1000 Col. Eileen Collins Blvd.
Syracuse, NY 13212

p – 315.454.3263
f – 315.454.8757
bids@syrairport.org

SECTION 01 – ADVERTISEMENT AND NOTICE TO CONTRACTORS
IFB 2024-09

NOTICE TO BIDDERS FOR
TAXIWAY A REHABILITATION (EAST) PROJECT AT
SYRACUSE HANCOCK INTERNATIONAL AIRPORT, SYRACUSE, NEW YORK

ISSUED APRIL 23, 2024 via syrairport.org/sraa/bids-rfp-rfq/.

Only Electronically Submitted Proposals for the construction of Taxiway A Rehabilitation (East) will be accepted at bids@syrairport.org **until 1:30 pm, local time, on Wednesday, June 13, 2024**

Project Description: This project consists of the rehabilitation and strengthening overlay of the existing Parallel Taxiway A and connecting taxiway pavements. Other items include maintenance and protection of traffic, drainage and stormwater improvements, airfield lighting and signage improvements, and new pavement markings. The project includes the phasing of construction work areas. The Bid Package encompasses work to be provided under two bid packages, the Base Bid General Construction as well as Base Bid and Add Alt. contract for the project area. The Base Bid project limits are identified in the construction bid plans.

Bid sets can be accessed by requesting access through bids@syrairport.org. Notice to Bidders will be placed on the Syracuse Regional Airport Authority Web page at https://syrairport.org/sraa/bids-rfp-rfq/.

Each bid must be accompanied by a certified check or bid bond, in the amount of five percent (5%) of the total maximum bid price for the contract in the form and subject to the conditions provided in the Information for Bidders.

A Pre-Bid Conference has been scheduled in order to review the specific requirements of this contract. All prospective bidders are encouraged to attend. Attendance at the Pre-Bid Conference will be considered by the Authority when reviewing the qualifications of the contractor to perform the work in accordance with the terms and conditions of the contract.

The Pre-Bid Conference is scheduled for Wednesday, **May 15, 2024**, at 11:00 AM at the Syracuse Hancock International Airport, John Walsh Conference Room #CT1114. You must notify Bids at bids@syrairport.org to be added to the list of attendees.

Any questions regarding bidding of this project shall be submitted by emailing bids@syrairport.org only. **THIS REQUIREMENT SHALL BE STRICTLY ENFORCED AND FAILURE TO STRICTLY COMPLY MAY RESULT IS DISQUALIFICATION OF RELEVANT BIDS**.

All RFI's must be submitted no later than Friday, May 17, 2024, by 5:00 pm and Addendums will be posted by Wednesday, May 29, 2024, to the Syracuse Regional Airport Authority website. Any necessary addendum to this project will be posted to the Syracuse Regional Airport Authority website as well as this advertisement. Bidders should check the website frequently for any updates.

Bids will be opened virtually on Microsoft Teams on June 13, 2024, at 2 PM. No in-person bid opening will be conducted. The Authority reserves the right to waive any informality in the bids and to reject any and all bids.

END OF SECTION 01- ADVERTISEMENT AND NOTICE TO CONTRACTOR

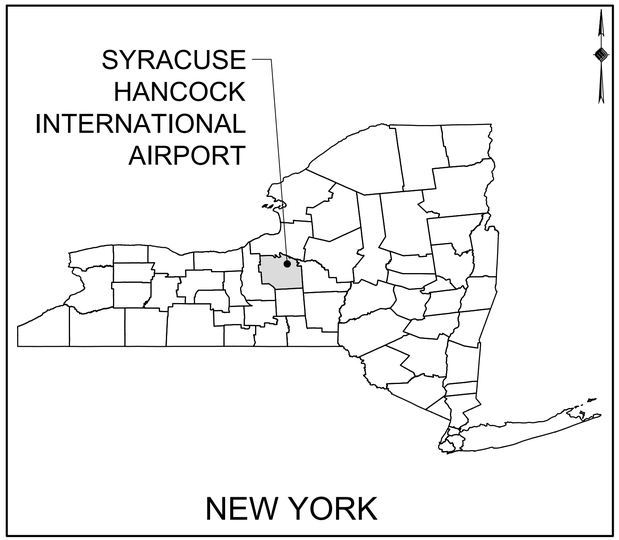
SYRACUSE HANCOCK INTERNATIONAL AIRPORT

REHABILITATION OF TAXIWAY A (EAST)

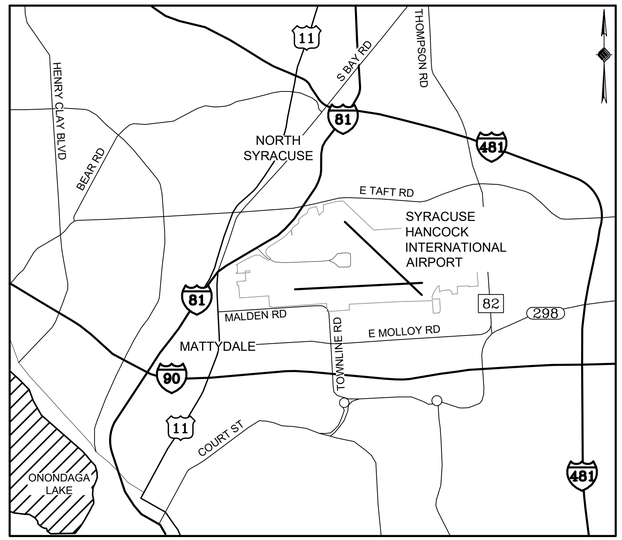
CONSTRUCTION BID SET
APRIL 2024

CITY OF SYRACUSE
COUNTY OF ONONDAGA
STATE OF NEW YORK

IFB REFERENCE #2024-03



LOCATION MAP



VICINITY MAP

PREPARED FOR:

SRAA Syracuse Regional Airport Authority

SYRACUSE REGIONAL AIRPORT AUTHORITY
1000 COL EILEEN COLLINS BLVD.
SYRACUSE, NY 13212
(315) 454-3263
WWW.SYRAIRPORT.ORG

PREPARED BY:

McFARLAND JOHNSON

49 COURT STREET, SUITE 240
BINGHAMTON, NEW YORK 13901

MCFARLAND JOHNSON PROJECT NO.: 18831.08

SEALED	STEVEN J. LANGE
PE_NO	084000
PE_DATE	APRIL 18, 2024

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

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CONSTRUCTION BID SET

STATE OF NEW YORK
STEVEN J. LANGE
084009
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

DRAWING SHEET INDEX

SCALE: NTS	DESIGN: JPM	**IN-01**	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	2 OF 81	

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BASE BID QUANTITY TABLE

BID ITEM	DESCRIPTION OF ITEM	UNIT	QUANTITY	FINAL QUANTITY
C-100-1	CONTRACTOR'S QUALITY CONTROL PROGRAM	LS	1	
C-102-3	SEED AND MULCH - TEMPORARY	SY	36,300	
C-102-17	SILT FENCE-TEMPORARY	LF	1,100	
C-102-25	DRAINAGE STRUCTURE INLET PROTECTION, SILT FENCE-TEMPORARY	LF	300	
C-102-44	CONSTRUCTION ENTRANCE/EXIT-TEMPORARY	SY	230	
C-102-46	CONCRETE WASHOUT STRUCTURE	EA	1	
C-105-1	MOBILIZATION (3% MAX)	LS	1	
C-105-2	ENGINEER'S FIELD OFFICE	LS	1	
M-120-1	MAINTENANCE AND PROTECTION OF TRAFFIC	LS	1	
M-120-2	LOW-PROFILE CONSTRUCTION BARRICADES	EA	460	
M-150-1	PROJECT SURVEY AND STAKEOUT	LS	1	
P-100-1	GEOTEXTILE STABILIZATION FABRIC	SY	6,000	
P-101-1	PROFILE COLD MILLING	SY	26,600	
P-101-3	MISCELLANEOUS COLD MILLING	SY	4,030	
P-101-4	JOINT AND CRACK REPAIR, TYPE 1	LF	13,300	
P-101-5	JOINT AND CRACK REPAIR, TYPE 2	LF	5,200	
P-101-6	PAINT AND RUBBER REMOVAL	SF	30	
P-152-1	UNCLASSIFIED EXCAVATION	CY	5,600	
P-152-2	EMBANKMENT IN PLACE	CY	3,100	
P-152-4	UNDERCUT EXCAVATION AND BACKFILL	CY	1,600	
P-153-1	CONTROLLED LOW-STRENGTH MATERIAL (CLSM)	CY	40	
P-209-1	CRUSHED AGGREGATE BASE COURSE	CY	2,900	
P-401-1	ASPHALT SURFACE COURSE	TON	12,400	
P-401-2	ASPHALT BINDER COURSE	TON	2,600	
P-603-1	BITUMINOUS TACK COAT	GAL	5,100	
P-605-1	JOINT SEALING FILLER	LF	450	
P-620-1	BLACK PAVEMENT MARKINGS	SF	100	
P-620-3	YELLOW PAVEMENT MARKINGS	SF	3,000	
P-620-6	TEMPORARY YELLOW PAVEMENT MARKINGS	SF	3,000	
P-620-8	PREFORMED THERMOPLASTIC MARKINGS	SF	1,000	
P-621-1	GROOVING	SY	8,000	
D-700-1	DRY SWALE	LF	900	
D-701-0224	REINFORCED CONCRETE PIPE CLASS IV, 24-INCH DIAMETER	LF	280	
D-701-62	REMOVE EXISTING DRAINAGE PIPE, 15-INCH TO 24-INCH DIAMETER	LF	58	
D-703-1	CONCRETE PLUGS FOR DRAINAGE PIPE	EA	2	
D-705-2	6" PERFORATED UNDERDRAIN COMPLETE, INCLUDING POROUS BACKFILL AND FILTER FABRIC	LF	4,300	
D-705-4	UNDERDRAIN CLEANOUT	EA	23	
D-705-5	UNDERDRAIN OUTLET	EA	1	
D-751-012	RECTANGULAR DRAINAGE STRUCTURE, 4' X 4'	EA	2	
D-751-4	ALTER EXISTING DRAINAGE STRUCTURE	EA	2	
D-751-51	ADJUST EXISTING DRAINAGE STRUCTURE	EA	2	
D-751-7	REMOVE EXISTING DRAINAGE STRUCTURE	EA	3	
D-751-9	CLEAN EXISTING DRAINAGE STRUCTURE	EA	12	
D-751-10	CLEAN EXISTING DRAINAGE PIPE	LF	1,700	
L-108-105	NO. 8 AWG, 5KV, L-824 TYPE C CABLE, INSTALLED IN TRENCH, DUCT BANK, OR CONDUIT	LF	17,000	
L-108-201	NO. 6 AWG, SOLID, BARE COPPER COUNTERPOISE WIRE INSTALLED IN TRENCH, ABOVE THE DUCT BANK OR CONDUIT	LF	4,900	
L-108-51	PAVEMENT SENSOR (V) WIRE	LF	300	
L-110-104	NON-ENCASED ELECTRICAL CONDUIT, 2" SCH. 40 PVC	LF	8,000	
L-110-304	NON-ENCASED ELECTRICAL CONDUIT, 2" RGS	LF	40	
L-115-201	ELECTRICAL JUNCTION STRUCTURE, L-867 CLASS 1, SOLID COVER	EA	4	
L-115-31	ADJUST EXISTING ELECTRICAL MANHOLE	EA	1	
L-125-21	L-861T MEDIUM INTENSITY ELEVATED QUARTZ TAXIWAY EDGE LIGHT	EA	16	
L-125-22	L-861T(L) MEDIUM INTENSITY ELEVATED LED TAXIWAY EDGE LIGHT	EA	30	
L-125-23	L-861T(L) MEDIUM INTENSITY ELEVATED LED TAXIWAY EDGE LIGHT ON EXISTING BASE CAN	EA	25	
L-125-64	REMOVE EXISTING ELEVATED BASE-MOUNTED EDGE LIGHT AND BASE CAN	EA	46	
L-125-65	REMOVE EXISTING ELEVATED BASE-MOUNTED EDGE LIGHT, BASE CAN TO REMAIN	EA	25	
L-125-7103	AIRFIELD GUIDANCE SIGN, SIZE 3, LED, ON NEW FOUNDATION	EA	7	
L-125-77	REMOVE EXISTING AIRFIELD GUIDANCE SIGN AND FOUNDATION	EA	8	
L-130-1	REPLACE PAVEMENT CONDITION SURFACE SENSOR	EA	1	
T-901-1	HYDROSEEDING	ACRE	7.5	
T-902-1	SOIL RESTORATION	ACRE	0.15	
T-905-1	TOPSOIL (OBTAINED ON-SITE)	CY	3,000	
T-908-1	MULCHING	ACRE	7.5	

BASE BID + ADD ALT QUANTITY TABLE

BID ITEM	DESCRIPTION OF ITEM	UNIT	QUANTITY	FINAL QUANTITY
C-100-1	CONTRACTOR'S QUALITY CONTROL PROGRAM	LS	1	
C-102-3	SEED AND MULCH - TEMPORARY	SY	67,800	
C-102-17	SILT FENCE-TEMPORARY	LF	1,900	
C-102-25	DRAINAGE STRUCTURE INLET PROTECTION, SILT FENCE-TEMPORARY	LF	400	
C-102-44	CONSTRUCTION ENTRANCE/EXIT-TEMPORARY	SY	460	
C-102-46	CONCRETE WASHOUT STRUCTURE	EA	2	
C-105-1	MOBILIZATION (3% MAX)	LS	1	
C-105-2	ENGINEER'S FIELD OFFICE	LS	1	
M-120-1	MAINTENANCE AND PROTECTION OF TRAFFIC	LS	1	
M-120-2	LOW-PROFILE CONSTRUCTION BARRICADES	EA	1,880	
M-120-3	LIGHTED RUNWAY CLOSURE MARKERS	EA	4	
M-150-1	PROJECT SURVEY AND STAKEOUT	LS	1	
P-100-1	GEOTEXTILE STABILIZATION FABRIC	SY	9,300	
P-101-1	PROFILE COLD MILLING	SY	53,600	
P-101-3	MISCELLANEOUS COLD MILLING	SY	8,110	
P-101-4	JOINT AND CRACK REPAIR, TYPE 1	LF	25,000	
P-101-5	JOINT AND CRACK REPAIR, TYPE 2	LF	9,900	
P-101-6	PAINT AND RUBBER REMOVAL	SF	910	
P-152-1	UNCLASSIFIED EXCAVATION	CY	9,200	
P-152-2	EMBANKMENT IN PLACE	CY	5,000	
P-152-4	UNDERCUT EXCAVATION AND BACKFILL	CY	2,500	
P-153-1	CONTROLLED LOW-STRENGTH MATERIAL (CLSM)	CY	40	
P-209-1	CRUSHED AGGREGATE BASE COURSE	CY	4,600	
P-401-1	ASPHALT SURFACE COURSE	TON	24,000	
P-401-2	ASPHALT BINDER COURSE	TON	5,000	
P-603-1	BITUMINOUS TACK COAT	GAL	9,500	
P-605-1	JOINT SEALING FILLER	LF	1,190	
P-620-1	BLACK PAVEMENT MARKINGS	SF	1,000	
P-620-3	YELLOW PAVEMENT MARKINGS	SF	6,500	
P-620-6	TEMPORARY YELLOW PAVEMENT MARKINGS	SF	6,500	
P-620-8	PREFORMED THERMOPLASTIC MARKINGS	SF	3,300	
P-621-1	GROOVING	SY	19,000	
D-700-1	DRY SWALE	LF	900	
D-701-0224	REINFORCED CONCRETE PIPE CLASS IV, 24-INCH DIAMETER	LF	280	
D-701-62	REMOVE EXISTING DRAINAGE PIPE, 15-INCH TO 24-INCH DIAMETER	LF	58	
D-703-1	CONCRETE PLUGS FOR DRAINAGE PIPE	EA	2	
D-705-2	6" PERFORATED UNDERDRAIN COMPLETE, INCLUDING POROUS BACKFILL AND FILTER FABRIC	LF	9,800	
D-705-4	UNDERDRAIN CLEANOUT	EA	45	
D-705-5	UNDERDRAIN OUTLET	EA	2	
D-751-012	RECTANGULAR DRAINAGE STRUCTURE, 4' X 4'	EA	2	

BASE BID + ADD ALT QUANTITY TABLE

BID ITEM	DESCRIPTION OF ITEM	UNIT	QUANTITY	FINAL QUANTITY
D-751-4	ALTER EXISTING DRAINAGE STRUCTURE	EA	8	
D-751-51	ADJUST EXISTING DRAINAGE STRUCTURE	EA	5	
D-751-7	REMOVE EXISTING DRAINAGE STRUCTURE	EA	3	
D-751-9	CLEAN EXISTING DRAINAGE STRUCTURE	EA	23	
D-751-10	CLEAN EXISTING DRAINAGE PIPE	LF	2,400	
L-108-104	NO. 6 AWG, 5KV, L-824 TYPE C CABLE, INSTALLED IN TRENCH, DUCT BANK, OR CONDUIT	LF	800	
L-108-105	NO. 8 AWG, 5KV, L-824 TYPE C CABLE, INSTALLED IN TRENCH, DUCT BANK, OR CONDUIT	LF	46,000	
L-108-201	NO. 6 AWG, SOLID, BARE COPPER COUNTERPOISE WIRE INSTALLED IN TRENCH, ABOVE THE DUCT BANK OR CONDUIT	LF	11,500	
L-108-51	PAVEMENT SENSOR (V) WIRE	LF	300	
L-109-204	INSTALL EXISTING 4KW CONSTANT CURRENT REGULATOR (CCR) IN ELECTRICAL VAULT	EA	1	
L-110-104	NON-ENCASED ELECTRICAL CONDUIT, 2" SCH. 40 PVC	LF	19,000	
L-110-304	NON-ENCASED ELECTRICAL CONDUIT, 2" RGS	LF	110	
L-115-201	ELECTRICAL JUNCTION STRUCTURE, L-867 CLASS 1, SOLID COVER	EA	14	
L-115-31	ADJUST EXISTING ELECTRICAL MANHOLE	EA	3	
L-125-21	L-861T MEDIUM INTENSITY ELEVATED QUARTZ TAXIWAY EDGE LIGHT	EA	38	
L-125-22	L-861T(L) MEDIUM INTENSITY ELEVATED LED TAXIWAY EDGE LIGHT	EA	97	
L-125-23	L-861T(L) MEDIUM INTENSITY ELEVATED LED TAXIWAY EDGE LIGHT ON EXISTING BASE CAN	EA	29	
L-125-2209	L-852T(L) MEDIUM INTENSITY IN-PAVEMENT LED TAXIWAY EDGE LIGHT ON EXISTING BASE CAN	EA	3	
L-125-500	L-804(L) ELEVATED LED RUNWAY GUARD LIGHT	EA	4	
L-125-501	L-852G(L) IN-PAVEMENT LED RUNWAY GUARD LIGHT	EA	31	
L-125-502	REMOVE EXISTING IN-PAVEMENT EDGE LIGHT, CAN TO REMAIN	EA	3	
L-125-64	REMOVE EXISTING ELEVATED BASE-MOUNTED EDGE LIGHT AND BASE CAN	EA	122	
L-125-65	REMOVE EXISTING ELEVATED BASE-MOUNTED EDGE LIGHT, BASE CAN TO REMAIN	EA	29	
L-125-67	REMOVE EXISTING RUNWAY GUARD LIGHTS AND BASE CAN	EA	4	
L-125-68	REMOVE AND RESET EXISTING GUARD LIGHT	EA	4	
L-125-75	REPLACE EXISTING AIRFIELD GUIDANCE SIGN PANEL	EA	20	
L-125-7103	AIRFIELD GUIDANCE SIGN, SIZE 3, LED, ON NEW FOUNDATION	EA	17	
L-125-7113	AIRFIELD GUIDANCE SIGN, SIZE 3, LED, ON EXISTING FOUNDATION	EA	1	
L-125-77	REMOVE EXISTING AIRFIELD GUIDANCE SIGN AND FOUNDATION	EA	16	
L-125-78	REMOVE EXISTING AIRFIELD GUIDANCE SIGN, FOUNDATION TO REMAIN	EA	1	
L-130-1	REPLACE PAVEMENT CONDITION SURFACE SENSOR	EA	2	
T-901-1	HYDROSEEDING	ACRE	14.0	
T-902-1	SOIL RESTORATION	ACRE	0.40	
T-905-1	TOPSOIL (OBTAINED ON-SITE)	CY	5,600.0	
T-908-1	MULCHING	ACRE	14.0	

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

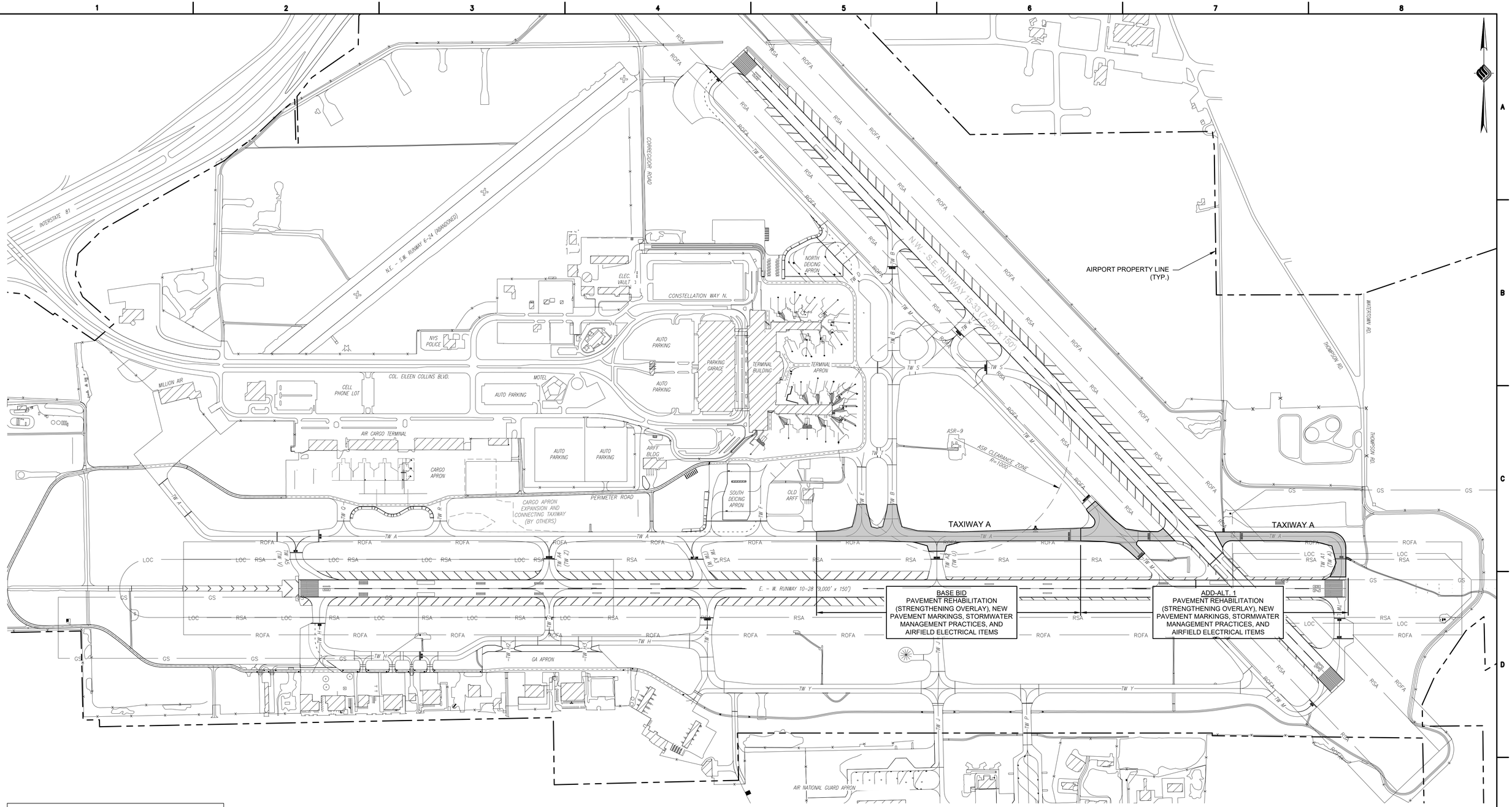
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

QUANTITY TABLE

SCALE: NTS	DESIGN: JPM	**QU-01**	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	3 OF 81	



LEGEND

PROJECT AREA

0 400 800 1200 FT.

SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK
STEVEN J. LANGE
084009
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

GENERAL PLAN

SCALE: AS SHOWN	DESIGN: JPM	**GP-01**
DRAWN: SDB	PROJECT: 18831.08	4 OF 81
CHECKED: SJL	DATE: APRIL 2024	

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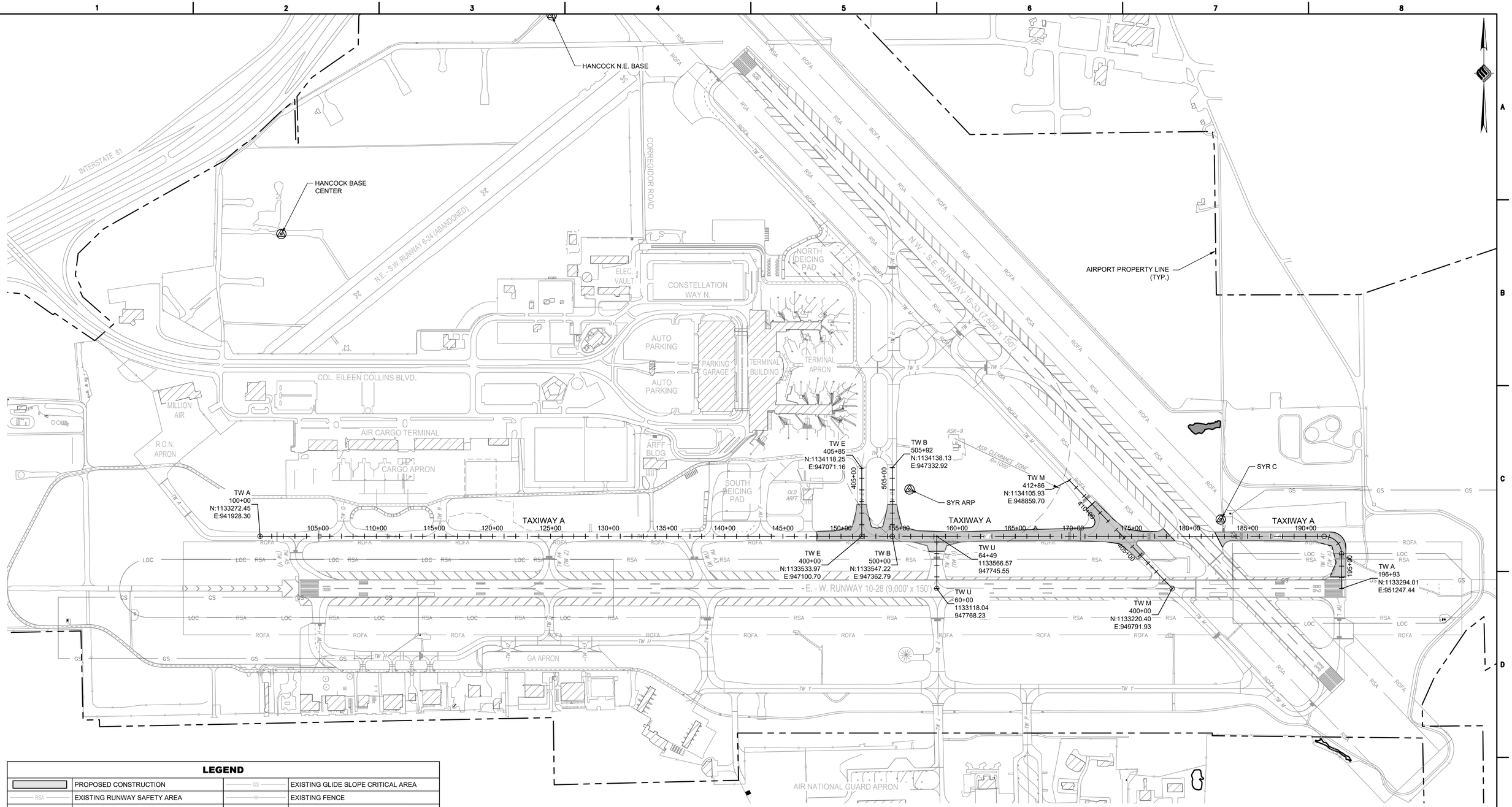

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SCALE

LEGEND

	PROPOSED CONSTRUCTION	GS	EXISTING GLIDE SLOPE CRITICAL AREA
RSA	EXISTING RUNWAY SAFETY AREA		EXISTING FENCE
ROFA	EXISTING RUNWAY OBJECT FREE AREA		EXISTING AIRPORT PROPERTY LINE
TSA	EXISTING TAXIWAY SAFETY AREA		SURVEY CONTROL POINT
TOFA	EXISTING TAXIWAY OBJECT FREE AREA		
POFZ	EXISTING PRECISION OBSTACLE FREE ZONE		
LOC	EXISTING LOCALIZER CRITICAL AREA		

SURVEY CONTROL POINT SCHEDULE

NAME	NORTHING	EASTING	ELEVATION	COMMENTS
HANCOCK NE BASE	1,137,896.99	944,220.35	410.83	NGS PRIMARY AIRPORT CONTROL STATION
HANCOCK BASE CENTER	1,135,879.25	941,975.25	414.86	NGS SECONDARY AIRPORT CONTROL STATION
SYR C	1,133,848.91	950,180.65	405.39	NGS SECONDARY AIRPORT CONTROL STATION
SYR ARP	1,133,960.64	947,584.37	421.00	AIRPORT REFERENCE POINT

CONSTRUCTION BID SET

STATE OF NEW YORK
STEVEN J. LANGE
084009
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

HORIZONTAL & VERTICAL CONTROL PLAN

SCALE: AS SHOWN	DESIGN: JPM	CP-01
DRAWN: SDB	PROJECT: 18831.08	5 OF 81
CHECKED: SJL	DATE: APRIL 2024	

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GENERAL ABBREVIATIONS

A	AMMETER, AMPERE
ABND	ABANDON
AC	ADVISORY CIRCULAR or ALTERNATING CURRENT
ACP	ASPHALT CONCRETE PAVEMENT
ADG	AIRCRAFT DESIGN GROUP
AF	AVIATION FUEL
AFL	AIRFIELD LIGHTING
AIRP.	AIRPORT
ALP	AIRPORT LAYOUT PLAN
ALSF	APPROACH LIGHT SYSTEM WITH SEQUENCE FLASHER
ALT	ALTERNATE
AOA	AIRCRAFT OPERATIONS AREA
APPROX.	APPROXIMATE
ARFF	AIRPORT RESCUE AND FIRE FIGHTING
ASTM	AMERICAN SOCIETY OF TESTING MATERIALS
ASPH	ASPHALT
AT	ACTIVE TAXIWAY
ATCT	AIRPORT TRAFFIC CONTROL TOWER
AVG	AVERAGE
AWG	AMERICAN WIRE GAUGE
AWOS	AUTOMATED WEATHER OBSERVING SYSTEM
BKR	BREAKER
BL	BASELINE
BLDG	BUILDING
BM	BENCHMARK
BMP	BEST MANAGEMENT PRACTICE
BOA	BUREAU OF AVIATION
BOF	BOTTOM OF FOOTING
BOT	BOTTOM
BP	BEGINNING POINT
BRL	BUILDING RESTRICTION LINE
BVCE	BEGINNING OF VERTICAL CURVE ELEVATION
BVCS	BEGINNING OF VERTICAL CURVE STATION
CB	CATCH BASIN
CC	CENTER OF CURVE
CCR	CONSTANT CURRENT REGULATOR
CF	CUBIC FEET/FOOT
CI or CIP	CAST IRON PIPE
CIR or CKT	CIRCUIT
CL	CENTERLINE
CLR	CLEARANCE OR CLASS
CO	CLEAN OUT
COMM	COMMUNICATIONS
CONC	CONCRETE
COND	CONDUIT
CONT	CONTINUOUS
CMP	CORRUGATED METAL PIPE
CRS	PVC COATED RIGID STEEL CONDUIT
C.T.	CURRENT TRANSFORMER
CY	CUBIC YARD
D	DATA
DBC	DIRECT BURIAL CABLE
D/C	DATA/COMMUNICATION
DIA	DIAMETER
DI or DIP(S)	DUCTILE IRON PIPE
DIPS	DUCTILE IRON PIPE SIZE
DV	DIVERSION VAULT
DWG	DRAWING
E	ELECTRICAL OR EAST
EA	EACH
E.F.	EACH FACE
EL	ELEVATION
ELEV	ELEVATION
EMH	ELECTRICAL MANHOLE
EOP	EDGE OF PAVEMENT
EP	END POINT
EQ	EQUAL
EVCE	END VERTICAL CURVE ELEVATION
EVCS	END VERTICAL CURVE STATION
E.W.	EACH WAY
EX, EXIST	EXISTING
EXP	EXPANSION
FAA	FEDERAL AVIATION ADMINISTRATION
FAR	FEDERAL AVIATION REGULATIONS
FFE	FINISHED FLOOR ELEVATION
FH	FIRE HYDRANT
FO	FIBER OPTIC COMMUNICATION LINE
FOD	FOREIGN OBJECT DEBRIS
FT	FOOT (FEET)
FTG	FOOTING
G	GAS
G (GND)	GROUND (ELECTRICAL)
GA	GENERAL AVIATION
GAL	GALLON
GALV	GALVANIZED
GFM	GOVERNMENT FURNISHED MATERIAL
GLY	GLYCOL
GPB	GROUND POWER BOX
GR	GRADE
GRS	GALVANIZED RIGID STEEL
G.S.	GLIDE SLOPE
GSCA	GLIDE SLOPE CRITICAL AREA
H.D.	HOT DIPPED
HDPE	HIGH DENSITY POLYETHYLENE
HH	HANDHOLE
HORIZ	HORIZONTAL
HW	HEADWALL
I.D.	INSIDE DIMENSION
IE	INVERT ELEVATION
ILS	INSTRUMENT LANDING SYSTEM
INV	INVERT
JB	JUNCTION BOX
JC	JUNCTION CAN
JT	JOINT
JCT	JUNCTION
K	RATE OF CURVATURE (K=L/A)
KV	KILOVOLT
KVA	KILOVOLT AMPERE(S)
KW	KILOWATT
KWH	KILOWATT HOUR
LAT	LATITUDE
LB	POUND
LCA	LOCALIZER CRITICAL AREA
LED	LIGHT-EMITTING DIODE
LF	LINEAR FEET/FOOT
LG	LONG
LIN	LINEAR
LOC	LOCALIZER
LONG	LONGITUDE
LVC	LENGTH OF VERTICAL CURVE
MALS	MEDIUM-INTENSITY APPROACH LIGHTING SYSTEM
MALS-R	MEDIUM-INTENSITY APPROACH LIGHTING SYSTEM W/ RUNWAY ALIGNMENT INDICATOR LIGHTS
MAT'L	MATERIAL
MECH	MECHANICAL
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MSL	MEAN SEA LEVEL
N	NORTH
NAD	NORTH AMERICAN DATUM
NEC	NATIONAL ELECTRIC CODE
NG	NATURAL GAS
NIC	NOT IN CONTRACT
NLT	NOT LATER THAN
NO or #	NUMBER
NOAA	NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NOTAM	NOTICE TO AIR MISSIONS
NPP	NON-PERFORATED PIPE
NTP	NOTICE TO PROCEED
NTS	NOT TO SCALE
NWS	NATIONAL WEATHER SERVICE
NY	NEW YORK
NYSDOT	NEW YORK STATE DEPARTMENT OF TRANSPORTATION
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
OFA	OBJECT FREE AREA
OFF or OS	OFFSET FROM BASELINE
OFZ	OBJECT FREE ZONE
OHP	OVERHEAD POWER
OPS	OPERATIONS
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
P	PANEL, POLE
PAPI	PRECISION APPROACH PATH INDICATOR
PC	POINT OF CURVATURE
PCC	PORTLAND CEMENT CONCRETE
PCF	POUND PER CUBIC FOOT
PCVC	POINT OF CURVATURE - VERTICAL CURVE
PTVC	POINT OF TANGENCY - VERTICAL CURVE
PI	POINT OF INTERSECTION
PIV	POINT OF INTERSECTION FOR VERTICAL CURVE
POB	POINT OF BEGINNING
POC	POINT ON CURVE
POE	POINT OF ENDING
PR or PROP	PROPOSED
PRC	POINT OF REVERSE CURVATURE
PSF	POUND PER SQUARE FOOT
PSI	POUND PER SQUARE INCH
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
QA	QUALITY ASSURANCE
QC	QUALITY CONTROL
RCP	REINFORCED CONCRETE PIPE
REF	REFERENCE
REIL	RUNWAY END IDENTIFIER LIGHT
REINF	REINFORCEMENT
REQD	REQUIRED
REV	REVISION OR REVISED
RGS	RIGID GALVANIZED STEEL
RPU	REMOTE PROCESSING UNIT
RPZ	RUNWAY PROTECTION ZONE
RSA	RUNWAY SAFETY AREA
R/W or RWY	RUNWAY
S	SOUTH
SCH	SCHEDULE
SD	STORM DRAIN
SDCO	STORM DRAIN CLEAN OUT
SDMH	STORM DRAIN MANHOLE
SDR	STANDARD DIMENSION RATIO
SECT	SECTION
SF	SQUARE FOOT/FEET
SHIA	SYRACUSE HANCOCK INTERNATIONAL AIRPORT
SHT	SHEET
SI	SQUARE INCH/INCHES
SIM	SIMILAR
SPEC	SPECIFICATION(S)
SRAA	SYRACUSE REGIONAL AIRPORT AUTHORITY
SS	SEWER OR STAINLESS STEEL
STA	STATION
STD	STANDARD
STL	STEEL
SUPP	SUPPLEMENTAL
SY	SQUARE YARD/YARDS
SYR	AIRPORT IDENTIFIER
T	TELEPHONE
TBD	TO BE DETERMINED
TEMP	TEMPORARY
TESC	TEMPORARY EROSION AND SEDIMENT CONTROL
THK	THICK
TOC	TOP OF CONCRETE
TOG	TOP OF GRADE
TOF	TOP OF FOOTING
TOP	TOP OF PIPE
TOS	TOP OF SLAB
TOT	TOTAL
TN	TON
TSA	TAXIWAY SAFETY AREA
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESOR
T/W or TWY	TAXIWAY
TYP	TYPICAL
UBC	UNIFORM BUILDING CODE
UD	UNDERDRAIN
UE	UNDERGROUND ELECTRIC
UFO	UNDERGROUND FIBER OPTIC
U/G	UNDERGROUND
UMC	UNIFORM MECHANICAL CODE
UNK	UNKNOWN
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTED POWER SOURCE
UPC	UNIFORM PLUMBING CODE
UT	UNDERGROUND TELEPHONE
VS	VERSUS
VERT.	VERTICAL
W	WATER OR WEST
W/	WITH
WP	WEATHERPROOF
WT	WEIGHT
WWF	WELDED WIRE FABRIC
XFMR	TRANSFORMER
&	AND
%	PERCENT

MISCELLANEOUS

KEYED NOTE CALLOUT, REFERENCE
SPECIFIC KEYED NOTES ON EACH SHEET

TW A
(TW A5)

CURRENT TAXIWAY IDENTIFIER
(PROPOSED TAXIWAY IDENTIFIER)

LINETYPE LEGEND

DESCRIPTION	LINETYPE
CENTERLINE	
AIRPORT BOUNDARY	
FENCE (BARBED WIRE)	
FENCE (CHAIN LINK)	
SANITARY SEWER, UNDERGROUND (W/ PIPE SIZE)	12" S
STORM SEWER, UNDERGROUND (W/ PIPE SIZE)	12" D
WATER, UNDERGROUND (W/ PIPE SIZE)	12" W
GLYCOL PIPING, UNDERGROUND (W/ PIPE SIZE)	12" GC
GAS, UNDERGROUND (W/ PIPE SIZE)	4" G
UNDERDRAIN	UD
LIMIT OF GRADING DISTURBANCE	LOD
CONTOUR LINES (MAJOR)	100
CONTOUR LINES (MINOR)	100.5
SILT FENCE	SF
SWALE/OPEN DITCH	
RUNWAY SAFETY AREA	RSA
RUNWAY OBJECT FREE AREA	ROFA
RUNWAY PROTECTION ZONE	RPZ
TAXIWAY SAFETY AREA	TSA
TAXIWAY OBJECT FREE AREA	TOFA
GLIDE SLOPE CRITICAL AREA	GS
LOCALIZER CRITICAL AREA	LOC
RAILROAD	
TREELINE	
GUIDE RAIL	
DRAWING MATCHLINE	

NOTES:
1. THE LEGEND ILLUSTRATES MAPPING FEATURES (EXISTING AND PROPOSED).
2. FEATURES ARE SHOWN AS EITHER LINEAR (UTILITIES, TOPOGRAPHY, ETC.) OR POINT (EDGE LIGHTS, GUIDANCE SIGNS, ETC.).
3. FEATURES SHOWN ON THE LEGEND AS PROPOSED FEATURES ALSO HAVE CORRESPONDING EXISTING FEATURES.
4. PROPOSED FEATURE SYMBOLOGY IS IDENTICAL TO EXISTING FEATURE SYMBOLOGY EXCLUDING LINE WEIGHT. LINE WEIGHT FOR PROPOSED FEATURES IS THICKER.
5. MAPPING FEATURES NOT INCLUDED ON THE LEGEND SHEET DO NOT HAVE A UNIQUE SYMBOLOGY (SUCH AS THE PAVEMENT EDGE) AND ARE LABELED ON THE PLANS.
6. FEATURES SHOWN AT THE LIGHTER WEIGHT ARE EXISTING ONLY AND DO NOT HAVE CORRESPONDING PROPOSED FEATURES.

CONSTRUCTION BID SET

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

ABBREVIATIONS & LEGEND

SCALE:	NTS	DESIGN: JPM	GN-01
DRAWN:	SDB	PROJECT: 18831.08	6 OF 81
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GENERAL CONSTRUCTION NOTES:

1. ALL ACTIVE PAVEMENT AREAS USED BY THE CONTRACTOR MUST BE CLEANED ON A CONTINUOUS BASIS. PAVEMENTS SHALL BE BRUSHED CLEAN AND HOSED DOWN, IF NECESSARY, TO REMOVE ANY MUD OR DEBRIS AND AS REQUESTED BY THE ENGINEER. ALL DEBRIS DEPOSITED ON ANY AIRPORT PAVEMENT SHALL BE REMOVED CONTINUOUSLY DURING THE COURSE OF WORK. IN ADDITION, THE CONTRACTOR MUST TAKE ALL NECESSARY PRECAUTIONS TO PREVENT MATERIALS FROM ESCAPING THE WORK AND/OR STOCKPILE/STAGING AREAS. THIS WORK SHALL BE CONSIDERED INCLUSIVE TO ITEM M-120-1, MAINTENANCE AND PROTECTION OF TRAFFIC.

2. THE PLANS SHOW SUBSURFACE STRUCTURES, ABOVE-GROUND STRUCTURES AND/OR UTILITIES FROM FIELD LOCATION AND RECORD MAPPING, EXACT LOCATION OF WHICH MAY VARY FROM THE LOCATIONS INDICATED. IN PARTICULAR, THE CONTRACTOR IS WARNED THAT THE EXACT OR EVEN APPROXIMATE LOCATION OF SUCH PIPELINES, SUBSURFACE STRUCTURES AND/OR UTILITIES IN THE AREA MAY BE DIFFERENT FROM THAT SHOWN OR MAY NOT BE SHOWN, AND IT SHALL BE HIS RESPONSIBILITY TO PROCEED WITH GREAT CARE IN EXECUTING ANY WORK. 72 HOURS BEFORE YOU DIG, DRILL, OR BLAST, CALL UDIG NEW YORK 1 (800) 962-7962.

3. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY CONDITIONS THAT VARY FROM THOSE SHOWN ON THE PLANS. THE CONTRACTOR'S WORK SHALL NOT VARY FROM THE PLANS WITHOUT THE EXPRESSED WRITTEN APPROVAL OF THE ENGINEER.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND INCURRING THE COST OF ALL REQUIRED PERMITS, INSPECTIONS, CERTIFICATES, ETC. REQUIRED BY LOCAL, STATE, AND FEDERAL AGENCIES AND SHALL COMPLY WITH ALL REQUIRED PERMITS.

5. ALL WORK SHALL BE DONE IN STRICT COMPLIANCE WITH ALL APPLICABLE NATIONAL, STATE AND LOCAL CODES, STANDARDS, ORDINANCES, RULES AND REGULATIONS.

6. THE CONTRACTOR SHALL:

   A. VERIFY ALL CONDITIONS IN THE FIELD PRIOR TO COMMENCEMENT OF WORK AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.

   B. EXAMINE THE SITE AND INCLUDE IN HIS WORK CONSIDERATION FOR THE EFFECT OF ALL EXISTING CONDITIONS ON THE WORK.

   C. PROVIDE AND INSTALL ALL MATERIALS AND PERFORM ALL WORK IN ACCORDANCE WITH THESE CONTRACT PLANS AND SPECIFICATIONS.

   D. HOLD THE OWNER HARMLESS AGAINST ANY AND ALL CLAIMS ARISING FROM WORK DONE BY THE CONTRACTOR ON THE SITE.

6. ALL TRENCH EXCAVATION AND ANY REQUIRED SHEETING AND SHORING SHALL BE DONE IN ACCORDANCE WITH THE LATEST REVISIONS OF NEW YORK STATE INDUSTRIAL CODE PART 23 AND OSHA REGULATIONS FOR CONSTRUCTION.

7. CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING AND THE MAINTENANCE OF SURFACE DRAINAGE DURING THE COURSE OF WORK. CONTRACTOR SHALL MAINTAIN EXISTING SITE DRAINAGE PATTERNS THROUGHOUT CONSTRUCTION.

8. ALL UTILITY WORK INVOLVING CONNECTIONS TO EXISTING SYSTEMS SHALL BE COORDINATED WITH THE ENGINEER AND THE UTILITY OWNER. NOTIFY THE ENGINEER AND THE UTILITY OWNER 72 HOURS BEFORE EACH AND EVERY CONNECTION TO EXISTING SYSTEMS IS MADE.

GENERAL NOTES:

1. THE CONTRACTOR SHALL COMPLY WITH FAA ADVISORY CIRCULAR (AC) 150/5370-2G, THE PROJECT SPECIFICATIONS, AND THE PLANS FOR GUIDANCE ON OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION. THE CONTRACTOR SHALL ALSO SUBMIT A SAFETY PLAN COMPLIANCE DOCUMENT (SPCD) FOR APPROVAL.

2. NOTICE TO AIR MISSIONS (NOTAM) ON ALL CONSTRUCTION ACTIVITIES WILL BE DIRECTED THROUGH THE ENGINEER AND ISSUED BY THE AIRPORT. ALL CLOSURES OF ANY PORTION OF A TAXIWAY OR RUNWAY WILL REQUIRE A MINIMUM OF 72 HOURS NOTICE PRIOR TO THE REQUESTED CLOSURE. REQUESTS FOR CLOSURE MUST BE MADE THROUGH THE ENGINEER AND WILL BE COORDINATED WITH THE AIRPORT. THE AUTHORITY TO CLOSE ANY AIRPORT FACILITY RESTS ENTIRELY WITH THE AIRPORT.

3. ALL CONSTRUCTION EQUIPMENT MUST MAINTAIN A DISTANCE GREATER THAN 25 FEET FROM ANY PARKED AIRCRAFT.

4. AT THE COMPLETION OF WORK IN ANY CONSTRUCTION PERIOD, AND PRIOR TO THE SCHEDULED OPENING OF THE DESIGNATED AIRFIELD FACILITY, AN INSPECTION TO DETERMINE WHETHER THE RESPECTIVE AIRPORT FACILITIES ARE IN THE APPROPRIATE CONDITION TO BE OPENED WILL BE PERFORMED BY THE ENGINEER AND A REPRESENTATIVE OF THE AIRPORT. THE CONTRACTOR'S CONSTRUCTION SUPERVISOR MUST BE PRESENT DURING THIS INSPECTION.

5. CONTRACTOR SHALL DESIGNATE ONE PRINCIPAL PERSON AND TWO BACKUP PEOPLE WHO CAN BE CONTACTED 24 HOURS A DAY IN THE EVENT OF AN EMERGENCY. THESE PEOPLE SHALL BE AUTHORIZED TO MAKE DECISIONS ON THE COMPANY'S BEHALF AND MUST PHYSICALLY RESPOND WITHIN ONE HOUR.

6. ACCESS FOR AIRPORT RESCUE AND FIRE FIGHTING EQUIPMENT AND PERSONNEL SHALL BE MAINTAINED AT ALL TIMES. THE AIRPORT RESCUE AND FIRE FIGHTING OPERATIONS SHALL HAVE RIGHT-OF-WAY OVER ALL CONTRACTORS OPERATIONS AT ALL TIMES.

7. THE CONTRACTOR WILL SUBMIT A PROJECT HEALTH AND SAFETY PLAN TO THE ENGINEER BEFORE THE START OF WORK.

8. DESIGN SURVEY COMPLETED BY PRUDENT ENGINEERING IN NOVEMBER 2021 & JULY 2022.

9. ATTENTION IS DIRECTED TO THE DATUM USED IN THESE PLANS. ALL BENCHMARK AND CONSTRUCTION ELEVATIONS SHOWN IN THESE PLANS ARE FROM VERTICAL DATUM, NAVD 88.

10. THE CONTRACTOR SHALL FURNISH AND PLACE THREE 2" x 4" WOOD MARKERS AT LOCATIONS OF EXISTING MONUMENTS TO REMAIN AS INDICATED ON THE PLANS OR AS ORDERED BY THE ENGINEER. THE 2" x 4" MARKERS SHALL BE 4' LONG AND SHALL BE FIRMLY EMBEDDED 18" INTO THE GROUND.

11. HORIZONTAL & VERTICAL CONTROL AS INDICATED ON SHEET CP-01, AS WELL AS GE-01 THROUGH GE-04.

12. UTILITIES SHOWN ARE FROM ACTUAL FIELD LOCATIONS AND RECORD PLANS. THEIR EXACT LOCATION MAY DIFFER FROM THAT AS SHOWN AND OTHERS MAY EXIST THAT ARE NOT SHOWN.

13. USE OF THE WORD "PROPOSED" THROUGHOUT THE CONTRACT DOCUMENTS REFERS TO WORK WITHIN THIS CONTRACT DIRECTED TO THE CONTRACTOR.

AVIATION NOTES:

1. IN ADDITION TO NORMAL SAFETY PRECAUTIONS EXPECTED OF THE CONTRACTOR, IT IS NOTED THAT SPECIAL CONSIDERATIONS MUST BE GIVEN TO THE FACT THAT CONSTRUCTION ACTIVITY WILL BE TAKING PLACE WITHIN THE CONFINES OF AN ACTIVE AIRPORT. IN THIS REGARD, NO EQUIPMENT OR MATERIAL CAN BE LOCATED SO AS TO OBSTRUCT THE SAFE FLOW OF TRAFFIC ON THE EXISTING RUNWAY AND TAXIWAY SURFACES. PARTICULAR ATTENTION MUST BE GIVEN TO THE USE OF TAXIWAYS AND RUNWAYS FOR THE PURPOSE OF MOVING OR PARKING EQUIPMENT.

2. ALL CONSTRUCTION VEHICLES OPERATING ON AIRPORT PROPERTY MUST DISPLAY A FAA APPROVED FLAG ON A STAFF OR ATTACHED TO THE VEHICLE SO THAT THE FLAG WILL BE READILY VISIBLE. THE FLAG SHALL NOT BE LESS THAN THREE FEET SQUARE CONSISTING OF AVIATION ORANGE AND WHITE SQUARES OF NOT LESS THAN A FOOT ON EACH SIDE (DAY ONLY). ROTATING AMBER BEACONS SHALL BE USED DURING THE DAY AND AT NIGHT.

3. THE CONTRACTOR'S JOB SUPERINTENDENT IS TO MEET WITH THE RESIDENT PROJECT REPRESENTATIVE PRIOR TO THE START OF EACH WORKING DAY TO COORDINATE DAILY CONSTRUCTION ACTIVITIES.

4. ALL INTERRUPTION OF APRON, TAXIWAY OR RUNWAY LIGHTING SHALL BE COORDINATED AND SUBJECT TO THE APPROVAL OF AIRPORT OPERATIONS.

5. THE CONTRACTOR IS TO POST A GUARD AT ALL GATES USED FOR ACCESS OF CONSTRUCTION EQUIPMENT AND/OR PERSONNEL. IF NOT MANNED, GATES MUST BE SECURELY LOCKED. ALL GATES MANNED BY AIRPORT PERSONNEL SHALL REQUIRE THE CONTRACTOR'S PERSONNEL TO COORDINATE ACCESS WITH AIRPORT SECURITY, PROVIDE IDENTIFICATION, AND OBEY ALL INSTRUCTIONS ISSUED. ALL VEHICLES OPERATING ON THE AIRPORT, INCLUDING THE VEHICLE OPERATOR, SHALL BE SUBJECT TO SEARCH AT ANY TIME.

6. THE ACCESS ROUTES ILLUSTRATED ON THE PLAN ARE TO BE USED FOR ACCESS TO THE WORK AREAS. ALL ACCESS ROADS TO STAGING AREAS AND/OR WORK AREAS ARE TO BE MAINTAINED BY THE CONTRACTOR. UPON COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL MAKE ALL NECESSARY REPAIRS TO THE HAUL ROADS AND CONSTRUCTION STAGING AREA(S) AS ORDERED BY THE ENGINEER. ALL DISTURBED AREAS, INCLUDING THE CONTRACTOR'S STAGING AREA(S) SHALL BE RESTORED TO A SMOOTH LINE AND GRADE WITH POSITIVE DRAINAGE. ALL STONE AND PAVEMENT PLACED AT THE STAGING AREA(S) SHALL BE REMOVED UNLESS SO REQUESTED TO BE LEFT IN PLACE BY THE OWNER. THE CONTRACTOR SHALL SEED AND MULCH ALL DISTURBED AREA(S). THERE WILL BE NO MEASUREMENT OR PAYMENT FOR SEEDING AND MULCHING REQUIRED OUTSIDE THE GRADING LIMITS, APPROVED STOCKPILE LIMITS, OR APPROVED HAUL ROADS AND STAGING AREA(S). PAVEMENT REPAIRS TO THE HAUL ROUTES SHALL BE CONSIDERED INCLUSIVE TO ITEM M-120-1, MAINTENANCE AND PROTECTION OF TRAFFIC. ALL OTHER REPARATIONS SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT.

7. ANY FINES ASSESSED TO THE AIRPORT DUE TO VIOLATIONS BY THE CONTRACTOR OF FAA SECURITY REQUIREMENTS SHALL BE PAID BY THE CONTRACTOR.

8. ANY FINES ASSESSED TO THE AIRPORT DUE TO VIOLATIONS BY THE CONTRACTOR OF NYSDEC STORMWATER RUNOFF REQUIREMENTS SHALL BE PAID BY THE CONTRACTOR.

GENERAL PHASING NOTES:

1. WORK SHALL BE COMPLETED WITHIN THE CONTRACT TIME ALLOWED IN THE SPECIFICATIONS AND AS DESCRIBED IN THE CONSTRUCTION PHASING DRAWINGS CONTAINED WITHIN THIS DRAWING SET.

2. THE CONSTRUCTION PHASING PLANS INDICATE THE GENERAL SEQUENCE IN WHICH CONSTRUCTION IS TO OCCUR. THE START OF ONE PHASE IS CONTINGENT UPON COMPLETION OF WORK IN THE PRECEDING PHASE, EXCEPT AS NOTED ON THE CONSTRUCTION PHASING DRAWINGS. TRAFFIC ROUTES SHALL BE MAINTAINED AS SHOWN.

3. ANY HAUL ROUTE REQUIRING CROSSING OF AN ACTIVE AIRCRAFT SURFACE WILL RESULT IN DELAYS, PARTICULARLY DURING PEAK MORNING AND AFTERNOON ARRIVAL AND DEPARTURE PERIODS. THE CONTRACTOR SHALL ADJUST CONSTRUCTION OPERATIONS AS NEEDED AT NO COST TO THE AIRPORT.

4. THE PHASING PLANS MAY NOT BE MODIFIED WITHOUT EXPRESS WRITTEN APPROVAL FROM THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SEQUENCING THE CONSTRUCTION AS NECESSARY TO SUCCESSFULLY ACCOMPLISH THE CONSTRUCTION WITHIN THE CONTRACT TIME WHILE MAINTAINING SAFE OPERATIONS OF THE AIRPORT, AND PROTECTING THE SAFETY OF THE PUBLIC AND WORKERS.

5. ALL CALLOUTS ON THE PHASING PLANS SHALL BE CONSIDERED INCIDENTAL ITEMS TO ITEM M-120-1 MAINTENANCE AND PROTECTION OF TRAFFIC AND NO SEPARATE PAYMENT SHALL BE PAID TO THE CONTRACTOR FOR THESE ITEMS UNLESS OTHERWISE NOTED.

6. OTHER CONSTRUCTION PROJECTS ON OR NEAR THE AIRPORT MAY BE IN PROGRESS, BY OTHERS, CONCURRENT WITH THIS PROJECT. THE CONTRACTOR SHALL COOPERATE AS NECESSARY AND NOT INTERFERE OR HINDER THE PROGRESS OF WORK BEING PERFORMED BY OTHER CONTRACTORS.

7. ALL CONSTRUCTION ACTIVITY WITHIN THE SAFETY AREA OF A RUNWAY (RSA) OR TAXIWAY (TSA) SHALL REQUIRE THE CLOSURE OF THE RUNWAY OR TAXIWAY OR A DESIGNATED PORTION THEREOF. AT NO TIME SHALL THE CONTRACTOR'S PERSONNEL ENTER THE RUNWAY OR TAXIWAY SAFETY AREA UNLESS THE RUNWAY/TAXIWAY IS CLOSED TO AIRCRAFT AND APPROVAL IS RECEIVED FROM THE AIRPORT. NO CLOSURES WILL BE ALLOWED WITHOUT WRITTEN APPROVAL FROM THE AIRPORT. CLOSURES MAY BE REVOKED AT ANY TIME. WORK WITHIN CLOSED RUNWAY AND TAXIWAY AREAS WILL HAVE RESTRICTED HOURS AS DESCRIBED IN THE CONSTRUCTION PHASING PLANS.

8. CONSTRUCTION ACTIVITY WITHIN THE RUNWAY OR TAXIWAY OBSTACLE FREE AREAS (OFA) IS PERMISSIBLE WHEN THE TAXIWAY AND/OR RUNWAY IS OPEN, IF THE ACTIVITY IS SCHEDULED 72 HOURS IN ADVANCE AND IF THE TRENCHES AND EQUIPMENT ARE PROPERLY MARKED AND LIGHTED. ALL CONSTRUCTION ACTIVITY MAY BE SUSPENDED OR RESTRICTED DURING PERIODS OF LOW VISIBILITY.

9. AT LEAST 72 HOURS IN ADVANCE OF THE WORK, THE CONTRACTOR SHALL PROVIDE A WRITTEN REQUEST FOR THE CLOSURE OF A TAXIWAY, RUNWAY, OR APRON AS REQUIRED TO CONFORM TO THE CONSTRUCTION PHASING DRAWINGS. THIS REQUEST SHALL INCLUDE THE TIMES REQUESTED AND THE CONTRACTOR'S PROPOSED DETAILED SCHEDULE OF OPERATIONS WITHIN THE AREA.

10. CONTRACTOR SHALL BE AWARE THAT PERMISSION TO CLOSE A RUNWAY, TAXIWAY, OR APRON MAY NOT BE IMMEDIATELY GRANTED DUE TO AIRPORT OPERATIONAL REQUIREMENTS.

11. NO STOCKPILED MATERIAL SHALL BE ALLOWED WITHIN RUNWAY OR TAXIWAY OBJECT FREE AREAS (OFA). NO STOCKPILED MATERIAL SHALL BE ALLOWED TO PENETRATE THE RUNWAY PRIMARY SURFACE. CARE MUST BE TAKEN TO AVOID STOCKPILING MATERIAL AND PARKING EQUIPMENT AT LOCATIONS THAT MAY INTERFERE WITH NAVIGATIONAL AIDS.

12. THE CONTRACTOR SHALL PROVIDE SAFETY FLAGGING AND CLOSURE BARRIERS TO IDENTIFY THE SAFETY AREAS, CLOSED AREAS, AND WORK AREAS AS SHOWN ON THE PHASING PLANS. PLACEMENT AND REMOVAL OF BARRICADES SHALL BE COMPLETED WHEN THE RUNWAY OR TAXIWAY IS CLOSED AND CONFIRMATION IS OBTAINED FROM THE ENGINEER.

13. CONSTRUCTION SHALL BE COMPLETED IN SUCH A MANNER THAT AT THE END OF A RUNWAY OR TAXIWAY CLOSURE PERIOD ALL WORK ITEMS ARE COMPLETE, THE SAFETY AREAS ARE IN A CONDITION SUITABLE FOR AIRCRAFT OPERATIONS, SUBJECT TO APPROVAL OF THE ENGINEER, AND LIGHTING SYSTEMS ARE OPERATIONAL. NO OPEN TRENCHES, STOCKPILES, LIPS OR DIPS GREATER THAN 3 INCHES WILL BE ALLOWED IN THE SAFETY AREA OF ANY OPEN RUNWAY OR TAXIWAY.

14. IN ADDITION TO THE TYPICAL BARRICADES REQUIRED FOR A TAXIWAY CLOSURE, SUPPLEMENTAL BARRICADES MAY BE NEEDED AS DETERMINED BY THE ENGINEER OR THE AIRPORT.

15. NO WORK SHALL BE DONE IN THE VICINITY OF ANY ELECTRICAL CABLES, COMMUNICATION CABLES, DUCT BANKS PRIOR TO THE CABLES BEING LOCATED BY THE CONTRACTOR. TEST HOLES FOR ALL ELECTRICAL, COMMUNICATION, AND FAA CABLES SHALL BE DUG BY HAND TO VERIFY LOCATION AND DEPTH PRIOR TO EXCAVATION. THE CONTRACTOR SHALL OBTAIN FAA APPROVAL FOR ALL WORK NEAR KNOWN FAA CABLES PRIOR TO EXCAVATION.

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANDE · 084000 · LICENSED PROFESSIONAL ENGINEER

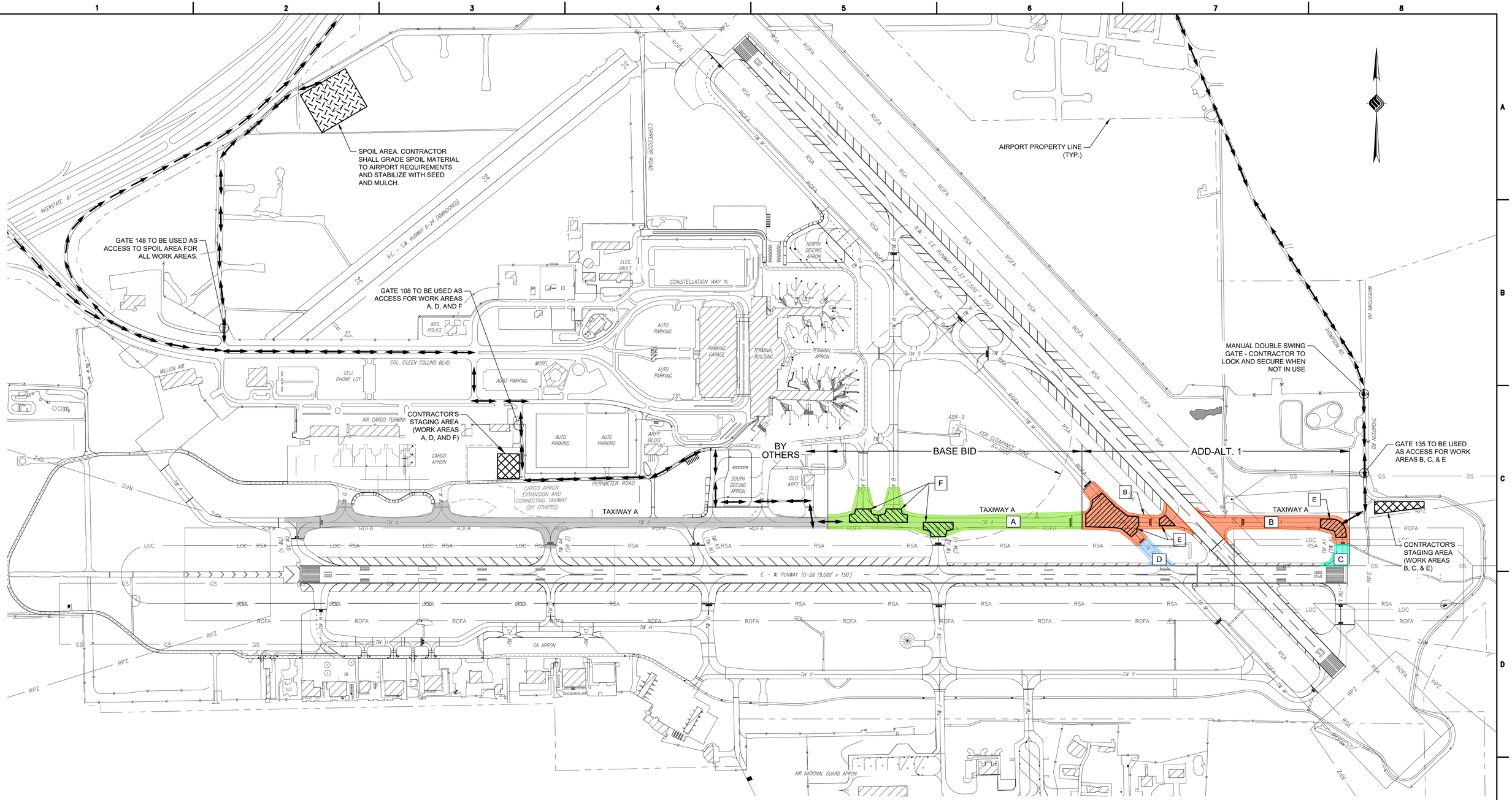
REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

GENERAL NOTES

SCALE: NTS	DESIGN: JPM	**GN-02**
DRAWN: SDB	PROJECT: 18831.08	
CHECKED: SJL	DATE: APRIL 2024	7 OF 81



LEGEND

WORK AREA A		CONTRACTOR STAGING AREA	
WORK AREA B		PROPOSED TAXIWAY DESIGNATION (EXISTING DESIGNATION)	TW A5 (TW V)
WORK AREA C		CONTRACTOR'S HAUL ROUTE	
WORK AREA D		FLAGGER LOCATION	
WORK AREA E			
WORK AREA F			

GENERAL PHASING NOTES:

1. SEE SHEETS CS-01 THROUGH CS-07 FOR INDIVIDUAL WORK AREA REQUIREMENTS.
2. SEE SHEETS CD-01 THROUGH CD-03 FOR PHASING DETAILS.
3. SEE SHEETS CN-01 AND CN-02 FOR DETAILED PHASING NOTES.
4. CONSTRUCTION VEHICLES MUST USE THE DESIGNATED HAUL ROUTE AT ALL TIMES DURING THE COURSE OF CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE SHUTDOWN OF ANY FAA-OWNED FACILITIES WITH LOCAL FAA SSC.
6. WORK AREAS E AND F CONSIST OF PAVEMENT GROOVING. SEE SHEETS CS-06 AND CS-07.

0 400 800 1200 FT.

SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084009 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

CONSTRUCTION SAFETY & PHASING PLAN - OVERALL

SCALE: AS SHOWN	DESIGN: JPM
DRAWN: SDB	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

CS-00

LEGEND

- WORK AREA THIS PHASE
- CONTRACTOR STAGING AREA
- CLOSED AIRCRAFT MOVEMENT AREAS
- OPEN AIRCRAFT MOVEMENT AREAS
- NON-MOVEMENT AREAS
- LOW PROFILE BARRICADES WITH WORK AREA DESIGNATION
- 30" CONSTRUCTION/TRAFFIC CONES, WHITE AND ORANGE REFLECTORIZED
- LIGHTED RUNWAY CLOSURE MARKER
- FLAGGER LOCATION
- CONTRACTOR'S HAUL/ACCESS ROUTE

WORK ITEMS/SEQUENCE OF CONSTRUCTION - THIS WORK AREA:

SEQUENCE	WORK ITEM
1.	ISSUE NOTAMS FOR TAXIWAY CLOSURES (SYRACUSE AIRPORT RESPONSIBILITY).
2.	PLACE LOW PROFILE CONSTRUCTION BARRICADES.
3.	COVER TAXIWAY EDGE LIGHTS WITH TEMPORARY COVERS WITHIN WORK AREA.
4.	MILL EXISTING TAXIWAY PAVEMENT AND COMPLETE PAVEMENT REPAIRS.
5.	EXCAVATE AND CONSTRUCT NEW FULL DEPTH PAVEMENT SECTION IN TAXIWAY FILLET AREAS.
6.	PAVE NEW P-401 BITUMINOUS SURFACE COURSE AND SAW AND SEAL PAVEMENT JOINTS.
7.	INSTALL NEW PAVEMENT MARKINGS.
8.	INSTALL NEW AIRFIELD LIGHTING INFRASTRUCTURE (CABLE, CONDUIT, COUNTERPOISE, LIGHT BASES, ETC.), LIGHT FIXTURES, AND SIGNS.
9.	INSTALL NEW WIRE AND CONDUIT FOR RUNWAY GUARD LIGHT CIRCUIT.
10.	REMOVE TEMPORARY EDGE LIGHT COVERS AND RESTORE AIRFIELD LIGHTING CIRCUITS.
11.	CLEAN TAXIWAY PAVEMENT AND AIRPORT/ENGINEER APPROVAL TO OPEN WORK AREA.
12.	REMOVE LOW PROFILE BARRICADES.
13.	REOPEN CLOSED AREAS.

SIGN "S-2" SEE DETAIL, SHEET CD-01

SPOIL AREA. CONTRACTOR SHALL GRADE SPOIL MATERIAL TO AIRPORT REQUIREMENTS AND STABILIZE WITH SEED AND MULCH.

AIRPORT PROPERTY LINE (TYP.)

CONTRACTOR ACCESS TO SPOIL AREA THROUGH GATE 148. GATE GUARD TO BE PROVIDED BY CONTRACTOR AND REQUIRED FOR ALL MATERIAL DELIVERIES. GATE SHALL BE LOCKED AND SECURED WHEN NOT IN USE.

CONTRACTOR ACCESS THROUGH GATE 108. SRAA SUPPLIED GATE GUARD STATIONED AT GATE. BADGE VERIFICATION AND VEHICLE INSPECTION REQUIRED

CONTRACTOR TO STATION FLAGGER AT APRON AND TW F INTERSECTION DURING WORK AREA A

SIGN "S-2" SEE DETAIL, SHEET CD-01

CONTRACTOR SHALL CONTINUOUSLY MONITOR AND CLEAN HAUL ROUTE.

REFER TO DWG. CD-02 FOR DETAILED BARRICADE LAYOUT IN THIS AREA

SIGN "S-3" SEE DETAIL, SHEET CD-01

COVER EDGE LIGHTS WITH PVC EDGE LIGHT COVERS

INSTALL TEMPORARY JUMPER FOR CIRCUIT T-4

INSTALL TEMPORARY JUMPER FOR CIRCUIT T-6

INSTALL TEMPORARY JUMPER FOR CIRCUIT T-1

N.E. - S.W. RUNWAY 6-24 (ABANDONED)

N.W. - S.E. RUNWAY 15-33 (7,500' x 150')

E. - W. RUNWAY 10-28 (9,000' x 150')

CONSTELLATION WAY N.

COL. EILEEN COLLINS BLVD.

CARGO ROAD

PERIMETER ROAD

MEADOWDALE RD.

THOMPSON RD.

HIGHGROVE RD.

MILLION AIR

NYS POLICE

CELL PHONE LOT

MOTEL

AUTO PARKING

PARKING GARAGE

TERMINAL BUILDING

TERMINAL APRON

NORTH DEICING APRON

AIR CARGO TERMINAL

CARGO APRON

CARGO APRON EXPANSION AND CONNECTING TAXIWAY (BY OTHERS)

SOUTH DEICING APRON

OLD ARFF

ELEC. VAULT

ASR-9

ASR CLEARANCE ZONE R=10000'

GA APRON

AIR NATIONAL GUARD APRON

WORK ITEMS THIS PHASE:

- MILL, REPAIR, AND PAVE TAXIWAY A INCLUDING STUB TAXIWAYS
- MODIFY TAXIWAY GEOMETRIES
- INSTALL NEW AIRFIELD LIGHTING AND SIGNAGE
- INSTALL PAVEMENT MARKINGS

FACILITIES DISABLED THIS PHASE:

- N/A

GENERAL PHASING NOTES:

1. SEE SHEETS CS-01 THROUGH CS-07 FOR INDIVIDUAL WORK AREA REQUIREMENTS.
2. SEE SHEETS CD-01 THROUGH CD-03 FOR PHASING DETAILS.
3. SEE SHEETS CN-01 AND CN-02 FOR DETAILED PHASING NOTES.
4. CONSTRUCTION VEHICLES MUST USE THE DESIGNATED HAUL ROUTE AT ALL TIMES DURING THE COURSE OF CONSTRUCTION.

0 400 800 1200 FT.

SCALE

CONSTRUCTION BID SET

WORK AREA REQUIREMENTS:

WORK AREA	CALENDAR TIME	REQUIREMENTS TO BEGIN	WORK HOUR RESTRICTIONS/ REQUIREMENTS	AIRFIELD CLOSURE AREAS	CLOSURE HOURS	LIQUIDATED DAMAGES	AIRPORT OPERATIONAL RESTRICTIONS
A	35 CALENDAR DAYS	NOTICE TO PROCEED	WORK NOT PERMITTED DURING DEICING OPERATIONS, APPROX. NOVEMBER - APRIL	PORTIONS OF TW A, E, AND B, TW U, PORTION OF SOUTH DEICING APRON	24 HOURS PER DAY	$5,000/CALENDAR DAY OR PORTION THEREOF	CHANGED TAXI PATTERNS

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON

49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

CONSTRUCTION SAFETY & PHASING PLAN - WORK AREA A - BASE BID

SCALE: AS SHOWN	DESIGN: JPM
DRAWN: SDB	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

CS-01
9 OF 81

K:\SYRACUSE\T-18831.08 TW A EAST DESIGN\DRAWINGS\SHEET FILES\18831.08-CSPP-BASE-01-A.DWG

LEGEND

- WORK AREA THIS PHASE
- CONTRACTOR STAGING AREA
- CLOSED AIRCRAFT MOVEMENT AREAS
- OPEN AIRCRAFT MOVEMENT AREAS
- NON-MOVEMENT AREAS
- LOW PROFILE BARRICADES WITH WORK AREA DESIGNATION
- 30" CONSTRUCTION/TRAFFIC CONES, WHITE AND ORANGE REFLECTORIZED
- LIGHTED RUNWAY CLOSURE MARKER
- FLAGGER LOCATION
- CONTRACTOR'S HAUL/ACCESS ROUTE

WORK ITEMS/SEQUENCE OF CONSTRUCTION - THIS WORK AREA:

SEQUENCE	WORK ITEM
1.	ISSUE NOTAMS FOR AREA CLOSURES (SYRACUSE AIRPORT RESPONSIBILITY).
2.	PLACE LIGHTED RUNWAY CLOSURE MARKERS.
3.	PLACE LOW PROFILE CONSTRUCTION BARRICADES.
4.	COVER TAXIWAY EDGE LIGHTS WITH TEMPORARY COVERS WITHIN WORK AREA.
5.	EXCAVATE AND CONSTRUCT FULL DEPTH PAVEMENT SECTION IN TAXIWAY FILLET AREAS
6.	MILL EXISTING TAXIWAY PAVEMENT AND COMPLETE PAVEMENT REPAIRS.
7.	PAVE NEW P-401 BITUMINOUS SURFACE COURSE AND SAW AND SEAL PAVEMENT JOINTS.
8.	INSTALL NEW PAVEMENT MARKINGS.
9.	INSTALL NEW AIRFIELD LIGHTING INFRASTRUCTURE (CABLE, CONDUIT, COUNTERPOISE, LIGHT BASES, ETC.), LIGHT FIXTURES, AND SIGNS.
10.	INSTALL NEW WIRE AND CONDUIT FOR RUNWAY GUARD LIGHT AND PAVEMENT SENSOR CIRCUITS.
11.	REMOVE TEMPORARY EDGE LIGHT COVERS AND RESTORE AIRFIELD LIGHTING CIRCUITS.
12.	CLEAN TAXIWAY PAVEMENT AND AIRPORT/ENGINEER APPROVAL TO OPEN WORK AREA.
13.	REMOVE LOW PROFILE BARRICADES AND LIGHTED RUNWAY CLOSURE MARKERS.
14.	REOPEN CLOSED AREAS.

SIGN "S-2" SEE DETAIL, SHEET CD-01

SPOIL AREA. CONTRACTOR SHALL GRADE SPOIL MATERIAL TO AIRPORT REQUIREMENTS AND STABILIZE WITH SEED AND MULCH.

CONTRACTOR ACCESS TO SPOIL AREA THROUGH GATE 148. GATE GUARD TO BE PROVIDED BY CONTRACTOR AND REQUIRED FOR ALL MATERIAL DELIVERIES. GATE SHALL BE LOCKED AND SECURED WHEN NOT IN USE.

CONTRACTOR SHALL CONTINUOUSLY MONITOR AND CLEAN HAUL ROUTE.

AIRPORT PROPERTY LINE (TYP.)

INSTALL TEMPORARY JUMPER FOR CIRCUIT T-7

INSTALL TEMPORARY JUMPER FOR CIRCUIT T-1

MANUAL DOUBLE SWING GATE - CONTRACTOR TO LOCK AND SECURE WHEN NOT IN USE

CONTRACTOR ACCESS THROUGH GATE 135. GATE GUARD TO BE PROVIDED BY CONTRACTOR AND REQUIRED FOR ALL MATERIAL DELIVERIES. GATE SHALL BE LOCKED AND SECURED WHEN NOT IN USE.

TEMPORARY CONSTRUCTION ENTRANCE (SEE DETAIL DWG. GD-02)

SIGN "S-2" (SEE DETAIL, SHEET CD-01)

SIGNS "S-1", "S-2" (SEE DETAIL, SHEET CD-01)

CONSTRUCT TEMPORARY ACCESS ROAD (SEE DETAIL DWG. CD-01)

PROVIDE AND MAINTAIN SPACE FOR PASSAGE OF AIRCRAFT

WORK ITEMS THIS PHASE:

- MILL, REPAIR, AND PAVE TAXIWAY A INCLUDING STUB TAXIWAYS
- MODIFY TAXIWAY GEOMETRIES
- INSTALL NEW AIRFIELD LIGHTING AND SIGNAGE
- INSTALL PAVEMENT MARKINGS

FACILITIES DISABLED THIS PHASE:

- RUNWAY 15 VASI (FAA OWNED)
- RUNWAY 15 MALS (FAA OWNED)
- RUNWAY 33 VASI (FAA OWNED)
- RUNWAY 28 GLIDE SLOPE (FAA OWNED)
- RUNWAY 15-33 EDGE LIGHT CIRCUIT
- RUNWAY 15-33 CENTERLINE LIGHT CIRCUIT
- TAXIWAY CIRCUIT #2
- TAXIWAY CIRCUIT #8

GENERAL PHASING NOTES:

1. SEE SHEETS CS-01 THROUGH CS-07 FOR INDIVIDUAL WORK AREA REQUIREMENTS.
2. SEE SHEETS CD-01 THROUGH CD-03 FOR PHASING DETAILS.
3. SEE SHEETS CN-01 AND CN-02 FOR DETAILED PHASING NOTES.
4. CONSTRUCTION VEHICLES MUST USE THE DESIGNATED HAUL ROUTE AT ALL TIMES DURING THE COURSE OF CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE SHUTDOWN OF ANY FAA-OWNED FACILITIES WITH LOCAL FAA SSC.

0 400 800 1200 FT.

SCALE

CONSTRUCTION BID SET

WORK AREA REQUIREMENTS:

WORK AREA	CALENDAR TIME	REQUIREMENTS TO BEGIN	WORK HOUR RESTRICTIONS/ REQUIREMENTS	AIRFIELD CLOSURE AREAS	CLOSURE HOURS	LIQUIDATED DAMAGES	AIRPORT OPERATIONAL RESTRICTIONS
B1	21 CALENDAR DAYS	COMPLETE WORK AREA A	NONE	RUNWAY 15-33, TW K, PORTION OF TW A, B, M, AND S	24 HOURS PER DAY	$5,000/HOUR OR PORTION THEREOF	RUNWAY 15-33 CLOSED, CHANGED TAXI PATTERNS

STATE OF NEW YORK · STEVEN J. LANDE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

CONSTRUCTION SAFETY & PHASING PLAN - WORK AREA B1 - ADD-ALT. 1

SCALE: AS SHOWN	DESIGN: JPM	CS-02	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	10 OF 81	

LEGEND

- WORK AREA THIS PHASE
- CONTRACTOR STAGING AREA
- CLOSED AIRCRAFT MOVEMENT AREAS
- OPEN AIRCRAFT MOVEMENT AREAS
- NON-MOVEMENT AREAS
- LOW PROFILE BARRICADES WITH WORK AREA DESIGNATION
- 30" CONSTRUCTION/TRAFFIC CONES, WHITE AND ORANGE REFLECTORIZED
- LIGHTED RUNWAY CLOSURE MARKER
- FLAGGER LOCATION
- CONTRACTOR'S HAUL/ACCESS ROUTE

SIGN "S-2" SEE DETAIL, SHEET CD-01

SPOIL AREA. CONTRACTOR SHALL GRADE SPOIL MATERIAL TO AIRPORT REQUIREMENTS AND STABILIZE WITH SEED AND MULCH.

CONTRACTOR ACCESS TO SPOIL AREA THROUGH GATE 148. GATE GUARD TO BE PROVIDED BY CONTRACTOR AND REQUIRED FOR ALL MATERIAL DELIVERIES. GATE SHALL BE LOCKED AND SECURED WHEN NOT IN USE.

CONTRACTOR SHALL CONTINUOUSLY MONITOR AND CLEAN HAUL ROUTE.

AIRPORT PROPERTY LINE (TYP.)

MANUAL DOUBLE SWING GATE - CONTRACTOR TO LOCK AND SECURE WHEN NOT IN USE

CONTRACTOR ACCESS THROUGH GATE 135. GATE GUARD TO BE PROVIDED BY CONTRACTOR AND REQUIRED FOR ALL MATERIAL DELIVERIES. GATE SHALL BE LOCKED AND SECURED WHEN NOT IN USE.

TEMPORARY CONSTRUCTION ENTRANCE (SEE DETAIL DWG. GD-02)

SIGN "S-2" (SEE DETAIL, SHEET CD-01)

SIGNS "S-1", "S-2" (SEE DETAIL, SHEET CD-01)

CONSTRUCT TEMPORARY ACCESS ROAD (SEE DETAIL DWG. GD-01)

AIRPORT-SUPPLIED RUNWAY CLOSURE MARKERS ON RUNWAY 10-28

WORK ITEMS/SEQUENCE OF CONSTRUCTION - THIS WORK AREA:

SEQUENCE	WORK ITEM
1.	ISSUE NOTAMS FOR AREA CLOSURES (SYRACUSE AIRPORT RESPONSIBILITY).
2.	PLACE LIGHTED RUNWAY CLOSURE MARKERS.
3.	INSTALL NEW WIRE AND CONDUIT FOR RUNWAY GUARD LIGHT AND PAVEMENT SENSOR CIRCUITS.
4.	RESTORE AIRFIELD LIGHTING CIRCUITS.
5.	CLEAN RUNWAY AND TAXIWAY PAVEMENT, AND AIRPORT/ENGINEER APPROVAL TO OPEN WORK AREA.
6.	REMOVE LOW PROFILE BARRICADES AND LIGHTED RUNWAY CLOSURE MARKERS.
7.	REOPEN CLOSED AREAS.

WORK ITEMS THIS PHASE:

- INSTALL CONDUIT AND CONDUCTORS FOR RUNWAY GUARD LIGHT CIRCUIT AND PAVEMENT SENSOR

FACILITIES DISABLED THIS PHASE:

- RUNWAY 15 VASI (FAA OWNED)
- RUNWAY 15 MALS (FAA OWNED)
- RUNWAY 33 VASI (FAA OWNED)
- RUNWAY 15-33 EDGE LIGHT CIRCUIT
- RUNWAY 15-33 CENTERLINE LIGHT CIRCUIT
- TAXIWAY CIRCUIT #2
- TAXIWAY CIRCUIT #8
- RUNWAY 10 & 28 GLIDE SLOPE (FAA OWNED)
- RUNWAY 10 & 28 LOCALIZER (FAA OWNED)
- RUNWAY 10 MALSR (FAA OWNED)
- RUNWAY 28 ALSF-2 (FAA OWNED)
- RUNWAY 28 PAPI
- RUNWAY 10-28 EDGE LIGHT CIRCUIT
- RUNWAY 10-28 CENTERLINE LIGHT CIRCUIT
- RUNWAY 10 & 28 TDZ LIGHT CIRCUIT

GENERAL PHASING NOTES:

1. SEE SHEETS CS-01 THROUGH CS-07 FOR INDIVIDUAL WORK AREA REQUIREMENTS.
2. SEE SHEETS CD-01 THROUGH CD-03 FOR PHASING DETAILS.
3. SEE SHEETS CN-01 AND CN-02 FOR DETAILED PHASING NOTES.
4. CONSTRUCTION VEHICLES MUST USE THE DESIGNATED HAUL ROUTE AT ALL TIMES DURING THE COURSE OF CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE SHUTDOWN OF ANY FAA-OWNED FACILITIES WITH LOCAL FAA SSC.

0 400 800 1200 FT.

SCALE

CONSTRUCTION BID SET

WORK AREA REQUIREMENTS:

WORK AREA	CALENDAR TIME	REQUIREMENTS TO BEGIN	WORK HOUR RESTRICTIONS/ REQUIREMENTS	AIRFIELD CLOSURE AREAS	CLOSURE HOURS	LIQUIDATED DAMAGES	AIRPORT OPERATIONAL RESTRICTIONS
B2	1 CALENDAR NIGHT	COMPLETE WORK AREA A	00:00 - 04:30	RUNWAY 15-33, RUNWAY 10-28, AND ALL TAXIWAYS	00:00 - 04:30	$10,000/HOUR OR PORTION THEREOF	ALL RUNWAYS AND TAXIWAYS CLOSED

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

CONSTRUCTION SAFETY & PHASING PLAN - WORK AREA B2 - ADD-ALT. 1

SCALE: AS SHOWN	DESIGN: JPM	**CS-03**	
DRAWN: SDB	PROJECT: 18831.08	11 OF 81	
CHECKED: SJL	DATE: APRIL 2024		

K:\SYRACUSE\T-18831.08 TW A EAST DESIGN\DRAWINGS\DRAWINGS\SHEET FILES\18831.08-CSPP-BASE-05-B2.DWG

LEGEND

- WORK AREA THIS PHASE
- CONTRACTOR STAGING AREA
- CLOSED AIRCRAFT MOVEMENT AREAS
- OPEN AIRCRAFT MOVEMENT AREAS
- NON-MOVEMENT AREAS
- LOW PROFILE BARRICADES WITH WORK AREA DESIGNATION
- 30" CONSTRUCTION/TRAFFIC CONES, WHITE AND ORANGE REFLECTORIZED
- LIGHTED RUNWAY CLOSURE MARKER
- FLAGGER LOCATION
- CONTRACTOR'S HAUL/ACCESS ROUTE

SIGN "S-2" SEE DETAIL, SHEET CD-01

SPOIL AREA. CONTRACTOR SHALL GRADE SPOIL MATERIAL TO AIRPORT REQUIREMENTS AND STABILIZE WITH SEED AND MULCH.

CONTRACTOR ACCESS TO SPOIL AREA THROUGH GATE 148. GATE GUARD TO BE PROVIDED BY CONTRACTOR AND REQUIRED FOR ALL MATERIAL DELIVERIES. GATE SHALL BE LOCKED AND SECURED WHEN NOT IN USE.

CONTRACTOR SHALL CONTINUOUSLY MONITOR AND CLEAN HAUL ROUTE.

AIRPORT PROPERTY LINE (TYP.)

MANUAL DOUBLE SWING GATE - CONTRACTOR TO LOCK AND SECURE WHEN NOT IN USE

CONTRACTOR ACCESS THROUGH GATE 135. GATE GUARD TO BE PROVIDED BY CONTRACTOR AND REQUIRED FOR ALL MATERIAL DELIVERIES. GATE SHALL BE LOCKED AND SECURED WHEN NOT IN USE.

ISOLATE AND DISABLE PORTION OF CIRCUIT T-2

TEMPORARY CONSTRUCTION ENTRANCE (SEE DETAIL DWG. GD-02)

SIGN "S-2" (SEE DETAIL, SHEET CD-01)

SIGNS "S-1", "S-2" (SEE DETAIL, SHEET CD-01)

CONSTRUCT TEMPORARY ACCESS ROAD (SEE DETAIL DWG. CD-01)

WORK ITEMS/SEQUENCE OF CONSTRUCTION - THIS WORK AREA:

SEQUENCE	WORK ITEM
1.	ISSUE NOTAMS FOR AREA CLOSURES (SYRACUSE AIRPORT RESPONSIBILITY).
2.	PLACE LIGHTED RUNWAY CLOSURE MARKERS.
3.	PLACE LOW PROFILE CONSTRUCTION BARRICADES.
4.	COVER TAXIWAY EDGE LIGHTS WITH TEMPORARY COVERS WITHIN WORK AREA.
5.	MILL EXISTING TAXIWAY PAVEMENT AND COMPLETE PAVEMENT REPAIRS.
6.	EXCAVATE AND CONSTRUCT NEW FULL DEPTH PAVEMENT SECTION IN TAXIWAY FILLET AREAS
7.	PAVE NEW P-401 BITUMINOUS SURFACE COURSE AND SAW AND SEAL PAVEMENT JOINTS.
8.	INSTALL NEW PAVEMENT MARKINGS.
9.	INSTALL NEW AIRFIELD LIGHTING INFRASTRUCTURE (CABLE, CONDUIT, COUNTERPOISE, LIGHT BASES, ETC.), LIGHT FIXTURES, AND SIGNS.
10.	REMOVE TEMPORARY EDGE LIGHT COVERS AND RESTORE AIRFIELD LIGHTING CIRCUITS.
11.	CLEAN TAXIWAY PAVEMENT AND AIRPORT/ENGINEER APPROVAL TO OPEN WORK AREA.
12.	REMOVE LOW PROFILE BARRICADES AND LIGHTED RUNWAY CLOSURE MARKERS.
13.	REOPEN CLOSED AREAS.

WORK ITEMS THIS PHASE:

- MILL, REPAIR, AND PAVE TAXIWAY A INCLUDING STUB TAXIWAYS
- MODIFY TAXIWAY GEOMETRIES
- INSTALL NEW AIRFIELD LIGHTING AND SIGNAGE
- INSTALL PAVEMENT MARKINGS

FACILITIES DISABLED THIS PHASE:

- RUNWAY 10 & 28 GLIDE SLOPE ANTENNA (FAA OWNED)
- RUNWAY 10 & 28 LOCALIZER ANTENNAS (FAA OWNED)
- RUNWAY 10 MALSR (FAA OWNED)
- RUNWAY 28 ALSF-2 (FAA OWNED
- RUNWAY 10 VASI (FAA OWNED)
- RUNWAY 28 PAPI (FAA OWNED)
- RUNWAY 10-28 EDGE LIGHT CIRCUIT
- RUNWAY 10-28 CENTERLINE LIGHT CIRCUIT
- RUNWAY 10 & RUNWAY 28 TOUCHDOWN ZONE LIGHT CIRCUIT

GENERAL PHASING NOTES:

1. SEE SHEETS CS-01 THROUGH CS-07 FOR INDIVIDUAL WORK AREA REQUIREMENTS.
2. SEE SHEETS CD-01 THROUGH CD-03 FOR PHASING DETAILS.
3. SEE SHEETS CN-01 AND CN-02 FOR DETAILED PHASING NOTES.
4. CONSTRUCTION VEHICLES MUST USE THE DESIGNATED HAUL ROUTE AT ALL TIMES DURING THE COURSE OF CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE SHUTDOWN OF ANY FAA-OWNED FACILITIES WITH LOCAL FAA SSC.

0 400 800 1200 FT.

SCALE

CONSTRUCTION BID SET

WORK AREA REQUIREMENTS:

WORK AREA	CALENDAR TIME	REQUIREMENTS TO BEGIN	WORK HOUR RESTRICTIONS/ REQUIREMENTS	AIRFIELD CLOSURE AREAS	CLOSURE HOURS	LIQUIDATED DAMAGES	AIRPORT OPERATIONAL RESTRICTIONS
C	5 CALENDAR DAYS	COMPLETE WORK AREA B	NONE	RUNWAY 10-28, TW V, Z, W, G, L, PORTIONS OF TW H, N, AND A	24 HOURS PER DAY	$10,000/HOUR OR PORTION THEREOF	RUNWAY 10-28 CLOSED, CHANGED TAXI PATTERNS

STATE OF NEW YORK · STEVEN J. LANDE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

CONSTRUCTION SAFETY & PHASING PLAN - WORK AREA C - ADD-ALT. 1

SCALE: AS SHOWN	DESIGN: JPM	**CS-04**	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	12 OF 81	

LEGEND

- WORK AREA THIS PHASE
- CONTRACTOR STAGING AREA
- CLOSED AIRCRAFT MOVEMENT AREAS
- OPEN AIRCRAFT MOVEMENT AREAS
- NON-MOVEMENT AREAS
- LOW PROFILE BARRICADES WITH WORK AREA DESIGNATION
- 30" CONSTRUCTION/TRAFFIC CONES, WHITE AND ORANGE REFLECTORIZED
- LIGHTED RUNWAY CLOSURE MARKER
- FLAGGER LOCATION
- CONTRACTOR'S HAUL/ACCESS ROUTE

WORK ITEMS/SEQUENCE OF CONSTRUCTION - THIS WORK AREA:

SEQUENCE	WORK ITEM
1.	ISSUE NOTAMS FOR AREA CLOSURES (SYRACUSE AIRPORT RESPONSIBILITY).
2.	PLACE LIGHTED RUNWAY CLOSURE MARKERS.
3.	PLACE LOW PROFILE CONSTRUCTION BARRICADES.
4.	COVER TAXIWAY EDGE LIGHTS WITH TEMPORARY COVERS WITHIN WORK AREA.
5.	MILL EXISTING TAXIWAY PAVEMENT AND COMPLETE PAVEMENT REPAIRS.
6.	PAVE NEW P-401 BITUMINOUS SURFACE COURSE AND SAW AND SEAL PAVEMENT JOINTS.
7.	INSTALL NEW PAVEMENT MARKINGS.
8.	INSTALL NEW AIRFIELD LIGHTING INFRASTRUCTURE (CABLE, CONDUIT, COUNTERPOISE, LIGHT BASES, ETC.), LIGHT FIXTURES, AND SIGNS.
9.	REMOVE TEMPORARY EDGE LIGHT COVERS AND RESTORE AIRFIELD LIGHTING CIRCUITS.
10.	CLEAN TAXIWAY PAVEMENT AND AIRPORT/ENGINEER APPROVAL TO OPEN WORK AREA.
11.	REMOVE LOW PROFILE BARRICADES AND LIGHTED RUNWAY CLOSURE MARKERS.
12.	REOPEN CLOSED AREAS.

SIGN "S-2" SEE DETAIL, SHEET CD-01

SPOIL AREA. CONTRACTOR SHALL GRADE SPOIL MATERIAL TO AIRPORT REQUIREMENTS AND STABILIZE WITH SEED AND MULCH.

AIRPORT PROPERTY LINE (TYP.)

CONTRACTOR ACCESS TO SPOIL AREA THROUGH GATE 148. GATE GUARD TO BE PROVIDED BY CONTRACTOR AND REQUIRED FOR ALL MATERIAL DELIVERIES. GATE SHALL BE LOCKED AND SECURED WHEN NOT IN USE.

CONTRACTOR ACCESS THROUGH GATE 108. SRAA SUPPLIED GATE GUARD STATIONED AT GATE. BADGE VERIFICATION AND VEHICLE INSPECTION REQUIRED

CONTRACTOR SHALL CONTINUOUSLY MONITOR AND CLEAN HAUL ROUTE.

SIGN "S-2" SEE DETAIL, SHEET CD-01

SIGN "S-3" SEE DETAIL, SHEET CD-01

ISOLATE AND TURN OFF PORTION OF CIRCUIT T-8

N.E. - S.W. RUNWAY 6-24 (ABANDONED)

N.W. - S.E. RUNWAY 15-33 (7,500' x 150')

E. - W. RUNWAY 10-28 (9,000' x 150')

CORREGIDOR ROAD

CONSTELLATION WAY N.

COL. EILEEN COLLINS BLVD.

MILLION AIR

CELL PHONE LOT

NYS POLICE

MOTEL

AUTO PARKING

PARKING GARAGE

TERMINAL BUILDING

TERMINAL APRON

NORTH DEICING APRON

SOUTH DEICING APRON

ELEC. VAULT

AIR CARGO TERMINAL

CARGO APRON

ARFF BLDG.

OLD ARFF

PERIMETER ROAD

CARGO APRON EXPANSION AND CONNECTING TAXIWAY (BY OTHERS)

GA APRON

AIR NATIONAL GUARD APRON

ASR-9

ASR CLEARANCE ZONE R=10000

MEMORIAL RD.

THOMPSON RD.

HIGINSON RD.

FACILITIES DISABLED THIS PHASE:

- RUNWAY 10 & 28 GLIDE SLOPE ANTENNA (FAA OWNED)
- RUNWAY 10 & 28 LOCALIZER ANTENNAS (FAA OWNED)
- RUNWAY 10 MALSR (FAA OWNED)
- RUNWAY 28 ALSF-2 (FAA OWNED
- RUNWAY 10 VASI (FAA OWNED)
- RUNWAY 28 PAPI (FAA OWNED)
- RUNWAY 10-28 EDGE LIGHT CIRCUIT
- RUNWAY 10-28 CENTERLINE LIGHT CIRCUIT
- RUNWAY 10 & RUNWAY 28 TOUCHDOWN ZONE LIGHT CIRCUIT

WORK ITEMS THIS PHASE:

- MILL, REPAIR, AND PAVE TAXIWAY M
- INSTALL NEW AIRFIELD LIGHTING AND SIGNAGE
- INSTALL PAVEMENT MARKINGS

GENERAL PHASING NOTES:

1. SEE SHEETS CS-01 THROUGH CS-07 FOR INDIVIDUAL WORK AREA REQUIREMENTS.
2. SEE SHEETS CD-01 THROUGH CD-03 FOR PHASING DETAILS.
3. SEE SHEETS CN-01 AND CN-02 FOR DETAILED PHASING NOTES.
4. CONSTRUCTION VEHICLES MUST USE THE DESIGNATED HAUL ROUTE AT ALL TIMES DURING THE COURSE OF CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE SHUTDOWN OF ANY FAA-OWNED FACILITIES WITH LOCAL FAA SSC.

SCALE: 0 400 800 1200 FT.

CONSTRUCTION BID SET

WORK AREA REQUIREMENTS:

WORK AREA	CALENDAR TIME	REQUIREMENTS TO BEGIN	WORK HOUR RESTRICTIONS/REQUIREMENTS	AIRFIELD CLOSURE AREAS	CLOSURE HOURS	LIQUIDATED DAMAGES	AIRPORT OPERATIONAL RESTRICTIONS
D	2 CALENDAR DAYS	COMPLETE WORK AREA C	WORK NOT PERMITTED DURING DEICING OPERATIONS, APPROX. NOVEMBER - APRIL	RUNWAY 10-28, TW Z, W, U, G, PORTIONS OF TW N, J, M, AND SOUTH DEICING APRON	24 HOURS PER DAY	$10,000/HOUR OR PORTION THEREOF	RUNWAY 10-28 CLOSED, CHANGED TAXI PATTERNS

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

CONSTRUCTION SAFETY & PHASING PLAN - WORK AREA D - ADD-ALT. 1

SCALE: AS SHOWN	DESIGN: JPM
DRAWN: SDB	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

CS-05
13 OF 81

LEGEND

- WORK AREA THIS PHASE
- CONTRACTOR STAGING AREA
- CLOSED AIRCRAFT MOVEMENT AREAS
- OPEN AIRCRAFT MOVEMENT AREAS
- NON-MOVEMENT AREAS
- LOW PROFILE BARRICADES WITH WORK AREA DESIGNATION
- 30" CONSTRUCTION/TRAFFIC CONES, WHITE AND ORANGE REFLECTORIZED
- LIGHTED RUNWAY CLOSURE MARKER
- FLAGGER LOCATION
- CONTRACTOR'S HAUL/ACCESS ROUTE

WORK ITEMS/SEQUENCE OF CONSTRUCTION - THIS WORK AREA:

SEQUENCE	WORK ITEM
1.	ISSUE NOTAMS FOR AREA CLOSURES (SYRACUSE AIRPORT RESPONSIBILITY).
2	PLACE LIGHTED RUNWAY CLOSURE MARKERS.
3.	PLACE LOW PROFILE CONSTRUCTION BARRICADES.
4.	COVER TAXIWAY EDGE LIGHTS WITH TEMPORARY COVERS WITHIN WORK AREA.
5.	GROOVE TAXIWAY PAVEMENTS.
6.	INSTALL FINAL COAT OF PAVEMENT MARKINGS.
7.	REMOVE TEMPORARY EDGE LIGHT COVERS AND RESTORE AIRFIELD LIGHTING CIRCUITS.
8.	CLEAN TAXIWAY PAVEMENT AND AIRPORT/ENGINEER APPROVAL TO OPEN WORK AREA.
9.	REMOVE LOW PROFILE BARRICADES AND LIGHTED RUNWAY CLOSURE MARKERS.
10.	REOPEN CLOSED AREAS.

SIGN "S-2" SEE DETAIL, SHEET CD-01

SPOIL AREA. CONTRACTOR SHALL GRADE SPOIL MATERIAL TO AIRPORT REQUIREMENTS AND STABILIZE WITH SEED AND MULCH.

CONTRACTOR ACCESS TO SPOIL AREA THROUGH GATE 148. GATE GUARD TO BE PROVIDED BY CONTRACTOR AND REQUIRED FOR ALL MATERIAL DELIVERIES. GATE SHALL BE LOCKED AND SECURED WHEN NOT IN USE.

CONTRACTOR SHALL CONTINUOUSLY MONITOR AND CLEAN HAUL ROUTE.

AIRPORT PROPERTY LINE (TYP.)

INSTALL TEMPORARY JUMPER FOR CIRCUIT T-7

INSTALL TEMPORARY JUMPER FOR CIRCUIT T-1

MANUAL DOUBLE SWING GATE - CONTRACTOR TO LOCK AND SECURE WHEN NOT IN USE

CONTRACTOR ACCESS THROUGH GATE 135. GATE GUARD TO BE PROVIDED BY CONTRACTOR AND REQUIRED FOR ALL MATERIAL DELIVERIES. GATE SHALL BE LOCKED AND SECURED WHEN NOT IN USE.

TEMPORARY CONSTRUCTION ENTRANCE (SEE DETAIL DWG. GD-02)

SIGN "S-2" (SEE DETAIL, SHEET CD-01)

SIGNS "S-1", "S-2" (SEE DETAIL, SHEET CD-01)

CONSTRUCT TEMPORARY ACCESS ROAD (SEE DETAIL DWG. CD-01)

PROVIDE AND MAINTAIN SPACE FOR PASSAGE OF AIRCRAFT

N.E. – S.W. RUNWAY 6–24 (ABANDONED)

E. – W. RUNWAY 10–28 (9,000' x 150')

N.W. – S.E. RUNWAY 14–32 (7,500' x 150')

CONSTELLATION WAY N.

COL. EILEEN COLLINS BLVD.

MILLION AIR

CARGO APRON EXPANSION AND CONNECTING TAXIWAY (BY OTHERS)

PERIMETER ROAD

GA APRON

AIR NATIONAL GUARD APRON

CORREGIDOR ROAD

THOMPSON RD.

WEEDEN RD.

NORTH DEICING APRON

SOUTH DEICING APRON

TERMINAL APRON

TERMINAL BUILDING

PARKING GARAGE

AUTO PARKING

CELL PHONE LOT

MOTEL

NYS POLICE

ELEC. VAULT

AIR CARGO TERMINAL

CARGO APRON

ARFF BLDG.

OLD ARFF

ASR-9

ASR CLEARANCE ZONE R=1000

RSA

ROFA

RPZ

LOC

GS

TW A

TW B

TW C

TW D

TW E

TW F

TW G

TW H

TW J

TW K

TW M

TW N

TW P

TW S

TW Y

WORK ITEMS THIS PHASE:

- GROOVE TAXIWAY PAVEMENT
- INSTALL FINAL COAT OF PAVEMENT MARKINGS

FACILITIES DISABLED THIS PHASE:

- RUNWAY 15 VASI (FAA OWNED)
- RUNWAY 15 MALS (FAA OWNED)
- RUNWAY 33 VASI (FAA OWNED)
- RUNWAY 15-33 EDGE LIGHT CIRCUIT
- RUNWAY 15-33 CENTERLINE LIGHT CIRCUIT
- TAXIWAY CIRCUIT #2
- TAXIWAY CIRCUIT #8

GENERAL PHASING NOTES:

1. SEE SHEETS CS-01 THROUGH CS-07 FOR INDIVIDUAL WORK AREA REQUIREMENTS.
2. SEE SHEETS CD-01 THROUGH CD-03 FOR PHASING DETAILS.
3. SEE SHEETS CN-01 AND CN-02 FOR DETAILED PHASING NOTES.
4. CONSTRUCTION VEHICLES MUST USE THE DESIGNATED HAUL ROUTE AT ALL TIMES DURING THE COURSE OF CONSTRUCTION.
5. CONTRACTOR SHALL COORDINATE SHUTDOWN OF ANY FAA-OWNED FACILITIES WITH LOCAL FAA SSC.
6. BARRICADES ARE REQUIRED TO BE REMOVED EACH MORNING BY 04:30.

0 400 800 1200 FT.

SCALE

CONSTRUCTION BID SET

WORK AREA REQUIREMENTS:

WORK AREA	CALENDAR TIME	REQUIREMENTS TO BEGIN	WORK HOUR RESTRICTIONS/ REQUIREMENTS	AIRFIELD CLOSURE AREAS	CLOSURE HOURS	LIQUIDATED DAMAGES	AIRPORT OPERATIONAL RESTRICTIONS
E	14 CALENDAR NIGHTS	30 CALENDAR DAYS AFTER COMPLETION OF WORK AREA D	00:00-04:30	RUNWAY 15-33, TW K, PORTIONS OF TW A, B, M, AND S	00:00-04:30	$5,000 / HOUR OR PORTION THEREOF	RUNWAY 15-33 CLOSED, CHANGED TAXI PATTERNS

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON

49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

CONSTRUCTION SAFETY & PHASING PLAN - WORK AREA E - ADD-ALT. 1

SCALE: AS SHOWN	DESIGN: JPM	CS-06	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	14 OF 81	

K:\SYR\ACI\SET-18831 (IR TW A EAST DESIGN\DRAWINGS\SHEET FILES\18831.06-CSPP-ADN(-E.DWG

LEGEND

- WORK AREA THIS PHASE
- CONTRACTOR STAGING AREA
- CLOSED AIRCRAFT MOVEMENT AREAS
- OPEN AIRCRAFT MOVEMENT AREAS
- NON-MOVEMENT AREAS
- LOW PROFILE BARRICADES WITH WORK AREA DESIGNATION
- 30" CONSTRUCTION/TRAFFIC CONES, WHITE AND ORANGE REFLECTORIZED
- LIGHTED RUNWAY CLOSURE MARKER
- FLAGGER LOCATION
- CONTRACTOR'S HAUL/ACCESS ROUTE

WORK ITEMS/SEQUENCE OF CONSTRUCTION - THIS WORK AREA:

SEQUENCE	WORK ITEM
1.	ISSUE NOTAMS FOR AREA CLOSURES (SYRACUSE AIRPORT RESPONSIBILITY).
2	PLACE LIGHTED RUNWAY CLOSURE MARKERS.
3.	PLACE LOW PROFILE CONSTRUCTION BARRICADES.
4.	COVER TAXIWAY EDGE LIGHTS WITH TEMPORARY COVERS WITHIN WORK AREA.
5.	GROOVE TAXIWAY PAVEMENTS.
6.	INSTALL FINAL COAT OF PAVEMENT MARKINGS.
7.	REMOVE TEMPORARY EDGE LIGHT COVERS AND RESTORE AIRFIELD LIGHTING CIRCUITS.
8.	CLEAN TAXIWAY PAVEMENT AND AIRPORT/ENGINEER APPROVAL TO OPEN WORK AREA.
9.	REMOVE LOW PROFILE BARRICADES AND LIGHTED RUNWAY CLOSURE MARKERS.
10.	REOPEN CLOSED AREAS.

