
ADDENDUM NO. 2

JUNE 8, 2017

**Tucson Airport Authority
Tucson International Airport
10112-254 Rehabilitate Runway 11L-29R and Connector Taxiways**

SCHEDULED FOR BID OPENING ON
WEDNESDAY, JUNE 14, 2017 AT 2:00 P.M. (M.S.T.)

QUESTIONS/CLARIFICATIONS RECEIVED FOR PROSPECTIVE BIDDERS:

Questions/Clarification received from prospective Bidders and responses are attached to this Addendum. The following Questions/Clarifications were received:

Granite AR 5-30-17, Granite 6-1-17, Granite 6-6-17, Granite 6-6-17 (A), Ashton 6-6-17

CLARIFICATIONS FOR ADDENDUM 1:

Clarification of Addendum 1 Pre-Bid Meeting Minutes and the question about the LED PAPI units. The L-880(B) 4-Box PAPI's are not LED PAPI's, the lamps shall be quartz lamps.

ADDITIONS AND REVISIONS TO THE PROJECT MANUAL:

In the Contract Documents remove "**Bid Sheets BS-1 thru BS-4**" and replace with the attached **Addendum #2 Bid Sheets BS-1 thru BS-4**.

In the Contract Documents Technical Specification Section "**Item P-152 EXCAVATION, SUBGRADE, AND EMBANKMENT**", **Section 152 – 2.2,b Proof rolling, first sentence**, delete in its entirety and replace with the following:

"After compaction is completed, the subgrade shall be proof rolled with a heavy pneumatic-tired roller having four or more tires abreast. The weight of the roller shall be more than 30,000 pounds and each tire shall be inflated to a minimum of 125 psi in the presence of the Engineer."

In the Contract Documents Technical Specification Section (Civil), Table of Content Below "**P-605 Joint Sealant for Concrete Pavement**" add the following, "**P-606 Adhesive Compounds, Two-Compound for Sealing Wire and Lights in Pavement**".

In the Contract Documents Technical Specification Section, Insert specification "**ITEM P-606 Adhesive Compounds, Two-Compound for Sealing Wire and Lights in Pavement**,

Addendum 2” attached to this Addendum after the “**ITEM P-605 Joint Sealant for Concrete Pavement**” specification.

In the Contract Documents Technical Specification Section “**Item L-100 ELECTRICAL GENERAL REQUIREMENTS**”, **Section 100 – 5.1 Electrical Services, Payment, Item L-100-5.22** delete in its entirety and replace with the following:
“**Item L-100-5.22 Temporary install existing Sign and Disconnect upon completion – per each**”.

In the Contract Documents Technical Specification Section, delete specification “**ITEM L-858(L) Airport Guidance Lighting Systems (Signage)**” in its entirety and replace with the attached specification “**ITEM L-858(L) Airport Guidance Lighting Systems (Signage) Addendum 2**” attached to this Addendum. Note that changes to the specification are hilited in YELLOW.

In the Contract Documents Technical Specification Section “**Item L-861(L) ELEVATED MEDUIUM INTENSITY EDGE LIGHT** ”, **Section 861(L) BASIS OF PAYMENT**, after pay Item L861(T) -4.8 add “**Item 861(T) -4.9 Remove temporary wood cover and re0install salvaged in-pavement taxiway centerline light. Provide spacers to adjust to new grade – per each**”.

ADDITIONS AND REVISIONS TO THE PROJECT PLANS:

The following plan sheets have been revised and are issued in this Addendum:

Sheet G215 PHASE 1D- TEMPORARY PAPI AT PHASE 3 RWY 11L THRESHOLD & TEMPORAY FLIGHT CHECK MARKING

Sheet G218 PHASE 1D- TEMPORARY PAPI AT PHASE 3 RWY 11L THRESHOLD ELECTRICAL DETAILS

Sheet G509 TEMPORARY PAPI INSTALLATION DETAILS

Sheet C451, TYPICAL SECTIONS - RWY 11L-29R

Sheet C452, TYPICAL SECTIONS – Blast Pad & TWY’s

Sheet C453, TYPICAL SECTIONS – TWY’s

Sheet C454, TYPICAL SECTIONS – TWY’s

Sheet C455, TYPICAL SECTIONS – TWY’s

Sheet C456, TYPICAL SECTIONS – TWY’s

Sheet C754, PAVEMENT MARKING DETAILS

Sheet E104, AIRFIELD ELECTRICAL REMOVAL PLAN 04

Sheet E204, AIRFIELD ELECTRICAL REMOVAL PLAN 04

Sheet E107, AIRFIELD ELECTRICAL REMOVAL PLAN 07

Sheet E111, AIRFIELD ELECTRICAL REMOVAL PLAN 11

Sheet E113, AIRFIELD ELECTRICAL REMOVAL PLAN 13

Sheet E205, AIRFIELD ELECTRICAL PLAN 05

Sheet E206, AIRFIELD ELECTRICAL PLAN 06

Sheet E211, AIRFIELD ELECTRICAL PLAN 11

Sheet E258, ELECTRICAL DETAILS – L-868 LIGHT BASE MOUNTING IN EXISTING PCC PAVEMENT

Attachment:

- Revised Bid Sheets BS-1 thru BS-4
- Questions/Clarifications Granite AR 5-30-17, Granite 6-1-17, Granite 6-6-17, Granite 6-6-17 (A), Ashton 6-6-17
- Revised Plan sheets – G215, G218, C451, C452, C453, C454, C455, C456, C754, E104, E204, E107, E111, E113, E205, E206, E211, and E258
- Item P-606 Adhesive Compounds, Two-Compound for Sealing Wire and Lights in Pavement specification.
- Item L-858(L) Airport Guidance Lighting Systems (Signage)

#	SECTION	ITEM DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL
AIP ELIGIBLE ITEMS						
1	Article 2-9.1	Agency Permits	LS	1		
2	FAA-105-3.1	Mobilization and Demobilization	LS	1		
3	P-100-3.1	Phasing	LS	1		
4	P-101-5.1	Mill Asphalt Pavement, 1" (Max)	SY	4,290		
5	P-101-5.2	Mill Asphalt Pavement, 2" (Max)	SY	114,110		
6	P-101-5.3	Mill Asphalt Pavement on PCC pavement, 2" (Max)	SY	1,400		
7	P-101-5.4	Mill Asphalt Pavement, 3" (Max)	SY	1,880		
8	P-101-5.5	Mill Asphalt Pavement, 0" to 4.5" (min.)	SY	157,790		
9	P-101-5.6	PCC Pavement Repairs (Spalls, Patches & Cracks)	LS	1		
10	P-101-5.7	Deep Crack Repair Asphalt Pavement	LF	52,000		
11	P-101-5.8	Remove Variable Depth PCC Pavement, 16" to 24"	SY	690		
12	P-101-5.9	Remove Inlet Structures/Headwalls	EA	12		
13	P-101-5.10	Remove Storm Drain Pipe	LF	2,030		
14	P-101-5.11	Obliteration/Removal of Airfield Markings	SF	329,000		
15	P-101-5.12	Obliteration/Removal of Temporary Airfield Markings	SF	116,010		
16	P-101-5.13	Remove Variable Depth Asphalt Erosion Control Pavement, 0 to 2"+	SY	84,700		
17	P-101-5.14	Remove Variable Depth Asphalt Pavement, 2" to 10"	SY	37,500		
18	P-101-5.15	Grind Variable Depth PCC Pavement Surface, 0" to 2"	SY	2,400		
19	P-101-5.16	Scratch Mill 1/4 - Inch Depth AC	SY	14,000		
20	P-102-5.1	Airport Safety and Security	LS	1		
21	P-151-4.1	Clearing and Grubbing	ACRE	60		
22	P-152-4.1	Unclassified Excavation for Embankment	CY	57,710		
23	P-152-4.2	Unsuitable Excavation	CY	1,140		
24	P-152-4.3	Subgrade Preparation, 12" Thick, 100% Compaction	SY	21,040		
25	P-152-4.4	Drainage Swale and Soil Stabilization Southeast of RWY 11L-29R	LF	520		
26	P-156-5.1	Temporary Air and Water Pollution, Soil Erosion, and Siltation Control	LS	1		
27	P-208-5.1	Aggregate Base Course	CY	4,700		
28	P-401-8.1	Asphalt Concrete Pavement (Surface Course)	TON	52,200		
29	P-403-8.1	Asphalt Concrete Pavement (Base and Surface Course)	TON	18,000		
30	P-501-8.1	18-inch PCC Pavement	SY	780		
31	P-501-8.2	18-inch Reinforced PCC Pavement	SY	940		
32	P-605-5.1	PCCP Joint Sealing Filler	LF	68,560		
33	P-620-5.1	Airfield Markings	SF	210,470		
34	P-620-5.2	Surface Painted Holding Position Signs	EA	33		
35	P-620-5.3	Temporary Airfield Markings	SF	83,500		
36	P-621-5.1	Sawcut Grooving	SY	130,000		

#	SECTION	ITEM DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL
37	P-901-5.1	Self-Adhesive Paving Membrane (12" wide)	LF	5,170		
38	P-902-7.1	Permanent Soil Stabilization	SY	71,270		
39	D-701-5.1	24-inch, RCP Class V Storm Drain Pipe	LF	20		
40	D-701-5.2	30-inch, RCP Class V Storm Drain Pipe	LF	75		
41	D-701-5.3	36-inch, RCP Class V Storm Drain Pipe	LF	62		
42	D-701-5.4	24-inch Pipe Collar	EA	1		
43	D-701-5.5	30-inch Pipe Collar	EA	2		
44	D-701-5.6	36-inch Pipe Collar	EA	2		
45	D-701-5.7	30-inch, RCP Class V Storm Drain Pipe Bend	EA	2		
46	D-701-5.8	30-inch, RCP Class V Storm Drain Pipe End Section	EA	1		
47	D-701-5.9	36-inch, RCP Class V Storm Drain Pipe End Section	EA	2		
48	D-751-5.1	Triple Ductile Iron Grate Catch Basin	EA	2		
49	D-751-5.2	Double Quad Ductile Iron Grate Catch Basin	EA	1		
50	T-901-5.1	Seeding	ACRE	70		
51	T-908-5.1	Mulching	ACRE	70		
52	F-170-5.1	14-foot High Temporary Portable Jet Blast Deflector	LS	1		
53	L-100-5.1	Remove and Salvage Taxiway / Runway Edge Light and Transformer, Demolish Fixture Base	EA	139		
54	L-100-5.2	Excavate and Remove Existing Conduit and Conductor	LF	10,432		
55	L-100-5.3	Remove and Salvage Elevated Runway Guard Light and Transformer, Demolish Fixture Base	EA	10		
56	L-100-5.4	Remove Existing Conductor, Conduit to Remain	LF	26,761		
57	L-100-5.5	Remove and Salvage In-Pavement Taxiway / Runway Edge Light and Transformer, Demolish Fixture Base	EA	9		
58	L-100-5.6	Remove and Salvage Airfield Guidance Sign and Transformer, Demolish Sign Base	EA	44		
59	L-100-5.7	Excavate and Remove Junction Can	EA	3		
60	L-100-5.8	Remove and Salvage In-pavement Taxiway Centerline Light and Isolation Transformer, Demolish Base Can	EA	16		
61	L-100-5.9	Remove and Salvage In-pavement Taxiway Centerline Light. Install Steel Cover on Existing Base	EA	17		
62	L-100-5.10	Remove and Salvage Retro Reflective Taxiway Edge Marker	EA	6		
63	L-100-5.11	Remove and Salvage REIL Unit for Reinstallation	EA	1		
64	L-100-5.12	Remove and Salvage In-pavement Light, Fill with Concrete and Install Steel Cover	EA	11		
65	L-100-5.13	Remove Hand Hole Lid	EA	16		
66	L-100-5.14	Re-Install Salvaged Retro Reflector Taxiway Edge Marker	EA	6		
67	L-100-5.15	Re-Install Salvaged REIL Unit	EA	1		
68	L-100-5.16	Excavate and Remove Existing Handhole	EA	4		
69	L-100-5.17	Remove and Salvage Elevated Runway Edge/Threshold Light and Install Temporary Steel Cover on Existing Base	EA	159		
70	L-100-5.18	Remove and Salvage Taxiway Edge Light and Install Temporary Wood Cover on Existing Base	EA	135		
71	L-100-5.19	New L-810 Obstruction Lights, Power Adapter and Circuit Jumper for Temporary Jet Blast Fence	LS	1		
72	L-100-5.20	Temporary Airfield Lighting Circuit Jumpers and Conduit	LF	10,590		
73	L-100-5.21	Storage Container (8' x 30' approx.) for FAA MALSR Equipment	EA	1		

#	SECTION	ITEM DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL
74	L-100-5.22	Temporary Install Existing Sign and Disconnect Upon Phase Completeion	EA	11		
75	L-100-5.23	Remove Temporary Inpavement L-850C Runway Lighting Return to Owner. Install Steel Blank Cover	EA	3		
76	L-100-5.24	Remove and Salvage L-858B Runway Distance Remaining Sign and Isolation Transformer. Demolish Sign Base	EA	2		
77	L-108-5.1	1/C #8-5kV L-824, Type 'C' Airfield Lighting Cable	LF	4,705		
78	L-108-5.2	2/C #8-5kV L-824, Type 'C' Airfield Lighting Cable	LF	14,945		
79	L-108-5.3	2/C, #6-5kV L-824 Type 'C' Airfield Lighting Cable	LF	27,020		
80	L-108-5.4	2/C, #6-5kV L-824 Type 'C' Airfield Lighting Cable - Temporary	LF	2,000		
81	L-108-5.5	Install New Temporary 2/C, #8, 5KV, L-824 Type "C" Airfield Lighting Cable in 2" Conduit Temp above Ground	LF	1,155		
82	L-108-5.6	Install New Temporary 2/C, #6, 5KV, L-824 Type "C" Airfield Lighting Cable in 2" Conduit Temp above Ground	LF	8,030		
83	L-110-5.1	Single-way (1) - 2" Conduit, Slurry Encased	LF	7,460		
84	L-110-5.2	Single-way (1) - 2" Conduit, Concrete Encased	LF	2,000		
85	L-110-5.3	Multiple-way, (2) - 2" Conduit, Concrete Encased	LF	850		
86	L-110-5.4	Single-way, (1) - 2" Conduit, Concrete Encased (Retrofit in Existing Full Strength Concrete Pavement)	LF	1,270		
87	L-110-5.5	Single-way, (1) - 2" Conduit, Directional Bore	LF	1,125		
88	L-110-5.6	Multiple-way, (6) - 4" Conduit, Concrete Encased	LF	280		
89	L-110-5.7	Multiple-way, (2) - 4" Conduit, Concrete Encased	LF	60		
90	L-115-5.1	New Handhole, Type I, (2'x3'x3') With Aircraft Rated (100,000 lb) Rated Lid Furnished and Installed	EA	7		
91	L-115-5.2	Retrofit Owner Furnished Handhole Aircraft Rated Lid on Existing Handhole and Furnish and Install New Cable Rack Arms	EA	15		
92	L-115-5.3	New Handhole, Type I, (2'x3'x3') With Aircraft Rated (100,000 lb) Rated Lid Furnished and Installed (Retrofit in Existing Full Strength Concrete Pavement)	EA	2		
93	L-804(L)-4.1	New LED L-804(L) Elevated Runway Guard Light and Transformer on New L-867 Base Can	EA	8		
94	L-804(L)-4.2	New LED L-804(L) Elevated Runway Guard Light and Transformer on New Shallow L-868 Base Can (Retrofit in Existing Full Strength Concrete Pavement)	EA	4		
95	L-804(L)-4.3	Elevated L-804(L) LED Runway Guard Light (with Stem and Frangible Coupling) and Isolation Transformer - Spares	EA	4		
96	L-850C-5.1	New In-Pavement L-850C Incandescent HIRL and Isolation Transformer on L-868 Base Retrofit in Existing Asphalt	EA	6		
97	L-850C-5.2	New Temporary In-Pavement L-850C Incandescent W/W HIRL and Transformer on L-868 Base Retrofit in Existing Asphalt	EA	3		
98	L-850C-5.3	New In-Pavement L-850C Incandescent W/W HIRL and Isolation Transformer - Spares	EA	1		
99	L-852G(L)-5.1	New Flush L-852G(L) Style 3 LED Runway Guidance Light and Transformer on New L-868 Base Can Retrofit in Existing Asphalt	EA	37		
100	L-852G(L)-5.2	New Flush L-852G(L) Style 3 LED Runway Guidance Light and Isolation Transformer - Spares	EA	4		
101	L-853-4.1	New Temporary Retro Reflector Taxiway Edge Marker	EA	8		
102	L-858(L)-6.1	Re-Install Salvaged L-858 Size 3, 2-Module Guidance Sign and Transformer with New Panels on New Sign Base	EA	6		
103	L-858(L)-6.2	Re-Install Salvaged L-858 Size 3, 3-Module Guidance Sign and Transformer with New Panels on New Sign Base	EA	8		
104	L-858(L)-6.3	Re-Install Salvaged L-858 Size 3, 4-Module Guidance Sign and Transformer with New Panels on New Sign Base	EA	8		
105	L-858(L)-6.4	New L-858(L) LED Size 3, Style 2, 2-Module, Airfield Guidance Sign on New Sign Base	EA	3		
106	L-858(L)-6.5	New L-858(L) LED Size 3, Style 2, 3-Module, Airfield Guidance Sign on New Sign Base (Retrofit in Existing Full Strength Concrete Pavement)	EA	2		
107	L-858(L)-6.6	New L-858(L) LED Size 3, Style 2, 4-Module, Airfield Guidance Sign on New Sign Base	EA	1		
108	L-858(L)-6.7	Re-Install Existing 3 Module Airfield Guidance Sign with New Shallow Transformer Housing (Retrofit in Existing Full Strength Concrete Pavement)	EA	14		

#	SECTION	ITEM DESCRIPTION	UNIT	QTY	UNIT PRICE	TOTAL
109	L-858(L)-6.8	New L-858(L) LED 2 Module Airfield Guidance Sign with New Shallow Transformer Housing (Retrofit in Existing Full Strength Concrete Pavement)	EA	4		
110	L-858(L)-6.9	New L-858(L) LED Size 3, 3 Module Airfield Guidance Sign and Transformer on New Sign Base	EA	1		
111	L-858(L)-6.10	Re-Install Salvaged L-858 Size 3, 4-Module Guidance Sign and Transformer on New Sign Base	EA	7		
112	L-858(L)-6.11	New Size 3 Temporary Airfield Guidance Sign Panels Installed in Existing Sign	EA	20		
113	L-858(L)-6.12	Re-Install Salvaged L-858 B Runway Distance Remaining Sign and Isolation Transformer on New Sign Base	EA	2		
114	L-861T(L)-4.1	Re-Install Salvaged Elevated Taxiway Light and Transformer on New L-867 Base Can	EA	75		
115	L-861T(L)-4.2	Remove Temporary Cover, Re-install Salvaged Taxiway Light on Existing Base with New Gasket	EA	140		
116	L-861T(L)-4.3	New Elevated L-861T(L) LED Taxiway Edge Light and Transformer on Existing Base Can	EA	18		
117	L-861T(L)-4.4	New L-861T(L) LED Taxiway Edge Light and Transformer on New Shallow L-868 Base Can (Retrofit in Existing Full Strength Concrete Pavement)	EA	17		
118	L-861T(L)-4.5	New L-861T(L) LED Taxiway Edge Light and Transformer on New L-868 Base Can (Retrofit in Existing Asphalt)	EA	22		
119	L-861T(L)-4.6	New Elevated L-861T(L) LED Taxiway Edge Light and Transformer on New L-867 Base Can With Enhanced Drain	EA	9		
120	L-861T(L)-4.7	New L-861T(L) LED Taxiway Edge Light and Transformer on New Shallow L-868 Base Can (Retrofit in Existing Full Strength Concrete Pavement) With Enhanced Drain	EA	9		
121	L-861T(L)-4.8	Elevated L-861T(L) LED Taxiway Edge Light (with Stem and Frangible Coupling) and Isolation Transformer - Spares	EA	7		
122	L-861T(L)-4.9	Remove temporary wood cover and reinstall salvaged in-pavement taxiway centerline light. Provide spacers to adjust to new grade	EA	18		
123	L-862-5.1	Remove Temporary Cover, Re-install and Re-Aim Salvaged Runway Light with New Transformer on Existing Base	EA	107		
124	L-862-5.2	New Temporary L-862E R/R High Intensity Runway End Edge Light and Transformer on Temporary Mounting	EA	8		
125	L-862-5.3	New Temporary L-862 High Intensity Runway Edge Light (W/W) and Transformer on Existing L-867 Base Can with New Gasket	EA	8		
126	L-862-5.4	New Temporary L-862T G/G High Intensity Threshold Light and Transformer on Temporary Mounting	EA	32		
127	L-862-5.5	New Temporary L-862 High Intensity Runway Edge Light (W/W) and Transformer on Temporary Mounting	EA	38		
128	L-867/868-6.1	Remove Temporary Cover on MALSR Base Can	EA	65		
129	L-867/868-6.2	Install Steel Cover on Existing Base Can	EA	14		
130	L-867/868-6.3	Install Temporary Steel Cover on Existing MALSR Base Can	EA	65		
131	L-880B-5.1	Install Temporary L-880(B) 4-Box PAPI, Isolation Transformer and Base Can with Grounding, Mounting with Temporary Conduit and Cables Between Light Units, Complete in Place, Aimed and Tested	EA	3		
132	L-880B-5.2	Install Temporary Conduit and Conductor for Feeding Temporary PAPI (2/C, #8, 5KV, L-824 Type "C" Airfield Lighting Cable in 2" C)	LF	739		
TOTAL AIP ELIGIBLE ITEMS						

NON-AIP ITEMS						
132	P-620-5.1	Airfield Markings	SF	13,500		
133	P-632-8.1	Bituminous Pavement Rejuvenator/Sealer	SY	13,760		
TOTAL NON-AIP ELIGIBLE ITEM						

GRAND TOTAL IN NUMBERS AIP AND NON-AIP ITEMS

GRAND TOTAL IN WORDS AIP AND NON-AIP ITEMS _____

10112-254 – REHABILITATE RUNWAY 11L-29R AND CONNECTOR TAXIWAYS
REQUEST FOR CLARIFICATION ON BID DOCUMENTS
Questions received from a Contractor, 5-30-17

1. The bid schedule does not include measurement of approximately 84,000 SY of +/- 2" Erosion Control Pavement removals or approximately 15,000 SY of Variable Depth Shoulder Pavement removals. Please clarify method and measurement of pavement for these items of work.

ANSWER – The method of measurement of the Erosion Control Pavement is based on the removal drawings (cadd files) and the boundaries of these areas in the construction plans. The Variable Depth Shoulder removal is based on the removal drawings (cadd files) and the boundaries of the shoulder removal areas in the construction plans. The Shoulder Pavement quantity is included in Item 17 Remove Variable Depth Asphalt Pavement 2" to 10" and this bid item has been revised (increased) and the updated quantity was issued in Addendum 1, issued on May 31, 2017.

2. Specification 152-2.2(b) specifies that proof rolling must be done with a pneumatic-tired roller with each tire loaded to a minimum of 30,000 pounds. Should this read that the roller should weight a minimum of 30,000 pounds? As written this specification is requiring a roller weighing 120 Tons which does not exist.

ANSWER – The Specification section is directly for the FAA Guide Specifications and appears to have an error in the description of the roller. The specification section will be revised and issued as an Addendum. The revised specification section will read, "After compaction is completed, the subgrade shall be proof rolled with a heavy pneumatic-tired roller having four or more tires abreast. The roller shall weigh more than 30,000 pounds and each tire shall be inflated to a minimum of 125 psi in the presence of the Engineer."

3. Bid documents state that nightly closures will commence at 2100 Hours. How will the contractor be compensated for cost and time when airport operations delay the closure time effectively reducing work windows?

ANSWER – See Master General Conditions, Section 9.7, page 24 of 40 for details of Contractor Claims For Delay.

4. Are the existing electrical handholes to receive the retrofit lid per Detail 3/E255 one-piece or two-piece units? Will the existing structure walls need to be saw cut to remove the existing lids or can the existing lids be removed without saw cutting? Both types have been encountered at TIA with a significant cost difference between the two.

ANSWER - This information is not available. Contractor shall proceed with worst case scenario.

5. Item L-880B-5.1 is missing from the Bid Schedule. It is identified in the specifications but not on the schedule

ANSWER -- L-880B-5.1 is in the Bid Sheet line 130 ItemL-880B-5.1.

6. Item L-100-5.4 has a unit of measure of LS on the Bid Schedule with a quantity of 26,761.

10112-254 – REHABILITATE RUNWAY 11L-29R AND CONNECTOR TAXIWAYS
REQUEST FOR CLARIFICATION ON BID DOCUMENTS
Questions received from a Contractor, 5-30-17

ANSWER - The Bid Sheet line 56 Item L-100-5.4 UNIT should read LF.

7. How will the Temporary Airfield Guidance signs per Detail 2/G507 measured and paid? Please provide an item on the Bid Schedule.

ANSWER - This information is covered in the Bid Sheet Line 74 Item L-100-5.22.

8. Please provide a copy of the Geotechnical Report to plan holders in lieu of requiring bidders to go view it at the engineer's office.

ANSWER – The Geotechnical Report is available at the TAA web site
<https://www.flytucson.com/taa/business/bids-rfps/> for downloading.

10112-254 – REHABILITATE RUNWAY 11L-29R AND CONNECTOR TAXIWAYS
REQUEST FOR CLARIFICATION ON BID DOCUMENTS
Question for Contractor 6-1-17

1. Please provide additional information pertaining to the variable asphalt pavement thicknesses on the runway, taxiway's and shoulders. With the information provided in the milling and paving plans there is insufficient detail to adequately quantify and estimate the limits of alternating pavement thicknesses. In order to achieve the P401 specification requirements for smoothness, density, and overall consistency, a constant pavement thickness is needed by paving lane within each phase of work. Areas requiring leveling courses need to be clearly bounded and quantifiable on the plans. As the plans currently stand, pavement thicknesses regularly vary numerous times in short length intervals. This will result in differential compaction along with a variety of other quality, cost, and schedule disparities. Additionally, this will make it nearly impossible to maintain the asphalt surfaces in the future as there will be significant variability in underlying lift thicknesses.

One potential solution is to revise the milling plan to mill to grades (profile mill) that keep the milled surface safely away from underlying pavement lifts while maintaining consistent pavement thicknesses by paving lane. In areas where the milled surface is within +/- 1" of existing pavement lifts, specify additional milling of 1"-2" and a leveling course. Separate pay items for this additional milling and leveling course paving would be appropriate as to prevent convoluting the other milling and paving items with materially different scopes of work.

ANSWER – The mill to grade (profile mill) does not work for this project because the existing asphalt surface, except for a section of the keel section on the west end of the runway previously replaced, has to be milled to a depth of 4 ½" to remove a previous 4" poor quality asphalt overlay. The surface is being milled a ½" deeper than the previous overlay thickness to insure all the poor quality asphalt is removed. In addition to asphalt being replaced for the 4 ½" milling additional asphalt material is being placed to correct the longitudinal and transverse gradient of the pavement to meet current FAA gradient criteria.

2. Please clarify the method and measurement of payment for the 4' wide by 2" thick asphalt minimum maintenance/housekeeping pads around sign bases in unpaved areas per Note 7 on Sheet E251. Does this apply to new signs only or both new and existing signs? Is the asphalt gradation per P403 specifications acceptable?

ANSWER – The asphalt shall be measured and paid for under P-403 item and the maintenance/housekeeping pads apply to new signs only.

3. Please clarify the method and measurement of payment for the type G Joints on Sheet C457. Does this detail apply only to Asphalt to PCCP joints or is it need at all interfaces between asphalt and concrete (i.e. MALSRs, Handholes, Sign Bases, Light Cans, ect.)?

10112-254 – REHABILITATE RUNWAY 11L-29R AND CONNECTOR TAXIWAYS
REQUEST FOR CLARIFICATION ON BID DOCUMENTS

Question for Contractor 6-1-17

ANSWER – The G Joint only applies to the asphalt to PCC Pavement not to the interface between
MALSR, Handholes, Sign Bases, Light Cans ... etc.

4. Please clarify the method and measurement of payment for the 4' Diameter x 2" thick AC aprons
specified around existing edge lights in undisturbed shoulders? See Note 6 on Sheet C401
(typical).

ANSWER – The asphalt shall be measured and paid for under P-403 item.

10112-254 – REHABILITATE RUNWAY 11L-29R AND CONNECTOR TAXIWAYS
REQUEST FOR CLARIFICATION ON BID DOCUMENTS
Contractor Questions 6-6-17

1. Please consider extending the bid date by approximately 1 week to accommodate the previous question regarding variable pavement thicknesses sent on 6/1/17. Once clarification to the variable pavement question is provided we need an adequate amount of time to takeoff, estimate, and coordinate with potential suppliers.

ANSWER- No extension will be given.

2. Temporary construction for safe-up within night work closure areas:
 - a. Please clarify the safe-up requirements within night work closure areas specific areas within the TSA and RSA.

ANSWER – See sheet G007, SAFETY AND SECURITY notes and the referenced FAA Advisory Circulars. The construction areas that are within the Runway Safety Area (RSA), Runway Obstacle Free Area (ROFA), Taxiway Safety Area (TSA), and Taxiway Obstacle Free Area (TOFA) have to meet FAA criteria. Additionally, TAA Operations will conduct an inspection an area before it is re-opened to aircraft traffic.

- b. Please clarify method and measurement of payment for temporary milling and paving required on runways, taxiways, and shoulders to accommodate temporary transitions within night work closure areas.

ANSWER- The method and measurement for temporary milling will be paid for under the Removal Item for milling depending on the thickness, the asphalt will be paid for under P-401 or P-403 depending on which course the transition occurs in will be measured in the field based on the actual construction and the Contractor Paving Plan.

3. Please clarify the method and measurement of payment for rubber removal.

ANSWER- Rubber removal is not anticipated to be needed as the locations for the Temporary Threshold markings are in areas where there would not be rubber removal and in most cases the temporary marking would be removed within days of placement and would be replaced nightly on new asphalt. Rubber removal of the existing markings on the existing PCC Runway ends will not be required as the existing marking will be removed and subsequently remarked in the same location in a later Phase of the project.

4. Please clarify the method and measurement of payment for the sign detailed on Sheet C754.

ANSWER- The sign is not needed and has been deleted from the project. See revised sheet in this Addendum.

5. The bid documents reference the use of ADOT 404 Asphaltic Concrete as alternative to the P-403 mix. ADOT 404 covers Bituminous Treatments such as prime coats, tack coats, fog coats, and chip seals. Should the bid documents reference ADOT 406 not ADOT 404?

10112-254 – REHABILITATE RUNWAY 11L-29R AND CONNECTOR TAXIWAYS
REQUEST FOR CLARIFICATION ON BID DOCUMENTS
Contractor Questions 6-6-17

ANSWER- There was a typo in the bid documents for the reference. However, the use of ADOT asphalt has been deleted from project. The typical section drawings have been revised and are issued in Addendum 2.

6. Bid items #72, 80, 81, 82 & 131 all refer to temporary conduits/conductors. Does each bid item include conduit, anchoring of conduit and noted conductors?

ANSWER- Yes each bid item includes all anchoring of conduit and conductors.

7. Will payment be made at the contract unit price for asphaltic concrete cut-back for joint construction?

ANSWER- No, the cut-back asphalt is incidental to the joint construction.

8. Instead of wired obstruction lighting on the portable blast deflectors detailed on Sheet G504, will Carmanah OL4 Solar LED General Purpose Hazard Marker be acceptable? The OL4 specs state Acceptable for barricade and construction applications at Commercial Part 139 Airports under FAA Advisory Circular AC 150/5370-2E.

ANSWER- No, the Carmanah OLD4 Solar LED light is not acceptable. The light on the blast deflector is an obstruction light and the Carmanah OLD4 Solar LED light does not meet the FAA L-810 Steady Burning Obstruction Light criteria.

9. The specified portable jet blast deflectors, BDI model G14NB-6P, are rated for 40PSF/125mph or taxi/breakaway power settings. At these low taxi power settings, the manufacturer states, "No aircraft shall be operated with engine nozzle closer than 60' and no tail closer than 35' to the leading edge of the blast deflector." We understand that the deflectors will be used to protect crew working on an active runway. What are the distances from the departing aircraft to the jet blast deflectors? We are concerned about potential sliding or overturn.

ANSWER- The Blast Deflectors are located over 1,000 feet from the point (temporary runway threshold) where aircraft will power up for take-off. The concrete foundation and the steel structure that supports the blast deflector will be heavy enough to prevent the unit from sliding or overturning.

10. Item 9 P-101-5.6 PCC Pavement Repairs (Spalls, Patches, and Cracks) is a LS item. The plan sheets indicate locations of: Medium Patch, Large Patch, Medium Spall, and Large Spall. However no sizes are indicated for the medium or large patches and spalls. Additionally, no cracks are identified. Could typical patch/spall sizes be called out, and an approximate crack quantity be identified?

ANSWER- The spall and patch repair sizes are identified on the plans and typically have the following sizes, small and medium are less than 5 square feet and the large are greater than 5 square feet. The cracks on the existing asphalt runway, taxiway and shoulder will be milled out and the crack quantity is an estimate of what cracks may be found in the asphalt surface after the milling is completed.

10112-254 – REHABILITATE RUNWAY 11L-29R AND CONNECTOR TAXIWAYS
REQUEST FOR CLARIFICATION ON BID DOCUMENTS
Contractor Questions 6-6-17

11. The drainage details indicate rip rap at some of the drainage inlets and outlets. There is no bid item for rip rap. Is this rip rap incidental to other items – drainage/temp air and water pollution, soil erosion, and siltation control?

ANSWER- The rip rap is incidental to the drainage item to be constructed.

10112-254 – REHABILITATE RUNWAY 11L-29R AND CONNECTOR TAXIWAYS
REQUEST FOR CLARIFICATION ON BID DOCUMENTS
Contractor Question 6-6-17

1. Please clarify the method and measurement of payment for the following:
 - a. Removal Plan sheet 06 (sht 161/C206) shows the removal of a concrete swale

ANSWER - The removal of the concrete swale is measured as a unit (each one removed) and is paid for under Item P-101-5.9.

- b. Removal Plan sheet 11 (sht 166/C211) shows the removal of a concrete Y ditch

ANSWER – The removal of the concrete swale is measured as a unit (each one removed) and is paid for under Item P-101-5.9.

10112-254 – REHABILITATE RUNWAY 11L-29R AND CONNECTOR TAXIWAYS
REQUEST FOR CLARIFICATION ON BID DOCUMENTS
Contractor Questions 6-6-17

- 1.) Specification section P-401 HMA requires the use of a material transfer vehicle. Will this be required, or will a windrow elevator (Ko-Cal) be acceptable? Additionally in Section P-403 it states a material transfer vehicle is not required. Please clarify.

ANSWER – A windrow elevator is not acceptable, provide a material transfer machine. A material transfer vehicle is not required for P-403 placement.

- 2.) Recognizing that only the paper plans are part of the contract documents, however in order to assist with takeoffs, will the CAD files be made available during the bid in order to ensure a thorough analysis of the anticipated quantities and to try and mitigate any discrepancies prior to bid?

ANSWER – CAD file will not be provided to bidder. The CAD file will be provided to the successful Contractor that the project is awarded to.

- 3.) Please clarify the intent of the Pavement Spot Elevation Plan sheets.

- a. Is the paving to be constructed to those final grades, or is it to be milled and replaced, matching the existing grades (i.e. mill 4.5", replace 4.5")?

ANSWER – Asphalt shall be constructed to the finish grade, not a mill and replace

- b. Or, is it anticipated to mill to the depths shown and replace to the thickness as noted to the final grade elevation (i.e. variable depth mill, at a given location mill 8", replace 8")?

ANSWER – The existing asphalt surface shall be milled to a 4.5" depth, except for a portion of the keel on the west end and the asphalt shall be place to the finish grades shown on the plans.

- c. Or, is it anticipated to mill a set depth (i.e. mill 4.5", replace variable thickness to the spot elevation shown at a given location replace 8")?

ANSWER – This scenario is correct.

- d. If (b) or (c), how will the paving be constructed as to not leave a vertical edge which would not be permitted under FAA rule?

