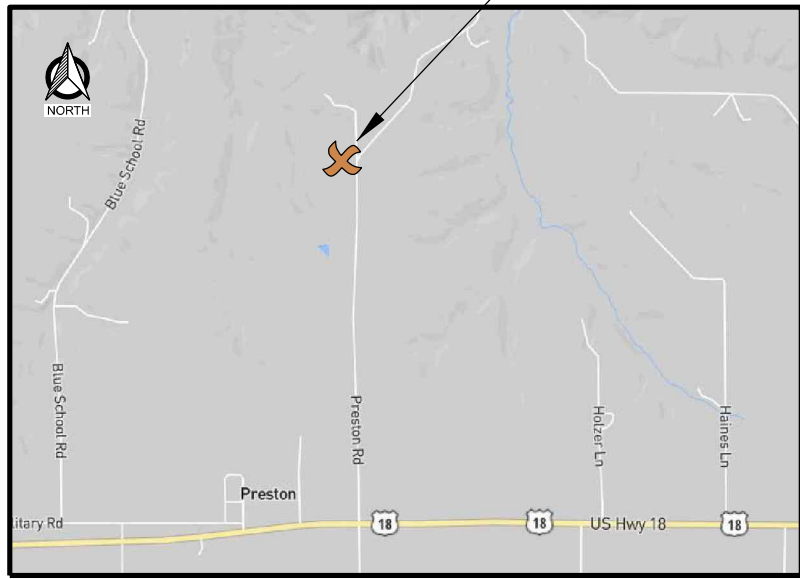


SITE LOCATION



FENNIMORE GF2 (31987)  
FENNIMORE, WISCONSIN  
285' SELF-SUPPORT TOWER

PROJECT DIRECTORY

ENGINEER:  
EDGE CONSULTING ENGINEERS, INC.  
624 WATER STREET  
PRAIRIE DU SAC, WI 53578  
CONTACT: ARLEN OSTRENG, PE  
PHONE: (608) 644-1449

OWNER  
GRANT COUNTY  
111 S. JEFFERSON ST.  
LANCASTER, WI 53813-0529  
CONTACT: SHERIFF NATE DRECKMAN  
PHONE: (608) 723-2157

RADIO SYSTEM VENDOR:  
RACOM CORPORATION  
3190 CEDAR CROSS COURT  
DUBUQUE, IA 52003  
CONTACT: TANNER METZ  
PHONE: (563) 583-2245

ELECTRICAL SERVICE PROVIDER:  
SCENIC RIVERS ENERGY COOPERATIVE  
231 N SHERIDAN STREET  
LANCASTER, WI 53813-1342  
PHONE: (608) 723-2121

PROJECT INFO

SITE ADDRESS:  
13497 PRESTON ROAD  
FENNIMORE, WI 53809

PROPERTY OWNER:  
DOUGLAS & CAROL NEEDHAM  
13826 CASS HOLLOW ROAD  
FENNIMORE, WI 53809

TOWER OWNER:  
GRANT COUNTY  
111 S. JEFFERSON ST.  
LANCASTER, WI 53813-0529

TOWER COORDINATES (PER 1-A CERTIFICATION):  
LAT (NAD83/2011): 42°-59'-42.43" N (42.995119)  
LONG (NAD83/2011): 90°-32'-16.53" W (-90.537925)  
GROUND ELEVATION (NAVD 88): 1117.0'  
ASR NUMBER: TBD

PLSS INFORMATION  
PART OF NE 1/4 OF THE SW 1/4  
SECTION 18, T6N, R1W  
TOWN OF WINGVILLE  
GRANT COUNTY  
WISCONSIN

PARCEL ID: 062-00371-0000

ZONING CLASSIFICATION: ?

SHEET INDEX

NO.:	SHEET TITLE
G-001	TITLE SHEET
1-2	* SITE SURVEY
C-101	OVERALL SITE PLAN
C-102	ENLARGED SITE PLAN
C-103	COMPOUND PLAN
C-104	GRADING AND EROSION CONTROL PLAN
C-501	SITE DETAILS
C-502	FENCE DETAILS
C-503	SHELTER FOUNDATION DETAILS
C-504	GENERATOR FUEL SYSTEM DETAILS
C-505	GRADING AND EROSION CONTROL DETAILS
A-101	SHELTER FLOOR PLAN
A-102	SHELTER CEILING PLAN
A-201	SHELTER ELEVATIONS: EXTERIOR
A-202	SHELTER ELEVATIONS: INTERIOR
T-201	TOWER LOADING / ELEVATION
T-501	TRANSMISSION LINE INSTALLATION DETAILS
T-502	ICE BRIDGE DETAILS
T-503	ANTENNA INSTALLATION DETAILS
E-101	GROUNDING PLAN
E-102	UTILITY PLAN
E-103	SHELTER GROUNDING PLAN
E-104	SHELTER ELECTRICAL PLAN
E-501	GROUNDING DETAILS
E-502	GROUNDING DETAILS
E-503	GROUNDING DETAILS
E-504	UTILITY DETAILS
E-505	UTILITY RACK DETAILS
	* BY OTHERS

CONSULTANT:

**Edge**  
Consulting Engineers, Inc.  
624 WATER STREET  
PRAIRIE DU SAC, WI 53578  
608.644.1449 VOICE  
608.644.1549 FAX  
www.edgesconsult.com

CLIENT:

**RACOM**  
critical communications

TITLE SHEET  
FENNIMORE GF2 (31987)  
FENNIMORE, WISCONSIN

SUBMITTAL:

INT.	DATE	DESCRIPTION:

