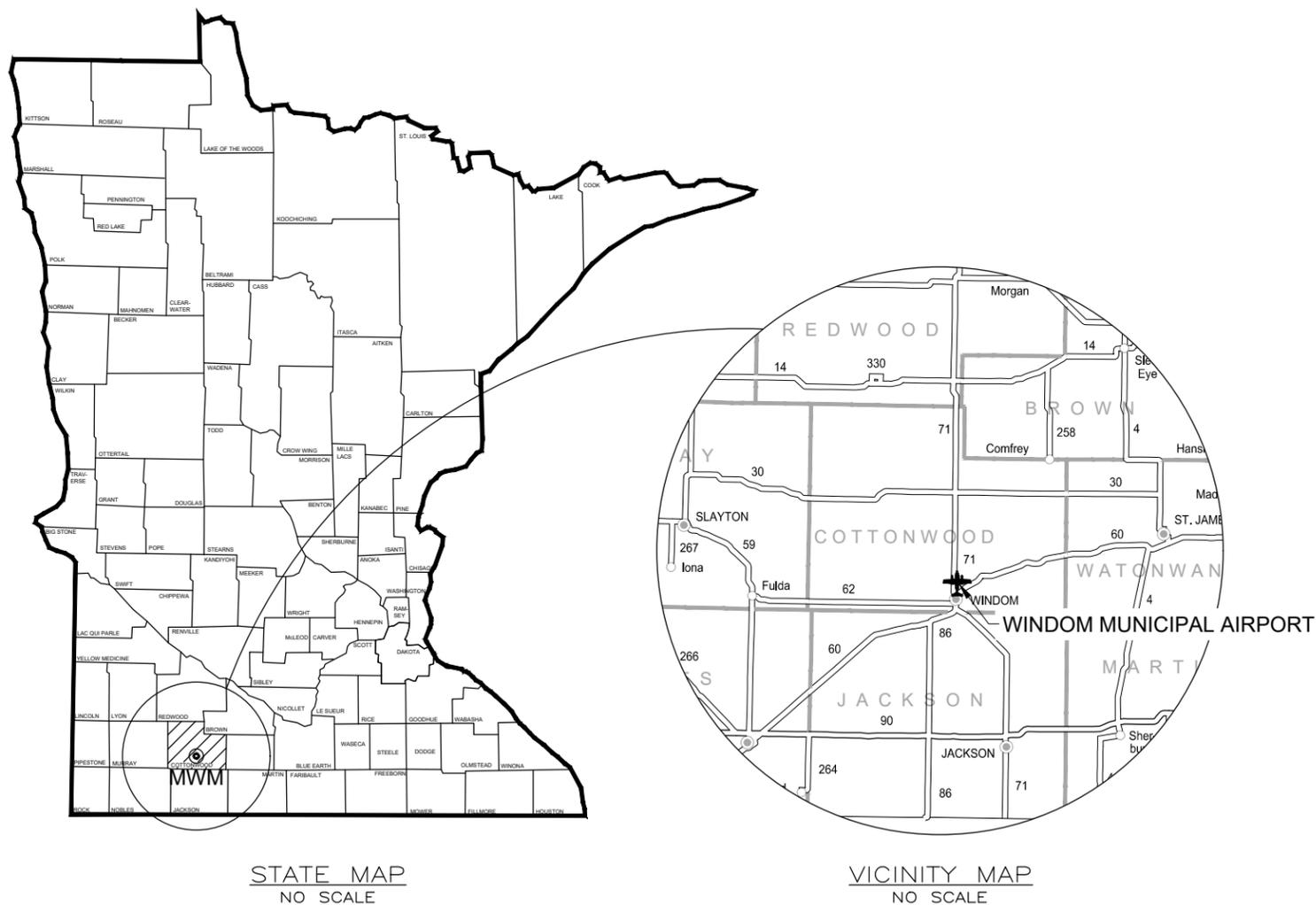


# CONSTRUCTION DRAWINGS FOR 2020 RUNWAY 17 & 35 PAPIS & UPDATE MIRLS & THRESHOLD LIGHTS AT THE WINDOM MUNICIPAL AIRPORT WINDOM, MN



STATE MAP  
NO SCALE

VICINITY MAP  
NO SCALE

## GOPHER STATE ONE CALL

(800) 252-1166 (651) 454-0002

NOTE:  
THE SUBSURFACE UTILITY QUALITY INFORMATION IN THIS PLAN IS LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02 ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."



Know what's below.  
Call before you dig.

THE CONTRACTOR SHALL CALL THE GOPHER STATE ONE CALL SYSTEM AT 811 BEFORE COMMENCING EXCAVATION.



OFFICE OF AERONAUTICS  
222 EAST PLATO BLVD.  
ST. PAUL, MINNESOTA - U.S.A. 55107

A.I.P. NO. 3-27-0113-13-20  
S.P. NO. A1701-39

### Sheet List Table

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11	ELECTRICAL DETAILS

WINDOM MUNICIPAL AIRPORT  
2020 RUNWAY 17 & 35 PAPIS &  
UPDATE MIRLS & THRESHOLD  
LIGHTS  
WINDOM, MN

MARK DATE DESCRIPTION  
REVISIONS

SEH FILE NO. 154865  
STATE PROJECT NO. A1701-39  
ISSUE DATE 04/07/2020  
DESIGNED BY LRR  
DRAWN BY JTH  
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SHEET TITLE  
TITLE SHEET

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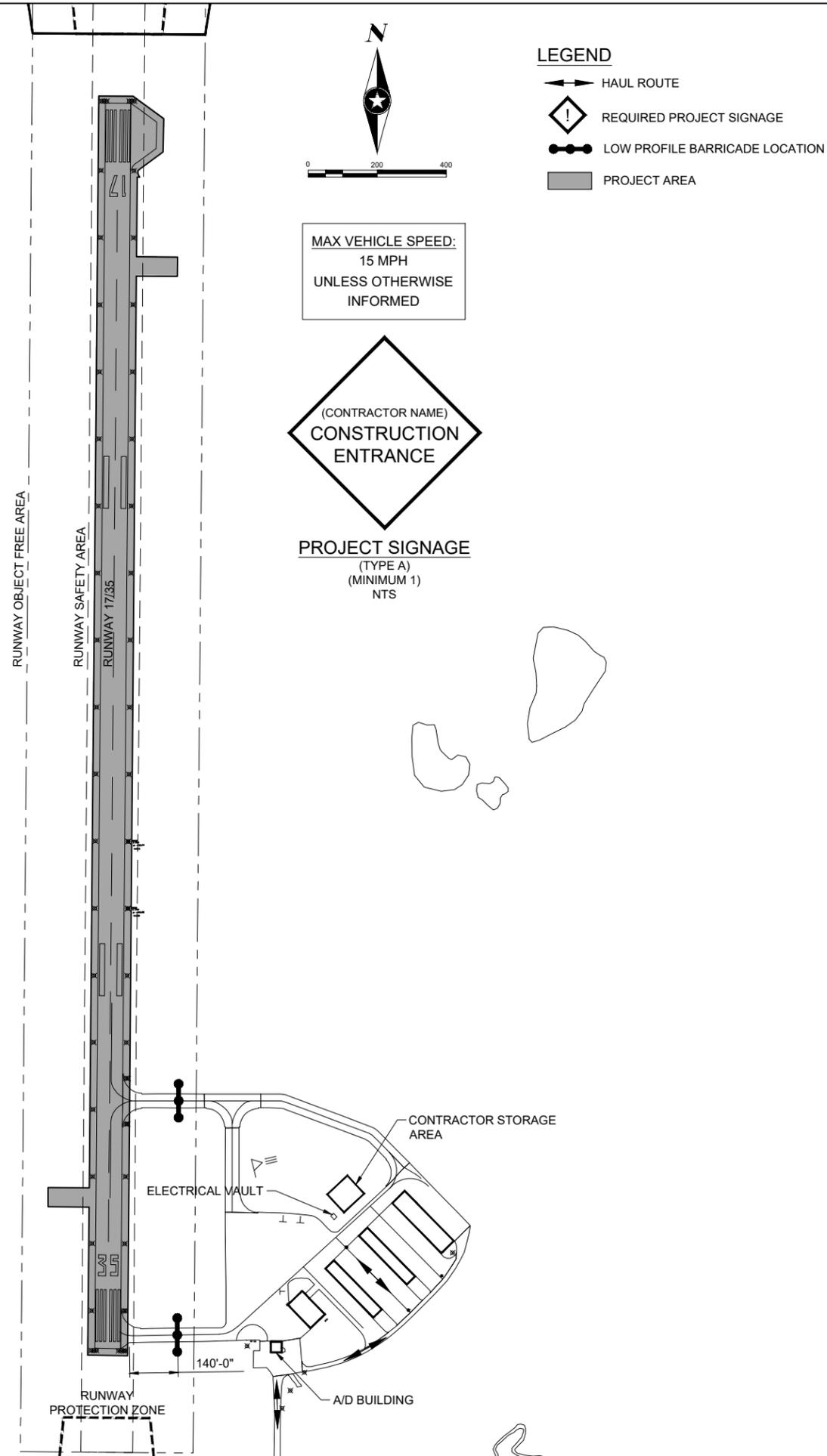
1

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR SUPPLEMENTARY SHEET WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
KRAFT  
Lindsay R. Ridd, PE  
DATE: 04/07/2020 LICENSE NO.: 49282

