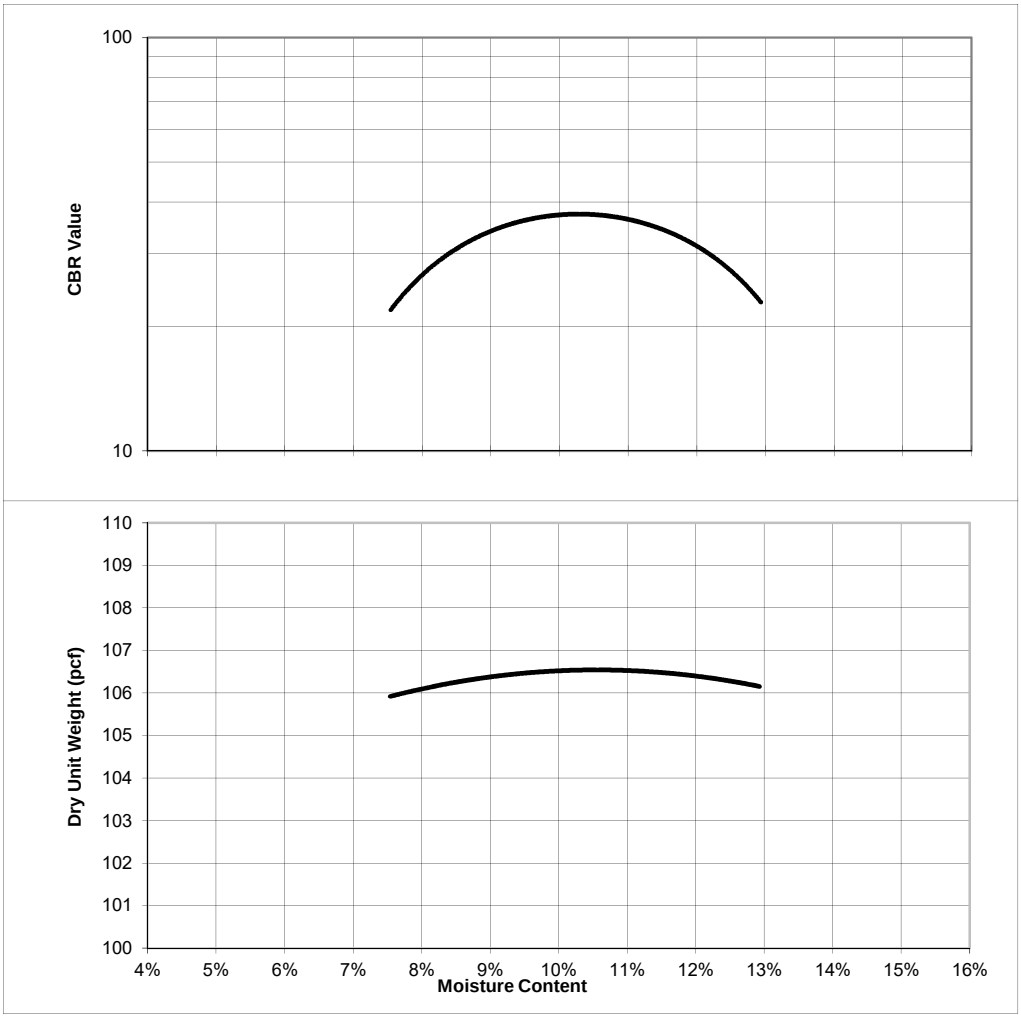
RESULTS OF CALIFORNIA BEARING RATIO TEST

Tested For: RS&H

Project: POK Taxiway G2

Project No. 6511-20-108-01
Report No. CBR 1

CBR & MOISTURE-DENSITY RELATIONSHIP



CBR Value	37		
Maximum Density	106.5 pcf	Description:	Light Brown Slightly Silty Sand
Optimum Moisture	10.7 %		
Test Method:	ASTM D1883: CBR		
Tested By:	J. Shuey	Sample Depth:	0' - 2'

cc:

Respectfully Submitted,
TIERRA INC.

TIERRA INC.

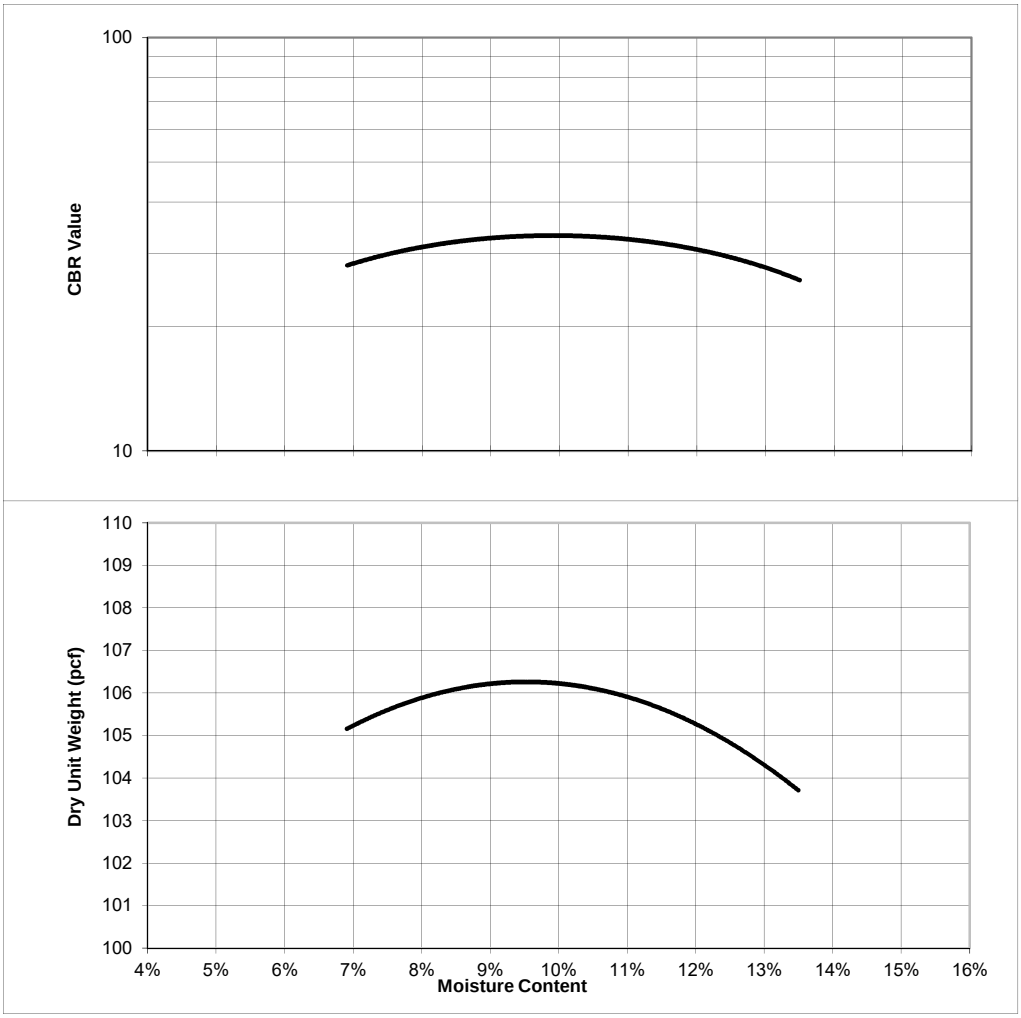
RESULTS OF CALIFORNIA BEARING RATIO TEST

Tested For: RS&H

Project: POK Taxiway G2

Project No. 6511-20-108-01
Report No. CBR 2

CBR & MOISTURE-DENSITY RELATIONSHIP



CBR Value	33		
Maximum Density	106.3 pcf	Description:	Light Yellowish Brown Slightly Silty Sand with Shell
Optimum Moisture	9.5 %		
Test Method:	ASTM D1883: CBR		
Tested By:	J. Shuey	Sample Depth:	0' - 2'

cc:

Respectfully Submitted,
TIERRA INC.

APPENDIX 2

CONSTRUCTION SAFETY AND PHASING PLAN (CSPP)

Tampa International Airport

HILLSBOROUGH COUNTY
AVIATION AUTHORITY
TAMPA, FLORIDA

CONSTRUCTION SAFETY
&
PHASING PLAN

FOR

TAXILANE G2

HCAA PROJECT NO. 6640 19
RS&H PROJECT NUMBER 204-001-056

PETER O. KNIGHT AIRPORT
TAMPA, FLORIDA

Prepared By

RS&H, INC.

December 4, 2020

CONSTRUCTION SAFETY AND PHASING PLAN (CSPP)

PETER O. KNIGHT AIRPORT
TAXILANE G2
AUTHORITY NO. 6640 19

TABLE OF CONTENTS

CONSTRUCTION SAFETY AND PHASING PLAN (CSPP)

PETER O. KNIGHT AIRPORT
TAXILANE G2
AUTHORITY NO. 6640 19

A. PURPOSE

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 all 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 a standalone document, written to correspond with the safety and security requirements set forth in AC 150/5370-2G, the airport safety and security requirements and local codes and requirements. 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 actions 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 Part 139 certified airports and construction projects funded by the Airport Improvement Program (AIP) or the Passenger Facility Charge (PFC) program.

The Contractor shall be required to submit a Safety Plan Compliance Document (SPCD) to the airport operator 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 must be submitted to the airport operator for approval prior to issuance of the Notice to Proceed.

In the event the Contractor's activities are found in non-compliance with the provisions of the CSPP or the SPCD, the Airport Construction Manager will direct the Contractor, in writing, to immediately cease those operations 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 conclusion of the safety meeting and all corrective actions required by the Contractor have been implemented.

B. SCOPE

HCAA was approached by a current TPF tenant, Sarasota Avionics (SRQ), regarding construction of a new MRO hangar facility. SRQ is designing and constructing their new facility on the east side of the airport south of the existing T-hangars. SRQ has procured their own design consultant and contractor for this work. In order to provide access from Taxiway G to the SRQ facility, a new connector taxilane must be constructed. This project consists of the design and construction of the new connector taxilane, Taxilane G2. The limits of the project area are identified on the exhibits included in Appendix A (see **Exhibit G003**).

Necessary construction locations, activities and associated costs have been identified and their impact to airport operations has been assessed. The impact of work to the AOA is discussed in detail below in Section C *PLAN REQUIREMENTS* and is graphically depicted in the Safety and Phasing exhibits included in Appendix A (see **Exhibits G002 thru G005**). These exhibits will be made part of the plan set issued to the Contractor for bidding and construction. For purposes of this document, the AOA is defined as the area of the airport used or intended to be used for unobstructed landing, takeoff or surface maneuvering of aircraft and shall be considered the airfield area located within the airport security fence.

C. PLAN REQUIREMENTS

1. **Coordination:** Airport operators and/or tenants impacted during construction have been or will have the opportunity to pose questions at pre-design, pre-bid and pre-construction conferences. In addition, construction progress meetings and meetings with the FAA Air Traffic Organization (ATO) will be held as required throughout the performance of the contract.

    a. **Pre-design Conference / Design Coordination Meetings** – A pre-design conference along with design review and coordination meetings were held throughout the design process at the Tampa International Airport (TPA) Administration Building in Tampa, Florida. In attendance were representatives from Hillsborough County Aviation Authority (Authority) and RS&H Inc. (RS&H). These meetings were used to discuss various items relating to design parameters, airport safety, routing of aircraft and equipment, sequencing of construction operations, environmental considerations and any other requirements pertinent to the project. The pre-design conference and design coordination meetings were essential in identifying and outlining potential affects and/or conflicts to airport operations during construction.

    b. **Pre-bid Conference** – The Authority and RS&H shall conduct a pre-bid conference to help clarify and explain construction methods, procedures and safety measures required by the contract.

    The meeting shall be held prior to the bid opening date. The pre-bid conference will be mandatory for all general contractors intending to bid on this project. The FAA will be invited.

    Typical agenda items included for this meeting are construction methods, construction procedures (i.e. statistical acceptance testing), operational safety requirements, Disadvantaged Business Enterprise (DBE) and other civil rights and labor requirements.

One of the primary focuses of the pre-bid conference will be to cover relevant information concerning the Contractor's requirements for developing and submitting a SPCD for review and approval. This will include both general and specific elements required in the SPCD. In addition, information on how the Contractor shall format the document to illustrate their plans for compliance with those provisions detailed out within this CSPP will also be provided.

Any changes or modifications recommended during the conference will be included in an addendum to the bid documents. A copy will be furnished to each prospective bidder who had requested a set of bid documents.

Copies of the proceedings containing all items discussed, including responses to questions, will be made available to each of the participants upon request.

c. Pre-construction Conference – A pre-construction conference, convened and conducted by the Authority and RS&H, shall be used to discuss operational safety, testing, quality control, quality acceptance, security, safety, labor requirements, environmental factors and other issues. This meeting, among all parties affected by the construction, should assist in a better understanding of potential problems and possible solutions for the course of the performance of this contract.

The pre-construction conference shall be conducted as soon as practicable after the contract has been awarded and before issuance of the notice to proceed.

The expected participants for this meeting shall include the following parties:

1) Authority's engineer.
2) Authority's Construction Manager.
3) Airport management.
4) Testing laboratory representative.
5) Contractor and subcontractor(s).
6) Contractor's project superintendent.
7) Contractor's project clerk.
8) Airport users impacted by the proposed construction.
9) Utility companies affected by the proposed construction.
10) Federal, State or Local agencies affected by the proposed construction such as FDOT, Southwest Florida Water Management District (SWFWMD), etc.
11) Representative of FAA Airports regional or field office.

The FAA Airports regional or field office should ensure that all appropriate FAA offices (Air Traffic, Flight Standards, etc.), military installations and Federal agencies that may have an interest in the project are notified.

The Authority's Construction Manager will prepare an agenda prior to the pre-construction conference. This will include, but is not limited to:

1) The scope of the project and the sequence and timing of all operations.
2) Relationship between the Construction Manager, Engineer and the Contractor.