CHECKED BY:	AJO
PLOT DATE:	6/20/2022
PROJECT NUMBER:	31987
SET TYPE:	BD
SHEET NUMBER:	G-001



TO OBTAIN LOCATION OF PARTICIPANTS' UNDERGROUND FACILITIES BEFORE YOU DIG IN WISCONSIN, CALL DIGGERS HOTLINE

TOLL FREE: 1-800-242-8511  
FAX A LOCATE: 1-800-242-5811

WI STATUTE 182.0175 (1974) REQUIRES MIN. OF 3 WORK DAYS NOTICE BEFORE YOU EXCAVATE

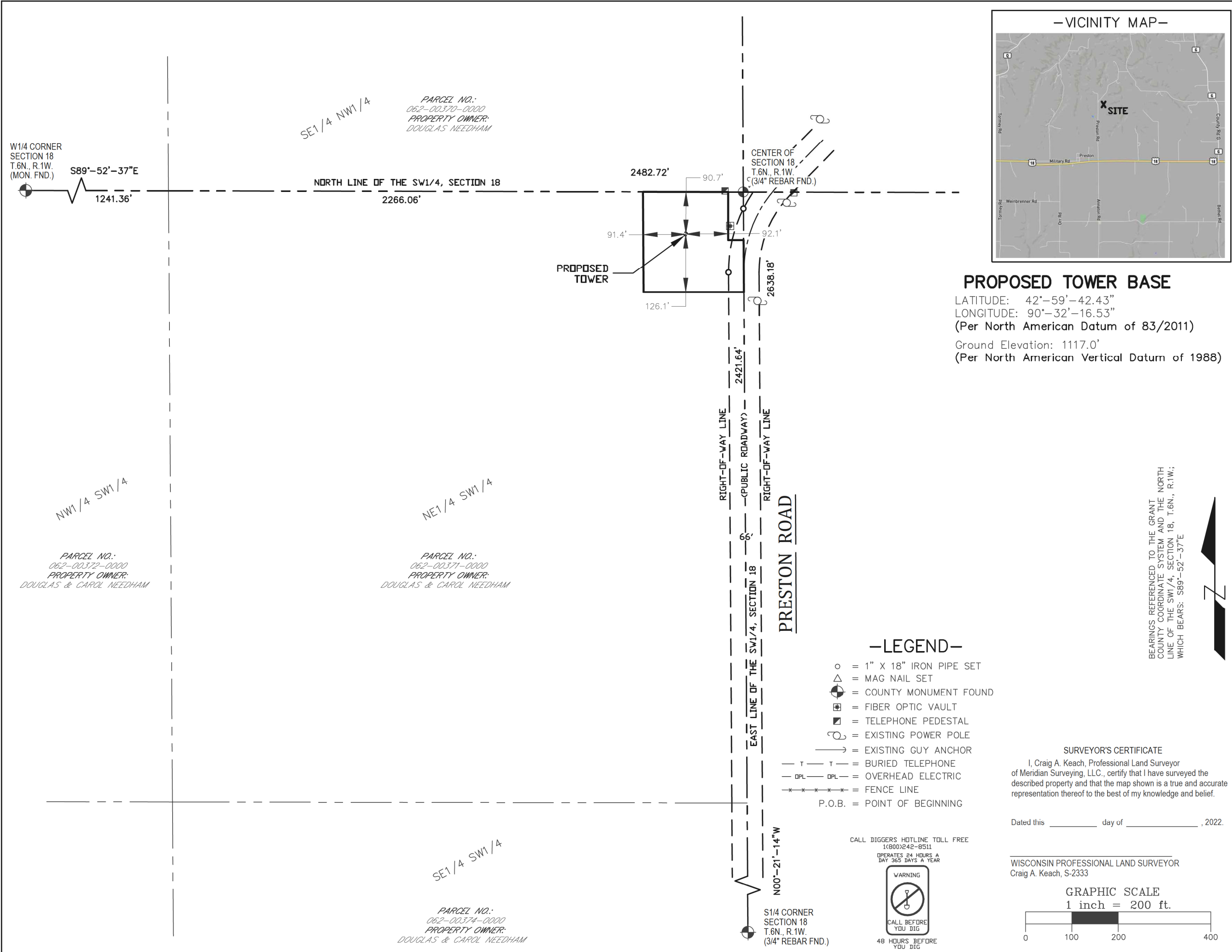
ENGINEER SEAL:



I HEREBY CERTIFY THAT THIS PLAN SET WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION OTHER THAN THE EXCEPTIONS NOTED IN THE SHEET INDEX, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF WISCONSIN.

SIGNATURE:

DATE: 6/20/2022



SURVEYED FOR:

**Edge**  
Consulting Engineers, Inc.

624 Water Street  
Prairie du Sac, WI 53578  
608.644.1449 voice  
608.644.1549 fax  
www.edgeconsult.com

SURVEYED FOR:

**GRANT COUNTY  
WISCONSIN**

111 SOUTH JEFFERSON STREET  
LANCASTER, WI 53813

**MERIDIAN**  
SURVEYING, LLC

N9637 Friendship Drive Kaukauna, WI 54130  
Office: 920-993-0881  
Fax: 920-273-6037

**SITE NAME:**  
FENNIMORE

**SITE ADDRESS:**  
PRESTON ROAD  
FENNIMORE, WI 53809

**PROPERTY OWNER:**  
DOUGLAS & CAROL NEEDHAM  
13826 CASS HOLLOW ROAD  
FENNIMORE, WI 53809

**PARCEL NO.:** 062-00371-0000

**DEED REFERENCE:** VOL. 935, PG. 259  
DOC. NO. 645276

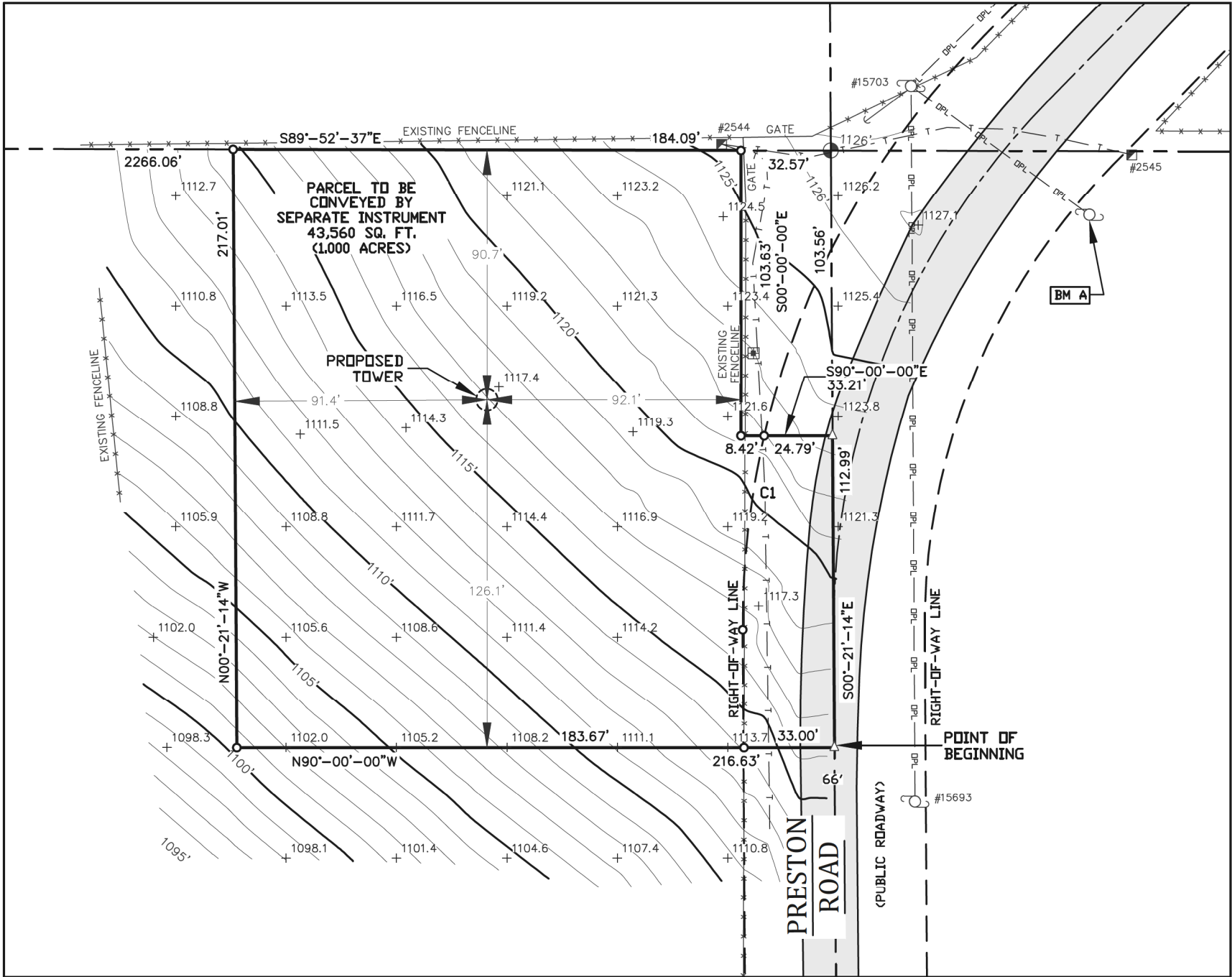
**SITE SURVEY  
FOR  
GRANT COUNTY**

BEING A PART OF THE NE1/4 OF THE SW1/4, SECTION 18, T.6N., R.1W., TOWN OF WINGVILLE, GRANT COUNTY, WISCONSIN

2	3-9-22	Added Tower Location	JB
1	1-25-22	Preliminary Survey	JD
NO.	DATE	DESCRIPTION	BY

DRAWN BY: J.D.	FIELD WORK DATE: 1-20-22
CHECKED BY: S.C.D.	FIELD BOOK: M-62, PG. 56
JOB NO.: 13410	SHEET 1 OF 2

BEARINGS REFERENCED TO THE GRANT COUNTY COORDINATE SYSTEM AND THE NORTH LINE OF THE SW1/4, SECTION 18, T.6N., R.1W.; WHICH BEARS: S89°-52'-37"E





- A. 285' SELF-SUPPORT TOWER
- B. 75' x 75' FENCED COMPOUND
- C. GRANT CO. TOWER SITE PARCEL (1.0 ACRES) (SEE SURVEY)