3535 MADIAS CENTER DR  
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**SCOPE OF WORK:**

- THRESHOLD LIGHT ADJUSTMENTS
- PAPI INSTALLATION
- MIRL UPDATES

**CONSTRUCTION SAFETY NOTES:**

**GENERAL SAFETY NOTES**

- ALL CONSTRUCTION SHALL MEET THE MOST CURRENT REQUIREMENTS OF FAA ADVISORY CIRCULARS WHICH ARE AVAILABLE ONLINE AT WWW.FAA.GOV, OR UPON REQUEST TO THE ENGINEER. APPLICABLE ADVISORY CIRCULARS MAY INCLUDE, BUT ARE NOT LIMITED TO, 150/5340-1, 5370-2, 5210-5, AND 70/7460-1.
- THE CONTRACTOR SHALL SUBMIT A DETAILED SCHEDULE OF CONSTRUCTION OPERATIONS AT LEAST 5 DAYS PRIOR TO THE PRECONSTRUCTION CONFERENCE. THE PHASING PLAN AND SCHEDULE MUST BE APPROVED BY THE ENGINEER AND THE OWNER PRIOR TO THE BEGINNING OF CONSTRUCTION OPERATIONS.
- ALL CONSTRUCTION PERSONNEL WILL BE REQUIRED TO COMPLETE AIRFIELD SAFETY TRAINING PRIOR TO COMMENCING WORK ON THE AIRFIELD.
- THE CONTRACTOR WILL ADVISE THE ENGINEER AND THE AIRPORT MANAGER 72 HOURS IN ADVANCE OF ANY PROPOSED CONSTRUCTION ACTIVITIES ON THE PROJECT.
- THE AIR OPERATIONS AREA (AOA) CONSISTS OF ALL AREAS OF THE AIRPORT LOCATED WITHIN THE PERIMETER SECURITY FENCE AND INCLUDES RUNWAYS, TAXIWAYS, AIRCRAFT PARKING APRONS, AND OTHER AREAS WHERE AIRCRAFT MAY MOVE UNDER THEIR OWN POWER, AS WELL AS RUNWAY PROTECTION ZONES.
- NO WORK SHALL BE ALLOWED WITHIN THE AOA UNTIL THE REQUIRED AIRFIELD CLOSURES HAVE BEEN MADE AND THE REQUIRED CLOSURE MARKERS AND BARRICADES ARE IN PLACE. ALL NECESSARY NOTICE TO AIRMEN (NOTAMS) WILL BE ISSUED BY THE AIRPORT MANAGER, WHICH SPECIFICALLY DETAIL THE CURRENT STATUS OF THE AIRPORT DURING CONSTRUCTION.
- WORK MAY BE STOPPED AT ANY TIME BY THE AIRPORT MANAGER OR ENGINEER IF IT IS DETERMINED THAT PROPER SAFETY PRECAUTIONS ARE NOT BEING TAKEN.
- CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH INFORMATION ON THIS SAFETY & PHASING PLAN AND THE SAFETY PLAN COMPLIANCE DOCUMENT CONTAINED IN THE SPECIFICATIONS.

**EQUIPMENT SAFETY REQUIREMENTS**

- THE MAXIMUM HEIGHT OF CONSTRUCTION EQUIPMENT TO BE USED ON THE AIRPORT SHALL BE 20 FEET. IF USE OF EQUIPMENT OF GREATER THAN 20 FEET IS NEEDED, THE CONTRACTOR SHALL FILE FAA FORM 7460-1 WITH THE APPROPRIATE FAA OFFICE. FORMS ARE AVAILABLE UPON REQUEST TO THE ENGINEER.
- ALL AIRPORT AND CONSTRUCTION EQUIPMENT ON THE AIRPORT SHALL BE MARKED, LIGHTED, AND FLAGGED ACCORDING TO FAA ADVISORY CIRCULARS.
- THE CONTRACTORS PARKED EQUIPMENT OR VEHICLES (INCLUDING PERSONAL VEHICLES) SHALL BE STORED IN THE STORAGE AREA LOCATION ON THIS SHEET. LARGE EQUIPMENT THAT IS BEING USED EACH WORKING DAY THAT CANNOT BE EASILY MOVED OUT OF THE AOA MAY BE LEFT OVERNIGHT WITHIN THE AOA AT A LOCATION DESIGNATED BY THE ENGINEER.

**BARRICADES**

- THE CONTRACTOR SHALL PROVIDE AND MAINTAIN LIGHTED LOW PROFILE BARRICADES THROUGHOUT THE DURATION OF THE PROJECT. PROVIDING AND PLACING BARRICADES, MAINTENANCE, BATTERY REPLACEMENT, AND MOVEMENT ARE ALL INCIDENTAL TO MOBILIZATION.
- ALL BARRICADES SHALL BE CONSTRUCTED AS SHOWN IN THE PROJECT DETAILS AND SHALL BE PLACED A MAXIMUM OF 20' APART ACROSS THE FULL WIDTH OF CLOSED PAVEMENTS. PLACE 3 BARRICADES AT EACH RUNWAY CLOSURE AND 2 BARRICADES AT EACH TAXIWAY CLOSURE LOCATION. BARRICADES SHALL BE LOCATED AS DIRECTED.
- THE CONTRACTOR SHALL KEEP A MINIMUM OF 10 BARRICADES ON-SITE. ADDITIONAL BARRICADES MAY BE REQUESTED BY ENGINEER AT NO ADDITIONAL COST.

**CONSTRUCTION HAUL ROUTES**

- THE CONTRACTOR SHALL ESTABLISH A HAUL ROUTE IN THE GENERAL AREA INDICATED ON THE PLAN. THE EXACT LOCATION OF THE HAUL ROUTE SHALL BE REVIEWED AND APPROVED BY THE ENGINEER. THIS ROUTE SHALL BE USED FOR DELIVERY AND REMOVAL OF ALL CONSTRUCTION EQUIPMENT AND MATERIALS AND ACCESS TO THE SITE FOR ALL PERSONNEL FOR THE DURATION OF THE PROJECT.
- THE CONTRACTOR SHALL KEEP THE ROUTE AND ALL PAVEMENTS CLEAR OF DEBRIS AT ALL TIMES. AT A MINIMUM, THE ROUTE SHALL BE SWEEPED AT THE END OF EACH WORKING DAY. ADDITIONAL SWEEPING MAY BE REQUIRED IMMEDIATELY UPON THE NOTIFICATION BY ENGINEER.
- THE ROUTE AND ALL AIRFIELD PAVEMENTS SHALL BE THOROUGHLY CLEANED PRIOR TO REOPENING TO AIRCRAFT USE.

**PENALTIES**

- FAILURE TO COMPLY WITH THE SAFETY AND PHASING PLANS THAT RESULT IN A RUNWAY INCURSION OR VEHICLE DEVIATION ON THE AIRFIELD SHALL HAVE A \$1,000 PENALTY ASSESSED TO THE PRIME CONTRACTOR. A SECOND RUNWAY INCURSION OR VEHICLE DEVIATION ON THE AIRFIELD SHALL BE ASSESSED A PENALTY OF \$2,500. A THIRD RUNWAY INCURSION OR VEHICLE DEVIATION ON THE AIRFIELD SHALL RESULT IN CONTRACT TERMINATION.

**SCHEDULE**

- CONTRACTOR WILL BE GIVEN THE FOLLOWING TIME FRAMES:  
PAPIS AND RUNWAY LIGHTING UPGRADES: 14 CALENDAR DAYS (CONSTRUCTION ONLY)

3535 MADISON CENTER DR  
MADISON, WI 53711  
PHONE: 608.492.2100  
FAX: 608.492.2150  
WWW.SEHINC.COM

SEH  
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR CONTRACT DOCUMENTS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF WISCONSIN.  
KRAFT  
Lindsey R. Ridd, PE  
DATE: 06/07/2020 LICENSE NO.: 49262

WINDOM MUNICIPAL AIRPORT  
2020 RUNWAY 17 & 35 PAPIS &  
UPDATE MIRLS & THRESHOLD  
LIGHTS  
WINDOM, MN

MARK	DATE	DESCRIPTION	REVISIONS

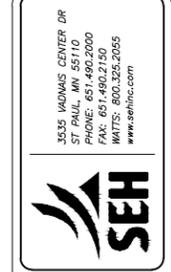
154865  
STATE PROJECT NO. A1701-39  
ISSUE DATE 04/07/2020  
DESIGNED BY LRR  
DRAWN BY JTH  
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SHEET TITLE  
CONSTRUCTION SAFETY  
PLAN

**GENERAL NOTES:**

1. THE EXISTING UTILITY LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE AND MAY NOT INCLUDE ALL UTILITIES PRESENT. THE CONTRACTOR SHALL BE RESPONSIBLE TO CALL MINNESOTA'S ONE-CALL NOTIFICATION CENTER (GSOC) AT 1-800-252-1166, AND COORDINATE FIELD LOCATIONS OF EXISTING UNDERGROUND UTILITIES PRIOR TO BEGINNING GRADING AND UTILITY WORK. THE CONTRACTOR SHALL IMMEDIATELY REPAIR ANY UTILITIES DAMAGED DURING CONSTRUCTION TO THE SATISFACTION OF THE UTILITY OWNER AT NO COST.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES AS REQUIRED BY THE CONSTRUCTION COVERED IN THESE PLANS.
3. ALL WORK SHALL CONFORM TO APPLICABLE LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS.
4. THE CONTRACTOR SHALL CONTACT THE ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY ERRORS OR INCONSISTENCIES.
5. ALL ESTIMATES OF QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR AND SUBCONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING ALL QUANTITIES. THE CONTRACTOR SHALL PROVIDE ALL WORK AND MATERIALS AS SHOWN ON THE PLANS.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL EXISTING AREAS, PAVEMENTS, STRUCTURES, OR OTHER FACILITIES DAMAGED DURING CONSTRUCTION ACTIVITIES TO EQUAL OR BETTER CONDITION.
7. THE CONTRACTOR SHALL REMOVE ALL DEBRIS RESULTING FROM WORK UNDER THIS CONTRACT TO AN APPROVED DUMP SITE.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE OWNER OR THE OWNER'S REPRESENTATIVE WITH REDLINED PLANS AND AS-BUILTS SURVEYS, CERTIFIED BY A PROFESSIONAL LAND SURVEYOR IN THE STATE OF MINNESOTA.
9. LOCATION OF ANY AIRPORT OWNED UTILITIES SHALL BE THE CONTRACTOR'S RESPONSIBILITY AND INCIDENTAL TO THE CONTRACT.
10. CONTRACTOR IS RESPONSIBLE FOR ALL CONSTRUCTION STAKING.