ANSWER – At the conclusion of each nights paving the edges of the pavement is required to place wedges per Sheet G500, Detail 8. The requirement is a temporary paving wedge shall be place at the edge of the paving lane. The wedge shall be 15' in length for each inch of elevation difference. The quantity estimate for P-403 includes about 5% increase of the quantity to account for the wedge.

10112-254 – REHABILITATE RUNWAY 11L-29R AND CONNECTOR TAXIWAYS
REQUEST FOR CLARIFICATION ON BID DOCUMENTS
Contractor Questions 6-6-17

- e. Additionally if (b), it would be impossible to mill up to 12.5” in one night and replace back to existing to ensure an even match to the existing adjacent asphalt to allow for airport operations.

ANSWER – Not sure where the 12” mill in the question is from but, the mill depth is 4.5” or less. Depending on the paving plan, it might be possible to remove and replace the 4.5” depth asphalt.

- 4.) The quantities in the bid schedule for Item 105 and item 106 don’t match what it is on the drawings. The bid schedule show quantity of 3 for item 105 and quantity of 2 for item 106. The drawings show a quantity of 7 for 105 and quantity of 3 for 106. Which one is correct the bid schedule or the drawings?

ANSWER - The bid tab is correct for item 105 and 106.

- 5.) Bid schedule Item 112 said New Size 3 Temporary Airfield Guidance Sign Panels Installed in Existing Signs. Where in the drawings show the location of the existing signs requiring temporary airfield sign panels?

ANSWER - This is a typo Refer to revised Bid Sheets.

- 6.) Drawing E256 show the detail for the 5 module airfield guidance sign with a 3 module and a 2 module sign but one concrete base. Where is the concrete base to be included in the bid schedule? The same happened for the 6 module airfield guidance sign.

ANSWER - The detail is a representation of the combination of the two signs. The concrete base shall be per the combination of the two signs Bid Sheets.

- 7.) Drawing E204, note 16 shows an existing airfield guidance sign with new panels. Where in the bid schedule are the panels to be included?

ANSWER - Refer to line 112 in Bid Sheet

- 8.) Drawing E204, where in the bid schedule are the materials for note 25 need to be included?

ANSWER - Refer to line 117 in Bid Sheet

- 9.) Is it the expectation that the runway centerline lights are to be removed and reinstalled during the same shift?

ANSWER - Refer to Phasing drawings for work to be performed.

- 10.) Airfield Electrical Plan lacks centerline light modifications for Taxiway A10.

10112-254 – REHABILITATE RUNWAY 11L-29R AND CONNECTOR TAXIWAYS
REQUEST FOR CLARIFICATION ON BID DOCUMENTS
Contractor Questions 6-6-17

ANSWER - Refer to sheet E107.

11.) Can the bid form be provided in excel format?

ANSWER – No.

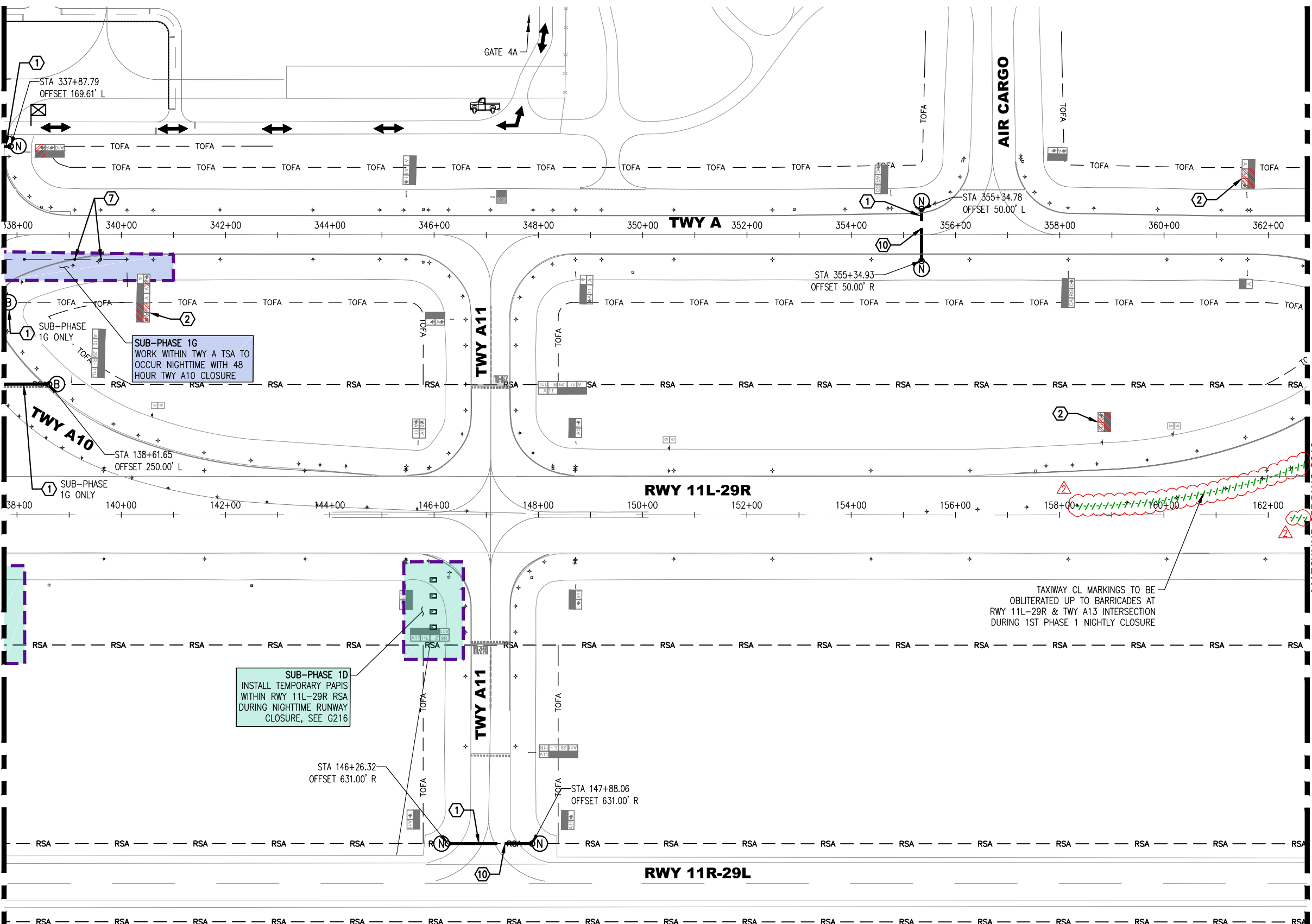
12.) We would like to request a ten (10) day extension to the bid due date in order to allow more time for subcontractors and suppliers to submit pricing and to ensure adequate time for DBE participation.

ANSWER – No extension is given.

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MATCHLINE, SEE DWG G210

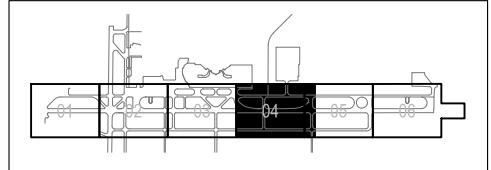
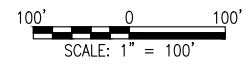
MATCHLINE, SEE DWG G212



LEGEND:

- RSA --- RUNWAY SAFETY AREA
- ERSA --- EXTENDED RUNWAY SAFETY AREA
- TOFA --- TAXIWAY OBJECT FREE AREA
- DAY & NIGHT CONSTRUCTION AREA
- NIGHTTIME ONLY CONSTRUCTION AREA
- HAUL ROUTE - ACCESS ROUTE (TWO WAY TRAFFIC)
- FLAGGER - NO ATCT RADIO COMMUNICATION
- BARRICADES, (DAYTIME & NIGHTTIME), SEE DETAILS 1, 2, 3, & 4, DWG G500
- BARRICADES, (DAYTIME ONLY)
- BARRICADES, (NIGHTTIME ONLY)
- RUNWAY CLOSURE LIGHTED 'X', SEE DETAIL 5, DWG G500
- PAVEMENT MARKINGS TO BE OBLITERATED
- AIRFIELD SIGNS TO BE COVERED, SEE DETAIL
- FOLLOW ME TRUCK IN SIDA AREA ONLY

- WORK TO BE PERFORMED:**
1. PLACE BARRICADES & LIGHTED "X"'S FOR NIGHTLY RUNWAY & TAXIWAY CLOSURES.
 2. COVER AIRFIELD SIGNAGE.
 3. ADD RWY EDGE LIGHT BASE CAN & CONDUIT AT TWY D/A2 INTERSECTION, SEE DWG G220.
 4. REMOVE EXISTING TWY A7 SHOULDER & EROSION CONTROL PAVEMENT. CONSTRUCT NEW FULL STRENGTH & SHOULDER FILLET GEOMETRY.
 5. REMOVE, SALVAGE AND RE-INSTALL AIRFIELD LIGHTING & SIGNAGE, SEE E100 & E200 SERIES FOR DETAILS (TYP).
 6. NEW TWY A7 PAVEMENT MARKINGS, SEE C700 SERIES FOR LAYOUT (TYP).
 7. INSTALL NEW AIRFIELD LIGHTING, SEE E100 & E200 SERIES FOR DETAILS (TYP).
 8. OBLITERATE EXISTING PAVEMENT MARKINGS, SEE G502 FOR DETAILS.
 9. REMOVE AIRFIELD HANDHOLE A7-2. INSTALL NEW HANDHOLE & EXTEND EXISTING DUCTBANK. SEE E100 & E200 SERIES FOR DETAILS (TYP).
 10. 15' BARRIER GAP FOR ARFF ACCESS ROUTE. SEE DWG G501 FOR DETAILS.
 11. SIGN TO BE PLACED AT BARRIER GAP, SEE DWG G501 FOR DETAILS.



KEY PLAN

AECOM
333 EAST WETMORE ROAD, SUITE 400
TUCSON, AZ 85705 T 520.887.1900

PLANS PREPARED BY:

NO.	REVISIONS / SUBMISSIONS	DATE
1	TEMPORARY PAPI REVISION	05.12.17
2	ADDENDUM #2	06.08.17

TUCSON
AIRPORT AUTHORITY
REHABILITATE RUNWAY 11L-29R
AND CONNECTOR TAXIWAYS

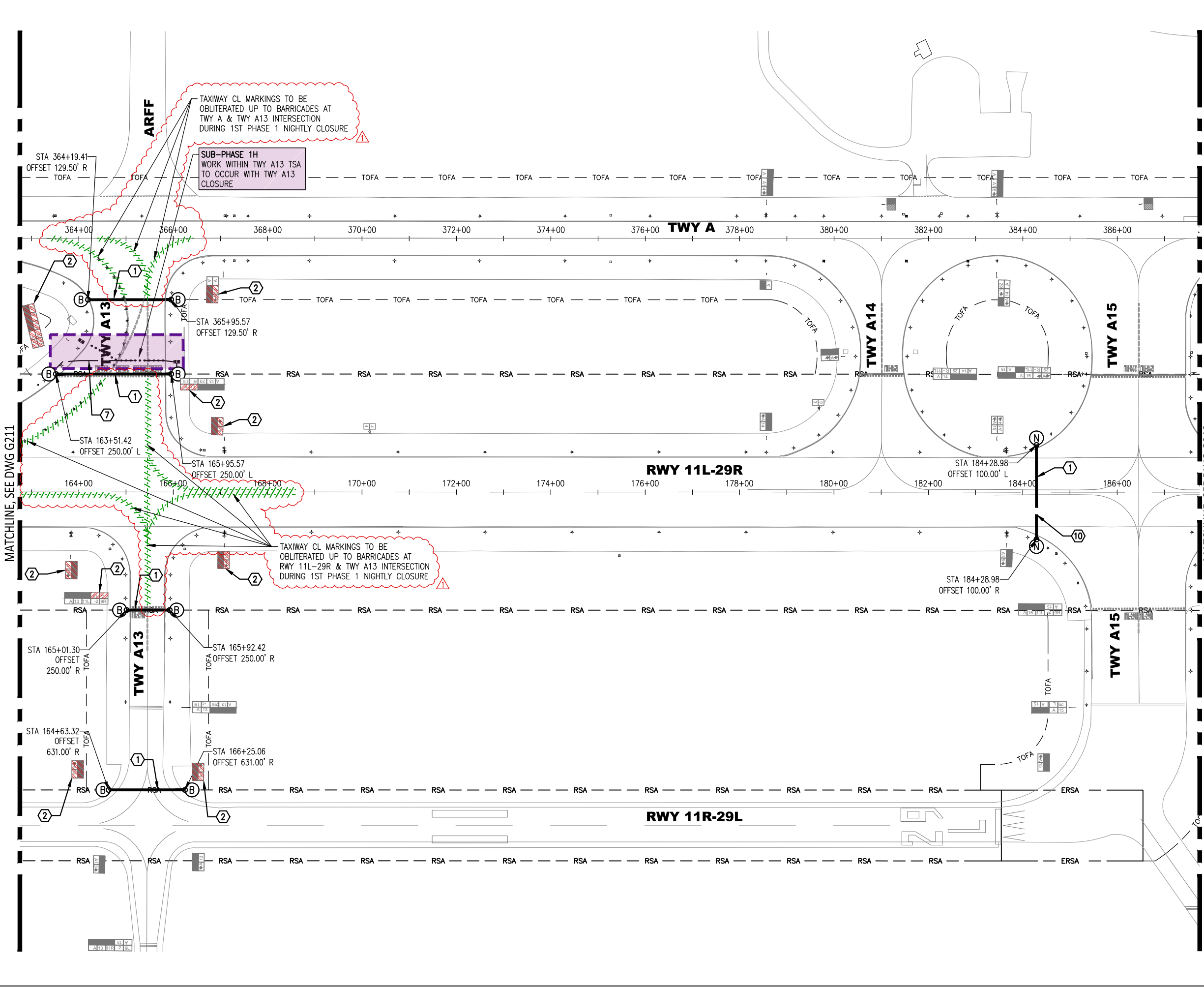
BID SET

DESIGNED BY: HF	DRAWN BY: HF	CHECKED BY: JC
DATE: 04.19.17	SCALE: PER PLAN	TAA PROJ.#: 10112254

PHASE 1 - AIRFIELD CLOSURES & CONSTRUCTION SEQUENCING
PLAN 4

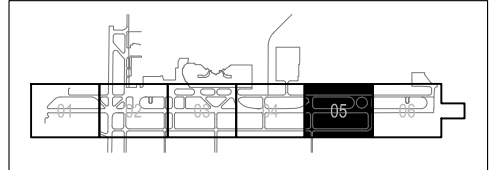
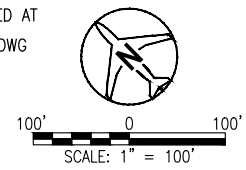
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G211
SHEET 25 OF 410

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- LEGEND:**
- RSA --- RUNWAY SAFETY AREA
 - ERSA --- EXTENDED RUNWAY SAFETY AREA
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 - BARRICADES, (DAYTIME ONLY)
 - BARRICADES, (NIGHTTIME ONLY)
 - RUNWAY CLOSURE LIGHTED 'X', SEE DETAIL 5, DWG G500
 - PAVEMENT MARKINGS TO BE OBLITERATED
 - AIRFIELD SIGNS TO BE COVERED, SEE DETAIL 7
 - FOLLOW ME TRUCK IN SIDA AREA ONLY

- WORK TO BE PERFORMED:**
1. PLACE BARRICADES & LIGHTED "X"'S FOR NIGHTLY RUNWAY & TAXIWAY CLOSURES.
 2. COVER AIRFIELD SIGNAGE.
 3. ADD RWY EDGE LIGHT BASE CAN & CONDUIT AT TWY D/A2 INTERSECTION, SEE DWG G220.
 4. REMOVE EXISTING TWY A7 SHOULDER & EROSION CONTROL PAVEMENT. CONSTRUCT NEW FULL STRENGTH & SHOULDER FILLET GEOMETRY.
 5. REMOVE, SALVAGE AND RE-INSTALL AIRFIELD LIGHTING & SIGNAGE, SEE E100 & E200 SERIES FOR DETAILS (TYP).
 6. NEW TWY A7 PAVEMENT MARKINGS, SEE C700 SERIES FOR LAYOUT (TYP).
 7. INSTALL NEW AIRFIELD LIGHTING, SEE E100 & E200 SERIES FOR DETAILS (TYP).
 8. OBLITERATE EXISTING PAVEMENT MARKINGS, SEE G502 FOR DETAILS.
 9. REMOVE AIRFIELD HANDHOLE A7-2. INSTALL NEW HANDHOLE & EXTEND EXISTING DUCTBANK. SEE E100 & E200 SERIES FOR DETAILS (TYP).
 10. 15' BARRIER GAP FOR ARFF ACCESS ROUTE. SEE DWG G501 FOR DETAILS.
 11. SIGN TO BE PLACED AT BARRIER GAP, SEE DWG G501 FOR DETAILS.



PLANS PREPARED BY: AECOM
 333 EAST WETMORE ROAD, SUITE 400
 TUCSON, AZ 85705 T 520.887.1800

DESIGNED BY: HF
DRAWN BY: HF
CHECKED BY: JC
DATE: 04.19.17
SCALE: PER PLAN

TAA PROJ.#: 10112254

REVISIONS / SUBMISSIONS

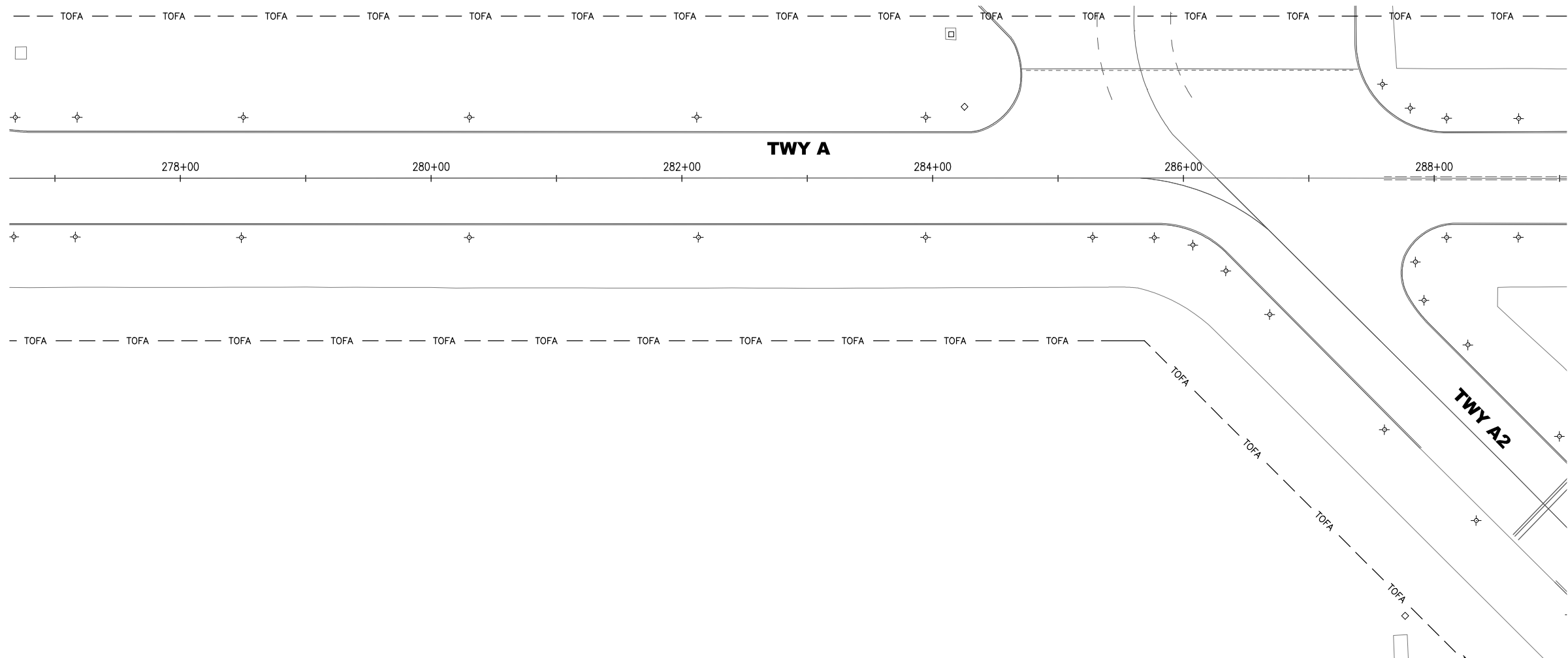
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1	06.08.17	ADDENDUM #2

TUCSON AIRPORT AUTHORITY
REHABILITATE RUNWAY 11L-29R AND CONNECTOR TAXIWAYS

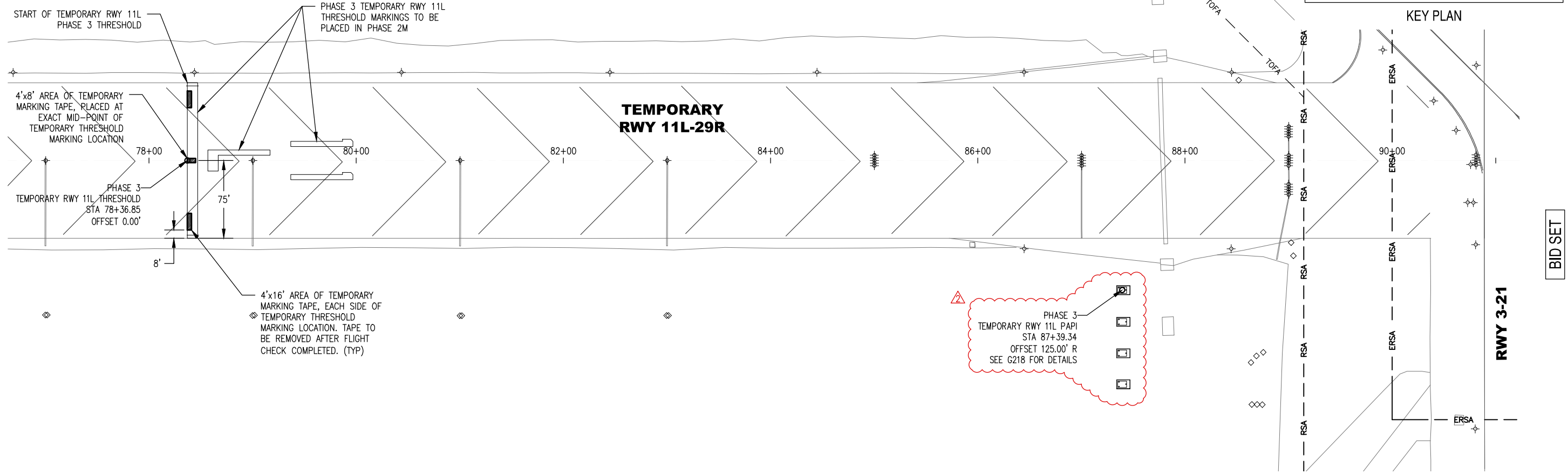
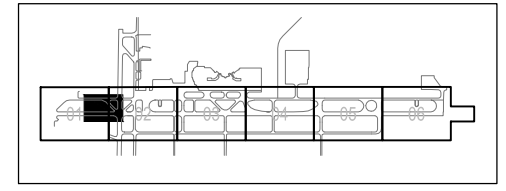
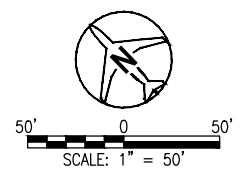
PHASE 1 - AIRFIELD CLOSURES & CONSTRUCTION SEQUENCING PLAN 5

SHEET REFERENCE NUMBER: G212
 SHEET 26 OF 410

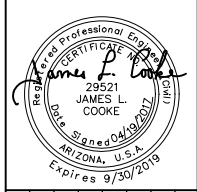
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- LEGEND:**
- RSA --- RUNWAY SAFETY AREA
 - ERSA --- EXTENDED RUNWAY SAFETY AREA
 - TOFA --- TAXIWAY OBJECT FREE AREA



PLANS PREPARED BY:
AECOM
 333 EAST WETMORE ROAD, SUITE 400
 TUCSON, AZ 85705 T 520.887.1800



NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM #2	06.08.17
2	TEMPORARY PAPI REVISION	05.12.17

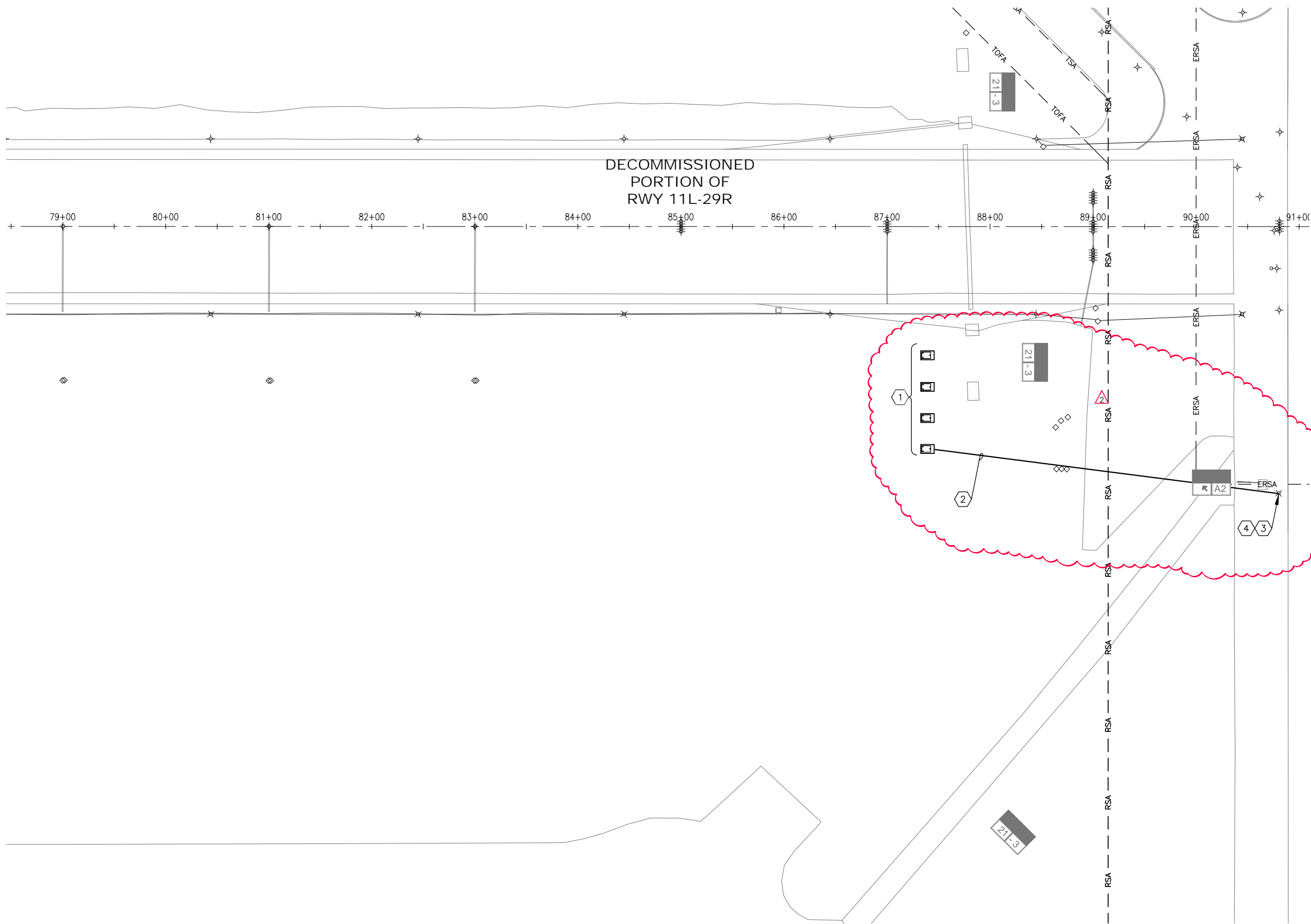
TUCSON
 AIRPORT AUTHORITY
 REHABILITATE RUNWAY 11L-29R
 AND CONNECTOR TAXIWAYS

DESIGNED BY: HF	DRAWN BY: HF
CHECKED BY: JC	DATE: 04.19.17
SCALE: PER PLAN	TAA PROJ.# 10112254

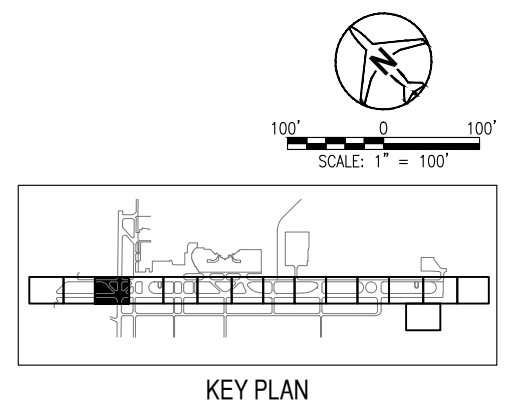
BID SET

SHEET OVERVIEW TITLE
 PHASE 1D - TEMPORARY PAPI
 INSTALLATION AT PHASE 3 RWY
 11L THRESHOLD & TEMPORARY
 FLIGHT CHECK MARKINGS

SHEET REFERENCE NUMBER:
G215
 SHEET 29 OF 410



- WORK TO BE PERFORMED:**
- 1 INSTALL TEMPORARY L-880(B) PAPI SYSTEM - CONNECT TO EXISTING 6.6A RUNWAY CIRCUIT AT NEAREST EDGE LIGHT. SEE DETAIL G509
 - 2 INSTALL TEMPORARY CONDUIT AND CONDUCTOR FOR FEEDING TEMPORARY PAPI. (2/C, #8, 5KV, L-824 TYPE "C" AIRFIELD LIGHTING CABLE IN 2"C).
 - 3 EXISTING RUNWAY EDGE LIGHT.
 - 4 EXISTING RUNWAY 3-21 CIRCUIT SHALL REMAIN ENERGIZED DAY AND NIGHT DURING THE DURATION OF CONSTRUCTION.



BID SET

PLANS PREPARED BY:

16719 East Palisades Blvd., Suite 202
Fountain Hills, AZ 85268
Phone: (480) 816-5341
Fax: (480) 816-5340
www.creng.com

36696
CATHERINE M.
ALCORN
Arizona, P.E.
Expires 9/30/2019

NO.	REVISIONS / SUBMISSIONS	DATE
2	ADDENDUM #2	06/06/17
1	TEMPORARY PAPI	05/12/17

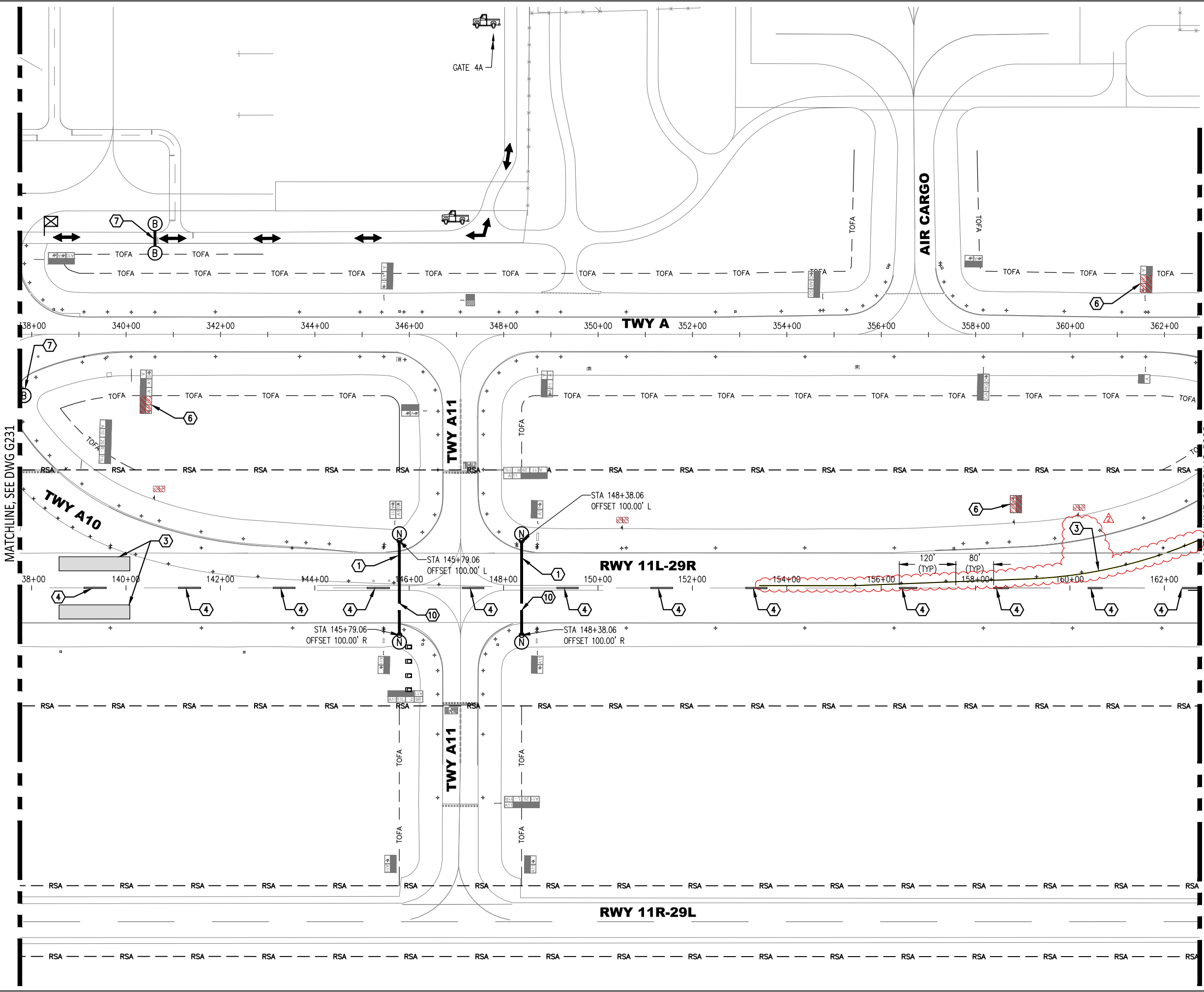
TUCSON
AIRPORT AUTHORITY
REHABILITATE RUNWAY 11L-29R
AND CONNECTOR TAXIWAYS

DESIGNED BY: KL	DRAWN BY: JW
CHECKED BY: CA	DATE: 06.01.17
SCALE: PER PLAN	TAA PROJ.# 10112254

SHEET OVERVIEW TITLE
PHASE 1D - TEMPORARY PAPI AT PHASE 3 RWY 11L THRESHOLD ELECTRICAL DETAILS

SHEET REFERENCE NUMBER:
G218
 SHEET 32 OF 410

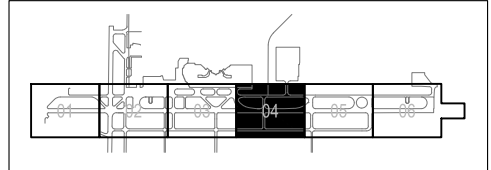
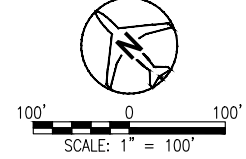
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LEGEND:

- RSA --- RUNWAY SAFETY AREA
- ERSA --- EXTENDED RUNWAY SAFETY AREA
- TOFA --- TAXIWAY OBJECT FREE AREA
- DAY & NIGHT CONSTRUCTION AREA
- NIGHTTIME ONLY CONSTRUCTION AREA
- HAUL ROUTE - ACCESS ROUTE (TWO WAY TRAFFIC)
- FLAGGER - NO ATCT RADIO COMMUNICATION
- BARRICADES, (DAYTIME & NIGHTTIME), SEE DETAILS 1, 2, 3, & 4, DWG G500
- BARRICADES, (DAYTIME ONLY)
- BARRICADES, (NIGHTTIME ONLY)
- RUNWAY CLOSURE LIGHTED "X", SEE DETAIL 5, DWG G500
- PAVEMENT MARKINGS TO BE OBLITERATED
- PAVEMENT MARKINGS TO BE OBLITERATED
- AIRFIELD SIGNS TO BE COVERED, SEE DETAIL 7
- (7) G500
- FOLLOW ME TRUCK IN SIDA AREA ONLY