PARCEL #: 062-00364-0000  
OWNER: DOUBLAS & CAROL NEEDHAM

PARCEL #: 062-00376-0000  
OWNER: DOUBLAS & CAROL NEEDHAM

## **GENERAL NOTES: (THIS SHEET)**

---

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. AERIAL IMAGERY PER:  
GRANT COUNTY GIS MAPPING DATA
3. PROPERTY LINES SHOWN PER SURVEY COMPLETED BY:  
MERIDIAN SURVEYING, LLC



**Edge**  
Consulting Engineers, Inc.

624 WATER STREET  
PRAIRIE DU SAC, WI 53578  
608.644.1449 VOICE  
608.644.1549 FAX  
[www.edgeconsult.com](http://www.edgeconsult.com)

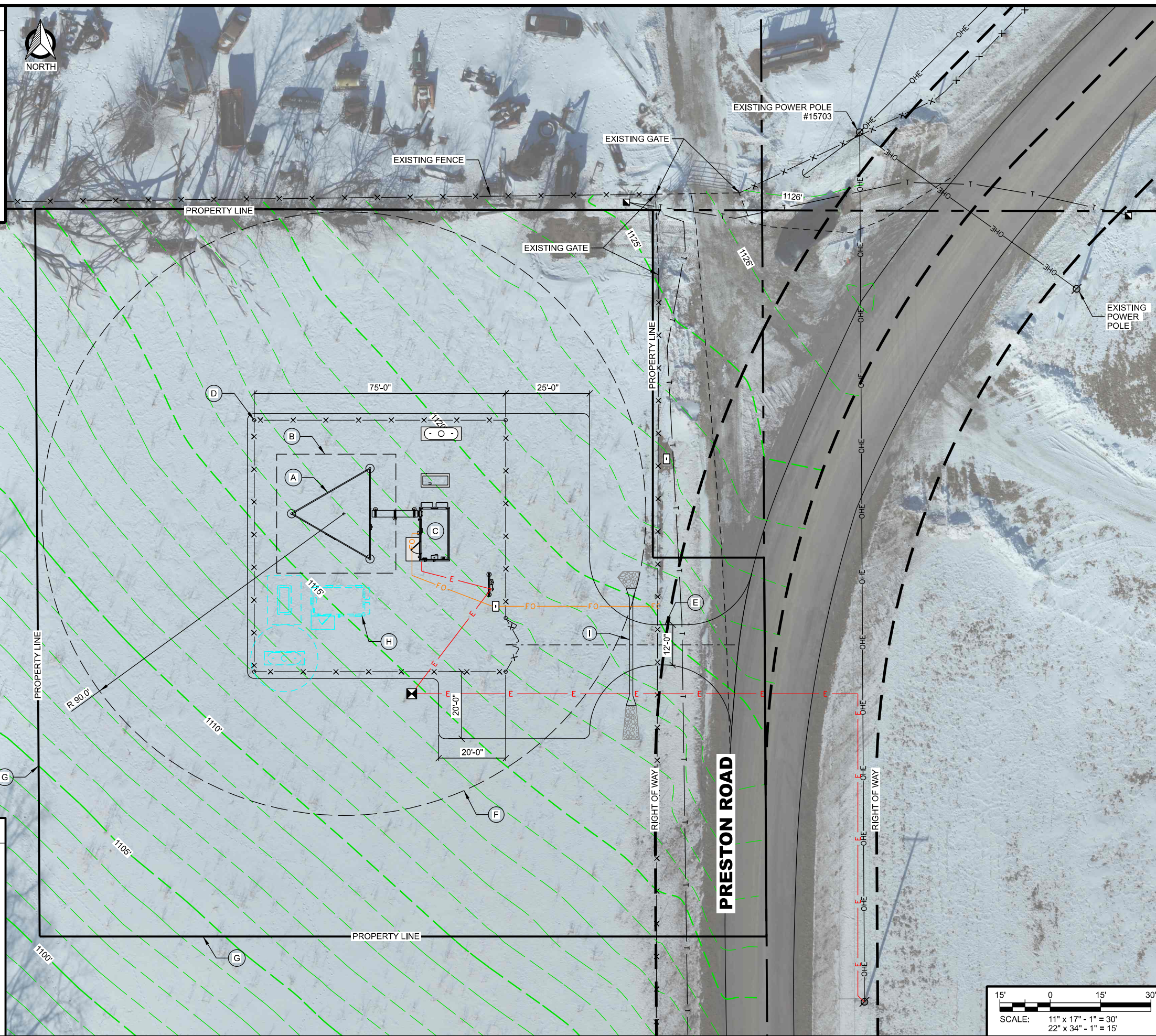

**RACOM**  
critical communications

**OVERALL SITE PLAN**  
**FENNIMORE GF2 (31987)**  
**FENNIMORE, WISCONSIN**

SUBMITTAL:		
SERIAL NO.	DATE:	DESCRIPTION:
CHECKED BY	AJO	
PLOT DATE	6/20/2022	
PROJECT NUMBER	31987	
SET TYPE	BD	
SHEET NUMBER	C-101	



- A. 285' SELF-SUPPORT TOWER (27' FACE WIDTH SHOWN);  
VERIFY WITH FINAL TOWER AND FOUNDATION PLANS
- B. TOWER FOUNDATION (35'-6" x 35'-6" PAD SHOWN);  
VERIFY WITH FINAL TOWER AND FOUNDATION PLANS
- C. GRANT COUNTY EQUIPMENT SHELTER
- D. 75' x 75' FENCED COMPOUND
- E. 12' WIDE ACCESS DRIVE
- F. 90' TOWER SETBACK RADIUS (FROM TOWER CENTER)
- G. GRANT CO. TOWER SITE PARCEL (1.0 ACRES) (SEE SURVEY)
- H. FUTURE TENANT
- I. DRIVEWAY CULVERT. SEE SHEET C-104 FOR DETAILS



1. NORTH ARROW SHOWN AS APPROXIMATE.
2. AERIAL IMAGERY PER UAS-DRONE FLIGHT:  
EDGE CONSULTING ENGINEERS, INC. ON 02/03/2022.
3. PROPERTY LINES SHOWN PER SURVEY COMPLETED BY:  
MERIDIAN SURVEYING, LLC.
4. TOPOGRAPHIC FEATURES PER TOPOGRAPHIC SURVEY BY:  
MERIDIAN SURVEYING, LLC.
5. UNDERGROUND UTILITIES SHOWN PER:  
DIGGERS HOTLINE TICKET #: 20220401462

I:\31900\31987\Design\CAD\BD\Plot\PlotC-102.dgn

 **Edge**  
Consulting Engineers, Inc.  
624 WATER STREET  
PRAIRIE DU SAC, WI 53571  
608.644.1449 VOICE  
608.644.1549 FAX  
[www.edgeconsult.com](http://www.edgeconsult.com)


**RACOM**  
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**ENLARGED SITE PLAN**  
**FENNIMORE GF2 (31987)**  
**FENNIMORE, WISCONSIN**

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© EDGE CONSULTING ENGINEERS, INC.