STATEMENT OF ESTIMATED QUANTITIES					
Line No.	Item No.	Item Description	Unit	Estimated Quantity	Final Quantity
1	70-08	Traffic Provision/Airport Security & Devices Phasing	LS	1	
2	C-105-5.1	Mobilization	LS	1	
3	50-06	Construction Layout and Staking	LS	1	
4	50-11	Maintenance & Restoration of Haul Roads	LS	1	
5	L-108-5.2	#8, 5kV Cable, Installed in Duct	LF	9,000	
6	L-108-5.3	#6, 600V Cable, Installed in Duct	LF	5,000	
7	L-110-5.1	2-Inch Sch. 80 PVC or HDPE Duct, Inc. Trench	LF	4,000	
8	L-110-5.2	3-Inch Sch 80 PVC/HDPE Duct, Directional Boring	LF	100	
9	L-125-5.1	Replace Runway Edge Lights Glass Globes (W/Y)	EA	35	
10	L-125-5.2	Medium Intensity Threshold Light	EA	4	
11	L-125-5.3	PAPI System	EA	2	
12	L-125-5.4	Handhole	EA	6	
13	L-125-5.5	7.5KW Regulator	EA	1	
14	L-125-5.6	Vault Electrical Systems & Testing	LS	1	
15	T-901-5.1	Turf Restoration	LS	1	
16	T-905-5.1	Select Topsoil Borrow	CY	100	



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**KRAFT REVIEW**  
 Lindboey R. Ridd, PE  
 DATE: 04/07/2020 LICENSE NO.: 49262

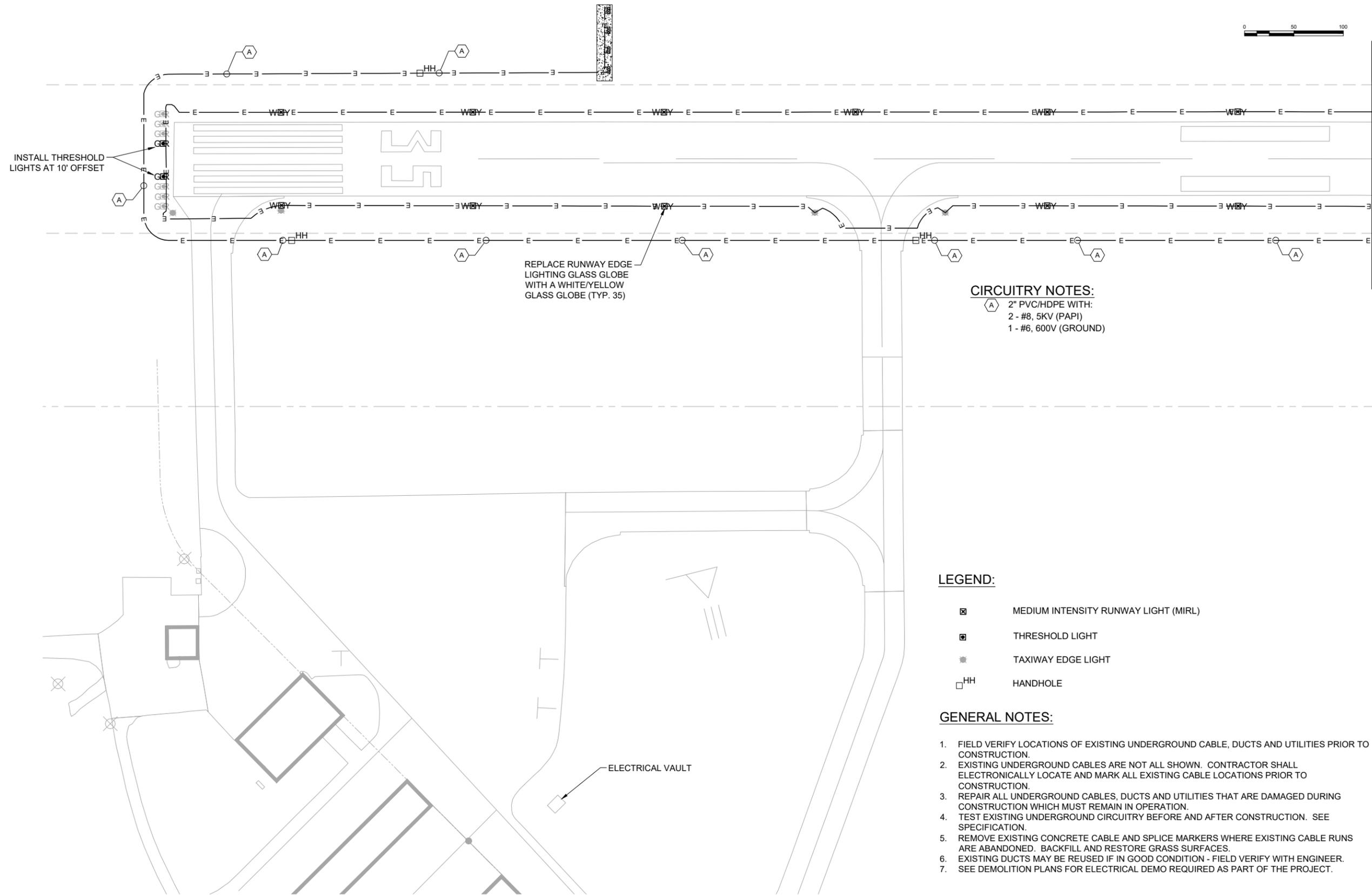
WINDOM MUNICIPAL AIRPORT  
 2020 RUNWAY 17 & 35 PAPI'S &  
 UPDATE MIRLS & THRESHOLD  
 LIGHTS  
 WINDOM, MN

MARK	DATE	DESCRIPTION
		REVISIONS

SEH FILE NO. 154865  
 STATE PROJECT NO. A1701-39  
 ISSUE DATE 04/07/2020  
 DESIGNED BY LRR  
 DRAWN BY JTH  
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SHEET TITLE  
**GENERAL NOTES AND  
 QUANTITIES**

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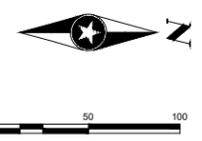
**CIRCUITRY NOTES:**  
 (A) 2" PVC/HDPE WITH:  
 2 - #8, 5KV (PAPI)  
 1 - #6, 600V (GROUND)

**LEGEND:**

- ☒ MEDIUM INTENSITY RUNWAY LIGHT (MIRL)
- ◼ THRESHOLD LIGHT
- ★ TAXIWAY EDGE LIGHT
- ◻ HH HANDHOLE

**GENERAL NOTES:**

1. FIELD VERIFY LOCATIONS OF EXISTING UNDERGROUND CABLE, DUCTS AND UTILITIES PRIOR TO CONSTRUCTION.
2. EXISTING UNDERGROUND CABLES ARE NOT ALL SHOWN. CONTRACTOR SHALL ELECTRONICALLY LOCATE AND MARK ALL EXISTING CABLE LOCATIONS PRIOR TO CONSTRUCTION.
3. REPAIR ALL UNDERGROUND CABLES, DUCTS AND UTILITIES THAT ARE DAMAGED DURING CONSTRUCTION WHICH MUST REMAIN IN OPERATION.
4. TEST EXISTING UNDERGROUND CIRCUITRY BEFORE AND AFTER CONSTRUCTION. SEE SPECIFICATION.
5. REMOVE EXISTING CONCRETE CABLE AND SPLICE MARKERS WHERE EXISTING CABLE RUNS ARE ABANDONED. BACKFILL AND RESTORE GRASS SURFACES.
6. EXISTING DUCTS MAY BE REUSED IF IN GOOD CONDITION - FIELD VERIFY WITH ENGINEER.
7. SEE DEMOLITION PLANS FOR ELECTRICAL DEMO REQUIRED AS PART OF THE PROJECT.