- WORK TO BE PERFORMED:**
1. PLACE BARRICADES & LIGHTED "X"'S FOR NIGHTLY RUNWAY & TAXIWAY CLOSURES.
 2. COVER AIRFIELD SIGNAGE.
 3. PLACE TEMPORARY RUNWAY & TAXIWAY MARKINGS FOR PHASE 2 THRESHOLD LOCATIONS, SEE G235 AND G235A FOR LAYOUT.
 4. PLACE TEMPORARY RUNWAY CENTERLINE SEGMENTS TO RE-SET MIDPOINT.
 5. PLACE TEMPORARY JET BLAST DEFLECTOR.
 6. REMOVE SIGN COVERS PLACED FOR PHASE 1 RUNWAY CONFIGURATION.
 7. REMOVE BARRICADES PLACED FOR PHASE 1 RUNWAY CONFIGURATION.
 8. PLACE TEMPORARY AIRFIELD SIGN FOR PHASE 2 RUNWAY CONFIGURATION.
 9. TEMPORARY 11L THRESHOLD ELECTRICAL CONFIGURATION, SEE DWG G236 FOR DETAILS.
 10. 15' BARRIER GAP FOR ARFF ACCESS ROUTE. SEE DWG G501 FOR DETAILS.
 11. SIGN TO BE PLACED AT BARRIER GAP, SEE DWG G501 FOR DETAILS.
 12. SEE C700 SERIES FOR PHASE 1 TWY PERMANENT MARKING LAYOUT DETAILS



KEY PLAN

PLANS PREPARED BY:

333 EAST WETMORE ROAD, SUITE 400
TUCSON, AZ 85705 T 520.887.1800

NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM #2	06.08.17
2	TEMPORARY PAPI REVISION	05.12.17

DESIGNED BY: HF

DRAWN BY: HF

CHECKED BY: JC

DATE: 04.19.17

SCALE: PER PLAN

TAA PROJ.# 10112254

SHEET OVERVIEW TITLE

PHASE 1K - RUNWAY RECOMMISSIONING PLAN 4

SHEET REFERENCE NUMBER:

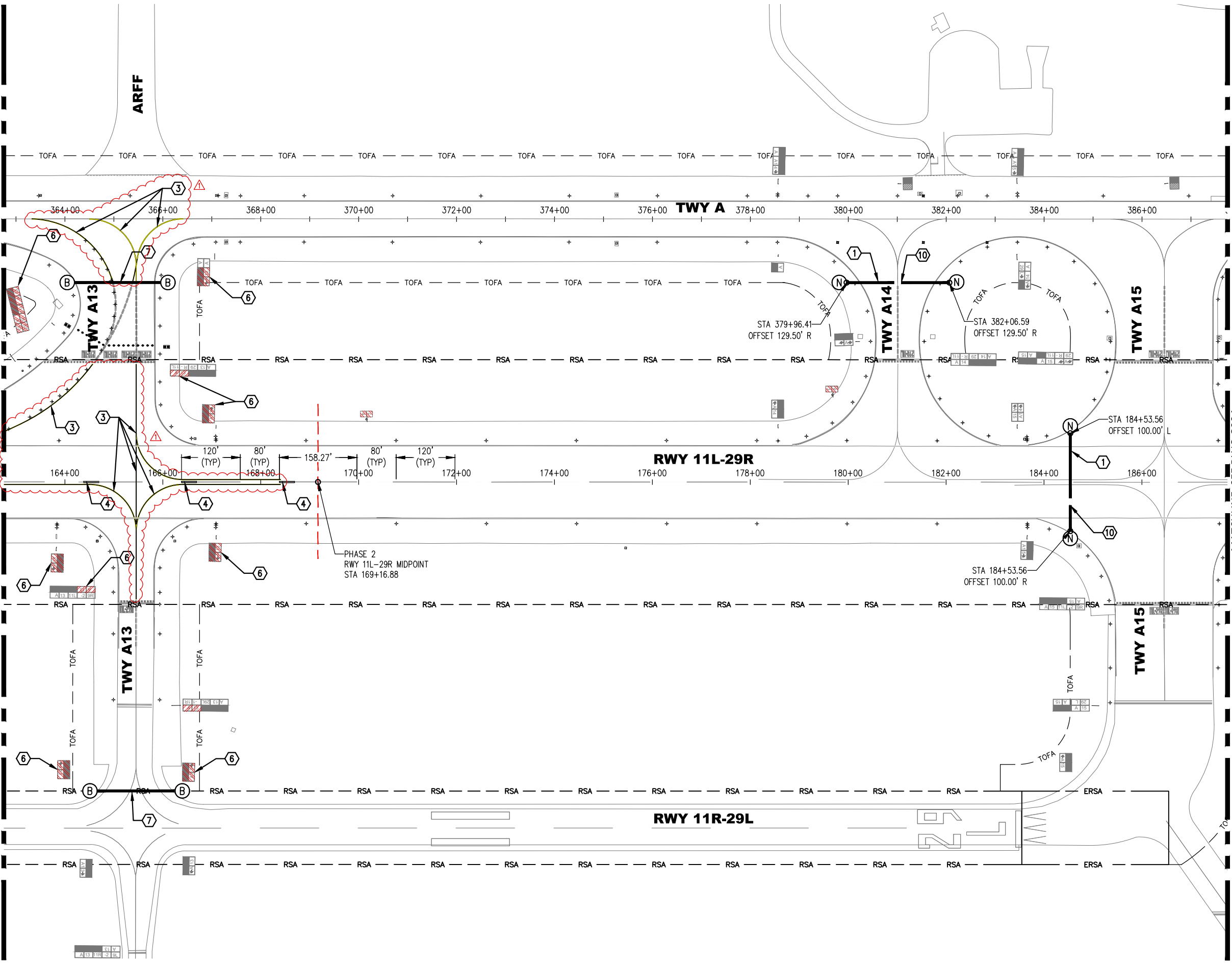
G232

SHEET 46 OF 410

FILE:C:\Users\alexander.melner\Box_Sync\Tucson\RWY 11L-29R\03 Design\02 Sheets\PHASE 1 RECOMMISSIONING.dwg DATE:Jun, 05 2017 TIME: 03:35 pm

MATCHLINE, SEE DWG G232

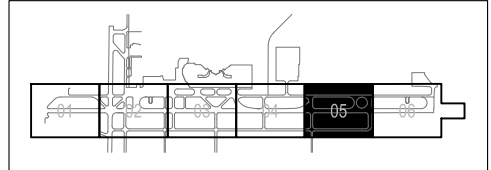
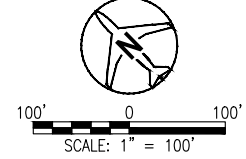
MATCHLINE, SEE DWG G234



LEGEND:

- RSA --- RUNWAY SAFETY AREA
- ERSA --- EXTENDED RUNWAY SAFETY AREA
- TOFA --- TAXIWAY OBJECT FREE AREA
- DAY & NIGHT CONSTRUCTION AREA
- NIGHTTIME ONLY CONSTRUCTION AREA
- HAUL ROUTE - ACCESS ROUTE (TWO WAY TRAFFIC)
- FLAGGER - NO ATCT RADIO COMMUNICATION
- BARRICADES, (DAYTIME & NIGHTTIME), SEE DETAILS 1, 2, 3, & 4, DWG G500
- BARRICADES, (DAYTIME ONLY)
- BARRICADES, (NIGHTTIME ONLY)
- RUNWAY CLOSURE LIGHTED "X", SEE DETAIL 5, DWG G500
- PAVEMENT MARKINGS TO BE OBLITERATED
- AIRFIELD SIGNS TO BE COVERED, SEE DETAIL (G500)
- FOLLOW ME TRUCK IN SIDA AREA ONLY

- WORK TO BE PERFORMED:**
1. PLACE BARRICADES & LIGHTED "X"'S FOR NIGHTLY RUNWAY & TAXIWAY CLOSURES.
 2. COVER AIRFIELD SIGNAGE.
 3. PLACE TEMPORARY RUNWAY & TAXIWAY MARKINGS FOR PHASE 2 THRESHOLD LOCATIONS, SEE G235 AND G235A FOR LAYOUT.
 4. PLACE TEMPORARY RUNWAY CENTERLINE SEGMENTS TO RE-SET MIDPOINT.
 5. PLACE TEMPORARY JET BLAST DEFLECTOR.
 6. REMOVE SIGN COVERS PLACED FOR PHASE 1 RUNWAY CONFIGURATION.
 7. REMOVE BARRICADES PLACED FOR PHASE 1 RUNWAY CONFIGURATION.
 8. PLACE TEMPORARY AIRFIELD SIGN FOR PHASE 2 RUNWAY CONFIGURATION.
 9. TEMPORARY 11L THRESHOLD ELECTRICAL CONFIGURATION, SEE DWG G236 FOR DETAILS.
 10. 15' BARRIER GAP FOR ARFF ACCESS ROUTE. SEE DWG G501 FOR DETAILS.
 11. SIGN TO BE PLACED AT BARRIER GAP, SEE DWG G501 FOR DETAILS.
 12. SEE C700 SERIES FOR PHASE 1 TWY PERMANENT MARKING LAYOUT DETAILS



KEY PLAN

PLANS PREPARED BY:

AECOM

333 EAST WETMORE ROAD, SUITE 400
TUCSON, AZ 85705 T 520.887.1800

NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM #2	06.08.17

DESIGNED BY: HF

DRAWN BY: HF

CHECKED BY: JC

DATE: 04.19.17

SCALE: PER PLAN

TAA PROJ.# 10112254

TUCSON

AIRPORT AUTHORITY

REHABILITATE RUNWAY 11L-29R AND CONNECTOR TAXIWAYS

SHEET OVERVIEW TITLE

PHASE 1K - RUNWAY RECOMMISSIONING PLAN 5









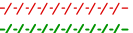



BID SET

SHEET REFERENCE NUMBER:

G233

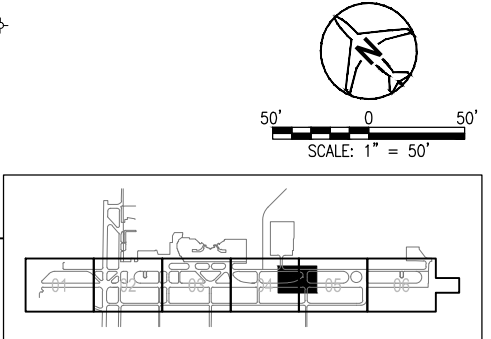
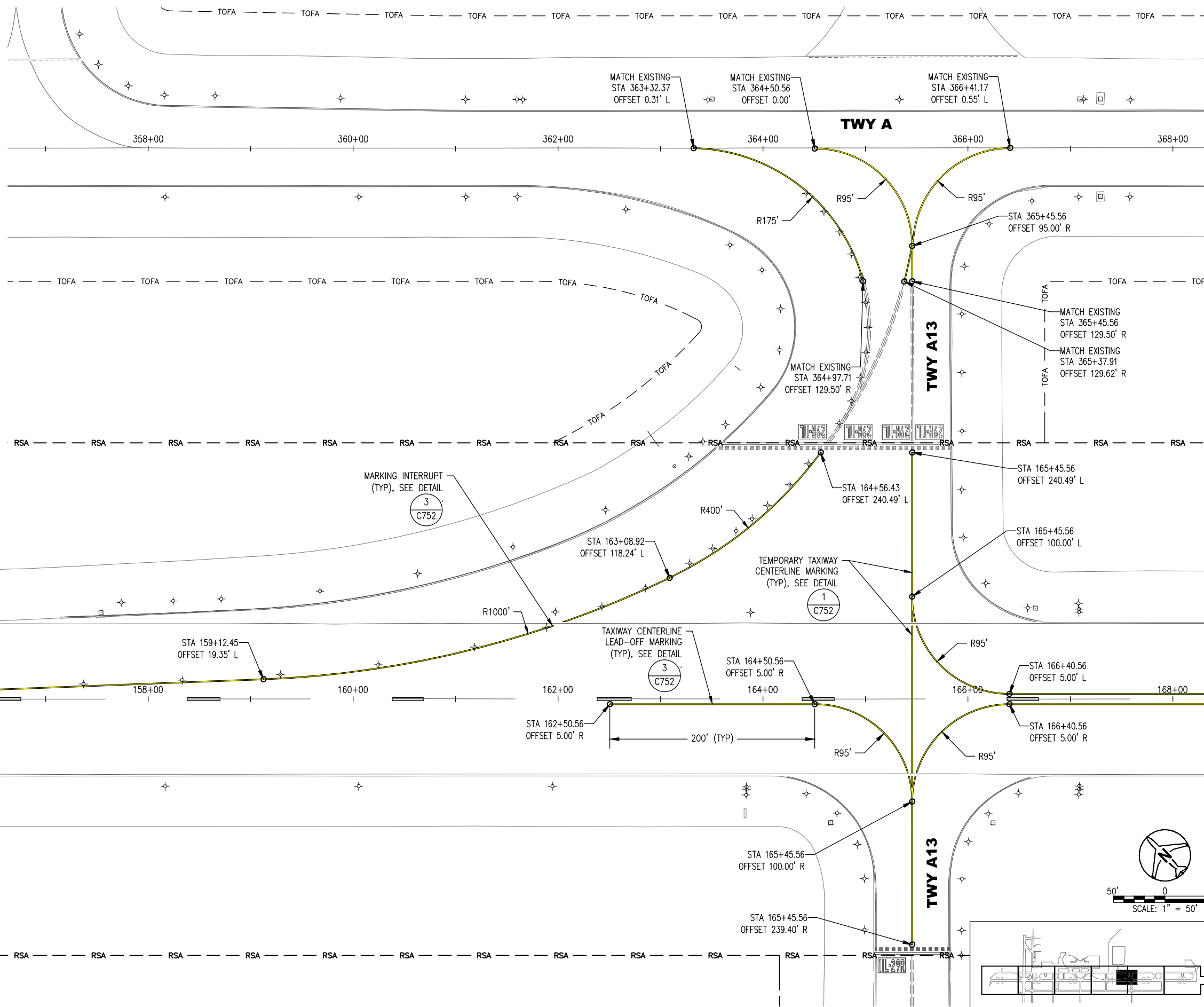
SHEET 47 OF 410

LEGEND:

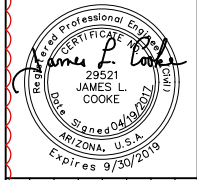
- RSA --- RUNWAY SAFETY AREA
- ERSA --- EXTENDED RUNWAY SAFETY AREA
- TOFA --- TAXIWAY OBJECT FREE AREA
-  DAY & NIGHT CONSTRUCTION AREA
-  NIGHTTIME ONLY CONSTRUCTION AREA
-  HAUL ROUTE - ACCESS ROUTE (TWO WAY TRAFFIC)
-  FLAGGER - NO ATCT RADIO COMMUNICATION
-  BARRICADES, (DAYTIME & NIGHTTIME), SEE DETAILS 1, 2, 3, & 4, DWG G500
-  BARRICADES, (DAYTIME ONLY)
-  BARRICADES, (NIGHTTIME ONLY)
-  RUNWAY CLOSURE LIGHTED 'X', SEE DETAIL 5, DWG G500
-  PAVEMENT MARKINGS TO BE OBLITERATED
-  PAVEMENT MARKINGS TO BE OBLITERATED
-  AIRFIELD SIGNS TO BE COVERED, SEE DETAIL
- 

NOTES

1. SEE C700 SERIES FOR PERMANENT MARKING LAYOUT AND STANDARD DETAILS.



AECOM
 333 EAST WETMORE ROAD, SUITE 400
 TUCSON, AZ 85705 T 920.887.1800

PLANS PREPARED BY:


NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM #2 - NEW SHEET	06.08.17

TUCSON
 AIRPORT AUTHORITY
 REHABILITATE RUNWAY 11L-29R
 AND CONNECTOR TAXIWAYS

DESIGNED BY: HF	DRAWN BY: HF
CHECKED BY: JC	DATE: 04.19.17
SCALE: PER PLAN	TAA PROJ.# 10112254

BID SET

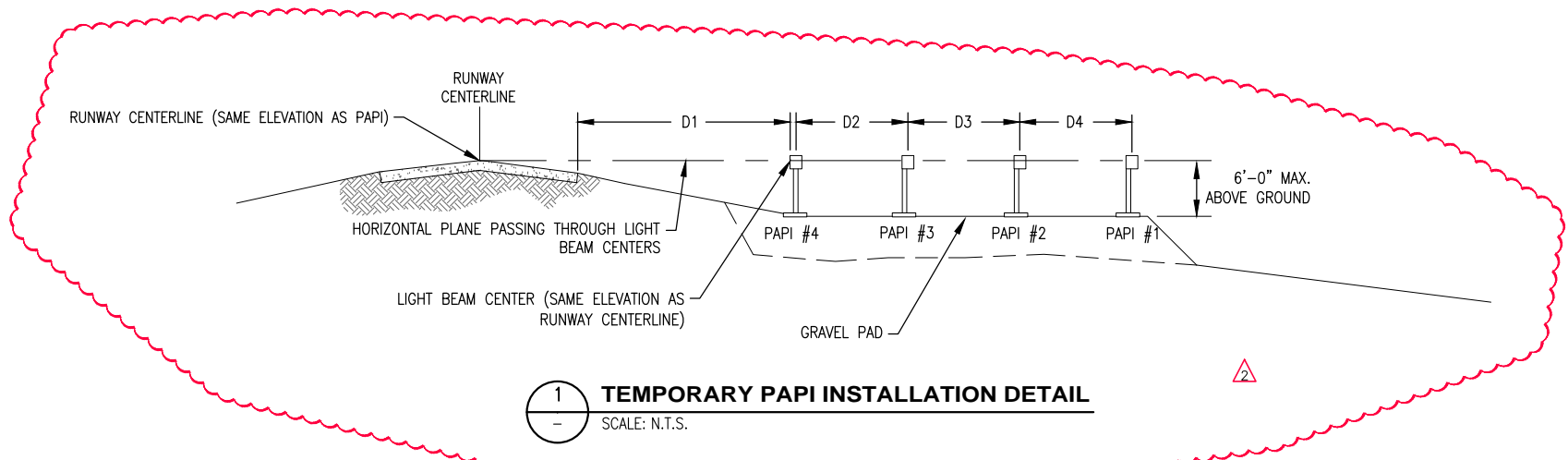
SHEET OVERVIEW TITLE

PHASE 1K - TEMPORARY MARKING LAYOUT

SHEET REFERENCE NUMBER:
G235A
 SHEET 49A OF 410

FILE:C:\Users\alexander.meisner\Box\Sync\Tucson\RWY_11L-29R\03_Design\02_Sheets\PHASE_1_MARKING.dwg DATE:Jun_06_2017 TIME: 04:30 pm

FILE:Q:\PROJECTS\15000\15005 TAA 10112254. Reconstruct Runway 11L-29R and Connector Taxiways\CAD\RWY 11L-29R\03 Design\02 Sheets\G509 TEMP PAPI INSTALLATION DETAILS.dwg DATE:Jun. 07. 2017 TIME: 04:18 pm

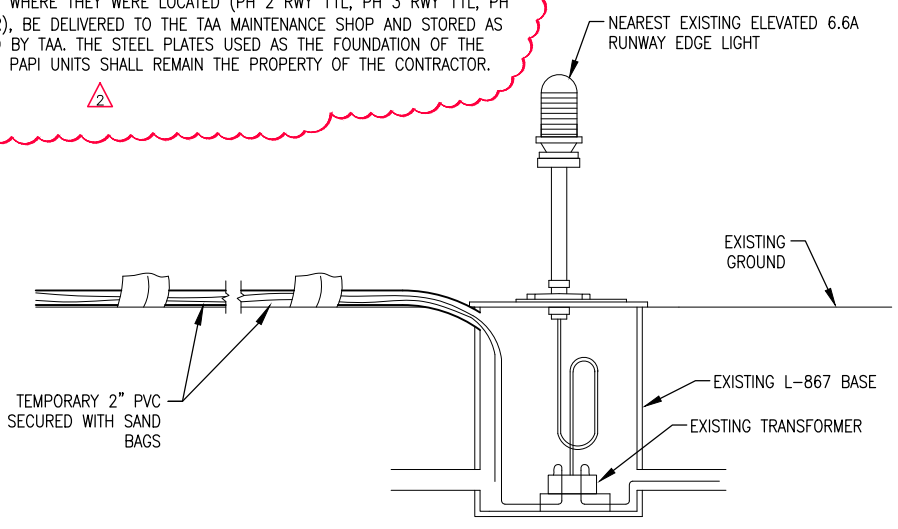


1 TEMPORARY PAPI INSTALLATION DETAIL
SCALE: N.T.S.

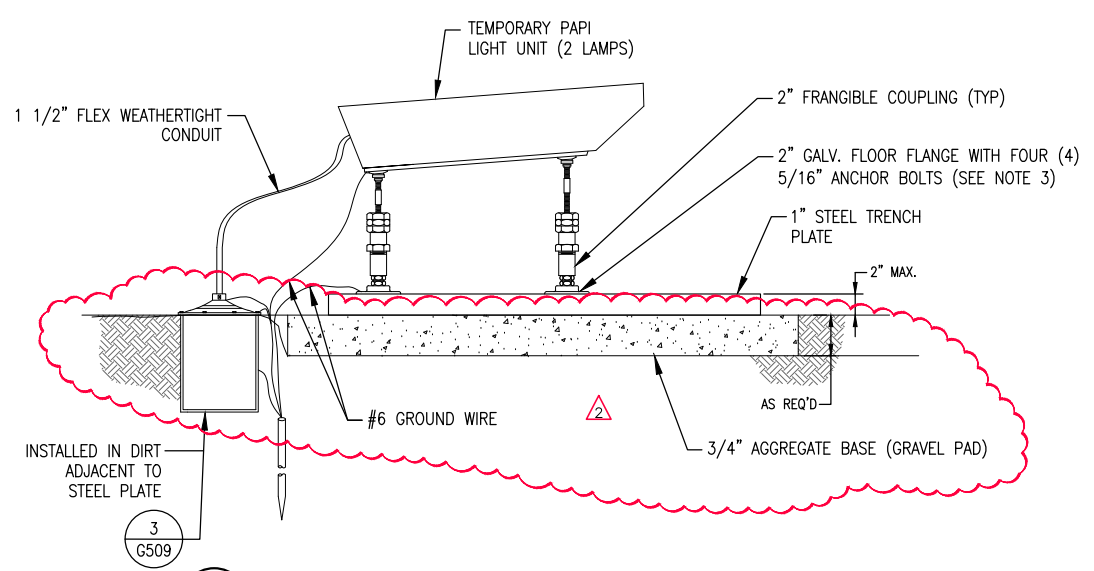
RUNWAY	STATION	D1 (DIST. FROM R/W EDGE TO PAPI #4 (FT))	D2 (DIST. FROM PAPI #4 TO PAPI #3) (FT)	D3 (DIST. FROM PAPI #3 TO PAPI #2) (FT)	D4 (DIST. FROM PAPI #2 TO PAPI #1) (FT)	LIGHT CENTER ELEVATION (APPROX.) (FT)	AIMING ANGLE				EFFECTIVE VISUAL THRESHOLD CROSSING HEIGHT (TCH)	THRESHOLD R/W CENTERLINE ELEV. (FT)	GRAVEL PAD ELEV. (FT)
							PAPI #4	PAPI #3	PAPI #2	PAPI #1			
11L (PHASE 2)	137+60.73	50	20	20	20	2603.85	3' 30'	3' 10'	2' 50'	2' 30'	55 FT	2597.37	2600.95
11L (PHASE 3)	87+39.34	50	20	20	20	2571.12	3' 30'	3' 10'	2' 50'	2' 30'	55 FT	2570.28	2568.12
29R (PHASE 3)	146+00.00	50	20	20	20	2609.81	3' 30'	3' 10'	2' 50'	2' 30'	55 FT	2619.04	2606.98

NOTE: THE PAPI LIGHT CENTER ELEVATIONS NOTED ABOVE SHALL BE VERIFIED BY SURVEY PROVIDED BY THE CONTRACTOR. THE LIGHT CENTER ELEVATIONS SHALL MATCH THE RUNWAY CENTERLINE ELEVATION PERPENDICULAR TO THE THE PAPI LOCATIONS.

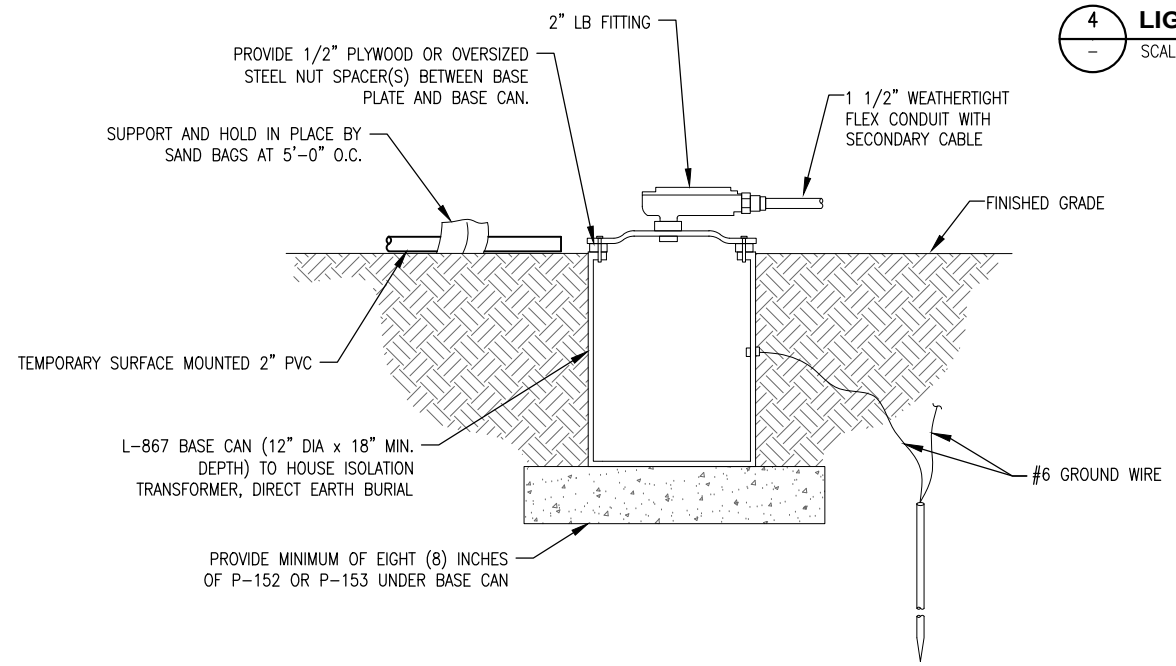
- NOTES**
- CONTRACTOR SHALL FURNISH AND INSTALL NEW L-880B 4-BOX PAPI FOR TEMPORARY OPERATIONS (DURING PHASES 2 AND 3) AT DESIGNATED LOCATIONS. PAPI SHALL BE CURRENT DRIVEN. PAPI SHALL BECOME THE PROPERTY OF TAA AT COMPLETION OF THE PROJECT. THE PAPI SHALL BE LOCATED AND AIMED IN ACCORDANCE WITH FAA ORDER 5850.2A.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE TEMPORARY EQUIPMENT INCLUDING LAMP REPLACEMENT DURING THE ENTIRE DURATION OF EACH PHASE.
 - ALL STEEL ASSOCIATED WITH THE PAPI FABRICATION SHALL BE GALVANIZED AND HARDWARE SHALL BE GALVANIZED OR STAINLESS STEEL.
 - INSTALL PAPI LIGHT HOUSE ASSEMBLY AND CONTROL CABINET ON STEEL CHANNEL BASE. INSTALL SUPPORT LEG FRANGIBLE COUPLINGS ON FLANGE FITTINGS SECURED TO THE STEEL CHANNEL BASE. NON-FRANGIBLE INSTALLATION ELEMENTS SHALL NOT EXCEED 6" ABOVE FINISHED GRADE.
 - POWER AND SIGNAL CABLE BETWEEN THE PAPI UNITS SHALL BE SIZED (CABLE AND CONDUIT) ACCORDING TO MANUFACTURERS' REQUIREMENTS.
 - CONTRACTOR SHALL BE PAID TO FURNISH AND INSTALL THE EQUIPMENT INCLUDING PAPI LIGHT HOUSING ASSEMBLIES, GROUNDING, AND ASSOCIATED TEMPORARY INFRASTRUCTURE AS A LUMP SUM. BID ITEM SHALL INCLUDE MAINTENANCE OF EACH TEMPORARY EQUIPMENT.
 - AT THE END OF CONSTRUCTION THE CONTRACTOR SHALL DISASSEMBLE AND PALLETIZE THE TEMPORARY PAPI BOXES, PARTS AND ACCESSORIES IN A NEAT AND ORDERLY FASHION FOR FUTURE REUSE. THE PALLETIZED PAPI UNITS SHALL BE LABELED TO IDENTIFY THE PHASE OF CONSTRUCTION, THE RUNWAY THRESHOLD WHERE THEY WERE LOCATED (PH 2 RWY 11L, PH 3 RWY 11L, PH 3 RWY 29R), BE DELIVERED TO THE TAA MAINTENANCE SHOP AND STORED AS INSTRUCTED BY TAA. THE STEEL PLATES USED AS THE FOUNDATION OF THE TEMPORARY PAPI UNITS SHALL REMAIN THE PROPERTY OF THE CONTRACTOR.



4 LIGHT FIXTURE USED AS POWER SOURCE
SCALE: N.T.S.



2 TEMPORARY PAPI LIGHT BOX INSTALLATION DETAIL
SCALE: N.T.S.



3 L-867 BASE CAN INSTALLATION DETAIL
SCALE: N.T.S.

PLANS PREPARED BY:
CR engineers
16719 East Palisades Blvd., Suite 202
Fountain Hills, AZ 85268
Phone: (480) 816-5341
Fax: (480) 816-5340
www.creng.com

36696
CATHERINE M.
ALCORN
Professional Engineer
Expires 9/30/2019

NO.	REVISIONS / SUBMISSIONS	DATE
2	ADDENDUM #2	06/09/17

TUCSON
AIRPORT AUTHORITY
REHABILITATE RUNWAY 11L-29R
AND CONNECTOR TAXIWAYS

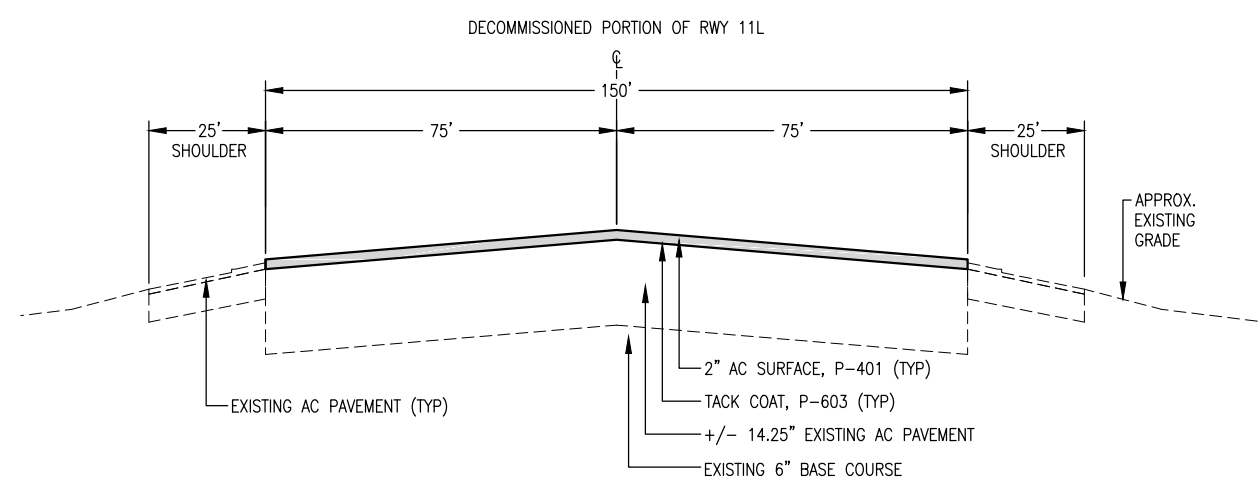
DESIGNED BY: KL
DRAWN BY: JW
CHECKED BY: CA
DATE: 06/01/17
SCALE: PER PLAN
TAA PROJ.#
10112254

BID SET

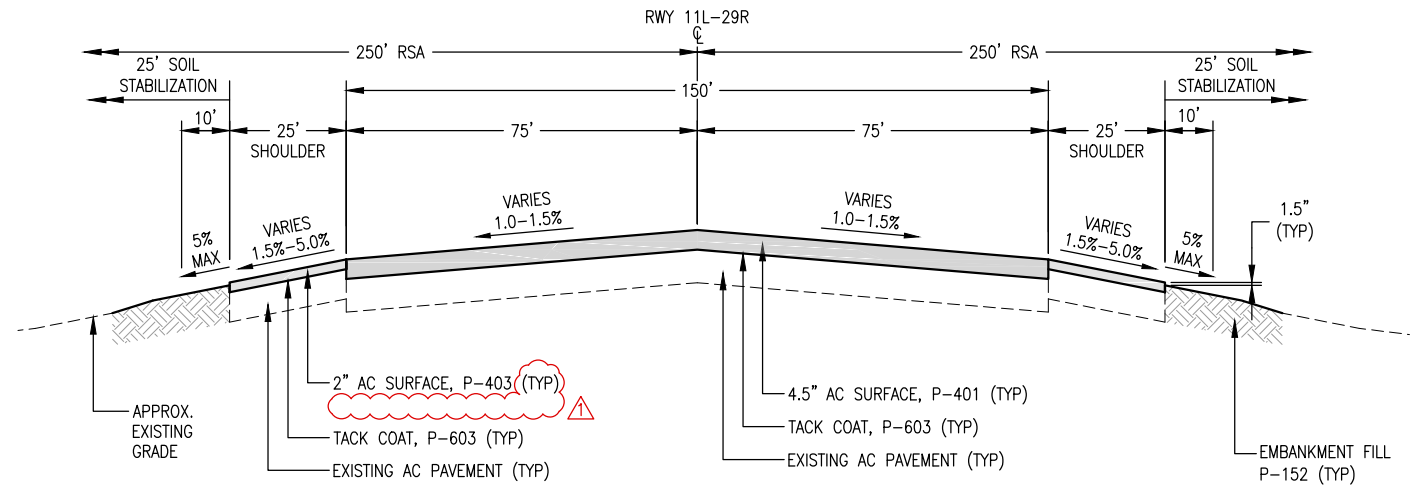
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**TEMPORARY PAPI INSTALLATION
DETAILS**