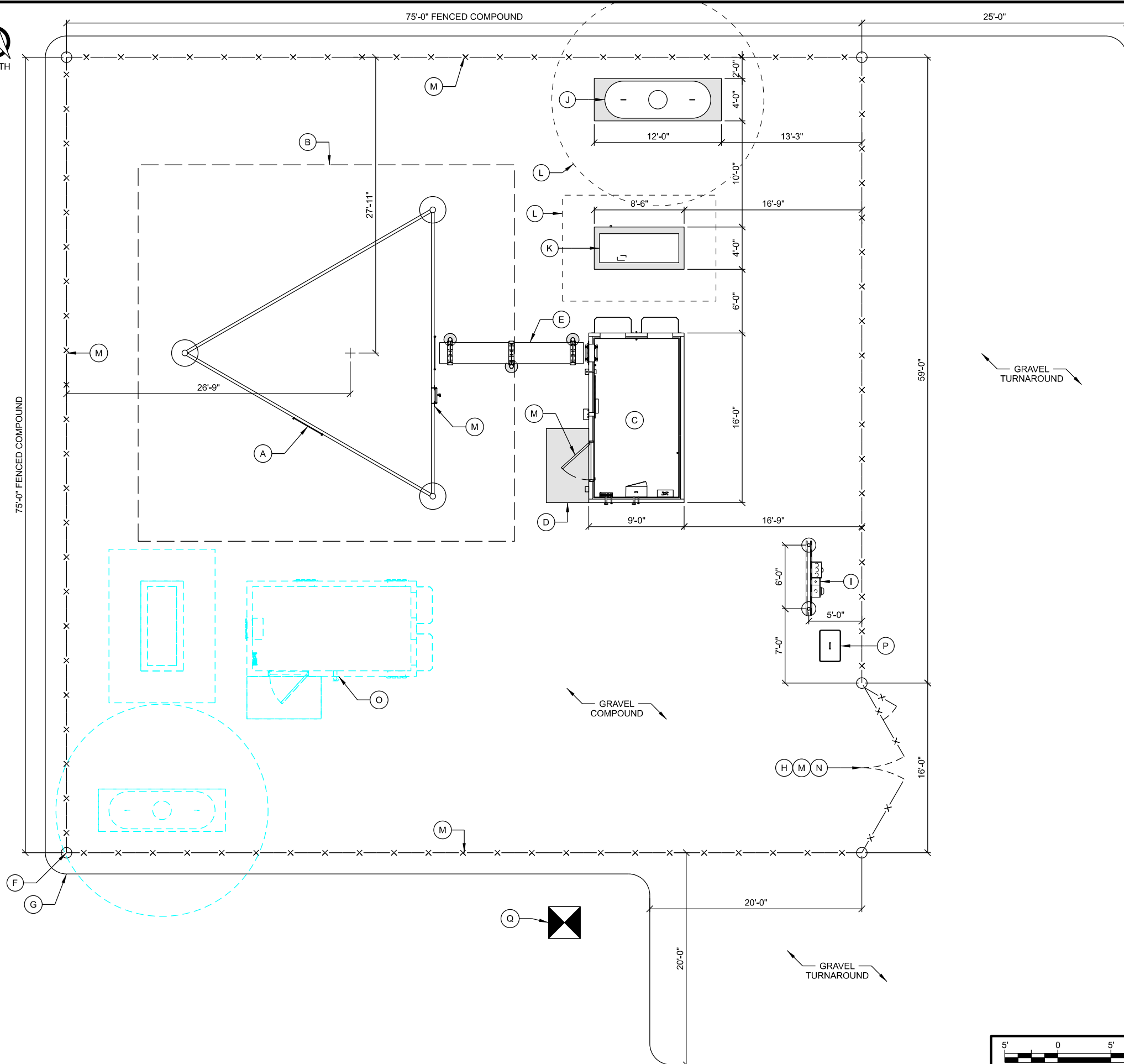


KEYNOTES: (THIS SHEET)

- A. 285' SELF-SUPPORT TOWER (27' FACE WIDTH SHOWN);  
VERIFY WITH FINAL TOWER AND FOUNDATION PLANS
- B. TOWER FOUNDATION (35'-6" x 35'-6" PAD SHOWN);  
VERIFY WITH FINAL TOWER AND FOUNDATION PLANS
- C. 9' x 16' GRANT COUNTY EQUIPMENT SHELTER;  
SEE A-101 FOR DETAILS
- D. 4' x 7' CONCRETE STOOP;  
SEE C-503 FOR DETAILS
- E. 24" WIDE ICE BRIDGE;  
SEE T-502 FOR DETAILS
- F. 75' x 75' FENCED COMPOUND;  
8' TALL (7' FABRIC W/ 1' BARB WIRE);  
SEE C-502 FOR DETAILS
- G. GRAVEL COMPOUND;  
EDGE TO EXTEND 2' BEYOND FENCE PERIMETER;  
SEE B/C-501 FOR DETAILS
- H. 16' WIDE VEHICLE ACCESS GATE W/ SNOW GATE  
AND MULTI-USER GATE LOCK SYSTEM;  
(LOCKS BY OWNER)
- I. MULTI-METER UTILITY RACK;  
SEE E-504 FOR DETAILS
- J. 500 GAL. LP FUEL TANK ON CONCRETE SLAB;  
SEE C-504 FOR DETAILS
- K. 36 kW GENERATOR ON CONCRETE SLAB;  
SEE C-504 FOR DETAILS
- L. CLEARANCE ZONE/SETBACKS  
- 10' AROUND LP TANK  
- 3' AROUND GENERATOR
- M. RF SIGNAGE (SUPPLIED BY RACOM)  
- (4) RF NOTICE SIGNS;  
INSTALL ON EACH SIDE OF FENCE  
- (2) RF CAUTION SIGNS;  
INSTALL NEAR TOWER CLIMB AND ON SHELTER DOOR
- N. ASR SIGN (SUPPLIED BY RACOM);  
(1) REQUIRED;  
SEE B/C-502 FOR DETAILS
- O. FUTURE TENANT
- P. FIBER OPTIC HANDHOLE BY GRANT CO.;  
SEE DETAIL E/E-504
- Q. GROUND MOUNTED ELECTRIC TRANSFORMER;  
BY UTILITY PROVIDER

GENERAL NOTES: (THIS SHEET)

1. NORTH ARROW SHOWN AS APPROXIMATE.



CONSULTANT:

**Edge**  
Consulting Engineers, Inc.  
624 WATER STREET  
PRAIRIE DU SAC, WI 53578  
608.644.1449 VOICE  
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www.edgeconsult.com

CLIENT:

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critical communications

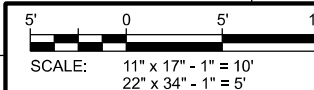
**COMPOUND PLAN**  
**FENNIMORE GF2 (31987)**  
**FENNIMORE, WISCONSIN**

SUBMITTAL:

INT.	DATE	DESCRIPTION

CHECKED BY	AJO
PLOT DATE	6/20/2022
PROJECT NUMBER	31987
SET TYPE	BD

SHEET NUMBER **C-103**





LEGEND: (THIS SHEET)

- EXISTING CONTOUR GRADES  
PROPOSED CONTOUR GRADES  
SPOT ELEVATIONS  
P = PROPOSED ELEV.  
E = EXISTING ELEV.  
FL = FLOW LINE  
IE = INVERT ELEV.  
TOC = TOP OF CONC.  
PROPOSED DRAINAGE PATH  
SILT FENCE, SEE DETAIL A/C-505  
LIMITS OF DISTURBANCE  
EROSION MAT  
TEMPORARY DITCH CHECK, SEE DETAIL B/C-505

GRADING NOTES: (THIS SHEET)