3535 MADRAS CENTER DR  
 SUITE 100  
 FARMINGTON, MN 55020  
 PHONE: 651.490.2100  
 FAX: 651.490.2150  
 TATS: 600.325.2055  
 www.sehinc.com

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**KRAFT**  
 REVIEW

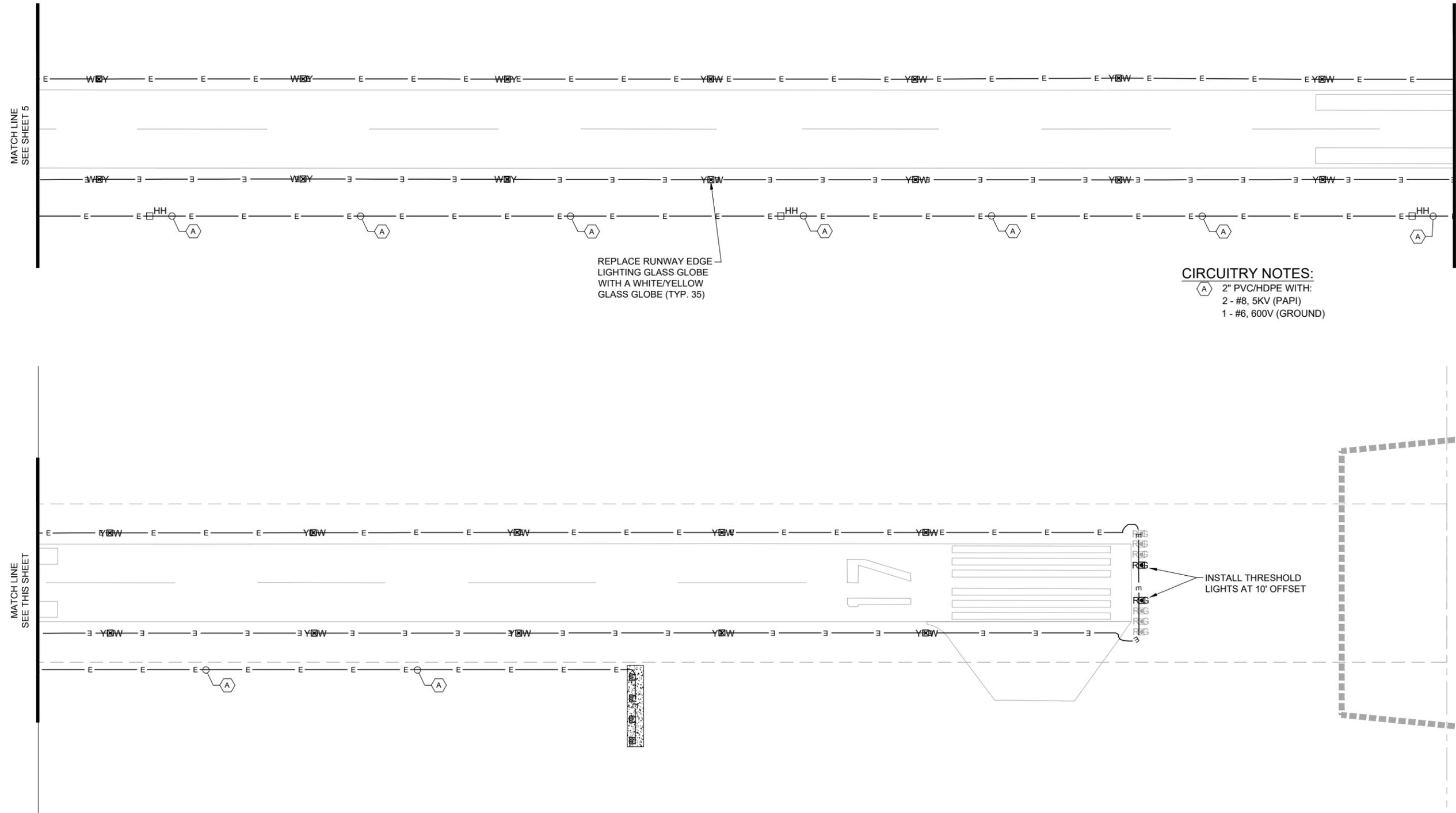
DATE: 04/07/2020 LINDSEY R. REIDT, PE LICENSE NO.: 49262

WINDOM MUNICIPAL AIRPORT  
 2020 RUNWAY 17 & 35 PAPI'S &  
 UPDATE MIRLS & THRESHOLD  
 LIGHTS  
 WINDOM, MN

MARK	DATE	DESCRIPTION	REVISIONS

SEH FILE NO.	154865
STATE PROJECT NO.	A1701-39
ISSUE DATE	04/07/2020
DESIGNED BY	LRR
DRAWN BY	JTH
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SHEET TITLE  
**ELECTRICAL PLAN**



**CIRCUITRY NOTES:**  
 (A) 2" PVC/HDPE WITH:  
 2 - #8, 5KV (PAPI)  
 1 - #6, 600V (GROUND)

**LEGEND:**

- MEDIUM INTENSITY RUNWAY LIGHT (MIRL)
- THRESHOLD LIGHT
- TAXIWAY EDGE LIGHT
- E — ELECTRICAL LINE



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**SKRAFT REVIEW**  
 Lindsey R. Kraft, PE  
 DATE: 04/07/2020 LICENSE NO.: 49262

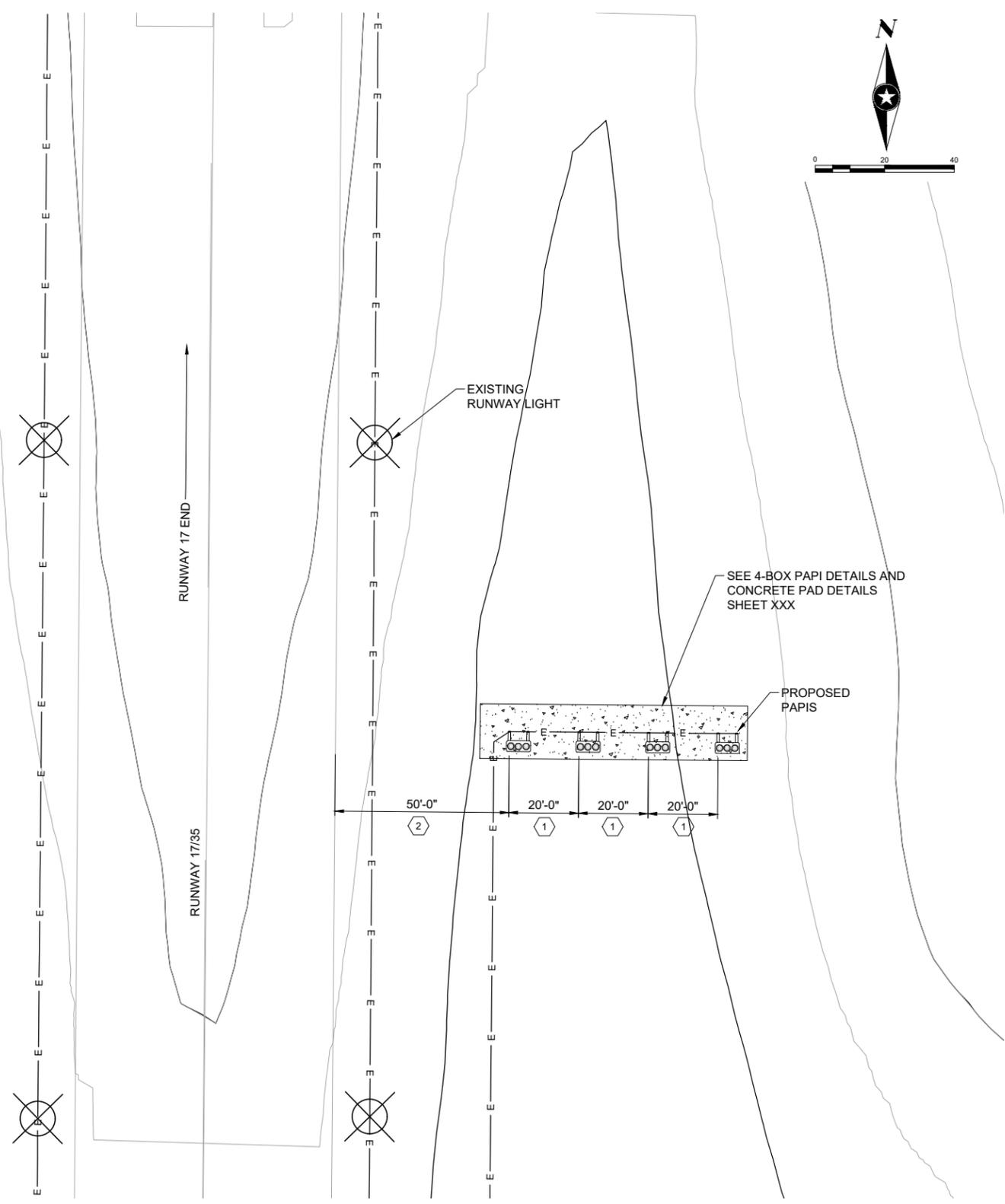
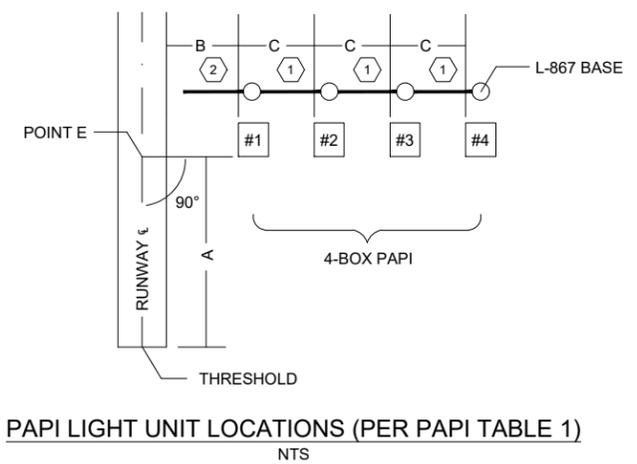
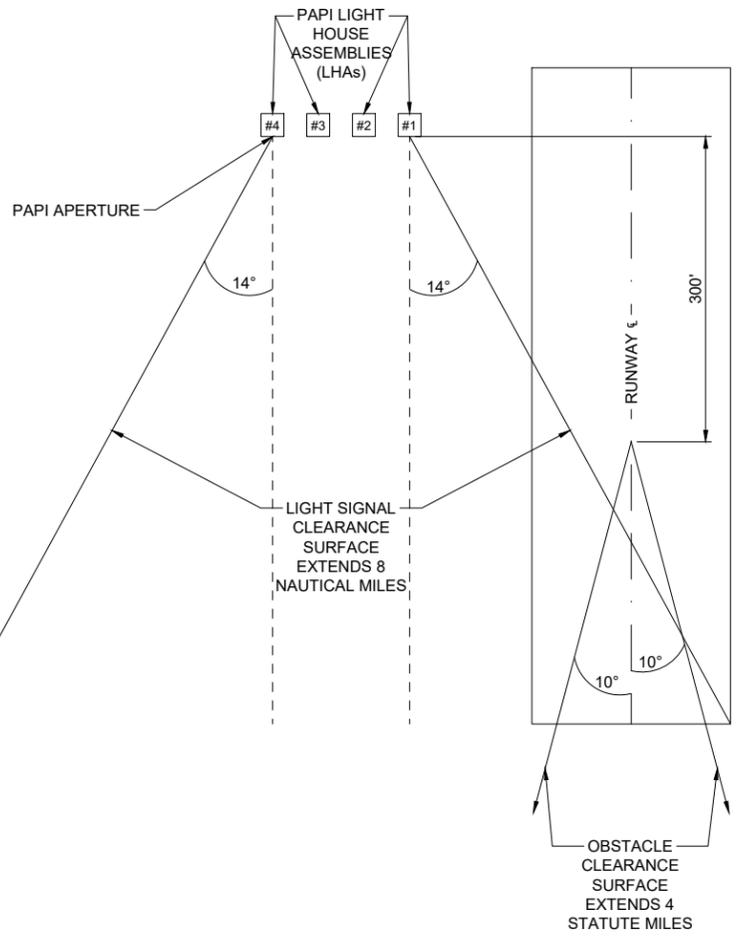
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SHEET TITLE  
**ELECTRICAL PLAN**