SHEET REFERENCE NUMBER:
G509
SHEET 140 OF 410

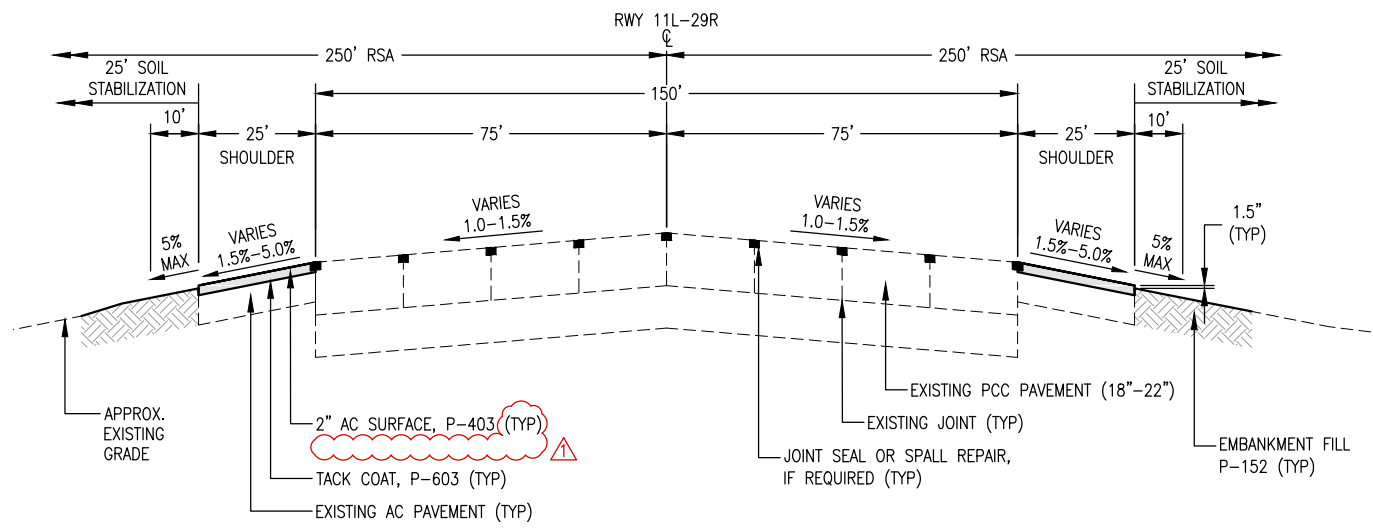
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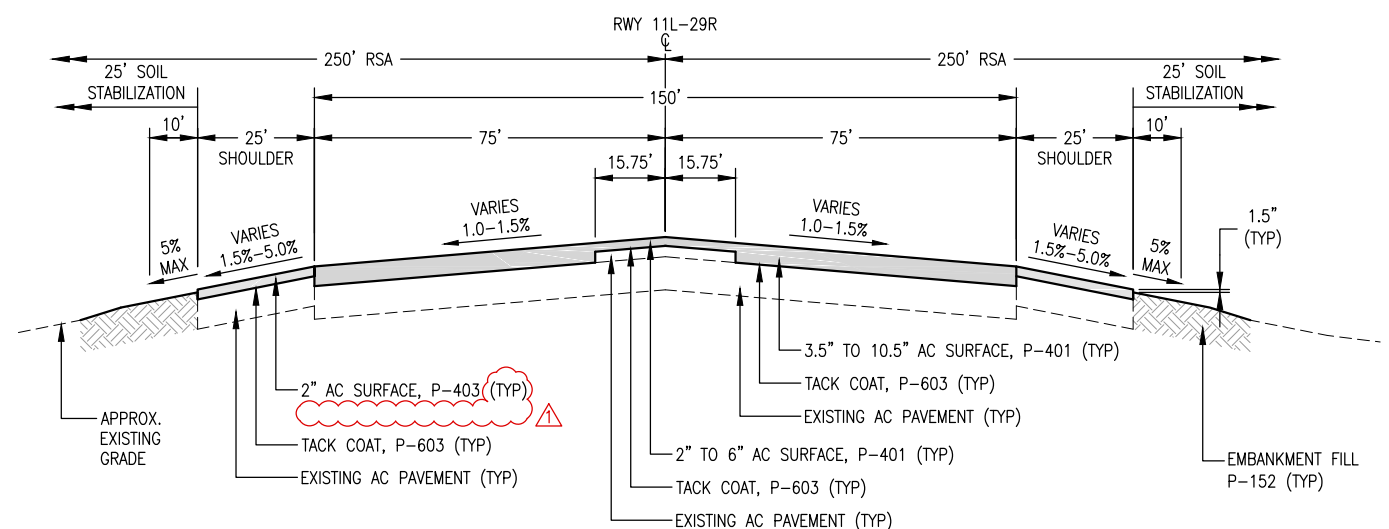
A DECOMMISSIONED PORTION OF RWY 11L
 SCALE: N.T.S.
 DECOMMISSIONED PORTION OF RWY 11L STA 70+06.91 TO 90+37.73



B TYPICAL SECTION - RWY 11L-29R ASPHALT CONCRETE
 SCALE: N.T.S.
 TWY PRECEDING RWY 11L-29R STA 98+60.60 TO 100+00.12
 RWY 11L-29R STA 141+84.21 TO 195+92.00



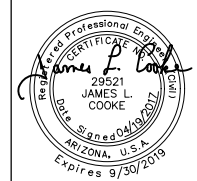
C TYPICAL SECTION - RWY 11L-29R EXISTING PCC
 SCALE: N.T.S.
 RWY 11L-29R STA 100+00.12 TO 111+84.30
 RWY 11L-29R STA 195+92.14 TO 209+95.45



D TYPICAL SECTION - RWY 11L-29R EMERGENCY REPAIR AREA
 SCALE: N.T.S.
 RWY 11L-29R STA 111+84.30 TO 141+84.39

GENERAL NOTE:
 REFER TO PAVING AND GEOMETRY SHEETS
 C401-C414 FOR PAVEMENT WIDTHS

PLANS PREPARED BY:



NO.	REVISIONS / SUBMISSIONS	DATE
06.08.17	ADDENDUM #2	

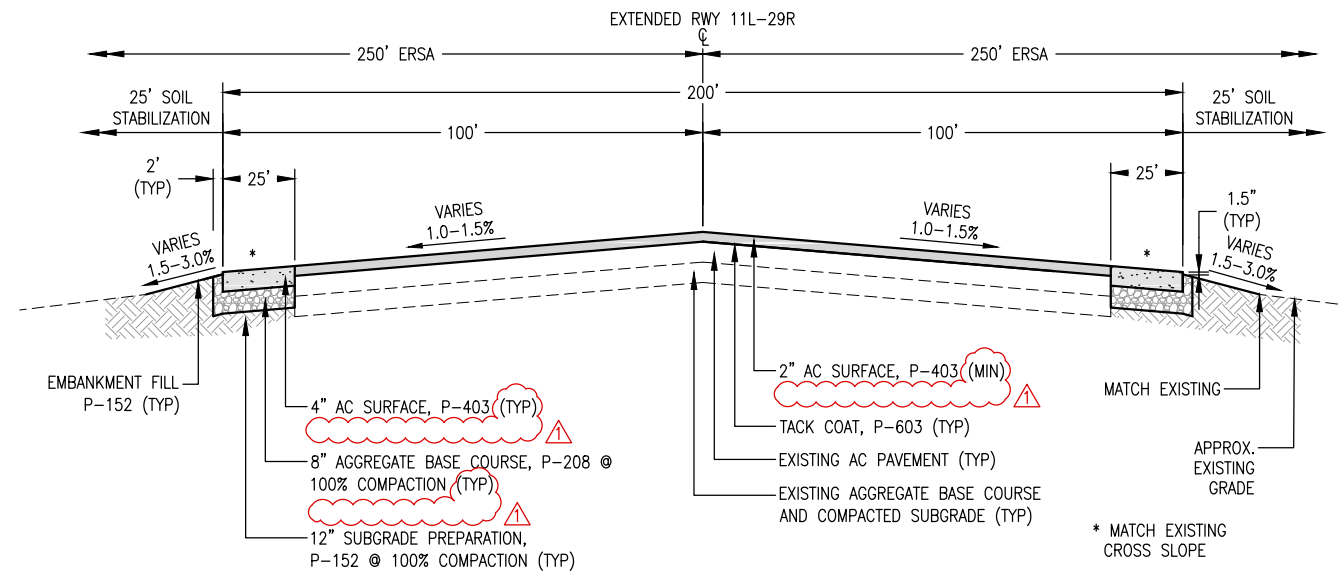


DESIGNED BY: JC	DRAWN BY: HF
CHECKED BY: JC	DATE: 04.13.17
SCALE: PER PLAN	TAA PROJ.# 10112254

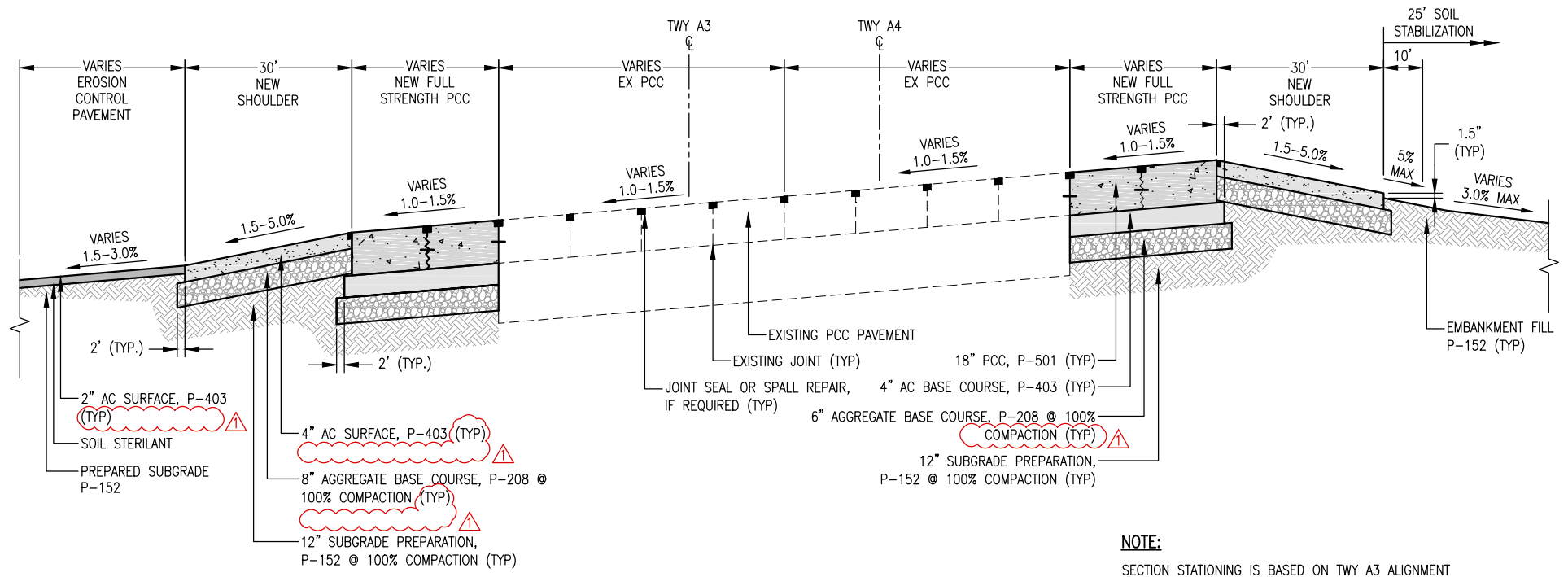
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SHEET REFERENCE NUMBER:	C451
SHEET	270 OF 410

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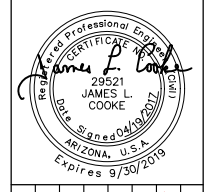
E TYPICAL SECTION - BLAST PAD
 SCALE: N.T.S.
 BLAST PAD STA 209+95.45 TO 211+96.02



F TYPICAL SECTION - TWYs A3 & A4
 SCALE: N.T.S.
 TWY A3 STA 30+75.00 TO 34+85.60

NOTE:
 SECTION STATIONING IS BASED ON TWY A3 ALIGNMENT

PLANS PREPARED BY:
AECOM
 333 EAST WETMORE ROAD, SUITE 400
 TUCSON, AZ 85705 T 520.887.1900



NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM #2	06.08.17

TUCSON
 AIRPORT AUTHORITY
 REHABILITATE RUNWAY 11L-29R
 AND CONNECTOR TAXIWAYS

DESIGNED BY: JC	DRAWN BY: HF
CHECKED BY: JC	DATE: 04.13.17
TAA PROJ.# 10112254	SCALE: PER PLAN

BID SET

SHEET OVERVIEW TITLE
 TYPICAL SECTIONS -
 BLAST PAD & TWYs

SHEET REFERENCE NUMBER:
C452
 SHEET 271 OF 410

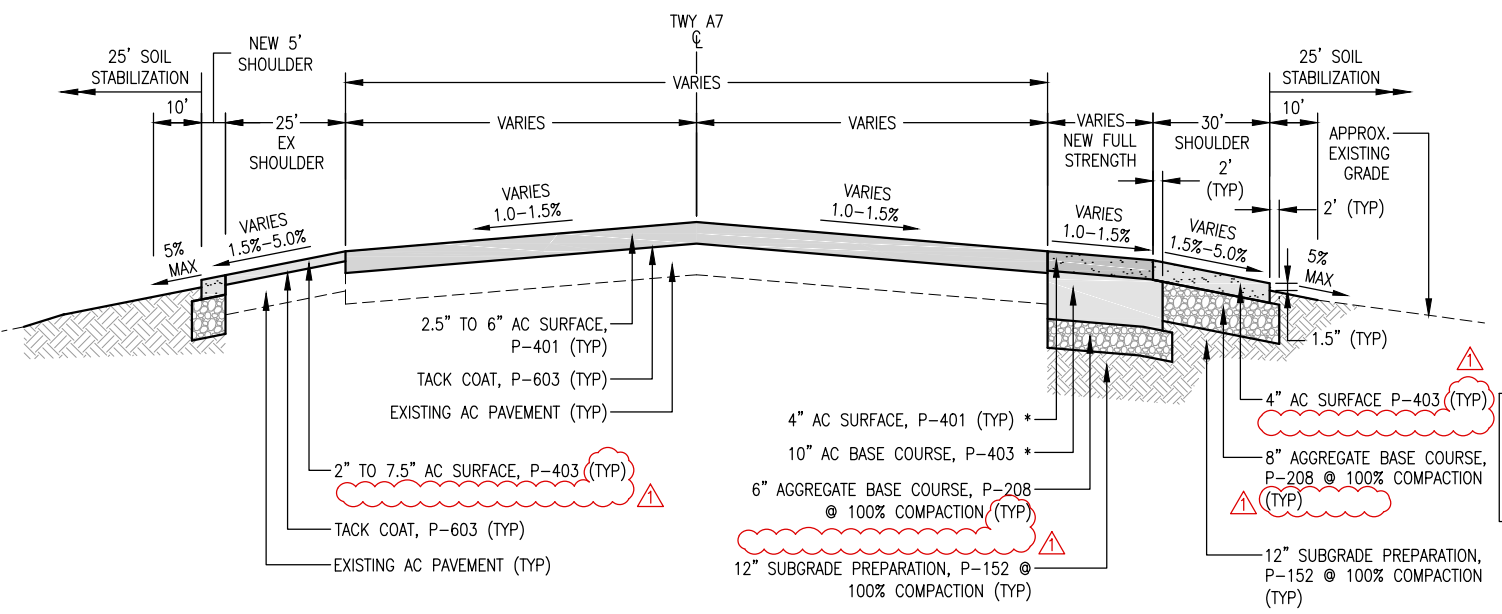
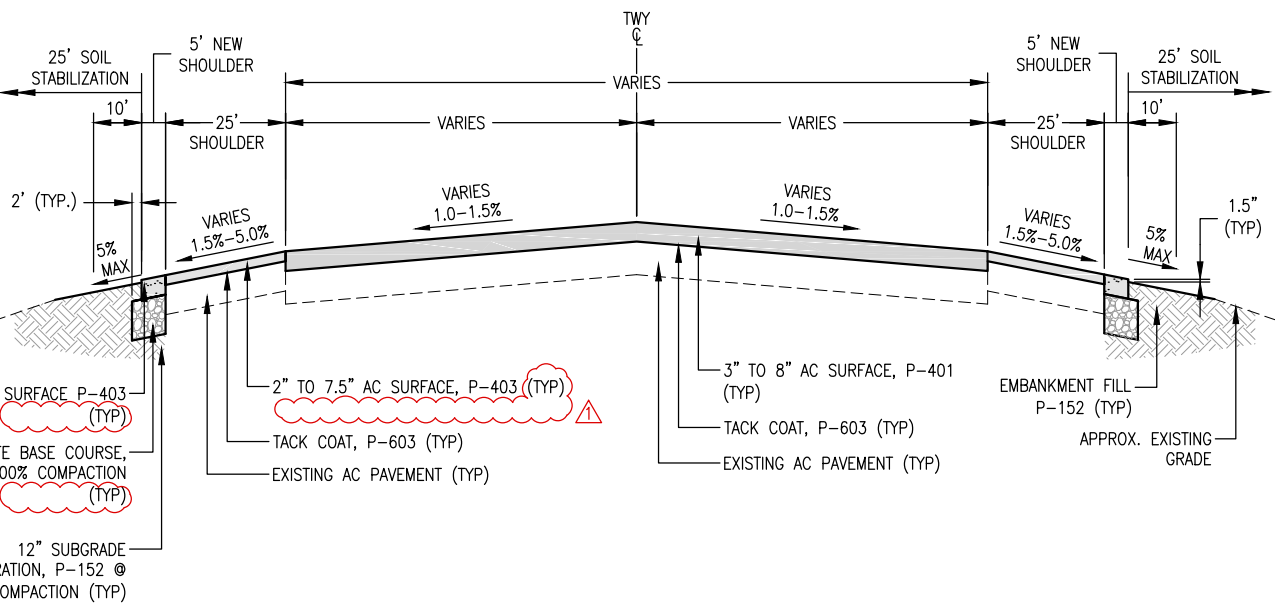
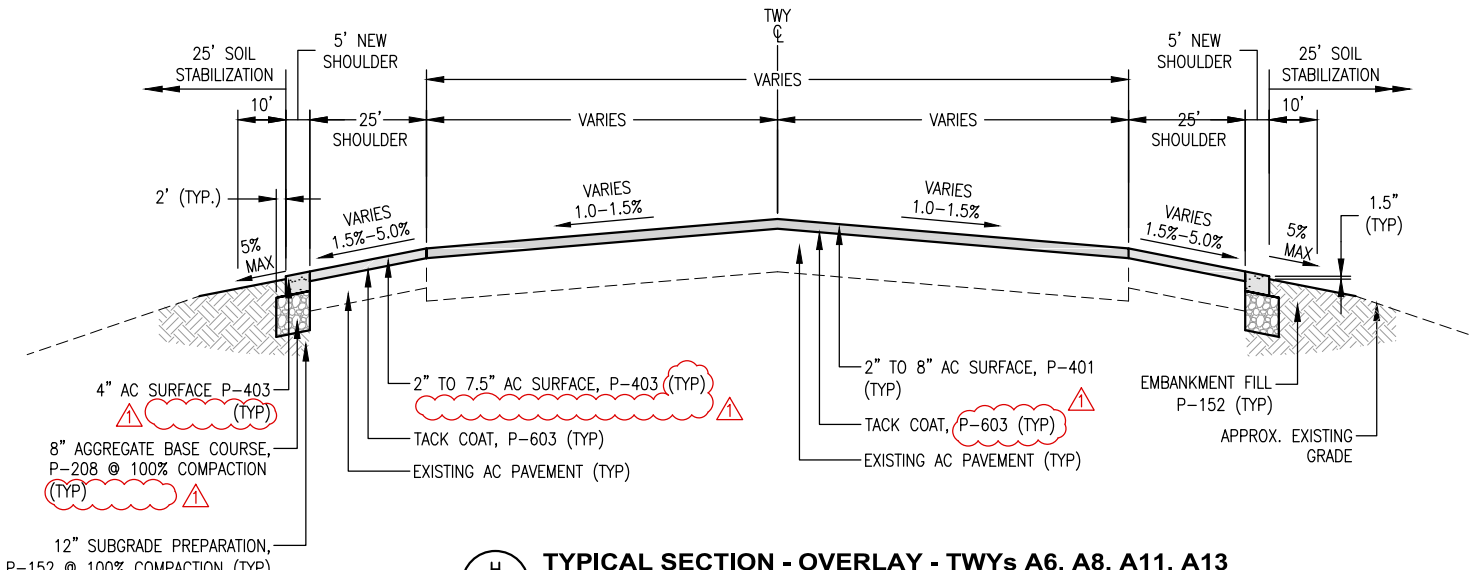
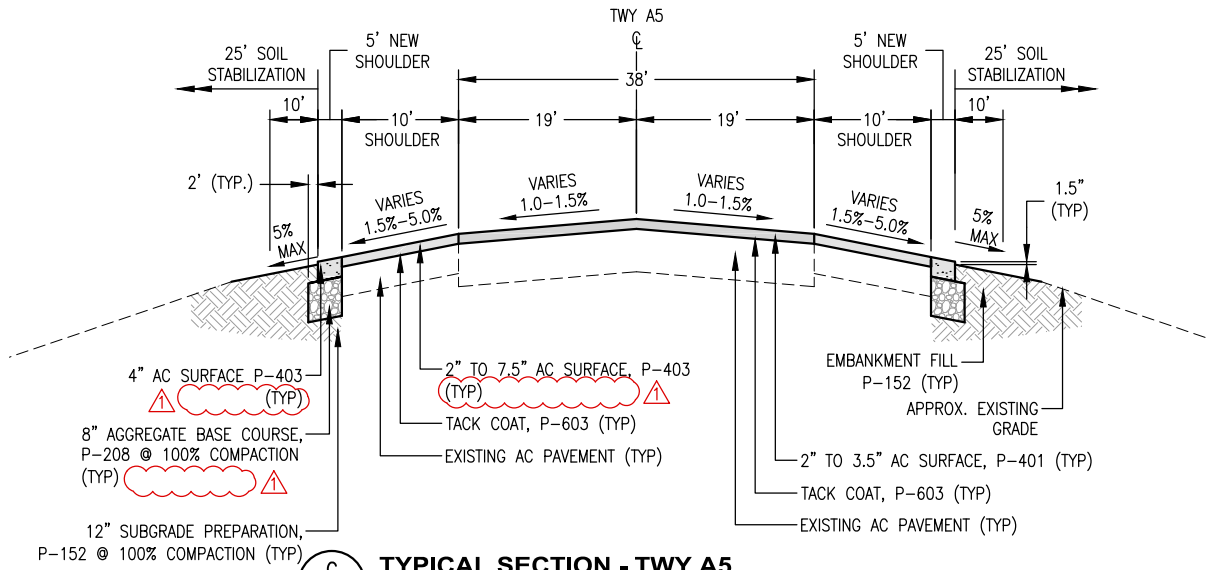
GENERAL NOTE:
 REFER TO PAVING AND GEOMETRY SHEETS
 C401-C414 FOR PAVEMENT WIDTHS



NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM #2	06.08.17

DESIGNED BY: JC	DRAWN BY: HF	CHECKED BY: JC	DATE: 04.13.17	SCALE: PER PLAN	TAA PROJ.#: 10112254
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SHEET OVERVIEW TITLE: TYPICAL SECTIONS - TWYs	SHEET REFERENCE NUMBER: C453
SHEET 272 OF 410	

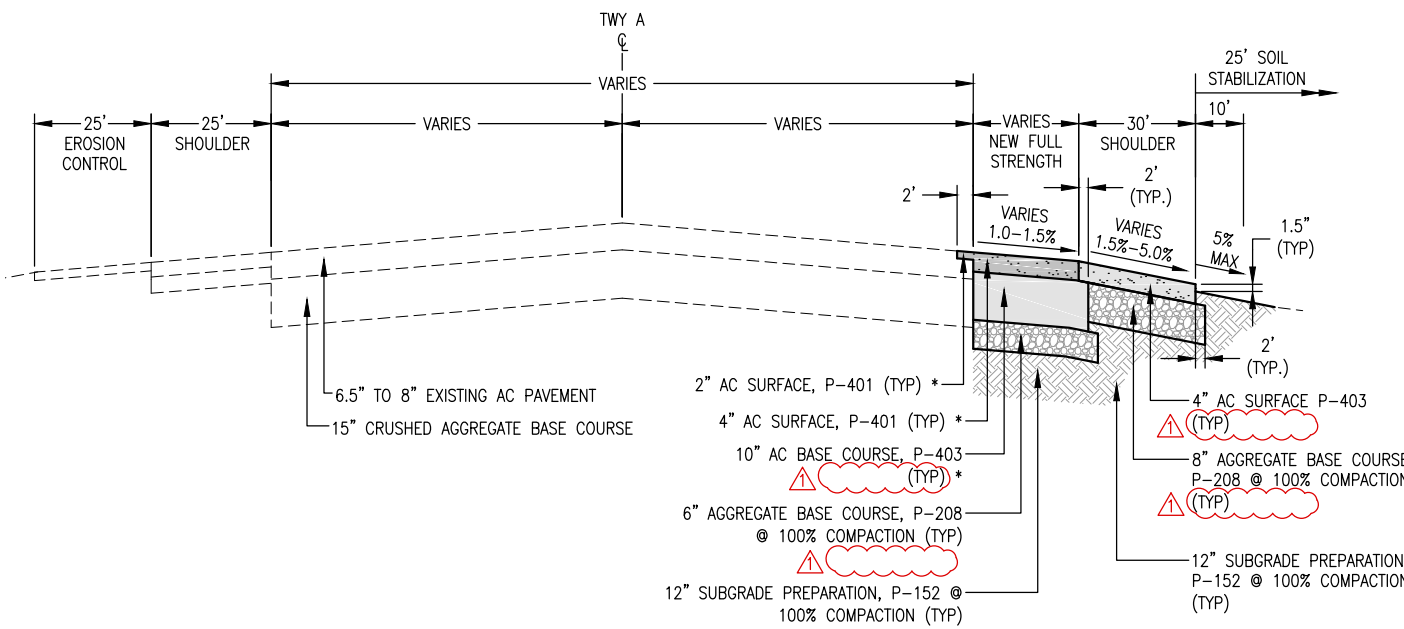


* TACK COAT, P-603 BETWEEN LIFTS (TYP)

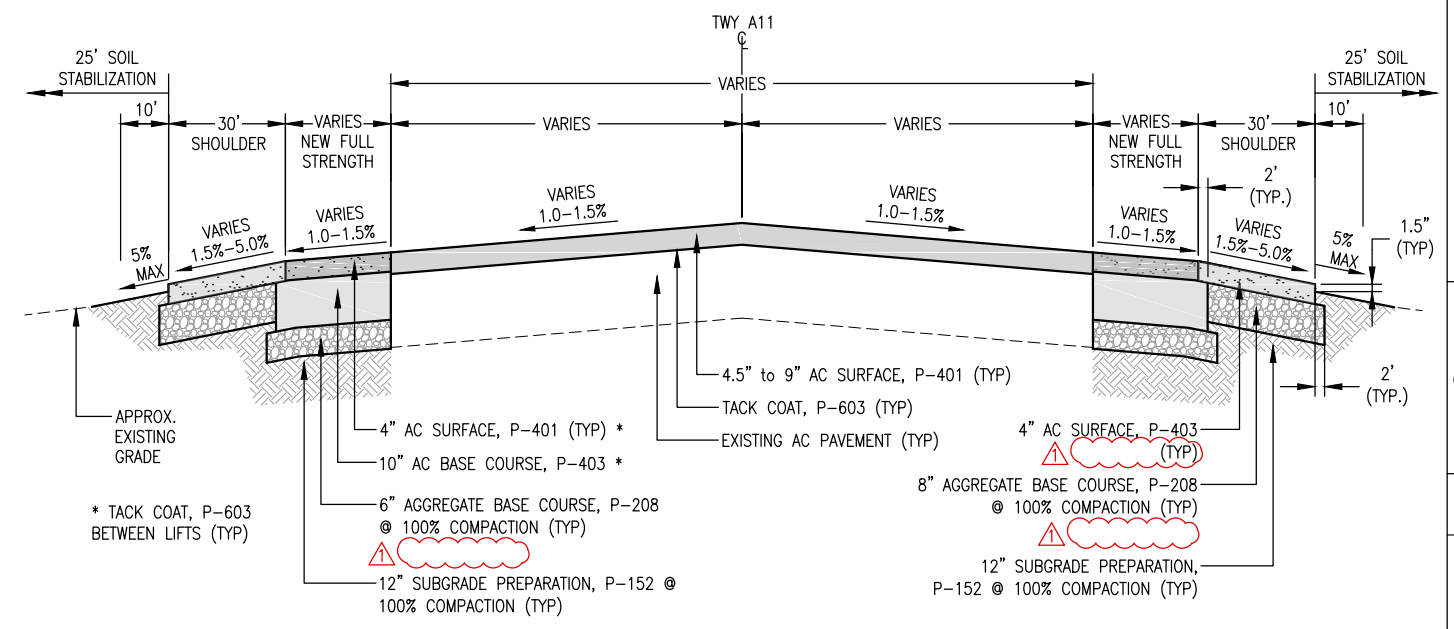
GENERAL NOTE:
 REFER TO PAVING AND GEOMETRY SHEETS C401-C414 FOR PAVEMENT WIDTHS

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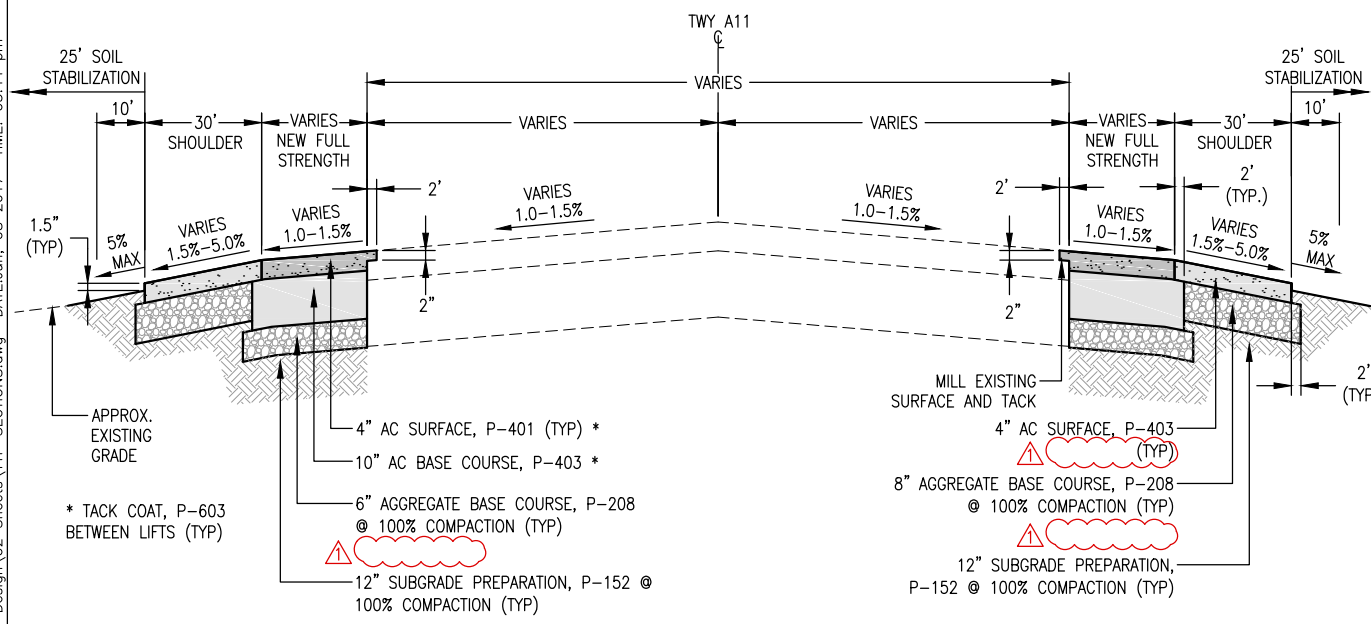
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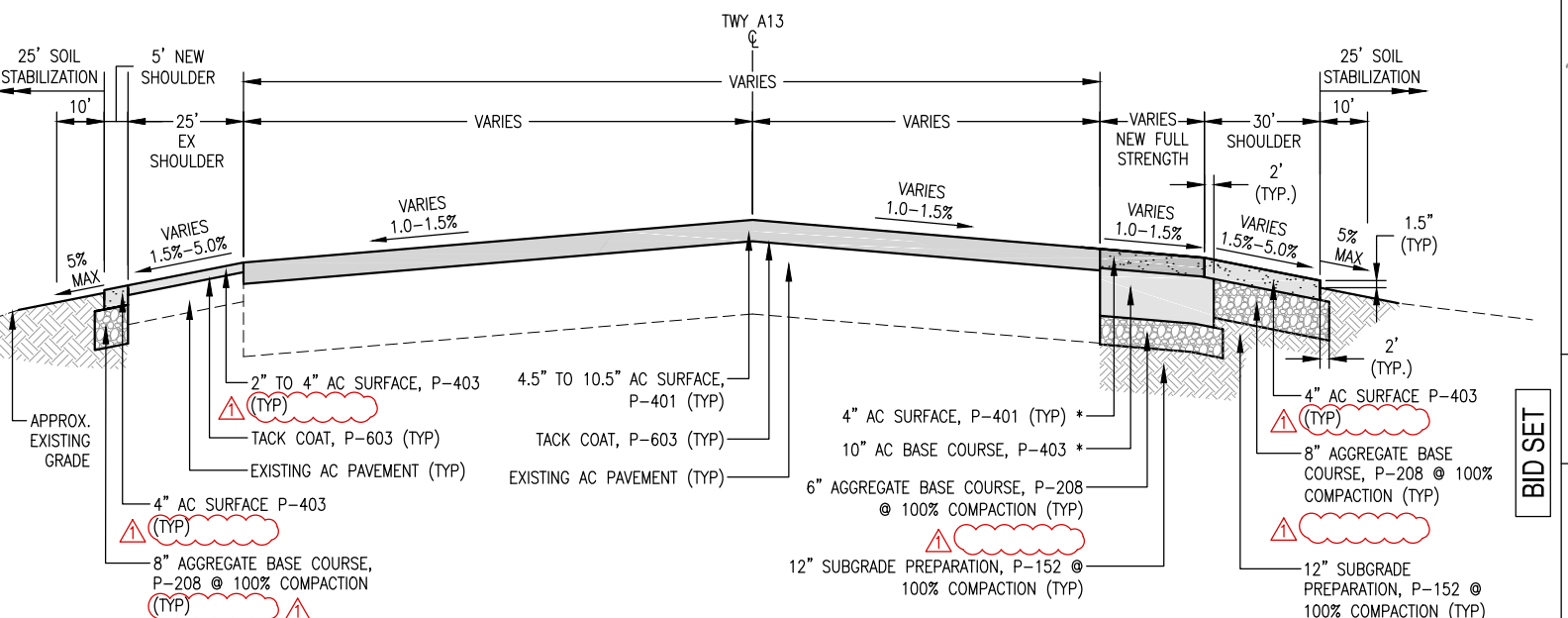
L **TYPICAL SECTION - TWY A**
 SCALE: N.T.S.
 TWY A STA 326+58.90 TO 332+28.38