1. CONTOUR INTERVAL IS 1 FOOT.
2. PERIMETER CONTROLS AND STONE TRACKING PADS SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES, INCLUDING CLEARING AND GRUBBING OPERATIONS. STONE TRACKING PAD SHALL BE A 12'X50' MIN. CONSISTING OF 3" BREAKER STONE.
3. CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL MEASURES, BEYOND THOSE SHOWN IN THIS PLAN, SUITABLE FOR THEIR MEANS AND METHODS TO KEEP ALL SEDIMENT ON SITE DURING CONSTRUCTION ACTIVITIES. THIS INCLUDES IMPLEMENTATION OF SILT FENCE, EROSION BALES, TRACKING PADS, DIVERSION BERMS AND/OR OTHER APPROPRIATE DEVICES.
4. CONTRACTOR SHALL GRADUALLY MATCH INTO EXISTING GRADE. NO PROPOSED EARTHWORK SHALL HAVE A GREATER SLOPE THAN 3:1. FINISHED SITE TO BE GRADED TO MAINTAIN POSITIVE DRAINAGE IN ALL AREAS.
5. DRIVEWAY GRADE WITHIN 25 FEET OF PUBLIC ROAD ACCESS POINT SHALL BE LESS THAN 10% (10:1).
6. FINISHED GRADE SLOPES GREATER THAN 4:1, DITCH BOTTOMS AND GRASS SURFACES WITHIN 6 FEET OF ANY PAVED OR GRAVEL SURFACE REQUIRE EROSION MAT (TYPE 2-D - 12 MONTH LONGEVITY, DOUBLE NET EROSION CONTROL BLANKET)
7. ALL DISTURBED GRASS/TURF AREAS SHALL BE RESTORED WITH TOPSOIL, SEED AND MULCH. TOPSOIL TO BE 6-INCHES MINIMUM. SEED TO CONSIST OF NATIVE PURE LIVE SEED (PLS) AT 98% PURITY AND 95% GERMINATION. MULCH TO BE WEED-FREE GRAIN STRAW.
8. CONTRACTOR TO PERFORM MAINTENANCE AND INSPECTION OF EROSION CONTROL DEVICES AND EXPOSED GRADE THROUGHOUT CONSTRUCTION. THE CONTRACTOR SHALL INSPECT THE EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES ON A WEEKLY BASIS AND WITHIN 24 HOURS AFTER A PRECIPITATION EVENT 0.5 INCHES OR GREATER WHICH RESULTS IN RUNOFF. CONTRACTOR SHALL CONTINUE MAINTENANCE AND INSPECTION UNTIL FULL VEGETATION ESTABLISHMENT AND/OR PROJECT ACCEPTANCE.
9. CONTRACTOR TO REMOVE EROSION CONTROL MEASURES AFTER PROJECT ACCEPTANCE.
10. SEE SHEET SURVEY FOR BENCHMARK LOCATIONS.

GENERAL NOTES: (THIS SHEET)

1. NORTH ARROW SHOWN AS APPROXIMATE.
2. PROPERTY LINES & TOPOGRAPHIC FEATURES PER TOPOGRAPHIC SURVEY BY:  
MERIDIAN SURVEYING, LLC ON 01/20/2022
7. UNDERGROUND UTILITIES SHOWN PER:  
DIGGERS HOTLINE TICKET #: 20220401462



PROPERTY LINE

SILT FENCE

LIMITS OF LAND DISTURBANCE

PROPERTY LINE

GRASS SWALE FLOWING WEST

GRASS SWALE FLOWING SOUTH TO CULVERT

CAUTION:  
EXISTING FIBER  
OPTIC BOX AND  
BURIED LINE

EXISTING FENCE

RIP RAP ENERGY  
DISSIPATOR; SEE  
DETAIL E/C-501

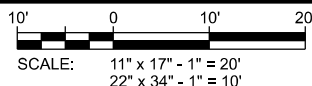
MATCH EXISTING  
PAVEMENT

35 LF - 12" CMP  
CULVERT @ 2% SLOPE;  
SEE DETAIL D/C-501

RIP RAP ENERGY DISSIPATOR;  
SEE DETAIL E/C-501

PRESTON ROAD

RIGHT-OF-WAY



CONSULTANT:

**Edge**  
Consulting Engineers, Inc.  
624 WATER STREET  
PRAIRIE DU SAC, WI 53578  
608.644.1449 VOICE  
608.644.1549 FAX  
www.edgesconsult.com

CLIENT:

**RACOM**  
critical communications

GRADING AND EROSION CONTROL PLAN  
FENNIMORE GF2 (31987)  
FENNIMORE, WISCONSIN

SUBMITTAL:

INT.	DATE:	DESCRIPTION:

CHECKED  
BY:

AJO

PLOT  
DATE:

6/20/2022

PROJECT  
NUMBER:

31987

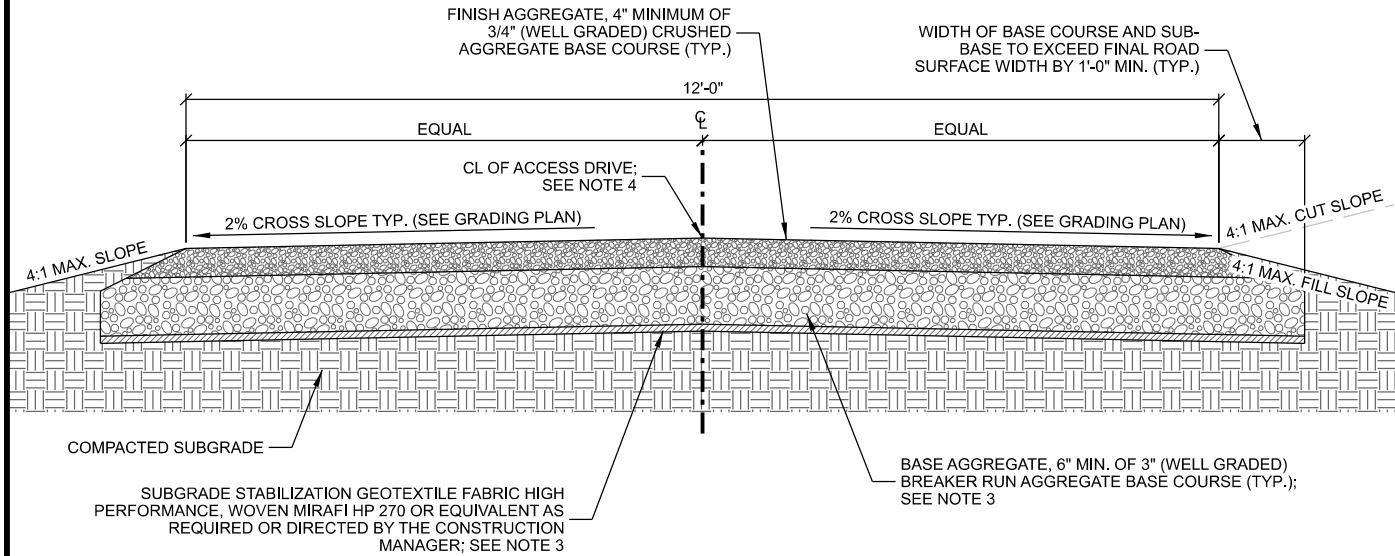
SET  
TYPE:

BD

SHEET  
NUMBER:

C-104

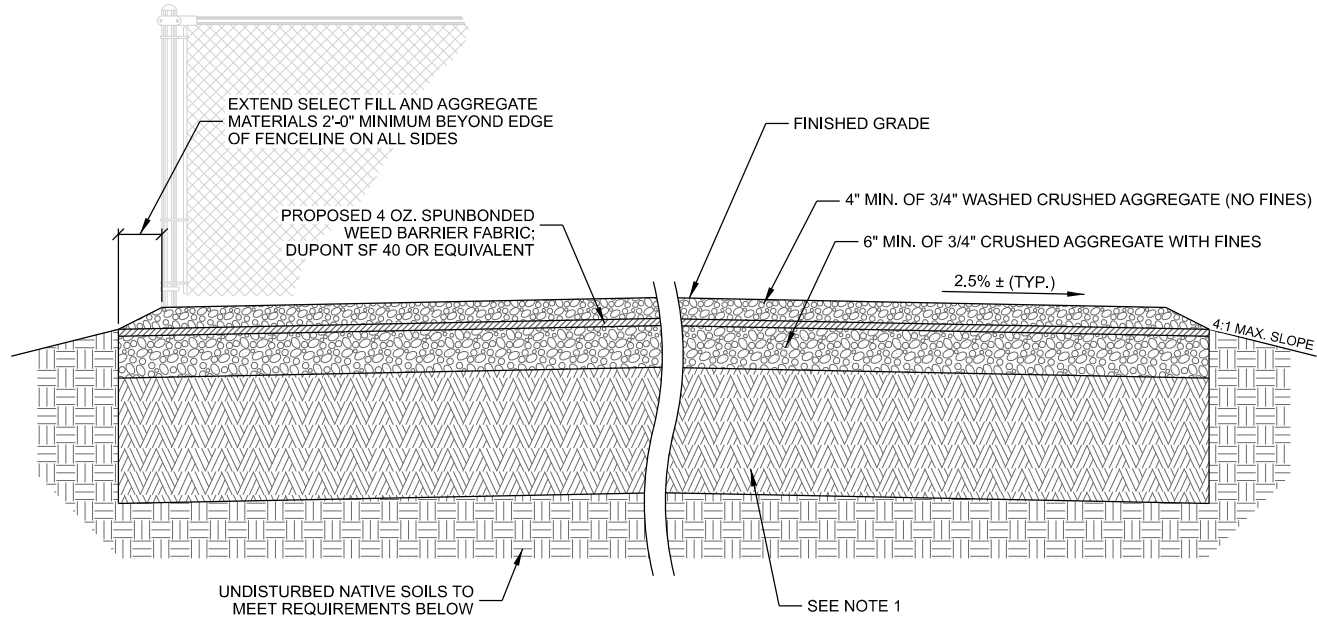




#### GENERAL NOTES:

1. REMOVE ALL TOPSOIL, ORGANIC MATERIAL AND WET OR POOR SOILS ALONG ACCESS DRIVE. CONTRACTOR TO REVIEW SITE CONDITIONS AND CONSULT GEOTECHNICAL REPORT FOR ANTICIPATED DEPTH OF SOILS THAT WILL REQUIRE REMOVAL. IF POOR SOILS ARE ENCOUNTERED AT A DEPTH OF MORE THAN 12", CONTACT CONSTRUCTION MANAGER FOR GUIDANCE.
2. SUBGRADE TO BE COMPACTED TO 90% STANDARD PROCTOR AND VERIFIED BY PROOF-ROLL WITH LOADED TRI-AXLE DUMP TRUCK. CONTACT CONSTRUCTION MANAGER FOR GUIDANCE FOR FAILING SUBGRADE SOILS.
3. FAILING AREAS OF SUBGRADE SHALL BE UNDERCUT TO A MINIMUM DEPTH OF 18" BELOW FINISH AGGREGATE AND STABILIZED WITH 3" (WELL GRADED) BREAKER RUN AGGREGATE OVER SUBGRADE STABILIZATION GEOTEXTILE FABRIC.
4. CONSULT GRADING PLAN OR SITE PLAN FOR FINAL SITE GRADES.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ASPHALT ACCESS DRIVE REPAIR AND RESTORATION FOLLOWING CONSTRUCTION COMPLETION. ANY DISTURBED OR DAMAGED AREAS SHALL BE RESTORED TO THEIR ORIGINAL OR BETTER CONDITION UPON COMPLETION OF WORK.

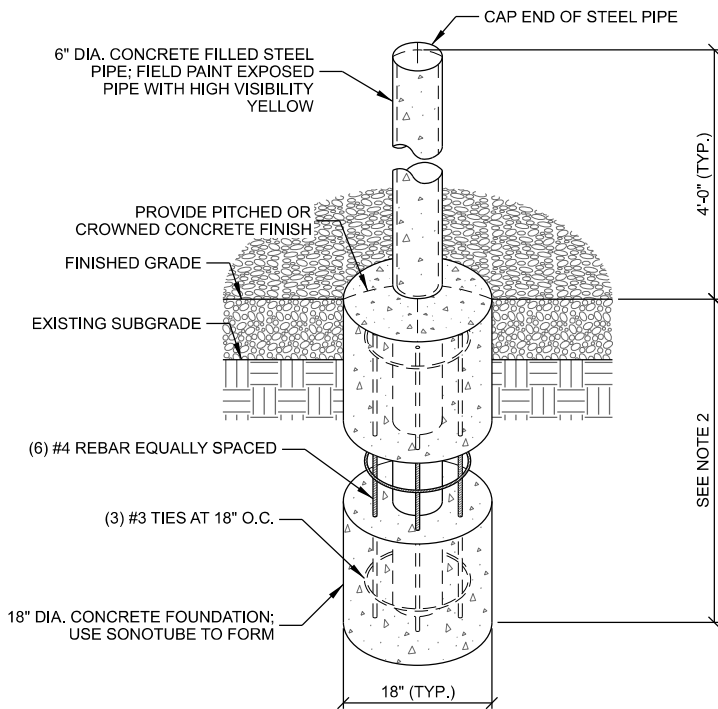
**A GRAVEL DRIVE CROSS SECTION**



#### NOTES:

1. REMOVE ALL TOPSOIL, ORGANIC MATERIAL AND WET OR POOR SOILS WITHIN COMPOUND AREA. CONTRACTOR TO REVIEW SITE CONDITIONS AND CONSULT GEOTECHNICAL REPORT FOR ANTICIPATED DEPTH OF SOILS THAT WILL REQUIRE REMOVAL. IF POOR SOILS ARE ENCOUNTERED SELECT FILL MAY BE REQUIRED. CONTACT CONSTRUCTION MANAGER FOR GUIDANCE.
2. FINAL TOWER FOUNDATION DESIGN RECOMMENDATIONS TO SUPERCEDE GRADING PLAN OR SITE PLAN ELEVATIONS.

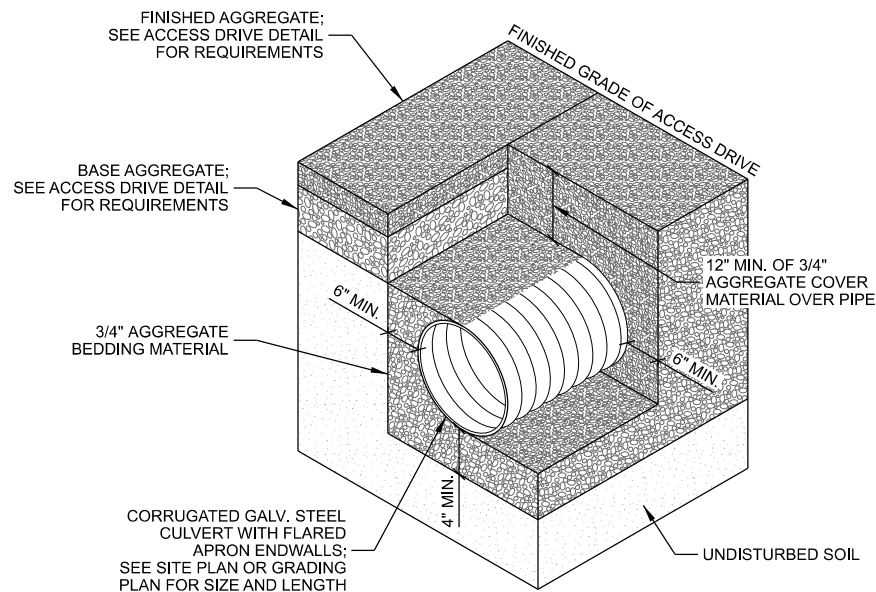
**B COMPOUND CROSS SECTION**



#### NOTES:

1. MAINTAIN 3" MINIMUM REBAR COVER IN ALL DIRECTION
2. PIER FOUNDATION DEPTH TO BE A MINIMUM OF 48"; DEPTH TO EXCEED LOCAL FROST DEPTH
3. CONCRETE TO BE A MINIMUM OF 4,000 PSI AT 28 DAYS