SIGN "S-2" SEE DETAIL, SHEET CD-01

SPOIL AREA. CONTRACTOR SHALL GRADE SPOIL MATERIAL TO AIRPORT REQUIREMENTS AND STABILIZE WITH SEED AND MULCH.

AIRPORT PROPERTY LINE (TYP.)

CONTRACTOR ACCESS TO SPOIL AREA THROUGH GATE 148. GATE GUARD TO BE PROVIDED BY CONTRACTOR AND REQUIRED FOR ALL MATERIAL DELIVERIES. GATE SHALL BE LOCKED AND SECURED WHEN NOT IN USE.

CONTRACTOR ACCESS THROUGH GATE 108. GATE GUARD TO BE PROVIDED BY CONTRACTOR AND REQUIRED FOR ALL MATERIAL DELIVERIES. GATE SHALL BE LOCKED AND SECURED WHEN NOT IN USE.

CONTRACTOR TO STATION FLAGGER AT APRON AND TW F INTERSECTION DURING WORK AREA F

SIGN "S-2" SEE DETAIL, SHEET CD-01

CONTRACTOR SHALL CONTINUOUSLY MONITOR AND CLEAN HAUL ROUTE.

REFER TO DWG. CD-02 FOR DETAILED BARRICADE LAYOUT IN THIS AREA

SIGN "S-3" SEE DETAIL, SHEET CD-01

COVER EDGE LIGHTS WITH PVC EDGE LIGHT COVERS

INSTALL TEMPORARY JUMPER FOR CIRCUIT T-4

INSTALL TEMPORARY JUMPER FOR CIRCUIT T-6

INSTALL TEMPORARY JUMPER FOR CIRCUIT T-1

N.E. – S.W. RUNWAY 6–24 (ABANDONED)

N.W. – S.E. RUNWAY 15–33 (7,500' x 150')

E. – W. RUNWAY 10–28 (9,000' x 150')

CONSTELLATION WAY N.

COL. EILEEN COLLINS BLVD.

PERIMETER ROAD

CORRIDOR ROAD

MEADOWLAWN RD.

THOMPSON RD.

HIGHPOINT RD.

NORTH DEICING APRON

TERMINAL APRON

TERMINAL BUILDING

PARKING GARAGE

AUTO PARKING

CELL PHONE LOT

NYS POLICE

MOTEL

MILLION AIR

AIR CARGO TERMINAL

CARGO APRON

CARGO APRON EXPANSION AND CONNECTING TAXIWAY (BY OTHERS)

GA APRON

AIR NATIONAL GUARD APRON

SOUTH DEICING APRON

OLD ARFF

ASR-9

ASR CLEARANCE ZONE R=1000'

WORK ITEMS THIS PHASE:

- GROOVE TAXIWAY PAVEMENT
- INSTALL FINAL COAT OF PAVEMENT MARKINGS

FACILITIES DISABLED THIS PHASE:

- N/A

GENERAL PHASING NOTES:

1. SEE SHEETS CS-01 THROUGH CS-07 FOR INDIVIDUAL WORK AREA REQUIREMENTS.
2. SEE SHEETS CD-01 THROUGH CD-03 FOR PHASING DETAILS.
3. SEE SHEETS CN-01 AND CN-02 FOR DETAILED PHASING NOTES.
4. CONSTRUCTION VEHICLES MUST USE THE DESIGNATED HAUL ROUTE AT ALL TIMES DURING THE COURSE OF CONSTRUCTION.
5. BARRICADES ARE REQUIRED TO BE REMOVED EACH MORNING BY 04:30.

0 400 800 1200 FT.

SCALE

CONSTRUCTION BID SET

WORK AREA REQUIREMENTS:

WORK AREA	CALENDAR TIME	REQUIREMENTS TO BEGIN	WORK HOUR RESTRICTIONS/REQUIREMENTS	AIRFIELD CLOSURE AREAS	CLOSURE HOURS	LIQUIDATED DAMAGES	AIRPORT OPERATIONAL RESTRICTIONS
F	7 CALENDAR NIGHTS	COMPLETE WORK AREA E	00:00-04:30 / WORK NOT PERMITTED DURING DEICING OPERATIONS, APPROX. NOVEMBER - APRIL	PORTIONS OF TW A, E, AND B, TW U, PORTION OF SOUTH DEICING APRON	00:00-04:30	$5,000/CALENDAR DAY OR PORTION THEREOF	CHANGED TAXI PATTERNS

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

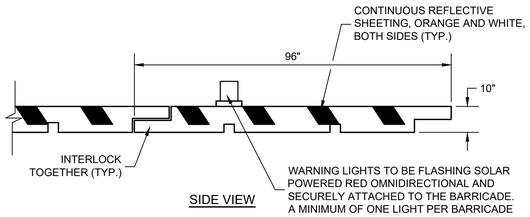
SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

CONSTRUCTION SAFETY & PHASING PLAN - WORK AREA F - BASE BID

SCALE: AS SHOWN	DESIGN: JPM	**CS-07**	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	15 OF 81	

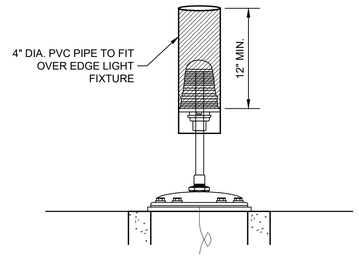
K:\SYRACUSE\T-18831.08 TW A EAST DESIGN\DRAWINGS\SHEET FILES\18831.08-CSPP-ADWG.F.DWG



NOTES:
1. BARRICADES SHALL BE OTW SAFETY AIRPORT BARRICADE (MODEL NO. AR10x96) OR APPROVED EQUAL. ALL BARRICADES SHALL BE NEW AT THE START OF CONSTRUCTION.
2. BARRICADES SHALL BE IN COMPLIANCE WITH AC 150/5370-2G.
3. OMNIDIRECTIONAL LIGHTS SHALL BE OTW SAFETY (MODEL NO. C01) FLASHING RED SOLAR LIGHT OR APPROVED EQUAL. LIGHTS SHALL SECURELY ATTACH TO THE BARRICADES. ALL LIGHTS SHALL BE NEW WHEN THE BARRICADES ARE INSTALLED. THE CONTRACTOR SHALL REPLACE ANY BROKEN OR FAILED LIGHTS IMMEDIATELY.
4. THE CONTRACTOR SHALL CLEAN AND MAINTAIN ALL BARRICADES AND LIGHTS THROUGHOUT THE DURATION OF CONSTRUCTION, AND DURING PERIODS OF NON-WORK, INCLUDING ANY WINTER SHUTDOWN PERIOD.
5. INSTALLED BARRICADES SHALL BE FILLED WITH WATER TO COUNTERACT WIND AND/OR JET BLAST. DURING SUB-FREEZING TEMPERATURES, FILL WITH POTASSIUM ACETATE OR CALCIUM CHLORIDE SOLUTION.

LOW PROFILE CONSTRUCTION BARRICADE — 1 CD-01

NOT TO SCALE
(ITEM M-120-2)



NOTES:
1. PVC EDGE LIGHT COVERS SHALL BE USED FOR EXISTING LIGHTS WHERE JUMPERS OR CIRCUIT DEACTIVATION IS IMPRACTICAL. LOCATIONS TO BE APPROVED BY THE ENGINEER.
2. REFERENCE DWG. CS-01 TO CS-06 FOR ELECTRICAL JUMPER LOCATIONS.

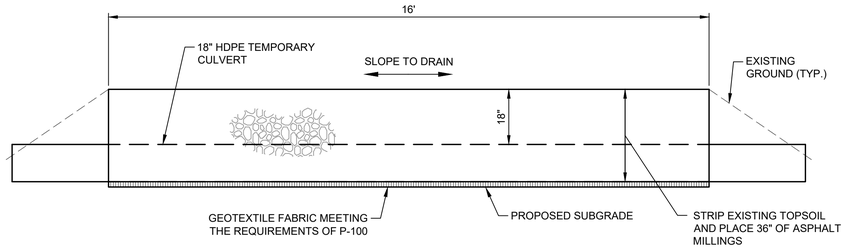
PVC PIPE EDGE LIGHT COVER — 2 CD-01

NOT TO SCALE
(INCIDENTAL TO ITEM M-120-1)

SIGN S-1 SIGN S-2 SIGN S-3

TEMPORARY CONSTRUCTION SIGNS — 3 CD-01

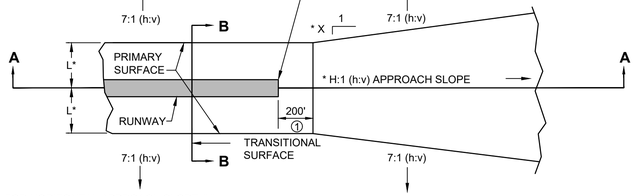
NOT TO SCALE
(INCIDENTAL TO ITEM M-120-1)



NOTES:
1. ALL COSTS ASSOCIATED WITH THE CONSTRUCTION OF TEMPORARY ACCESS ROAD AND RESTORATION SHALL BE INCLUSIVE TO ITEM M-120-1.
2. SUBGRADE SHALL BE COMPACTED IN ACCORDANCE WITH ITEM P-152.
3. UPON CONSTRUCTION COMPLETION, ALL ELEMENTS OF THE TEMPORARY ACCESS ROAD SHALL BE REMOVED AND THE AREA RESTORED WITH TOPSOIL, SEED, MULCH PER ITEMS T-905, T-901, AND T-908 RESPECTIVELY.
4. STRIPPED TOPSOIL SHALL BE STOCKPILED AND SAVED FOR RESTORATION OF THE TEMPORARY ACCESS ROAD.
5. ANY SURPLUS TOPSOIL SHALL BE THE PROPERTY OF THE AIRPORT.
6. ALL TEMPORARY CULVERT CROSSINGS SHALL BE PLACED PERPENDICULAR TO THE STREAM WHERE POSSIBLE. CROSSINGS MAY DEVIATE AS MUCH AS 15 DEGREES FROM PERPENDICULAR, IF NECESSARY.

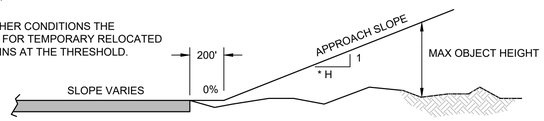
TEMPORARY ACCESS ROAD — 4 CD-01

NOT TO SCALE
(INCIDENTAL TO ITEM M-120-1)

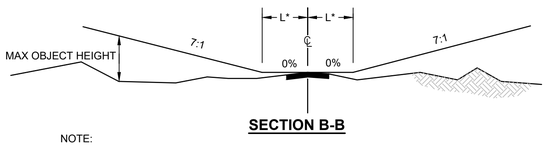


NOTE: FOR HORIZONTAL APPROACH SLOPE (H), DISTANCE (L), AND FLARE RATIO (X), SEE TABLE BELOW.

1 UNDER FAIR WEATHER CONDITIONS THE APPROACH SLOPE FOR TEMPORARY RELOCATED THRESHOLDS BEGINS AT THE THRESHOLD.



SECTION A-A



SECTION B-B

NOTE:

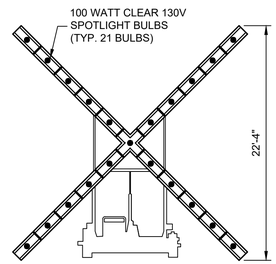
1. ANY EQUIPMENT OR OBJECTS PENETRATING THE PART 77 IMAGINARY SURFACES SHALL BE COORDINATED, IN ADVANCE, WITH THE ENGINEER. OBSTRUCTIONS PENETRATING THE PART 77 SURFACES SHALL BE MARKED AND/OR LIGHTED IN ACCORDANCE WITH FAA GUIDELINES.

RUNWAY	APPROACH SLOPE (H)	L	X
10	50:1	500	0.15
28	50:1	500	0.15
15	34:1	500	0.15
33	34:1	500	0.15

FAR PART 77 IMAGINARY SURFACES — 7 CD-01

NOT TO SCALE

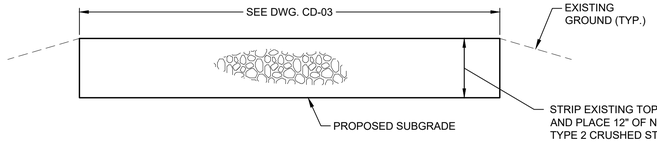
AS MANUFACTURED BY SWEEPSTER INC.
(OR APPROVED EQUAL)



NOTES:
1. THE CONTRACTOR SHALL PROVIDE (4) NEW LIGHTED RUNWAY CLOSURE MARKERS FOR THE PROJECT.
2. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FURNISH ALL FUEL AND TO SERVICE THE CLOSURE MARKERS. SERVICE INCLUDES BUT IS NOT LIMITED TO: TUNE-UP, WEEKLY OIL CHANGE, BATTERY CHARGING, AND BULB REPLACEMENT.

LIGHTED RUNWAY CLOSURE MARKER — 5 CD-01

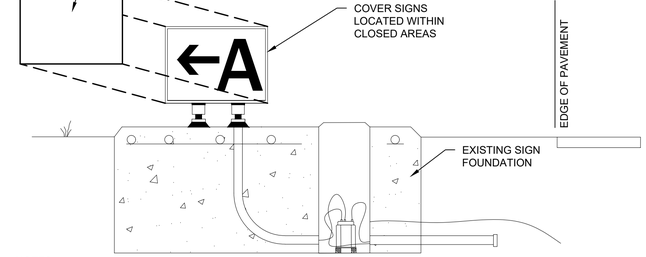
NOT TO SCALE
(ITEM M-120-3)



NOTES:
1. ALL COSTS ASSOCIATED WITH THE CONSTRUCTION OF THE STAGING AREA AND RESTORATION SHALL BE INCLUSIVE TO ITEM M-120-1.
2. SUBGRADE SHALL BE COMPACTED IN ACCORDANCE WITH ITEM P-152.
3. UPON CONSTRUCTION COMPLETION, ALL ELEMENTS OF THE STAGING AREA SHALL BE REMOVED AND THE AREA RESTORED WITH TOPSOIL AND SEED.
4. STRIPPED TOPSOIL SHALL BE STOCKPILED AND SAVED FOR RESTORATION OF THE STAGING AREA.
5. ANY SURPLUS TOPSOIL SHALL BE THE PROPERTY OF THE AIRPORT.

CONTRACTOR'S STAGING AREA — 8 CD-01

NOT TO SCALE



NOTES:
1. AIRFIELD GUIDANCE SIGNS WITHIN CLOSED WORK AREAS MUST BE DEACTIVATED BY TURNING APPLICABLE CIRCUIT OFF OR BE COVERED AS SHOWN.
2. COVERS USED TO DEACTIVATE UNNEEDED AIRFIELD SIGNS SHALL BE A SINGLE DARK COLOR, OPAQUE MATERIAL CONTAINING NO WORDING OR IMAGES. RIGID COVERS SHALL MATCH THE SIZE AND SHAPE OF THE SIGN PANEL. FABRIC SIGN COVERS MAY REQUIRE MORE THAN ONE LAYER OF FABRIC TO PREVENT LEGIBILITY OF THE SIGN.
3. TEMPORARY COVER SHALL BE SECURED TO SIGN TO PREVENT MOVEMENT. METHOD SHALL BE REVIEWED AND APPROVED BY THE ENGINEER.

TEMPORARY SIGN COVER — 6 CD-01

NOT TO SCALE
(INCIDENTAL TO ITEM M-120-1)

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

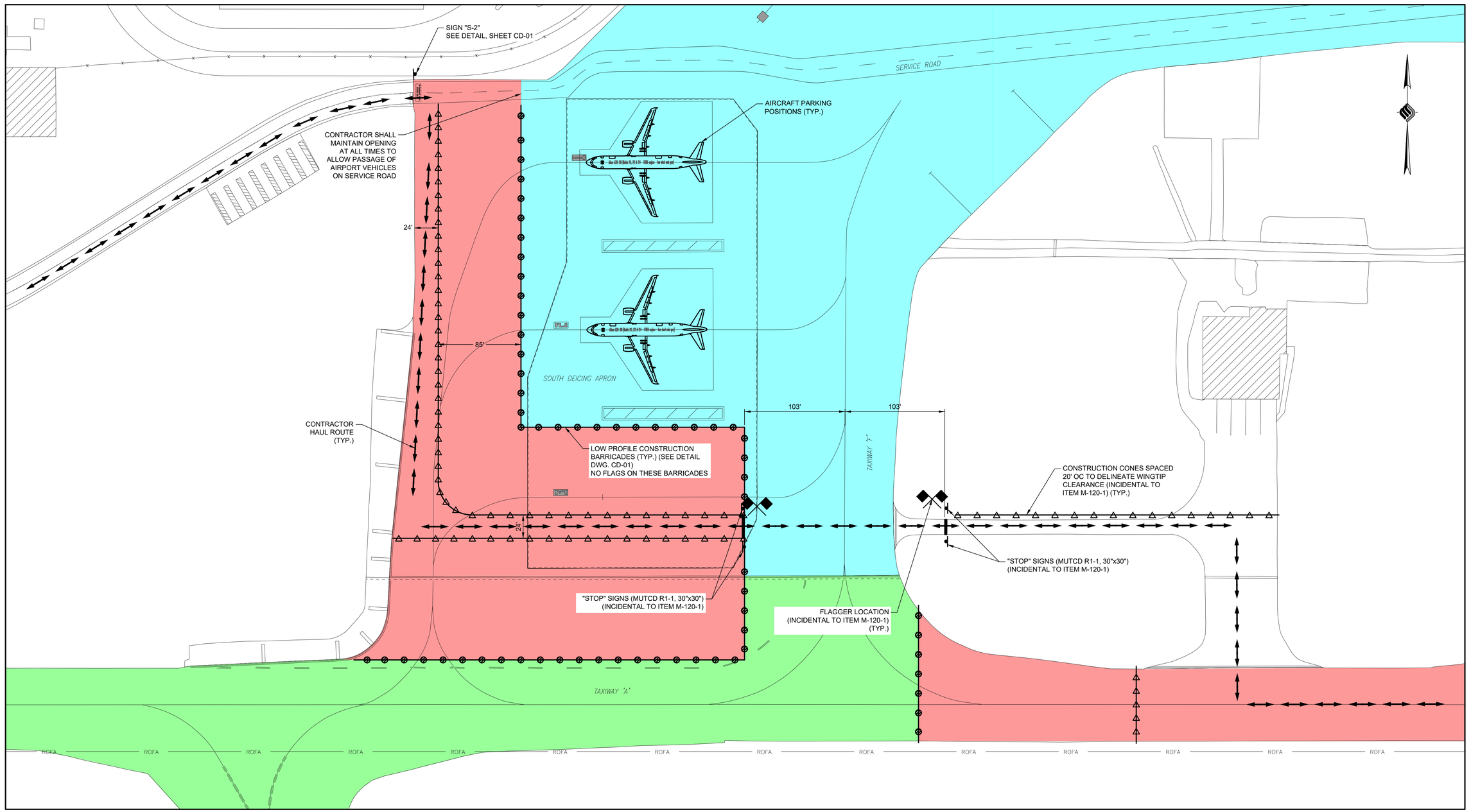
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

CONSTRUCTION SAFETY & PHASING DETAILS - 1

SCALE:	NTS	DESIGN: JPM	**CD-01**
DRAWN:	SDB	PROJECT: 18831.08	
CHECKED:	SJL	DATE: APRIL 2024	16 OF 81

K:\SYRACUSE\T-18831.08 TW A EAST DESIGN\DRAWINGS\SHEET FILES\18831.08-CSPP-DETS.DWG



NOTE:
1. THE PARTIAL CLOSURE OF THE SOUTH DEICING APRON DEPICTED ON THIS DRAWING SHALL NOT BE PERMITTED DURING DEICING OPERATIONS. DEICING OPERATIONS TAKE PLACE BETWEEN NOVEMBER AND APRIL EACH YEAR, APPROXIMATELY.

LEGEND

- OPEN AIRFIELD PAVEMENT
- CLOSED AIRFIELD PAVEMENT
- NON-MOVEMENT AREA

0 50 100 150 FT.
SCALE

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49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

WORK AREA A SOUTH DEICING APRON DETAIL (BASE BID)

SCALE: AS SHOWN	DESIGN: JPM
DRAWN: SDB	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

CD-02
17 OF 81

K:\SYRACUSE\T-18831.08 TW A EAST DESIGN\DRAWINGS\SHEET FILES\18831.08-CSPP-DETS-2.DWG

NOTE:
1. APPROXIMATE CONDITION OF CONTRACTOR'S STAGING AREA AT THE TIME OF BID IS TURF. CONTRACTOR SHALL STRIP EXISTING TOPSOIL AND CONSTRUCT STAGING AREA PER DETAIL ON SHEET CD-01.

0 60 120 180 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

CONTRACTOR STAGING AREA LAYOUT (WORK AREAS A, D, F)

SCALE: AS SHOWN	DESIGN: JPM
DRAWN: SDB	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

CD-03
18 OF 81

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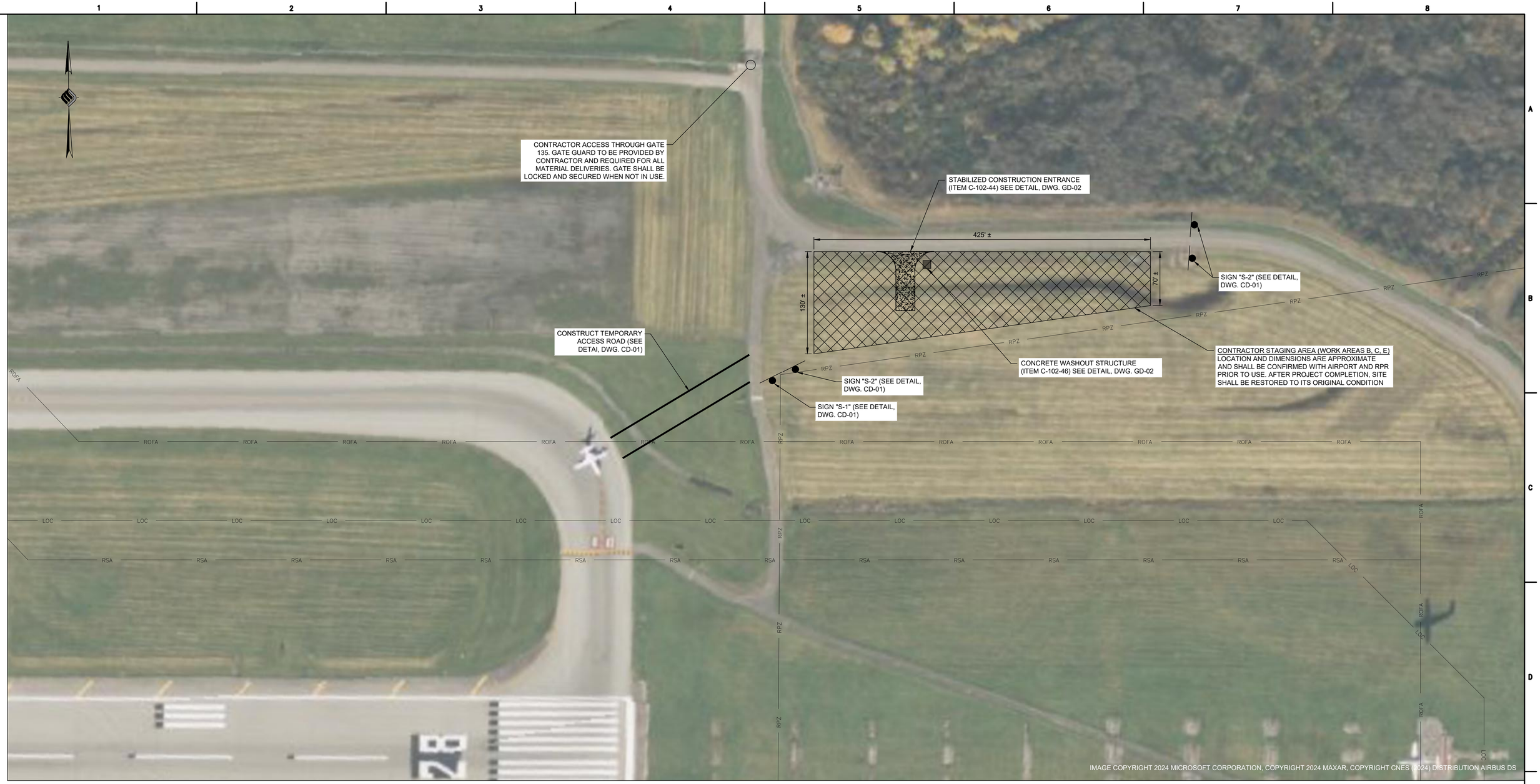

NOTE:
1. APPROXIMATE CONDITION OF CONTRACTOR'S STAGING AREA AT THE TIME OF BID IS TURF. CONTRACTOR SHALL STRIP EXISTING TOPSOIL AND CONSTRUCT STAGING AREA PER DETAIL ON SHEET CD-01.

0 60 120 180 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK
STEVEN J. LANGE
084009
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

CONTRACTOR STAGING AREA LAYOUT (WORK AREAS B, C, E)

SCALE: AS SHOWN	DESIGN: JPM	CD-04
DRAWN: SDB	PROJECT: 18831.08	19 OF 81
CHECKED: SJL	DATE: APRIL 2024	

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CONSTRUCTION SAFETY AND PHASING NOTES:

1. THE CONTRACTOR SHALL PROVIDE ADEQUATE EQUIPMENT ONSITE TO CONTINUOUSLY MAINTAIN ALL CONSTRUCTION HAUL ROUTES. ALL AIRFIELD PAVEMENT AND PUBLIC ROADWAYS USED BY THE CONTRACTOR SHALL BE INSPECTED AND CLEANED ON A CONTINUOUS BASIS. A MINIMUM OF (1) OPERABLE VACUUM SWEEPER TRUCK AND (1) WATER TRUCK SHALL BE ONSITE AT ALL TIMES.
2. THE CONTRACTOR SHALL PROVIDE THE RPR WITH 7-DAYS ADVANCE NOTICE IN WRITING PRIOR TO THE START OF CONSTRUCTION IN ANY WORK AREA TO ALLOW FOR THE APPROPRIATE NOTAMs TO BE ISSUED BY THE OWNER
3. ALL WORK SHOWN ON THE CONSTRUCTION SAFETY AND PHASING PLAN AND THIS SHEET, UNLESS OTHERWISE NOTED, SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM M-120-1, MAINTENANCE AND PROTECTION OF TRAFFIC.
4. FINAL LOCATION AND DIMENSIONS OF CONTRACTOR'S STAGING AREA SHALL BE DETERMINED IN THE FIELD BY THE OWNER, RPR AND CONTRACTOR.
5. PRIOR TO THE START OF CONSTRUCTION, THE RPR, AIRPORT, AND CONTRACTOR SHALL COOPERATIVELY DOCUMENT THE LOCATION AND CONDITION OF ALL HAUL ROUTES, INCLUDING PUBLIC ROADWAYS.
6. AT NO TIME SHALL THE CONTRACTOR'S PERSONNEL, EQUIPMENT OR VEHICLES ENTER THE RUNWAY SAFETY AREA (RSA), TAXIWAY SAFETY AREA (TSA), OR ANY AIRFIELD PAVED AREA, UNLESS AUTHORIZED BY THE OWNER AND THE AREA IS CLOSED TO AIRCRAFT. CONTRACTOR SHALL COORDINATE WITH THE RPR.
7. CONSTRUCTION EQUIPMENT IS NOT PERMITTED IN ANY TAXIWAY OBJECT FREE AREA (TOFA), OR RUNWAY SAFETY AREA (RSA) UNLESS AUTHORIZED THROUGH A CLOSURE OF THE AIRFIELD AREA BY THE AIRPORT.
8. ALL COSTS ASSOCIATED WITH PREPARATION, SET UP, TEAR DOWN AND RESTORATION OF THE CONTRACTOR'S STAGING AREA SHALL BE PAID FOR UNDER THE LUMP SUM PRICE BID FOR ITEM M-120-1 MAINTENANCE AND PROTECTION OF TRAFFIC, AND ITEM C-105-1 MOBILIZATION UNLESS OTHERWISE NOTED ON THE PLANS.
9. ALL WORK SHALL COMPLY WITH THE REQUIREMENTS OF FEDERAL AVIATION ADMINISTRATION (FAA) ADVISORY CIRCULAR (AC) 150/5370-2G, OF THE "OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION" OR LATEST REVISION. SEE CONSTRUCTION SAFETY AND PHASING PLAN IN THE PROJECT SPECIFICATIONS FOR ADDITIONAL INFORMATION.
10. THE CONTRACTOR SHALL SUBMIT A CONSTRUCTION SCHEDULE TO THE RPR PRIOR TO COMMENCING WORK ON THE AIRPORT, A MINIMUM OF TEN (10) CALENDAR DAYS PRIOR TO THE PRE-CONSTRUCTION MEETING. THIS SCHEDULE SHALL BE REVISED WEEKLY. NO WORK SHALL BE PERMITTED OUTSIDE THE AREAS INCLUDED IN THE APPROVED SCHEDULE.
11. PRIOR TO OPENING THE WORK AREAS TO AIRCRAFT TRAFFIC, THE PAVEMENT SURFACE SHALL BE WASHED / SWEPT CLEAN AND THE WORK AREA WILL BE INSPECTED BY THE AIRPORT, CONTRACTOR AND RPR. INSPECTIONS WILL BE SCHEDULED IMMEDIATELY FOLLOWING THE COMPLETION OF THE CONSTRUCTION ACTIVITY THAT CAUSED THE WORK AREA TO BE CLOSED. CONTRACTOR AND RPR SHALL COORDINATE ALL ACTIVITIES WITH AIRPORT OPERATIONS.
12. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE CONSTRUCTION SAFETY AND PHASING PLAN OF THE PROJECT SPECIFICATIONS FOR SPECIFIC WORK AREA INSTRUCTIONS AND REQUIREMENTS.
13. NO PERSONAL CONTRACTOR EMPLOYEE VEHICLES ARE ALLOWED WITHIN THE AIRPORT SECURITY FENCE. ALL CONTRACTOR'S EMPLOYEE VEHICLES MUST REMAIN PARKED OUTSIDE EITHER GATE 108 OR GATE 135 DEPENDING ON WHERE WORK IS TAKING PLACE. ONLY OFFICIAL COMPANY VEHICLES SHALL BE ALLOWED ON-SITE AND WITHIN THE AIRPORT SECURITY FENCE.
14. THE CONTRACTOR SHALL NOTE THAT NO CONSTRUCTION MAY OCCUR WITHIN A SAFETY AREA WHILE THE ASSOCIATED RUNWAY OR TAXIWAY IS OPEN FOR AIRCRAFT OPERATIONS.
15. OPEN TRENCHES OR EXCAVATION ARE NOT PERMITTED WITHIN A SAFETY AREA WHILE THE ASSOCIATED RUNWAY OR TAXIWAY IS OPEN. IF BACKFILLING EXCAVATIONS BEFORE THE RUNWAY OR TAXIWAY MUST BE OPENED IS IMPRACTICABLE, CONTRACTOR SHALL COVER THE EXCAVATIONS APPROPRIATELY, COVERING FOR OPEN TRENCHES MUST BE DESIGNED AND SUBMITTED TO THE RPR FOR REVIEW AND APPROVAL, TO ALLOW THE SAFE OPERATION OF THE HEAVIEST AIRCRAFT OPERATING ON THE RUNWAY ACROSS THE TRENCH WITHOUT DAMAGE TO THE AIRCRAFT.
16. CONTRACTOR SHALL PROMINENTLY MARK OPEN TRENCHES AND EXCAVATIONS AT THE CONSTRUCTION SITE WITH RED OR ORANGE FLAGS, AS APPROVED BY THE RPR, AND LIGHT THEM WITH RED LIGHTS DURING HOURS OF RESTRICTED VISIBILITY OR DARKNESS.
17. CONSTRUCTION SHALL BE COMPLETED IN SUCH A MANNER THAT AT THE END OF A RUNWAY OR TAXIWAY CLOSURE PERIOD ALL WORK ITEMS ARE COMPLETE, THE SAFETY AREAS ARE IN A CONDITION SUITABLE FOR AIRCRAFT OPERATIONS, SUBJECT TO APPROVAL OF THE RPR AND AIRPORT, AND LIGHTING SYSTEMS ARE OPERATIONAL. NO OPEN TRENCHES, STOCKPILES, LIPS, OR DIPS GREATER THAN 3 INCHES WILL BE ALLOWED IN THE SAFETY AREA OF ANY OPEN RUNWAY OR TAXIWAY.
18. CONTRACTOR SHALL TAKE ALL THE NECESSARY MEASURES TO ENSURE THAT ALL FOREIGN OBJECT DEBRIS (FOD) ARE REMOVED FROM ACTIVE PAVEMENT CROSSINGS. CONTRACTOR MAY NOT LEAVE THE CONSTRUCTION SITE PRIOR TO AIRPORT OPERATIONS APPROVAL THAT ALL ACTIVE PAVEMENT CROSSINGS ARE CLEAN.
19. STOCKPILE MATERIALS ARE NOT PERMITTED WITHIN THE RSA, ROFA, TSA, AND TOFA. STOCKPILE MATERIAL SHALL BE LOCATED AS SHOWN ON CSPP DRAWINGS OR AS ORDERED BY THE RPR. STOCKPILE MATERIAL STORED ON AIRPORT PROPERTY SHALL NOT EXCEED AN ELEVATION OF 25' ABOVE GROUND LEVEL. STOCKPILE MATERIAL SHALL BE PROMINENTLY MARKED AND LIGHTED DURING HOURS OF RESTRICTED VISIBILITY OR DARKNESS.
20. CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING ELECTRICAL AND COMMUNICATION FACILITIES AT ALL TIMES. CONTRACTOR SHALL COORDINATE UTILITY DEMOLITION AND INSTALLATION TO MAINTAIN SERVICE BY INSTALLING TEMPORARY ELECTRICAL JUMPERS ABOVE GROUND IN CONDUIT, UNLESS OTHERWISE APPROVED BY THE RPR. TEMPORARY ELECTRICAL JUMPERS SHALL BE PROTECTED WHEN CROSSING THROUGH WORK AREAS BY PLACING ORANGE FLAGGING AT INTERVALS ALONG THE LENGTH OF THE JUMPER AND INSTALLING STEEL PLATES OVER SECTIONS THAT WILL BE UNDER CONSTRUCTION TRAFFIC. COST OF TEMPORARY JUMPER CABLES, CONNECTIONS, CONDUITS, SPLICING, STEEL PLATES, AND CONES SHALL BE INCIDENTAL TO ITEM M-120-1 MAINTENANCE AND PROTECTION OF TRAFFIC.
21. CONTRACTOR SHALL MAINTAIN EXISTING DRAINAGE PATTERNS AND NOT BLOCK ANY DRAINAGE PIPE, OR DITCH FLOWS. CONTRACTOR MAY EXTEND EXISTING CULVERTS AS NECESSARY TO ACCOMMODATE HAUL ROUTE TRUCK TRAFFIC. ANY MODIFICATIONS TO EXISTING DRAINAGE PATTERNS NOT SHOWN ON THE PLANS SHALL BE APPROVED BY THE RPR. COST SHALL BE INCLUSIVE TO ITEM M-120-1 MAINTENANCE AND PROTECTION OF TRAFFIC. ALL MODIFICATIONS TO EXISTING DRAINAGE FEATURES MADE BY THE CONTRACTOR AND NOT SHOWN AS PROPOSED ON THE PLANS SHALL BE CONSIDERED TEMPORARY AND SHALL BE REMOVED AND RESTORED BY THE CONTRACTOR PRIOR TO PROJECT COMPLETION.
22. CONTRACTOR SHALL PROTECT UNDERGROUND UTILITIES SUCH AS DRAINAGE PIPES AND ELECTRICAL CABLES / CONDUITS BY PLACING STEEL PLATES AND MILLINGS AT CONTRACTOR HAUL ROUTE CROSSINGS AS REQUESTED BY THE RPR, OR AIRPORT OPERATIONS. COST SHALL BE INCLUSIVE TO ITEM M-120-1 MAINTENANCE AND PROTECTION OF TRAFFIC.
23. CONTRACTOR SHALL HOLD DAILY SAFETY BRIEFINGS WITH THEIR EMPLOYEES, SUBCONTRACTOR'S EMPLOYEES, AND DRIVERS TO ENSURE ALL CONSTRUCTION PERSONNEL KNOW APPLICABLE AIRPORT PROCEDURES AND CHANGES TO THOSE PROCEDURES THAT MAY AFFECT THEIR WORK.
24. THE CONTRACTOR MUST ALSO ADHERE TO THE CONSTRUCTION SAFETY AND PHASING PLAN (CSPP) FOR THIS PROJECT, AS WELL AS PREPARE AND SUBMIT A SAFETY PLAN COMPLIANCE DOCUMENT (SPCD) FOR APPROVAL TO THE RPR AND OWNER A MINIMUM OF FOURTEEN (14) CALENDAR DAYS PRIOR TO THE START OF CONSTRUCTION. NO WORK SHALL COMMENCE UNTIL THE SPCD HAS BEEN SIGNED, SUBMITTED, AND APPROVED.
25. CONTRACTOR SHALL PROVIDE ESCORT TO AND FROM THE WORK AREAS AND STAGING AREA FOR ALL DELIVERIES ON AIRPORT PROPERTY. DRIVER ESCORTS MUST BE EQUIPPED WITH AN APPROVED RADIO FOR AIRCRAFT COMMUNICATIONS. ALL ESCORT VEHICLES AND CONSTRUCTION EQUIPMENT SHALL BE EQUIPPED WITH A WORKING FLASHING AMBER BEACON AND FAA APPROVED FLAGS.
26. ALL MAINTENANCE AND PROTECTION OF TRAFFIC (MPT) MEASURES SHALL BE INSTALLED BY THE CONTRACTOR AS WELL AS CHECKED AND APPROVED BY THE RPR AND AIRPORT OPERATIONS PRIOR TO THE START OF CONSTRUCTION.
27. EXISTING SECURITY GATES 108 AND 135 ARE MANNED BY AIRPORT SECURITY PERSONNEL. PRIOR TO ENTERING THE AIRSIDE FACILITIES, ALL CONTRACTOR AND SUBCONTRACTOR PERSONNEL, MATERIAL TRUCK DRIVERS, AND ANY OTHER CONTRACTOR PERSONNEL WILL BE REQUIRED TO PRESENT ID (AIRPORT SECURITY BADGE OR OTHER APPROVED ID SUCH AS A DRIVER'S LICENSE, IF BEING ESCORTED) AND AN APPROVED VEHICLE PLACARD TO GAIN ENTRY. ANY CONTRACTOR VEHICLE NOT COMPLYING WITH THESE REQUIREMENTS WILL BE DENIED ACCESS AND MAY HAVE THEIR AIRPORT ID REVOKED. THIS PROCESS WILL BE REPEATED EACH AND EVERY TIME THE CONTRACTOR WISHES TO GAIN ACCESS TO THE AIRSIDE FACILITIES.
28. THE CONTRACTOR SHALL COORDINATE WITH THE RPR AND AIRPORT OWNER AT LEAST THIRTY (30) CALENDAR DAYS PRIOR TO THE START OF THE CONSTRUCTION WORK FOR ALL LOGISTICS OF THE PROJECT.
29. THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN & RE-GRADE THE HAUL ROUTE, AS ORDERED BY THE RPR THROUGHOUT THE DURATION OF THIS CONTRACT. THE CONTRACTOR SHALL ALSO FULLY RESTORE THE HAUL ROUTE TO ITS ORIGINAL OR BETTER CONDITION AT THE CONCLUSION OF CONSTRUCTION. ALL WORK ASSOCIATED WITH CONSTRUCTING, MAINTAINING, REPLACING AND RESTORING THE HAUL ROUTE SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM M-120-1, MAINTENANCE AND PROTECTION OF TRAFFIC.
30. WORK FOR THE PHASES SHALL NOT BE PERFORMED SIMULTANEOUSLY, UNLESS OTHERWISE EXPLICITLY STATED WITHIN THE PHASING NOTES, TO ALLOW FOR MINIMIZED IMPACTS TO AIRPORT OPERATIONS.
31. SIGNS ADJACENT TO AREAS USED BY AIRCRAFT MUST COMPLY WITH FRANGIBLE REQUIREMENTS OF AC 150/5220-23 OR LATEST REVISON, FRANGIBLE CONNECTIONS, WHICH MAY REQUIRE MODIFICATION TO SIZE AND HEIGHT GUIDANCE IN THE MUTCD. SIGNS SHALL BE MOUNTED ON POLE WITH FRANGIBLE FITTINGS (BREAKAWAY POST)
32. CONTRACTOR IS RESPONSIBLE FOR SNOW REMOVAL IN THEIR WORK AND STAGING AREAS.

PROJECT PHASING SUMMARY							
WORK AREA	DURATION (CALENDAR DAYS OR NIGHTS)	REQUIREMENTS TO BEGIN	WORK HOUR RESTRICTIONS / REQUIREMENTS	AIRFIELD CLOSURE AREAS	CLOSURE HOURS	LIQUIDATED DAMAGES	AIRPORT OPERATIONAL RESTRICTIONS
A	35 CALENDAR DAYS	NOTICE TO PROCEED	WORK NOT PERMITTED DURING DEICING OPERATIONS, APPROX. NOVEMBER - APRIL	PORTIONS OF TW A, E, AND B, TW U, PORTION OF SOUTH DEICING APRON	24 HOURS / DAY	$5,000 / CALENDAR DAY OR PORTION THEREOF	CHANGED TAXI PATTERNS
B1*	21 CALENDAR DAYS	COMPLETE WORK AREA A	NONE	RUNWAY 15-33, TW K, PORTION OF TW A, B, M, AND S	24 HOURS / DAY	$5,000 / HOUR OR PORTION THEREOF	RUNWAY 15-33 CLOSED, CHANGED TAXI PATTERNS
B2*	1 CALENDAR NIGHT	COMPLETE WORK AREA A	00:00-04:30	RUNWAY 15-33, RUNWAY 10-28, ALL TAXIWAYS	00:00-04:30	$10,000 / HOUR OR PORTION THEREOF	ALL RUNWAYS AND TAXIWAYS CLOSED
C*	5 CALENDAR DAYS	COMPLETE WORK AREA B	NONE	RUNWAY 10-28, TW V, Z, W, G, L, PORTIONS OF TW H, N, AND A	24 HOURS / DAY	$10,000 / HOUR OR PORTION THEREOF	RUNWAY 10-28 CLOSED, CHANGED TAXI PATTERNS
D*	2 CALENDAR DAYS	COMPLETE WORK AREA C	WORK NOT PERMITTED DURING DEICING OPERATIONS, APPROX. NOVEMBER - APRIL	RUNWAY 10-28, TW Z, W, U, G, PORTIONS OF TW N, J, M, AND SOUTH DEICING APRON	24 HOURS / DAY	$10,000 / HOUR OR PORTION THEREOF	RUNWAY 10-28 CLOSED, CHANGED TAXI PATTERNS
E*	14 CALENDAR NIGHTS	30 CALENDAR DAYS AFTER COMPLETION OF WORK AREA D	00:00-04:30	RUNWAY 15-33, TW K, PORTIONS OF TW A, B, M, AND S	00:00-04:30	$5,000 / HOUR OR PORTION THEREOF	RUNWAY 15-33 CLOSED. CHANGED TAXI PATTERNS
F	7 CALENDAR NIGHTS	COMPLETE WORK AREA E	00:00-04:30 / WORK NOT PERMITTED DURING DEICING OPERATIONS, APPROX. NOVEMBER - APRIL	PORTIONS OF TW A, E, AND B, TW U, PORTION OF SOUTH DEICING APRON	00:00-04:30	$5,000 / CALENDAR NIGHT OR PORTION THEREOF	CHANGED TAXI PATTERNS

* WORK AREA IS PART OF ADD-ALT. 1.

PROJECT DURATION AND OVERALL LIQUIDATED DAMAGES:

A. PROJECT TOTAL DURATION: **63 CONSECUTIVE CALENDAR DAYS AND 22 CONSECUTIVE CALENDAR NIGHTS**. FAILURE TO COMPLETE ALL THE WORK WITHIN THE TOTAL CONTRACT TIME OF 63 CALENDAR DAYS AND 22 CALENDAR NIGHTS SPECIFIED WILL RESULT IN THE ASSESSMENT OF LIQUIDATED DAMAGES IN THE AMOUNT OF $10,000 FOR EACH CALENDAR DAY OR PORTION THEREOF IN WHICH THE WORK ITEMS REMAIN INCOMPLETE.

B. BASE BID DURATION: **35 CONSECUTIVE CALENDAR DAYS AND 7 CONSECUTIVE CALENDAR NIGHTS.**

C. ADD-ALT. 1 DURATION: **28 CONSECUTIVE CALENDAR DAYS AND 15 CONSECUTIVE CALENDAR NIGHTS.**

TOTAL PROJECT DURATION: 63 CALENDAR DAYS & 22 CALENDAR NIGHTS

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

CONSTRUCTION SAFETY & PHASING NOTES - 1

SCALE: NTS	DESIGN: JPM
DRAWN: SDB	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

CN-01
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GENERAL WORK AREA DESCRIPTIONS

WORK AREA A (BASE BID):
CONTAINS ALL WORK ASSOCIATED WITH THE REHABILITATION OF TAXIWAY A AND THE INTERSECTION OF TAXIWAY A WITH TAXIWAYS E AND B. WORK INCLUDES THE INSTALLATION OF TEMPORARY E&S MEASURES, DEMOLITION OF EXISTING AIRFIELD FEATURES (PAVEMENT, LIGHTS, SIGNS, ETC.), MILLING OF EXISTING PAVEMENTS, EXCAVATION, INSTALLATION OF ELECTRICAL INFRASTRUCTURE (EDGE LIGHTS, GUIDANCE SIGNS, CABLE, CONDUIT), DRAINAGE INFRASTRUCTURE AND STORMWATER IMPROVEMENTS, BASE COURSE, ASPHALT COURSES, PAVEMENT MARKINGS, TOPSOILING, AND HYDROSEEDING. THIS WORK IS LOCATED OUTSIDE OF ALL RUNWAY SAFETY AREAS (RSA).

TIME OF COMPLETION:
WORK IN WORK AREA A SHALL BEGIN AFTER THE NOTICE TO PROCEED IS RECEIVED AND SHALL BE COMPLETED IN 35 CONSECUTIVE CALENDAR DAYS.

LIQUIDATED DAMAGES:
FAILURE TO COMPLETE ALL THE WORK IN WORK AREA A WITHIN THE 35 CALENDAR DAYS SPECIFIED WILL RESULT IN THE ASSESSMENT OF LIQUIDATED DAMAGES IN THE AMOUNT OF $5,000 FOR EACH CALENDAR DAY OR PORTION THEREOF IN WHICH THE WORK ITEMS REMAIN INCOMPLETE.

WORK AREA B1 (ADD-ALT. 1):
CONTAINS ALL WORK ASSOCIATED WITH THE REHABILITATION OF THE TAXIWAY A AND TAXIWAY M INTERSECTION AND TAXIWAY A EAST OF RUNWAY 15-33. THIS WORK INCLUDES INSTALLING TEMPORARY E&S MEASURES, DEMOLITION OF EXISTING AIRFIELD FEATURES (PAVEMENT, LIGHTS, SIGNS, ETC.), MILLING OF EXISTING PAVEMENTS, EXCAVATION, INSTALLATION OF ELECTRICAL INFRASTRUCTURE (EDGE LIGHTS, GUIDANCE SIGNS, CABLE, CONDUIT), DRAINAGE INFRASTRUCTURE AND STORMWATER IMPROVEMENTS, BASE COURSE, ASPHALT COURSES, PAVEMENT MARKINGS, TOPSOILING, AND HYDROSEEDING. THIS WORK IS LOCATED WITHIN RUNWAY SAFETY AREAS (RSA) AND REQUIRES RUNWAY 15-33 TO BE CLOSED DURING CONSTRUCTION.

TIME OF COMPLETION:
WORK IN WORK AREA B1 SHALL BEGIN AFTER COMPLETING WORK AREA A AND SHALL BE COMPLETED IN 21 CONSECUTIVE CALENDAR DAYS. WORK AREA B1 SHALL RUN CONCURRENTLY WITH WORK AREA B2.

LIQUIDATED DAMAGES:
FAILURE TO COMPLETE ALL THE WORK IN WORK AREA B1 AND REOPEN RUNWAY 15-33 WITHIN THE 21 CALENDAR DAYS SPECIFIED WILL RESULT IN THE ASSESSMENT OF LIQUIDATED DAMAGES IN THE AMOUNT OF $5,000 FOR EACH HOUR OR PORTION THEREOF IN WHICH THE WORK ITEMS REMAIN INCOMPLETE AND RUNWAY 15-33 IS NOT REOPENED.

WORK AREA B2 (ADD-ALT. 1):
CONTAINS ALL WORK ASSOCIATED WITH THE INSTALLATION OF CABLE AND CONDUIT FOR THE PROPOSED RUNWAY GUARD LIGHT AND PAVEMENT SURFACE SENSOR CIRCUITS. THIS WORK IS LOCATED WITHIN BOTH THE RUNWAY 10-28 AND RUNWAY 15-33 RUNWAY SAFETY AREAS (RSA) AND REQUIRES RUNWAY 10-28 AND RUNWAY 15-33 TO BE CLOSED DURING CONSTRUCTION.

TIME OF COMPLETION:
WORK IN WORK AREA B2 SHALL BEGIN AFTER COMPLETING WORK AREA A AND SHALL BE COMPLETED IN 1 CALENDAR NIGHT BETWEEN THE HOURS OF 00:00 AND 04:30. WORK AREA B2 SHALL RUN CONCURRENTLY WITH WORK AREA B1. **THE CONTRACTOR IS REQUIRED TO SCHEDULE AND COORDINATE THIS CLOSURE WITH THE AIRPORT, FAA AIR TRAFFIC CONTROL, FAA TECH OPS, AND ENGINEER. NO WORK SHALL TAKE PLACE UNTIL ALL PARTIES HAVE COME TO AN AGREEMENT ON THE CLOSURE DATE. THE CONTRACTOR SHALL NOT BE ENTITLED TO ADDITIONAL COMPENSATION FOR LOST TIME AND/OR PRODUCTIVITY DUE TO RESCHEDULING OF THE CLOSURE.**

LIQUIDATED DAMAGES:
FAILURE TO COMPLETE ALL THE WORK IN WORK AREA B2 AND REOPEN RUNWAY 10-28 WITHIN THE 1 CALENDAR NIGHT SPECIFIED WILL RESULT IN THE ASSESSMENT OF LIQUIDATED DAMAGES IN THE AMOUNT OF $10,000 FOR EACH HOUR OR PORTION THEREOF IN WHICH THE WORK ITEMS REMAIN INCOMPLETE AND RUNWAY 10-28 IS NOT REOPENED.

WORK AREA C (ADD-ALT. 1):
CONTAINS ALL WORK ASSOCIATED WITH THE REHABILITATION OF THE PORTION OF TAXIWAY A EAST LOCATED WITHIN THE RUNWAY 10-28 SAFETY AREA AT RUNWAY 28. THIS WORK INCLUDES INSTALLING TEMPORARY E&S MEASURES, DEMOLITION OF EXISTING AIRFIELD FEATURES (PAVEMENT, LIGHTS, SIGNS, ETC.), MILLING OF EXISTING PAVEMENTS, EXCAVATION, INSTALLATION OF ELECTRICAL INFRASTRUCTURE (EDGE LIGHTS, GUIDANCE SIGNS, CABLE, CONDUIT), DRAINAGE INFRASTRUCTURE AND STORMWATER IMPROVEMENTS, BASE COURSE, ASPHALT COURSES, PAVEMENT MARKINGS, TOPSOILING, AND HYDROSEEDING. THIS WORK IS LOCATED WITHIN RUNWAY SAFETY AREAS (RSA) AND REQUIRES RUNWAY 10-28 TO BE CLOSED DURING CONSTRUCTION.

TIME OF COMPLETION:
WORK IN WORK AREA C SHALL BEGIN AFTER COMPLETION OF WORK AREAS B1 & B2 AND SHALL BE COMPLETED IN 5 CONSECUTIVE CALENDAR DAYS.

LIQUIDATED DAMAGES:
FAILURE TO COMPLETE ALL THE WORK IN WORK AREA C AND REOPEN RUNWAY 10-28 WITHIN THE 5 CALENDAR DAYS SPECIFIED WILL RESULT IN THE ASSESSMENT OF LIQUIDATED DAMAGES IN THE AMOUNT OF $10,000 FOR EACH HOUR OR PORTION THEREOF IN WHICH THE WORK ITEMS REMAIN INCOMPLETE AND RUNWAY 10-28 IS NOT REOPENED.

WORK AREA D (ADD-ALT. 1):
CONTAINS ALL WORK ASSOCIATED WITH THE REHABILITATION OF THE SECTION OF TAXIWAY M LOCATED WITHIN THE RUNWAY 10-28 SAFETY AREA. THIS WORK INCLUDES DEMOLITION OF EXISTING AIRFIELD ELECTRICAL ITEMS (LIGHTS, SIGNS, ETC.), INSTALLATION OF ELECTRICAL INFRASTRUCTURE (EDGE LIGHTS, CABLE, CONDUIT), PAVEMENT MARKINGS, TOPSOILING, AND HYDROSEEDING. THIS WORK IS LOCATED WITHIN RUNWAY SAFETY AREAS (RSA) AND REQUIRES RUNWAY 10-28 TO BE CLOSED DURING CONSTRUCTION.

TIME OF COMPLETION:
WORK IN WORK AREA D SHALL BEGIN AFTER COMPLETING WORK AREA C AND SHALL BE COMPLETED IN 2 CONSECUTIVE CALENDAR DAYS.

LIQUIDATED DAMAGES:
FAILURE TO COMPLETE ALL THE WORK IN WORK AREA D AND REOPEN RUNWAY 10-28 WITHIN THE 2 CALENDAR DAYS SPECIFIED WILL RESULT IN THE ASSESSMENT OF LIQUIDATED DAMAGES IN THE AMOUNT OF $10,000 FOR EACH HOUR OR PORTION THEREOF IN WHICH THE WORK ITEMS REMAIN INCOMPLETE AND RUNWAY 10-28 IS NOT REOPENED.

WORK AREA E (ADD-ALT. 1):
CONTAINS ALL WORK ASSOCIATED WITH THE GROOVING OF THE TAXIWAY A AND M (SOUTH) INTERSECTION, TAXIWAY A AND RUNWAY 15-33 INTERSECTION INSIDE THE RUNWAY SAFETY AREA (RSA), AND TAXIWAY A EAST OF RUNWAY 15-33, AS WELL AS PLACEMENT OF THE FINAL COAT OF MARKINGS IN THESE AREAS. A PORTION OF THIS WORK IS LOCATED WITHIN THE RUNWAY 15-33 SAFETY AREA AND REQUIRES RUNWAY 15-33 TO BE CLOSED DURING CONSTRUCTION.

TIME OF COMPLETION:
WORK IN WORK AREA E SHALL BEGIN 30 CALENDAR DAYS AFTER THE COMPLETION OF WORK AREA D AND SHALL BE COMPLETED IN 14 CONSECUTIVE CALENDAR NIGHTS BETWEEN THE HOURS OF 00:00 AND 04:30.

LIQUIDATED DAMAGES:
FAILURE TO COMPLETE ALL THE WORK IN WORK AREA E WITHIN THE 14 CALENDAR NIGHTS SPECIFIED WILL RESULT IN THE ASSESSMENT OF LIQUIDATED DAMAGES IN THE AMOUNT OF $5,000 FOR EACH HOUR OR PORTION THEREOF IN WHICH THE WORK ITEMS REMAIN INCOMPLETE AND RUNWAY 15-33 IS NOT REOPENED.

WORK AREA F (BASE BID):
CONTAINS ALL WORK ASSOCIATED WITH THE GROOVING OF THE INTERSECTIONS OF TAXIWAY A WITH TAXIWAYS E, B, AND U. PLACEMENT OF THE FINAL COAT OF MARKINGS IN THESE AREAS WILL ALSO BE INCLUDED. THIS WORK IS LOCATED OUTSIDE ALL RUNWAY SAFETY AREAS (RSA).

TIME OF COMPLETION:
WORK IN WORK AREA F SHALL BEGIN AFTER COMPLETING WORK AREA E AND SHALL BE COMPLETED IN 7 CONSECUTIVE CALENDAR NIGHTS BETWEEN THE HOURS OF 00:00 AND 04:30.

LIQUIDATED DAMAGES:
FAILURE TO COMPLETE ALL THE WORK IN IN WORK AREA F WITHIN THE 7 CALENDAR NIGHTS SPECIFIED WILL RESULT IN THE ASSESSMENT OF LIQUIDATED DAMAGES IN THE AMOUNT OF $5,000 FOR EACH CALENDAR NIGHT OR PORTION THEREOF IN WHICH THE WORK ITEMS REMAIN INCOMPLETE.

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANDER · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

CONSTRUCTION SAFETY & PHASING NOTES - 2

SCALE: NTS	DESIGN: JPM	**CN-02**	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	21 OF 81	

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Page 1 of 1

BORING LOG

PROJECT:	Syracuse Airport - Taxiway A 'East'			**JOB NUMBER:**	G036-22--PW Labs #L-22091
LOCATION:	Syracuse, New York			**BORING NUMBER:**	B-1/C-1
CLIENT:	PW Laboratories, Inc.			**SURFACE ELEVATION:**	As Obtained by Client
				GROUND WATER READINGS	
DATE STARTED:	07/13/22	**DATE COMPLETED:**	07/13/22		Depth to Water: / Casing At:
DRILLER:	Marc Cheney	**HELPER:**	Zack Cheney	**WHILE DRILLING:**	7.6' / 9.1'
				BEFORE CASING REMOVED:	7.6' / 9.1'
CASING TYPE:	2 1/4" Hollow Stem Augers			**AFTER CASING REMOVED:**	None Noted
DRILL RIG:	Truck Mounted Central Mine Equipment Model 55			**CAVED AT DEPTH:**	3.4'

SAMPLE NUMBER	DEPTH OF SAMPLE	BLOW COUNTS OF SAMPLER DRIVE (per 6")	C/N	RECOVERY (inches)	DESCRIPTION OF SOIL (Color, Primary Matrix, Complementary Matrix)	DEPTH OF STRATA CHANGE
					12.00" Asphalt Pavement	1.1
1	1.1'-1.5'	50@5"	N/50+	5	Grey Crushed Stone (moist) ~*Fill*~	1.5
2a	3.1'-3.5'	18-18-13-14	N/31	12	Grey Crushed Stone with Geo-Fabric (moist) ~*Fill*~	3.5
2b	3.5'-5.1'				Brown cmf SAND, trace SILT (moist, compact)	
3	5.1'-7.1'	4-7-6-6	N/13	21	Brown fine SAND, trace SILT (wet, medium compact)	
4	7.1'-9.1'	3-5-6-6	N/11	24	Similar Soil (saturated, medium compact)	9.1
5	9.1'-11.1'	3-4-5-6	N/9	23	Grey SILT, trace fine SAND (wet, stiff)	
					Bottom of Boring @ 11.1'	

Notes:
Key to Drilling Terms: N - No. of blows to drive sampler 12" w/ 140 lb. hammer falling / 30"; C - % of Bedrock Core Recovery

Page 1 of 1

BORING LOG

PROJECT:	Syracuse Airport - Taxiway A 'East'			**JOB NUMBER:**	G036-22--PW Labs #L-22091
LOCATION:	Syracuse, New York			**BORING NUMBER:**	B-2/C-3
CLIENT:	PW Laboratories, Inc.			**SURFACE ELEVATION:**	As Obtained by Client
				GROUND WATER READINGS	
DATE STARTED:	07/13/22	**DATE COMPLETED:**	07/13/22		Depth to Water: / Casing At:
DRILLER:	Marc Cheney	**HELPER:**	Zack Cheney	**WHILE DRILLING:**	None Noted
				BEFORE CASING REMOVED:	None Noted / 9.2'
CASING TYPE:	2 1/4" Hollow Stem Augers			**AFTER CASING REMOVED:**	None Noted
DRILL RIG:	Truck Mounted Central Mine Equipment Model 55			**CAVED AT DEPTH:**	2.0'

SAMPLE NUMBER	DEPTH OF SAMPLE	BLOW COUNTS OF SAMPLER DRIVE (per 6")	C/N	RECOVERY (inches)	DESCRIPTION OF SOIL (Color, Primary Matrix, Complementary Matrix)	DEPTH OF STRATA CHANGE
					13.50" Asphalt Pavement	1.2
1	1.2'-3.2'	26-32-34-29	N/66	18	Grey/Brown cmf GRAVEL and cmf SAND, little SILT (moist, very compact)	
2	3.2'-5.2'	9-11-10-9	N/21	14	Dark Brown cmf SAND with Interlayered Brown mf SAND, trace SILT (moist, medium compact)	5.2
3	5.2'-7.2'	3-2-6-6	N/8	19	Black to Grey SILT, ltle fine SAND, trace CLAY, trace Root Hairs (moist, stiff)	7.2
4	7.2'-9.2'	3-3-3-2	N/6	24	Grey SILT (saturated, medium stiff)	
5	9.2'-11.2'	2-1-2-2	N/3	24	Grey SILT, trace fine SAND (saturated, soft)	
					Bottom of Boring @ 11.2'	

Notes:
Key to Drilling Terms: N - No. of blows to drive sampler 12" w/ 140 lb. hammer falling / 30"; C - % of Bedrock Core Recovery

Page 1 of 1

BORING LOG

PROJECT:	Syracuse Airport - Taxiway A 'East'			**JOB NUMBER:**	G036-22--PW Labs #L-22091
LOCATION:	Syracuse, New York			**BORING NUMBER:**	B-3/C-6
CLIENT:	PW Laboratories, Inc.			**SURFACE ELEVATION:**	As Obtained by Client
				GROUND WATER READINGS	
DATE STARTED:	07/13/22	**DATE COMPLETED:**	07/13/22		Depth to Water: / Casing At:
DRILLER:	Marc Cheney	**HELPER:**	Zack Cheney	**WHILE DRILLING:**	9.1' / 9.4'
				BEFORE CASING REMOVED:	8.7' / 9.4'
CASING TYPE:	2 1/4" Hollow Stem Augers			**AFTER CASING REMOVED:**	None Noted
DRILL RIG:	Truck Mounted Central Mine Equipment Model 55			**CAVED AT DEPTH:**	2.3'

SAMPLE NUMBER	DEPTH OF SAMPLE	BLOW COUNTS OF SAMPLER DRIVE (per 6")	C/N	RECOVERY (inches)	DESCRIPTION OF SOIL (Color, Primary Matrix, Complementary Matrix)	DEPTH OF STRATA CHANGE
					16.00" Asphalt Pavement	1.4
1	1.4'-3.4'	33-39-34-26	N/73	20	Grey mf GRAVEL and cmf SAND, trace SILT (moist, very compact)	3.4
2	3.4'-5.4'	9-8-8-9	N/16	17	Grey SILT, little fine SAND, trace CLAY (moist, very stiff)	
3	5.4'-7.4'	3-3-3-2	N/6	24	Brown SILT, trace fine SAND (wet, medium stiff)	7.4
4	7.4'-9.4'	2-3-4-4	N/7	19	Brown fine SAND, trace SILT (wet, loose)	
5	9.4'-11.4'	2-2-4-4	N/6	24	Similar Soil (saturated, loose)	
					Bottom of Boring @ 11.4"	

Notes:
Key to Drilling Terms: N - No. of blows to drive sampler 12" w/ 140 lb. hammer falling / 30"; C - % of Bedrock Core Recovery

Page 1 of 1

BORING LOG

PROJECT:	Syracuse Airport - Taxiway A 'East'			**JOB NUMBER:**	G036-22--PW Labs #L-22091
LOCATION:	Syracuse, New York			**BORING NUMBER:**	B-4/C-7
CLIENT:	PW Laboratories, Inc.			**SURFACE ELEVATION:**	As Obtained by Client
				GROUND WATER READINGS	
DATE STARTED:	07/12/22	**DATE COMPLETED:**	07/12/22		Depth to Water: / Casing At:
DRILLER:	Marc Cheney	**HELPER:**	Zack Cheney	**WHILE DRILLING:**	8.7' / 9.0'
				BEFORE CASING REMOVED:	8.6' / 9.0'
CASING TYPE:	2 1/4" Hollow Stem Augers			**AFTER CASING REMOVED:**	None Noted
DRILL RIG:	Truck Mounted Central Mine Equipment Model 55			**CAVED AT DEPTH:**	1.4'

SAMPLE NUMBER	DEPTH OF SAMPLE	BLOW COUNTS OF SAMPLER DRIVE (per 6")	C/N	RECOVERY (inches)	DESCRIPTION OF SOIL (Color, Primary Matrix, Complementary Matrix)	DEPTH OF STRATA CHANGE
					10.25" Asphalt Pavement	1.0
1	1.0'-3.0'	32-32-30-37	N/62	18	Grey/Brown cmf GRAVEL and cmf SAND, trace SILT (moist, very compact)	
2	3.0'-5.0'	16-19-13-9	N/32	15	Similar Soil (moist, compact)	
3	5.0'-7.0'	6-5-5-3	N/10	0	No Sample Recovery	7.0
4	7.0'-9.0'	2-1-1-2	N/2	20	Light Brown SILT, trace fine SAND (wet, very soft)	9.0
5	9.0'-11.0'	1-2-2-3	N/4	17	Brown fine SAND, little SILT (saturated, loose)	
					Bottom of Boring @ 11.0'	

Notes:
Key to Drilling Terms: N - No. of blows to drive sampler 12" w/ 140 lb. hammer falling / 30"; C - % of Bedrock Core Recovery

DISCLAIMER:
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NOTE:
1. LOCATIONS OF SOIL BORINGS, PAVEMENT CORES, AND TEST PITS SHOWN ON EXISTING CONDITIONS & DEMOLITION ("DE") DRAWINGS.

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

BORING LOGS

SCALE: NTS	DESIGN: JPM
DRAWN: SDB	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

BL-01
22 OF 81

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TAXIWAY 'A' (EAST) TEST PITS

PW Laboratories, Inc.
6544 Fremont Road - East Syracuse, New York 13057
Office 315.437.1420 - Fax 315.503-3058 - pwlabsinc@hotmail.com

Test Pit Investigation Log

Report Date: August 8, 2022
Project # : L-22091
Project Title: Rehabilitation of Taxiway 'A' East
MJ Project #18831.01
Project Location: Syracuse Hancock International Airport
Syracuse, New York
Test Pit Location: See Engineers Drawing

Date Started: July 11, 2022
Date Completed: July 11, 2022
Test Pit # 4
Surface Elev.: At Grade
Recorded By: Donald P. Blasland
Groundwater Depth: None Encountered
Perched Water Depth: None Encountered

DEPTH (Feet)	SAMPLE DEPTH (Feet)	SAMPLE NO.	SAMPLE TYPE	IN-SITU TEST(s)	TEST DEPTH (Feet)	DESCRIPTION OF MATERIAL	Strata Change Depth (Feet)
						Topsoil	0.5
1.0						Concrete	
						Bottom of Test Pit 1.2'	
2.0							
3.0							
4.0							
5.0							
6.0							
7.0							

Notes: *No sample was obtained*
NMC = Natural Moisture Content

PW Laboratories, Inc.
6544 Fremont Road - East Syracuse, New York 13057
Office 315.437.1420 - Fax 315.503-3058 - pwlabsinc@hotmail.com

Test Pit Investigation Log

Report Date: August 8, 2022
Project # : L-22091
Project Title: Rehabilitation of Taxiway 'A' East
MJ Project #18831.01
Project Location: Syracuse Hancock International Airport
Syracuse, New York
Test Pit Location: See Engineers Drawing

Date Started: July 11, 2022
Date Completed: July 11, 2022
Test Pit # 5
Surface Elev.: At Grade
Recorded By: Donald P. Blasland
Groundwater Depth: None Encountered
Perched Water Depth: None Encountered

DEPTH (Feet)	SAMPLE DEPTH (Feet)	SAMPLE NO.	SAMPLE TYPE	IN-SITU TEST(s)	TEST DEPTH (Feet)	DESCRIPTION OF MATERIAL	Strata Change Depth (Feet)
						Topsoil	0.5
1.0						Brown moist fine to medium SAND, little silt	1.2
						AC Penetrated CRUSHED STONE	1.5
2.0						Brown moist fine to coarse SAND, some fine to coarse gravel, trace silt	
3.0							2.8
						Brown moist fine to coarse SAND and SILT, trace fine to medium gravel	
4.0							
5.0							
6.0							
7.0						Bottom of Test Pit 6.0'	

Notes: *No sample was obtained*
NMC = Natural Moisture Content

PW Laboratories, Inc.
6544 Fremont Road - East Syracuse, New York 13057
Office 315.437.1420 - Fax 315.503-3058 - pwlabsinc@hotmail.com

Test Pit Investigation Log

Report Date: August 8, 2022
Project # : L-22091
Project Title: Rehabilitation of Taxiway 'A' East
MJ Project #18831.01
Project Location: Syracuse Hancock International Airport
Syracuse, New York
Test Pit Location: See Engineers Drawing

Date Started: July 11, 2022
Date Completed: July 11, 2022
Test Pit # 6
Surface Elev.: At Grade
Recorded By: Donald P. Blasland
Groundwater Depth: None Encountered
Perched Water Depth: None Encountered

DEPTH (Feet)	SAMPLE DEPTH (Feet)	SAMPLE NO.	SAMPLE TYPE	IN-SITU TEST(s)	TEST DEPTH (Feet)	DESCRIPTION OF MATERIAL	Strata Change Depth (Feet)
						Topsoil	0.5
1.0						Brown moist SILT, some fine to coarse sand, little clay	
2.0							
3.0							
	3.0 - 3.5	6A	Bulk	NMC	3.0		
4.0							
5.0							
6.0							
7.0						Bottom of Test Pit 6.2'	

Notes:
NMC = Natural Moisture Content

PW Laboratories, Inc.
6544 Fremont Road - East Syracuse, New York 13057
Office 315.437.1420 - Fax 315.503-3058 - pwlabsinc@hotmail.com

Test Pit Investigation Log

Report Date: August 8, 2022
Project # : L-22091
Project Title: Rehabilitation of Taxiway 'A' East
MJ Project #18831.01
Project Location: Syracuse Hancock International Airport
Syracuse, New York
Test Pit Location: See Engineers Drawing

Date Started: July 11, 2022
Date Completed: July 11, 2022
Test Pit # 7
Surface Elev.: At Grade
Recorded By: Donald P. Blasland
Groundwater Depth: None Encountered
Perched Water Depth: None Encountered

DEPTH (Feet)	SAMPLE DEPTH (Feet)	SAMPLE NO.	SAMPLE TYPE	IN-SITU TEST(s)	TEST DEPTH (Feet)	DESCRIPTION OF MATERIAL	Strata Change Depth (Feet)
						Topsoil	0.5
1.0						Brown Gray moist mottled SILT	1.0
						Brown moist to wet SILT, little clay, little coarse to fine sand	
2.0							
3.0							
4.0							
5.0							
6.0						Brown gray moist mottled SILT	5.9
						Bottom of Test Pit 6.0'	
7.0							

Notes: *No sample was obtained*
NMC = Natural Moisture Content

NOTE:
1. LOCATIONS OF SOIL BORINGS, PAVEMENT CORES, AND TEST PITS SHOWN ON EXISTING CONDITIONS & DEMOLITION ("DE") DRAWINGS.

DISCLAIMER:
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CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANDE · 084099 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)
TEST PIT LOGS

SCALE: NTS	DESIGN: JPM	**BL-02**	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	23 OF 81	

PW Laboratories, Inc.
6544 Fremont Road - East Syracuse, New York 13057
Office 315.437.1420 ~ Fax 315.503-3058~ pwlabsinc@hotmail.com

Report Date: 8/8/2022

L-22091
Syracuse Hancock International Airport - Rehabilitation of Taxiway 'A' East - Syracuse, NY
MJ Project #18831.01

Asphalt Pavement Section Thickness (ASTM D3549)

			Asphalt Pavement Estimated Thickness								
Core I.D.	Lab I.D. #	Core Location	1st (Upper) Course (Inches)	2nd Course (Inches)	3rd Course (Inches)	4th Course (Inches)	5th Course (Inches)	6th Course (Inches)	7th Course (Inches)	8TH Course (Inches)	Asphalt Pavement Total Test Hole Thickness (Inches)
C-1	42944	See Engineer's Drawing	1 3/4CT	2 7/8 CT	4 1/8 BI	3 3/4 BI	-	-	-	-	12 1/2
C-2	42945	See Engineer's Drawing	2 BI	2 5/8 BI	3 7/8 CT	2 3/8 CT	1 5/8 CT	2 1/8 CT	1 BA	-	15 5/8
C-3	42946	See Engineer's Drawing	2 CT	2 3/4 BI	1 3/8 FT	2 7/8 CT	2 CT	2 CT	1 BA	-	14
C-4	42947	See Engineer's Drawing	2 CT	2 7/8 CT	3 1/2 CT	2 3/4 BI	3 1/4 BI	-	-	-	14 3/8
C-5	42948	See Engineer's Drawing	2 1/8 CT	3 5/8 BI	2 3/4 CT	1 1/2 CT	1 1/2 CT	2 BA	-	-	13 1/2
C-6	42949	See Engineer's Drawing	2 FT	1 3/8 FT	1 1 /2 CT	2 CT	2 7/8 BI	3 BI	3 1/8 BI	-	15 7/8
C-7	42950	See Engineer's Drawing	1 5/8 CT	1 1/2 BI	1 3/8 CT	1 5/8 CT	2 1/8 BI	2 1/4 BI	-	-	10 1/2
C-8	42951	See Engineer's Drawing	1 3/4 CT	1 3/8 CT	1 3/8 CT	1 3/4 CT	1 1/2 BI	3 BI	-	-	10 3/4
C-9	42952	See Engineer's Drawing	2 3/4 CT	2 CT	1 3/4 CT	2 5/8 CT	1 7/8 BI	2 1/2 BI	-	-	13 1/2
C-10	42953	See Engineer's Drawing	1 5/8 FT	2 1/4 FT	2 3/8 BI	2 3/4 BI	1 7/8 BI	2 1/2 CT	-	-	13 3/8
C-11	42954	See Engineer's Drawing	3 CT	2 3/8 CT	2 CT	1 1/2 FT	1 3/8 FT	1 1/4 FT	2 1/4 BI	3 1/2 BI	17 3/4

Note: (1) All Thickness Measurements Were Obtained To The Nearest 1/8 Inch.
(2) Description Of Course Type Derived From Estimate Of Nominal Maximum Aggregate Size

PAVEMENT DESCRIPTION
FT = Fine Top
CT = Coarse Top
BI = Binder
BA = Base

NOTE:
1. LOCATIONS OF SOIL BORINGS, PAVEMENT CORES, AND TEST PITS SHOWN ON EXISTING CONDITIONS & DEMOLITION ("DE") DRAWINGS.

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CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

PAVEMENT CORE SUMMARY

SCALE: NTS	DESIGN: JPM	**BL-03**	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	24 OF 81	

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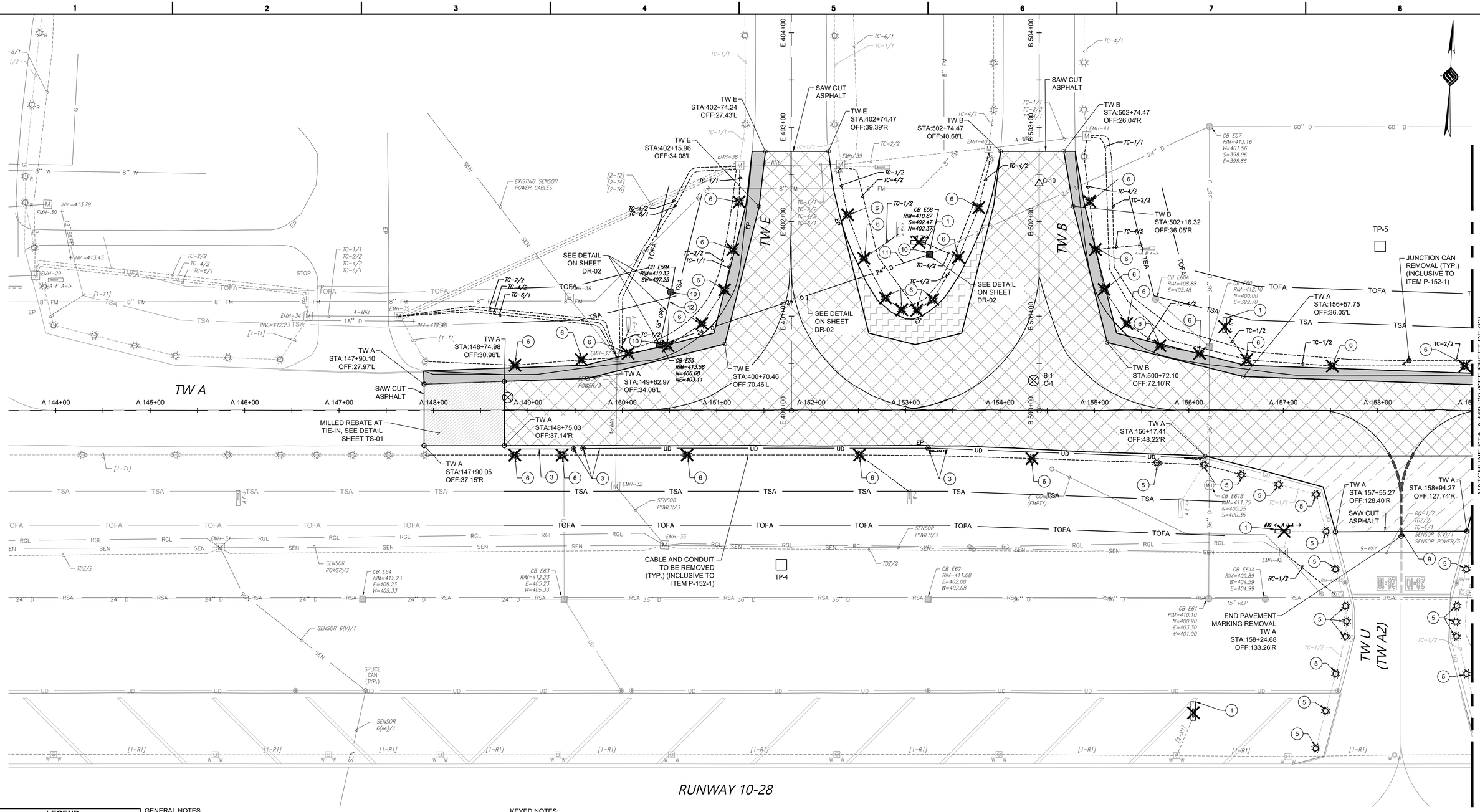


LEGEND

- PROFILE MILL EXISTING ASPHALT PAVEMENT (SEE NOTE 2)
- PROPOSED FULL DEPTH PAVEMENT SECTION (SEE NOTE 3)
- PAVEMENT REMOVAL & SOIL RESTORATION (SEE NOTE 4)
- PROPOSED PAVEMENT TRANSITION AREA (SEE NOTE 5)
- REMOVE STRUCTURE
- C-1 PAVEMENT CORE
- B-1 C-3 BORING AND PAVEMENT CORE
- TP-1 TEST PIT

GENERAL NOTES:

1. SEE CONSTRUCTION PHASING DRAWINGS FOR DEMOLITION SEQUENCING (CS SERIES).
2. PROFILE MILLING SHALL BE PAID FOR UNDER ITEM P-101-1.
3. FULL DEPTH EXCAVATION FOR NEW PAVEMENT SECTION SHALL BE PAID FOR UNDER ITEM P-152-1 AS DETAILED ON DWG. TS-01.
4. PAVEMENT REMOVAL IN SOIL RESTORATION AREAS SHALL BE PAID FOR UNDER ITEM P-152-1. SOIL RESTORATION SHALL BE PAID SEPARATELY UNDER ITEM T-902-1. SEE DETAIL SHEET GD-02.
5. MILLING IN PAVEMENT TRANSITION AREA SHALL BE PAID UNDER ITEM P-101-3. SEE DETAIL ON DWG. TS-02.
6. AREAS INDICATED AS ASPHALT REMOVAL SHALL INCLUDE SAW CUT AND REMOVAL OF THE PAVEMENT.
7. ALL PAVEMENT REMOVAL SHALL BE SAW CUT TO FORM A CLEAN EDGE AT THE LINE OF REMOVAL.
8. ASPHALT MILLINGS GENERATED FROM ASPHALT REMOVAL ARE TO BE REMOVED AND DISPOSED OF OFF-SITE BY THE CONTRACTOR. SEE SPEC SECTION P-101.
9. TYPE AND LOCATION OF EXISTING UTILITIES SHOWN IS BASED ON AVAILABLE INFORMATION. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND LOCATING ALL EXISTING UTILITIES PRIOR TO DEMOLITION AND EXCAVATION.
10. ITEMS TO REMAIN SHALL BE PROTECTED AS NECESSARY.
11. COORDINATE UTILITY DEMOLITION TO MAINTAIN UTILITY SERVICES AT ALL TIMES, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
12. MAINTAIN SERVICE TO EXISTING ELECTRICAL AND COMMUNICATION FACILITIES AT ALL TIMES.
13. CONTRACTOR IS TO VERIFY ALL ITEMS FOR REMOVAL AND REPORT DISCREPANCIES TO ENGINEER.
14. THE AIRPORT SHALL HAVE THE RIGHT TO SALVAGE ANY OR ALL ELECTRICAL ITEMS REMOVED, INCLUDING LIGHTS, SIGNS, GUARD LIGHTS, TRANSFORMERS, ETC. THE CONTRACTOR SHALL COORDINATE WITH THE AIRPORT REGARDING SALVAGED ITEMS PRIOR TO REMOVAL.
15. REFER TO DWG. NOS. GR-01 TO GR-04 AND DR-01 TO DR-03 FOR EXISTING DRAINAGE STRUCTURE MODIFICATION DETAILS AND TABLES.

KEYED NOTES:

1. REMOVE AIRFIELD GUIDANCE SIGN AND FOUNDATION (ITEM L-125-77)
2. REMOVE AND RESET EXISTING GUARD LIGHT (ITEM L-125-68)
3. REMOVE EXISTING UNDERDRAIN PIPE / CLEAN-OUT (INC. TO ITEM P-152-1)
4. REMOVE EXISTING IN-PAVEMENT EDGE LIGHT, CAN TO REMAIN (ITEM L-125-502)
5. REMOVE EXISTING ELEVATED EDGE LIGHT, CAN TO REMAIN (ITEM L-125-65)
6. REMOVE BASE-MOUNTED ELEVATED EDGE LIGHT AND CAN (ITEM L-125-64)
7. REMOVE AIRFIELD GUIDANCE SIGN, FOUNDATION TO REMAIN (ITEM L-125-78)
8. REMOVE RUNWAY GUARD LIGHT AND CAN (ITEM L-125-67)
9. REMOVE PAVEMENT MARKINGS BY WATERBLASTING (ITEM P-101-6)
10. REMOVE EXISTING DRAINAGE STRUCTURE (ITEM D-751-7)
11. PLACE CLSM & CONCRETE PLUGS IN EXISTING DRAINAGE PIPE (ITEM P-153-1 & D-703-1)
12. REMOVE EXISTING DRAINAGE PIPE (ITEM D-701-62)

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

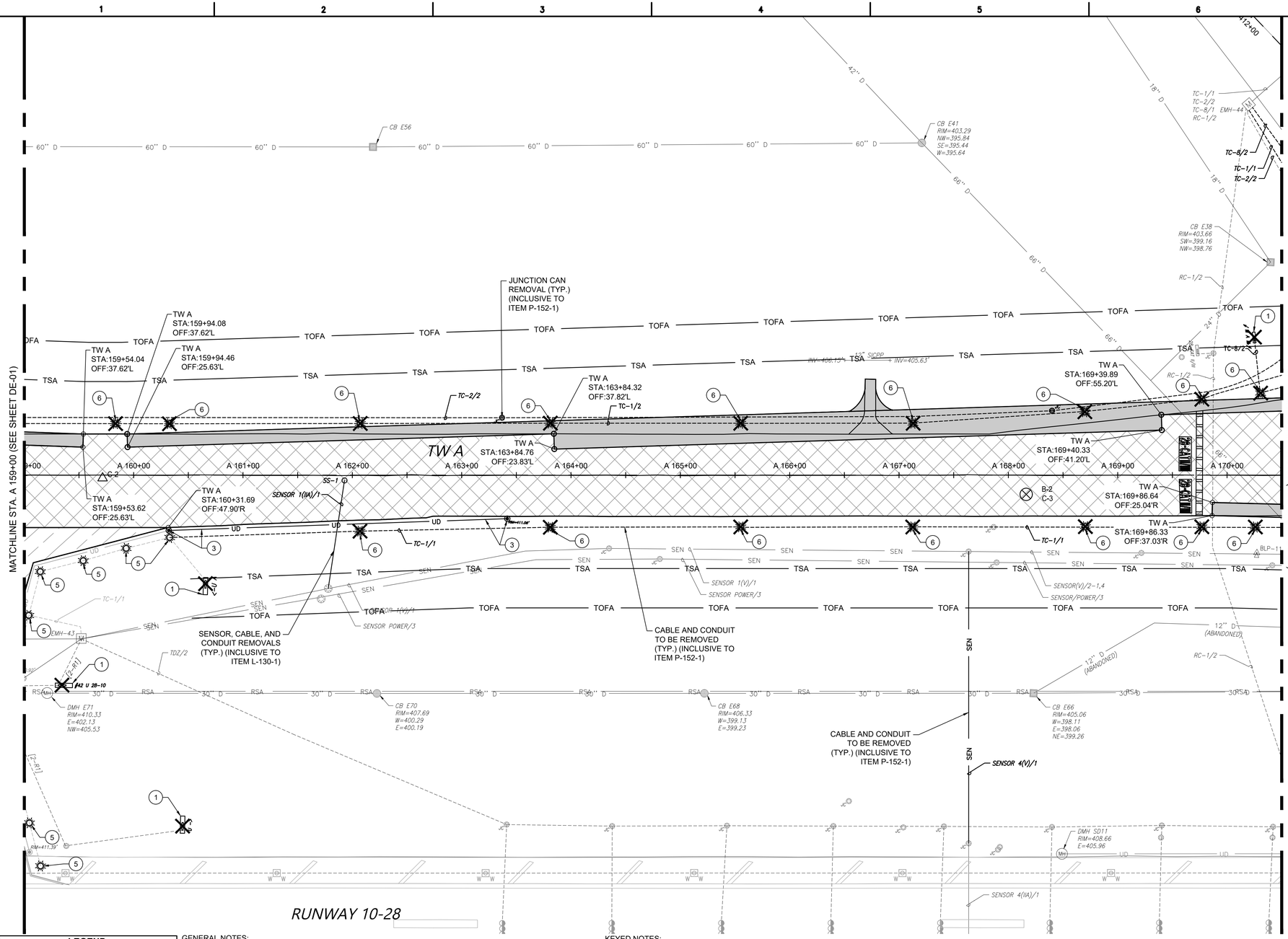
SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

EXISTING CONDITIONS & DEMOLITION PLAN (SHEET 1 OF 4)

SCALE: AS SHOWN	DESIGN: JPM	**DE-01**
DRAWN: SDB	PROJECT: 18831.08	
CHECKED: SJL	DATE: APRIL 2024	25 OF 81

K:\SYRACUSE\RT-18831.08 TW A EAST DESIGN\DRAWINGS\SHEET FILES\18831.08-DEMO.DWG



LEGEND

- PROFILE MILL EXISTING ASPHALT PAVEMENT (SEE NOTE 2)
- PROPOSED FULL DEPTH PAVEMENT SECTION (SEE NOTE 3)
- PAVEMENT REMOVAL & SOIL RESTORATION (SEE NOTE 4)
- PROPOSED PAVEMENT TRANSITION AREA (SEE NOTE 5)
- REMOVE STRUCTURE
- C-1 PAVEMENT CORE
- B-1, C-3 BORING AND PAVEMENT CORE
- TP-1 TEST PIT

GENERAL NOTES:

1. SEE CONSTRUCTION PHASING DRAWINGS FOR DEMOLITION SEQUENCING (CS SERIES).
2. PROFILE MILLING SHALL BE PAID FOR UNDER ITEM P-101-1.
3. FULL DEPTH EXCAVATION FOR NEW PAVEMENT SECTION SHALL BE PAID FOR UNDER ITEM P-152-1 AS DETAILED ON DWG. TS-01.
4. PAVEMENT REMOVAL IN SOIL RESTORATION AREAS SHALL BE PAID FOR UNDER ITEM P-152-1. SOIL RESTORATION SHALL BE PAID SEPARATELY UNDER ITEM T-902-1. SEE DETAIL SHEET GD-02.
5. MILLING IN PAVEMENT TRANSITION AREA SHALL BE PAID UNDER ITEM P-101-3. SEE DETAIL ON DWG. TS-02.
6. AREAS INDICATED AS ASPHALT REMOVAL SHALL INCLUDE SAW CUT AND REMOVAL OF THE PAVEMENT.
7. ALL PAVEMENT REMOVAL SHALL BE SAW CUT TO FORM A CLEAN EDGE AT THE LINE OF REMOVAL.
8. ASPHALT MILLINGS GENERATED FROM ASPHALT REMOVAL ARE TO BE REMOVED AND DISPOSED OF OFF-SITE BY THE CONTRACTOR. SEE SPEC SECTION P-101.
9. TYPE AND LOCATION OF EXISTING UTILITIES SHOWN IS BASED ON AVAILABLE INFORMATION. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND LOCATING ALL EXISTING UTILITIES PRIOR TO DEMOLITION AND EXCAVATION.
10. ITEMS TO REMAIN SHALL BE PROTECTED AS NECESSARY.
11. COORDINATE UTILITY DEMOLITION TO MAINTAIN UTILITY SERVICES AT ALL TIMES, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
12. MAINTAIN SERVICE TO EXISTING ELECTRICAL AND COMMUNICATION FACILITIES AT ALL TIMES.
13. CONTRACTOR IS TO VERIFY ALL ITEMS FOR REMOVAL AND REPORT DISCREPANCIES TO ENGINEER.
14. THE AIRPORT SHALL HAVE THE RIGHT TO SALVAGE ANY OR ALL ELECTRICAL ITEMS REMOVED, INCLUDING LIGHTS, SIGNS, GUARD LIGHTS, TRANSFORMERS, ETC. THE CONTRACTOR SHALL COORDINATE WITH THE AIRPORT REGARDING SALVAGED ITEMS PRIOR TO REMOVAL.
15. REFER TO DWG. NOS. GR-01 TO GR-04 AND DR-01 TO DR-03 FOR EXISTING DRAINAGE STRUCTURE MODIFICATION DETAILS AND TABLES.

KEYED NOTES:

1. REMOVE AIRFIELD GUIDANCE SIGN AND FOUNDATION (ITEM L-125-77)
2. REMOVE AND RESET EXISTING GUARD LIGHT (ITEM L-125-68)
3. REMOVE EXISTING UNDERDRAIN PIPE / CLEAN-OUT (INC. TO ITEM P-152-1)
4. REMOVE EXISTING IN-PAVEMENT EDGE LIGHT, CAN TO REMAIN (ITEM L-125-502)
5. REMOVE EXISTING ELEVATED EDGE LIGHT, CAN TO REMAIN (ITEM L-125-65)
6. REMOVE BASE-MOUNTED ELEVATED EDGE LIGHT AND CAN (ITEM L-125-64)
7. REMOVE AIRFIELD GUIDANCE SIGN, FOUNDATION TO REMAIN (ITEM L-125-78)
8. REMOVE RUNWAY GUARD LIGHT AND CAN (ITEM L-125-67)
9. REMOVE PAVEMENT MARKINGS BY WATERBLASTING (ITEM P-101-6)
10. REMOVE EXISTING DRAINAGE STRUCTURE (ITEM D-751-7)
11. PLACE CLSM & CONCRETE PLUGS IN EXISTING DRAINAGE PIPE (ITEM P-153-1 & D-703-1)
12. REMOVE EXISTING DRAINAGE PIPE (ITEM D-701-62)

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

EXISTING CONDITIONS & DEMOLITION PLAN (SHEET 2 OF 4)

SCALE: AS SHOWN	DESIGN: JPM	**DE-02**
DRAWN: SDB	PROJECT: 18831.08	
CHECKED: SJL	DATE: APRIL 2024	26 OF 81

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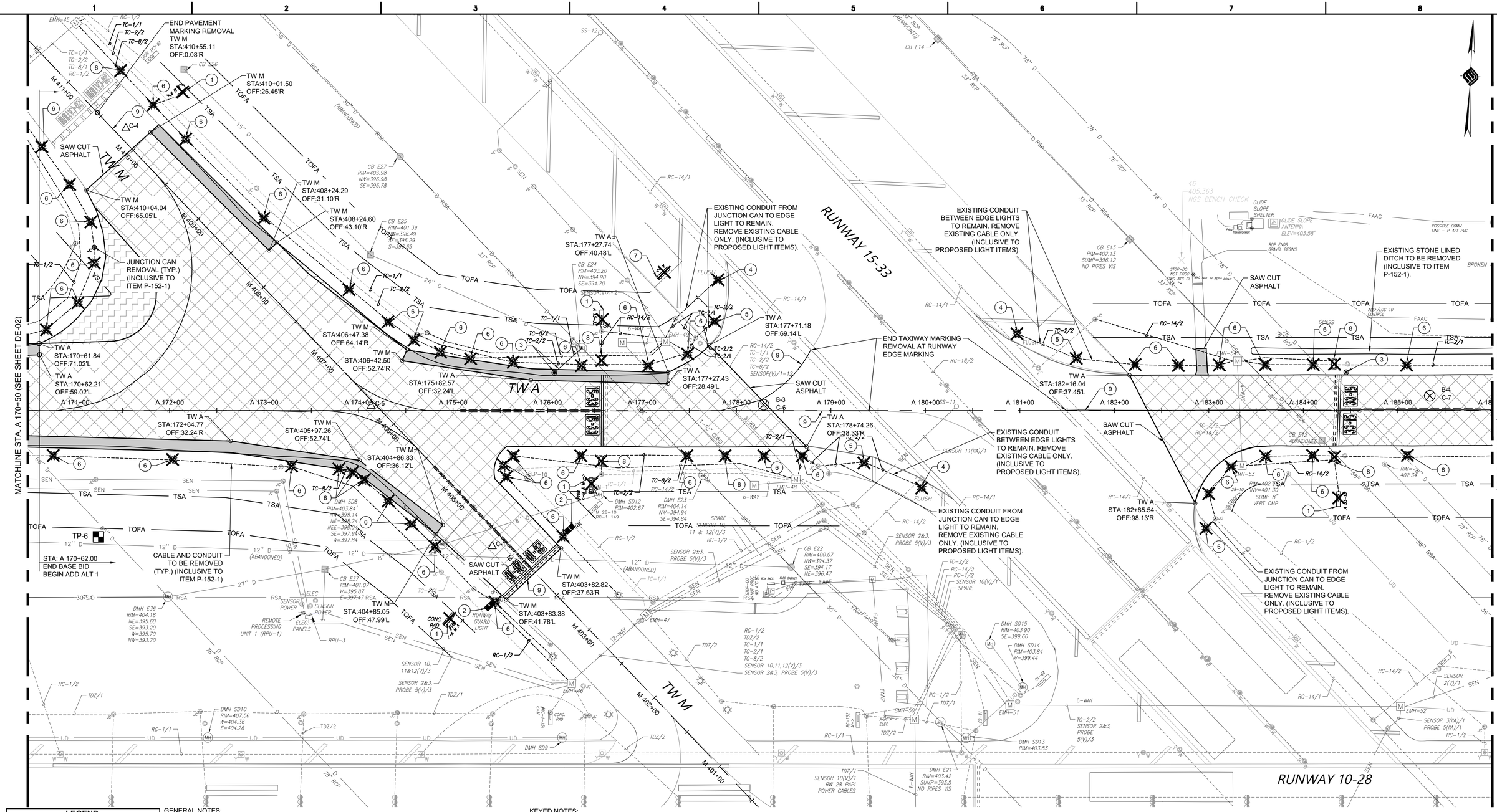

LEGEND

- PROFILE MILL EXISTING ASPHALT PAVEMENT (SEE NOTE 2)
- PROPOSED FULL DEPTH PAVEMENT SECTION (SEE NOTE 3)
- PAVEMENT REMOVAL & SOIL RESTORATION (SEE NOTE 4)
- PROPOSED PAVEMENT TRANSITION AREA (SEE NOTE 5)
- REMOVE STRUCTURE
- C-1 PAVEMENT CORE
- B-1 / C-3 BORING AND PAVEMENT CORE
- TP-1 TEST PIT

GENERAL NOTES:

1. SEE CONSTRUCTION PHASING DRAWINGS FOR DEMOLITION SEQUENCING (CS SERIES).
2. PROFILE MILLING SHALL BE PAID FOR UNDER ITEM P-101-1.
3. FULL DEPTH EXCAVATION FOR NEW PAVEMENT SECTION SHALL BE PAID FOR UNDER ITEM P-152-1 AS DETAILED ON DWG. TS-01.
4. PAVEMENT REMOVAL IN SOIL RESTORATION AREAS SHALL BE PAID FOR UNDER ITEM P-152-1. SOIL RESTORATION SHALL BE PAID SEPARATELY UNDER ITEM T-902-1. SEE DETAIL SHEET GD-02.
5. MILLING IN PAVEMENT TRANSITION AREA SHALL BE PAID UNDER ITEM P-101-3. SEE DETAIL ON DWG. TS-02.
6. AREAS INDICATED AS ASPHALT REMOVAL SHALL INCLUDE SAW CUT AND REMOVAL OF THE PAVEMENT.
7. ALL PAVEMENT REMOVAL SHALL BE SAW CUT TO FORM A CLEAN EDGE AT THE LINE OF REMOVAL.
8. ASPHALT MILLINGS GENERATED FROM ASPHALT REMOVAL ARE TO BE REMOVED AND DISPOSED OF OFF-SITE BY THE CONTRACTOR. SEE SPEC SECTION P-101.
9. TYPE AND LOCATION OF EXISTING UTILITIES SHOWN IS BASED ON AVAILABLE INFORMATION. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND LOCATING ALL EXISTING UTILITIES PRIOR TO DEMOLITION AND EXCAVATION.
10. ITEMS TO REMAIN SHALL BE PROTECTED AS NECESSARY.
11. COORDINATE UTILITY DEMOLITION TO MAINTAIN UTILITY SERVICES AT ALL TIMES, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
12. MAINTAIN SERVICE TO EXISTING ELECTRICAL AND COMMUNICATION FACILITIES AT ALL TIMES.
13. CONTRACTOR IS TO VERIFY ALL ITEMS FOR REMOVAL AND REPORT DISCREPANCIES TO ENGINEER.
14. THE AIRPORT SHALL HAVE THE RIGHT TO SALVAGE ANY OR ALL ELECTRICAL ITEMS REMOVED, INCLUDING LIGHTS, SIGNS, GUARD LIGHTS, TRANSFORMERS, ETC. THE CONTRACTOR SHALL COORDINATE WITH THE AIRPORT REGARDING SALVAGED ITEMS PRIOR TO REMOVAL.
15. REFER TO DWG. NOS. GR-01 TO GR-04 AND DR-01 TO DR-03 FOR EXISTING DRAINAGE STRUCTURE MODIFICATION DETAILS AND TABLES.

KEYED NOTES:

1. REMOVE AIRFIELD GUIDANCE SIGN AND FOUNDATION (ITEM L-125-77)
2. REMOVE AND RESET EXISTING GUARD LIGHT (ITEM L-125-68)
3. REMOVE EXISTING UNDERDRAIN PIPE / CLEAN-OUT (INC. TO ITEM P-152-1)
4. REMOVE EXISTING IN-PAVEMENT EDGE LIGHT, CAN TO REMAIN (ITEM L-125-502)
5. REMOVE EXISTING ELEVATED EDGE LIGHT, CAN TO REMAIN (ITEM L-125-65)
6. REMOVE BASE-MOUNTED ELEVATED EDGE LIGHT AND CAN (ITEM L-125-64)
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8. REMOVE RUNWAY GUARD LIGHT AND CAN (ITEM L-125-67)
9. REMOVE PAVEMENT MARKINGS BY WATERBLASTING (ITEM P-101-6)
10. REMOVE EXISTING DRAINAGE STRUCTURE (ITEM D-751-7)
11. PLACE CLSM & CONCRETE PLUGS IN EXISTING DRAINAGE PIPE (ITEM P-153-1 & D-703-1)
12. REMOVE EXISTING DRAINAGE PIPE (ITEM D-701-62)

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

EXISTING CONDITIONS & DEMOLITION PLAN (SHEET 3 OF 4)

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SCALE: AS SHOWN	DESIGN: JPM	DE-03
DRAWN: SDB	PROJECT: 18831.08	
CHECKED: SJL	DATE: APRIL 2024	27 OF 81

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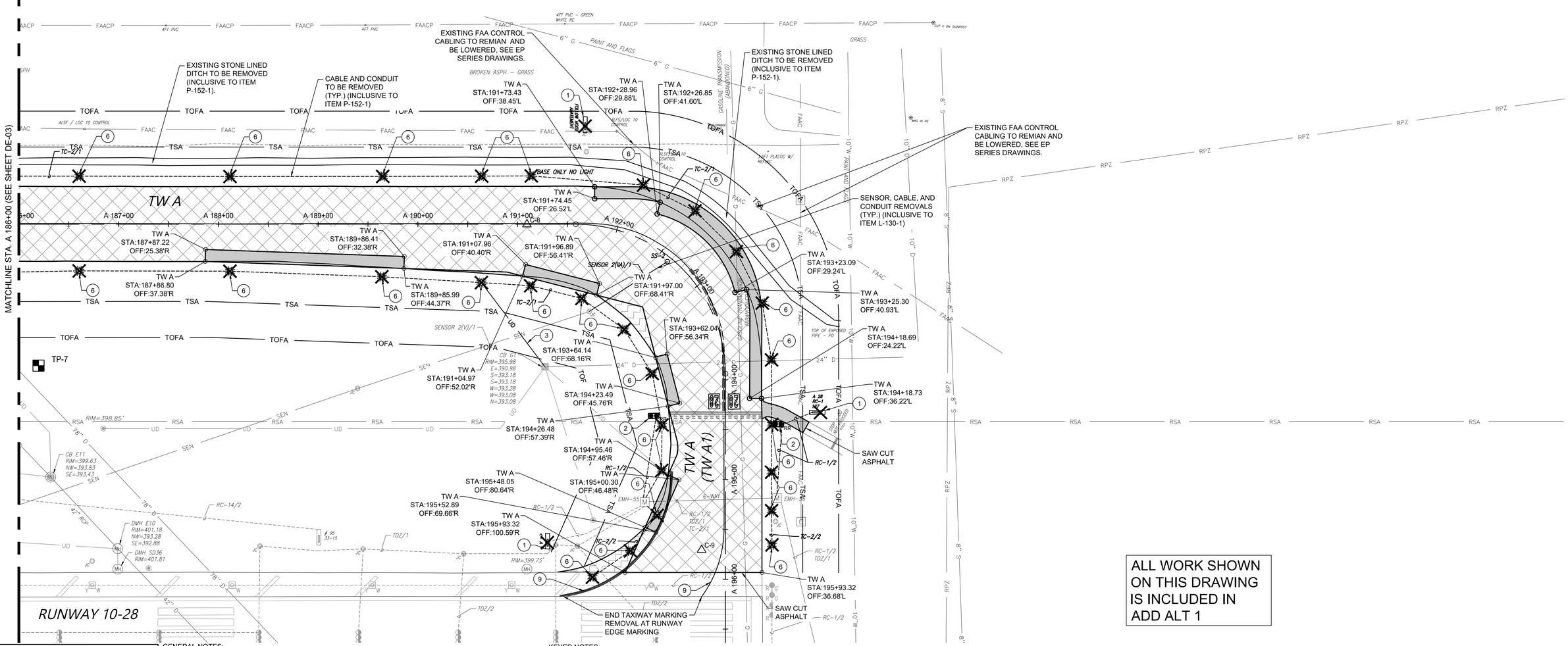

ALL WORK SHOWN ON THIS DRAWING IS INCLUDED IN ADD ALT 1

LEGEND

- PROFILE MILL EXISTING ASPHALT PAVEMENT (SEE NOTE 2)
- PROPOSED FULL DEPTH PAVEMENT SECTION (SEE NOTE 3)
- PAVEMENT REMOVAL & SOIL RESTORATION (SEE NOTE 4)
- PROPOSED PAVEMENT TRANSITION AREA (SEE NOTE 5)
- REMOVE STRUCTURE
- C-1 PAVEMENT CORE
- B-1, C-3 BORING AND PAVEMENT CORE
- TP-1 TEST PIT

GENERAL NOTES:

1. SEE CONSTRUCTION PHASING DRAWINGS FOR DEMOLITION SEQUENCING (CS SERIES).
2. PROFILE MILLING SHALL BE PAID FOR UNDER ITEM P-101-1.
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7. ALL PAVEMENT REMOVAL SHALL BE SAW CUT TO FORM A CLEAN EDGE AT THE LINE OF REMOVAL.
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15. REFER TO DWG. NOS. GR-01 TO GR-04 AND DR-01 TO DR-03 FOR EXISTING DRAINAGE STRUCTURE MODIFICATION DETAILS AND TABLES.

KEYED NOTES:

1. REMOVE AIRFIELD GUIDANCE SIGN AND FOUNDATION (ITEM L-125-77)
2. REMOVE AND RESET EXISTING GUARD LIGHT (ITEM L-125-68)
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11. PLACE CLSM & CONCRETE PLUGS IN EXISTING DRAINAGE PIPE (ITEM P-153-1 & D-703-1)
12. REMOVE EXISTING DRAINAGE PIPE (ITEM D-701-62)

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

EXISTING CONDITIONS & DEMOLITION PLAN (SHEET 4 OF 4)

SCALE: AS SHOWN	DESIGN: JPM	DE-04
DRAWN: SDB	PROJECT: 18831.08	28 OF 81
CHECKED: SJL	DATE: APRIL 2024	

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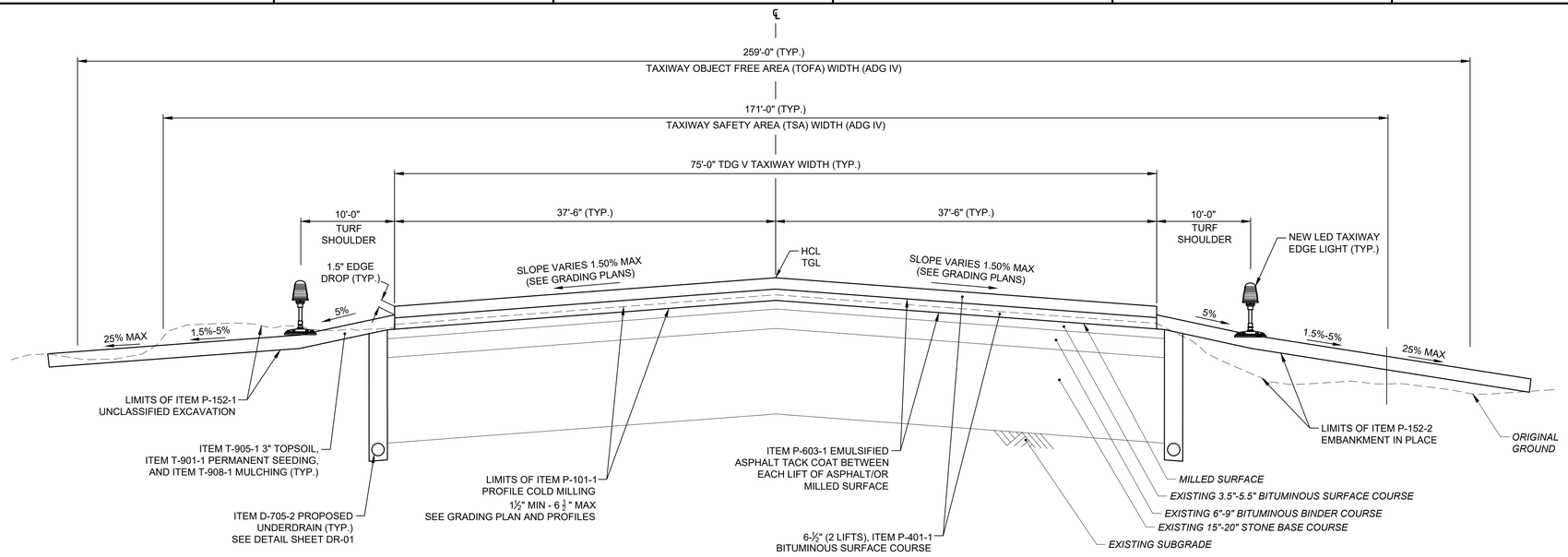


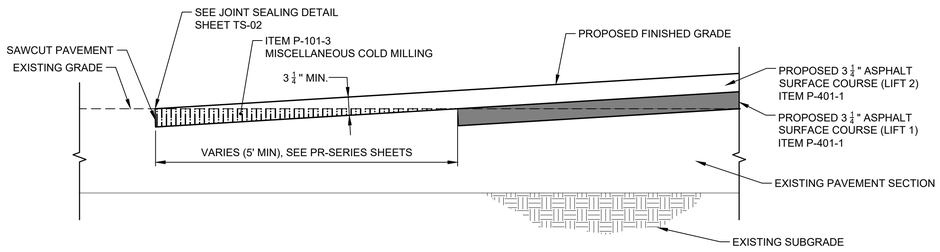
PROPOSED TAXIWAY A AND CONNECTING TAXIWAYS - MILL & OVERLAY SECTION

1 TS-01

STA. A 148+75 TO STA. A 170+62.00 (BASE BID)
STA. A 170+62.00 TO STA. A 178+37.49 (ADD ALT 1) AND
STA. A 182+35.24 TO STA. A 195+93.32 (ADD ALT 1)
N.T.S.