**L-880 PAPI OCS & LSCS**  
NTS



PAPI TABLE 1	
DESCRIPTION	RUNWAY 17
TYPE	L-880
STYLE	B
CLASS	II
DIMENSION A	477.03'
DIMENSION B	50'
DIMENSION C	20'
THRESHOLD CROSSING HEIGHT	25'
THRESHOLD ELEVATION	1408.00'
THRESHOLD CROSSING HEIGHT ELEVATION	1433.00'
RUNWAY STATION AT $\epsilon$ (POINT E)	N/A
RUNWAY $\epsilon$ ELEVATION (POINT E)	1408.00'
PAPI GLIDE PATH ANGLE	3°
PAPI OCS & LSCS ANGLE	1°30'

PAPI TABLE 2								
LIGHT HOUSING ASSEMBLY	GROUND ELEVATION	STRUCTURE HEIGHT	TOP ELEVATION	AIMING ANGLE	APERTURE ELEVATION <sup>1</sup>	APERTURE STATIONING	APERTURE LATITUDE	APERTURE LONGITUDE
#1	1406.00'	3.33'	1409.33'	3°30'	1409.00'	N/A	N43° 55' 01.39"	W95° 06' 32.50"
#2	1406.00'	3.33'	1409.33'	3°10'	1409.00'	N/A	N43° 55' 01.39"	W95° 06' 32.23"
#3	1406.00'	3.33'	1409.33'	2°50'	1409.00'	N/A	N43° 55' 01.39"	W95° 06' 31.96"
#4	1406.48'	2.85'	1409.33'	2°30'	1409.00'	N/A	N43° 55' 01.39"	W95° 06' 31.68"

- KEYNOTES:**
- ① 2" SCHEDULE 80 PVC OR HDPE WITH:  
2 - #8 5kV (PAPI SERIES CIRCUIT)  
4 - #8 5kV (TILT SWITCH CIRCUIT, CONFIRM)  
1 - #6 600V (GROUND)
  - ② CIRCUITRY PER AIRFIELD PLAN

- NOTES:**
1. PROPOSED PAPI APERTURE ELEVATION ALLOWED TO BE ELEVATED AT 1345.41' ± 1.0' TO ACCOUNT FOR MANUFACTURER DEFINED STRUCTURE HEIGHT RANGE.
  2. PAPI SYSTEM TO BE TIED INTO EXISTING PAPI CIRCUITRY.

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3535 MADRAS CENTER DR  
MADRAS, IN 46051-1000  
PHONE: 865-490-2100  
FAX: 865-490-2150  
WWW.SEHINC.COM

DATE: 04/07/2020 LICENSE NO.: 49282

INDOOR AIR QUALITY REVIEW

LINDSEY R. REDDT, PE

WINDOM MUNICIPAL AIRPORT  
2020 RUNWAY 17 & 35 PAPIS &  
UPDATE MIRLS & THRESHOLD  
LIGHTS  
WINDOM, MN

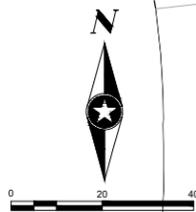
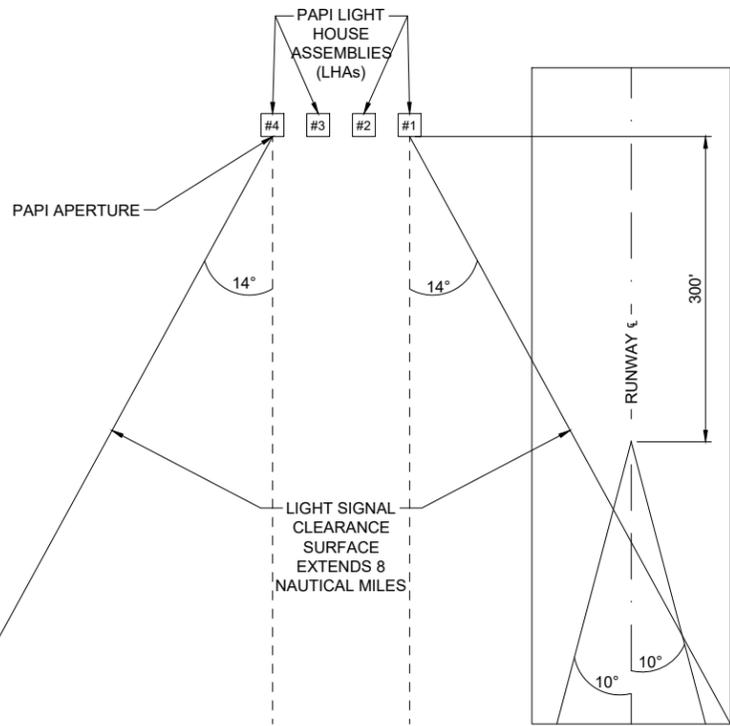
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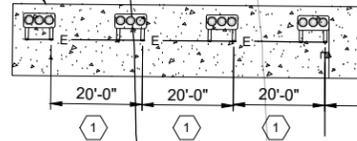
SHEET TITLE  
PAPI INSTALLATION

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**L-880 PAPI OCS & LSCS**  
NTS



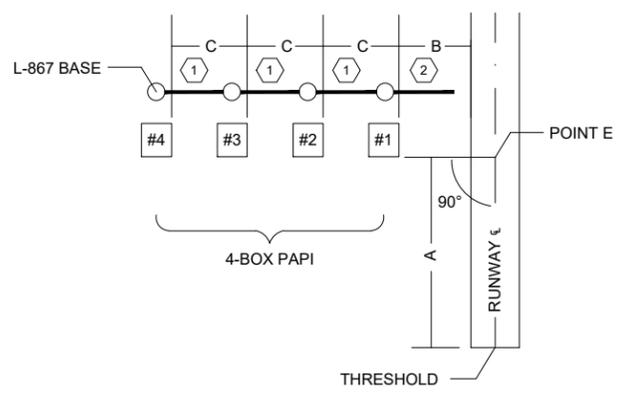
SEE 4-BOX PAPI DETAILS AND CONCRETE PAD DETAILS SHEET E1.05



EXISTING RUNWAY LIGHT

RUNWAY 17/35

RUNWAY 35 END



**PAPI LIGHT UNIT LOCATIONS (PER PAPI TABLE 1)**  
NTS

PAPI TABLE 1	
DESCRIPTION	RUNWAY 35
TYPE	L-880
STYLE	B
CLASS	II
DIMENSION A	441.70'
DIMENSION B	50'
DIMENSION C	20'
THRESHOLD CROSSING HEIGHT	25'
THRESHOLD ELEVATION	1406.00'
THRESHOLD CROSSING HEIGHT ELEVATION	1431.00'
RUNWAY STATION AT $\epsilon$ (POINT E)	N/A
RUNWAY $\epsilon$ ELEVATION (POINT E)	1408.00'
PAPI GLIDE PATH ANGLE	3°
PAPI OCS & LSCS ANGLE	1°30'

**PAPI TABLE 2**

LIGHT HOUSING ASSEMBLY	GROUND ELEVATION	STRUCTURE HEIGHT	TOP ELEVATION	AIMING ANGLE	APERTURE ELEVATION <sup>1</sup>	APERTURE STATIONING	APERTURE LATITUDE	APERTURE LONGITUDE
#1	1405.40'	1.93'	1407.33'	3°30'	1407.00'	N/A	N43° 54' 34.83"	W95° 06' 35.19"
#2	1404.69'	2.64'	1407.33'	3°10'	1407.00'	N/A	N43° 54' 34.83"	W95° 06' 35.46"
#3	1404.00'	3.33'	1407.33'	2°50'	1407.00'	N/A	N43° 54' 34.83"	W95° 06' 35.73"
#4	1404.00'	3.33'	1407.33'	2°30'	1407.00'	N/A	N43° 54' 34.83"	W95° 06' 36.00"

**KEYNOTES:**

- ① 2" SCHEDULE 80 PVC OR HDPE WITH:  
2 - #8 5kv (PAPI SERIES CIRCUIT)  
4 - #8 5kv (TILT SWITCH CIRCUIT, CONFIRM)  
1 - #6 600V (GROUND)
- ② CIRCUITRY PER AIRFIELD PLAN

**NOTES:**

1. PROPOSED PAPI APERTURE ELEVATION ALLOWED TO BE ELEVATED AT 1345.41' ± 1.0' TO ACCOUNT FOR MANUFACTURER DEFINED STRUCTURE HEIGHT RANGE.
2. PAPI SYSTEM TO BE TIED INTO EXISTING PAPI CIRCUITRY.