3) Relationship between the FAA and the Authority.
4) Identification of the Contractor's superintendent and a discussion of his/her authority and responsibilities.
5) Designation of the Authority's representative responsible for notifying the Flight Service Station serving the airport of the proposed start and completion dates of construction or of any circumstances requiring a NOTAM. Planned coordination, control and communications needed for those closures and crossings identified for this project are discussed in detail in Section 9, *Notification of Construction Activities*.
6) Scheduling of work and the need to perform certain items at various stages of the project, including operational safety problems that might arise because of the proposed work.
7) Notice to proceed date.
8) Safety during construction, including the responsibility for marking and lighting of closed and hazardous areas. See AC 150/5370-2 *Operational Safety on Airports during Construction* and AC 150/5340-1, *Standards for Airport Markings*, current editions, for detailed information.
9) Security requirements.
10) The need for continuing vigilance for potential or existing hazards relative to any of the items associated with construction operations on an active or closed airfield surface.

d. Contractor Progress Meetings. Weekly construction meetings shall be held to discuss work progress and to address current or potential security and safety concerns. These meetings may be adjusted to a day-to-day basis as necessary for specific work items. Operational safety and security shall be a standing agenda item for discussion during these weekly/daily construction progress meetings.

e. Scope or Schedule Changes. Major changes in the scope and/or duration of the project may necessitate revisions to the CSPP. The FAA Airports Regional or District office shall be promptly notified of any proposed changes to this CSPP. Changes to this document require review and approval by the airport operator and the FAA prior to implementation. In addition, the Construction Manager shall coordinate proposed changes with any and all appropriate local or federal government agencies (i.e. EPA, OSHA, TSA, state environmental agencies, etc.).

f. FAA ATO Coordination. Early coordination with FAA ATO is required to schedule airway facility shutdowns and restarts. Relocation or adjustments to NAVAIDs, or changes to final grades in critical areas, may require an FAA flight inspection prior to restarting the facility. Flight inspections must be coordinated and scheduled well in advance of the intended facility restart.

It shall remain the Contractor's responsibility to be aware and cognizant of all activities on the airfield. The Contractor shall follow those procedures referenced above should work be required in, around, or near any airfield NAVAIDs.

2. Phasing: Construction phasing for this project has been coordinated with the Authority's Airport Operations and Maintenance personnel. The sequenced construction phases established in this

CSPP have been incorporated into the project design and are reflected in the contract plans and specifications.

This work associated with this project generally consists of earthwork and grading, and asphalt taxiway construction including subgrade preparation, base course placement, asphalt paving and pavement marking. Also included are electrical improvements including the installation of taxiway edge lighting. This work is being conducted to accommodate future expansion of the airport. An exhibit of the overall airport layout indicating the improvement areas is included in Appendix A (see **Exhibit G003**).

Phasing for the project has been established to minimize impacts to the AOA. All phase limits require construction to be outside of all runway safety areas and taxiway object free areas of active airfield pavements while the affected runways or taxiways are open. In addition, the phasing requires that runway approach surfaces be clear of any equipment, stockpiles or other items at all times. Portions of the work requiring taxiway closures must implement the use of low-profile barricades and closure markers to allow adjacent taxiways and runways to remain open while preventing construction vehicles and equipment from inadvertent entry onto active taxiways and runways and aircraft from taxiing onto closed taxiways. Portions of the work requiring runway closures must implement the use of portable runway closure devices and low-profile barricades to prevent aircraft from inadvertently landing or taking off on a closed runway.

a. Phase Elements. The sequence of construction for this project has been phased in order to maintain aircraft operations at an acceptable level of efficiency while providing the maximum amount of flexibility for the Contractor. This resulted in an 2-phase project with a total duration of 105 consecutive calendar days. Durations are based on daytime work hours as specified on the plans unless otherwise noted.

General elements of the project sequencing and phasing are as follows:

Construction access and haul routes – Refer to Appendix A, **Exhibit G003**, for Contractor access to the project site. Applicable control along Contractor haul routes for both safety and security must be maintained at all times. Reference Section 5.b *Vehicle and Pedestrian Operations*, Section 15 *Marking and Signs for Access Routes* and Section 17 *Protection of Runway and Taxiway Safety Areas* of this document for additional information.

Emergency access routes – Emergency access in and around the site will be maintained by the Contractor, as required, for the duration of this project.

Required hazard marking and lighting – Low profile barricades, safety fencing, runway and taxiway closure devices, signs, lighting and/or safety flag details and usage requirements are provided on the exhibits included in Appendix A (see **Exhibit G002**). The Contractor must prominently mark open trenches and excavations within the construction site, with approval from Construction Manager, and light them with red lights during hours of restricted visibility or darkness. In addition, reference Section 15 *Marking and Signs for Access Routes*, Section 16 *Hazard Marking and Lighting* and

Section 17 *Protection of Runway and Taxiway Safety Areas* of this document for additional information.

Lead times for required notifications – The Contractor is required to coordinate lead times with the Construction Manager and Airport Operations. Lead times for required notifications shall be established at the pre-construction meeting.

Phase specific project elements were taken into consideration and are addressed as follows (Refer to Appendix A, **Exhibit G005**):

Phase 0 – Mobilization – The Contractor has 90 consecutive calendar days to complete this phase, which is necessary prior to beginning construction activity. No work activity will be performed in the AOA during this phase.

Phase 1 – Taxilane G2 Construction outside of Taxiway G Object Free Area – The work included in this phase consists of the construction of the Taxilane G2 outside of active runway safety areas and taxiway object free areas. The Contractor shall have 45 consecutive calendar days to complete this work.

Phase 2 – Taxilane G2 Construction Inside of Taxiway G Object Free area – This phase consists of all work required to complete the construction of Taxilane G2 within the limits of Taxiway G OFA including demolition, earthwork and grading, pavement construction, pavement markings, and airfield electrical work. The Contractor shall have 10 consecutive calendar days to complete this work.

NOTAMS, if required, will be issued by Airport Operations to address aircraft maneuvering modifications during all phases of work.

The proposed construction sequencing represents the general requirements to accomplish the work with minimal impact to the operation of the airfield. The construction phasing has been reviewed with airport personnel to ensure all potential operational issues are identified.

b. Construction Safety Drawings. Graphical exhibits specifically indicating operational safety procedures and methods in areas affected by construction activities associated with this project (by phase) have been provided with this CSPP in Appendix A and incorporated into the project plan set (see **Exhibit G002**).

3. Areas and Operations Affected by the Construction Activity: Runways, taxiways and other airfield surfaces shall remain in use by aircraft to the maximum extent possible without compromising safety. The performance of this contract will require the partial and/or full closures (i.e., the pavement is unavailable for any aircraft operation) of one runway. Also refer to Section 2 *Phasing*. Mobilization (Phase 0) is excluded from the following tables because there are no anticipated operational impacts during this phase.

TABLE 1 – OPERATIONS EFFECTS

Phase	Phase 1 (45 consecutive calendar days)	
Scope of Work	Earthwork and grading, subbase preparation, base placement and compaction, asphalt paving, pavement marking, and lighting outside the Taxiway G object free area	
Operational Requirements	Normal (Existing)	Phase 1 (Anticipated)
Runway 18-36	ARC B-I (S)	ARC B-I (S)
Runway 4-22	ARC B-I (S)	ARC B-I (S)
Taxiway G	ADG I	ADG I

Phase	Phase 2 (10 consecutive calendar days)	
Scope of Work	Earthwork and grading, subbase preparation, base placement and compaction, asphalt paving, pavement marking, and lighting inside the Taxiway G object free area	
Operational Requirements	Normal (Existing)	Phase 2 (Anticipated)
Runway 18-36	ARC B-I (S)	ARC B-I (S)
Runway 4-22	ARC B-I (S)	ARC B-I (S)
Taxiway G	ADG I	Closed between TL U and Runway 18-36

a. Identification of affected areas. See 2.b *Construction Safety Drawings* above for graphical identification of areas affected by construction operations. Of particular concern are the following:

i. Closing, or partial closing, of runways, taxiways and aprons:
Full closures of runways and partial closures of taxiways are anticipated for this project.

ii. Closing of rescue access routes:
Access into, through, and/or around the project work areas by emergency vehicles may be impacted during construction and will be coordinated during construction.

iii. Closing of access routes used by airport support vehicles:
Access routes utilized by airport support vehicles may be impacted during construction and will be coordinated during construction.

iv. Interruption of utilities, including water supplies for firefighting:
No utility impacts are anticipated for this project.

v. Approach/departure surfaces affected by heights of objects:
No impacts are anticipated for this project.

vi. Construction areas:
These areas include the project work area, storage/stockpile areas, and Contractor haul routes on active airfield surfaces. These areas are identified graphically on the exhibits included in Appendix A.

b. 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 Construction Manager and Airport Operations. Any required NOTAM's to be issued will be sent through the Construction Manager and issued by Airport Operations.

i. **Temporary changes to runway and/or taxiway operations:**
The affected runway identified in the previous section will require temporary closures during construction. Required NOTAM's shall be issued on the various temporary changes to aircraft access through the affected areas.

ii. **Detours for rescue and other airport vehicles:**
The project work site shall remain open to all emergency vehicles during emergency situations. The Contractor is required to maintain access in and around the project work area for all emergency vehicles. Proper routing of this traffic will be effectively communicated to all supervisory personnel involved in the construction project.

iii. **Maintenance of essential utilities:**
Special attention shall be given to preventing unscheduled interruption of utility services and facilities. Where required due to construction purposes, the FAA shall locate all of their underground 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.

iv. **Temporary changes to air traffic control procedures:**
Changes to air traffic control procedures are not anticipated as part of this project.

4. Protection of Navigation Aids (NAVAIDs): Before commencing construction activity, parking vehicles or storing construction equipment and materials near a NAVAID, coordination with the

appropriate FAA ATO to evaluate the effects of construction activity and the required distances and direction from the NAVAID is required. (See section 9.e.3 *NAVAIDS* below). Construction activities, materials/equipment storage and vehicle parking near electronic NAVAIDs require special consideration since they may interfere with lines of site and signals essential to air navigation. It is not anticipated that any airfield NAVAIDs will be affected by the performance of the work associated with this project.

5. Contractor Access: This CSPP details those areas to which the Contractor must have access, and how Contractor personnel will access those project work areas.

a. Location of stockpiled construction materials. Stockpiled materials and equipment storage are not permitted within the runway safety area, taxiway safety area, obstacle free zone or object free area of an operational runway or taxiway. Stockpiled material shall be constrained in a manner to prevent movement resulting from either aircraft jet blast or wind conditions in excess of ten miles per hour. In addition, stockpiled material shall have silt fence located around the material to prevent FOD from moving onto the airfield pavements or polluting watercourses. Stockpiled material shall not be permitted within the protected areas of the runways, or allowed to penetrate into any of the protected airspace.

Open trenches exceeding 3 inches in depth and 5 inches in width are not permitted within the limits of safety areas of operational runways or taxiways.

In addition, all demolished pavement materials and unclassified excavation materials shall be removed and legally disposed of off airport property and not stockpiled on airport property, unless noted otherwise in the contract documents.

b. Vehicle and pedestrian operations. Vehicle and pedestrian access routes for airport construction projects must be controlled to prevent inadvertent or unauthorized entry of persons, vehicles or animals onto the AOA. The airport operator will coordinate requirements for vehicle operations with the affected airport tenants, contractors and the FAA ATO. Specific vehicle and pedestrian requirements for this project are as follows:

All construction vehicles and personnel shall be restricted to the immediate work areas specified by the contract for this project. These areas include the haul routes into the work area, the designated contractor staging area and the areas under construction. Use of alternate haul routes or staging areas by the Contractor shall not be permitted without prior notification and approval by the Construction Manager.

Access or haul routes used by Contractor vehicles must be clearly marked to prevent inadvertent entry to areas open to airport operations. Construction traffic must remain on the designated haul routes, never straying from the approved paths. Maintenance and upkeep of the haul routes are the responsibility of the Contractor. Dust and other debris must be removed from any haul route pavement by a mechanical sweeper and vacuum truck. Application of water on dirt or gravel haul routes must be provided as often as necessary. Haul roads in any airport traffic areas must be especially monitored for dust and debris to prevent any potential Foreign Object Debris (FOD) situations. The Contractor is responsible for any damage caused by construction traffic on the haul routes, regardless of

whether in an approved or un-approved traffic area. Following construction completion, the Contractor must restore the haul route areas to clean, pre-construction condition. Special attention must be given to ensure that if construction traffic is to share or cross any emergency routes that emergency right of way is not impeded at any time, and that construction traffic on haul roads do not interfere with NAVAIDs or approach surfaces of operational runways. Any other work necessary in compliance with safety and security requirements is considered incidental to the project, and therefore, shall not be directly paid for.

The Contractor will be required to escort all employees and subcontractors to the project site. All trucks will be inspected for FOD prior to utilizing these haul routes to minimize FOD potential on the airfield pavements. The Contractor will be responsible for monitoring the airfield pavements for FOD and cleaning as necessary.

The Contractor must service all construction vehicles within the limits of the project work area. Parked construction vehicles must be outside the object free areas and never in the safety areas of active runways or taxiways. Construction vehicles and equipment shall not be permitted to remain within the construction site when work is not being performed. They must be parked or stored in the contractor staging area when not in use.

Portions of the project area(s) requiring runway and taxiway closures shall be bounded by the low-profile barricades or closure markers identifying Contractor personnel and vehicle area operation limits. The locations of any barricaded project limits, haul routes, contractor staging areas and associated safety and security details are also provided graphically on the exhibits included in Appendix A.

At no time will vehicles or personnel enter portions of the secure AOA outside the contract area unless permitted and accompanied by an airport approved escort.