M **TYPICAL SECTION - TWY A11**
 SCALE: N.T.S.
 TWY A11 STA 111+75.00 TO 114+62.88



N **TYPICAL SECTION - TWY A11**
 SCALE: N.T.S.
 TWY A11 STA 114+62.88 TO 115+76.23



P **TYPICAL SECTION - TWY A13**
 SCALE: N.T.S.
 TWY A13 STA 113+75.00 TO 116+00.00

GENERAL NOTE:
 REFER TO PAVING AND GEOMETRY SHEETS
 C401-C414 FOR PAVEMENT WIDTHS

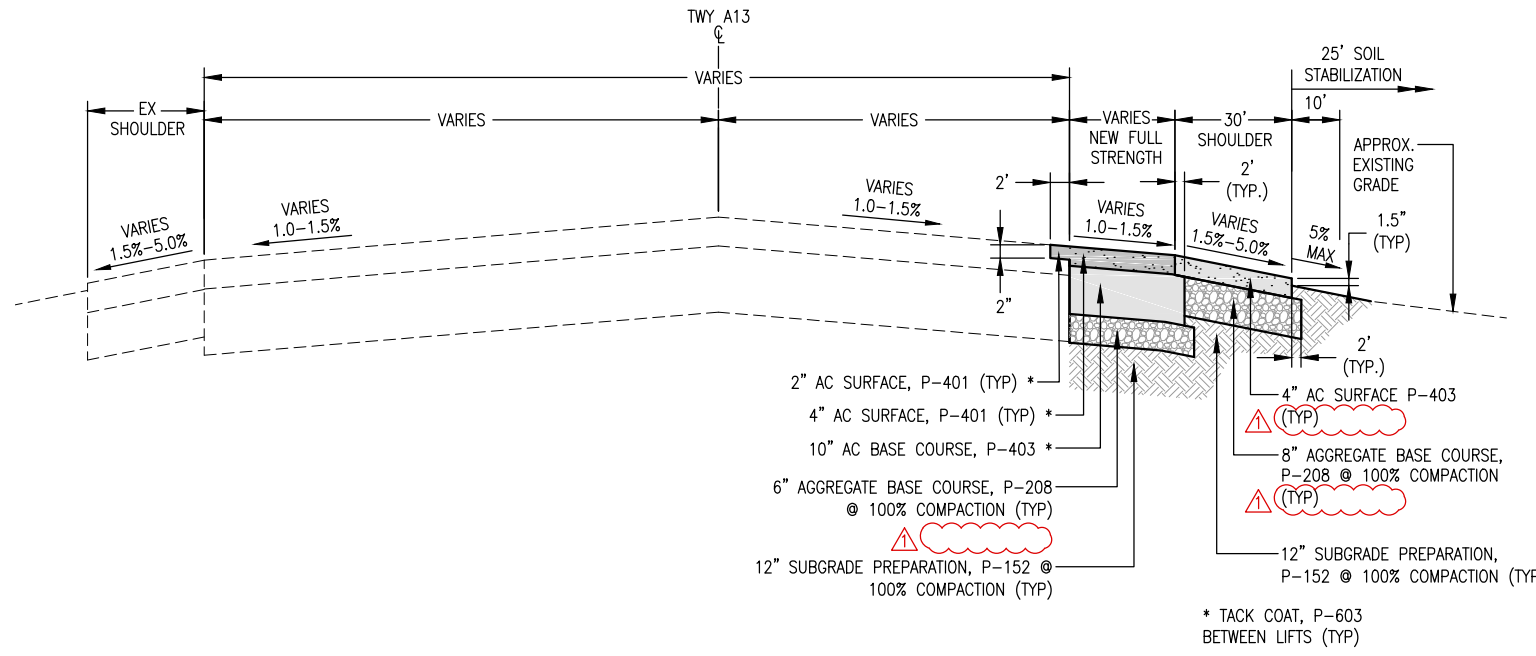


NO.	REVISIONS / SUBMISSIONS	DATE
06.08.17		
ADDENDUM #2		

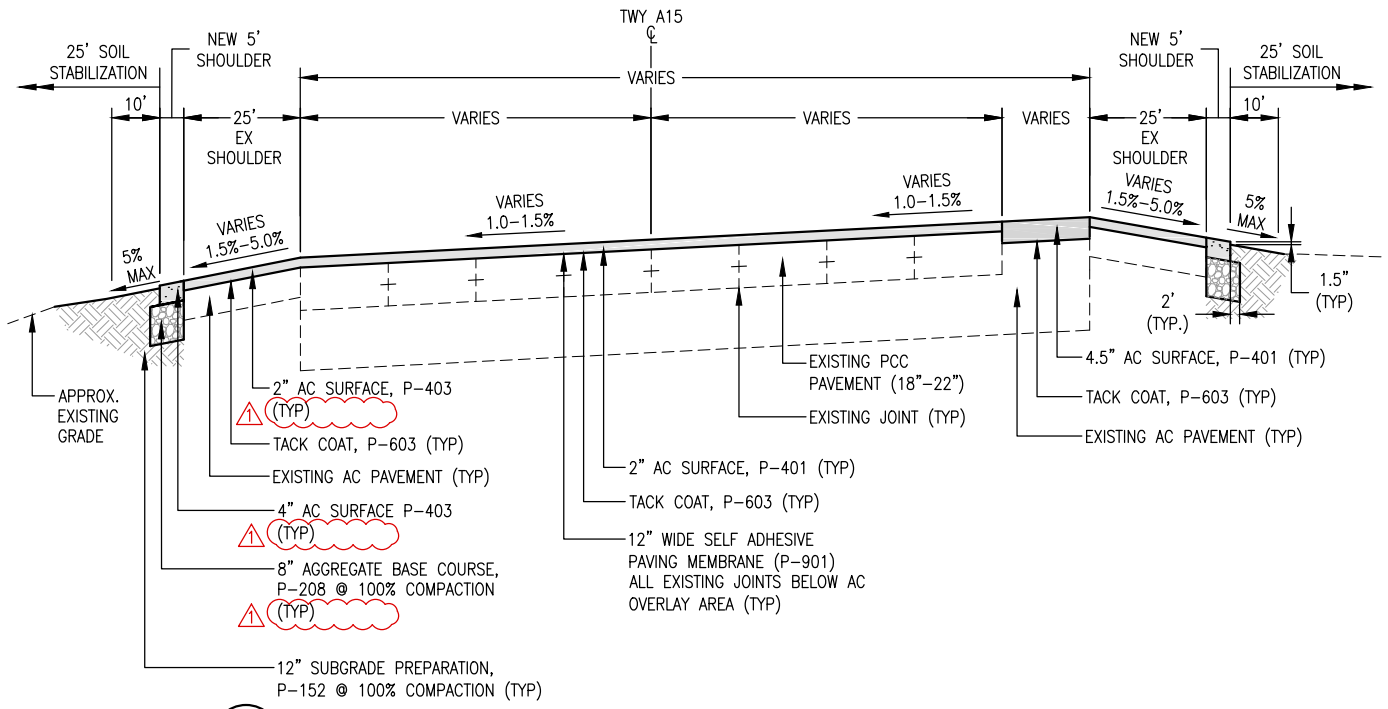
DESIGNED BY: JC	DRAWN BY: HF
CHECKED BY: JC	DATE: 04.19.17
TAA PROJ.#	SCALE: PER PLAN
10112254	

BID SET
 TYPICAL SECTIONS -
 TWYs

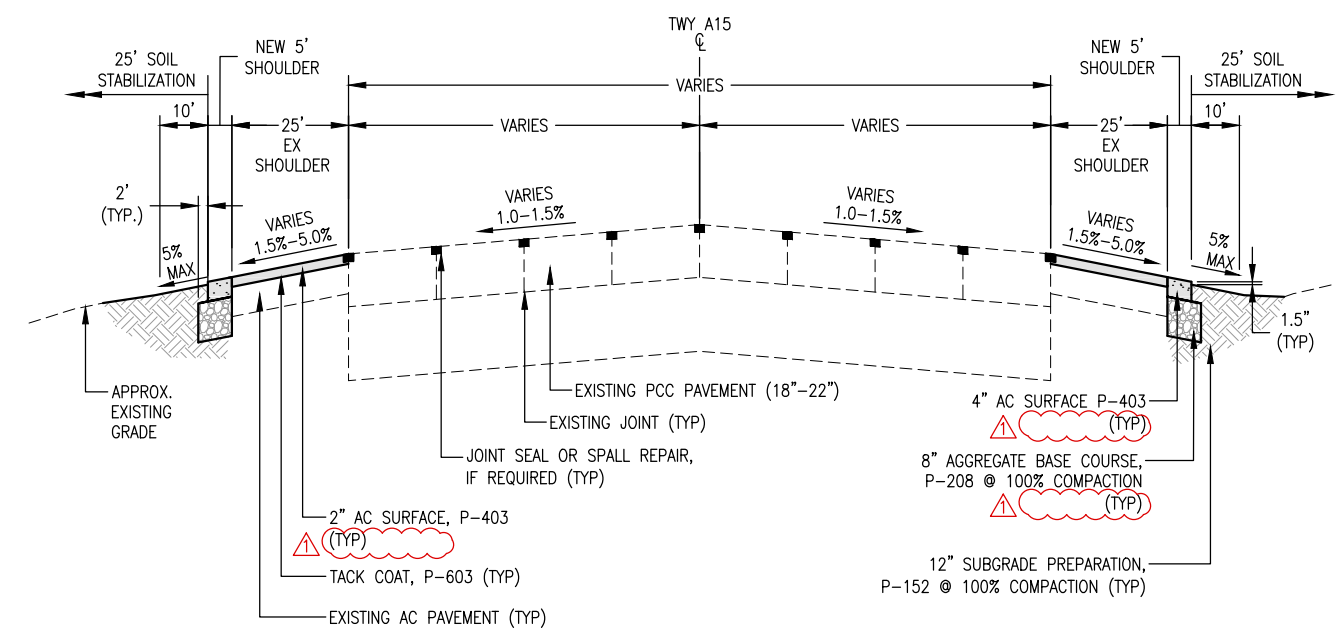
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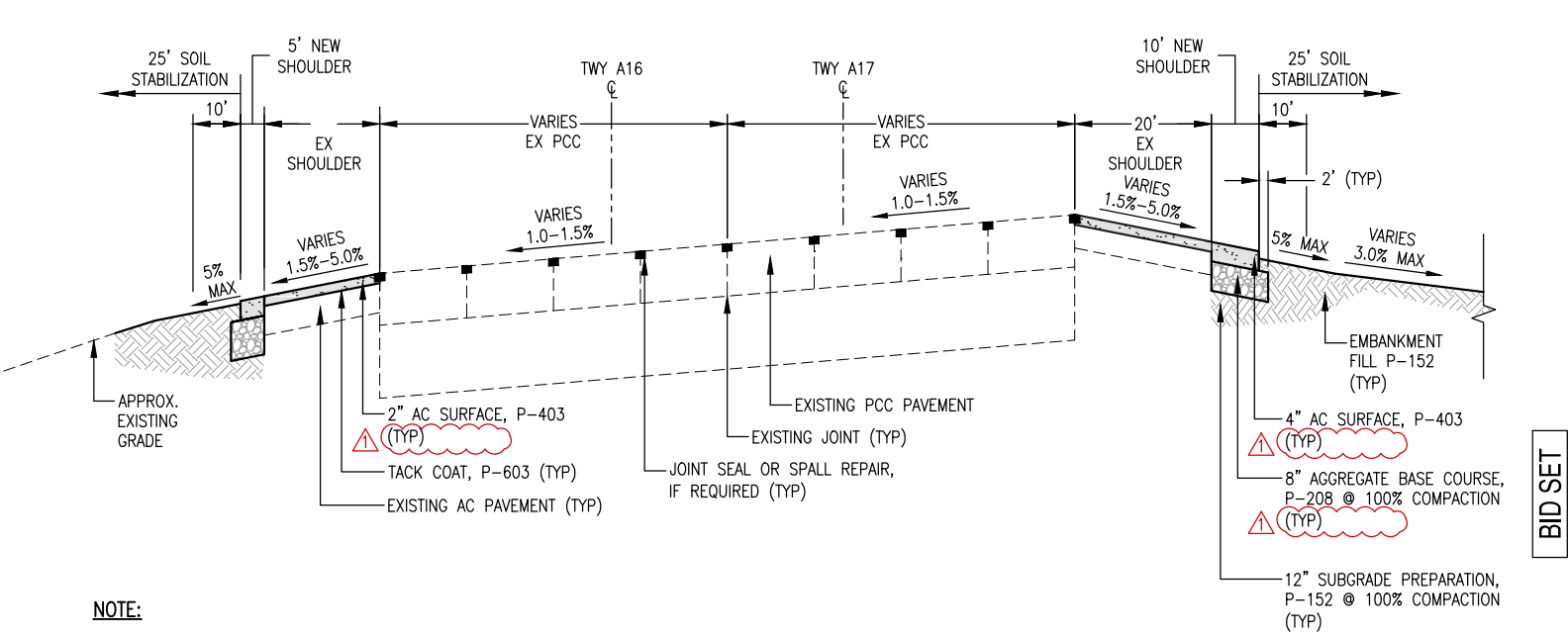
Q TYPICAL SECTION - TWY A13
 SCALE: N.T.S.
 TWY A13 STA 116+00.00 TO 117+90.32



R TYPICAL SECTION - TWY A15
 SCALE: N.T.S.
 TWY A15 STA 113+62.41 TO 114+25.00
 TWY A15 STA 115+75.00 TO 116+25.04



S TYPICAL SECTION - TWY A15
 SCALE: N.T.S.
 TWY A15 STA 112+27.40 TO 113+62.41
 TWY A15 STA 116+25.04 TO 117+42.02



T TYPICAL SECTION - TWYs A16 & A17
 SCALE: N.T.S.
 TWY A17 STA 117+75.00 TO 118+74.64

NOTE:
 SECTION STATIONING IS BASED ON TWY A17 ALIGNMENT.

GENERAL NOTE:
 REFER TO PAVING AND GEOMETRY SHEETS
 C401-C414 FOR PAVEMENT WIDTHS

FILED:\Box_Sync\Tucson\RWY 11L-29R\03 Design\02_Sheets\TYP SECTIONS.dwg DATE: Jun, 08 2017 TIME: 05:44 pm

AECOM
 333 EAST WETMORE ROAD, SUITE 400
 TUCSON, AZ 85705 T 520.887.1800



NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM #2	06.08.17

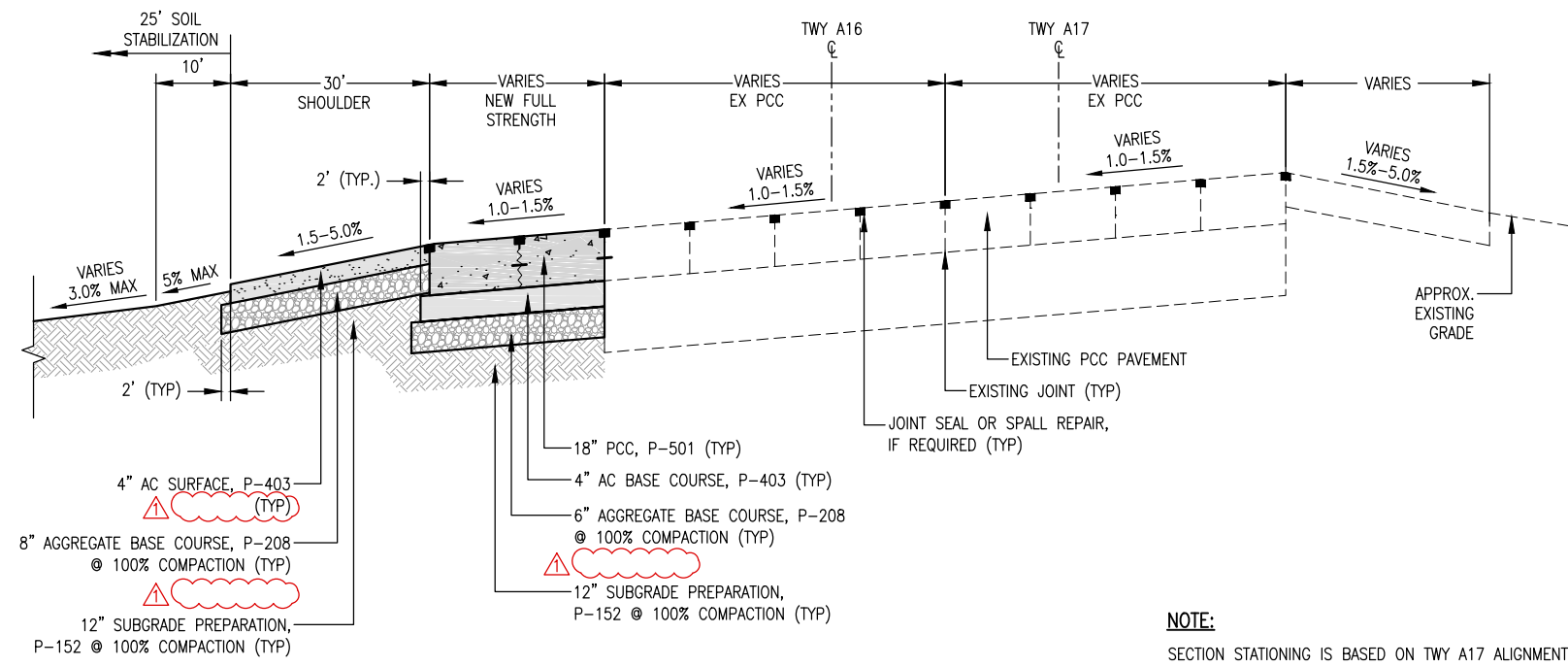
TUCSON
 AIRPORT AUTHORITY
 REHABILITATE RUNWAY 11L-29R
 AND CONNECTOR TAXIWAYS

DESIGNED BY: JC	DRAWN BY: HF
CHECKED BY: JC	DATE: 04.19.17
TAA PROJ.# 10112254	SCALE: PER PLAN

BID SET
 SHEET OVERVIEW TITLE
 TYPICAL SECTIONS - TWYs

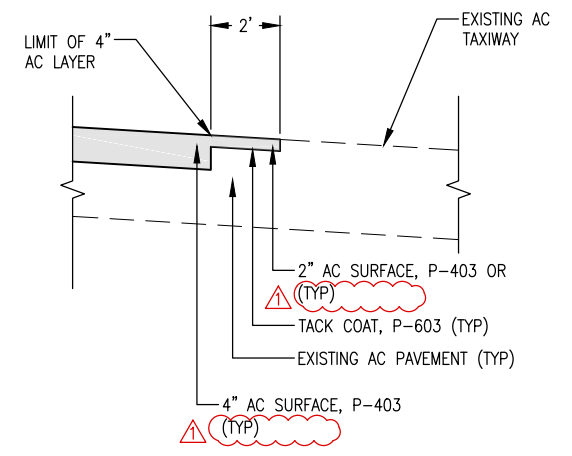
SHEET REFERENCE NUMBER:
C455
 SHEET 274 OF 410

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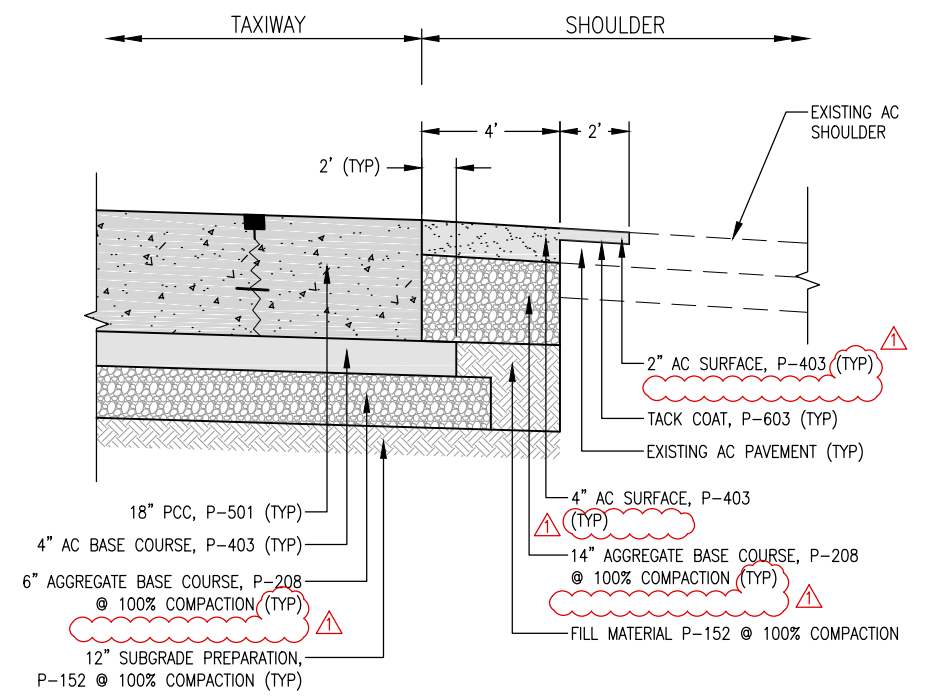


U **TYPICAL SECTION - TWYs A16 & A17**
 SCALE: N.T.S.
 TWY A17 STA 118+74.64 TO 119+71.08 (INCLUDES RIGHT SIDE SHOULDER SHOWN IN SECTION T)
 TWY A17 STA 119+71.08 TO 121+53.22

NOTE:
 SECTION STATIONING IS BASED ON TWY A17 ALIGNMENT.



1 **KEY IN 4.5\"/>**



2 **SHOULDER CONSTRUCTION NEXT TO NEW PCC DETAIL**
 SCALE: N.T.S.

GENERAL NOTE:
 REFER TO PAVING AND GEOMETRY SHEETS
 C401-C414 FOR PAVEMENT WIDTHS

PLANS PREPARED BY: **AECOM**
 333 EAST WETMORE ROAD, SUITE 400
 TUCSON, AZ 85705 T 520.887.1900

NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM #2	06.08.17

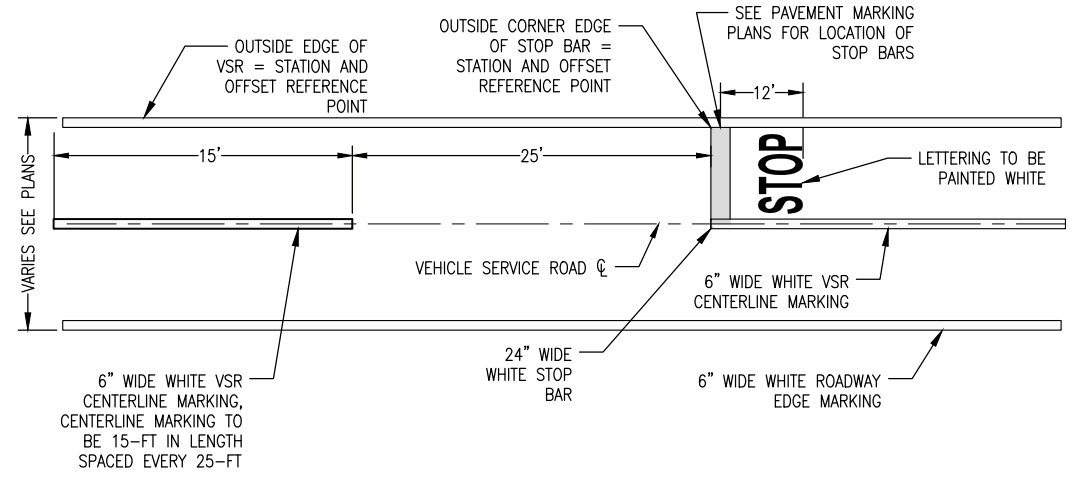
TUCSON
AIRPORT AUTHORITY
REHABILITATE RUNWAY 11L-29R
AND CONNECTOR TAXIWAYS

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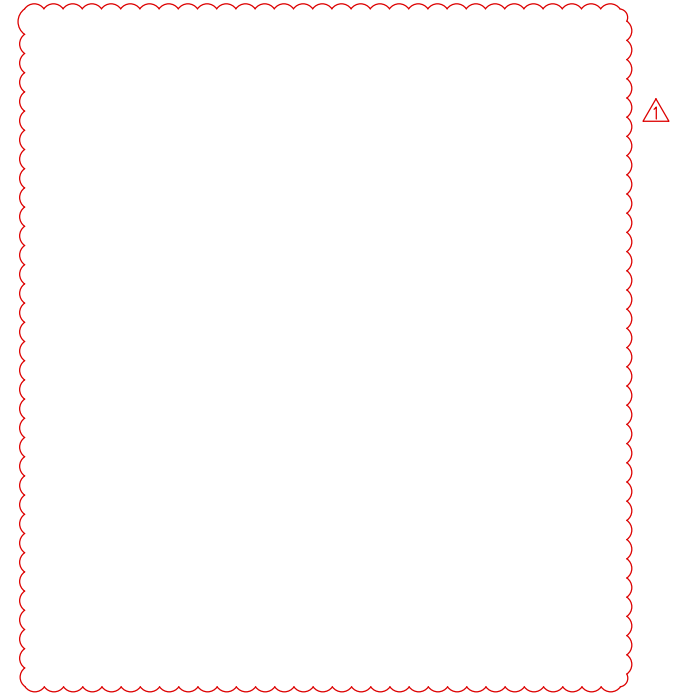
DESIGNED BY: JC	CHECKED BY: JC	DATE: 04.19.17	TAA PROJ.#: 10112254
DRAWN BY: HF	SCALE: PER PLAN		

SHEET OVERVIEW TITLE
TYPICAL SECTIONS - TWYs

SHEET REFERENCE NUMBER:
C456
 SHEET 275 OF 410



1 VEHICLE SERVICE ROAD MARKINGS
SCALE: N.T.S.

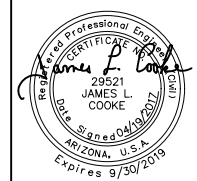


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PAVEMENT MARKING DETAILS	DRAWN BY: HF
	CHECKED BY: JC
	DATE: 04.13.17
	SCALE: PER PLAN
SHEET REFERENCE NUMBER:	TAA PROJ# 10112254
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	SHEET 365 OF 410

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AND CONNECTOR TAXIWAYS

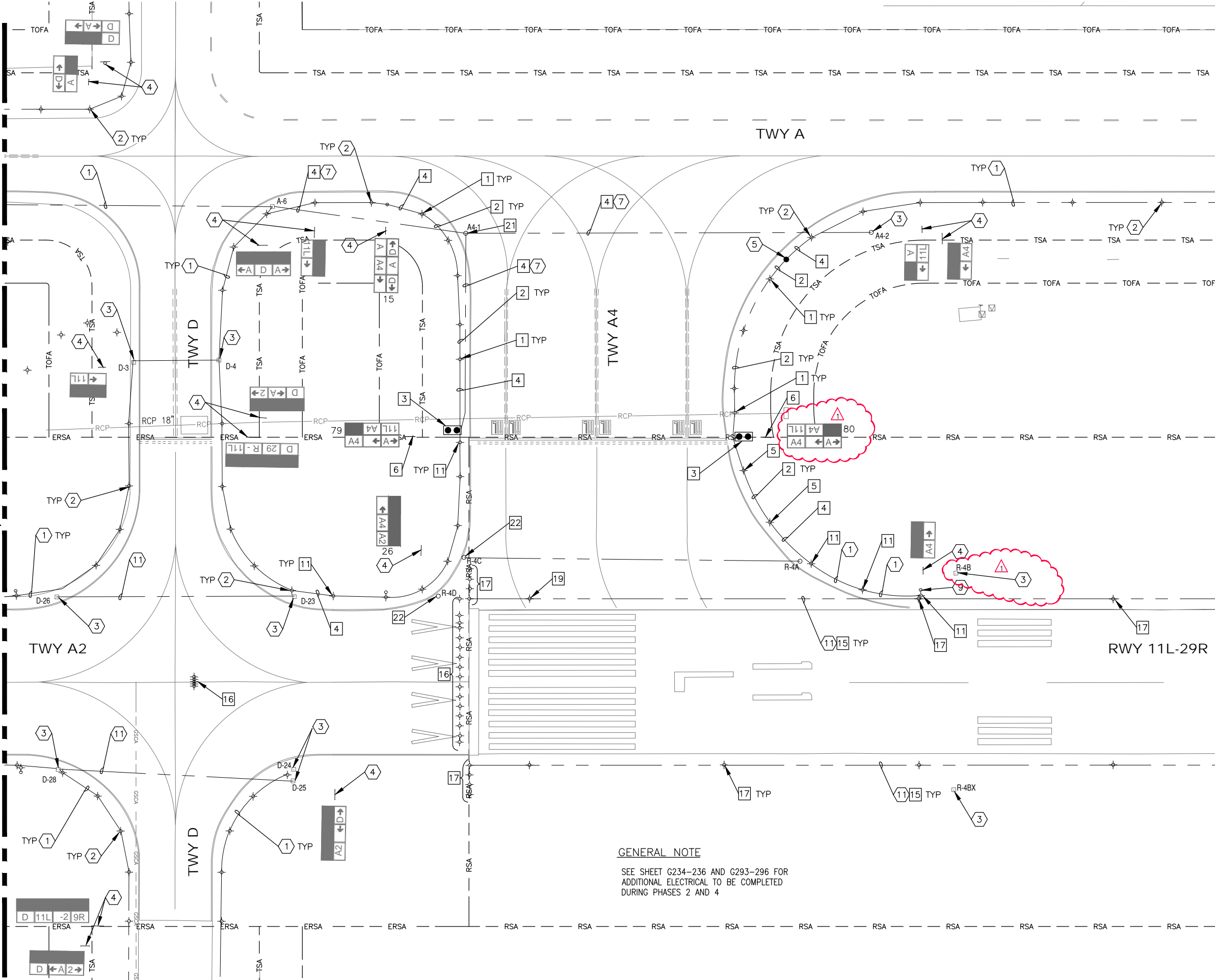
NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM #2	06.08.17



PLANS PREPARED BY:
AECOM
333 EAST WETMORE ROAD, SUITE 400
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MATCHLINE, SEE DWG E103

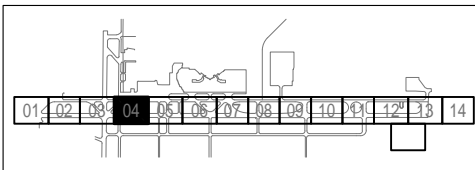
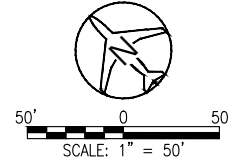
MATCHLINE, SEE DWG E105



GENERAL NOTE
 SEE SHEET G234-236 AND G293-296 FOR
 ADDITIONAL ELECTRICAL TO BE COMPLETED
 DURING PHASES 2 AND 4

- REMOVAL NOTES**
- 1 REMOVE AND SALVAGE EXISTING TAXIWAY EDGE LIGHT AND ISOLATION TRANSFORMER FOR REINSTALLATION. REMOVE BASE CAN. (9 TOTAL)
 - 2 EXCAVATE AND REMOVE EXISTING CONDUIT AND CONDUCTOR. RETURN CONDUCTOR TO OWNER.
 - 3 REMOVE EXISTING RUNWAY GUARD LIGHT FIXTURE AND ISOLATION TRANSFORMER. RETURN TO OWNER. REMOVE BASE CAN. (2 TOTAL)
 - 4 REMOVE EXISTING CONDUCTOR BACK TO NEXT ADJACENT LIGHT FIXTURE OR HANDHOLE. CONDUIT TO REMAIN.
 - 5 REMOVE AND SALVAGE EXISTING IN-PAVEMENT TAXIWAY EDGE LIGHT AND ISOLATION TRANSFORMER RETURN TO OWNER. REMOVE BASE CAN. (2 TOTAL)
 - 6 REMOVE AND SALVAGE EXISTING AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER FOR REINSTALLATION. REMOVE SIGN BASE. (2 TOTAL)
 - 11 REMOVE AND SALVAGE EXISTING TAXIWAY LIGHT FOR RE-INSTALLATION. INSTALL TEMPORARY WOOD COVER WITH EXISTING GASKET ON EXISTING BASE CAN. PROTECT ISOLATION TRANSFORMER. (10 TOTAL)
 - 15 REMOVE EXISTING CONDUCTOR. RETURN TO OWNER.
 - 16 FAA TO REMOVE AND SALVAGE EXISTING MALSR LIGHT BAR AND ISOLATION TRANSFORMERS FOR RE-INSTALLATION. CONTRACTOR TO INSTALL TEMPORARY STEEL COVER ON EXISTING BASE CAN. CONTRACTOR SHALL REPAIR/TAP ANY DAMAGED THREADS OR RINGS FOR REPLACEMENT WITH NEW BOLTS AND NEW RINGS AS REQUIRED (NPI).
 - 17 REMOVE AND SALVAGE EXISTING RUNWAY EDGE OR THRESHOLD LIGHT FOR RE-INSTALLATION. INSTALL TEMPORARY STEEL COVER WITH EXISTING GASKET ON EXISTING BASE CAN. REMOVE ISOLATION TRANSFORMER AND RETURN TO OWNER. (14 TOTAL)
 - 19 REMOVE EXISTING RUNWAY IN-PAVEMENT LIGHT AND ISOLATION TRANSFORMER. RETURN TO OWNER. REMOVE BASE CAN. (1 TOTAL)
 - 21 REMOVE AND DISPOSE OF EXISTING HANDHOLE. (1 TOTAL)
 - 22 REMOVE AND DISPOSE OF EXISTING HANDHOLE LID FOR REPLACEMENT WITH OWNER FURNISHED LID. (2 TOTAL)

- REFERENCE NOTES**
- 1 EXISTING CONDUIT AND CONDUCTOR TO REMAIN. PROTECT IN PLACE.
 - 2 EXISTING ELEVATED LIGHT FIXTURE TO REMAIN. PROTECT IN PLACE.
 - 3 EXISTING HANDHOLE TO REMAIN. PROTECT IN PLACE.
 - 4 EXISTING AIRFIELD GUIDANCE SIGN TO REMAIN. PROTECT IN PLACE.
 - 5 APPROXIMATE SPLICE POINT OF EXISTING CONDUIT AND COUNTERPOISE.
 - 6 EXISTING IN-PAVEMENT EDGE LIGHT TO REMAIN. PROTECT IN PLACE.
 - 7 CONTRACTOR SHALL VERIFY EXISTING CIRCUITS PRIOR TO REMOVING CABLE FOR REPLACEMENT.
 - 9 EXISTING JUNCTION CAN TO REMAIN. PROTECT IN PLACE.
 - 11 EXISTING CONDUIT TO REMAIN. PROTECT IN PLACE.