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I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR CONTRACT DOCUMENTS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

**REVIEW**  
Lindsey R. Ridd, PE  
DATE: 04/07/2020 LICENSE NO.: 49262

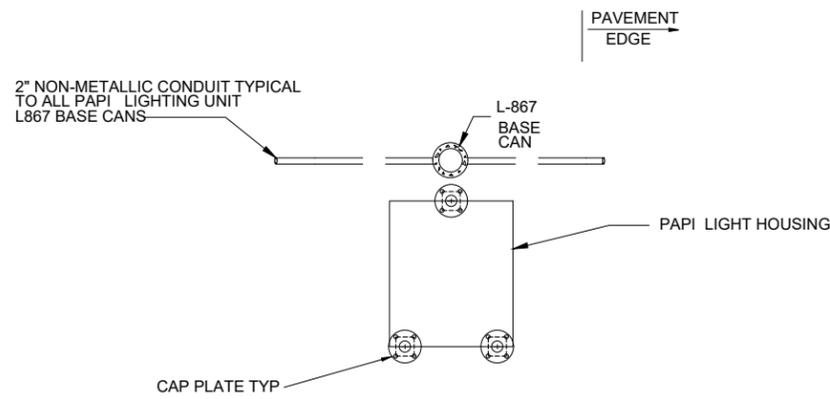
WINDOM MUNICIPAL AIRPORT  
2020 RUNWAY 17 & 35 PAPIS &  
UPDATE MIRLS & THRESHOLD  
LIGHTS  
WINDOM, MN

MARK	DATE	DESCRIPTION	REVISIONS

SEH FILE NO. 154865  
STATE PROJECT NO. A1701-39  
ISSUE DATE 04/07/2020  
DESIGNED BY LRR  
DRAWN BY JTH  
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SHEET TITLE  
PAPI INSTALLATION

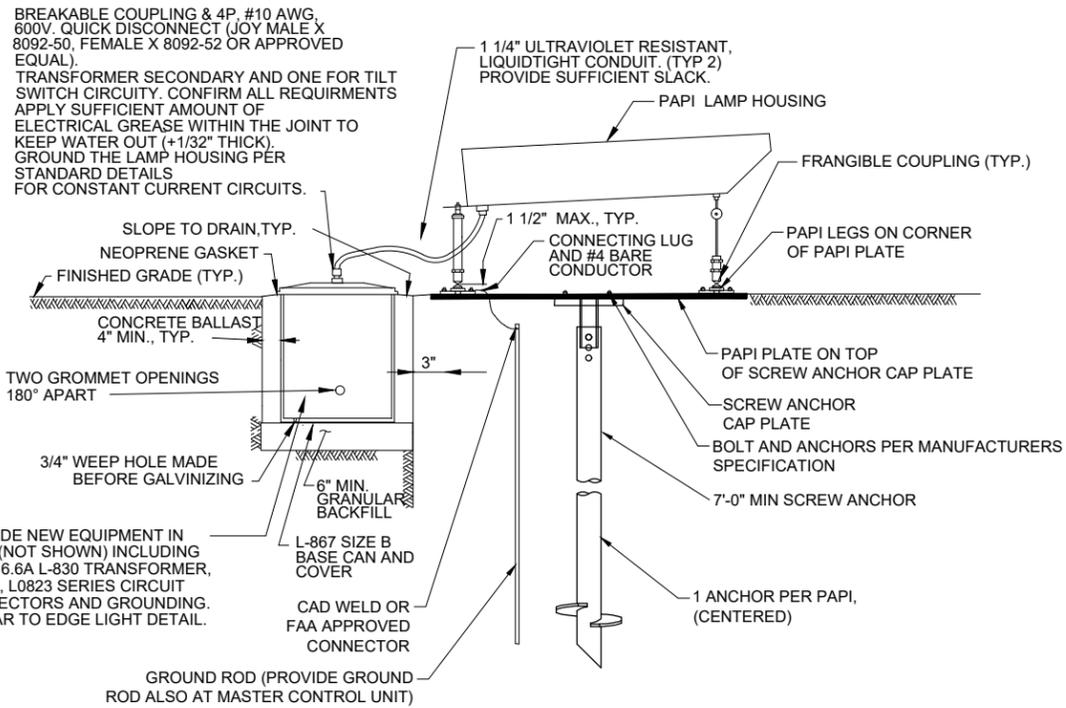
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NOTE:  
LAYOUT OF PAPI LEGS IS ILLUSTRATIVE ONLY.  
ACTUAL LAYOUT WILL BE IN ACCORDANCE WITH  
MANUFACTURERS DESIGN.

**PAPI UNIT PLAN VIEW (TYPICAL)**

NTS

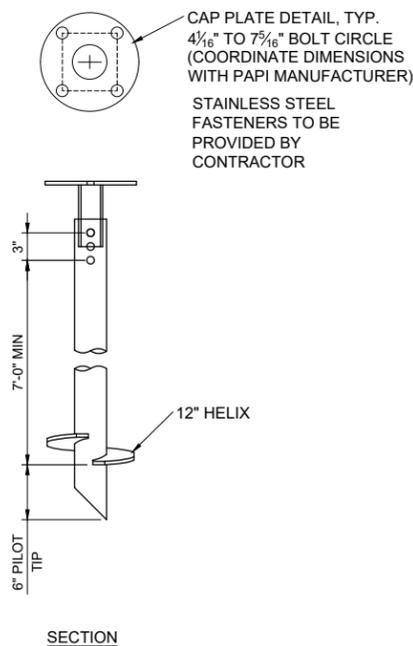


**PAPI LIGHTING UNIT (TYPICAL)**

NTS

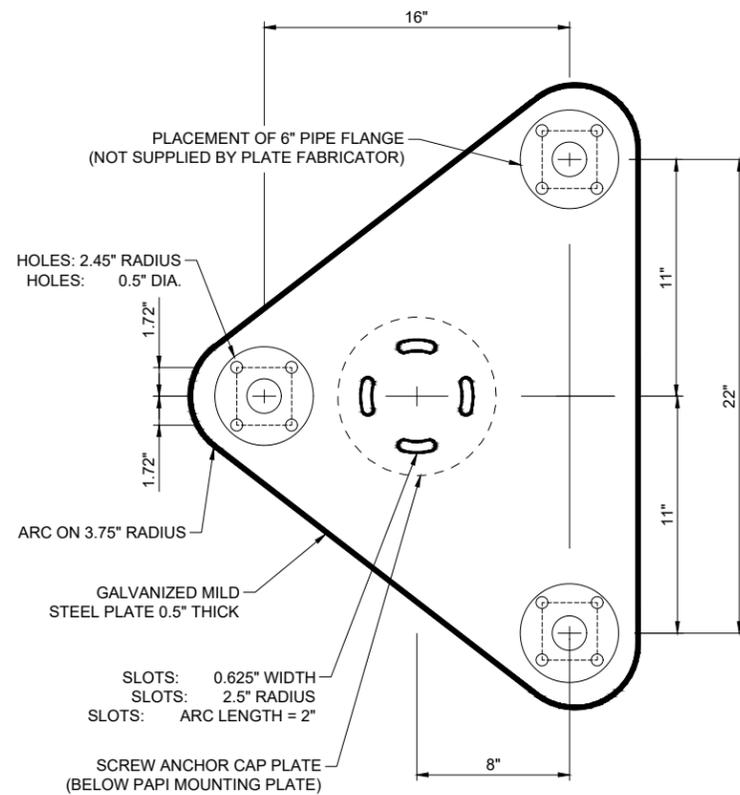
**\*\*NOTE:**  
IN ORDER TO MEET THE REQUIREMENTS OF GENERAL NOTE NO. 1, PROVIDE MEANS TO ADJUST  
AZIMUTH AIMING OF PAPI HOUSINGS, SUCH AS FRONT ANCHOR FLANGES WITH SLOTTED BOLT  
HOLES.

EQUIPMENT SHOWN IN GREY WILL BE SUPPLIED BY OTHERS, INSTALLED BY CONTRACTOR.



**FOUNDATION DETAILS**

(COORDINATE DIMENSIONS WITH  
MANUFACTURER)  
CHANCE ENGINEERING FOUNDATION,  
COMMUNICATION SYSTEM T112-0262,  
OR APPROVED EQUAL  
NOT TO SCALE



**PAPI MOUNTING PLATE**

NTS

**PAPI MOUNTING PLATE NOTE:**

CONTRACTOR IS RESPONSIBLE TO CHANGE THE INDICATED DIMENSIONS BASED ON  
MANUFACTURER'S DATA FOR THE ACTUAL LEG SPACING AND ORIENTATION FOR THE SPECIFIC PAPI  
THAT THE CONTRACTOR WILL PROVIDE UNDER THE CONTRACT. PROVIDE A DETAILED DRAWING OF  
THE PAPI MOUNTING PLATE WITH THE SUBMITTAL DRAWINGS DURING SHOP DRAWING REVIEW FOR  
THE PROJECT.

