

LETTING ITEM NO. 03A
 IDOT LETTING: SEPTEMBER 22, 2023

LE056
 TOTAL SHEETS = 31

CONSTRUCTION PLANS

INSTALL AIRPORT SECURITY FENCING

JOLIET REGIONAL PORT DISTRICT
 LEWIS UNIVERSITY AIRPORT (LOT)
 ROMEOVILLE, WILL COUNTY, ILLINOIS

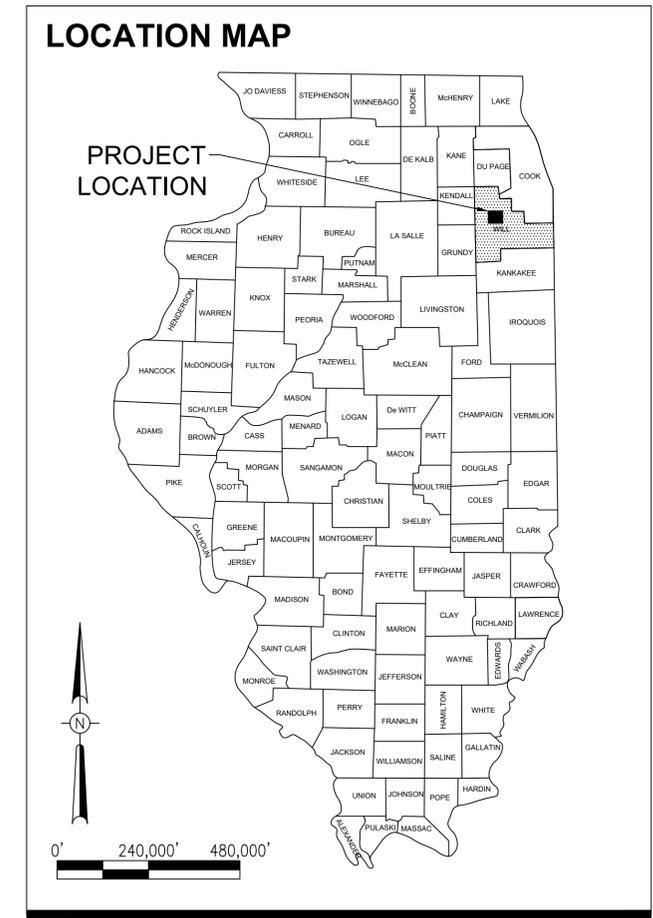
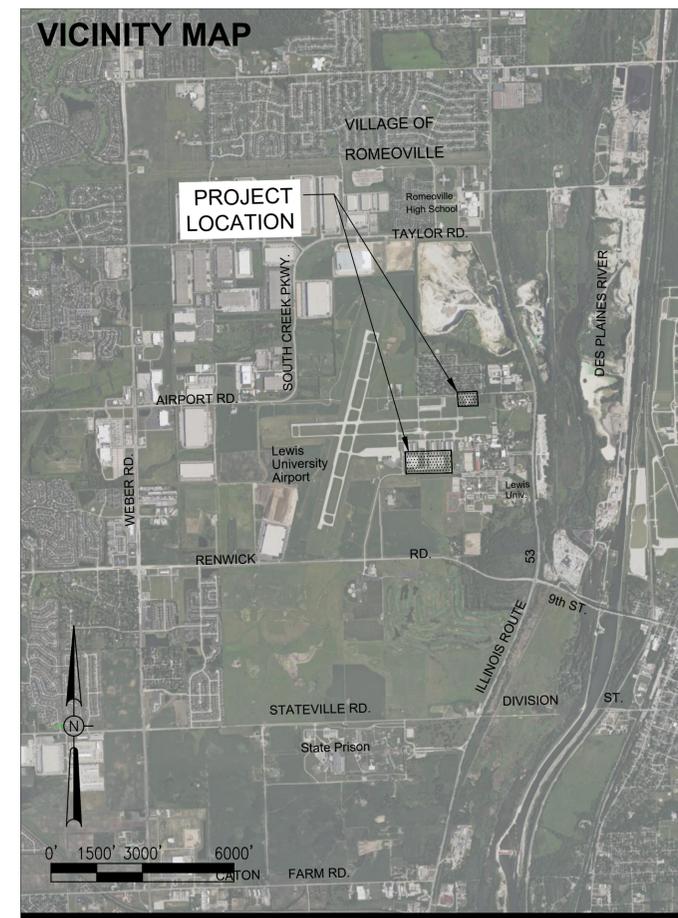
SBG PROJECT NO. 3-17-SBGP-TBD
 IDA PROJECT NO. LOT-4536
 BCM PROJECT NO. LE056

100% SUBMITTAL
 JULY 28, 2023

SPECIAL NOTICE
 THIS PROJECT IS GOVERNED BY FAA REQUIRED BUY AMERICAN PREFERENCE REQUIREMENTS. ALL BIDS MUST INCLUDE COMPLETED FAA REQUIRED CERTIFICATIONS AT THE TIME OF BID. SEE THE BID PROPOSAL AND ANY SOLICITATION ADDENDA REGARDING THIS MATTER.

NOTICE TO CONTRACTORS AND BIDDERS

THESE CONSTRUCTION PLANS RELY UPON THE SPECIAL PROVISIONS AND THE SPECIFICATIONS TO PROVIDE FOR A COMPLETE DESCRIPTION OF THE WORK AND CONSTRUCTION REQUIREMENTS. THE PLANS SHALL ONLY BE USED IN COMBINATION WITH ALL CONTRACT DOCUMENTS.



No.	Issue/Description	Sheets Changed	Date	By

Seal Date of Plans

JULY 28, 2023

Kris Salvaterra, P.E.
 Project Engineer Date

550 WEST JACKSON BOULEVARD, SUITE 600
 CHICAGO, ILLINOIS 60601

JULY 28, 2023

Ronald M. Hudson, AICP
 Project Manager Date

Lewis University Airport
 JOLIET REGIONAL PORT DISTRICT

JULY 28, 2023

Chris Lawson
 Director of Aviation Date

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SUMMARY OF QUANTITIES				
BASE BID - INSTALL SECURITY FENCING				
ITEM NO.	DESCRIPTION	UNITS	PLAN QUANTITY	RECORD QUANTITY
AR108051	POWER CABLE IN UNIT DUCT	FOOT	420.0	
AR108052	POWER CABLE IN CONDUIT	FOOT	245.0	
AR150510	ENGINEER'S FIELD OFFICE	L SUM	1.0	
AR150520	MOBLIZATION	L SUM	1.0	
AR150530	TRAFFIC MAINTENANCE	L SUM	1.0	
AR152411	UNCLASSIFIED EXCAVATION	L SUM	1.0	
AR156511	DITCH CHECK	EACH	10.0	
AR156520	INLET PROTECTION	EACH	4.0	
AR156540	RIPRAP	SQ YD	33.0	
AR162230	CLASS E MANUAL SLIDE GATE - 30'	EACH	5.0	
AR162506	CLASS E FENCE 6"	FOOT	3,100.0	
AR162530	WALKWAY GATES, CLASS E (5')	EACH	3.0	
AR162630	CLASS E GATE-30'	EACH	3.0	
AR162900	REMOVE CLASS E FENCE	FOOT	930.0	
AR162905	REMOVE GATE	EACH	3.0	
AR208606	6" AGGREGATE BASE COURSE	SQ YD	60.0	
AR501606	6" PCC SIDEWALK	SQ FT	520.0	
AR701524	24" RCP, CLASS IV	FOOT	25.0	
AR701530	30" RCP, CLASS IV	FOOT	90.0	
AR701536	36" RCP, CLASS IV	FOOT	90.0	
AR751567	MANHOLE 7'	EACH	1.0	
AR752430	PRECAST REINFORCED CONC. FES 30"	EACH	1.0	
AR752436	PRECAST REINFORCED CONC. FES 36"	EACH	1.0	
AR752530	GRATING FOR CONC. FES 30"	EACH	1.0	
AR752536	GRATING FOR CONC. FES 36"	EACH	1.0	
AR752900	REMOVE END SECTION	EACH	1.0	
AR801006	INFILTRATION BASIN	SQ YD	140.0	
AR801013	PROTECTION BOLLARD	EACH	4.0	
AR801036	ELECTRIC GATE OPERATOR - COMPLETE	EACH	1.0	
AR901510	SEEDING	ACRE	1.0	
AR905530	TOPSOILING	SQ YD	4,695.0	
AR908516	MULCHING	SQ YD	4,695.0	

ADDITIVE ALTERNATE NO. 1 - SECOND ELECTRIC GATE OPERATOR				
ITEM NO.	DESCRIPTION	UNITS	PLAN QUANTITY	RECORD QUANTITY
AS801036	ELECTRIC GATE OPERATOR - COMPLETE	L SUM	1.0	
AS801013	PROTECTION BOLLARD	EACH	4.0	

ADDITIVE ALTERNATE NO. 2 - FENCE COATING VINYL UPGRADE				
ITEM NO.	DESCRIPTION	UNITS	PLAN QUANTITY	RECORD QUANTITY
AT801037	FENCE COATING UPGRADE TO VINYL	L SUM	1.0	
AT801038	GATE COATING UPGRADE TO VINYL	L SUM	1.0	

PAYMENT WILL BE MADE UNDER THE ITEM NUMBERS, DESCRIPTIONS AND UNITS NOTED IN THE SUMMARY OF QUANTITIES TABLE IN ACCORDANCE WITH THE BASIS OF PAYMENT FOR EACH RESPECTIVE WORK ITEM NOTED IN THE SPECIAL PROVISIONS, COMPLETED AND ACCEPTED BY THE ENGINEER.