GENERAL NOTES:

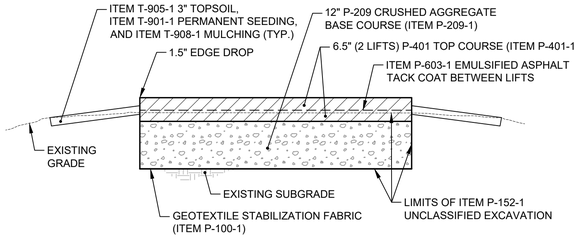
1. ALL COSTS ASSOCIATED WITH SAWING, FORMING, AND SEALING OF JOINTS SHALL BE CONSIDERED INCIDENTAL TO THE PAVEMENT ITEMS.
2. LONGITUDINAL PAVING JOINTS IN ONE LAYER SHALL BE OFFSET BY AT LEAST 1.0' FROM LONGITUDINAL PAVING JOINTS IN THE PREVIOUS LAYER.
3. TRANSVERSE PAVING JOINTS IN ADJACENT LANES SHALL BE OFFSET A MINIMUM OF 10'.
4. SURVEY OF FINISHED SURFACES: THE CONTRACTOR SHALL CROSS SECTION THE AGGREGATE BASE SURFACE LIFTS AND EACH PAVEMENT LIFT TO VERIFY THAT EACH OPERATION HAS PRODUCED A UNIFORM SURFACE MEETING THE SPECIFICATION REQUIREMENTS. CROSS SECTIONS SHALL BE TAKEN AT 25 L.F. INTERVALS WITH A 18 L.F. MAXIMUM TRANSVERSE SPACING, STARTING AT CENTERLINE. RESULTS OF THE SURVEY SHALL BE FURNISHED TO THE ENGINEER A MINIMUM OF 24 HOURS BEFORE THE INTENDED PLACEMENT OF THE FOLLOWING COURSE. THE INFORMATION SUPPLIED SHALL IDENTIFY THE SURFACE, LOCATION BY STATION AND OFFSET, DESIGN ELEVATION, ACTUAL ELEVATION, AND THE ELEVATION DIFFERENCE NOTED. ANY REQUIRED CORRECTIONS TO THE SURFACE SHALL BE APPROVED BY THE ENGINEER AND CONDUCTED AT NO ADDITIONAL COST TO THE OWNER.
5. MAINLINE PAVING ON THE ASPHALT PAVEMENTS SHALL BE AT A WIDTH OF 19 L.F. THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH MANUFACTURER'S INFORMATION VERIFYING THAT THE PAVER(S) TO BE UTILIZED FOR MAINLINE PAVING ARE DESIGNED TO PLACE THE REQUIRED DEPTH OF ASPHALT AT THIS WIDTH.
6. PRODUCTION PAVING SHALL BE SCHEDULED SUCH THAT THE FULL WIDTH OF THE PAVEMENT AREA IS PLACED DURING A SINGLE PAVING PRODUCTION DAY. A FULL WIDTH EXPANSION JOINT SHALL BE PLACED AT THE LOCATION OF THE COLD JOINT LEFT AT THE END OF EACH PRODUCTION DAY. COLD JOINTS ON THE FIRST AND SECOND LIFT SHALL BE STAGGERED A MINIMUM OF 50 L.F. FROM EACH OTHER. SEE JOINT SEALING DETAIL ON SHEET TS-02.
7. IRREGULAR JOINTS, OR PAVING JOINTS THAT ARE ALLOWED TO COOL BELOW 150 DEGREES F, SHALL BE SAWCUT FULL DEPTH AND TACK COATED PRIOR TO PLACEMENT OF THE ADJOINING PAVING LANE.
8. PAVING CONTROL: THE INTENT IS TO PROVIDE A BASE SURFACE WHICH UNIFORM LIFTS OF BITUMINOUS ASPHALT CAN BE PLACED. EACH OPERATION SHALL BE CONTROLLED BY MEANS THAT SHALL PRODUCE THE DESIRED SURFACE, GRADES AND UNIFORMITY AS REQUIRED BY THE SPECIFICATIONS. THE FOLLOWING CONTROLS SHALL BE UTILIZED FOR THE REFERENCED OPERATION UNLESS OTHERWISE APPROVED BY THE ENGINEER, AND SUCH APPROVAL SHALL REQUIRE ACTUAL DEMONSTRATED PROOF THAT THE CONTROL PROVIDES THE SPECIFIED SURFACE.
   A. MILLING OPERATION: DUAL REFERENCE STRING LINE
   B. BASE AND SURFACE LIFT OF ASPHALT: DUAL REFERENCE STRING LINE
   C. FINAL LIFT OF ASPHALT: MOBILE REFERENCE NOT LESS THAN 30 FEET IN LENGTH
9. NO ON-SITE DISPOSAL OF UNUSED ASPHALT IS PERMITTED.
10. THE FINAL LONGITUDINAL PAVING JOINT SHALL NOT BE INSTALLED ON THE TRUE TAXIWAY CENTERLINE.



PAVEMENT KEYING DETAIL

2 TS-01

N.T.S



ACCESS ROAD TYPICAL SECTION

3 TS-01

NOT TO SCALE

PROPOSED FULL-DEPTH TAXIWAY PAVEMENT TYPICAL SECTION

4 TS-01

N.T.S

TYPICAL PAVEMENT MILLED REBATE AND TIE-IN DETAIL

5 TS-01

N.T.S

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANDE · 084000 · LICENSED PROFESSIONAL ENGINEER

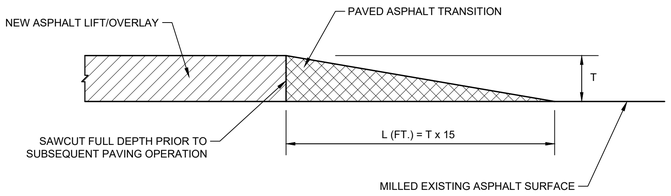
REV	DATE	DESCRIPTION	BY

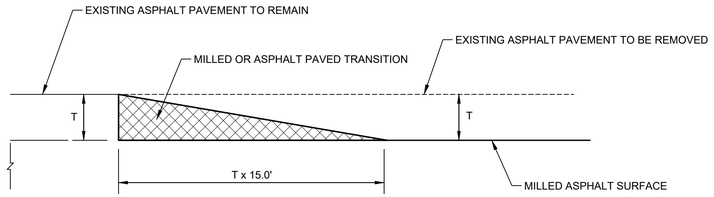
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

TYPICAL SECTIONS & PAVEMENT DETAILS (SHEET 1 OF 2)

SCALE: NTS	DESIGN: JPM	**TS-01**	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	29 OF 81	



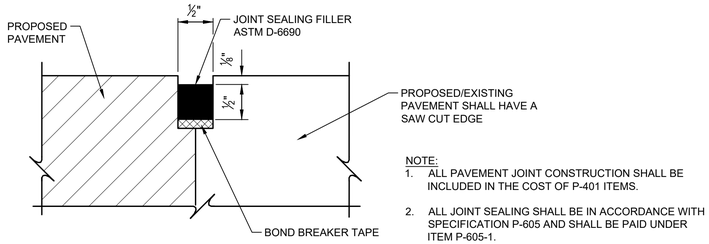


NOTE:
1. T = THICKNESS OF NEW LIFT/PAVEMENT REMOVED IN INCHES
2. ALL COSTS ASSOCIATED WITH PAVEMENT TRANSITIONS SHALL BE INCLUDED IN ITEM M-120-1

TEMPORARY LONGITUDINAL PAVEMENT TRANSITION DETAIL

1 TS-02

N.T.S

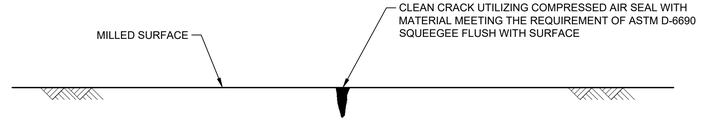


NOTE:
1. ALL PAVEMENT JOINT CONSTRUCTION SHALL BE INCLUDED IN THE COST OF P-401 ITEMS.
2. ALL JOINT SEALING SHALL BE IN ACCORDANCE WITH SPECIFICATION P-605 AND SHALL BE PAID UNDER ITEM P-605-1.

JOINT SEALING DETAIL

2 TS-02

N.T.S
ITEM P-605-1

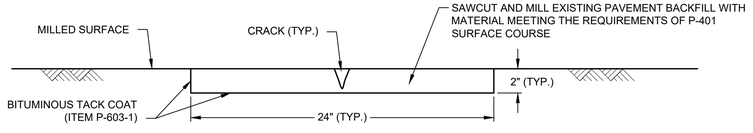


NOTE:
1. APPLICATION = ¼" <¾" OR AS ORDERED BY ENGINEER.
2. INCLUDE ALL COSTS IN ITEM P-101-4.

TYPE 1 PAVEMENT REPAIR DETAIL

5 TS-02

N.T.S
ITEM P-101-4

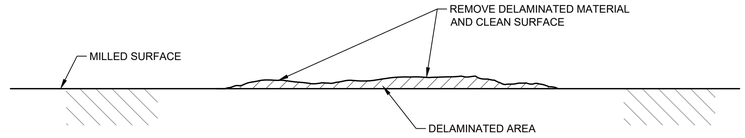


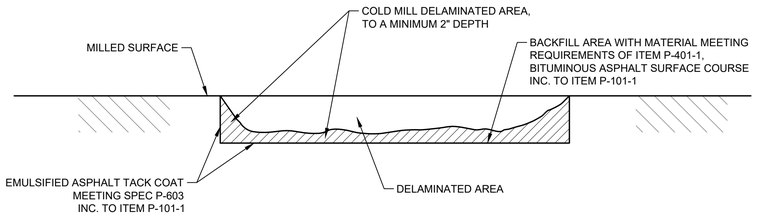
NOTE:
1. APPLICATION = >¾", MULTIPLE CRACKS, OR AS ORDERED BY ENGINEER.
2. INCLUDE ALL COSTS IN ITEM P-101-5.

TYPE 2 PAVEMENT REPAIR DETAIL

3 TS-02

N.T.S
ITEM P-101-5

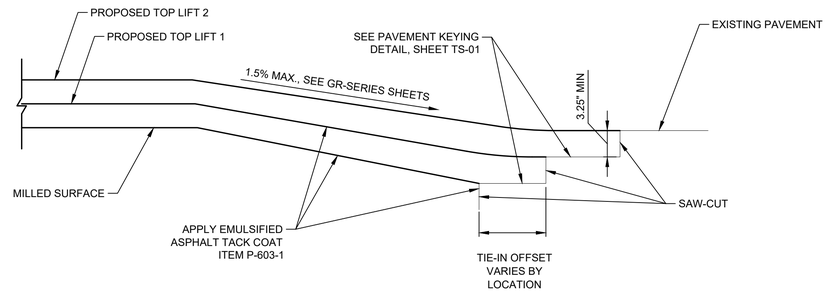




MILLED SURFACE CORRECTION DETAIL

6 TS-02

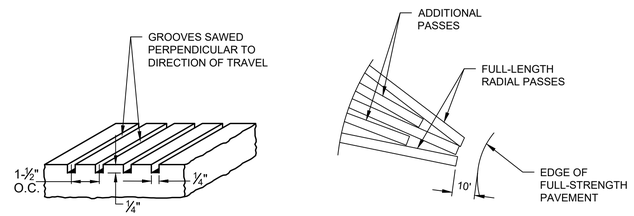
N.T.S
INCLUSIVE TO ITEM P-101-1



TYPICAL PAVEMENT TRANSITION DETAIL

4 TS-02

N.T.S



ISOMETRIC VIEW
N.T.S.

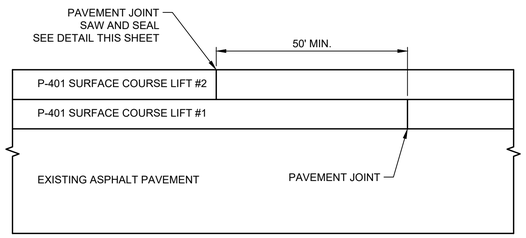
PLAN VIEW
N.T.S.

NOTES:
1. CONTRACTOR TO FIELD VERIFY THE PAVEMENT GROOVING LIMITS WITH THE ENGINEER PRIOR TO COMMENCEMENT OF THE GROOVING.
2. GROOVES SHALL BE SAWED RADIALLY TO TAXIWAY CENTERLINE.
3. THE AREA BETWEEN FULL LENGTH RADIAL PASSES SHALL BE GROOVED WITH AS MANY PASSES AS REQUIRED TO FILL THIS AREA.
4. GROOVING SHALL BE PERFORMED AFTER JOINT SEALING OPERATIONS. GROOVES SHALL NOT CROSS JOINTS AT AN ANGLE LESS THAN 45 DEGREES.

TYPICAL TRANSVERSE TAXIWAY GROOVING DETAIL

8 TS-02

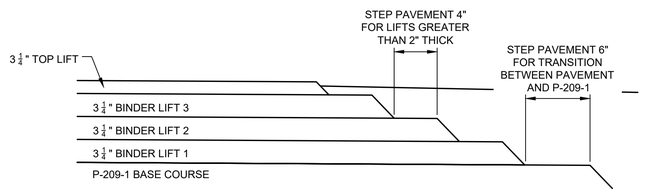
NOT TO SCALE
(ITEM P-621-1)



PAVEMENT JOINT LAYOUT DETAIL

9 TS-02

N.T.S



TYPICAL PAVEMENT STEP DETAIL

7 TS-02

N.T.S

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

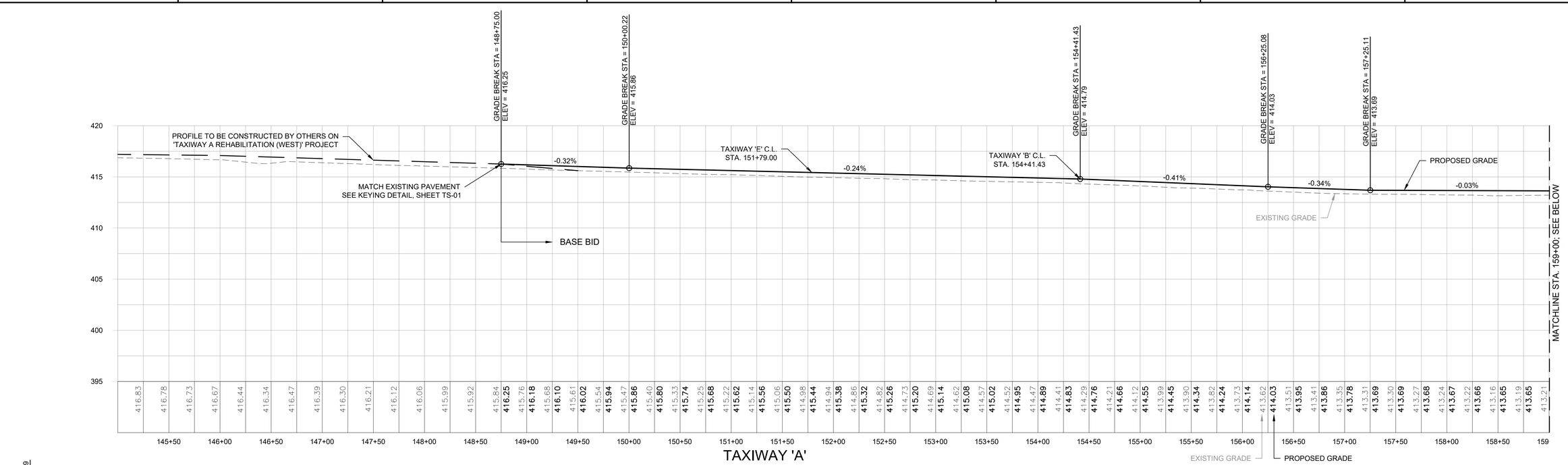
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

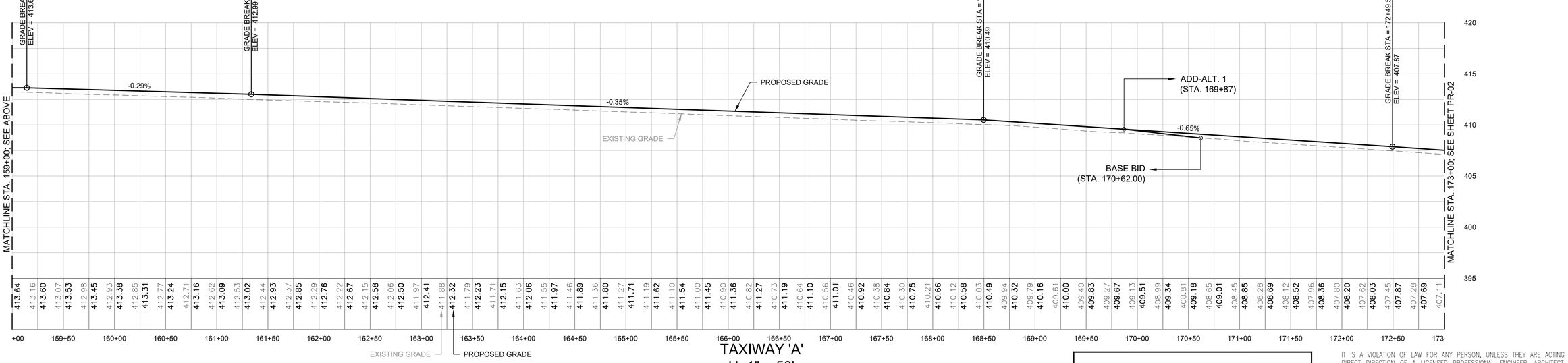
TYPICAL SECTIONS & PAVEMENT DETAILS (SHEET 2 OF 2)

SCALE:	NTS	DESIGN:	JPM
DRAWN:	SDB	PROJECT:	18831.08
CHECKED:	SJL	DATE:	APRIL 2024

TS-02
30 OF 81



TAXIWAY 'A'
H: 1" = 50'
V: 1" = 5'



TAXIWAY 'A'
H: 1" = 50'
V: 1" = 5'

CONSTRUCTION BID SET

0 50 100 150 FT.
HORIZONTAL SCALE

0 5 10 15 FT.
VERTICAL SCALE

STATE OF NEW YORK · STEVEN J. LANGE · 084009 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

TAXIWAY A PROFILE (SHEET 1 OF 2)

SCALE: AS SHOWN	DESIGN: JPM
DRAWN: SDB	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

PR-01
31 OF 81

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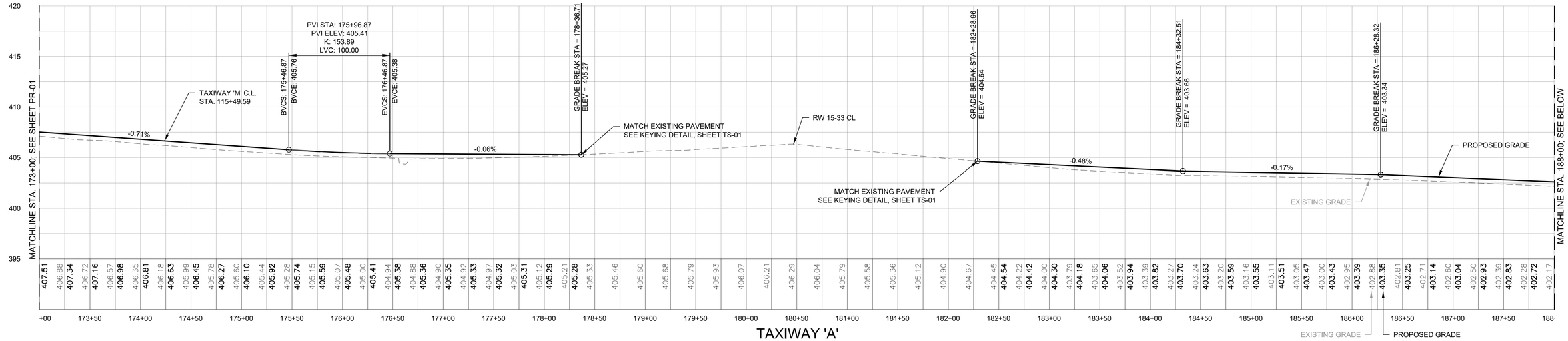
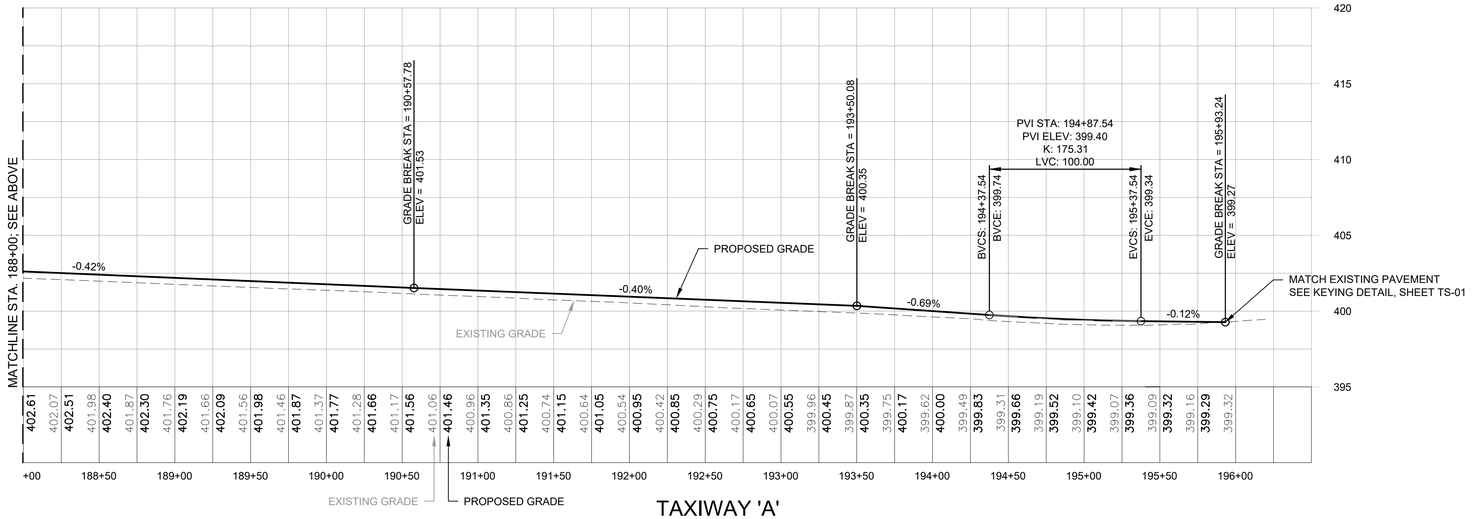


TAXIWAY 'A'
H: 1" = 50'
V: 1" = 5'



TAXIWAY 'A'
H: 1" = 50'
V: 1" = 5'

0 50 100 150 FT.
HORIZONTAL SCALE

0 5 10 15 FT.
VERTICAL SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANDRE · 084009 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

TAXIWAY A PROFILE (SHEET 2 OF 2)

SCALE: AS SHOWN	DESIGN: JPM	**PR-02**
DRAWN: SDB	PROJECT: 18831.08	32 OF 81
CHECKED: SJL	DATE: APRIL 2024	

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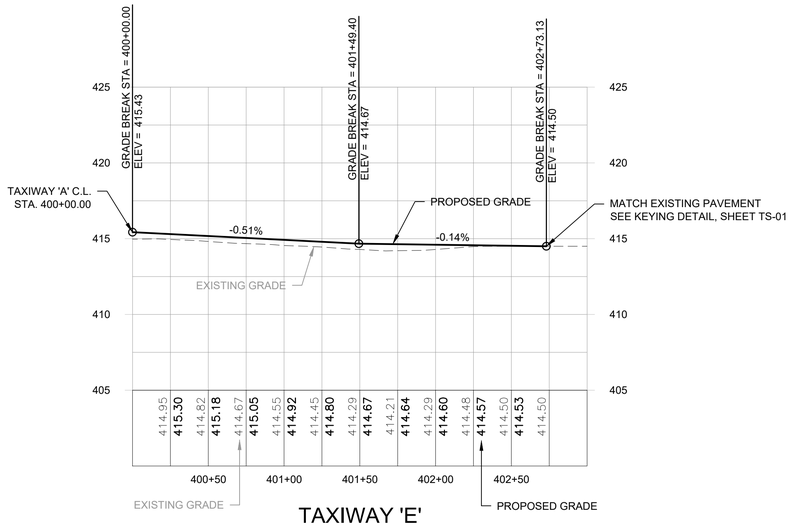
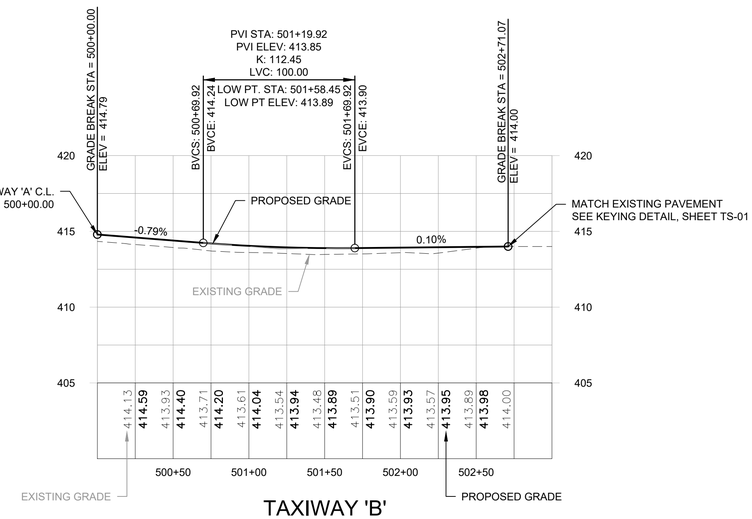
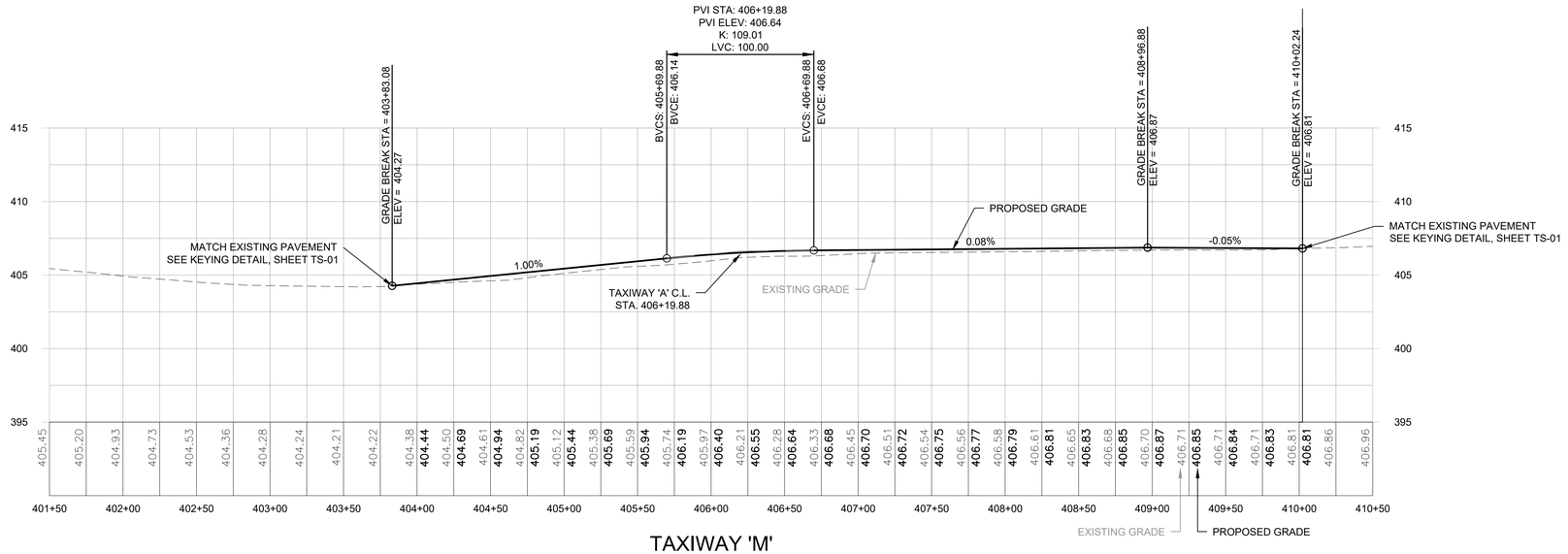


TAXIWAY 'E'
H: 1" = 50'
V: 1" = 5'



TAXIWAY 'B'
H: 1" = 50'
V: 1" = 5'



TAXIWAY 'M'
H: 1" = 50'
V: 1" = 5'

CONSTRUCTION BID SET

0 50 100 150 FT.
HORIZONTAL SCALE

0 5 10 15 FT.
VERTICAL SCALE

STATE OF NEW YORK
STEVEN J. LANDE
084000
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

CONNECTING TAXIWAY PROFILES

SCALE: AS SHOWN	DESIGN: JPM	**PR-03**
DRAWN: SDB	PROJECT: 18831.08	
CHECKED: SJL	DATE: APRIL 2024	33 OF 81

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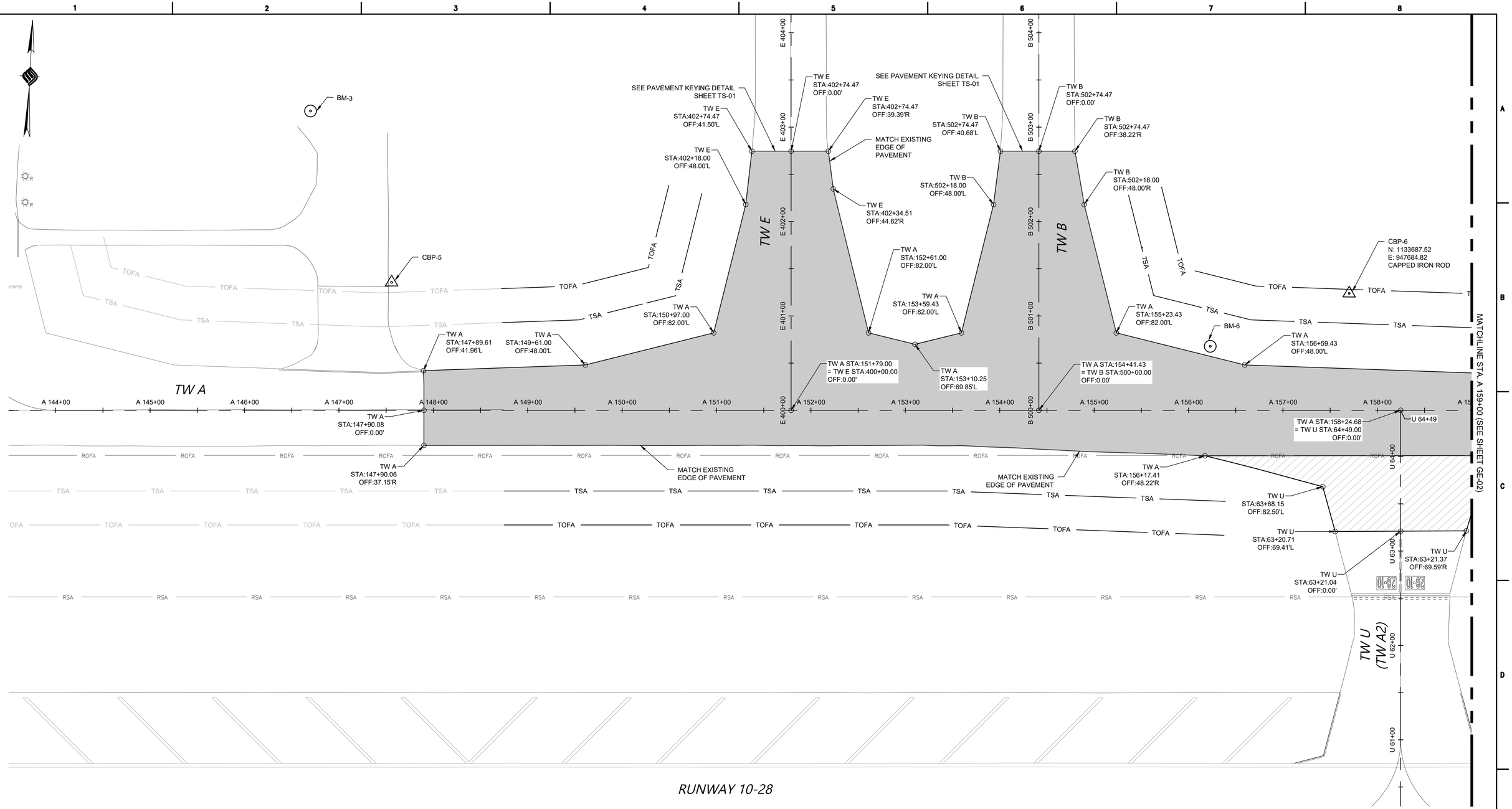

RUNWAY 10-28

BM	STA/OFF	DESCRIPTION	ELEV.
3	A 146+69.93/ 317.11'L	CUT X IN PAVEMENT	419.73'
6	A 156+22.97/ 67.80'L	CUT X EAST SIDE OF DRAINAGE STRUCTURE RIM	412.13'

LEGEND

- PROPOSED TAXIWAY PAVEMENT SEE DETAIL SHEET TS-01
- PROPOSED PAVEMENT TRANSITION AREA SEE DETAIL SHEET TS-02
- PROPOSED ACCESS ROAD PAVEMENT SEE DETAIL SHEET TS-01
- TOFA — PROPOSED TAXIWAY OBJECT FREE AREA
- TSA — PROPOSED TAXIWAY SAFETY AREA
- SURVEY BENCHMARK
- SURVEY BASELINE POINT

0 50 100 150 FT

SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

GEOMETRY PLAN & HORIZONTAL AND VERTICAL CONTROL (SHEET 1 OF 4)

SCALE: AS SHOWN	DESIGN: JPM	GE-01
DRAWN: SDB	PROJECT: 18831.08	
CHECKED: SJL	DATE: APRIL 2024	34 OF 81

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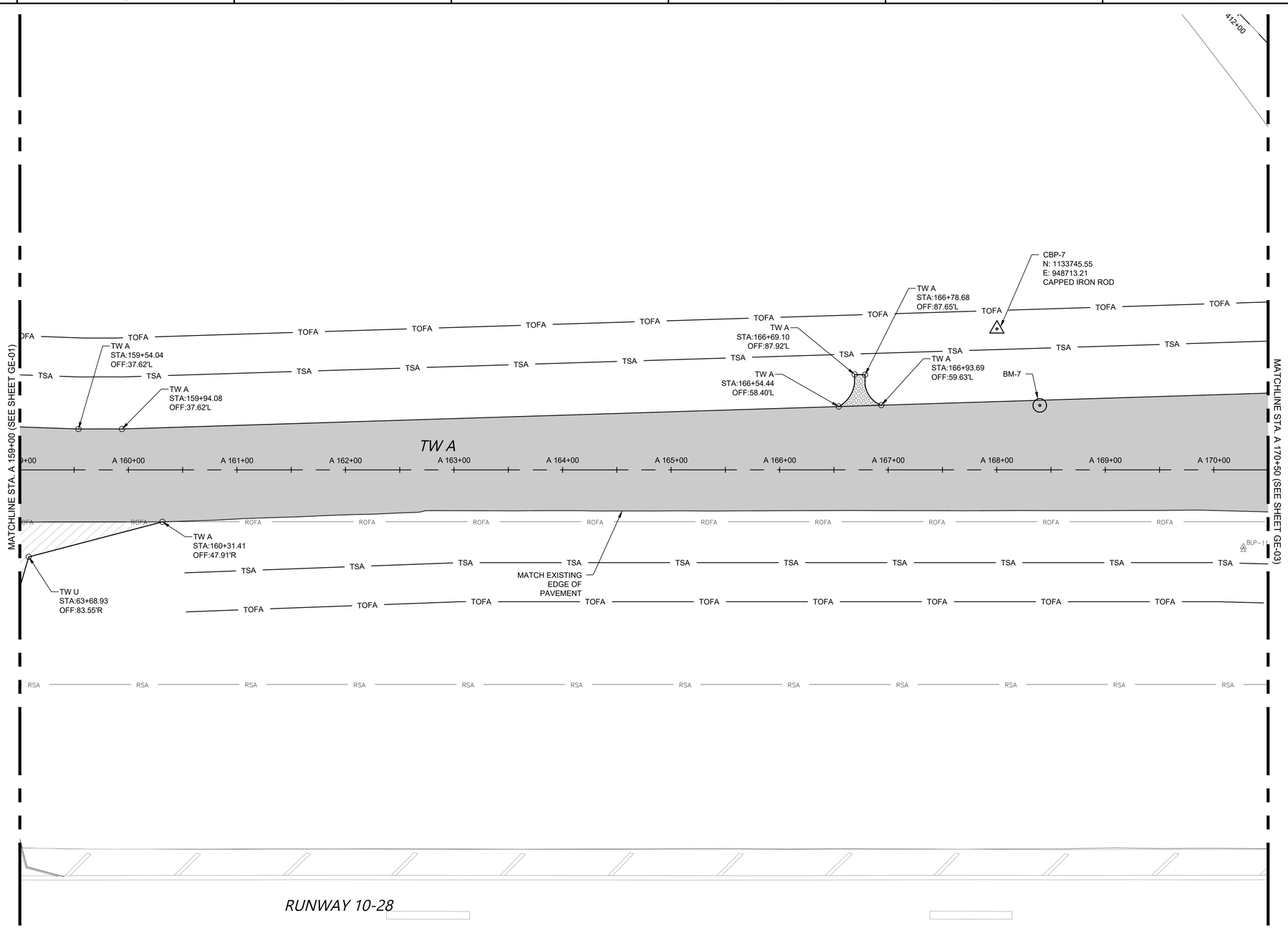


BM	STA/OFF	DESCRIPTION	ELEV.
7	A 168+39.65/ 59.40'L	CUT X IN THE NORTHWEST ELECTRIC MANHOLE BOLT	409.13'

LEGEND

- PROPOSED TAXIWAY PAVEMENT SEE DETAIL SHEET TS-01
- PROPOSED PAVEMENT TRANSITION AREA SEE DETAIL SHEET TS-02
- PROPOSED ACCESS ROAD PAVEMENT SEE DETAIL SHEET TS-01
- TOFA — PROPOSED TAXIWAY OBJECT FREE AREA
- TSA — PROPOSED TAXIWAY SAFETY AREA
- SURVEY BENCHMARK
- SURVEY BASELINE POINT

0 50 100 150 FT

SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084009 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

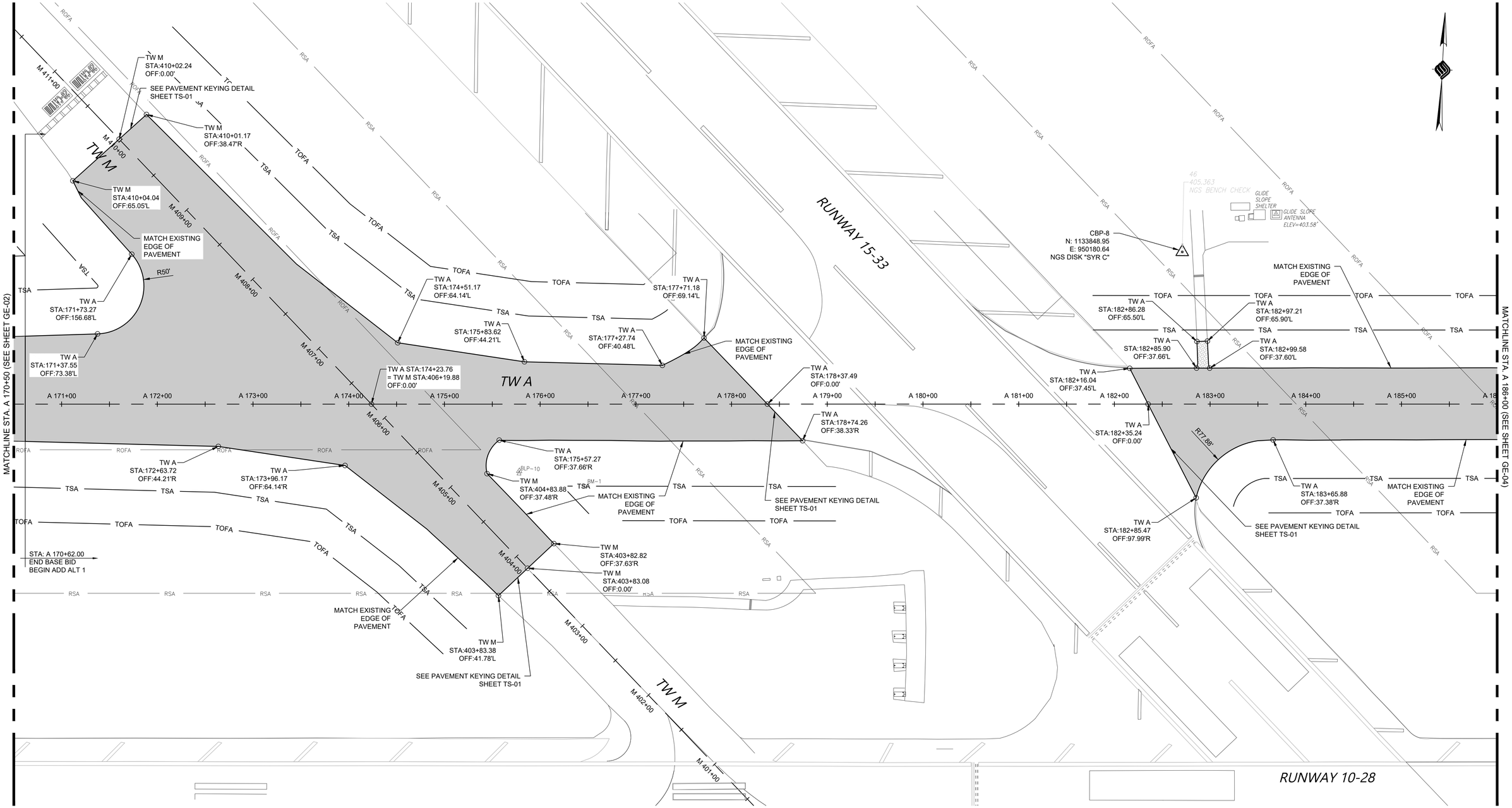
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

GEOMETRY PLAN & HORIZONTAL AND VERTICAL CONTROL (SHEET 2 OF 4)

SCALE: AS SHOWN	DESIGN: JPM	**GE-02**
DRAWN: SDB	PROJECT: 18831.08	35 OF 81
CHECKED: SJL	DATE: APRIL 2024	



LEGEND

- PROPOSED TAXIWAY PAVEMENT SEE DETAIL SHEET TS-01
- PROPOSED PAVEMENT TRANSITION AREA SEE DETAIL SHEET TS-02
- PROPOSED ACCESS ROAD PAVEMENT SEE DETAIL SHEET TS-01
- TOFA — PROPOSED TAXIWAY OBJECT FREE AREA
- TSA — PROPOSED TAXIWAY SAFETY AREA
- SURVEY BENCHMARK
- SURVEY BASELINE POINT

0 50 100 150 FT

SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084099 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET, SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

GEOMETRY PLAN & HORIZONTAL AND VERTICAL CONTROL (SHEET 3 OF 4)

SCALE: AS SHOWN	DESIGN: JPM	**GE-03**
DRAWN: SDB	PROJECT: 18831.08	36 OF 81
CHECKED: SJL	DATE: APRIL 2024	

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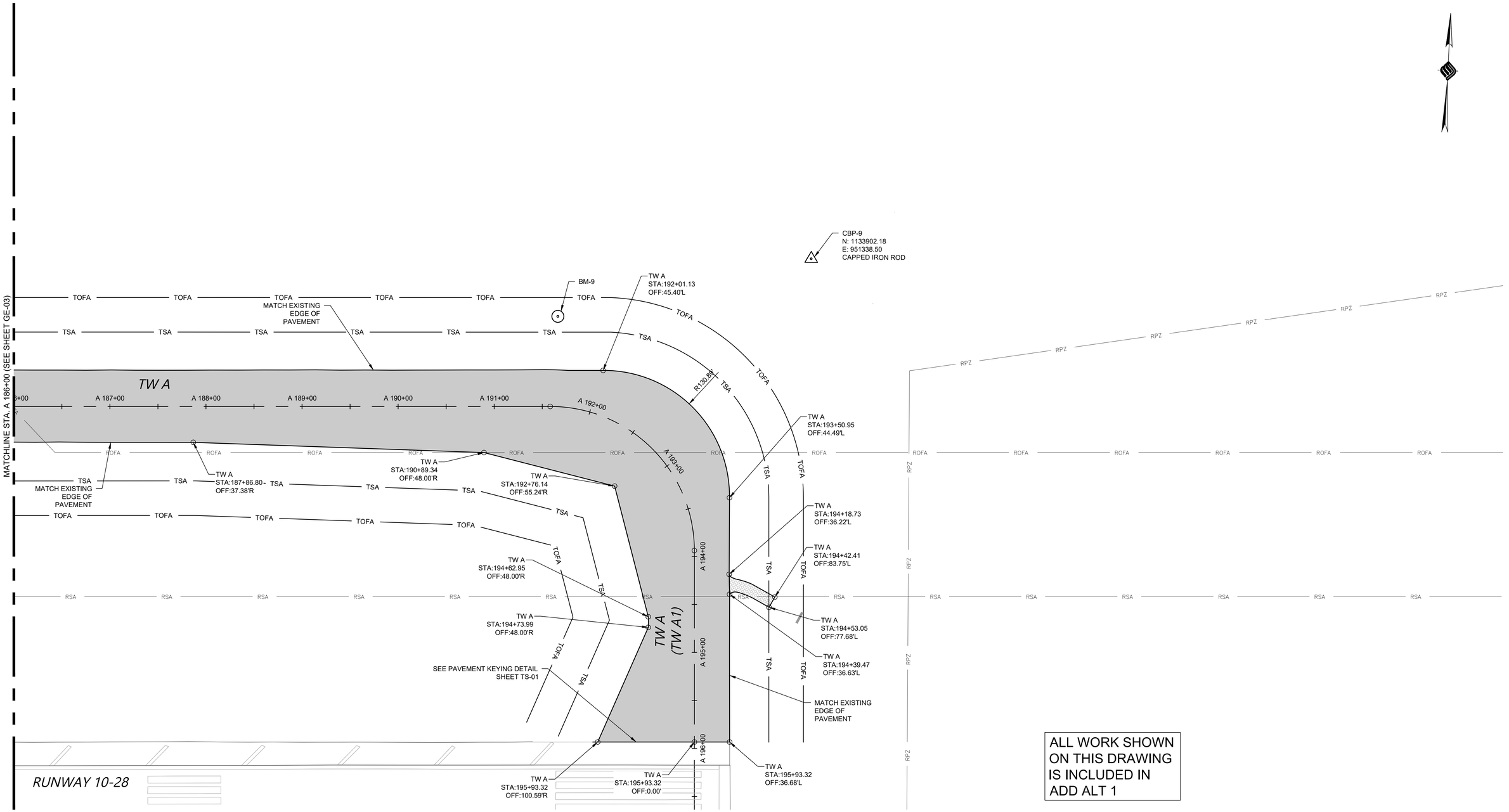


BM	STA/OFF	DESCRIPTION	ELEV.
9	A 191+63.21 / 93.90'L	CUT BOX ON THE SOUTHWEST CORNER OF CONCRETE SIGN BASE	399.05'

LEGEND

- PROPOSED TAXIWAY PAVEMENT SEE DETAIL SHEET TS-01
- PROPOSED PAVEMENT TRANSITION AREA SEE DETAIL SHEET TS-02
- PROPOSED ACCESS ROAD PAVEMENT SEE DETAIL SHEET TS-01
- TOFA — PROPOSED TAXIWAY OBJECT FREE AREA
- TSA — PROPOSED TAXIWAY SAFETY AREA
- SURVEY BENCHMARK
- SURVEY BASELINE POINT

0 50 100 150 FT
SCALE

ALL WORK SHOWN ON THIS DRAWING IS INCLUDED IN ADD ALT 1

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084099 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

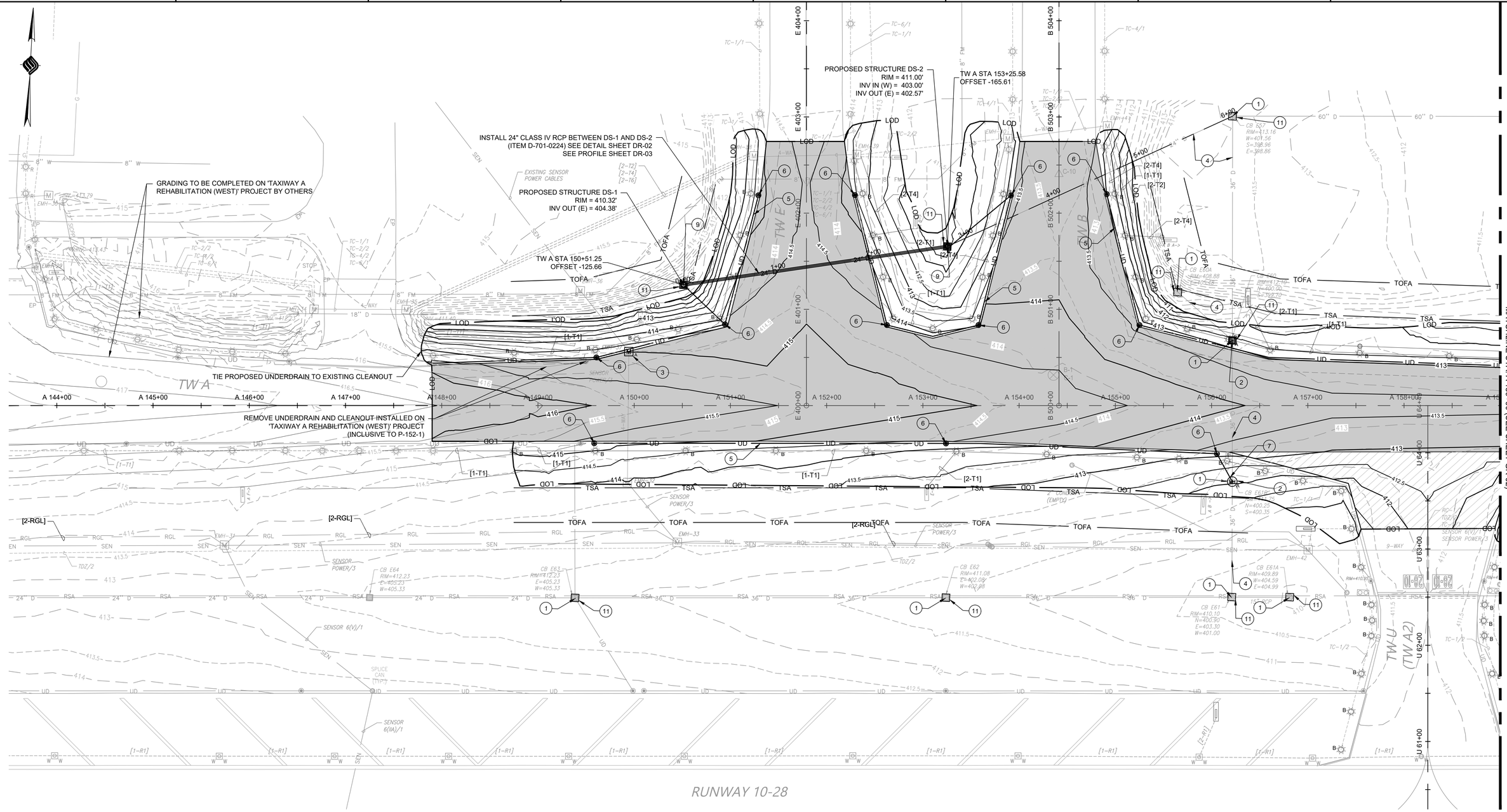
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

GEOMETRY PLAN & HORIZONTAL AND VERTICAL CONTROL (SHEET 4 OF 4)

SCALE: AS SHOWN	DESIGN: JPM	**GE-04**
DRAWN: SDB	PROJECT: 18831.08	37 OF 81
CHECKED: SJL	DATE: APRIL 2024	



LEGEND

- 415 — PROPOSED MAJOR CONTOUR
- 415.5 — PROPOSED MINOR CONTOUR
- 415 — EXISTING MAJOR CONTOUR
- 415.5 — EXISTING MINOR CONTOUR
- LOD — LIMIT OF DISTURBANCE
- PROPOSED UNDERDRAIN CLEANOUT
- EXISTING UNDERDRAIN CLEANOUT
- PROPOSED AIRCRAFT RATED CATCH BASIN/INLET
- EXISTING CATCH BASIN/INLET
- MH — PROPOSED STORM DRAIN MANHOLE
- MH — EXISTING STORM DRAIN MANHOLE
- GC — EXISTING GLYCOL MANHOLE

KEYED NOTES:

1. CLEAN EXISTING DRAINAGE STRUCTURE (ITEM D-751-9)
2. ADJUST EXISTING DRAINAGE STRUCTURE (ITEM D-751-51) SEE DETAIL SHEET DR-02
3. ADJUST EXISTING ELECTRICAL MANHOLE (ITEM L-115-31) SEE DETAIL SHEET ED-04
4. CLEAN EXISTING DRAINAGE PIPE (ITEM D-751-10)
5. PROPOSED 6" PERFORATED UNDERDRAIN PIPE (ITEM D-705-2) SEE DETAIL SHEET DR-01
6. PROPOSED UNDERDRAIN CLEANOUT (ITEM D-705-4) SEE DETAIL SHEET DR-01
7. CONNECT PIPE TO DRAINAGE STRUCTURE (ITEM D-751-4) SEE DETAIL SHEET DR-01
8. UNDERDRAIN OUTLET (ITEM D-705-5) SEE DETAIL SHEET DR-01
9. PROPOSED 4'x4' RECTANGULAR DRAINAGE STRUCTURE WITH AIRCRAFT RATED FRAME AND GRATE (ITEM D-751-012) SEE DETAIL SHEET DR-02
10. PROPOSED 6" SOLID WALL HDPE UNDERDRAIN OUTLET PIPE (PAID UNDER ITEM D-705-2) SEE DETAIL SHEET DR-01
11. DRAINAGE STRUCTURE INLET PROTECTION - TEMP. SILT FENCE (ITEM C-102-25) SEE DETAIL SHEET GD-01
12. INSTALL TEMPORARY SILT FENCE (ITEM C-102-17) SEE DETAIL SHEET GD-01
13. DRY SWALE (ITEM D-700-1) SEE DETAIL SHEET DR-03

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084009 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

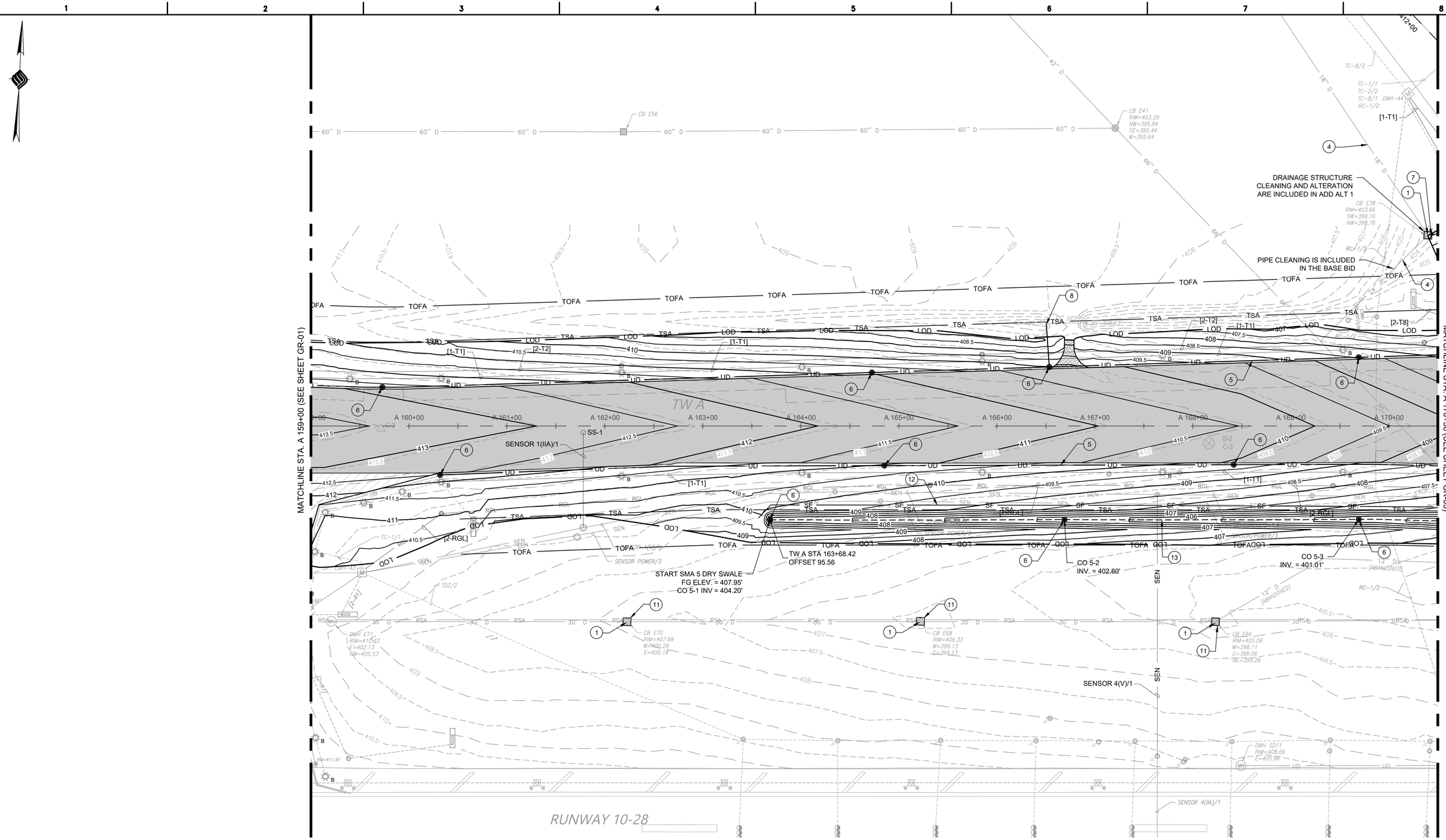
SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

GRADING & EROSION CONTROL PLAN (SHEET 1 OF 4)

SCALE: AS SHOWN	DESIGN: JPM
DRAWN: SGJ	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

GR-01
38 OF 81



LEGEND

- 415 — PROPOSED MAJOR CONTOUR
- 415.5 — PROPOSED MINOR CONTOUR
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- EXISTING CATCH BASIN/INLET
- (MH) PROPOSED STORM DRAIN MANHOLE
- (MH) EXISTING STORM DRAIN MANHOLE
- (GC) EXISTING GLYCOL MANHOLE

KEYED NOTES:

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12. INSTALL TEMPORARY SILT FENCE (ITEM C-102-17) SEE DETAIL SHEET GD-01
13. DRY SWALE (ITEM D-700-1) SEE DETAIL SHEET DR-03

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

NEW YORK STATE OF STEVEN J. LANGE 084009 LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

GRADING & EROSION CONTROL PLAN (SHEET 2 OF 4)

SCALE: AS SHOWN	DESIGN: JPM	GR-02
DRAWN: SGJ	PROJECT: 18831.08	39 OF 81
CHECKED: SJL	DATE: APRIL 2024	

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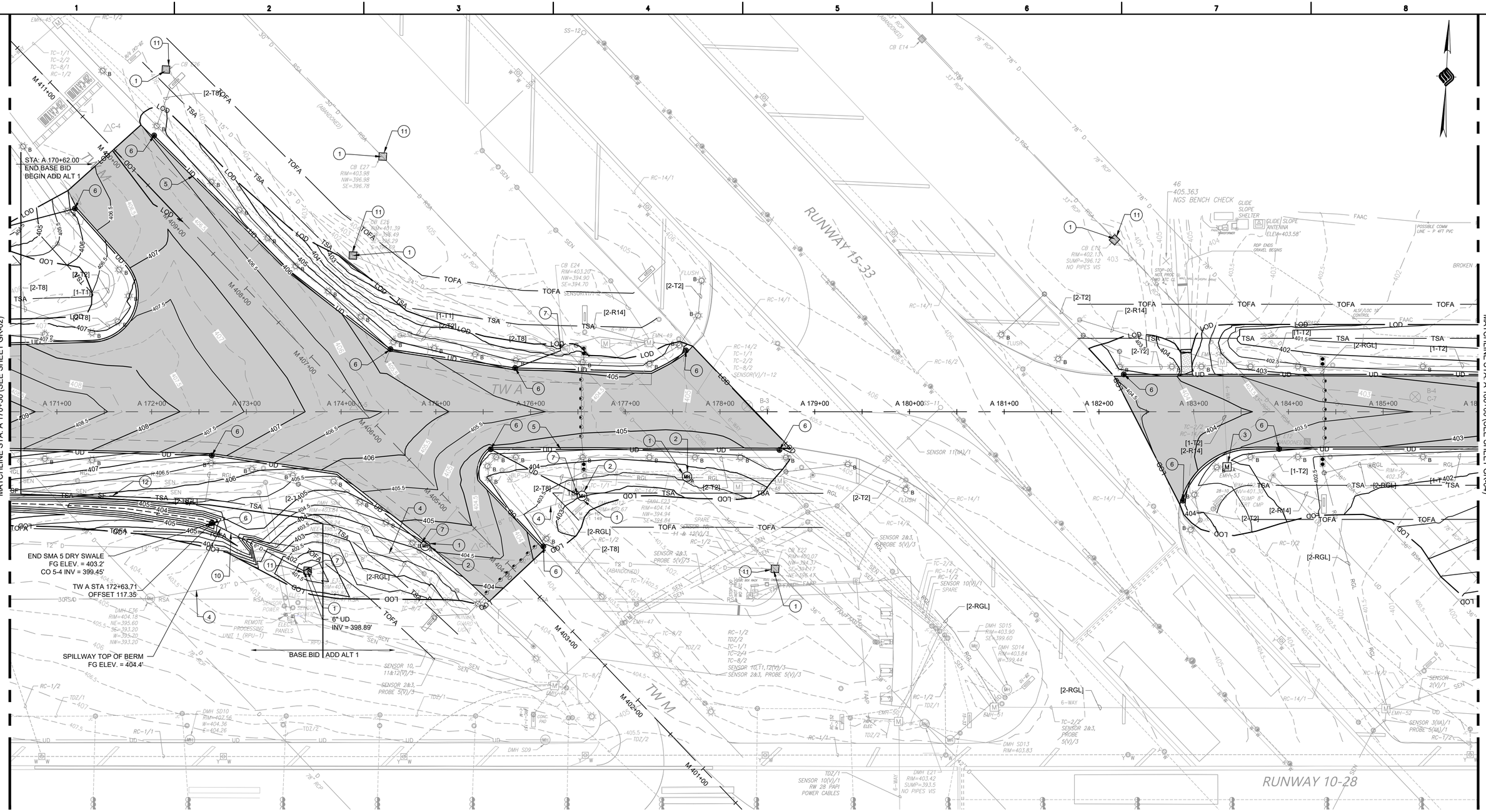

LEGEND

- 415 — PROPOSED MAJOR CONTOUR
- 415.5 — PROPOSED MINOR CONTOUR
- 415 — EXISTING MAJOR CONTOUR
- 415.5 — EXISTING MINOR CONTOUR
- LOD — LIMIT OF DISTURBANCE
- PROPOSED UNDERDRAIN CLEANOUT
- EXISTING UNDERDRAIN CLEANOUT
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- EXISTING CATCH BASIN/INLET
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13. DRY SWALE (ITEM D-700-1) SEE DETAIL SHEET DR-03

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECT DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

STATE OF NEW YORK
STEVEN J. LANGE
084009
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET, SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

GRADING & EROSION CONTROL PLAN (SHEET 3 OF 4)

SCALE: AS SHOWN	DESIGN: JPM	GR-03
DRAWN: SGJ	PROJECT: 18831.08	
CHECKED: SJL	DATE: APRIL 2024	40 OF 81

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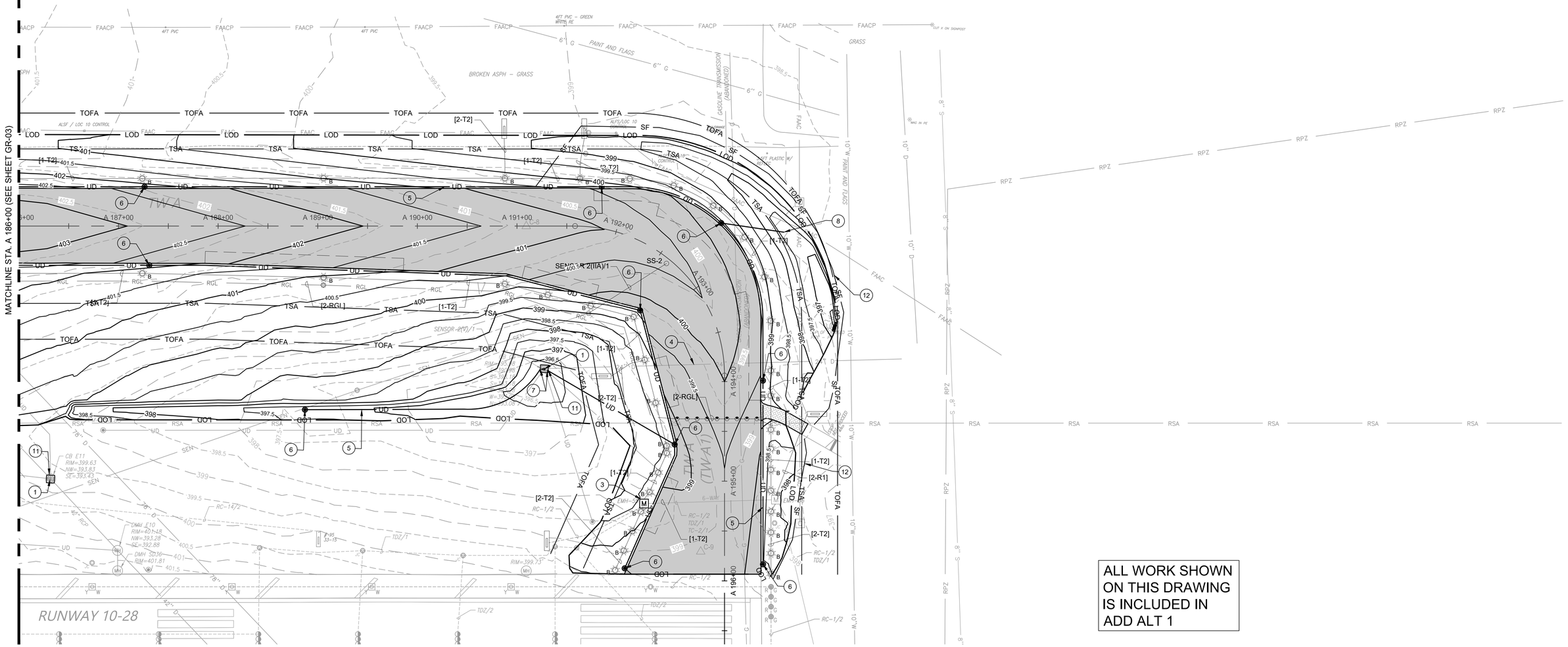

ALL WORK SHOWN ON THIS DRAWING IS INCLUDED IN ADD ALT 1

LEGEND

- 415 — PROPOSED MAJOR CONTOUR
- 415.5 — PROPOSED MINOR CONTOUR
- 415 — EXISTING MAJOR CONTOUR
- 415.5 — EXISTING MINOR CONTOUR
- LOD — LIMIT OF DISTURBANCE
- PROPOSED UNDERDRAIN CLEANOUT
- EXISTING UNDERDRAIN CLEANOUT
- PROPOSED AIRCRAFT RATED CATCH BASIN/INLET
- EXISTING CATCH BASIN/INLET
- (MH) PROPOSED STORM DRAIN MANHOLE
- (MH) EXISTING STORM DRAIN MANHOLE
- (GC) EXISTING GLYCOL MANHOLE

KEYED NOTES:

1. CLEAN EXISTING DRAINAGE STRUCTURE (ITEM D-751-9)
2. ADJUST EXISTING DRAINAGE STRUCTURE (ITEM D-751-51) SEE DETAIL SHEET DR-02
3. ADJUST EXISTING ELECTRICAL MANHOLE (ITEM L-115-31) SEE DETAIL SHEET ED-04
4. CLEAN EXISTING DRAINAGE PIPE (ITEM D-751-10)
5. PROPOSED 6" PERFORATED UNDERDRAIN PIPE (ITEM D-705-2) SEE DETAIL SHEET DR-01
6. PROPOSED UNDERDRAIN CLEANOUT (ITEM D-705-4) SEE DETAIL SHEET DR-01
7. CONNECT PIPE TO DRAINAGE STRUCTURE (ITEM D-751-4) SEE DETAIL SHEET DR-01
8. UNDERDRAIN OUTLET (ITEM D-705-5) SEE DETAIL SHEET DR-01
9. PROPOSED 4'x4' RECTANGULAR DRAINAGE STRUCTURE WITH AIRCRAFT RATED FRAME AND GRATE (ITEM D-751-012) SEE DETAIL SHEET DR-02
10. PROPOSED 6" SOLID WALL HDPE UNDERDRAIN OUTLET PIPE (PAID UNDER ITEM D-705-2) SEE DETAIL SHEET DR-01
11. DRAINAGE STRUCTURE INLET PROTECTION - TEMP. SILT FENCE (ITEM C-102-25) SEE DETAIL SHEET GD-01
12. INSTALL TEMPORARY SILT FENCE (ITEM C-102-17) SEE DETAIL SHEET GD-01
13. DRY SWALE (ITEM D-700-1) SEE DETAIL SHEET DR-03

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

GRADING & EROSION CONTROL PLAN (SHEET 4 OF 4)

SCALE: AS SHOWN	DESIGN: JPM	GR-04
DRAWN: SGJ	PROJECT: 18831.08	41 OF 81
CHECKED: SJL	DATE: APRIL 2024	

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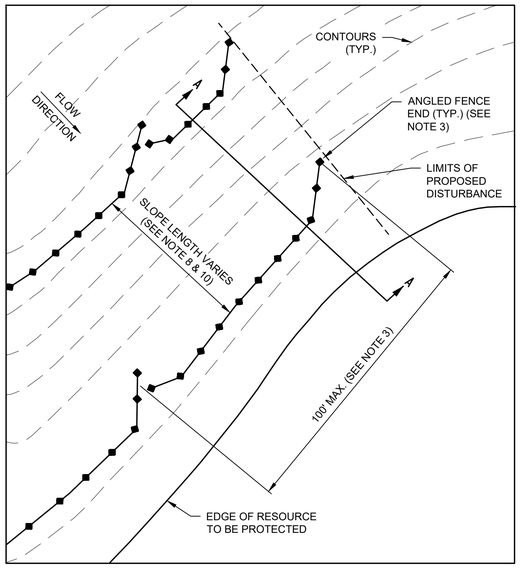
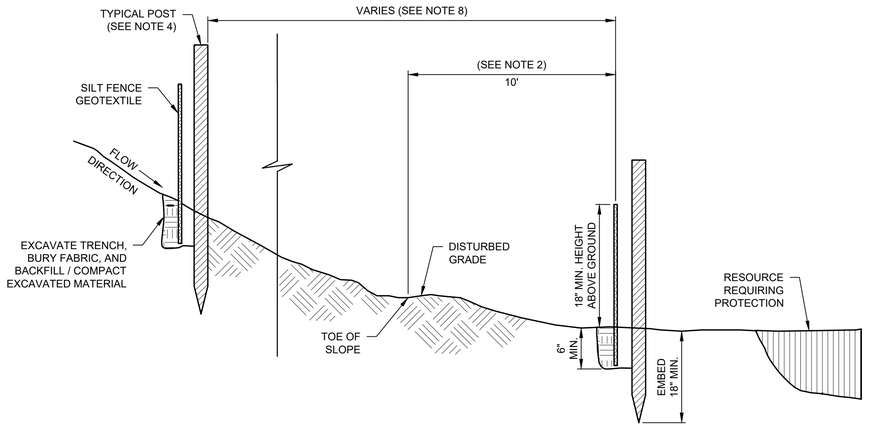
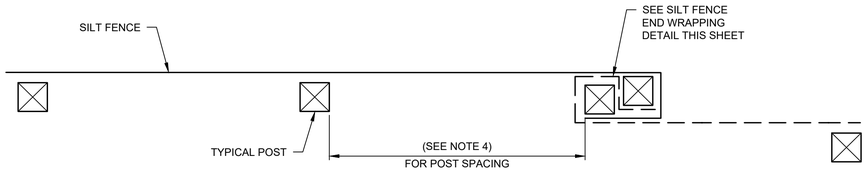


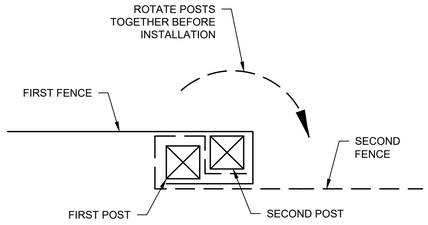
PLAN
EXAMPLE LAYOUT OF SILT FENCE



SECTION A-A
SILT FENCE - TEMPORARY
N.T.S



PLAN
SILT FENCE PLACEMENT
N.T.S.



SILT FENCE END WRAPPING DETAIL
N.T.S.

TEMPORARY SILT FENCE

1
GD-01

ITEM C-102-17
N.T.S.

GENERAL NOTES:

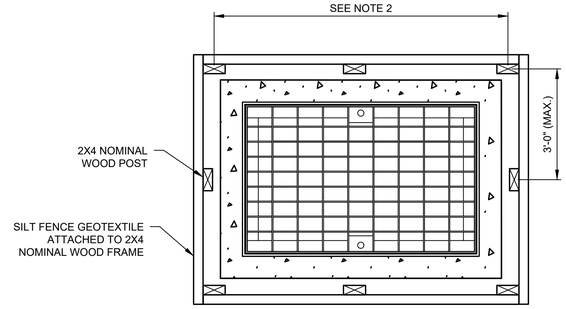
1. SILT FENCE SHALL BE INSTALLED ON A LINE OF EQUAL ELEVATION (CONTOUR). IT MAY BE INSTALLED AT INTERMEDIATE POINTS UP SLOPES AS WELL AS AT THE BOTTOM.
2. FOR LOCATIONS THAT WARRANT PLACEMENT OF SILT FENCE AT THE BASE OF SLOPES, SILT FENCE SHALL BE PLACED A MINIMUM OF 10 FEET FROM THE TOE OF THE SLOPE, TO PROVIDE ADEQUATE AREA FOR SEDIMENT STORAGE AND FACILITATE MAINTENANCE OF THE SEDIMENT CONTAINMENT AREA.
3. THE ENDS OF A ROW OF SILT FENCE SHALL BE ANGLED UP SLOPE TO PREVENT CHANNELIZED FLOW FROM BEING CONVEYED PAST THE ENDS OF THE FENCE. A SECTION OF SILT FENCE SHOULD NOT EXCEED 100 FEET IN LENGTH.
4. WOOD POSTS FOR SILT FENCE SHALL HAVE A CROSS-SECTION AREA OF 3.5 SQUARE INCHES. SPACING FOR THE PROVIDED SILT FENCE POSTS SHALL BE 10 FEET MAXIMUM CENTER TO CENTER. THE LENGTH OF SILT FENCE POSTS SHALL BE 40 INCHES.
5. THE BOTTOM EDGE OF SILT FENCE SHALL BE BURIED A MINIMUM OF 6" BELOW GROUND. THE FENCE SHALL BE INSTALLED WITH THE POSTS ON THE DOWNSLOPE SIDE OF THE FABRIC.
6. WHERE ENDS OF GEOTEXTILE FABRIC COME TOGETHER, THEY SHALL BE OVERLAPPED, FOLDED AND STAPLED TO PREVENT SEDIMENT BYPASS, OR THE END POSTS OF TWO SECTIONS SHALL BE WRAPPED AS SHOWN IN THE DETAIL FOR SILT FENCE END WRAPPING.
7. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION REACHES ONE-HALF OF THE ABOVE GROUND HEIGHT OR WHEN BULGES DEVELOP IN THE FABRIC. SEDIMENT SHALL BE DISPOSED OF AS UNSUITABLE MATERIAL.
8. THE FOLLOWING ARE MAXIMUM SLOPE LENGTHS (DISTANCE BETWEEN ROWS) FOR SILT FENCE INSTALLATION:

SILT FENCE MAXIMUM SLOPE LENGTH (FEET)		
SLOPE	STEEPNESS	STANDARD**
*5-10%	20:1 TO 10:1	125
10-20%	10:1 TO 5:1	100
20-33%	5:1 TO 3:1	60
33-50%	3:1 TO 2:1	40
> 50%	> 2:1	20

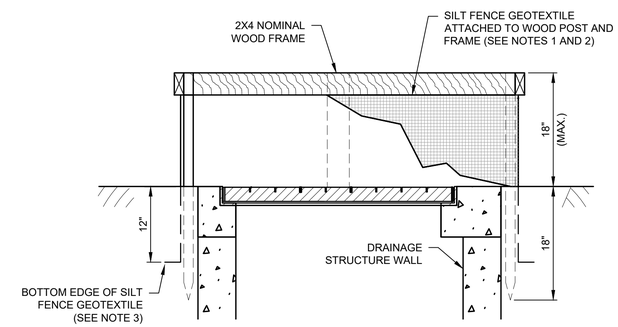
* FOR SLOPES LESS THAN 5% SILT FENCE IS NOT REQUIRED UNLESS IN SENSITIVE AREAS OR HIGHLY ERODIBLE AREAS.

** STANDARD SILT FENCE IS FABRIC ROLLS STAPLED TO WOODEN POSTS DRIVEN 18 INCHES INTO THE GROUND.

9. ALL WORK REQUIRED FOR THE INSTALLATION OF SILT FENCE (EXCAVATION, BACKFILL, COMPACTION OF SOIL, MAINTENANCE, AND REMOVAL/RESTORATION) SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM C-102-17.



PLAN



CROSS SECTION

APPLICATION NOTES:

1. THE TOP OF THE INLET PROTECTION SHALL BE SET TO ALLOW OVERFLOW INTO THE INLET AND NOT BYPASS TO UNPROTECTED RESOURCES.
2. MAXIMUM DRAINAGE AREA TO THE PRACTICE SHALL NOT EXCEED ONE ACRE.

GENERAL NOTES:

1. SILT FENCE GEOTEXTILE SHALL BE A SINGLE CONTINUOUS PIECE TO ELIMINATE JOINTS. OVERLAP GEOTEXTILE ENDS TO THE NEXT POST.
2. SPACE POSTS EVENLY AROUND INLET WITH A MAXIMUM SPACING OF 3'. WIRE MESH MAY BE REQUIRED BEHIND GEOTEXTILE TO PROVIDE SUPPORT. POSTS SHALL BE DRIVEN CLOSE TO THE INLET TO MINIMIZE EXPOSED SOIL BETWEEN THE INLET AND THE PRACTICE. DRIVE POSTS A MINIMUM OF 18" INTO THE GROUND.
3. SILT FENCE GEOTEXTILE SHALL BE EMBEDDED 12" AND BACKFILLED. GEOTEXTILE SHALL BE SECURELY FASTENED TO POSTS AND FRAME.
4. MEASURES SHALL BE INSPECTED AFTER EVERY RUNOFF EVENT AND REPAIRED AS NECESSARY. SEDIMENT SHALL BE REMOVED WHEN IT REACHES ONE-HALF THE MEASURE HEIGHT (STORAGE CAPACITY). SEDIMENT SHALL BE DISPOSED OF AS UNSUITABLE MATERIALS.

DRAINAGE STRUCTURE INLET PROTECTION - TEMPORARY SILT FENCE

2
GD-01

ITEM C-102-25

CONSTRUCTION BID SET

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

GRADING & EROSION CONTROL DETAILS (SHEET 1 OF 2)

SCALE: NTS	DESIGN: JPM	**GD-01**	
DRAWN: SGJ	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	42 OF 81	

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SEASON	VARIETY	RATE (LBS/ACRE)	MULCH TYPE	MULCH RATE (TONS/ACRE)
APRIL 1 TO OCTOBER 15	ANNUAL RYEGRASS	30	FIBER	2

NOTES:
1. SEED SHALL HAVE A MINIMUM SEED PURITY OF 98%, A MINIMUM GERMINATION OF 90%, AND CONTAIN 99% PURE LIVE SEED.

TEMPORARY SEED AND MULCH TABLE

1 GD-02

ITEM C-102-3

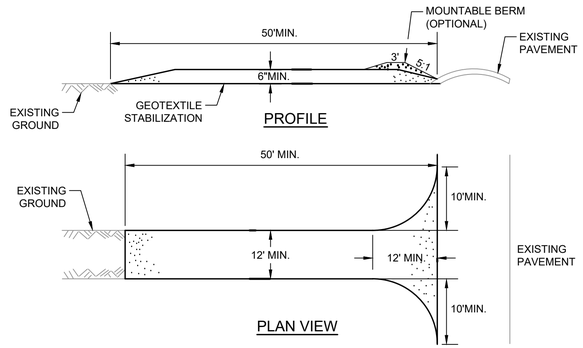
VARIETY	RATE (LBS/ACRE)	MULCH TYPE	MULCH RATE (TONS/ACRE)
SEED TYPE 1	110	FIBER	2-3
SEED TYPE 2	110	FIBER	2-3
SEED TYPE 3	110	FIBER	2-3

NOTES:
1. SEED MIX SHALL BE A THREE-WAY BLEND OF ENDOPHYTE ENHANCED DWARF TURF TYPE TALL FESCUES MEETING THE REQUIREMENT OF SPECIFICATION T-901.
2. SEED SHALL HAVE A >90% ENDOPHYTE INFECTION, A MINIMUM SEED PURITY OF 98%, A MINIMUM GERMINATION OF 90%, AND EACH CONTAIN 33% PURE LIVE SEED.

PERMANENT SEED AND MULCH TABLE

2 GD-02

ITEM T-908-1
ITEM T-901-1

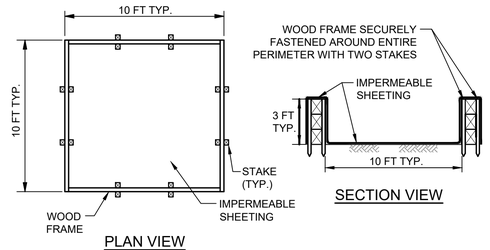


CONSTRUCTION SPECIFICATIONS:
1. STONE SIZE - USE # 3 CRUSHED STONE OR GRAVEL.
2. LENGTH - NOT LESS THAN 50 FEET.
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE STABILIZATION - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND REQUIRED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN EVENT.
10. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED IN THE STAGING AREA.

CONSTRUCTION ENTRANCE

3 GD-02

ITEM C-102-44
N.T.S.

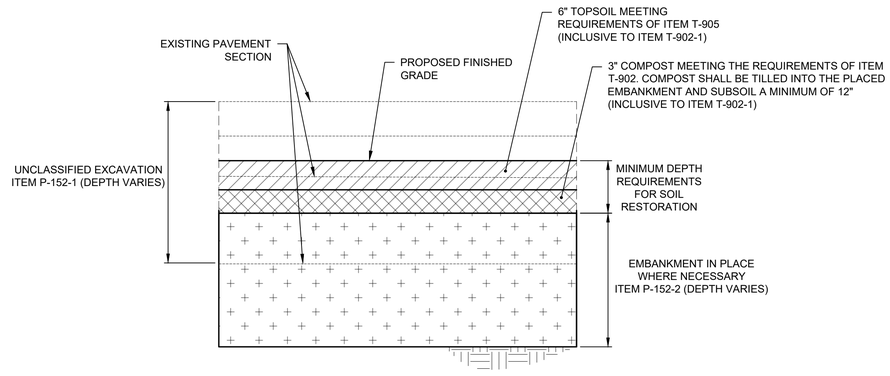


GENERAL NOTES:
1. LOCATE WASHOUT STRUCTURE A MINIMUM OF 50 FEET AWAY FROM OPEN CHANNELS, STORM DRAIN INLETS, SENSITIVE AREAS, WETLANDS, BUFFERS AND WATER COURSES AND AWAY FROM CONSTRUCTION TRAFFIC.
2. SIZE WASHOUT STRUCTURE FOR VOLUME NECESSARY TO CONTAIN WASH WATER AND SOLIDS AND MAINTAIN AT LEAST 4 INCHES OF FREEBOARD. TYPICAL DIMENSIONS ARE 10 FEET X 10 FEET X 3 FEET DEEP.
3. PREPARE SOIL BASE FREE OF ROCKS OR OTHER DEBRIS THAT MAY CAUSE TEARS OR HOLES IN THE LINER. FOR LINER, USE 10 MIL OR THICKER UV RESISTANT, IMPERMEABLE SHEETING, FREE OF HOLES AND TEARS OR OTHER DEFECTS THAT COMPROMISE IMPERMEABILITY OF THE MATERIAL.
4. PROVIDE A SIGN FOR THE WASHOUT IN CLOSE PROXIMITY TO THE FACILITY.
5. KEEP CONCRETE WASHOUT STRUCTURE WATER TIGHT. REPLACE IMPERMEABLE LINER IF DAMAGED (E.G., RIPPED OR PUNCTURED). EMPTY OR REPLACE WASHOUT STRUCTURE THAT IS 75 PERCENT FULL, AND DISPOSE OF ACCUMULATED MATERIAL PROPERLY. DO NOT REUSE PLASTIC LINER. WET-VACUUM STORED LIQUIDS THAT HAVE NOT EVAPORATED AND DISPOSE OF IN AN APPROVED MANNER. PRIOR TO FORECASTED RAINSTORMS, REMOVE LIQUIDS OR COVER STRUCTURE TO PREVENT OVERFLOWS. REMOVE HARDENED SOLIDS, WHOLE OR BROKEN UP, FOR DISPOSAL OR RECYCLING. MAINTAIN RUNOFF DIVERSION AROUND EXCAVATED WASHOUT STRUCTURE UNTIL STRUCTURE IS REMOVED.
6. CONCRETE WASHOUT STRUCTURES SHALL BE LOCATED ADJACENT TO THE CONTRACTOR STAGING AREA, OR AS DIRECTED BY ENGINEER. WASHOUT STRUCTURES SHALL BE LOCATED OUTSIDE ALL PROTECTED SURFACES, SAFETY AREAS, AND OBJECT FREE AREAS.

CONCRETE WASHOUT STRUCTURE

4 GD-02

NOT TO SCALE
(ITEM C-102-46)



NOTES:
1. EXISTING PAVEMENT SECTION SHALL BE REMOVED TO THE BOTTOM OF THE COMPACTED BASE/SUBBASE COURSE.

SOIL RESTORATION DETAIL

5 GR-02

NOT TO SCALE
(ITEM T-902-1)

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

GRADING & EROSION CONTROL DETAILS (SHEET 2 OF 2)

SCALE: NTS	DESIGN: JPM
DRAWN: SGJ	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

GD-02
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EROSION AND SEDIMENT CONTROL GENERAL NOTES:

1. THE CONTRACTOR IS ADVISED THAT ALL EARTH DISTURBANCE ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH NYSDEC SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES FROM CONSTRUCTION ACTIVITY (GP 0-15-002) AND THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) DEVELOPED FOR THE PROJECT. A COPY OF THE SWPPP SHALL BE MAINTAINED ONSITE AT ALL TIMES.
2. THE CONTRACTOR IS REQUIRED TO PERFORM ALL CONSTRUCTION OPERATIONS IN A MANNER SO AS TO MINIMIZE SOIL EROSION AND ENSURE SEDIMENT CONTROL.
3. THE CONTRACTOR SHALL COMPLY WITH THE PROVISIONS OF ALL ENVIRONMENTAL PERMITS ISSUED FOR THIS PROJECT. PERMITS WILL BE AVAILABLE TO THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION.
4. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO PREVENT DIRECT OR INDIRECT CONTAMINATION OF THE STREAMS AND WETLANDS BY SILT, SEDIMENT, FUELS, SOLVENTS, LUBRICANTS, EPOXY COATINGS, CONCRETE LEACHATE, OR ANY OTHER POLLUTANT ASSOCIATED WITH CONSTRUCTION AND CONSTRUCTION PROCEDURES. DURING CONSTRUCTION, NO WET OR FRESH LEACHATE SHALL BE ALLOWED TO ESCAPE INTO ANY WATERBODIES (INCLUDING WETLANDS), NOR SHALL WASHINGS FROM CONCRETE TRUCKS, MIXERS, OR OTHER DEVICES BE ALLOWED TO ESCAPE INTO ANY WATERBODIES OR WETLANDS.
5. THE LOCATION OF EROSION AND SEDIMENT CONTROL MEASURES AS INDICATED IN THE CONTRACT DOCUMENTS MAY REQUIRE FIELD ADJUSTMENT DEPENDING ON THE SEQUENCE OF CONSTRUCTION ACTIVITIES, CONSTRUCTION METHODS, AND/OR ACTUAL FIELD CONDITIONS. THE ENGINEER SHALL BE NOTIFIED OF ANY SIGNIFICANT FIELD CHANGES.
6. ALL DREDGED AND EXCAVATED MATERIAL SHALL BE DISPOSED OF AND BE SUITABLY PROTECTED SO THAT IT CANNOT REASONABLY RE-ENTER ANY WATERBODY OR WETLAND.
7. THE CONTRACTOR SHALL DESIGNATE TO THE ENGINEER A SUPERVISOR OF EROSION AND SEDIMENT CONTROL WITH ADEQUATE TRAINING AS PRESCRIBED IN GP-0-15-002. THIS INDIVIDUAL WILL BE RESPONSIBLE FOR MONITORING IMPENDING WEATHER CONDITIONS THAT MAY HAVE AN EFFECT ON DAILY CONSTRUCTION OPERATIONS AND THE NEED TO PROVIDE THE REQUIRED EROSION AND SEDIMENT CONTROLS.
8. OTHER EROSION CONTROL MEASURES MAY BE REQUIRED BY THE ENGINEER IN ADDITION TO SCHEMES SHOWN. PAYMENT FOR ADDITIONAL WORK SHALL BE PAID FOR UNDER THE APPROPRIATE ITEMS IN THE CONTRACT.
9. ALL DISTURBED AREAS SHALL BE GRADED IN A MANNER THAT DIRECTS RUNOFF TO AN EROSION AND SEDIMENT CONTROL MEASURE AT THE END OF EACH WORKING DAY.
10. CONSTRUCTION ENTRANCES SHALL BE PROVIDED AT ALL POINTS OF EGRESS FROM THE CONSTRUCTION SITE TO A MAINTAINED ROADWAY.
11. ALL STORM DRAINAGE OUTLETS SHALL BE STABILIZED, AS REQUIRED, BEFORE DISCHARGE POINTS BECOME OPERATIONAL.
12. A HYDRAULICALLY APPLIED MULCH SHALL BE USED FOR TEMPORARY AND PERMANENT SOIL STABILIZATION. THE HYDRAULIC MULCH SHALL BE APPLIED PER SPECIFICATIONS.
13. STOCKPILE LOCATIONS AND STAGING AREAS SHALL BE APPROVED BY THE ENGINEER. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER AND HAVE A PERIMETER SEDIMENT CONTROL SYSTEM CONSISTING OF A SILT FENCE BARRIER. STOCKPILES THAT WILL BE EXPOSED FOR MORE THAN FOURTEEN (14) DAYS SHALL BE STABILIZED WITH A ROLLED EROSION CONTROL PRODUCT OR TEMPORARY SEED AND SOIL STABILIZER.
14. ANY ADDITIONAL EROSION CONTROL MEASURES USED TO SUPPLEMENT THESE PLANS SHALL BE IN ACCORDANCE WITH THE TECHNICAL REQUIREMENTS CONTAINED IN THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL, NOVEMBER 2016 VERSION.
15. UPON FINAL STABILIZATION REMOVE SILT FENCE, INLET PROTECTION, CONCRETE WASHOUT STRUCTURE, CONSTRUCTION ENTRANCES, AND OTHER TEMPORARY EROSION CONTROL PRACTICES THAT REMAIN AND RESEED/REPAIR ANY AREAS DAMAGED UPON REMOVAL.
16. REFER TO DRAWING GD-02 FOR TEMPORARY AND PERMANENT SEEDING MIXES.
17. TEMPORARY STABILIZATION AS PRESCRIBED IN THE SPDES PERMIT SHALL BE PROVIDED WITH TEMPORARY SEED AND HYDRAULIC MULCH.
18. ANY BORROW MATERIAL FROM OFF SITE AREAS OR DISPOSED WASTE OFF SITE SHALL BE THE CONTRACTORS RESPONSIBILITY AND THE CONTRACTOR SHALL PROVIDE THEIR OWN EROSION AND SEDIMENT CONTROL PLAN.
19. THE CONTRACTOR SHALL REMOVE FROM THE SITE, RECYCLE, OR DISPOSE OF ALL BUILDING MATERIALS AND CONSTRUCTION WASTES IN ACCORDANCE WITH THE NYSDEC SOLID WASTE MANAGEMENT REGULATIONS. THE CONTRACTOR SHALL NOT ILLEGALLY BURY, DUMP, OR DISCHARGE ANY BUILDING MATERIAL OR CONSTRUCTION WASTES AT THE SITE.
20. A COPY OF THE GENERAL PERMIT (GP-0-15-002), NOI, NOI ACKNOWLEDGEMENT LETTER, SWPPP, AND INSPECTION REPORTS SHALL BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES AND UNTIL THE SITE ACHIEVES FINAL STABILIZATION AND THE NOTICE OF TERMINATION (NOT) HAS BEEN SUBMITTED TO THE NYSDEC.
21. THE OWNER SHALL HAVE THE QUALIFIED INSPECTOR PERFORM A FINAL SITE INSPECTION PRIOR TO SUBMITTING THE NOT. THE QUALIFIED INSPECTOR SHALL, BY SIGNING THE FINAL STABILIZATION AND POST CONSTRUCTION STORMWATER MANAGEMENT PRACTICE CERTIFICATION STATEMENT ON THE NOT, CERTIFY THAT ALL DISTURBED AREAS HAVE ACHIEVED FINAL STABILIZATION, AND ALL E&SC MEASURES HAVE BEEN REMOVED, AND THAT ALL POST CONSTRUCTION STORMWATER MANAGEMENT PRACTICES HAVE BEEN CONSTRUCTED IN CONFORMANCE WITH THE SWPPP.
22. FINAL STABILIZATION MEANS THAT ALL SOIL DISTURBANCE ACTIVITIES HAVE CEASED AND A UNIFORM, PERENNIAL VEGETATIVE COVER WITH A DENSITY OF EIGHTY (80) PERCENT OVER THE ENTIRE PERVIOUS SURFACE HAS BEEN ESTABLISHED; OR OTHER EQUIVALENT STABILIZATION MEASURES, AS DEFINED IN THE SPDES PERMIT, HAVE BEEN APPLIED ON ALL DISTURBED AREAS.

INSPECTION AND MAINTENANCE NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF ALL INSTALLED EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMPs) AND PERMANENT STORMWATER MANAGEMENT FACILITIES DURING CONSTRUCTION.
2. THE OWNER SHALL INSPECT, IN ACCORDANCE WITH THE REQUIREMENTS OF THE NEW YORK STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL (BLUEBOOK), THE EROSION AND SEDIMENT CONTROLS IDENTIFIED IN THE SWPPP TO ENSURE THAT THEY ARE BEING MAINTAINED IN EFFECTIVE OPERATING CONDITION AT ALL TIMES.
3. FOR CONSTRUCTION SITES WHERE SOIL DISTURBANCE ACTIVITIES HAVE BEEN TEMPORARILY SUSPENDED (I.E. WINTER SHUTDOWN) AND TEMPORARY STABILIZATION MEASURES HAVE BEEN APPLIED TO ALL DISTURBED AREAS, THE OWNER CAN STOP CONDUCTING THE MAINTENANCE INSPECTIONS. MAINTENANCE INSPECTIONS SHALL BE CONDUCTED AS SOON AS SOIL DISTURBANCE ACTIVITIES RESUME.
4. SITE INSPECTIONS BY A QUALIFIED INSPECTOR SHALL BE IN CONFORMANCE WITH THE FOLLOWING REQUIREMENTS:
   - AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS FOR CONSTRUCTION SITES WHERE SOIL DISTURBANCE ACTIVITIES ARE ON-GOING.
   - FOR CONSTRUCTION SITES WITH AUTHORIZATION TO DISTURB GREATER THAN FIVE (5) ACRES OF SOIL AT ANY ONE TIME, THE QUALIFIED INSPECTOR SHALL CONDUCT AT LEAST TWO (2) SITE INSPECTIONS EVERY SEVEN (7) CALENDAR DAYS. THE TWO (2) INSPECTIONS SHALL BE SEPARATED BY A MINIMUM OF TWO (2) FULL CALENDAR DAYS.
   - AT LEAST ONCE EVERY THIRTY (30) CALENDAR DAYS FOR CONSTRUCTION STIES WHERE SOIL DISTURBANCE ACTIVITIES HAVE BEEN TEMPORARILY SUSPENDED (I.E. WINTER SHUTDOWN) AND TEMPORARY STABILIZATION MEASURES HAVE BEEN APPLIED TO ALL DISTURBED AREAS.
   - FOR CONSTRUCTION SITES WHERE SOIL DISTURBANCE ACTIVITIES HAVE BEEN SHUT DOWN WITH PARTIAL PROJECT COMPLETION, THE QUALIFIED INSPECTOR CAN STOP CONDUCTING INSPECTIONS IF ALL AREAS DISTURBED AS OF THE PROJECT SHUTDOWN DATE HAVE ACHIEVED FINAL STABILIZATION AND ALL POST CONSTRUCTION STORMWATER MANAGEMENT PRACTICES REQUIRED FOR THE COMPLETED PORTION OF THE PROJECT HAVE BEEN CONSTRUCTED IN CONFORMANCE WITH THE SWPPP AND ARE OPERATIONAL.
   - ALL INSPECTIONS SHALL BE COMPLETED WITHIN ONE CALENDAR DAY. WITHIN 3 CALENDAR DAYS FROM THE COMPLETION OF INSPECTION, THE CONTRACTOR SHALL: REPAIR OR REBUILD THE CONTROL MEASURES TO FUNCTION AS ORIGINALLY INTENDED AND REMOVE SEDIMENT DEPOSITION WHICH REACHES ONE HALF THE HEIGHT OF THE CONTROL MEASURES. TORN OR PUNCTURED SILT FENCE FABRIC MAY BE REPAIRED BY THE PLACEMENT OF A PATCH, ON THE UPSTREAM SIDE, CONSISTING OF AN ADDITIONAL LAYER OF FABRICE OVER THE DAMAGED AREA, OR REPLACEMENT OF THE DAMAGED SECTION.
5. THE QUALIFIED INSPECTOR REQUIREMENTS ARE PRESCRIBED IN APPENDIX A OF THE SPDES GENERAL PERMIT.
6. ALL SEDIMENT REMOVED FROM TEMPORARY BMPs WILL BE DISPOSED OF ON-SITE.
7. ALL SEEDED AREAS WILL BE FERTILIZED, RESEEDED AS NECESSARY AND SOIL STABILIZERS APPLIED ACCORDING TO THE SPECIFICATIONS TO MAINTAIN A DENSE VEGETATIVE COVER.
8. ALL SITE INSPECTIONS WILL BE DOCUMENTED IN AN INSPECTION REPORT LOG BOOK KEPT FOR THIS PURPOSE AND SHALL INCLUDE THE MINIMUM REQUIREMENTS OUTLINED IN PART IV.C.3 OF THE SPDES GENERAL PERMIT.
9. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING AND RENETTING MUST BE PERFORMED IMMEDIATELY. IF EROSION AND SEDIMENT CONTROL FACILITIES FAIL TO PERFORM AS EXPECTED, REPLACEMENT MEASURES, OR MODIFICATIONS OF THOSE INSTALLED WILL BE REQUIRED.

EROSION AND SEDIMENT CONTROL SEQUENCE OF CONSTRUCTION:

1. EROSION AND SEDIMENT CONTROL PRACTICES WILL BE COORDINATED WITH EACH STAGE OF CONSTRUCTION.
2. PRIOR TO STARTING ANY CONSTRUCTION OPERATION, THE CONTRACTOR SHALL IDENTIFY CONSTRUCTION ENTRANCE LOCATIONS FOR APPROVAL AND INSTALL STABILIZED CONSTRUCTION ENTRANCES IN ACCORDANCE WITH THE DETAILS. THE CONTRACTOR SHALL ALSO IDENTIFY THE CONCRETE WASHOUT STRUCTURE LOCATION FOR APPROVAL.
3. INSTALL PERIMETER CONTROLS, SUCH AS SILT FENCE, INLET PROTECTION, AND OTHER EROSION CONTROL MEASURES IDENTIFIED PRIOR TO COMMENCEMENT OF EARTH DISTURBANCE ACTIVITIES.
4. THE CONTRACTOR SHALL REFER TO THE CONSTRUCTION SAFETY AND PHASING PLANS AND NOTES. ALL BMPs SHALL BE INSTALLED PRIOR TO WORK IN EACH PHASE.
5. SOIL RESTORATION OF IMPERVIOUS AREAS REMOVED FROM THE PROJECT AREA SHALL BE INITIATED ONCE THOSE AREAS HAVE REACHED ROUGH GRADE.
6. IN AREAS WHERE SOIL DISTURBANCE ACTIVITY HAS TEMPORARILY OR PERMANENTLY CEASED, THE APPLICATION OF SOIL STABILIZATION MEASURES MUST BE INITIATED BY THE END OF THE NEXT BUSINESS DAY AND COMPLETED WITHIN SEVEN (7) DAYS.
7. ALL SEEDED AREAS WILL BE FERTILIZED, RESEEDED AS NECESSARY AND HYDRAULIC MULCH APPLIED ACCORDING TO THE SPECIFICATIONS TO MAINTAIN A DENSE VEGETATIVE COVER.
8. WHEN VEGETATION IS ESTABLISHED, REMOVE SILT FENCE AND ANY OTHER TEMPORARY EROSION CONTROL MEASURES THAT REMAIN AND CLEAN OUT ANY SEDIMENTATION IN THE DRAINAGE PIPES AND SWALES. RESEED/REPAIR ANY AREAS DAMAGED DURING THESE ACTIVITIES.

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

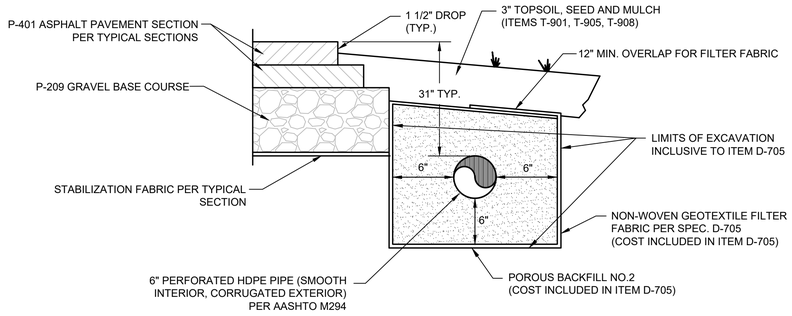
REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)
EROSION & SEDIMENT CONTROL NOTES

SCALE: NTS	DESIGN: JPM
DRAWN: SDB	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

GD-03
44 OF 81



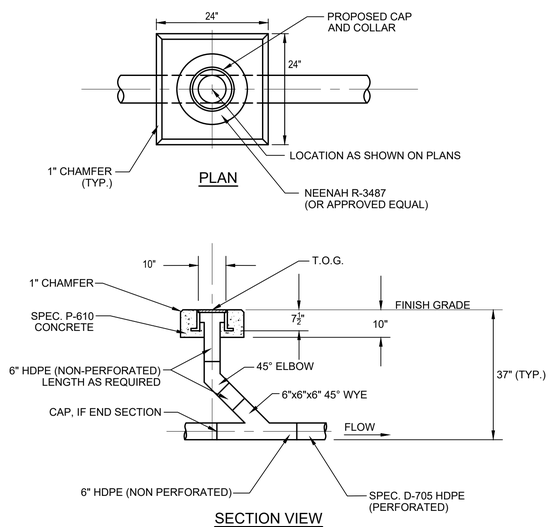
NOTES:

1. ALL COSTS ASSOCIATED WITH UNDERDRAIN INSTALLATION INCLUDING OUTLETS, CONNECTION TO STRUCTURE AND END SECTIONS SHALL BE INCLUDED IN THE PRICE BID FOR ITEM D-705-2.
2. ALL UNDERDRAIN PIPE TO BE SMOOTH INTERIOR/CORRUGATED EXTERIOR HDPE, TUBING IS NOT ALLOWED.

6" PERFORATED UNDERDRAIN DETAIL

ITEM D-705-2
N.T.S.

1 / DR-01

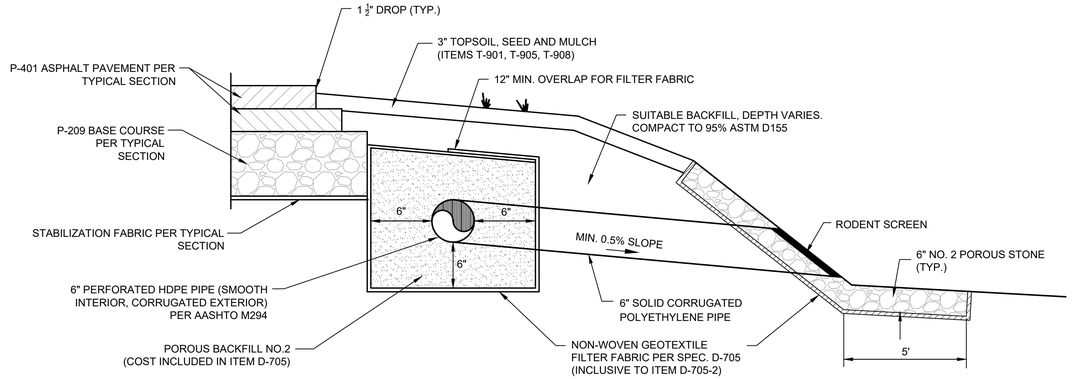


SECTION VIEW

UNDERDRAIN CLEAN OUT DETAIL

ITEM D-705-4
N.T.S.

2 / DR-01



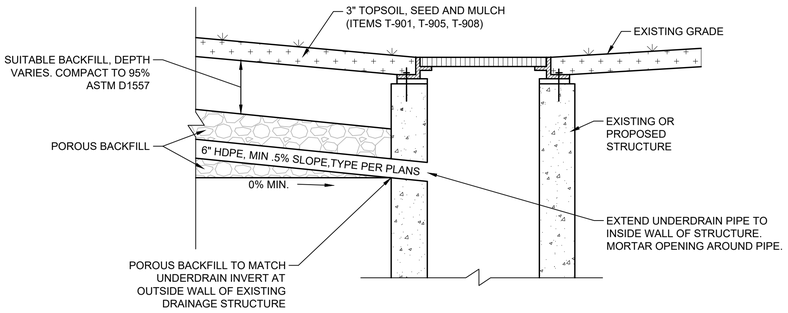
NOTES:

1. ALL COSTS ASSOCIATED WITH INSTALLING UNDERDRAIN OUTLETS SHALL BE INCLUDED IN THE PRICE BID FOR ITEM D-705-5.
2. ALL UNDERDRAIN PIPE TO BE SMOOTH INTERIOR/CORRUGATED EXTERIOR HDPE, TUBING IS NOT ALLOWED.

UNDERDRAIN OUTLET DETAIL

ITEM D-705-5
N.T.S.