**GENERAL NOTES**

1. AZIMUTHAL AIMING. EACH LIGHT UNIT SHALL BE AIMED OUTWARD INTO THE APPROACH ZONE ON A LINE PARALLEL TO THE RUNWAY CENTERLINE WITHIN A TOLERANCE OF  $\pm 1/2$  DEGREE.
2. MOUNTING HEIGHT TOLERANCES. THE BEAM CENTERS OF ALL LIGHT UNITS SHALL BE WITHIN  $\pm 1$  INCH OF A HORIZONTAL PLANE. THIS HORIZONTAL PLANE SHALL BE WITHIN  $\pm 1$  FOOT (0.3 M) OF THE ELEVATION OF THE RUNWAY CENTERLINE AT THE INTERCEPT POINT OF THE VISUAL GLIDEPATH WITH THE RUNWAY EXCEPT AT LOCATIONS RAISED TO BE CLEAR OF SNOW BUILDUP ON THE GROUND AT THE PAPI LOCATIONS.
3. TOLERANCE ALONG LINE PERPENDICULAR TO RUNWAY. THE FRONT FACE OF EACH LIGHT UNIT IN A BAR SHALL BE LOCATED ON A LINE PERPENDICULAR TO THE RUNWAY CENTERLINE WITHIN  $\pm 6$  INCHES.
4. NON-METALLIC COMPONENTS IN LIGHT FIXTURES, STEMS AND BREAKABLE COUPLINGS ARE NOT PERMITTED. L-867 PLASTIC TRANSFORMER HOUSINGS ARE NOT ACCEPTABLE.
5. ALL HARDWARE SHALL BE STAINLESS STEEL. ALL MACHINE THREADED CONNECTIONS SHALL HAVE ANTI-SEIZING COMPOUND.



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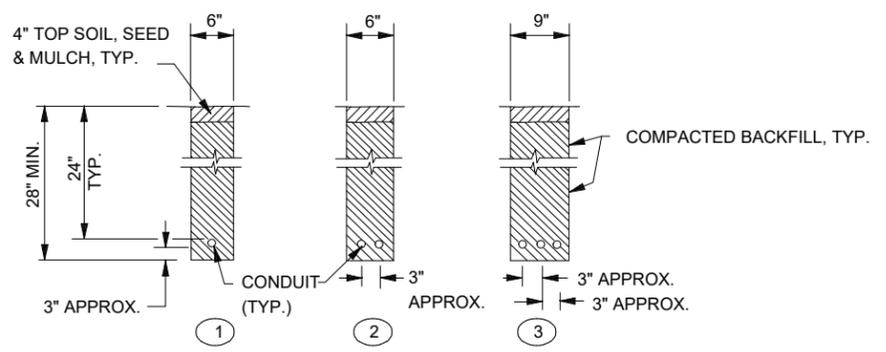
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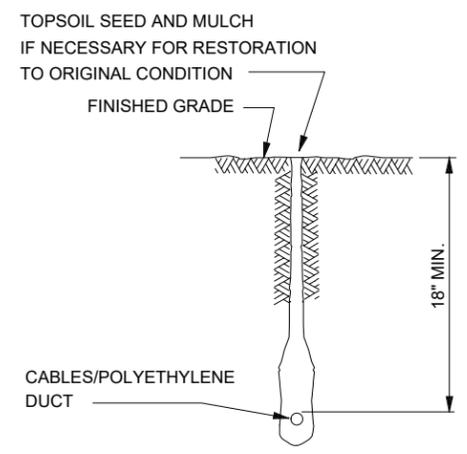
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SHEET TITLE  
**ELECTRIC DETAILS (PAPI)**

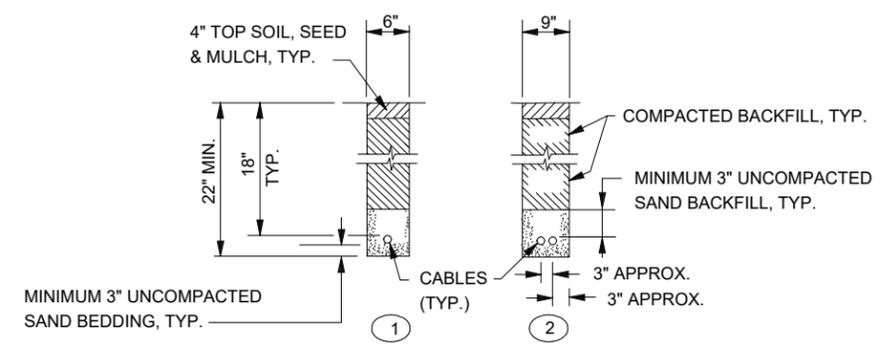
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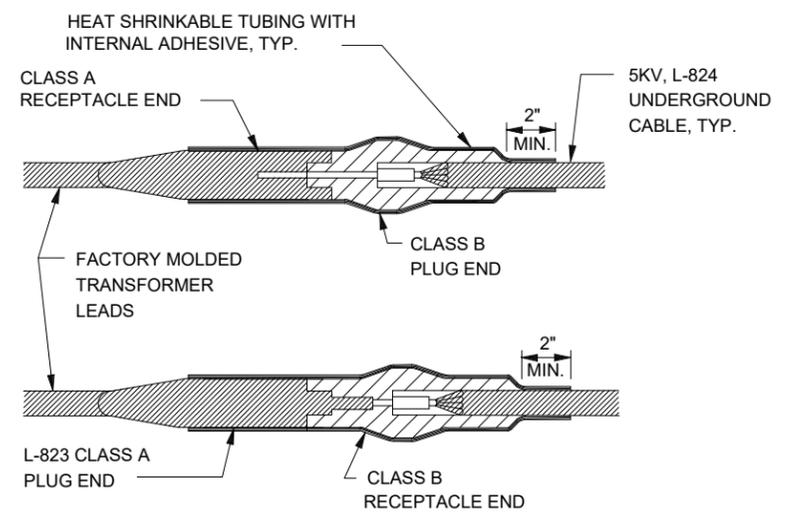
**PVC DUCT/CONDUIT IN TRENCH DETAILS**  
NOT TO SCALE



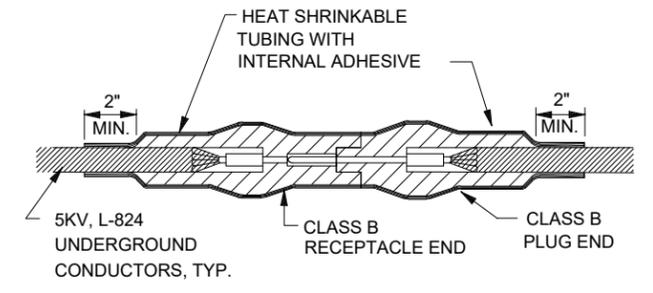
**PLOWED CABLE/POLYETHYLENE DUCT DETAIL**  
NOT TO SCALE



**CABLE IN TRENCH DETAILS**  
NOT TO SCALE



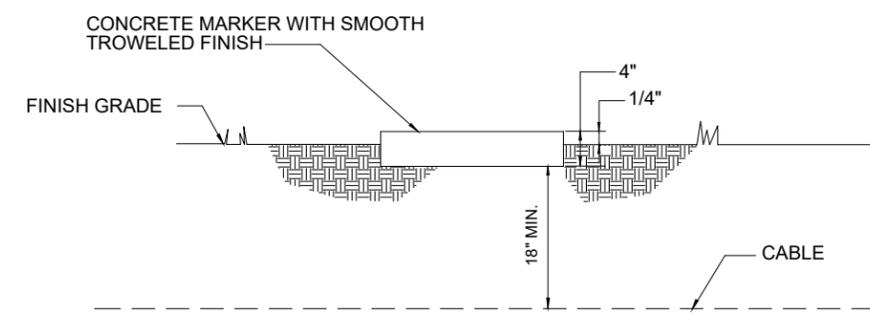
**FIGURE A**  
FOR L-823 CONNECTORS USED AT L-830 ISOLATION TRANSFORMER JUNCTION WITH 5KV LOOP CIRCUIT



**FIGURE B**  
FOR L-823 PLUG SPLICES IN 5KV HOMERUN CIRCUITS AND FOR EXTENSIONS OF NEW AND EXISTING 5KV CIRCUITS

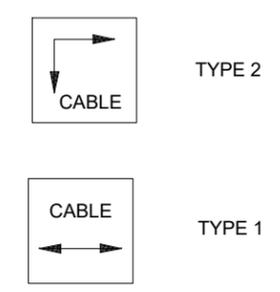
- NOTES:
1. CABLE/TRENCH DEPTH DIMENSIONS ARE SHOWN FOR UG CABLE(S) WITHOUT CONSIDERATION OF OTHER VERTICALLY STACKED CABLES. REFER TO STANDARD SPECIFICATIONS FOR DIMENSION REQUIREMENTS FOR CABLES STACKED VERTICALLY IN TRENCH.
  2. DETAIL NUMBERS INDICATE NUMBER OF CABLES OR CONDUITS. TRENCHES FOR MORE THAN 2 CABLES AND MORE THAN 3 POLYETHYLENE DUCTS OR CONDUITS SHALL BE INCREASED 3 INCHES IN WIDTH FOR EACH ADDITIONAL CABLE AND POLYETHYLENE DUCT OR CONDUIT.
  3. TRENCHES, PLOWING, CABLE, CONDUIT AND POLYETHYLENE DUCT REQUIRED SHALL BE AS SHOWN ON PLAN SHEETS.

**5KV CABLE SPLICE WATERPROOFING DETAILS**  
NOT TO SCALE



- NOTES:
- EACH CABLE RUN SHALL BE MARKED AT APPROXIMATELY EVERY 200 FEET ALONG THE RUN WITH AN ADDITIONAL MARKER AT EACH CHANGE OF DIRECTION.

**CONCRETE CABLE MARKER**

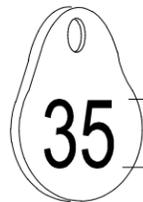


**DUCT, CABLE & SPLICE MARKER DETAILS**  
NOT TO SCALE

- NOTES:
1. MARKERS SHALL BE 24 INCHES SQUARE BY 4 INCHES THICK PLACED WHERE SHOWN ON THE PLAN DRAWINGS, EXCEPT FOR DUCT MARKERS, WHICH SHALL BE PLACED ACCORDING TO THE ENGINEER.