Lewis University Airport
JOLIET REGIONAL PORT DISTRICT

No. Description By Chk. App. Date
Issues

INSTALL AIRPORT SECURITY FENCING

IDA No: LOT-4536
BCM NO. LE056
SBG No: 3-17-SBGP-TBD

100% PREFINAL

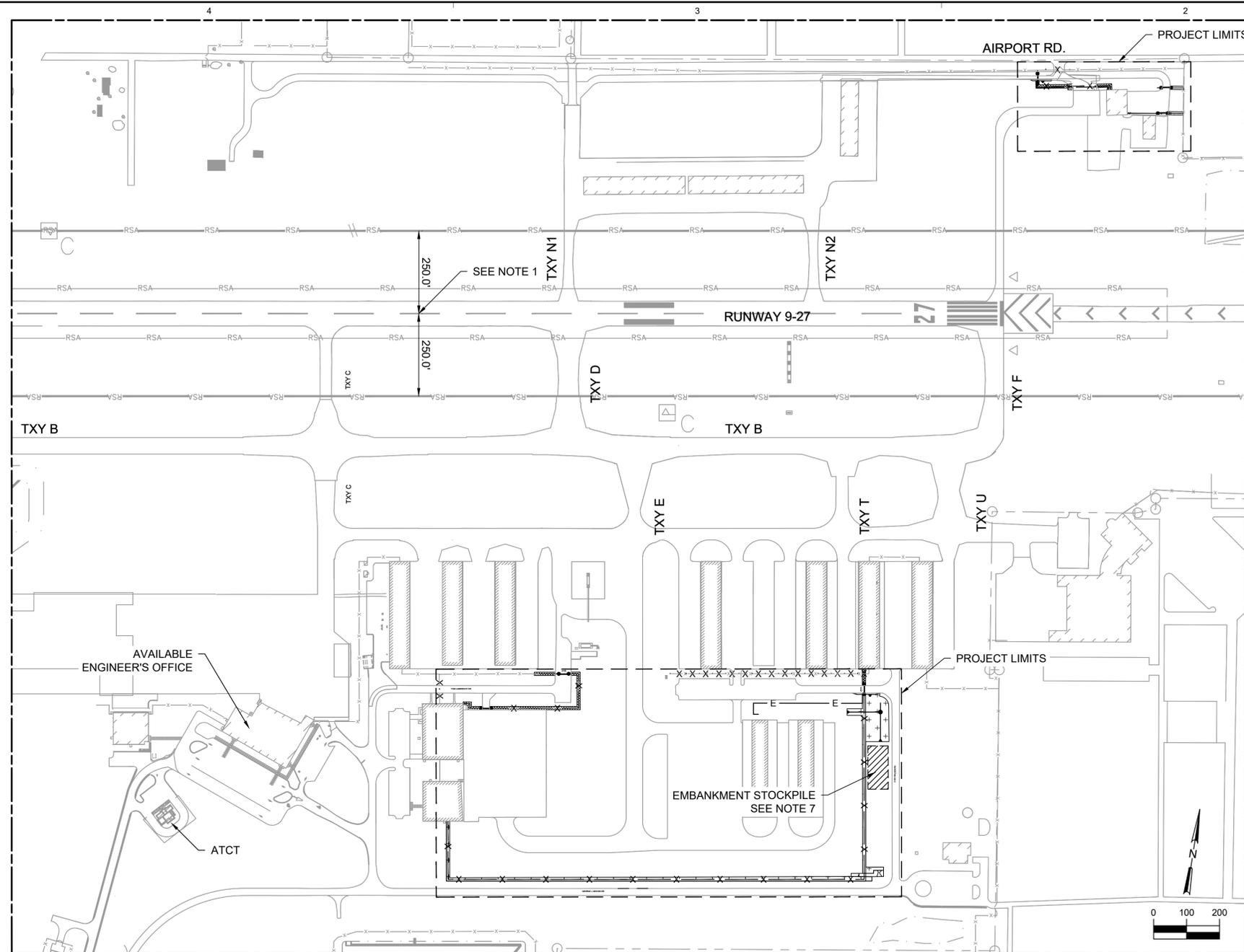
KEY PLAN

DRAWING TITLE
INDEX OF SHEETS AND SUMMARY OF QUANTITIES

APPROVED SHEET NO.
RMH
CHECKED
KWS
DRAWN BY
JVJ

2

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GENERAL NOTES

PROJECT DESCRIPTION

THIS PROJECT IS TO EXTEND THE CHAIN-LINK FENCING AND INSTALL GATES AT CHICAGO-ROMEIOVILLE AIRPORT, INCLUDING, AMONG OTHER INCIDENTAL WORK, THE FOLLOWING BASE BID ITEMS:

- PLACEMENT OF TEMPORARY EROSION CONTROL MEASURES.
- PROVIDE SELECT GRADING OF EARTH TO ACCOMMODATE FENCE LINE AND DRAINAGE FLOW.
- INSTALL DRAINAGE PIPE, MANHOLES AND FLARED END SECTIONS.
- CONSTRUCT PC CONCRETE SIDEWALK.
- INSTALL CLASS E CHAIN-LINK FENCING.
- INSTALL ELECTRIC GATES, MANUAL GATES, AND MANUAL PEDESTRIAN SWINGING GATES.
- CONSTRUCT ELECTRICAL POWER AND CONTROL CABLING AND EQUIPMENT.
- TOPSOIL, SEED, AND MULCH FENCE LINE AND DISTURBED AREAS.

AS ADDITIVE ALTERNATE NO. 1, AN ADDITIONAL ELECTRIC GATE OPERATOR AND PROTECTIVE BOLLARS ARE TO BE INSTALLED.

AS ADDITIVE ALTERNATIVE NO. 2, ALL FENCE AND GATES ARE TO BE VINYL COATED GREEN.

PROTECTION OF EXISTING AIRPORT FACILITIES

THE CONTRACTOR IS TO BE RESPONSIBLE FOR THE PROTECTION OF EXISTING UNDERGROUND AND OVERHEAD UTILITIES AND LIGHTING EQUIPMENT; DRIVEWAY AND ROAD PAVEMENT AND SHOULDERS; RUNWAY, TAXIWAY AND APRON PAVEMENTS AND SHOULDERS; RUNWAY, TAXIWAY AND AIRPORT LIGHTING EQUIPMENT; AND SEEDED AND TURFED AREAS THAT ARE UTILIZED IN OR AFFECTED BY THE CONTRACTOR'S ACTIVITIES. ITEMS DAMAGED BY THE CONTRACTOR ARE TO BE REPAIRED AT CONTRACTOR'S EXPENSE AND TO THE SATISFACTION OF AIRPORT MANAGER AND THE OWNER'S REPRESENTATIVE.

IN ADDITION, WHEN CONDITIONS DICTATE OR AS DETERMINED BY THE AIRPORT MANAGER OR THE OWNER'S REPRESENTATIVE, THE CONTRACTOR SHALL BE REQUIRED TO USE A PICK-UP TYPE SWEEPER IN ALL ACTIVE CONSTRUCTION AIRFIELD PAVEMENT AREAS. THE CONTRACTOR WILL BE REQUIRED TO HAVE A SWEEPER AVAILABLE FOR USE AT ALL TIMES. THE COST OF SWEEPING SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE FAA (SMO) THROUGH THE RESIDENT ENGINEER TO LOCATE ALL FAA CABLES ON THE PROJECT SITE. ALL FAA CABLES SHALL BE PROTECTED AT ALL TIMES. NO FAA CABLING HAS BEEN IDENTIFIED WITHIN THE PROJECT LIMITS.

CONTRACTOR'S ACCESS AND TEMPORARY FACILITIES

CONTRACTOR'S ACCESS TO THE PROJECT WHEN ON AIRPORT PROPERTY IS SHOWN ON THIS SHEET. CONTRACTOR'S ACCESS TO THE AIRPORT ITSELF IS TO BE PROVIDED BY PUBLIC RIGHTS-OF-WAY. THE CONTRACTOR IS TO SECURE ALL NECESSARY PERMITS FOR THE USE OF ANY PUBLIC RIGHTS-OF-WAY AND IS TO MAINTAIN TRAFFIC ON THESE PUBLIC ROADS AT ALL TIMES, WITH THE COSTS OF PERMITTING, CLEANING AND REPAIRING OF PAVEMENT DAMAGED BY CONTRACTOR'S ACTIVITIES INCIDENTAL TO THE CONTRACT. USE OF AND REPAIRS TO ANY PUBLIC FACILITIES ARE TO BE COMPLETED TO THE SATISFACTION OF THE FACILITY'S OWNER.

HEAVY VEHICLES SHALL NOT CROSS EXISTING PAVEMENT SURFACES EXCEPT AS APPROVED BY THE AIRPORT MANAGER AND THE OWNER'S REPRESENTATIVE. ANY DAMAGE TO PAVEMENTS THAT MAY OCCUR BY THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE AND TO THE SATISFACTION OF THE AIRPORT MANAGER AND THE OWNER'S REPRESENTATIVE.

THE CONTRACTOR IS TO PROVIDE AN EQUIPMENT, STORAGE AND PARKING AREA AT THE LOCATION SHOWN ON THIS SHEET. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE ACCESS ROADS AND THE STORAGE AREA DURING CONSTRUCTION AND TO RESTORE THE AREAS AT PROJECT COMPLETION TO CONDITIONS SUITABLE TO THE AIRPORT MANAGER AND THE OWNER'S REPRESENTATIVE. AT THE AIRPORT MANAGER'S DISCRETION, THE TEMPORARY FACILITIES MAY REMAIN, BUT THEY MUST BE LEFT IN CONDITIONS SUITABLE TO THE AIRPORT MANAGER. THE COST OF PROVIDING, MAINTAINING AND RESTORING THE TEMPORARY FACILITIES IS INCIDENTAL TO THE CONTRACT.

RESPONSIBILITY FOR EXISTING UTILITIES

THE LOCATION, SIZE AND/OR TYPE OF MATERIAL OF EXISTING UNDERGROUND OR OVERHEAD UTILITIES AS MAY BE INDICATED ON THESE CONSTRUCTION PLANS IS NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE. NEITHER THE OWNER NOR THE PROJECT ENGINEER HAVE INDEPENDENTLY VERIFIED THIS INFORMATION AND NEITHER ASSUMES ANY RESPONSIBILITY WHATSOEVER IN RESPECT TO THE ACCURACY, SUFFICIENCY OR COMPLETENESS OF THE INFORMATION AND GIVE NO EXPRESSED OR IMPLIED GUARANTEE THAT ANY CONDITIONS INDICATED ARE REPRESENTATIVE OF ACTUAL CONDITIONS TO BE ENCOUNTERED

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ACTUAL LOCATION OF ALL SUCH FACILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES AND AGENCIES OF HIS CONSTRUCTION PLANS AND SHALL OBTAIN FROM EACH PARTY DETAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF ALL UTILITIES AND THE WORKING SCHEDULE OF ANY REMOVALS OR ADJUSTMENTS REQUIRED OF THE UTILITY. THE CONTRACTOR SHALL CONTACT J.U.L.I.E. (PHONE 800-892-0123) TO ASSIST IN THE ABOVE.

CONTACT THE FAA (FEDERAL AVIATION ADMINISTRATION) FOR ASSISTANCE IN LOCATING FAA CABLES AND UTILITIES. LOCATION OF FAA POWER, CONTROL, AND COMMUNICATION CABLES SHALL BE COORDINATED WITH AND/OR LOCATED BY THE FAA.

THE CONTRACTOR SHALL PROTECT ANY FACILITIES TO THE SATISFACTION OF THE UTILITY OR OWNING-AGENCY WITH THE COST OF ANY REQUIRED PROTECTION TO BE INCIDENTAL TO THE CONTRACT. IN THE EVENT A UTILITY LINE OR SERVICE IS UNEXPECTEDLY ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER'S REPRESENTATIVE AND THE UTILITY COMPANY OR AGENCY OF JURISDICTION. ANY SUCH UTILITIES DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED TO SERVICE IMMEDIATELY.

AIRPORT SECURITY

THE CONTRACTOR IS TO COORDINATE GATE SECURITY, THROUGH THE RESIDENT ENGINEER, WITH THE AIRPORT MANAGEMENT. AIRPORT SECURITY SHALL BE MAINTAINED AT ALL TIMES.

ALL TAXIWAYS WITHIN THE PROJECT LIMITS ARE FAA CATEGORY II.

NOTES

1. NO WORK WITHIN THESE LIMITS AT ANY TIME. THE CONTRACTOR SHALL NOT CROSS ANY RUNWAYS OR OTHER ACTIVE AIRFIELD MOVEMENT AREA PAVEMENTS.
2. WORK MUST BE CONTROLLED.
3. MAXIMUM HEIGHT SHALL BE 25 FEET AT ALL LOCATIONS, EXCEPT FOR CRANE HEIGHTS OF 50 FEET AT THE PROPOSED SLIDING GATE LOCATIONS, AND/OR BY PRIOR APPROVAL OF THE ENGINEER (SEE SPECIAL PROVISIONS).
4. TRAFFIC TO BE MAINTAINED ON ALL AIRPORT ROADWAYS AT ALL TIMES.
5. NO CLOSURES TO TAXIWAY, APRON, ROADWAY, AND AUTO PARKING SHALL BE CONDUCTED EXCEPT AS SHOWN IN THE SITE PLAN.
6. THE AIRCRAFT AND GROUND VEHICLE TRAFFIC IS UNDER THE CONTROL OF AN FAA AIRCRAFT CONTROL TOWER. ALL CONTRACTOR ACTIVITY IS SUBJECT TO THIS CONTROL. THE AIRPORT MANAGER OR THEIR REPRESENTATIVE WILL COORDINATE CONTRACTOR ACTIVITIES WITH THE FAA CONTROL TOWER MANAGER. THE CONTRACTOR IS REQUIRED TO GIVE ADVANCE NOTICE OF ANY REQUESTS ON ANY ACTIVE AIRFIELD RUNWAYS OR TAXIWAYS.
7. EMBANKMENT BORROW STOCKPILE SHALL BE RESTORED TO EXISTING LANDSCAPING CONDITIONS AT THE PROJECT END.

EXISTING BENCHMARKS

PROJECT BENCHMARKS ARE AS FOLLOWS:

- N 1,798,251.29
E 1,050,054.84
ELEV 668.13
- N 1,798,457.54
E 1,050,630.31
ELEV 666.06

THIS DATA IS NOT ILLINOIS STATE PLANE COORDINATES

Know what's below. Call before you dig.