3 / DR-01



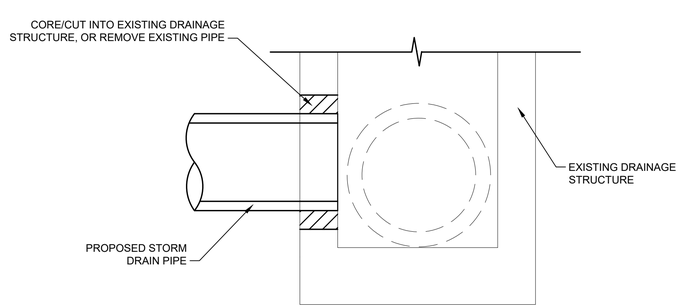
GENERAL NOTES:

1. WHEN UNDERDRAIN TERMINTAES AT A STRUCTURE THE PIPE SHALL BE PLACED SO THAT IT PENETRATES THE FULL WALL OF THE STRUCTURE AND MORTAR PLACED AT ALL VOIDS.
2. ALL WORK ASSOCIATED WITH OUTLETTING UNDERDRAIN TO THE DRAINAGE STRUCTURE SHALL BE INCLUDED IN ITEM D-751-4.

UNDERDRAIN TIE-IN DETAIL

N.T.S.

4 / DR-01



NOTES:

1. WHEN DRAINAGE PIPE TERMINATES AT STRUCTURE THE PIPE SHALL BE PLACED SO THAT IT PENETRATES THE FULL WALL OF THE STRUCTURE. MORTAR SHALL BE PLACED AT ALL VOIDS.
2. ALL WORK ASSOCIATED WITH OUTLETTING PIPE TO DRAINAGE STRUCTURES SHALL BE PAID FOR UNDER ITEM D-751-4. PIPE CONNECTIONS TO PROPOSED STRUCTURES SHALL BE INCLUSIVE TO ITEM D-751-012.
3. ALTERATIONS (PIPE TIE-IN'S TO EXISTING STRUCTURES) SHALL BE PAID FOR PER EACH TIE-IN COMPLETED AND ACCEPTED BY THE ENGINEER.

CONNECTION TO EXISTING DRAINAGE STRUCTURE

N.T.S
ITEM D-751-4

5 / DR-01

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084009 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

DRAINAGE DETAILS (SHEET 1 OF 3)

SCALE: NTS	DESIGN: JPM	**DR-01**	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	45 OF 81	

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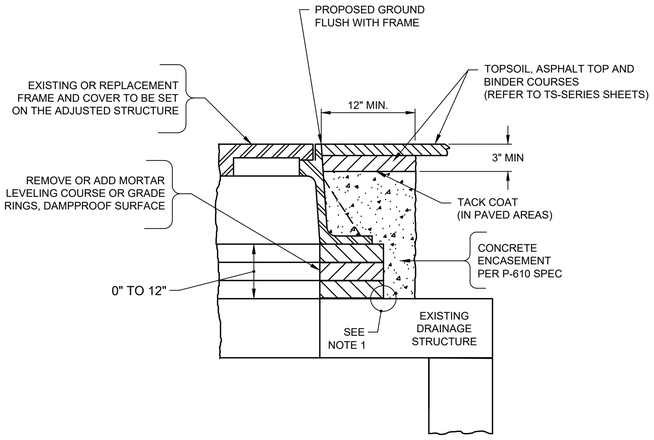
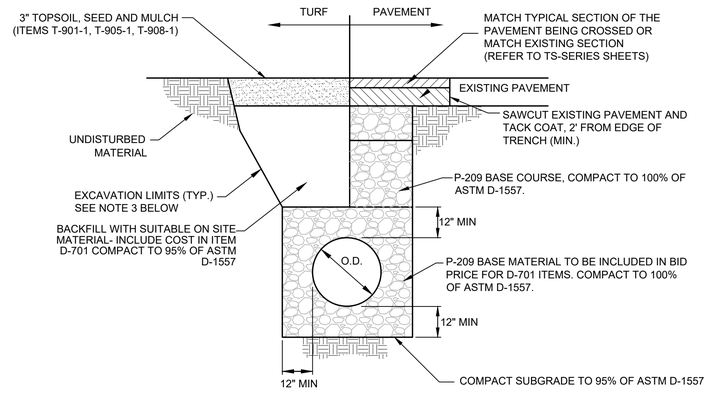


NOTES:
1. THE LOWER LIMIT OF THE CONCRETE ENCASEMENT SHALL BE AT, OR BELOW, THE LOWEST PORTION OF THE BRICK AND MORTAR LEVELING COURSE.
2. THE CONTRACTOR SHALL REMOVE OR ADD COURSES OF BLOCK OR BRICK IN ORDER TO ADJUST THE MANHOLE SUCH THAT THE FRAME AND COVER/GRATE WILL BE AT THE PROPER FINISH GRADE AND CROSS-SLOPE.
3. THE COST FOR TACK COAT, CONCRETE ENCASEMENT, DAMPROOFING, EXCAVATION, BACKFILL AND LEVELING COURSES SHALL BE INCLUDED IN ITEM D-751-51.

MINOR FRAME & COVER/GRATE ADJUSTMENT - RAISE & LOWER

1 / DR-02

N.T.S
ITEM D-751-51

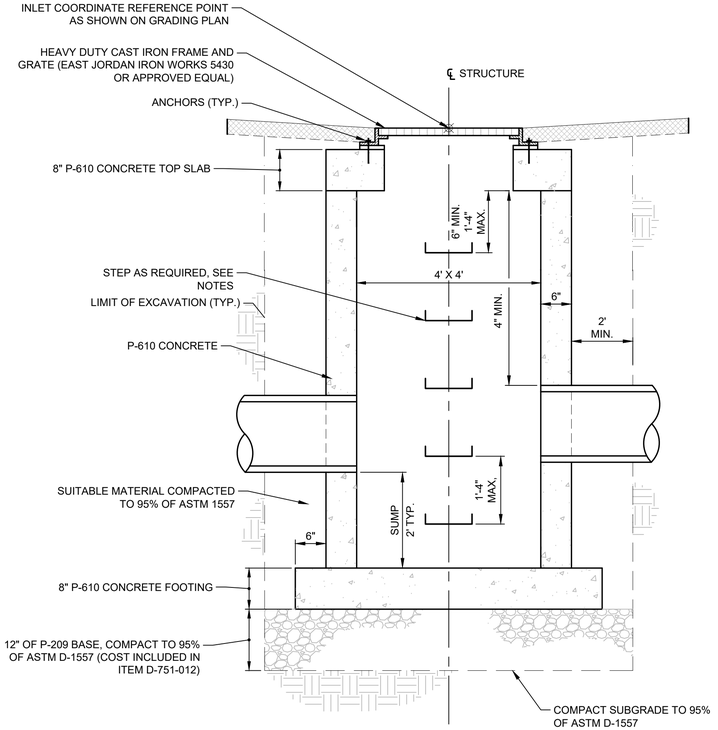


NOTES:
1. THE CONTRACTOR SHALL DO ALL BRACING, SHEATHING, OR SHORING NECESSARY TO IMPLEMENT AND PROTECT THE EXCAVATION AS REQUIRED FOR SAFETY OR CONFORMANCE TO GOVERNING LAWS.
2. SHEETING AND SHORING SYSTEMS DESIGN MUST BE PREPARED BY A NEW YORK STATE LICENSED PROFESSIONAL ENGINEER.
3. ALL EXCAVATION AND ANY REQUIRED SHEETING AND SHORING SHALL BE DONE IN ACCORDANCE WITH THE LATEST REVISIONS OF THE FOLLOWING CODES:
   A. SUBPART 23-4, "EXCAVATION OPERATIONS" OF NEW YORK STATE DEPARTMENT OF LABOR INDUSTRIAL CODE RULE 23.
   B. SUBPART P, "EXCAVATION, TRENCHING AND SHORING" OF U.S. DEPARTMENT OF LABOR O.S.H.A. REGULATIONS FOR CONSTRUCTION.
   THE MORE STRINGENT REQUIREMENT IN EACH CODE SHALL APPLY.
4. WORK INCLUDES DEWATERING AS NECESSARY
5. PIPE SHALL BE INSTALLED IN THE CENTER OF THE TRENCH.

TYPICAL PIPE TRENCH DETAIL

2 / DR-02

N.T.S
ITEM D-701-0224

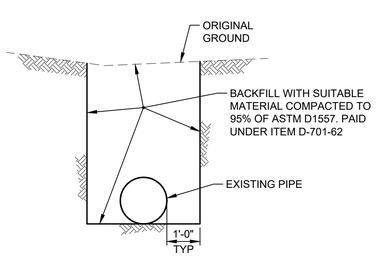


NOTES:
1. DRAINAGE STRUCTURES SHALL BE CAST IN PLACE (RECTANGULAR ONLY) OR PRECAST UNITS (RECTANGULAR OR ROUND).
2. STEPS SHALL BE REQUIRED IN ALL STRUCTURES DEEPER THAN 4'-0".
3. COORDINATES ARE GIVEN TO THE CENTER OF THE STRUCTURE.
4. DRAINAGE INLETS AND MANHOLES SHALL BE DESIGNED TO CARRY A SURFACE WHEEL LOADING OF 195 PSI MINIMUM (BOEING 767-400).
5. ALL CASTINGS SHALL BE CAPABLE OF CARRYING AN AIRCRAFT WHEEL LOADING OF 195 PSI MINIMUM (BOEING 767-400).

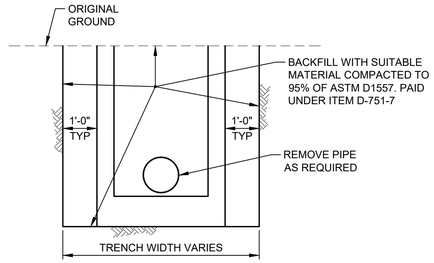
RECTANGULAR DRAINAGE STRUCTURE, 4'x4'

3 / DR-02

NOT TO SCALE
ITEM D-751-012



REMOVAL OF EXISTING PIPES
N.T.S.

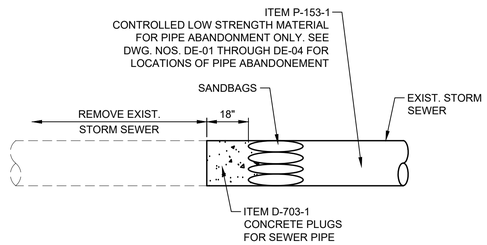


REMOVAL OF EXISTING DRAINAGE STRUCTURES
N.T.S.

NOTE:
1. EXCAVATION AND REMOVAL OF EXISTING STRUCTURES OR EXISTING PIPES WILL BE PAID FOR UNDER ITEM D-751-7 AND ITEM D-701-62, RESPECTIVELY.
2. EXISTING STRUCTURES AND PIPES SHALL BE FULLY REMOVED PRIOR TO BACKFILLING.

EXISTING REMOVAL DETAILS

4 / DR-02



PIPE ABANDONMENT NOTES:
1. WHEN PLACING CONTROLLED LOW STRENGTH MATERIAL (CLSM), PLUG DOWNSTREAM END OF PIPE TO BE ABANDONED AND PLACE CLSM FROM UPSTREAM END OR A.O.B.E.

DETAILS FOR PERMANENT PIPE PLUG OR ABANDONMENT

5 / DR-02

N.T.S
ITEM P-153-1, ITEM D-703-1

CONSTRUCTION BID SET

STATE OF NEW YORK
STEVEN J. LANDE
084000
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

DRAINAGE DETAILS (SHEET 2 OF 3)

SCALE: NTS	DESIGN: JPM	DR-02	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	46 OF 81	

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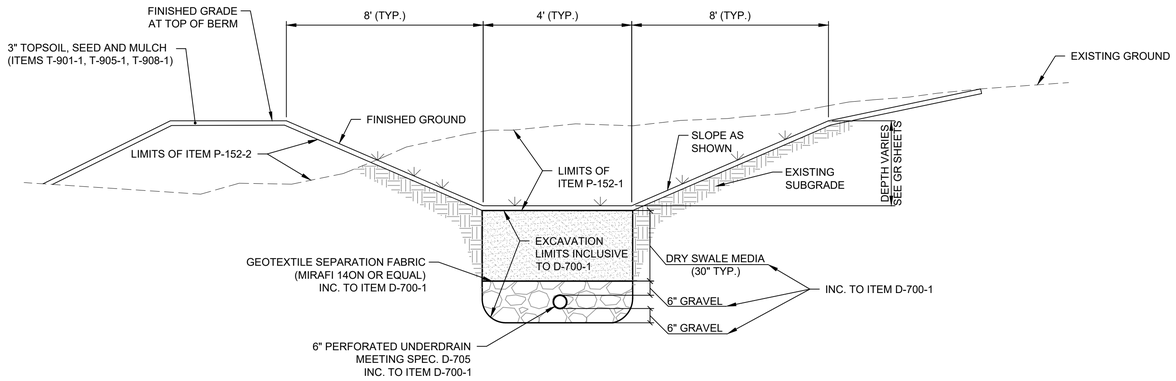


NOTES:
1. THE LONGITUDINAL GRADE OF UNDERDRAIN PIPE SHALL FOLLOW THE LONGITUDINAL GRADE OF THE SWALE BOTTOM. AT THE END OF EACH SWALE, UNDERDRAIN SHALL BE SLOPED TO DRAIN INTO THE STRUCTURE IT IS OUTLET INTO.

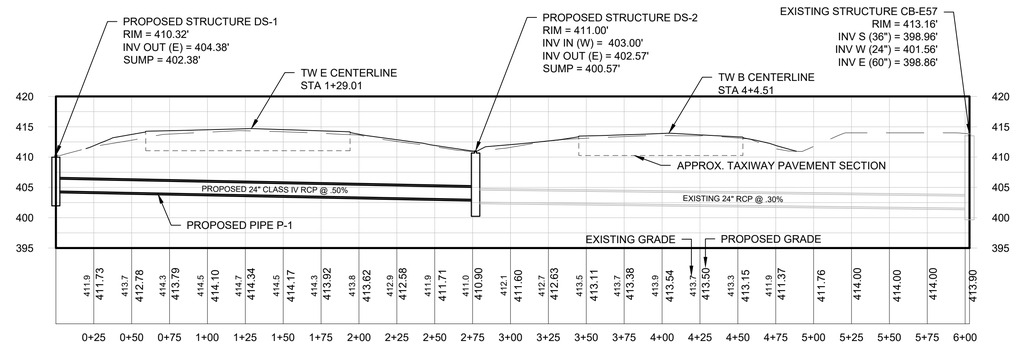
TYPICAL DRY SWALE DETAIL

ITEM D-700-1
N.T.S.

1
DR-03

DRY SWALE SUMMARY TABLE				
DRY SWALE	BOTTOM WIDTH (FT)	SIDE SLOPE (H:V)	LONGITUDINAL SLOPE (%)	LENGTH (FT)
SMA-5	4	4:1	0.55	897

DRY SWALE CONSTRUCTION NOTES:
1. AT NO TIME DURING CONSTRUCTION SHALL RUNOFF CONTAINING SEDIMENT FROM CONSTRUCTION ACTIVITIES BE DIRECTED INTO A DRY SWALE.
2. TO THE GREATEST EXTENT POSSIBLE, COMPLETE ALL WORK ITEMS AND STABILIZE ALL DISTURBED AREAS UPSLOPE OF A PROPOSED DRY SWALE PRIOR TO THE CONSTRUCTION OF THE SWALE ITSELF.
3. PRIOR TO INSTALLATION OF THE DRY SWALE MEDIA, SILT FENCE AND/OR SEDIMENT FILTER LOG SHALL BE INSTALLED UPSLOPE OF THE PROPOSED DRY SWALE TO PREVENT SEDIMENT FROM ENTERING THE DRY SWALE MEDIA BED. THE SILT FENCE AND/OR FILTER LOG SHALL BE MAINTAINED BY THE CONTRACTOR UNTIL THE DISTURBED AREA UPSLOPE OF THE SWALE IS FULLY STABILIZED.
4. IF THE DRY SWALE MEDIA BECOMES CLOGGED AS A RESULT OF THE CONTRACTOR'S ACTIONS, THE MEDIA SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.



PIPE P-1 PROFILE
Horizontal Scale: 1" = 50'
Vertical Scale: 1" = 12'

ADJUST EXISTING DRAINAGE STRUCTURE (RAISE/LOWER) - ITEM D-751-51						
STRUCTURE ID	STATION	OFFSET	SIDE	EXISTING ELEVATION	PROPOSED ELEVATION	ELEVATION ADJUSTMENT
CB E60	TW A 156+21.53	67.838'	L	412.10'	412.62'	+ 0.52'
DMH E23	TW A 177+65.16	68.549'	R	404.14'	403.67'	- 0.47'
DMH SD12	TW A 176+54.50	88.853'	R	402.67'	403.03'	+ 0.36'
DMH SD8	TW M 404+72.38	50.251'	L	403.84'	404.37'	+ 0.53'
CB E61B	TW A 156+21.49	79.031'	R	411.75'	412.06'	+ 0.31'

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

DRAINAGE DETAILS (SHEET 3 OF 3)

SCALE: NTS	DESIGN: JPM	**DR-03**	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	47 OF 81	

PROPOSED ELECTRICAL LEGEND

SYMBOL	DESCRIPTION	ASSOCIATED ITEM NUMBER
	EXISTING, ELEVATED L-861T TAXIWAY EDGE LIGHT TO REMAIN	-
	PROPOSED, ELEVATED L-861T QUARTZ TAXIWAY EDGE LIGHT WITH NEW TRANSFORMER ON NEW L-867B BASE CAN IN ASPHALT OR TURF. LENS COLOR IS BLUE.	L-125-21
W Y	EXISTING, ELEVATED L-862 RUNWAY EDGE LIGHT TO REMAIN	-
W Y	PROPOSED, ELEVATED L-862 RUNWAY EDGE LIGHT WITH NEW TRANSFORMER ON NEW L-867B BASE CAN. "W" DENOTES WHITE/CLEAR LENS COLOR. "Y" DENOTES YELLOW LENS COLOR. "R" DENOTES RED LENS COLOR. "G" DENOTES GREEN LENS COLOR.	N/A
W Y	EXISTING, IN-PAVEMENT L-850C RUNWAY EDGE LIGHT TO REMAIN	-
W Y	PROPOSED, IN-PAVEMENT L-850C RUNWAY EDGE LIGHT WITH NEW TRANSFORMER ON NEW L-868B BASE CAN. "W" DENOTES WHITE/CLEAR LENS COLOR. "Y" DENOTES YELLOW LENS COLOR. "R" DENOTES RED LENS COLOR. "G" DENOTES GREEN LENS COLOR.	N/A
G R	EXISTING, ELEVATED L-862E RUNWAY THRESHOLD LIGHT TO REMAIN	-
G R	PROPOSED, ELEVATED L-862E RUNWAY THRESHOLD LIGHT WITH NEW TRANSFORMER ON NEW L-867B BASE CAN. "G" DENOTES GREEN LENS COLOR. "R" DENOTES RED LENS COLOR.	N/A
	EXISTING IN-PAVEMENT L-850B RUNWAY TOUCHDOWN ZONE LIGHT TO REMAIN	-
	PROPOSED, IN-PAVEMENT L-850B RUNWAY TOUCHDOWN ZONE LIGHT WITH NEW TRANSFORMER ON NEW L-868B BASE CAN. LENS COLOR IS CLEAR/WHITE.	N/A
W R	EXISTING, IN-PAVEMENT L-850A RUNWAY CENTERLINE LIGHT TO REMAIN	-
W R	PROPOSED, IN-PAVEMENT L-850A RUNWAY CENTERLINE WITH NEW TRANSFORMER ON NEW L-868B BASE CAN. "W" DENOTES WHITE/CLEAR LENS COLOR. "R" DENOTES RED LENS COLOR.	N/A
	EXISTING, ELEVATED L-804 RUNWAY GUARD LIGHT TO REMAIN	-
	PROPOSED, ELEVATED L-804(L) RUNWAY GUARD LIGHT WITH NEW TRANSFORMER ON NEW L-867B BASE CAN IN NEW ASPHALT PAVEMENT	L-125-500
RR	EXISTING, ELEVATED L-804 RUNWAY GUARD LIGHT WITH EXISTING TRANSFORMER TO BE REMOVED AND REINSTALLED ON NEW L-867B BASE CAN IN ASPHALT OR TURF	L-125-68
	PROPOSED, IN-PAVEMENT L-852G(L) RUNWAY GUARD LIGHT WITH NEW TRANSFORMER ON NEW L-868B BASE CAN IN NEW ASPHALT PAVEMENT	L-125-501
	EXISTING L-858 AIRFIELD GUIDANCE SIGN AND FOUNDATION REMAIN	-
	PROPOSED L-858 AIRFIELD GUIDANCE SIGN ON NEW FOUNDATION. NUMBER OF SIGN MODULES VARIES	L-125-7103
EF	PROPOSED L-858 AIRFIELD GUIDANCE SIGN ON EXISTING FOUNDATION	L-125-7113
	EXISTING RUNWAY DISTANCE REMAINING SIGN AND FOUNDATION TO REMAIN	-
	EXISTING L-853 RETROREFLECTIVE EDGE MARKER TO REMAIN	-
M	EXISTING AIRFIELD LIGHTING MANHOLE TO REMAIN	-
M	PROPOSED AIRCRAFT RATED 4'X4'X4' AIRFIELD LIGHTING MANHOLE	-
M A	EXISTING AIRFIELD LIGHTING MANHOLE TO BE ADJUSTED TO GRADE WITH RISER	L-115-31
P	EXISTING FAA POWER MANHOLE TO REMAIN	-
C	EXISTING FAA COMMUNICATION MANHOLE TO REMAIN	-
	EXISTING JUNCTION/SPLICE CAN TO REMAIN	-
	PROPOSED L-867B JUNCTION CAN WITH COVER PLATE IN ASPHALT OR TURF	L-115-201
	EXISTING PAPI UNIT AND FOUNDATION TO REMAIN	-
	EXISTING L-807 PRIMARY OR L-806 SUPPLEMENTAL WIND CONE TO REMAIN	-
	EXISTING GLIDE SLOPE ANTENNA (TYPE VARIES) AND FOUNDATION TO REMAIN	-
	EXISTING LOCALIZER ANTENNA AND FOUNDATION TO REMAIN	-
	EXISTING STEADY BURN MALS APPROACH LIGHT AND FOUNDATION TO REMAIN	-
	EXISTING RAIL APPROACH LIGHT AND FOUNDATION TO REMAIN	-

[1-T1] OR TC-1/1
EXISTING AIRFIELD LIGHTING CONDUIT AND WIRE TO REMAIN. "T1" OR "TC-1" DENOTES CIRCUIT ID.

[1-T1]
PROPOSED 2" SCHEDULE 40 PVC CONDUIT, WIRE(S), AND (1) #6 GROUND WIRE. "T1" DENOTES CIRCUIT ID. REFER TO TABLE THIS SHEET FOR WIRE TYPE. "1" PRECEDING CIRCUIT ID DENOTES NUMBER OF CONDUCTORS.

4-WAY
EXISTING AIRFIELD DUCTBANK (SIZE SHOWN) AND WIRE TO REMAIN

[2-RGL]
RGL RGL
PROPOSED WIRE(S) AND (1) #6 GROUND WIRE IN EXISTING CONDUIT. "RGL" DENOTES RUNWAY GUARD LIGHT CIRCUIT. REFER TO "EP" DRAWING SERIES FOR WIRE TYPE. "2" PRECEDING CIRCUIT ID DENOTES NUMBER OF CONDUCTORS.

[2-RGL]
RGL RGL
PROPOSED 2" SCHEDULE 40 PVC CONDUIT, WIRE(S), AND (1) #6 GROUND WIRE. "RGL" DENOTES RUNWAY GUARD LIGHT CIRCUIT. REFER TO "EP" DRAWING SERIES FOR WIRE TYPE. "2" PRECEDING CIRCUIT ID DENOTES NUMBER OF CONDUCTORS.

SEN
EXISTING PAVEMENT SURFACE SENSOR CONDUIT AND WIRE TO REMAIN. WIRE TYPE VARIES AND IS DENOTED AS EITHER TYPE IIA OR TYPE V ON "EP" SERIES DRAWINGS

SEN
PROPOSED PAVEMENT SURFACE SENSOR CONDUIT AND WIRE TO REMAIN. WIRE TYPE VARIES AND IS DENOTED AS EITHER TYPE IIA OR TYPE V ON "EP" SERIES DRAWINGS

FAAP FAAP
EXISTING FAA FACILITY POWER CONDUIT AND WIRE TO REMAIN

FAAC FAAC
EXISTING FAA FACILITY COMMUNICATION CONDUIT AND WIRE TO REMAIN

FAACP FAACP
EXISTING FAA FACILITY POWER AND COMMUNICATION CONDUIT AND WIRE TO REMAIN

UE
EXISTING UNDERGROUND POWER CONDUIT AND WIRE TO REMAIN

UT
EXISTING UNDERGROUND TELEPHONE/COMMUNICATION CONDUIT AND WIRE TO REMAIN

UFO
EXISTING UNDERGROUND FIBER OPTIC CONDUIT AND WIRE TO REMAIN

VASI
EXISTING VISUAL APPROACH SLOPE INDICATOR (VASI) CONDUIT AND WIRE TO REMAIN

AB
EXISTING ABANDONED CONDUIT AND WIRE

CIRCUIT SCHEDULE		
CIRCUIT ID	DESCRIPTION	CABLE TYPE
RC-1	RW 10-28 EDGE	1-1/C NO. 8 AWG, 5KV
RC-3	RW 10-28 CENTERLINE	1-1/C NO. 8 AWG, 5KV
RC-14	RW 15-33 EDGE	1-1/C NO. 6 AWG, 5KV
RC-16	RW 15-33 CENTERLINE	1-1/C NO. 6 AWG, 5KV
TDZ	RW 28 TOUCHDOWN ZONE LIGHTS	1-1/C NO. 6 AWG, 5KV
TC-1	TW "A" CENTER, TW "B", TW "F", TW "U"	1-1/C NO. 8 AWG, 5KV
TC-2	TW "A" EAST	1-1/C NO. 8 AWG, 5KV
TC-4	TW "B" SOUTH	1-1/C NO. 8 AWG, 5KV
TC-8	TW "M" CENTER	1-1/C NO. 8 AWG, 5KV
TC-11	TW "A" WEST, TW "Q", TW "R", TW "Z"	1-1/C NO. 8 AWG, 5KV
SENSOR POWER/3	SURFACE SENSOR POWER	2-1/C NO. 8 AWG, 5KV & 1-1/C NO. 6 AWG GROUND
SENSOR 6(V)/1	WIRES FOR SURFACE SENSOR 6 (EXAMPLE)	TYPE (V) WIRE
SENSOR 6(IIA)/1	WIRE FOR SURFACE SENSOR 6 (EXAMPLE)	TYPE (IIA) WIRE

LIGHT LENS COLOR LEGEND	
B	360° BLUE
R	360° RED
W-Y	180° WHITE, 180° YELLOW
W-W	180° WHITE, 180° WHITE
G-R	180° GREEN, 180° RED
R-R	180° RED, 180° RED

NOTES:
1. CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING ELECTRICAL ELECTRICAL AND COMMUNICATION FACILITIES AT ALL TIMES.
2. REFER TO SHEETS ED-01 THROUGH ED-07 FOR ELECTRICAL DETAILS.

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084099 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

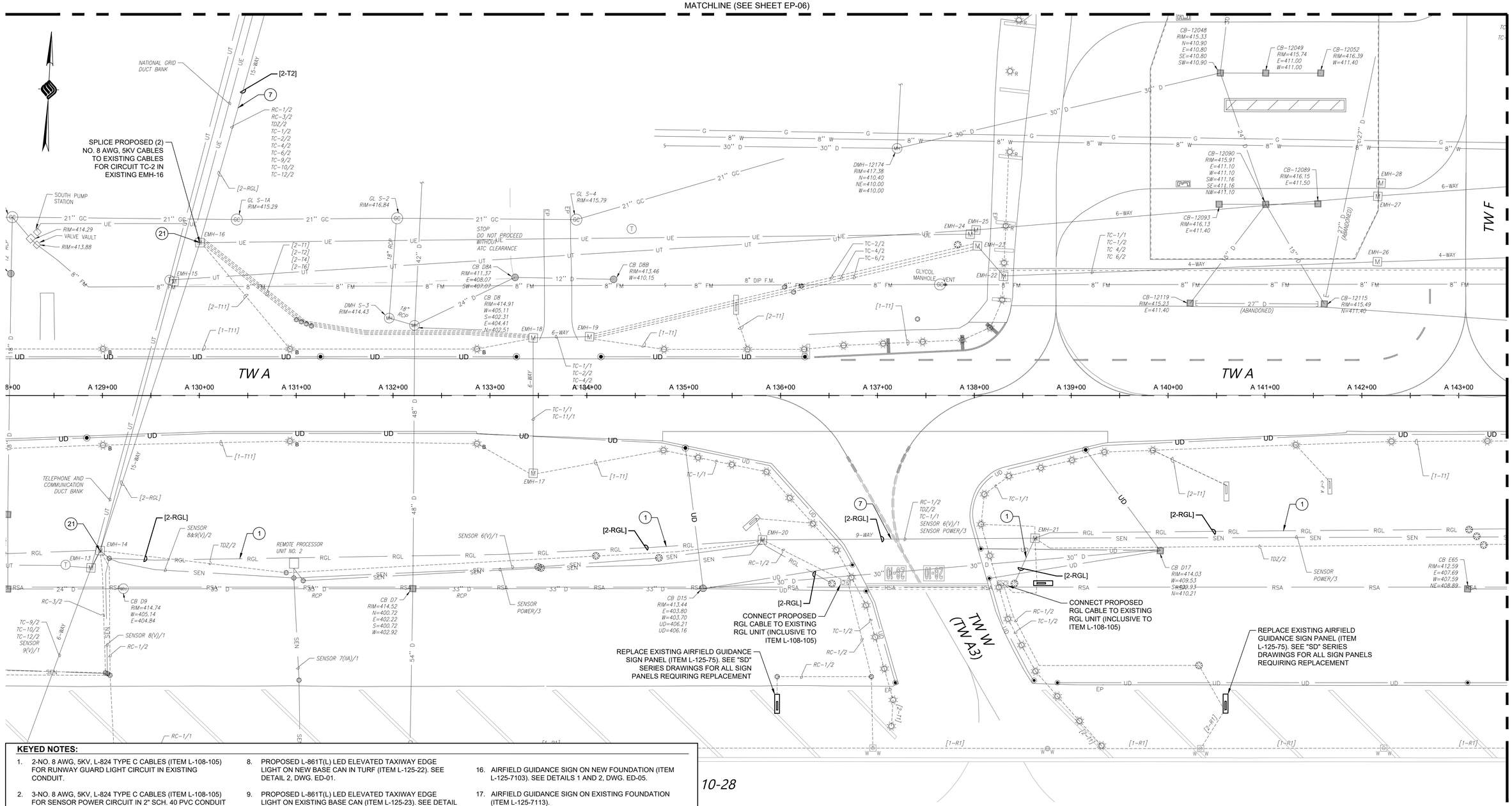
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

AIRFIELD ELECTRICAL LEGEND AND CABLE IDENTIFICATION

SCALE: NONE	DESIGN: JPM	**EP-00**	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	48 OF 81	



KEYED NOTES:

1. 2-NO. 8 AWG, 5KV, L-824 TYPE C CABLES (ITEM L-108-105) FOR RUNWAY GUARD LIGHT CIRCUIT IN EXISTING CONDUIT.
2. 3-NO. 8 AWG, 5KV, L-824 TYPE C CABLES (ITEM L-108-105) FOR SENSOR POWER CIRCUIT IN 2" SCH. 40 PVC CONDUIT (ITEM L-110-104).
3. NO. 8 AWG, 5KV, L-824 TYPE C CABLES (ITEM L-108-105) IN 2" SCH. 40 PVC CONDUIT (ITEM L-110-104) WITH PROPOSED COUNTERPOISE WIRE IN SEPARATE TRENCH (ITEM L-108-201). SEE DETAIL 1, DWG. ED-01.
4. NO. 8 AWG, 5KV, L-824 TYPE C CABLE (ITEM L-108-105) IN 2" RGS CONDUIT (ITEM L-110-304) WITH PROPOSED COUNTERPOISE WIRE ABOVE CONDUIT (ITEM L-108-201). SEE DETAIL 6, DWG. ED-01.
5. NO. 8 AWG, 5KV, L-824 TYPE C CABLE (ITEM L-108-105) IN 2" SCH. 40 PVC CONDUIT (ITEM L-110-104). SEE DETAIL 5, ED-01.
6. NO. 8 AWG, 5KV, L-824 TYPE C CABLE (ITEM L-108-105) IN EXISTING CONDUIT.
7. INSTALL PROPOSED CABLE IN EXISTING DUCT BANK (INCLUSIVE TO RESPECTIVE L-108 ITEM).
8. PROPOSED L-861T(L) LED ELEVATED TAXIWAY EDGE LIGHT ON NEW BASE CAN IN TURF (ITEM L-125-22). SEE DETAIL 2, DWG. ED-01.
9. PROPOSED L-861T(L) LED ELEVATED TAXIWAY EDGE LIGHT ON EXISTING BASE CAN (ITEM L-125-23). SEE DETAIL 7, DWG. ED-01.
10. PROPOSED L-852T(L) LED IN-PAVEMENT TAXIWAY EDGE LIGHT ON EXISTING BASE CAN (ITEM L-125-2209). SEE DETAIL 3, DWG. ED-05.
11. PROPOSED L-861T QUARTZ ELEVATED TAXIWAY EDGE LIGHT ON NEW BASE CAN IN TURF (ITEM L-125-21). SEE DETAIL 2, DWG. ED-01.
12. REMOVE AND RESET EXISTING ELEVATED GUARD LIGHT AND FOUNDATION (ITEM L-125-68).
13. PROPOSED L-804(L) ELEVATED RUNWAY GUARD LIGHT ON NEW FOUNDATION (ITEM L-125-500). SEE DETAIL 1, DWG. ED-02.
14. PROPOSED L-852G(L) IN-PAVEMENT RUNWAY GUARD LIGHT (ITEM L-125-501). SEE DETAILS 1, 2, AND 3, DWG. ED-03.
15. PROPOSED L-867 CLASS 1 JUNCTION CAN (ITEM L-115-201). SEE DETAIL 3, DWG. ED-01.
16. AIRFIELD GUIDANCE SIGN ON NEW FOUNDATION (ITEM L-125-7103). SEE DETAILS 1 AND 2, DWG. ED-05.
17. AIRFIELD GUIDANCE SIGN ON EXISTING FOUNDATION (ITEM L-125-7113).
18. INSTALL SURFACE CONDITION SENSOR (ITEM L-130-1) (TYP. OF 2). SEE DETAIL 1, DWG. ED-04.
19. INSTALL SENSOR (IIA) CABLE. CONNECT TO EXISTING SENSOR (V) CABLE IN EXISTING JUNCTION CAN. (INCLUSIVE TO ITEM L-130-1).
20. INSTALL SENSOR (V) CABLE (ITEM L-108-51). SPLICE TO SENSOR (IIA) CABLE IN JUNCTION CAN. SEE DETAIL 1, DWG. ED-04.
21. SPLICE PROPOSED CABLE TO EXISTING CABLE (SIZE VARIES) IN EXISTING EDGE LIGHT, SIGN BASE, JUNCTION CAN, OR ELECTRICAL MANHOLE (INCLUSIVE TO RESPECTIVE L-108 ITEM).
22. NO. 6 AWG, 5KV, L-824 TYPE C CABLE (ITEM L-108-104) IN 2" SCH. 40 PVC CONDUIT (ITEM L-110-104) WITH PROPOSED COUNTERPOISE WIRE ABOVE CONDUIT (ITEM L-108-201). SEE DETAIL 6, DWG. ED-01.

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

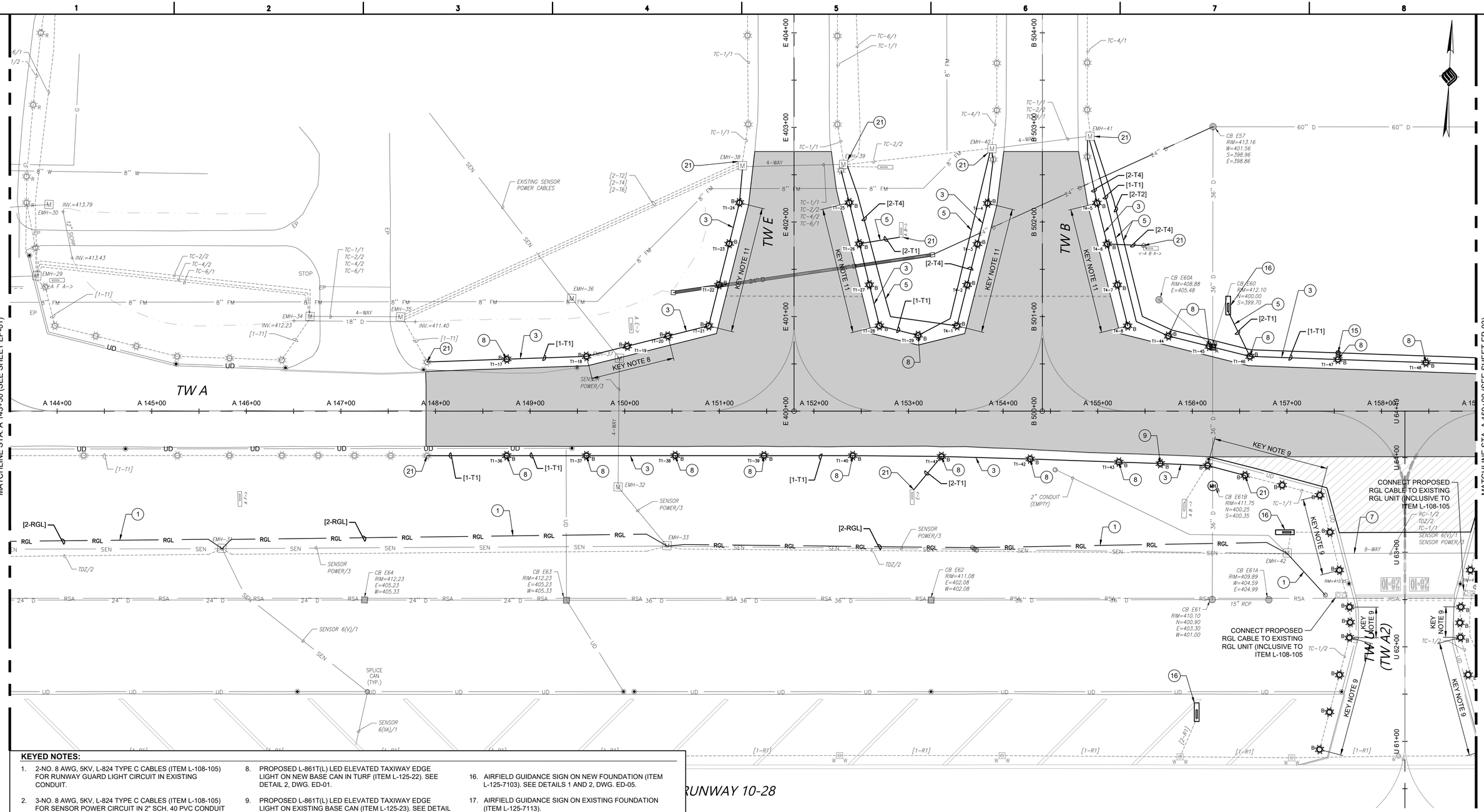
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

AIRFIELD LIGHTING PLAN (SHEET 1 OF 5)

SCALE: AS SHOWN	DESIGN: JPM	**EP-01**	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	49 OF 81	



KEYED NOTES:

1. 2-NO. 8 AWG, 5KV, L-824 TYPE C CABLES (ITEM L-108-105) FOR RUNWAY GUARD LIGHT CIRCUIT IN EXISTING CONDUIT.
2. 3-NO. 8 AWG, 5KV, L-824 TYPE C CABLES (ITEM L-108-105) FOR SENSOR POWER CIRCUIT IN 2" SCH. 40 PVC CONDUIT (ITEM L-110-104).
3. NO. 8 AWG, 5KV, L-824 TYPE C CABLES (ITEM L-108-105) IN 2" SCH. 40 PVC CONDUIT (ITEM L-110-104) WITH PROPOSED COUNTERPOISE WIRE IN SEPARATE TRENCH (ITEM L-108-201). SEE DETAIL 1, DWG. ED-01.
4. NO. 8 AWG, 5KV, L-824 TYPE C CABLE (ITEM L-108-105) IN 2" RGS CONDUIT (ITEM L-110-304) WITH PROPOSED COUNTERPOISE WIRE ABOVE CONDUIT (ITEM L-108-201). SEE DETAIL 6, DWG. ED-01.
5. NO. 8 AWG, 5KV, L-824 TYPE C CABLE (ITEM L-108-105) IN 2" SCH. 40 PVC CONDUIT (ITEM L-110-104). SEE DETAIL 5, ED-01.
6. NO. 8 AWG, 5KV, L-824 TYPE C CABLE (ITEM L-108-105) IN EXISTING CONDUIT.
7. INSTALL PROPOSED CABLE IN EXISTING DUCT BANK (INCLUSIVE TO RESPECTIVE L-108 ITEM).
8. PROPOSED L-861T(L) LED ELEVATED TAXIWAY EDGE LIGHT ON NEW BASE CAN IN TURF (ITEM L-125-22). SEE DETAIL 2, DWG. ED-01.
9. PROPOSED L-861T(L) LED ELEVATED TAXIWAY EDGE LIGHT ON EXISTING BASE CAN (ITEM L-125-23). SEE DETAIL 7, DWG. ED-01.
10. PROPOSED L-852T(L) LED IN-PAVEMENT TAXIWAY EDGE LIGHT ON EXISTING BASE CAN (ITEM L-125-2209). SEE DETAIL 3, DWG. ED-05.
11. PROPOSED L-861T QUARTZ ELEVATED TAXIWAY EDGE LIGHT ON NEW BASE CAN IN TURF (ITEM L-125-21). SEE DETAIL 2, DWG. ED-01.
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14. PROPOSED L-852G(L) IN-PAVEMENT RUNWAY GUARD LIGHT (ITEM L-125-501). SEE DETAILS 1, 2, AND 3, DWG. ED-03.
15. PROPOSED L-867 CLASS 1 JUNCTION CAN (ITEM L-115-201). SEE DETAIL 3, DWG. ED-01.
16. AIRFIELD GUIDANCE SIGN ON NEW FOUNDATION (ITEM L-125-7103). SEE DETAILS 1 AND 2, DWG. ED-05.
17. AIRFIELD GUIDANCE SIGN ON EXISTING FOUNDATION (ITEM L-125-7113).
18. INSTALL SURFACE CONDITION SENSOR (ITEM L-130-1) (TYP. OF 2). SEE DETAIL 1, DWG. ED-04.
19. INSTALL SENSOR (IIA) CABLE. CONNECT TO EXISTING SENSOR (V) CABLE IN EXISTING JUNCTION CAN. (INCLUSIVE TO ITEM L-130-1).
20. INSTALL SENSOR (V) CABLE (ITEM L-108-51). SPLICE TO SENSOR (IIA) CABLE IN JUNCTION CAN. SEE DETAIL 1, DWG. ED-04.
21. SPLICE PROPOSED CABLE TO EXISTING CABLE (SIZE VARIES) IN EXISTING EDGE LIGHT, SIGN BASE, JUNCTION CAN, OR ELECTRICAL MANHOLE (INCLUSIVE TO RESPECTIVE L-108 ITEM).
22. NO. 6 AWG, 5KV, L-824 TYPE C CABLE (ITEM L-108-104) IN 2" SCH. 40 PVC CONDUIT (ITEM L-110-104) WITH PROPOSED COUNTERPOISE WIRE ABOVE CONDUIT (ITEM L-108-201). SEE DETAIL 6, DWG. ED-01.

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK
STEVEN J. LANGE
084000
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

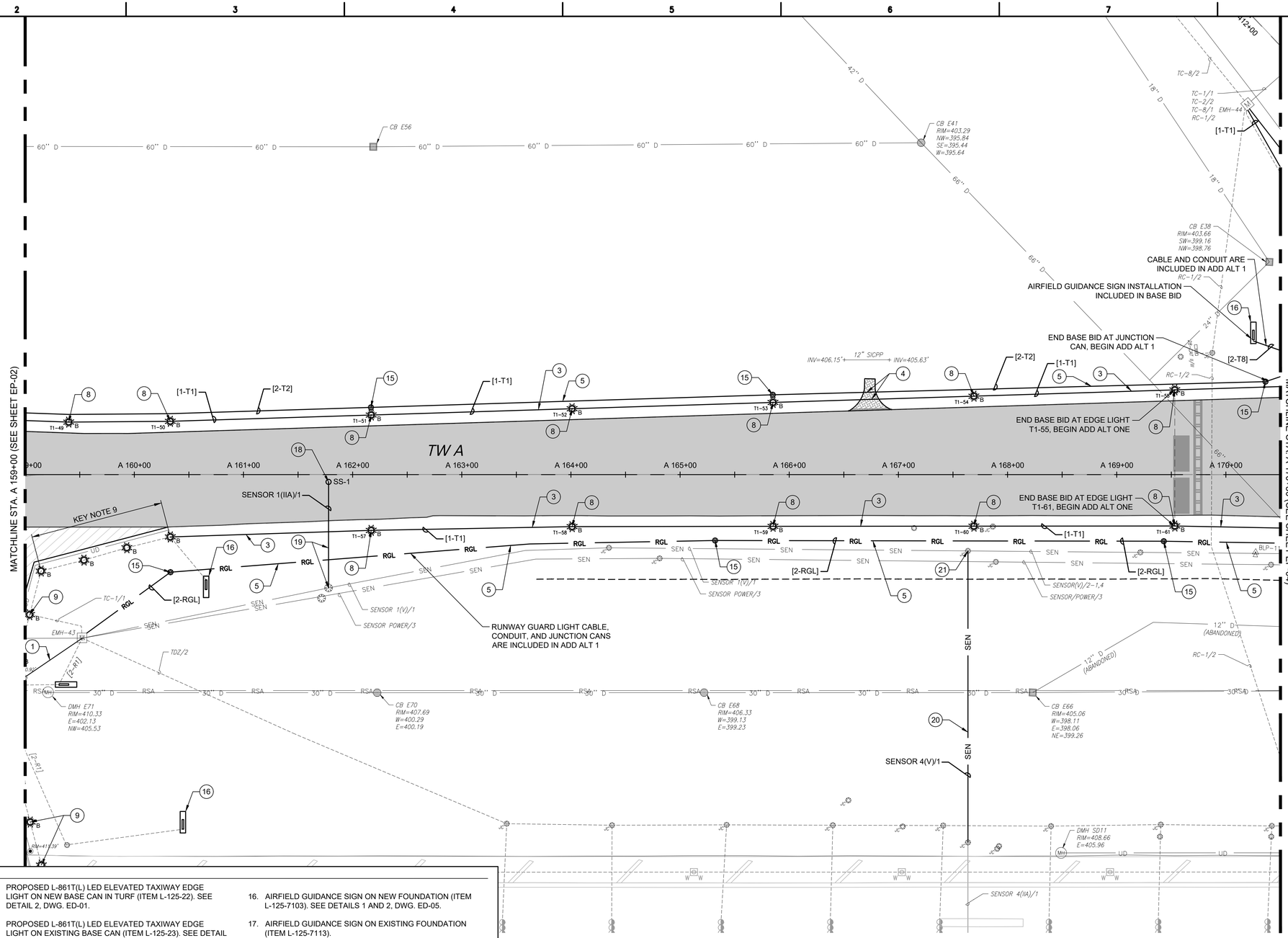
SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

AIRFIELD LIGHTING PLAN (SHEET 2 OF 5)

SCALE: AS SHOWN	DESIGN: JPM	EP-02
DRAWN: JPM	PROJECT: 18831.08	
CHECKED: SJL	DATE: APRIL 2024	50 OF 81

K:\SYRACUSE\RT-18831.08 TW A EAST DESIGN\DRAWINGS\SHEET FILES\18831.08-ELEC.DWG



KEYED NOTES:

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5. NO. 8 AWG, 5KV, L-824 TYPE C CABLE (ITEM L-108-105) IN 2" SCH. 40 PVC CONDUIT (ITEM L-110-104). SEE DETAIL 5, ED-01.
6. NO. 8 AWG, 5KV, L-824 TYPE C CABLE (ITEM L-108-105) IN EXISTING CONDUIT.
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8. PROPOSED L-861T(L) LED ELEVATED TAXIWAY EDGE LIGHT ON NEW BASE CAN IN TURF (ITEM L-125-22). SEE DETAIL 2, DWG. ED-01.
9. PROPOSED L-861T(L) LED ELEVATED TAXIWAY EDGE LIGHT ON EXISTING BASE CAN (ITEM L-125-23). SEE DETAIL 7, DWG. ED-01.
10. PROPOSED L-852T(L) LED IN-PAVEMENT TAXIWAY EDGE LIGHT ON EXISTING BASE CAN (ITEM L-125-2209). SEE DETAIL 3, DWG. ED-05.
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17. AIRFIELD GUIDANCE SIGN ON EXISTING FOUNDATION (ITEM L-125-7113).
18. INSTALL SURFACE CONDITION SENSOR (ITEM L-130-1) (TYP. OF 2). SEE DETAIL 1, DWG. ED-04.
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20. INSTALL SENSOR (V) CABLE (ITEM L-108-51). SPLICE TO SENSOR (IIA) CABLE IN JUNCTION CAN. SEE DETAIL 1, DWG. ED-04.
21. SPLICE PROPOSED CABLE TO EXISTING CABLE (SIZE VARIES) IN EXISTING EDGE LIGHT, SIGN BASE, JUNCTION CAN, OR ELECTRICAL MANHOLE (INCLUSIVE TO RESPECTIVE L-108 ITEM).
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0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

AIRFIELD LIGHTING PLAN (SHEET 3 OF 5)

SCALE: AS SHOWN	DESIGN: JPM	**EP-03**	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	51 OF 81	

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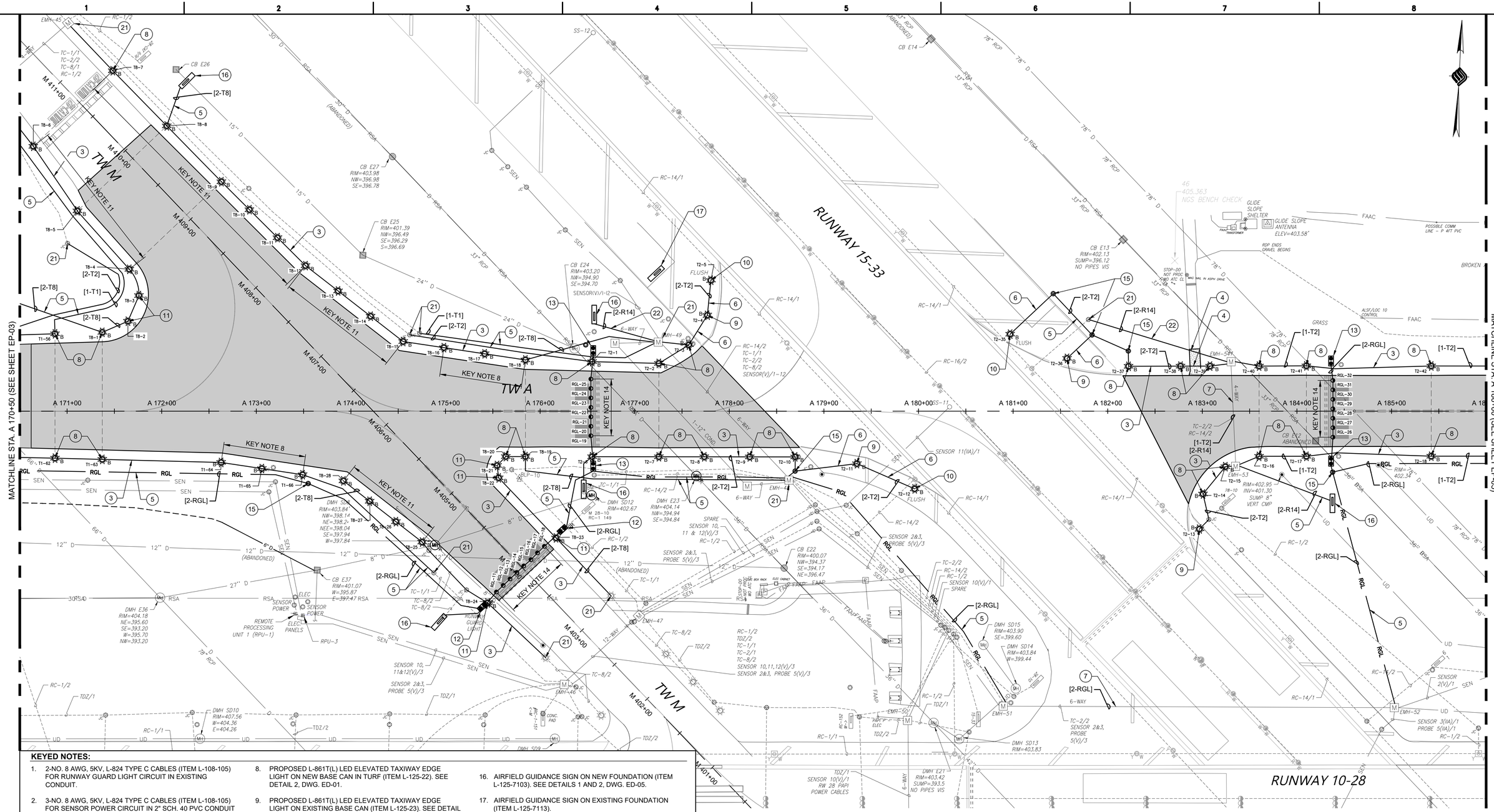

KEYED NOTES:

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8. PROPOSED L-861T(L) LED ELEVATED TAXIWAY EDGE LIGHT ON NEW BASE CAN IN TURF (ITEM L-125-22). SEE DETAIL 2, DWG. ED-01.
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16. AIRFIELD GUIDANCE SIGN ON NEW FOUNDATION (ITEM L-125-7103). SEE DETAILS 1 AND 2, DWG. ED-05.
17. AIRFIELD GUIDANCE SIGN ON EXISTING FOUNDATION (ITEM L-125-7113).
18. INSTALL SURFACE CONDITION SENSOR (ITEM L-130-1) (TYP. OF 2). SEE DETAIL 1, DWG. ED-04.
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ALL WORK SHOWN
ON THIS DRAWING
IS INCLUDED IN
ADD ALT 1

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECT DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR, TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

STATE OF NEW YORK
STEVEN J. LANGE
084600
LICENSED PROFESSIONAL ENGINEER

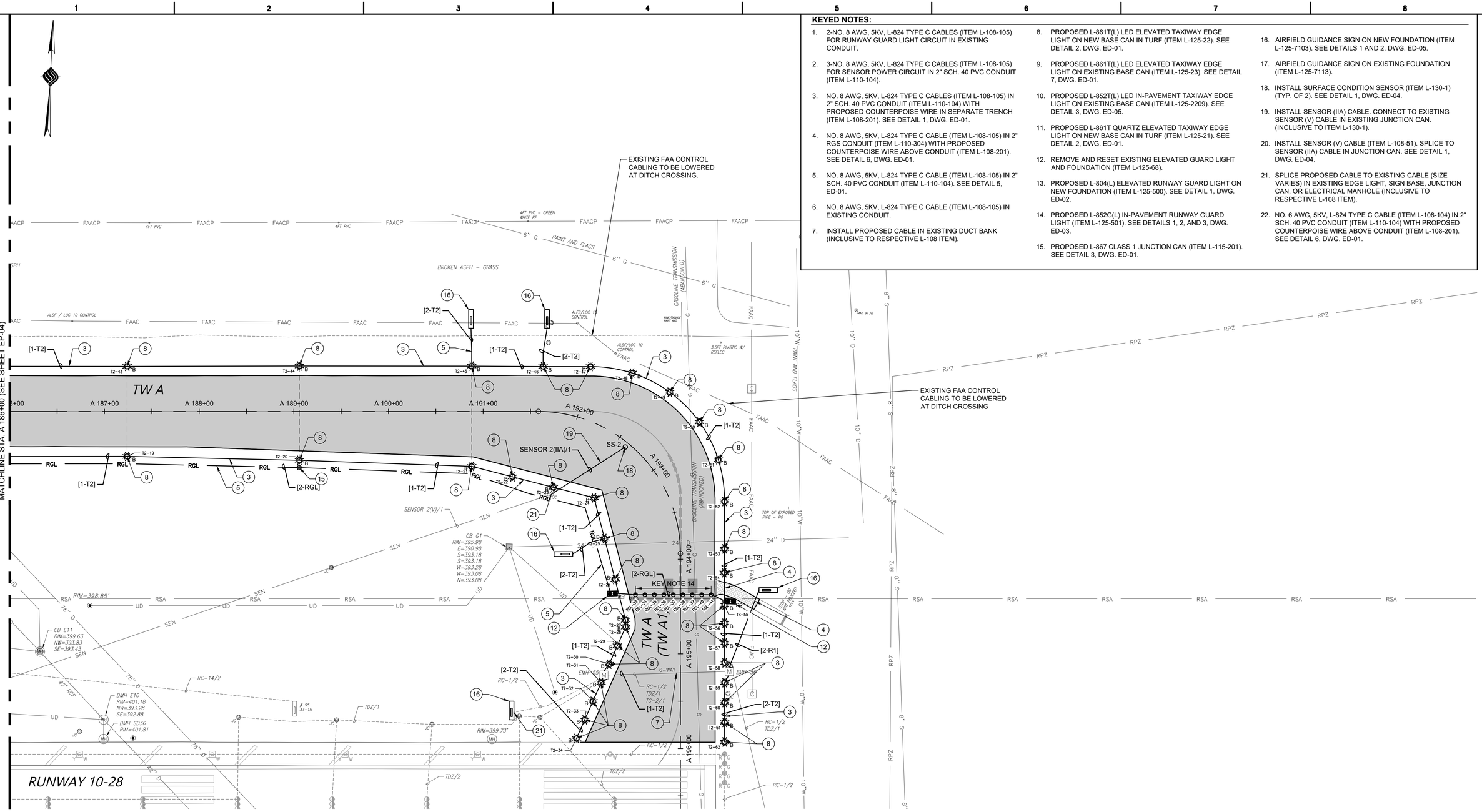
REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

AIRFIELD LIGHTING PLAN
(SHEET 4 OF 5)

SCALE: AS SHOWN	DESIGN: JPM	**EP-04**
DRAWN: SDB	PROJECT: 18831.08	
CHECKED: SJL	DATE: APRIL 2024	52 OF 81



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18. INSTALL SURFACE CONDITION SENSOR (ITEM L-130-1) (TYP. OF 2). SEE DETAIL 1, DWG. ED-04.
19. INSTALL SENSOR (IIA) CABLE. CONNECT TO EXISTING SENSOR (V) CABLE IN EXISTING JUNCTION CAN. (INCLUSIVE TO ITEM L-130-1).
20. INSTALL SENSOR (V) CABLE (ITEM L-108-51). SPLICE TO SENSOR (IIA) CABLE IN JUNCTION CAN. SEE DETAIL 1, DWG. ED-04.
21. SPLICE PROPOSED CABLE TO EXISTING CABLE (SIZE VARIES) IN EXISTING EDGE LIGHT, SIGN BASE, JUNCTION CAN, OR ELECTRICAL MANHOLE (INCLUSIVE TO RESPECTIVE L-108 ITEM).
22. NO. 6 AWG, 5KV, L-824 TYPE C CABLE (ITEM L-108-104) IN 2" SCH. 40 PVC CONDUIT (ITEM L-110-104) WITH PROPOSED COUNTERPOISE WIRE ABOVE CONDUIT (ITEM L-108-201). SEE DETAIL 6, DWG. ED-01.

ALL WORK SHOWN ON THIS DRAWING IS INCLUDED IN ADD ALT 1

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084009 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

AIRFIELD LIGHTING PLAN (SHEET 5 OF 5)

SCALE: AS SHOWN	DESIGN: JPM	**EP-05**
DRAWN: SDB	PROJECT: 18831.08	53 OF 81
CHECKED: SJL	DATE: APRIL 2024	

EXISTING ELECTRICAL VAULT, SEE SHEET ED-07 FOR PARTIAL INTERIOR FLOOR PLAN

ELEC. VAULT

CONSTELLATION WAY N.

NORTH DEICING APRON

TERMINAL BUILDING

TERMINAL APRON

PARKING GARAGE

AUTO PARKING

MOTEL

ARFF BLDG

OLD ARFF

SOUTH DEICING APRON

PERIMETER ROAD

CARGO APRON EXPANSION AND CONNECTING TAXIWAY (BY OTHERS)

ASR-9

ASR CLEARANCE ZONE R=10000'

TW B

TW F

TW K

TW S

TW T

TW A

RSA

ROFA

[2-T2]

UE

EXISTING AIRFIELD LIGHTING HOME RUN DUCTBANKS TO EXISTING ELECTRICAL VAULT

EMH-16
SEE SHEET EP-01 FOR CIRCUITRY CONTINUATION

303+90

140+00 145+00 150+00 155+00 160+00

400+00 405+00 405+85

500+00 505+00 505+92

0 150 300 450 FT.
SCALE

KEYED NOTES:

1. 2-NO. 8 AWG, 5KV, L-824 TYPE C CABLES (ITEM L-108-105) FOR RUNWAY GUARD LIGHT CIRCUIT IN EXISTING CONDUIT.
2. 3-NO. 8 AWG, 5KV, L-824 TYPE C CABLES (ITEM L-108-105) FOR SENSOR POWER CIRCUIT IN 2" SCH. 40 PVC CONDUIT (ITEM L-110-104).
3. NO. 8 AWG, 5KV, L-824 TYPE C CABLES (ITEM L-108-105) IN 2" SCH. 40 PVC CONDUIT (ITEM L-110-104) WITH PROPOSED COUNTERPOISE WIRE IN SEPARATE TRENCH (ITEM L-108-201). SEE DETAIL 1, DWG. ED-01.
4. NO. 8 AWG, 5KV, L-824 TYPE C CABLE (ITEM L-108-105) IN 2" RGS CONDUIT (ITEM L-110-304) WITH PROPOSED COUNTERPOISE WIRE ABOVE CONDUIT (ITEM L-108-201). SEE DETAIL 6, DWG. ED-01.
5. NO. 8 AWG, 5KV, L-824 TYPE C CABLE (ITEM L-108-105) IN 2" SCH. 40 PVC CONDUIT (ITEM L-110-104). SEE DETAIL 5, ED-01.
6. NO. 8 AWG, 5KV, L-824 TYPE C CABLE (ITEM L-108-105) IN EXISTING CONDUIT.
7. INSTALL PROPOSED CABLE IN EXISTING DUCT BANK (INCLUSIVE TO RESPECTIVE L-108 ITEM).
8. PROPOSED L-861T(L) LED ELEVATED TAXIWAY EDGE LIGHT ON NEW BASE CAN IN TURF (ITEM L-125-22). SEE DETAIL 2, DWG. ED-01.
9. PROPOSED L-861T(L) LED ELEVATED TAXIWAY EDGE LIGHT ON EXISTING BASE CAN (ITEM L-125-23). SEE DETAIL 7, DWG. ED-01.
10. PROPOSED L-852T(L) LED IN-PAVEMENT TAXIWAY EDGE LIGHT ON EXISTING BASE CAN (ITEM L-125-2209).
11. PROPOSED L-861T QUARTZ ELEVATED TAXIWAY EDGE LIGHT ON NEW BASE CAN IN TURF (ITEM L-125-21). SEE DETAIL 2, DWG. ED-01.
12. REMOVE AND RESET EXISTING ELEVATED GUARD LIGHT AND FOUNDATION (ITEM L-125-68).
13. PROPOSED L-804(L) ELEVATED RUNWAY GUARD LIGHT ON NEW FOUNDATION (ITEM L-125-500). SEE DETAIL 1, DWG. ED-02.
14. PROPOSED L-852G(L) IN-PAVEMENT RUNWAY GUARD LIGHT (ITEM L-125-501). SEE DETAILS 1, 2, AND 3, DWG. ED-03.
15. PROPOSED L-867 CLASS 1 JUNCTION CAN (ITEM L-115-201). SEE DETAIL 3, DWG. ED-01.
16. AIRFIELD GUIDANCE SIGN ON NEW FOUNDATION (ITEM L-125-7103). SEE DETAILS 1 AND 2, DWG. ED-05.
17. AIRFIELD GUIDANCE SIGN ON EXISTING FOUNDATION (ITEM L-125-7113).
18. INSTALL SURFACE CONDITION SENSOR (ITEM L-130-1) (TYP. OF 2). SEE DETAIL 1, DWG. ED-04.
19. INSTALL SENSOR (IIA) CABLE. CONNECT TO EXISTING SENSOR (V) CABLE IN EXISTING JUNCTION CAN. (INCLUSIVE TO ITEM L-130-1).
20. INSTALL SENSOR (V) CABLE (ITEM L-108-51). SPLICE TO SENSOR (IIA) CABLE IN JUNCTION CAN. SEE DETAIL 1, DWG. ED-04.
21. SPLICE PROPOSED CABLE TO EXISTING CABLE (SIZE VARIES) IN EXISTING EDGE LIGHT, SIGN BASE, JUNCTION CAN, OR ELECTRICAL MANHOLE (INCLUSIVE TO RESPECTIVE L-108 ITEM).
22. NO. 6 AWG, 5KV, L-824 TYPE C CABLE (ITEM L-108-104) IN 2" SCH. 40 PVC CONDUIT (ITEM L-110-104) WITH PROPOSED COUNTERPOISE WIRE ABOVE CONDUIT (ITEM L-108-201). SEE DETAIL 6, DWG. ED-01.

ALL WORK SHOWN ON THIS DRAWING IS INCLUDED IN ADD ALT 1

CONSTRUCTION BID SET

STATE OF NEW YORK
STEVEN J. LANGE
084000
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

AIRFIELD LIGHTING HOMERUN

SCALE: AS SHOWN	DESIGN: JPM	**EP-06**
DRAWN: SDB	PROJECT: 18831.08	54 OF 81
CHECKED: SJL	DATE: APRIL 2024	

K:\SYR\ACDET\18831.08 TW A EAST DESIGN\DRAWINGS\SHEET FILES\18831.08-ELEC-HMRN.DWG

AIRFIELD LIGHTING SCHEDULE

FIXTURED ID	NORTHING	EASTING	FIXTURE TYPE	LENS COLOR	BASE CAN	REFERENCE DRAWING	COMMENTS
T8-15	1,133,722.45	949,370.32	L-861T	BLUE	L-867B	EP-04	
T1-17	1,133,573.55	946,794.61	L-861T(L)	BLUE	L-867B	EP-02	
T8-16	1,133,718.16	949,413.68	L-861T(L)	BLUE	L-867B	EP-04	
T1-18	1,133,580.77	946,878.65	L-861T(L)	BLUE	L-867B	EP-02	
T8-17	1,133,713.86	949,457.03	L-861T(L)	BLUE	L-867B	EP-04	
T1-19	1,133,595.76	946,946.00	L-861T(L)	BLUE	L-867B	EP-02	
T8-18	1,133,709.56	949,500.39	L-861T(L)	BLUE	L-867B	EP-04	
T1-20	1,133,606.62	946,963.55	L-861T(L)	BLUE	L-867B	EP-02	
T1-21	1,133,619.54	947,006.01	L-861T(L)	BLUE	L-867B	EP-02	
T8-19	1,133,607.50	949,505.55	L-861T(L)	BLUE	L-867B	EP-04	
T1-22	1,133,663.43	947,014.65	L-861T	BLUE	L-867B	EP-02	
T8-20	1,133,606.50	949,484.84	L-861T(L)	BLUE	L-867B	EP-04	
T1-23	1,133,707.31	947,023.30	L-861T	BLUE	L-867B	EP-02	
T1-24	1,133,751.20	947,031.94	L-861T	BLUE	L-867B	EP-02	
T1-25	1,133,757.06	947,147.86	L-861T	BLUE	L-867B	EP-02	
T1-26	1,133,714.26	947,160.67	L-861T	BLUE	L-867B	EP-02	
T1-27	1,133,671.47	947,173.48	L-861T	BLUE	L-867B	EP-02	
T1-28	1,133,628.67	947,186.29	L-861T	BLUE	L-867B	EP-02	
T1-29	1,133,620.65	947,227.73	L-861T(L)	BLUE	L-867B	EP-02	
T1-36	1,133,471.64	946,799.76	L-861T(L)	BLUE	L-867B	EP-02	
T1-37	1,133,475.90	946,883.95	L-861T(L)	BLUE	L-867B	EP-02	
T1-38	1,133,480.68	946,977.64	L-861T(L)	BLUE	L-867B	EP-02	
T1-39	1,133,485.43	947,071.33	L-861T(L)	BLUE	L-867B	EP-02	
T1-40	1,133,490.18	947,165.03	L-861T(L)	BLUE	L-867B	EP-02	
T1-41	1,133,494.05	947,258.76	L-861T(L)	BLUE	L-867B	EP-02	
T1-42	1,133,496.07	947,352.55	L-861T(L)	BLUE	L-867B	EP-02	
T1-43	1,133,497.56	947,446.35	L-861T(L)	BLUE	L-867B	EP-02	
T1-44	1,133,633.33	947,491.91	L-861T(L)	BLUE	L-867B	EP-02	
T1-45	1,133,624.76	947,535.45	L-861T(L)	BLUE	L-867B	EP-02	
T1-46	1,133,616.18	947,578.99	L-861T(L)	BLUE	L-867B	EP-02	
T1-47	1,133,617.61	947,672.07	L-861T(L)	BLUE	L-867B	EP-02	
T1-48	1,133,619.03	947,765.15	L-861T(L)	BLUE	L-867B	EP-02	
T1-49	1,133,620.45	947,858.22	L-861T(L)	BLUE	L-867B	EP-03	
T1-50	1,133,625.87	947,951.13	L-861T(L)	BLUE	L-867B	EP-03	
T1-51	1,133,640.91	948,134.64	L-861T(L)	BLUE	L-867B	EP-03	
T1-52	1,133,655.96	948,318.16	L-861T(L)	BLUE	L-867B	EP-03	
T1-53	1,133,671.00	948,501.68	L-861T(L)	BLUE	L-867B	EP-03	
T1-54	1,133,686.04	948,685.19	L-861T(L)	BLUE	L-867B	EP-03	
T1-55	1,133,701.08	948,868.71	L-861T(L)	BLUE	L-867B	EP-03	
T1-56	1,133,712.04	949,002.37	L-861T(L)	BLUE	L-867B	EP-04	
T1-57	1,133,535.41	948,139.98	L-861T(L)	BLUE	L-867B	EP-03	
T1-58	1,133,548.11	948,323.61	L-861T(L)	BLUE	L-867B	EP-03	
T1-59	1,133,557.70	948,507.41	L-861T(L)	BLUE	L-867B	EP-03	
T1-60	1,133,567.13	948,691.21	L-861T(L)	BLUE	L-867B	EP-03	
T1-61	1,133,576.56	948,875.01	L-861T(L)	BLUE	L-867B	EP-03	

AIRFIELD LIGHTING SCHEDULE

FIXTURED ID	NORTHING	EASTING	FIXTURE TYPE	LENS COLOR	BASE CAN	REFERENCE DRAWING	COMMENTS
T1-62	1,133,580.74	949,009.01	L-861T(L)	BLUE	L-867B	EP-04	
T1-63	1,133,581.97	949,059.01	L-861T(L)	BLUE	L-867B	EP-04	
T1-64	1,133,585.07	949,184.62	L-861T(L)	BLUE	L-867B	EP-04	
T1-65	1,133,580.77	949,227.97	L-861T(L)	BLUE	L-867B	EP-04	
T1-66	1,133,576.47	949,271.33	L-861T(L)	BLUE	L-867B	EP-04	
T8-1	1,133,716.12	949,052.23	L-861T(L)	BLUE	L-867B	EP-04	
T8-2	1,133,729.23	949,078.69	L-861T	BLUE	L-867B	EP-04	
T8-3	1,133,756.93	949,088.95	L-861T	BLUE	L-867B	EP-04	
T8-4	1,133,784.12	949,077.40	L-861T	BLUE	L-867B	EP-04	
T8-5	1,133,843.06	949,019.48	L-861T	BLUE	L-867B	EP-04	
T8-6	1,133,908.86	948,969.47	L-861T	BLUE	L-867B	EP-04	
T8-7	1,133,992.92	949,049.32	L-861T	BLUE	L-867B	EP-04	
T8-8	1,133,937.56	949,109.24	L-861T	BLUE	L-867B	EP-04	
T8-9	1,133,881.51	949,169.91	L-861T	BLUE	L-867B	EP-04	
T8-10	1,133,853.46	949,201.01	L-861T	BLUE	L-867B	EP-04	
T8-11	1,133,825.41	949,232.11	L-861T	BLUE	L-867B	EP-04	
T8-12	1,133,797.37	949,263.21	L-861T	BLUE	L-867B	EP-04	
T8-13	1,133,772.40	949,298.92	L-861T	BLUE	L-867B	EP-06	
T8-14	1,133,747.43	949,334.62	L-861T	BLUE	L-867B	EP-04	
T8-21	1,133,596.59	949,476.11	L-861T	BLUE	L-867B	EP-04	
T8-22	1,133,583.59	949,478.46	L-861T	BLUE	L-867B	EP-04	
T8-23	1,133,523.29	949,542.13	L-861T	BLUE	L-867B	EP-04	
T8-24	1,133,450.94	949,473.41	L-861T	BLUE	L-867B	EP-04	
T8-25	1,133,511.74	949,401.08	L-861T	BLUE	L-867B	EP-04	
T8-26	1,133,531.89	949,372.28	L-861T	BLUE	L-867B	EP-04	
T8-27	1,133,552.03	949,343.48	L-861T	BLUE	L-867B	EP-04	
T8-28	1,133,572.17	949,314.68	L-861T	BLUE	L-867B	EP-04	
T2-1	1,133,711.30	949,570.90	L-861T(L)	BLUE	L-867B	EP-04	
T2-2	1,133,713.04	949,641.42	L-861T(L)	BLUE	L-867B	EP-04	
T2-3	1,133,734.06	949,671.99	L-861T(L)	BLUE	L-867B	EP-04	
T2-4	1,133,766.45	949,690.07	L-861T(L)	BLUE	EXISTING BASE CAN	EP-04	
T2-5	1,133,803.51	949,691.91	L-852T(L)	BLUE	EXISTING BASE CAN	EP-04	
T2-6	1,133,610.98	949,575.98	L-861T(L)	BLUE	L-867B	EP-04	
T2-7	1,133,614.46	949,646.40	L-861T(L)	BLUE	L-867B	EP-04	
T2-8	1,133,616.83	949,694.37	L-861T(L)	BLUE	L-867B	EP-04	
T2-9	1,133,619.20	949,742.34	L-861T(L)	BLUE	L-867B	EP-04	
T2-10	1,133,621.57	949,790.31	L-861T(L)	BLUE	L-867B	EP-04	
T2-11	1,133,617.71	949,855.89	L-861T(L)	BLUE	EXISTING BASE CAN	EP-04	
T2-12	1,133,594.24	949,918.17	L-852T(L)	BLUE	EXISTING BASE CAN	EP-04	
T2-13	1,133,566.96	950,220.92	L-861T(L)	BLUE	EXISTING BASE CAN	EP-04	
T2-14	1,133,604.20	950,222.83	L-861T(L)	BLUE	L-867B	EP-04	
T2-15	1,133,634.18	950,244.99	L-861T(L)	BLUE	L-867B	EP-04	
T2-16	1,133,646.93	950,280.02	L-861T(L)	BLUE	L-867B	EP-04	
T2-17	1,133,649.50	950,329.96	L-861T(L)	BLUE	L-867B	EP-04	
T2-18	1,133,656.27	950,461.76	L-861T(L)	BLUE	L-867B	EP-04	

AIRFIELD LIGHTING SCHEDULE

FIXTURED ID	NORTHING	EASTING	FIXTURE TYPE	LENS COLOR	BASE CAN	REFERENCE DRAWING	COMMENTS
T2-19	1,133,665.60	950,643.50	L-861T(L)	BLUE	L-867B	EP-05	
T2-20	1,133,670.66	950,825.46	L-861T(L)	BLUE	L-867B	EP-05	
T2-21	1,133,673.47	951,007.53	L-861T(L)	BLUE	L-867B	EP-05	
T2-22	1,133,664.57	951,051.11	L-861T(L)	BLUE	L-867B	EP-05	
T2-23	1,133,655.68	951,094.69	L-861T(L)	BLUE	L-867B	EP-05	
T2-24	1,133,646.78	951,138.27	L-861T(L)	BLUE	L-867B	EP-05	
T2-25	1,133,604.32	951,151.52	L-861T(L)	BLUE	L-867B	EP-05	
T2-26	1,133,561.86	951,164.77	L-861T(L)	BLUE	L-867B	EP-05	
T2-27	1,133,519.40	951,178.01	L-861T(L)	BLUE	L-867B	EP-05	
T2-28	1,133,512.08	951,178.41	L-861T(L)	BLUE	L-867B	EP-05	
T2-29	1,133,492.07	951,170.78	L-861T(L)	BLUE	L-867B	EP-05	
T2-30	1,133,472.07	951,163.14	L-861T(L)	BLUE	L-867B	EP-05	
T2-31	1,133,452.06	951,155.50	L-861T(L)	BLUE	L-867B	EP-05	
T2-32	1,133,432.06	951,147.87	L-861T(L)	BLUE	L-867B	EP-05	
T2-33	1,133,412.05	951,140.23	L-861T(L)	BLUE	L-867B	EP-05	
T2-34	1,133,392.04	951,132.60	L-861T(L)	BLUE	L-867B	EP-05	
T2-35	1,133,762.66	950,010.74	L-852T(L)	BLUE	EXISTING BASE CAN	EP-04	
T2-36	1,133,740.12	950,072.11	L-861T(L)	BLUE	EXISTING BASE CAN	EP-04	
T2-37	1,133,735.05	950,137.44	L-861T(L)	BLUE	L-867B	EP-04	
T2-38	1,133,738.00	950,192.31	L-861T(L)	BLUE	L-867B	EP-04	
T2-39	1,133,739.58	950,223.46	L-861T(L)	BLUE	L-867B	EP-04	
T2-40	1,133,742.22	950,275.21	L-861T(L)	BLUE	L-867B	EP-04	
T2-41	1,133,745.00	950,325.13	L-861T(L)	BLUE	L-867B	EP-04	
T2-42	1,133,751.51	950,456.95	L-861T(L)	BLUE	L-867B	EP-04	
T2-43	1,133,760.62	950,638.70	L-861T(L)	BLUE	L-867B	EP-05	
T2-44	1,133,770.17	950,820.43	L-861T(L)	BLUE	L-867B	EP-05	
T2-45	1,133,779.25	951,002.18	L-861T(L)	BLUE	L-867B	EP-05	
T2-46	1,133,782.66	951,077.52	L-861T(L)	BLUE	L-867B	EP-05	
T2-47	1,133,785.12	951,127.46	L-861T(L)	BLUE	L-867B	EP-05	
T2-48	1,133,780.53	951,171.77	L-861T(L)	BLUE	L-867B	EP-05	
T2-49	1,133,762.33	951,212.44	L-861T(L)	BLUE	L-867B	EP-05	
T2-50	1,133,732.34	951,245.38	L-861T(L)	BLUE	L-867B	EP-05	
T2-51	1,133,693.56	951,267.32	L-861T(L)	BLUE	L-867B	EP-05	
T2-52	1,133,649.87	951,276.05	L-861T(L)	BLUE	L-867B	EP-05	
T2-53	1,133,599.94	951,278.61	L-861T(L)	BLUE	L-867B	EP-05	
T2-54	1,133,574.83	951,279.66	L-861T(L)	BLUE	L-867B	EP-05	
RGL-11	1,133,462.99	949,482.10	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-12	1,133,470.24	949,488.99	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-13	1,133,477.49	949,495.87	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-14	1,133,484.74	949,502.76	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-15	1,133,491.99	949,509.65	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-16	1,133,498.92	949,516.87	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-17	1,133,506.49	949,523.42	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-18	1,133,513.74	949,530.31	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-19	1,133,632.96	949,573.50	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084009 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)
AIRFIELD LIGHTING SCHEDULE

SCALE: AS SHOWN	DESIGN: JPM	**EP-07**	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	55 OF 81	

K:\SYRACUSE\T-18831.08 TW A EAST DESIGN\DRAWINGS\SHEET FILES\18831.08-ELEC.DWG

AIRFIELD LIGHTING SCHEDULE

FIXTURED ID	NORTHING	EASTING	FIXTURE TYPE	LENS COLOR	BASE CAN	REFERENCE DRAWING	COMMENTS
RGL-20	1,133,642.95	949,573.00	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-21	1,133,652.94	949,572.49	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-22	1,133,662.92	949,571.99	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-23	1,133,672.91	949,571.48	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-24	1,133,682.90	949,570.98	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-25	1,133,692.88	949,570.47	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-26	1,133,671.07	950,356.99	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-27	1,133,681.06	950,356.49	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-28	1,133,691.05	950,355.98	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-29	1,133,701.03	950,355.48	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-30	1,133,711.02	950,354.97	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-31	1,133,721.01	950,354.47	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
RGL-32	1,133,731.00	950,353.96	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-04	
T4-1	1,133,632.81	947,268.11	L-861T	BLUE	L-867B	EP-02	
T4-2	1,133,676.50	947,276.71	L-861T	BLUE	L-867B	EP-02	
T4-3	1,133,720.19	947,285.32	L-861T	BLUE	L-867B	EP-02	
T4-4	1,133,763.88	947,293.92	L-861T	BLUE	L-867B	EP-02	
T4-5	1,133,769.93	947,409.40	L-861T	BLUE	L-867B	EP-02	
T4-6	1,133,727.25	947,422.39	L-861T	BLUE	L-867B	EP-02	
T4-7	1,133,684.58	947,435.38	L-861T	BLUE	L-867B	EP-02	
T4-8	1,133,641.91	947,448.37	L-861T	BLUE	L-867B	EP-02	
TS-55	1,133,540.74	951,281.64	L-861T(L)	BLUE	L-867B	EP-05	
T2-56	1,133,521.56	951,282.63	L-861T(L)	BLUE	L-867B	EP-05	
T2-57	1,133,500.62	951,283.69	L-861T(L)	BLUE	L-867B	EP-05	
T2-58	1,133,479.68	951,284.76	L-861T(L)	BLUE	L-867B	EP-05	
T2-59	1,133,458.74	951,285.82	L-861T(L)	BLUE	L-867B	EP-05	
T2-60	1,133,437.81	951,286.89	L-861T(L)	BLUE	L-867B	EP-05	
T2-61	1,133,416.87	951,287.95	L-861T(L)	BLUE	L-867B	EP-05	
T2-62	1,133,396.24	951,289.00	L-861T(L)	BLUE	L-867B	EP-05	
RGL-33	1,133,546.85	951,187.09	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-05	
RGL-34	1,133,547.35	951,197.08	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-05	
RGL-35	1,133,547.86	951,207.07	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-05	
RGL-36	1,133,548.36	951,217.06	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-05	
RGL-37	1,133,548.87	951,227.04	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-05	
RGL-38	1,133,549.37	951,237.03	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-05	
RGL-39	1,133,549.88	951,247.02	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-05	
RGL-40	1,133,550.38	951,257.00	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-05	
RGL-41	1,133,550.89	951,266.99	L-852G(L)	YELLOW ALTERNATING	L-868B	EP-05	

CONSTRUCTION BID SET

STATE OF NEW YORK
STEVEN J. LANGE
084009
LICENSED PROFESSIONAL ENGINEER

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McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

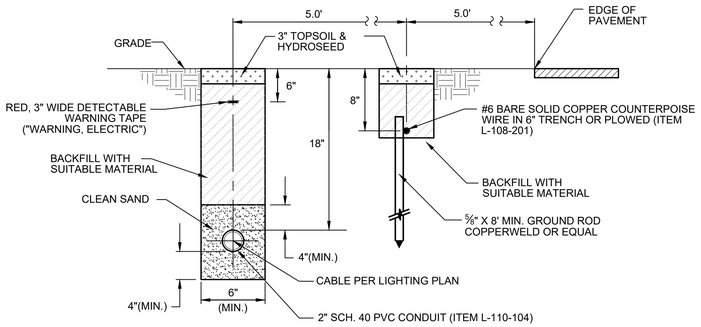
SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

AIRFIELD LIGHTING SCHEDULE

SCALE: AS SHOWN	DESIGN: JPM	**EP-08**
DRAWN: SDB	PROJECT: 18831.08	56 OF 81
CHECKED: SJL	DATE: APRIL 2024	

K:\SYR\CIVIL\SET-18831.08 TW A EAST DESIGN\DRAWINGS\SHEET FILES\18831.08-ELEC.DWG



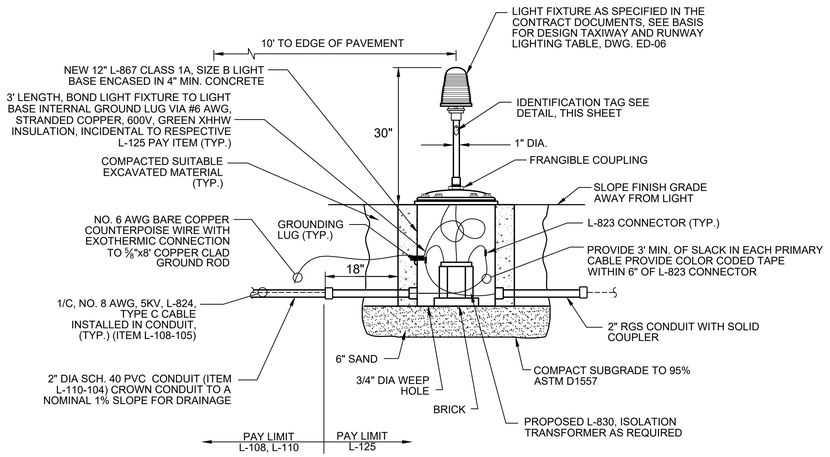
NOTES:

1. #6 BARE COUNTERPOISE WITH ⅝" X 8' MIN. GROUND ROD INSTALLED AT MAXIMUM 500' SPACING.
   INSTALL GROUND RODS TO TERMINATE THE COUNTERPOISE AT BOTH ENDS OF DUCT.
2. TOP OF GROUND ROD SHALL BE INSTALLED 6" BELOW GRADE AND ATTACHED TO THE COUNTERPOISE WITH AN EXOTHERMIC WELDED CONNECTION MADE AT 8" BELOW GRADE.
3. COST OF TRENCHING, BACKFILL, AND RESTORATION TO BE INCLUDED IN CABLE/CONDUIT BID ITEMS.

CONDUIT AND COUNTERPOISE TRENCHING FOR TAXIWAY LIGHTING

1 ED-01

NOT TO SCALE
(ITEM L-108-105, -201 & ITEM L-110-104)



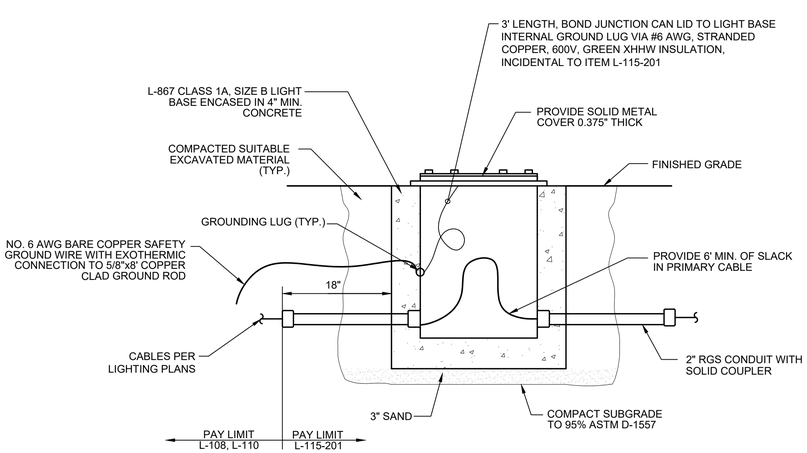
TAXIWAY EDGE LIGHT NOTES:

1. TAXIWAY EDGE LIGHTS ARE TO BE SET 10' FROM THE EDGE OF PAVEMENT TO THE CENTERLINE OF THE LIGHT FIXTURE.
2. THE CONTRACTOR SHALL ADJUST THE HORIZONTAL DISTANCE FROM THE EDGE OF THE PAVEMENT SUCH THAT THE LIGHT FIXTURES FORM A STAIGHT-LINE HORIZONTALLY ALONG THE ENTIRE TAXIWAY EDGE AND VERTICALLY FOLLOW THE TAXIWAY GRADE.
3. SUFFICIENT CABLE SLACK (MIN. OF 3 FEET) SHALL BE LEFT IN EACH BASE TO ALLOW TRANSFORMER(S) TO BE TAKEN OUT OF THE BASE.
4. ID NUMBER SHALL BE ASSIGNED USING A LOGICAL ORDER, DEPENDENT ON EXISTING LIGHT ID NUMBERS AND APPROVED BY THE ENGINEER AND AIRPORT.
5. THE CONTRACTOR SHALL IDENTIFY WHICH LIGHT BASES REQUIRE MORE THAN TWO DUCTS OPENINGS TO ACCEPT ADDITIONAL CONDUIT

BASE-MOUNTED ELEVATED TAXIWAY EDGE LIGHT IN TURF

2 ED-01

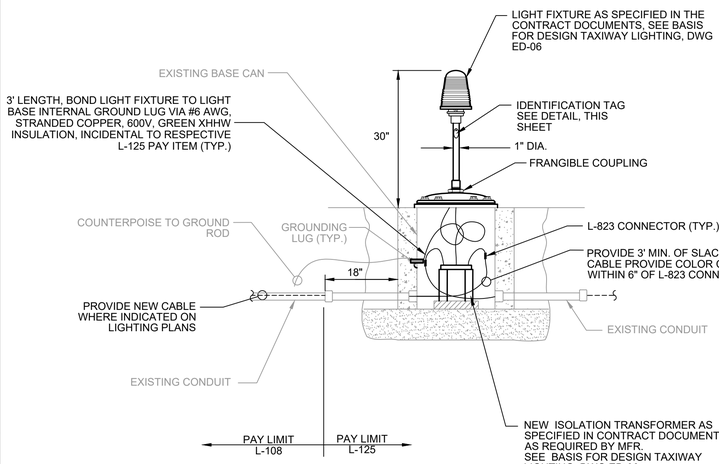
NOT TO SCALE
(ITEMS L-125-21, L-125-22)



ELECTRICAL JUNCTION CAN

3 ED-01

NOT TO SCALE
(ITEM L-115-201)



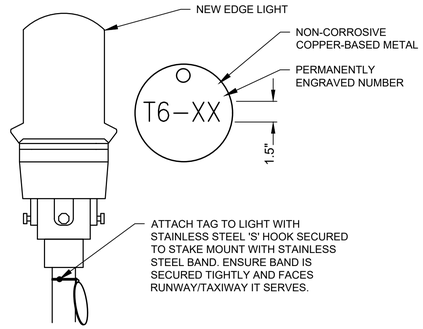
NOTE:

1. IN LOCATIONS WHERE NEW EDGE LIGHTS ARE TO BE INSTALLED ON EXISTING BASE CANS, REMOVAL OF THE EXISTING EDGE LIGHTS AND TRANSFORMERS SHALL BE PAID UNDER ITEM L-125-65.

INSTALL NEW BASE MOUNTED ELEVATED TAXIWAY EDGE LIGHT ON EXISTING BASE CAN

7 ED-01

NOT TO SCALE
(ITEM L-125-23)

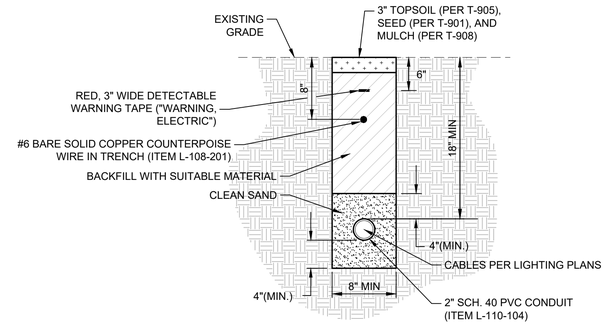


NOTE:
EACH LIGHT SHALL BE TAGGED WITH THE IDENTIFICATION NUMBER SHOWN ON LIGHTS TO BE REPLACED AND A.O.B.E.

LIGHT IDENTIFICATION TAG

4 ED-01

NOT TO SCALE
(INCIDENTAL TO ITEM L-125)



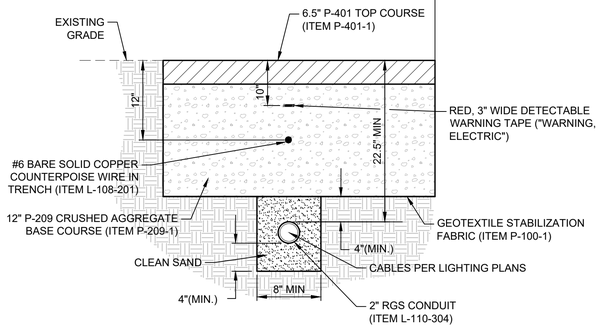
NOTES:

1. COST OF TRENCHING, BACKFILL, AND RESTORATION TO BE INCLUDED IN RESPECTIVE CONDUIT BID ITEM.

GENERAL CONDUIT TRENCHING DETAIL

5 ED-01

NOT TO SCALE
(ITEM L-108-104, -105, -201 & L-110-104)



NOTES:

1. COST OF TRENCHING AND CLEAN SAND TO BE INCLUDED IN 2" RGS CONDUIT BID ITEM (L-110-304).

CONDUIT TRENCHING AT ACCESS ROAD CROSSING

6 ED-01

NOT TO SCALE
(ITEM L-108-105, -201 & L-110-304)

CONSTRUCTION BID SET

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McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

ELECTRICAL DETAILS (SHEET 1 OF 7)

SCALE:	NTS	DESIGN: JPM	ED-01
DRAWN:	SDB	PROJECT: 18831.08	57 OF 81
CHECKED:	SJL	DATE: APRIL 2024	

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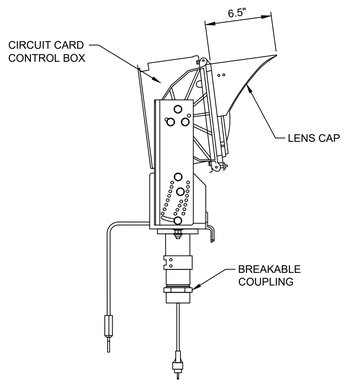
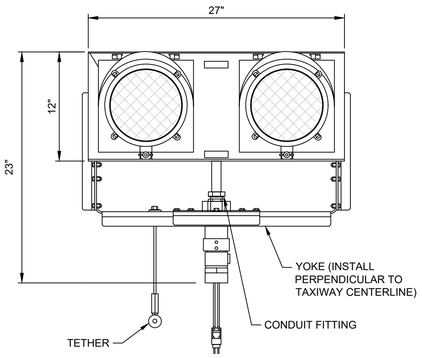
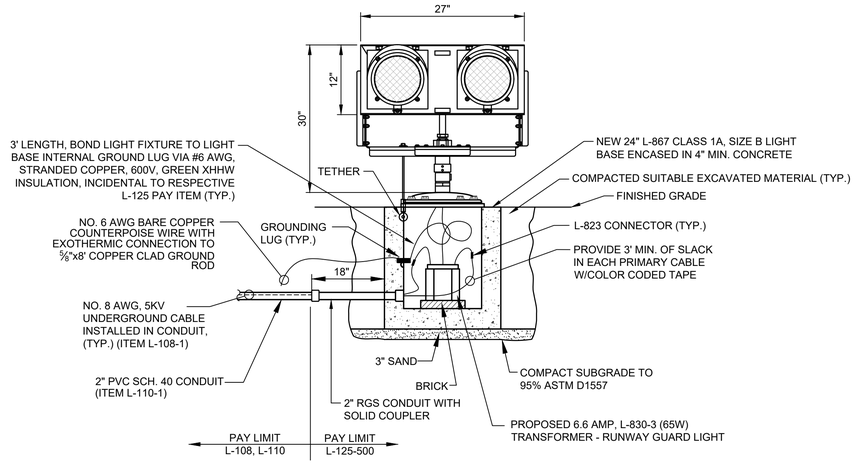


SIDE VIEW

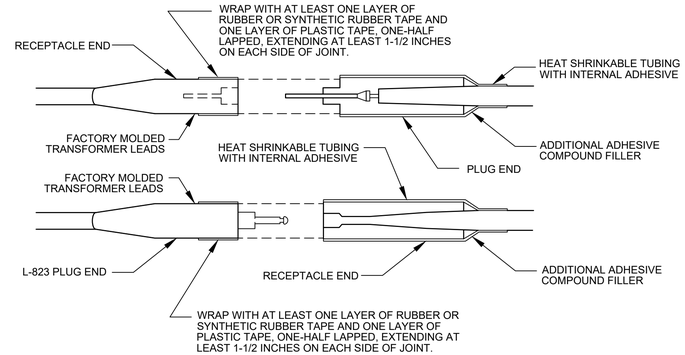


FRONT VIEW

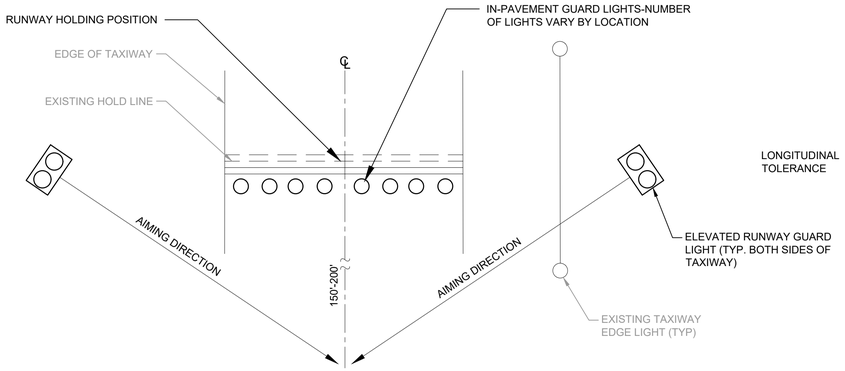


RUNWAY GUARD LIGHT DETAIL (1 / ED-02)

NOT TO SCALE
(ITEM L-125-500)



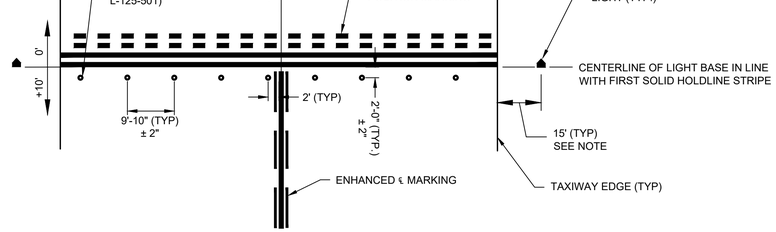
L-823 CONNECTIONS



AIMING NOTES:
1. CONTRACTOR SHALL AIM THE CENTER OF THE LIGHT BEAM TOWARD THE AIRCRAFT COCKPIT WHEN THE AIRCRAFT IS BETWEEN 150 FT AND 200 FT FROM THE HOLDING POSITION, ALONG THE PREDOMINANT TAXI PATH TO THE HOLDING POSITION.
2. CONTRACTOR SHALL POSITION ALL NEW ELEVATED RUNWAY GUARD LIGHT FIXTURES 5 TO 10 DEGREES ABOVE THE HORIZONTAL AND POINTED TOWARDS CENTERLINE 150'-200' FROM THE RUNWAY HOLDING POSITION. THE FINAL AIMING POSITION SHALL BE APPROVED BY THE ENGINEER.

L-804(L) ELEVATED RUNWAY GUARD LIGHT AIMING DIAGRAM (3 / ED-02)

NOT TO SCALE
(ITEM L-125-500)



NOTES:
1. THE OFFSET OF THE ELEVATED RUNWAY GUARD LIGHT HOUSING TO THE TAXIWAY EDGE HAS A LATERAL TOLERANCE OF -5' TO +2'. THE LOCATION OF THE ELEVATED RUNWAY GUARD LIGHT BASE MUST BE LOCATED SO AS TO NOT INTERFERE WITH THE READABILITY OF THE RUNWAY HOLDING POSITION SIGNS. THE FINAL LOCATION OF THE ELEVATED RUNWAY GUARD LIGHT BASE SHALL BE APPROVED BY THE RPR BEFORE THE CONTRACTOR COMMENCES ANY WORK.
2. THE DISTANCE BETWEEN THE TAXIWAY EDGE LIGHTS AND THE ELEVATED RUNWAY GUARD LIGHTS MUST BE A MINIMUM OF 3'-6".

RUNWAY GUARD LIGHT BASE LAYOUT (2 / ED-02)

NOT TO SCALE
(ITEMS L-125-500, L-125-501)

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084009 · LICENSED PROFESSIONAL ENGINEER

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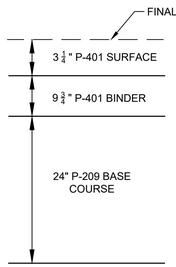
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

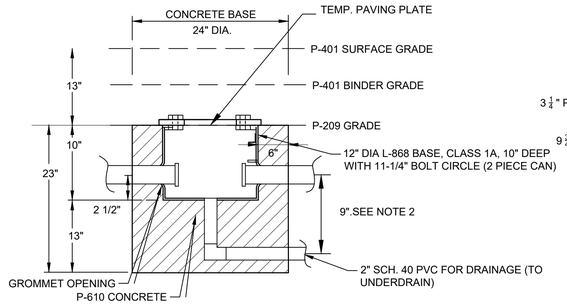
ELECTRICAL DETAILS (SHEET 2 OF 7)

SCALE: NTS	DESIGN: JPM	**ED-02**	
DRAWN: SDB	PROJECT: 18831.08		58 OF 81
CHECKED: SJL	DATE: APRIL 2024		



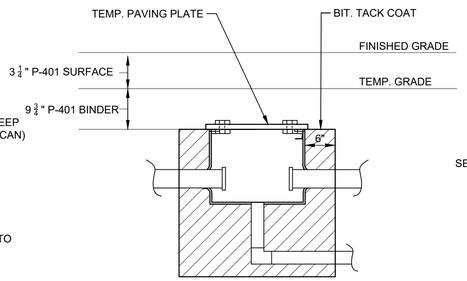
STEP 1

1. CONSTRUCT PAVEMENT SECTION UP TO P-209 BASE COURSE ELEVATION.
2. EXCAVATE FOR LIGHT BASE FOUNDATION AND CONDUIT.



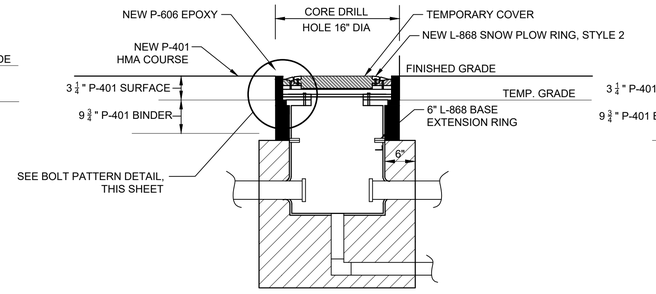
STEP 2

1. INSTALL NEW L-868 TYPE 1A, 12" DIA. BASE ALONG WITH REQUIRED CONDUIT AND DRAIN CONNECTIONS AND INSTALL TEMP. PAVING COVER.
2. PROVIDE CONDUIT SPACER EVERY 5'-0" TO MAINTAIN SEPARATION.
3. INSTALL GROUND ROD FOR EACH BASE CAN FOR GROUNDING AND COUNTERPOISE REQUIREMENTS.
4. CONSTRUCT CONCRETE FOUNDATION AND CONDUIT ENCASEMENT AS SHOWN ON CAN DETAIL.
5. BACKFILL AND COMPACT IN ACCORDANCE WITH P-209 SPECIFICATIONS AS APPLICABLE



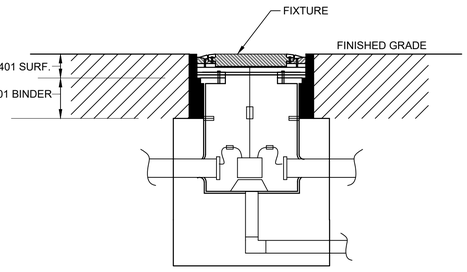
STEP 3

1. SURVEY LOCATION OF INSTALLED L-868 BASE WITH TEMP. PAVING COVER APPLY BIT. TACK COAT AND INSTALL P-401 HMA COURSES.



STEP 4

1. CORE DRILL 2" DIA. PILOT HOLE TO LOCATE L-868 BASE BENEATH NEW P-401 HMA COURSE.
2. CORE DRILL 16" DIA. HOLE, EXCAVATE MATERIAL, REMOVE TEMP. PAVING PLATE. INSTALL EXTENSION RING SECTION OF L-868 AND SPACERS AS REQUIRED.



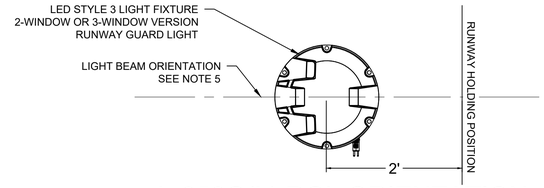
STEP 5

1. INSTALL ELECTRICAL COMPONENTS (SEE SEMI FLUSH LIGHT FIXTURE DETAIL, SHEET ED-04)

L-852G(L) IN-PAVEMENT RUNWAY GUARD LIGHT INSTALLATION DETAIL

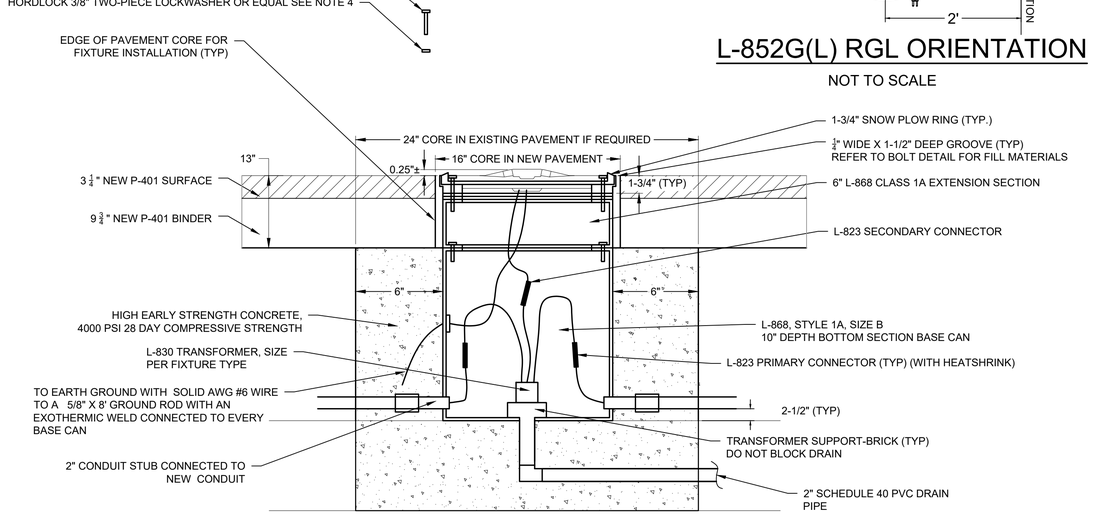
1 / ED-03

NOT TO SCALE
(ITEM L-125-501)



L-852G(L) RGL ORIENTATION

NOT TO SCALE



LIGHT DETAIL NOTES:

1. REFER TO SHEET EP-01 THROUGH EP-07 FOR LIGHT FIXTURE LAYOUT LOCATION.
2. LIGHT BASES SHALL BE INSTALLED WITH CARE TO ASSURE VERTICAL & AZIMUTH ALIGNMENT OF FIXTURE.
3. PROVIDE 3' CABLE SLACK WITHIN LIGHT BASE TO ALLOW TRANSFORMER SERVICING.
4. BOLTS AND WASHERS USED DURING INSTALLATION OF BASE, CABLE, AND TRANSFORMERS SHALL BE REPLACED WITH NEW, FOR FINAL INSTALLATION. MINIMUM THREAD EMPLACEMENT BEYOND BOTTOM OF FLANGE OF BASE IS 3/4". MAXIMUM LENGTH OF BOLT TO BE 3-1/2".
5. LIGHT BEAM ORIENTATION FOR IN-PAVEMENT RGLS: THE L-868 BASES FOR IN-PAVEMENT RGLS LIGHTS MUST BE INSTALLED SUCH THAT A LINE THROUGH ONE PAIR OF BOLT HOLES ON OPPOSITE SIDES OF THE BASE IS PARALLEL TO THE RUNWAY HOLDING POSITION MARKING. EACH FIXTURE IS INSTALLED SO THAT THE LIGHT BEAM FACES AWAY FROM THE RUNWAY AND IS PERPENDICULAR TO THE RUNWAY HOLDING POSITION MARKING WITHIN A TOLERANCE OF ±1 DEGREE. IT WILL BE NECESSARY TO ORIENT THE LIGHTS AT SOME ANGLE TO THE MARKING. TO ACCOMPLISH THIS, INSTALL A 12-BOLT LIGHT BASE USING THE ABOVE PROCEDURE; THIS ALLOWS THE LIGHT FIXTURES TO BE ADJUSTED 30 DEGREES LEFT OR RIGHT, AS REQUIRED.
6. SNOW RINGS STYLE 2 (1-3/4") SHALL BE UNI-DIRECTIONAL FOR RUNWAY GUARD LIGHTS.