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1-1/2" MIN. FOR MAX. 3 NUMBER/LETTER COMBINATIONS. 1" MIN. FOR MORE THAN 3 NUMBER/LETTER COMBINATIONS, OR IF 2 LINES ARE REQUIRED. COLORED TAGS MAY BE USED TO REDUCE NUMBER/LETTER COMBINATIONS.

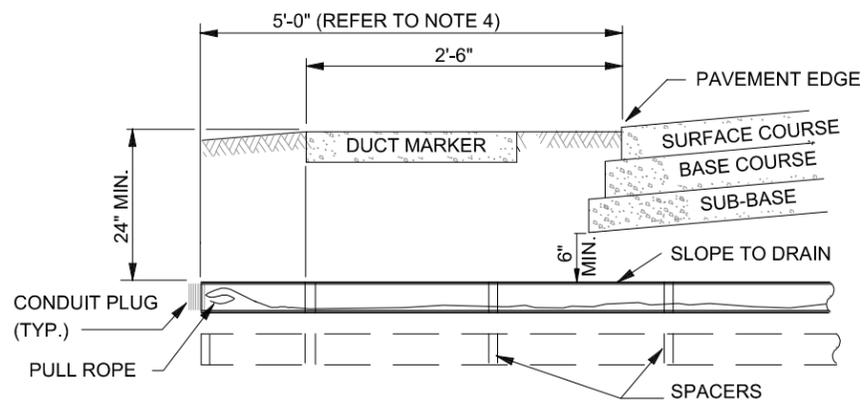
AFFIX NON-CORROSIVE NUMBERING TAG TO FIXTURE FACING PAVEMENT WITH SET SCREW, WIRE TIE, OR METAL BAND, NUMBERS SHALL BE ENGRAVED FOR PERMANENT READABILITY.

### NUMBERING TAG DETAIL

CONTRACTOR SHALL REUSE EXISTING NUMBERING TAGS, MATCHING EXISTING STYLE, OR PROVIDE "ALL" NEW TAGS.

### LIGHT DETAIL NOTES:

1. PRIOR TO CONCRETE BACKFILL, A PLYWOOD COVER SHALL BE PROVIDED ON BASE TO ALLOW FOR A 1/4" WIDE GROOVE FOR INSTALLATION OF BASE PLATE, SPACER RINGS AND FLANGE RING.
2. ONCE FLANGE RING AND BASE PLATE HAVE BEEN INSTALLED, POUR 3/4" OF SILICA SAND AND FILL REMAINDER WITH P606 EPOXY IN GROOVE.
3. BASE PLATE FOR ELEVATED LIGHT SHALL BE PROVIDED WITH 11.25" BOLT CIRCLE DIAMETER AND 3 1/4" DIA. X 1/2" DEEP COUNTER BORE AROUND FRANGIBLE COUPLING TAP. BASE PLATE SHALL BE PAINTED YELLOW BY THE MANUFACTURER.
4. ALL HARDWARE SHALL BE STAINLESS STEEL. ALL MACHINE THREADED CONNECTIONS SHALL HAVE ANTI-SEIZING COMPOUND.
5. STAINLESS STEEL BOLTS SECURING BASE PLATE SHALL BE 3" LONG.

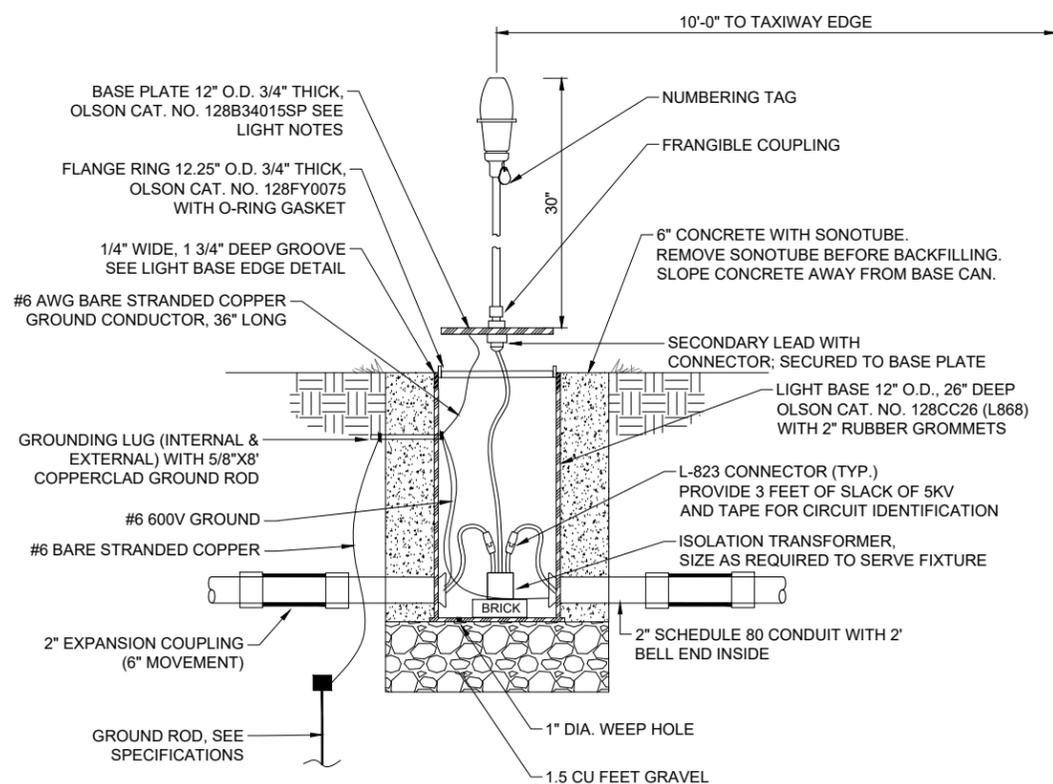


### ELECTRICAL DUCT DETAIL

NOT TO SCALE

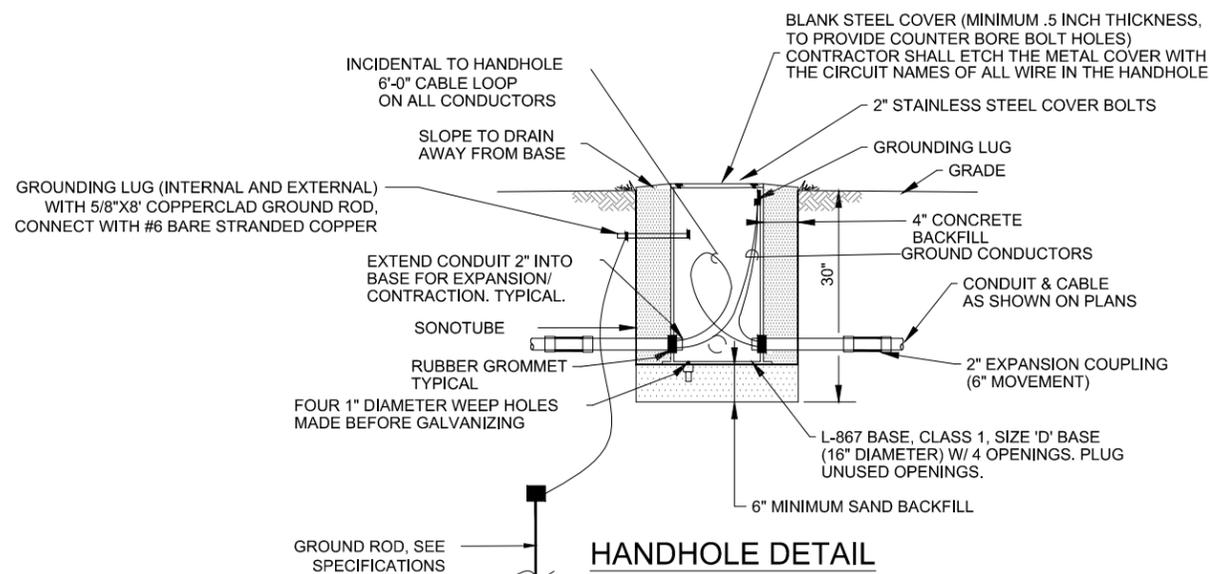
### GENERAL NOTES:

1. SEE PLAN DRAWINGS FOR EDGE LIGHT AND NUMBERING TAG LOCATIONS, OR INSTALL AS DIRECTED BY ENGINEER.
2. COLOR CODE WIRE IDENTIFICATION TAPE AS FOLLOWS: WHEN FACING LIGHT WITH BACK TO PAVEMENT, CABLE TO THE LEFT IS CODED RED AND CABLE TO THE RIGHT IS CODED BLUE.
3. NONMETALLIC COMPONENTS IN THE LIGHT FIXTURE STEMS AND BREAKABLE COUPLINGS ARE NOT PERMITTED. ALL HARDWARE SHALL BE STAINLESS STEEL. ALL MACHINE THREADED CONNECTIONS SHALL HAVE ANTI-SEIZING COMPOUND.
4. PROVIDE SUFFICIENT CABLE IN LIGHT BASE TO ALLOW REMOVAL OF TRANSFORMER CONNECTORS WITHOUT DISCONNECTING CIRCUITRY.



### BASE MOUNTED EDGE LIGHT DETAIL

NOT TO SCALE



### HANDHOLE DETAIL

NOT TO SCALE

NOTE: PROVIDE SUFFICIENT CABLE IN LIGHT BASE TO ALLOW REMOVAL OF TRANSFORMER CONNECTORS WITHOUT DISCONNECTING CIRCUITRY

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**KRAFT REVIEW**  
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SHEET TITLE  
ELECTRICAL DETAILS

SHEET

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