J.U.L.I.E. JOINT UTILITY LOCATING INFORMATION FOR EXCAVATORS
www.illinois1call.com

THE LOCATION, SIZE AND TYPE OF MATERIAL OF EXISTING UNDERGROUND UTILITIES INDICATED ON THE PLANS IS NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT OR COMPLETE IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE ACTUAL LOCATIONS OF ALL SUCH FACILITIES, INCLUDING SERVICE CONNECTIONS TO UNDERGROUND UTILITIES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY UTILITY COMPANIES OF HIS OPERATIONAL PLANS, OBTAIN FROM RESPECTIVE UTILITY COMPANIES DETAILED INFORMATION AND ASSISTANCE RELATIVE TO THE LOCATION OF THEIR FACILITIES AND THE WORKING SCHEDULE OF THE COMPANIES FOR REMOVAL OR ADJUSTMENT WHERE REQUIRED. IN THE EVENT AN UNEXPECTED UTILITY INTERFERENCE IS ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY COMPANY OF JURISDICTION AND THE ONE-CALL NOTICE SYSTEM. THE ENGINEER SHALL ALSO BE IMMEDIATELY NOTIFIED. ANY SUCH UTILITY OR SERVICES SHALL BE RESTORED TO SERVICE AT ONCE AND PAID FOR BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CONTRACT.

CALL J.U.L.I.E. FOR UTILITY INFORMATION AT 811.

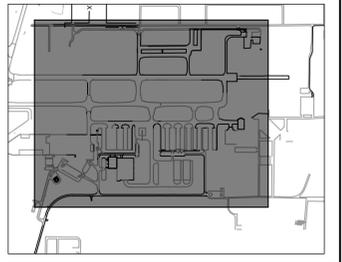
No.	Description	By	Chk.	App.	Date

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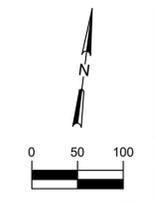
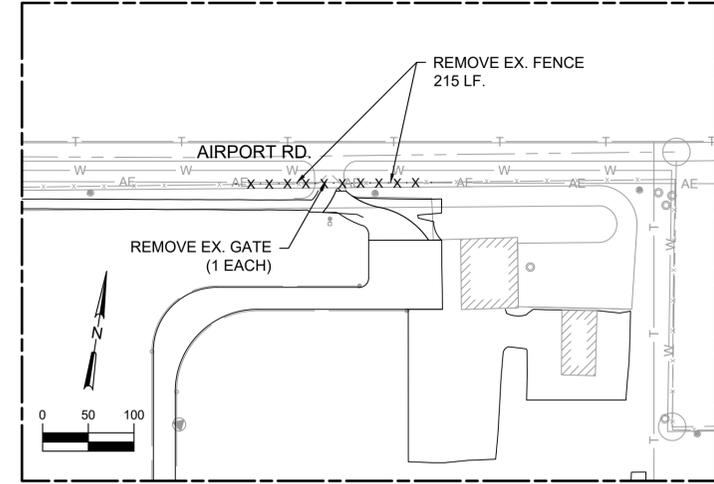
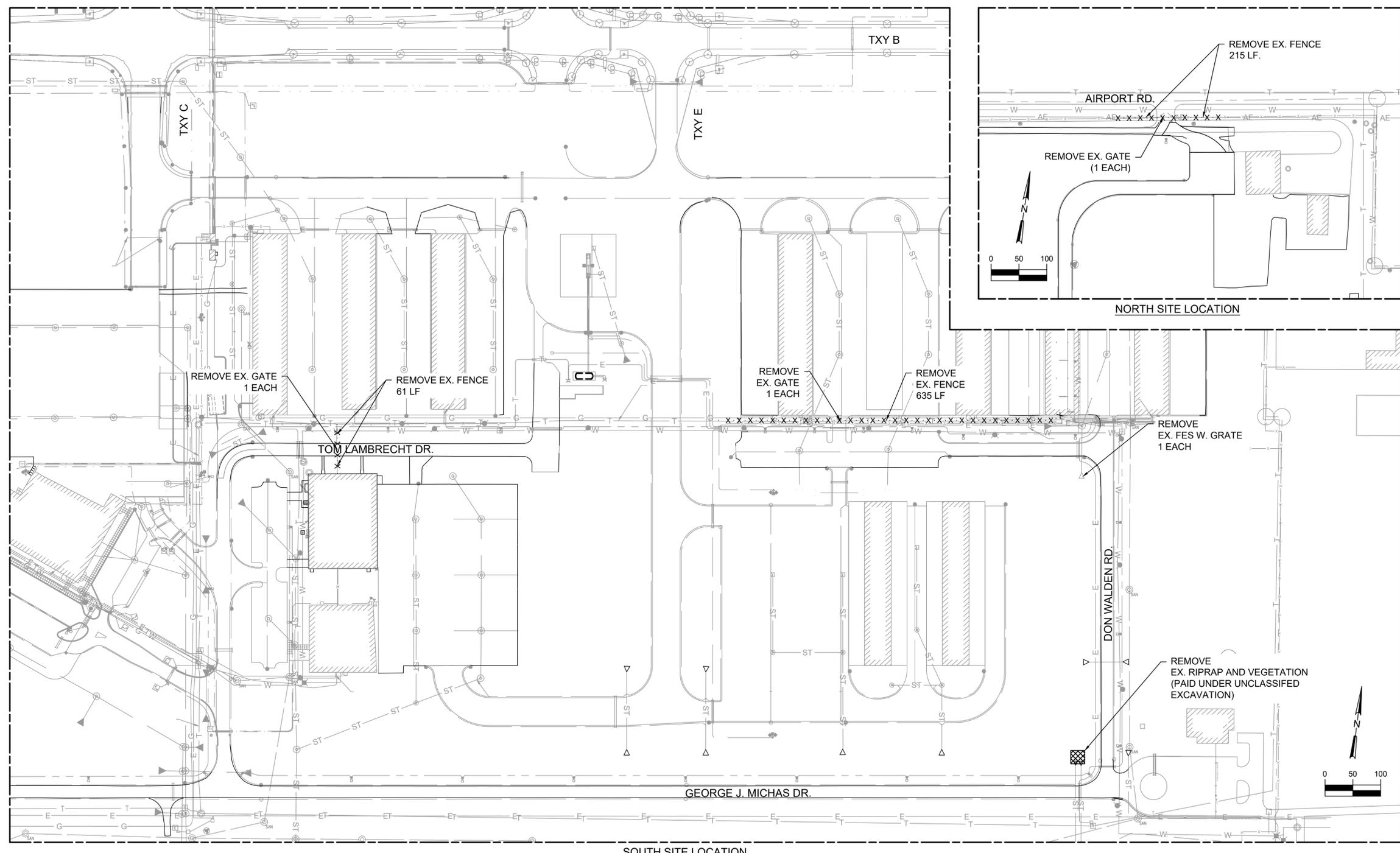
KEY PLAN



DRAWING TITLE
SITE PLAN, PROJECT CONTROL PLAN, AND GENERAL NOTES

APPROVED	SHEET NO.
RH	3
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KWS	
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JVJ	

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LEGEND

— ST —	EX. STORM SEWER	⊕	EX. LIGHT POLE
— SA —	EX. SANITARY MAIN	▨	EX. BUILDING
— G —	EX. NATURAL GAS	-x-x-x-x-	PROPOSED LINEAR DEMOLITION
— FO —	EX. FIBER / TELECOMMUNICATIONS LINE	⊠	PROPOSED AREA DEMOLITION
— E —	EX. ELECTRIC LINE		
— X —	EX. FENCE		
---	EX. PROPERTY LINE		
○ _{MAN}	EX. MANHOLE		
□	EX. INLET		
△	EX. DRAINAGE END SECTION (FES)		
○ _{SM}	EX. SANITARY MANHOLE		

NOTES

1. THE CONTRACTOR SHALL CONDUCT THEIR OWN FIELD INVESTIGATION TO DETERMINE THE EXACT LOCATION OF THE UNDERGROUND UTILITIES. THE LOCATION OF UNDERGROUND UTILITIES AS INDICATED ON THE PLANS HAS BEEN OBTAINED FROM EXISTING RECORDS. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY IN RESPECT TO THE ACCURACY, COMPLETENESS, OR SUFFICIENCY OF THE INFORMATION. ANY UTILITY, INCLUDING AIRFIELD ELECTRICAL CABLE AND LIGHTS, DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED BY HIM AT HIS OWN EXPENSE IN A MANNER WHICH IS SATISFACTORY TO THE ENGINEER AND TO THE OWNER OF THE UTILITY. ANY REPAIRS THAT MUST BE MADE BY THE OWNER OF THE UTILITY SHALL HAVE THE COST REIMBURSED TO THE UTILITY BY THE CONTRACTOR. AIRFIELD LIGHTING CABLES DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED BY A QUALIFIED ELECTRICIAN WITH THE COSTS TO BE BORNE BY THE CONTRACTOR.
2. THE CONTRACTOR SHALL TAKE MEASURES TO PROTECT EXISTING PAVEMENTS. ANY PAVEMENTS DAMAGED BY THE CONTRACTOR'S EQUIPMENT SHALL BE SAWCUT PER THE OWNER OR RESIDENT ENGINEER AND REPLACED IN KIND AT NO ADDITIONAL COST TO THE CONTRACT.
3. THE CONTRACTOR SHALL REMOVE EXISTING FENCE AS CALLED OUT IN THE PLANS TO THE NEAREST EXISTING END POST.

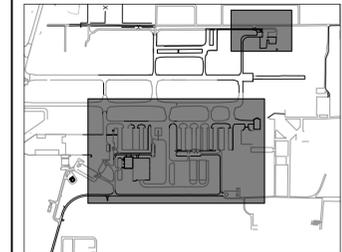
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KEY PLAN

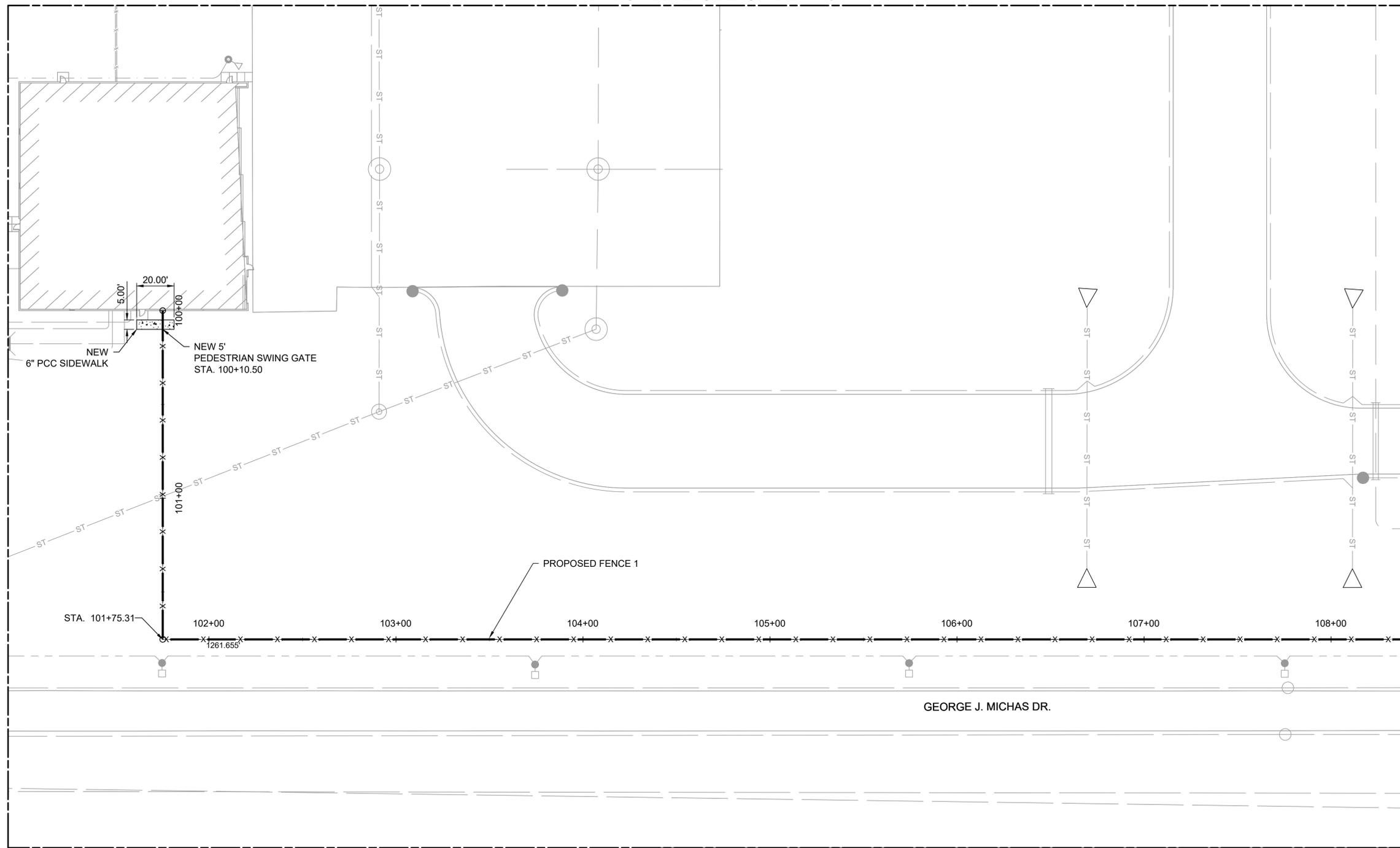


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EXISTING CONDITIONS AND PROPOSED REMOVALS

APPROVED RMH	SHEET NO.
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DRAWN BY KWS	