All construction-related activity taking place within any airport defined movement area requires the presence of an authorized airport escort having radio communication with incoming aircraft unless prior approval is obtained from the Construction Manager or Airport Operations. Spotters and/or flaggers having radio or telephone contact with the airport may be used with the approval of the Construction Manager or Airport Operations. Any command or instruction given by the flaggers or spotters shall be immediately obeyed by the equipment operator.

All vehicles operating on the airport must be marked with flashing yellow/amber beacons and orange and white flags during daylight hours. In addition the vehicles and equipment will have identifying symbols at a minimum of 8-inch block-type characters of contrasting color that are easily legible. During hours of darkness or low visibility they shall be marked with at least flashing yellow/amber beacons.

Beacons and flags must be maintained to standards and in good working and operational condition. Beacons must be located on the uppermost part of the vehicle structure, visible from any direction, and flash 75 +/- 15 flashes per minute. Flags shall be 3’ by 3’ with alternating 1’ by 1’ international orange and white squares and shall be replaced by the

Contractor if they become faded, discolored or ragged as determined by Airport Operations or the Construction Manager.

At no time shall active taxiways or taxilanes be crossed by construction equipment without notification and proper approval/clearance from the Construction Manager or Airport Operations.

Aircraft traffic will continue to use the existing runways, aprons and taxiways of the airport during the time that work under a contract is being performed. The Contractor shall, at all times, conduct the work as to create no hindrance, hazard or obstacle to aircraft using the airport.

Airport operators and contractors must also maintain a high level of security during construction when access points are created in the security fencing to permit construction vehicle access. Gates used for temporary access shall be manned by construction personnel to prevent unauthorized access by vehicles, animals or people. Procedures conforming to airport security protocols should be in place to ensure that only authorized persons and vehicles have access to the AOA and to prohibit "piggybacking" behind another person or vehicle. Access shall be made available at all times to all airport emergency vehicles traveling to operations areas within the proximity of the construction work zone.

6. **Wildlife Management:** Construction contractors must carefully control and continuously remove waste or loose materials that might attract wildlife. Contractor personnel must be aware of and avoid construction activities that can create wildlife hazards on airports.

   a. **Trash.** Food scraps from construction personnel activity must be collected.

   b. **Standing water.** Water shall not be allowed to collect and pool for more than any single 24-hour period.

   c. **Tall grass and seeds.** The use of millet seed in turfing and seeding operations shall not be permitted.

   d. **Poorly maintained fencing and gates.** It is essential that a secure AOA be maintained. Access gates and fencing adjacent to work areas shall be continuously maintained by the Contractor and any damage shall be repaired immediately. Temporary fence shall meet FAA requirements and be maintained during construction.

   e. **Disruption of existing wildlife habitat.** Not applicable to this project.

7. **Foreign Object Debris (FOD) Management:** Special care and measures shall be taken to prevent FOD and associated damage when working in an airport environment. The Contractor shall be held responsible for implementing an approved FOD Management Plan as a part of the SPCD. The FOD Management Plan will have procedures for prevention, regular cleanup and containment of construction material and debris. The Contractor will ensure all vehicles related to the construction project using paved surfaces in the AOA shall be free of any debris that could create a FOD hazard. Special attention will be given to the cleaning of cracks and pavement

joints. All taxiways, aprons and runways must remain clean. Waste containers with attached lids shall be required on construction sites.

Special attention should be given to securing lightweight construction material (concrete insulating blankets, tarps, insulation, etc.). Specific securing procedures and/or chain-link enclosures may be required.

Contractors will provide their own equipment for vehicle and equipment washing and clean up.

Immediate access to a power sweeper and vacuum truck is required when construction occurs on any pavement area inside the AOA, unless an appropriate alternative has been approved by the Construction Manager.

Special attention shall be paid to FOD control in airport traffic areas to prevent damage to aircraft and other airport vehicles and facilities.

8. **Hazardous Materials (HAZMAT) Management:** Contractors operating construction vehicles and equipment on the airport must be prepared to expeditiously contain and clean-up spills resulting from fuel, hydraulic fluid, or other chemical fluid leaks. Transport and handling of other hazardous materials on an airport also requires special procedures. To that end, the Contractor is required to develop and implement spill prevention and response procedures for vehicle operations. The Contractor shall incorporate these procedures into the SPCD. This includes maintenance of appropriate MSDS data and appropriate prevention and response equipment on-site.

9. **Notification of Construction Activities:** The following is information and procedures for immediate notification of airport users and the FAA of any conditions adversely affecting the operational safety of the airport. Points of contact for the various parties involved with the project shall be identified and shared at the pre-construction meeting among the various parties, reference Section 1.c Pre-construction Conference.

   a. **Points of contact/list of responsible representatives:**

      Emergency:
      Dial 911 – Refer to site as “Peter O. Knight Airport”

      Information, Compliance, and Assistance:
      Airport Communications Center: (813) 870-8770 (24 hrs/day, 7 days/wk)

   b. **Notices to Airmen (NOTAM).** Only the airport operator may initiate or cancel NOTAMs on airport conditions and is the only entity that can close or open a runway or taxiway. The airport operator must coordinate the issuance, maintenance and cancellation of NOTAMs about airport conditions resulting from construction activities with tenants and the local air traffic facility (control tower, approach control or air traffic control center) and must provide information on closed or hazardous conditions on airport movement areas to the FAA Flight Service Station (FSS) so it can issue a NOTAM. The airport operator must file and maintain a list of authorized representatives with the FSS. Only the FAA may issue or cancel NOTAMs

on shutdown or irregular operation of FAA owned facilities. Any person having reason to believe that a NOTAM is missing, incomplete or inaccurate must notify the airport operator.

Any NOTAMs for planned airfield operations modifications for this project must be coordinated through Airport Operations via the Construction Manager. Reference Section 2 *Phasing* for planned closures for this project that require issuance of a NOTAM.

c. Emergency notification procedures. In the event of an emergency, the Contractor shall be required to immediately notify emergency services at the appropriate phone number provided in Section 9.a above. Specific emergency notification procedures shall be incorporated into the Contractor's SPCD.

In the event of an aircraft emergency, severe weather conditions or any issue as determined by the Construction Manager or Airport Operations that may affect aircraft operations, the Contractor's personnel and/or equipment may be required to immediately vacate the area(s) affected.

d. Coordination with Rescue Personnel. The Contractor shall coordinate, through the Construction Manager, with mutual aid providers and other emergency services if construction requires the following:

- The deactivation and subsequent reactivation of water lines or fire hydrants.
- The re-routing, blocking and restoration of emergency access routes.
- The use of hazardous materials on the airfield.

Procedures and methods for addressing any planned or emergency response actions on the airfield concerning this project shall be established and implemented prior to the start of construction.

e. Notification to the FAA.

i. **Part 77.** Any person proposing construction or alteration of objects that affect navigable airspace, as defined in Part 77, must notify the FAA. This includes construction equipment and proposed parking areas for this equipment (i.e. cranes, graders, haul trucks, etc.) on airports. FAA Form 7460-1, Notice of Proposed Construction or Alteration, can be used for this purpose and submitted to the appropriated FAA Airports Regional or District Office.

ii. **Part 157.** With some exceptions, Title 14CFR Part 157, Notice of Construction, Alteration, Activation and Deactivation of Airports, requires that the airport operator notify the FAA in writing whenever a non-Federally funded project involves the construction of a new airport; the construction, realigning, altering, activating, or abandoning of a runway, landing strip, or associated taxiway; or the deactivation or abandoning of an entire airport. Notification involves submitting FAA Form 7480-1, Notice of Landing Area Proposal, to the nearest FAA Airports Regional or District Office. It is not anticipated that Part 157 notifications will be required for this project.

iii. **NAVAIDS.** For emergency (short-notice) notification about impacts to both airport owned and FAA owned NAVAIDs, contact the Airport Communications Center at the phone number provided in Section 9.a above:

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. Shutdown of NAVAIDS facilities is not anticipated to be required for this project.

2) **FAA owned.** The airport operator must notify the appropriate FAA ATO Service Area Planning and Requirements (P&R) Group a minimum of 45 days prior to implementing an event that causes impacts to NAVAIDs. (Impacts to FAA equipment covered by a Reimbursable Agreement (RA) do not have to be reported by the airport operator). Coordinate work for an FAA owned NAVAID shutdown with the local FAA ATO/Technical Operations office, including any necessary reimbursable agreements and flight checks. Detail procedures that address unanticipated utility outages and cable cuts that could impact FAA NAVAIDs. In addition, provide seven days' notice to schedule the actual shutdown. Shutdown of NAVAIDS facilities is not anticipated to be required for this project.

10. Inspection Requirements:

a. Daily (or more frequent) inspections. Inspections shall be conducted by the Contractor at least daily, but more frequently if necessary, to ensure conformance with the CSPP. A sample checklist is provided in Appendix B of this document. In addition to Contractor's required inspections, the Construction Manager or Airport Operations will inspect the construction site once a day to ensure compliance with the CSPP and the SPCD. The Construction Manager will have inspectors monitoring activity throughout construction.

b. Final inspections. A final inspection with the Construction Manager, Airport Operations and Contractor will take place prior to allowing aircraft operations commence.

11. Underground Utilities: Special attention shall be given to preventing unscheduled interruption of utility services and facilities. Where required due to construction purposes, the FAA shall locate all of their underground cables. The Contractor shall locate and/or arrange for the location of all the underground cables. When an underground cable is damaged due to the Contractor's negligence, the Contractor shall immediately repair the cable affected 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 will be marked prior to beginning excavation.

12. Special Conditions: In the event of an aircraft emergency or unsafe airfield conditions (e.g., low-visibility operations, aircraft in distress, aircraft accident, security breach, etc.), the Contractor's personnel and/or equipment may be required to immediately vacate the area. The Contractor

will receive notification from the Construction Manager or Airport Operations when special conditions require the construction site to be vacated. In any event, extreme care should be exercised should construction personnel identify any emergency vehicle moving toward the runway with emergency lights displayed. This will generally mean that an emergency situation is imminent.

13. Runway and Taxiway Visual Aids: Visual aids include marking, lighting, signs and other visual NAVAIDs. Those areas where aircraft will be operating shall be clearly and visibly separated from construction areas, including closed runways. Throughout the duration of the construction project, the Contractor shall inspect and verify that these areas remain clearly marked and visible at all times and that marking, lighting, signs and visual NAVAIDs remain in place and operational.

a. General. Airport markings, lighting, signs, and other visual NAVAIDs must be clearly visible to pilots, not misleading, confusing or deceptive. All must be secured in place to prevent movement by prop wash, jet blast, wing vortices, or other wind currents and constructed of materials that would minimize damage to an aircraft in the event of inadvertent contact.

b. Markings. No airfield pavement marking modifications are anticipated as part of this project.

c. Lighting and visual NAVAIDs. No lighting facilities or visual NAVAIDS will be impacted by this work. The Contractor shall ensure that all lighting facilities not impacted by work remain operational during construction.

14. Marking and Signs for Access Routes: The location of the access point leading to the project site shall be as specified in the project plan set and as provided graphically on the exhibits included in Appendix A (see **Exhibit G003**). It shall be the Contractor's responsibility to coordinate off-site haul routes with the appropriate owner who has jurisdiction over the affected route. The haul routes, to the extent possible, shall be marked and signed in accordance with FAA airfield signage requirements, the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD) and/or state highway specifications.

15. Hazard Marking and Lighting:

a. Purpose. Hazard marking and lighting prevents pilots from entering areas closed to aircraft and prevents construction personnel from entering areas open to aircraft. To that end, comprehensible warning indicators for any area affected by construction that is normally accessible to aircraft, personnel or vehicles shall be installed and maintained by the Contractor for the duration of construction operations.

b. Equipment. Low-profile barricades of the type detailed in the project drawings with omnidirectional flashing lights shall be placed outside the aircraft movement areas at the edge of the object free areas and the project work limits. The Contractor shall have a person on call 24 hours a day for emergency maintenance of airport hazard lighting, barricades and closure devices. The Contractor must file the contact person's information with the airport

operator. Lighting should be checked for proper operation at least once per day, preferably at dusk.

16. Protection of Runway and Taxiway Safety and Object Free Areas: Safety area encroachments, improper ground vehicle operations and unmarked or uncovered holes and trenches in the vicinity of aircraft operation surfaces and construction areas are the three most recurring threats to safety during construction. Protection of runway and taxiway safety areas, object free areas, obstacle free zones and approach/departure surfaces shall be a standing requirement for the duration of construction operations. Reference Section 9 *Notification of construction activities* and Section 14 *Runway and taxiway visual aids* for taxiway closure requirements. Reference Section 16 *Hazard marking and lighting* for hazard marking. Reference Section 18 *Other limitations on construction* for height restrictions (as required).

a. Runway Safety Area (RSA). A RSA is the defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot or excursion from the runway by aircraft.

All Runways	*RSA Distance from Centerline (ft)*	*RSA Width (ft)*	*RSA Length from End of Runway (ft)*
B-1 (Small)	60	120	240

No construction may occur within the existing RSA while the runway is open. Any construction within the RSA must be approved with Airport Operations prior to starting work.
The airport operator must coordinate any adjustment of RSA dimensions, to meet the above requirement, with the appropriate FAA Airports Regional or District Office and the local FAA air traffic manager and issue a NOTAM.

Open trenches or excavations are not permitted within the RSA while the runway is open. The Contractor must backfill trenches before the runway is opened. Coverings are not allowed in runway safety areas.

Construction associated with this project will occur within the existing RSA. The Contractor shall be aware of and follow the above indicated provisions when working within the RSA.

b. Runway Object Free Area (ROFA). Construction, including excavations, may be permitted in the ROFA; however, equipment must be removed from the ROFA when not in use and material should not be stockpiled in the ROFA if not necessary. Stockpiling material in the ROFA requires submittal of a 7460-1 form with justification provided to the appropriate FAA Airports Regional or District Office for approval.