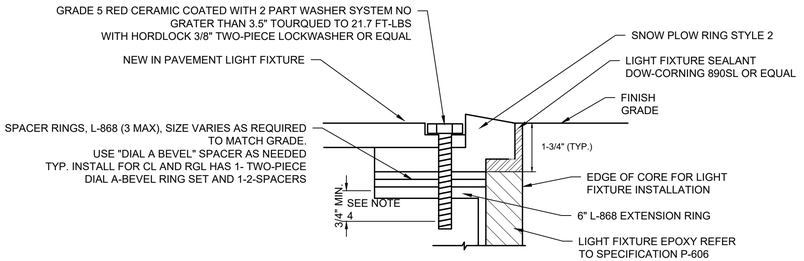
IN-PAVEMENT L-852G(L) RUNWAY GUARD LIGHT

3 / ED-03

NOT TO SCALE
(ITEM L-125-501)

IN PAVEMENT GUARD LIGHT INSTALLATION NOTES:

1. CONCRETE AROUND BASE CAN AND CONDUIT. PLACE CONCRETE ANCHOR USING CARE THAT NEITHER JIG NOR LIGHT BASE ALIGNMENT IS DISTURBED (TYP.). FOR EXPEDIENCY, CONTRACTOR MAY USE HIGH EARLY CONCRETE.
2. DO NOT USE SHIPPING BOLTS. USE SAE GRADE 5 FLUOROPOLYMER COATED BOLTS WITH 2 PART LOCKING WASHERS TO ATTACH THE LIGHT FIXTURE. TORQUE BOLTS TO 21.7 FT-LBS.
3. DRAIN SHALL TERMINATE IN TAXIWAY UNDERDRAIN SYSTEM INSTALL LATERAL EVERY 10 LIGHTS AS SHOWN ON DRAWINGS
4. #6 AWG BARE COPPER COUNTERPOISE SHALL BE EXOTHERMICALLY BONDED TO ¾" COPPER CLAD GROUND ROD
5. #6 AWG BARE COPPER COUNTERPOISE WIRE MUST BE MECHANICALLY BONDED TO THE EXTERNAL CAN LUG, CONTINUOUS FROM CAN TO CAN.
6. COUNTERPOISE MUST BE INSTALLED A MINIMUM OF 4" ABOVE CONDUIT.
7. THE CAN SHALL BE INSTALLED SUCH THAT THE LIGHT BEAM (CENTER OF LIGHT BASE) IS ALIGNED AS DESCRIBED PER AC 150/5340-30, PARAGRAPH 11.1. THE LIGHT BEAM MUST BE ALIGNED AS DESCRIBED IN THE LIGHTING SYSTEM MANUAL WITH A TOLERANCE ±-1 DEGREE. THE LIGHTING FIXTURE MUST BE LEVEL, AND THE TOP OF THE SNOW RING EDGE MUST BE BETWEEN +0 INCH AND -1/16 INCH FROM THE PAVEMENT TOP.
8. THE CAN SHALL BE INSTALLED IN SUCH A MANNER THAT THE MOUNTING HEIGHT SHALL BE IN ACCORDANCE WITH AC 150/5340-30, PARAGRAPH 11.2 ELEVATION OF THE BASE WITH RESPECT TO THE TAXIWAY OR RUNWAY SURFACE AND AZIMUTH WITH RESPECT TO THE EDGE LIGHTS ARE TWO PARAMETERS THAT MUST BE MET. IT IS ABSOLUTELY NECESSARY THAT THE ELEVATION OF THE LIGHT BASE TOP FLANGE BE AT LEAST THE THICKNESS OF THE LIGHT FITTING PLUS THE THICKNESS OF TYPICAL PAVING TOLERANCES OF ±1/2 INCH (13 MM) BELOW THE PAVEMENT FINISHED SURFACE. IF LESS THAN THAT REMAINS AFTER PAVING, THE LIGHTING FIXTURE WILL BE UNACCEPTABLY HIGH. IF MORE THAN 3/4 INCH (19 MM) IS LEFT, FLAT SPACER RINGS CAN BE USED TO BRING THE LIGHTING FIXTURES UP TO THE CORRECT ELEVATION. IN ORDER TO PRESERVE THE BASE INTEGRITY AND PROPER BOLT TORQUE, A MAXIMUM OF TWO SPACER RINGS MAY BE STACKED TOGETHER.
9. THE LIGHT BASE CAN SHALL HAVE AN INTEGRAL ANCHOR RING TO DISSIPATE AIRCRAFT/LARGE VEHICULAR WHEEL LOADS.
10. END OF SNOW PLOW RING MUST BE SET ⅛" BELOW PAVEMENT IN ALL DIRECTIONS. SEE DETAIL 'A'
11. UTILIZE 2-PIECE BEVELED SPACER RING TO ENSURE SNOW RING FITS FLUSH IN ALL DIRECTIONS
12. SURVEY LOCATION OF L-868 BASE CAN & INSTALL TEMP STEEL PAVING COVER. INSTALL P-401.
13. DRAIN CONDUIT ONLY REQUIRED FOR LATERAL TO UNDERDRAIN. SEE LAYOUT SHEETS FOR LOCATIONS. CORE DEPTH FOR CANS WITHOUT DRAIN CONDUITS CAN BE REDUCED TO 28".
14. REFER TO SHEET ED-04 FOR IN PAVEMENT GUARD LIGHT ELECTRICAL COMPONENTS



BOLT DETAIL FOR ALL IN PAVEMENT INSTALLATION

2 / ED-03

NOT TO SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

ELECTRICAL DETAILS (SHEET 3 OF 7)

SCALE:	NTS	DESIGN: JPM	**ED-03**
DRAWN:	SDB	PROJECT: 18831.08	59 OF 81
CHECKED:	SJL	DATE: APRIL 2024	

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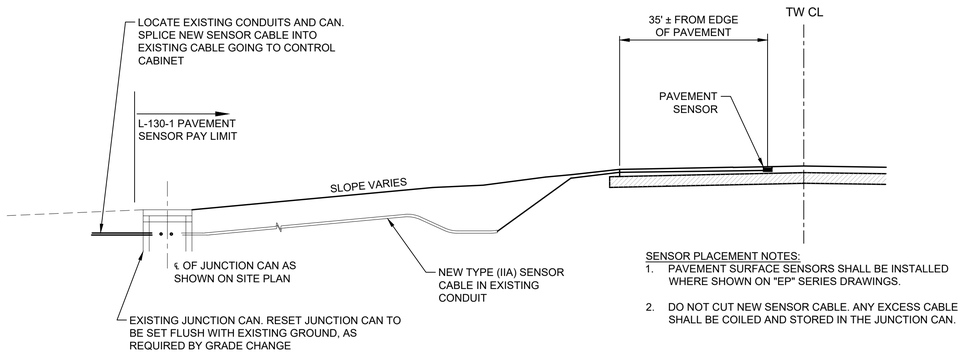
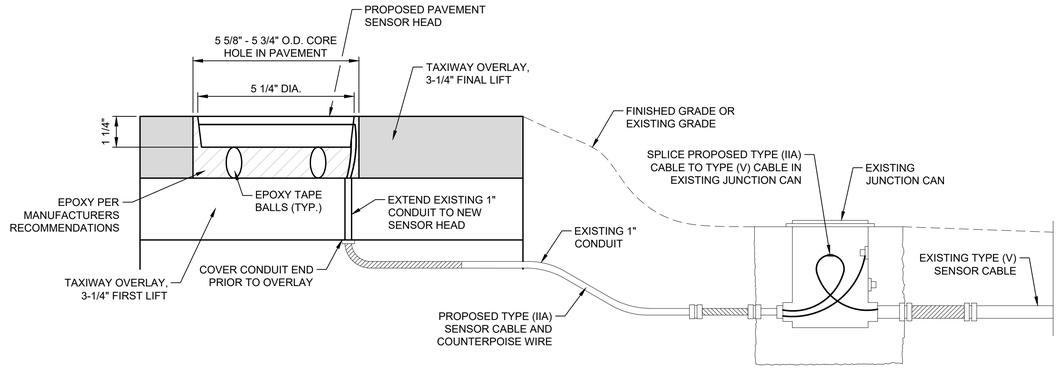


SENSOR PLACEMENT NOTES:

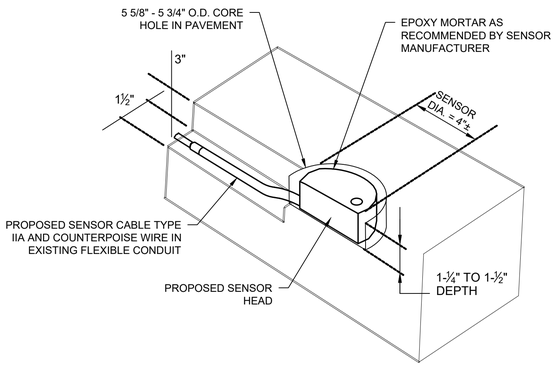
1. PAVEMENT SURFACE SENSORS SHALL BE INSTALLED WHERE SHOWN ON "EP" SERIES DRAWINGS.
2. DO NOT CUT NEW SENSOR CABLE. ANY EXCESS CABLE SHALL BE COILED AND STORED IN THE JUNCTION CAN.



PAVEMENT SENSOR INSTALLATION IN OVERLAY AREA

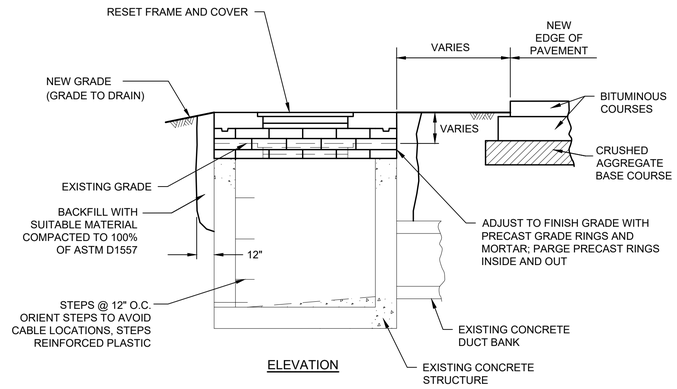
1 / ED-04

NOT TO SCALE
(ITEM L-130-1)



PAVEMENT SENSOR CUTOUT DETAIL

N.T.S.



ELEVATION

NOTES:

1. PROVIDE PERMANENT LABELING OF ALL CABLES WITHIN MANHOLE.
2. ALL WORK SHOWN ON DETAIL TO BE PAID UNDER ITEM L-115-31, INCLUDING PROTECTION AND SPLICING OF EXISTING CIRCUITS.
3. LOW VOLTAGE (600 V) AND HIGH VOLTAGE (5000 V) CONDUCTORS MUST BE INSTALLED IN SEPARATE WIREWAYS AND SEPARATED WITHIN MANHOLES.

ADJUST EXISTING ELECTRICAL MANHOLE

2 / ED-04

NOT TO SCALE
(ITEM L-115-31)

ADJUST EXISTING ELECTRICAL MANHOLE (RAISE/LOWER) - ITEM L-115-31

STRUCTURE ID	STATION	OFFSET	SIDE	EXISTING ELEVATION	PROPOSED ELEVATION	ELEVATION ADJUSTMENT
EMH 37	TW A 149+94.41	56.040'	L	414.46'	414.99'	+ .53'
EMH 53	TW A 183+35.52	58.653'	R	403.50'	403.15'	- .35'
EMH 55	TW A 195+22.61	80.788'	R	397.63'	398.71'	+ 1.08'

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANDE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

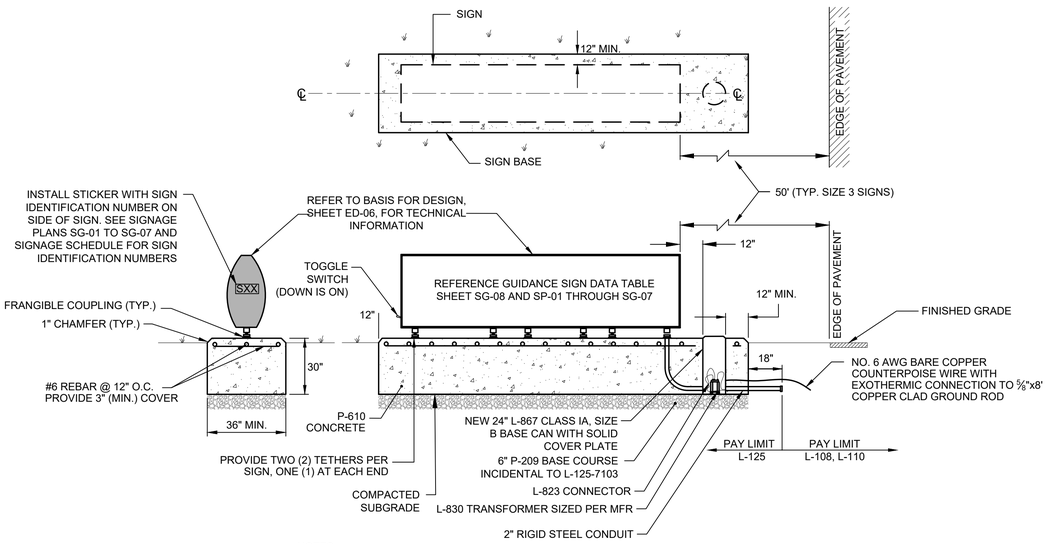
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

ELECTRICAL DETAILS (SHEET 4 OF 7)

SCALE: NTS	DESIGN: JPM	ED-04	
DRAWN: SDB	PROJECT: 18831.08	60 OF 81	
CHECKED: SJL	DATE: APRIL 2024		

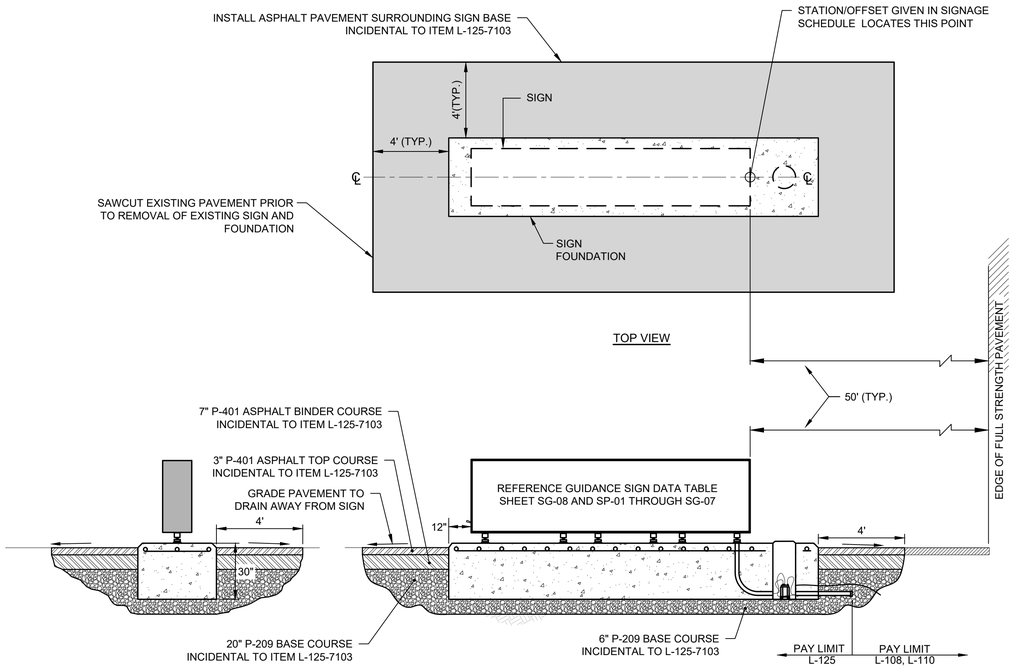


NOTES:
1. CONTRACTOR SHALL VERIFY TRANSFORMER REQUIREMENTS FOR ALL CIRCUITS AND FIXTURES.
2. SIGNS OVER 145" IN LENGTH SHALL BE CONSTRUCTED IN TWO SECTIONS, WITH A 3" MIN. TO 12" MAX. CLEAR DISTANCE BETWEEN SIGNS.
3. PROVIDE 0.375" THICK STEEL COVER PLATE INCLUDING BOLTS AND GASKET.

NEW TAXIWAY GUIDANCE SIGN ON NEW FOUNDATION

1 / ED-05

NOT TO SCALE
(ITEM L-125-7103)



END VIEW

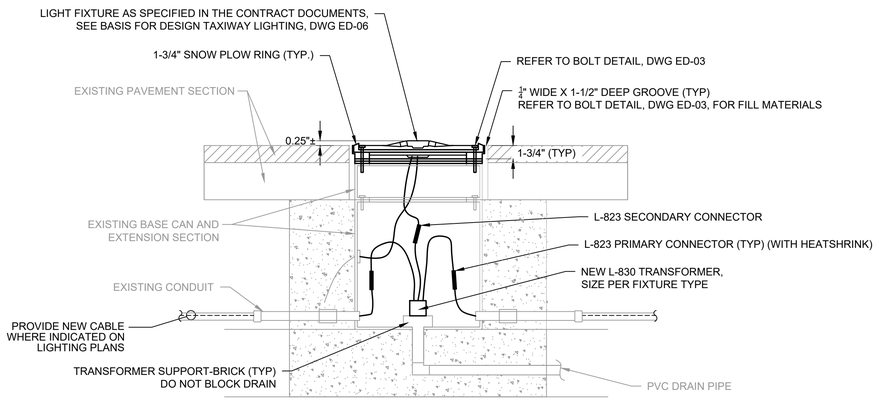
FRONT VIEW

NOTES:
1. CONTRACTOR SHALL VERIFY TRANSFORMER REQUIREMENTS FOR ALL CIRCUITS AND FIXTURES.
2. SIGNS OVER 145" IN LENGTH SHALL BE CONSTRUCTED IN TWO SECTIONS, WITH A 3" MIN. TO 12" MAX. CLEAR DISTANCE BETWEEN SIGNS.
3. PROVIDE 0.375" THICK STEEL COVER PLATE INCLUDING BOLTS AND GASKET.

NEW AIRFIELD GUIDANCE SIGN IN PAVEMENT

2 / ED-05

NOT TO SCALE
(ITEM L-125-7103)



NOTE:
1. IN LOCATIONS WHERE NEW EDGE LIGHTS ARE TO BE INSTALLED ON EXISTING BASE CANS, REMOVAL OF THE EXISTING EDGE LIGHTS AND TRANSFORMERS SHALL BE PAID UNDER ITEM L-125-502.

INSTALL NEW IN PAVEMENT TAXIWAY EDGE LIGHT ON EXISTING BASE CAN

3 / ED-05

NOT TO SCALE
(ITEM L-125-2209)

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

ELECTRICAL DETAILS (SHEET 5 OF 7)

SCALE:	NTS	DESIGN: JPM	ED-05
DRAWN:	SDB	PROJECT: 18831.08	61 OF 81
CHECKED:	SJL	DATE: APRIL 2024	

BASIS FOR DESIGN - TAXIWAY LIGHTING (TAXIWAY LIGHTING EQUIPMENT SHALL MEET OR EXCEED THE REQUIREMENTS OF FAA AC 150/5345-46, CURRENT EDITION)							
LIGHT FIXTURE	TYPE	LAMP	LENS	FIXTURE HEIGHT	CLASS	MODE	NOTES
ELEVATED MEDIUM INTENSITY TAXIWAY EDGE LIGHT (MITL)	L-861T(L)	LED	BLUE (GLASS)	30 INCHES	2 - BASE-MOUNTED FIXTURE	1 - CONSTANT CURRENT, 6.6 AMPERES	- L-861T(L) EQUIPMENT SHALL BE THIRD PARTY CERTIFIED (INTERTEK/ETL). - L-867 CLASS IA SIZE B STANDARD BASE. - 10/15W L-830 ISOLATION TRANSFORMER.
ELEVATED MEDIUM INTENSITY TAXIWAY EDGE LIGHT (MITL)	L-861T	QUARTZ	BLUE (GLASS)	30 INCHES	2 - BASE-MOUNTED FIXTURE	1 - CONSTANT CURRENT, 6.6 AMPERES	- L-861T EQUIPMENT SHALL BE THIRD PARTY CERTIFIED (INTERTEK/ETL). - L-867 CLASS IA SIZE B STANDARD BASE. - 30/45W L-830 ISOLATION TRANSFORMER.
IN-PAVEMENT MEDIUM INTENSITY TAXIWAY EDGE LIGHT (MITL)	L-852T(L)	LED	BLUE (GLASS)	24 INCHES±	2 - BASE-MOUNTED FIXTURE	1 - CONSTANT CURRENT, 6.6 AMPERES	- L-852T(L) EQUIPMENT SHALL BE THIRD PARTY CERTIFIED (INTERTEK/ETL). - INSTALLED ON EXISTING BASE CANS. - 15W L-830 ISOLATION TRANSFORMER.

BASIS FOR DESIGN RUNWAY GUARD LIGHTING (RUNWAY AND TAXIWAY LIGHTING EQUIPMENT SHALL MEET OR EXCEED THE REQUIREMENTS OF FAA AC 150/5345-46, CURRENT EDITION)							
LIGHT FIXTURE	TYPE	LAMP	LENS	FIXTURE HEIGHT	CLASS	MODE	NOTES
IN-PAVEMENT RUNWAY GUARD LIGHTS (RGL)	L-852G(L)	LED	YELLOW, ALTERNATELY FLASHING	STYLE 3 - LESS THAN OR EQUAL TO 1/4 INCH ABOVE FINISHED GRADE	2 - BASE-MOUNTED FIXTURE	1 - CONSTANT CURRENT, 6.6 AMPERES	• EQUIPMENT SHALL BE THIRD PARTY CERTIFIED (INTERTEK/ETL) • NO ARCTIC OR HEATER OPTION • UL 467 RATED GROUND LUG, ACCEPTS #6 AWG GROUND WIRE • COMPATIBLE SNOW PLOW RING • L-868 CLASS IA SIZE B STANDARD BASE • 30/45W OR 65W L-830 ISOLATION TRANSFORMER (PROVIDE PER MFR RECOMMENDATION) • REMOTE PROGRAMMING DEVICE, AS REQUIRED, FOR AUTONOMOUS FIXTURES
ELEVATED RUNWAY GUARD LIGHTS (RGL)	L-804(L)	LED	YELLOW, ALTERNATELY FLASHING	24 INCHES ±	2 - BASE-MOUNTED FIXTURE	1 - CONSTANT CURRENT, 6.6 AMPERES	• EQUIPMENT SHALL BE THIRD PARTY CERTIFIED (INTERTEK/ETL) • UL 467 RATED GROUND LUG, ACCEPTS #6 AWG GROUND WIRE • L-867 CLASS IA SIZE B STANDARD BASE • 65W L-830 ISOLATION TRANSFORMER

BASIS FOR DESIGN L-858 AIRFIELD GUIDANCE SIGNS (L-858 EQUIPMENT SHALL MEET OR EXCEED THE REQUIREMENTS OF FAA AC 150/5345-44, CURRENT EDITION)						
AIRFIELD GUIDANCE SIGN	TYPE	SIZE	STYLE	CLASS	MODE	NOTES
L-858 (L - LED) (TAXIWAY CIRCUITS)	PER PLANS	3 - 30" LEGEND PANEL WITH AN 18" LEGEND	2 - POWERED FROM 3-STEP 6.6A CIRCUIT	2 - -40F (-40C) TO 131F (55C)	2 - WITHSTAND WIND LOADS OF 200 MPH	- L-858 EQUIPMENT SHALL BE THIRD PARTY CERTIFIED (INTERTEK/ETL). - FURNISH WITH TWO (2) TETHERS AND LOCAL ON/OFF SWITCH FOR MAINTENANCE (ORIENTED WITH "OFF" UP)
L-858 (L - LED) (RUNWAY CIRCUITS)	PER PLANS	3 - 30" LEGEND PANEL WITH AN 18" LEGEND	3 - POWERED FROM 5-STEP 6.6A CIRCUIT	2 - -40F (-40C) TO 131F (55C)	2 - WITHSTAND WIND LOADS OF 200 MPH	- L-858 EQUIPMENT SHALL BE THIRD PARTY CERTIFIED (INTERTEK/ETL). - FURNISH WITH TWO (2) TETHERS AND LOCAL ON/OFF SWITCH FOR MAINTENANCE (ORIENTED WITH "OFF" UP)

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

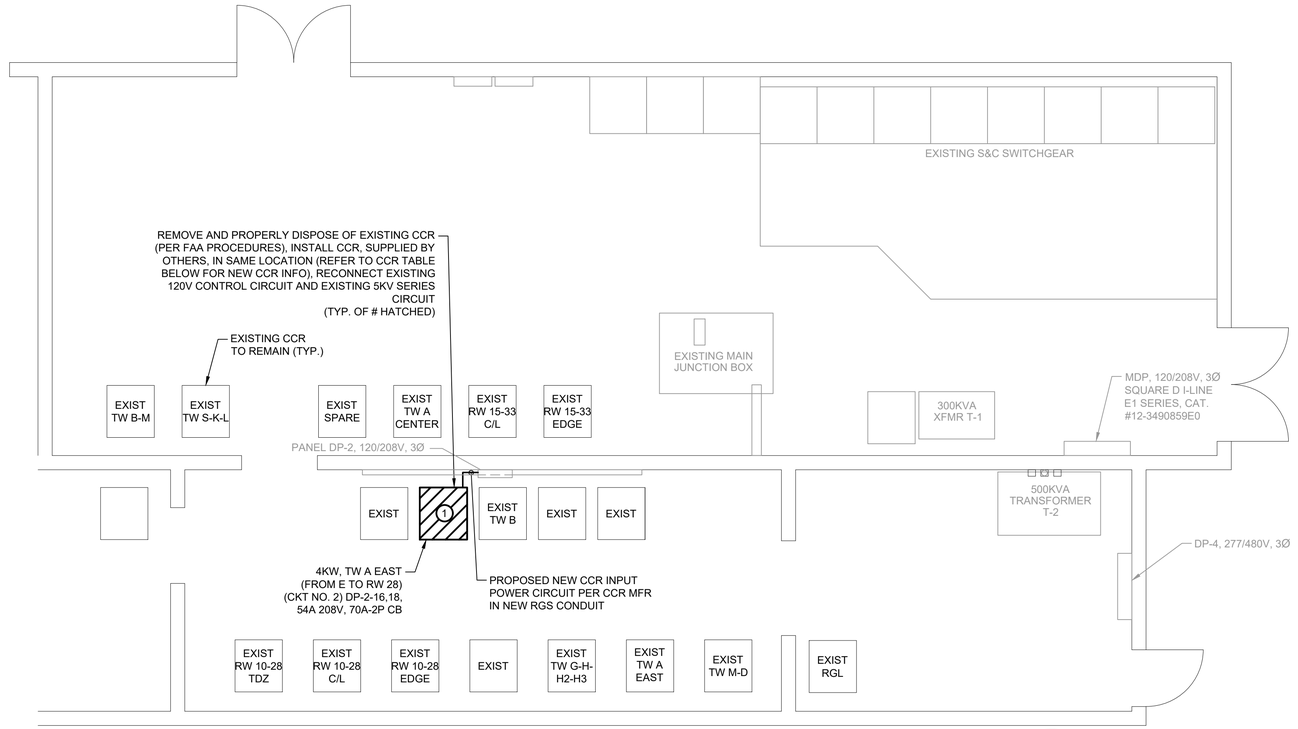
REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

ELECTRICAL DETAILS (SHEET 6 OF 7)

SCALE:	NTS	DESIGN: JPM	**ED-06**
DRAWN:	SDB	PROJECT: 18831.08	62 OF 81
CHECKED:	SJL	DATE: APRIL 2024	



PARTIAL EXISTING TRANSFORMER VAULT BUILDING

1
ED-07

FLOOR PLAN: 1/4" = 1'-0"
CCR LOCATIONS / DIMENSIONS ARE N.T.S. AND DIAGRAMMATIC

L-828 / L-829 CONSTANT CURRENT REGULATORS									
REF. #	EXISTING CIRCUIT DESCRIPTION	NEW NAMEPLATE ID	PANEL - CIRCUIT # / VOLTAGE	TYPE	STYLE	CLASS	SIZE	ITEM NO.	NOTES
1	TAXIWAY A EAST (TW E TO RW 28) ("CIRCUIT 2")	TAXIWAY A EAST ("CIRCUIT 2")	DP-2-16, 18 / 208V	L-829	1 - THREE BRIGHTNESS STEPS	1 - 6.6 AMPERES OUTPUT	4 KW	L-109-204	- MAINTAIN AND RECONNECT EXISTING CONTROLS (120V).

NOTES:
1. CONTRACTOR TO INSTALL 4KW CCR SUPPLIED BY OTHERS ON PREVIOUS PROJECT. CONSTANT CURRENT REGULATOR TABLE PROVIDED FOR INFORMATION ONLY.
2. REFERENCE CCR NAMEPLATE FOR LINE CURRENT. FEEDER CIRCUIT BREAKER (CB) SHALL BE SIZED TO CARRY 125% OF LINE CURRENT OR AS PER MFR (USE THE STRICTER OF 125% OR PER MFR). FEEDER CIRCUIT BREAKERS SHALL BE NEW (REPLACE EXISTING CIRCUIT BREAKER WITH COMPATIBLE CB FROM PANEL MFR.), VERIFY CB SIZE WITH MFR NAMEPLATE MIN. RECOMMENDED CB.
3. PROVIDE GROUNDING PER MFR. BOND TO EXISTING VAULT GROUND LOOP. CONNECT THE GROUND CONDUCTOR TO THE EQUIPMENT GROUND TERMINAL. NOTE: DO NOT CONNECT COUNTERPOISE TO THIS TERMINAL.
4. VERIFY LINE VOLTAGE(S) IN THE FIELD FOR FEEDER CIRCUITS FED FROM EXISTING PANELS. USE ONLY A TRUE RMS METER TO ACCURATELY MEASURE THE LINE VOLTAGE.
5. CONNECT EXISTING 120V CONTROL LINES TO CCR.
6. OPERATE CCR IN LOCAL MODE AND REMOTE MODE AT ALL BRIGHTNESS STEPS. CHECK FOR CORRECT CURRENT LEVEL AT EACH STEP. PREPARE A REPORT OF THE OPERATIONS AND INCLUDE IN FINAL CCR O&M MANUAL.

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084009 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

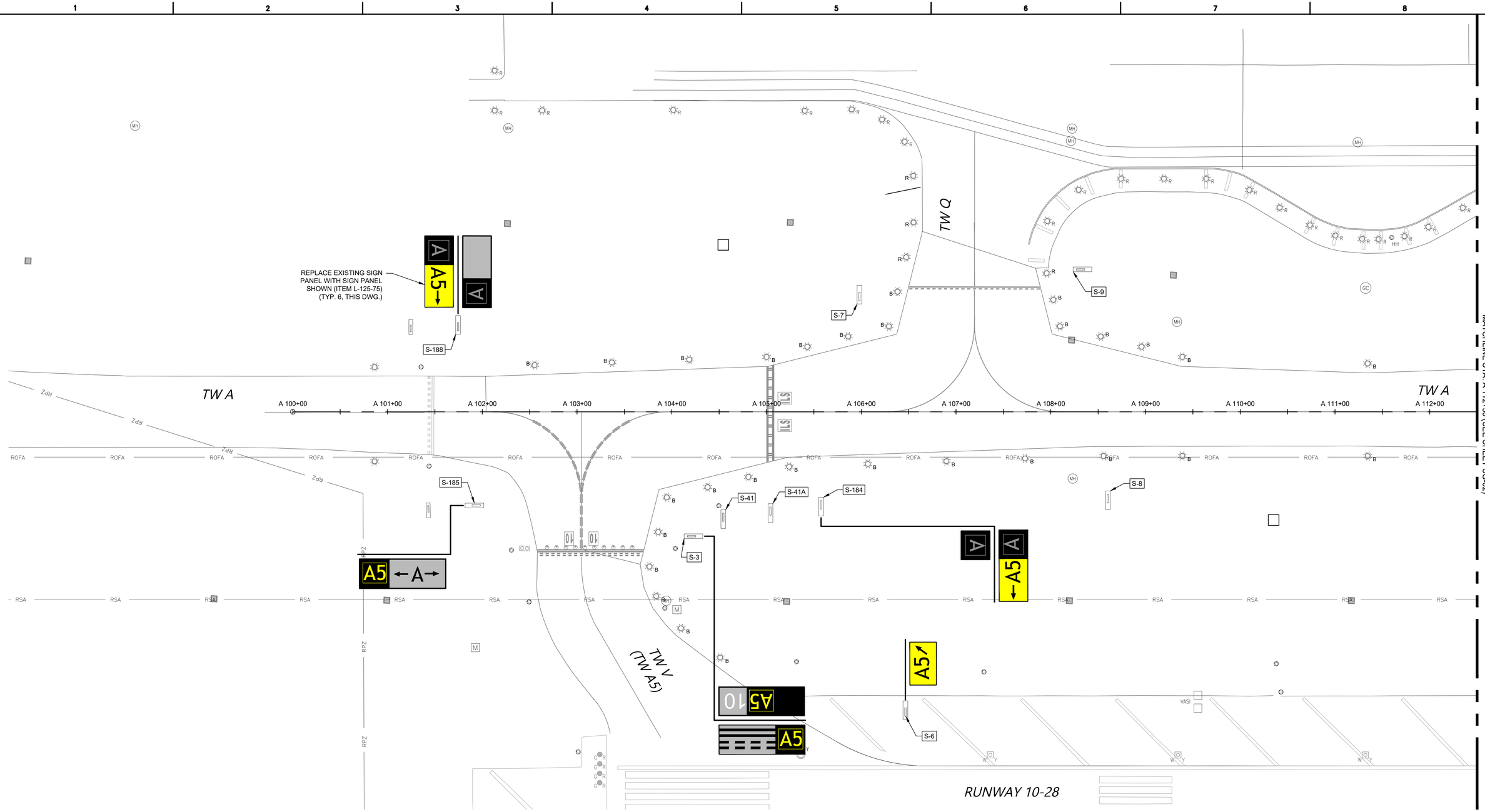
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

ELECTRICAL DETAILS (SHEET 7 OF 7)

SCALE: NTS	DESIGN: JPM	**ED-07**
DRAWN: SDB	PROJECT: 18831.08	63 OF 81
CHECKED: SJL	DATE: APRIL 2024	



LEGEND

- PROPOSED AIRFIELD GUIDANCE SIGN
- EXISTING AIRFIELD GUIDANCE SIGN
- A5↗ PROPOSED SIGN PANEL (ADD ALT 1)
- ←A→ EXISTING SIGN PANEL TO REMAIN

NOTE:

1. SEE SHEET SG-08 FOR GUIDANCE SIGN DATA TABLE.
2. FOR EXISTING SIGNS THAT REQUIRE MODIFICATION (I.E. PANEL REPLACEMENT), CONTRACTOR SHALL FIELD VERIFY MANUFACTURER AND CHARACTERISTICS OF EACH EXISTING SIGN TO BE MODIFIED.
3. REPLACEMENT SIGN PANELS FOR EXISTING SIGNS SHALL BE FROM THE MANUFACTURER OF THE EXISTING SIGN.

ALL WORK SHOWN ON THIS DRAWING IS INCLUDED IN ADD ALT 1

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANDE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

PROPOSED AIRFIELD SIGNAGE PLAN (SHEET 1 OF 7)

SCALE: AS SHOWN	DESIGN: JPM
DRAWN: SDB	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

SG-01
64 OF 81

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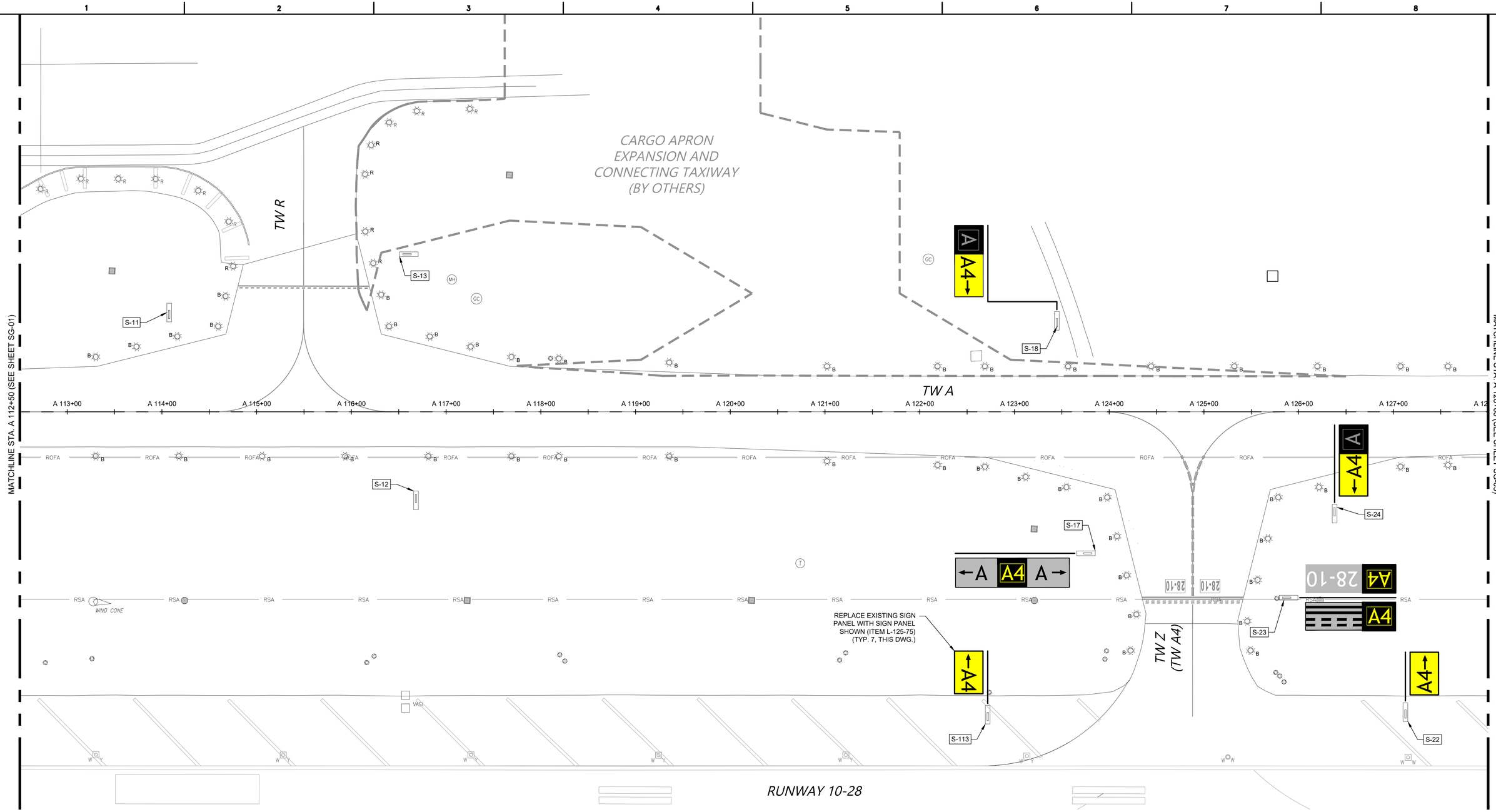

LEGEND

- PROPOSED AIRFIELD GUIDANCE SIGN
- EXISTING AIRFIELD GUIDANCE SIGN
- A5 — PROPOSED SIGN PANEL (ADD ALT 1)
- ←A→ — EXISTING SIGN PANEL TO REMAIN

NOTE:

1. SEE SHEET SG-08 FOR GUIDANCE SIGN DATA TABLE.
2. FOR EXISTING SIGNS THAT REQUIRE MODIFICATION (I.E. PANEL REPLACEMENT), CONTRACTOR SHALL FIELD VERIFY MANUFACTURER AND CHARACTERISTICS OF EACH EXISTING SIGN TO BE MODIFIED.
3. REPLACEMENT SIGN PANELS FOR EXISTING SIGNS SHALL BE FROM THE MANUFACTURER OF THE EXISTING SIGN.

ALL WORK SHOWN ON THIS DRAWING IS INCLUDED IN ADD ALT 1

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084009 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

PROPOSED AIRFIELD SIGNAGE PLAN (SHEET 2 OF 7)

SCALE: AS SHOWN	DESIGN: JPM
DRAWN: SDB	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

SG-02
65 OF 81

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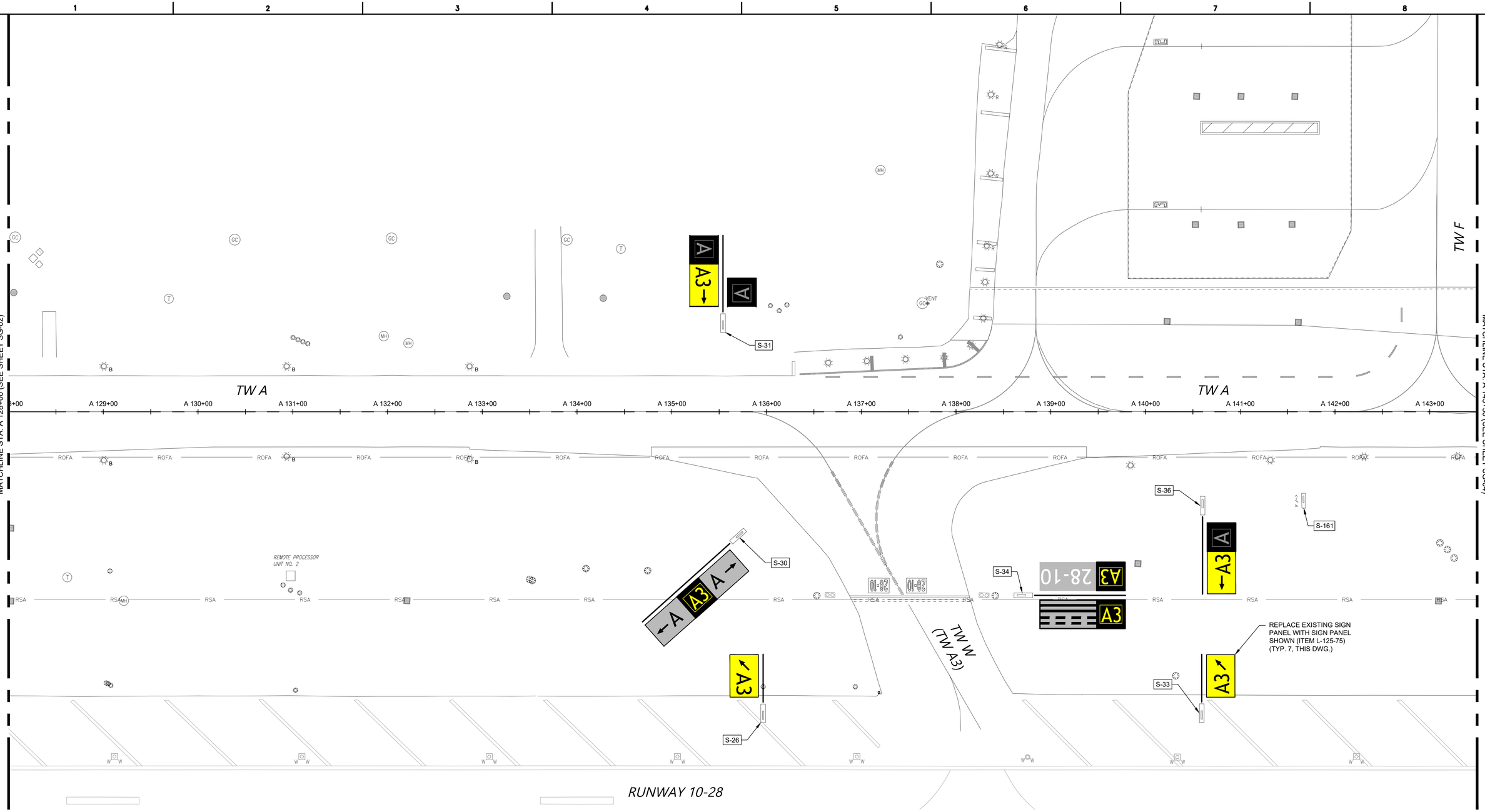

LEGEND

- PROPOSED AIRFIELD GUIDANCE SIGN
- EXISTING AIRFIELD GUIDANCE SIGN
- A5 — PROPOSED SIGN PANEL (ADD ALT 1)
- ←A→ — EXISTING SIGN PANEL TO REMAIN

NOTE:

1. SEE SHEET SG-08 FOR GUIDANCE SIGN DATA TABLE.
2. FOR EXISTING SIGNS THAT REQUIRE MODIFICATION (I.E. PANEL REPLACEMENT), CONTRACTOR SHALL FIELD VERIFY MANUFACTURER AND CHARACTERISTICS OF EACH EXISTING SIGN TO BE MODIFIED.
3. REPLACEMENT SIGN PANELS FOR EXISTING SIGNS SHALL BE FROM THE MANUFACTURER OF THE EXISTING SIGN.

ALL WORK SHOWN ON THIS DRAWING IS INCLUDED IN ADD ALT 1

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANDRE · 084009 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

PROPOSED AIRFIELD SIGNAGE PLAN (SHEET 3 OF 7)

SCALE: AS SHOWN	DESIGN: JPM
DRAWN: SDB	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

SG-03
66 OF 81

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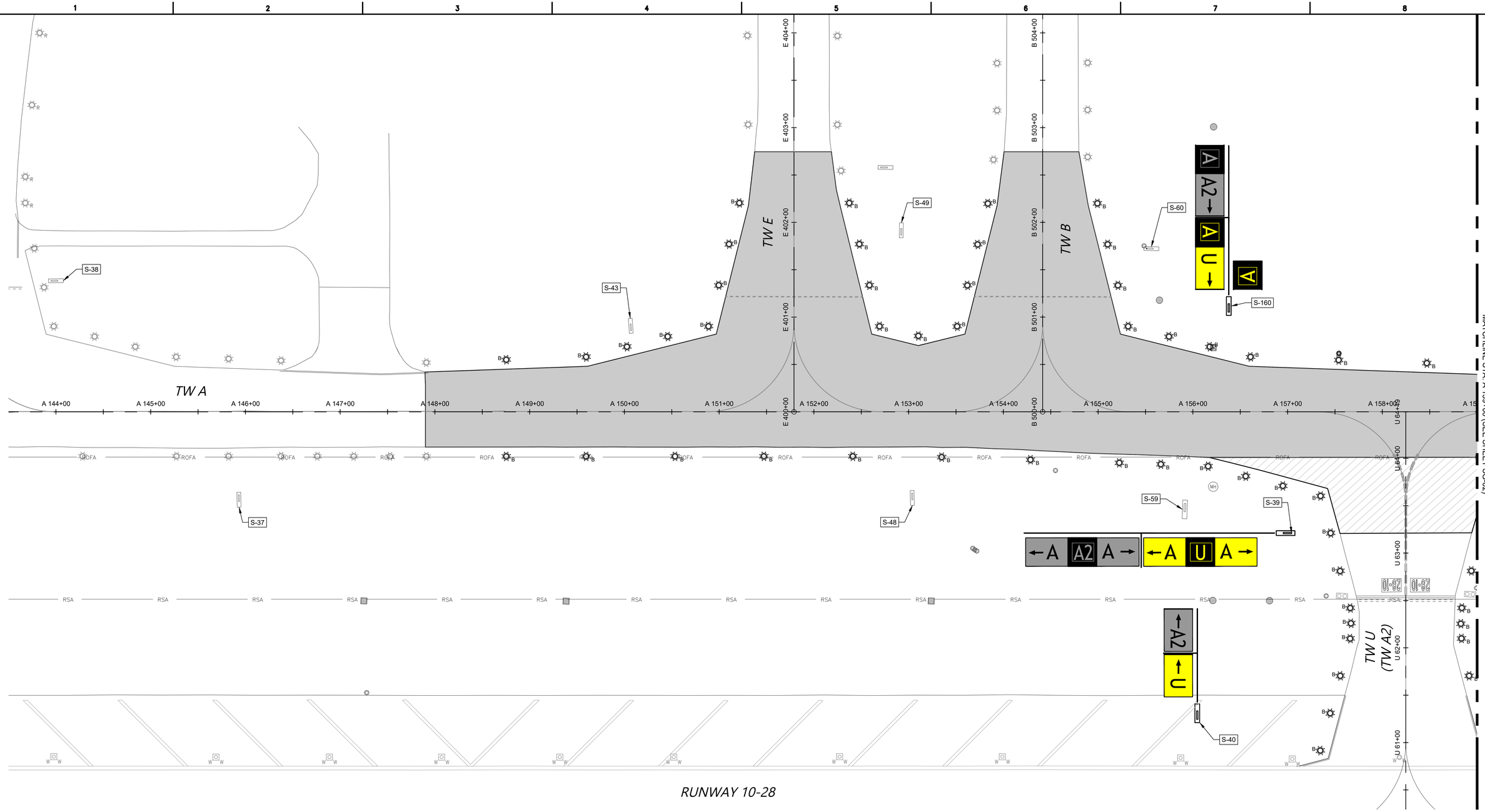

LEGEND

- PROPOSED AIRFIELD GUIDANCE SIGN
- EXISTING AIRFIELD GUIDANCE SIGN
- A5 — PROPOSED SIGN PANEL (ADD ALT 1)
- ← A → — PROPOSED SIGN PANEL (BASE BID)

NOTE:

1. SEE SHEET SG-08 FOR GUIDANCE SIGN DATA TABLE.
2. FOR EXISTING SIGNS THAT REQUIRE MODIFICATION (I.E. PANEL REPLACEMENT), CONTRACTOR SHALL FIELD VERIFY MANUFACTURER AND CHARACTERISTICS OF EACH EXISTING SIGN TO BE MODIFIED.
3. REPLACEMENT SIGN PANELS FOR EXISTING SIGNS SHALL BE FROM THE MANUFACTURER OF THE EXISTING SIGN.

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

PROPOSED AIRFIELD SIGNAGE PLAN (SHEET 4 OF 7)

SCALE: AS SHOWN	DESIGN: JPM
DRAWN: SDB	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

SG-04
67 OF 81

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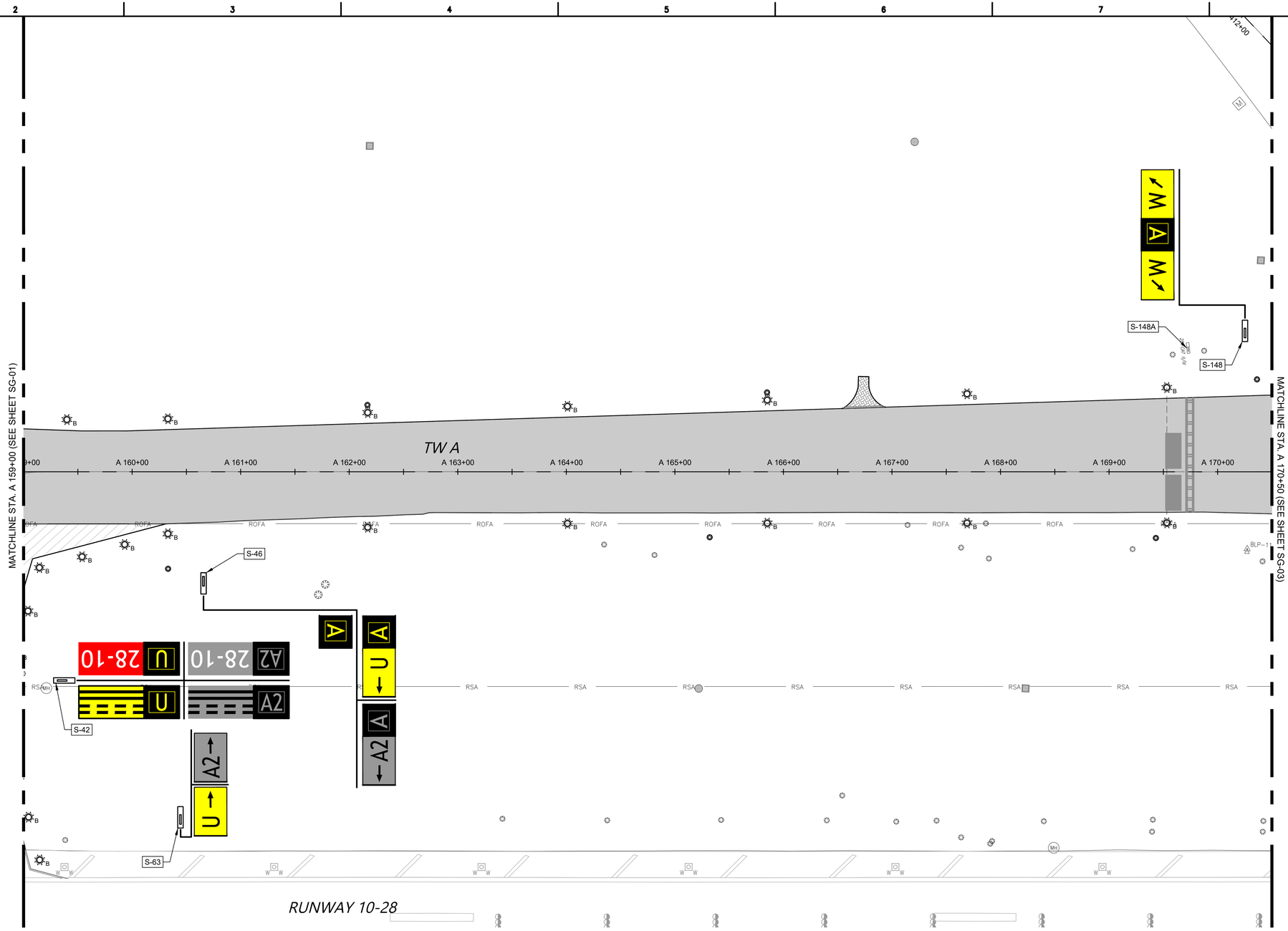


LEGEND

- PROPOSED AIRFIELD GUIDANCE SIGN
- EXISTING AIRFIELD GUIDANCE SIGN
- A5 — PROPOSED SIGN PANEL (ADD ALT 1)
- A — PROPOSED SIGN PANEL (BASE BID)

NOTE:

1. SEE SHEET SG-08 FOR GUIDANCE SIGN DATA TABLE.
2. FOR EXISTING SIGNS THAT REQUIRE MODIFICATION (I.E. PANEL REPLACEMENT), CONTRACTOR SHALL FIELD VERIFY MANUFACTURER AND CHARACTERISTICS OF EACH EXISTING SIGN TO BE MODIFIED.
3. REPLACEMENT SIGN PANELS FOR EXISTING SIGNS SHALL BE FROM THE MANUFACTURER OF THE EXISTING SIGN.

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084099 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

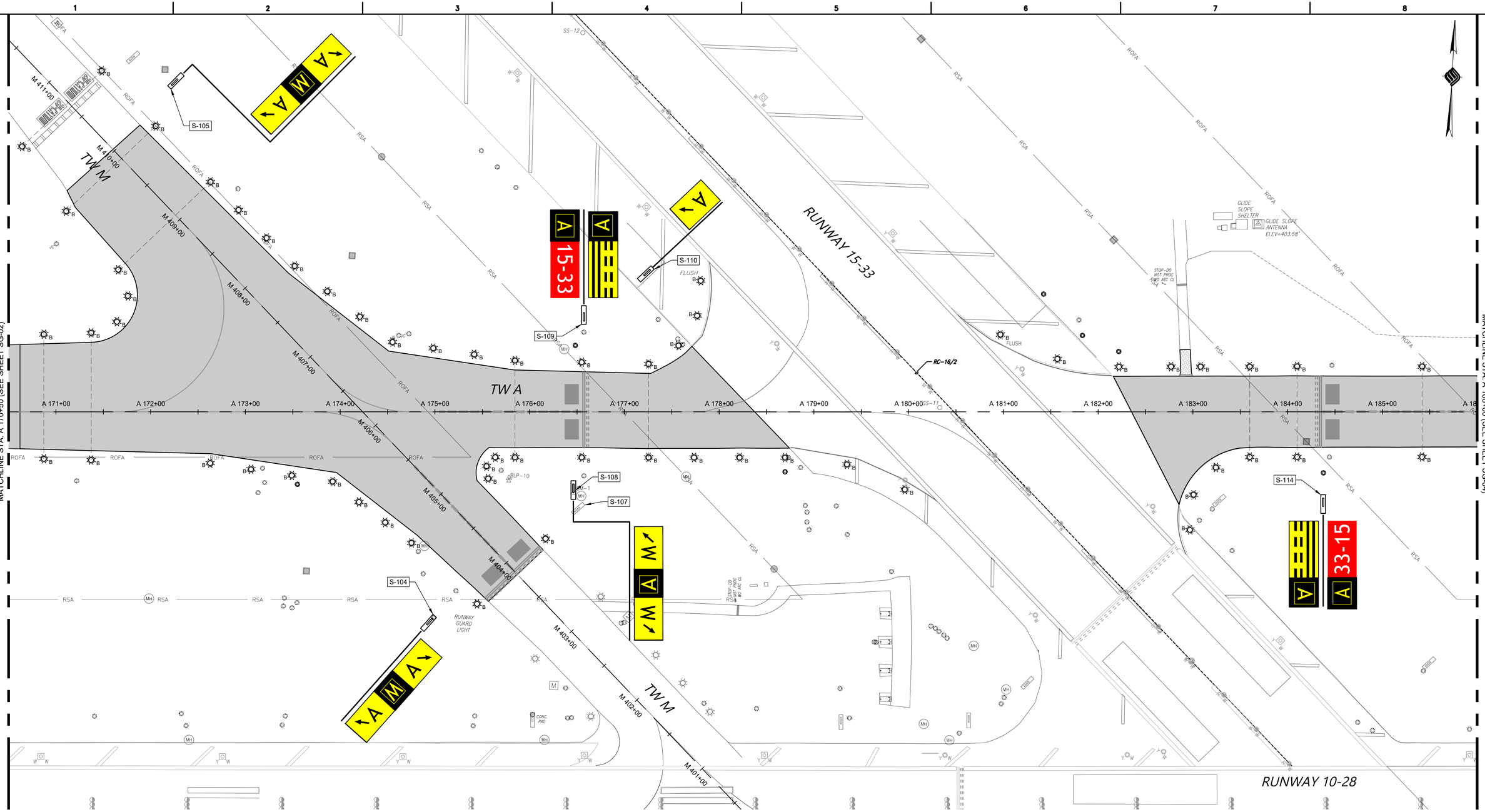
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

PROPOSED AIRFIELD SIGNAGE PLAN (SHEET 5 OF 7)

SCALE: AS SHOWN	DESIGN: JPM
DRAWN: SDB	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

SG-05
68 OF 81



LEGEND

- PROPOSED AIRFIELD GUIDANCE SIGN
- EXISTING AIRFIELD GUIDANCE SIGN
- A5 — PROPOSED SIGN PANEL (ADD ALT 1)
- ←A→ — EXISTING SIGN PANEL TO REMAIN

NOTE:

1. SEE SHEET SG-08 FOR GUIDANCE SIGN DATA TABLE.
2. FOR EXISTING SIGNS THAT REQUIRE MODIFICATION (I.E. PANEL REPLACEMENT), CONTRACTOR SHALL FIELD VERIFY MANUFACTURER AND CHARACTERISTICS OF EACH EXISTING SIGN TO BE MODIFIED.
3. REPLACEMENT SIGN PANELS FOR EXISTING SIGNS SHALL BE FROM THE MANUFACTURER OF THE EXISTING SIGN.

ALL WORK SHOWN ON THIS DRAWING IS INCLUDED IN ADD ALT 1

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084009 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

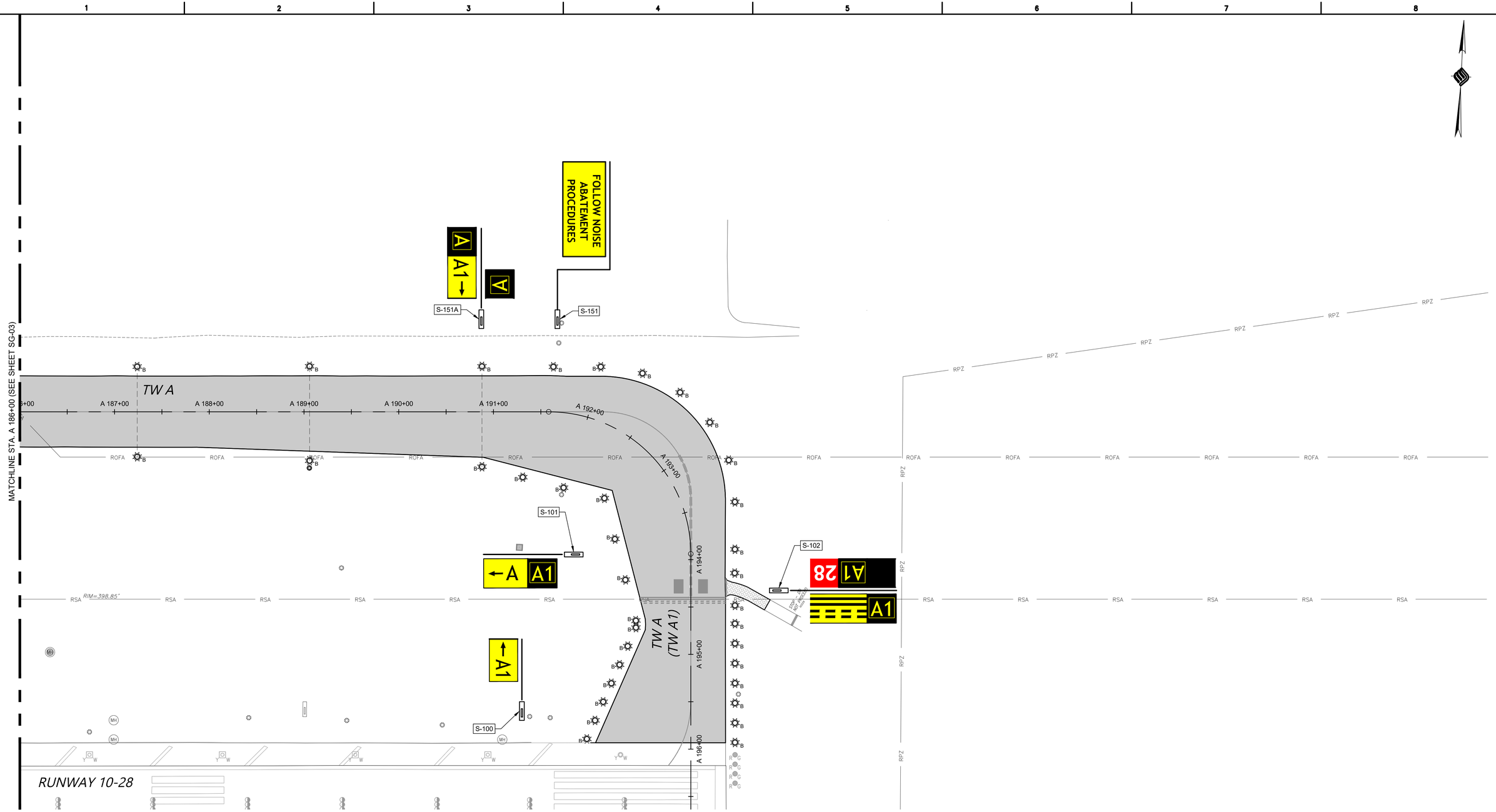
SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

PROPOSED AIRFIELD SIGNAGE PLAN (SHEET 6 OF 7)

SCALE: AS SHOWN	DESIGN: JPM
DRAWN: SDB	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

SG-06
69 OF 81



LEGEND

- PROPOSED AIRFIELD GUIDANCE SIGN
- EXISTING AIRFIELD GUIDANCE SIGN
- A5 — PROPOSED SIGN PANEL (ADD ALT 1)
- ←A→ — EXISTING SIGN PANEL TO REMAIN

NOTE:

1. SEE SHEET SG-08 FOR GUIDANCE SIGN DATA TABLE.
2. FOR EXISTING SIGNS THAT REQUIRE MODIFICATION (I.E. PANEL REPLACEMENT), CONTRACTOR SHALL FIELD VERIFY MANUFACTURER AND CHARACTERISTICS OF EACH EXISTING SIGN TO BE MODIFIED.
3. REPLACEMENT SIGN PANELS FOR EXISTING SIGNS SHALL BE FROM THE MANUFACTURER OF THE EXISTING SIGN.

ALL WORK SHOWN ON THIS DRAWING IS INCLUDED IN ADD ALT 1

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

PROPOSED AIRFIELD SIGNAGE PLAN (SHEET 7 OF 7)

SCALE: AS SHOWN	DESIGN: JPM
DRAWN: SDB	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

SG-07
70 OF 81

K:\SYR\ACS\SET-18831.08 TW A EAST DESIGN\DRAWINGS\SHEET FILES\18831.08-SIGN.DWG

GUIDANCE SIGN LAYOUT TABLE

REFERENCE DRAWING	SIGN ID	STATION	OFFSET (FT.)	CIRCUIT NO.	ITEM NO.	COMMENTS	BASE BID / ADD ALT
SG-01	S-185	A 101+98.05	98.87 R	TC-11	L-125-75	REPLACE SIGN PANELS (1 EA)	ADD ALT 1
	S-188	A 101+74.44	85.38 L	TC-11	L-125-75	REPLACE SIGN PANELS (1 EA)	ADD ALT 1
	S-3	A 104+16.52	131.32 R	RC-1	L-125-75	REPLACE SIGN PANELS (2 EA)	ADD ALT 1
	S-41	A 104+54.36	106.85 R	TC-11	-	NO CHANGES	N/A
	S-41A	A 105+04.14	100.43 R	RC-1	-	NO CHANGES	N/A
	S-184	A 105+57.52	93.75 R	TC-11	L-125-75	REPLACE SIGN PANELS (1 EA)	ADD ALT 1
	S-7	A 105+98.05	117.33 L	TC-11	-	NO CHANGES	N/A
	S-9	A 108+27.09	150.35 L	TC-11	-	NO CHANGES	N/A
	S-8	A 108+60.21	87.05 R	TC-11	-	NO CHANGES	N/A
	S-6	V 10+11.95	235.14 R	RC-1	L-125-75	REPLACE SIGN PANELS (1 EA)	ADD ALT 1
SG-02	S-11	A 114+07.74	98.41 L	TC-11	-	NO CHANGES	N/A
	S-12	A 116+68.19	86.99 R	TC-11	-	NO CHANGES	N/A
	S-13	A 116+54.34	166.34 L	TC-11	-	NO CHANGES	N/A
	S-18	A 123+44.75	89.65 L	TC-11	L-125-75	REPLACE SIGN PANELS (1 EA)	ADD ALT 1
	S-17	Z 52+99.81	106.35 L	TC-11	L-125-75	REPLACE SIGN PANELS (1 EA)	ADD ALT 1
	S-113	Z 51+23.14	216.43 L	RC-1	L-125-75	REPLACE SIGN PANELS (1 EA)	ADD ALT 1
	S-22	Z 51+25.83	224.49 R	RC-1	L-125-75	REPLACE SIGN PANELS (1 EA)	ADD ALT 1
	S-23	Z 52+52.95	94.83 R	RC-1	L-125-75	REPLACE SIGN PANELS (2 EA)	ADD ALT 1
	S-24	Z 53+48.02	149+75 R	TC-11	L-125-75	REPLACE SIGN PANELS (1 EA)	ADD ALT 1
SG-03	S-31	A 135+54.05	87.29 L	TC-1	L-125-75	REPLACE SIGN PANELS (1 EA)	ADD ALT 1
	S-30	A 135+74.77	126.92 R	TC-1	L-125-75	REPLACE SIGN PANELS (1 EA)	ADD ALT 1
	S-26	A 135+96.43	324.63 R	RC-1	L-125-75	REPLACE SIGN PANELS (1 EA)	ADD ALT 1
	S-33	A 140+59.34	324.40 R	RC-1	L-125-75	REPLACE SIGN PANELS (1 EA)	ADD ALT 1
	S-34	A 138+64.69	193.75 R	RC-1	L-125-75	REPLACE SIGN PANELS (2 EA)	ADD ALT 1
	S-36	A 140+60.17	92.68 R	TC-1	L-125-75	REPLACE SIGN PANELS (1 EA)	ADD ALT 1
	S-161	A 141+66.73	88.78 R	TC-1	-	NO CHANGES	N/A
SG-04	S-37	A 145+93.03	87.64 R	TC-1	-	NO CHANGES	N/A
	S-38	A 143+94.88	138.29 L	TC-1	-	NO CHANGES	N/A
	S-39	A 157+04.20	127.98 R	TC-1	L-125-7103	NEW SIGN AND FOUNDATION	BASE BID
	S-40	A 156+04.68	324.58 R	RC-1	L-125-7103	NEW SIGN AND FOUNDATION	BASE BID
	S-43	A 150+07.06	85.71 L	TC-1	-	NO CHANGES	N/A
	S-48	A 153+03.68	85.83 R	TC-1	-	NO CHANGES	N/A
	S-49	E 401+86.55	113.18 R	TC-1	-	NO CHANGES	N/A
	S-59	A 155+91.66	96.69 R	TC-1	-	NO CHANGES	N/A
	S-60	B 501+72.35	109.63 R	TC-4	-	NO CHANGES	N/A
	S-160	A 156+37.90	105.31 L	TC-1	L-125-7103	NEW SIGN AND FOUNDATION	BASE BID
SG-05	S-42	A 159+31.10	192.28 R	RC-1	L-125-7103	NEW SIGN AND FOUNDATION	BASE BID
	S-46	A 160+65.77	96.41 R	TC-1	L-125-7103	NEW SIGN AND FOUNDATION	BASE BID
	S-63	A 160+44.68	324.77 R	RC-1	L-125-7103	NEW SIGN AND FOUNDATION	BASE BID
	S-148	A 170+25.19	123.49 L	TC-1	-	NO CHANGES	N/A
	S-148A	A 169+73.14	110.95 L	RC-1	L-125-7103	NEW SIGN AND FOUNDATION	BASE BID
SG-06	S-105	M 410+08.58	91.76 R	TC-8	L-125-7103	NEW SIGN AND FOUNDATION	ADD ALT 1
	S-104	M 404+11.12	96.84 L	TC-8	L-125-7103	NEW SIGN AND FOUNDATION	ADD ALT 1
	S-107	M 403+89.20	89.30 R	RC-1	-	NO CHANGES	N/A
	S-108	A 176+46.12	76.20 R	TC-2	L-125-7103	NEW SIGN AND FOUNDATION	ADD ALT 1
	S-109	A 176+57.22	95.83 L	RC-14	L-125-7103	NEW SIGN AND FOUNDATION	ADD ALT 1
	S-110	A 177+27.18	149.96 L	RC-14	L-125-78	NEW SIGN ON EXISTING FOUNDATION	ADD ALT 1
	S-114	A 184+37.50	91.02 R	RC-14	L-125-7103	NEW SIGN AND FOUNDATION	ADD ALT 1
SG-07	S-151A	A 190+87.21	91.43 L	TC-2	L-125-7103	NEW SIGN AND FOUNDATION	ADD ALT 1
	S-151	A 191+64.05	91.61 L	TC-2	L-125-7103	NEW SIGN AND FOUNDATION	ADD ALT 1
	S-101	A 193+94.55	117.23 R	TC-2	L-125-7103	NEW SIGN AND FOUNDATION	ADD ALT 1
	S-102	A 194+32.57	86.51 L	RC-1	L-125-7103	NEW SIGN AND FOUNDATION	ADD ALT 1
	S-100	A 195+66.16	178.31 R	RC-1	L-125-7103	NEW SIGN AND FOUNDATION	ADD ALT 1

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANDER · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

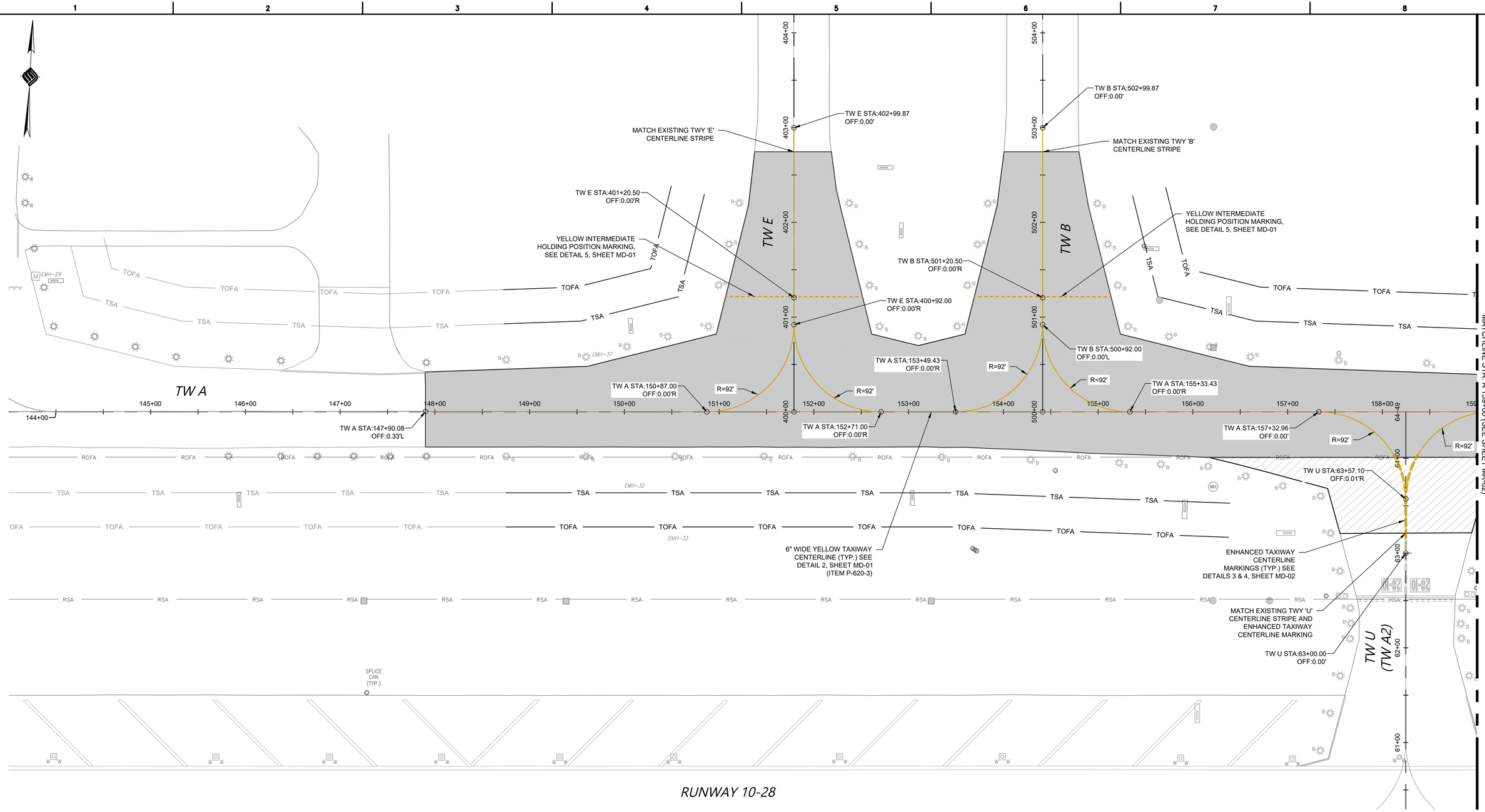
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

GUIDANCE SIGN DATA TABLE

SCALE: AS SHOWN	DESIGN: JPM	**SG-08**
DRAWN: SDB	PROJECT: 18831.08	71 OF 81
CHECKED: SJL	DATE: APRIL 2024	

K:\SYR\PROJECTS\18831.08 TW A EAST DESIGN\DRAWINGS\DRAWINGS\SHEET FILES\18831.08-SIGN.DWG



NOTES:

1. COORDINATES GIVEN ON DRAWINGS ARE TO THE CENTER OF LINE ON CENTERLINES, THE EDGE OF OUTER EDGE LINE (YELLOW) FOR EDGE LINES, AND TO THE EDGE OF THE FIRST SOLID STRIPE FOR HOLD POSITION MARKINGS.
2. MARKINGS SHALL BE PAID FOR UNDER THE FOLLOWING ITEMS:
   YELLOW MARKINGS SHALL BE PAID FOR UNDER ITEM P-620-3.

   BLACK MARKINGS SHALL BE PAID FOR UNDER ITEM P-620-1.

   THERMOPLASTIC SURFACE PAINTED HOLD SIGNS SHALL BE PAID FOR UNDER ITEM P-620-8.
3. A BLACK BORDER SHALL ONLY BE REQUIRED FOR PROPOSED MARKINGS LOCATED ON EXISTING OR LIGHT-COLORED PAVEMENT.

0 50 100 150 FT

SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK
STEVEN J. LANGE
084000
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

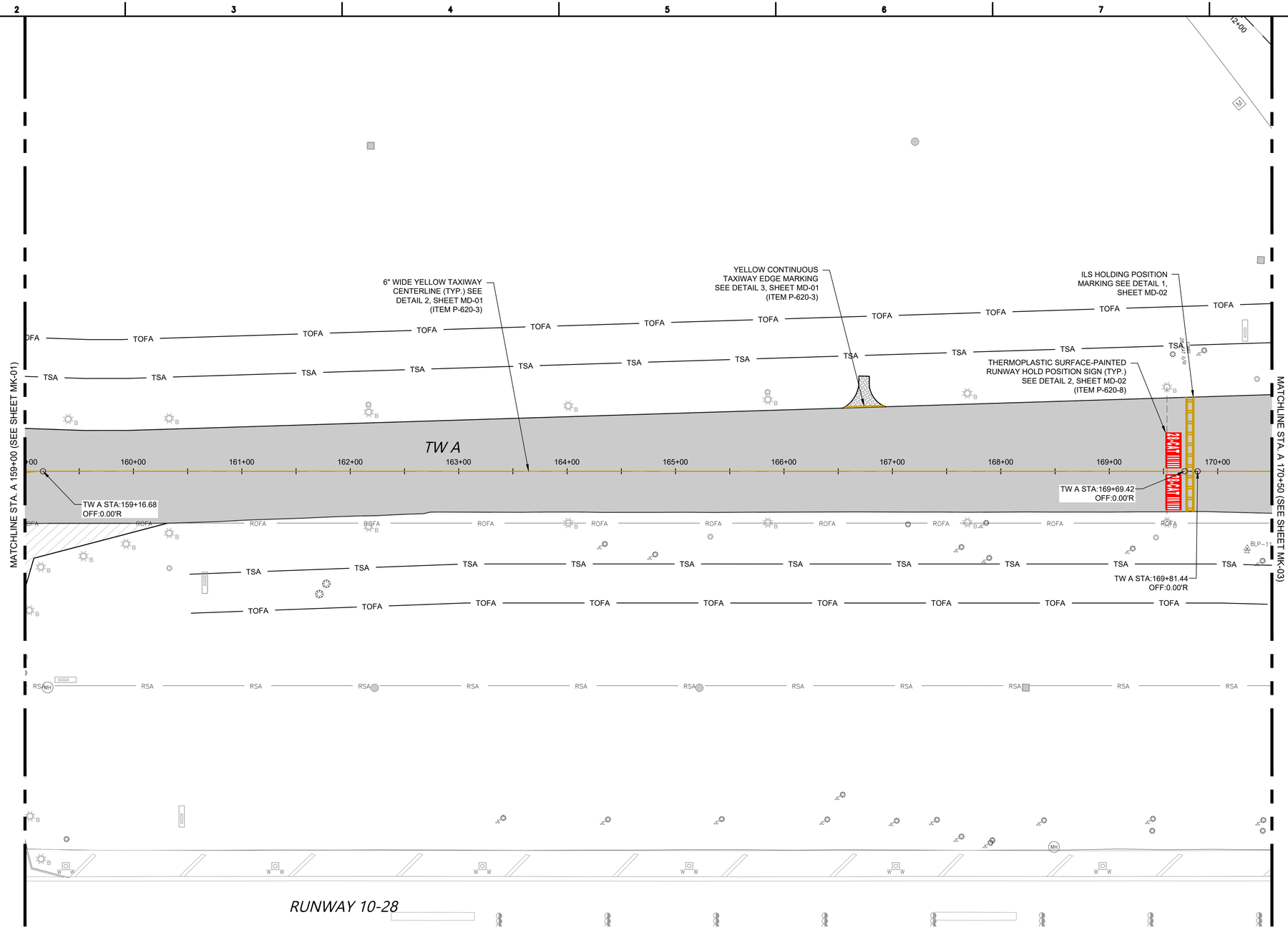
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

MARKING PLAN
(SHEET 1 OF 4)

SCALE: AS SHOWN	DESIGN: JPM	**MK-01**
DRAWN: SDB	PROJECT: 18831.08	72 OF 81
CHECKED: SJL	DATE: APRIL 2024	



NOTES:

1. COORDINATES GIVEN ON DRAWINGS ARE TO THE CENTER OF LINE ON CENTERLINES, THE EDGE OF OUTER EDGE LINE (YELLOW) FOR EDGE LINES, AND TO THE EDGE OF THE FIRST SOLID STRIPE FOR HOLD POSITION MARKINGS.
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0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084099 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

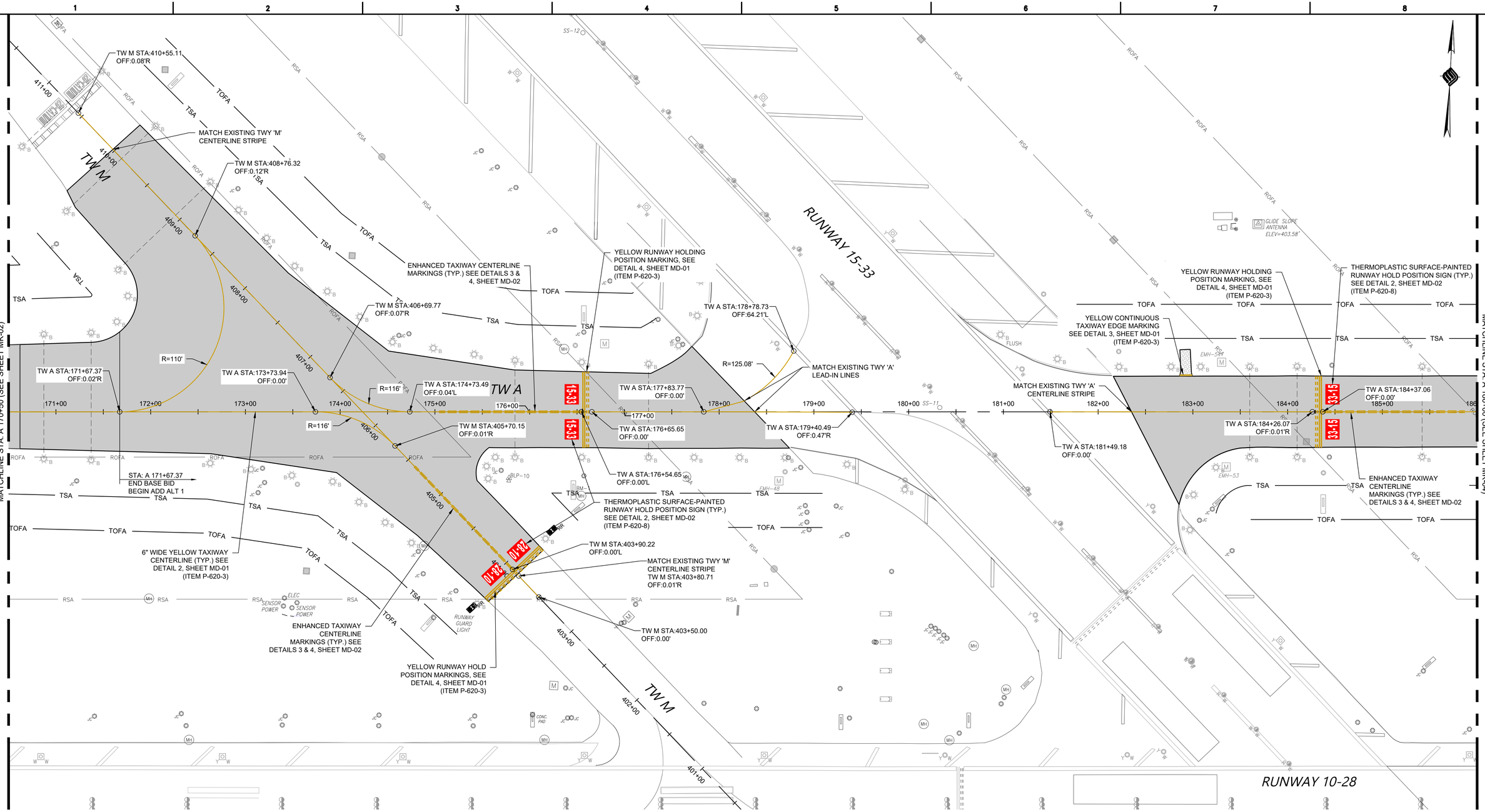
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

MARKING PLAN (SHEET 2 OF 4)

SCALE: AS SHOWN	DESIGN: JPM	**MK-02**
DRAWN: SDB	PROJECT: 18831.08	73 OF 81
CHECKED: SJL	DATE: APRIL 2024	



NOTES:

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3. A BLACK BORDER SHALL ONLY BE REQUIRED FOR PROPOSED MARKINGS LOCATED ON EXISTING OR LIGHT-COLORED PAVEMENT.

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK
STEVEN J. LANGE
084009
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

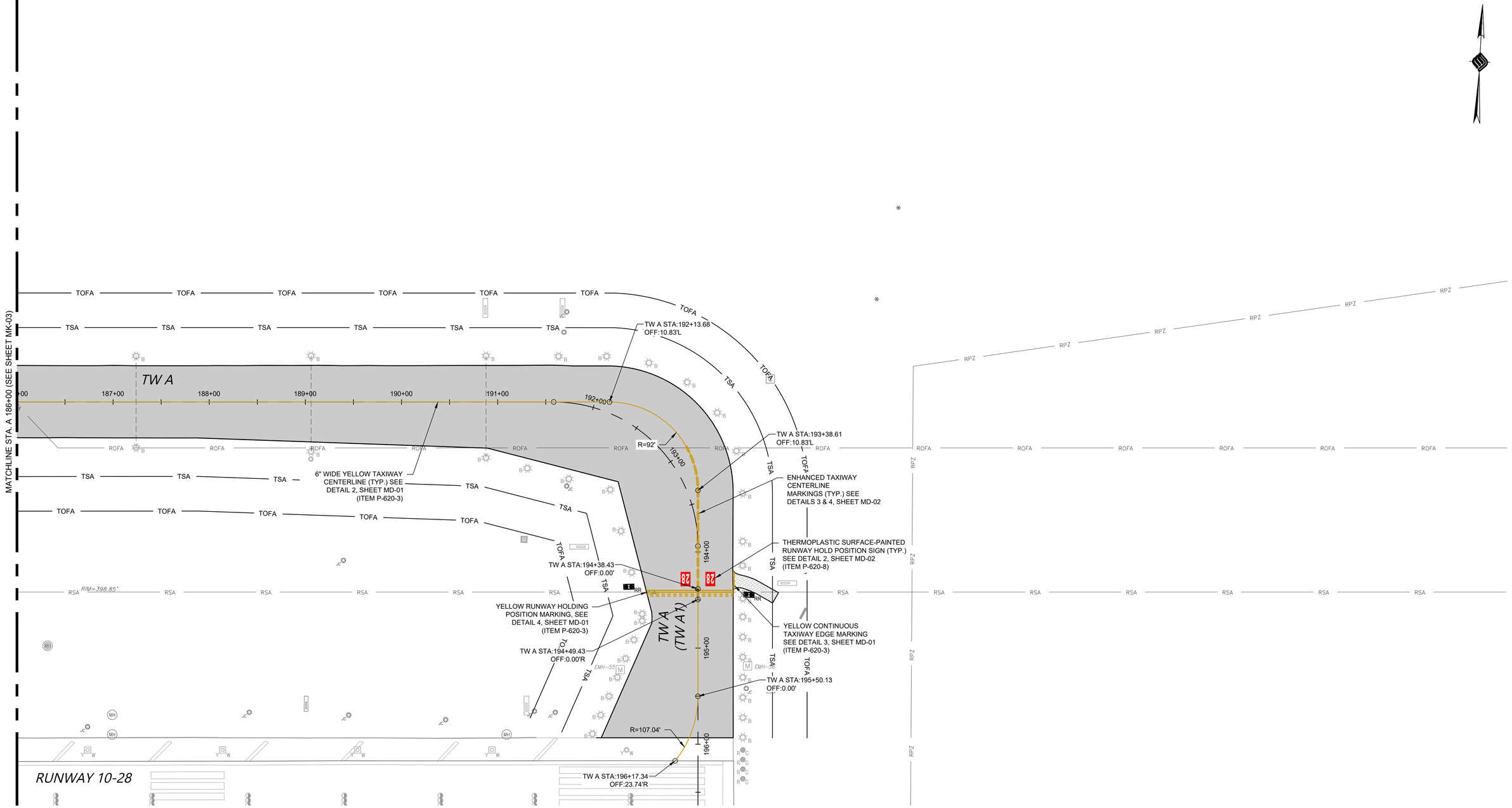
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

MARKING PLAN
(SHEET 3 OF 4)

SCALE: AS SHOWN	DESIGN: JPM	MK-03
DRAWN: SDB	PROJECT: 18831.08	74 OF 81
CHECKED: SJL	DATE: APRIL 2024	



NOTES:

1. COORDINATES GIVEN ON DRAWINGS ARE TO THE CENTER OF LINE ON CENTERLINES, THE EDGE OF OUTER EDGE LINE (YELLOW) FOR EDGE LINES, AND TO THE EDGE OF THE FIRST SOLID STRIPE FOR HOLD POSITION MARKINGS.
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   BLACK MARKINGS SHALL BE PAID FOR UNDER ITEM P-620-1.
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3. A BLACK BORDER SHALL ONLY BE REQUIRED FOR PROPOSED MARKINGS LOCATED ON EXISTING OR LIGHT-COLORED PAVEMENT.

ALL WORK SHOWN ON THIS DRAWING IS INCLUDED IN ADD ALT 1

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

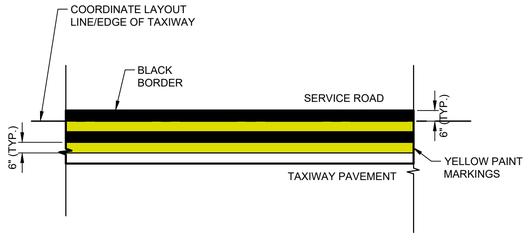
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

MARKING PLAN (SHEET 4 OF 4)

SCALE: AS SHOWN	DESIGN: JPM	MK-04
DRAWN: SDB	PROJECT: 18831.08	75 OF 81
CHECKED: SJL	DATE: APRIL 2024	

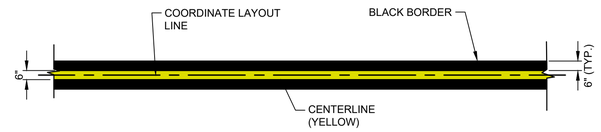
K:\SYR\ACDET-18831.08 TW A EAST DESIGN\DRAWINGS\SHEET FILES\18831-04A MARK.DWG



CONTINUOUS TAXIWAY EDGE MARKING

NTS

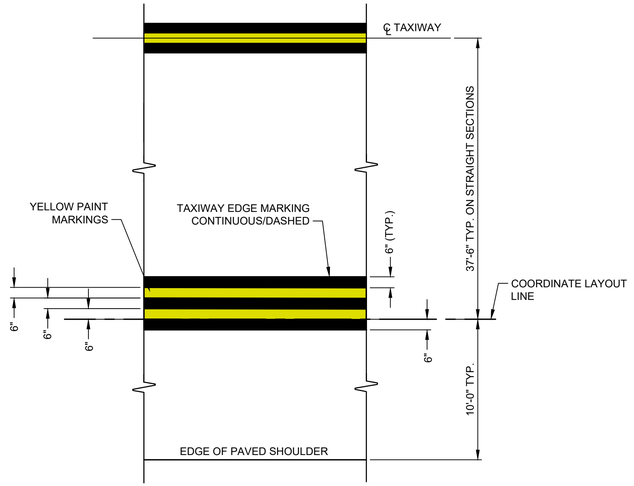
1 MD-01



6" TAXIWAY CENTERLINE MARKING

NTS

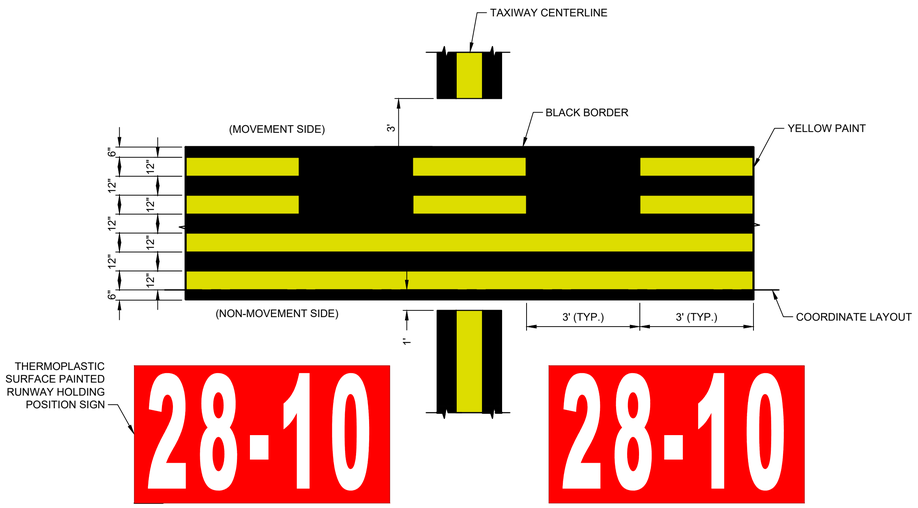
2 MD-01



TYPICAL TAXIWAY EDGE MARKINGS

NTS

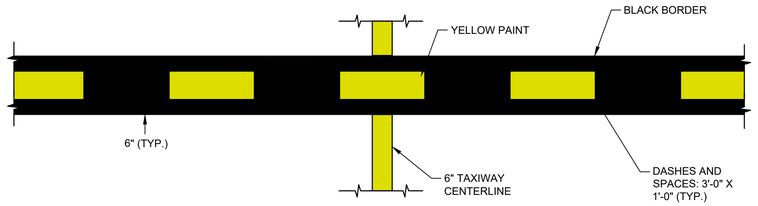
3 MD-01



RUNWAY HOLDING POSITION MARKING

NTS

4 MD-01



INTERMEDIATE HOLD POSITION MARKING

NTS

5 MD-01

DRAWING NOTES:

1. COORDINATES GIVEN ON DRAWINGS ARE TO THE CENTER OF LINE ON CENTERLINES, THE EDGE OF OUTER EDGE LINE (YELLOW) FOR EDGE LINES, AND TO THE EDGE OF THE FIRST SOLID STRIPE FOR HOLD POSITION MARKINGS.
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CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

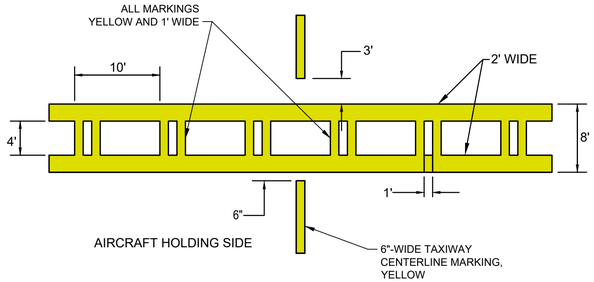
REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK
REHABILITATION OF TAXIWAY A (EAST)

MARKING DETAILS (SHEET 1 OF 2)

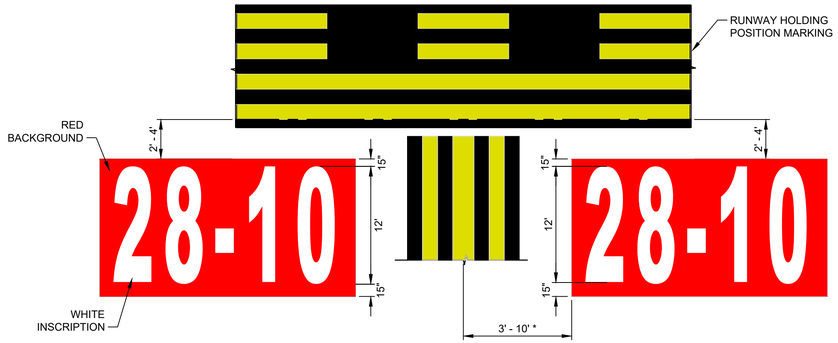
SCALE: NTS	DESIGN: JPM	**MD-01**
DRAWN: SDB	PROJECT: 18831.08	
CHECKED: SJL	DATE: APRIL 2024	76 OF 81



ILS CRITICAL AREA HOLD POSITION MARKING

NTS

1 MD-02



*FROM NEAREST POINT FOR NON-PERPENDICULAR ALIGNMENTS

SURFACE PAINTED RUNWAY HOLDING POSITION SIGN - THERMOPLASTIC

NTS

2 MD-02

DRAWING NOTES:

1. COORDINATES GIVEN ON DRAWINGS ARE TO THE CENTER OF LINE ON CENTERLINES, THE EDGE OF OUTER EDGE LINE (YELLOW) FOR EDGE LINES, AND TO THE EDGE OF THE FIRST SOLID STRIPE FOR HOLD POSITION MARKINGS.
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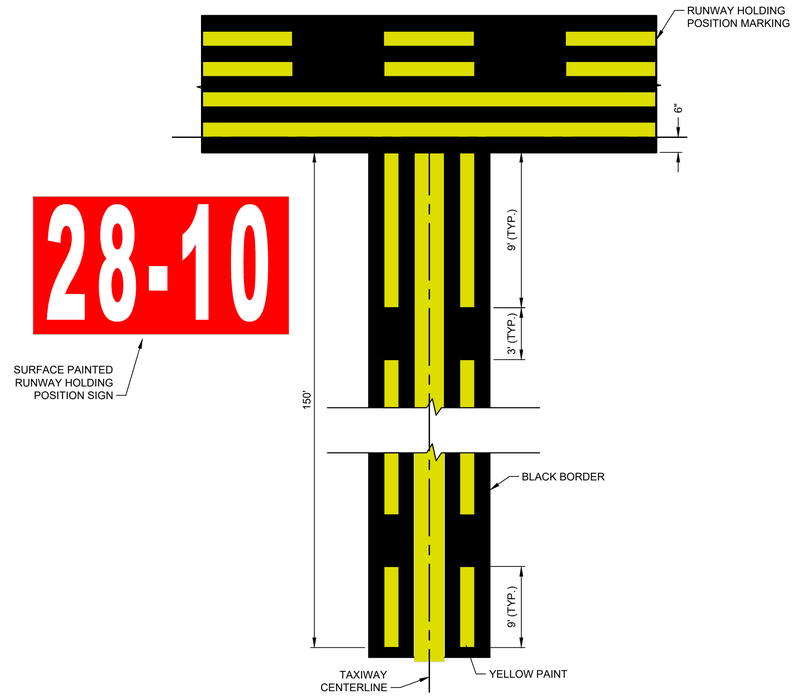
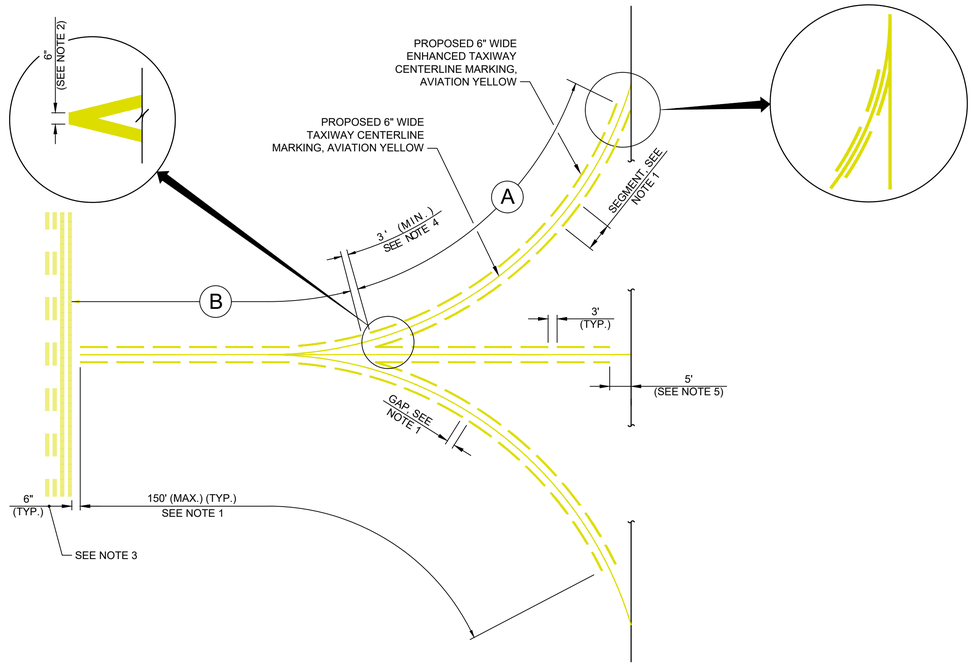
3. A BLACK BORDER SHALL ONLY BE REQUIRED FOR PROPOSED MARKINGS LOCATED ON EXISTING OR LIGHT-COLORED PAVEMENT.



ENHANCED TAXIWAY CENTERLINE MARKINGS

NTS

3 MD-02



ENHANCED TAXIWAY CENTERLINE MARKING

NTS

4 MD-02

NOTES:

1. ENHANCED MARKINGS SHALL BE LAID OUT ALONG THE TAXIWAY CENTERLINE WITH 9 FOOT LONG SEGMENTS AND 3 FOOT LONG GAPS FOR A DISTANCE OF 150 FEET. SEGMENTS AND GAPS SHALL LINE UP WITH EACH OTHER ON OPPOSITE SIDES OF THE CENTERLINE. ALONG CURVED CENTERLINES, THE SEGMENTS AND GAPS SHALL BE PAINTED SUCH THAT THEIR ENDS ARE IN LINE WITH RADIAL LINES TO THE POINTS LAID OUT ALONG THE CENTERLINE. THIS WILL RESULTS IN SEGMENTS AND GAPS ON THE OUTSIDE OF THE CURVE BEING LONGER THAN THE SEGMENTS AND GAPS ON THE INSIDE OF THE CURVE.
2. ENHANCED MARKINGS "A" SHALL BEGIN AT THE LOCATION WHERE THE STRIPES OVERLAP TO PROVIDE A 6" WIDE "V" AS SHOWN.
3. ENHANCED MARKINGS "B" SHALL BEGIN 6" FROM THE HOLDING POSITION MARKING, OR AT THE BEGINNING OF THE CENTERLINE MARKINGS IF DIFFERENT THAN 6".
4. ENHANCED MARKINGS "B" SHALL END 3' BEFORE ENHANCED MARKINGS "A".
5. END ENHANCED MARKINGS 5' FROM INTERSECTING TAXIWAY CENTERLINES ALONG STRAIGHT SEGMENTS ONLY IF THE TOTAL LENGTH IS LESS THAN 150'.
6. PROVIDE 6" SPACED BETWEEN TAXIWAY CENTERLINE AND ENHANCED TAXIWAY CENTERLINE MARKINGS.
7. WHERE ENHANCED MARKINGS ALONG A CURVED CENTERLINE MEET A STRAIGHT CENTERLINE BEFORE THE OVERALL 150 FOOT DIMENSION IS REACHED, THE SHALL END WHERE THE OUTSIDE SEGMENT (OR GAP) INTERSECTS WITH THE STRAIGHT TAXIWAY CENTERLINE. THE INNER SEGMENT (OR GAP) SHALL END AT THE SAME LOCATION RADIALLY AS THE OUTER SEGMENT (OR GAP).

CONSTRUCTION BID SET

STATE OF NEW YORK
STEVEN J. LANDE
084000
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

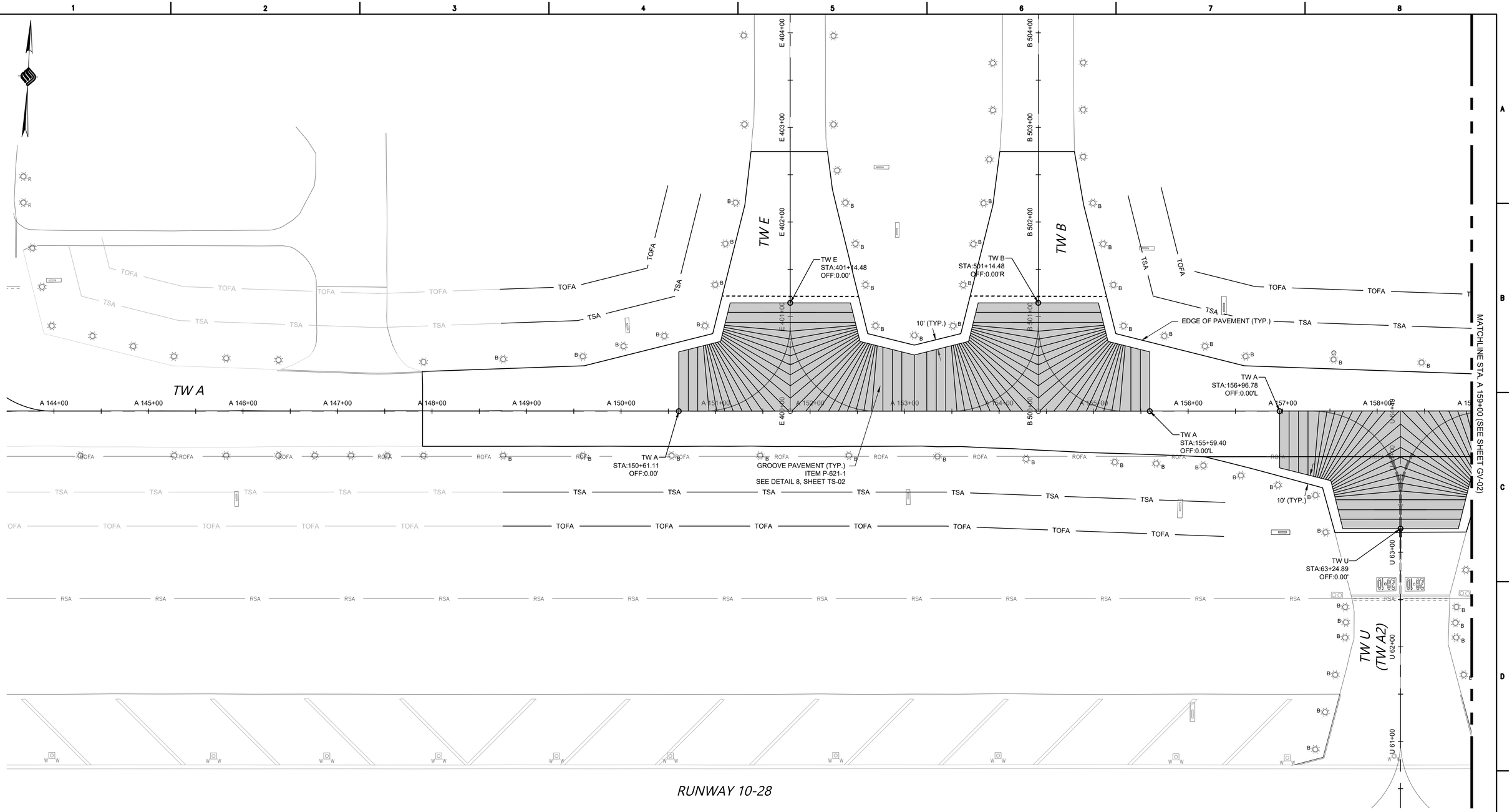
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

MARKING DETAILS (SHEET 2 OF 2)

SCALE: NTS	DESIGN: JPM	**MD-02**	
DRAWN: SDB	PROJECT: 18831.08		
CHECKED: SJL	DATE: APRIL 2024	77 OF 81	



LEGEND

AREA TO BE GROOVED

NOTE:
1. SEE "TYPICAL TRANSVERSE TAXIWAY GROOVING DETAIL" ON SHEET TS-02.