MATCHLINE SEE SHEET 10



MATCHLINE SEE SHEET 8



Lewis University Airport
JOLIET REGIONAL PORT DISTRICT

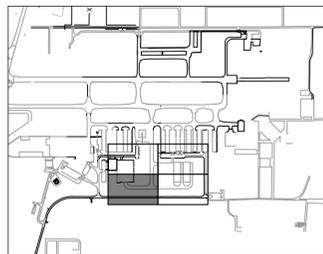
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KEY PLAN



DRAWING TITLE
PROPOSED FENCING PLAN - 1

APPROVED RMH	SHEET NO.
CHECKED KWS	7
DRAWN BY KWS	



LEGEND

- EX. 6' HIGH SECURITY FENCE
- PROPOSED 6' HIGH CLASS E SECURITY FENCE
- PROPOSED 6' HIGH CLASS E GATE
- PROPOSED 6' HIGH CLASS E PEDESTRIAN WALKWAY GATE
- NEW DRAINAGE STORM SEWER
- NEW DRAINAGE STRUCTURES
- NEW INFILTRATION BASIN

NOTES

1. NEW FENCE LINE FOLLOWS THE EXISTING GRADE UNLESS OTHERWISE NOTED. ALSO, SEE SPECIAL PROVISIONS FOR ADDITIONAL FENCE LINE GRADING REQUIREMENTS.
2. SOME EXISTING AND NEW UTILITIES HAVE BEEN OMITTED FOR CLARITY.
3. GATES ARE STATIONED AT THE CENTER OF THE GATE.
4. SEE PROPOSED DRAINAGE SHEETS FOR DRAINAGE PLAN DETAILS
5. CLEARING OF THE FENCE LINE AND SURFACE IRREGULARITIES SHALL BE PERFORMED UNDER ITEM 162 OF THE STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS. WORK SHALL BE PAID UNDER ITEM 152, AR152411 - UNCLASSIFIED EXCAVATION.
6. AT CONNECTION AT EXISTING FENCE, CONTRACTOR SHALL SET A NEW CORNER/END POST AND CONNECT NEW AND EXISTING FABRIC AT NEW POST. COST OF THIS WORK WILL NOT BE MEASURED SEPARATELY BUT SHALL BE INCLUDED IN THE UNIT PRICE FOR CLASS E FENCE.

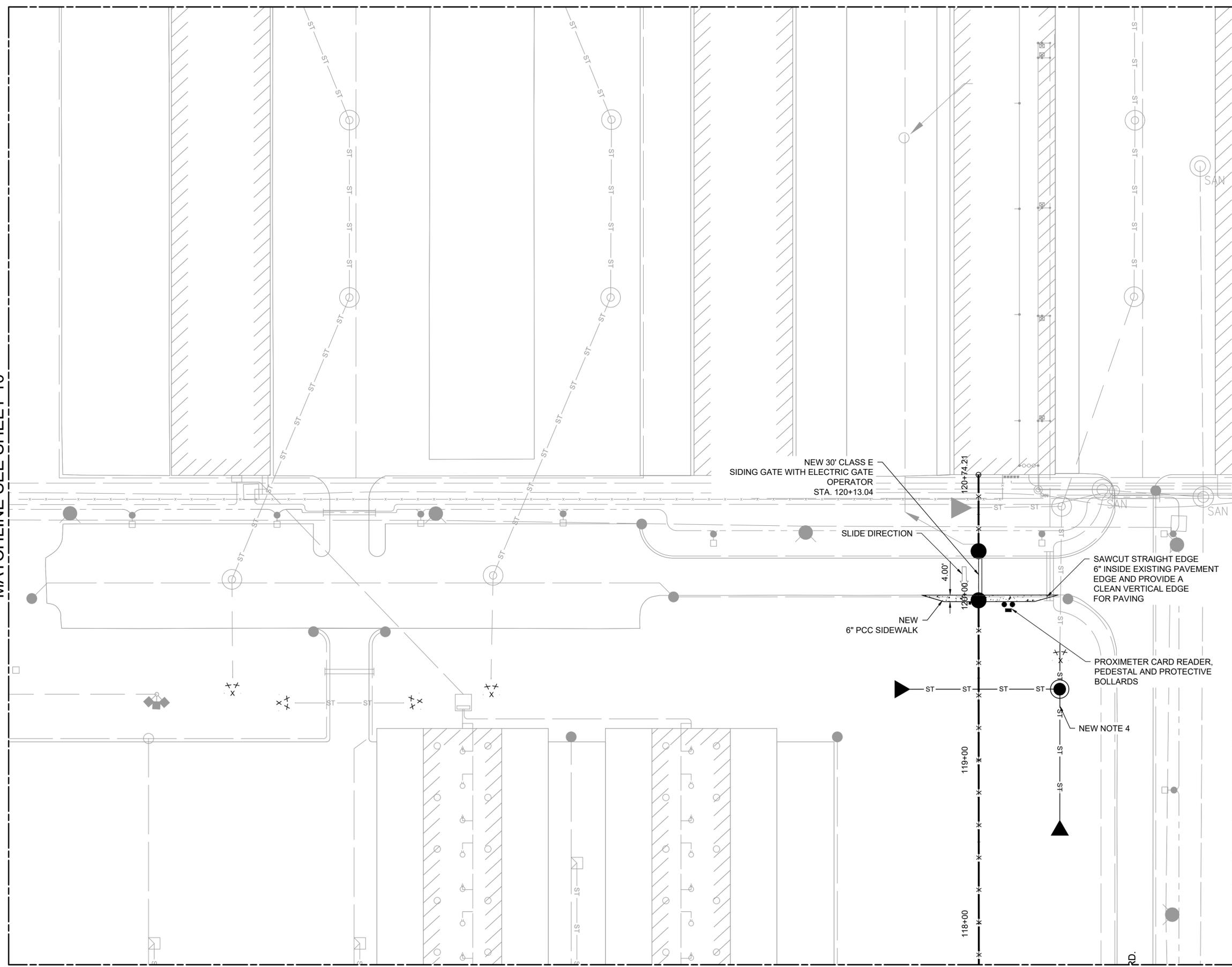
ALIGNMENT DATA - FENCE 1

DESCRIPTION	STATION	NORTHING	EASTING
START OF ALIGNMENT	100+00.00	1,798,470.83	1,050,722.10
PI	101+75.31	1,798,295.68	1,050,729.52
PI	114+37.78	1,798,349.04	1,051,990.05
END ALIGNMENT	120+74.21	1,798,985.69	1,051,962.69

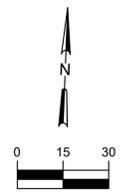
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MATCHLINE SEE SHEET 10



MATCHLINE SEE SHEET 8

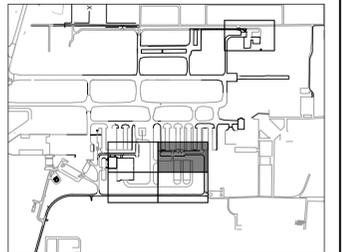


No.	Description	By	Chk.	App. Date

INSTALL AIRPORT SECURITY FENCING

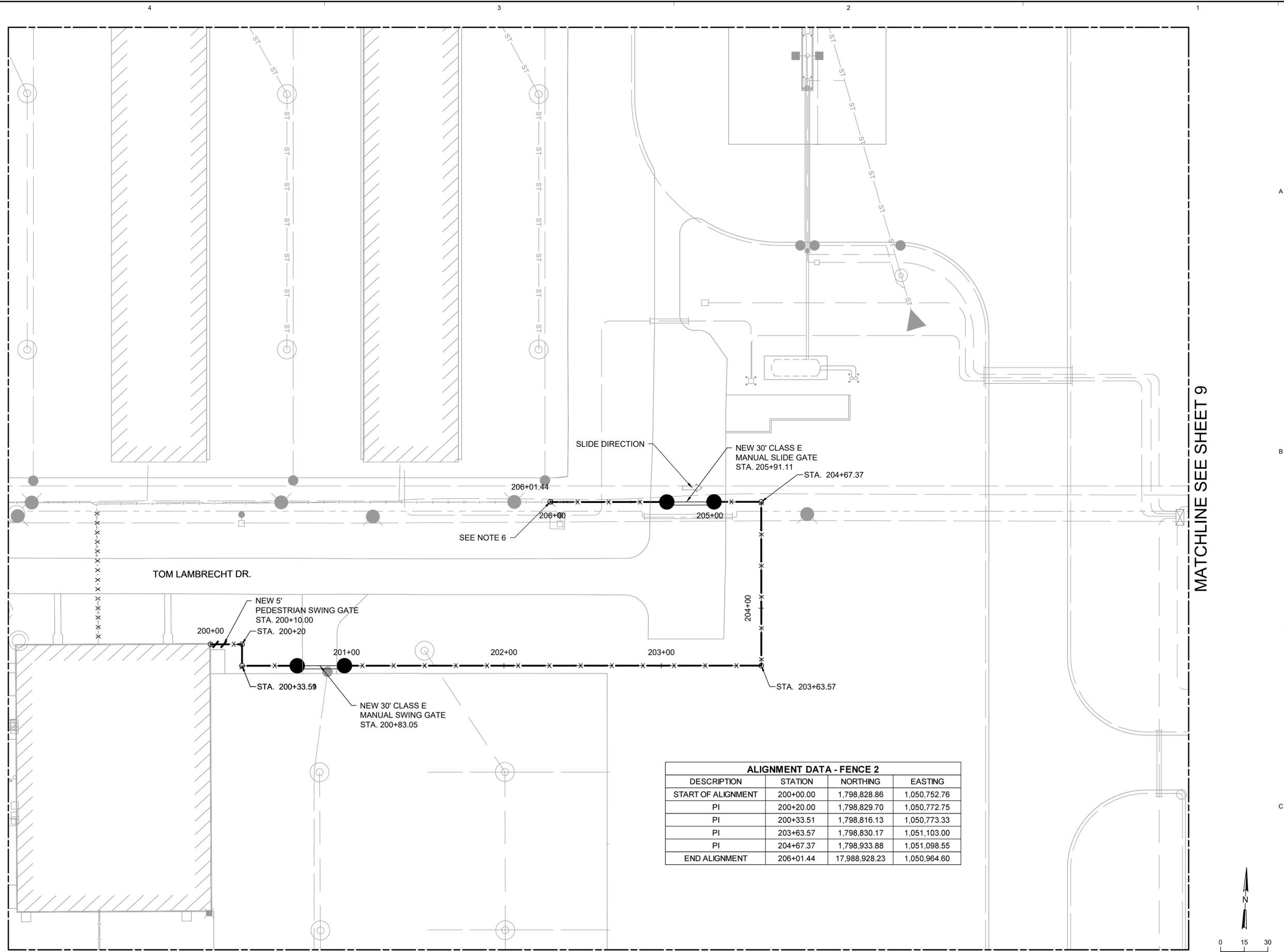
IDA No: LOT-4536
 BCM NO. LE056
 SBG No: 3-17-SBGP-TBD
 100% PREFINAL