Runways	*ROFA Distance from Centerline (ft)*	*ROFA Width (ft)*	*ROFA Length from End of Runway (ft)*
B-1 (Small)	125	250	240

Construction associated with this project will within the existing ROFA. The Contractor shall be aware of and follow the above indicated provisions when working within the ROFA.

c. **Taxiway Safety Area (TSA).** The TSA is a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway. No construction may occur within the TSA while the taxiway is open for aircraft operations.

Taxiways	*TSA Distance from Centerline (ft)*	*TSA Width (ft)*
ADG I	24.5	49

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.

After the taxiway has been closed, contractors must prominently mark open trenches and excavations at the construction site with red or orange flags, as approved by the airport operator and light them with red lights during hours of restricted visibility or darkness.

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 be capable, under dry conditions, of supporting airport maintenance equipment, aircraft rescue and firefighting equipment and the occasional passage of aircraft without causing structural damage to the aircraft.

Construction associated with this project is expected to occur within the TSA. The Contractor shall be aware of and follow the above indicated provisions when working within the TSA.

Taxiway and Taxilane Object Free Area (TOFA). Unlike the Runway Object Free Area, aircraft wings regularly penetrate the taxiway/taxilane object free area during normal operations. Thus the restrictions are more stringent. No construction equipment may be parked within the TOFA while the taxiway/taxilane is open for aircraft operations.

Taxiways	*TOFA Distance from Centerline (ft)*	*TOFA Width (ft)*
ADG I	44.5	89

Construction associated with this project is expected to occur within the TOFA. The Contractor shall be aware of and follow the above indicated provisions when working within the TOFA.

d. Obstacle Free Zone (OFZ). Construction personnel, material, and/or equipment may not penetrate the OFZ while the runway is open for aircraft operations. The OFZ is a defined volume of airspace centered about and above the runway centerline.

Due to the location and anticipated height of construction associated with this project, no impacts to the runway obstacle free zone are anticipated as part of this project.

e. Runway approach/departure surfaces. All personnel, materials, and/or equipment must remain clear of the applicable threshold siting surfaces. Objects that do not penetrate these surfaces may still be obstructions to air navigation and may affect standard instrument approach procedures. Coordinate with the FAA through the appropriate FAA Airports Regional or District Office.

Construction activity in a runway approach/departure area may result in the need to partially close a runway or displace the existing runway threshold. Partial runway closure, displacement of the runway threshold, as well as closure of the complete runway and other portions of the movement area also require coordination through the airport operator with the appropriate FAA air traffic manager (FSS if non-towered) and ATO/Technical Operations (for affected NAVAIDS) and airport users.

Due to the location of construction associated with this project, no impacts to the runway approach/departure surfaces are anticipated as part of this project.

17. Other limitations on construction:

a. Prohibitions. The following prohibitions are in effect for the duration of this project:

i. No use of tall equipment (cranes, concrete pumps, etc.) unless a 7460-1 determination letter is issued for such equipment.

ii. No use of open-flame welding or torches unless fire safety precautions are provided and the airport operator has approved their use.

iii. No use of electrical blasting caps or explosives of any kind on or within 1,000 ft (300 m) of the airport property.

iv. No use of flare pots within the AOA.

b. Restrictions.

i. Construction suspension required during specific airport operations – Refer to Section 2 *Phasing*.

ii. Areas that cannot be worked within simultaneously – Refer to Section 2 *Phasing* for restrictions on concurrent work activities.

iii. Day or night construction restrictions – Working hours shall be as shown on the plans. Refer to Section 2 *Phasing*.

APPENDIX A

Project Safety, Security and Phasing Exhibits

SECURITY NOTES

1. IT IS INTENDED THAT THE CONTRACTOR SHALL COMPLY WITH ALL SECURITY REQUIREMENTS SPECIFIED HEREIN AND IN THE CONTRACT DOCUMENTS. THE PROJECT SUPERINTENDENT/SUPERVISOR SHALL BE REQUIRED TO FAMILIARIZE THEMSELVES WITH REQUIREMENTS OF OPERATING WITHIN AND AROUND THE AIRPORT AND APPLICABLE RULES AND REGULATIONS. THE SUPERINTENDENT/SUPERVISOR SHALL BE RESPONSIBLE FOR BRIEFING ALL CONTRACTOR PERSONNEL ON THESE REQUIREMENTS AND, FROM TIME TO TIME, OTHER SECURITY PROVISIONS ADOPTED BY HCAA. 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 CONSTRUCTION MANAGER. NO OTHER ACCESS POINTS SHALL BE ALLOWED UNLESS APPROVED BY HCAA AND DIRECTED BY THE CONSTRUCTION MANAGER. 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.

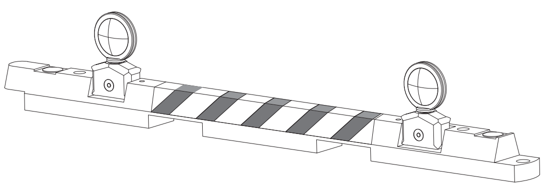
3. ALL CONTRACTOR'S MATERIAL ORDERS FOR DELIVERY TO THE SITE MUST BE ESCORTED BY THE CONTRACTOR. THIS WILL PRECLUDE DELIVERY TRUCKS FROM ENTERING INTO THE AIRPORT OR TAKING SHORT-CUTS THROUGH THE PERIMETER GATES AND ENTERING INTO AIRCRAFT OPERATIONS AREAS INADVERTENTLY.

4. THE CONTRACTOR ACCESS GATE DESIGNATED FOR USE MAY BE UTILIZED BY OTHER CONTRACTORS, HCAA STAFF, OR TENANTS 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.

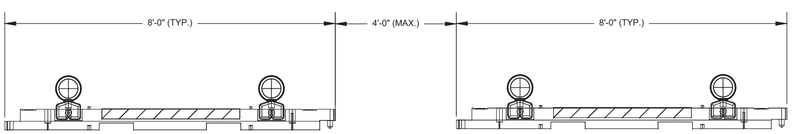
5. IDENTIFICATION OF PERSONNEL: AT THE CONSTRUCTION MANAGER'S DISCRETION, ALL EMPLOYEES OF THE CONTRACTOR OR SUBCONTRACTORS, REQUIRING ACCESS TO THE CONSTRUCTION SITE, ARE REQUIRED TO BE SUPPLIED WITH IDENTIFICATION BADGES TO BE WORN AT ALL TIMES WHILE WITHIN THE AREAS. BADGES SHALL BE SUPPLIED BY THE CONTRACTOR AND SHALL STATE "CONTRACTOR - TAXILANE G-2". BADGES CAN BE PLASTIC WALLET SIZE OR METAL PIN WITH A MINIMUM 2 1/2" DIAMETER AND MUST BE WORN ON OUTER GARMENTS SO AS TO BE CLEARLY VISIBLE. BADGING IS TO BE UNIFORM IN APPEARANCE AND SUFFICIENTLY DISTINCTIVE IN DESIGN OR COLOR TO CLEARLY IDENTIFY AN EMPLOYEE AS BEING ASSIGNED/ASSOCIATED WITH THIS CONTRACT. THE BADGE NUMBER SHALL BE PROMINENT FOR EASY IDENTIFICATION. BADGES ARE TO BE IDENTIFIED NUMERICALLY AND ISSUED INDIVIDUALLY TO WHOM IT IS ASSIGNED. BLOCKS OF NUMBERS CAN BE ASSIGNED TO SUBCONTRACTORS. SUPPLY, ISSUANCE AND CONTROL OF IDENTIFICATION BADGES SHALL BE THAT OF THE CONTRACTOR THROUGH THE SUPERINTENDENT. IN LIEU OF ISSUING BADGES, THE SUPERINTENDENT CAN REQUIRE THAT EACH EMPLOYEE WEAR AN OUTER GARMENT WITH THE COMPANY NAME, PROMINENTLY PLACED, SO THAT ALL PERSONNEL CAN BE IDENTIFIED AS BEING A MEMBER OF THIS GROUP.

6. IDENTIFICATION OF VEHICLES: THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN A LIST OF CONTRACTOR AND SUB-CONTRACTOR VEHICLES AUTHORIZED TO OPERATE ON THE SITE. VEHICLES SHALL DISPLAY A LARGE COMPANY SIGN ON BOTH SIDES OF THE VEHICLE. THE CONTRACTOR SHALL ISSUE TO THE CONSTRUCTION MANAGER, 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.

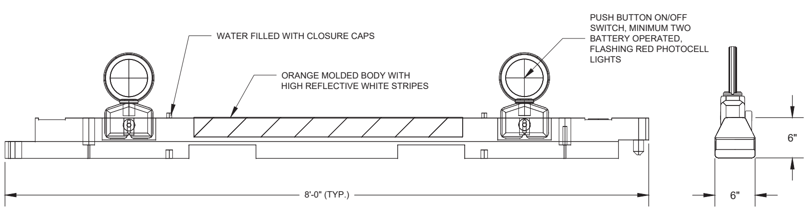
7. ALL ACCESS GATES SHALL BE NORMALLY CLOSED DURING CONSTRUCTION AND MANNED AT ALL TIMES WHILE GATE IS OPEN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO KEEP THE AIRPORT SECURED AT ALL TIMES DURING CONSTRUCTION.



LOW-PROFILE BARRICADE
ISOMETRIC VIEW



BARRICADE SPACING



FRONT VIEW

SIDE VIEW

1 G002 **LOW-PROFILE BARRICADE DETAIL**

NOT TO SCALE

SAFETY NOTES

1. THE CONTRACTOR SHALL ACQUAINT ITS SUPERVISORS AND EMPLOYEES OF THE AIRPORT ACTIVITY AND OPERATIONS THAT ARE INHERENT TO THIS ACTIVE AIRPORT AND SHALL CONDUCT ITS CONSTRUCTION ACTIVITIES TO CONFORM TO ALL ROUTINE REQUIREMENTS AND EMERGENCY AIR TRAFFIC REQUIREMENTS AND GUIDELINES ON SAFETY SPECIFIED IN THE CONTRACT DOCUMENTS.

2. ALL CONTRACTOR VEHICLES THAT ARE AUTHORIZED TO OPERATE ON THE AIRPORT OUTSIDE OF THE DESIGNATED CONSTRUCTION AREA LIMITS OR HAUL ROUTES AS SPECIFIED ON THE PLANS AND OR IN AREAS ADJACENT TO ACTIVE AIRCRAFT OPERATIONS AREA (AOA) SHALL DISPLAY IN FULL VIEW ABOVE THE VEHICLE A 3' X 3' OR LARGER ORANGE AND WHITE CHECKERBOARD FLAG, EACH CHECKERBOARD COLOR BEING 1' SQUARE AND A FLASHING AMBER (YELLOW) DOME-TYPE LIGHT, MOUNTED ON TOP OF THE VEHICLE AND OF SUCH INTENSITY TO CONFORM TO LOCAL CODES FOR MAINTENANCE AND EMERGENCY VEHICLES.

3. ANY VEHICLE OPERATING IN THE ACTIVE AOA DURING THE HOURS OF DARKNESS MUST BE EQUIPPED WITH A FLASHING AMBER (YELLOW) DOME-TYPE LIGHT AS PREVIOUSLY DESCRIBED.

4. NO RUNWAY, TAXIWAY, APRON OR AIRPORT ROADWAY SHALL BE CLOSED WITHOUT WRITTEN APPROVAL OF THE HILLSBOROUGH COUNTY AVIATION AUTHORITY (HCAA), TO ENABLE NECESSARY ADVISORIES TO AIRPORT SERVICE OR TENANTS. A MINIMUM OF 72 HOURS WRITTEN NOTICE OF REQUESTED CLOSING SHALL BE DIRECTED TO HCAA THROUGH THE CONSTRUCTION MANAGER.

5. ANY CONSTRUCTION ACTIVITY WITHIN 120 FEET OF AN ACTIVE RUNWAY CENTERLINE, 44.5 FEET FROM AN ACTIVE TAXIWAY EDGE OR OPEN EXCAVATION AREAS IN EXCESS OF 3 INCHES DEEP WITHIN THE ABOVE AREAS, WILL REQUIRE CLOSURE OF THE AFFECTED RUNWAY OR TAXIWAY, UNLESS OTHERWISE APPROVED BY THE AIRPORT. CLOSURE REQUIRES THE SAME PROVISIONS AS PARAGRAPH NO. 4 ABOVE.

6. OPEN FLAMES, WELDING OR TORCH-CUTTING OPERATIONS ARE PROHIBITED UNLESS ADEQUATE FIRE AND SAFETY PRECAUTIONS HAVE BEEN TAKEN, THE PROCEDURE IS APPROVED BY THE CONSTRUCTION MANAGER, AND A CUTTING AND WELDING PERMIT HAS BEEN ISSUED BY HCAA.

7. DEBRIS, WASTE AND LOOSE MATERIAL CAPABLE OF CAUSING DAMAGE TO AIRCRAFT LANDING GEARS, PROPELLERS OR BEING INGESTED INTO AIRCRAFT ENGINES SHALL NOT BE ALLOWED TO BE ON ACTIVE AIRCRAFT MOVEMENT AREA PAVEMENT OR ALONG HAUL ROUTES. THE CONTRACTOR SHALL REMOVE IT IMMEDIATELY AND CONTINUOUSLY DURING CONSTRUCTION BY MECHANICAL VACUUM SWEEPER OR OTHER APPROVED METHODS.

8. THE PROJECT SUPERINTENDENT/SUPERVISOR WILL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS. PRIOR TO THE COMMENCEMENT OF WORK, THE PROJECT SUPERINTENDENT/SUPERVISOR SHALL PROVIDE THE CONSTRUCTION MANAGER WITH AN OUTLINE OF A PROPOSED ACCIDENT AND FIRE PROTECTION PLAN FOR ALL WORK CONTEMPLATED UNDER THE CONTRACT AND CONDUCT AT LEAST ONE SAFETY MEETING EACH MONTH FOR EACH SHIFT AND REQUIRE THE ATTENDANCE OF ALL SUPERVISORS AT SUCH MEETINGS. COPIES OF THE MINUTES OF SAFETY MEETINGS SHALL BE KEPT ON FILE IN THE CONTRACTOR'S FIELD OFFICE AND BE MADE AVAILABLE UPON DEMAND BY THE CONSTRUCTION MANAGER.