0 50 100 150 FT
SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084009 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

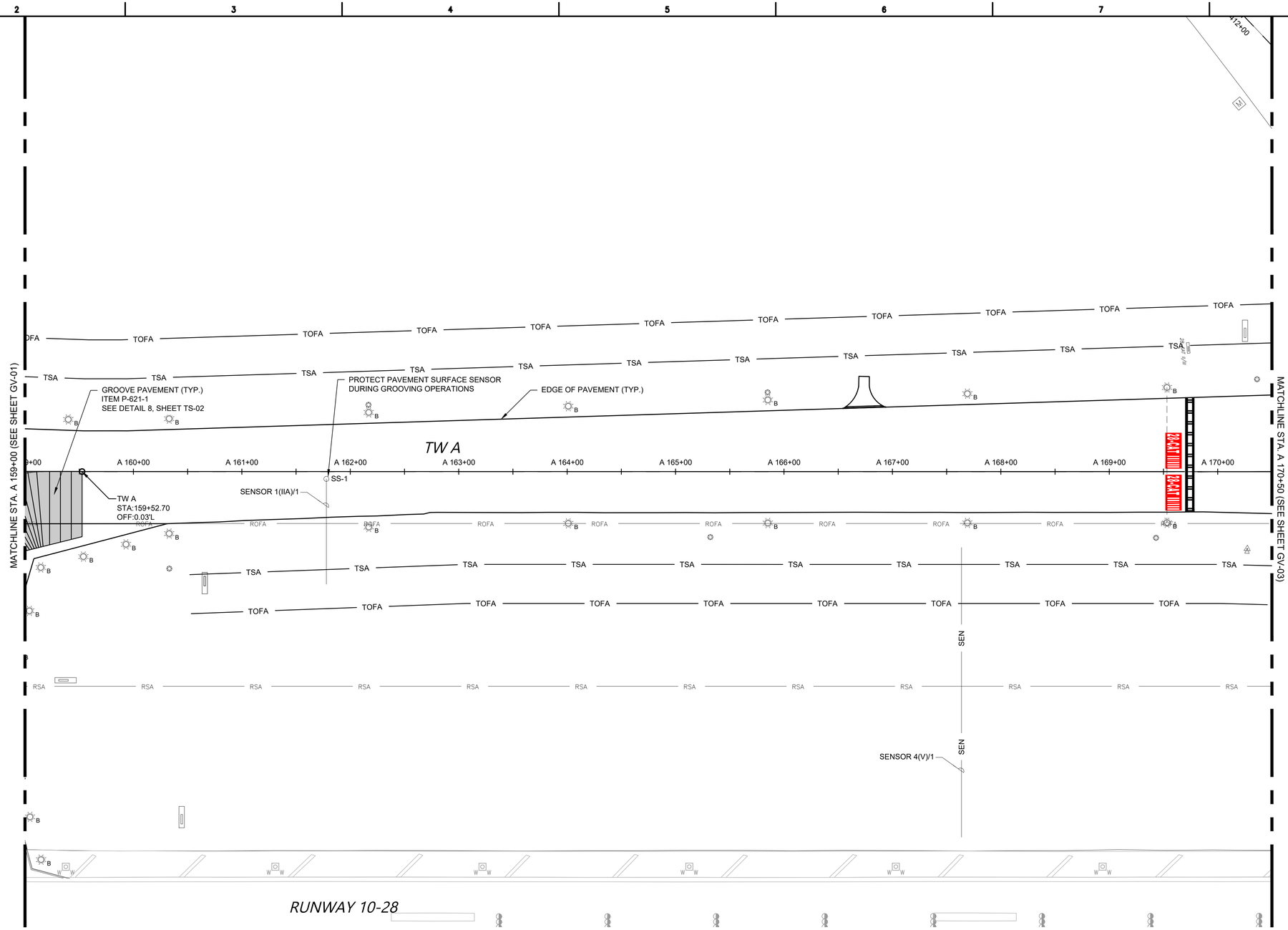
McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

PAVEMENT GROOVING PLAN (SHEET 1 OF 4)

SCALE: AS SHOWN	DESIGN: JPM	**GV-01**
DRAWN: SDB	PROJECT: 18831.08	78 OF 81
CHECKED: SJL	DATE: APRIL 2024	



LEGEND

AREA TO BE GROOVED

NOTE:

1. SEE "TYPICAL TRANSVERSE TAXIWAY GROOVING DETAIL" ON SHEET TS-02.

0 50 100 150 FT

SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK
STEVEN J. LANGE
084000
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

PAVEMENT GROOVING PLAN (SHEET 2 OF 4)

SCALE: AS SHOWN	DESIGN: JPM	GV-02
DRAWN: SDB	PROJECT: 18831.08	79 OF 81
CHECKED: SJL	DATE: APRIL 2024	

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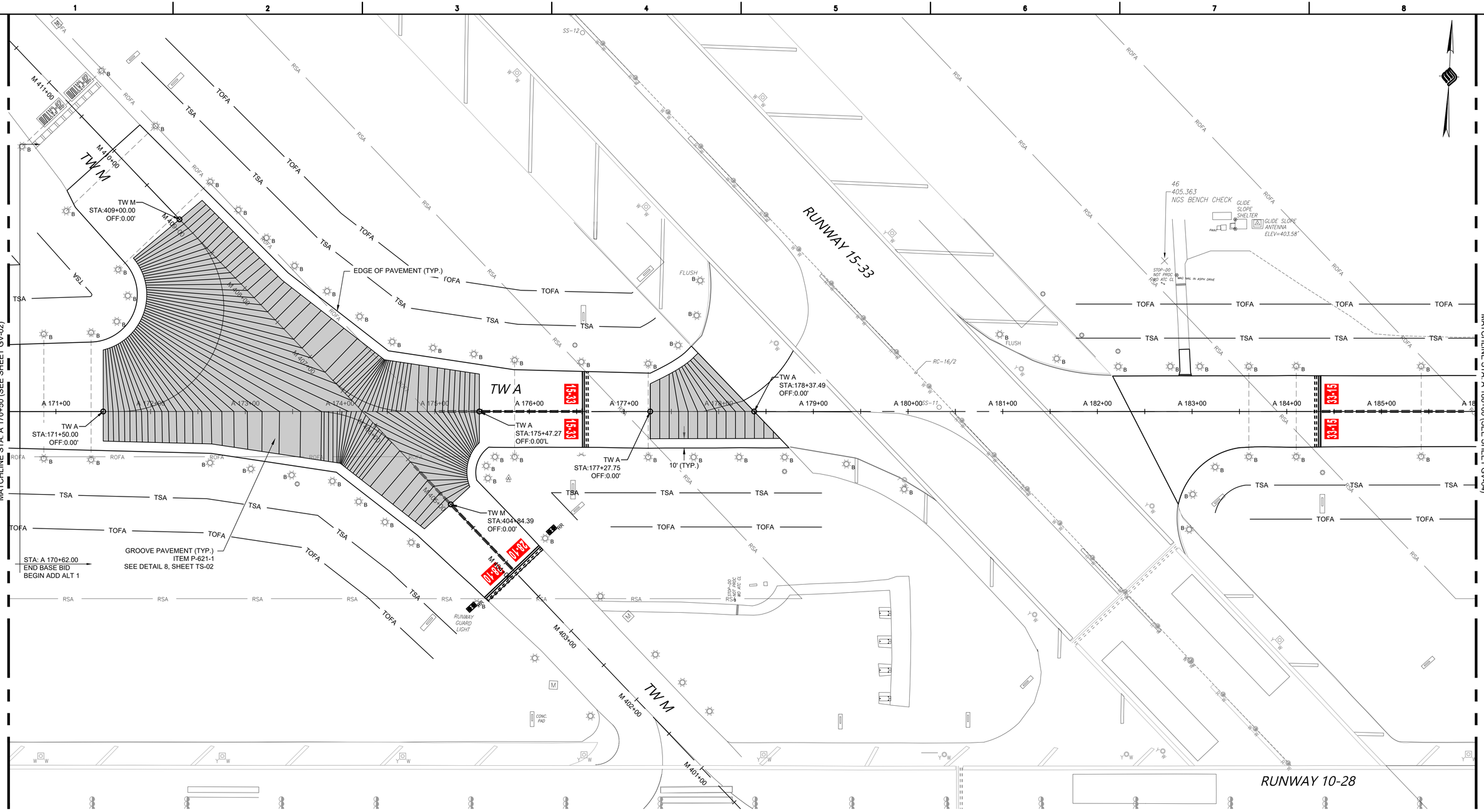


LEGEND

AREA TO BE GROOVED

NOTE:

1. SEE "TYPICAL TRANSVERSE TAXIWAY GROOVING DETAIL" ON SHEET TS-02.

ALL WORK SHOWN ON THIS DRAWING IS INCLUDED IN ADD ALT 1

0 50 100 150 FT

SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK
STEVEN J. LANGE
084009
LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

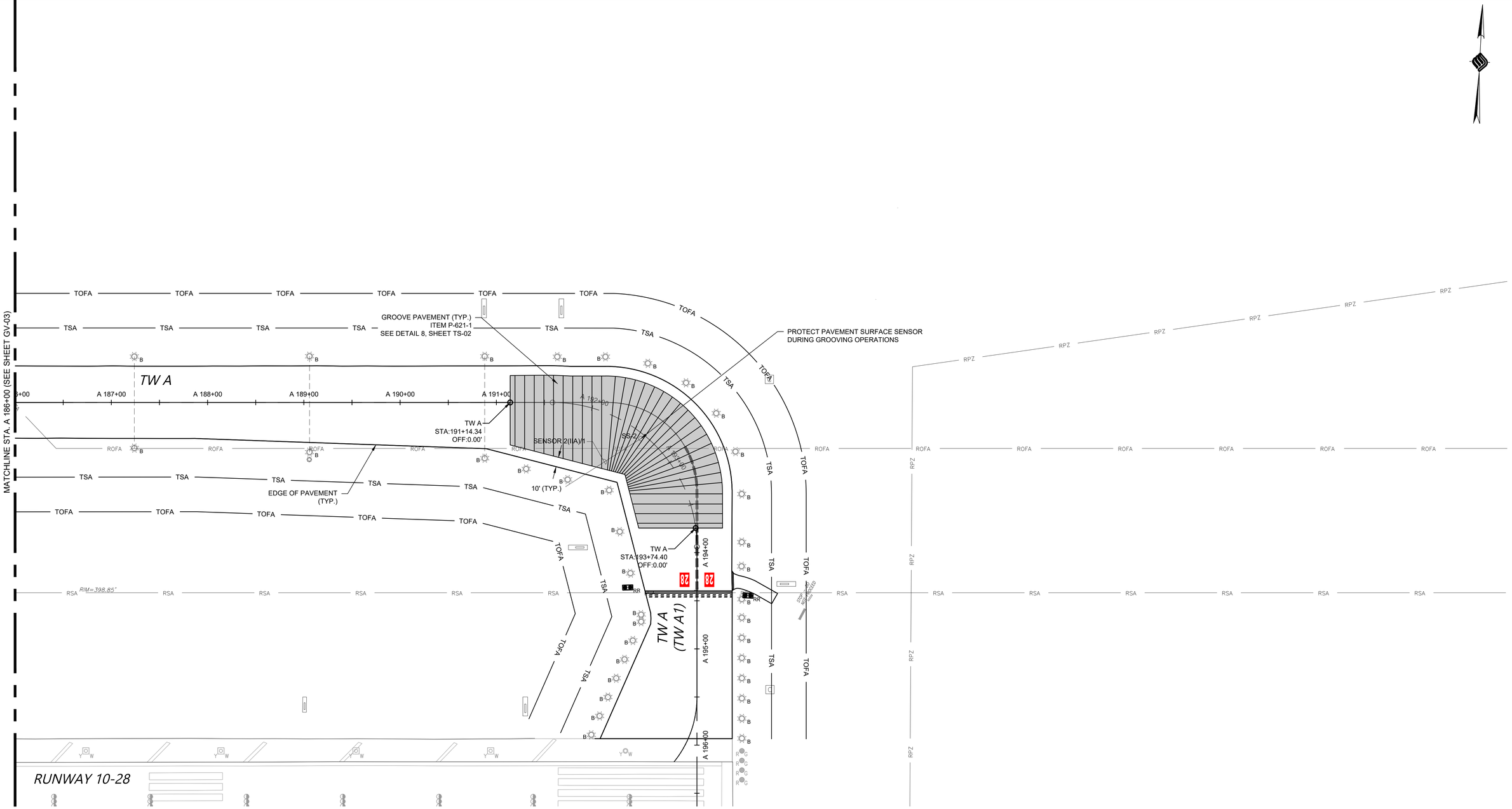
SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

PAVEMENT GROOVING PLAN (SHEET 3 OF 4)

SCALE: AS SHOWN	DESIGN: JPM
DRAWN: SDB	PROJECT: 18831.08
CHECKED: SJL	DATE: APRIL 2024

GV-03
80 OF 81



LEGEND

AREA TO BE GROOVED

NOTE:

1. SEE "TYPICAL TRANSVERSE TAXIWAY GROOVING DETAIL" ON SHEET TS-02.

ALL WORK SHOWN ON THIS DRAWING IS INCLUDED IN ADD ALT 1

0 50 100 150 FT

SCALE

CONSTRUCTION BID SET

STATE OF NEW YORK · STEVEN J. LANGE · 084000 · LICENSED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY

McFARLAND JOHNSON
49 COURT STREET; SUITE 240
BINGHAMTON, NY 13901

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
CITY OF SYRACUSE, STATE OF NEW YORK

REHABILITATION OF TAXIWAY A (EAST)

PAVEMENT GROOVING PLAN (SHEET 4 OF 4)

SCALE: AS SHOWN	DESIGN: JPM	**GV-04**
DRAWN: SDB	PROJECT: 18831.08	81 OF 81
CHECKED: SJL	DATE: APRIL 2024	

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
C-100-1	1	CONTRACTOR'S QUALITY CONTROL PROGRAM LS LS	$_____._____	$_____._____
C-102-3	36,300	SEED AND MULCH - TEMPORARY SY SY	$_____._____	$_____._____
C-102-17	1,100	SILT FENCE-TEMPORARY LF LF	$_____._____	$_____._____
C-102-25	300	DRAINAGE STRUCTURE INLET PROTECTION, SILT FENCE-TEMPORARY LF LF	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
C-102-44	230 SY	CONSTRUCTION ENTRANCE/EXIT-TEMPORARY SY	$_____._____	$_____._____
C-102-46	1 EA	CONCRETE WASHOUT STRUCTURE EA	$_____._____	$_____._____
C-105-1	1 LS	MOBILIZATION (3% MAX) LS	$_____._____	$_____._____
C-105-2	1 LS	ENGINEER'S FIELD OFFICE LS	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
M-120-1	1	MAINTENANCE AND PROTECTION OF TRAFFIC LS LS	$_____._____	$_____._____
M-120-2	460	LOW-PROFILE CONSTRUCTION BARRICADES EA EA	$_____._____	$_____._____
M-150-1	1	PROJECT SURVEY AND STAKEOUT LS LS	$_____._____	$_____._____
P-100-1	6,000	GEOTEXTILE STABILIZATION FABRIC SY SY	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
P-101-1	26,600	PROFILE COLD MILLING SY SY	$_____._____	$_____._____
P-101-3	4,030	MISCELLANEOUS COLD MILLING SY SY	$_____._____	$_____._____
P-101-4	13,300	JOINT AND CRACK REPAIR, TYPE 1 LF LF	$_____._____	$_____._____
P-101-5	5,200	JOINT AND CRACK REPAIR, TYPE 2 LF LF	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
P-101-6	30	PAINT AND RUBBER REMOVAL SF SF	$_____._____	$_____._____
P-152-1	5,600	UNCLASSIFIED EXCAVATION CY CY	$_____._____	$_____._____
P-152-2	3,100	EMBANKMENT IN PLACE CY CY	$_____._____	$_____._____
P-152-4	1,600	UNDERCUT EXCAVATION AND BACKFILL CY CY	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
P-153-1	40	CONTROLLED LOW-STRENGTH MATERIAL (CLSM) CY _____ _____ CY	$_____._____	$_____._____
P-209-1	2,900	CRUSHED AGGREGATE BASE COURSE CY _____ _____ CY	$_____._____	$_____._____
P-401-1	12,400	ASPHALT SURFACE COURSE TON _____ _____ TON	$_____._____	$_____._____
P-401-2	2,600	ASPHALT BINDER COURSE TON _____ _____ TON	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
P-603-1	5,100	BITUMINOUS TACK COAT GAL GAL	$_____._____	$_____._____
P-605-1	450	JOINT SEALING FILLER LF LF	$_____._____	$_____._____
P-620-1	100	BLACK PAVEMENT MARKINGS SF SF	$_____._____	$_____._____
P-620-3	3,000	YELLOW PAVEMENT MARKINGS SF SF	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
P-620-6	3,000	TEMPORARY YELLOW PAVEMENT MARKINGS SF SF	$_____._____	$_____._____
P-620-8	1,000	PREFORMED THERMOPLASTIC MARKINGS SF SF	$_____._____	$_____._____
P-621-1	8,000	GROOVING SY SY	$_____._____	$_____._____
D-700-1	900	DRY SWALE LF LF	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
D-701-0224	280	REINFORCED CONCRETE PIPE CLASS IV, 24-INCH DIAMETER LF LF	$_____._____	$_____._____
D-701-62	58	REMOVE EXISTING DRAINAGE PIPE, 15-INCH TO 24-INCH DIAMETER LF LF	$_____._____	$_____._____
D-703-1	2	CONCRETE PLUGS FOR DRAINAGE PIPE EA EA	$_____._____	$_____._____
D-705-2	4,300	6" PERFORATED UNDERDRAIN COMPLETE, INCLUDING POROUS BACKFILL AND FILTER FABRIC LF LF	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
D-705-4	23	UNDERDRAIN CLEANOUT EA EA	$_____.____	$_____.____
D-705-5	1	UNDERDRAIN OUTLET EA EA	$_____.____	$_____.____
D-751-012	2	RECTANGULAR DRAINAGE STRUCTURE, 4' X 4' EA EA	$_____.____	$_____.____
D-751-4	2	ALTER EXISTING DRAINAGE STRUCTURE EA EA	$_____.____	$_____.____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
D-751-51	2	ADJUST EXISTING DRAINAGE STRUCTURE EA EA	$_____._____	$_____._____
D-751-7	3	REMOVE EXISTING DRAINAGE STRUCTURE EA EA	$_____._____	$_____._____
D-751-9	12	CLEAN EXISTING DRAINAGE STRUCTURE EA EA	$_____._____	$_____._____
D-751-10	1,700	CLEAN EXISTING DRAINAGE PIPE LF LF	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices	Price in Figures	
		Unit Pice	Total Amount
L-108-105	17,000 NO. 8 AWG, 5KV, L-824 TYPE C CABLE, INSTALLED IN TRENCH, DUCT BANK, OR CONDUIT LF LF	$_____._____	$_____._____
L-108-201	4,900 NO. 6 AWG, SOLID, BARE COPPER COUNTERPOISE WIRE INSTALLED IN TRENCH, ABOVE THE DUCT BANK OR CONDUIT LF LF	$_____._____	$_____._____
L-108-51	300 PAVEMENT SENSOR (V) WIRE LF LF	$_____._____	$_____._____
L-110-104	8,000 NON-ENCASED ELECTRICAL CONDUIT, 2" SCH. 40 PVC LF LF	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
L-110-304	40	NON-ENCASED ELECTRICAL CONDUIT, 2" RGS LF LF	$_____._____	$_____._____
L-115-201	4	ELECTRICAL JUNCTION STRUCTURE, L-867 CLASS 1, SOLID COVER EA EA	$_____._____	$_____._____
L-115-31	1	ADJUST EXISTING ELECTRICAL MANHOLE EA EA	$_____._____	$_____._____
L-125-21	16	L-861T MEDIUM INTENSITY ELEVATED QUARTZ TAXIWAY EDGE LIGHT EA EA	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices	Price in Figures	
		Unit Pice	Total Amount
L-125-22	30 L-861T(L) MEDIUM INTENSITY ELEVATED LED TAXIWAY EDGE LIGHT EA _____ _____ EA	$_____._____	$_____._____
L-125-23	25 L-861T(L) MEDIUM INTENSITY ELEVATED LED TAXIWAY EDGE LIGHT ON EXISTING BASE CAN EA _____ _____ EA	$_____._____	$_____._____
L-125-64	46 REMOVE EXISTING ELEVATED BASE-MOUNTED EDGE LIGHT AND BASE CAN EA _____ _____ EA	$_____._____	$_____._____
L-125-65	25 REMOVE EXISTING ELEVATED BASE-MOUNTED EDGE LIGHT, BASE CAN TO REMAIN EA _____ _____ EA	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
L-125-7103	7	AIRFIELD GUIDANCE SIGN, SIZE 3, LED, ON NEW FOUNDATION EA EA	$_____._____	$_____._____
L-125-77	8	REMOVE EXISTING AIRFIELD GUIDANCE SIGN AND FOUNDATION EA EA	$_____._____	$_____._____
L-130-1	1	REPLACE PAVEMENT CONDITION SURFACE SENSOR EA EA	$_____._____	$_____._____
T-901-1	7.5	HYDROSEEDING ACRE ACRE	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
T-902-1	0.15	SOIL RESTORATION ACRE ACRE	$_____._____	$_____._____
T-905-1	3,000	TOPSOIL (OBTAINED ON-SITE) CY CY	$_____._____	$_____._____
T-908-1	7.5	MULCHING ACRE ACRE	$_____._____	$_____._____
		Total Price in Words	**Total Price in Figures**	
Base Bid			$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
C-100-1	1	CONTRACTOR'S QUALITY CONTROL PROGRAM LS LS	$_____._____	$_____._____
C-102-3	67,800	SEED AND MULCH - TEMPORARY SY SY	$_____._____	$_____._____
C-102-17	1,900	SILT FENCE-TEMPORARY LF LF	$_____._____	$_____._____
C-102-25	400	DRAINAGE STRUCTURE INLET PROTECTION, SILT FENCE-TEMPORARY LF LF	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
C-102-44	460	CONSTRUCTION ENTRANCE/EXIT-TEMPORARY SY _____ _____ SY	$_____._____	$_____._____
C-102-46	2	CONCRETE WASHOUT STRUCTURE EA _____ _____ EA	$_____._____	$_____._____
C-105-1	1	MOBILIZATION (3% MAX) LS _____ _____ LS	$_____._____	$_____._____
C-105-2	1	ENGINEER'S FIELD OFFICE LS _____ _____ LS	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
M-120-1	1	MAINTENANCE AND PROTECTION OF TRAFFIC LS LS	$_____._____	$_____._____
M-120-2	1,880	LOW-PROFILE CONSTRUCTION BARRICADES EA EA	$_____._____	$_____._____
M-120-3	4	LIGHTED RUNWAY CLOSURE MARKERS EA EA	$_____._____	$_____._____
M-150-1	1	PROJECT SURVEY AND STAKEOUT LS LS	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
P-100-1	9,300	GEOTEXTILE STABILIZATION FABRIC SY SY	$_____._____	$_____._____
P-101-1	53,600	PROFILE COLD MILLING SY SY	$_____._____	$_____._____
P-101-3	8,110	MISCELLANEOUS COLD MILLING SY SY	$_____._____	$_____._____
P-101-4	25,000	JOINT AND CRACK REPAIR, TYPE 1 LF LF	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
P-101-5	9,900	JOINT AND CRACK REPAIR, TYPE 2 LF LF	$_____._____	$_____._____
P-101-6	910	PAINT AND RUBBER REMOVAL SF SF	$_____._____	$_____._____
P-152-1	9,200	UNCLASSIFIED EXCAVATION CY CY	$_____._____	$_____._____
P-152-2	5,000	EMBANKMENT IN PLACE CY CY	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
P-152-4	2,500	UNDERCUT EXCAVATION AND BACKFILL CY CY	$_____.____	$_____.____
P-153-1	40	CONTROLLED LOW-STRENGTH MATERIAL (CLSM) CY CY	$_____.____	$_____.____
P-209-1	4,600	CRUSHED AGGREGATE BASE COURSE CY CY	$_____.____	$_____.____
P-401-1	24,000	ASPHALT SURFACE COURSE TON TON	$_____.____	$_____.____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
P-401-2	5,000	ASPHALT BINDER COURSE TON TON	$_____._____	$_____._____
P-603-1	9,500	BITUMINOUS TACK COAT GAL GAL	$_____._____	$_____._____
P-605-1	1,190	JOINT SEALING FILLER LF LF	$_____._____	$_____._____
P-620-1	1,000	BLACK PAVEMENT MARKINGS SF SF	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
P-620-3	6,500	YELLOW PAVEMENT MARKINGS SF SF	$_____._____	$_____._____
P-620-6	6,500	TEMPORARY YELLOW PAVEMENT MARKINGS SF SF	$_____._____	$_____._____
P-620-8	3,300	PREFORMED THERMOPLASTIC MARKINGS SF SF	$_____._____	$_____._____
P-621-1	19,000	GROOVING SY SY	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
D-700-1	900	DRY SWALE LF LF	$_____._____	$_____._____
D-701-0224	280	REINFORCED CONCRETE PIPE CLASS IV, 24-INCH DIAMETER LF LF	$_____._____	$_____._____
D-701-62	58	REMOVE EXISTING DRAINAGE PIPE, 15-INCH TO 24-INCH DIAMETER LF LF	$_____._____	$_____._____
D-703-1	2	CONCRETE PLUGS FOR DRAINAGE PIPE EA EA	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices	Price in Figures	
		Unit Pice	Total Amount
D-705-2	9,800 6" PERFORATED UNDERDRAIN COMPLETE, INCLUDING POROUS BACKFILL AND FILTER FABRIC LF LF	$_____.____	$_____.____
D-705-4	45 UNDERDRAIN CLEANOUT EA EA	$_____.____	$_____.____
D-705-5	2 UNDERDRAIN OUTLET EA EA	$_____.____	$_____.____
D-751-012	2 RECTANGULAR DRAINAGE STRUCTURE, 4' X 4' EA EA	$_____.____	$_____.____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
D-751-4	8	ALTER EXISTING DRAINAGE STRUCTURE EA EA	$_____._____	$_____._____
D-751-51	5	ADJUST EXISTING DRAINAGE STRUCTURE EA EA	$_____._____	$_____._____
D-751-7	3	REMOVE EXISTING DRAINAGE STRUCTURE EA EA	$_____._____	$_____._____
D-751-9	23	CLEAN EXISTING DRAINAGE STRUCTURE EA EA	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
D-751-10	2,400	CLEAN EXISTING DRAINAGE PIPE LF LF	$_____._____	$_____._____
L-108-104	800	NO. 6 AWG, 5KV, L-824 TYPE C CABLE, INSTALLED IN TRENCH, DUCT BANK, OR CONDUIT LF LF	$_____._____	$_____._____
L-108-105	46,000	NO. 8 AWG, 5KV, L-824 TYPE C CABLE, INSTALLED IN TRENCH, DUCT BANK, OR CONDUIT LF LF	$_____._____	$_____._____
L-108-201	11,500	NO. 6 AWG, SOLID, BARE COPPER COUNTERPOISE WIRE INSTALLED IN TRENCH, ABOVE THE DUCT BANK OR CONDUIT LF LF	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
L-108-51	300	PAVEMENT SENSOR (V) WIRE LF LF	$_____._____	$_____._____
L-109-204	1	INSTALL EXISTING 4KW CONSTANT CURRENT REGULATOR (CCR) IN ELECTRICAL VAULT EA EA	$_____._____	$_____._____
L-110-104	19,000	NON-ENCASED ELECTRICAL CONDUIT, 2" SCH. 40 PVC LF LF	$_____._____	$_____._____
L-110-304	110	NON-ENCASED ELECTRICAL CONDUIT, 2" RGS LF LF	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices	Price in Figures	
		Unit Pice	Total Amount
L-115-201	ELECTRICAL JUNCTION STRUCTURE, L-867 CLASS 1, SOLID COVER 14 EA EA	$_____.____	$_____.____
L-115-31	ADJUST EXISTING ELECTRICAL MANHOLE 3 EA EA	$_____.____	$_____.____
L-125-21	L-861T MEDIUM INTENSITY ELEVATED QUARTZ TAXIWAY EDGE LIGHT 38 EA EA	$_____.____	$_____.____
L-125-22	L-861T(L) MEDIUM INTENSITY ELEVATED LED TAXIWAY EDGE LIGHT 97 EA EA	$_____.____	$_____.____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
L-125-23	29	L-861T(L) MEDIUM INTENSITY ELEVATED LED TAXIWAY EDGE LIGHT ON EXISTING BASE CAN EA _____ _____ EA	$_____._____	$_____._____
L-125-2209	3	L-852T(L) MEDIUM INTENSITY IN-PAVEMENT LED TAXIWAY EDGE LIGHT ON EXISTING BASE CAN EA _____ _____ EA	$_____._____	$_____._____
L-125-500	4	L-804(L) ELEVATED LED RUNWAY GUARD LIGHT EA _____ _____ EA	$_____._____	$_____._____
L-125-501	31	L-852G(L) IN-PAVEMENT LED RUNWAY GUARD LIGHT EA _____ _____ EA	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
L-125-502	3	REMOVE EXISTING IN-PAVEMENT EDGE LIGHT, CAN TO REMAIN EA EA	$_____._____	$_____._____
L-125-64	122	REMOVE EXISTING ELEVATED BASE-MOUNTED EDGE LIGHT AND BASE CAN EA EA	$_____._____	$_____._____
L-125-65	29	REMOVE EXISTING ELEVATED BASE-MOUNTED EDGE LIGHT, BASE CAN TO REMAIN EA EA	$_____._____	$_____._____
L-125-67	4	REMOVE EXISTING RUNWAY GUARD LIGHTS AND BASE CAN EA EA	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
L-125-68	4	REMOVE AND RESET EXISTING GUARD LIGHT EA _____ _____ EA	$_____._____	$_____._____
L-125-75	20	REPLACE EXISTING AIRFIELD GUIDANCE SIGN PANEL EA _____ _____ EA	$_____._____	$_____._____
L-125-7103	17	AIRFIELD GUIDANCE SIGN, SIZE 3, LED, ON NEW FOUNDATION EA _____ _____ EA	$_____._____	$_____._____
L-125-7113	1	AIRFIELD GUIDANCE SIGN, SIZE 3, LED, ON EXISTING FOUNDATION EA _____ _____ EA	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices	Price in Figures	
		Unit Pice	Total Amount
L-125-77	16 EA REMOVE EXISTING AIRFIELD GUIDANCE SIGN AND FOUNDATION EA	$_____._____	$_____._____
L-125-78	1 EA REMOVE EXISTING AIRFIELD GUIDANCE SIGN, FOUNDATION TO REMAIN EA	$_____._____	$_____._____
L-130-1	2 EA REPLACE PAVEMENT CONDITION SURFACE SENSOR EA	$_____._____	$_____._____
T-901-1	14 ACRE HYDROSEEDING ACRE	$_____._____	$_____._____

Item No.	Unit Quantity and Description and Unit Bid Prices		Price in Figures	
			Unit Pice	Total Amount
T-902-1	0.40	SOIL RESTORATION ACRE ACRE	$_____._____	$_____._____
T-905-1	5,600	TOPSOIL (OBTAINED ON-SITE) CY CY	$_____._____	$_____._____
T-908-1	14	MULCHING ACRE ACRE	$_____._____	$_____._____
		Total Price in Words	**Total Price in Figures**	
Base Bid + Add Alt			$_____._____	$_____._____

TECHNICAL SPECIFICATIONS

FOR THE CONSTRUCTION OF

REHABILITATION OF TAXIWAY A (EAST)

SYRACUSE HANCOCK INTERNATIONAL AIRPORT

SYRACUSE REGIONAL AIRPORT AUTHORITY
SYRACUSE, NEW YORK

IFB REFERENCE #2024-03

APRIL 18, 2024

Prepared By:

McFARLAND JOHNSON

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MJ PROJECT NO. 18831.08

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Item C-100 Contractor Quality Control Program (CQCP)

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

The Contractor shall establish a CQCP that will:

- **a.** Provide qualified personnel to develop and implement the CQCP.
- **b.** Provide for the production of acceptable quality materials.
- **c.** Provide sufficient information to assure that the specification requirements can be met.
- **d.** Document the CQCP process.

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

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

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

- **a.** Review of the CQCP including submittals, QC Testing, Action & Suspension Limits for Production, Corrective Action Plans, Distribution of QC reports, and Control Charts.
- **b.** Discussion of the QA program.
- **c.** Discussion of the QC and QA Organization and authority including coordination and information exchange between QC and QA.
- **d.** Establish regular meetings to discuss control of materials, methods and testing.
- **e.** Establishment of the overall QC culture.

100-2 Description of program.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

a. Specification item number

b. Item description

c. Description of submittal

d. Specification paragraph requiring submittal

e. Scheduled date of submittal

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

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

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

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

100-7 Contractor QC testing facility.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(1) Technical specification item number and description

(2) Compliance with approved submittals

(3) Proper storage of materials and equipment

(4) Proper operation of all equipment

(5) Adherence to plans and technical specifications

(6) Summary of any necessary corrective actions

(7) Safety inspection.

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

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

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

(1) Technical specification item number and description

(2) Test designation

(3) Location
(4) Date of test
(5) Control requirements
(6) Test results
(7) Causes for rejection
(8) Recommended remedial actions
(9) Retests

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

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

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

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

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

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

100-12 Noncompliance.

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

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

(1) Order the Contractor to replace ineffective or unqualified QC personnel or subcontractors and/or
(2) Order the Contractor to stop operations until appropriate corrective actions are taken.

METHOD OF MEASUREMENT

100-13 Basis of measurement and payment. Contractor Quality Control Program (CQCP) is for the personnel, tests, facilities and documentation required to implement the CQCP. The CQCP will be paid as a lump sum with the following schedule of partial payments:

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

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

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

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

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

BASIS OF PAYMENT

100-14 Payment will be made under:

Item:	Description	Unit
C-100-1	Contractor's Quality Control Program	Lump Sum

REFERENCES

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

National Institute for Certification in Engineering Technologies (NICET)

ASTM International (ASTM)

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

END OF ITEM C-100

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

DESCRIPTION

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

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

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

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

MATERIALS

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

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

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

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

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

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

102-2.7 Drainage Structure Inlet Protection-Temporary. The materials shall meet the following requirements:

a. Silt Fence. Geotextile shall meet the requirements of Section 737-01 G. Silt Fence of New York State Department of Transportation (NYSDOT) Standard Specifications and be listed in the NYSDOT Materials and Equipment Approved List (Approved List). Drainage Structure Inlet

Protection assembly shall consist of silt fence geotextile, posts, frame and fasteners and may include mesh support consistent with the Approved List.

i. **Post/Frame**. Shall be 2 inches by 4 inch nominal dimension wood posts a minimum of 40 inches long.

ii. **Mesh Support**. For those silt fence geotextiles on the Approved List that require a mesh support, the support shall consist of 14 gauge (minimum) welded wire mesh with a maximum of 6-inch x 6 inch opening or polymeric mesh. All mesh support shall be a minimum of 28 inches in height.

iii. **Fasteners**. Fasteners shall be heavy duty staples, hog rings, tie wires, or any other fastener compatible with the post material.

102-2.8 Concrete Washout Structure. Shall meet the requirements in the contract documents.

CONSTRUCTION REQUIREMENTS

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

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

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

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

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

The Contractor shall provide immediate permanent or temporary pollution control measures to minimize contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment

as directed by the RPR. If temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or directed by the RPR, the work shall be performed by the Contractor and the cost shall be incidental to this item.

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

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

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

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

102-3.5 Drainage Structure Inlet Protection-Temporary. Drainage structure inlet protection shall be placed where shown in the contract documents and constructed in accordance with the details on the contract plans.

102-3.6 Concrete Washout Structure. Concrete washout structures shall be constructed in accordance with the details and to the dimensions shown in the contract documents.

METHOD OF MEASUREMENT

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

- **a. Drainage Structure Inlet Protection-Temporary**. This work will be measured as the number of linear feet to the nearest whole linear foot of drainage structure inlet protection installed. No additional measurements will be made for seams or overlaps.
- **b. Construction Entrance/Exit-Temporary.** This work will be measured as the number of square yards to the nearest whole square yard of construction entrance/exit installed.
- **c. Seed and Mulch-Temporary.** This work will be measured as the number of square yards to the nearest whole square yard of temporary seeding and mulching installed.
- **d. Concrete Washout Structure.** This work will be measured as the number of concrete washout structures installed.

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

BASIS OF PAYMENT

102-5.1 General. The unit price bid for all work items shall include the cost of all labor, equipment, and materials necessary to satisfactorily complete the work, including the cost of removal of accumulated sediment.

Progress payments will be made for all sediment control measures as follows: Seventy-Five (75) percent the price bid will be paid after installation of Drainage Structure Inlet Protection-Temporary. The remaining percentage will be paid when the temporary practice is removed, and the remaining area is permanently stabilized.

102-5.2 Drainage Structure Inlet Protection-Temporary. The unit price bid for drainage structure inlet protection-temporary shall include the cost of all labor, materials, and equipment necessary to satisfactorily complete the work.

102-5.3 Accepted quantities of temporary water pollution, soil erosion, and siltation control work ordered by the RPR and measured as provided in paragraph 102-4.1 will be paid for under:

Item	Description	Unit
C-102-3	Seed and Mulch-Temporary	Square Yard
C-102-17	Silt Fence-Temporary	Linear Foot
C-102-25	Drainage Structure Inlet Protection, Silt Fence-Temporary	Linear Foot
C-102-44	Construction Entrance/Exit-Temporary	Square Yard
C-102-46	Concrete Washout Structure	Each

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

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

REFERENCES

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

Advisory Circulars (AC)

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

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

ASTM International (ASTM)

ASTM D6461 *Standard Specification for Silt Fence Materials*

United States Department of Agriculture (USDA)

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

END OF ITEM C-102

Item C-105 Mobilization

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

105-2 Mobilization limit. Mobilization shall be limited to 3.0 percent of the total project cost.

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

105-4 Engineer/RPR field office. The Contractor shall provide dedicated space for the use of the field RPR and inspectors, as a field office for the duration of the project. This space shall be located conveniently near the construction and shall be separate from any space used by the Contractor. The Contractor shall furnish water, sanitary facilities, heat, air conditioning, and electricity in accordance with local building codes.

The field office shall be fully operational a minimum of two (2) weeks prior to the start of construction and shall be so continued if required by the Resident Project Representative (RPR) for a period not to exceed one month (30 calendar days) after the last day of contract work.

No construction shall be started until the office is furnished as herein specified and made available to the RPR.

a. **General.** The Contractor shall furnish the following furniture and equipment:

TABLE 105-1 FIELD OFFICE FURNITURE AND EQUIPMENT	
Field Office Item	**Quantity**
Office desk	2
Office swivel chairs	3
Folding chairs	8
Folding conference table	2
Cork bulletin board	2
Dry erase board	2
Fire resistant cabinet (4-drawer)	1
Waste baskets	3
First aid kit	1
Fire extinguisher, dry chemical type for A, B, C ratings	1
Refrigerator	1
Keurig coffee maker with supply of K-cups	1
Water cooler with hot/cold supply	1
Printer/photocopier/scanner/fax machine	1
Laptop computer	1
Tablet	1
Cellular phone	1
Digital camera	2
Pencil sharpener	1
Two-way aviation radio	2
Infrared thermometer	2
Cleaning Supplies	As needed

The above furniture need not be new (with the exception of the coffee pot, water cooler and computer equipment) but must be in first class serviceable condition. Acceptability of all items shall be determined by the Engineer.

The Contractor shall provide, paper, ink for the printer and copier, bottle water and other supplies throughout the duration of the project.

The Contractor shall provide all servicing, repairs, replacement and upkeep on the Contractor supplied equipment throughout the project duration.

b. Engineer's Field Office. The Engineer's Field Office shall be within a secured, weatherproof building or mobile trailer. If two or more mobile trailer units are provided, they shall be joined with weatherproof connections. Mobile trailers shall be in new or like new condition. The Contractor may furnish equivalent facilities in an existing building, provided that the building is located to provide convenient service. The minimum floor area for the Engineer's Field Office shall be 400ft² with a minimum ceiling height of 7-feet. It shall be divided into a minimum of two rooms and shall have at least 6 windows with adequate locks and blinds.

Two exterior doors, with locks, shall be provided. For each exterior door, there shall be provided two sets of keys for the Engineer. Screens shall be provided for all exterior windows and doors and shades shall be provided for windows and doors.

The Engineer's Field Office shall be in accordance with the requirements of the New York State Uniform Fire Prevention and Building Code, 19 NYCRR, and any applicable local codes.

The office shall have an adequate lighting installation including lighting fixtures, outlets, lamps, wiring, switches and like work as required. The electrical system shall be able to continuously operate all equipment and be provided with adequate receptacles. To accommodate computer equipment, the field office shall be provided with a dedicated 20-amp electrical service and a vacant floor-to-ceiling area with a 3-foot x 3-foot footprint along a wall for the installation of a computer hardware rack/cabinet. Electric light shall be provided by non-glare-type luminaries to provide a minimum illumination level of 100 foot-candles at desk-height level.

The type and layout of the heating system shall be approved by the Engineer. It shall be adequate to maintain an ambient air temperature of 70ºF inside the building with an outside temperature of -20ºF. The Contractor shall provide any fuel required for heating purposes.

For summer use, air conditioning unit(s) shall be provided for each room in the building. The air conditioning system shall be capable of maintaining an inside room temperature of 60ºF with an outside air temperature of 100ºF.

The contractor shall provide replacement filters which should be replaced once per month or more frequently if needed.

Fire extinguishers and smoke and carbon monoxide detectors shall be provided and installed.

All utilities shall be provided and maintained by the Contractor.

i. **Potable Water.** From a local municipal water supply, certified well or bottled with a heating/refrigerator unit to provide hot and cold water. An exterior frost-free hose bib shall be provided in a location adjacent to the Engineer's Field Office. The hose bib need not be installed on a potable water line, and if the water in the line is not potable, it shall be clearly marked as such.

ii. **Restroom.** A separately enclosed room, lockable from the inside, that is properly ventilated and in compliance with applicable sanitary codes. The Contractor shall provide all lavatory amenities, necessary paper and soap products, hot and cold running water and a toilet. The toilet shall be flushtype where sanitary facilities are available, and a type approved by the Engineer prior to installation where sanitary facilities are not available. The sanitary facilities shall be maintained and cleaned throughout the duration of the project on a weekly basis.

iii. **Parking Area.** The Contractor shall provide and/or construct a paved or hard surfaced (gravel or bankrun material) secure parking area with dedicated parking spaces adjacent to the Engineer's Field Office. Each parking space shall be 9 feet by 18 feet, and the minimum required number of spaces to be provided shall be 6.

iv. **Cellular Telephone.** A portable cellular "smart phone(s)" for the exclusive use of the inspection staff. The minimum required number of cellular phones to be provided is specified in Table 110-1 (these lines are in addition to the separate line to be provided for the facsimile machine). The smart phone(s) shall be supplied with a data plan and have voicemail and texting capabilities. It shall

include a protective case, wall charger, car charger, and a belt clip/case. Telephone service shall be maintained throughout the course of the project.

v. **Facsimile Machine.** Plain paper laser or inkjet facsimile machine with a dedicated telephone line. The machine shall be capable of sending and printing a maximum paper size of 8 1/2 x 14 inches, have a minimum 20 page memory storage, a minimum 20-sheet document feeder, a minimum 50-sheet paper capacity, transmit at least 6 pages per minute and have an autodial/redial with a minimum of 50 phone number memory. The machine shall be capable of storing and printing outgoing message confirmation information and printing the sender's name, fax number and page number on incoming faxes.

vi. **Printer/Photocopier.** The Contractor shall furnish, install and maintain a multi-function copier/printer/fax/scanner, HP Officejet Pro 8600 e-All-in-One Printer - N911a or approved equal. The copying machine shall have a dedicated telephone line for use as a fax machine. The Contractor shall furnish all of the copy paper, ink cartridges and other supplies required by the Engineer. The Contractor shall maintain the unit fully operational and in proper adjustment for the duration of required use of the Engineer's office. At the conclusion of the project the copier will be returned to the Contractor. Initially 6 new black ink cartridges (HP 950XL) and 3 new color ink cartridges (HP 951XL) shall be provided. Additional cartridges shall be provided as required throughout the construction period.

vii. **Pencil Sharpener.** Manual or electric pencil sharpener, minimum 1 per room.

viii. **Exterior Bulletin Board.** An installed 4 foot x 8-foot weatherproof bulletin board in front of or adjacent to the Engineer's Field Office. The bulletin board may be attached to an outside wall of the office. The location selected must be handicapped accessible and clearly visible.

ix. **Interior Bulletin Board.** An installed, wall-mounted 4 foot x 6-foot bulletin board made of cork or similar material in a large room, and one 2 foot x 4 foot wall mounted bulletin board installed per room.

x. **Dry Erase Board.** Installed, wall-mounted 2 foot x 4-foot dry erase boards, minimum one per room.

xi. **Fire Resistant Cabinet.** Fire resistant, legal size filing cabinet with locks and 2 keys each, meeting the requirements of ANSI/UL Standard 72 for Insulated Filing Devices, Class 350-1 hour. Each office shall be provided with two 2-drawer cabinets, and the required number of additional 4-drawer cabinets as specified in Table 110-1.

xii. **Wastebasket.** Minimum 7-gallon wastebasket, minimum one per desk.

xiii. **Refrigerator.** Electric, providing a minimum storage space of 4 cubic feet.

xiv. **Kitchenette.** To include a minimum 1 cubic foot, 1,300-watt microwave oven, a sink with hot and cold running water with minimum dimensions of 15 inch x 15 inch x 6 inch deep, usable counter space with minimum dimensions of 5 feet long x 2 feet deep and cabinet space with minimum dimensions of 5 feet long x 1 1/2 feet deep x 2 1/2 feet high. If the water in the sink is not potable, it shall be clearly marked as such.

xv. **First Aid Kit.** A Type III kit in accordance with ANSI Z308.1 Minimum Requirements for Workplace First Aid Kits. The minimum number of first aid kits to be provided is specified in Table 110-1.

xvi. **Infrared Thermometer.** LCD display with the ability to measure surface temperatures in a range of -10°F to 800°F or greater and at a minimum 10:1 distance-to-spot ratio. Basic accuracy shall not exceed +/-5.0%. Minimum battery life shall be 12 hours.

xvii. **Office Desk and Chair.** Fully assembled freestanding office desks and chairs. Each desk shall have a 5 feet long by 2 1/2 feet wide work surface and a height of 30 inches, at least 2 lockable drawers and include an adjustable shelf approximately 1 foot wide and no less than 2 1/2 feet long. Each desk shall also be provided with an adjustable chair with arms, 5 legs with casters and be adjustable from approximately 16 inches to 24 inches in height. Each desk shall have a dedicated electrical outlet receptacle. The required number of office desks and chairs to be provided is specified in Table 110-1.

xviii. **Office/Conference Table.** Commercial-grade rectangular table with weather/spill resistant top, a minimum of 8 feet long by 2 1/2 feet wide by 30 inches high. The minimum required number of office/conference tables to be provided is specified in Table 110-1.

xix. **Folding Chair.** Commercial-grade, folding steel chair with approximate overall dimensions of 30 inches high by 19 inches wide by 21 inches deep. The minimum required number of folding chairs to be provided is specified in Table 110-1.

xx. **Two-way Handheld Radios.** Radios shall be handheld units, supplied new, with spare batteries, exterior antennas (magnetic mount), ear plug, remote mic, belt carrying case, and battery chargers. The radios shall be frequency adjustable and capable of tuning into the Airport's UNICOM frequency. At the completion of the project, the radios will remain the property of the Contractor.

xxi. Fully Rugged Tablet Requirements. The field office shall be equipped with a NEW fully rugged tablet capable of surviving drops, shocks, water spills, dirt and vibrations. The tablet shall come equipped with, at minimum, a 128GB Solid State Drive (SSD), 4GB RAM, and 8MP camera. The fully rugged tablet shall be capable of connecting over Wi-Fi and cellular data networks. At the conclusion of the project the tablet will be returned to the Contractor.

xxii. **Laptop Computer.** NEW laptop computer(s) shall be supplied for the sole use of the inspection staff. Laptop computer(s) shall be Panasonic Toughbook F9 Business Rugged Laptop or similar. Laptop computer(s) shall be supplied with a charger and carrying case.

The following software shall be installed, activated, and functioning on each laptop computer: Windows 10 Professional, Microsoft Office 2017 (Full Version), and Adobe Acrobat X Pro.

The laptop computer(s) shall be set up, configured, operational, and provided to the Engineer two (2) weeks prior to the start of construction. At the conclusion of the project, the laptop computer(s) will be returned to the Contractor with its hard drive wiped clean

xxiii. **Cleaning Supplies.** The Contractor shall supply sufficient cleaning supplies for the Engineer to perform necessary COVID-19 cleaning of the Engineer's Field Office on a daily basis. Cleaning supplies shall be as recommended by the Center for Disease Control (CDC) for disinfecting against COVID-19 (https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2). At a minimum the cleaning supplies shall include disposable latex or nitrile gloves, cleanser

from the above referenced EPA approved webpage, paper towels, and alcohol-based hand sanitizer that is at least 60% alcohol.

CONSTRUCTION DETAILS

105-5 Engineer's Field Office. The Engineer's Field Office shall be fully equipped and made available for use and occupancy by the inspection staff prior to the start of any contract work and shall be made available after contract final acceptance as directed in writing by the Engineer.

All furniture and equipment shall be fully assembled, operational, clean and serviceable. The Engineer's Field Office shall be cleaned weekly or more often if required, and the timing of the cleaning operations shall be coordinated with the Engineer. The Contractor shall remove and dispose of all rubbish generated in the office and shall keep the office free from pests. The Contractor shall remove snow from all areas subject to vehicular circulation and parking.

After completion, all portable buildings or trailers, fencing, surfacing and utilities shall be removed from the location and the areas cleaned, loamed and restored as required.

105-6 Electrical Power. The Contractor shall provide utility electrical power to the Engineer's Office. The Contractor shall pay for the installation of the electrical service and pay all electric bills for the service.

105-7 High Speed Internet Service. The Contractor shall provide high speed internet service either hardwired or wireless and maintain and pay for the service throughout the duration of Construction.

METHOD OF MEASUREMENT

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

a. With first pay request, 25%.

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

c. When 50% or more of the original contract is earned, an additional 40%.

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

Should the Bidder exceed the foregoing three percent (3%), the Engineer will make the necessary adjustment to determine the total amount bid based on the arithmetically correct proposal.

BASIS OF PAYMENT

105-6 Payment will be made under:

Item	Description	Unit
C-105-1	Mobilization (3% Max)	Lump Sum
C-105-2	Engineer's Field Office	Lump Sum

REFERENCES

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

Office of Federal Contract Compliance Programs (OFCCP)

Executive Order 11246, as amended

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

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

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

END OF ITEM C-105

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

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

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

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

110-2 METHOD FOR COMPUTING PWL. The computational sequence for computing PWL is as follows:

a. Divide the lot into n sublots in accordance with the acceptance requirements of the specification.
b. Locate the random sampling position within the sublot in accordance with the requirements of the specification.
c. Make a measurement at each location, or take a test portion and make the measurement on the test portion in accordance with the testing requirements of the specification.
d. Find the sample average (X) for all sublot test values within the lot by using the following formula:

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

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

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

n = Number of sublot test values

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

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

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

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

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

n = Number of sublot test values

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

$$\mathbf{Q_L = (X - L) / S_n}$$

Where: L = specification lower tolerance limit

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

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

$$\mathbf{Q_L = (X - L) / S_n}$$
and
$$\mathbf{Q_U = (U - X) / S_n}$$

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

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

$$\mathbf{PWL = (P_U + P_L) - 100}$$

Where: P_L = percent within lower specification limit

P_U = percent within upper specification limit

EXAMPLE OF PWL CALCULATION

Project: Example Project

Test Item: Item P-401, Lot A.

A. PWL Determination for Mat Density.

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

A-1 = 96.60

A-2 = 97.55

A-3 = 99.30

A-4 = 98.35

n = 4

2. Calculate average density for the lot.

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

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

X = 97.95% density

3. Calculate the standard deviation for the lot.

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

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

$S_n = 1.15$

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

$Q_L = (X - L) / S_n$

$Q_L = (97.95 - 96.30) / 1.15$

$Q_L = 1.4348$

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

PWL = 98

B. PWL Determination for Air Voids.

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

A-1 = 5.00

A-2 = 3.74

A-3 = 2.30

A-4 = 3.25

2. Calculate the average air voids for the lot.

$X = (x_1 + x_2 + x_3 \ldots n) / n$

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

X = 3.57%

3. Calculate the standard deviation S_n for the lot.

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

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

$S_n = 1.12$

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

$Q_L = (X - L) / S_n$

$Q_L = (3.57 - 2.00) / 1.12$

$Q_L = 1.3992$

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

$P_L = 97$

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

$Q_U = (U - X) / S_n$

$Q_U = (5.00 - 3.57) / 1.12$

$Q_U = 1.2702$

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

$P_U = 93$

8. Calculate Air Voids PWL

$PWL = (P_L + P_U) - 100$

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

EXAMPLE OF OUTLIER CALCULATION (REFERENCE ASTM E178)

Project: Example Project

Test Item: Item P-401, Lot A.

A. Outlier Determination for Mat Density.

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

A-3 = 99.30

A-4 = 98.35

A-2 = 97.55

A-1 = 96.60

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

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

a. For measurements greater than the average:

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

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

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

b. For measurements less than the average:

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

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

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

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

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

OR

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

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

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

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

REFERENCES

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

ASTM International (ASTM)

ASTM E178 Standard Practice for Dealing with Outlying Observations

END OF ITEM C-110

Item M-105 Contractor Staging Area

DESCRIPTION

105-1.1 Description. This specification details the provisions of providing a staging area(s) and/or batch plant area for the Contractor's operations, material storage and field office for the Contractor's field personnel. The location for staging areas and batch plant areas shall be as shown on the Construction drawings. This item shall also consist of mobilization and demobilization of such facilities.

105-1.2 Staging Areas. The Contractor's Staging Area(s) and/or Batch Plant Area are shown on the contract plans. These areas shall be used for the Contractor's operations, and the storage of materials and equipment. Employee personal vehicles shall be parked in the staging area.

Contractor shall be responsible for any site improvements as may be needed for Contractor's use of the provided site, including site security, if required. The site shall be restored to its original condition at the completion of construction, unless otherwise approved.

The staging areas shall be kept in a neat and orderly fashion. Stock piling of materials (such as earth and pavement materials) may be permitted and approval is at the discretion of the Engineer. The Engineer reserves the right to direct the Contractor to correct any deficiencies in the maintenance of the staging area and the Contractor shall promptly comply with the directives of the Engineer.

105-1.3 Advertising. No sign will be permitted for advertising the name of the Contractor or any subcontractors other than permanently attached or painted signs on the sides of the Contractor's field offices, vehicles, and equipment. One neat sign with black lettering on a white background may be used to designate the Contractor's receiving area for deliveries. The sign shall not exceed fifteen feet + two inches (15' 2") and it shall be subject to approval by the Engineer.

105-1.4 Removals. The field office(s) and all equipment furnished under this item are the property of the Contractor. Removal of the field offices and cleanup of the staging areas and employee parking sites shall be completed within five (5) calendar days following final acceptance of the work under this contract. Batch plant machinery, equipment, and any material stockpiles shall be removed from the site within fifteen (15) calendar days after completion of paving operations, unless otherwise approved by the Engineer.

The Contractor shall, to the satisfaction of the Engineer, restore the staging area(s) and batch plant area to a clean and orderly condition after removal of all materials, equipment, and facilities before vacating the construction area.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

105-2.1 BASIS OF PAYMENT. The performance of this Work shall not be paid for directly but shall be considered an incidental obligation of the Contractor covered under Item M-120-1 Maintenance and Protection of Traffic.

END OF ITEM M-105

Item M-120 Maintenance and Protection of Traffic

DESCRIPTION

120-1.1 GENERAL. Maintenance and Protection of Traffic consists of but is not limited to, the work necessary to set up security fencing and gates, install temporary haul roads, install and remove temporary lighting equipment, pavement sweeping and cleaning, construction signs and utilities, safety flagging and barricades, obtain all required permits, pay all fees, transport all employees and materials to and from the work site, and all other expenses as required for the Project. This item shall include all traffic control (flaggers) and gate guards as required and shown on the drawings, and any temporary gate guard shelters as may be needed.

This work shall consist of maintaining aircraft and vehicular traffic and protecting the public from damage to person and property within the limits of and for the duration of the Contract.

The Contractor shall comply with all guidelines regarding construction safety set forth in FAA Advisory Circular 150/5370-2G, "Operational Safety on Airports During Construction", Special General Provisions.

The requirements of Section 619, Work Zone Traffic Control, as specified in the New York State Department of Transportation Standard Specifications latest issue, plus all revisions and addenda pertaining thereto, shall apply with the following modifications and/or revisions as described below.

The following additional items are specifically included without limiting the generality implied by these Specifications and the Contract Drawings.

- Providing qualified gate guards and/or flag persons at the locations shown on the plans or as directed by the Engineer.
- Installation, maintenance, and removal of temporary haul roads necessary to construct the project.
- Grading, maintenance, temporary erosion and sediment control measures, temporary and/or permanent seeding, and mulching for any on-site spoil areas.
- Installation, maintenance, and removal of temporary security fencing and gates including padlocks.
- Installation, maintenance, and removal of temporary pavement markings.
- Installation, maintenance and removal of temporary orange safety fencing.
- Staged or phased construction.
- Off-peak construction periods, including both day and night shift work.
- Temporary construction lighting for night shift construction periods.
- Locating and marking of existing underground lighting or other airfield circuits within the project work areas.

- Temporary alteration or decommissioning of any existing Runway or Taxiway lighting, signage, or NAVAID.

- Installation, maintenance and removal of temporary or permanent barricades, warning signs, hazard markings and runway closure markings.

- Installation, maintenance, and removal of temporary lights and lighting circuits including lighted runway closure markings.

- Testing and maintenance of existing, temporary, and new lighting circuitry.

- Installation, maintenance, and removal of any temporary pavement tapers, transitions or temporary accesses to any airport facilities.

- Installation, maintenance, and removal of any temporary asphalt pavement tapers and/or transitions in accordance with FAA Advisory Circular 150/5370-13.

- Installation, maintenance, and removal of any temporary milled tapers and/or transitions in accordance with FAA Advisory Circular 150/5370-13.

- Installation, maintenance, and removal of any temporary drainage, including, ditches, swales, piping and de-watering of work areas.

- Alteration, adjustment, maintenance of any drainage inlets, structures or systems necessary to maintain runway drainage during construction.

- Cleaning and maintenance of all areas within construction limits and haul routes or areas disturbed by the Contractor's operation via vacuum trucks.

- Restoration of all surfaces disturbed because of the Contractor's Operations, which are not otherwise paid for under a specific item.

- Maintenance and safe-keeping of airport-owned lighted runway closure markers, if utilized.

120-1.2 LIGHTING. This work shall also consist of furnishing, installing, operating, maintaining, moving, and removing portable light towers and equipment-mounted lighting fixtures for nighttime construction operations, for the duration of nighttime work on the contact. Nighttime operations consist of work specifically scheduled to occur after sunset and before sunrise.

120-1.3 RUNWAY CLOSURE MARKERS. This work shall consist of furnishing, operating, and maintaining four (4) portable lighted runway closure markers, to be utilized 24 hours per day, 7 days per week during any runway closure period. The equipment shall be in first class serviceable condition as approved by the Engineer.

MATERIALS

120-2.1 GENERAL. All barriers, barricades, flagging, and warning signs shall be approved by the Engineer prior to installation. Provide submittals to the Engineer prior to placement of any signs, barriers, barricades, and flagging.

All barriers, barricades, flagging, and warning signs shall be portable, and less than 3 feet high in total height unless noted otherwise on the drawings, and equipped with an operational red flashing light. Barriers and barricades shall have reflective orange and white markings conforming to the standards outlined in the MUTCD.

Barriers, barricades, safety flagging, and warning signs shall be placed at the locations shown on the drawings or as directed by the Engineer. Unless otherwise noted or directed, barriers and safety flagging shall be positioned 3 feet outside of construction area limits.

Barriers, barricades, flagging, and warning signs shall be installed and repositioned as required or directed by the Engineer for phases and stages of the project at no added cost to the Airport.

Barriers, barricades, flagging, and warning signs shall be properly secured to prevent movement by wind and jet blast, and inspected regularly to ensure that all lights are functioning properly.

All maintenance work required to keep barriers, barricades, safety flagging, warning lights/batteries, flags, warning signs etc. clean and in good operating condition shall be provided by the Contractor at no additional expense to the Airport. Contractor shall clean and maintain all barriers, barricades, safety flagging and warning signs as needed or directed throughout construction. Contractor shall also clean and maintain all barriers, barricades, safety flagging and warning signs during non-work periods, including any winter shut-down periods. Should a problem be identified with any barriers, barricades, safety flagging or warning signs during a non-work period, Contractor shall be responsible for correcting the condition within a one (1) hour response time.

At the completion of each work phase, the signs, barricades, flagging, etc. shall be removed or relocated as shown on the drawings or as directed by the Engineer. At the completion of construction, all signs, barricades, flagging etc. shall be removed from airport property by the Contractor, unless otherwise provided.

120-2.2 LOW PROFILE CONSTRUCTION BARRICADES.

a. Contractor-Provided Low-Profile Construction Barricades. Contractor-provided low-profile closure barricades and components shall be as shown on the drawings and as follows:

1. Low profile barricades shall be OTW Safety Model AR10x96 or approved equal. Low profile barricades shall include pre-molded mounting holes with positive screw or snap-type connections for secure connections of warning lights to the barriers. Barricades shall be capable of being filled with water to prevent movement by wind and jet blast.

2. Warning lights for low profile barricades shall be OTW Safety Model ARL-FLR-CN or approved equal. Warning lights shall be omnidirectional flashing red, solar powered and shall be capable of securely fastening to premolded mounting connection on barrier.

3. All contractor-provided barricades and lights shall be new at the time of initial installation.

b. Airport-Provided Low-Profile Closure Barriers.

1. No low-profile closure barriers shall be provided by the Airport for this project.

120-2.3 WARNING LIGHTS. Flashing warning lights shall be placed on barriers and at the locations shown on the drawings. Unless shown otherwise on the drawings, warning lights shall be in accordance

with the current requirements of ITE Standards for Flashing and Steady Burning Warning Lights, as shown below:

TABLE 120-1 WARNING LIGHTS	
Criteria	**Requirement**
Type	Flashing Solar LED
Lens Directional Faces	Omni Directional
Flashing Rate Per Minute	55 – 75
Hours of Operation	Dusk to Dawn
Color of Lens	Red

Warning lights shall be solar-powered, battery-operated with the battery in a weatherproof enclosure. Lights shall be equipped with a solar switch which shall turn the light on at dusk and off at dawn. Warning lights shall be secured to the construction signs, barricade or support by tamper-proof bolts. The fastening of the light to the support shall be approved by the Engineer.

120-2.4 TEMPORARY LIGHTED RUNWAY CLOSURE MARKERS. Temporary lighted runway closure markers shall be as shown on the drawings and shall conform to FAA Advisory Circulars 150/5340-1L and 150/5370-2G. Lighted runway closure markers shall be portable units that can be quickly towed to and from the runway, consist of a minimum of at least 9 light sources arranged in the shape of the letter "X", provide a minimum day effective intensity of 70,000 candela (cd) at the beam center, simultaneously flash all light sources mounted on the "X" at a rate of 2.5 seconds on and 2.5 seconds off, and be energized by a portable power supply capable of a minimum of 24 hours continuous operation.

120-2.5 TEMPORARY AIRFIELD LIGHTING REVISIONS. All airfield lighting associated with closed portions of taxiways, including centerline lights, edge lights, and lighted signs shall be disconnected during the closure, and re-established when returned to service. Temporary airfield lighting revisions shall be in accordance with the drawings.

In addition to disconnection of power, existing taxiway exit signs associated with closed taxiways shall be covered with a solid black blank panel in accordance with Item L-125 or by other means as approved by the Engineer.

120-2.6 TEMPORARY HAUL ROADS. All approved Contractor haul roads leading from the project site to a public road shall be constructed per the Drawings. Construction access locations shall also include stabilized construction entrance pads per Item C-102. The Contractor shall design, construct, and maintain all temporary access roads for the duration of construction. All temporary paved roads shall be removed at the end of construction and returned to their pre-construction condition unless permission is granted in writing by the Engineer for it to remain.

120-2.7 SPOIL AREAS (ON-SITE). Approved spoil area(s) for the Contractor's use on this project are shown on the Contract Plans. The Contractor will be required to continuously grade the spoil area to maintain a neat and orderly condition. Erosion and sediment controls including silt fence, temporary seed and mulch, and other measures as deemed necessary by the RPR shall be installed and maintained by the Contractor. Separation of construction and demolition debris including electrical conduit, wire, underdrain pipe, etc. is required.

The Contractor will be required to grade and shape the spoil area to meet airport requirements. This may include restrictions on height, side slopes, and condition. At the completion of the project, the Contractor shall permanently seed and mulch the stockpile in accordance with specifications T-901 and T-908

respectively, and remove all temporary erosion and sediment control measures once turf has been established.

CONSTRUCTION METHODS

120-3.1 SAFETY. The Contractor shall be responsible for maintenance, control and the safe guarding of all traffic within and immediately abutting the areas where work is being conducted. Whenever, in the opinion of the Engineer, the Contractor has not provided sufficient or proper safety precautions and safeguards, the Contractor shall immediately correct deficiencies by adding crossing guards, lights, barricades, flagging, or whatever else the Engineer deems advisable, including suspension of work, if directed.

The Contractor shall be aware that aircraft operations on runways, taxiways and aprons adjacent to construction areas will result in jet blast and prop wash occurring in the work area. The Contractor shall take all steps necessary to protect workers, equipment and materials from exposure to jet blast and prop wash, including but not limited to scheduling construction activities during periods of low aircraft operations and pulling back from a high jet blast work area to allow passage of large aircraft.

The Contractor shall secure all barricades, safety fencing and any other temporary installations from movement from wind and jet blast, and the Contractor shall sequence construction activities and implement erosion control methods to prevent dust and blown debris from jet blast.

Special care shall be exercised to prevent vehicles and pedestrians from falling into open excavations or being otherwise harmed as a result of the work. The Contractor shall, in all cases, hold the Owner harmless for any and all damages resulting from any of the Contractor's operations.

No speed limit signs shall be placed by the Contractor unless authorized by the Engineer. Any limits properly established shall be for a temporary period only and shall be removed at the direction of the Engineer.

At all intersecting roads within the project and along Contractor’s haul routes, adequate warning signs and stop signs shall be placed in advance of the intersection in accordance with MUTCD construction signing standards, as shown on the drawings, and as directed by the Engineer.

120-3.2 BARRICADES, SAFETY FLAGGING.

a. General. Position barriers, barricades, and safety flagging as shown on the drawings or as directed by the Engineer to isolate work areas from active taxiway/apron areas. Place barricades as needed to clearly define work area, but no more than 20-foot spacing, unless otherwise noted.

b. Low Profile Closure Barriers.

1. Place low profile barriers at the locations shown on the drawings, and as approved by the Engineer. Coordinate access to closure areas with the Engineer prior to placement. Low profile barricades shall be interlocked together without space between barricades unless directed otherwise by the Engineer. Barriers shall be filled with water, except during subfreezing temperatures fill with potassium acetate or calcium chloride solution to prevent freezing.

120-3.3 TEMPORARY RUNWAY/TAXIWAY "X" CLOSURE MARKERS. Temporary lighted runway closure markers and fabric runway/taxiway closure X's shall be placed at the locations shown on the drawings and removed when no longer required. The Contractor shall supply a minimum of two lighted runway closure X's and one fabric runway/taxiway closure X.

120-3.4 SITE ACCESS AND HAUL ROADS. Construction access to work areas shall be as shown on the Drawings. If construction access is required in addition to the construction entrances shown on the drawings, secure Engineer's approval of all additional project construction entrances prior to construction. The Contractor shall maintain the integrity of all haul routes throughout the duration of construction as approved by the Engineer. All haul routes, staging areas and equipment storage shall be at the location shown on the Drawings, unless otherwise approved by the Engineer.

METHOD OF MEASUREMENT

120-4.1 MAINTENANCE AND PROTECTION OF TRAFFIC. The work under maintenance and protection of traffic will be measured for payment on a lump sum basis.

120-4.2 LOW-PROFILE CONSTRUCTION BARRICADES. The quantity to be measured for payment will be the number of barricade units installed.

BASIS OF PAYMENT

120-5.1 MAINTENANCE AND PROTECTION OF TRAFFIC. The lump sum price bid for maintenance and protection of traffic shall include all equipment, materials, and labor necessary to adequately and safely maintain and protect traffic. This shall include: installation, maintenance, removal, and restoration of all haul roads, all elements of security badging including any required fees, training, or courses, all necessary gate guards and/or flaggers, installation, maintenance, removal, and restoration of all temporary fences and/or gates, any provisions for roadway closures including barricades, lane closures, flaggers, or temporary signals,

In the event the contract completion date is extended, no additional payment will be made for maintenance and protection of traffic.

Progress payments will be made for this item in proportion to the total amount of contract work completed, less any deductions for unsatisfactory maintenance and protection of traffic.

No payment will be made under maintenance and protection of traffic for each calendar day during which there are substantial deficiencies in compliance with the Specification requirements of any subsection of this Section as determined by the Engineer. The amount of such calendar day non-payment will be determined by dividing the lump sum amount bid for maintenance and protection of traffic by the number of calendar days between the date the Contractor commences work and the date of completion as designated in this proposal, without regard to any extension of time.

If the Contractor fails to maintain and protect traffic adequately and safely for a period of 4 hours, the Owner shall correct the adverse conditions by any means it deems appropriate and shall deduct the cost of the corrective work from any monies due the Contractor. The cost of this work shall be in addition to the liquidated damages and non-payment for maintenance and protection of traffic listed above.

However, where major non-conformance with the requirement of this Specification is noted by the Engineer and prompt Contractor compliance is deemed not to be obtainable, all contract work may be stopped by direct

order of the Engineer regardless of whether corrections are made by the Owner as stated in the paragraph above.

120-5.2 LOW-PROFILE CONSTRUCTION BARRICADES. The price bid per each low-profile construction barricade shall include all equipment, materials, and labor necessary to transport, install, relocate, maintain, and alter low-profile construction barricades during the course of the project.

Payments will be made for this item as the phases of work progress and in accordance with the low-profile construction barricade locations shown on the contract plans.

No payment will be made for low-profile construction barricades that do not meet the specifications herein and the details shown on the contract plans. This includes, but is not limited to, inadequate placement, incorrect placement, barricades that are not filled with water, barricades that are not anchored properly, and barricades that have not been maintained properly.

Payment will be made under:

Item	**Description**	**Unit**
M-120-1	Maintenance and Protection of Traffic	Lump Sum
M-120-2	Low-profile Construction Barricades	Each
M-120-3	Lighted Runway Closure Markers	Each

END OF ITEM M-120

Item M-130 Gate Guards and Flagging Operations

DESCRIPTION

130-1.1 The item of work to be performed under this section shall consist of providing gate guards and flagging operations at the locations shown on the drawings or as directed by the Engineer. This work shall conform to the requirements of FAA Advisory Circular No. 150/5370-2G and the "Manual on Uniform Traffic Control Devices for Streets and Highways" (MUTCD) and all supplements thereto, with the modifications and additions herein.

130-1.2 Construction Safety Officer. Contractor shall identify a Construction Safety Officer who shall be responsible for assuring that all gate security, gate guards, and flagging operations are in conformance with the drawings, specifications, and any directions provided by the Engineer. The Contractor shall provide name and phone number for Construction Safety Officer, who shall be available by telephone 7 days per week, 24 hours a day throughout the construction duration, including nonworking periods and winter shut-down periods.

CONSTRUCTION REQUIREMENTS

130-2.1 Contractor-Provided Construction Gate Guard.

A. Access Points/Gates/Gate Guards

1. All gates used for Contractor access to the airfield shall be staffed by qualified and trained gate guards at all times the gates are in use for construction activities in progress on the project. The Contractor shall provide gate guards for each gate used by any construction vehicle. The gate guard is required to check each person entering the secure area through the gate for a valid Airport ID badge, construction escort badge, or delivery escort badge; a valid vehicle ramp permit; and required vehicle markings. Any person or vehicle not in compliance with these requirements will be denied access.

2. When not actively in use, gates shall be kept closed and locked. After each vehicle entry or exit during periods of operation, the gate must be pulled closed or an airport-approved barricade must be placed in front of the gate to require a vehicle to stop so that an inadvertent entry into the secure area is prevented.

3. Access to construction sites through non-motorized vehicle gates shall be coordinated with Airport staff. **Contractor-supplied locks shall not be placed on gates. Airport-supplied locks shall be used**. At the end of each shift, the gate will be closed and locked by an employee of the Contractor. Gate operations shall be checked by Syracuse Hancock International Airport (SHIA) personnel, the Engineer, and the Contractor’s Safety Officer frequently to ensure compliance with proper security procedures. The Contractor shall coordinate all required gate access times twenty-four (24) hours in advance with the Engineer.

4. All vehicles under escort shall be physically inspected by the gate guard prior to entering the secure area.

5. Unless otherwise noted, the Contractor shall provide guard shacks as needed, at each gate location used by the Contractor, including power service, if needed.

B. Contractor-Provided Construction Gate Guards

1. Contractor shall provide qualified personnel to perform gate guard services at construction gates used for access to secure areas of the Airport.

2. Personnel assigned to provide gate guard services shall obtain an Airport-issued identification badge prior to providing service. To be qualified to obtain the identification badge, personnel shall:

    a. Undergo a fingerprint based criminal history records check as required by TSR 1542.209. Contractor's employees to be used for gate guard services shall be able to pass this check with no convictions for a disqualifying offense as outlined by the Transportation Security Administration (TSA).

    b. Successfully complete an FAA-required training course offered by the Airport which includes understanding airfield lighting and signage, general airport safety, airfield driving techniques, and proper radio communication.

3. Personnel assigned to provide gate guard services shall have the ability to clearly speak, read, write and understand the English language.

4. Personnel assigned to provide gate guard services shall be supervised and checked at frequent intervals by the Contractor's supervisor and SHIA personnel to ensure they are in compliance with all security requirements associated with staffing a perimeter gate access point leading to a secure area of the airport.

5. Personnel assigned to provide gate guard services shall wear a safety vest at all times.

6. Personnel assigned to provide gate guard services shall not carry a firearm.

7. Personnel assigned to provide gate guard services must have the ability to communicate directly with the Airport's Operations Office by cellular telephone provided by the Contractor.

8. The Contractor shall provide temporary restroom facilities for use by the gate guards at the access gate. If the gate is to be used for access at night, the Contractor shall provide and maintain in working condition a temporary light plant to illuminate the gate and vehicle inspection area. Lighting shall be approved by the Engineer and shall not conflict with any airport lighting or protected air space.

C. Gate Guard Duties: Guard responsibilities include:

1. Checking all incoming individuals and vehicles for Airport authorized identification, permits, and required vehicle markings to prevent unauthorized entrance into secure areas.

2. Comparing the name on the identification badge for each individual entering through the gate with an Airport-provided "stop list." If a person's name is on the stop list, entry shall be denied and the Airport's Operations Office immediately notified.

3. Conducting vehicle searches to ensure that weapons, explosive devices and other prohibited items are not allowed into the secure area of the airport; if weapons or other prohibited items are found, the gate guard shall prevent entry and immediately notify the Airport's Control Center.

4. Ensuring that the security gate is closed when not actively being used to prevent security breaches.

130-2.2 Crossing Guards/Flaggers. All flaggers shall be adequately trained in flagging operations by recognized training programs, including the American Traffic Safety Services Association, the National Safety Council, unions, or construction industry associations, or by an individual who holds a current certification as a flagger training instructor from such a program. Prior to the start of flagging operations, the Contractor shall provide to the Engineer a list of certified flaggers to be used in the operation, identifying the source of flagger training for each individual. When requested by the Engineer, flaggers shall demonstrate their competency in flagging procedures. Flaggers not competent in flagging procedures shall be retrained or replaced at once.

The Contractor shall provide adequately equipped flagging personnel at the locations shown on the drawings or as required by the Engineer during construction working hours and non-working hours for safe flow of vehicle and aircraft traffic. All flagging, and associated warning signing shall be completed in accordance with the approved plans and specifications.

METHOD OF MEASUREMENT

130-3.1 Unless otherwise provided, all requirements of this section shall be considered incidental to and included in the payments made for Item M-120-1 Maintenance and Protection of Traffic.

BASIS OF PAYMENT

130-4.1 Unless otherwise provided, no separate payment will be made for the requirements of this section and the costs for work of this section shall be included in the lump sum price bid for Item M-120-1 Maintenance and Protection of Traffic.

USE AND MATERIAL REQUIREMENTS

FAA AC 150/5370-2G	Operational Safety on Airports During Construction
Manual on Uniform Traffic Control Devices (MUTCD)	All applicable sections
New York State Department of Transportation (NYSDOT) Work Zone Traffic Control	Section 619

END OF ITEM M-130

Item M-140 Street and Pavement Cleaning

DESCRIPTION

140-1.1 The work to be performed under this section shall consist of pavement cleaning and prevention of tracking of material onto public and private streets, airport roadways, and runway, taxiway, or apron pavements.

MATERIALS AND CONSTRUCTION METHODS

140-2.1 Wheel Cleaning.

a. The Contractor shall clean wheels of vehicles leaving the construction site to eliminate tracking of debris and construction materials onto active and inactive runways, taxiways, aprons, and airport or public roads. Stabilized Construction Entrances shall be constructed at each construction access to the site in accordance with the plans and specification C-102.

b. The Contractor shall install wheel cleaning devices in accordance with the drawings or as directed by the Engineer. If Engineer determines that Contractor's wheel cleaning procedures are not effective or acceptable, the Contractor shall modify the wheel cleaning procedure to the Engineer's satisfaction and at Contractor's expense.

c. Additional methods selected may include wheel washing, wheel bath, mud palliative, or others which effectively clean wheels and eliminate tracking. When, in the opinion of the Engineer, the wheel cleaning is no longer needed, the material or bath shall be removed from the site and the site restored to pre-construction conditions.

d. Contractor shall ensure clean wheels prior to crossing active or inactive runways, taxiways, aprons, or accessing public and airport roads. All materials and apparatus necessary for wheel cleaning are the responsibility of the Contractor and shall be considered incidental to other items in the Contract.

140-2.2 Routine Pavement Cleaning.

a. The Contractor shall keep the surfaces of all taxiways, aprons, and roadways (public and private), including shoulder areas, free of dirt, mud, material spillage, and other deleterious material and debris along all haul routes and adjacent taxiways and roadways.

b. The Contractor shall have available at all times, and at each taxiway crossing, a self-propelled pickup sweeper for pavement cleaning and debris removal. The type and number of sweepers are subject to the approval of the Engineer. Taxiways shall be continuously cleaned while any haul operations are crossing an active taxiway or apron. Sweepers shall yield to aircraft operations at all times.

c. Roadways shall be cleaned within 2 hours of request and as often as required to maintain the roadway surfaces in acceptable condition, as determined by the Engineer.

d. The use of water to perform pavement cleaning shall be kept to a minimum.

e. A separate shadow or backup vehicle shall be provided for each sweeper operating on all roads, where required. The shadow or backup vehicle shall follow the sweeper during sweeping

operation and shall be equipped with an arrow board meeting the Manual of Uniform Traffic Control Devices standards.

f. Cleanliness of roads must comply with all local ordinances.

g. The Contractor assumes all responsibility for maintaining visibility of all pavement markings and protection and/or replacement of all pavement markings.

140-2.3 Emergency Pavement Cleaning.

a. In case of an emergency involving material spillage or other causes, the Contractor shall immediately dispatch a sweeper or other equipment and labor to the site and proceed with the necessary clean-up.

b. The Contractor shall immediately notify the Engineer of the nature and location of such emergencies.

c. If the Contractor fails to begin clean-up at the emergency site within one hour of the time of occurrence, Syracuse Hancock International Airport will proceed with the clean-up in accordance with the Special Conditions and the Construction Safety and Security Compliance Manual for Syracuse Hancock International Airport and bill the Contractor accordingly.

METHOD OF MEASUREMENT AND BASIS OF PAYMENT

140-3.1 No separate measurement or payment will be made for the Work required by this section. The cost for this portion of the Work will be considered incidental to and included in the payments made for Item M-120 Maintenance and Protection of Traffic.

END OF ITEM M-140

Item M-150 Project Survey and Stakeout

DESCRIPTION

150-1.1 PROJECT SURVEY AND STAKEOUT. This work shall consist of providing all necessary survey work to establish, spatially position, and verify the locations of existing and proposed terrain features and measure quantities of items in accordance with the contract documents or as directed by the Engineer. This work includes but is not limited to the establishment, reestablishment or localization of primary and secondary control, the stakeout or layout of proposed features, the initialization, calibration and navigation of automated equipment operations, the location or verification of existing terrain or of constructed features, the verification of geospatial data for proposed construction work and the coordination and sharing of engineering data with the Engineer or other contract stakeholders.

The survey and stakeout shall proceed immediately following the award of the Contract and shall be expeditiously progressed to completion in a manner and at a rate satisfactory to the Engineer. The Contractor shall keep the Engineer full informed as to the progress of the survey and stakeout. All survey fieldwork and computations shall be performed under the direction of a Professional Land Surveyor registered in the State of New York.

CONSTRUCTION METHODS AND MATERIALS

150-2.1 SURVEY CONTROL PLAN. The Contractor shall develop and submit a Survey Control Plan. Contract control includes all statewide or local primary and secondary horizontal and vertical control which will be used for the geospatial positioning of work items. Upon the Contractor's completion of initial survey reconnaissance and control verification, but prior to beginning primary field operations, the Contractor shall submit a Contract Control Plan document which is to be signed and sealed by a Land Surveyor registered in the State of New York, for acceptance by the Engineer. The Contract Control Plan shall include the below listed required control information and follow the acceptance procedure.

All revisions or additions to contract control for the purpose of stakeout or layout of proposed work items shall be provided in writing to the Engineer prior to beginning that revised portion of stakeout or layout work.

1. **Acceptance Procedure.**
    a. The Contractor shall document required information and submit electronically to the Engineer at least 10 work days prior to beginning field operations.
    b. Upon acceptance of the procedure by the Engineer, the Contractor shall submit 2 signed and sealed copies to the Engineer.

2. **Control Information.**

The Contractor shall list the following control information (tabular format is acceptable):

a. All contract control shown in the contract documents.
b. The following elements shall be submitted for all contract control points or benchmarks:
    (1) Recovered in the field and did it appear undisturbed?
    (2) Contract indicated coordinate or elevation.
    (3) Field determined coordinate or elevation.
    (4) Contractor adjusted coordinate or elevation, or necessary.
    (5) Point or benchmark intended to be used for construction purposes.

c. Adjustment method is used to balance or adjust the control (ex: Compass Rule for Baseline or Calibration Report for GPS, etc). Attach a copy of the adjustment/calibration report.
d. Survey Grid diagram (drawn to a legible scale) with grid dimensions indicated. Grid pattern shall not exceed 100 feet by 100 feet. The grid lines shall be aligned with finished surface concrete pavement joint lines, or roadway centerline station as applicable, and include all grade breaks, edges of pavement and pavement sections, swale lines and limits of construction.
e. New York State Plane Coordinate System (NYSPCS) Zone utilized.
f. Horizontal Datum used.
g. Vertical Datum used.
h. Additional (new) control is anticipated to be needed and where will they be set?
i. When a GPS base station(s) is utilized on a project either for inspection or stakeout, provide the determined coordinate and elevation value of the station, and the datum differential from that localized value to a NYS CORS determined value.

3. Methods or Procedures.
The Contractor shall document and provide the following survey information on methods or procedures to be used:

a. Survey methods used to verify the control (ex: Total Station, GPS/RTK, Auto Level, etc).
b. Survey method(s) used to stakeout which types of proposed features.
c. Automated Machine Guidance (AMG) proposed for use on this contract.
d. Type and frequency of quality control measures included to maintain the proper calibration and adjustment of the AMG systems.
e. If GPS will be used for stakeout or for AMG, will the NYS CORS Network be used as its reference network or will base station(s) be used?
f. If a base station is to be used, describe the mounting location, attachment technique, and instrumental protection included which ensures a sound and reliable reference station will be provided.

150-2.2 SUBMITTALS (PRE-CONSTRUCTION). The Contractor shall provide a completed *Survey Control Plan* as described above as well as the overseeing surveyor's license and experience information demonstrating qualifications for construction stakeout. In addition, the Contractor shall provide a survey of the existing project area to the Engineer for review. Any discrepancies shall be resolved prior to beginning construction operations.

150-2.3 SUBMITTALS (CONSTRUCTION). The Contractor shall furnish survey data and calculations of quantities for each layer of material placed in the form of surface elevations at the grid locations identified in the *Survey Control Plan*. No material shall be placed until the surface, survey data, and calculations for the underlying layer have been submitted by the Contractor and approved by the Engineer. All construction submittals of grade information by the Contractor shall be signed and sealed by a Professional Land Surveyor registered in the State of New York.

150-2.4 SUBMITTALS (POST-CONSTRUCTION). After project completion, the Contractor shall provide a red-lined hard copy plan set showing as-built features denoting changes from the original design. Every dimension, elevation and coordinate shown on the drawings shall be field checked by the surveyor with the as-built information shown in red. The surveyor shall certify that the information shown on the red-lined hard copy plan set is correct.

Electronic versions of the as-built information may be substituted for hard copies only when approved by the Engineer. Electronic versions must be compatible with the current software used by the Engineer.

150-2.5 SURVEY EQUIPMENT. The Contractor shall furnish tools, supplies, and stakes suitable for use in survey work. Stakes and hubs shall be of sufficient length to provide a solid set in the ground with sufficient surface area above ground for necessary legible markings. Survey instruments and supporting equipment shall be capable of achieving the specified tolerances. Calibrate survey equipment for accuracy prior to beginning survey work and as required.

CONSTRUCTION DETAILS

150-3.1 PREPARATION. The Contractor shall establish construction survey points, elevations and grades as necessary to control layout and complete the work. The Contractor shall verify all control surveying and staking meets specified tolerances prior to beginning work.

The Contractor shall calculate all grades, elevations, offsets and alignment data necessary for staking and/or setting items of work. Alternate methods of establishing grade control with wire lines, computer or laser controlled grading or other suitable methods must be approved by the Engineer.

The Contractor shall provide appropriate traffic control for all survey activities.

150-3.2 CONTRACT PROVISION DISCLAIMER. RELEASE OF AIRPORT DATA: The Contractor may obtain an electronic copy of the data points prepared by the Owner. The Owner provides data points in AutoCAD format only. The Contractor is responsible for translation into other formats. This data does not include the commercial software needed to read the points. In order to obtain an electronic copy, the Contractor shall make a written request to the Engineer and be obligated to sign an Electronic Media Release agreement. The Contractor agrees and understands that the data points are prepared by the Owner for its own purposes and not for the benefit of private individuals or businesses. The Contractor waives any and all claims that may result from the use of or reliance upon the data points. The Contractor indemnifies the Owner and holds it harmless for any damages, costs, attorneys' fees, or other liabilities that might be incurred as a result of the Contractor's use and reliance on the data.

150-3.3 STAKE MAINTENANCE AND MARKING. The Contractor shall maintain ALL staking necessary for the work until the construction has been completed and accepted by the Engineer.

a. Legibly mark all survey stakes with station and offset referenced to their respective control line.
b. Mark slope, reference and ground stakes with station.
c. Renew illegible stakes at no additional cost to the Owner.

150-3.4 CONTROL POINTS AND SURVEY TOLERANCES. The Contractor shall relocate initial horizontal and vertical control points in conflict with construction to areas that will not be disturbed by construction operations. The coordinates and elevations for the relocated points shall be given to the Engineer before the initial points are disturbed.

The Contractor shall protect benchmarks from construction activities. Benchmarks shall be positioned to allow a level rod to stand vertically and squarely on the mark.

The Contractor shall survey and establish control within the tolerances in Table 150-1 below.

TABLE 150-1 SURVEY TOLERANCES		
Description	Horizontal	Vertical
	decimals of a foot	
Control points	3rd Order or better	3rd Order or better
Centerline points	± 0.04	± 0.04
Cross sections and slope stakes	± 0.10	± 0.10
Slope stake references	± 0.10	± 0.10
Culverts and ditches	± 0.10	± 0.10
Minor drainage structures	± 0.08	± 0.05
Curb and gutter	± 0.04	± 0.02
Guardrail and concrete barrier	± 0.01	± 0.05
Retaining walls	± 0.01	± 0.04
Environmental control limits	± 1.00	----
Clearing and grubbing limits	± 1.00	----
Right of Way limits	± 0.07	----
Subgrade finish stakes	± 0.10	± 0.05
Surface course finish grade stakes	± 0.05	± 0.02
Signals and electrical	± 0.01	± 0.10
Striping	± 0.08	----
Airfield Lighting & Signage	± 0.50	----
Paving reference line	± 0.05	± 0.02
Bridge substructure and overall	± 0.04	± 0.04
Bridge superstructure and overall	± 0.04	± 0.04

The survey tolerances of any items not listed in Table 1 shall be coordinated with the Engineer. Tolerances given in Table 1 are subordinate to any tolerances listed in other specification sections.

If machine controls (ie: GPS, robotic total station, etc.) have not been approved by the Engineer, the Contractor shall set grade finishing stakes:

1. For grade elevations and horizontal alignment:
    a. On centerline.
    b. On each shoulder at runway, taxiway and roadway cross section locations and between centerline and shoulder with a maximum spacing of 25 feet.
    c. At the top of subgrade and the top of each aggregate course.

2. Maximum spacing between stakes along the alignment: 50 feet.
3. Brushes or guard stakes shall be used at each grade finishing stake.
4. Grade finishing stakes must be reset as many times as necessary to construct the subgrade and each aggregate course.

150-3.5 SURVEY FOR SURFACE AND QUANTITY VERIFICATION. Contractor shall survey each of the following surfaces in accordance with the approved Survey Plan:

- Existing Ground (prior to construction)
- Baseline: existing ground after completion of stripping and pavement demolition.

- Subgrade (bottom of excavation) (P-152)
- Top of Base Material: Crushed Aggregate (P-209)
- Top of Finish Grade:
    - Bituminous Surface Course (P-401)

Survey of each surface shall be completed on the approved Survey Grid and submitted according to submittal requirements in Supplemental General Provisions, Part C – General Aviation Clauses, Section 56 "Shop Drawings and Submittals. Contractor shall complete quantity calculations of each layer and submit data and calculations to Engineer for verification and acceptance. The Engineer shall be allowed 2 working days to verify and accept or reject the submittal, and the Engineer reserves the right to request additional survey points, if deemed necessary. No material shall be placed until the surface, survey data, and quantity calculations for the underlying layer have been approved by the Engineer.

At the completion of each surface, and at the completion of the work, all partial surfaces shall be merged and stitched together to form a single, complete topographic surface for each layer, and the total quantities of each layer shall be recalculated and submitted to the Engineer for review. The total quantities will be compared to the total of all partial/interim quantity calculations for each layer, and all progress payments based on interim condition surveys shall be subject to revision based on Engineer's review of the compiled, final surfaces and calculations.

150-3.6 CONCRETE AND ASPHALT PAVING. The Contractor shall develop a method of horizontal and vertical control for the placement of concrete and asphalt pavements:

1. Utilize laser, wire, or string line, for example, to maintain horizontal and vertical control.
2. Maximum spacing: 40 feet.
3. Set control on both sides of paving lane.

Stake concrete joint locations.

150-3.7 DRAINAGE STRUCTURES. The Contractor shall stake drainage and cleanout structures to fit field conditions and in coordination with the Engineer. The location of the structures may differ from the plans.

1. Survey and record the ground profile along the centerline of the structure.
2. Determine the slope catch points at inlets and outlets.
3. Set reference points and record information necessary to determine structure length and end treatments.
4. Stake ditches or grade to make the structure functional.
5. Mark guard stakes with the following, when applicable:
    a. Diameter, length and type of culvert (for example 18" x 35' RCP)
    b. The vertical and horizontal distance from the hub to the invert at the end of the culvert or any intermediate point as needed or directed
    c. Flow line grade of the pipe
    d. Station
6. For storm sewers and waterlines provide a reference at a maximum spacing of 50 feet. Reference inverts of pipe at all manholes.

150-3.8 CULVERTS. The Contractor shall set horizontal and vertical control and reference points. Establish and reference the centerline, back of parapet, skew, and flow line elevations at inlet, outlet and breaks.

150-3.9 CURB AND GUTTER. The Contractor shall set curb and gutter staking at 25-foot intervals on tangents and 10-foot intervals on curves. Set line and grade for curb and gutter within 0.02 feet of the proposed or established grade line.

150-3.10 RETAINING WALLS. The Contractor shall set horizontal and vertical control and reference points. Establish and reference the centerline offsets for the walls, radius points, and the beginning and ending wall locations as shown on the plans.

The Contractor shall stake retaining wall vertical and horizontal control at a maximum spacing of 25 feet on tangent sections and 10 feet on curved sections unless otherwise approved.

150-3.11 PAVEMENT MARKING. The Contractor shall layout all temporary and permanent pavement markings, including markings not painted by Contractor.

The Contractor shall place references for pavement striping a minimum of 150 feet apart on tangents and a minimum of 50 feet on curves.

150-3.12 CLEANUP. The Contractor shall remove and dispose of all flagging, lath, stakes and other staking material after the project is complete.

150-3.13 UTILITIES. As part of cooperating with the utility companies, the Contractor shall stake control lines as needed, so their facilities can be relocated to their proper final position. Also, stake crossings or potential points of conflict between facilities to give proper horizontal and vertical control for the relocation. Schedule this survey work with the utility companies to minimize delays and disruption of survey stakes. Replace all disturbed stakes as necessary to facilitate the relocations. The Contractor is responsible for costs incurred to relocate any utility more than once due to inaccurate or incomplete staking.

METHOD OF MEASUREMENT

150-4.1 PROJECT SURVEY AND STAKEOUT. This work will be measured on a lump sum basis.

BASIS OF PAYMENT

150-5.1 PROJECT SURVEY AND STAKEOUT. Survey shall be paid by the Lump Sum and shall include all labor, equipment and materials necessary to complete the item as described in the drawings and specifications. The percentage of the Lump Sum payment paid in each application for payment shall be proportionate to the percentage of work completed during the period included in the application for payment, except that the final 10 percent of this item will not be paid until the as-built drawings are submitted and approved by the Engineer.

Payment will be made under:

Item	Description	Unit
M-150-1	Project Survey and Stakeout	Lump Sum

END OF ITEM M-150

Item P-100 Geotextiles

DESCRIPTION

100-1.1 Geotextiles. This work shall consist of furnishing and installing approved Geotextile of the Class and Type indicated, over the prepared subgrade surfaces, and in the manner shown on the plans or as directed by the RPR, in writing, prior to performing the work.

100-1.2 General. No separate measurement for payment will be made for geotextile fabric used in the installation of the following items, rather it shall be considered incidental to the installation/construction of that item. Additionally, material requirements for geotextile fabric shall be as specified in the following items.

- Item C-102 – Temporary Air and Water Pollution, Soil Erosion, and Siltation Control
- Item P-152 – Excavation and Embankment
- Item D-705 – Pipe Underdrains for Airports
- Other items as specified

MATERIALS

100-2.1 Geotextile Fabric. Geotextile fabric shall consist of woven or non-woven filaments of polypropylene, polyester, nylon or polyethylene. Non-woven fabric may be needle punched, heat-bonded, or combinations thereof. The fabric shall be inert to commonly encountered chemicals, rot proof, dimensionally stable (i.e., fibers must maintain their relative position with respect to each other), resistant to delamination, and conform to the following physical properties:

TABLE P-100-1 GEOTEXTILE REQUIREMENTS

Property	**Test Method**	**Units**	**Elongation <50%**	**Elongation ≥50%**
Grab Strength	ASTM D 4632	lbs.	247 (min)	157 (min)
Tear Strength	ASTM D 4533	lbs.	90[1] (min)	56 (min)
Puncture Strength	ASTM D 6241	lbs.	495 (min)	309 (min)
Permittivity	ASTM D 4491	sec^{-1}	0.02 (min)	
Apparent Opening Size	ASTM D 4751	U.S.	No. 30 Sieve max. avg. roll value	

Table 100-1 Notes:
[1] For woven monofilament geotextiles the minimum average value is 56 lbf.

The geotextile fabric shall be specified by the manufacturer for use as a separation layer. Fabric values should represent "minimum average roll values (MARV)".

100-2.2 Geogrid. Not used.

CONSTRUCTION METHODS

100-3.1 General. Geotextile fabric shall be placed on the prepared subgrade surface where shown in the plans, on subgrade in prepared undercut areas as described in Item P-152, and as directed by the RPR.

Geogrid shall be installed as shown in the plans or as directed by the RPR to provide base/subgrade reinforcement.

Geotextile fabric and geogrid shall be installed in accordance with the details shown on the Contract Drawings and in strict accordance with the manufacturer's recommendations.

100-3.2 Delivery, Storage, Preparation, and Installation. Geotextile fabric and geogrid shall be delivered to the job site in such a manner as to facilitate handling and incorporation into the work without damage. Material shall be stored in such a manner as to prevent exposure to direct sunlight and damage by other construction activities.

Prior to the installation of the geotextile fabric, the application surface shall be cleared of debris and sharp objects. All wheel tracks or ruts in excess of three (3) inches in depth shall be graded smooth or otherwise filled with soil to provide a reasonably smooth surface.

Geotextile fabric and/or geogrid may be installed on the application surface either by hand or mechanical methods, provided that the fabric or geogrid is not torn or the surface rutted.

Fabric of insufficient width or length to full cover the specified area shall be lapped or sewn. The following are minimums for each:

1. Lap Only – 12” or manufacturer’s recommendations, whichever is greater.
2. Sewn – 4”

If sewn, the seam strength shall be equal or more than the minimum grab tensile strength of the fabric when tested wet.

The fabric shall be placed to the width and depth directed by the RPR. Unless otherwise specified, the material shall be back dumped on the fabric in a sequence of operations beginning at the outer edges of the treatment area with subsequent placement towards the middle.

Placement of the aggregate on the fabric shall be accomplished by spreading dumped material off previously placed material with a bulldozer blade or end-loader, in such a manner as to prevent tearing or shoving of the cloth. Dumping of material directly on the fabric will only be permitted to establish an initial working platform. No vehicles or construction equipment shall be allowed on the fabric prior to placement of the granular blanket.

The geotextile fabric shall be protected from exposure to sunlight during transport and storage. Following placement, the fabric shall not be left uncovered for more than twenty-four hours.

The fabric shall be installed immediately before the subbase course to minimize exposure to sunlight. Traffic or construction equipment will not be allowed directly on the geotextile fabric. The Contractor shall keep pedestrian traffic on the applied fabric to a minimum and shall repair any damage to the fabric at his cost as directed by the RPR.

Fabric that becomes torn or damaged shall be replaced or patched. The patch shall extend three feet beyond the perimeter of the tear or damage.

METHOD OF MEASUREMENT

100-4.1 Geotextiles. The quantity of geotextile fabric will be the number of square yards computed from the payment lines indicated in the contract documents. Measurement will not be made for geotextile used for repairs, seams, or overlaps.

No separate measurement for payment will be made for fabric used in the installation of unsuitable material removal and replacement, riprap, stormwater facilities, underdrains, structures, for weed block and other applications but rather it shall be considered incidental to the installation requiring the geotextile fabric.

BASIS OF PAYMENT

100-5.1 Geotextiles. The unit price bid shall include the cost of furnishing all labor, equipment, and materials necessary to complete the work, including the cost of preparing the surface upon which the geotextile is placed. No payment will be made for replacement or repairs.

100-5.2 Geogrid. The unit price bid shall include the cost of furnishing all labor, equipment, and materials necessary to complete the work, including the cost of preparing the surface upon which the geogrid is placed. No payment will be made for replacement or repairs.

Payment will be made under:

Item	Description	Unit
P-100-1	Geotextile Stabilization Fabric	Square Yard

MATERIAL REQUIREMENTS

ASTM D4632	Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
ASTM D4833	Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products
ASTM D4533	Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D6637	Standard Test Method for Determining Tensile Properties of Geogrids by the Dingle of Multi-Rib Tensile Method
ASTM D7737	Standard Test Method for Individual Geogrid Junction Strength
ASTM D7748	Standard Test Method for Flexural Rigidity of Geogrids, Geotextile and Related Products
GRI:GG9	Geosynthetic Research Institute, Test Method GG9, Torsional Behavior of Bidirectional Geogrids When Subject to In-Plane Rotation

END OF ITEM P-100

Item P-101 Preparation/Removal of Existing Pavements

DESCRIPTION

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

EQUIPMENT AND MATERIALS

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

CONSTRUCTION

101-3.1 Removal of existing pavement.

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

a. Concrete pavement removal. Full depth saw cuts shall be made perpendicular to the slab surface. The Contractor shall saw through the full depth of the slab including any dowels at the joint, removing the pavement and installing new dowels as shown on the plans and per the specifications. Where the perimeter of the removal limits is not located on the joint and there are no dowels present, the perimeter shall be saw cut the full depth of the pavement. The pavement inside the saw cut shall be removed by methods which will not cause distress in the pavement which is to remain in place. If the material is to be wasted on the airport site, it shall be reduced to a maximum size of 6 inches. Concrete slabs that are damaged by under breaking shall be repaired or removed and replaced as directed by the RPR.

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

b. Asphalt pavement removal. Asphalt pavement to be removed shall be cut to the full depth of the asphalt pavement around the perimeter of the area to be removed. If the material is to be wasted on the airport site, it shall be broken to a maximum size of 3 inches (76mm).

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

101-3.2 Preparation of joints and cracks prior to overlay/surface treatment. Remove all vegetation and debris from cracks to a minimum depth of 1 inch (25 mm). If extensive vegetation exists, treat the specific area with a concentrated solution of a water-based herbicide approved by the RPR. Fill all cracks

greater than 1/4 inch (6 mm) wide) with a crack sealant per ASTM D6690. The crack sealant, preparation, and application shall be compatible with the surface treatment/overlay to be used. To minimize contamination of the asphalt with the crack sealant, underfill the crack sealant a minimum of 1/8 inch (3 mm), not to exceed ¼ inch (6 mm). Any excess joint or crack sealer shall be removed from the pavement surface.

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

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

Gradation

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

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

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

101-3.3 Removal of Foreign Substances/contaminates prior to remarking. Removal of foreign substances/contaminates from existing pavement that will affect the bond of the new treatment shall consist of removal of rubber, fuel spills, oil, crack sealer, at least 90% of paint, and other foreign substances from the surface of the pavement. Areas that require removal are designated on the plans and as directed by the RPR in the field during construction.

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

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

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

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

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

101-3.5 Cold milling. Milling shall be performed with a power-operated milling machine or grinder, capable of producing a uniform finished surface. The milling machine or grinder shall operate without tearing or gouging the underlaying surface. The milling machine or grinder shall be equipped with grade and slope controls, and a positive means of dust control. All millings shall be removed and disposed in areas designated on the plans. If the Contractor mills or grinds deeper or wider than the plans specify, the Contractor shall replace the material removed with new material at the Contractor’s Expense.

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

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

c. Clean-up. The Contractor shall sweep the milled surface daily and immediately after the milling until all residual materials are removed from the pavement surface. Prior to paving, the Contractor shall wet down the milled pavement and thoroughly sweep and/or blow the surface to remove loose residual material. Waste materials shall be collected and removed from the pavement surface and adjacent areas by sweeping or vacuuming. Waste materials shall be removed and disposed of off Airport property.

101-3.6. Preparation of asphalt pavement surfaces prior to surface treatment. Existing asphalt pavements to be treated with a surface treatment shall be prepared as follows:

a. Patch asphalt pavement surfaces that have been softened by petroleum derivatives or have failed due to any other cause. Remove damaged pavement to the full depth of the damage and replace with new asphalt pavement similar to that of the existing pavement in accordance with paragraph 101-3.4b.

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

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

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

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

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

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

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

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

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

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

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

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

101-3.9.4 Removal of Pipe and other Buried Structures.

a. Removal of Existing Pipe Material. Remove the types of pipe as indicated on the plans. The pipe material shall be legally disposed of off-site in a timely manner following removal. Trenches shall be backfilled with material equal to or better in quality than adjacent embankment. Trenches under paved areas must be compacted to 95% of ASTM D1557.

b. Removal of Inlets/Manholes. Where indicated on the plans or as directed by the RPR, inlets and/or manholes shall be removed and legally disposed of off-site in a timely fashion after removal. Excavations after removal shall be backfilled with material equal or better in quality than adjacent embankment. When under paved areas must be compacted to 95% of ASTM D1557, when outside of paved areas must be compacted to 95% of ASTM D1557.

METHOD OF MEASUREMENT

101-4.1 Profile Cold Milling (Pavement Removal). The unit of measurement for pavement removal shall be the number of square yards (square meters) removed by the Contractor by milling. Any pavement removed outside the limits of removal because the pavement was damaged by negligence on the part of the Contractor shall not be included in the measurement for payment. No direct measurement or payment shall be made for saw cutting. Saw cutting shall be incidental to pavement removal.

101-4.2 Miscellaneous Cold Milling. The unit of measure for cold milling shall be measured as the number of square yards, to the nearest whole square yard, milled for the construction of pavement joints as specified on the plans. The location and average depth of the cold milling shall be as shown on the plans.

101-4.3 Joint and Crack Repairs, Type 1. The unit of measurement for Type 1 joint and crack repair shall be measured as the number of linear feet to the nearest whole linear foot of Type I Pavement Repairs completed and accepted in place.

101-4.4 Joint and Crack repairs, Type 2. The unit of measurement for Type 2 Pavement Repairs shall be measured as the number of linear feet to the nearest whole linear foot of Type 2 Pavement Repairs completed and accepted in place.

101-4.5 Paint and Rubber Removal. The unit of measurement for Paint and Rubber Removal shall be measured as the number of linear feet to the nearest whole square foot of paint and/or rubber removed per the plans.

BASIS OF PAYMENT

101-5.1 Payment. Payment shall be made at contract unit price for the unit of measurement as specified above. This price shall be full compensation for furnishing all materials and for all preparation, hauling, and placing of the material and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

Item	Description	Unit
P-101-1	Profile Cold Milling	Square Yard
P-101-3	Miscellaneous Cold Milling	Square Yard
P-101-4	Joint and Crack Repair, Type 1	Linear Foot
P-101-5	Joint and Crack Repair, Type 2	Linear Foot
P-101-6	Paint and Rubber Removal	Square Foot

REFERENCES

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

Advisory Circulars (AC)

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

ASTM International (ASTM)

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

END OF ITEM P-101

Item P-152 Excavation, Subgrade, and Embankment

DESCRIPTION

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

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

a. Unclassified excavation. Unclassified excavation shall consist of the excavation and disposal of all material, regardless of its nature.

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

CONSTRUCTION METHODS

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

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

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

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

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

a. Blasting. Blasting shall not be allowed.

152-2.2 Excavation. No excavation shall be started until the work has been staked out by the Contractor and the RPR has obtained from the Contractor, the survey notes of the elevations and measurements of

the ground surface. The Contractor and RPR shall agree that the original ground lines shown on the original topographic mapping are accurate, or agree to any adjustments made to the original ground lines.

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

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

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

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

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

b. Undercutting. Rock, shale, hardpan, loose rock, boulders, or other material unsatisfactory for safety areas, subgrades, roads, shoulders, or any areas intended for turf shall be excavated to a minimum depth of 12 inches (300 mm) below the subgrade or to the depth specified by the RPR. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be disposed of at locations shown on the plans. This excavated material shall be paid for under item P-152-4 Undercut Excavation and Backfill. The excavated area shall be backfilled with suitable material obtained from the grading operations or borrow areas and compacted to specified densities. The necessary backfill will constitute a part of the embankment. Where rock cuts are made, backfill with select material. Any pockets created in the rock surface shall be drained in accordance with the details shown on the plans. Undercutting will be paid as Item P-152-4 Undercut Excavation and Backfill.

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

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

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

152-2.4 Drainage excavation. Drainage excavation shall consist of excavating drainage ditches including intercepting, inlet, or outlet ditches; or other types as shown on the plans. The work shall be performed in sequence with the other construction. Ditches shall be constructed prior to starting adjacent excavation operations. All satisfactory material shall be placed in embankment fills; unsuitable material shall be

placed in designated waste areas or as directed by the RPR. All necessary work shall be performed true to final line, elevation, and cross-section. The Contractor shall maintain ditches constructed on the project to the required cross-section and shall keep them free of debris or obstructions until the project is accepted.

152-2.5 Preparation of cut areas or areas where existing pavement has been removed. In those areas on which a subbase or base course is to be placed, the top 12 inches of subgrade shall be compacted to not less than 95% of maximum density for non-cohesive soils, and 90% of maximum density for cohesive soils as determined by ASTM D1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Rolling operations shall be continued until the embankment is compacted to not less than 100% of maximum density for non-cohesive soils, and 95% of maximum density for cohesive soils as determined by ASTM D1557. Under all areas to be paved, the embankments shall be compacted to a depth of 22 inches and to a density of not less than 95% percent of the maximum density as determined by ASTM D1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

On all areas outside of the pavement areas, no compaction will be required on the top 3 inches which shall be prepared for a seedbed in accordance with item T-901.

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

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

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

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

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

spalls and finer fragments of rock. The lift shall not be constructed above an elevation 4 feet (1.2 m) below the finished subgrade.