KEY PLAN



DRAWING TITLE
PROPOSED FENCING PLAN - 3

APPROVED RMH	SHEET NO.
CHECKED KWS	9
DRAWN BY JJ	



ALIGNMENT DATA - FENCE 2

DESCRIPTION	STATION	NORTHING	EASTING
START OF ALIGNMENT	200+00.00	1,798,828.86	1,050,752.76
PI	200+20.00	1,798,829.70	1,050,772.75
PI	200+33.51	1,798,816.13	1,050,773.33
PI	203+63.57	1,798,830.17	1,051,103.00
PI	204+67.37	1,798,933.88	1,051,098.55
END ALIGNMENT	206+01.44	17,988,928.23	1,050,964.60

MATCHLINE SEE SHEET 9

MATCHLINE SEE SHEET 7

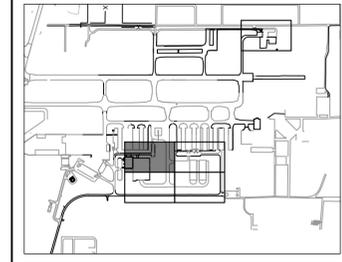
No.	Description	By	Chk.	App.	Date
Issues					

INSTALL AIRPORT SECURITY FENCING

IDA No: LOT-4536
BCM NO. LE056
SBG No: 3-17-SBGP-TBD

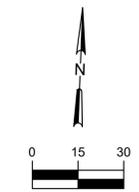
100% PREFINAL

KEY PLAN



DRAWING TITLE
PROPOSED FENCING PLAN - 4

APPROVED RMH	SHEET NO.
CHECKED KWS	10
DRAWN BY JJ	

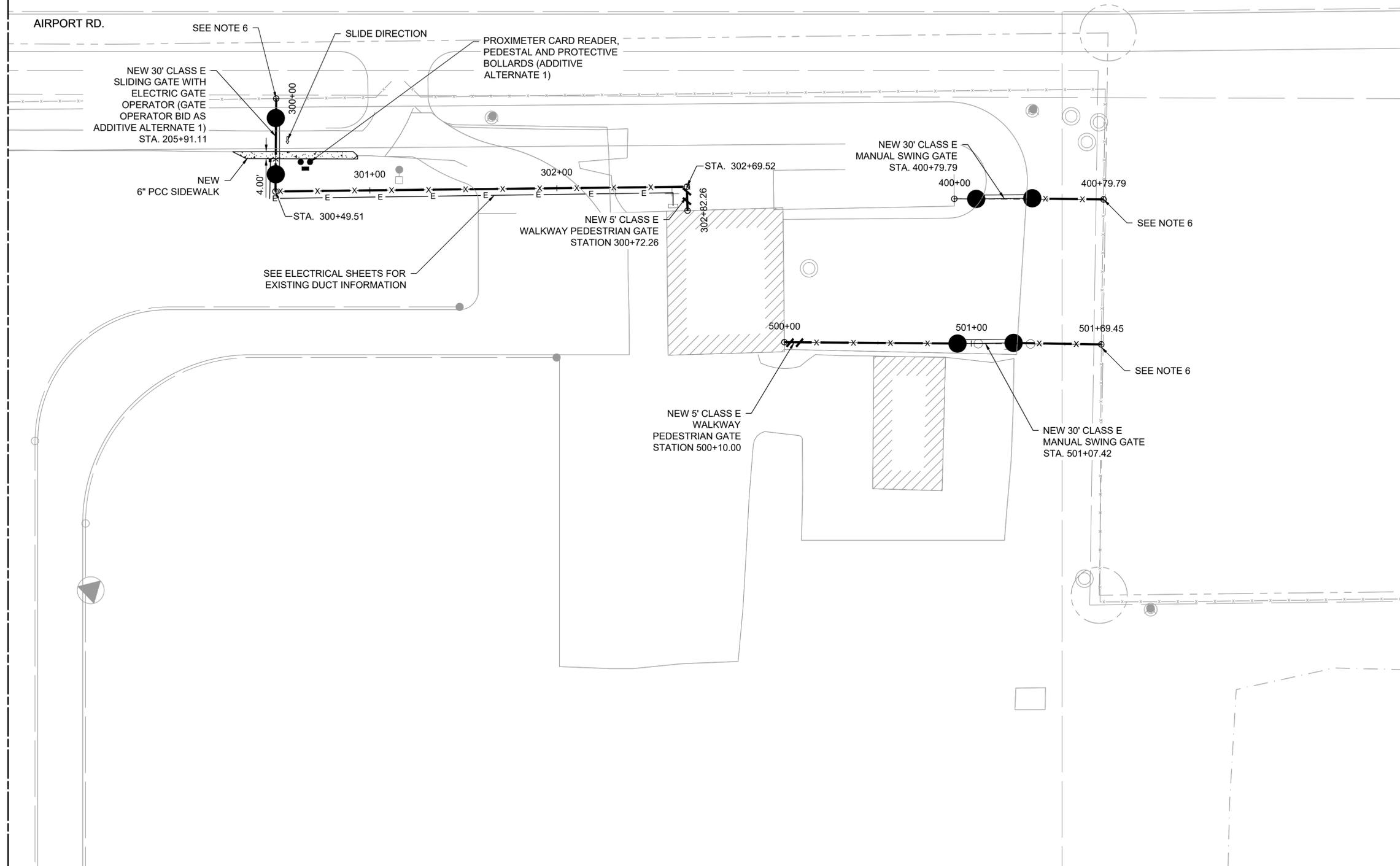


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 DATE PLOTTED: 7/31/2023 12:34 PM
 PLOT DEVICE DRIVER: EPLD STYLE TABLE - CTB
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ALIGNMENT DATA - FENCE 3			
DESCRIPTION	STATION	NORTHING	EASTING
START OF ALIGNMENT	300+00.00	1,800,817.90	1,052,412.08
PI	300+49.51	1,800,768.41	1,052,413.78
PI	302+69.52	1,800,780.23	1,052,633.46
END ALIGNMENT	300+72.26	1,800,767.52	1,052,634.38

ALIGNMENT DATA - FENCE 4			
DESCRIPTION	STATION	NORTHING	EASTING
START OF ALIGNMENT	400+00.00	1,800,779.83	1,052,776.62
END ALIGNMENT	400+79.79	1,800,782.90	1,052,856.35

ALIGNMENT DATA - FENCE 5			
DESCRIPTION	STATION	NORTHING	EASTING
START OF ALIGNMENT	500+00.00	1,800,699.60	1,052,689.07
END ALIGNMENT	501+69.45	1,800,705.59	1,052,858.41



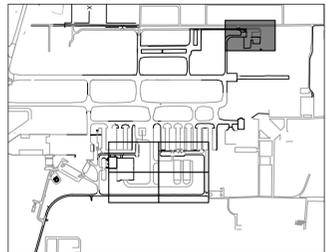
No.	Description	By	Chk.	App.	Date

INSTALL AIRPORT SECURITY FENCING

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BCM NO. LE056
SBG No: 3-17-SBGP-TBD

100% PREFINAL

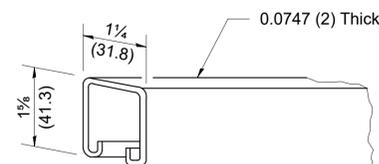
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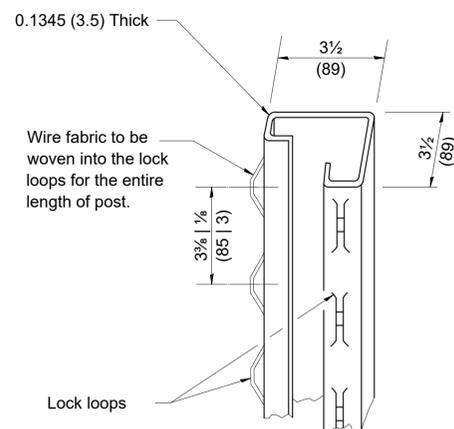
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CHECKED KWS	11
DRAWN BY JJ	

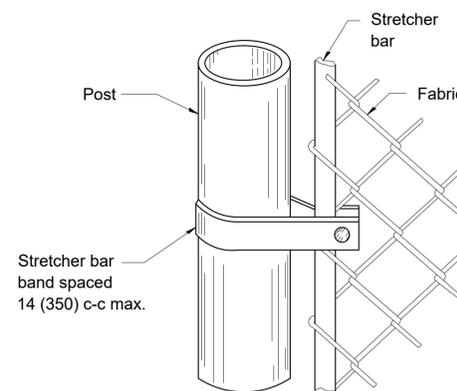
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 PRINTED BY: KRIS SAWYER



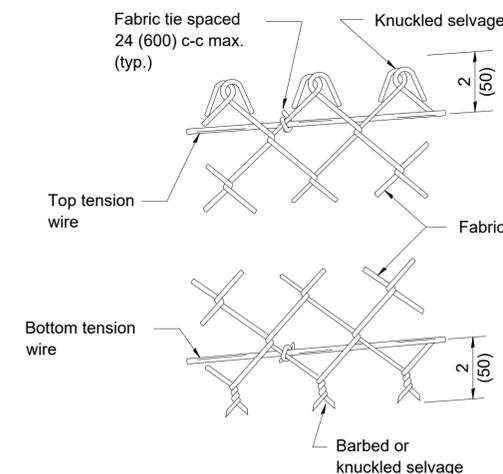
ROLL FORMED SECTION OF BRACE



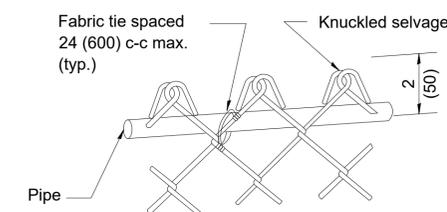
ROLL FORMED SECTION OF TERMINAL & GATE POST



METHOD OF FASTENING STRETCHER BAR TO POST



METHOD OF TYING FABRIC TO TENSION WIRES



METHOD OF TYING FABRIC TO PIPE

LINE POST	
Section	lbs./ft. (kg/m)
Pipe Type A 1.90 (48.3) O.D.	2.72 (4.05)
Pipe Type B 1.90 (48.3) O.D.	2.28 (3.39)
Pipe Type C 1.90 (48.3) O.D.	2.26 (3.36)
H 1.875x1.625 (47.6x41.3)	2.72 (4.05)
□	1.60 (2.38)
I	2.30 (3.42)

TERMINAL POST	
Section	lbs./ft. (kg/m)
Pipe Type A 2.375 (60.3) O.D.	3.65 (5.43)
Pipe Type B 2.375 (60.3) O.D.	3.11 (4.63)
Pipe Type C 2.375 (60.3) O.D.	3.09 (4.60)
Roll Formed 3 1/2 x 3 1/2 (89.0 x 89.0)	See detail
Sq. Tubing 2 1/2 x 2 1/2 (63.5 x 63.5)	4.32 (6.43)

TOP RAIL AND HORIZONTAL BRACES	
Section	lbs./ft. (kg/m)
Pipe Type A 1.66 (42.2) O.D.	2.27 (3.38)
Pipe Type B 1.66 (42.2) O.D.	1.83 (2.72)
Pipe Type C 1.66 (42.2) O.D.	1.82 (2.71)
H 1.31x1.5 (33.3x38.1)	2.25 (3.35)
Roll Formed 1 1/2 x 1 1/4 (41.3 x 31.8)	See detail

GATE POSTS *							
Gate Opening * ft. (m)		Pipe Type A		Sq. Tubing		Pipe Type B	
Single	Double	Size (O.D.)	lbs./ft. (kg/m)	Size	lbs./ft. (kg/m)	Size (O.D.)	kg/m (lbs./ft.)
Up to 4 (1.2)	Up to 8 (2.5)	2.375 (60.3)	3.65 (5.43)	2 1/2 (63.5)	4.32 (6.43)	2.375 (60.3)	3.11 (4.63)
Over 4 (1.2) to 8 (2.5)	Over 8 (2.5) to 16 (5.0)	2.875 (73.0)	5.79 (8.62)	3 (76.2)	5.78 (8.60)	2.875 (73.0)	4.64 (6.91)
Over 8 (2.5) to 12 (3.6)	Over 16 (5.0) to 24 (7.4)	3.5 (89.0)	7.58 (11.28)	3 (76.2)	8.80 (13.10)	3.5 (89)	5.707 (8.49)

* The 3 1/2 x 3 1/2 (89.0 x 89.0) roll formed section as detailed may be used as gate posts for single gate up to 6' (1.8 m) and double gate up to 12' (3.6 m).