9. THE EMERGENCY NUMBER TO CALL FOR ANY INCIDENT ON THE PROJECT OR AIRPORT SHALL BE 911, AND THE SITE IS PETER O. KNIGHT AIRPORT, UNLESS OTHERWISE NOTIFIED BY HCAA.

10. CONSTRUCTION DURING THE PROJECT MAY BE HALTED AT ANY TIME BY THE CONSTRUCTION MANAGER IF IT IS DETERMINED TO BE IN THE BEST INTEREST OF HCAA OR AIRPORT OPERATIONAL SAFETY, AND THE CONTRACTOR MAY BE DIRECTED TO REMOVE EQUIPMENT AND/OR EVACUATE THE SITE. NECESSARY EXTENSIONS IN CONTRACT TIME MAY BE GRANTED OR A STOP WORK ORDER WILL BE ISSUED DUE TO THESE DELAYS, HOWEVER, THERE WILL BE NO ADJUSTMENTS IN CONTRACT PRICE DUE TO THESE DELAYS.

11. THE CONTRACTOR IS FULLY RESPONSIBLE FOR AIRCRAFT AND AIRPORT OPERATIONAL SAFETY ASSOCIATED WITH CONSTRUCTION ACTIVITIES RELATIVE TO THE CONSTRUCTION PROJECT AT ALL TIMES.

12. THE PLANS AND SAFETY NOTES ARE NOT IN ANY WAY INTENDED TO IMPLY OR PROVIDE ANY DIRECTION REGARDING THE CONTRACTOR'S OWN CONSTRUCTION WORKFORCE SAFETY. THE CONTRACTOR'S SAFETY REQUIREMENTS/ACCOMMODATIONS ASSOCIATED WITH THE PROJECT CONSTRUCTION WORKFORCE IS SOLELY AND ENTIRELY THE RESPONSIBILITY OF THE CONTRACTOR.

BARRICADE NOTES

1. BARRICADES SHALL BE INSTALLED AT THE LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE CONSTRUCTION MANAGER AND AS REQUIRED BY THE CONTRACTOR TO PROTECT THE WORK AREA. THE PHASE DURING WHICH EACH BARRICADE IS TO REMAIN IN PLACE IS INDICATED BY THE PHASING DRAWINGS. BARRICADES SHALL BE INSTALLED AT THE BEGINNING OF EACH PHASE AND SHALL REMAIN IN PLACE THROUGHOUT THE PHASE. IF THE CONTRACTOR MUST TEMPORARILY REMOVE ANY OF THE BARRICADES (TO ALLOW CONSTRUCTION TRAFFIC TO TRAVEL INTO OR OUT OF THE CONSTRUCTION AREA, OR TO COMPLETE CONSTRUCTION AT THE PHASE BOUNDARY), THE CONTRACTOR SHALL PROVIDE A FLAGMAN TO PREVENT AIRCRAFT OR VEHICLE TRAFFIC FROM INADVERTENTLY TRAVELING INTO THE CONSTRUCTION AREA UNTIL THE BARRICADE IS REPLACED AT ITS ORIGINAL POSITION.

2. ALL BARRICADES SHALL EXTEND BEYOND THE EDGES OF PAVEMENT AND SHOULDER PAVEMENT BY 8'-0" OR AS DIRECTED BY THE CONSTRUCTION MANAGER.

3. ALL FLASHING RED LOW PROFILE BARRIER LIGHTS MUST REMAIN OPERABLE DURING PERIODS OF LOW VISIBILITY AND DARKNESS.

4. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MAINTENANCE OF BARRICADES INCLUDING LIGHTS DURING CONSTRUCTION. ALL LIGHTS SHALL BE KEPT IN OPERABLE CONDITION. SAND BAGS SHALL BE REPLACED WHEN EXHIBITING SIGNS OF DISINTEGRATION AND ANY LOOSE SAND FROM THE BAGS SHALL BE REMOVED FROM THE PAVEMENT SURFACE.

5. ALL LIGHT FIXTURES SHALL BE VERIFIED AS OPERATIONAL BY THE CONTRACTOR DAILY.

6. DETAIL OF LOW PROFILE BARRICADE SHOWN AS AN EXAMPLE. OTHER DETAILS OF LOW PROFILE BARRICADES (e.g. HALVED 6" SCH. 40 PVC PIPE) MAY BE APPROVED BY THE ENGINEER AND CONSTRUCTION MANAGER.

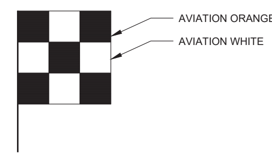
7. THE CONTRACTOR SHALL FURNISH, MAINTAIN, AND REMOVE THE BARRICADES AS DIRECTED BY THE CONSTRUCTION MANAGER. THE COST ASSOCIATED WITH THIS WORK SHALL BE INCLUDED IN THE C-106-1 MAINTENANCE OF TRAFFIC AND TEMPORARY CONSTRUCTION ITEMS PAY ITEM.

UNLIT TAXIWAY CLOSURE MARKER NOTES:

1. CONTRACTOR SHALL SUBMIT, TO THE ENGINEER, MATERIALS AND METHODS THAT WILL BE USED CONSTRUCT EACH UNLIT TAXIWAY CLOSURE MARKER. UNLIT TAXIWAY CLOSURE MARKERS MUST CONFORM TO AC 150/5370-2, LATEST EDITION AND AC 150/5340-1, LATEST EDITION.

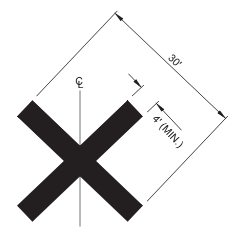
2. UNLIT TAXIWAY CLOSURE MARKER SHALL BE YELLOW SUPPLEMENTED WITH REFLECTIVE YELLOW PAINT OR TAPE AND PROPERLY WEIGHTED TO THE PAVEMENT WITH YELLOW PAINTED SANDBAGS TO PREVENT DISLOCATION FROM WIND.

3. PAYMENT FOR UNLIT TAXIWAY CLOSURE MARKER PLACEMENT SHALL BE INCLUSIVE OF THE C-106-1 MAINTENANCE OF TRAFFIC AND TEMPORARY CONSTRUCTION ITEMS PAY ITEMS.



2 G002 **CONSTRUCTION SAFETY FLAG**

SEE SAFETY NOTE 2 ON THIS SHEET FOR CONSTRUCTION SAFETY FLAG MOUNTING LOCATION REQUIREMENTS



3 G002 **TAXIWAY CLOSURE MARKER (PATTERN C)**

100% DESIGN SUBMITTAL

DATE	REVISIONS
	BY

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H, Inc.
1715 N. Westshore Blvd., Suite 600
Tampa, Florida 33607-3999
813-289-5550
www.rsandh.com
FL.Cert.Nos. AAC001886
EB0005620 LCC000210

Tampa International Airport

PROJECT NAME
TAXILANE G2

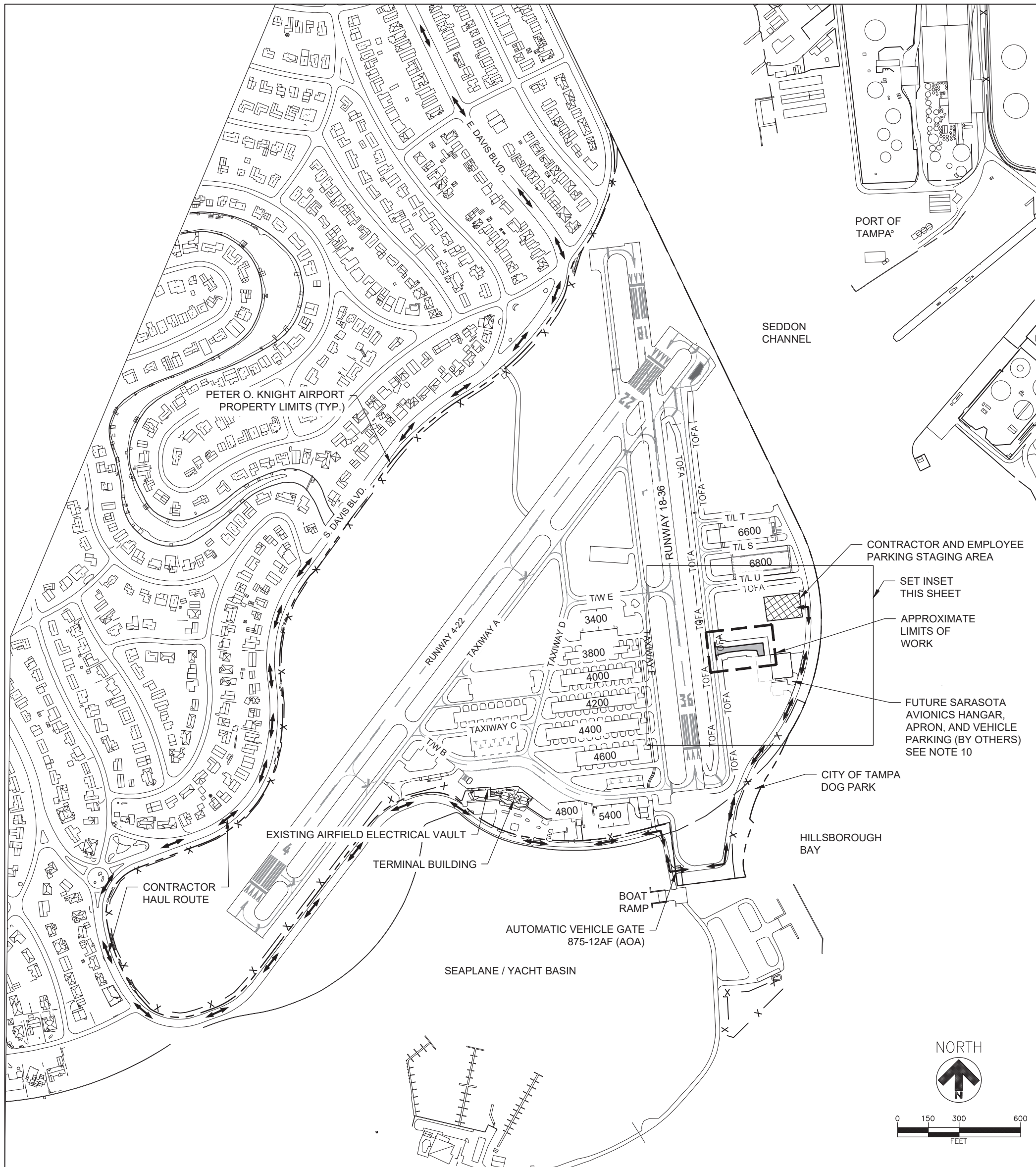
SHEET TITLE
SAFETY AND SECURITY NOTES AND DETAILS

DESIGNED: DAG
DRAWN: SCB
CHECKED: SCS

HCAA NO.: 6640 19
JOB NO.: 204-0001-056

DATE: DECEMBER 4, 2020

G002
SHEET NO.:



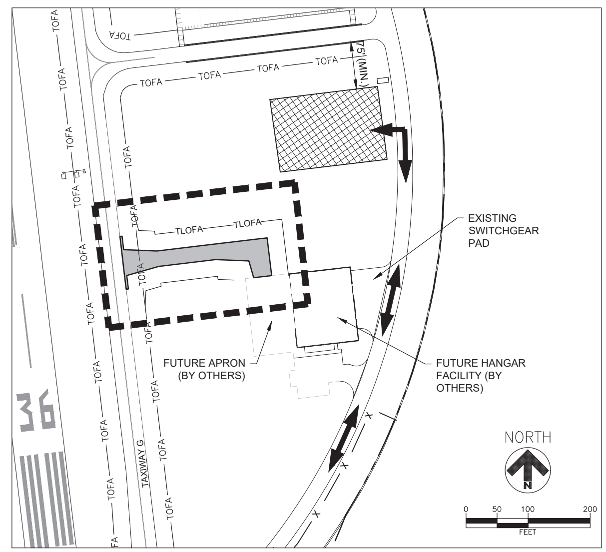
1
G003
OVERALL CONTRACT LAYOUT PLAN

LEGEND

- AIRPORT PROPERTY LIMITS
- CONTRACTOR'S HAUL ROUTE
- CONTRACTOR AND EMPLOYEE PARKING STAGING AREA
- APPROXIMATE LIMITS OF WORK
- x — EXISTING FENCE LINE
- TOFA — TAXIWAY OBJECT FREE AREA

CONTRACT LAYOUT PLAN NOTES

1. FOR GENERAL NOTES AND CONTRACTOR'S STAGING AREA NOTES, SEE SHEET G004.
2. FOR PHASING INFORMATION, SEE SHEET G005.
3. FOR THE WORK DETAILS ASSOCIATED WITH EACH WORK AREA, REFER TO THE "C" AND "E" SERIES SHEETS.
4. ACCESS TO THE SITE SHALL BE AS SHOWN ON THIS SHEET. THE CONTRACTOR SHALL NOT UTILIZE ALTERNATIVE ROUTES UNLESS PREVIOUSLY APPROVED BY THE CONSTRUCTION MANAGER.
5. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE OFF-SITE HAUL ROUTES (STATE HIGHWAYS, COUNTY ROADS OR CITY STREETS AS REQUIRED) WITH THE APPROPRIATE OWNER, GOVERNING THE JURISDICTION OVER THE AFFECTED ROUTE.
6. THE CONTRACTOR SHALL KEEP BOTH ON AND OFF SITE HAUL ROUTES CLEAN AND FREE OF DEBRIS AND DUST AT ALL TIMES. THE CONTRACTOR SHALL BE REQUIRED TO CLEAN HAUL ROUTES AS REQUIRED. VACUUM TRUCK/SWEEPER COMBO AND OPERATORS WILL REMAIN AT THE SITE UNTIL THE AREA IS ACCEPTED BY THE CONSTRUCTION MANAGER AND AIRPORT OPERATIONS FOR THE START OF AIRCRAFT OPERATIONS.
7. AT NO TIMES SHALL THE CONTRACTOR UTILIZE ACTIVE AIRFIELD PAVEMENTS FOR ON SITE HAUL ROUTES.
8. ACCESS TO AIRPORT PROPERTY IS THROUGH EXISTING AIRPORT GATES. GATES TO REMAIN CLOSED AND LOCKED WHEN NOT IN USE.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING THE AIRPORT SECURE AT ALL TIMES DURING CONSTRUCTION.
10. WORK IN ADJACENT SITE MAY BE ON-GOING DURING CONSTRUCTION. CONTRACTOR TO COORDINATE WORK AS REQUIRED.