KEY PLAN

PLANS PREPARED BY:

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NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM #2	06/09/17

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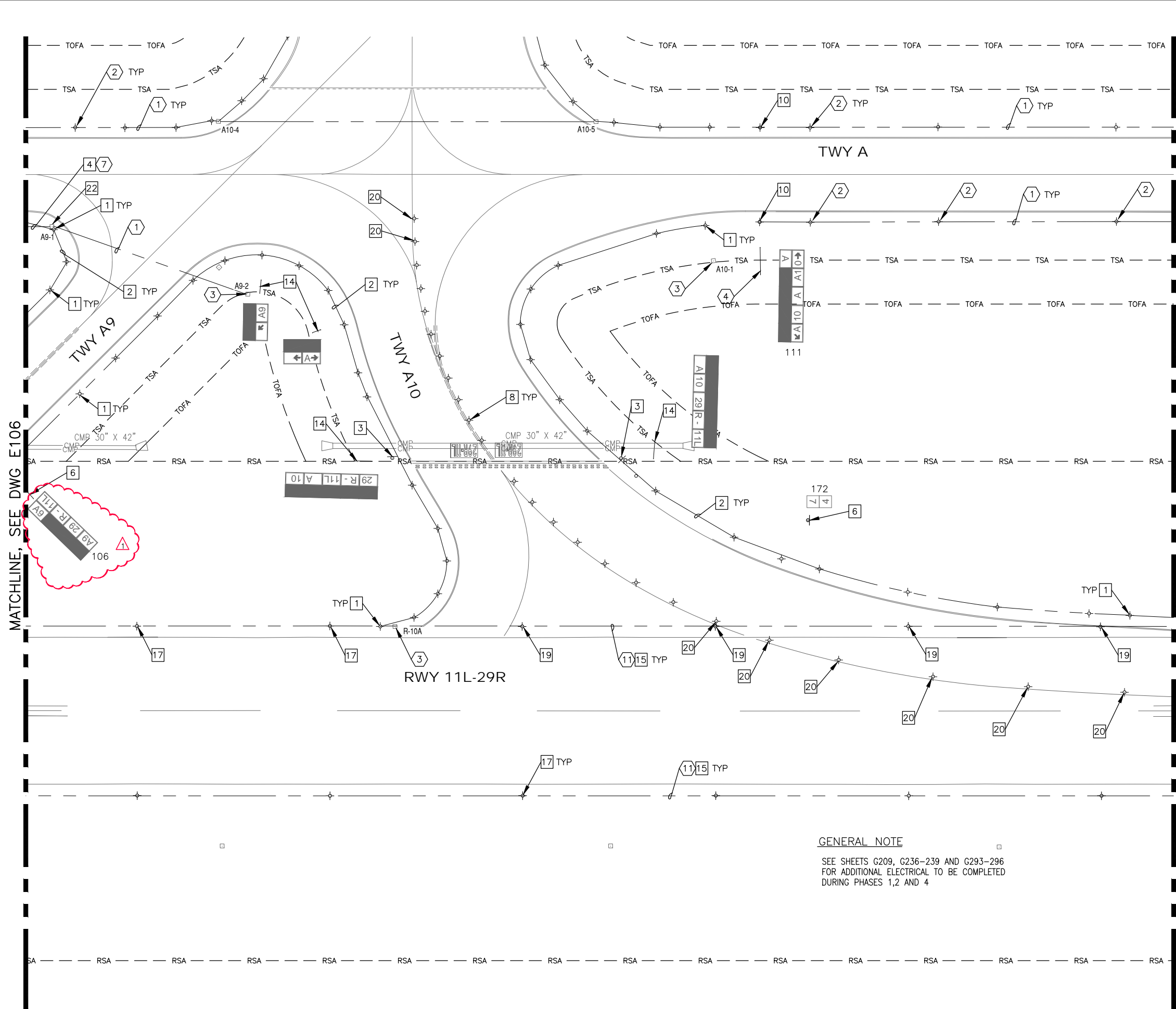
DESIGNED BY: KL	DRAWN BY: JMW
CHECKED BY: CA	DATE: 06/01/17
SCALE: PER PLAN	TAA PROJ.# 10112254

SHEET OVERVIEW TITLE

**AIRFIELD ELECTRICAL
 REMOVAL PLAN 04**

SHEET REFERENCE NUMBER:
E104
 SHEET 368 OF 410

FILE:Q:\PROJECTS\15000\15005 TAA 10112254- Reconstruct Runway 11L-29R and Connector Taxiways CAD (RWY 11L-29R) D3 Design\02 Sheets\E107.dwg DATE:Jun, 07, 2017 TIME: 02:52 pm



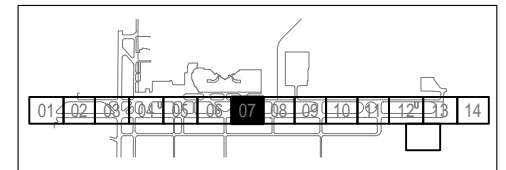
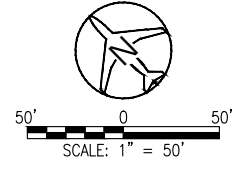
MATCHLINE, SEE DWG E106

MATCHLINE, SEE DWG E108

GENERAL NOTE
 SEE SHEETS G209, G236-239 AND G293-296 FOR ADDITIONAL ELECTRICAL TO BE COMPLETED DURING PHASES 1,2 AND 4

- REMOVAL NOTES**
- 1 REMOVE AND SALVAGE EXISTING TAXIWAY EDGE LIGHT AND ISOLATION TRANSFORMER FOR REINSTALLATION. REMOVE BASE CAN. (36 TOTAL)
 - 2 EXCAVATE AND REMOVE EXISTING CONDUIT AND CONDUCTOR. RETURN CONDUCTOR TO OWNER.
 - 3 REMOVE EXISTING RUNWAY GUARD LIGHT FIXTURE AND ISOLATION TRANSFORMER. REMOVE BASE CAN. (2 TOTAL)
 - 4 REMOVE EXISTING CONDUCTOR BACK TO NEXT ADJACENT LIGHT FIXTURE OR HANDHOLE. CONDUIT TO REMAIN.
 - 6 REMOVE AND SALVAGE EXISTING AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER FOR REINSTALLATION. REMOVE SIGN BASE. (2 TOTAL)
 - 8 REMOVE AND RETURN TO OWNER EXISTING IN-PAVEMENT TAXIWAY CENTERLINE LIGHT AND ISOLATION TRANSFORMER. REMOVE BASE CAN. (16 TOTAL)
 - 10 REMOVE AND SALVAGE EXISTING TAXIWAY EDGE LIGHT AND ISOLATION TRANSFORMER FOR REINSTALLATION. BASE CAN TO REMAIN. (2 TOTAL)
 - 14 REMOVE AND SALVAGE EXISTING AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER. REMOVE CONCRETE SIGN BASE. (4 TOTAL)
 - 15 REMOVE EXISTING CONDUCTOR. RETURN TO OWNER.
 - 17 REMOVE AND SALVAGE EXISTING RUNWAY EDGE OR THRESHOLD LIGHT FOR RE-INSTALLATION. INSTALL TEMPORARY STEEL COVER WITH EXISTING GASKET ON EXISTING BASE CAN. REMOVE ISOLATION TRANSFORMER AND RETURN TO OWNER. (8 TOTAL)
 - 19 REMOVE EXISTING RUNWAY IN-PAVEMENT LIGHT AND ISOLATION TRANSFORMER. RETURN TO OWNER. REMOVE BASE CAN. (4 TOTAL)
 - 20 REMOVE AND RETURN EXISTING IN-PAVEMENT TAXIWAY CENTERLINE LIGHT AND ISOLATION TRANSFORMER TO OWNER. REMOVE AND DISPOSE OF BASE CAN EXTENSION. PLUG CONDUIT AND FILL BASE CAN WITH CONCRETE. INSTALL STEEL PLATE ON EXISTING BASE CAN. CONTRACTOR SHALL AS-BUILT LOCATION OF ABANDONED BASE CAN. (8 TOTAL)
 - 22 REMOVE AND DISPOSE OF EXISTING HANDHOLE LID FOR REPLACEMENT WITH OWNER PROVIDED LID. (1 TOTAL)

- REFERENCE NOTES**
- 1 EXISTING CONDUIT AND CONDUCTOR TO REMAIN. PROTECT IN PLACE.
 - 2 EXISTING ELEVATED LIGHT FIXTURE TO REMAIN. PROTECT IN PLACE.
 - 3 EXISTING HANDHOLE TO REMAIN. PROTECT IN PLACE.
 - 4 EXISTING AIRFIELD GUIDANCE SIGN TO REMAIN. PROTECT IN PLACE.
 - 5 APPROXIMATE SPLICE POINT OF EXISTING CONDUIT AND COUNTERPOISE.
 - 6 EXISTING IN-PAVEMENT EDGE LIGHT TO REMAIN. PROTECT IN PLACE.
 - 7 CONTRACTOR SHALL VERIFY EXISTING CIRCUITS PRIOR TO REMOVING CABLES FOR REPLACEMENT.
 - 11 EXISTING CONDUIT TO REMAIN. PROTECT IN PLACE.



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NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM #2	06/09/17

TUCSON
 AIRPORT AUTHORITY
 REHABILITATE RUNWAY 11L-29R
 AND CONNECTOR TAXIWAYS

DESIGNED BY: KL	DRAWN BY: JW
CHECKED BY: CA	DATE: 06/01/17
SCALE: PER PLAN	TAA PROJ.# 10112254

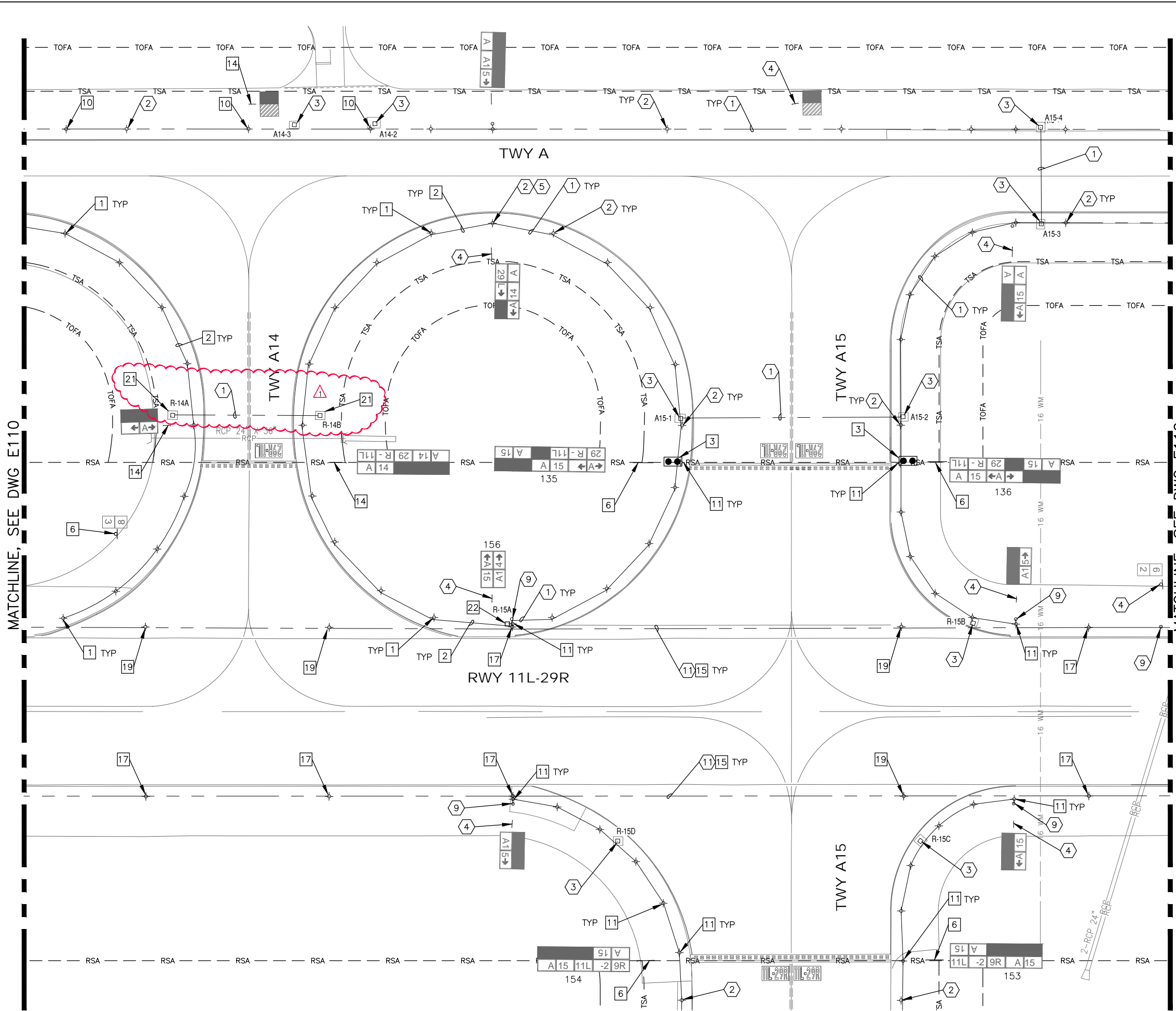
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SHEET OVERVIEW TITLE

AIRFIELD ELECTRICAL
 REMOVAL PLAN 07

SHEET REFERENCE NUMBER:
E107
 SHEET 371 OF 410

FILE:Q:\PROJECTS\15000\15005 TAA 10112254- Reconstruct Runway 11L-29R and Connector Taxiways CAD\RWY 11L-29R\03 Design\02 Sheets\E111.dwg DATE:Jun, 07, 2017 TIME: 10:11 am

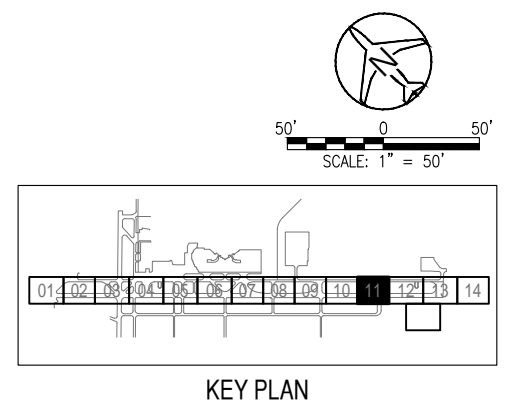


REMOVAL NOTES

- 1 REMOVE AND SALVAGE EXISTING TAXIWAY EDGE LIGHT AND ISOLATION TRANSFORMER FOR REINSTALLATION. REMOVE BASE CAN. (18 TOTAL)
- 2 EXCAVATE AND REMOVE EXISTING CONDUIT AND CONDUCTOR. RETURN CONDUCTOR TO OWNER.
- 3 REMOVE EXISTING RUNWAY GUARD LIGHT FIXTURE AND ISOLATION TRANSFORMER RETURN TO OWNER. REMOVE BASE CAN. (2 TOTAL)
- 6 REMOVE AND SALVAGE EXISTING AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER FOR REINSTALLATION. REMOVE SIGN BASE. (5 TOTAL)
- 10 REMOVE AND SALVAGE EXISTING TAXIWAY EDGE LIGHT AND ISOLATION TRANSFORMER. BASE CAN TO REMAIN. (3 TOTAL)
- 11 REMOVE AND SALVAGE EXISTING TAXIWAY LIGHT FOR RE-INSTALLATION. INSTALL TEMPORARY WOOD COVER WITH EXISTING GASKET ON EXISTING BASE CAN. PROTECT ISOLATION TRANSFORMER. (24 TOTAL)
- 14 REMOVE AND SALVAGE EXISTING AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER. REMOVE CONCRETE SIGN BASE. (3 TOTAL)
- 15 REMOVE EXISTING CONDUCTOR RETURN TO OWNER.
- 17 REMOVE AND SALVAGE EXISTING RUNWAY EDGE OR THRESHOLD LIGHT FOR RE-INSTALLATION. INSTALL TEMPORARY STEEL COVER WITH EXISTING GASKET ON EXISTING BASE CAN. REMOVE ISOLATION TRANSFORMER. (6 TOTAL)
- 19 REMOVE EXISTING RUNWAY IN-PAVEMENT LIGHT AND ISOLATION TRANSFORMER. RETURN TO OWNER. REMOVE BASE CAN. (4 TOTAL)
- 21 REMOVE AND DISPOSE OF EXISTING HANDHOLE. (2 TOTAL)
- 22 REMOVE AND DISPOSE OF EXISTING HANDHOLE LID FOR REPLACEMENT WITH OWNER PROVIDED LID. (1 TOTAL)

REFERENCE NOTES

- 1 EXISTING CONDUIT AND CONDUCTOR TO REMAIN. PROTECT IN PLACE.
- 2 EXISTING ELEVATED LIGHT FIXTURE TO REMAIN. PROTECT IN PLACE.
- 3 EXISTING HANDHOLE TO REMAIN. PROTECT IN PLACE.
- 4 EXISTING AIRFIELD GUIDANCE SIGN TO REMAIN. PROTECT IN PLACE.
- 5 APPROXIMATE SPLICE POINT OF EXISTING CONDUIT AND COUNTERPOISE.
- 6 EXISTING IN-PAVEMENT EDGE LIGHT TO REMAIN. PROTECT IN PLACE.
- 9 EXISTING JUNCTION CAN TO REMAIN. PROTECT IN PLACE.
- 11 EXISTING CONDUIT TO REMAIN. PROTECT IN PLACE.



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NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM #2	06/09/17

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AND CONNECTOR TAXIWAYS

DESIGNED BY: KL	DRAWN BY: JW
CHECKED BY: CA	DATE: 06/01/17
SCALE: PER PLAN	TAA PROJ.# 10112254

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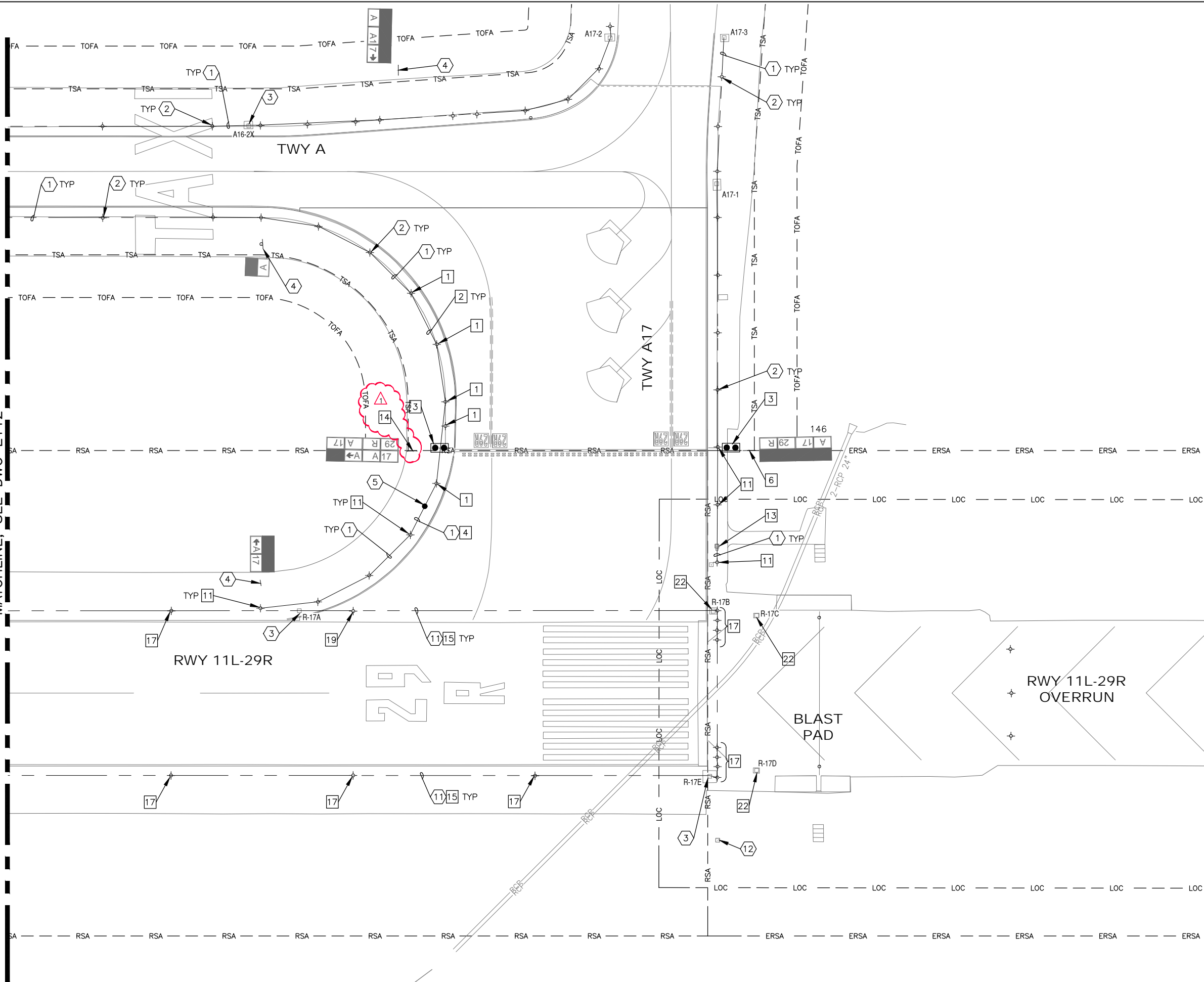
SHEET OVERVIEW TITLE

AIRFIELD ELECTRICAL
REMOVAL PLAN 11

SHEET REFERENCE NUMBER:
E111
SHEET 375 OF 410

FILE:Q:\PROJECTS\15000\15005 TAA 10112254 Reconstruct Runway 11L-29R and Connector Taxiways CAD\RWY 11L-29R\03 Design\02 Sheets\E113.dwg DATE:Jun, 07, 2017 TIME: 02:52 pm

MATCHLINE, SEE DWG E112

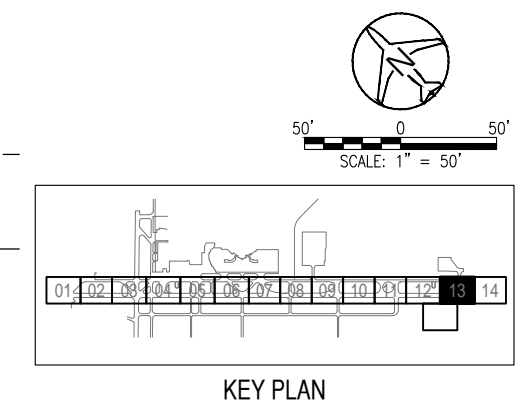


REMOVAL NOTES

- 1 REMOVE AND SALVAGE EXISTING TAXIWAY EDGE LIGHT AND ISOLATION TRANSFORMER FOR REINSTALLATION. REMOVE BASE CAN. (5 TOTAL)
- 2 EXCAVATE AND REMOVE EXISTING CONDUIT AND CONDUCTOR. RETURN CONDUCTOR TO OWNER.
- 3 REMOVE EXISTING RUNWAY GUARD LIGHT FIXTURE AND ISOLATION TRANSFORMER. REMOVE BASE CAN. (2 TOTAL)
- 4 REMOVE EXISTING CONDUCTOR BACK TO NEXT ADJACENT LIGHT FIXTURE OR HANDHOLE. CONDUIT TO REMAIN.
- 6 REMOVE AND SALVAGE EXISTING AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER FOR RE-INSTALLATION. REMOVE SIGN BASE. (2 TOTAL)
- 11 REMOVE AND SALVAGE EXISTING TAXIWAY LIGHT FOR RE-INSTALLATION. INSTALL TEMPORARY WOOD COVER WITH EXISTING GASKET ON EXISTING BASE CAN. PROTECT ISOLATION TRANSFORMER. (7 TOTAL)
- 13 REMOVE AND SALVAGE EXISTING REIL UNIT FOR RE-INSTALLATION. PROTECT CONCRETE BASE. (1 TOTAL)
- 14 REMOVE AND SALVAGE EXISTING AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER. REMOVE CONCRETE SIGN BASE. (1 TOTAL)
- 15 REMOVE EXISTING CONDUCTOR RETURN TO OWNER.
- 17 REMOVE AND SALVAGE EXISTING RUNWAY EDGE OR THRESHOLD LIGHT FOR RE-INSTALLATION. INSTALL TEMPORARY STEEL COVER WITH EXISTING GASKET ON EXISTING BASE CAN. REMOVE ISOLATION TRANSFORMER. (12 TOTAL)
- 19 REMOVE EXISTING RUNWAY IN-PAVEMENT LIGHT AND ISOLATION TRANSFORMER RETURN TO OWNER. REMOVE BASE CAN. (1 TOTAL)
- 22 REMOVE AND DISPOSE OF EXISTING HANDHOLE LID FOR REPLACEMENT WITH OWNER PROVIDED LID. (3 TOTAL)

REFERENCE NOTES

- 1 EXISTING CONDUIT AND CONDUCTOR TO REMAIN. PROTECT IN PLACE.
- 2 EXISTING ELEVATED LIGHT FIXTURE TO REMAIN. PROTECT IN PLACE.
- 3 EXISTING HANDHOLE TO REMAIN. PROTECT IN PLACE.
- 4 EXISTING AIRFIELD GUIDANCE SIGN TO REMAIN. PROTECT IN PLACE.
- 5 APPROXIMATE SPLICE POINT OF EXISTING CONDUIT AND COUNTERPOISE.
- 6 EXISTING IN-PAVEMENT EDGE LIGHT TO REMAIN. PROTECT IN PLACE.
- 11 EXISTING CONDUIT TO REMAIN. PROTECT IN PLACE.
- 12 EXISTING REIL. PROTECT IN PLACE.



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36696
CATHERINE M. ALCORN
Arizona, P.E.
Expires 9/30/2019

NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM #2	06/09/17

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REHABILITATE RUNWAY 11L-29R
AND CONNECTOR TAXIWAYS

DESIGNED BY: KL	DRAWN BY: JW
CHECKED BY: CA	DATE: 06/01/17
SCALE: PER PLAN	TAA PROJ.# 10112254

SHEET OVERVIEW TITLE

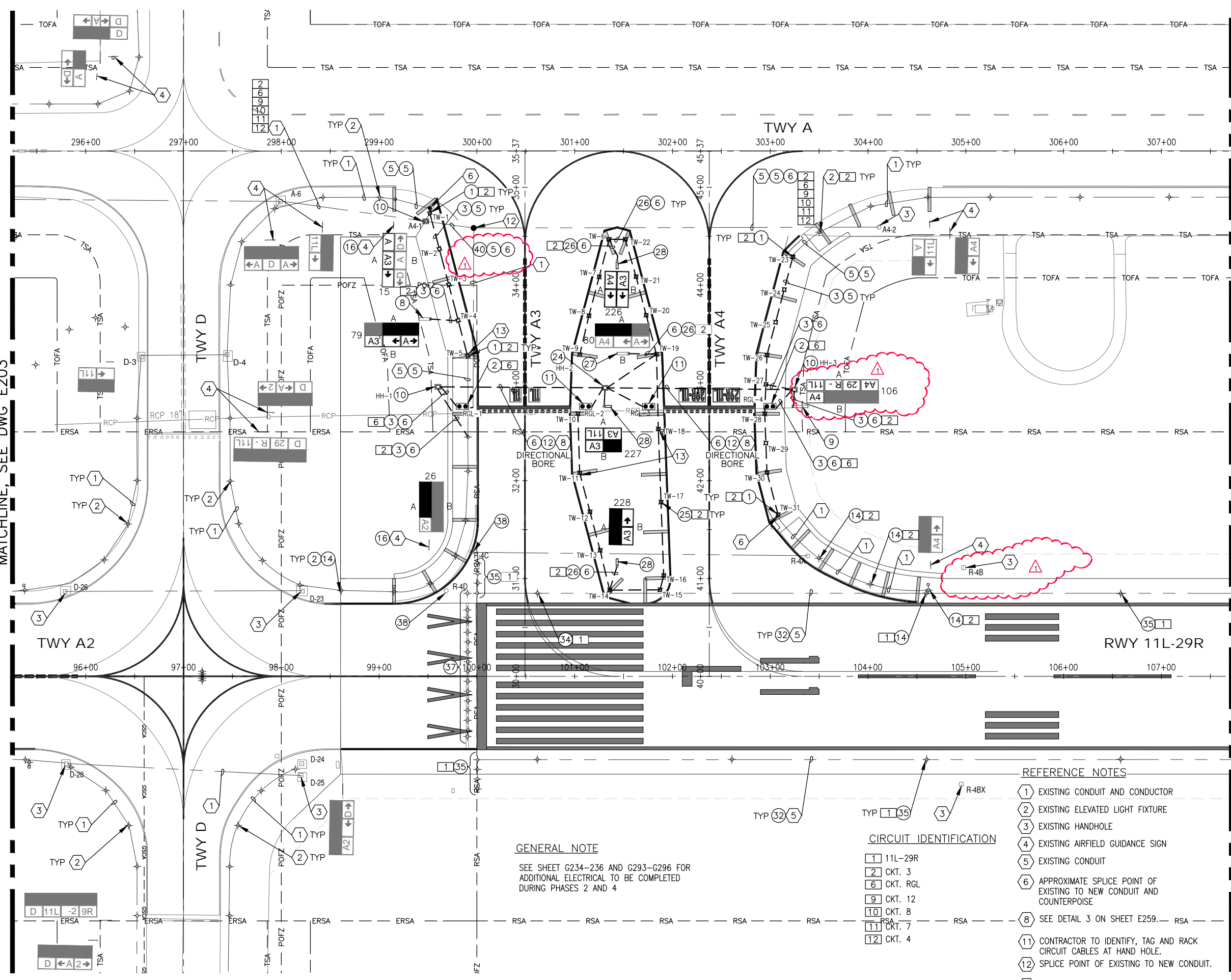
AIRFIELD ELECTRICAL
REMOVAL PLAN 13

SHEET REFERENCE NUMBER:
E113
SHEET 377 OF 410

FILE:Q:\PROJECTS\15000\15005 TAA 10112254 Reconstruct Runway 11L-29R and Connector Taxiways CAD\RWY 11L-29R\03 Design\02 Sheets\E204.dwg DATE:Jun, 07, 2017 TIME: 09:48 am

MATCHLINE, SEE DWG E203

MATCHLINE, SEE DWG E205



- CONSTRUCTION NOTES**
- RE-INSTALL SALVAGED L-861(L) LED TAXIWAY EDGE LIGHT AND ISOLATION TRANSFORMER ON NEW L-867 BASE. SEE DETAIL 1 ON SHEET E250. (14 TOTAL)
 - INSTALL NEW LED RUNWAY GUARD LIGHT AND ISOLATION TRANSFORMER ON NEW L-867 BASE, SEE DETAIL 1 SHEET E257. (2 TOTAL)
 - 1-2" CE
 - NEW 1/C, #8 5KV, L-824 TYPE "C" AIRFIELD LIGHTING CABLE.
 - NEW 2/C, #8 5KV, L-824 TYPE "C" AIRFIELD LIGHTING CABLE.
 - RE-INSTALL SALVAGED L-858 SIZE 3, 3-MODULE AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER WITH NEW PANELS ON NEW SIGN BASE. SEE SHEET E251. (1 TOTAL)
 - RE-INSTALL SALVAGED L-858 SIZE 3, 4-MODULE AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER WITH NEW PANELS ON NEW SIGN BASE. SEE DETAIL 1 SHEET E251. (1 TOTAL)
 - NEW 2'x3'x3" HANDHOLE WITH AIRCRAFT-RATED LID. SEE DETAIL 1 ON SHEET E254. (4 TOTAL)
 - NEW LED RUNWAY GUARD LIGHT AND ISOLATION TRANSFORMER ON NEW SHALLOW L-868 BASE, SEE SHEET E257. (2 TOTAL)
 - 2-2" CE
 - REMOVE TEMPORARY WOOD COVER AND RE-INSTALL SALVAGED TAXIWAY LIGHT ON EXISTING BASE CAN WITH NEW GASKET AND RE-CONNECT TO ISOLATION TRANSFORMER. (11 TOTAL)
 - 2-4" CE DUCTBANK
 - EXISTING AIRFIELD GUIDANCE SIGN WITH NEW PANELS. (2 TOTAL)
 - NEW 2'x3'x3" HANDHOLE WITH AIRCRAFT-RATED LID RETROFIT IN EXISTING PCCP. (1 TOTAL)
 - RE-INSTALL SALVAGED L-861(L) LED TAXIWAY EDGE LIGHT AND ISOLATION TRANSFORMER ON NEW SHALLOW L-868 BASE CAN. (17 TOTAL)
 - NEW 1-2" RETROFIT IN EXISTING CONCRETE PAVEMENT. SEE SHEET E258.
 - RE-INSTALL SALVAGED L-858 SIZE 3, 3-MODULE AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER WITH NEW PANELS ON NEW SIGN BASE WITH NEW TRANSFORMER HOUSING AND 2" POWER STUB CONDUIT RETROFIT IN EXISTING CONCRETE PAVEMENT. SEE SHEET E259. (1 TOTAL)
 - NEW L-858 SIZE 3, 2-MODULE AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER ON NEW SIGN BASE WITH NEW TRANSFORMER HOUSING AND 2" POWER STUB CONDUIT RETROFIT IN EXISTING CONCRETE PAVEMENT. SEE SHEET E259. (3 TOTAL)
 - NEW 1/C, #6 5KV, L-824 TYPE "C" AIRFIELD LIGHTING CABLE.
 - NEW L-850C IN-PAVEMENT RUNWAY LIGHT AND ISOLATION TRANSFORMER ON NEW L-868 CAN. SEE DETAIL 1 ON SHEET E260.
 - REMOVE TEMPORARY STEEL COVER AND REINSTALL RUNWAY/THRESHOLD EDGE LIGHT ON EXISTING BASE CAN WITH NEW GASKET AND NEW ISOLATION TRANSFORMER. (1 TOTAL)
 - CONTRACTOR TO REMOVE TEMPORARY STEEL COVER AND FAA TO REINSTALL SALVAGED MALSR LIGHT BAR ON EXISTING BASE CAN. (16 TOTAL)
 - INSTALL NEW 2'x3' HANDHOLE LID ON EXISTING HAND HOLE - ADJUST TO NEW GRADE AS REQUIRED. OWNER PROVIDED CONTRACTOR INSTALLED. SEE SHEET E255 (3 TOTAL)
 - 6-4" CE DUCTBANK

REFERENCE NOTES

- EXISTING CONDUIT AND CONDUCTOR
- EXISTING ELEVATED LIGHT FIXTURE
- EXISTING HANDHOLE
- EXISTING AIRFIELD GUIDANCE SIGN
- EXISTING CONDUIT
- APPROXIMATE SPLICE POINT OF EXISTING TO NEW CONDUIT AND COUNTERPOISE
- SEE DETAIL 3 ON SHEET E259. RSA
- CONTRACTOR TO IDENTIFY, TAG AND RACK CIRCUIT CABLES AT HAND HOLE.
- SPLICE POINT OF EXISTING TO NEW CONDUIT.
- SEE DETAIL 1 ON SHEET E250. ENHANCED BASE CAN DRAIN REQUIRED.