GATE FRAMES	
Section	lbs./ft. (kg/m)
Pipe Type A 1.66 (42.2) O.D.	2.27 (3.38)
Pipe Type B 1.66 (42.2) O.D.	1.83 (2.72)
Pipe Type C 1.66 (42.2) O.D.	1.82 (2.71)

No.	Description	By	Chk.	App.	Date

INSTALL AIRPORT SECURITY FENCING

IDA No: LOT-4536
BCM NO. LE056
SBG No: 3-17-SBGP-TBD

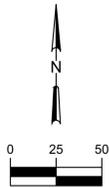
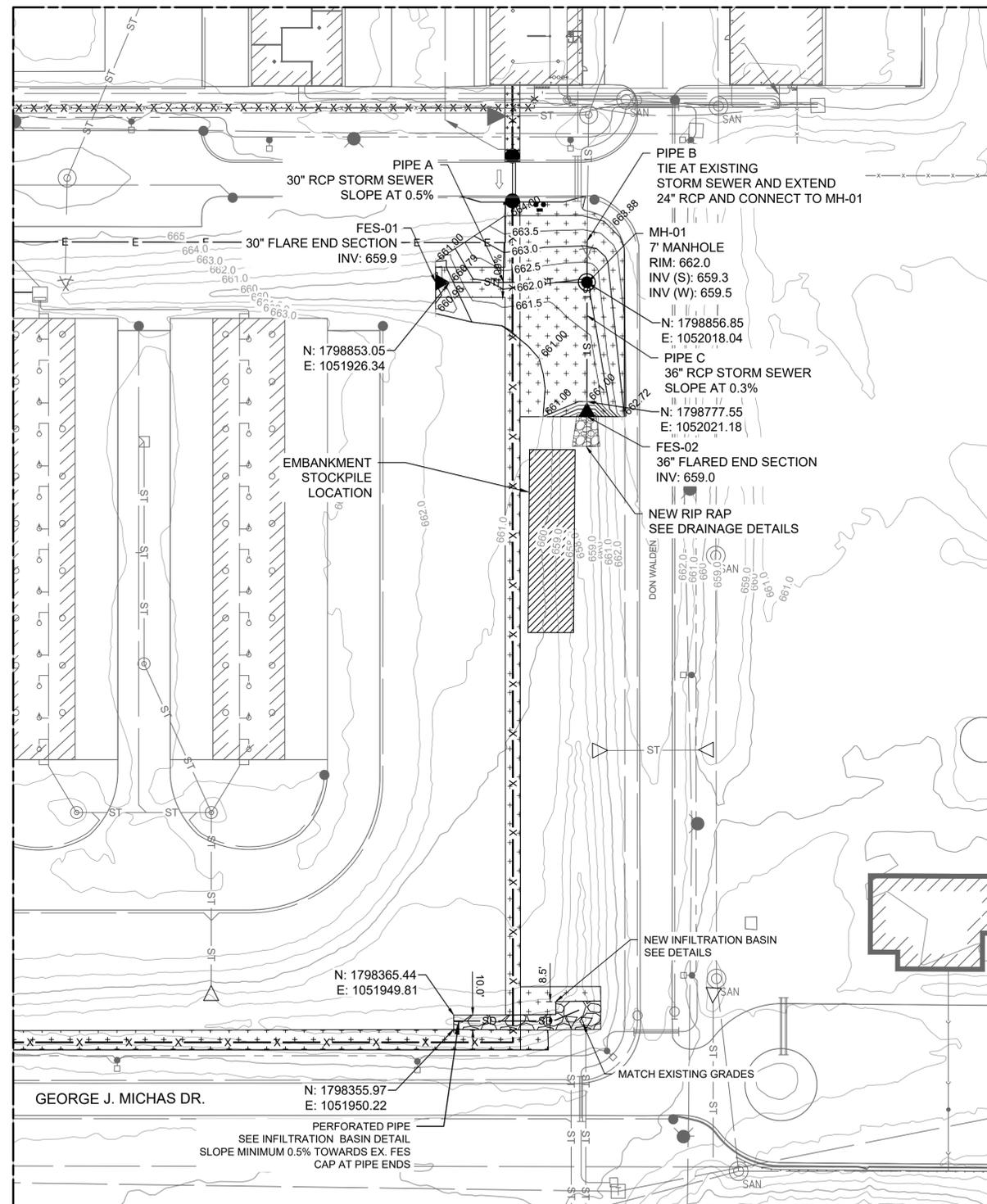
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KEY PLAN

DRAWING TITLE
FENCE DETAILS - 2

APPROVED
RMH
CHECKED
KWS
DRAWN BY
JVJ

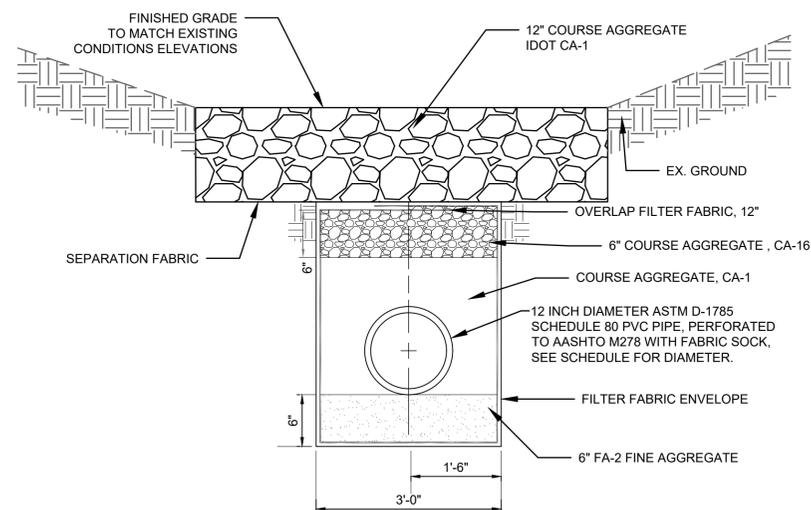
SHEET NO.
13



EARTHWORK SUMMARY TABLE				
LOCATION	4" TOPSOIL STRIPPING (CUBIC YARDS)	4" TOPSOIL PLACEMENT (CUBIC YARDS)	UNCLASSIFIED CUT (CUBIC YARDS)	UNCLASSIFIED FILL WITH 15% SHRINKAGE (CUBIC YARDS)
FILL GRADING SITE	145.5	145.5	1.3	679.3
INFILTRATION TRENCH	15.4	0.0	161.2	0.0
PCC SIDEWALK	6.3	0.0	18.8	0.0
TOTAL NET	167.2	145.5	181.3	679.3

EARTHWORK NOTES

1. TOPSOIL STRIPPING, UNCLASSIFIED CUT, AND UNCLASSIFIED FILL EMBANKMENT SHALL NOT BE MEASURED AND PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR UNCLASSIFIED EXCAVATION AR152411 - LUMP SUM.
2. AREAS OF UNSUITABLE MATERIAL (EXISTING RIPRAP, DEAD VEGETATION, ETC.) SHALL BE DESIGNATED WITH THE RESIDENT ENGINEER IN THE FIELD. UNSUITABLE MATERIAL SHALL NOT BE USED AS EMBANKMENT FILL MATERIAL AND SHALL BE HAULED OFF-SITE.
3. EMBANKMENT SOIL SHALL BE TAKEN FROM STOCKPILE PROVIDED.
4. STOCKPILE FOR EMBANKMENT IN ADJACENT AREA. STOCKPILE TO BE RESTORED AT PROJECT END, AND SHALL NOT BE PAID FOR SEPARATELY BUT INCIDENTAL TO AR152411 (SEE CONSTRUCTION SAFETY PLAN).
5. TOPSOIL PLACEMENT SHALL BE PAID UNDER PAY ITEM AR905530 - TOPSOILING.



INFILTRATION BASIN

NOTES

1. THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER FOR THE LAYOUT OF THE INFILTRATION TRENCH PRIOR TO INSTALLATION.
2. THE INFILTRATION TRENCH LAYOUT AND ELEVATION GRADES SHALL MATCH THE BOTTOM OF THE EXISTING DITCH GRADES AND CONDITIONS. THE CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER OF THE FINAL LAYOUT OF THE INFILTRATION TRENCH PRIOR TO INSTALLATION.
3. UNSUITABLE MATERIAL ENCOUNTERED DURING PLACEMENT OF BEDDING SHALL BE REMOVED AND REPLACED.
4. SEPARATE PAYMENT FOR COURSE AND FINE AGGREGATES, FILTER FABRIC ENVELOPE, PVC PIPE, AND FABRIC SOCK WILL NOT BE MADE BUT SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE PER SQUARE YARD FOR INFILTRATION BASIN.
5. SEE SPECIAL PROVISIONS.

DRAINAGE PIPE SCHEDULE

PIPE	UPSTREAM STRUCTURE	DOWNSTREAM STRUCTURE	UPSTREAM INVERT	DOWNSTREAM INVERT	PIPE SIZE / TYPE	PIPE LENGTH	PIPE SLOPE
A	FES-01	MH-01	659.90	659.50	30" RCP	85.00	0.5%
B*	EX. PIPE	MH-01	MATCH EX.	659.50	24" RCP	20.00	0.3%
C	MH-01	FES-02	659.30	659.00	36" RCP	80.00	0.3%

*CONTRACTOR SHALL VERIFY NEW PIPE EXTENSION MAINTAINS A MINIMUM SLOPE OF 0.3%

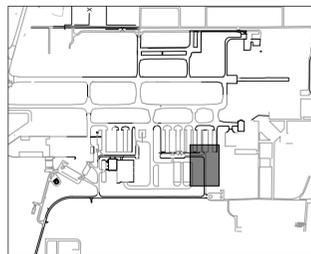
No.	Description	By	Chk.	App. Date

INSTALL AIRPORT SECURITY FENCING

IDA No: LOT-4536
BCM NO. LE056
SBG No: 3-17-SBGP-TBD

100% PREFINAL

KEY PLAN



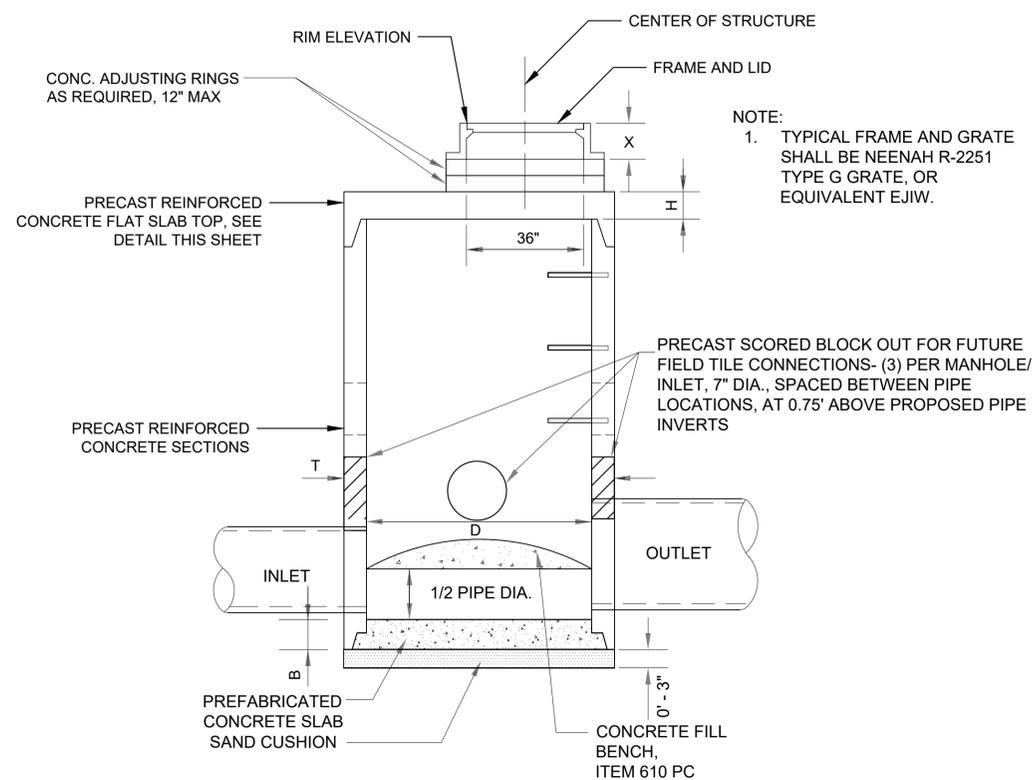
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PROPOSED GRADING AND DRAINAGE PLAN