2
G003
CONTRACT LAYOUT PLAN DETAILS

100% DESIGN SUBMITTAL

BY | REVISIONS | DATE

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H

Tampa International Airport

PROJECT NAME: TAXILANE G2

SHEET TITLE: CONTRACT LAYOUT PLAN AND NOTES

DESIGNED:	DAG
DRAWN:	SCB
CHECKED:	SCS
HCAA NO.:	6640 19
JOB NO.:	204-0001-056
DATE:	DECEMBER 4, 2020

SHEET NO.: G003

GENERAL NOTES

1. HAUL ROUTES: LOCATION OF HAUL ROUTES ON THE AIRPORT SITE SHALL BE AS SPECIFIED ON THE PLANS OR AS APPROVED BY THE CONSTRUCTION MANAGER. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE OFF-SITE HAUL ROUTES (STATE HIGHWAYS, COUNTY ROADS OR CITY STREETS) WITH THE APPROPRIATE OWNER WHO HAS JURISDICTION OVER THE AFFECTED ROUTE. ON-SITE HAUL ROUTES SHALL BE MAINTAINED BY THE CONTRACTOR AND SHALL BE RESTORED TO THEIR ORIGINAL CONDITION UPON COMPLETION OF BEING USED AS A HAUL ROUTE. THE BEFORE AND AFTER CONDITION OF ON-SITE HAUL ROUTES SHALL BE JOINTLY INSPECTED AND CONDITION DETERMINED BY THE CONTRACTOR AND THE CONSTRUCTION MANAGER. FENCING, DRAINAGE, GRADING AND OTHER MISCELLANEOUS CONSTRUCTION REQUIRED TO CONSTRUCT TEMPORARY HAUL ROUTES OR ACCESS POINTS ON THE AIRPORT WILL BE THE CONTRACTOR'S TOTAL RESPONSIBILITY AND SHALL BE APPROVED BY THE CONSTRUCTION MANAGER PRIOR TO THE WORK. ALL ON-SITE FAA ACCESS ROADS TO FAA FACILITIES SHALL REMAIN OPEN AND MAINTAINED AT ALL TIMES. PHOTOGRAPHS AND A VIDEO OF THE HAUL ROUTES SPECIFIED BY THE PLANS MUST BE PROVIDED BY THE CONTRACTOR BEFORE AND AFTER CONSTRUCTION TO THE CONSTRUCTION MANAGER. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO HAUL ROUTES RESULTING FROM CONSTRUCTION TRAFFIC. HAUL ROADS ARE TO REMAIN CLEAN AT ALL TIMES. ALL COSTS ARE TO BE INCLUDED IN ITEM C-106-1.
2. ANY DAMAGE TO STATE, COUNTY, LOCAL OR AIRPORT FACILITY ROADWAYS CAUSED BY THE CONTRACTOR'S HAULING OR CONSTRUCTION EQUIPMENT SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE CONSTRUCTION MANAGER AT CONTRACTOR'S SOLE EXPENSE.
3. THE CONTRACTOR SHALL MAINTAIN AT ALL TIMES A SECURED AIR OPERATIONS AREA (AOA). THIS SHALL INCLUDE THE TEMPORARY FENCING AND NECESSARY ACCESS GATES. ACCESS GATES TO THE AOA LOCATIONS SHALL BE AS SHOWN ON THE PLANS, OR APPROVED BY CONSTRUCTION MANAGER. A SECURITY GUARD IS REQUIRED AT ALL TIMES WHEN AN ACCESS GATE IS IN USE. NO OTHER SITE ACCESS WILL BE ALLOWED. SECURITY GUARDS MUST UNDERGO A FINGERPRINT-BASED BACKGROUND CHECK AND OBTAIN A SIDA BADGE FROM HCAA. THE COST OF THE SIDA BADGE SHALL BE THE CONTRACTORS RESPONSIBILITY.
4. FOR MANUAL GATES ONLY, THE CONTRACTOR SHALL INSTALL ITS OWN LOCK AT EACH GATE AUTHORIZED FOR USE IN THIS CONTRACT. THE CONTRACTOR SHALL INSTALL ITS LOCK BY INTERLOCKING TO THE EXISTING HCAA LOCK ON THE GATE. THE CONTRACTOR SHALL PROVIDE 4 DUPLICATE KEYS FOR EACH LOCK TO THE CONSTRUCTION MANAGER. LOCK I.D. TAGS SHALL BE PLACED ON EACH LOCK BY THE CONTRACTOR WITH THE COMPANY NAME AND EMERGENCY CONTACT NUMBER INSCRIBED ON THE SURFACE. THIS REQUIREMENT SHALL NOT APPLY TO AUTOMATIC TYPE ACCESS CONTROLLED GATES.
5. THE CONTRACTOR'S VEHICLES AND EQUIPMENT SHALL BE RESTRICTED TO THE CONSTRUCTION LIMITS AND CONTRACTOR'S STAGING AREA ONLY. DESIGNATED PARKING FOR THE CONTRACTOR'S EMPLOYEES VEHICLES SHALL BE RESTRICTED TO THE CONTRACTORS STAGING AREA OR OTHER LOCATIONS IDENTIFIED BY THE CONSTRUCTION MANAGER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRANSPORTING ALL PERSONNEL BETWEEN THE STAGING AREA AND THE PROJECT WORK AREAS. OVERNIGHT EQUIPMENT STORAGE SHALL BE AT THE CONTRACTORS STAGING AREA ONLY.
6. LIMITS OF WORK SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR, ENGINEER, AND CONSTRUCTION MANAGER PRIOR TO BEGINNING WORK.
7. THERE ARE EXISTING UNDERGROUND UTILITIES IN THE PROJECT WORK AREA. LOCATION, ELEVATION, AND DIMENSIONS OF EXISTING UTILITIES, STRUCTURES AND OTHER FEATURES ARE SHOWN IN ACCORDANCE WITH THE BEST INFORMATION AVAILABLE AT TIME OF THE PREPARATION OF THESE PLANS BUT DO NOT PURPORT TO BE ABSOLUTELY ACCURATE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE EVERY UNDERGROUND UTILITY LOCATED, FLAGGED AND IDENTIFIED PRIOR TO CONSTRUCTION, AND AT A MINIMUM HAVE A SUNSHINE STATE "ONE CALL" PLACED (DIAL 811 OR 1-800-432-4770). HCAA TO BE NOTIFIED AS A PART OF THE "ONE CALL" PROCESS. ANY DAMAGE DONE TO ANY EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL IMMEDIATELY REPAIR ANY UTILITY DAMAGED BY HIS ACTIONS AT NO ADDITIONAL COST TO THE OWNER.
8. PROTECTION AND REPAIR OF DAMAGE TO EXISTING CABLES: LOCATION OF EXISTING FAA UNDERGROUND CABLES WILL BE FLAGGED ONE TIME BY THE LOCAL AIRWAY FACILITIES SECTOR OFFICE PERSONNEL IF APPLICABLE THROUGH COORDINATION WITH THE CONSTRUCTION MANAGER. THESE FLAGS SHALL BE PROTECTED AND MAINTAINED BY THE CONTRACTOR AT ALL TIMES. IF FLAGS ARE LOST OR REMOVED BY THE CONTRACTOR, THEY WILL BE FLAGGED AGAIN AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING UTILITY LOCATIONS ON NON-FAA UNDERGROUND CABLES. ALL UNDERGROUND CABLES SHALL BE PROTECTED AND DAMAGES REPAIRED EXPEDITIOUSLY AT NO ADDITIONAL COST TO THE OWNER.
9. CONSTRUCTION LIMITS: ALL CONTRACTOR VEHICLES AND TRAFFIC SHALL REMAIN WITHIN THE DESIGNATED CONSTRUCTION LIMITS OR HAUL ROUTES. ABSOLUTELY NO CONTRACTOR VEHICLES WILL BE ALLOWED ON OTHER AIRFIELD OPERATIONS AREAS.
10. NIGHTTIME CONSTRUCTION LIGHTING: WHEN NIGHT WORK IS PERMITTED OR REQUIRED, THE CONTRACTOR SHALL PROVIDE SUFFICIENT LIGHTING CAPABLE OF FULLY ILLUMINATING THE WORK AREA. THE CONTRACTOR SHALL COORDINATE THE DIRECTION AND ANGLE OF THE LIGHTS WITH THE CONSTRUCTION MANAGER TO PREVENT IMPAIRING THE VISION OF AIRCRAFT OPERATIONS AND THE FAA AIR TRAFFIC CONTROL TOWER.
11. REFER TO PROJECT MANUAL FOR PROJECT PERMITTING REQUIREMENTS.
12. ALL MATERIALS TO BE INSTALLED SHALL BE APPROVED BY THE ENGINEER AND THE CONSTRUCTION MANAGER PRIOR TO INSTALLATION.
13. WASTE DISPOSAL: ALL WASTE MATERIAL GENERATED AS PART OF CONSTRUCTION SHALL BE REMOVED FROM THE CONSTRUCTION AREA AND BE DISPOSED OF OFF-SITE IN A LEGAL MANNER. NO MATERIAL SHALL BE WASTED ON THE AIRPORT SITE.
14. ANY EXISTING TURF AREA DISTURBED OUTSIDE THE PROPOSED LIMITS OF GRADING, AS A RESULT OF THE CONTRACTOR'S WORK EFFORT SHALL BE SODDED AT THE CONSTRUCTION MANAGER'S DISCRETION IN ACCORDANCE WITH THE AIRPORT'S DESIGN STANDARDS AND CONTRACT SPECIFICATIONS AT THE CONTRACTOR'S EXPENSE. ANY SOD INSTALLED SHALL MATCH THE EXISTING SOD SPECIES.
15. THE CONTRACTOR SHALL PROVIDE A FULL-TIME ON-SITE SUPERVISOR FOR THE DURATION OF THE PROJECT. FOR OTHER SUPERVISOR REQUIREMENTS REFER TO THE PROJECT SPECIFICATIONS.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE STAKE-OUT OF THE PROJECT (I.E., LINE, GRADE, SLOPE STAKE, UTILITY RELOCATIONS OR ANY OTHER STAKE OUT THAT MAY BE REQUIRED TO COMPLETE THE PROJECT) IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. ANY AND ALL EXPENSES INCURRED FOR THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM C-104-1.
17. THE CONTRACTOR SHALL ENDEAVOR TO PROTECT PRIVATE PROPERTY. ANY DAMAGE CAUSED BY THE CONTRACTOR IN THE PERFORMANCE OF HIS WORK SHALL BE CORRECTED TO THE SATISFACTION OF THE CONSTRUCTION MANAGER AT NO ADDITIONAL COST TO THE OWNER.
18. THE CONTRACTOR SHALL COORDINATE THE WORK OF THIS PROJECT WITH THE CONSTRUCTION MANAGER, HCAA, ALL TENANTS, OTHER CONTRACTORS AND OTHER ON GOING PROJECTS AT THE SITE AS REQUIRED.
19. WORK AREA CLEANLINESS: THE CONTRACTOR'S WORK AND STAGING AREAS ARE IN VERY CLOSE PROXIMITY TO ACTIVE AIRCRAFT OPERATIONS. THE AIRCRAFT'S JET ENGINES ARE SUSCEPTIBLE TO INTAKE OF MATERIAL FROM PAVEMENT SURFACES WHICH COULD CAUSE DAMAGE TO THE AIRCRAFT. THE CONTRACTOR SHALL TAKE SPECIAL CARE TO ENSURE THE SITE IS CLEAN AND FREE OF DEBRIS AT ALL TIMES. UPON COMPLETION OF A DAY'S WORK, THE CONTRACTOR SHALL INSPECT ALL PAVEMENTS IN THE IMMEDIATE VICINITY OF THE DAY'S WORK AREA FOR DEBRIS PRIOR TO LEAVING THE SITE. ANY DEBRIS SHALL BE REMOVED FROM THE SITE. PAYMENT FOR THIS WORK SHOULD BE CONSIDERED INCIDENTAL TO THE PROJECT. NO ADDITIONAL COMPENSATION WILL BE MADE FOR CLEANING EFFORTS.