CIRCUIT IDENTIFICATION

- 1 11L-29R
- 2 CKT. 3
- 6 CKT. RGL
- 9 CKT. 12
- 10 CKT. 8
- 11 CKT. 7
- 12 CKT. 4

GENERAL NOTE

SEE SHEET G234-236 AND G293-G296 FOR ADDITIONAL ELECTRICAL TO BE COMPLETED DURING PHASES 2 AND 4

BID SET

DESIGNED BY: KL	DRAWN BY: JW
CHECKED BY: CA	DATE: 06/01/17
SCALE: PER PLAN	TAA PRO.# 10112254

AIRFIELD ELECTRICAL PLAN 04

SHEET REFERENCE NUMBER: E204
SHEET 279 OF 410

PLANS PREPARED BY:

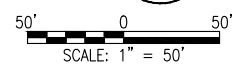
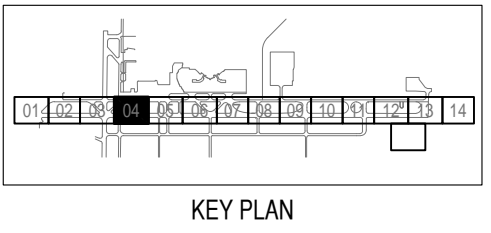
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CATHERINE M. ALCORN
Professional Engineer
Arizona, P.E. No. 13294
Expires 9/30/2019

DATE: 06/09/17
REVISIONS / SUBMISSIONS: #2

TUCSON

AIRPORT AUTHORITY
REHABILITATE RUNWAY 11L-29R
AND CONNECTOR TAXIWAYS



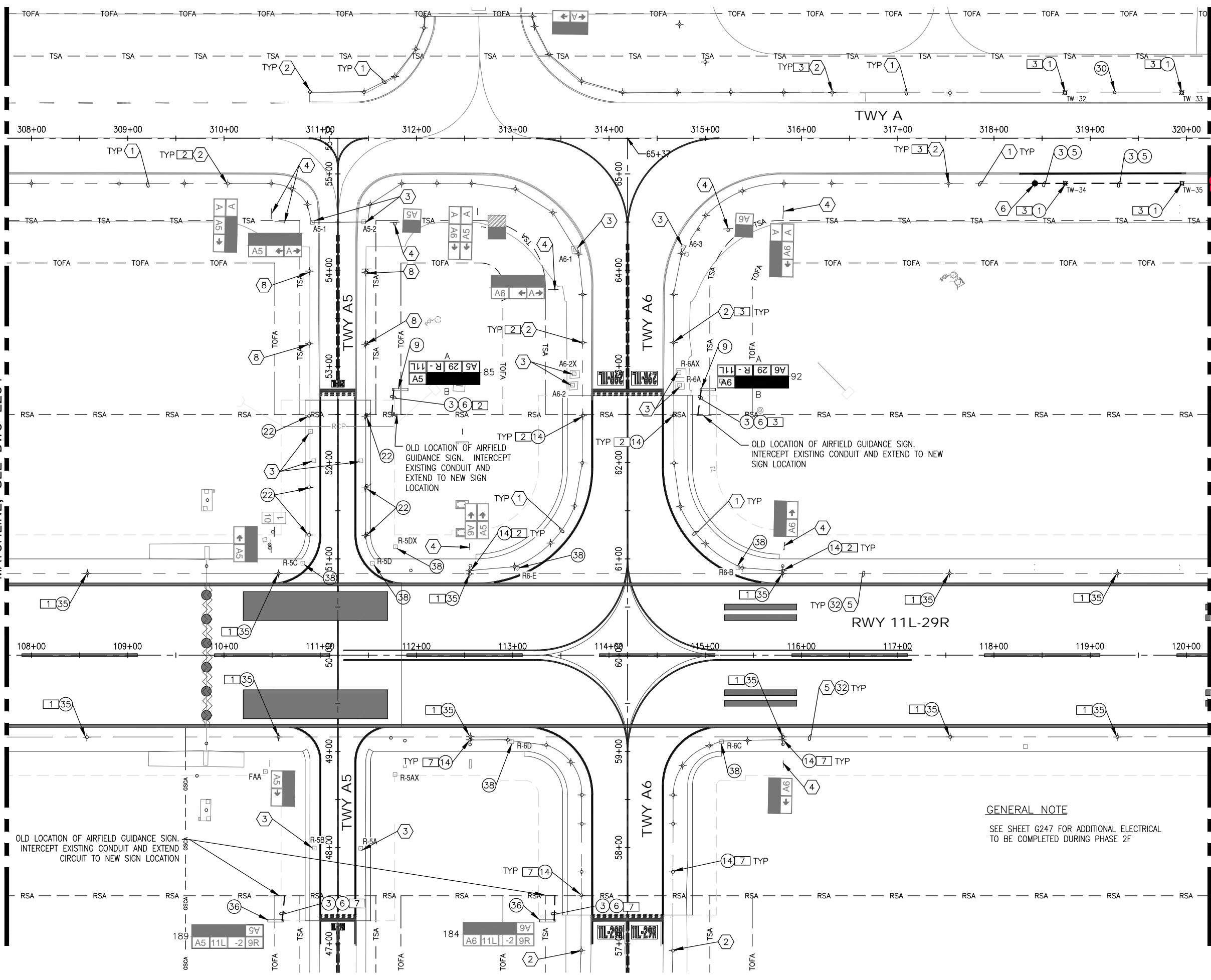
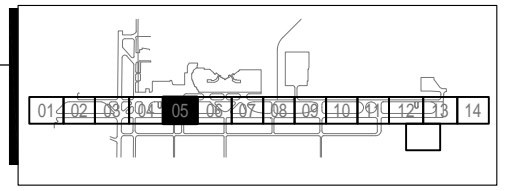
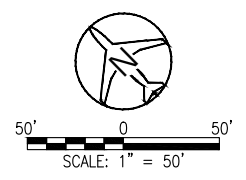
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MATCHLINE, SEE DWG E204

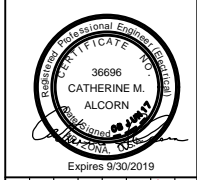
- ### CONSTRUCTION NOTES
- ① RE-INSTALL SALVAGED L-861(L) TAXIWAY EDGE LIGHT AND ISOLATION TRANSFORMER ON NEW L-867 BASE. SEE DETAIL 1 ON SHEET E250. (2 TOTAL)
 - ③ 1-2" C SE
 - ⑤ NEW 1/C, #8 5KV, L-824 TYPE "C" AIRFIELD LIGHTING CABLE.
 - ⑥ NEW 2/C, #8 5KV, L-824 TYPE "C" AIRFIELD LIGHTING CABLE.
 - ⑨ RE-INSTALL SALVAGED L-858(L) SIZE 3, 4-MODULE AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER WITH NEW PANELS ON NEW SIGN BASE. SEE SHEET E251. (2 TOTAL)
 - ⑭ REMOVE TEMPORARY WOOD COVER AND RE-INSTALL SALVAGED TAXIWAY LIGHT ON EXISTING BASE CAN WITH NEW GASKET AND RE-CONNECT TO ISOLATION TRANSFORMER. (27 TOTAL)
 - ⑲ RE-INSTALL SALVAGED RETROREFLECTIVE TAXIWAY EDGE MARKERS. (6 TOTAL)
 - ⑳ INSTALL STEEL COVER ON EXISTING BASE CAN.
 - ㉓ NEW 1/C, #6 5KV, L-824 TYPE "C" AIRFIELD LIGHTING CABLE.
 - ㉔ REMOVE TEMPORARY STEEL COVER AND REINSTALL RUNWAY/THRESHOLD EDGE LIGHT ON EXISTING BASE CAN WITH NEW GASKET AND NEW ISOLATION TRANSFORMER. (12 TOTAL)
 - ㉕ RE-INSTALL SALVAGED L-858 SIZE 3, 4 MODULE AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER ON NEW SIGN BASE. SEE SHEET E251. (2 TOTAL)
 - ㉖ INSTALL NEW 2'x3' HANDHOLE LID ON EXISTING HAND HOLE - ADJUST TO NEW GRADE AS REQUIRED. OWNER PROVIDED CONTRACTOR INSTALLED. SEE SHEET E255 (7 TOTAL)

- ### REFERENCE NOTES
- ① EXISTING CONDUIT AND CONDUCTOR
 - ② EXISTING ELEVATED LIGHT FIXTURE
 - ③ EXISTING HANDHOLE
 - ④ EXISTING AIRFIELD GUIDANCE SIGN
 - ⑤ EXISTING CONDUIT
 - ⑥ APPROXIMATE SPLICE POINT OF EXISTING TO NEW CONDUIT AND COUNTERPOISE
 - ⑧ EXISTING RETROREFLECTIVE TAXIWAY EDGE MARKER
- ### CIRCUIT IDENTIFICATION
- ① 11L-29R
 - ② CKT. 3
 - ③ CKT. 1
 - ⑦ CKT. 16

GENERAL NOTE
SEE SHEET G247 FOR ADDITIONAL ELECTRICAL TO BE COMPLETED DURING PHASE 2F



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NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM #2	06/09/17

TUCSON
AIRPORT AUTHORITY
REHABILITATE RUNWAY 11L-29R
AND CONNECTOR TAXIWAYS

DESIGNED BY: KL
DRAWN BY: JW
CHECKED BY: CA
DATE: 06/01/17
SCALE: PER PLAN
TAA PROJ.# 10112254

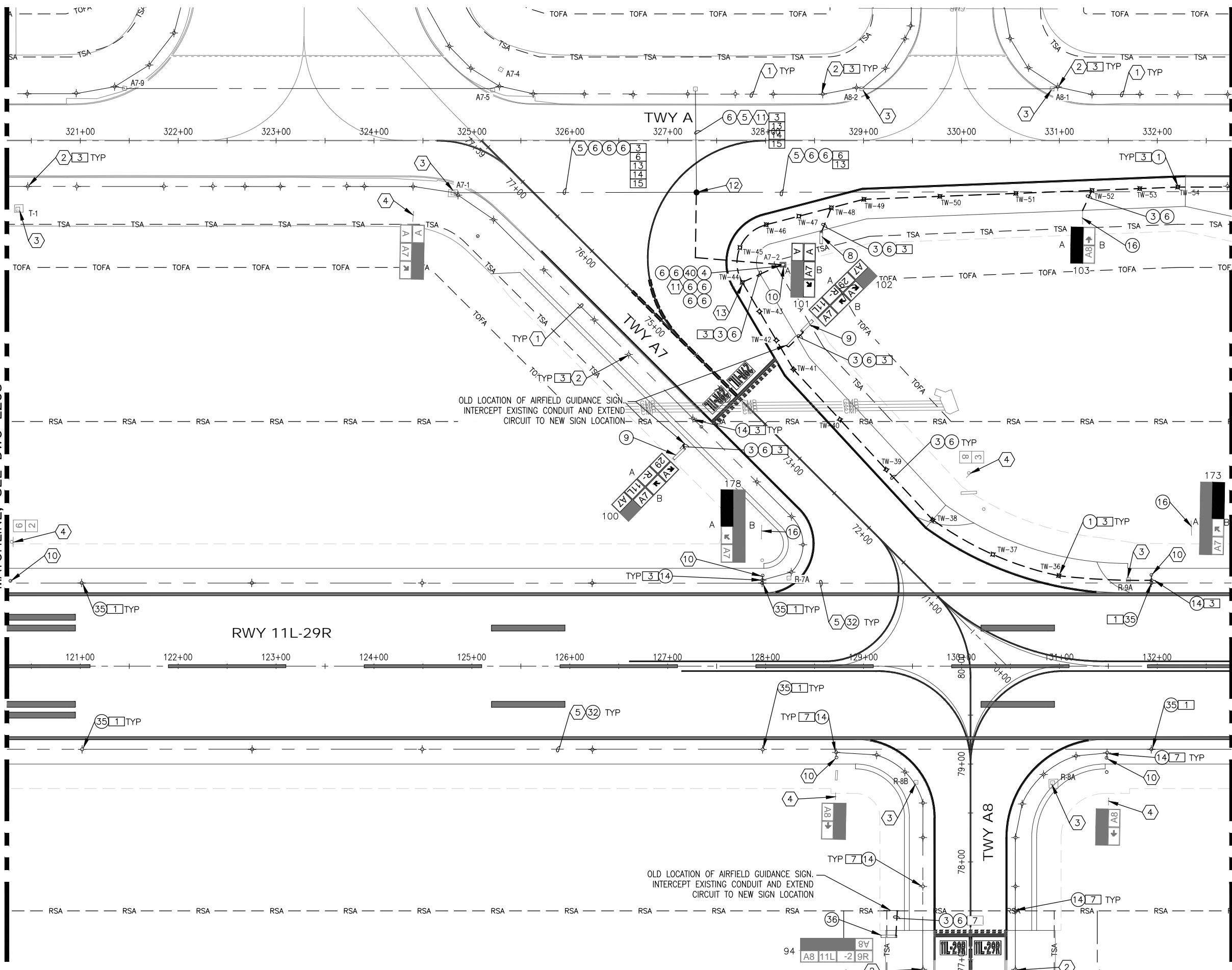
SHEET OVERVIEW TITLE
AIRFIELD ELECTRICAL PLAN 05

SHEET REFERENCE NUMBER:
E205
SHEET 380 OF 410

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MATCHLINE, SEE DWG E205

MATCHLINE, SEE DWG E207



CONSTRUCTION NOTES

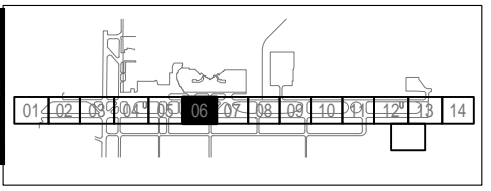
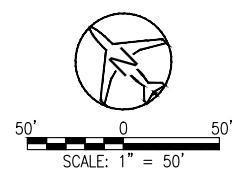
- ① RE-INSTALL SALVAGED L-861T TAXIWAY EDGE LIGHT AND ISOLATION TRANSFORMER ON NEW L-867 BASE. SEE DETAIL 1 ON SHEET E250. (19 TOTAL)
- ③ 1-2" CE
- ④ 1-2" CE
- ⑥ NEW 2/C, #8 5KV, L-824 TYPE "C" AIRFIELD LIGHTING CABLE.
- ⑧ RE-INSTALL SALVAGED L-858 SIZE 3, 3-MODULE AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER WITH NEW PANELS ON NEW SIGN BASE. SEE SHEET E251. (1 TOTAL)
- ⑨ RE-INSTALL SALVAGED L-858 SIZE 3, 4-MODULE AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER WITH NEW PANELS ON NEW SIGN BASE. SEE DETAIL 1 SHEET E251. (2 TOTAL)
- ⑩ NEW 2x3x3" HANDHOLE WITH AIRCRAFT-RATED LID. SEE DETAIL 1 ON SHEET E254. (1 TOTAL)
- ⑭ REMOVE TEMPORARY WOOD COVER AND RE-INSTALL SALVAGED TAXIWAY LIGHT ON EXISTING BASE CAN WITH NEW GASKET AND RE-CONNECT TO ISOLATION TRANSFORMER. (20 TOTAL)
- ⑰ EXISTING AIRFIELD GUIDANCE SIGN WITH NEW PANELS. (3 TOTAL)
- ⑳ NEW 1/C, #6 5KV, L-824 TYPE "C" AIRFIELD LIGHTING CABLE.
- ㉓ REMOVE TEMPORARY STEEL COVER AND REINSTALL RUNWAY/THRESHOLD EDGE LIGHT ON EXISTING BASE CAN WITH NEW GASKET AND NEW ISOLATION TRANSFORMER. (13 TOTAL)
- ㉔ RE-INSTALL SALVAGED L-858 SIZE 3, AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER ON NEW SIGN BASE. SEE SHEET E251. (1 TOTAL)
- ④① 6-4" CE DUCTBANK

REFERENCE NOTES

- ① EXISTING CONDUIT AND CONDUCTOR
- ② EXISTING ELEVATED LIGHT FIXTURE
- ③ EXISTING HANDHOLE
- ④ EXISTING AIRFIELD GUIDANCE SIGN
- ⑤ EXISTING CONDUIT
- ⑩ EXISTING JUNCTION CAN
- ①① CONTRACTOR TO IDENTIFY, TAG AND RACK CIRCUIT CABLES AT HAND HOLE.
- ①② SPLICE POINT OF EXISTING TO NEW CONDUIT.
- ①③ SEE DETAIL 1 ON SHEET E250. ENHANCED BASE CAN DRAIN REQUIRED.

CIRCUIT IDENTIFICATION

- ① 11L-29R
- ③ CKT. 1
- ⑥ CKT. RGL
- ⑦ CKT. 16
- ⑬ CKT. 9
- ⑭ CKT. 11
- ⑮ CKT. 14



KEY PLAN

PLANS PREPARED BY: **CR engineers**
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PROFESSIONAL ENGINEER
 36696
 CATHERINE M. ALCORN
 LICENSE NO. 15000
 Expires 9/30/2019

DESIGNED BY: KL	DRAWN BY: JW
CHECKED BY: CA	DATE: 06.01.17
SCALE: PER PLAN	TAA PROJ.#
10112254	10112254

BID SET

TUCSON
 AIRPORT AUTHORITY
 REHABILITATE RUNWAY 11L-29R
 AND CONNECTOR TAXIWAYS

SHEET OVERVIEW TITLE

AIRFIELD ELECTRICAL PLAN 06

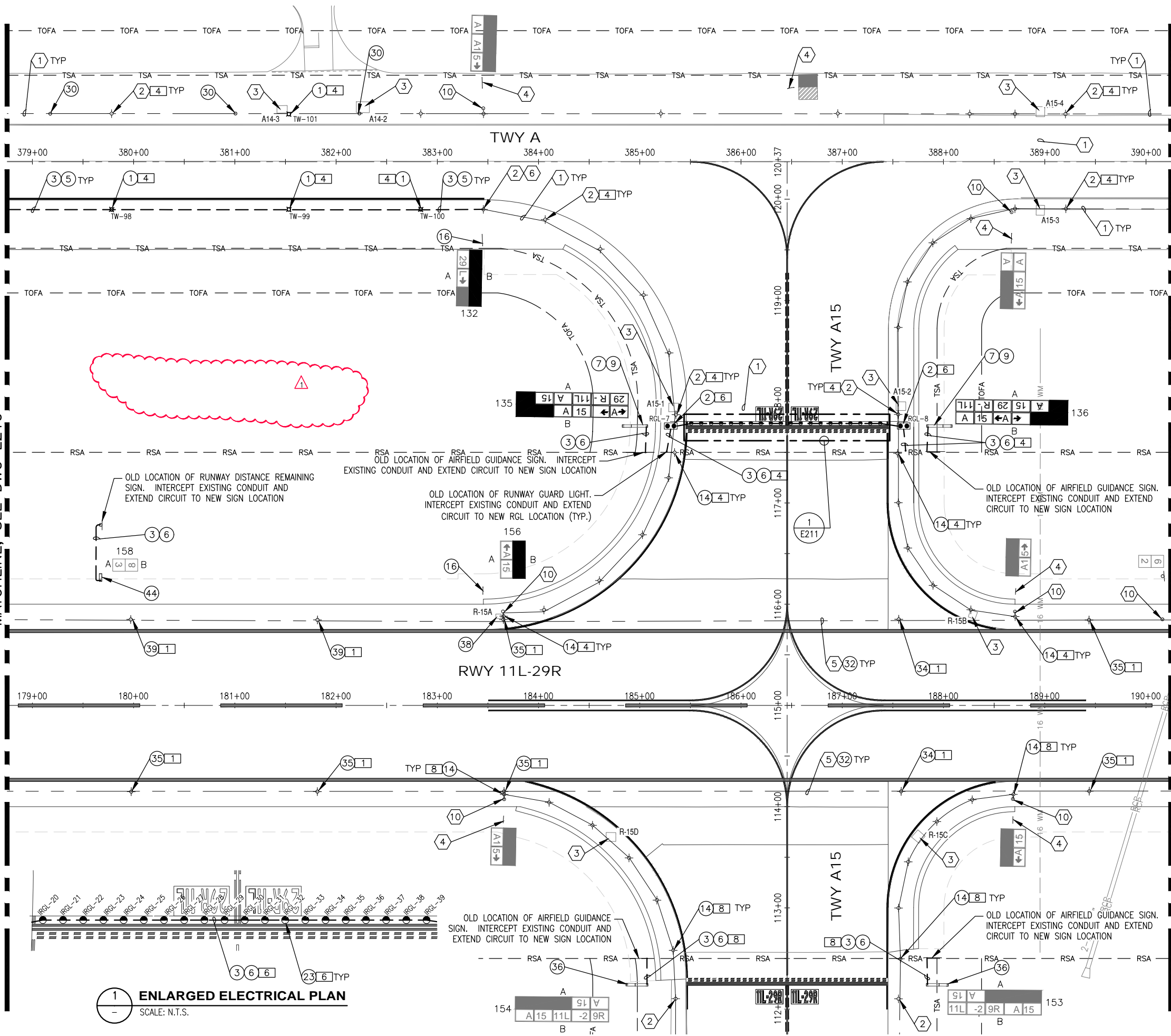
SHEET REFERENCE NUMBER:
E206
 SHEET 381 OF 410

REVISIONS / SUBMISSIONS
 NO. 1
 DATE 06/08/17
 ADDENDUM #2

FILE:Q:\PROJECTS\15000\15005 TAA 10112254 Reconstruct Runway 11L-29R and Connector Taxiways CAD\RWY 11L-29R\03 Design\02 Sheets\E211.dwg DATE:Jun, 07, 2017 TIME: 02:50 pm

MATCHLINE, SEE DWG E210

MATCHLINE, SEE DWG E212



1 ENLARGED ELECTRICAL PLAN
SCALE: N.T.S.

CONSTRUCTION NOTES

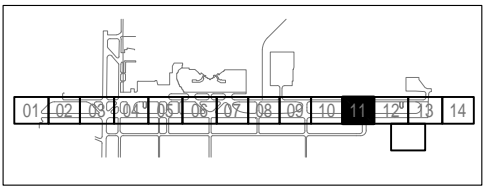
- ① RE-INSTALL SALVAGED L-861T TAXIWAY EDGE LIGHT AND ISOLATION TRANSFORMER ON NEW L-867 BASE. SEE DETAIL 1 ON SHEET E250. (3 TOTAL)
- ② INSTALL NEW LED RUNWAY GUARD LIGHT AND ISOLATION TRANSFORMER ON NEW L-867 BASE, SEE DETAIL 1 SHEET E257. (2 TOTAL)
- ③ 1-2°C SE
- ④ 1-2°C CE
- ⑤ NEW 1/C, #8 5KV, L-824 TYPE "C" AIRFIELD LIGHTING CABLE.
- ⑥ NEW 2/C, #8 5KV, L-824 TYPE "C" AIRFIELD LIGHTING CABLE.
- ⑦ RE-INSTALL SALVAGED L-858 SIZE 3, 2-MODULE AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER WITH NEW PANELS ON NEW SIGN BASE. SEE SHEET E256. (2 TOTAL)
- ⑧ RE-INSTALL SALVAGED L-858 SIZE 3, 4-MODULE AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER WITH NEW PANELS ON NEW SIGN BASE. SEE DETAIL 1 SHEET E256. (2 TOTAL)
- ⑭ REMOVE TEMPORARY WOOD COVER AND RE-INSTALL SALVAGED TAXIWAY LIGHT ON EXISTING BASE CAN WITH NEW GASKET AND RE-CONNECT TO ISOLATION TRANSFORMER. (24 TOTAL)
- ⑮ EXISTING AIRFIELD GUIDANCE SIGN WITH NEW PANELS. (2 TOTAL)
- ⑰ NEW L-852G IN-PAVEMENT RUNWAY GUARD LIGHT RETROFIT IN EXISTING ASPHALT. SEE DETAIL 2 ON SHEET E260. (23 TOTAL)
- ⑳ INSTALL STEEL COVER ON EXISTING BASE CAN. (2 TOTAL)
- ㉑ NEW 1/C, #6 5KV, L-824 TYPE "C" AIRFIELD LIGHTING CABLE.
- ㉒ NEW L-850C IN-PAVEMENT RUNWAY LIGHT AND ISOLATION TRANSFORMER ON NEW L-868 CAN. SEE DETAIL 1 ON SHEET E260. (2 TOTAL)
- ㉓ REMOVE TEMPORARY STEEL COVER AND REINSTALL RUNWAY/THRESHOLD EDGE LIGHT ON EXISTING BASE CAN WITH NEW GASKET AND NEW ISOLATION TRANSFORMER. (6 TOTAL)
- ㉔ RE-INSTALL SALVAGED L-858 SIZE 3, 5 MODULE AIRFIELD GUIDANCE SIGN AND ISOLATION TRANSFORMER ON NEW SIGN BASE. SEE SHEET E256. (2 TOTAL)
- ㉕ INSTALL NEW 2'x3' HANDHOLE LID ON EXISTING HAND HOLE - ADJUST TO NEW GRADE AS REQUIRED. OWNER PROVIDED CONTRACTOR INSTALLED. SEE SHEET E255. (1 TOTAL)
- ㉖ REMOVE TEMPORARY STEEL COVER AND REINSTALL RUNWAY/THRESHOLD EDGE LIGHT ON EXISTING BASE CAN WITH NEW GASKET, NEW ISOLATION TRANSFORMER AND CONVERSION RING. (2 TOTAL)
- ㉗ RE-INSTALL SALVAGED L-858B RUNWAY DISTANCE REMAINING SIGN AND ISOLATION TRANSFORMER ON NEW SIGN BASE. SEE SHEET E251. (1 TOTAL)

REFERENCE NOTES

- ① EXISTING CONDUIT AND CONDUCTOR
- ② EXISTING ELEVATED LIGHT FIXTURE
- ③ EXISTING HANDHOLE
- ④ EXISTING AIRFIELD GUIDANCE SIGN
- ⑤ EXISTING CONDUIT
- ⑩ EXISTING JUNCTION CAN

CIRCUIT IDENTIFICATION

- ① 11L-29R
- ④ CKT. 10
- ⑥ CKT. RGL
- ⑧ CKT. 17



KEY PLAN

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CATHERINE M. ALCORN
Professional Engineer
Arizona, P.E.
Expires 9/30/2019

NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM #2	06/09/17

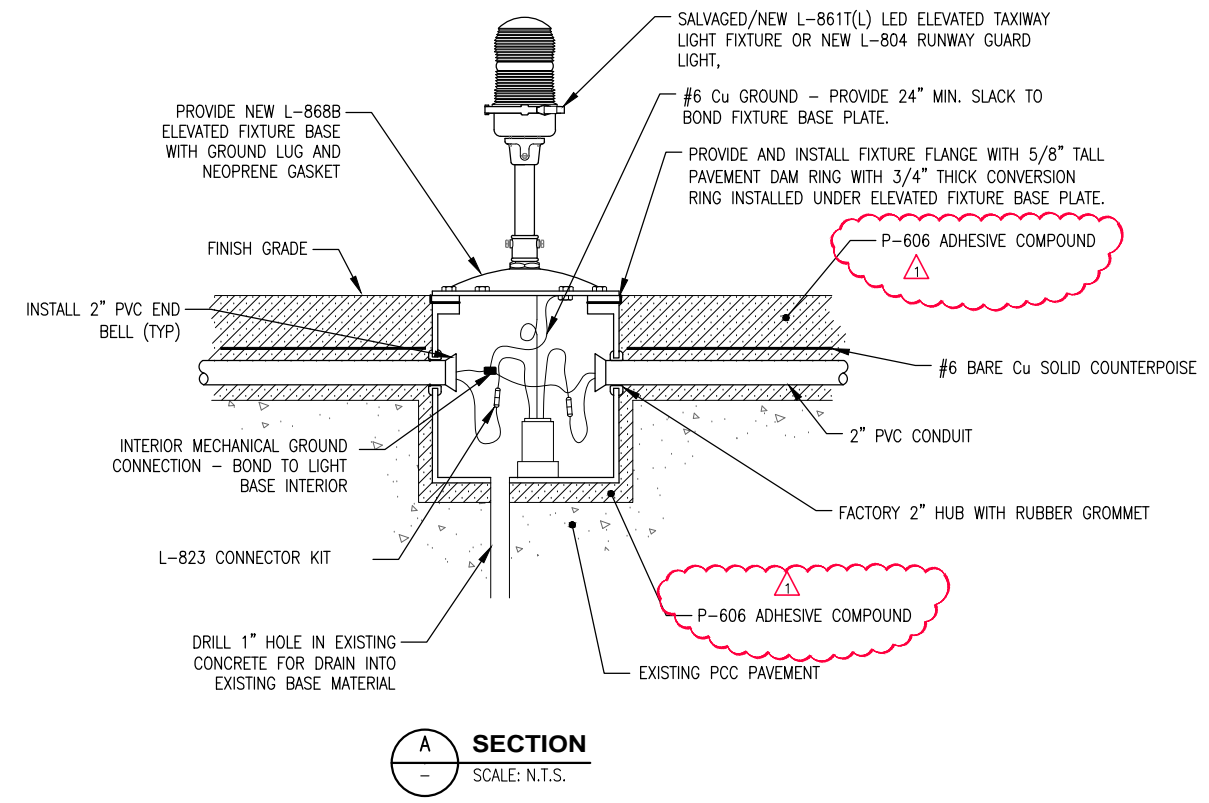
TUCSON
AIRPORT AUTHORITY
REHABILITATE RUNWAY 11L-29R
AND CONNECTOR TAXIWAYS

DESIGNED BY: KL
DRAWN BY: JW
CHECKED BY: CA
DATE: 06/01/17
SCALE: PER PLAN
TAA PROJ.#
10112254

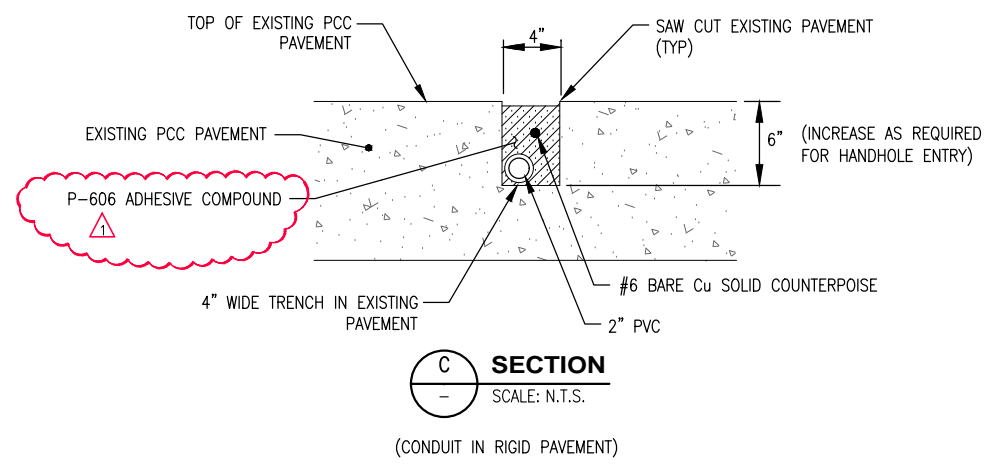
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AIRFIELD ELECTRICAL PLAN 11

SHEET REFERENCE NUMBER:
E211
SHEET 386 OF 410

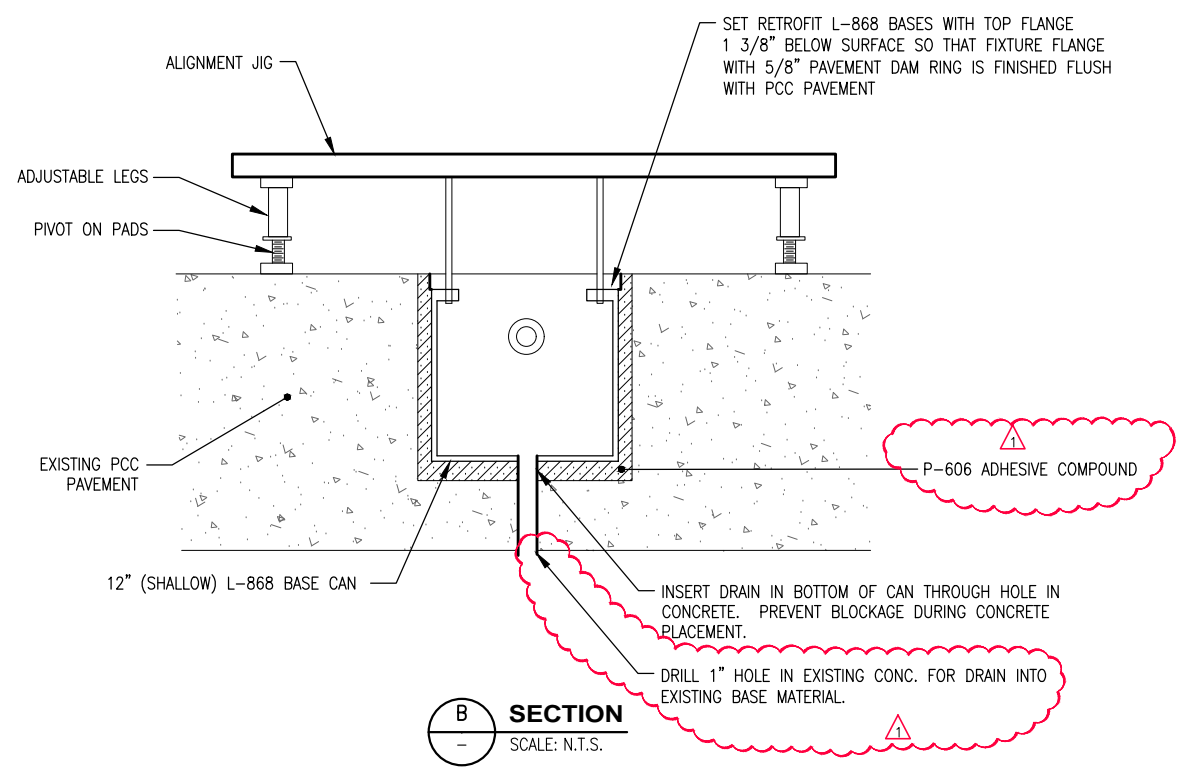
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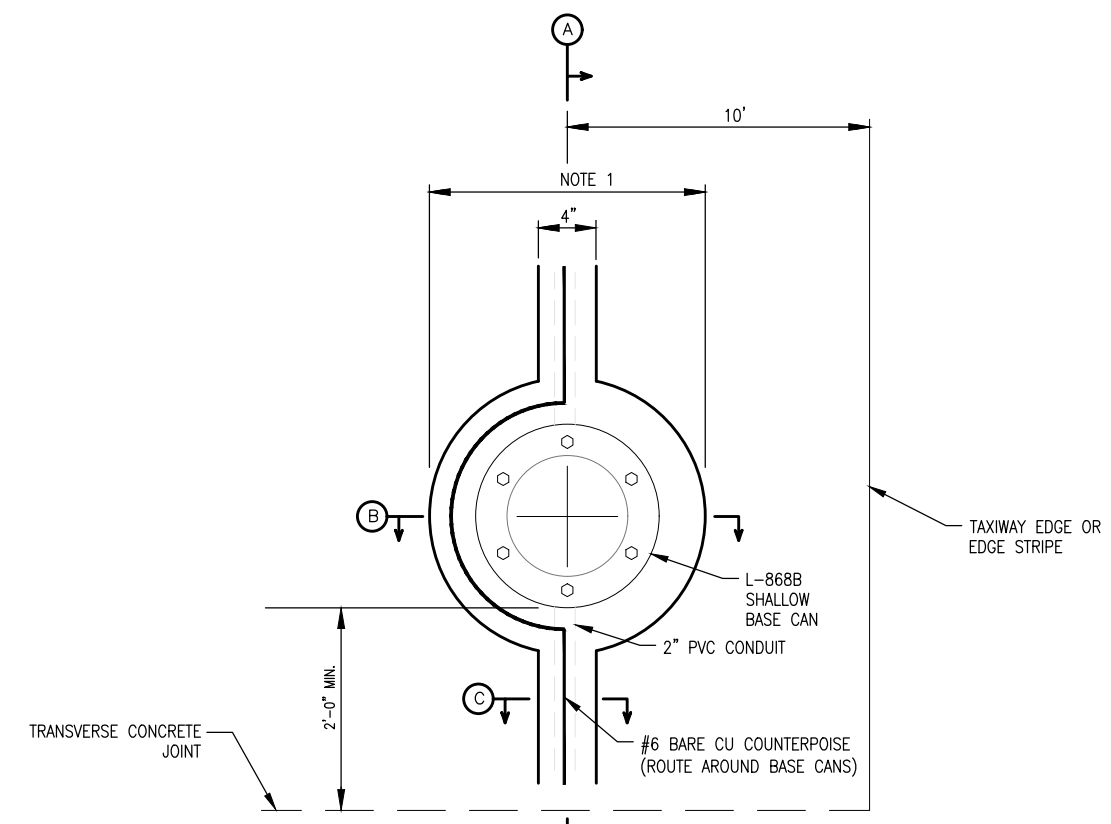
A SECTION
SCALE: N.T.S.



C SECTION
SCALE: N.T.S.
(CONDUIT IN RIGID PAVEMENT)



B SECTION
SCALE: N.T.S.



1 L-868 LIGHT BASE MOUNTING IN EXISTING PCC PAVEMENT
SCALE: N.T.S.

- NOTES:**
- CORE LIGHT BASE OUTER DIAMETER + 2" MINIMUM IN EXISTING PAVEMENT.
 - L-868 BASE, 12" DIAMETER, 12" DEEP CAN
 - HUBS SHALL BE 2" FACTORY HUB WITH RUBBER GROMMET OR FIELD DRILLED AS REQUIRED.
 - LIGHT BASE SHALL CONFORM TO FAA ADVISORY CIRCULAR 150/5345/42G, SPECIFICATION FOR AIRPORT LIGHT BASES AND TRANSFORMER HOUSINGS.
 - ALL GROUND CONNECTIONS SHALL BE INSPECTED BY CONSTRUCTION MANAGER PRIOR TO PLACEMENT OF CONCRETE OR EPOXY.
 - COUNTERPOISE SHALL BE INSTALLED A MINIMUM OF 2" BELOW PAVEMENT SURFACE, DO NOT CONNECT TO LIGHT BASE.
 - SECURE CONDUIT TO BOTTOM OF CHANNEL WITH 1-HOLE STRAPS ANCHORED TO CONCRETE.
 - PROVIDE FLANGE RINGS WITH PAVEMENT DAM RINGS TO FACILITATE FUTURE FLUSH BLANK PLATE INSTALLATION.

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CATHERINE M. ALCORN
Professional Engineer
Expires 9/30/2019

NO.	REVISIONS / SUBMISSIONS	DATE
1	ADDENDUM #2	06/09/17

TUCSON
AIRPORT AUTHORITY
REHABILITATE RUNWAY 11L-29R
AND CONNECTOR TAXIWAYS

DESIGNED BY: KL
DRAWN BY: JW
CHECKED BY: CA
DATE: 06/01/17
SCALE: PER PLAN
TAA PROJ.#
10112254

BID SET
SHEET OVERVIEW TITLE
ELECTRICAL DETAILS -
L-868 LIGHT BASE MOUNTING IN
EXISTING PCC PAVEMENT

SHEET REFERENCE NUMBER:
E258
SHEET 397 OF 410

Item P-606 Adhesive Compounds, Two-Component for Sealing Wire and Lights in Pavement

DESCRIPTION

606-1.1. This specification covers two types of material; a liquid suitable for sealing electrical wire in saw cuts in pavement and for sealing light fixtures or bases in pavement, and a paste suitable for embedding light fixtures in the pavement. Both types of material are two-component filled formulas with the characteristics specified in paragraph 606-2.4. Materials supplied for use with bituminous concrete pavements must be formulated so they are compatible with the bituminous concrete.

EQUIPMENT AND MATERIALS

606-2.1 Curing. When pre-warmed to 77°F (25°C), mixed, and placed in accordance with manufacturer's directions, the materials shall cure at temperatures of 45°F (7°C) or above without the application of external heat.

606-2.2 Storage. The adhesive components shall not be stored at temperatures over 86°F (30°C).

606-2.3 Caution. Installation and use shall be in accordance with the manufacturer's recommended procedures. Avoid prolonged or repeated contact with skin. In case of contact, wash with soap and flush with water. If taken internally, call doctor. Keep away from heat or flame. Avoid vapor. Use in well-ventilated areas. Keep in cool place. Keep away from children.

606-2.4 Characteristics. When mixed and cured in accordance with the manufacturer's directions, the materials shall have the following properties shown in Table 1.

SAMPLING, INSPECTION, AND TEST PROCEDURES

606-3.1 Tensile properties. Tests for tensile strength and elongation shall be conducted in accordance with ASTM D638.

606-3.2 Expansion. Tests for coefficients of linear and cubical expansion shall be conducted in accordance with ASTM D1168, Method B, except that mercury shall be used instead of glycerine. The test specimen shall be mixed in the proportions specified by the manufacturer, and cured in a glass tub approximately 2 inch (50 mm) long by 3/8 inch (9 mm) in diameter. The interior of the tube shall be pre-coated with a silicone mold release agent. The hardened sample shall be removed from the tube and aged at room temperature for one (1) week before conducting the test. The test temperature range shall be from 35°F (2°C) to 140°F (60°C).