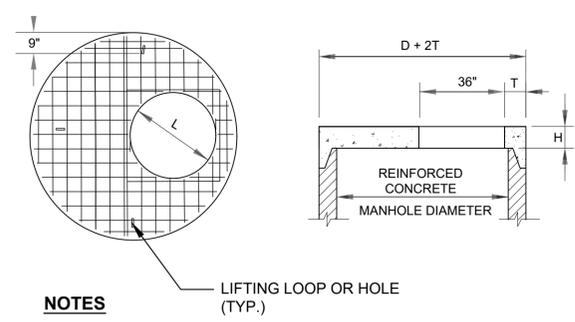
APPROVED
RMH
CHECKED
KWS
DRAWN BY
KWS

SHEET NO.
17

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 PLOTTED BY: KRS SALVITERA
 DATE PLOTTED: 7/31/2023 12:48 PM
 PLOT DEVICE DRIVER: ELOT STYLE TABLE - CIB
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NOTE:
1. TYPICAL FRAME AND GRATE SHALL BE NEENAH R-2251 TYPE G GRATE, OR EQUIVALENT EJIW.



NOTES

1. ADDITIONAL TOP AND BOTTOM BARS PLACED ADJACENT TO ACCESS MANHOLE.
2. MINIMUM 1" COVER ON ALL STEEL BARS.
3. THREE LIFTING LOOPS OR HOLES.
4. MINIMUM STEEL REINFORCEMENT IN EACH DIRECTION TO BE WWF 1.06 SQ. IN./FT. IN ACCORDANCE WITH AASHTO M199 AND IDOT STANDARDS.
5. FOR "L" DIMENSION SEE STORM SEWER SCHEDULES.

PRECAST REINFORCED CONCRETE FLAT SLAB TOP

**MANHOLE DATA - 7'
(IDOT STANDARD MODIFIED)**

INSIDE DIA. "D" (IN.)	WALL THICKNESS "T" (IN.)	TOP THICKNESS "H" (IN.)	BOTTOM THICKNESS "B" (IN.)
84"	8"	9"	9"

NOTES

1. FOR "L" DIMENSION AND FRAME AND LID INFORMATION, SEE DRAINAGE PIPE SCHEDULE.
2. CENTER OF FRAME TO BE USED FOR LOCATING STRUCTURE. FOR STRUCTURE LOCATIONS AND ADDITIONAL INFORMATION, SEE DRAINAGE PIPE SCHEDULE.
3. ALL STRUCTURES ARE TO BE PRECAST REINFORCED CONCRETE SECTIONS, BENCHES WAY TO BE CAST IN PLACE.

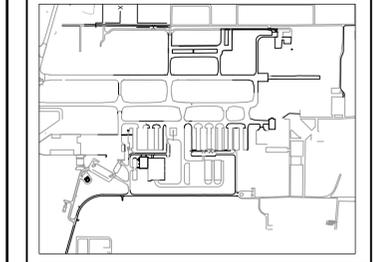
No.	Description	By	Chk.	App.	Date
Issues					

INSTALL AIRPORT SECURITY FENCING

IDA No: LOT-4536
BCM NO. LE056
SBG No: 3-17-SBGP-TBD

100% PREFINAL

KEY PLAN



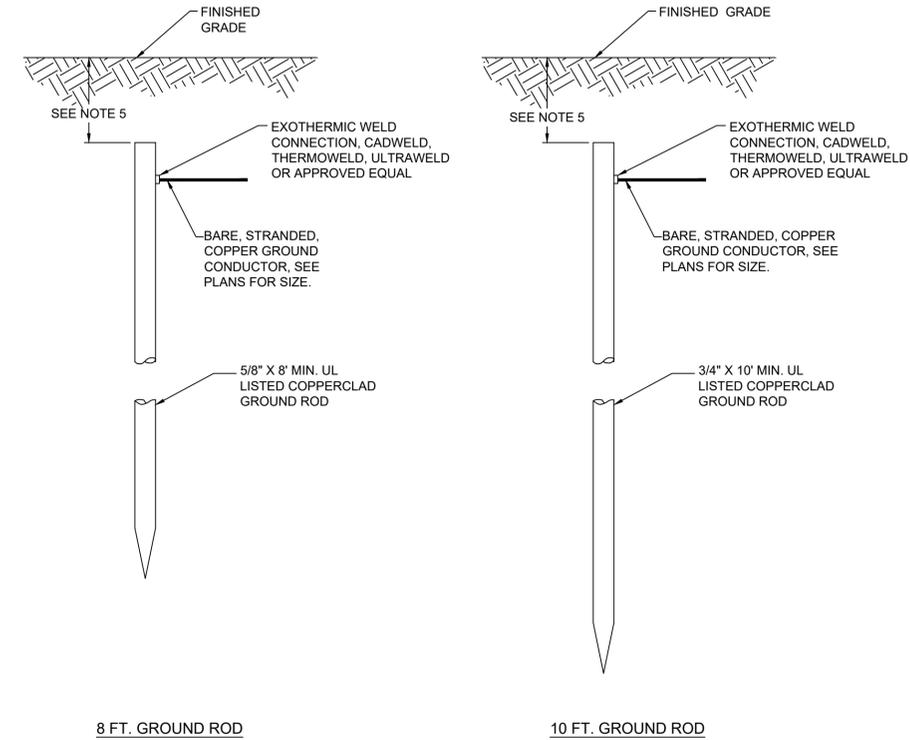
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CHECKED KWS	19
DRAWN BY KWS	

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 FILE STYLE TABLE: CIB
 PLOTTED BY: KRS SALVETERA
 DATE PLOTTED: 7/31/2023 12:48 PM
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GROUNDING NOTES