CONTRACTOR STAGING AREA NOTES

1. THE CONTRACTOR SHALL COORDINATE WITH THE CONSTRUCTION MANAGER DURING THE MOBILIZATION PHASE FOR ESTABLISHMENT OF A STAGING AREA. THE CONTRACTOR SHALL UTILIZE THIS LOCATION THROUGHOUT CONSTRUCTION.
2. THE CONTRACTOR SHALL TAKE CARE TO ENSURE THAT ALL EQUIPMENT AND MATERIALS LOCATED WITHIN THE CONTRACTOR'S STAGING AREA ARE LOCATED OUTSIDE OF ANY RUNWAY OR TAXIWAY OBJECT FREE AREAS.
3. IF REQUESTED BY THE CONTRACTOR, ADDITIONAL AREAS ADJACENT TO THE WORK SITE MAY BE MADE AVAILABLE FOR USE BY THE CONTRACTOR AS A STAGING AREA AT THE DISCRETION OF THE CONSTRUCTION MANAGER.
4. THE EXACT LOCATIONS AND DIMENSIONS OF THE STAGING AREA WILL BE CONFIRMED IN THE FIELD BY THE CONSTRUCTION MANAGER.
5. THE STAGING AREA LOCATION DOES NOT HAVE EXISTING UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING ANY UTILITIES REQUIRED FOR HIS OWN USE AND ANY UTILITIES REQUIRED WILL BE AT THE CONTRACTORS EXPENSE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE ALL ASSOCIATED UTILITY CONNECTIONS FOR THE STAGING AREA WITH THE LOCAL AUTHORITIES.
6. AT THE CONCLUSION OF CONSTRUCTION, AND BEFORE FINAL ACCEPTANCE, THE STAGING AREA AND EMPLOYEE PARKING AREA SHALL BE RESTORED TO THEIR PRE-CONSTRUCTION CONDITION. THE AREA SHALL BE GRADED TO DRAIN AS EXISTING AND SEEDED IF NECESSARY PER THE PROJECT DRAWINGS AND SPECIFICATIONS. COST SHALL BE CONSIDERED INCIDENTAL TO THE C-105-1 MOBILIZATION PAY ITEM. ANY DAMAGE DONE TO EXISTING FENCE, PAVEMENT, CURBS, ETC. AS A RESULT OF THE CONTRACTORS FORCES SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
7. NO STAGING ON ANY ACTIVE AIRFIELD PAVEMENTS OR ROADWAYS WILL BE ALLOWED AT ANY TIME.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING THEIR OWN FENCING, MAINTAINING EXISTING FENCING, AND SECURING THE STAGING AREA AS NECESSARY.

CONTRACTOR STAGING AREA NOTES

1. ANY EXISTING TURF AREA DISTURBED OUTSIDE THE LIMITS OF WORK, AS A RESULT OF THE CONTRACTOR'S WORK EFFORT SHALL BE SEEDED OR SODDED AT THE CONSTRUCTION MANAGER'S DISCRETION IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. COST FOR THE SITE RESTORATION SHALL BE INCLUDED IN THE C-105-1 MOBILIZATION PAY ITEM.

100% DESIGN SUBMITTAL

DATE	REVISIONS	BY

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H

Tampa International Airport

PROJECT NAME: TAXILANE G2

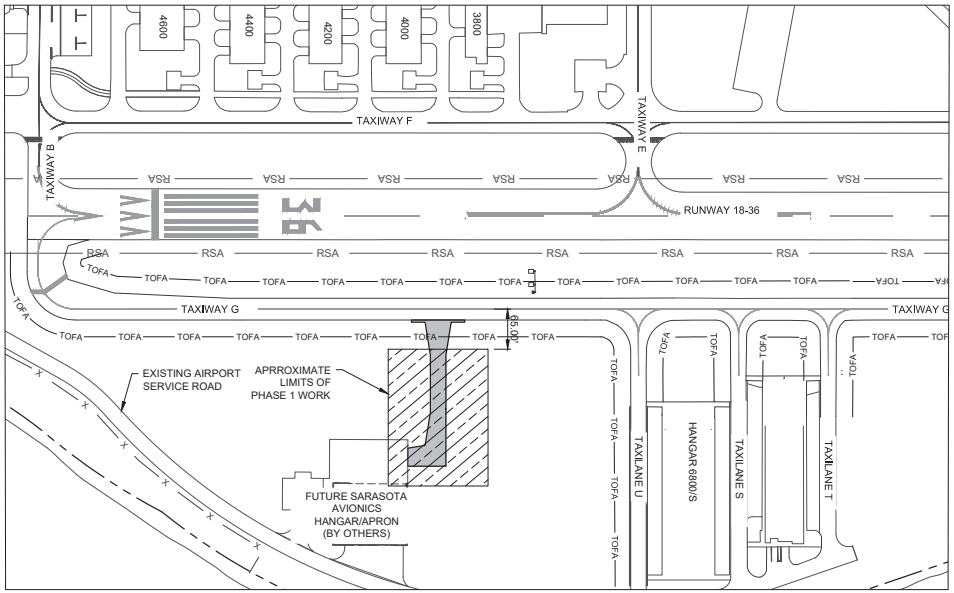
SHEET TITLE: GENERAL AND STAGING AREA NOTES

DESIGNED: DAG
DRAWN: SCB
CHECKED: SCS

HCAA NO.: 6640 19
JOB NO.: 204-0001-056

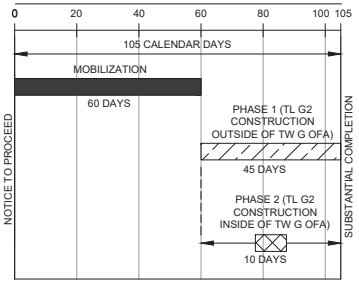
DATE: DECEMBER 4, 2020

SHEET NO.: G004



1 G005 **PHASE 1 CONSTRUCTION**

CONSTRUCTION PHASING SCHEMATIC



PHASING NOTES

1. FOR CONTRACT LAYOUT PLANS AND ASSOCIATED NOTES, REFER TO SHEETS G003 AND G004.
2. PHASING PLAN INCLUDES A GRAPHICAL DEPICTION OF THE LIMITS OF WORK ASSOCIATED WITH EACH WORK AREA.
3. FOR THE WORK DETAILS ASSOCIATED WITH EACH WORK AREA, REFER TO THE "C" AND "E" SERIES SHEETS.
4. THE CONTRACTOR SHALL SUPPLY A COMPLETE AND DETAILED CONSTRUCTION SCHEDULE TO THE CONSTRUCTION MANAGER FOR REVIEW AND APPROVAL PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL NOT REVISE THE SCHEDULE WITHOUT THE WRITTEN APPROVAL OF THE CONSTRUCTION MANAGER.
5. THE DURATIONS INCLUDED FOR PHASING ARE CONSECUTIVE CALENDAR DAYS.
6. 48 HOUR'S NOTICE SHALL BE PROVIDED PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES TO ENSURE THAT APPROPRIATE NOTAMS ARE ISSUED.
7. WORK HOURS SHALL BE 7AM TO 7PM, MONDAY THRU FRIDAY, UNLESS OTHERWISE NOTED.

PHASING DESCRIPTIONS

THE PROJECT CONSISTS OF THREE (3) PHASES. DESCRIPTIONS OF EACH OF THE PHASES IDENTIFIED ARE AS FOLLOWS:

PHASE 0 - MOBILIZATION

THE CONTRACTOR SHALL UTILIZE THIS PHASE TO MOBILIZE FOR CONSTRUCTION. MOBILIZATION SHALL INCLUDE, BUT NOT LIMITED TO, THE DEVELOPMENT OF A COMPREHENSIVE CONSTRUCTION SCHEDULE, PREPARATION AND SUBMISSION OF ALL SHOP DRAWINGS FOR REVIEW AND APPROVAL, COORDINATION OF ANY PERMITTING REQUIREMENTS, ORDERING OF MATERIALS (SPECIAL ATTENTION SHALL BE PAID TO ITEMS WITH LONG LEAD TIMES), ETC. IT IS THE INTENT OF THIS PHASE TO PROVIDE THE CONTRACTOR WITH SUFFICIENT TIME TO COMPLETE ALL TASKS REQUIRED TO FULLY MOBILIZE BEFORE BREAKING GROUND ON THE CONSTRUCTION SITE. THE CONTRACTOR HAS 60 CONSECUTIVE CALENDAR DAYS FOR PHASE 0.

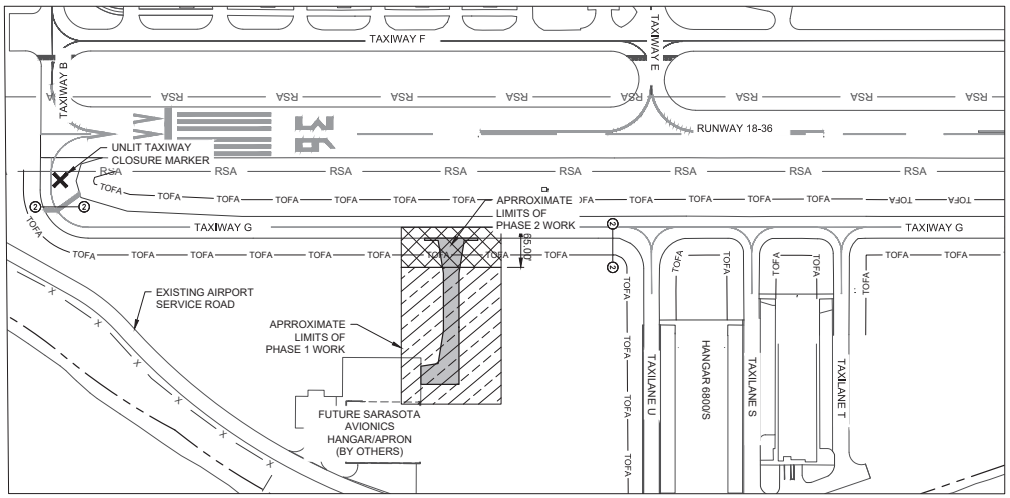
ADDITIONALLY, THE PRE-CONSTRUCTION CONFERENCE SHALL BE CONDUCTED DURING THIS PHASE TO FAMILIARIZE THE CONTRACTOR WITH THE PROJECT SITE, OPERATIONS REQUIREMENTS AND OTHER GENERAL PROJECT REQUIREMENTS.

PHASE 1 - TAXILANE G2 CONSTRUCTION (OUTSIDE TAXIWAY G OBJECT FREE AREA)

PHASE 1 CONSISTS OF ALL WORK REQUIRED TO COMPLETE THE CONSTRUCTION OF THE TAXIWAY G2 OUTSIDE THE LIMITS OF TAXIWAY G OFA INCLUDING DEMOLITION, EARTHWORK AND GRADING, PAVEMENT CONSTRUCTION, PAVEMENT MARKINGS, AND AIRFIELD ELECTRICAL WORK. PHASE 1 DURATION SHALL BEGIN 60 DAYS AFTER THE NOTICE TO PROCEED UNLESS A WRITTEN REQUEST IS MADE TO AND APPROVED BY THE CONSTRUCTION MANAGER. THE CONTRACTOR HAS 45 CONSECUTIVE CALENDAR DAYS FOR PHASE 1.

PHASE 2 - TAXILANE G2 CONSTRUCTION (WITHIN TAXIWAY G OBJECT FREE AREA)

PHASE 2 CONSISTS OF ALL WORK REQUIRED TO COMPLETE THE CONSTRUCTION OF TAXILANE G2 WITHIN THE LIMITS OF TAXIWAY G OFA INCLUDING DEMOLITION, EARTHWORK AND GRADING, PAVEMENT CONSTRUCTION, PAVEMENT MARKINGS, AND AIRFIELD ELECTRICAL WORK.. THE CONTRACTOR SHALL COORDINATE WITH THE AIRPORT FOR TSA ACCESS. THE CONTRACTOR HAS 10 CONSECUTIVE CALENDAR DAYS FOR PHASE 2. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER A MINIMUM OF 7 CALENDAR DAYS PRIOR TO BEGINNING WORK IN PHASE 2.



1 G005 **PHASE 2 CONSTRUCTION**

LEGEND

- BARRICADE / PHASE NUMBER
- PHASE 1
- PHASE 2
- RSA — RUNWAY SAFETY AREA
- TOFA — TAXIWAY OBJECT FREE AREA
- UNLIT TAXIWAY CLOSURE MARKER. SEE NOTES AND DETAILS, SHEET G002.

GENERAL BARRICADE PLAN NOTES

1. FOR SAFETY AND SECURITY NOTES, SEE SHEET G002.
2. BARRICADE LOCATIONS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS FOR EACH PHASE. ULTIMATELY IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ALL PROPER SAFETY MEASURES ARE FOLLOWED DURING CONSTRUCTION, INCLUDING PROPER PLACEMENT AND LOCATION OF LOW PROFILE BARRICADES.
3. GUIDANCE SIGNS AND LIGHTING ASSOCIATED WITH THE TAXIWAY CLOSURE SHALL BE COVERED WITH OPAQUE MATERIAL TO PREVENT AIRCRAFT FROM INADVERTENTLY TAXIING ONTO THE CLOSED PAVEMENTS. MATERIAL SHALL BE APPROVED BY THE CONSTRUCTION MANAGER AND SHALL NOT DAMAGE THE SIGN OR FIXTURE SURFACES. COST SHALL BE INCLUDED IN COST FOR FURNISHING THE MATERIAL USED TO COVER GUIDANCE SIGNS AND LIGHTING SHALL BE INCIDENTAL TO ITEM L-105-1 TEMPORARY AIRFIELD LIGHTING SYSTEM.

NORTH

0 50 100 200 FEET

100% DESIGN SUBMITTAL

HILLSBOROUGH COUNTY AVIATION AUTHORITY
TAMPA, FLORIDA

RS&H

Tampa International Airport

PROJECT NAME: TAXILANE G2

SHEET TITLE: CONSTRUCTION PHASING AND BARRICADE PLAN

DESIGNED: DAG
DRAWN: SCB
CHECKED: SCS
HCAA NO.: 6640 19
JOB NO.: 204-0001-056
DATE: DECEMBER 4, 2020

G005
SHEET NO.:

APPENDIX B

Construction Safety Checklist

APPENDIX B. CONSTRUCTION PROJECT DAILY SAFETY INSPECTION CHECKLIST

The situations identified below are potentially hazardous conditions that may occur during airport construction projects. Safety area encroachments, unauthorized and improper ground vehicle operations, and unmarked or uncovered holes and trenches near aircraft operating surfaces pose the most prevalent threats to airport operational safety during airport construction projects. The list below is one tool that the airport operator or contractor may use to aid in identifying and correcting potentially hazardous conditions. It should be customized as appropriate for each project including information such as the date, time and name of the person conducting the inspection.