606-3.3 Test for dielectric strength. Test for dielectric strength shall be conducted in accordance with ASTM D149 for sealing compounds to be furnished for sealing electrical wires in pavement.

Table 1. Property Requirements

Physical or Electrical Property	Minimum	Maximum	ASTM Method
Tensile			
Portland cement concrete	1,000 psi (70 kg/sq cm)		D 638
Bituminous concrete	500 psi (35 kg/sq cm)		
Elongation			
Portland cement concrete		See note ¹	D 638
Bituminous concrete	50%		D 638
Coef. of cub. exp. cu. cm/cu. cm/°C	0.00090	0.00120	D 1168
Coef. of lin. exp. cm/cm/°C	0.000030	0.000040	D 1168
Dielectric strength, short time test	350 volts/mil.		D 149
Arc resistance	125 sec		
Pull-off			
Adhesion to steel	1,000 psi (70 kg/sq cm)		
Adhesion to Portland cement concrete	200 psi (14 kg/sq cm)		
Adhesion to asphalt concrete	No test available.		
Adhesion to aluminum	250 psi		

¹ 20% or more (without filler) for formulations to be supplied for areas subject to freezing.

606-3.4 Test for arc resistance. Test for arc resistance shall be conducted for sealing compounds to be furnished for sealing electrical wires in pavement.

606-3.5 Test for adhesion to steel. The ends of two smooth, clean, steel specimens of convenient size (1 inch by 1 inch by 6 inch) (25 mm by 25 mm by 150 mm) would be satisfactory when bonded together with adhesive mixture and allowed to cure at room temperature for a period of time to meet formulation requirements and then tested to failure on a Riehle (or similar) tensile tester. The thickness of adhesive to be tested shall be 1/4 inch (6 mm).

606-3.6 Adhesion to Portland cement concrete

a. Concrete test block preparation. The aggregate grading shall be as shown in Table 2.

The coarse aggregate shall consist of crushed rock having a minimum of 75% of the particles with at least one fractured face and having a water absorption of not more than 1.5%. The fine aggregate shall consist of crushed sand manufactured from the same parent rock as the coarse aggregate. The concrete shall have a water-cement ratio of 5.5 gallons (21 liters) of water per bag of cement, a cement factor of 6, ±0.5, bags of cement per cubic yard (0.76 cubic meter) of concrete, and a slump of 2-1/2 inch (60 mm), ±1/2 inch (60 mm ±12 mm). The ratio of fine aggregate to total aggregate shall be approximately 40% by

solid volume. The air content shall be 5.0%, $\pm 0.5\%$, and it shall be obtained by the addition to the batch of an air-entraining admixture such as Vinsol® resin. The mold shall be of metal and shall be provided with a metal base plate.

Means shall be provided for securing the base plate to the mold. The assembled mold and base plate shall be watertight and shall be oiled with mineral oil before use. The inside measurement of the mold shall be such that several one inch (25 mm) by 2 inch (75 mm) by 3 inch (25 mm by 50 mm by 75 mm) test blocks can be cut from the specimen with a concrete saw having a diamond blade. The concrete shall be prepared and cured in accordance with ASTM C192.

Table 2. Aggregate For Bond Test Blocks

Type	Sieve Size	Percent Passing
Coarse Aggregate	3/4 inch (19 mm)	97 to 100
	1/2 inch (12 mm)	63 to 69
	3/8 inch (9 mm)	30 to 36
	No. 4 (4.75 mm)	0 to 3
Fine Aggregate	No. 4 (4.75 mm)	100
	No. 8 (2.36 mm)	82 to 88
	No. 16 (1.18 mm)	60 to 70
	No. 30 (600 μm)	40 to 50
	No. 50 (300 μm)	16 to 26
	No. 100 (150 μm)	5 to 9

b. Bond test. Prior to use, oven-dry the test blocks to constant weight at a temperature of 220°F to 230°F (104°C to 110°C), cool to room temperature, 73.4°F $\pm 3^\circ\text{F}$ (23°C $\pm 1.6^\circ\text{C}$), in a desiccator, and clean the surface of the blocks of film or powder by vigorous brushing with a stiff-bristled fiber brush. Two test blocks shall be bonded together on the one inch by 3 inch (25 mm by 75 mm) sawed face with the adhesive mixture and allowed to cure at room temperature for a period of time to meet formulation requirements and then tested to failure in a Riehle (or similar) tensile tester. The thickness of the adhesive to be tested shall be 1/4 inch (6 mm).

606-3.7 Compatibility with asphalt concrete. Test for compatibility with asphalt in accordance with ASTM D5329.

606-3.8 Adhesive compounds - Contractor's responsibility. The Contractor shall furnish the vendor's certified test reports for each batch of material delivered to the project. The report shall certify that the material meets specification requirements and is suitable for use with [Portland cement concrete] [bituminous concrete] pavements. The report shall be delivered to the Engineer before permission is granted for use of the material. In addition the Contractor shall obtain a statement from the supplier or manufacturer that guarantees the material for one year. The supplier or manufacturer shall furnish evidence that the material has performed satisfactorily on other projects.

606-3.9 Application. Adhesive shall be applied on a dry, clean surface, free of grease, dust, and other loose particles. **A manufacturer's representative shall be present during the initial installation of the material to ensure** the method of mixing and application is in strict accordance with the manufacturer's recommendations. When used with Item P-605, such as light can installation, Item P-605 shall not be applied until the Item P-606 has fully cured.

METHOD OF MEASUREMENT

606-4.1 When required in the installation of an in-runway lighting system or portion thereof, no measurement will be made for direct payment of adhesive, as the cost of furnishing and installing shall be considered as a subsidiary obligation in the completion of the installation.

BASIS OF PAYMENT

606-5.1 No separate payment will be made for the P-606 material

TESTING REQUIREMENTS

ASTM C192	Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
ASTM D149	Standard Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies
ASTM D638	Standard Test Method for Tensile Properties of Plastics
ASTM D1168	Standard Test Method for Hydrocarbon Waxes Used for Electrical Insulation
ASTM D5329	Standard Test Methods for Sealants and Fillers, Hot-applied, for Joints and Cracks in Asphaltic and Portland Cement Concrete Pavements

END OF ITEM P-606

ITEM L-858(L) AIRPORT GUIDANCE LIGHTING SYSTEMS (SIGNAGE)

DESCRIPTION

858(L)-1.1 Related Documents. The General Provisions of the Contract, including General and Special Conditions apply to work specified in this Item.

858(L)-1.2 General. This Item shall consist of internally lighted LED airport taxiway guidance signage furnished and installed in accordance with this specification, the referenced specifications, the manufacturer's recommendations, and the applicable codes, standards and Advisory Circulars. The signs shall be installed at the locations and in accordance with the dimensions, design, and details shown in the plans. This item shall also include the relocation of existing signs with new panels on new concrete bases. 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 RE, including concrete sign base and transformer enclosure with cover. Also included are temporarily mounted existing taxiway guidance signs, to be temporarily installed during construction phasing. **Sentence deleted.**

858(L)-1.3 FAA Advisory Circulars and Standards.

- A. Taxiway signs and related materials covered by FAA specifications shall have the prior approval of the Federal Aviation Administration, Airports Service, Washington, DC 20591, and shall be certified by an approved laboratory such as ETL as conforming with applicable FAA standards and requirements, or shall be verified as exceeding FAA standards as required by these specifications.
- B. All other equipment and material covered by other referenced specifications shall be subjected to acceptance through manufacturer's certification of compliance with the applicable specification. All electrical materials and equipment for which there is a nationally recognized standard shall bear the conformance labeling of the third party inspection authority, such as Underwriters Laboratories, Inc., Factory Mutual, ETL, or approved equal.
- C. The following documents, of the issue in effect on date of application for qualification, are applicable to the extent specified:

Federal Aviation Administration (FAA) Advisory Circulars.

AC 150/5340-18F	Standards for Airport Sign Systems
AC 150/5345-26D	Specification for L-823 Plug and Receptacle, Cable Connections (including Changes 1 & 2)
AC 150/5340-30H	Design and Installation Details for Airport Visual Aids

Reconstruct Runway 11L-29R and Connector Taxiways
TAA Project No. 10112-254

AC 150/5345-42H	Specification for Light Base and Transformer Housings, Junction Boxes and Accessories
AC 150/5345-44K	Specification for Taxiway and Runway Signs
AC 150/5345-47C	Isolation Transformers for Airport Lighting Systems
AC 150/5345-53D	Airport Lighting Equipment Certification Program <i>Federal Specification</i>
L-S-300	Sheeting and Tape -- Reflective; Non-exposed Lens, Adhesive Backing Military Standard
MIL-STD-810	Environmental Test Methods <u>American Society for Testing and Materials (ASTM)</u>
ASTM D 4956	Specification for Retro-reflective Sheeting for Traffic Control <u>National Fire Protection Association (NFPA)</u>
NFPA 70	National Electrical Code

(Copies of FAA Advisory Circulars may be obtained from the Department of Transportation, Publications Section, M-494.3, Washington, DC 20590).

(Copies of Federal Specifications may be obtained from General Services Administration offices in Washington, DC, Atlanta, Boston, Denver, Chicago, Kansas City, New York, San Francisco, and Seattle).

(Copies of Military Standards may be obtained from the Commanding Officer, Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, PA 19120, and Attention: Code CDS).

The signs shall meet or exceed FAA requirements when subjected to the qualification tests as described in the latest edition of AC 150/5345-44K.

The installation of Underground Cable for Airports, Airport Underground Electrical Duct, and Airport Lighting Systems that are not a part of this item are covered under the separate respective items of these specifications.

858(L)-1.4 Shop Drawings and Material Lists. Prior to the installation of any material and equipment and within 30 days of contract award, the Contractor shall submit to the Owner for approval six (6) copies of manufacturers' brochures containing complete dimensional and performance characteristics, installation and operation instructions, etc., for the following equipment: This list shall include the name of each item, the Federal Aviation Administration

specification number, the manufacturer's name, the manufacturer's catalog number, and the size, type and/or rating of each item.

- A. Shop drawings shall be submitted showing: installation requirements (i.e., foundation size, anchor bolt location, etc.); sign assembly, including all fabrication assembly and internal and external wiring diagrams; message layout for each sign; and tabulation of total volt-ampere (VA) for each sign at highest intensity step.
- B. Catalog cuts shall be submitted showing: sign and sign base (features and accessories, installation details); results of tests performed by an independent laboratory testing source in accordance with AC 150/5345-44K addressing visual examination, wind load and frangibility load tests, photometric test results with luminance maps, environmental tests, production tests; load data for all brightness steps, as measured from the primary side of the isolation transformer, and power factor; lamp life.
- C. Sign schedules including sign numbers and face panel descriptions.
- D. Steel L-867 base and steel cover (sign base and transformer enclosure.)
- E. Dimensioned and detailed pre-cast concrete bases.
- F. Manufacturer's statement of warranty (see Paragraph 858-2.8)

In addition to the above specific items, a materials list shall be submitted listing each specification paragraph number and stating whether the materials proposed are as specified or are substitutions. If the item is a substitute item, a complete submittal as described in the above paragraph shall be provided for that item.

The submittal shall be complete and made in one submission in booklet form with hardbound cover. Partial submissions will not be reviewed or considered.

858(L)-1.5 Material Delivery Schedule and Requirements. All signs and associated materials (transformers and connecting cables, transformer housings, anchor bolts, floor flanges, breakable couplings, and incidental mounting hardware), for the project shall be procured under this contract in accordance with the material delivery directed by the RE. The following material distinction is made to define the material to be delivered:

- A. Mounting Hardware. Mounting hardware shall include detailed installation shop drawings as prepared by the sign supplier and approved by the RE, transformer housings, anchor bolts and floor flange templates, and sign markers (blank).
- B. Sign. Signs shall include the actual sign to be installed, transformer and connecting cables, floor flanges, breakable couplings, tethers, and all other incidentals necessary to provide a complete and operable sign.

EQUIPMENT AND MATERIALS (LIGHTED SIGNS)

858(L)-2.1 General. Taxiway guidance signs, hereinafter referred to as "Signs," shall be retro-reflective and shall be the internally illuminated, use a LED (light emitting diode) technology and shall be ETL certified, conforming to AC 150/5345-44K, other referenced publications, and to the requirements of this Section. In the event of conflict, the more stringent of these shall apply. The signs shall have a record of having operated successfully for a minimum period of one year at an airport located in the continental United States. The sign manufacturer shall have minimum five years' experience in the manufacture of lighted airfield signs to FAA requirements.

Airport signage equipment and materials covered by FAA specifications shall have the prior approval of the Federal Aviation Administration, Airports Service, Washington, D.C. 20591, and shall be listed in Advisory Circular 150/5345-53C, Airport Lighting Equipment Certification Program.

All other equipment and materials covered by other referenced specifications shall be subject to acceptance through the manufacturer's certification of compliance with the applicable specifications and subject to Owner's approval.

Lists of the equipment and materials required for a particular system are contained in the applicable Advisory Circulars.

Match existing signs, new airport signs shall be curved face Lumacurve as manufactured by Standard Signs Inc., or approved equal, to match existing airfield signage. The Airport/Owner desires to achieve and maintain standardized airfield lighting equipment in order to reduce costs by minimizing replacement parts inventory and maintenance training.

858(L)-2.2 Sign Classification. The classification of each sign shall be as shown on the Construction Drawings and as specified below:

A. Types. Signs of the following types are included:

- (1) Type L-858Y. Direction, Destination, and Boundary Sign. Black legend on a yellow background.
- (2) Type L-858L. Taxiway Location Sign. Yellow legend and border on a black background.
- (3) Type L-858R. Mandatory Instruction Sign. White Legend on a red background.

B. Sizes. Signs of the following sizes are included:

- (1) Size 3. 30-inch Legend panel with an 18-inch Legend. (Existing Signage).

C. Styles. Signs of the following styles are included:

- (1) Style 2. Powered from a 3-step series lighting circuit with a current range of 4.8 to 6.6 amperes (A).

- (2) Style 3. Powered from a 5-step series lighting circuit with a current range of 2.8 to 6.6 amperes (A).

D. Classes. Lighted signs of the following classes are included:

- (1) Class 1. Operation for -4° degrees Fahrenheit (F) (-20° degrees Celsius (C)) to 131° degrees F (55 degrees C) environment.

E. Modes of Signs. Signs of the following modes are part of this specification:

- (1) Mode 2 – must withstand wind loads of 200 mph.

858(L)-2.3 Equipment To Be Supplied. The sign shall be complete in accordance with all specification requirements and shall include mounting legs and hardware, electrical disconnects, any required series circuit adapter unit, and an instruction booklet.

858(L)-2.4 Environmental Requirement. The signs, including all required components, shall be designed for continuous outdoor use under an ambient temperature range from -20 degrees C to +55 degrees C. The signs shall be capable of withstanding wind velocities up to 200 mph and exposure to driving rains.

858(L)-2.5 Construction Features.

A. Sign Construction.

- (1) Signs shall be constructed of lightweight, nonferrous materials, and shall be designed for installation on a concrete pad foundation. All required mounting hardware, except anchor bolts, shall be supplied with the sign. Loose parts shall be tethered to, or otherwise prevented from blowing away from, the installed sign enclosure. All screws or latches shall be the captive type, and shall be easy to open and close.
- (2) Mounting legs for each sign shall have frangible points located 2 inches or less above the concrete pad foundation. The frangible points shall withstand wind loads due to jet blast of 200 mph, as simulated by an applied static load of 0.9 psi, but shall break before reaching an applied static load over the legend panel of 1.3 psi. Legend panels and panel supports shall withstand, at a minimum, the pressure at which the frangible points break.
- (3) Taxiway guidance signs shall be of a modular design. Individual sign panel construction shall not exceed 42 inches in length. Sign panel shall be top load installed for maintenance efficiency.
- (4) To insure reduced energy and maintenance requirements, the L-858 sign light source shall utilize an energy efficient, long life LED type lamp or engineer approved equal. Lamps shall be 4W with an estimated life of 25,000 hours. To facilitate quick lamp changes without the use of tools, lamps shall utilize a screw base socket. All sign configurations shall have a power factor of .92 or higher as

measured on the primary of the **L-830 isolation transformer**. Sign systems must operate on both medium intensity (4.8A – 6.6A) and high intensity (2.8A – 6.6A) circuits without internal modification to give the airport maximum flexibility in sign usage and minimize parts to be stocked. To maximize maintenance personnel safety, there shall be no more than 170Vdc at any point inside the sign. In addition, the power supply circuit shall output a regulated DC current of 0.29 amps maximum.

- (5) Signs shall have legends on one or both sides, as required by the Drawings. The sign face shall comply with paragraph 858(L)-2.11. The sign face assembly shall have gasketing between the sign material and housing.
 - (6) The color of the sign enclosure shall be black.
 - (7) The sign shall be completely sealed against sand and dust so that all internal surfaces will remain bright and clean. The lamp(s) shall be easily changeable, and ballast and all electrical control equipment shall be easily accessible in enclosures mounted to the interior of the sign structure.
- B. Tether. Each sign shall be supplied with a minimum of two tethers, with not less than two tethers per five sign legs, which can be secured to the sign enclosure. The tethers shall be installable such that each sign, when knocked down by a wind of greater than 200 mph, shall remain attached to the sign foundation. Tethers shall be 1/8" stainless steel aircraft cable and shall be secured to the sign enclosure and to a support leg base flange anchor bolt with lock nuts and large diameter washers.
- C. Electrical Features.
- (1) The signs shall be relampable without the use of tools. Loose parts shall be tethered to, or otherwise prevented from blowing away from, the installed sign enclosure. All screws and latches shall be the captive type.
 - (2) Power input from the lighting circuit shall be made through an isolation transformer conforming to AC 150/5345-47C.
 - (3) Power input leads shall be at least two feet in length and shall allow for lead termination in a Type 1, Class A, Style 9 receptacle conforming to AC 150/5345-26D.
 - (4) The L-858 sign light source shall utilize individual Light Emitting Diode (LED) lamps or Engineer approved equal.
 - (5) All wiring shall conform to the requirements of NFPA 70. All wiring shall be color-coded and shall be clearly labeled. There shall be no exposed wiring.
 - (6) All electrical materials and equipment for which there is a nationally recognized standard shall bear the conformance labeling of the third party inspection authority, such as Underwriters Laboratories, Inc., Factory Mutual, or ETL.

858(L)-2.6 Replacement Sign Panels.

- A. The spacing, stroke, shape of legend characters, numerals, symbols, border for Type L-858 sign faces, and message dividers shall be in accordance with latest version of FAA AC 150/5345-44.
- B. Replacement sign panels shall be fabricated by the original sign Manufacturer and shall be provided with a warranty for a minimum of three years against the delamination of the surface films from the face of the signs.

858(L)-2.7 Replacement Parts Policy. In order to maximize safe operations on the airfield, reduce risk of runway incursions and minimize inventory requirements, sign manufacturer shall provide the Owner an emergency replacement signs and parts service for the life of the signs. Orders for replacement parts and complete signs shall ship within 24 hours of order receipt. Manufacturer shall provide a history of providing such a service for a minimum of 5 years. The cost for this policy shall be considered incidental to each pay item for the signs.

858(L)-2.8 Spares. In case of knock-downs or maintenance vehicle damage, new installations shall include 20- percent spare lamps/light sources for every sign supplied and 2 spare power supplies for every 10 signs supplied (minimum qty of 1). This will further protect the airport from premature component failure that occurs after the manufacturer's warranty expiration but prior to reaching the projected light sources full rated life.

858(L)-2.9 Electrical Disconnect.

- A. All lighted signs must be equipped with a power input disconnect cable terminated with a Type II plug under the requirements of **AC 150/5345-26**.
- B. The length of power disconnect cable must be at least 6 inches longer than required to permit the plug end to reach the top of the concrete pad on which the sign is mounted.
- C. A cable clamp or similar restraining device must be provided in the sign to prevent strain on the cable terminal connections when the cable plug is pulled apart.
- D. There must be no above ground power cable connections to signs. Power to a sign or sign array must be provided through breakaway cable connectors installed within the frangible point portion of the sign's mounting legs.
- E. There must be no external above ground electrical connection between signs in a sign array.
- F. The sign manufacturer must offer an optional ON/OFF power switch that is appropriate for the style of lighted signs. Signs for this project will be equipped with power switch and weatherproof cover.

858(L)-2.10 Sign Sizes. The heights of the signs shall be in accordance with the dimensions as follows:

<u>Size</u>	<u>Legend Height</u> (Inches)	<u>Legend Panel Height</u> (Inches)	<u>Overall Mounting Height</u> (Inches)
3	18	30	42

The lengths of the signs shall be determined by the message to be conveyed, but shall not exceed the maximum length specified by Table 1 of AC 150/5345-44K.

858(L)-2.11 Sign Faces.

- A. The signs shall be either single face (message only on one side) or double face (messages on two sides). The spacing, stroke, shape of legend characters, numerals, symbols, border for Type L-858L sign faces, and message dividers shall be in accordance with FAA AC 150/5345-44K.
- B. The Contractor and Manufacturer shall provide a warranty for a minimum of three years against the delaminating of the surface films from the face of the signs.

858(L)-2.12 Performance Requirements.

A. Sign Operation.

- (1) Signs shall be energized and operated at any incoming current value of the series lighting circuit without flickering.
- (2) The luminance level and uniformity of the sign shall be maintained across all series lighting circuit current values, as measured from the primary side of the isolation transformer.
- (3) Power input from the series lighting circuit shall be made through isolation transformers, properly rated, and conforming to AC 150/5345-47C.
- (4) Minimum rated operating LED lamp life, when sign is operated at the highest intensity step, shall not be less than 20,000 hours.
- (5) The connection of multiple signs on a taxiway lighting circuit shall not adversely impact other circuit components, such as constant current regulator or isolation transformer.

B. Sign Luminance and Color.

- (1) The internally illuminated background of the Type L-858Y sign and the legend of the Types L-858R and L858L signs shall have an average luminance from 10 to 30 foot-lamberts, with 16 to 30 foot-lamberts at the 2 highest intensity steps (white or yellow).
- (2) Signs must be viewed from 800' feet at night to determine if the luminance level is sufficient to make the Type L-858Y and L-858R background colors and Type L-858L legend and border colors readily discernible. Type L-858B, Runway

Distance Remaining signs, must be viewed from 200' feet at full brightness. Panel joints must not interfere with the legibility of the sign or leak light to create a color discontinuity across the joint. Signs must be evenly illuminated with no dark areas or banding that interferes with legibility. Uniformity shall be kept as defined in FAA AC 150/5345-44K.

- (3) The sign shall have a uniformity ratio no greater than 5:1 for luminance measured at any 3-inch grid on the sign for a specific color, and no more than 1.5:1 for luminance measured at any adjacent 3-inch grids.
- (4) Manufacturer shall provide a three-year warranty on the retro reflective material lamination process.

858(L)-2.13 Finish. External surfaces of the signs, excluding the mounting legs and face panel, shall be painted with a primer coat and a low luster, black finish coat. The surface color treatment of the nonmetallic surfaces shall be equal in quality to that obtained on metal surfaces.

858(L)-2.14 Nameplate. Each sign shall have a nameplate giving the Sign Name as shown on the Construction Drawings, Type, Size, Style, Class, manufacturer's name, address, catalog number, and lamp data, including type and rating. The nameplate on Style 2, and 3 signs shall give the total maximum volt-amp load and power factor as seen from the primary of the isolation transformer. The total maximum volt-amp load indicated shall reflect the highest possible volt-amp loading on the regulator and shall include loading due to a "worst case" isolation transformer, and any required ballast and/or adaptor units. The nameplate shall be mounted to the exterior of the sign enclosure at the topside of the sign.

858(L)-2.15 Workmanship. The equipment shall be fabricated in accordance with the highest quality workmanship. All wiring shall be neatly run and laced. All sharp edges and burrs shall be removed. Painted surfaces shall be free from runs, blotches, and scratches.

858(L)-2.16 Instruction Booklet. Two (2) copies of an instruction booklet shall be included with each order of signs, which shall include installation instructions, maintenance procedures (including operating voltage and point readings), and a complete parts list, including recommended spare parts list. It shall also describe the lamp wattage or current needed to maintain the luminance levels specified herein.

858(L)-2.17 Sign Cover. Sign covers shall be capable of fully covering the sign and withstanding the weather conditions and jet blast to which it may be subjected during its installation. The material shall be sufficiently heavy (similar to canvas) to completely obscure the sign message so that it cannot be read.

858(L)-2.18 Concrete. Concrete for bases shall conform to the requirements of Item P-610 Structural Portland Cement Concrete. Precast concrete base shall be sized for four module signs.

858(L)-2.19 Conduit. Rigid steel and EMT conduit and fittings shall conform to the requirements of Fed. Spec. WW-C-581. PVC conduit and fittings shall conform to the requirements of Fed. Spec. W-C-1094.

858(L)-2.20 Light Base. Type L-867, galvanized steel, size B, one-piece, with steel cover plates meeting the requirements of FAA AC 150/5345-42H. Provide with grounding lug, grommets and drainage holes as shown on the drawings.

858(L)-2.21 Isolating Transformer. An isolating transformer shall be provided with each sign and shall conform to the requirements of the applicable Advisory Circular. Provide with extended secondary connector cable kit. Transformers shall be minimum sized per manufacturer's requirements. Isolation transformer shall conform to the latest edition of FAA AC 150-5345-47C, Isolation Transformers for Airport Lighting Systems. The isolation transformer shall be an integrated unit, with power input leads at least 24 inches in length - one lead terminating in a Type I, Class A, Style 2 plug and the other lead in a Type I, Class A, Style 9 receptacle, conforming to the latest edition of FAA AC 150-5345-26D, Specification for L-823 Plug and Receptacle, Cable Connectors.

EQUIPMENT AND MATERIALS (UNLIGHTED SIGNS deleted).

CONSTRUCTION METHODS.

858(L)-4.1 General. The installation and testing details for the systems shall be as specified in the applicable Advisory Circulars.

858(L)-4.2 Phasing and Interruptions. The construction phasing and airfield operational requirements for this project may require that new signs are installed, tested, switched to OFF, and covered until directed by the RE to activate the signs. Activating the signs will be done as directed by the RE or Airport.

858(L)-4.3 Temporary Unlighted Signs. If lighted signs are not available when required, existing signs shall be temporary mounted, powered and installed on steel channel strut next to the foundations for the associated permanent sign where required for aircraft operations. Sign legs with frangible points shall be fastened to the steel strut with bolts and secured with sandbags as required and as approved by the RE and Airport. When no longer required, signs shall be removed and returned to Airport. Temporary unlighted signs shall be removed when no longer required unless otherwise directed by the RE.

858(L)-4.4 Location/Elevation. The signs shall be installed at the locations indicated in the plans. New Size 3 Guidance Signs shall be located where indicated, offset 35' to 60' from the edge of full-strength pavement. Longitudinal tolerance is 1'-0". Foundation elevation shall be no more than one-inch above finish grade as established on the civil grading and drainage drawings. A 4 foot wide by 2" thick asphalt housekeeping pad shall be provided around each new sign base in unpaved areas and contoured as required by civil grading and drainage plans. Asphalt shall be in conform to the requirements of Item P-403 for mix design.

858(L)-4.5 Transformer. The transformer shall be installed in the L-867 base at location and position as indicated on the plans. The primary cable connections shall be made by use of the L-823 plug and receptacle cable connectors in accordance with plans and specifications.

858(L)-4.6 Hardware. All bolts, nuts, washers and lock washers shall be stainless steel. Install using high temperature anti-seize compound.

858(L)-4.7 Cable, Connector, And Isolation Transformers. The primary and secondary cable leads of the transformers are supplied with factory-installed molded connectors. Visual inspection of these items during installation is very important. Minor cuts, bruises, or mishandling may result in progressive deterioration, which will eventually cause complete failure, but not until sometime after acceptance tests. During installation, these items shall be inspected for the following:

- a. The mating surfaces of molded connectors are clean and dry when plugged together. If clean and dry inside, these high voltage connectors, with taping, form a connection equal or superior to a conventional high voltage splice. Conversely, if they are wet or dirty no amount of taping can produce a satisfactory connection. Two or three turns of tape should be used to hold the connector together and keep the parting line clean. Keeping the factory-installed caps in place until the final connection is made can ensure cleanliness of mating surfaces. The mating surfaces of uncapped connectors should not be laid down, touched, or breathed upon. If a connection must be broken, the connectors should be immediately capped.
- b. The connectors are completely plugged together. After initial plugging, trapped air pressure may partially separate the plug and receptacle. If this happens, wait a few seconds and push them together again. Two or three turns of tape should be used to hold them in place.
- c. The cables are not cut by shovels, kinked, and crushed by vehicle wheels bruised by rocks, or damaged in any way during handling and installation.
- d. The cables do not directly cross each other and are separated by the specified distance.
- e. The cables are not bent sharply where they enter (or leave) a conduit, and are supported properly by tamped ground so future settling will not cause sharp bends.

858(L)-4.8 Identification Numbers. Circuit identification shall be assigned to each sign in accordance with the drawings. The placing of the Circuit ID shall be accomplished by use of 2-inch diameter brass or bronze marker, with the numerals approximately 1/4-inch in height, engraved or stamped in, embedded in concrete next to transformer housing as detailed on the drawings, so each faces the taxiway or runway. Sign identification numbers shown on plans shall be engraved by Manufacturer furnish.

858(L)-4.9 Field Tests and Inspections.

- a. Contractor shall provide the RE 10 working days' notice prior to test(s). All deficiencies found shall be corrected and tests repeated.
- b. Operation. Upon completion of all the tests required under other sections, the Contractor shall show by in-service demonstration that all circuits, control equipment, and all

lights covered by the contract are in good operating condition. The testing of each circuit shall be made using local control switches on the regulators in each lighting vault. Each switch shall be operated so that each switch position is engaged at least five times. During this process, all lights and associate equipment shall be observed to determine that each circuit operates properly. Telephone or radio communication between the operator and the observers shall be provided. The above tests shall be repeated from the alternate control station, from the remote control points, and also again from the local control switches on the regulators. Each lighting circuit shall be tested by operating the lighting circuits at each brightness step. Visual examination shall be made at the beginning and at the end of this test to determine that the correct signs are energized.

858(L)-4.10 Electrical Tests on Cables. In addition to the cable tests required under other sections, the test described below shall be performed on the segment of primary series circuit cable connecting each sign to a light base. The test shall be performed for each sign prior to connecting the sign to the runway or taxiway lighting circuit. The test results shall be recorded and shall be submitted to the RE. The purpose of the test is to verify the good condition of new cable installed in conduit, prior to connecting to the existing lighting circuit.

- a. Connect together the segments of primary cable from the sign base to the connecting light base. Include the sign isolation transformer in the loop. Support both leads so that there are gaps of several inches between bare conductors and ground. Make sure that the cable sheath is clean and dry for a distance of at least one foot from the end of the cable. Also make sure that exposed insulation at the end of the cable is clean and dry.
- b. Apply a 500-volt test voltage with suitable meg-ohmmeter, such as model 1250 made by AEMC (manually operated), or approved equal. 500 Volts must be applied to the circuit. The insulation resistance to ground shall not be less than 200 meg-ohms to be acceptable. The contractor shall repair/replace any cable segment reading less than 200 meg-ohms and retest, at no additional cost to the airport. Only after acceptable readings are obtained shall the cable be connected to the series lighting circuit.
- c. All the 500 and higher voltage tests on the airfield lighting circuits must be carefully monitored by the RE to ensure that excessive voltages are not applied to the circuits. The contractor shall coordinate all the tests with the RE prior to starting the tests.
- d. The field test and the inspection of the system shall be incorporated into the signage pay items, with no separate payment made.

METHOD OF MEASUREMENT

858(L)-5.1 New L-858(L) Size 3 Signs on New Foundations. The quantity of each new sign shall include: Furnishing a new L-858(L) sign, LEDs/lamps, isolation transformer, L-867 transformer housing, hardware, conduits to sign with spare stubs and ground rod, driven thru PVC sleeve with ground conductor bonds to equipment installed and mounted to a new concrete foundation with new wiring and L-823 connectors installed as a complete unit, connected to circuit, operating for a minimum of one week burn-in period, ready for operation and accepted. New signs shall include 4" wide by 2" thick asphalt housekeeping pad around

each concrete base and shall be covered until ready for operation. No separate payment will be made.

858(L)-5.2 Existing L-858(L) with New Sign Panels on New Foundation. The quantity of each shall include: Furnishing a new L-858(L) sign panels, L-867 transformer housing, hardware, conduits to sign with spare stubs and ground rod driven thru PVC sleeve with ground conductor bonds to equipment installed and mounted to a new concrete foundation with new wiring and L-823 connectors installed as a complete unit, connected to circuit, and shall include 4" wide by 2" thick asphalt housekeeping pad around each concrete base, operating for a minimum of one week burn-in period, ready for operation and accepted. Relocated signs shall be temporarily covered until ready for operation and existing temporary signs are removed. No separate payment will be made.

BASIS OF PAYMENT

858(L)-6.1 System Component. Payment will be made at the contract unit price for each complete system component listed below installed in place by the Contractor and accepted. This price shall 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-858(L)-6.1 | Re-Install Salvaged L-858 Size 3, 2-Module Guidance Sign and Transformer with New Panels on New Sign Base – per each |
| Item L-858(L)-6.2 | Re-Install Salvaged L-858 Size 3, 3-Module Guidance Sign and Transformer with New Panels on New Sign Base – per each |
| Item L-858(L)-6.3 | Re-Install Salvaged L-858 Size 3, 4-Module Guidance Sign and Transformer with New Panels on New Sign Base – per each |
| Item L-858(L)-6.4 | New L-858(L) LED Size 3, Style 2, 2-Module, Airfield Guidance Sign on New Sign Base – per each |
| Item L-858(L)-6.5 | New L-858(L) LED Size 3, Style 2, 3-Module, Airfield Guidance Sign on New Sign Base (Retrofit in Existing Full Strength Concrete Pavement) – per each |
| Item L-858(L)-6.6 | New L-858(L) LED Size 3, Style 2, 4-Module, Airfield Guidance Sign on New Sign Base – per each |
| Item L-858(L)-6.7 | Re-Install Existing 3 Module Airfield Guidance Sign with New Shallow Transformer Housing (Retrofit in Existing Full Strength Concrete Pavement) – per each |

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- | | |
|--------------------|---|
| Item L-858(L)-6.8 | New L-858(L) LED 2 Module Airfield Guidance Sign with New Shallow Transformer Housing (Retrofit in Existing Full Strength Concrete Pavement) – per each |
| Item L-858(L)-6.9 | New L-858(L) LED Size 3, 3 Module Airfield Guidance Sign and Transformer on New Sign Base– per each |
| Item L-858(L)-6.10 | Re-Install Salvaged L-858 Size 3, 4-Module Guidance Sign and Transformer on New Sign Base – per each |
| Item L-858(L)-6.11 | New Size 3 Airfield Guidance Sign Panels Installed in Existing Sign – per each |
| Item L-858(L)-6.12 | Re-Install Salvaged L-858 B Runway Distance Remaining Sign and Isolation Transformer on New Sign Base – per each |

REFERENCED PUBLICATIONS

858-7.1 FEDERAL SPECIFICATIONS REFERENCED IN ITEM L-858.

<u>Number</u>	<u>Title</u>
WW-C-581	Conduit, Metal, Rigid; and Coupling, Elbow; and Nipple, Electrical Conduit: Zinc-Coated
W-C-1094	Conduit, Plastic-Type II Schedule 40

858-7.2 FAA SPECIFICATION REFERENCED IN L-858.

<u>Number</u>	<u>Title</u>
AC 150/5340-18F	Standards for Airport Sign Systems
AC 150/5345-26D	Specification for L-823 Plug and Receptacle, Cable Connections (including Changes 1 & 2)
AC 150/5345-42H Boxes	Specification for Light Base and Transformer Housings, Junction and Accessories (including Change 1)
AC 150/5345-44K	Specification for Taxiway and Runway Signs
AC 150/5345-47C	Isolation Transformers for Airport Lighting Systems
AC 150/5345-53D	Airport Lighting Equipment Certification Program

END OF ITEM L-858(L)