- THE CONTRACTOR SHALL FURNISH AND INSTALL ALL GROUNDING AS MAY BE NECESSARY OR REQUIRED TO MAKE A COMPLETE GROUNDING SYSTEM AS REQUIRED BY THE LATEST NATIONAL ELECTRICAL CODE (NEPA 70) IN FORCE AND AS DETAILED HEREIN. THE RELIABILITY OF THE GROUNDING SYSTEM IS DEPENDENT ON CAREFUL, PROPER INSTALLATION AND CHOICE OF MATERIALS. IMPROPER PREPARATION OF SURFACES TO BE JOINED TO MAKE AN ELECTRICAL PATH, LOOSE JOINTS OR CORROSION CAN INTRODUCE IMPEDANCE THAT WILL SERIOUSLY IMPAIR THE ABILITY OF THE GROUND PATH TO PROTECT PERSONNEL AND EQUIPMENT AND TO ABSORB TRANSIENTS THAT CAN CAUSE NOISE IN COMMUNICATIONS CIRCUITS. THE FOLLOWING FUNCTIONS ARE PARTICULARLY IMPORTANT TO ENSURE A RELIABLE GROUND SYSTEM:
- FURNISH AND INSTALL GROUND RODS AS DETAILED HEREIN. GROUND RODS FOR ELECTRICAL INSTALLATIONS SHALL BE MINIMUM 3/4-IN. DIAMETER BY 10-FT LONG, UL-LISTED, COPPER CLAD WITH 10-MIL MINIMUM COPPER COATING. GROUND RODS FOR FENCE GROUNDING SHALL BE 5/8-IN. DIAMETER BY 10-FT. LONG, UL LISTED, COPPER CLAD WITH 10-MIL MINIMUM COPPER COATING. GROUND RODS SHALL BE SPACED OR AS DETAILED ON THE RESPECTIVE PLANS, AND IN NO CASE SPACED LESS THAN ONE ROD LENGTH APART. ALL CONNECTIONS TO GROUND RODS, GROUND FIELDS, AND/OR THE GROUND RING SHALL BE MADE WITH EXOTHERMIC WELD TYPE CONNECTORS, CADWELDED BY ERICO PRODUCTS, INC., SOLON, OHIO, (PHONE 1-800-248-9353), THERMOWELD BY CONTINENTAL INDUSTRIES, INC., TULSA, OKLAHOMA (PHONE 918-663-1440), ULTRAWELD BY HARGER, GRAYSLAKE, ILLINOIS (PHONE 1-800-842-7437), OR APPROVED EQUAL. EXOTHERMIC WELD CONNECTIONS SHALL BE INSTALLED IN CONFORMANCE WITH THE RESPECTIVE MANUFACTURER'S DIRECTIONS USING MOLDS AS REQUIRED FOR EACH RESPECTIVE APPLICATION. BOLTED CONNECTIONS WILL NOT BE PERMITTED AT GROUND RODS OR AT BURIED GROUNDING ELECTRODE CONDUCTORS.
- CONTRACTOR SHALL TEST EACH MADE ELECTRODE GROUND ROD/GROUND FIELD/GROUND RING WITH AN INSTRUMENT SPECIFICALLY DESIGNED FOR TESTING GROUND FIELD SYSTEMS. IF GROUND RESISTANCE EXCEEDS 25 OHMS, CONTACT THE PROJECT ENGINEER FOR FURTHER DIRECTION. COPIES OF GROUND FIELD TEST RESULTS SHALL BE FURNISHED TO THE RESIDENT ENGINEER/RESIDENT PROJECT REPRESENTATIVE.
- ALL PRODUCTS ASSOCIATED WITH THE GROUNDING SYSTEM SHALL BE UL-LISTED AND LABELED.
- ALL BOLTED OR MECHANICAL CONNECTIONS SHALL BE COATED WITH A CORROSION PREVENTATIVE COMPOUND BEFORE JOINING, SANCHEM INC. "NO-OX-ID "A-SPECIAL" COMPOUND, BURNDY PENETROX E, OR EQUAL.
- METALLIC SURFACES TO BE JOINED SHALL BE PREPARED BY THE REMOVAL OF ALL NON-CONDUCTIVE MATERIAL, PER 2011 NATIONAL ELECTRICAL CODE ARTICLE 250-12. ALL COPPER BUS BARS MUST BE CLEANED PRIOR TO MAKING CONNECTIONS TO REMOVE SURFACE OXIDATION.
- METALLIC RACEWAY FITTINGS SHALL BE MADE UP TIGHT TO PROVIDE A PERMANENT LOW IMPEDANCE PATH FOR ALL CIRCUITS. METAL CONDUIT TERMINATIONS IN ENCLOSURES SHALL BE BONDED TO THE ENCLOSURE WITH UL-LISTED FITTINGS SUITABLE FOR GROUNDING. PROVIDE GROUNDING BUSHINGS WITH BONDING JUMPERS FOR ALL METAL CONDUITS ENTERING SERVICE EQUIPMENT (METER BASE, CT CABINET, MAIN SERVICE BREAKER ENCLOSURE, ETC.). PROVIDE GROUNDING BUSHINGS WITH BONDING JUMPERS FOR ALL METAL CONDUITS ENTERING AN ENCLOSURE THROUGH CONCENTRIC OR ECCENTRIC KNOCKOUTS THAT ARE PUNCHED OR OTHERWISE FORMED SO AS TO IMPAIR THE ELECTRICAL CONNECTION TO GROUND. STANDARD LOCKNUTS OR BUSHINGS SHALL NOT BE THE SOLE MEANS FOR BONDING WHERE A CONDUIT ENTERS AN ENCLOSURE THROUGH A CONCENTRIC OR ECCENTRIC KNOCKOUT
- ALL CONNECTIONS, LOCATED ABOVE GRADE, BETWEEN THE DIFFERENT TYPES OF GROUNDING CONDUCTORS SHALL BE MADE USING UL-LISTED DOUBLE COMPRESSION CRIMP TYPE CONNECTORS OR UL-LISTED BOLTED GROUND CONNECTORS. FOR GROUND CONNECTIONS TO ENCLOSURES, CASES AND FRAMES OF ELECTRICAL EQUIPMENT NOT SUPPLIED WITH GROUND LUGS THE CONTRACTOR SHALL DRILL REQUIRED HOLES FOR MOUNTING A BOLTED GROUND CONNECTOR. ALL BOLTED GROUND CONNECTORS SHALL BE BURNDY, THOMAS AND BETTS, OR EQUAL. TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUES IN UL STANDARD 486A TO ASSURE PERMANENT AND EFFECTIVE GROUNDING.
- ALL METAL EQUIPMENT ENCLOSURES, CONDUITS, CABINETS, BOXES, RECEPTACLES, MOTORS, ETC. SHALL BE BONDED TO THE RESPECTIVE GROUNDING SYSTEM.
- PROVIDE ALL BOXES FOR PROPOSED OUTLETS, SWITCHES, CIRCUIT BREAKERS, ETC. WITH GROUNDING SCREWS. PROVIDE ALL PANELBOARD, SWITCHGEAR, ETC., ENCLOSURES WITH GROUNDING BARS WITH INDIVIDUAL SCREWS, LUGS, CLAMPS, ETC., FOR EACH OF THE GROUNDING CONDUCTORS THAT ENTER THEIR RESPECTIVE ENCLOSURES.
- EACH NEW FEEDER CIRCUIT AND/OR BRANCH CIRCUIT SHALL INCLUDE AN EQUIPMENT GROUND WIRE. METAL RACEWAY OR CONDUIT SHALL NOT MEET THIS REQUIREMENT. THE EQUIPMENT GROUND WIRE FROM EQUIPMENT SHALL NOT BE SMALLER THAN ALLOWED BY 2011 NEC TABLE 250-122 "MINIMUM SIZE CONDUCTORS OR GROUNDING RACEWAY AND EQUIPMENT." WHEN CONDUCTORS ARE ADJUSTED IN SIZE TO COMPENSATE FOR VOLTAGE DROP, EQUIPMENT-GROUNDING CONDUCTORS SHALL BE ADJUSTED PROPORTIONATELY ACCORDING TO CIRCULAR MIL AREA. ALL EQUIPMENT GROUND WIRES SHALL BE COPPER, EITHER BARE OR INSULATED GREEN IN COLOR WHERE THE EQUIPMENT GROUNDING CONDUCTORS ARE INSULATED, THEY SHALL BE IDENTIFIED BY THE COLOR GREEN, AND SHALL BE THE SAME INSULATION TYPE AS THE PHASE CONDUCTORS.
- ALL EXTERIOR METAL CONDUIT, WHERE NOT ELECTRICALLY CONTINUOUS BECAUSE OF MANHOLES, HANDHOLES, NON-METALLIC JUNCTION BOXES, ETC., SHALL BE BONDED TO ALL OTHER METAL CONDUIT IN THE RESPECTIVE DUCT RUN, AND AT EACH END, WITH A COPPER-BONDING JUMPER SIZED IN CONFORMANCE WITH 2011 NEC 250-102. WHERE METAL CONDUITS TERMINATE IN AN ENCLOSURE (SUCH AS A MOTOR CONTROL CENTER, SWITCHBOARD, ETC) WHERE THERE IS NOT ELECTRICAL CONTINUITY WITH THE CONDUIT AND THE RESPECTIVE ENCLOSURE, PROVIDE A BONDING JUMPER FROM THE RESPECTIVE ENCLOSURE GROUND BUS TO THE CONDUIT SIZED PER 2011 NEC 250-102.
- IT IS THE INTENT OF THIS SPECIFICATION THAT ALL MOTOR FRAMES, PUMP BASES ELECTRICAL EQUIPMENT ENCLOSURES, PANEL HOUSINGS, CONDUITS, BOXES, ETC. HAVE A CONTINUOUS COPPER WIRE GROUND CONNECTION AND SHALL BE POSITIVELY BONDED TO THE RESPECTIVE GROUNDING SYSTEM. CONDUIT CONNECTORS WILL NOT BE CONSIDERED AS ADEQUATE GROUNDING.
- PROVIDE A POSITIVE GROUND BOND FOR ALL OUTLET BOXES, ELECTRICAL EQUIPMENT ENCLOSURES, GROUNDING RECEPTACLES, TOGGLE SWITCHES, ETC. INSTALL A GROUNDING CONDUCTOR IN ALL WIRE AND CABLE RACEWAYS. GROUND CONDUCTOR TO HAVE 600-VOLT INSULATION AND BE IDENTIFIED BY A CONTINUOUS GREEN COLOR COATING. THEY SHALL BE USED SOLELY FOR GROUNDING PURPOSES AND BE ENTIRELY SEPARATE FROM WHITE GROUNDED NEUTRAL CONDUCTOR, EXCEPT AT SUPPLY SIDE OF SERVICE DISCONNECTING MEANS, WHERE GROUNDING AND NEUTRAL SYSTEMS ARE TO BE CONNECTED TO SERVICE GROUND.
- EACH AND ALL GROUNDED CASED AND METAL PARTS ASSOCIATED WITH ELECTRICAL EQUIPMENT SHALL BE TESTED FOR CONTINUITY OF CONNECTION WITH GROUND BUS SYSTEM BY CONTRACTOR IN PRESENCE OF OWNER'S REPRESENTATIVE.
- ALL CONNECTIONS BETWEEN THE DIFFERENT TYPES OF GROUNDING CONDUCTORS ABOVE GRADE SHALL BE MADE USING BOLTED GROUND CONNECTORS. GROUND LUGS SHALL BE PROVIDED IN ALL ENCLOSURES AND WIRING TERMINATION JUNCTION BOXES. EQUIPMENT GROUNDING AND GROUNDING CONDUCTOR SHALL BE CONNECTED TO THESE GROUND LUGS. FOR GROUND CONNECTIONS TO ENCLOSURES, CASES AND FRAMES OF ELECTRICAL EQUIPMENT NOT SUPPLIED WITH GROUND LUGS THE CONTRACTOR SHALL DRILL REQUIRED HOLES FOR MOUNTING A BOLTED GROUND CONNECTOR. ALL BOLTED GROUND CONNECTORS SHALL BE BURNDY, OR EQUAL.
- BOND ALL NONCURRENT-CARRYING PARTS OF METAL EQUIPMENT TO GROUND SYSTEM.
- BUILDING STRUCTURAL STEEL SYSTEM SHALL BE BONDED TO ELECTRICAL GROUND SYSTEM.
- INSTALL GROUNDING ELECTRODE CONDUCTORS, LIGHTNING PROTECTION DOWN CONDUCTORS AND SEPARATE GROUND CONDUCTORS IN SCHEDULE 40 OR SCHEDULE 80 PVC CONDUIT OR EXPOSED WHERE ACCEPTABLE TO LOCAL CODES. WHERE GROUNDING ELECTRODE CONDUCTORS, LIGHTNING PROTECTION DOWN CONDUCTORS OR INDIVIDUAL GROUND CONDUCTORS ARE RUN IN PVC CONDUIT, DO NOT COMPLETELY ENCIRCLE CONDUIT WITH FERROUS AND/OR MAGNETIC MATERIALS. USE NON-METALLIC REINFORCED FIBERGLASS STRUT SUPPORT. WHERE METAL CONDUIT CLAMPS ARE INSTALLED, USE NYLON BOLTS, NUTS, WASHERS AND SPACERS TO INTERRUPT A COMPLETE METALLIC PATH FROM ENCIRCLING THE CONDUIT. THIS IS REQUIRED TO AVOID GIRDLING OF GROUND CONDUCTORS. GIRDLING OF A GROUND CONDUCTOR IS THE RESULT OF PLACING THE CONDUCTOR IN A RING OF MAGNETIC MATERIAL. THIS RING COULD BE A METALLIC CONDUIT, U-BOLT OR STRUT SUPPORT PIPE CLAMP, OR OTHER SUPPORT HARDWARE. THE RESULT OF GIRDLING GROUND CONDUCTORS SIGNIFICANTLY INCREASES THE INDUCTIVE IMPEDANCE OF THE GROUND CONDUCTOR. INDUCTIVE AND CAPACITIVE IMPEDANCE IS A TYPE OF RESISTANCE THAT OPPOSES THE FLOW OF ALTERNATING CURRENT. ANY INCREASE IN THE IMPEDANCE OF A GROUND CONDUCTOR REDUCES ITS ABILITY TO EFFECTIVELY MITIGATE RADIO FREQUENCY NOISE IN THE GROUND SYSTEM. THE CONDITION WHERE A GROUND CONDUCTOR IS GIRDLING DURING A LIGHTNING STRIKE RESULTS IN PHENOMENA KNOWN AS SURGE IMPEDANCE LOADING. SURGE IMPEDANCE LOADING IS A RESULT OF VOLTAGE AND CURRENT REACHING 500,000 VOLTS AND 10,000 AMPS FOR A SHORT DURATION. GIRDLING FURTHER INCREASES THE IMPEDANCE AT LIGHTNING FREQUENCIES OF 100 KILOHERTZ TO 100 MEGAHERTZ. AT THESE POWER AND FREQUENCY LEVELS ANY INCREASE IN THE IMPEDANCE OF THE GROUND CONDUCTOR MUST BE CONTROLLED. DURING LIGHTNING DISCHARGE CONDITIONS A LOW INDUCTIVE IMPEDANCE PATH IS MORE IMPORTANT THAN A LOW DC RESISTANCE PATH.
- IF LOCAL CODES DICTATE THAT INDIVIDUAL GROUNDING CONDUCTORS MUST BE RUN IN METAL CONDUIT OR RACEWAY, THEN THE CONDUIT OR RACEWAY MUST BE BONDED AT EACH END OF THE RUN WITH A BONDING JUMPER SIZED EQUAL TO THE INDIVIDUAL GROUNDING CONDUCTOR OR AS REQUIRED BY 2011 NEC 250-102. NOTE THIS DOES NOT APPLY TO AC EQUIPMENT GROUNDING CONDUCTORS RUN WITH AC CIRCUITS.
- WHERE A CONFLICT IS DETERMINED WITH RESPECT TO GROUNDING REQUIREMENTS PER MANUFACTURER INSTALLATION INSTRUCTIONS, NEC, AND/OR THE CONTRACT DOCUMENTS, CONTACT THE RESIDENT ENGINEER OR PROJECT ENGINEER FOR FURTHER DIRECTIONS.
- GROUND RODS SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA TO COMPLY WITH THE AIRPORT IMPROVEMENT PROGRAM BUY AMERICAN PREFERENCE REQUIREMENTS. STEEL USED TO MANUFACTURE GROUND RODS SHALL BE 100 PERCENT DOMESTIC STEEL.



8 FT. GROUND ROD

10 FT. GROUND ROD

GROUND RODS
NTS

NOTES

- TYPE AND MINIMUM NUMBER OF GROUND RODS SHALL BE AS SPECIFIED ON THE PLANS.
- THE RESISTANCE TO GROUND OF THE GROUNDING SYSTEM SHALL NOT EXCEED 25 OHMS.
- COST OF GROUND RODS IS INCIDENTAL TO THE ASSOCIATED ITEMS REQUIRING GROUNDING UNLESS OTHERWISE SPECIFIED.
- GROUND RODS SHALL BE SPACED AS DETAILED ON THE PLANS AND SHALL NOT BE SPACED LESS THAN ONE ROD LENGTH APART.
- TOP OF GROUND RODS SHALL BE 12" MINIMUM BELOW GRADE UNLESS DETAILED OTHERWISE HEREIN.

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