Item	Action Required (Describe)	No Action Required (Check)
Excavation adjacent to taxiways improperly backfilled.		
Mounds of earth, construction materials, temporary structures, and other obstacles near any open taxiway or taxi lane; in the related Object Free area; or obstructing any sign or marking.		
Heavy equipment (stationary or mobile) operating or idle near AOA, in runway approaches and departures areas, or in OFZ.		
Equipment or material near NAVAIDs that may degrade or impair radiated signals and/or the monitoring of navigation and visual aids. Unauthorized or improper vehicle operations in localizer or glide slope critical areas, resulting in electronic interference and/or facility shutdown.		
Improperly positioned or malfunctioning lights or unlighted airport hazards, such as holes or excavations, on any open taxiway, or open taxi lane or in a related safety, approach, or departure area.		

Obstacles, loose pavement, trash, and other debris on or near AOA. Construction debris (gravel, sand, mud, paving materials) on airport pavements may result in aircraft propeller, turbine engine, or tire damage. Also, loose materials may blow about, potentially causing personal injury or equipment damage.		
Improper or inadequate marking or lighting of taxiways that could cause pilot confusion and provide a potential for a runway incursion. Inadequate or improper methods of marking, barricading, and lighting of temporarily closed portions of AOA create aviation hazards.		
Wildlife attractants — such as trash (food scraps not collected from construction personnel activity), grass seeds, tall grass, or standing water — on or near airports.		
Failure to issue, update, or cancel NOTAMs about airport or runway closures or other construction related airport conditions.		
Failure to mark and identify utilities or power cables. Damage to utilities and power cables during construction activity can result in the loss of runway / taxiway lighting; loss of navigation, visual, or approach aids; disruption of weather reporting services; and/or loss of communications.		
Restrictions on ARFF access from fire stations to the runway / taxiway system or airport buildings.		
Objects, regardless of whether they are marked or flagged, or activities anywhere on or near an airport that could be distracting, confusing, or alarming to pilots during aircraft operations.		

Water, dirt, debris, or other contaminants that temporarily obscure or derogate the visibility of runway/taxiway marking, lighting, and pavement edges. Any condition or factor that obscures or diminishes the visibility of areas under construction.		
Spillage from vehicles (gasoline, diesel fuel, oil) on active pavement areas, such as taxiways, aprons, and airport roadways.		
Failure to maintain drainage system integrity during construction (for example, no temporary drainage provided when working on a drainage system).		
Failure to provide for proper electrical lockout and tagging procedures. At larger airports with multiple maintenance shifts/workers, construction contractors should make provisions for coordinating work on circuits.		
Failure to control dust. Consider limiting the amount of area from which the contractor is allowed to strip turf.		
Exposed wiring that creates an electrocution or fire ignition hazard. Identify and secure wiring, and place it in conduit or bury it.		
Construction work taking place outside of designated work areas and out of phase.		

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TAXIWAY G2

HCAA Project No. 6640 19

Peter O. Knight Airport
Tampa, Florida

Hillsborough County Aviation Authority

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qnty	Unit	Total Amount Per Item (Unit Price Times Est Qnty)
C-102-1	Temporary Erosion and Sedimentation Control				
	Dollars ____ Cents	$ 4,812.59	1	LS	$ 4,812.59
	Bid Price Per Unit In Words	In Numbers			
C-103-1	Safety and Security				
	Dollars ____ Cents	$ 10,509.98	1	LS	$ 10,509.98
	Bid Price Per Unit In Words	In Numbers			
C-104-1	Project Survey and Stakeout				
	Dollars ____ Cents	$ 20,713.59	1	LS	$ 20,713.59
	Bid Price Per Unit In Words	In Numbers			
C-105-1	Mobilization				
	Dollars ____ Cents	$ 29,753.55	1	LS	$ 29,753.55
	Bid Price Per Unit In Words	In Numbers			
C-106-1	Maintenance of Traffic and Temporary Construction Items				
	Dollars ____ Cents	$ 13,283.33	1	LS	$ 13,283.33
	Bid Price Per Unit In Words	In Numbers			
U-100-1	4" PVC Watermain Adjustment (Complete)				
	Dollars ____ Cents	$ 7,407.68	1	LS	$ 7,407.68
	Bid Price Per Unit In Words	In Numbers			
FL-160-1	6” Stabilized Subgrade (LBR 40)				
	Dollars ____ Cents	$ **7.14**	1,015	SY	$ 7,247.10
	Bid Price Per Unit In Words	In Numbers			

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qnty	Unit	Total Amount Per Item (Unit Price Times Est Qnty)
P-152-1	Unclassified Excavation				
	Dollars Cents (Bid Price Per Unit In Words)	$ **21.00** (In Numbers)	400	CY	$ 8,400.00
P-152-2	Embankment (In-Place)				
	Dollars Cents (Bid Price Per Unit In Words)	$ **45.00** (In Numbers)	150	CY	$ 6,750.00
P-152-3	Topsoil Stripping, (4" Thick)				
	Dollars Cents (Bid Price Per Unit In Words)	$ **7,500.98** (In Numbers)	0.90	AC	$ 6,750.88
P-219-1	4" Recycled Concrete Aggregate Base Course				
	Dollars Cents (Bid Price Per Unit In Words)	$ **13.40** (In Numbers)	950	SY	$ 12,730.00
P-403-1	Asphalt Mixture Surface Course				
	Dollars Cents (Bid Price Per Unit In Words)	$ **174.63** (In Numbers)	150	TN	$ 26,194.50
P-620-1	Taxilane Painting (Includes Reflective with Glass Beads and Non-Reflective)				
	Dollars Cents (Bid Price Per Unit In Words)	$ **6.67** (In Numbers)	500	SF	$ 3,335.00
T-904-1	Sodding				
	Dollars Cents (Bid Price Per Unit In Words)	$ **2.88** (In Numbers)	3,460	SY	$ 9,964.80
L-105-1	Temporary Airport Lighting Systems				
	Dollars Cents (Bid Price Per Unit In Words)	$ 6,269.28 (In Numbers)	1	LS	$ 6,269.28

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qnty	Unit	Total Amount Per Item (Unit Price Times Est Qnty)
L-108-1	No. 8 AWG, 5kV, L-824, Type C Cable, Installed in Trench, Duct Bank or Conduit				
	_____ Dollars _____ Cents (Bid Price Per Unit In Words)	$ **2.59** (In Numbers)	800	LF	$ 2,072.00
L-108-2	No. 6 AWG, Solid, Bare Copper Counterpoise Wire, Installed in Trench, Above the Duct Bank or Conduit, Including Connections/Terminations				
	_____ Dollars _____ Cents (Bid Price Per Unit In Words)	$ **2.99** (In Numbers)	380	LF	$ 1,136.20
L-110-1	Remove Conduit, Duct Bank and Cable				
	_____ Dollars _____ Cents (Bid Price Per Unit In Words)	$ 2,947.34 (In Numbers)	1	LS	$ 2,947.34
L-110-2	Non-Encased Electrical Conduit, 1-Way, 2-Inch				
	_____ Dollars _____ Cents (Bid Price Per Unit In Words)	$ **3.24** (In Numbers)	335	LF	$ 1,085.40
L-110-3	Concrete Encased Electrical Duct Bank, 2-Way, 2-Inch				
	_____ Dollars _____ Cents (Bid Price Per Unit In Words)	$ 74.22 (In Numbers)	50	LF	$ 3,711.00
L-125-1	L-861(T) Elevated Taxiway Edge Light on New L-867B Base Can				
	_____ Dollars _____ Cents (Bid Price Per Unit In Words)	$ **1,245.56** (In Numbers)	12	EA	$ 14,946.72
L-125-2	L-853 Retroreflective Marker				
	_____ Dollars _____ Cents (Bid Price Per Unit In Words)	$ 366.99 (In Numbers)	11	EA	$ 4,036.89

Bid Item Number	Item Description and Bid Price Per Unit (In Words)	Bid Price Per Unit (In Numbers)	Est Qnty	Unit	Total Amount Per Item (Unit Price Times Est Qnty)
L-125-3	Unlit Taxiway End Marker Sign				
	Bid Price Per Unit In Words: _____ Dollars _____ Cents	$ 4,792.86 (In Numbers)	1	EA	$ 4,792.86
L-125-3	Relocate Elevated Airfield Light and Base Can				
	Bid Price Per Unit In Words: _____ Dollars _____ Cents	$ 1,321.25 (In Numbers)	2	EA	$ 2,642.50
	Sub-total for all Bid Items not including Owner's Allowance				$ 211,493.19
	Owner's Allowance				
	Bid Price Per Unit In Words: Twenty-Five Thousand Dollars Zero Cents	$ 25,000.00 (In Numbers)	1	Allow	$ 25,000.00
	Total Bid Amount including Owner's Allowance				
	Total Bid Amount in Words: Two Hundred Thirty Six Thousand Four Hundred Ninety Three Dollars Nineteen Cents	$ 236,493.19 (In Numbers)			

NOTE: Basis of payment will be in accordance with the technical specifications applicable to each Bid Item Number.

Name of Bidder: Cobb Site Development
(Typed or Printed)

Signature of Bidder: [signature]
(Same as Bid Form)

Title: COO

Date: 1/4/21

Exhibit D

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 SCHEDULE OF OWNER'S ALLOWANCES

A. These allowances will cover the total cost of all Work authorized under a Work Order, including but not limited to design, cost of materials and equipment delivered and unloaded at the Project site, and all applicable taxes, permits, fees, labor, installation costs and integration as applicable. The Contractor's percentage, overhead and profit for the allowance will be included in the Work Order amount.

B. Should the aggregate of charges for all approved Work Orders issued by the Owner under the allowances be less than the amount of the allowance, the final Contract Sum will be decreased by the amount of the difference. No Work will be performed that would cause total charges under the allowances to exceed the authorized allowance amount. The authorized allowance amount may be increased by Change Order.

C. The following allowance amounts will be included in the Contract Sum bid amount on the Bid Form:

$25,000

OWNER'S ALLOWANCE: Allow an amount of ~~$50,000~~ of the Contract Sum for:

1. Owner's Allowance may be used as required for resolution of unforeseeable conditions relating to an increase over the estimated quantities of the various bid items based on the actual quantities as constructed and accepted in the field.

2. Owner's Allowance may be used for resolution of unforeseeable conditions relating to existing utilities (sanitary and storm sewer, potable water, irrigation and landscaping, fire protection, conduits, electrical conductors, communication cabling, security lines, fiber optic lines, lighting, fueling, etc.), existing concrete slabs, existing foundations, existing adjacent facilities, in conflict with the proposed work. This includes unknown items encased in or buried under the areas of the work.

3. Owner's Allowance may be used for resolution of unforeseeable conditions relating to existing or new asphalt or concrete pavements including repairs of the base, sub-base or removal and replacement of unsuitable soils

4. Owner's Allowance may be used for resolution of unforeseeable conditions relating to existing airfield lighting or signage.

5. Owner's Allowance may be used for resolution of unforeseeable or unknown modifications to the project work as required by the authority having jurisdiction (Building Office, Fire Marshall, City Inspector, etc.).

Certificate Of Completion

Envelope Id: 3024EB8EFC0745C59FB606D745EB4935
Subject: Please DocuSign: 6640 19 CO#2 - Docusign.pdf
Source Envelope:
Document Pages: 208
Certificate Pages: 5
AutoNav: Enabled
EnvelopeId Stamping: Enabled
Time Zone: (UTC-05:00) Eastern Time (US & Canada)

Signatures: 2
Initials: 0

Status: Completed

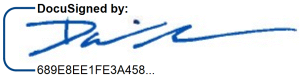
Envelope Originator:
James Hanney
P.O. Box 22287
Tampa, FL 33622
JHanney@TampaAirport.com
IP Address: 35.138.255.8

Record Tracking

Status: Original
1/25/2021 5:50:03 PM
Security Appliance Status: Connected
Storage Appliance Status: Connected

Holder: James Hanney
JHanney@TampaAirport.com
Pool: StateLocal
Pool: Hillsborough County Aviation Authority

Location: DocuSign
Location: DocuSign

Signer Events	Signature	Timestamp
David Gordon David.Gordon@rsandh.com RS&H, Inc. Security Level: Email, Account Authentication (None)	DocuSigned by:  689E8EE1FE3A458... Signature Adoption: Uploaded Signature Image Using IP Address: 173.169.194.139	Sent: 1/25/2021 6:02:15 PM Viewed: 1/26/2021 8:34:40 AM Signed: 1/26/2021 8:39:25 AM
Electronic Record and Signature Disclosure: Accepted: 1/26/2021 8:34:40 AM ID: 955f6eb6-e2b8-49d0-8a63-5918b3a923c0		
Kyle Cobb kyle@lcobbconstruction.com MBR Security Level: Email, Account Authentication (None)	DocuSigned by:  1E59E7AF52D4468... Signature Adoption: Pre-selected Style Using IP Address: 198.0.10.37	Sent: 1/26/2021 8:39:33 AM Viewed: 1/26/2021 8:40:14 AM Signed: 1/26/2021 8:42:10 AM
Electronic Record and Signature Disclosure: Accepted: 1/26/2021 8:40:14 AM ID: 731be72d-61e8-413c-b634-3c943a41f5b6		

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	1/25/2021 6:02:15 PM
Certified Delivered	Security Checked	1/26/2021 8:40:14 AM
Signing Complete	Security Checked	1/26/2021 8:42:10 AM
Completed	Security Checked	1/26/2021 8:42:10 AM

Payment Events	Status	Timestamps

Electronic Record and Signature Disclosure

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Required hardware and software

Operating Systems:	Windows® 2000, Windows® XP, Windows Vista®; Mac OS® X
Browsers:	Final release versions of Internet Explorer® 6.0 or above (Windows only); Mozilla Firefox 2.0 or above (Windows and Mac); Safari™ 3.0 or above (Mac only)
PDF Reader:	Acrobat® or similar software may be required to view and print PDF files
Screen Resolution:	800 x 600 minimum
Enabled Security Settings:	Allow per session cookies

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