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

152-2.9 Proof rolling. The purpose of proof rolling the subgrade is to identify any weak areas in the subgrade and not for compaction of the subgrade. Before start of embankment, the subgrade area shall be proof rolled with a 20 ton Tandem axle Dual Wheel Dump Truck loaded to the legal limit with tires inflated to 80/100/150 psi in the presence of the RPR. Apply a minimum of 100% coverage, or as specified by the RPR, under pavement areas. A coverage is defined as the application of one tire print over the designated area. Soft areas of subgrade that deflect more than 1 inch (25 mm) or show permanent deformation greater than 1 inch (25 mm) shall be removed and replaced with suitable material or reworked to conform to the moisture content and compaction requirements in accordance with these specifications. Removal and replacement of soft areas is incidental to this item.

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

The material to be compacted shall be within ±2% of optimum moisture content before being rolled to obtain the prescribed compaction (except for expansive soils). When the material has greater than 30 percent retained on the ¾ inch (19.0 mm) sieve, follow the methods in ASTM D1557**.** Tests for moisture content and compaction will be taken at a minimum of 2,000 S.Y. of subgrade. All quality assurance testing shall be done by the Contractor's laboratory in the presence of the RPR, and density test results shall be furnished upon completion to the RPR for acceptance determination.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

METHOD OF MEASUREMENT

152-3.1 General. Measurement for payment specified by the cubic yard (cubic meter) shall be computed by the average end areas of design cross sections for computation of neat line design quantities. The end area is that bound by the original ground line established by field cross-sections and the final theoretical pay line established by cross-sections shown on the plans, subject to verification by the RPR.

152-3.2 Unclassified Excavation. The quantity of Unclassified Excavation to be paid for shall be the number of cubic yards (cubic meters) measured in its original position. Measurement shall not include the

quantity of materials excavated without authorization beyond normal slope lines, or the quantity of material used for purposes other than those directed.

152-3.3 Embankment in Place. The quantity of embankment in place to be paid for shall be the number of cubic yards (cubic meters) measured in its final, compacted position. Measurement shall not include the quantity of materials placed beyond normal slope lines, or the quantity of material used for purposes other than those directed.

152-3.4 Undercut Excavation and Backfill. The quantity of Undercut Excavation and Backfill to be paid for shall be the number of cubic yards (cubic meters) measured in its original position. Measurement shall not include the quantity of materials excavated without authorization beyond normal slope lines, or the quantity or material used for purposes other than those directed.

BASIS OF PAYMENT

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

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

152-4.3 Undercut Excavation and Backfill. "Undercut excavation and backfill" payment shall be made at the contract unit price per cubic yard (cubic meter). This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item	Description	Unit
P-152-1	Unclassified Excavation	Cubic Yard
P-152-2	Embankment in Place	Cubic Yard
P-152-4	Undercut Excavation and Backfill	Cubic Yard

REFERENCES

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

American Association of State Highway and Transportation Officials (AASHTO)

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

ASTM International (ASTM)

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

Advisory Circulars (AC)

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

Software

FAARFIELD – FAA Rigid and Flexible Iterative Elastic Layered Design

U.S. Department of Transportation

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

END OF ITEM P-152

Item P-153 Controlled Low-Strength Material (CLSM)

DESCRIPTION

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

MATERIALS

153-2.1 Materials.

a. Cement. Cement shall conform to the requirements of ASTM C150 Type 1.

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

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

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

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

MIX DESIGN

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

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

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

CONSTRUCTION METHODS

153-4.1 Placement.

a. Placement. CLSM may be placed by any reasonable means from the mixing unit into the space to be filled. Agitation is required during transportation and waiting time. Placement shall be performed so structures or pipes are not displaced from their final position and intrusion of CLSM into unwanted areas is avoided. The material shall be brought up uniformly to the fill line shown on the plans or as directed by the RPR. Each placement of CLSM shall be as continuous an operation as possible. If CLSM is placed in more than one lift, the base lift shall be free of surface water and loose foreign material prior to placement of the next lift.

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

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

153-4.2 Curing and protection

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

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

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

METHOD OF MEASUREMENT

153-5.1 Measurement.

Controlled low-strength material (CLSM) shall be measured by the number of cubic yards as specified, completed, and accepted.

BASIS OF PAYMENT

153-6.1 Payment.

Controlled low-strength material (CLSM) shall be paid for at the contract unit price per cubic yard. Payment shall be full compensation for all materials, equipment, labor, and incidentals required to complete the work as specified.

Payment will be made under:

Item	Description	Unit
P-153-1	Controlled Low-Strength Material (CLSM)	Cubic Yard

REFERENCES

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

ASTM International (ASTM)

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

Item P-209 Crushed Aggregate Base Course

DESCRIPTION

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

MATERIALS

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

Crushed Aggregate Base Material Requirements

Material Test	Requirement	Standard
Coarse Aggregate		
Resistance to Degradation	Loss: 45% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Percentage of Fractured Particles	Minimum 90% by weight of particles with at least two fractured faces and 98% with at least one fractured face[1]	ASTM D5821
Flat Particles, Elongated Particles, or Flat and Elongated Particles	10% maximum, by weight, of flat, elongated, or flat and elongated particles [2]	ASTM D4791
Bulk density of slag	Weigh not less than 70 pounds per cubic foot (1.12 Mg/cubic meter)	ASTM C29
Clay lumps and friable particles	Less than or equal to 3 percent	ASTM C142
Fine Aggregate		
Liquid limit	Less than or equal to 25	ASTM D4318
Plasticity Index	Not more than five (5)	ASTM D4318

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

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

209-2.2 Gradation requirements. The gradation of the aggregate base material shall meet the requirements of the gradation given in the following table when tested per ASTM C117 and ASTM C136. The gradation shall be well graded from coarse to fine and shall not vary from the lower limit on one sieve to the high limit on an adjacent sieve or vice versa.

Gradation of Aggregate Base

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

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

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

209-2.3 Sampling and Testing.

a. General. After a stockpile has been sampled, it shall not be modified, moved, or reshaped. Material shall not be added to a stockpile after sampling. If material is added after the stockpile has been sampled, or the stockpile is otherwise tampered with, the Engineer will declare the stockpile rejected and it shall be disposed of. Material from a rejected or expired stockpile may be disposed of or may be used in the construction of another stockpile provided no portion of the new stockpile overlaps the location of the existing stockpile.

All required material tests shall be valid for a period of twelve (12) months. Should the contract work take place during multiple construction seasons, the Engineer, at his/her discretion, may request re-sampling and re-testing of the material.

All stockpiles will expire two years from the date of acceptance. After the expiration date, the stockpile shall be disposed of in accordance with paragraph 209-2.3a.

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

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

209-2.4 Separation Geotextile. Refer to Specification P-100 for separation geotextile requirements.

CONSTRUCTION METHODS

209-3.1 Control strip. The first half-day of construction shall be considered the control strip. The Contractor shall demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of the specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. The maximum compacted thickness may be increased to a maximum of 12 inches (300 mm) upon the Contractor's demonstration that approved equipment and operations will uniformly compact the lift to the specified density. The RPR must witness this demonstration and approve the lift thickness prior to full production.

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

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

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

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

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

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

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

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

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

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

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

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

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

209-3.9 Acceptance sampling and testing. Crushed aggregate base course shall be accepted for density and thickness on an area basis. Two tests shall be made for density and thickness for each 1200 square yds (1000 m^2.) Sampling locations will be determined on a random basis per ASTM D3665.

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

Each area shall be accepted for density when the field density is at least 100% of the maximum density of laboratory specimens compacted and tested per ASTM D1557. The in-place field density shall be determined per ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938. If the specified density is not attained, the area represented by the failed test must be reworked and/or recompacted and two additional random tests made. This procedure shall be followed until the specified density is reached. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

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

METHOD OF MEASUREMENT

209-4.1 The quantity of crushed aggregate base course will be determined by measurement of the number of cubic yards (cubic meters) of material actually constructed and accepted by the RPR as complying with the plans and specifications. The quantity of crushed aggregate base course shall be measured in its final position based upon the depth specified multiplied by the surface area. Base materials shall not be included in any other excavation quantities. Crushed aggregate base course placed in areas outside those indicated without authorization will not be measured for payment.

BASIS OF PAYMENT

209-5.1 Payment shall be made at the contract unit price per cubic yard (cubic meter) for crushed aggregate base course. This price shall be full compensation for furnishing all materials, for preparing and placing these materials, and for all labor, equipment tools, and incidentals necessary to complete the item.

Payment will be made under:

Item	Description	Unit
P-209-1	Crushed Aggregate Base Course	Cubic Yard

REFERENCES

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

ASTM International (ASTM)

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

ASTM D2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4643	Standard Test Method for Determination of Water Content of Soil and Rock by Microwave Oven Heating
ASTM D4751	Standard Test Methods for Determining Apparent Opening Size of a Geotextile
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM D7928	Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis

American Association of State Highway and Transportation Officials (AASHTO)

M288	Standard Specification for Geosynthetic Specification for Highway Applications

END OF ITEM P-209

Item P-401 Asphalt Mix Pavement

DESCRIPTION

401-1.1 This item shall consist of pavement courses composed of mineral aggregate and asphalt binder mixed in a central mixing plant and placed on a prepared base or stabilized course in accordance with these specifications and shall conform to the lines, grades, thicknesses, and typical cross-sections shown on the plans. Each course shall be constructed to the depth, typical section, and elevation required by the plans and shall be rolled, finished, and approved before the placement of the next course.

MATERIALS

401-2.1 Aggregate. Aggregates shall consist of crushed stone, crushed gravel, crushed slag, screenings, natural sand, and mineral filler, as required. The aggregates should have no known history of detrimental pavement staining due to ferrous sulfides, such as pyrite. Coarse aggregate is the material retained on the No. 4 (4.75 mm) sieve. Fine aggregate is the material passing the No. 4 (4.75 mm) sieve.

a. Coarse aggregate. Coarse aggregate shall consist of sound, tough, durable particles, free from films of matter that would prevent thorough coating and bonding with the asphalt material and free from organic matter and other deleterious substances. Coarse aggregate material requirements are given in the table below.

Coarse Aggregate Material Requirements

Material Test	Requirement	Standard
Resistance to Degradation	Loss: 40% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Clay lumps and friable particles	1.0 % maximum	ASTM C142
Percentage of Fractured Particles	For pavements designed for aircraft gross weights of 60,000 pounds (27200 kg) or more: Minimum 75% by weight of particles with at least two fractured faces and 85% with at least one fractured face[1]	ASTM D5821
	For pavements designed for aircraft gross weights less than 60,000 pounds (27200 kg): Minimum 50% by weight of particles with at least two fractured faces and 65% with at least one fractured face[1]	
Flat, Elongated, or Flat and Elongated Particles	8% maximum, by weight, of flat, elongated, or flat and elongated particles at 5:1 [2]	ASTM D4791
Bulk density of slag [3]	Weigh not less than 70 pounds per cubic foot (1.12 Mg/cubic meter)	ASTM C29.

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

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

[3] Only required if slag is specified.

b. Fine aggregate. Fine aggregate shall consist of clean, sound, tough, durable, angular shaped particles produced by crushing stone, slag, or gravel and shall be free from coatings of clay, silt, or other objectionable matter. Natural (non-manufactured) sand may be used to obtain the gradation of the fine aggregate blend or to improve the workability of the mix. Fine aggregate material requirements are listed in the table below.

Fine Aggregate Material Requirements

Material Test	Requirement	Standard
Liquid limit	25 maximum	ASTM D4318
Plasticity Index	4 maximum	ASTM D4318
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 10% maximum using Sodium sulfate - or - 15% maximum using magnesium sulfate	ASTM C88
Clay lumps and friable particles	1.0% maximum	ASTM C142
Sand equivalent	45 minimum	ASTM D2419

c. Sampling. ASTM D75 shall be used in sampling coarse and fine aggregate.

401-2.2 Mineral filler. Mineral filler (baghouse fines) may be added in addition to material naturally present in the aggregate. Mineral filler shall meet the requirements of ASTM D242.

Mineral Filler Requirements

Material Test	Requirement	Standard
Plasticity Index	4 maximum	ASTM D4318

401-2.3 Asphalt binder. Asphalt binder shall conform to ASTM D6373 Performance Grade (PG) 76-22 for surface course and 64-22 (min) for the binder course. 76-22 may be used for the binder course as well, at the Contractor's discretion.

401-2.4 Anti-stripping agent. Any anti-stripping agent or additive (anti-strip) shall be heat stable and shall not change the asphalt binder grade beyond specifications. Anti-strip shall be an approved material of the Department of Transportation of the State in which the project is located.

COMPOSITION

401-3.1 Composition of mixture(s). The asphalt mix shall be composed of a mixture of aggregates, filler and anti-strip agent if required, and asphalt binder. The aggregate fractions shall be sized, handled in separate size groups, and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula (JMF).

401-3.2 Job mix formula (JMF) laboratory. The laboratory used to develop the JMF shall possess a current certificate of accreditation, listing D3666 from a national accrediting authority and all test methods required for developing the JMF; and be listed on the accrediting authority's website. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the Resident Project Representative (RPR) prior to start of construction.

401-3.3 Job mix formula (JMF). No asphalt mixture shall be placed until an acceptable mix design has been submitted to the RPR for review and accepted in writing. The RPR's review shall not relieve the Contractor of the responsibility to select and proportion the materials to comply with this section.

When the project requires asphalt mixtures of differing aggregate gradations and/or binders, a separate JMF shall be submitted for each mix. Add anti-stripping agent to meet tensile strength requirements.

The JMF shall be prepared by an accredited laboratory that meets the requirements of paragraph 401-3.2. The asphalt mixture shall be designed using procedures contained in Asphalt Institute MS-2 Mix Design Manual, 7th Edition**.** Samples shall be prepared and compacted using the gyratory compactor in accordance with ASTM D6925.

Should a change in sources of materials be made, a new JMF must be submitted to the RPR for review and accepted in writing before the new material is used. After the initial production JMF has been approved by the RPR and a new or modified JMF is required for whatever reason, the subsequent cost of the new or modified JMF, including a new control strip when required by the RPR, will be borne by the Contractor.

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

The JMF shall be submitted in writing by the Contractor at least 30 days prior to the start of paving operations. The JMF shall be developed within the same construction season using aggregates proposed for project use.

The JMF shall be dated, and stamped or sealed by the responsible professional Engineer of the laboratory and shall include the following items as a minimum:

- Manufacturer's Certificate of Analysis (COA) for the asphalt binder used in the JMF in accordance with paragraph 401-2.3. Certificate of asphalt performance grade is with modifier already added, if used and must indicate compliance with ASTM D6373. For plant modified asphalt binder, certified test report indicating grade certification of modified asphalt binder.
- Manufacturer's Certificate of Analysis (COA) for the anti-stripping agent if used in the JMF in accordance with paragraph 401-2.4.
- Certified material test reports for the course and fine aggregate and mineral filler in accordance with paragraphs 401-2.1.
- Percent passing each sieve size for individual gradation of each aggregate cold feed and/or hot bin; percent by weight of each cold feed and/or hot bin used; and the total combined gradation in the JMF.
- Specific Gravity and absorption of each coarse and fine aggregate.
- Percent natural sand.
- Percent fractured faces.
- Percent by weight of flat particles, elongated particles, and flat and elongated particles (and criteria).
- Percent of asphalt.
- Number of blows or gyrations
- Laboratory mixing and compaction temperatures.
- Supplier-recommended field mixing and compaction temperatures.
- Plot of the combined gradation on a 0.45 power gradation curve.
- Graphical plots of air voids, voids in the mineral aggregate (VMA), and unit weight versus asphalt content. To achieve minimum VMA during production, the mix design needs to account for material breakdown during production.
- Tensile Strength Ratio (TSR).

- Type and amount of Anti-strip agent when used.
- Asphalt Pavement Analyzer (APA) results.
- Date the JMF was developed. Mix designs that are not dated or which are from a prior construction season shall not be accepted.

Table 1. Asphalt Design Criteria

Test Property	Value	Test Method
Number of blows or gyrations	75	
Air voids (%)	3.5	ASTM D3203
Percent voids in mineral aggregate (VMA), minimum	See Table 2	ASTM D6995
Tensile Strength Ratio (TSR)[1]	not less than 80 at a saturation of 70-80%	ASTM D4867
Asphalt Pavement Analyzer (APA)[2,3]	Less than 10 mm @ 4000 passes	AASHTO T340 at 250 psi hose pressure at 64°C test temperature

[1] Test specimens for TSR shall be compacted at 7 ± 1.0 % air voids. In areas subject to freeze-thaw, use freeze-thaw conditioning in lieu of moisture conditioning per ASTM D4867.

[2] AASHTO T340 at 100 psi hose pressure at 64°C test temperature may be used in the interim. If this method is used the required Value shall be less than 5 mm @ 8000 passes

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

The mineral aggregate shall be of such size that the percentage composition by weight, as determined by laboratory sieves, will conform to the gradation or gradations specified in Table 2 when tested in accordance with ASTM C136 and ASTM C117.

The gradations in Table 2 represent the limits that shall determine the suitability of aggregate for use from the sources of supply; be well graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve, or vice versa.

Table 2. Aggregate - Asphalt Pavements

Sieve Size	Percentage by Weight Passing Sieve	
	Gradation 1	**Gradation 2**
1 inch (25.0 mm)	100	--
3/4 inch (19.0 mm)	90-100	100
1/2 inch (12.5 mm)	68-88	90-100
3/8 inch (9.5 mm)	60-82	72-88
No. 4 (4.75 mm)	45-67	53-73
No. 8 (2.36 mm)	32-54	38-60
No. 16 (1.18 mm)	22-44	26-48
No. 30 (600 µm)	15-35	18-38
No. 50 (300 µm)	9-25	11-27
No. 100 (150 µm)	6-18	6-18
No. 200 (75 µm)	3-6	3-6
Minimum Voids in Mineral Aggregate (VMA)[1]	14.0	15.0
Asphalt percent by total weight of mixture:		
Stone or gravel	4.5-7.0	5.0-7.5
Slag	5.0-7.5	6.5-9.5
Recommended Minimum Construction Lift Thickness	3 inch	2 inch

[1]To achieve minimum VMA during production, the mix design needs to account for material breakdown during production.

The aggregate gradations shown are based on aggregates of uniform specific gravity. The percentages passing the various sieves shall be corrected when aggregates of varying specific gravities are used, as indicated in the Asphalt Institute MS-2 Mix Design Manual, 7th Edition.

401-3.4 Reclaimed asphalt pavement (RAP). RAP shall not be used.

401-3.5 Control Strip. Full production shall not begin until an acceptable control strip has been constructed and accepted in writing by the RPR**.** The Contractor shall prepare and place a quantity of asphalt according to the JMF. The underlying grade or pavement structure upon which the control strip is to be constructed shall be the same as the remainder of the course represented by the control strip.

The Contractor will not be allowed to place the control strip until the Contractor quality control program (CQCP), showing conformance with the requirements of paragraph 401-5.1, has been accepted, in writing, by the RPR.

The control strip will consist of at least 250 tons (227 metric tons) or 1/2 sublot, whichever is greater. The control strip shall be placed in two lanes of the same width and depth to be used in production with a longitudinal cold joint. The cold joint must be cut back in accordance with paragraph 401-4.14 using the same procedure that will be used during production. The cold joint for the control strip will be an exposed construction joint at least four (4) hours old or when the mat has cooled to less than 160°F (71°C). The

equipment used in construction of the control strip shall be the same type, configuration and weight to be used on the project.

The control strip will be considered acceptable by the RPR if the gradation, asphalt content, and VMA are within the action limits specified in paragraph 401-5.5a; and Mat density greater than or equal to 94.5%, air voids 3.5% +/- 1%, and joint density greater than or equal to 92.5%.

If the control strip is unacceptable, necessary adjustments to the JMF, plant operation, placing procedures, and/or rolling procedures shall be made and another control strip shall be placed. Unacceptable control strips shall be removed at the Contractor's expense.

The control strip will be considered one lot for payment based upon the average of a minimum of 3 samples (no sublots required for control strip). Payment will only be made for an acceptable control strip in accordance with paragraph 401-8.1 using a lot pay factor equal to 100.

CONSTRUCTION METHODS

401-4.1 Weather limitations. The asphalt shall not be placed upon a wet surface or when the surface temperature of the underlying course is less than specified in Table 4. The temperature requirements may be waived by the RPR, if requested; however, all other requirements including compaction shall be met.

Table 4. Surface Temperature Limitations of Underlying Course

Mat Thickness	Base Temperature (Minimum)	
	°F	°C
3 inches (7.5 cm) or greater	40 [1]	4
Greater than 2 inches (50 mm) but less than 3 inches (7.5 cm)	45	7

401-4.2 Asphalt plant. Plants used for the preparation of asphalt shall conform to the requirements of American Association of State Highway and Transportation Officials (AASHTO) M156 including the following items.

a. Inspection of plant. The RPR, or RPR's authorized representative, shall have access, at all times, to all areas of the plant for checking adequacy of equipment; inspecting operation of the plant: verifying weights, proportions, and material properties; and checking the temperatures maintained in the preparation of the mixtures.

b. Storage bins and surge bins. The asphalt mixture stored in storage and/or surge bins shall meet the same requirements as asphalt mixture loaded directly into trucks. Asphalt mixture shall not be stored in storage and/or surge bins for a period greater than twelve (12) hours. If the RPR determines there is an excessive heat loss, segregation, or oxidation of the asphalt mixture due to temporary storage, temporary storage shall not be allowed.

401-4.3 Aggregate stockpile management. Aggregate stockpiles shall be constructed in a manner that prevents segregation and intermixing of deleterious materials. Aggregates from different sources shall be stockpiled, weighed and batched separately at the asphalt batch plant. Aggregates that have become segregated or mixed with earth or foreign material shall not be used.

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

401-4.4 Hauling equipment. Trucks used for hauling asphalt shall have tight, clean, and smooth metal beds. To prevent the asphalt from sticking to the truck beds, the truck beds shall be lightly coated with a

minimum amount of paraffin oil, lime solution, or other material approved by the RPR. Petroleum products shall not be used for coating truck beds. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary, to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers shall be securely fastened.

401-4.4.1 Material transfer vehicle (MTV). Material transfer vehicles used to transfer the material from the hauling equipment to the paver, shall use a self-propelled, material transfer vehicle with a swing conveyor that can deliver material to the paver without making contact with the paver. The MTV shall be able to move back and forth between the hauling equipment and the paver providing material transfer to the paver, while allowing the paver to operate at a constant speed. The Material Transfer Vehicle will have remixing and storage capability to prevent physical and thermal segregation.

401-4.5 Asphalt pavers. Asphalt pavers shall be self-propelled with an activated heated screed, capable of spreading and finishing courses of asphalt that will meet the specified thickness, smoothness, and grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface. The asphalt paver shall be equipped with a control system capable of automatically maintaining the specified screed grade and elevation.

If the spreading and finishing equipment in use leaves tracks or indented areas, or produces other blemishes in the pavement that are not satisfactorily corrected by the scheduled operations, the use of such equipment shall be discontinued.

The paver shall be capable of paving to a minimum width specified in paragraph 401-4.12.

401-4.6 Rollers. The number, type, and weight of rollers shall be sufficient to compact the asphalt to the required density while it is still in a workable condition without crushing of the aggregate, depressions or other damage to the pavement surface. Rollers shall be in good condition, clean, and capable of operating at slow speeds to avoid displacement of the asphalt. All rollers shall be specifically designed and suitable for compacting asphalt concrete and shall be properly used. Rollers that impair the stability of any layer of a pavement structure or underlying soils shall not be used.

401-4.7 Density device. The Contractor shall have on site a density gauge during all paving operations in order to assist in the determination of the optimum rolling pattern, type of roller and frequencies, as well as to monitor the effect of the rolling operations during production paving. The Contractor shall supply a qualified technician during all paving operations to calibrate the gauge and obtain accurate density readings for all new asphalt. These densities shall be supplied to the RPR upon request at any time during construction. No separate payment will be made for supplying the density gauge and technician.

401-4.8 Preparation of asphalt binder. The asphalt binder shall be heated in a manner that will avoid local overheating and provide a continuous supply of the asphalt binder to the mixer at a uniform temperature. The temperature of unmodified asphalt binder delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles, but shall not exceed 325°F (160°C) when added to the aggregate. The temperature of modified asphalt binder shall be no more than 350°F (175°C) when added to the aggregate.

401-4.9 Preparation of mineral aggregate. The aggregate for the asphalt shall be heated and dried. The maximum temperature and rate of heating shall be such that no damage occurs to the aggregates. The temperature of the aggregate and mineral filler shall not exceed 350°F (175°C) when the asphalt binder is added. Particular care shall be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

401-4.10 Preparation of Asphalt mixture. The aggregates and the asphalt binder shall be weighed or metered and mixed in the amount specified by the JMF. The combined materials shall be mixed until the aggregate obtains a uniform coating of asphalt binder and is thoroughly distributed throughout the

mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but not less than 25 seconds for batch plants. The wet mixing time for all plants shall be established by the Contractor, based on the procedure for determining the percentage of coated particles described in ASTM D2489, for each individual plant and for each type of aggregate used. The wet mixing time will be set to achieve 95% of coated particles. For continuous mix plants, the minimum mixing time shall be determined by dividing the weight of its contents at operating level by the weight of the mixture delivered per second by the mixer. The moisture content of all asphalt upon discharge shall not exceed 0.5%.

401-4.11 Application of Prime and Tack Coat. Immediately before placing the asphalt mixture, the underlying course shall be cleaned of all dust and debris.

A tack coat shall be applied in accordance with Item P-603 to all vertical and horizontal asphalt and concrete surfaces prior to placement of the first and each subsequent lift of asphalt mixture.

401-4.12 Laydown plan, transporting, placing, and finishing. Prior to the placement of the asphalt, the Contractor shall prepare a laydown plan with the sequence of paving lanes and width to minimize the number of cold joints; the location of any temporary ramps; laydown temperature; and estimated time of completion for each portion of the work (milling, paving, rolling, cooling, etc.). The laydown plan and any modifications shall be approved by the RPR.

Deliveries shall be scheduled so that placing and compacting of asphalt is uniform with minimum stopping and starting of the paver. Hauling over freshly placed material shall not be permitted until the material has been compacted, as specified, and allowed to cool to approximately ambient temperature. The Contractor, at their expense, shall be responsible for repair of any damage to the pavement caused by hauling operations.

Contractor shall survey each lift of asphalt surface course and certify to RPR that every lot of each lift meets the grade tolerances of paragraph 401-6.2d before the next lift can be placed.

Edges of existing asphalt pavement abutting the new work shall be saw cut and the cut off material and laitance removed. Apply a tack coat in accordance with P-603 before new asphalt material is placed against it.

The speed of the paver shall be regulated to eliminate pulling and tearing of the asphalt mat. Placement of the asphalt mix shall begin along the centerline of a crowned section or on the high side of areas with a one way slope unless shown otherwise on the laydown plan as accepted by the RPR. The asphalt mix shall be placed in consecutive adjacent lanes having a minimum width of 18 feet (m) except where edge lanes require less width to complete the area. Additional screed sections attached to widen the paver to meet the minimum lane width requirements must include additional auger sections to move the asphalt mixture uniformly along the screed extension.

The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least one foot (30 cm); however, the joint in the surface top course shall be at the centerline of crowned pavements. Transverse joints in one course shall be offset by at least 10 feet (3 m) from transverse joints in the previous course. Transverse joints in adjacent lanes shall be offset a minimum of 10 feet (3 m).On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the asphalt may be spread and luted by hand tools.

The RPR may at any time, reject any batch of asphalt, on the truck or placed in the mat, which is rendered unfit for use due to contamination, segregation, incomplete coating of aggregate, or overheated asphalt mixture. Such rejection may be based on only visual inspection or temperature measurements. In the event of such rejection, the Contractor may take a representative sample of the rejected material in the presence of the RPR, and if it can be demonstrated in the laboratory, in the presence of the RPR, that such material was erroneously rejected, payment will be made for the material at the contract unit price.

Areas of segregation in the surface course, as determined by the RPR, shall be removed and replaced at the Contractor's expense. The area shall be removed by saw cutting and milling a minimum of the construction lift thickness as specified in paragraph 401-3.3, Table 2 for the approved mix design. The area to be removed and replaced shall be a minimum width of the paver and a minimum of 10 feet (3 m) long.

401-4.13 Compaction of asphalt mixture. After placing, the asphalt mixture shall be thoroughly and uniformly compacted by self-propelled rollers. The surface shall be compacted as soon as possible when the asphalt has attained sufficient stability so that the rolling does not cause undue displacement, cracking or shoving. The sequence of rolling operations and the type of rollers used shall be at the discretion of the Contractor. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Any surface defects and/or displacement occurring as a result of the roller, or from any other cause, shall be corrected at the Contractor's expense.

Sufficient rollers shall be furnished to handle the output of the plant. Rolling shall continue until the surface is of uniform texture, true to grade and cross-section, and the required field density is obtained. To prevent adhesion of the asphalt to the roller, the wheels shall be equipped with a scraper and kept moistened with water as necessary.

In areas not accessible to the roller, the mixture shall be thoroughly compacted with approved power tampers.

Any asphalt that becomes loose and broken, mixed with dirt, contains check-cracking, or in any way defective shall be removed and replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at the Contractor's expense. Skin patching shall not be allowed.

401-4.14 Joints. The formation of all joints shall be made to ensure a continuous bond between the courses and obtain the required density. All joints shall have the same texture as other sections of the course and meet the requirements for smoothness and grade.

The roller shall not pass over the unprotected end of the freshly laid asphalt except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course. The tapered edge shall be cut back to its full depth and width on a straight line to expose a vertical face prior to placing the adjacent lane. In both methods, all contact surfaces shall be coated with an asphalt tack coat before placing any fresh asphalt against the joint.

Longitudinal joints which have been left exposed for more than four (4) hours; the surface temperature has cooled to less than 175°F (80°C**)**; or are irregular, damaged, uncompacted or otherwise defective shall be cut back with a cutting wheel or pavement saw a maximum of 3 inches (75 mm) to expose a clean, sound, uniform vertical surface for the full depth of the course. All cutback material and any laitance produced from cutting joints shall be removed from the project. Asphalt tack coat in accordance with P-603 shall be applied to the clean, dry joint prior to placing any additional fresh asphalt against the joint. The cost of this work shall be considered incidental to the cost of the asphalt.

401-4.15 Saw-cut grooving. Saw-cut grooves shall be provided as specified in Item P-621.

401-4.16 Diamond grinding. Diamond grinding shall be completed prior to pavement grooving. Diamond grinding shall be accomplished by sawing with saw blades impregnated with industrial diamond abrasive.

Diamond grinding shall be performed with a machine designed specifically for diamond grinding capable of cutting a path at least 3 feet (0.9 m) wide. The saw blades shall be 1/8-inch (3-mm) wide with a sufficient number of blades to create grooves between 0.090 and 0.130 inches (2 and 3.5 mm) wide; and peaks and ridges approximately 1/32 inch (1 mm) higher than the bottom of the grinding cut. The actual number of blades will be determined by the Contractor and depend on the hardness of the aggregate.

Equipment or grinding procedures that cause ravels, aggregate fractures, spalls or disturbance to the pavement will not be permitted. Contractor shall demonstrate to the RPR that the grinding equipment will produce satisfactory results prior to making corrections to surfaces.Grinding will be tapered in all directions to provide smooth transitions to areas not requiring grinding. The slurry resulting from the grinding operation shall be continuously removed and the pavement left in a clean condition. The Contractor shall apply a surface treatment per P-608 to all areas that have been subject to grinding.

401-4.17 Nighttime paving requirements. The Contractor shall provide adequate lighting during any nighttime construction. A lighting plan shall be submitted by the Contractor and approved by the RPR prior to the start of any nighttime work. All work shall be in accordance with the approved CSPP and lighting plan.

CONTRACTOR QUALITY CONTROL (CQC)

401-5.1 General. The Contractor shall develop a Contractor Quality Control Program (CQCP) in accordance with Item C-100. No partial payment will be made for materials without an approved CQCP.

401-5.2 Contractor quality control (QC) facilities. The Contractor shall provide or contract for testing facilities in accordance with Item C-100. The RPR shall be permitted unrestricted access to inspect the Contractor's QC facilities and witness QC activities. The RPR will advise the Contractor in writing of any noted deficiencies concerning the QC facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to be adversely affecting the test results, the incorporation of the materials into the work shall be suspended immediately and will not be permitted to resume until the deficiencies are satisfactorily corrected.

401-5.3 Contractor QC testing. The Contractor shall perform all QC tests necessary to control the production and construction processes applicable to these specifications and as set forth in the approved CQCP. The testing program shall include, but not necessarily be limited to, tests for the control of asphalt content, aggregate gradation, temperatures, aggregate moisture, field compaction, and surface smoothness. A QC Testing Plan shall be developed as part of the CQCP.

a. Asphalt content. A minimum of two tests shall be performed per day in accordance with ASTM D6307 or ASTM D2172 for determination of asphalt content. When using ASTM D6307, the correction factor shall be determined as part of the first test performed at the beginning of plant production; and as part of every tenth test performed thereafter. The asphalt content for the day will be determined by averaging the test results.

b. Gradation. Aggregate gradations shall be determined a minimum of twice per day from mechanical analysis of extracted aggregate in accordance with ASTM D5444, ASTM C136, and ASTM C117.

c. Moisture content of aggregate. The moisture content of aggregate used for production shall be determined a minimum of once per day in accordance with ASTM C566.

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

e. Temperatures. Temperatures shall be checked, at least four times per day, at necessary locations to determine the temperatures of the dryer, the asphalt binder in the storage tank, the asphalt at the plant, and the asphalt at the job site.

f. In-place density monitoring. The Contractor shall conduct any necessary testing to ensure that the specified density is being achieved. A nuclear gauge may be used to monitor the pavement density in accordance with ASTM D2950.

g. Smoothness for Contractor Quality Control.

The Contractor shall perform smoothness testing in transverse and longitudinal directions daily to verify that the construction processes are producing pavement with variances less than ¼ inch in 12 feet, identifying areas that may pond water which could lead to hydroplaning of aircraft. If the smoothness criteria is not met, appropriate changes and corrections to the construction process shall be made by the Contractor before construction continues

The Contractor may use a 12-foot (3.7 m) "straightedge, a rolling inclinometer meeting the requirements of ASTM E2133 or rolling external reference device that can simulate a 12-foot (3.7m) straightedge approved by the RPR. Straight-edge testing shall start with one-half the length of the straightedge at the edge of pavement section being tested and then moved ahead one-half the length of the straightedge for each successive measurement. Testing shall be continuous across all joints. The surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between the two high points. If the rolling inclinometer or external reference device is used, the data may be evaluated using either the FAA profile program, ProFAA, or FHWA ProVal, using the 12-foot straightedge simulation function.

Smoothness readings shall not be made across grade changes or cross slope transitions. The transition between new and existing pavement shall be evaluated separately for conformance with the plans.

(1) Transverse measurements. Transverse measurements shall be taken for each day's production placed. Transverse measurements shall be taken perpendicular to the pavement centerline each 50 feet (15 m) or more often as determined by the RPR. The joint between lanes shall be tested separately to facilitate smoothness between lanes.

(2) Longitudinal measurements. Longitudinal measurements shall be taken for each day's production placed. Longitudinal tests shall be parallel to the centerline of paving; at the center of paving lanes when widths of paving lanes are less than 20 feet (6 m); and at the third points of paving lanes when widths of paving lanes are 20 ft (6 m) or greater. When placement abuts previously placed material the first measurement shall start with one half the length of the straight edge on the previously placed material.

Deviations on the final surface course in either the transverse or longitudinal direction that will trap water greater than 1/4 inch (6 mm) shall be corrected with diamond grinding per paragraph 401-4.16 or by removing and replacing the surface course to full depth. Grinding shall be tapered in all directions to provide smooth transitions to areas not requiring grinding. All areas in which diamond grinding has been performed shall be subject to the final pavement thickness tolerances specified in paragraph 401-6.1d(3). Areas that have been ground shall be sealed with a surface treatment in accordance with Item P-608. To avoid the surface treatment creating any conflict with runway or taxiway markings, it may be necessary to seal a larger area.

Control charts shall be kept to show area of each day's placement and the percentage of corrective grinding required. Corrections to production and placement shall be initiated when corrective grinding is required. If the Contractor's machines and/or methods produce significant areas that need corrective actions in excess of 10 percent of a day's production, production shall be stopped until corrective measures are implemented by the Contractor.

h. Grade. Grade shall be evaluated daily to allow adjustments to paving operations when grade measurements do not meet specifications. As a minimum, grade shall be evaluated prior to and after the placement of the first lift and after placement of the surface lift.

Measurements will be taken at appropriate gradelines (as a minimum at center and edges of paving lane) and longitudinal spacing as shown on cross-sections and plans. The final surface of the pavement will not vary from the gradeline elevations and cross-sections shown on the plans by more than 1/2 inch

(12 mm) vertically and 0.1 feet (30 mm) laterally. The documentation will be provided by the Contractor to the RPR within 24 hours.

Areas with humps or depressions that exceed grade or smoothness criteria and that retain water on the surface must be ground off provided the course thickness after grinding is not more than 1/2 inch (12 mm) less than the thickness specified on the plans. Grinding shall be in accordance with paragraph 401-4.16.

The Contractor shall repair low areas or areas that cannot be corrected by grinding by removal of deficient areas to the depth of the final course plus ½ inch and replacing with new material. Skin patching is not allowed.

401-5.4 Sampling. When directed by the RPR, the Contractor shall sample and test any material that appears inconsistent with similar material being sampled, unless such material is voluntarily removed and replaced or deficiencies corrected by the Contractor. All sampling shall be in accordance with standard procedures specified.

401-5.5 Control charts. The Contractor shall maintain linear control charts for both individual measurements and range (i.e. difference between highest and lowest measurements) for aggregate gradation, asphalt content, and VMA. The VMA for each day will be calculated and monitored by the QC laboratory.

Control charts shall be posted in a location satisfactory to the RPR and kept current. As a minimum, the control charts shall identify the project number, the contract item number, the test number, each test parameter, the Action and Suspension Limits applicable to each test parameter, and the Contractor's test results. The Contractor shall use the control charts as part of a process control system for identifying potential problems and assignable causes before they occur. If the Contractor's projected data during production indicates a problem and the Contractor is not taking satisfactory corrective action, the RPR may suspend production or acceptance of the material.

a. Individual measurements. Control charts for individual measurements shall be established to maintain process control within tolerance for aggregate gradation, asphalt content, and VMA. The control charts shall use the job mix formula target values as indicators of central tendency for the following test parameters with associated Action and Suspension Limits:

Control Chart Limits for Individual Measurements

Sieve	Action Limit	Suspension Limit
3/4 inch (19.0 mm)	±6%	±9%
1/2 inch (12.5 mm)	±6%	±9%
3/8 inch (9.5 mm)	±6%	±9%
No. 4 (4.75 mm)	±6%	±9%
No. 16 (1.18 mm)	±5%	±7.5%
No. 50 (300 µm)	±3%	±4.5%
No. 200 (75 µm)	±2%	±3%
Asphalt Content	±0.45%	±0.70%
Minimum VMA	-0.5%	-1.0%

b. Range. Control charts shall be established to control gradation process variability. The range shall be plotted as the difference between the two test results for each control parameter. The Suspension Limits specified below are based on a sample size of n = 2. Should the Contractor elect to perform more

than two tests per lot, the Suspension Limits shall be adjusted by multiplying the Suspension Limit by 1.18 for n = 3 and by 1.27 for n = 4.

Control Chart Limits Based on Range

Sieve	Suspension Limit
1/2 inch (12.5 mm)	11%
3/8 inch (9.5 mm)	11%
No. 4 (4.75 mm)	11%
No. 16 (1.18 mm)	9%
No. 50 (300 µm)	6%
No. 200 (75 µm)	3.5%
Asphalt Content	0.8%

c. Corrective Action. The CQCP shall indicate that appropriate action shall be taken when the process is believed to be out of tolerance. The Plan shall contain rules to gauge when a process is out of control and detail what action will be taken to bring the process into control. As a minimum, a process shall be deemed out of control and production stopped and corrective action taken, if:

(1) One point falls outside the Suspension Limit line for individual measurements or range; or

(2) Two points in a row fall outside the Action Limit line for individual measurements.

401-5.6 QC reports. The Contractor shall maintain records and shall submit reports of QC activities daily, in accordance with Item C-100.

MATERIAL ACCEPTANCE

401-6.1 Acceptance sampling and testing. Unless otherwise specified, all acceptance sampling and testing necessary to determine conformance with the requirements specified in this section will be performed by the RPR at no cost to the Contractor except that coring as required in this section shall be completed and paid for by the Contractor.

a. Quality assurance (QA) testing laboratory. The QA testing laboratory performing these acceptance tests will be accredited in accordance with ASTM D3666. The QA laboratory accreditation will be current and listed on the accrediting authority's website. All test methods required for acceptance sampling and testing will be listed on the lab accreditation.

b. Lot size. A standard lot will be equal to one day's production divided into approximately equal sublots of between 400 to 600 tons. When only one or two sublots are produced in a day's production, the sublots will be combined with the production lot from the previous or next day.

Where more than one plant is simultaneously producing asphalt for the job, the lot sizes will apply separately for each plant.

c. Asphalt air voids. Plant-produced asphalt will be tested for air voids on a sublot basis.

(1) Sampling. Material from each sublot shall be sampled in accordance with ASTM D3665. Samples shall be taken from material deposited into trucks at the plant or at the job site in accordance with ASTM D979. The sample of asphalt may be put in a covered metal tin and placed in an oven for not less than 30 minutes nor more than 60 minutes to maintain the material at or above the compaction temperature as specified in the JMF.

(2) Testing. Air voids will be determined for each sublot in accordance with ASTM D3203 for a set of three compacted specimens prepared in accordance with ASTM D6925.

d. In-place asphalt mat and joint density. Each sublot will be tested for in-place mat and joint density as a percentage of the theoretical maximum density (TMD).

(1) Sampling. The Contractor will cut minimum 5 inch (125 mm) diameter samples in accordance with ASTM D5361. The Contractor shall furnish all tools, labor, and materials for cleaning, and filling the cored pavement. Laitance produced by the coring operation shall be removed immediately after coring, and core holes shall be filled within one day after sampling in a manner acceptable to the RPR.

(2) Bond. Each lift of asphalt shall be bonded to the underlying layer. If cores reveal that the surface is not bonded, additional cores shall be taken as directed by the RPR to determine the extent of unbonded areas. Unbonded areas shall be removed by milling and replaced at no additional cost as directed by the RPR.

(3) Thickness. Thickness of each lift of surface course will be evaluated by the RPR for compliance to the requirements shown on the plans after any necessary corrections for grade. Measurements of thickness will be made using the cores extracted for each sublot for density measurement. The maximum allowable deficiency at any point will not be more than 1/4 inch (6 mm) less than the thickness indicated for the lift. Average thickness of lift, or combined lifts, will not be less than the indicated thickness. Where the thickness tolerances are not met, the lot or sublot shall be corrected by the Contractor at his expense by removing the deficient area and replacing with new pavement. The Contractor, at his expense, may take additional cores as approved by the RPR to circumscribe the deficient area.

(4) Mat density. One core shall be taken from each sublot. Core locations will be determined by the RPR in accordance with ASTM D3665. Cores for mat density shall not be taken closer than one foot (30 cm) from a transverse or longitudinal joint. The bulk specific gravity of each cored sample will be determined in accordance with ASTM D2726. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each sublot sample by the TMD for that sublot.

(5) Joint density. One core centered over the longitudinal joint shall be taken for each sublot that has a longitudinal joint. Core locations will be determined by the RPR in accordance with ASTM D3665. The bulk specific gravity of each core sample will be determined in accordance with ASTM D2726. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each joint density sample by the average TMD for the lot. The TMD used to determine the joint density at joints formed between lots will be the lower of the average TMD values from the adjacent lots.

401-6.2 Acceptance criteria.

a. General. Acceptance will be based on the implementation of the Contractor Quality Control Program (CQCP) and the following characteristics of the asphalt and completed pavements: air voids, mat density, joint density, grade and Profilograph roughness**.**

b. Air Voids and Mat density. Acceptance of each lot of plant produced material for mat density and air voids will be based on the percentage of material within specification limits (PWL). If the PWL of the lot equals or exceeds 90%, the lot will be acceptable. Acceptance and payment will be determined in accordance with paragraph 401-8.1.

c. Joint density. Acceptance of each lot of plant produced asphalt for joint density will be based on the PWL. If the PWL of the lot is equal to or exceeds 90%, the lot will be considered acceptable. If the PWL is less than 90%, the Contractor shall evaluate the reason and act accordingly. If the PWL is less than 80%, the Contractor shall cease operations and until the reason for poor compaction has been determined. If the PWL is less than 71%, the pay factor for the lot used to complete the joint will be

reduced by five (5) percentage points. This lot pay factor reduction will be incorporated and evaluated in accordance with paragraph 401-8.1.

d. Grade. The final finished surface of the pavement shall be surveyed to verify that the grade elevations and cross-sections shown on the plans do not deviate more than 1/2 inch (12 mm) vertically or 0.1 feet (30 mm) laterally.

Cross-sections of the pavement shall be taken at a minimum 50-foot (15-m) longitudinal spacing, at all longitudinal grade breaks, and at start and end of each lane placed. Minimum cross-section grade points shall include grade at centerline, ± 10 feet of centerline, and edge of taxiway pavement.

The survey and documentation shall be stamped and signed by a licensed surveyor. Payment for sublots that do not meet grade for over 25% of the sublot shall not be more than 95%.

e. Profilograph roughness for QA Acceptance. Not used.

401-6.3 Percentage of material within specification limits (PWL). The PWL will be determined in accordance with procedures specified in Item C-110. The specification tolerance limits (L) for lower and (U) for upper are contained in Table 5.

Table 5. Acceptance Limits for Air Voids and Density

Test Property	Pavements Specification Tolerance Limits	
	L	**U**
Air Voids Total Mix (%)	2.0	5.0
Surface Course Mat Density (%)	92.8	-
Base Course Mat Density (%)	92.0	-
Joint density (%)	90.5	--

a. Outliers. All individual tests for mat density and air voids will be checked for outliers (test criterion) in accordance with ASTM E178, at a significance level of 5%. Outliers will be discarded, and the PWL will be determined using the remaining test values. The criteria in Table 5 is based on production processes which have a variability with the following standard deviations: Surface Course Mat Density (%), 1.30; Base Course Mat Density (%), 1.55; Joint Density (%), 1.55.

The Contractor should note that (1) 90 PWL is achieved when consistently producing a surface course with an average mat density of at least 94.5% with 1.30% or less variability, (2) 90 PWL is achieved when consistently producing a base course with an average mat density of at least 94.0% with 1.55% or less variability, and (3) 90 PWL is achieved when consistently producing joints with an average joint density of at least 92.5% with 1.55% or less variability.

401-6.4 Resampling pavement for mat density.

a. General. Resampling of a lot of pavement will only be allowed for mat density, and then, only if the Contractor requests same, in writing, within 48 hours after receiving the written test results from the RPR. A retest will consist of all the sampling and testing procedures contained in paragraphs 401-6.1d and 401-6.2b. Only one resampling per lot will be permitted.

(1) A redefined PWL will be calculated for the resampled lot. The number of tests used to calculate the redefined PWL will include the initial tests made for that lot plus the retests.

(2) The cost for resampling and retesting shall be borne by the Contractor.

b. Payment for resampled lots. The redefined PWL for a resampled lot will be used to calculate the payment for that lot in accordance with Table 6.

c. Outliers. Check for outliers in accordance with ASTM E178, at a significance level of 5%.

METHOD OF MEASUREMENT

401-7.1 Measurement. Asphalt shall be measured by the number of tons of asphalt used in the accepted work. Batch weights or truck scale weights will be used to determine the basis for the tonnage.

BASIS OF PAYMENT

401-8.1 Payment. Payment for a lot of asphalt meeting all acceptance criteria as specified in paragraph 401-6.2 shall be made based on results of tests for mat density and air voids. Payment for acceptable lots shall be adjusted according to paragraph 401-8.1c for mat density and air voids; and paragraph 401-6.2c for joint density, subject to the limitation that:

a. The total project payment for plant mix asphalt pavement shall not exceed 100 percent of the product of the contract unit price and the total number of tons (kg) of asphalt used in the accepted work.

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

c. Basis of adjusted payment. The pay factor for each individual lot shall be calculated in accordance with Table 6. A pay factor shall be calculated for both mat density and air voids. The lot pay factor shall be the higher of the two values when calculations for both mat density and air voids are 100% or higher. The lot pay factor shall be the product of the two values when only one of the calculations for either mat density or air voids is 100% or higher. The lot pay factor shall be the lower of the two values when calculations for both mat density and air voids are less than 100%. If PWL for joint density is less than 71% then the lot pay factor shall be reduced by 5% but be no higher than 95%.

For each lot accepted, the adjusted contract unit price shall be the product of the lot pay factor for the lot and the contract unit price. Payment shall be subject to the total project payment limitation specified in paragraph 401-8.1a. Payment in excess of 100% for accepted lots of asphalt shall be used to offset payment for accepted lots of asphalt pavement that achieve a lot pay factor less than 100%.

Payment for sublots which do not meet grade in accordance with paragraph 401-6.2d after correction for over 25% of the sublot shall be reduced by 5%.

Table 6. Price adjustment schedule[1]

Percentage of material within specification limits (PWL)	Lot pay factor (percent of contract unit price)
96 – 100	106
90 – 95	PWL + 10
75 – 89	0.5 PWL + 55
55 – 74	1.4 PWL – 12
Below 55	Reject [2]

[1] Although it is theoretically possible to achieve a pay factor of 106% for each lot, actual payment above 100% shall be subject to the total project payment limitation specified in paragraph 401-8.1a.

[2] The lot shall be removed and replaced. However, the RPR may decide to allow the rejected lot to remain. In that case, if the RPR and Contractor agree in writing that the lot shall not be removed, it shall be paid for at 50% of the contract unit price and the total project payment shall be reduced by the amount withheld for the rejected lot.

d. Profilograph Roughness. Not used.

401-8.1 Payment.

Payment will be made under:

Item	Description	Unit
P-401-1	Asphalt Surface Course	Ton
P-401-2	Asphalt Binder Course	Ton

REFERENCES

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

ASTM International (ASTM)

ASTM C29	Standard Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C127	Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates

ASTM C566	Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D242	Standard Specification for Mineral Filler for Bituminous Paving Mixtures
ASTM D946	Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction
ASTM D979	Standard Practice for Sampling Asphalt Paving Mixtures
ASTM D1073	Standard Specification for Fine Aggregate for Asphalt Paving Mixtures
ASTM D1188	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
ASTM D2172	Standard Test Method for Quantitative Extraction of Bitumen from Asphalt Paving Mixtures
ASTM D1461	Standard Test Method for Moisture or Volatile Distillates in Asphalt Paving Mixtures
ASTM D2041	Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D2489	Standard Practice for Estimating Degree of Particle Coating of Bituminous-Aggregate Mixtures
ASTM D2726	Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures
ASTM D2950	Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods
ASTM D3203	Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
ASTM D3381	Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4552	Standard Practice for Classifying Hot-Mix Recycling Agents
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D4867	Standard Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures

ASTM D5361	Standard Practice for Sampling Compacted Asphalt Mixtures for Laboratory Testing
ASTM D5444	Standard Test Method for Mechanical Size Analysis of Extracted Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
ASTM D6084	Standard Test Method for Elastic Recovery of Bituminous Materials by Ductilometer
ASTM D6307	Standard Test Method for Asphalt Content of Hot Mix Asphalt by Ignition Method
ASTM D6373	Standard Specification for Performance Graded Asphalt Binder
ASTM D6752	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Automatic Vacuum Sealing Method
ASTM D6925	Standard Test Method for Preparation and Determination of the Relative Density of Hot Mix Asphalt (HMA) Specimens by Means of the SuperPave Gyratory Compactor.
ASTM D6926	Standard Practice for Preparation of Bituminous Specimens Using Marshall Apparatus
ASTM D6927	Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures
ASTM D6995	Standard Test Method for Determining Field VMA based on the Maximum Specific Gravity of the Mix (Gmm)
ASTM E11	Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves
ASTM E178	Standard Practice for Dealing with Outlying Observations
ASTM E1274	Standard Test Method for Measuring Pavement Roughness Using a Profilograph
ASTM E950	Standard Test Method for Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling Reference
ASTM E2133	Standard Test Method for Using a Rolling Inclinometer to Measure Longitudinal and Transverse Profiles of a Traveled Surface

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M156	Standard Specification for Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
AASHTO T329	Standard Method of Test for Moisture Content of Hot Mix Asphalt (HMA) by Oven Method
AASHTO T324	Standard Method of Test for Hamburg Wheel-Track Testing of Compacted Asphalt Mixtures
AASHTO T 340	Standard Method of Test for Determining the Rutting Susceptibility of Hot Mix Asphalt (APA) Using the Asphalt Pavement Analyzer (APA)

Asphalt Institute (AI)

Asphalt Institute Handbook MS-26, Asphalt Binder

Asphalt Institute MS-2 Mix Design Manual, 7th Edition

AI State Binder Specification Database

Federal Highway Administration (FHWA)

Long Term Pavement Performance Binder Program

Advisory Circulars (AC)

AC 150/5320-6	Airport Pavement Design and Evaluation

FAA Orders

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

Software

FAARFIELD

END OF ITEM P-401

Item P-603 Emulsified Asphalt Tack Coat

DESCRIPTION

603-1.1 This item shall consist of preparing and treating an asphalt or concrete surface with asphalt material in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

603-2.1 Asphalt Materials. The asphalt material shall be an emulsified asphalt as specified in ASTM D3628 as an asphalt application for tack coat appropriate to local conditions and as specified below in Table 603-1. The emulsified asphalt shall not be diluted. The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the asphalt material to the Resident Project Representative (RPR) before the asphalt material is applied for review and acceptance. The furnishing of COA for the asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

TABLE 603-1 BITUMINOUS MATERIAL

Type and Grade	Specification	Application Temperature	
		Degrees F	Degrees C
RS-1h	ASTM D 977	75 – 130	25 – 55
CRS-1h	ASTM D 2397	75 – 130	25 - 55

CONSTRUCTION METHODS

603-3.1 Weather limitations. The tack coat shall be applied only when the existing surface is dry and the atmospheric temperature is 50°F (10°C) or above; the temperature has not been below 35°F (2°C) for the 12 hours prior to application; and when the weather is not foggy or rainy. The temperature requirements may be waived when directed by the RPR.

603-3.2 Equipment. The Contractor shall provide equipment for heating and applying the emulsified asphalt material. The emulsion shall be applied with a manufacturer-approved computer rate-controlled asphalt distributor. The equipment shall be in good working order and contain no contaminants or diluents in the tank. Spray bar tips must be clean, free of burrs, and of a size to maintain an even distribution of the emulsion. Any type of tip or pressure source is suitable that will maintain predetermined flow rates and constant pressure during the application process with application speeds under eight (8) miles per hour (13 km per hour) or seven (700) feet per minute (213 m per minute).

The equipment will be tested under pressure for leaks and to ensure proper set-up before use to verify truck set-up (via a test-shot area), including but not limited to, nozzle tip size appropriate for application, spray-bar height and pressure and pump speed, evidence of triple-overlap spray pattern, lack of leaks, and any other factors relevant to ensure the truck is in good working order before use.

The distributor truck shall be equipped with a minimum 12-foot (3.7-m) spreader spray bar with individual nozzle control with computer-controlled application rates. The distributor truck shall have an easily accessible thermometer that constantly monitors the temperature of the emulsion, and have an operable mechanical tank gauge that can be used to cross-check the computer accuracy. If the distributor is not

equipped with an operable quick shutoff valve, the prime operations shall be started and stopped on building paper.

The distributor truck shall be equipped to effectively heat and mix the material to the required temperature prior to application as required. Heating and mixing shall be done in accordance with the manufacturer's recommendations. Do not overheat or over mix the material.

The distributor shall be equipped with a hand sprayer.

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

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

603-3.3 Application of emulsified asphalt material. The emulsified asphalt shall not be diluted. Immediately before applying the emulsified asphalt tack coat, the full width of surface to be treated shall be swept with a power broom and/or power blower to remove all loose dirt and other objectionable material.

The emulsified asphalt material shall be uniformly applied with an asphalt distributor at the rates appropriate for the conditions and surface specified in the table below. The type of asphalt material and application rate shall be approved by the RPR prior to application.

Emulsified Asphalt

Surface Type	Residual Rate, gal/SY (L/square meter)	Emulsion Application Bar Rate, gal/SY (L/square meter)
New asphalt	0.02-0.05 (0.09-0.23)	0.03-0.07 (0.13-0.32)
Existing asphalt	0.04-0.07 (0.18-0.32)	0.06-0.11 (0.27-0.50)
Milled Surface	0.04-0.08 (0.18-0.36)	.0.06-0.12 (0.27-0.54)
Concrete	0.03-0.05 (0.13-0.23)	0.05-0.08 (0.23-0.36)

After application of the tack coat, the surface shall be allowed to cure without being disturbed for the period of time necessary to permit drying and setting of the tack coat. This period shall be determined by the RPR. The Contractor shall protect the tack coat and maintain the surface until the next course has been placed. When the tack coat has been disturbed by the Contractor, tack coat shall be reapplied at the Contractor's expense.

603-3.4 Freight and waybills. The Contractor shall submit waybills and delivery tickets, during progress of the work. Before the final statement is allowed, file with the RPR certified waybills and certified delivery tickets for all emulsified asphalt materials used in the construction of the pavement covered by the contract. Do not remove emulsified asphalt material from storage until the initial outage and temperature measurements have been taken. The delivery or storage units will not be released until the final outage has been taken.

METHOD OF MEASUREMENT

603-4.1 The emulsified asphalt material for tack coat shall be measured by the gallon (liter). Volume shall be corrected to the volume at 60°F (16°C) in accordance with ASTM D1250. The emulsified asphalt

material paid for will be the measured quantities used in the accepted work, provided that the measured quantities are not 10% over the specified application rate. Any amount of emulsified asphalt material more than 10% over the specified application rate for each application will be deducted from the measured quantities, except for irregular areas where hand spraying of the emulsified asphalt material is necessary. Water added to emulsified asphalt will not be measured for payment.

BASIS OF PAYMENT

603.5-1 Payment shall be made at the contract unit price per gallon (liter) of emulsified asphalt material. This price shall be full compensation for furnishing all materials, for all preparation, delivery, and application of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item	**Description**	**Unit**
P-603-1	Bituminous Tack Coat	Gallon

REFERENCES

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

ASTM International (ASTM)

ASTM D1250	Standard Guide for Use of the Petroleum Measurement Tables
ASTM D2995	Standard Practice for Estimating Application Rate and Residual Application Rate of Bituminous Distributors
ASTM D3628	Standard Practice for Selection and Use of Emulsified Asphalts

TABLE IV-3 TEMPERATURE-VOLUME CORRECTIONS FOR EMULSIFIED ASPHALTS					
°C	°F	*M	°C	°F	*M
10.0	50	1.00250	35.6	96	0.99100
10.6	51	1.00225	36.1	97	0.99075
11.1	52	1.00200	36.7	98	0.99050
11.7	53	1.00175	37.2	99	0.99025
12.2	54	1.00150	37.8	100	0.99000
12.8	55	1.00125	38.3	101	0.98975
13.3	56	1.00100	38.9	102	0.98950
13.9	57	1.00075	39.4	103	0.98925
14.4	58	1.00050	40.0	104	0.98900
15.0	59	1.00025	40.6	105	0.98875
15.6	60	1.00000	41.1	106	0.98850
16.1	61	0.99975	41.7	107	0.98825
16.7	62	0.99950	42.2	108	0.98800
17.2	63	0.99925	42.8	109	0.98775
17.8	64	0.99900	43.3	110	0.98750
18.3	65	0.99875	43.9	111	0.98725
18.9	66	0.99850	44.4	112	0.98700
19.4	67	0.99825	45.0	113	0.98675
20.0	68	0.99800	45.6	114	0.98650
20.6	69	0.99775	46.1	115	0.98625
21.1	70	0.99750	46.7	116	0.98600
21.7	71	0.99725	47.2	117	0.98575
22.2	72	0.99700	47.8	118	0.98550
22.8	73	0.99675	48.3	119	0.98525
23.3	74	0.99650	48.9	120	0.98500
23.9	75	0.99625	49.4	121	0.98475
24.4	76	0.99600	50.0	122	0.98450
25.0	77	0.99575	50.6	123	0.98425
25.6	78	0.99550	51.1	124	0.98400
26.1	79	0.99525	51.7	125	0.98375
26.7	80	0.99500	52.2	126	0.98350
27.2	81	0.99475	52.8	127	0.98325
27.8	82	0.99450	53.3	128	0.98300
28.3	83	0.99425	53.9	129	0.98275
28.9	84	0.99400	54.4	130	0.98250
29.4	85	0.99375	55.0	131	0.98225
30.0	86	0.99350	55.6	132	0.98200
30.6	87	0.99325	56.1	133	0.98175
31.1	88	0.99300	56.7	134	0.98150
31.7	89	0.99275	57.2	135	0.98125
32.2	90	0.99250	57.8	136	0.98100
32.8	91	0.99225	58.3	137	0.98075
33.3	92	0.99200	58.9	138	0.98050
33.9	93	0.99175	59.4	139	0.98025
34.4	94	0.99150	60.0	140	0.98000
35.0	95	0.99125	60.6	141	0.97975

TABLE IV-3 TEMPERATURE-VOLUME CORRECTIONS FOR EMULSIFIED ASPHALTS					
°C	°F	*M	°C	°F	*M
61.1	142	0.97950	73.3	164	0.97400
61.7	143	0.97925	73.9	165	0.97375
62.2	144	0.97900	74.4	166	0.97350
62.8	145	0.97875	75.0	167	0.97325
63.3	146	0.97850	75.6	168	0.97300
63.9	147	0.97825	76.1	169	0.97275
64.4	148	0.97800	76.7	170	0.97250
65.0	149	0.97775	77.2	171	0.97225
65.6	150	0.97750	77.8	172	0.97200
66.1	151	0.97725	78.3	173	0.97175
66.7	152	0.97700	78.9	174	0.97150
67.2	153	0.97675	76.4	175	0.97125
67.8	154	0.97650	80.0	176	0.97100
68.3	155	0.97625	80.6	177	0.97075
68.9	156	0.97600	81.1	178	0.97050
69.4	157	0.97575	81.7	179	0.97025
70.0	158	0.97550	82.2	180	0.97000
70.6	159	0.97525	82.8	181	0.96975
71.1	160	0.97500	83.3	182	0.96950
71.7	161	0.97475	83.9	183	0.96925
72.2	162	0.97450	84.4	184	0.96900
72.8	163	0.97425	-	-	-

END ITEM P-603

Item P-605 Joint Sealants for Pavements

DESCRIPTION

605-1.1 This item shall consist of providing and installing a resilient and adhesive joint sealing material capable of effectively sealing joints in pavement; joints between different types of pavements; and cracks in existing pavement.

MATERIALS

605-2.1 Joint sealants. Joint sealant materials shall meet the requirements of ASTM D6690 Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements.

Each lot or batch of sealant shall be delivered to the jobsite in the manufacturer's original sealed container. Each container shall be marked with the manufacturer's name, batch or lot number, the safe heating temperature, and shall be accompanied by the manufacturer's certification stating that the sealant meets the requirements of this specification.

605-2.2 Backer rod. The material furnished shall be a compressible, non-shrinking, non-staining, non-absorbing material that is non-reactive with the joint sealant in accordance with ASTM D5249. The backer-rod material shall be 25% ± 5 % larger in diameter than the nominal width of the joint.

605-2.3 Bond breaking tapes. Provide a bond breaking tape or separating material that is a flexible, non-shrinkable, non-absorbing, non-staining, and non-reacting adhesive-backed tape. The material shall have a melting point at least 5°F (3°C) greater than the pouring temperature of the sealant being used when tested in accordance with ASTM D789. The bond breaker tape shall be approximately 1/8 inch (3 mm) wider than the nominal width of the joint and shall not bond to the joint sealant.

CONSTRUCTION METHODS

605-3.1 Time of application. Joints shall be sealed as soon after completion of the curing period as feasible and before the pavement is opened to traffic, including construction equipment. The pavement temperature shall be 50°F (10°C) and rising at the time of application of the poured joint sealing material. Do not apply sealant if moisture is observed in the joint.

605-3.2 Equipment. Machines, tools, and equipment used in the performance of the work required by this section shall be approved before the work is started and maintained in satisfactory condition at all times. Submit a list of proposed equipment to be used in performance of construction work including descriptive data, 10 days prior to use on the project.

a. Tractor-mounted routing tool. Provide a routing tool, used for removing old sealant from the joints, of such shape and dimensions and so mounted on the tractor that it will not damage the sides of the joints. The tool shall be designed so that it can be adjusted to remove the old material to varying depths as required. The use of V-shaped tools or rotary impact routing devices will not be permitted. Hand-operated spindle routing devices may be used to clean and enlarge random cracks.

b. Concrete saw. Provide a self-propelled power saw, with water-cooled diamond or abrasive saw blades, for cutting joints to the depths and widths specified.

c. Sandblasting equipment. Sandblasting is not allowed.

d. Waterblasting equipment. The Contractor must demonstrate waterblasting equipment including the pumps, hose, guide and nozzle size, under job conditions, before approval in accordance with paragraph 605-3.3. The Contractor shall demonstrate, in the presence of the RPR, that the method cleans the joint and does not damage the joint.

e. Hand tools. Hand tools may be used, when approved, for removing defective sealant from a crack and repairing or cleaning the crack faces. Hand tools should be carefully evaluated for potential spalling effects prior to approval for use.

f. Hot-poured sealing equipment. The unit applicators used for heating and installing ASTM D6690 joint sealant materials shall be mobile and shall be equipped with a double-boiler, agitator-type kettle with an oil medium in the outer space for heat transfer; a direct-connected pressure-type extruding device with a nozzle shaped for inserting in the joint to be filled; positive temperature devices for controlling the temperature of the transfer oil and sealant; and a recording type thermometer for indicating the temperature of the sealant. The applicator unit shall be designed so that the sealant will circulate through the delivery hose and return to the inner kettle when not in use.

605-3.3 Preparation of joints. Pavement joints for application of material in this specification must be dry, clean of all scale, dirt, dust, curing compound, and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method cleans the joint and does not damage the joint.

a. Sawing. All joints shall be sawed in accordance with specifications and plan details. Immediately after sawing the joint, the resulting slurry shall be completely removed from joint and adjacent area by flushing with a jet of water, and by use of other tools as necessary.

b. Sealing. Immediately before sealing, the joints shall be thoroughly cleaned of all remaining laitance, curing compound, filler, protrusions of hardened concrete, old sealant and other foreign material from the sides and upper edges of the joint space to be sealed. Cleaning shall be accomplished by tractor-mounted routing equipment**,** concrete saw, or waterblaster as specified in paragraph 605-3.2. The newly exposed concrete joint faces and the pavement surface extending a minimum of 1/2 inch (12 mm) from the joint edge shall be sandblasted clean. Sandblasting shall be accomplished in a minimum of two passes. One pass per joint face with the nozzle held at an angle directly toward the joint face and not more than 3 inches (75 mm) from it. After final cleaning and immediately prior to sealing, blow out the joints with compressed air and leave them completely free of debris and water. The joint faces shall be surface dry when the seal is applied.

c. Backer Rod. When the joint opening is of a greater depth than indicated for the sealant depth, plug or seal off the lower portion of the joint opening using a backer rod in accordance with paragraph 605-2.2 to prevent the entrance of the sealant below the specified depth. Take care to ensure that the backer rod is placed at the specified depth and is not stretched or twisted during installation.

d. Bond-breaking tape. Where inserts or filler materials contain bitumen, or the depth of the joint opening does not allow for the use of a backup material, insert a bond-separating tape breaker in accordance with paragraph 605-2.3 to prevent incompatibility with the filler materials and three-sided adhesion of the sealant. Securely bond the tape to the bottom of the joint opening so it will not float up into the new sealant.

605-3.4 Installation of sealants. Joints shall be inspected for proper width, depth, alignment, and preparation, and shall be approved by the RPR before sealing is allowed. Sealants shall be installed in accordance with the following requirements:

Immediately preceding, but not more than 50 feet (15 m) ahead of the joint sealing operations, perform a final cleaning with compressed air. Fill the joints from the bottom up to 1/8 inch ±1/16 inch below the top of pavement surface; or bottom of groove for grooved pavement. Remove and discard excess or spilled sealant from the pavement by approved methods. Install the sealant in such a manner as to prevent the formation of voids and entrapped air. In no case shall gravity methods or pouring pots be used to install the sealant material. Traffic shall not be permitted over newly sealed pavement until authorized by the RPR. When a primer is recommended by the manufacturer, apply it evenly to the joint faces in accordance with the manufacturer's instructions. Check the joints frequently to ensure that the newly installed sealant is cured to a tack-free condition within the time specified.

605-3.5 Inspection. The Contractor shall inspect the joint sealant for proper rate of cure and set, bonding to the joint walls, cohesive separation within the sealant, reversion to liquid, entrapped air and voids. Sealants exhibiting any of these deficiencies at any time prior to the final acceptance of the project shall be removed from the joint, wasted, and replaced as specified at no additional cost to the airport.

605-3.6 Clean-up. Upon completion of the project, remove all unused materials from the site and leave the pavement in a clean condition.

METHOD OF MEASUREMENT

605-4.1 Joint sealing material shall be measured by the linear foot of sealant in place, completed, and accepted.

BASIS OF PAYMENT

605-5.1 Payment for joint sealing material shall be made at the contract unit price per linear foot. The price shall be full compensation for furnishing all materials, for all preparation, delivering, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item	Description	Unit
P-605-1	Joint Sealing Filler	Linear Foot

REFERENCES

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

ASTM International (ASTM)

ASTM D789	Standard Test Method for Determination of Relative Viscosity of Polyamide (PA)
ASTM D5249	Standard Specification for Backer Material for Use with Cold- and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints
ASTM D6690	Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt

Advisory Circulars (AC)

AC 150/5340-30	Design and Installation Details for Airport Visual Aids

END ITEM P-605

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

DESCRIPTION

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

MATERIALS

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

606-2.2 Storage. The adhesive components shall not be stored at temperatures over 86°F (30°C), unless otherwise specified by the manufacturer.

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

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

Table 1. Property Requirements

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

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

SAMPLING, INSPECTION, AND TEST PROCEDURES

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

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

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

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

606-3.5 Test for adhesion to steel. The ends of two smooth, clean, steel specimens of convenient size (1 inch by 1 inch by 6 inch) (25 mm by 25 mm by 150 mm) would be satisfactory when bonded together

with adhesive mixture and allowed to cure at room temperature for a period of time to meet formulation requirements and then tested to failure on a Riehle (or similar) tensile tester. The thickness of adhesive to be tested shall be 1/4 inch (6 mm).

606-3.6 Adhesion to Portland cement concrete

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

The coarse aggregate shall consist of crushed rock having a minimum of 75% of the particles with at least one fractured face and having a water absorption of not more than 1.5%. The fine aggregate shall consist of crushed sand manufactured from the same parent rock as the coarse aggregate. The concrete shall have a water-cement ratio of 5.5 gallons (21 liters) of water per bag of cement, a cement factor of 6, ±0.5, bags of cement per cubic yard (0.76 cubic meter) of concrete, and a slump of 2-1/2 inch (60 mm), ±1/2 inch (60 mm ±12 mm). The ratio of fine aggregate to total aggregate shall be approximately 40% by solid volume. The air content shall be 5.0%, ±0.5%, and it shall be obtained by the addition to the batch of an air-entraining admixture such as Vinsol® resin. The mold shall be of metal and shall be provided with a metal base plate.

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

Table 2. Aggregate for Bond Test Blocks

Type	Sieve Size	Percent Passing
Coarse Aggregate	3/4 inch (19.0 mm)	97 to 100
	1/2 inch (12.5 mm)	63 to 69
	3/8 inch (9.5 mm)	30 to 36
	No. 4 (4.75 mm)	0 to 3
Fine Aggregate	No. 4 (4.75 mm)	100
	No. 8 (2.36 mm)	82 to 88
	No. 16 (1.18 mm)	60 to 70
	No. 30 (600 μm)	40 to 50
	No. 50 (300 μm)	16 to 26
	No. 100 (150 μm)	5 to 9

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

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

606-3.8 Adhesive compounds - Contractor's responsibility. The Contractor shall furnish the vendor's certified test reports for each batch of material delivered to the project. The report shall certify that the

material meets specification requirements and is suitable for use with asphalt concrete pavements. The report shall be provided to and accepted by the Resident Project Representative (RPR) before use of the material. In addition, the Contractor shall obtain a statement from the supplier or manufacturer that guarantees the material for one year. The supplier or manufacturer shall furnish evidence that the material has performed satisfactorily on other projects.

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

METHOD OF MEASUREMENT

606-4.1 When required in the installation of an in-runway/in-taxiway 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 Payment for adhesive shall be considered incidental to those items in the contract where adhesive installation is required. This shall be considered full compensation for furnishing all materials, and for all preparation, delivering, and application of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

REFERENCES

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

ASTM International (ASTM)

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

END OF ITEM P-606

Item P-610 Concrete for Miscellaneous Structures

DESCRIPTION

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

MATERIALS

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

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

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

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

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

Coarse Aggregate Grading Requirements

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

610-2.2.1 Coarse Aggregate susceptibility to durability (D) cracking. Coarse aggregate may only be accepted from sources that have a 20-year service history for the same gradation to be supplied with no history of D-Cracking. Aggregates that do not have a 20-year record of service free from major repairs (less than 5% of slabs replaced) in similar conditions without D-cracking shall not be used unless the material currently being produced has a durability factor greater than or equal to 95 per ASTM C666. The Contractor shall submit a current certification and test results to verify the aggregate acceptability. Test results will only be accepted from a State Department of Transportation (DOT) materials laboratory or an accredited laboratory. Certification and test results which are not dated or which are over one (1) year old or which are for different gradations will not be accepted.

Crushed granite, calcite cemented sandstone, quartzite, basalt, diabase, rhyolite or trap rock are considered to meet the D-cracking test requirements but must meet all other quality tests specified in Item P-501.

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

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

610-2.5 Cementitious materials.

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

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

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

610-2.7 Admixtures. The Contractor shall submit certificates indicating that the material to be furnished meets all of the requirements indicated below. In addition, the RPR may require the Contractor to submit complete test data from an approved laboratory showing that the material to be furnished meets all of the requirements of the cited specifications. Subsequent tests may be made of samples taken by the RPR from

the supply of the material being furnished or proposed for use on the work to determine whether the admixture is uniform in quality with that approved.

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

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

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

610-2.8 Premolded joint material. Premolded joint material for expansion joints shall meet the requirements of ASTM D1751**.**

610-2.9 Joint filler. The filler for joints shall meet the requirements of Item P-605, unless otherwise specified.

610-2.10 Steel reinforcement. Reinforcing steel shall conform to the following requirements:

Steel Reinforcement

Reinforcing Steel	**ASTM A615, ASTM A706, ASTM A775, ASTM A934**
Welded Steel Wire Fabric	**ASTM A1064, ASTM A884**
Welded Deformed Steel Fabric	**ASTM A1064**
Bar Mats	**ASTM A184 or ASTM A704**

610-2.11 Materials for curing concrete. Curing materials shall conform to one of the following:

Materials for Curing

Waterproof paper	**ASTM C171**
Clear or white Polyethylene Sheeting	**ASTM C171**
White-pigmented Liquid Membrane-Forming Compound, Type 2, Class B	**ASTM C309**

CONSTRUCTION METHODS

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

610-3.2 Concrete Mixture. The concrete shall develop a compressive strength of 4000 psi (28 MPa) in 28 days as determined by test cylinders made in accordance with ASTM C31 and tested in accordance with ASTM C39. Five (5) test cylinders shall be cast, and they shall be tested in the following increments:

a) (2) 7-day
b) (2) 28-day
c) (1) Hold

The concrete shall contain not less than 470 pounds of cementitious material per cubic yard (280 kg per cubic meter). The water cementitious ratio shall not exceed 0.45 by weight. The air content of the concrete shall be 5% +/- 1.2% as determined by ASTM C231 and shall have a slump of not more than 4 inches (100 mm) as determined by ASTM C143.

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

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

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

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

610-3.4 Forms. Concrete shall not be placed until all the forms and reinforcements have been inspected and approved by the RPR. Forms shall be of suitable material and shall be of the type, size, shape, quality, and strength to build the structure as shown on the plans. The forms shall be true to line and grade and shall be mortar-tight and sufficiently rigid to prevent displacement and sagging between supports. The surfaces of forms shall be smooth and free from irregularities, dents, sags, and holes. The Contractor shall be responsible for their adequacy.

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

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

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

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

610-3.8 Placing concrete. All concrete shall be placed during daylight hours, unless otherwise approved. The concrete shall not be placed until the depth and condition of foundations, the adequacy of forms and falsework, and the placing of the steel reinforcing have been approved by the RPR. Concrete shall be placed as soon as practical after mixing, but in no case later than one (1) hour after water has been added to the mix. The method and manner of placing shall avoid segregation and displacement of the reinforcement. Troughs, pipes, and chutes shall be used as an aid in placing concrete when necessary. The

concrete shall not be dropped from a height of more than 5 feet (1.5 m). Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to rehandling or flowing. Do not subject concrete to procedures which cause segregation. Concrete shall be placed on clean, damp surfaces, free from running water, or on a properly consolidated soil foundation.

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

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

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

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

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

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

QUALITY ASSURANCE (QA)

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

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

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

METHOD OF MEASUREMENT

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

BASIS OF PAYMENT

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

REFERENCES

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

ASTM International (ASTM)

ASTM A184	Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A704	Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement
ASTM A706	Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A775	Standard Specification for Epoxy-Coated Steel Reinforcing Bars
ASTM A884	Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement
ASTM A934	Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM A1064	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C114	Standard Test Methods for Chemical Analysis of Hydraulic Cement
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM C171	Standard Specification for Sheet Materials for Curing Concrete
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C311	Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete

ASTM C666	Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
ASTM C685	Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars
ASTM C1017	Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM C1157	Standard Performance Specification for Hydraulic Cement
ASTM C1260	Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM C1365	Standard Test Method for Determination of the Proportion of Phases in Portland Cement and Portland-Cement Clinker Using X-Ray Powder Diffraction Analysis
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D1751	Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types)
ASTM D1752	Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction

American Concrete Institute (ACI)

ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting
ACI 308R	Guide to External Curing of Concrete
ACI 309R	Guide for Consolidation of Concrete

END OF ITEM P-610

Item P-620 Runway and Taxiway Marking

DESCRIPTION

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

MATERIALS

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

620-2.2 Marking materials.

Table 1. Marking Materials

Paint[1]				Glass Beads[2]	
Type	**Color**	**Fed Std. 595 Number**	**Application Rate Maximum**	**Type**	**Application Rate Minimum**
Waterborne Type I	White	37925	115 ft^2/gal (2.8 m^2/l)	See Preformed Thermoplastic Section Below	See Preformed Thermoplastic Section Below
Waterborne Type I	Red	31136	115 ft^2/gal (2.8 m^2/l)	See Preformed Thermoplastic Section Below	See Preformed Thermoplastic Section Below
Waterborne Type I	Yellow	33538 or 33655	115 ft^2/gal (2.8 m^2/l)	Type I Gradation A	7 lb/gal (0.85 kg/l)
Waterborne Type I	Black	37038	115 ft^2/gal (2.8 m^2/l)	No Beads	No Beads
Temporary Marking Waterborne Type I or II	Yellow	33538 or 33655	230 ft^2/gal (5.6 m^2/l)	No Beads	No Beads

[1] See paragraph 620-2.2a

[2] See paragraph 620-2.2b

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

Waterborne. Paint shall meet the requirements of Federal Specification TT-P-1952F, Type I. The non-volatile portion of the vehicle for all paint types shall be composed of a 100% acrylic polymer as determined by infrared spectral analysis.

Waterborne or solvent based black paint should be used to outline a border at least 6 inches (150 mm) wide around markings on all light-colored pavements. Preformed thermoplastic markings shall have a non-reflectorized black border integral to the marking.

Preformed Thermoplastic Airport Pavement Markings. Markings must be composed of ester modified resins in conjunction with aggregates, pigments, and binders that have been factory produced as a finished product. The material must be impervious to degradation by aviation fuels, motor fuels, and lubricants.

(1) The markings must be able to be applied in temperatures as low as 35°F without any special storage, preheating, or treatment of the material before application.

(a) The markings must be supplied with an integral, non-reflectorized black border.

(2) Graded glass beads.

(a) The material must contain a minimum of 30% intermixed graded glass beads by weight. The intermixed beads shall conform to Federal Specification TT-B-1325D, Type I, gradation A and Federal Specification TT-B-1325D, Type IV.

(b) The material must have factory applied coated surface beads in addition to the intermixed beads at a rate of one (1) lb (0.45 kg) (±10%) per 10 square feet (1 sq m). These factory-applied coated surface beads shall have a minimum of 90% true spheres, minimum refractive index of 1.50, and meet the following gradation.

Preformed Thermoplastic Bead Gradation

Size Gradation		Retained, %	Passing, %
U.S. Mesh	µm		
12	1700	0 - 2	98 - 100
14	1400	0 - 3.5	96.5 - 100
16	1180	2 - 25	75 - 98
18	1000	28 - 63	37 - 72
20	850	63 - 72	28 - 37
30	600	67 - 77	23 - 33
50	300	89 - 95	5 - 11
80	200	97 - 100	0 - 3

(3) Heating indicators. The material manufacturer shall provide a method to indicate that the material has achieved satisfactory adhesion and proper bead embedment during application and that the installation procedures have been followed.

(4) Pigments. Percent by weight.

(a) White:

- Titanium Dioxide, ASTM D476, type II shall be 10% minimum.

(b) Yellow and Colors:

- Titanium Dioxide, ASTM D476, type II shall be 1% minimum.
- Organic yellow, other colors, and tinting as required to meet color standard.

(5) Prohibited materials. The manufacturer shall certify that the product does not contain mercury, lead, hexavalent chromium, halogenated solvents, nor any carcinogen as defined in 29 CFR 1910.1200 in amounts exceeding permissible limits as specified in relevant federal regulations.

(6) Daylight directional reflectance.

(a) White: The daylight directional reflectance of the white paint shall not be less than 75% (relative to magnesium oxide), when tested in accordance with ASTM E2302.

(b) Yellow: The daylight directional reflectance of the yellow paint shall not be less than 45% (relative to magnesium oxide), when tested in accordance with ASTM E2302. The x and y values shall be consistent with the federal Hegman yellow color standard chart for traffic yellow standard 33538, or shall be consistent with the tolerance listed below:

x .462	x .470	x .479	x .501
y .438	y .455	y .428	y .452

(7) Skid resistance. The surface, with properly applied and embedded surface beads, must provide a minimum resistance value of 45 BPN when tested according to ASTM E303.

(8) Thickness. The material must be supplied at a nominal thickness of 65 mil (1.7 mm).

(9) Environmental resistance. The material must be resistant to deterioration due to exposure to sunlight, water, salt, or adverse weather conditions and impervious to aviation fuels, gasoline, and oil.

(10) Retroreflectivity. The material, when applied in accordance with manufacturer's guidelines, must demonstrate a uniform level of nighttime retroreflection when tested in accordance to ASTM E1710.

(11) Packaging. Packaging shall protect the material from environmental conditions until installation.

(12) Preformed thermoplastic airport pavement marking requirements.

(a) The markings must be a resilient thermoplastic product with uniformly distributed glass beads throughout the entire cross-sectional area. The markings must be resistant to the detrimental effects of aviation fuels, motor fuels and lubricants, hydraulic fluids, deicers, anti-icers, protective coatings, etc. Lines, legends, and symbols must be capable of being affixed to asphalt and/or Portland cement concrete pavements by the use of a large radiant heater. Colors shall be available as required.

(b) The markings must be capable of conforming to pavement contours, breaks, and faults through the action of airport traffic at normal pavement temperatures. The markings must be capable of fully conforming to grooved pavements, including pavement grooving per advisory circular (AC) 150/5320-12, current version. The markings shall have resealing characteristics, such that it is capable of fusing with itself and previously applied thermoplastics when heated with a heat source per manufacturer's recommendation.

(c) Multicolored markings must consist of interconnected individual pieces of preformed thermoplastic pavement marking material, which through a variety of colors and patterns, make up the desired design. The individual pieces in each large marking segment (typically more than 20 feet (6 m) long) must be factory assembled with a compatible material and interconnected so that in the field it is not necessary to assemble the individual pieces within a marking segment. Obtaining multicolored effect by overlaying materials of different colors is not acceptable due to resulting inconsistent marking thickness and inconsistent application temperature in the marking/substrate interface.

(d) The marking material must set up rapidly, permitting the access route to be re-opened to traffic after application.

(e) The marking material shall have an integral color throughout the thickness of the marking material.

b. Reflective media. Glass beads for white and yellow paint shall meet the requirements for Federal Specification TT-B-1325D Type I, Gradation A.

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

Glass beads shall be treated with all compatible coupling agents recommended by the manufacturers of the paint and reflective media to ensure adhesion and embedment.

Glass beads shall not be used in black and green paint.

Type III glass beads shall not be used in red and pink paint.

Preformed thermoplastic pavement markings should yield at least 225 mcd/m^2/lux on white markings at installation and at least 100 mcd/m^2/lux on yellow markings at installation.

Retroreflectivity shall be measured by a portable retroreflectometer according to ASTM E1710 and the practices in ASTM D7585 shall be followed for taking retroreflectivity readings with a portable

retroreflectometer and computing measurement averages. A vehicle-mounted retroreflectometer may also be used.

CONSTRUCTION METHODS

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

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

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

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

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

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

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

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

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

620-3.5 Application. A period of **30 calendar days** shall elapse between placement of surface course or seal coat and application of the permanent paint markings. Paint shall be applied at the locations and to

the dimensions and spacing shown on the plans. Paint shall not be applied until the layout and condition of the surface has been approved by the RPR.

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

Marking Dimensions and Spacing Tolerance

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

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

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

620-3.6 Application--preformed thermoplastic airport pavement markings. To ensure minimum single-pass application time and optimum bond in the marking/substrate interface, the materials must be applied using a variable speed self-propelled mobile heater with an effective heating width of no less than 16 feet (5 m) and a free span between supporting wheels of no less than 18 feet (5.5 m). The heater must emit thermal radiation to the marking material in such a manner that the difference in temperature of 2 inches (50 mm) wide linear segments in the direction of heater travel must be within 5% of the overall average temperature of the heated thermoplastic material as it exits the heater. The material must be able to be applied at ambient and pavement temperatures down to 35°F (2°C) without any preheating of the pavement to a specific temperature. The material must be able to be applied without the use of a thermometer. The pavement shall be clean, dry, and free of debris. A non-volatile organic content (non-VOC) sealer with a maximum applied viscosity of 250 centiPoise must be applied to the pavement shortly before the markings are applied. The supplier must enclose application instructions with each box/package.

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

620-3.8 Retro-reflectance. [Reflectance shall be measured with a portable retro-reflectometer meeting ASTM E1710 (or equivalent). A total of 6 reading shall be taken over a 6 square foot area with 3 readings taken from each direction. The average shall be equal to or above the minimum levels of all readings which are within 30% of each other.

Minimum Retro-Reflectance Values

Material	Retro-reflectance mcd/m^2/lux		
	White	**Yellow**	**Red**
Initial Type I	300	175	35
Initial Type III	600	300	35
Initial Thermoplastic	225	100	35
All materials, remark when less than[1]	100	75	10

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

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

METHOD OF MEASUREMENT

620-4.1a. The quantity of permanent markings to be paid for shall be measured by the number of square feet (square meters) of painting performed in accordance with the specifications and accepted by the RPR.

620-4.1b. The quantity of temporary markings to be paid for shall be the number of square feet (square meters) of painting performed in accordance with the specifications and accepted by the RPR.

620-4.1c. The quantity of preformed markings to be paid for shall be the number of square feet (square meters) of preformed markings.

Glass beads shall be considered incidental to the respective paint item. No separate measurement for payment shall be made.

BASIS OF PAYMENT

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

620-5.1b. Payment for temporary markings shall be made at the contract price for the number of square feet (square meters) of painting.

620-5.1c. Payment for preformed markings shall be made at the contract price for **t**he number of square feet (square meters) of preformed markings**.**

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

Payment will be made under:

Item	Description	Unit
P-620-1	Black Pavement Markings	Square Foot
P-620-3	Yellow Pavement Markings	Square Foot
P-620-6	Temporary Yellow Pavement Markings	Square Foot
P-620-8	Preformed Thermoplastic Markings	Square Foot

REFERENCES

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

ASTM International (ASTM)

ASTM D476	Standard Classification for Dry Pigmentary Titanium Dioxide Products
ASTM D968	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D1652	Standard Test Method for Epoxy Content of Epoxy Resins
ASTM D2074	Standard Test Method for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method
ASTM D2240	Standard Test Method for Rubber Property - Durometer Hardness
ASTM D7585	Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments
ASTM E303	Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
ASTM E1710	Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer
ASTM E2302	Standard Test Method for Measurement of the Luminance Coefficient Under Diffuse Illumination of Pavement Marking Materials Using a Portable Reflectometer
ASTM G154	Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

Code of Federal Regulations (CFR)

40 CFR Part 60, Appendix A-7, Method 24
Determination of volatile matter content, water content, density, volume solids, and weight solids of surface coatings

29 CFR Part 1910.1200 Hazard Communication

Federal Specifications (FED SPEC)

FED SPEC TT-B-1325D	Beads (Glass Spheres) Retro-Reflective
FED SPEC TT-P-1952F	Paint, Traffic and Airfield Marking, Waterborne
FED STD 595	Colors used in Government Procurement

Commercial Item Description

A-A-2886B	Paint, Traffic, Solvent Based

Advisory Circulars (AC)

AC 150/5340-1	Standards for Airport Markings
AC 150/5320-12	Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces

END OF ITEM P-620

Item P-621 Saw-Cut Grooves

DESCRIPTION

621-1.1 This item consists of constructing saw-cut grooves to minimize hydroplaning during wet weather, providing a skid resistant surface in accordance with these specifications and at the locations shown on the plans, or as directed by the Resident Project Representative (RPR).

CONSTRUCTION METHODS

621-2.1 Procedures. The Contractor shall submit to the RPR the grooving sequence and method of placing guide lines to control grooving operation. Transverse grooves saw-cut in the pavement must form a 1/4 inch (+1/16 inch, -0 inch) wide by 1/4 inch (±1/16 inch) deep by 1-1/2 inch (-1/8 inch, +0 inch) center-to-center configuration. The grooves must be continuous for the entire runway length. They must be saw-cut transversely (perpendicular to centerline) in the runway and high-speed taxiway pavement to not less than 10 feet from the runway pavement edge to allow adequate space for equipment operation.

The saw-cut grooves must meet the following tolerances. The tolerances apply to each day's production and to each piece of grooving equipment used for production. The Contractor is responsible for all controls and process adjustments necessary to meet these tolerances. The Contractor shall routinely spot check for compliance each time the equipment aligns for a grooving pass.

a. Alignment tolerance. The grooves shall not vary more than ±1-1/2 inch (38 mm) in alignment for 75 feet (23 m) along the runway length, allowing for realignment every 500 feet (150 m) along the runway length.

b. Groove tolerance.

(1) Depth. The standard depth is 1/4 inch (6 mm). At least 90% of the grooves must be at least 3/16 inch (5 mm), at least 60% of the grooves must be at least 1/4 inch (6 mm), and not more than 10% of the grooves may exceed 5/16 inch (8 mm).

(2) Width. The standard width is 1/4 inch (6 mm). At least 90% of the grooves must be at least 3/16 inch (5 mm), at least 60% of the grooves must be at least 1/4 inch (6 mm), and not more than 10% of the grooves may exceed 5/16 inch (8 mm).

(3) Center-to-center spacing. The standard spacing is 1-1/2 inch (38 mm). Minimum spacing 1-3/8 inch (34 mm). Maximum spacing 1-1/2 inch (38 mm).

Saw-cut grooves must not be closer than 3 inches (8 cm) or more than 9 inches (23 cm) from transverse joints in concrete pavements. Grooves must not be closer than 6 inches (150 mm) and no more than 18 inches (0.5 m) from in-pavement light fixtures. Grooves may be continued through longitudinal construction joints. Where neoprene compression seals have been installed and the compression seals are recessed sufficiently to prevent damage from the grooving operation, grooves may be continued through the longitudinal joints. Where neoprene compression seals have been installed and the compression seals are not recessed sufficiently to prevent damage from the grooving operation, grooves must not be closer than 3 inches (8 cm) or more than 5 inches (125 mm) from the

longitudinal joints. Where lighting cables are installed, grooving through longitudinal or diagonal saw kerfs shall not be allowed.

621-2.2 Environmental requirements. Grooving operations will not be permitted when freezing conditions prevent the immediate removal of debris and/or drainage of water from the grooved area. Discharge and disposal of waste slurry shall be the Contractor's responsibility.

621-2.3 Control strip. Groove a control strip in an area of the pavement outside of the trafficked area, as approved by the RPR. The area shall be 50 feet (15.2m) long by two lanes wide. Demonstrate the setup and alignment process, the grooving operation, and the waste slurry disposal.

621-2.4 Existing pavements. Bumps, depressed areas, bad or faulted joints, and badly cracked and/or spalled areas in the pavement shall not be grooved until such areas are adequately repaired or replaced.

621-2.5 New pavements. New asphalt and Portland cement concrete pavements shall be allowed to cure for a minimum of 30 days before grooving, to allow the material to become stable enough to prevent closing of the grooves under normal use. If it can be demonstrated that grooves are stable, and can be installed with no spalling, tearing or raveling of the groove edge, grooving may occur sooner that 30 days with approval of the RPR. All grade corrections must be completed prior to grooving. Spalling along or tearing or raveling of the groove edges shall not be allowed.

621-2.6 Grooving machine. Provide a grooving machine that is power driven, self-propelled, specifically designed and manufactured for pavement grooving, and has a self-contained and integrated continuous slurry vacuum system as the primary method for removing waste slurry. The grooving machine shall be equipped with diamond-saw cutting blades, and capable of making at least 18 inches (0.5 m) in width of multiple parallel grooves in one pass of the machine. Thickness of the cutting blades shall be capable of making the required width and depth of grooves in one pass of the machine. The cutting head shall not contain a mixture of new and worn blades or blades of unequal wear or diameter. Match the blade type and configuration with the hardness of the existing airfield pavement. The wheels on the grooving machine shall be of a design that will not scar or spall the pavement. Provide the machine with devices to control depth of groove and alignment.

621-2.7 Water supply. Water for the grooving operation shall be provided by the Contractor.

621-2.8 Clean-up. During and after installation of saw-cut grooves, the Contractor must remove from the pavement all debris, waste, and by-products generated by the operations to the satisfaction of the RPR. Cleanup of waste material must be continuous during the grooving operation. Flush debris produced by the machine to the edge of the grooved area or pick it up as it forms. The dust coating remaining shall be picked up or flushed to the edge of the area if the resultant accumulation is not detrimental to the vegetation or storm drainage system. Accomplish all flushing operations in a manner to prevent erosion on the shoulders or damage to vegetation. Waste material must be disposed of in an approved manner. Waste material must not be allowed to enter the airport storm sewer system. The Contractor must dispose of these wastes in strict compliance with all applicable state, local, and federal environmental statutes and regulations

621-2.9 Repair of damaged pavement. Grooving must be stopped and damaged pavement repaired at the Contractor's expense when directed by the RPR.

ACCEPTANCE

621-3.1 Acceptance testing. Grooves will be accepted based on results of zone testing. All acceptance testing necessary to determine conformance with the groove tolerances specified will be performed by the RPR.

Instruments for measuring groove width and depth must have a range of at least 0.5 inch (12 mm) and a resolution of at least 0.005 inch (0.13 mm). Gauge blocks or gauges machined to standard grooves width, depth, and spacing may be used.

Instruments for measuring center-to-center spacing must have a range of at least 3 inches (8 cm) and a resolution of at least 0.02 inch (0.5 mm).

The RPR will measure grooves in five zones across the pavement width. Measurements will be made at least three times during each day's production. Measurements in all zones will be made for each cutting head on each piece of grooving equipment used for each day's production.

The five zones are as follows:

Zone 1	Centerline to 5 feet (1.5 m) left or right of the centerline.
Zone 2	5 feet (1.5 m) to 25 feet (7.5 m) left of the centerline.
Zone 3	5 feet (1.5 m) 25 feet (7.5 m) right of the centerline.
Zone 4	25 feet (7.5 m) to edge of grooving left of the centerline.
Zone 5	25 feet (7.5 m) to edge of grooving right of the centerline.

At a random location within each zone, five consecutive grooves sawed by each cutting head on each piece of grooving equipment will be measured for width, depth, and spacing. The five consecutive measurements must be located about the middle blade of each cutting head ±4 inches (100 mm). Measurements will be made along a line perpendicular to the grooves.

- Width or depth measurements less than 0.170 inch (4 mm) shall be considered less than 3/16 inch (5 mm).
- Width or depth measurements more than 0.330 inch (8 mm) shall be considered more than 5/16 inch (8 mm).
- Width or depth measurements more than 0.235 inch (6 mm) shall be considered more than 1/4 inch (6 mm).

Production must be adjusted when more than one groove on a cutting head fails to meet the standard depth, width, or spacing in more than one zone.

METHOD OF MEASUREMENT

621-4.1 The quantity of grooving to be paid for shall be the number of square yards (square meters) of grooving performed in accordance with the specifications and accepted by the RPR per paragraph 621-3.1.

BASIS OF PAYMENT

621-5.1 Payment for saw-cut grooving. Payment for saw-cut grooving will be made at the contract unit price per square yard (square meter) for saw-cut grooving. This price shall be full compensation for furnishing all materials, and for all preparation, delivering, and application of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item	Description	Unit
P-621-1	Grooving	Square Yard

REFERENCES

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

Advisory Circulars (AC)

AC 150/5320-12 Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces

END OF ITEM P-621

Item D-700 Dry Swale

DESCRIPTION

700-1.1 This item shall consist of the construction of an dry swale, alteration of an existing drainage structure, installation of associated drainage pipe, and required site grading in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans.

MATERIALS

700-2.1 General. Materials shall meet the requirements shown on the plans and specified below.

700-2.2 Observation well with screw top lid. (Not used).

700-2.3 Geotextile. Geotextile shall be needle-punched, non-woven fabric of strength class 2, apparent opening size class C; acceptable per NYSDOT Technical Services approved list of geosynthetics for highway construction.

700-2.4 Underdrain gravel. Underdrain gravel shall be Type I, NYSDOT Item 605.0901.

700-2.5 Perforated underdrain pipe. Perforated underdrain pipe shall be 6" Schedule 40 PVC. Perforated sections shall have 3/8" holes at 6" O.C., with 4 holes per row.

700-2.6 Filter media. Dry swale filter media shall be composed of inorganic and organic fractions—The inorganic fraction shall be NYSDOT Item 608.1101, Type III. The Organic fraction (5-15%) shall be peat moss per 2015 NYS Stormwater Management Design Manual Table C-1.

700-2.7 Joint mortar. Pipe joint mortar shall consist of one part Portland cement and two parts sand. The Portland cement shall conform to the requirements of ASTM C 150, Type I. The sand shall conform to the requirements of ASTM C 144.

700-2.8 Elastomeric seals. Elastomeric seals shall conform to the requirements of ASTM F 477.

CONSTRUCTION METHODS

700-3.1 Equipment. All equipment necessary and required for the proper construction of pipe underdrains shall be on the project, in first-class working condition, and approved by the Engineer before construction is permitted to start.

1. Heavy equipment and traffic shall be restricted from traveling over the dry swale to minimize compaction of the soil.

2. Excavate the dry swale to the design dimensions. Excavated materials shall be placed away from the trench sides to enhance trench wall stability. Large tree roots must be trimmed flush with the trench sides in order to prevent fabric puncturing or tearing of the filter fabric during subsequent

installation procedures. The side walls of the trench shall be roughened where sheared and sealed by heavy equipment.

3. A filter fabric geotextile shall interface between the trench side walls and between the stone reservoir and gravel filter layers. The width of the geotextile must include sufficient material to conform to trench perimeter irregularities and for a 6-inch minimum top overlap. The filter fabric shall extend on the bottom of the dry swale for a distance of 6 to 12 inches. Stones or other anchoring objects should be placed on the fabric at the edge of the trench to keep the trench open during windy periods. When overlaps are required between rolls, the uphill roll should lap a minimum of 2 feet over the downhill roll in order to provide a shingled effect.

4. The stone aggregate should be placed in lifts and compacted using plate compactors. A maximum loose lift thickness of 12 inches is recommended.

5. Following the stone aggregate placement, the filter fabric shall be folded over the stone aggregate to form a 6-inch minimum longitudinal lap. The desired fill soil or stone aggregate shall be placed over the lap at sufficient intervals to maintain the lap during subsequent backfilling.

6. Care shall be exercised to prevent natural or fill soils from intermixing with the stone aggregate. All contaminated stone aggregate shall be removed and replaced with uncontaminated stone aggregate. Voids can be created between the fabric and the excavation sides and shall be avoided. Removing boulders or other obstacles from the trench walls is one source of such voids, therefore, natural soils should be placed in these voids at the most convenient time during construction to ensure fabric conformity to the excavation sides.

7. Vertically excavated walls may be difficult to maintain in areas where soil moisture is high or where soft cohesive or cohesionless soils are predominate. These conditions may require laying back of the side slopes to maintain stability.

8. PVC distribution pipes shall be Schedule 40 and meet ASTM Std. D 1784. All fittings and perforations (1/2 inch in diameter) shall meet ASTM Std. D 2729.

700-3.2 Backfilling.

The backfill shall be placed in loose layers not exceeding 18 inches in depth and loosely compacted (tamped lightly with a dozer or backhoe bucket). Backfilling shall be done in a manner to avoid injurious top or side pressures on the pipe.

In embankments and for other areas outside of the bottom of the dry swale, the backfill shall be compacted to the density required for embankments in unpaved areas under Item P-152.

a. Deflection Testing. The Engineer may at any time, not withstanding previous material acceptance, reject or require re-installation of pipe that exceeds 5 percent deflection when measured in accordance with ASTM D 2321, including Appendices.

700-3.3 Connections. When the plans call for connections to existing or proposed pipe or structures, these connections shall be watertight and made so that a smooth uniform flow line will be obtained throughout the drainage system.

700-3.4 Cleaning and restoration of site. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. Surplus dirt may be deposited in embankments,

shoulders, or as ordered by the Engineer. Except for paved areas of the airport, the Contractor shall restore all disturbed areas to their original condition.

METHOD OF MEASUREMENT

700-4.1 Dry Swale. The dry swale will be measured in linear feet of dry swale in place, completed, and accepted. It shall be measured along the centerline of the dry swale.

BASIS OF PAYMENT

700-5.1 Dry Swale. Payment for Dry Swales will be by the linear foot. This price shall be full compensation for furnishing all materials and for all preparation, excavation, geotextile, dry swale media, filter fabric, underdrain pipe, pipe fittings, mortar, backfilling, observation wells, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item	Description	Unit
D-700-1	Dry Swale	Linear Foot

END OF ITEM D-700

Item D-701 Pipe for Storm Drains and Culverts

DESCRIPTION

701-1.1 This item shall consist of the construction of pipe culverts and storm drains in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans.

MATERIALS

701-2.1 Materials shall meet the requirements shown on the plans and specified below. Underground piping and components used in drainage systems for terminal and aircraft fueling ramp drainage shall be noncombustible and inert to fuel in accordance with National Fire Protection Association (NFPA) 415.

701-2.2 Pipe. The pipe shall be of the type called for on the plans or in the proposal and shall be in accordance with the following appropriate requirements:

AASHTO R73	Standard Practice for Evaluation of Precast Concrete Drainage Productions
ASTM C76	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C1479	Standard Practice for Installation of Precast Concrete Sewer, Storm Drain, and Culvert Pipe Using Standard Installations
ASTM C1840	Standard Practice for Inspection and Acceptance of Installed Reinforced Concrete Culvert, Storm Drain, and Storm Sewer Pipe

701-2.3 Concrete. Concrete for pipe cradles shall have a minimum compressive strength of 2000 psi (13.8 MPa) at 28 days and conform to the requirements of ASTM C94.

701-2.4 Rubber gaskets. Rubber gaskets for rigid pipe shall conform to the requirements of ASTM C443. Rubber gaskets for PVC pipe, polyethylene, and polypropylene pipe shall conform to the requirements of ASTM F477. Rubber gaskets for zinc-coated steel pipe and precoated galvanized pipe shall conform to the requirements of ASTM D1056, for the "RE" closed cell grades. Rubber gaskets for steel reinforced thermoplastic ribbed pipe shall conform to the requirements of ASTM F47.

701-2.5 Joint mortar. Pipe joint mortar shall consist of one part Portland cement and two parts sand. The Portland cement shall conform to the requirements of ASTM C150, Type I. The sand shall conform to the requirements of ASTM C144.

701-2.6 Joint fillers. Poured filler for joints shall conform to the requirements of ASTM D6690.

701-2.7 Plastic gaskets. Not used.

701-2.8. Controlled low-strength material (CLSM). Controlled low-strength material shall conform to the requirements of Item P-153. When CLSM is used, all joints shall have gaskets.

701-2.9 Precast box culverts. Manufactured in accordance with and conforming to ASTM C1433.

701-2.10 Precast concrete pipe. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or American Concrete Pipe Association QCast Plant Certification program.

CONSTRUCTION METHODS

701-3.1 Excavation. The width of the pipe trench shall be sufficient to permit satisfactory jointing of the pipe and thorough tamping of the bedding material under and around the pipe, but it shall not be less than the external diameter of the pipe plus 12 inches (300 mm) on each side. The trench walls shall be approximately vertical.

The Contractor shall comply with all current federal, state and local rules and regulations governing the safety of men and materials during the excavation, installation and backfilling operations. Specifically, the Contractor shall observe that all requirements of the Occupational Safety and Health Administration (OSHA) relating to excavations, trenching and shoring are strictly adhered to. The width of the trench shall be sufficient to permit satisfactorily jointing of the pipe and thorough compaction of the bedding material under the pipe and backfill material around the pipe, but it shall not be greater than the widths shown on the plans trench detail.

Where rock, hardpan, or other unyielding material is encountered, the Contractor shall remove it from below the foundation grade for a depth of at least 8 inch (200 mm) or 1/2 inch (12 mm) for each foot of fill over the top of the pipe (whichever is greater) but for no more than three-quarters of the nominal diameter of the pipe. The excavation below grade should be filled with granular material to form a uniform foundation.

Where a firm foundation is not encountered at the grade established, due to soft, spongy, or other unstable soil, the unstable soil shall be removed and replaced with approved granular material for the full trench width. The RPR shall determine the depth of removal necessary. The granular material shall be compacted to provide adequate support for the pipe.

The excavation for pipes placed in embankment fill shall not be made until the embankment has been completed to a height above the top of the pipe as shown on the plans.

701-3.2 Bedding. The bedding surface for the pipe shall provide a foundation of uniform density to support the pipe throughout its entire length.

a. Rigid pipe. The pipe bedding shall be constructed uniformly for the full length of the pipe barrel, as required on the plans. The maximum aggregate size shall be 1 in when the bedding thickness is less than 6 inches, and 1-1/2 in when the bedding thickness is greater than 6 inches. Bedding shall be loosely placed uncompacted material under the middle third of the pipe prior to placement of the pipe.

b. Flexible pipe. For flexible pipe, the bed shall be roughly shaped to fit the pipe, and a bedding blanket of sand or fine granular material shall be provided as follows:

Flexible Pipe Bedding

Pipe Corrugation Depth		Minimum Bedding Depth	
inch	**mm**	**inch**	**mm**
1/2	12	1	25
1	25	2	50
2	50	3	75
2-1/2	60	3-1/2	90

c. Other pipe materials. For PVC, polyethylene, polypropylene, or fiberglass pipe, the bedding material shall consist of coarse sands and gravels with a maximum particle size of 3/4 inches (19 mm). For pipes installed under paved areas, no more than 12% of the material shall pass the No. 200 (0.075

mm) sieve. For all other areas, no more than 50% of the material shall pass the No. 200 (0.075 mm) sieve. The bedding shall have a thickness of at least 6 inches (150 mm) below the bottom of the pipe and extend up around the pipe for a depth of not less than 50% of the pipe's vertical outside diameter.

701-3.3 Laying pipe. The pipe laying shall begin at the lowest point of the trench and proceed upgrade. The lower segment of the pipe shall be in contact with the bedding throughout its full length. Bell or groove ends of rigid pipes and outside circumferential laps of flexible pipes shall be placed facing upgrade.

Paved or partially lined pipe shall be placed so that the longitudinal center line of the paved segment coincides with the flow line.

Elliptical and elliptically reinforced concrete pipes shall be placed with the manufacturer's reference lines designating the top of the pipe within five degrees of a vertical plane through the longitudinal axis of the pipe.

701-3.4 Joining pipe. Joints shall be made with (1) cement mortar, (2) cement grout, (3) rubber gaskets, (4) plastic gaskets, or (5) coupling bands.

Mortar joints shall be made with an excess of mortar to form a continuous bead around the outside of the pipe and shall be finished smooth on the inside. Molds or runners shall be used for grouted joints to retain the poured grout. Rubber ring gaskets shall be installed to form a flexible watertight seal.

a. Concrete pipe. Concrete pipe may be either bell and spigot or tongue and groove. Pipe sections at joints shall be fully seated and the inner surfaces flush and even. Concrete pipe joints shall be sealed with rubber gaskets meeting ASTM C443 when leak resistant joints are required.

b. Metal pipe. Not used.

c. PVC, Polyethylene, or Polypropylene pipe. Not used.

d. Fiberglass pipe. Not used.

701-3.5 Embedment and Overfill. Pipes shall be inspected before any fill material is placed; any pipes found to be out of alignment, unduly settled, or damaged shall be removed and re-laid or replaced at the Contractor's expense.

701-3.5-1 Embedment Material Requirements

a. Concrete Pipe. Embedment material and compaction requirements shall be in accordance with the applicable Type of Standard Installation (Types 1, 2, 3, or 4) per ASTM C1479. If a concrete cradle or CLSM embedment material is used, it shall conform to the plan details.

b. Plastic and fiberglass Pipe. Embedment material shall meet the requirements of ASTM D3282, A-1, A-2-4, A-2-5, or A-3. Embedment material shall be free of organic material, stones larger than 1.5 inches in the greatest dimension, or frozen lumps. Embedment material shall extend to 12 inches above the top of the pipe.

c. Metal Pipe. Embedment material shall be granular as specified in the contract document and specifications, and shall be free of organic material, rock fragments larger than 1.5 inches in the greatest dimension and frozen lumps. As a minimum, backfill materials shall meet the requirements of ASTM D3282, A-1, A-2, or A-3. Embedment material shall extend to 12 inches above the top of the pipe.

701-3.5-2 Placement of Embedment Material

The embedment material shall be compacted in layers not exceeding 6 inches (150 mm) on each side of the pipe and shall be brought up one foot (30 cm) above the top of the pipe or to natural ground level, whichever is greater. Thoroughly compact the embedment material under the haunches of the pipe

without displacing the pipe. Material shall be brought up evenly on each side of the pipe for the full length of the pipe.

When the top of the pipe is above the top of the trench, the embedment material shall be compacted in layers not exceeding 6 inches (150 mm) and shall be brought up evenly on each side of the pipe to one foot (30 cm) above the top of the pipe. All embedment material shall be compacted to a density required under Item P-152.

Concrete cradles and flowable fills, such as controlled low strength material (CLSM) or controlled density fill (CDF), may be used for embedment provided adequate flotation resistance can be achieved by restraints, weighing, or placement technique.

It shall be the Contractor's responsibility to protect installed pipes and culverts from damage due to construction equipment operations. The Contractor shall be responsible for installation of any extra strutting or backfill required to protect pipes from the construction equipment.

701-3.6 Overfill

Pipes shall be inspected before any overfill is in place. Any pipes found to be out of alignment, unduly settled, or damaged shall be removed and relaid or replaced at the Contractor's expense. Evaluation of any damage to RCP shall be evaluated based on AASHTO R73.

Overfill material shall be place and compacted in layers as required to achieve compaction to at least 95 percent standard proctor per ASTM D1557. The soil shall contain no debris, organic matter, frozen material, or stones with a diameter greater than one half the thickness of the compacted layers being placed.

701-3.7 Inspection Requirements

An initial post installation inspection shall be performed by the RPR no sooner than 30 days after completion of installation and final backfill. Clean or flush all lines prior to inspection.

Reinforced concrete pipe shall be inspected, evaluated, and reported on in accordance with ASTM C1840, "Standard Practice for Inspection and Acceptance of Installed Reinforced Concrete Culvert, Storm Drain, and Storm Sewer Pipe." Any issues reported shall include still photo and video documentation. The zoom ratio shall be provided for all still or video images that document any issues of concern by the inspection firm.

METHOD OF MEASUREMENT

701-4.1 The length of pipe shall be measured in linear feet (m) of pipe in place, completed, and accepted. It shall be measured along the centerline of the pipe from end or inside face of structure to the end or inside face of structure, whichever is applicable. The several classes, types, and sizes shall be measured separately. All fittings shall be included in the footage as typical pipe sections in the pipe being measured.

BASIS OF PAYMENT

701-5.0 These prices shall fully compensate the Contractor for furnishing all materials and for all preparation, excavation, and installation of these materials; and for all labor, equipment, tools, and incidentals necessary to complete the item.

701-5.1 Payment will be made at the contract unit price per linear foot (meter) for each kind of pipe of the size and material designated.

701-5.2 Payment will be made at the contract unit price per linear foot (meter) for the removal of each pipe of the size and material designated.

Payment will be made under:

Item	Description	Unit
D-701-0224	Reinforced Concrete Pipe Class IV, 24-inch Dia.	Linear Foot
D-701-62	Remove Existing Drainage Pipe, 15-Inch to 24-Inch Diameter	Linear Foot

REFERENCES

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

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M167	Standard Specification for Corrugated Steel Structural Plate, Zinc-Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches
AASHTO M190	Standard Specification for Bituminous-Coated Corrugated Metal Culvert Pipe and Pipe Arches
AASHTO M196	Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains
AASHTO M219	Standard Specification for Corrugated Aluminum Alloy Structural Plate for Field-Bolted Pipe, Pipe-Arches, and Arches
AASHTO M243	Standard Specification for Field Applied Coating of Corrugated Metal Structural Plate for Pipe, Pipe-Arches, and Arches
AASHTO M252	Standard Specification for Corrugated Polyethylene Drainage Pipe
AASHTO M294	Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter
AASHTO M304	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Wall Drain Pipe and Fittings Based on Controlled Inside Diameter
AASHTO MP20	Standard Specification for Steel Reinforced Polyethylene (PE) Ribbed Pipe, 300- to 900-mm (12- to 36-in.) Diameter

ASTM International (ASTM)

ASTM A760	Standard Specification for Corrugated Steel Pipe, Metallic Coated for Sewers and Drains
ASTM A761	Standard Specification for Corrugated Steel Structural Plate, Zinc Coated, for Field-Bolted Pipe, Pipe-Arches, and Arches
ASTM A762	Standard Specification for Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains
ASTM A849	Standard Specification for Post-Applied Coatings, Pavings, and Linings for Corrugated Steel Sewer and Drainage Pipe
ASTM B745	Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains

ASTM C14	Standard Specification for Nonreinforced Concrete Sewer, Storm Drain, and Culvert Pipe
ASTM C76	Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
ASTM C94	Standard Specification for Ready Mixed Concrete
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
ASTM C506	Standard Specification for Reinforced Concrete Arch Culvert, Storm Drain, and Sewer Pipe
ASTM C507	Standard Specification for Reinforced Concrete Elliptical Culvert, Storm Drain and Sewer Pipe
ASTM C655	Standard Specification for Reinforced Concrete D-Load Culvert, Storm Drain and Sewer Pipe
ASTM C990	Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants
ASTM C1433	Standard Specification for Precast Reinforced Concrete Monolithic Box Sections for Culverts, Storm Drains, and Sewers
ASTM D1056	Standard Specification for Flexible Cellular Materials Sponge or Expanded Rubber
ASTM D3034	Standard Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM D3212	Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
ASTM D3262	Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting Resin) Sewer Pipe
ASTM D3282	Standard Practice for Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes
ASTM D4161	Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting Resin) Pipe Joints Using Flexible Elastomeric Seals
ASTM D6690	Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements
ASTM F477	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F667	Standard Specification for 3 through 24 in. Corrugated Polyethylene Pipe and Fittings
ASTM F714	Standard Specification for Polyethylene (PE) Plastic Pipe (DR PR) Based on Outside Diameter
ASTM F794	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe & Fittings Based on Controlled Inside Diameter

ASTM F894	Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe
ASTM F949	Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings
ASTM F2435	Standard Specification for Steel Reinforced Polyethylene (PE) Corrugated Pipe
ASTM F2562	Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage
ASTM F2736	Standard Specification for 6 to 30 in. (152 to 762 mm) Polypropylene (PP) Corrugated Single Wall Pipe and Double Wall Pipe
ASTM F2764	Standard Specification for 30 to 60 in. (750 to 1500 mm) Polypropylene (PP) Triple Wall Pipe and Fittings for Non-Pressure Sanitary Sewer Applications
ASTM F2881	Standard Specification for 12 to 60 in. (300 to 1500 mm) Polypropylene (PP) Dual Wall Pipe and Fittings for Non-Pressure Storm Sewer Applications

National Fire Protection Association (NFPA)

NFPA 415	Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways

END ITEM D-701

Item D-703 Concrete Plugs for Sewer Pipe

DESCRIPTION

703-1.1 Under this item, the Contractor shall construct plugs in storm, sanitary or combined sewers at locations shown on the Plans or where directed by the Engineer.

MATERIALS

703-2.1 General. The plugs shall be constructed of either concrete poured in place, concrete blocks or common brick set in mortar beds. These materials shall meet the requirements shown on the plans and specified below.

703-2.2 Concrete. Concrete shall conform to the requirements of Item P-610 Structural Portland Cement Concrete.

703-2.3 Concrete block. Concrete Block shall conform to the requirements of New York State Department of Transportation (NYSDOT) Standard Specifications Section 704-04.

703-2.4 Common brick. Common Brick shall conform to the requirements of NYSDOT Standard Specifications Section 704-01.

703-2.5 Mortar. Mortar shall conform to the requirements of NYSDOT Standard Specifications Section 705-21.

CONSTRUCTION DETAILS

703-3.1 General. All work shall be performed in a workmanlike manner by competent personnel. The minimum thickness of the plugs shall be the inside diameter of the pipe being plugged or 24 inches, whichever is less.

METHOD OF MEASUREMENT

703-4.1 This work will be measured by the number of concrete plugs constructed in accordance with the Plans, specifications or as ordered by the Engineer.

BASIS OF PAYMENT

703-5.1 Payment will be made at the contract unit price per each concrete plug installed. The unit price bid shall include the cost of all labor, materials and equipment necessary to complete the work. Excavation and backfill shall be paid for under their respective items in accordance with the details shown on the Plans.

Payment will be made under:

Item No.	Description	Pay Unit
D-703-1	Concrete Plugs for Drainage Pipe	Each

END ITEM D-703

Item D-705 Pipe Underdrains for Airports

DESCRIPTION

705-1.1 This item shall consist of the construction of pipe drains in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans.

MATERIALS

705-2.1 General. Materials shall meet the requirements shown on the plans and specified below.

705-2.2 Pipe. The pipe shall be of the type called for on the plans or in the proposal and shall be in accordance with the following appropriate requirements.

American Association of State Highway and Transportation Officials (AASHTO) M196	Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains
AASHTO M252	Standard Specification for Corrugated Polyethylene Drainage Pipe
ASTM F758	Standard Specification for Smooth-Wall Poly (Vinyl Chloride) (PVC) Plastic Underdrain Systems for Highway, Airport, and Similar Drainage
ASTM F794	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe & Fittings Based on Controlled Inside Diameter
ASTM F949	Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings

705-2.3 Joint mortar. Pipe joint mortar shall consist of one part by volume of Portland cement and two parts sand. The Portland cement shall conform to the requirements of ASTM C150, Type I. The sand shall conform to the requirements of ASTM C144.

705-2.4 Elastomeric seals. Elastomeric seals shall conform to the requirements of ASTM F477.

705-2.5 Porous backfill. Porous backfill shall be free of clay, humus, or other objectionable matter, and shall conform to the gradation in Table 1 when tested in accordance with ASTM C136.

Table 1. Gradation of Porous Backfill

Sieve Designation (square openings)	Percentage by Weight Passing Sieves	
	Porous Material No. 1	Porous Material No. 2
1-1/2 inch (37.5 mm)		100
1 inch (25.0 mm)		90 - 100
3/8 inch (9.5 mm)	100	25 - 60
No. 4 (4.75 mm)	95-100	5 - 40
No. 8 (2.36 mm)		0 - 20
No. 16 (1.18 mm)	45-80	
No. 50 (300 µm)	10-30	
No. 100 (150 µm)	0-10	

When two courses of porous backfill are specified in the plans, the finer of the materials shall conform to particle size tabulated herein for porous material No. 1. The coarser granular material shall meet the gradation given in the tabulation for porous material No. 2.

705-2.6 Granular material. Granular material used for backfilling shall conform to the requirements of ASTM D2321 for Class IA, IB, or II materials.

705-2.7 Filter fabric. The filter fabric shall conform to the requirements of AASHTO M288 Class 2 or equivalent.

Table 2. Fabric Properties

Fabric Property	Test Method	Test Requirement
Grab Tensile Strength, lbs	ASTM D4632	125 min
Grab Tensile Elongation %	ASTM D4632	50 min
Burst Strength, psi	ASTM D3785	125 min
Trapezoid Tear Strength, lbs	ASTM D4533	55 min
Puncture Strength, lbs	ASTM D4833	40 min
Abrasion, lbs	ASTM D4886	15 max loss
Equivalent Opening Size	ASTM D4751	70-100
Permittivity sec^{-1}	ASTM D4491	0.80
Accelerated Weathering (UV Stability) (Strength Retained - %)	ASTM D4355 *(500 hrs exposure)	70

705-2.8 Controlled low-strength material (CLSM). Controlled low-strength material shall conform to the requirements of Item P-153. All joints shall have elastomeric seals. The locations where CLSM is permitted is shown on the plans.

CONSTRUCTION METHODS

705-3.1 Equipment. All equipment required for the construction of pipe underdrains shall be on the project, in good working condition, and approved by the RPR before construction is permitted to start.

705-3.2 Excavation. The width of the pipe trench shall be sufficient to permit satisfactory jointing of the pipe and thorough tamping of the bedding material under and around the pipe, but shall not be less than the external diameter of the pipe plus 6 inches (150 mm) on each side of the pipe. The trench walls shall be approximately vertical.

Where rock, hardpan, or other unyielding material is encountered, it shall be removed below the foundation grade for a depth of at least 4 inches (100 mm). The excavation below grade shall be backfilled with selected fine compressible material, such as silty clay or loam, and lightly compacted in layers not over 6 inches (150 mm) in uncompacted depth to form a uniform but yielding foundation.

Where a firm foundation is not encountered at the grade established, due to soft, spongy, or other unstable soil, the unstable soil shall be removed and replaced with approved granular material for the full trench width. The RPR shall determine the depth of removal necessary. The granular material shall be compacted to provide adequate support for the pipe.

Excavated material not required or acceptable for backfill shall be disposed of by the Contractor as directed by the RPR. The excavation shall not be carried below the required depth; if this occurs, the trench shall be backfilled at the Contractor's expense with material approved by the RPR and compacted to the density of the surrounding material.

The pipe bedding shall be constructed uniformly over the full length of the pipe barrel, as required on the plans. The maximum aggregate size shall be 1 inch when the bedding thickness is less than 6 inches, and 1-1/2 inch when the bedding thickness is greater than 6 inches. Bedding shall be loosely placed, uncompacted material under the middle third of the pipe prior to placement of the pipe.

The Contractor shall do trench bracing, sheathing, or shoring necessary to perform and protect the excavation as required for safety and conformance to federal, state and local laws. Unless otherwise provided, the bracing, sheathing, or shoring shall be removed by the Contractor after the backfill has reached at least 12 inches (300 mm) over the top of the pipe. The sheathing or shoring shall be pulled as the granular backfill is placed and compacted to avoid any unfilled spaces between the trench wall and the backfill material. The cost of bracing, sheathing, or shoring, and the removal of same, shall be included in the unit price bid per foot (meter) for the pipe.

705-3.3 Laying and installing pipe.

a. Concrete pipe. The laying of the pipe in the finished trench shall be started at the lowest point and proceed upgrade. When bell and spigot pipe is used, the bells shall be laid upgrade. If tongue and groove pipe is used, the groove end shall be laid upgrade. Holes in perforated pipe shall be placed down, unless otherwise shown on the plans. The pipe shall be firmly and accurately set to line and grade so that the invert will be smooth and uniform. Pipe shall not be laid on frozen ground.

Pipe which is not true in alignment, or which shows any settlement after laying, shall be taken up and re-laid by the Contractor at no additional expense. Making adjustments in grade by exerting force on the barrel of the pipe with excavating equipment, by lifting and dropping the pipe, or by lifting the pipe and packing bedding material under it shall be prohibited. If the installed pipe section is not to grade, the pipe section shall be completely removed, the grade corrected, and the pipe rejoined."

b. Metal pipe. The metal pipe shall be laid with the separate sections joined firmly together with bands, with outside laps of circumferential joints pointing upgrade, and with longitudinal laps on the sides. Any metal in the pipe or bands that is not protected thoroughly by galvanizing shall be coated with a suitable asphaltum paint.

During installation, the asphalt-protected pipe shall be handled without damaging the asphalt coating. Any breaks in the bitumen or treatment of the pipe shall be refilled with the type and kind of bitumen used in coating the pipe originally.

c. PVC, fiberglass, or polyethylene pipe. PVC or polyethylene pipe shall be installed in accordance with the requirements of ASTM D2321. Perforations shall meet the requirements of AASHTO M252 or AASHTO M294 Class 2, unless otherwise indicated on the plans. The pipe shall be laid accurately to line and grade. Fiberglass per ASTM D3839 Standard Guide for Underground Installation of "Fiberglass" (Glass-Fiber Reinforced Thermosetting-Resin) Pipe.

d. All types of pipe. The upgrade end of pipelines, not terminating in a structure, shall be plugged or capped as approved by the RPR.

Unless otherwise shown on the plans, a 4-inch (100 mm) bed of granular backfill material shall be spread in the bottom of the trench throughout the entire length under all perforated pipe underdrains.

Pipe outlets for the underdrains shall be constructed when required or shown on the plans. The pipe shall be laid with tight-fitting joints. Porous backfill is not required around or over pipe outlets for underdrains. All connections to other drainage pipes or structures shall be made as required and in a satisfactory manner. If connections are not made to other pipes or structures, the outlets shall be protected and constructed as shown on the plans.

e. Filter fabric. The filter fabric shall be installed in accordance with the manufacturer's recommendations, or in accordance with the AASHTO M288 Appendix, unless otherwise shown on the plans.

705-3.4 Mortar. The mortar shall be of the desired consistency for caulking and filling the joints of the pipe and for making connections to other pipes or to structures. Mortar that is not used within 45 minutes after water has been added shall be discarded. Retempering of mortar shall not be permitted.

705-3.5 Joints in concrete pipe. When open or partly open joints are required or specified, they shall be constructed as indicated on the plans. The pipe shall be laid with the ends fitted together as designed. If bell and spigot pipe is used, mortar shall be placed along the inside bottom quarter of the bell to center the following section of pipe.

The open or partly open joints shall be surrounded with granular material meeting requirements of porous backfill No. 2 in Table 1 or as indicated on the plans. This backfill shall be placed so its thickness will be not less than 3 inches (75 mm) nor more than 6 inches (150 mm), unless otherwise shown on the plans.

When the original material excavated from the trench is impervious, commercial concrete sand or granular material meeting requirements of porous backfill No. 1 shall surround porous backfill No. 2 (Table 1), as shown on the plans or as directed by the RPR.

When the original material excavated from the trench is pervious and suitable, it may be used as backfill in lieu of porous backfill No. 1, when indicated on the plans or as directed by the RPR.

705-3.6 Embedment and Backfill

a. Earth. All trenches and excavations shall be backfilled soon after the pipes are installed, unless additional protection of the pipe is directed. The embedment material shall be select material from excavation or borrow and shall be approved by the RPR. The select material shall be placed on each side of the pipe out to a distance of the nominal pipe diameter and one foot (30 cm) over the top of the pipe and shall be readily compacted. It shall not contain stones 3 inches (75 mm) or larger in size, frozen lumps, chunks of highly plastic clay, or any other material that is objectionable to the RPR. The material shall be moistened or dried, as required to aid compaction. Placement of the embedment material shall not cause displacement of the pipe. Thorough compaction under the haunches and along the sides to the top of the pipe shall be obtained.

The embedment material shall be placed in loose layers not exceeding 6 inches (150 mm) in depth under and around the pipe. Backfill material over the pipe shall be placed in lifts not exceeding 8 inches (200 mm). Successive layers shall be added and thoroughly compacted by hand and pneumatic tampers, approved by the RPR, until the trench is completely filled and brought to the planned elevation. Embedment and backfilling shall be done to avoid damaging top or side of the pipe.

In embankments and other unpaved areas, the backfill shall be compacted per Item P-152 to the density required for embankments in unpaved areas. Under paved areas, the subgrade and any backfill shall be compacted per Item P-152 to the density required for embankments for paved areas.

b. Granular backfill. When granular backfill is required, placement in the trench and about the pipe shall be as shown on the plans. The granular backfill shall not contain an excessive amount of foreign matter, nor shall soil from the sides of the trench or from the soil excavated from the trench be allowed to filter into the granular backfill. When required by the RPR, a template shall be used to properly place and separate the two sizes of backfill. The backfill shall be placed in loose layers not exceeding 6 inches (150 mm) in depth. The granular backfill shall be compacted by hand and pneumatic tampers to the requirements as given for embankment. Backfilling shall be done to avoid damaging top or side pressure on the pipe. The granular backfill shall extend to the elevation of the trench or as shown on the plans.

When perforated pipe is specified, granular backfill material shall be placed along the full length of the pipe. The position of the granular material shall be as shown on the plans. If the original material excavated from the trench is pervious and suitable, it shall be used in lieu of porous backfill No. 1.

If porous backfill is placed in paved or adjacent to paved areas before grading or subgrade operations is completed, the backfill material shall be placed immediately after laying the pipe. The depth of the granular backfill shall be not less than 12 inches (300 mm), measured from the top of the underdrain. During subsequent construction operations, a minimum depth of 12 inches (300 mm) of backfill shall be maintained over the underdrains. When the underdrains are to be completed, any unsuitable material shall be removed exposing the porous backfill. Porous backfill containing objectionable material shall be removed and replaced with suitable material. The cost of removing and replacing any unsuitable material shall be at the Contractor's expense.

If a granular subbase blanket course is used which extends several feet beyond the edge of paving to the outside edge of the underdrain trench, the granular backfill material over the underdrains shall be placed in the trench up to an elevation of 2 inches (50 mm) above the bottom surface of the granular subbase blanket course. Immediately prior to the placing of the granular subbase blanket course, the Contractor shall blade this excess trench backfill from the top of the trench onto the adjacent subgrade where it can be incorporated into the granular subbase blanket course. Any unsuitable material that remains over the underdrain trench shall be removed and replaced. The subbase material shall be placed to provide clean contact between the subbase material and the underdrain granular backfill material for the full width of the underdrain trench.

c. Controlled low-strength material (CLSM). Controlled low-strength material shall conform to the requirements of Item P-153.

705-3.7 Flexible Pipe Ring Deflection. The flexible pipe shall be inspected by the Contractor during and after installation to ensure that the internal diameter of the pipe barrel has not been reduced by more than 5 percent. For guidance on properly sizing mandrels, refer to ASTM D3034 and ASTM F679 appendices.

705-3.8Connections. When the plans call for connections to existing or proposed pipe or structures, these connections shall be watertight and made to obtain a smooth uniform flow line throughout the drainage system.

705-3.9 Cleaning and restoration of site. After the backfill is completed, the Contractor shall dispose of all surplus material, soil, and rubbish from the site. Surplus soil may be deposited in embankments,

shoulders, or as directed by the RPR. Except for paved areas of the airport, the Contractor shall restore all disturbed areas to their original condition.

METHOD OF MEASUREMENT

705-4.1 Pipe Underdrains, Complete. The length of pipe shall be the number of linear feet (meters) of pipe underdrains in place, completed, and approved; measured along the centerline of the pipe from end or inside face of structure to the end or inside face of structure, whichever is applicable. The several classes, types, and sizes shall be measured separately. All fittings shall be included in the footage as typical pipe sections in the pipeline being measured.

705-4.2 Underdrain Cleanouts. The quantity of underdrain cleanouts to be paid for shall be the number, each, of cleanouts, complete in place and accepted by the RPR.

705-4.3 Underdrain Outlets. The quantity of underdrain outlets to be paid for shall be the number, each, of outlets, complete in place and accepted by the RPR.

BASIS OF PAYMENT

705-5.1 Payment will be made at the contract unit price per linear foot (meter) for pipe underdrains of the type, class, and size designated.

705-5.2 Pipe underdrains, Complete. Payment will be made at the contract unit price per linear foot (meter) for pipe underdrains, complete (including porous backfill and filter fabric).

705-5.3 Underdrain Cleanouts. Payment will be made at the contract unit price for underdrain cleanouts completed.

705-5.4 Underdrain Outlets. Payment will be made at the contract unit price for underdrain outlets completed.

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

Payment will be made under:

Item	Description	Unit
D-705-2	6” Perforated Underdrain Complete, Including Porous Backfill and Filter Fabric	Linear Foot
D-705-4	Underdrain Cleanout	Each
D-705-5	Underdrain Outlet	Each

REFERENCES

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

ASTM International (ASTM)

ASTM A760	Standard Specification for Corrugated Steel Pipe, Metallic Coated for Sewers and Drains

ASTM A762	Standard Specification for Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C444	Standard Specification for Perforated Concrete Pipe
ASTM C654	Standard Specification for Porous Concrete Pipe
ASTM D2321	Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D3262	Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting Resin) Sewer Pipe
ASTM D4161	Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting Resin) Pipe Joints Using Flexible Elastomeric Seals
ASTM F477	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F758	Standard Specification for Smooth Wall Poly (Vinyl Chloride) (PVC) Plastic Underdrain Systems for Highway, Airport, and Similar Drainage
ASTM F794	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe & Fittings Based on Controlled Inside Diameter
ASTM F949	Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings
ASTM F2562	Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M190	Standard Specification for Bituminous - Coated Corrugated Metal Culvert Pipe and Pipe Arches
AASHTO M196	Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains
AASHTO M252	Standard Specification for Corrugated Polyethylene Drainage Pipe
AASHTO M288	Standard Specification for Geotextile Specification for Highway Applications
AASHTO M294	Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter
AASHTO M304	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Wall Drain Pipe and Fittings Based on Controlled Inside Diameter
AASHTO MP20	Standard Specification for Steel-Reinforced Polyethylene (PE) Ribbed Pipe, 300- to 900-mm (12- to 36-in.) diameter
AASHTO	Standard Specifications for Highway Bridges

END OF ITEM D-705

Item D-751 Manholes, Catch Basins, Inlets and Inspection Holes

DESCRIPTION

751-1.1 This item shall consist of construction of manholes, catch basins, inlets, and inspection holes, in accordance with these specifications, at the specified locations and conforming to the lines, grades, and dimensions shown on the plans or required by the RPR.

MATERIALS

751-2.1 Brick. The brick shall conform to the requirements of ASTM C32, Grade MS.

751-2.2 Mortar. Mortar shall consist of one part Portland cement and two parts sand. The cement shall conform to the requirements of ASTM C150, Type I. The sand shall conform to the requirements of ASTM C144.

751-2.3 Concrete. Plain and reinforced concrete used in structures, connections of pipes with structures, and the support of structures or frames shall conform to the requirements of Item P-610.

751-2.4 Precast concrete pipe manhole rings. Precast concrete pipe manhole rings shall conform to the requirements of ASTM C478. Unless otherwise specified, the risers and offset cone sections shall have an inside diameter of not less than 36 inches (90 cm) nor more than 48 inches (120 cm). There shall be a gasket between individual sections and sections cemented together with mortar on the inside of the manhole. Gaskets shall conform to the requirements of ASTM C443.

751-2.5 Corrugated metal. Corrugated metal shall conform to the requirements of American Association of State Highway and Transportation Officials (AASHTO) M36.

751-2.6 Frames, covers, and grates. The castings shall conform to one of the following requirements:

a. ASTM A48, Class 35B: Gray iron castings

b. ASTM A47: Malleable iron castings

c. ASTM A27: Steel castings

d. ASTM A283, Grade D: Structural steel for grates and frames

e. ASTM A536, Grade 65-45-12: Ductile iron castings

f. ASTM A897: Austempered ductile iron castings

All castings or structural steel units shall conform to the dimensions shown on the plans and shall be designed to support the loadings, aircraft gear configuration and/or direct loading, specified.

Each frame and cover or grate unit shall be provided with fastening members to prevent it from being dislodged by traffic but which will allow easy removal for access to the structure.

All castings shall be thoroughly cleaned. After fabrication, structural steel units shall be galvanized to meet the requirements of ASTM A123.

751-2.7 Steps. The steps or ladder bars shall be gray or malleable cast iron or galvanized steel. The steps shall be the size, length, and shape shown on the plans and those steps that are not galvanized shall be given a coat of asphalt paint, when directed.

751-2.8 Precast inlet structures. Manufactured in accordance with and conforming to ASTM C913.

CONSTRUCTION METHODS

751-3.1 Unclassified excavation.

a. The Contractor shall excavate for structures and footings to the lines and grades or elevations, shown on the plans, or as staked by the RPR. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown. The elevations of the bottoms of footings, as shown on the plans, shall be considered as approximately only; and the RPR may direct, in writing, changes in dimensions or elevations of footings necessary for a satisfactory foundation.

b. Boulders, logs, or any other objectionable material encountered in excavation shall be removed. All rock or other hard foundation material shall be cleaned of all loose material and cut to a firm surface either level, stepped, or serrated, as directed by the RPR. All seams or crevices shall be cleaned out and grouted. All loose and disintegrated rock and thin strata shall be removed. Where concrete will rest on a surface other than rock, the bottom of the excavation shall not be disturbed and excavation to final grade shall not be made until immediately before the concrete or reinforcing is placed.

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

d. All bracing, sheathing, or shoring involved in the construction of this item shall be removed by the Contractor after the completion of the structure. Removal shall not disturb or damage finished masonry. The cost of removal shall be included in the unit price bid for the structure.

e. After excavation is completed for each structure, the Contractor shall notify the RPR. No concrete or reinforcing steel shall be placed until the RPR has approved the depth of the excavation and the character of the foundation material.

751-3.2 Brick structures.

a. Foundations. A prepared foundation shall be placed for all brick structures after the foundation excavation is completed and accepted. Unless otherwise specified, the base shall consist of reinforced concrete mixed, prepared, and placed in accordance with the requirements of Item P-610.

b. Laying brick. All brick shall be clean and thoroughly wet before laying so that they will not absorb any appreciable amount of additional water at the time they are laid. All brick shall be laid in freshly made mortar. Mortar not used within 45 minutes after water has been added shall be discarded. Retempering of mortar shall not be permitted. An ample layer of mortar shall be spread on the beds and a shallow furrow shall be made in it that can be readily closed by the laying of the brick. All bed and head joints shall be filled solid with mortar. End joints of stretchers and side or cross joints of headers shall be fully buttered with mortar and a shoved joint made to squeeze out mortar at the top of the joint. Any bricks that may be loosened after the mortar has taken its set, shall be removed, cleaned, and re-laid with fresh mortar. No broken or chipped brick shall be used in the face, and no spalls or bats shall be used except where necessary to shape around irregular openings or edges; in which case, full bricks shall be placed at ends or corners where possible, and the bats shall be used in the interior of the course. In making closures, no piece of brick shorter than the width of a whole brick shall be used; and wherever practicable, whole brick shall be used and laid as headers.

c. Joints. All joints shall be filled with mortar at every course Exterior faces shall be laid up in advance of backing. Exterior faces shall be plastered or parged with a coat of mortar not less than 3/8 inch (9 mm) thick before the backing is laid up. Prior to parging, all joints on the back of face courses shall be

cut flush. Unless otherwise noted, joints shall be not less than 1/4 inch (6 mm) nor more than 1/2 inch (12 mm) wide and the selected joint width shall be maintained uniform throughout the work.

d. Pointing. Face joints shall be neatly struck, using the weather-struck joint. All joints shall be finished properly as the laying of the brick progresses. When nails or line pins are used, the holes shall be immediately plugged with mortar and pointed when the nail or pin is removed.

e. Cleaning. Upon completion of the work all exterior surfaces shall be thoroughly cleaned by scrubbing and washing with water. If necessary to produce satisfactory results, cleaning shall be done with a 5% solution of muriatic acid which shall then be rinsed off with liberal quantities of water.

f. Curing and cold weather protection. The brick masonry shall be protected and kept moist for at least 48 hours after laying the brick. Brick masonry work or pointing shall not be done when there is frost on the brick or when the air temperature is below 50°F (10°C) unless the Contractor has, on the project ready to use, suitable covering and artificial heating devices necessary to keep the atmosphere surrounding the masonry at a temperature of not less than 60°F (16°C) for the duration of the curing period.

751-3.3 Concrete structures. Concrete structures which are to be cast-in-place within the project boundaries shall be built on prepared foundations, conforming to the dimensions and shape indicated on the plans. The construction shall conform to the requirements specified in Item P-610. Any reinforcement required shall be placed as indicated on the plans and shall be approved by the RPR before the concrete is placed.

All invert channels shall be constructed and shaped accurately to be smooth, uniform, and cause minimum resistance to flowing water. The interior bottom shall be sloped to the outlet.

751-3.4 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another RPR approved third party certification program.

Precast concrete structures shall conform to ASTM C478. Precast concrete structures shall be constructed on prepared or previously placed slab foundations conforming to the dimensions and locations shown on the plans. All precast concrete sections necessary to build a completed structure shall be furnished. The different sections shall fit together readily. Joints between precast concrete risers and tops shall be full-bedded in cement mortar and shall: (1) be smoothed to a uniform surface on both interior and exterior of the structure or (2) utilize a rubber gasket per ASTM C443. The top of the upper precast concrete section shall be suitably formed and dimensioned to receive the metal frame and cover or grate, or other cap, as required. Provision shall be made for any connections for lateral pipe, including drops and leads that may be installed in the structure. The flow lines shall be smooth, uniform, and cause minimum resistance to flow. The metal or metal encapsulated steps that are embedded or built into the side walls shall be aligned and placed in accordance to ASTM C478. When a metal ladder replaces the steps, it shall be securely fastened into position.

751-3.5 Corrugated metal structures. Corrugated metal structures shall be prefabricated. All standard or special fittings shall be furnished to provide pipe connections or branches with the correct dimensions and of sufficient length to accommodate connecting bands. The fittings shall be welded in place to the metal structures. The top of the metal structure shall be designed so that either a concrete slab or metal collar may be attached to allow the fastening of a standard metal frame and grate or cover. Steps or ladders shall be furnished as shown on the plans. Corrugated metal structures shall be constructed on prepared foundations, conforming to the dimensions and locations as shown on the plans. When indicated, the structures shall be placed on a reinforced concrete base.

751-3.6 Inlet and outlet pipes. Inlet and outlet pipes shall extend through the walls of the structures a sufficient distance beyond the outside surface to allow for connections. They shall be cut off flush with

the wall on the inside surface of the structure, unless otherwise directed. For concrete or brick structures, mortar shall be placed around these pipes to form a tight, neat connection.

751-3.7 Placement and treatment of castings, frames, and fittings. All castings, frames, and fittings shall be placed in the positions indicated on the plans or as directed by the RPR, and shall be set true to line and elevation. If frames or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place before the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

When frames or fittings are placed on previously constructed masonry, the bearing surface of the masonry shall be brought true to line and grade and shall present an even bearing surface so the entire face or back of the unit will come in contact with the masonry. The unit shall be set in mortar beds and anchored to the masonry as indicated on the plans or as directed by the RPR. All units shall set firm and secure.

After the frames or fittings have been set in final position, the concrete or mortar shall be allowed to harden for seven (7) days before the grates or covers are placed and fastened down.

751-3.8 Installation of steps. The steps shall be installed as indicated on the plans or as directed by the RPR. When the steps are to be set in concrete, they shall be placed and secured in position before the concrete is placed. When the steps are installed in brick masonry, they shall be placed as the masonry is being built. The steps shall not be disturbed or used until the concrete or mortar has hardened for at least seven (7) days. After seven (7) days, the steps shall be cleaned and painted, unless they have been galvanized.

When steps are required with precast concrete structures they shall meet the requirements of ASTM C478. The steps shall be cast into the side of the sections at the time the sections are manufactured or set in place after the structure is erected by drilling holes in the concrete and cementing the steps in place.

When steps are required with corrugated metal structures, they shall be welded into aligned position at a vertical spacing of 12 inches (300 mm).

Instead of steps, prefabricated ladders may be installed. For brick or concrete structures, the ladder shall be held in place by grouting the supports in drilled holes. For metal structures, the ladder shall be secured by welding the top support to the structure and grouting the bottom support into drilled holes in the foundation or as directed by the RPR.

751-3.9 Backfilling.

a. After a structure has been completed, the area around it shall be backfilled with approved material, in horizontal layers not to exceed 8 inches (200 mm) in loose depth, and compacted to the density required in Item P-152. Each layer shall be deposited evenly around the structure to approximately the same elevation. The top of the fill shall meet the elevation shown on the plans or as directed by the RPR.

b. Backfill shall not be placed against any structure until approved by the RPR. For concrete structures, approval shall not be given until the concrete has been in place seven (7) days, or until tests establish that the concrete has attained sufficient strength to withstand any pressure created by the backfill and placing methods.

c. Backfill shall not be measured for direct payment. Performance of this work shall be considered an obligation of the Contractor covered under the contract unit price for the structure involved.

751-3.10 Cleaning and restoration of site. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. Surplus dirt may be deposited in embankments, shoulders, or as approved by the RPR. The Contractor shall restore all disturbed areas to their original condition. The Contractor shall remove all tools and equipment, leaving the entire site free, clear, and in good condition.

751-3.11 Cleaning Drainage Structures. Drainage structures identified in the contract documents shall be cleaned. Materials removed shall be disposed of in accordance with P-152.

751-3.12 Cleaning Closed Drainage System. Closed drainage systems identified in the contract documents shall be cleaned. Materials removed shall be disposed of in accordance with P-152.

METHOD OF MEASUREMENT

751-4.1 Manholes, catch basins, inlets, and inspection holes new installed, altered, adjusted, removed, or cleaned shall be measured by the unit.

751-4.2 Drainage pipes cleaned shall be measured by the linear foot.

BASIS OF PAYMENT

751-5.1 The accepted quantities of manholes, catch basins, inlets, and inspection holes will be paid for at the contract unit price per each in place when completed. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling and placing of the materials; furnishing and installation of such specials and connections to pipes and other structures as may be required to complete the item as shown on the plans; and for all labor equipment, tools and incidentals necessary to complete the structure.

Payment will be made under:

Item	Description	Unit
D-751-012	Rectangular Drainage Structure 4’ x 4’	Each
D-751-4	Alter Existing Drainage Structure	Each
D-751-51	Adjust Existing Drainage Structure	Each
D-751-7	Remove Existing Drainage Structure	Each
D-751-9	Clean Existing Drainage Structure	Each
D-751-10	Clean Existing Drainage Pipe	Linear Foot

REFERENCES

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

ASTM International (ASTM)

ASTM A27	Standard Specification for Steel Castings, Carbon, for General Application
ASTM A47	Standard Specification for Ferritic Malleable Iron Castings
ASTM A48	Standard Specification for Gray Iron Castings
ASTM A123	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A283	Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates

ASTM A536	Standard Specification for Ductile Iron Castings
ASTM A897	Standard Specification for Austempered Ductile Iron Castings
ASTM C32	Standard Specification for Sewer and Manhole Brick (Made from Clay or Shale)
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
ASTM C478	Standard Specification for Precast Reinforced Concrete Manhole Sections
ASTM C913	Standard Specification for Precast Concrete Water and Wastewater Structures.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M36	Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains

END OF ITEM D-751

Item L-108 Underground Power Cable for Airports

DESCRIPTION

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

EQUIPMENT AND MATERIALS

108-2.1 General.

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

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

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

d. All materials and equipment used to construct this item shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete any non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment to which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in the project that may accrue directly or indirectly from late submissions or resubmissions of submittals. Only Third Party certified manufacturers, listed in AC 150/5345-53, Appendix 3 Addendum (as required) and meeting the BUY AMERICAN preference requirements can provide equipment and materials specified in the Contract Documents. Documentation certifying compliance with the BUY AMERICAN preference rules for Airport Improvement Program (AIP) cited in 49 USC §50101) shall be included with each equipment and material submittal.

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

f. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for at least twelve (12) months from the date of final acceptance by

the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner. The Contractor shall maintain a minimum insulation resistance in accordance with paragraph 108-3.10e with isolation transformers connected in new circuits and new segments of existing circuits through the end of the contract warranty period when tested in accordance with AC 150/5340-26, *Maintenance Airport Visual Aid Facilities*, paragraph 5.1.3.1, Insulation Resistance Test.

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

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

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

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

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

108-2.3 Bare copper wire (counterpoise, bare copper wire ground and ground rods). Wire for counterpoise or ground installations for airfield lighting systems shall be No. 6 AWG bare solid copper wire for counterpoise and/or No. 6 AWG insulated stranded for grounding bond wire per ASTM B3 and ASTM B8, and shall be bare copper wire or tinned copper wire per ASTM B33. For voltage powered circuits, the equipment grounding conductor shall comply with NEC Article 250.

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

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

a. The cast splice. A cast splice, employing a plastic mold and using epoxy resin equivalent to that manufactured by 3M™ Company, "Scotchcast" Kit No. 82-B, or an approved equivalent, used for potting the splice is acceptable.

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

c. The factory-molded plug-in splice. Specification for L-823 Connectors, Factory-Molded to Individual Conductors, is acceptable.

d. The taped or heat-shrink splice. Taped splices employing field-applied rubber, or synthetic rubber tape covered with plastic tape is acceptable. The rubber tape should meet the requirements of ASTM D4388 and the plastic tape should comply with Military Specification MIL-I-24391 or Commercial Item Description A-A-55809. Heat shrinkable tubing shall be heavy-wall, self-sealing tubing rated for the voltage of the wire being spliced and suitable for direct-buried installations. The tubing shall be factory coated with a thermoplastic adhesive-sealant that will adhere to the insulation of the wire being spliced forming a moisture- and dirt-proof seal. Additionally, heat shrinkable tubing for multi-conductor cables, shielded cables, and armored cables shall be factory kits that are designed for the application. Heat shrinkable tubing and tubing kits shall be manufactured by Tyco Electronics/ Raychem Corporation, Energy Division, or approved equivalent.

In all the above cases, connections of cable conductors shall be made using crimp connectors using a crimping tool designed to make a complete crimp before the tool can be removed. All L-823/L-824 splices and terminations shall be made per the manufacturer's recommendations and listings.

All connections of counterpoise, grounding conductors and ground rods shall be made by the exothermic process or approved equivalent, except that a light base ground clamp connector shall be used for attachment to the light base. All exothermic connections shall be made per the manufacturer's recommendations and listings.

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

108-2.6 Concrete. Concrete shall be proportioned, placed, and cured per state department of transportation structural concrete with minimum 25% Type F fly ash, and a minimum allowable compressive strength of 4,000 psi (28 MPa).

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

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

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

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

108-2.11 Existing circuits. Whenever the scope of work requires connection to an existing circuit, the existing circuit's insulation resistance shall be tested, in the presence of the RPR. The test shall be performed per this item and prior to any activity that will affect the respective circuit. The Contractor shall record the results on forms acceptable to the RPR. When the work affecting the circuit is complete,

the circuit's insulation resistance shall be checked again, in the presence of the RPR. The Contractor shall record the results on forms acceptable to the RPR. The second reading shall be equal to or greater than the first reading or the Contractor shall make the necessary repairs to the existing circuit to bring the second reading above the first reading. All repair costs including a complete replacement of the L-823 connectors, L-830 transformers and L-824 cable, if necessary, shall be borne by the Contractor. All test results shall be submitted in the Operation and Maintenance (O&M) Manual.

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

108-2.13 Type V cable. Type V extension cable shall be as specified by the pavement surface sensor manufacturer and shall be compatible with all pavement surface sensors specified in specification L-130.

CONSTRUCTION METHODS

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

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

In addition to connectors being installed at individual isolation transformers, L-823 cable connectors for maintenance and test points shall be installed at locations shown on the plans. Cable circuit identification markers shall be installed on both sides of the L-823 connectors installed and on both sides of slack loops where a future connector would be installed.

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

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

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

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

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

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

The cable shall be installed in a manner that prevents harmful stretching of the conductor, damage to the insulation, or damage to the outer protective covering. The ends of all cables shall be sealed with moisture-seal tape providing moisture-tight mechanical protection with minimum bulk, or alternately, heat shrinkable tubing before pulling into the conduit and it shall be left sealed until connections are made. Where more than one cable is to be installed in a conduit, all cable shall be pulled in the conduit at the same time. The pulling of a cable through duct banks or conduits may be accomplished by hand winch or power winch with the use of cable grips or pulling eyes. Maximum pulling tensions shall not exceed the cable manufacturer's recommendations. A non-hardening cable-pulling lubricant recommended for the type of cable being installed shall be used where required.

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

The manufacturer's minimum bend radius or NEC requirements (whichever is more restrictive) shall apply. Cable installation, handling and storage shall be per manufacturer's recommendations. During cold weather, particular attention shall be paid to the manufacturer's minimum installation temperature. Cable shall not be installed when the temperature is at or below the manufacturer's minimum installation temperature. At the Contractor's option, the Contractor may submit a plan, for review by the RPR, for heated storage of the cable and maintenance of an acceptable cable temperature during installation when temperatures are below the manufacturer's minimum cable installation temperature.

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

108-3.3 Splicing. Connections of the type shown on the plans shall be made by experienced personnel regularly engaged in this type of work and shall be made as follows:

a. Cast splices. These shall be made by using crimp connectors for jointing conductors. Molds shall be assembled, and the compound shall be mixed and poured per the manufacturer's instructions and to the satisfaction of the RPR.

b. Field-attached plug-in splices. These shall be assembled per the manufacturer's instructions. These splices shall be made by plugging directly into mating connectors. The joint where the connectors come together shall be finished by one of the following methods: (1) wrapped with at least one layer of rubber or synthetic rubber tape and one layer of plastic tape, one-half lapped, extending at least 1-1/2

inches (38 mm) on each side of the joint (2) Covered with heat shrinkable tubing with integral sealant extending at least 1-1/2 inches (38 mm) on each side of the joint or (3) On connector kits equipped with water seal flap; roll-over water seal flap to sealing position on mating connector.

c. Factory-molded plug-in splices. These shall be made by plugging directly into mating connectors. The joint where the connectors come together shall be finished by one of the following methods: (1) Wrapped with at least one layer of rubber or synthetic rubber tape and one layer of plastic tape, one-half lapped, extending at least 1-1/2 inches (38 mm) on each side of the joint. (2) Covered with heat shrinkable tubing with integral sealant extending at least 1-1/2 inches (38 mm) on each side of the joint. or (3) On connector kits so equipped with water seal flap; roll-over water seal flap to sealing position on mating connector.

d. Taped or heat-shrink splices. A taped splice shall be made in the following manner:

Bring the cables to their final position and cut so that the conductors will butt. Remove insulation and jacket allowing for bare conductor of proper length to fit compression sleeve connector with 1/4 inch (6 mm) of bare conductor on each side of the connector. Prior to splicing, the two ends of the cable insulation shall be penciled using a tool designed specifically for this purpose and for cable size and type. Do not use emery paper on splicing operation since it contains metallic particles. The copper conductors shall be thoroughly cleaned. Join the conductors by inserting them equidistant into the compression connection sleeve. Crimp conductors firmly in place with crimping tool that requires a complete crimp before tool can be removed. Test the crimped connection by pulling on the cable. Scrape the insulation to assure that the entire surface over which the tape will be applied (plus 3 inches (75 mm) on each end) is clean. After scraping, wipe the entire area with a clean lint-free cloth. Do not use solvents.

Apply high-voltage rubber tape one-half lapped over bare conductor. This tape should be tensioned as recommended by the manufacturer. Voids in the connector area may be eliminated by highly elongating the tape, stretching it just short of its breaking point. The manufacturer's recommendation for stretching tape during splicing shall be followed. Always attempt to exactly half-lap to produce a uniform buildup. Continue buildup to 1-1/2 times cable diameter over the body of the splice with ends tapered a distance of approximately one inch (25 mm) over the original jacket. Cover rubber tape with two layers of vinyl pressure-sensitive tape one-half lapped. Do not use glyptol or lacquer over vinyl tape as they react as solvents to the tape. No further cable covering or splice boxes are required.

Heat shrinkable tubing shall be installed following manufacturer’s instructions. Direct flame heating shall not be permitted unless recommended by the manufacturer. Cable surfaces within the limits of the heat-shrink application shall be clean and free of contaminates prior to application.

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

108-3.4 Bare counterpoise wire installation for lightning protection and grounding. If shown on the plans or included in the job specifications, bare solid #6 AWG copper counterpoise wire shall be installed for lightning protection of the underground cables. The RPR shall select one of two methods of lightning protection for the airfield lighting circuit based upon sound engineering practice and lightning strike density.

a. Equipotential. Not used.

b. Isolation. Counterpoise size is as shown on the plans. The isolation method is an alternate method for use only with edge lights installed in turf and stabilized soils and raceways installed parallel to and adjacent to the edge of the pavement. NFPA 780 uses 15 feet to define "adjacent to".

The counterpoise conductor shall be installed halfway between the pavement edge and the light base, mounting stake, raceway, or cable being protected.

The counterpoise conductor shall be installed 8 inches (203 mm) minimum below grade. The counterpoise is not connected to the light base or mounting stake. An additional grounding electrode is required at each light base or mounting stake. The grounding electrode is bonded to the light base or mounting stake with a 6 AWG solid copper conductor.

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

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

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

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

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

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

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

108-3.5 Counterpoise installation above multiple conduits and duct banks. Counterpoise wires shall be installed above multiple conduits/duct banks for airfield lighting cables, with the intent being to provide a complete area of protection over the airfield lighting cables. When multiple conduits and/or duct banks for airfield cable are installed in the same trench, the number and location of counterpoise wires above the conduits shall be adequate to provide a complete area of protection measured 45 degrees each side of vertical.

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

108-3.6 Counterpoise installation at existing duct banks. When airfield lighting cables are indicated on the plans to be routed through existing duct banks, the new counterpoise wiring shall be terminated at ground rods at each end of the existing duct bank where the cables being protected enter and exit the duct bank. The new counterpoise conductor shall be bonded to the existing counterpoise system.

108-3.7 Exothermic bonding. Bonding of counterpoise wire shall be by the exothermic welding process or equivalent method accepted by the RPR. Only personnel experienced in and regularly engaged in this type of work shall make these connections.

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

a. All slag shall be removed from welds.

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

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

108-3.8 Testing. The Contractor shall furnish all necessary equipment and appliances for testing the airport electrical systems and underground cable circuits before and after installation. The Contractor shall perform all tests in the presence of the RPR. The Contractor shall demonstrate the electrical characteristics to the satisfaction of the RPR. All costs for testing are incidental to the respective item being tested. For phased projects, the tests must be completed by phase. The Contractor must maintain the test results throughout the entire project as well as during the warranty period that meet the following:

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

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

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

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

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

e. That the insulation resistance to ground of all new non-grounded high voltage series circuits or cable segments is not less than 100 megohms. Verify continuity of all series airfield lighting circuits prior to energization.

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

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

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

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

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

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

METHOD OF MEASUREMENT

108-4.1 Trenching shall not be measured separately for payment and shall be considered incidental to the unit price bid per linear foot of cable.

The cost of all excavation, backfill, dewatering and restoration regardless of the type of material encountered shall be included in the unit price bid for each wire type listed below.

108-4.2 Cable or counterpoise wire installed in trench, duct bank or conduit shall be measured by the number of linear feet (meters) installed and grounding connectors, and trench marking tape ready for operation, and accepted as satisfactory. Separate measurement shall be made for each cable or counterpoise wire installed in trench, duct bank or conduit. The measurement for this item shall not include additional quantities required for slack.

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

BASIS OF PAYMENT

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

Payment will be made under:

Item	Description	Unit
L-108-104	No. 6 AWG, 5 kV, L-824 Type C Cable, Installed in Trench, Duct Bank, or Conduit	Linear Foot
L-108-105	No. 8 AWG, 5 kV, L-824 Type C Cable, Installed In Trench, Duct Bank, or Conduit	Linear Foot
L-108-201	No. 6 AWG, Solid, Bare Copper Counterpoise Wire Installed in Trench, Above the Duct Bank or Conduit Including Connections/Terminations	Linear Foot
L-108-51	Pavement Sensor (V) Wire	Linear Foot

REFERENCES

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

Advisory Circulars (AC)

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

Commercial Item Description

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

ASTM International (ASTM)

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

Mil Spec

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

National Fire Protection Association (NFPA)

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

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

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

Federal Aviation Administration Standard

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

END OF ITEM L-108

Item L-109 Airport Transformer Vault and Vault Equipment

DESCRIPTION

109-1.1 This item shall consist of removal and replacement of existing airport transformer vault equipment. This work shall also include the furnishing of all vault equipment, wiring, electrical buses, cable, conduit, potheads, and grounding systems. This work shall also include the painting of equipment and conduit; the marking and labeling of equipment and the labeling or tagging of wires; the testing of the installation; and the furnishing of all incidentals necessary to place it in operating condition as a completed unit to the satisfaction of the RPR.

EQUIPMENT AND MATERIALS

109-2.1 General.

a. Airport lighting equipment and materials covered by advisory circulars (AC) shall be certified in AC 150/5345-53, Airport Lighting Equipment Certification Program (ALECP) and listed in the ALECP Addendum.

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

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

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

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

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

109-2.2 Rigid steel conduit. Rigid steel conduit and fittings shall be per Underwriters Laboratories Standards 6 and 514B.

109-2.3 FAA-approved equipment. Certain items of airport lighting equipment installed in vaults are covered by individual ACs listed below:

AC 150/5345-3	Specification for L-821, Panels for Remote Control of Airport Lighting
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-10	Specification for Constant Current Regulators and Regulator Monitors

109-2.4 Other electrical equipment. Circuit breakers and all other regularly used commercial items of electrical equipment not covered by FAA equipment specifications and ACs shall conform to the applicable rulings and standards of the Institute of Electrical and Electronic Engineers (IEEE) or the National Electrical Manufacturers Association (NEMA). When specified, test reports from a testing laboratory indicating that the equipment meets the specifications shall be supplied. In all cases, equipment shall be new and a first-grade product. This equipment shall be supplied in the quantities required for the specific project and shall incorporate the electrical and mechanical characteristics specified in the proposal and plans. Equipment selected and installed by the Contractor shall maintain the interrupting current rating of the existing systems or specified rating whichever is greater.

109-2.5 Wire. Wire (in conduit) rated up to 5,000 volts shall be per AC 150/5345-7, Specification for L-824 Underground Electrical Cables for Airport Lighting Circuits. For ratings up to 600 volts, moisture and heat resistant thermoplastic wire conforming to Commercial Item Description A-A-59544A Type THWN-2 shall be used. The wires shall be of the type, size, number of conductors, and voltage shown in the plans or in the proposal.

a. Control circuits. Unless otherwise indicated on the plans, wire shall be not less than No. 12 American wire gauge (AWG) and shall be insulated for 600 volts.

CONSTRUCTION METHODS

INSTALLATION OF EQUIPMENT IN VAULT OR PREFABRICATED METAL HOUSING

109-3.1 General. The Contractor shall furnish, install, and connect all equipment, equipment accessories, conduit, cables, wires, buses, grounds, and support necessary to ensure a complete and operable electrical distribution center for the airport lighting system as specified herein and shown in the plans.

The equipment installation and mounting shall comply with the requirements of the National Electrical Code and local code agency having jurisdiction. All electrical work shall comply with the NEC and local code agency having jurisdiction including the separation of under 600V work from 5,000V work."

109-3.2 Conduit. The Contractor shall furnish and install conduit between square ducts and equipment or between different items of equipment when the equipment is designed for conduit connection.

109-3.3 Wiring and connections. The Contractor shall make all necessary electrical connections in the vault per the wiring diagrams furnished and as directed by the RPR. In wiring to the terminal blocks, the Contractor shall leave sufficient extra length on each control lead to make future changes in connections at the terminal block. This shall be accomplished by running each control lead the longest way around the box to the proper terminal. Leads shall be neatly laced in place.

109-3.4 Marking and labeling. All equipment, control wires, terminal blocks, etc., shall be tagged, marked, or labeled as specified below:

a. Wire identification. The Contractor shall furnish and install self-sticking wire labels or identifying tags on all control wires at the point where they connect to the control equipment or to the terminal blocks. Wire labels, if used, shall be of the self-sticking preprinted type and of the manufacturer's recommended size for the wire involved. Identification -markings designated in the plans shall be followed. Tags, if used, shall be of fiber not less than 3/4 inch (19 mm) in diameter and not less than 1/32 inch (1 mm) thick. Identification markings designated in the plans shall be stamped on tags by means of small tool dies. Each tag shall be securely tied to the proper wire by a nonmetallic cord.

b. Labels. The Contractor shall stencil identifying labels on the cases of regulators, breakers, and distribution and control relay cases with white oil paint as designated by the RPR. The letters and numerals shall be not less than one inch (25 mm) in height and shall be of proportionate width. The Contractor shall also mark the correct circuit designations per the wiring diagram on the terminal marking strips, which are a part of each terminal block.

METHOD OF MEASUREMENT

109-4.1 The quantity of equipment to be paid for under this item shall consist of all equipment installed, connected, and accepted as a complete unit ready for operation within an existing vault.

BASIS OF PAYMENT

109-5.1 Payment will be made at the contract unit price for each completed and accepted vault equipment installation. 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 the item.

Payment will be made under:

Item	Description	Unit
L-109-204	Install Existing 4kW Constant Current Regulator (CCR) in Electrical Vault	Each

REFERENCES

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

Advisory Circulars (AC)

AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-10	Specification for Constant Current Regulators and Regulator Monitors
AC 150/5345-53	Airport Lighting Equipment Certification Program

Commercial Item Description (CID)

A-A 59544	Cable and Wire, Electrical (Power, Fixed Installation) Institute of Electrical and Electronic Engineers (IEEE)

Underwriters Laboratories (UL)

UL Standard 6	Electrical Rigid Metal Conduit – Steel
UL Standard 514B	Conduit, Tubing, and Cable Fittings

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)

END OF ITEM L-109

Item L-110 Airport Underground Electrical Duct Banks and Conduits

DESCRIPTION

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

EQUIPMENT AND MATERIALS

110-2.1 General.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

CONSTRUCTION METHODS

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

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

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

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

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

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

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

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

Trenches for conduits and duct banks may be excavated manually or with mechanical trenching equipment unless in pavement, in which case they shall be excavated with mechanical trenching

equipment. Walls of trenches shall be essentially vertical so that a minimum of shoulder surface is disturbed. Blades of graders shall not be used to excavate the trench.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Flowable backfill may alternatively be used.

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

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

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

110-3.6 Backfilling for duct banks. After the concrete has cured, the remaining trench shall be backfilled and compacted per Item P-152 “Excavation and Embankment” except that the material used for backfill shall be select material not larger than 4 inches (100 mm) in diameter. In addition to the requirements of Item P-152, where duct banks are installed under pavement, one moisture/density test per

lift shall be made for each 250 linear feet (76 m) of duct bank or one work period's construction, whichever is less.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during backfilling operations.

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

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

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

110-3.8 Ownership of removed cable. The Owner shall have the right of first refusal for all removed cable on the project. Should the Owner not wish to retain the cable, it shall be disposed of off-site by the Contractor.

METHOD OF MEASUREMENT

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

BASIS OF PAYMENT

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

Payment will be made under:

Item	Description	Unit
L-110-104	Non-Encased Electrical Conduit, 2" Sch. 40 PVC	Linear Foot
L-110-304	Non-Encased Electrical Conduit, 2" RGS	Linear Foot

REFERENCES

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

Advisory Circular (AC)

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

ASTM International (ASTM)

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

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)

Underwriters Laboratories (UL)

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

END OF ITEM L-110

Item L-115 Electrical Manholes and Junction Structures

DESCRIPTION

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

EQUIPMENT AND MATERIALS

115-2.1 General.

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

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

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

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

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

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

115-2.3 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another engineer approved third party certification program. Provide precast concrete structures where shown on the plans.

Precast concrete structures shall be an approved standard design of the manufacturer. Precast units shall have mortar or bitumastic sealer placed between all joints to make them watertight. The structure shall be designed to withstand 100,000 lb. aircraft loads, unless otherwise shown on the plans. Openings or knockouts shall be provided in the structure as detailed on the plans.

Threaded inserts and pulling eyes shall be cast in as shown on the plans.

If the Contractor chooses to propose a different structural design, signed and sealed shop drawings, design calculations, and other information requested by the RPR shall be submitted by the Contractor to allow for a full evaluation by the RPR. The RPR shall review per the process defined in the General Provisions.

115-2.4 Junction boxes. Junction boxes shall be L-867 Class 1 (non-load bearing) or L-868 Class 1 (load bearing) airport light bases that are encased in concrete. The light bases shall have a L-894 blank cover, gasket, and stainless-steel hardware. All bolts, studs, nuts, lock washers, and other similar fasteners used for the light fixture assemblies must be fabricated from 316L (equivalent to EN 1.4404), 18-8, 410, or 416 stainless steel. If 18-8, 410, or 416 stainless steel is utilized it shall be passivated and be free from any discoloration. Covers shall be 3/8-inch (9-mm) thickness for L-867 and 3/4-inch (19-mm) thickness for L-868. All junction boxes shall be provided with both internal and external ground lugs.

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

115-2.6 Concrete. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

115-2.7 Frames and covers. The frames shall conform to one of the following requirements:

a. ASTM A48	Gray iron castings
b. ASTM A47	Malleable iron castings
c. ASTM A27	Steel castings
d. ASTM A283, Grade D	Structural steel for grates and frames
e. ASTM A536	Ductile iron castings
f. ASTM A897	Austempered ductile iron castings

All castings specified shall withstand a maximum tire pressure of 250 psi and maximum load of 100,000 lbs. (45,000 kg).

All castings or structural steel units shall conform to the dimensions shown on the plans and shall be designed to support the loadings specified.

Each frame and cover unit shall be provided with fastening members to prevent it from being dislodged by traffic, but which will allow easy removal for access to the structure.

All castings shall be thoroughly cleaned. After fabrication, structural steel units shall be galvanized to meet the requirements of ASTM A123.

Each cover shall have the word “ELECTRIC” or other approved designation cast on it. Each frame and cover shall be as shown on the plans or approved equivalent. No cable notches are required.

Each manhole shall be provided with a “DANGER -- PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER” safety warning sign as detailed in the Contract Documents and in accordance with OSHA 1910.146 (c)(2).

115-2.8 Ladders. Ladders, if specified, shall be galvanized steel or as shown on the plans.

115-2.9 Reinforcing steel. All reinforcing steel shall be deformed bars of new billet steel meeting the requirements of ASTM A615, Grade 60.

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

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

115-2.12 Cable trays. Cable trays shall be of plastic or aluminum. Cable trays shall be located as shown on the plans.

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

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

115-2.15 Pulling-in irons. Pulling-in irons shall be manufactured with 7/8-inch (22 mm) diameter hot-dipped galvanized steel or stress-relieved carbon steel roping designed for concrete applications (7 strand, 1/2-inch (12 mm) diameter with an ultimate strength of 270,000 psi (1862 MPa)). Where stress-relieved carbon steel roping is used, a rustproof sleeve shall be installed at the hooking point and all exposed surfaces shall be encapsulated with a polyester coating to prevent corrosion.

115-2.16 Ground rods. Ground rods shall be one piece, copper clad steel. The ground rods shall be of the length and diameter specified on the plans, but in no case shall they be less than 8 feet (2.4 m) long nor less than 5/8 inch (16 mm) in diameter.

CONSTRUCTION METHODS

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

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

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

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

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

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

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

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

115-3.2 Concrete structures. Concrete structures shall be built on prepared foundations conforming to the dimensions and form indicated on the plans. The concrete and construction methods shall conform to the requirements specified in Item P-610. Any reinforcement required shall be placed as indicated on the plans and shall be approved by the RPR before the concrete is placed.

115-3.3 Precast unit installations. Precast units shall be installed plumb and true. Joints shall be made watertight by use of sealant at each tongue-and-groove joint and at roof of manhole. Excess sealant shall be removed and severe surface projections on exterior of neck shall be removed.

115-3.4 Placement and treatment of castings, frames and fittings. All castings, frames and fittings shall be placed in the positions indicated on the Plans or as directed by the RPR and shall be set true to line and to correct elevation. If frames or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place and position before the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

Field connections shall be made with bolts, unless indicated otherwise. Welding will not be permitted unless shown otherwise on the approved shop drawings and written approval is granted by the casting manufacturer. Erection equipment shall be suitable and safe for the workman. Errors in shop fabrication or deformation resulting from handling and transportation that prevent the proper assembly and fitting of parts shall be reported immediately to the RPR and approval of the method of correction shall be obtained. Approved corrections shall be made at Contractor’s expense.

Anchor bolts and anchors shall be properly located and built into connection work. Bolts and anchors shall be preset by the use of templates or such other methods as may be required to locate the anchors and anchor bolts accurately.

Pulling-in irons shall be located opposite all conduit entrances into structures to provide a strong, convenient attachment for pulling-in blocks when installing cables. Pulling-in irons shall be set directly into the concrete walls of the structure.

115-3.5 Installation of ladders. Ladders shall be installed such that they may be removed if necessary. Mounting brackets shall be supplied top and bottom and shall be cast in place during fabrication of the structure or drilled and grouted in place after erection of the structure.

115-3.6 Removal of sheeting and bracing. In general, all sheeting and bracing used to support the sides of trenches or other open excavations shall be withdrawn as the trenches or other open excavations are being refilled. That portion of the sheeting extending below the top of a structure shall be withdrawn, unless otherwise directed, before more than 6 inches (150 mm) of material is placed above the top of the structure and before any bracing is removed. Voids left by the sheeting shall be carefully refilled with

selected material and rammed tight with tools especially adapted for the purpose or otherwise as may be approved.

The RPR may direct the Contractor to delay the removal of sheeting and bracing if, in his judgment, the installed work has not attained the necessary strength to permit placing of backfill.

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

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

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

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

115-3.9 Grounding. A ground rod shall be installed in the floor of all concrete structures so that the top of rod extends 6 inches (150 mm) above the floor. The ground rod shall be installed within one foot (30 cm) of a corner of the concrete structure. Ground rods shall be installed prior to casting the bottom slab. Where the soil condition does not permit driving the ground rod into the earth without damage to the ground rod, the Contractor shall drill a 4-inch (100 mm) diameter hole into the earth to receive the ground rod. The hole around the ground rod shall be filled throughout its length, below slab, with Portland cement grout. Ground rods shall be installed in precast bottom slab of structures by drilling a hole through bottom slab and installing the ground rod. Bottom slab penetration shall be sealed watertight with Portland cement grout around the ground rod.

A grounding bus of 4/0 bare stranded copper shall be exothermically bonded to the ground rod and loop the concrete structure walls. The ground bus shall be a minimum of one foot (30 cm) above the floor of the structure and separate from other cables. No. 2 American wire gauge (AWG) bare copper pigtails shall bond the grounding bus to all cable trays and other metal hardware within the concrete structure. Connections to the grounding bus shall be exothermic. If an exothermic weld is not possible, connections to the grounding bus shall be made by using connectors approved for direct burial in soil or concrete per UL 467. Hardware connections may be mechanical, using a lug designed for that purpose.

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

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

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

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

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

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

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

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

115-3.13 Manhole elevation adjustments. The Contractor shall adjust the tops of existing manholes in areas designated in the Contract Documents to the new elevations shown. The Contractor shall be responsible for determining the exact height adjustment required to raise or lower the top of each manhole to the new elevations. The existing top elevation of each manhole to be adjusted shall be determined in the field and subtracted/added from the proposed top elevation.

The Contractor shall remove/extend the existing top section or ring and cover on the manhole structure or manhole access. The Contractor shall install precast concrete sections or grade rings of the required dimensions to adjust the manhole top to the new proposed elevation or shall cut the existing manhole walls to shorten the existing structure, as required by final grades. The Contractor shall reinstall the manhole top section or ring and cover on top and check the new top elevation.

The Contractor shall construct a concrete slab around the top of adjusted structures located in graded areas that are not to be paved. The concrete slab shall conform to the dimensions shown on the plans.

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

METHOD OF MEASUREMENT

115-4.1 Electrical manholes and junction structures shall be measured by each unit completed in place and accepted. The following items shall be included in the price of each unit: All required excavation and dewatering; sheeting and bracing; all required backfilling with on-site materials; restoration of all surfaces and finished grading and turfing; all required connections; temporary cables and connections; and ground rod testing.

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

BASIS OF PAYMENT

115-5.1 The accepted quantity of electrical manholes and junction structures will be paid for at the Contract unit price per each, complete and in place. This price shall be full compensation for furnishing

all materials and for all preparation, excavation, backfilling and placing of the materials, furnishing and installation of appurtenances and connections to duct banks and other structures as may be required to complete the item as shown on the plans and for all labor, equipment, tools and incidentals necessary to complete the structure.

115-5.2 Payment shall be made at the contract unit price for manhole elevation adjustments. 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, including but not limited to, spacers, concrete, rebar, dewatering, excavating, backfill, topsoil, sodding and pavement restoration, where required, to complete this item as shown in the plans and to the satisfaction of the RPR.

Payment will be made under:

Item	Description	Unit
L-115-201	Electrical Junction Structure, L-867 Class 1, Solid Cover	Each
L-115-31	Adjust Existing Electrical Manhole	Each

REFERENCES

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

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

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

Advisory Circular (AC)

AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-42	Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-53	Airport Lighting Equipment Certification Program

Commercial Item Description (CID)

A-A 59544	Cable and Wire, Electrical (Power, Fixed Installation)

ASTM International (ASTM)

ASTM A27	Standard Specification for Steel Castings, Carbon, for General Application
ASTM A47	Standard Specification for Ferritic Malleable Iron Castings
ASTM A48	Standard Specification for Gray Iron Castings
ASTM A123	Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products

ASTM A283	Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
ASTM A536	Standard Specification for Ductile Iron Castings
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A897	Standard Specification for Austempered Ductile Iron Castings
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C206	Standard Specification for Finishing Hydrated Lime

FAA Engineering Brief (EB)

EB #83	In Pavement Light Fixture Bolts

Mil Spec

MIL-P-21035	Paint High Zinc Dust Content, Galvanizing Repair

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)

END OF ITEM L-115

Item L-125 Installation of Airport Lighting Systems

DESCRIPTION

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

EQUIPMENT AND MATERIALS

125-2.1 General.

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

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

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

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

e. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner. All LED light fixtures must be warranted by the manufacturer for a minimum of 4 years after date of installation inclusive of all electronics.

EQUIPMENT AND MATERIALS

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

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

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

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

125-2.6 Runway and Taxiway Lights. Runway and taxiway lights shall conform to the requirements of AC 150/5345-46. Lamps shall be of size and type indicated, or as required by fixture manufacturer for each lighting fixture required under this contract. Filters shall be of colors conforming to the specification for the light concerned or to the standard referenced.

Lights

Type	Class	Mode	Style	Option	Base	Filter	Transformer	Notes
L-852G(L) LED In-pavement runway guard lights	2	1	3	N/A	L-868 Class IA Size B	Yellow	L-830-3 (65W) Or L-830-4 (100W)	• Autonomous, alternating flash • One L-823 plug • Snowplow ring
L-804(L) LED Elevated runway guard lights	2	1	N/A	N/A	L-867 Class IA Size B	Yellow	L-830-3 (65W)	• Autonomous, alternating flash • Unmonitored
L-861T(L) LED Elevated taxiway edge lights	2	1	N/A	N/A	L-867 Class IA Size B	Blue	L-830-16 (10/15W)	• 15W bi-pin LED lamps
L-861T Quartz Elevated taxiway edge lights	2	1	N/A	N/A	L-867 Class IA Size B	Blue	L-830-1 (30/45W)	• 45W bi-pin quartz lamps
L-852T(L) In-pavement taxiway edge lights	2	1	3	N/A	Existing Base Can	Blue	L-830-16 (10/15W)	• 15W bi-pin LED lamps • 8” diameter fixture • Adapter ring required

125-2.7 Runway and Taxiway Signs. Runway and Taxiway Guidance Signs should conform to the requirements of AC 150/5345-44.

Signs

Type	Size	Style	Class	Mode	Notes
L-858(L – LED) (Taxiway Circuits)	3 – 30" Legend Panel with an 18" Legend	2 – Powered from 3-step 6.6A circuit	2 - -40F (-40C) to 131F (55C)	2 – Withstand Wind Loads of 200 MPH	-L-858 equipment shall be third party certified (Intertek/ETL) -Furnish with two (2) tethers and local on/off switch for maintenance (oriented with "OFF" up)
L-858(L – LED) (Runway Circuits)	3 – 30" Legend Panel with an 18" Legend	3 – Powered from 5-step 6.6A circuit	2 - -40F (-40C) to 131F (55C)	2 – Withstand Wind Loads of 200 MPH	-L-858 equipment shall be third party certified (Intertek/ETL) -Furnish with two (2) tethers and local on/off switch for maintenance (oriented with "OFF" up)

125-2.8 Light Base and Transformer Housings. Light Base and Transformer Housings should conform to the requirements of AC 150/5345-42. Light bases shall be Type L-867 or L-868, as required, Class 1B, Size B shall be provided as indicated or as required to accommodate the fixture or device installed thereon. Base plates, cover plates, and adapter plates shall be provided to accommodate various sizes of fixtures.

125-2.9 Isolation Transformers. Isolation Transformers shall be Type L-830, size as required for each installation. Transformer shall conform to AC 150/5345-47.

INSTALLATION

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

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

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

125-3.2 Testing. All lights shall be fully tested by continuous operation for not less than 24 hours as a completed system prior to acceptance. The test shall include operating the constant current regulator in

each step not less than 10 times at the beginning and end of the 24-hour test. The fixtures shall illuminate properly during each portion of the test.

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

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

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

METHOD OF MEASUREMENT

125-4.1 Runway and taxiway lights will be measured by the number of each type installed as completed units in place, ready for operation, and accepted by the RPR.

125-4.2 Guidance signs will be measured by the number of each type and size installed as completed units, in place, ready for operation, and accepted by the RPR.

125-4.3 Guidance sign panel replacement will be measured by the number of panels replaced and accepted by the RPR.

BASIS OF PAYMENT

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

Payment will be made under:

Item	Description	Unit
L-125-21	L-861T Medium Intensity Elevated Quartz Taxiway Edge Light	Each
L-125-22	L-861T(L) Medium Intensity Elevated LED Taxiway Edge Light	Each
L-125-23	L-861T(L) Medium Intensity Elevated LED Taxiway Edge Light on Existing Base Can	Each
L-125-2209	L-852T(L) Medium Intensity In-Pavement LED Taxiway Edge Light on Existing Base Can	Each
L-125-500	L-804(L) Elevated LED Runway Guard Light	Each
L-125-501	L-852G(L) In-Pavement LED Runway Guard Light	Each
L-125-502	Remove Existing In-Pavement Edge Light, Can to Remain	Each
L-125-64	Remove Existing Elevated Base-Mounted Edge Light and Base Can	Each
L-125-65	Remove Existing Elevated Base-Mounted Edge Light, Base Can to Remain	Each
L-125-67	Remove Existing Runway Guard Lights and Base Can	Each

L-125-68	Remove and Reset Existing Guard Light	Each
L-125-75	Replace Existing Airfield Guidance Sign Panel	Each
L-125-7103	Airfield Guidance Sign, Size 3, LED, on New Foundation	Each
L-125-7113	Airfield Guidance Sign, Size 3, LED, on Existing Foundation	Each
L-125-77	Remove Existing Airfield Guidance Sign and Foundation	Each
L-125-78	Remove Existing Airfield Guidance Sign, Foundation to Remain	Each

REFERENCES

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

Advisory Circulars (AC)

AC 150/5340-18	Standards for Airport Sign Systems
AC 150/5340-26	Maintenance of Airport Visual Aid Facilities
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-42	Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories
AC 150/5345-44	Specification for Runway and Taxiway Signs
AC 150/5345-46	Specification for Runway and Taxiway Light Fixtures
AC 150/5345-47	Specification for Series to Series Isolation Transformers for Airport Lighting Systems
AC 150/5345-53	Airport Lighting Equipment Certification Program

Engineering Brief (EB)

EB No. 67	Light Sources Other than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures

END OF ITEM L-125

Item L-130 Surface Pavement Sensors

DESCRIPTION

130-1.1 This item shall consist of the installation of new pavement temperature sensors, Type IIA cable (as required), and saw kerf cuts in existing pavement including splicing Type IIA cable to Type V cable in existing or proposed junction cans.

EQUIPMENT AND MATERIALS

130-2.1 General.

a. Airport equipment and materials covered by Federal Aviation Administration (FAA) specifications shall be approved under the Airport Lighting Equipment Certification Program Described in Advisory Circular (AC) 150/5345-53, current version.

b. All other equipment and material covered by other referenced specifications shall be subject to acceptance through manufacture's certification of compliance with the applicable specification, when requested by the Resident Project Representative (RPR).

c. Manufacturer's certifications shall not relieve the Contractor of the Contractor's responsibility to provide materials in accordance with these specifications and acceptable to the RPR. Materials supplied and/or installed that do not materially comply with these specifications, at the sole cost of the Contractor.

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

e. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The RPR reserves the right to reject any and all equipment, materials or procedures, which, in the RPR's opinion, does not meet the system design and the standards and codes, specified herein.

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

g. Submit three (3) copies of manufacturer's data sheets together with Contractor's certification that the materials comply with the specification.

130-2.2 Pavement Sensors. In order to match the existing system pavement sensors, the pavement sensor shall be a model FP2000 as manufactured by Vaisala, Inc. (Contractor shall verify existing system pavement sensor model in the field). These new pavement sensors shall meet the following technical requirements:

- Surface Temperature Range: -60°F to 176°F (-51°C to +80°C)
- Depth of Solution: 0.02 inches to 0.5 inches (0.03 cm to 1.27 cm)
- Operating Temperature Range: -40°F to 176°F (-40°C to +80°C)
- Cable Length: 150, 300 or 500 feet (46, 91 or 152 meters) with Vaisala Type IIA; 5000 feet (1524 meters) with splice
- Mean Time Between Failures: 40,000 hours

The contact information for the manufacturer is:

Vaisala, Inc. – Boston
10-D Gill Street
Woburn, MA 01801
Phone: (888) 824-7252 OR (781) 933-4500
Email: weathersales.northamerica@vaisala.com

As part of the submittal process, the Contractor shall provide the following information:

a. Material data sheet for pavement sensor, cables, conduits, and sealants
b. Proposed installation schedule
c. Written calibration and test procedure for each component of the system
d. Provide the proposed method and materials to backfill pavement cores and sawcuts required to install pavement sensors and sensor cables

The sensor component or head shall conform to the following design criteria:

a. Internal components shall be solid state without relays, tubes, or other electromechanical devices. The head shall be factory adjusted and require no adjustment in the field.

b. All electronic components shall be permanently potted and sealed against shock, moisture, and vibration. The cable shall be permanently molded and sealed to the head in a leak-proof design. An additional waterproof seal may be installed on the cable/head interface or cable/cable connection to ensure against moisture wicking.

c. The sensor component head shall be a thermally neutral device, fabricated of a non-corrosive material, with a thermal conductivity closely approximating the surrounding airport pavement material. It shall be color matched on a site-specific basis to each pavement surface to simulate actual pavement heat emission and absorption of solar radiation.

d. The component head surface texture shall be similar to that of that of the surrounding pavement surface and approximate the flow and pooling characteristics of water on the surrounding pavement.

e. The component head design and configuration shall require a pavement installation procedure of no greater complexity than for a standard in-pavement lighting fixture, i.e., a single core and/or cableway saw cut for each sensor head.

f. The power/data transmission cable shall be of sufficient length and capacity to extend to a signal processing site a minimum of 2,000 feet from the sensor component head.

g. The head shall have sufficient durability to function over a range of surface or air temperatures form +175° F to -20°F.

h. The head shall be suitable for embedment into the asphalt pavement.

i. The head shall be compatible with the existing remote processing unit in all respects.

130-2.3 Cable. Provide Vaisala Type IIA cable (as required), attached and molded into sensor with a non-removable waterproof cable entrance for each sensor.

Cable Lengths shall be suitable for extension to the existing termination points.

130-2.4 Sealant Around Sensors. The sealant to be used around pavement sensors shall be a self-leveling silicone joint sealant is a one-part cold-applied, easy-to-use, self-leveling silicone material that cures to an ultra-low-modulus silicone rubber upon exposure to atmospheric moisture. The cured silicone rubber remains flexible over the entire temperature range expected in pavement applications (i.e. -20º - 300º F). The product must conform to or meet the following standards: ASTM D5893 Type SL, FAA P-605 for silicone joint sealants, SS-S-200E (section 4.4.12) Flame Test Requirements and EN 14187-5 Hydorlosis Test. The product shall be Dow-Corning 890-SL Silicone Joint Sealant or an approved equal.

CONSTRUCTION METHODS

130-3.1 Salvage of Existing Equipment. Pavement sensors and any other ancillary equipment deemed salvageable by the Owner shall be **salvaged to the Owner on a daily basis**. The equipment salvage return location shall be designated by the Owner at the beginning of the project. Cabling will not be salvaged for this project.

130-3.2 Location of Sensor Heads. Sensor heads shall be installed as shown on the approved plans. The location for proposed surface sensor heads shall be marked out prior to installation. The Engineer shall review and approve all locations prior to installation.

130-3.3 Installation. Holes shall be sawed or drilled in the pavement to accommodate the sensor. The sides and bottom of the hole and kerf shall be cleaned (sandblasting may be necessary) and flushed with a high velocity air jet or wiped dry to ensure a good bond with the sealing agent.

Correct orientation of the sensor head with respect to aircraft traffic is essential for proper self-cleaning of the conductive probes built into the sensor. Sensor heads shall be flush with the top surface and in the plane of the pavement surface. When filling the kerf and drill hole, the installer shall make sure that the bonding agent fills the cavity and does not extrude over the sensor head. The cables shall be anchored in the bottom of the clean kerf cut with wedges or similar devices before the kerf is filled with the manufacturers' recommended bonding agent.

AC l50/5340-30, Design and Installation Details for Airport Visual Aids, provides additional installation recommendations.

130-3.4 Connection/Inspection and Test. Connections from in-pavement sensor heads to the remote field unit shall be made in accordance with manufacturers' instructions and the FAA Advisory circulars

referenced in the foregoing paragraph. The connections shall be checked and the complete system aligned during installation. Since any in-pavement component problems are not easily corrected after the sensor units are sealed in the runway, a complete check for all sensor functions shall be accomplished prior to sealing and/or project completion. All test equipment and adjustments required at a particular site shall be supplied by the system manufacturer. All elements of the sensor electric power supply system, including materials, components, and designs, shall conform to national, State, local, and FAA-accepted practices or codes for the installation of systems with similar electrical power requirements and placements.

METHOD OF MEASUREMENT

130-4.1 The quantity of pavement sensors installed to be paid for under this item shall be the number of installed and accepted by the Engineer. As part of the installation, the removal of the existing sensor shall be considered part of this item. As noted above, the Owner shall have the first right of refusal for the salvaging of the materials. If the Owner does not desire to salvage the materials, the Contractor shall properly dispose of the materials off the site. The measurement shall be for furnishing and installing the pavement sensors including the pavement coring, sawcutting, sensor, sensor cabling, conduit materials from the pavement to the junction can, epoxy filler, and all other incidental items required for a complete installation. The measurement shall also include all calibration and testing of the pavement sensor by the vendor's representative. No separate measurements shall be made for cable for conduit.

BASIS OF PAYMENT

130-5.1 Payment will be made at the contract unit price for each complete pavement sensor installed and accepted by the Engineer including removal of existing sensors. This price shall be full compensation for all labor, materials, equipment, tools, excavation, backfill and compaction and incidentals necessary to complete this item. The payment shall also include all calibration and testing of the pavement sensor by the vendor's representative as part of the complete system installation.

Payment will be made under:

Item No.	**Description**	**Pay Unit**
L-130-1	Replace Pavement Condition Surface Sensor	Each

MATERIAL REQUIREMENTS

AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-53	Airport Lighting Equipment Certification Program
NFPA-70	National Electrical Code (NEC)

END OF ITEM L-130

Item T-901 Seeding

DESCRIPTION

901-1.1 This item shall consist of soil preparation, seeding, liming, fertilizing, and establishing turf in the areas shown on the plans or as directed by the RPR in accordance with these specifications.

MATERIALS

901-2.1 Seed. The species and application rates of grass, legume, and cover-crop seed furnished shall be those stipulated herein. Seed shall conform to the requirements of Federal Specification JJJ-S-181, Federal Specification, Seeds, Agricultural.

Seed shall be furnished separately or in mixtures in standard containers labeled in conformance with the Agricultural Marketing Service (AMS) Seed Act and applicable state seed laws with the seed name, lot number, net weight, percentages of purity and of germination and hard seed, and percentage of maximum weed seed content clearly marked for each kind of seed. The Contractor shall furnish the RPR duplicate signed copies of a statement by the vendor certifying that each lot of seed has been tested by a recognized laboratory for seed testing within six (6) months of date of delivery. This statement shall include: name and address of laboratory, date of test, lot number for each kind of seed, and the results of tests as to name, percentages of purity and of germination, and percentage of weed content for each kind of seed furnished, and, in case of a mixture, the proportions of each kind of seed. Wet, moldy, or otherwise damaged seed will be rejected.

Seeds shall be applied as follows:

Permanent Seeding:
Seed mix shall be a three-way blend of endophyte enhanced dwarf turf type tall fescues (*Schedonorus arundinaceus*) varieties meeting the following criteria:

Permanent Seeding Properties and Rate of Application

Seed	Pure Live Seed (Percent)	Minimum Seed Purity (Percent)	Minimum Germination (Percent)	Rate of Application (lb/acre)	Endophyte Infection (Percent)
Seed Type 1	33	98	90	110	>90
Seed Type 2	33	98	90	110	>90
Seed Type 3	33	98	90	110	>90

Seeding shall be performed during the period between September 1 and October 15 (latest crop, fresh seed, subject to proper storage and testing results) inclusive, unless otherwise approved by the RPR.

Temporary Seeding:
Seed mix shall be a turf type annual ryegrass (*Lolium multiflorum*) meeting the following criteria:

Temporary Seeding Properties and Rate of Application

Seed	Pure Live Seed (Percent)	Minimum Seed Purity (Percent)	Minimum Germination (Percent)	Rate of Pure Live Seed Application (lb/acre)
Annual Ryegrass	99	98	90	110

Temporary seeding shall be performed during the period between April 1 and October 15 (latest crop, fresh seed, subject to proper storage and testing results) inclusive, unless otherwise approved by the RPR. Perennial ryegrass (*Lolium perenne*), or any type of perennial-annual ryegrass hybrid (*Lolium hybridum*) or annual ryegrass-meadow fescue hybrid (*Festulolium braunii*) shall not be considered as an acceptable substitute.

Pure live seed (PLS) is the amount of living, viable seed in a larger total amount of seed. The amount of seed to be applied is obtained by using the purity and germination percentages from the label on the actual bag of seed to be used on the project. To calculate the amount of seed to be applied:

a. Obtain the PLS factor by multiplying the seed label germination percentage times the seed label purity percentage;

b. Divide the specified PLS rate by the PLS factor;

c. Round off the result as approve.

For example, assume a PLS seeding rate of 300 lbs/acre is specified and the seed label shows a purity of 98 percent and germination of 90 percent. Multiply 0.98 by 0.90 to obtain a PLS factor of 0.88. The specified PLS rate of 300 lbs/acre, divided by the factor of 0.88, equals 340.91. Thus approximately 341 lbs/acre of total needs to be applied in order to meet a specified PLS seeding rate of 300 lbs/acre.

901-2.2 Lime. Lime shall be ground limestone containing not less than 85% of total carbonates, and shall be ground to such fineness that 90% will pass through a No. 20 (850 µm) mesh sieve and 50% will pass through a No. 100 (150 µm) mesh sieve. Coarser material will be acceptable, providing the rates of application are increased to provide not less than the minimum quantities and depth specified in the special provisions on the basis of the two sieve requirements above. Dolomitic lime or a high magnesium lime shall contain at least 10% of magnesium oxide. Lime shall be applied at the rate of 3,050 pounds per acre at 100% Effective Neutralizing Value (ENV). To calculate actual rate, the rate of use equals the recommended rate divided by ENV (of lime source) x 100. All liming materials shall conform to the requirements of ASTM C602.

901-2.3 Fertilizer. Fertilizer shall be standard commercial fertilizers supplied separately or in mixtures containing the percentages of total nitrogen, available phosphoric acid, and water-soluble potash. They shall be applied at the rate and to the depth specified, and shall meet the requirements of applicable state laws. They shall be furnished in standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon. No cyanamide compounds or hydrated lime shall be permitted in mixed fertilizers.

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

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

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

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

Fertilizers shall be a commercial fertilizer and shall be spread at the following rate per acre: 43.5 lbs. Nitrogen (N); 87 lbs. Phosphoric Acid (P2O5); and 0 lbs. Potash (K2O). This is equivalent to a commercial 10-20-0 fertilizer applied at a rate of 435 lbs. per acre.

901-2.4 Soil for repairs. The soil for fill and topsoiling of areas to be repaired shall be at least of equal quality to that which exists in areas adjacent to the area to be repaired. The soil shall be relatively free from large stones, roots, stumps, or other materials that will interfere with subsequent sowing of seed, compacting, and establishing turf, and shall be approved by the RPR before being placed.

CONSTRUCTION METHODS

901-3.1 Advance preparation and cleanup. After grading of areas has been completed and before applying fertilizer and ground limestone, areas to be seeded shall be raked or otherwise cleared of stones larger than 2 inches (50 mm) in any diameter, sticks, stumps, and other debris that might interfere with sowing of seed, growth of grasses, or subsequent maintenance of grass-covered areas. If any damage by erosion or other causes has occurred after the completion of grading and before beginning the application of fertilizer and ground limestone, the Contractor shall repair such damage include filling gullies, smoothing irregularities, and repairing other incidental damage.

An area to be seeded shall be considered a satisfactory seedbed without additional treatment if it has recently been thoroughly loosened and worked to a depth of not less than 5 inches (125 mm) as a result of grading operations and, if immediately prior to seeding, the top 3 inches (75 mm) of soil is loose, friable, reasonably free from large clods, rocks, large roots, or other undesirable matter, and if shaped to the required grade.

When the area to be seeded is sparsely sodded, weedy, barren and unworked, or packed and hard, any grass and weeds shall first be cut or otherwise satisfactorily disposed of, and the soil then scarified or otherwise loosened to a depth not less than 5 inches (125 mm). Clods shall be broken and the top 3 inches (75 mm) of soil shall be worked into a satisfactory seedbed by discing, or by use of cultipackers, rollers, drags, harrows, or other appropriate means.

901-3.2 Dry application method.

a. Liming. Lime shall be applied separately and prior to the application of any fertilizer or seed and only on seedbeds that have previously been prepared as described above. The lime shall then be worked into the top 3 inches (75 mm) of soil after which the seedbed shall again be properly graded and dressed to a smooth finish.

b. Fertilizing. Following advance preparations and cleanup fertilizer shall be uniformly spread at the rate that will provide not less than the minimum quantity stated in paragraph 901-2.3.

c. Seeding. Grass seed shall be sown at the rate specified in paragraph 901-2.1 immediately after fertilizing. The fertilizer and seed shall be raked within the depth range stated in the special provisions. Seeds of legumes, either alone or in mixtures, shall be inoculated before mixing or sowing, in accordance with the instructions of the manufacturer of the inoculant. When seeding is required at other than the seasons shown on the plans or in the special provisions, a cover crop shall be sown by the same methods required for grass and legume seeding.

d. Rolling. After the seed has been properly covered, the seedbed shall be immediately compacted by means of an approved lawn roller, weighing 40 to 65 pounds per foot (60 to 97 kg per meter) of width for clay soil (or any soil having a tendency to pack), and weighing 150 to 200 pounds per foot (223 to 298 kg per meter) of width for sandy or light soils.

901-3.3 Wet application method.

a. General. The Contractor may elect to apply seed and fertilizer (and lime, if required) by spraying them on the previously prepared seedbed in the form of an aqueous mixture and by using the methods and equipment described herein. The rates of application shall be as specified in the special provisions.

b. Spraying equipment. The spraying equipment shall have a container or water tank equipped with a liquid level gauge calibrated to read in increments not larger than 50 gallons (190 liters) over the entire range of the tank capacity, mounted so as to be visible to the nozzle operator. The container or tank shall also be equipped with a mechanical power-driven agitator capable of keeping all the solids in the mixture in complete suspension at all times until used.

The unit shall also be equipped with a pressure pump capable of delivering 100 gallons (380 liters) per minute at a pressure of 100 lb / sq inches (690 kPa). The pump shall be mounted in a line that will recirculate the mixture through the tank whenever it is not being sprayed from the nozzle. All pump passages and pipe lines shall be capable of providing clearance for 5/8 inch (16 mm) solids. The power unit for the pump and agitator shall have controls mounted so as to be accessible to the nozzle operator. There shall be an indicating pressure gauge connected and mounted immediately at the back of the nozzle.

The nozzle pipe shall be mounted on an elevated supporting stand in such a manner that it can be rotated through 360 degrees horizontally and inclined vertically from at least 20 degrees below to at least 60 degrees above the horizontal. There shall be a quick-acting, three-way control valve connecting the recirculating line to the nozzle pipe and mounted so that the nozzle operator can control and regulate the amount of flow of mixture delivered to the nozzle. At least three different types of nozzles shall be supplied so that mixtures may be properly sprayed over distance varying from 20 to 100 feet (6 to 30 m). One shall be a close-range ribbon nozzle, one a medium-range ribbon nozzle, and one a long-range jet nozzle. For case of removal and cleaning, all nozzles shall be connected to the nozzle pipe by means of quick-release couplings.

In order to reach areas inaccessible to the regular equipment, an extension hose at least 50 feet (15 m) in length shall be provided to which the nozzles may be connected.

c. Mixtures. Lime, if required, shall be applied separately, in the quantity specified, prior to the fertilizing and seeding operations. Not more than 220 pounds (100 kg) of lime shall be added to and mixed with each 100 gallons (380 liters) of water. Seed and fertilizer shall be mixed together in the relative proportions specified, but not more than a total of 220 pounds (100 kg) of these combined solids shall be added to and mixed with each 100 gallons (380 liters) of water.

All water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances harmful to plant life. The Contractor shall identify to the RPR all sources of water at least two (2) weeks prior to use. The RPR may take samples of the water at the source or from the tank at any time and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source that is disapproved by the RPR following such tests.

All mixtures shall be constantly agitated from the time they are mixed until they are finally applied to the seedbed. All such mixtures shall be used within two (2) hours from the time they were mixed or they shall be wasted and disposed of at approved locations.

d. Spraying. Lime, if required, shall be sprayed only upon previously prepared seedbeds. After the applied lime mixture has dried, the lime shall be worked into the top 3 inches (75 mm), after which the seedbed shall again be properly graded and dressed to a smooth finish.

Mixtures of seed and fertilizer shall only be sprayed upon previously prepared seedbeds on which the lime, if required, shall already have been worked in. The mixtures shall be applied by means of a high-pressure spray that shall always be directed upward into the air so that the mixtures will fall to the ground like rain in a uniform spray. Nozzles or sprays shall never be directed toward the ground in such a manner as might produce erosion or runoff.

Particular care shall be exercised to ensure that the application is made uniformly and at the prescribed rate and to guard against misses and overlapped areas. Proper predetermined quantities of the mixture in accordance with specifications shall be used to cover specified sections of known area.

Checks on the rate and uniformity of application may be made by observing the degree of wetting of the ground or by distributing test sheets of paper or pans over the area at intervals and observing the quantity of material deposited thereon.

On surfaces that are to be mulched as indicated by the plans or designated by the RPR, seed and fertilizer applied by the spray method need not be raked into the soil or rolled. However, on surfaces on which mulch is not to be used, the raking and rolling operations will be required after the soil has dried.

901-3.4 Maintenance of seeded areas. The Contractor shall protect seeded areas against traffic or other use by warning signs or barricades, as approved by the RPR. Surfaces gullied or otherwise damaged following seeding shall be repaired by regrading and reseeding as directed. The Contractor shall mow, water as directed, and otherwise maintain seeded areas in a satisfactory condition until final inspection and acceptance of the work.

When either the dry or wet application method outlined above is used for work done out of season, it will be required that the Contractor establish a good stand of grass of uniform color and density to the satisfaction of the RPR. A grass stand shall be considered adequate when bare spots are one square foot (0.01 sq m) or less, randomly dispersed, and do not exceed 3% of the area seeded.

METHOD OF MEASUREMENT

901-4.1 Seeding. The quantity of seeding to be paid for shall be the number of acres, to the nearest 0.10 acre, measured on the ground surface, completed, established, and accepted.

BASIS OF PAYMENT

901-5.1 Seeding. Payment shall be made at the contract unit price per acre or fraction thereof, which price and payment shall be full compensation for furnishing, placing, and establishing all material and for all labor, equipment, tools, and incidentals necessary to complete the work prescribed in this item.

Payment will be made under:

Item	Description	Unit
T-901-1	Hydroseeding	Acre

REFERENCES

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

ASTM International (ASTM)
ASTM C602 Standard Specification for Agricultural Liming Materials

Federal Specifications (FED SPEC)
FED SPEC JJJ-S-181, Federal Specification, Seeds, Agricultural

Advisory Circulars (AC)
AC 150/5200-33 Hazardous Wildlife Attractants on or Near Airports

FAA/United States Department of Agriculture
Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM T-901

ITEM T-902 SOIL RESTORATION

DESCRIPTION

902-1.1 This item consists of the soil restoration of former impervious areas being demolished. Work includes the placement and tilling of compost into the subsoil, rock-picking existing stone/rock materials, placement of topsoil, and seeding the area to achieve soil stabilization.

Excavation to the subsoil shall be paid for in accordance with Item P-152 Excavation and Embankment.

All work is to be accomplished in accordance with the specifications, plans, and as ordered by the Engineer.

MATERIALS

902-2.1 COMPOST. Compost shall be the material resulting from the biological and biochemical decomposition of biosolids, source-separated organic waste, yard waste, leaves or agricultural waste. These composts shall have been commercially or municipally produced. Compost and composting facilities shall be in compliance with all federal laws (40 CFR Part 503 and others), Article 10 of the Agriculture and Markets Law and 6 NYCRR Part 360.

Biosolids, including mixed solid waste, septage and other sludges, are the solid or semi-solid organic material generated by a wastewater treatment plant. Source-separated organic waste (SSOW) is readily decomposable material that is separated at the point of waste generation, and may include, but not be limited to, food scraps, food processing residues, soiled and/or unrecyclable paper, and other compostable materials. Yard waste includes grass clippings, leaves and other similar readily-compostable organic material.

Compost shall be reasonably free of sticks, stones, refuse, materials deleterious to soil structure, or any material toxic or detrimental to plant germination and growth. Compost containing foreign material may be rejected on the basis of a visual examination.

Composted biosolids shall have a certificate from a laboratory approved by the NYSDOH verifying compliance with all applicable laws, rules, and regulations. Only facilities permitted to compost biosolids under 6 NYCRR Part 360 will be allowed to furnish biosolid compost. The certification shall be supplied by the Contractor prior to the delivery of any composted biosolids, topsoil containing composted biosolids, or other such regulated material to the contract site.

1. Compost shall have a minimum organic-matter content of 30% (dryweight basis) as determined by loss on ignition.
2. Product shall be loose and friable, not dusty, and have a moisture content of 35% - 60%, (wet weight basis).
3. Particle size shall be < 1/2 inch, (100% passing).
4. Soluble salts concentration shall be < 4.0 mmhos/cm (ds/m), maximum.
5. Compost shall be stable to very stable.
6. pH shall be between 6.0-8.5.

902-2.2 TOPSOIL. Topsoil shall meet the requirements of Item T-905 Topsoiling.

902-2.3 SEED. Seed shall meet the requirements of Permanent Seeding as specified in Item T-901 Seeding.

CONSTRUCTION METHODS

902-3.1 GENERAL. Existing pavement shall be removed in accordance with Item P-101 Surface Preparation and excavation shall be completed in accordance with Item P-152 Excavation and Embankment.

Once impervious have been excavated and rough graded, compost shall be applied over subsoil at a nominal depth of 3 inches and tilled into the subsoil to a minimum depth of 12 inches. Tilling shall be completed using a cat-mounted ripper, tractor-mounted disc, or tiller, mixing, and circulating air and compost into the subsoils. Tilling shall not be performed within the drip line of any existing trees or over utility installations that are within 24 inches of the surface.

Stone and rock materials four inches and larger shall be removed from the site.

Topsoil shall be placed at a depth of 6 inches in accordance with Item T-905 Topsoiling.

Soil restoration areas shall be stabilized with permanent seeding in accordance with Item T-901 Seeding.

METHOD OF MEASUREMENT

902-4.1 The quantity of soil restoration to be paid for shall be the number of acres, to the nearest 0.10 acre, measured on the ground surface, completed and accepted.

BASIS OF PAYMENT

901-5.1 Payment shall be made at the contract unit price per acre or fraction thereof, which price and payment shall be full compensation for furnishing and placing all material and for all labor, equipment, tools, and incidentals necessary to complete the work prescribed in this item.

Payment will be made under:

Item No.	Description	Pay Unit
T-902-1	Soil Restoration	Acre

GENERAL REQUIREMENTS

6 NYCRR Part 360	Solid Waste Management Facilities
40 CFR Part 503	Standards for the Use or Disposal of Sewage Sludge
Article 10 Agriculture and Markets Law	Sale and Analysis of Commercial Fertilizer

END OF ITEM T-902

Item T-905 Topsoil

DESCRIPTION

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

MATERIALS

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

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

Should the Contractor elect to use stripped topsoil from the site, the material may require screening to meet the above material requirements, based on a visual inspection by the RPR.

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

CONSTRUCTION METHODS

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

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

905-3.2 Preparing the ground surface. Immediately prior to dumping and spreading the topsoil on any area, the surface shall be loosened by discs or spike-tooth harrows, or by other means approved by the RPR, to a minimum depth of 2 inches (50 mm) to facilitate bonding of the topsoil to the covered subgrade soil. The surface of the area to be topsoiled shall be cleared of all stones larger than 2 inches (50 mm) in any diameter and all litter or other material which may be detrimental to proper bonding, the rise of capillary moisture, or the proper growth of the desired planting. Limited areas, as shown on the plans, which are too compact to respond to these operations shall receive special scarification.

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

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

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

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

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

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

The finished surface shall be maintained for subsequent contract work such as seeding, sodding, mulching, or planting.

METHOD OF MEASUREMENT

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

BASIS OF PAYMENT

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

Payment will be made under:

Item	Description	Unit
T-905-1	Topsoil (Obtained on-site)	Cubic Yard

REFERENCES

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

ASTM International (ASTM)

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

Advisory Circulars (AC)

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

FAA/United States Department of Agriculture

Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM T-905

Item T-908 Mulching

DESCRIPTION

908-1.1 This item shall consist of furnishing, hauling, placing, and securing mulch on surfaces indicated on the plans or designated by the RPR.

MATERIALS

908-2.1 Mulch material. Acceptable mulch shall be the materials listed below or any approved locally available material that is similar to those specified. Mulch shall be free from noxious weeds, mold, and other deleterious materials. Mulch materials, which contain matured seed of species that would volunteer and be detrimental to the proposed overseeding, or to surrounding farm land, will not be acceptable. Straw or other mulch material which is fresh and/or excessively brittle, or which is in such an advanced stage of decomposition as to smother or retard the planted grass, will not be acceptable.

a. Type I Wood Fiber Mulch. Wood fiber shall be a first generation product manufactured directly from 100 percent wood which has been recovered or diverted from solid waste. Wood fiber shall be manufactured from unadulterated wood that is not contaminated with paint, chemicals, non-wood shingles, plastic or other foreign materials. Wood fiber mulch shall not be manufactured exclusively from paper.

b. Type II Cellulose Mulch. Cellulose or Paper mulch shall be composed of 100% clean recycled cellulose fiber and free of plastic netting.

i. Water Holding Capacity >1000%
ii. Moisture Content 12% +/-3
iii. Organic Matter >93%
iv. Ash Content <7%
v. pH Range 6.5 +/-2
vi. Non toxic dye

c. Type III Cellulose and Wood Fiber Blend Mulch. Cellulose and Wood fiber blend shall be composed of biodegradable recycled 100% wood fibers and recycled paper, phyto-sanitized and free from plastic netting.

i. Wood fiber 70% Minimum
ii. Paper fiber 30% Maximum
iii. Water Holding Capacity >1000%
iv. Moisture Content 12% +/-3
v. Organic Matter >93%
vi. Ash Content <7%
vii. pH Range 5.5 +/-2

908-2.2 Inspection. The RPR shall be notified of sources and quantities of mulch materials available and the Contractor shall furnish him with representative samples of the materials to be used 30 days before delivery to the project. These samples may be used as standards with the approval of the RPR and any materials brought on the site that do not meet these standards shall be rejected.

CONSTRUCTION METHODS

908-3.1 Mulching. Before spreading mulch, all large clods, stumps, stones, brush, roots, and other foreign material shall be removed from the area to be mulched. Mulch shall be applied immediately after seeding. The spreading of the mulch may be by hand methods, blower, or other mechanical methods, provided a uniform covering is obtained.

Mulch material shall be furnished, hauled, and evenly applied on the area shown on the plans or designated by the RPR. Straw or hay shall be spread over the surface to a uniform thickness at the rate of 2 to 3 tons per acre (1800 - 2700 kg per acre) to provide a loose depth of not less than 1-1/2 inches (38 cm) nor more than 3 inches (75 mm). Other organic material shall be spread at the rate directed by the RPR. Mulch may be blown on the slopes and the use of cutters in the equipment for this purpose will be permitted to the extent that at least 95% of the mulch in place on the slope shall be 6 inches (150 mm) or more in length. When mulches applied by the blowing method are cut, the loose depth in place shall be not less than one inch (25 mm) nor more than 2 inches (50 mm).

908-3.2 Securing mulch. The mulch shall be held in place by light discing, a very thin covering of topsoil, pins, stakes, wire mesh, asphalt binder, or other adhesive material approved by the RPR. Where mulches have been secured by either of the asphalt binder methods, it will not be permissible to walk on the slopes after the binder has been applied. When an application of asphalt binder material is used to secure the mulch, the Contractor must take every precaution to guard against damaging or disfiguring structures or property on or adjacent to the areas worked and will be held responsible for any such damage resulting from the operation.

If the “peg and string” method is used, the mulch shall be secured by the use of stakes or wire pins driven into the ground on 5-foot (1.5-m) centers or less. Binder twine shall be strung between adjacent stakes in straight lines and crisscrossed diagonally over the mulch, after which the stakes shall be firmly driven nearly flush to the ground to draw the twine down tight onto the mulch.

908-3.3 Care and repair.

a. The Contractor shall care for the mulched areas until final acceptance of the project. Care shall consist of providing protection against traffic or other use by placing warning signs, as approved by the RPR, and erecting any barricades that may be shown on the plans before or immediately after mulching has been completed on the designated areas.

b. The Contractor shall be required to repair or replace any mulch that is defective or becomes damaged until the project is finally accepted. When, in the judgment of the RPR, such defects or damages are the result of poor workmanship or failure to meet the requirements of the specifications, the cost of the necessary repairs or replacement shall be borne by the Contractor.

c. If the “asphalt spray” method is used, all mulched surfaces shall be sprayed with asphalt binder material so that the surface has a uniform appearance. The binder shall be uniformly applied to the mulch at the rate of approximately 8 gallons (32 liters) per 1,000 square feet (100 sq m), or as directed by the RPR, with a minimum of 6 gallons (24 liters) and a maximum of 10 gallons (40 liters) per 1,000 square feet (100 sq m) depending on the type of mulch and the effectiveness of the binder securing it. Asphalt binder material may be sprayed on the mulched slope areas from either the top or the bottom of the slope. An approved spray nozzle shall be used. The nozzle shall be operated at a distance of not less than 4 feet (1.2 m) from the surface of the mulch and uniform

distribution of the asphalt material shall be required. A pump or an air compressor of adequate capacity shall be used to ensure uniform distribution of the asphalt material.

d. If the "asphalt mix" method is used, the mulch shall be applied by blowing, and the asphalt binder material shall be sprayed into the mulch as it leaves the blower. The binder shall be uniformly applied to the mulch at the rate of approximately 8 gallons (32 liters) per 1,000 square feet (100 sq m) or as directed by the RPR, with a minimum of 6 gallons (24 liters) and a maximum of 10 gallons (40 liters) per 1,000 square feet (100 sq m) depending on the type of mulch and the effectiveness of the binder securing it.

METHOD OF MEASUREMENT

908-4.1 The quantity of mulching to be paid for shall be the number of acres, to the nearest 0.10 acre, measured on the ground surface, completed and accepted.

BASIS OF PAYMENT

908-5.1 Payment will be made at the contract unit price per acre or fraction thereof for mulching. The price shall be full compensation for furnishing all materials and for placing and anchoring the materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item	Description	Unit
T-908-1	Mulching	Acre

REFERENCES

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

ASTM International (ASTM)
ASTM D977 Standard Specification for Emulsified Asphalt

Advisory Circulars (AC)
AC 150/5200-33 Hazardous Wildlife Attractants on or Near Airports

FAA/United States Department of Agriculture
Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM T-908