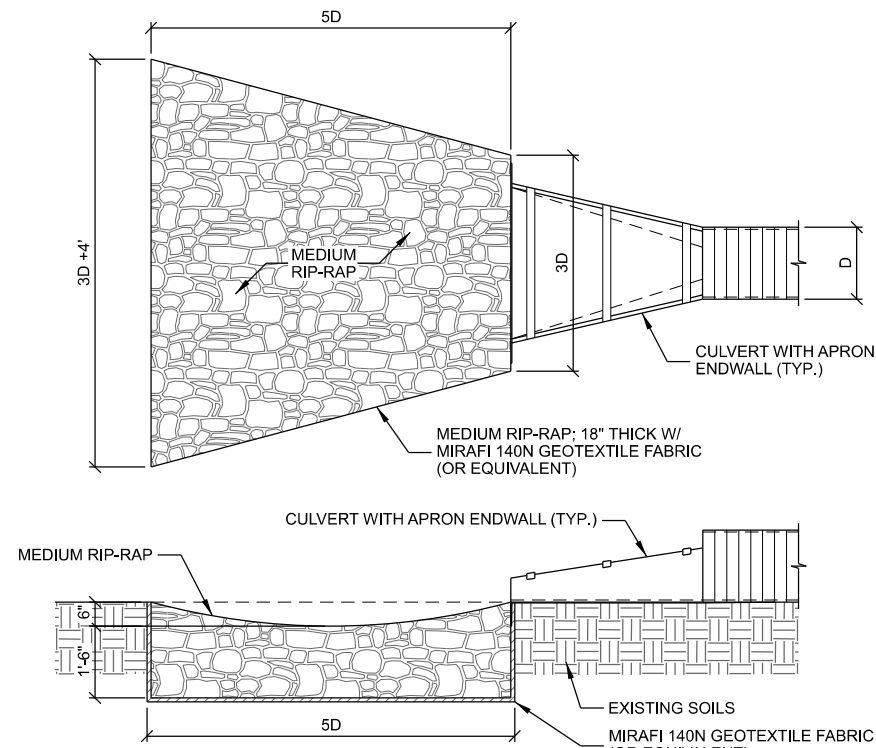
**C PIPE BOLLARD**



#### NOTES:

1. FOR CULVERT TRENCHES LOCATED OUTSIDE OF OF ACCESS DRIVE AREAS, BACKFILL MATERIAL MAY BE USED TO ACHIEVE REQUIRED COVER AFTER MINIMUM BEDDING REQUIREMENTS HAVE BEEN MET.
2. BACKFILL MATERIAL TO BE COMPACTED TO 90% MODIFIED PROCTOR AND TO BE FREE OF FROZEN CLODS AND STONES LARGER THAN 6".
3. GRADE AREAS UPSTREAM AND DOWNSTREAM OF CULVERT TO ACHIEVE POSITIVE DRAINAGE. SEE SITE PLAN OR GRADING PLAN FOR DETAILS.

**D CULVERT**



#### NOTES:

1. RIP-RAP DIMENSION TO BE DETERMINED BASED ON CULVERT DIAMETER "D".

**E RIP-RAP ENERGY DISSIPATOR**

#### CONSULTANT:

**Edge**  
Consulting Engineers, Inc.  
624 WATER STREET  
PRAIRIE DU SAC, WI 53578  
608.644.1449 VOICE  
608.644.1549 FAX  
www.edgeconsult.com

#### CLIENT:

**RACOM**  
critical communications

**SITE DETAILS**  
**FENNIMORE GF2 (31987)**  
**FENNIMORE, WISCONSIN**

#### SUBMITTAL:

INT.	DATE	DESCRIPTION

CHECKED BY	AJO
PLOT DATE	6/20/2022
PROJECT NUMBER	31987
SET TYPE	BD
SHEET NUMBER	<b>C-501</b>



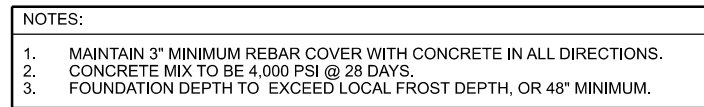
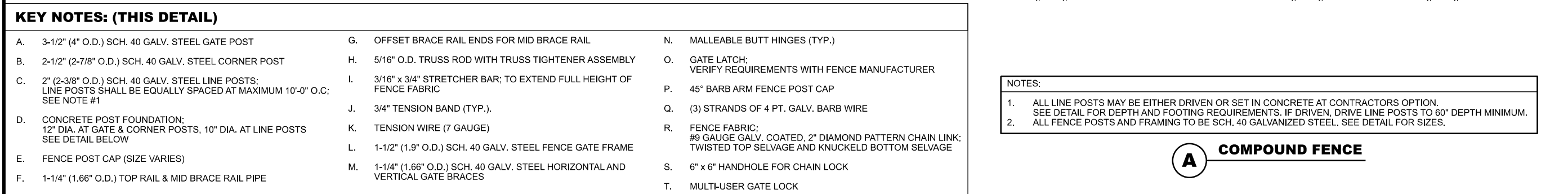


Diagram illustrating the components and structure of an Access Gate, showing a cross-section of the gate and surrounding fence system.

Key components and labels:

- REFER TO SPECIFICATIONS FOR REQUIREMENTS**: Points to the top section of the gate structure.
- ASR Number:**
- Contact:**
- Facility Name:**
- ACCESS GATE**: Label for the gate structure.

## C ANTENNA STRUCTURE REGISTRATION (ASR) SIGNAGE

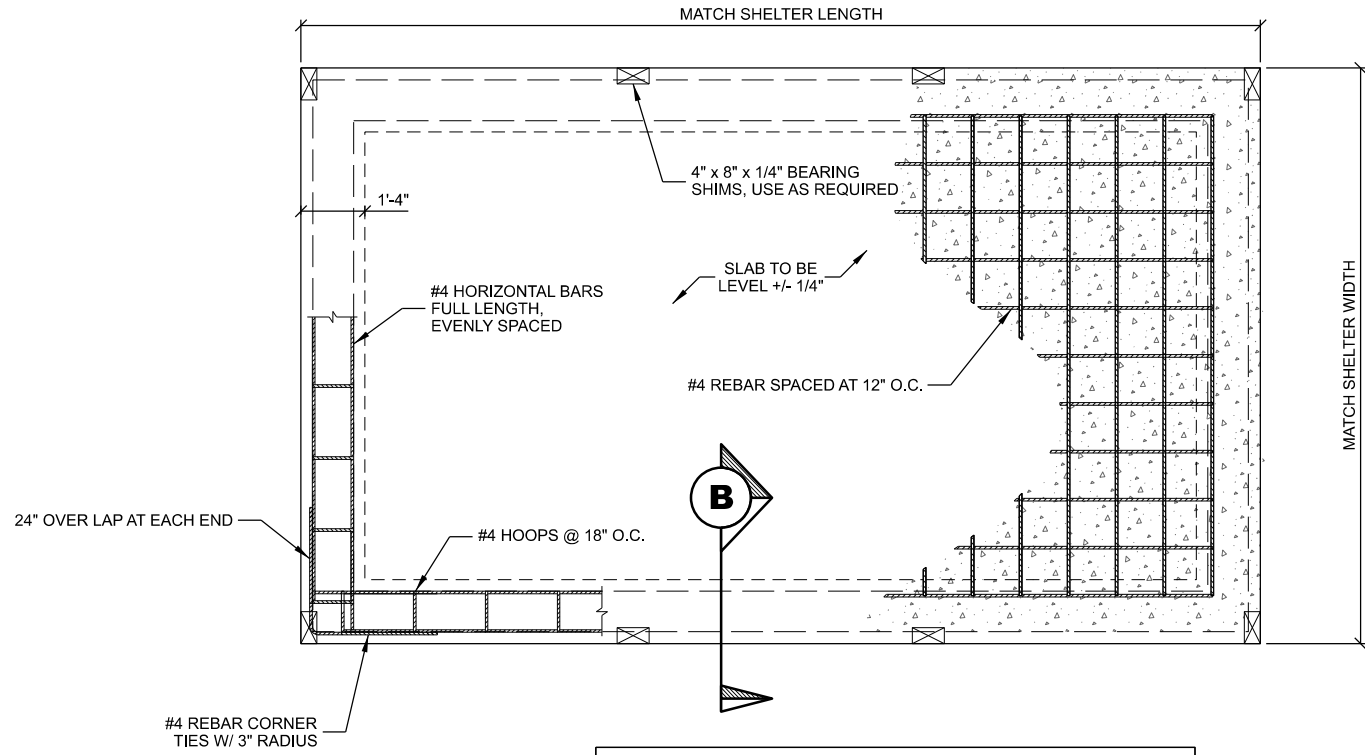
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CLIENT:

 **RACOM**  
critical communications

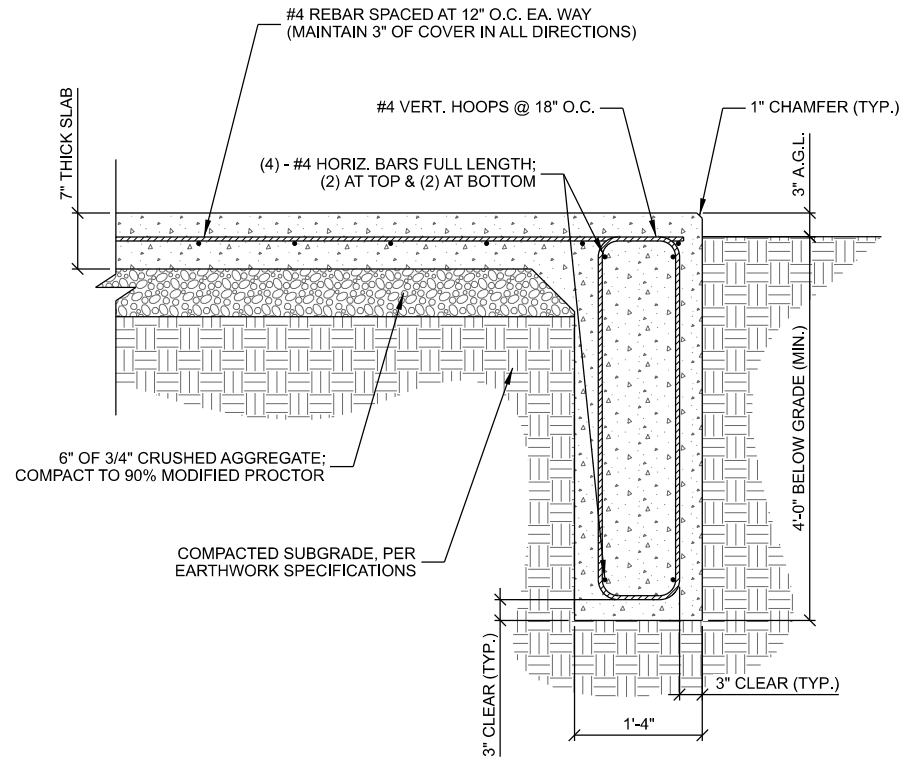
**FENCE DETAILS**  
**FENNIMORE GF2 (31987)**  
**FENNIMORE, WISCONSIN**

SUBMITTAL:		
INT.	DATE:	DESCRIPTION:
CHECKED BY	AJO	
PLOT DATE	6/20/2022	
PROJECT NUMBER	31987	
SET TYPE	BD	
SHEET NUMBER	<b>C-502</b>	

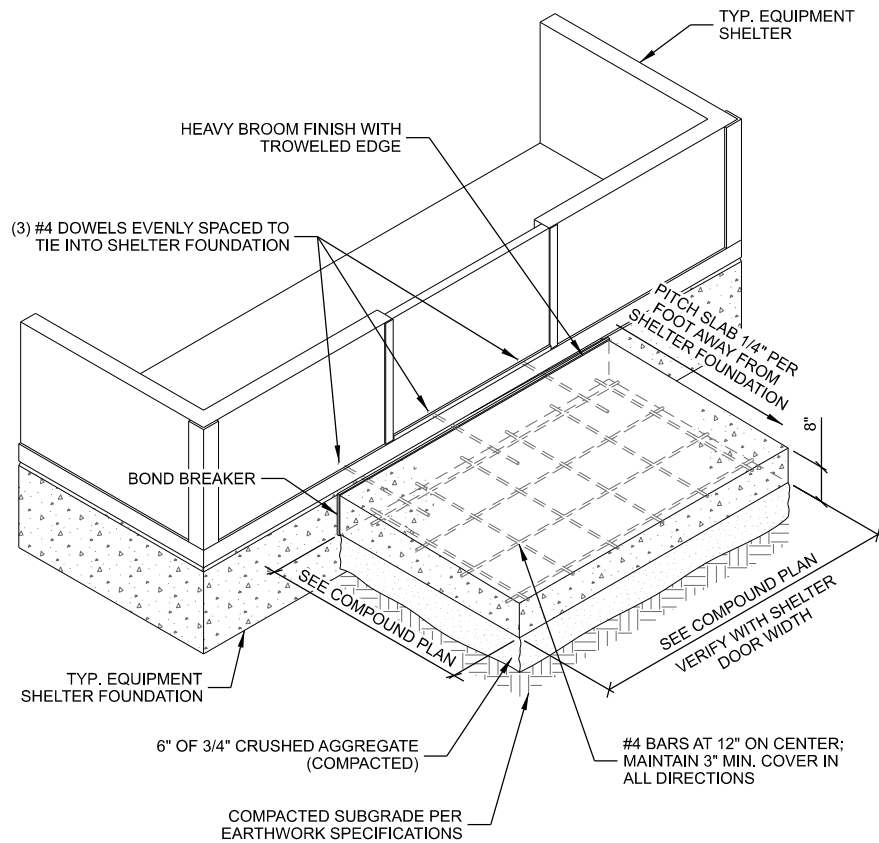


- NOTES:
1. BEARING SHIM: GALVANIZED STEEL, 4 EACH SIDE USE SHIMS AS REQUIRED TO ASSURE SHELTER IS BEARING AT PERIMETER.

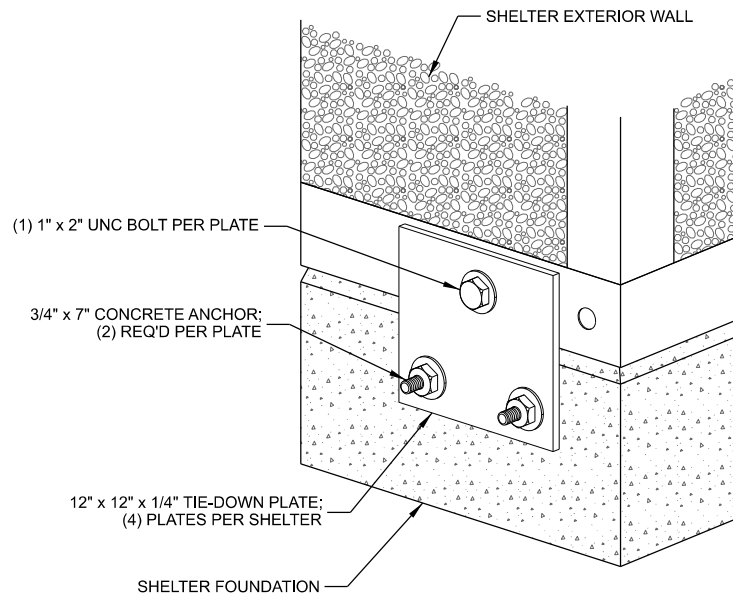
**A SHELTER FOUNDATION PLAN**  
SCALE: 11" x 17" - 1/4" = 1'-0"  
22" x 34" - 1/2" = 1'-0"



**B SHELTER FOUNDATION**  
SCALE: 11" x 17" - 1/2" = 1'-0"  
22" x 34" - 1" = 1'-0"



**C SHELTER STOOP**



**D TIE DOWN PLATE**

#### CONCRETE AND REINFORCING NOTES:

1. ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH LOCAL BUILDING CODE REQUIREMENTS AND MOST CURRENT VERSION OF ACI STANDARDS.
2. ALL CONCRETE UNLESS SPECIFICALLY NOTED SHALL BE NORMAL WEIGHT (145 PCF) AND SHALL ACHIEVE A 28-DAY COMPRESSIVE STRENGTH ( $f_c$ ) OF 4,000 PSI. EXPOSED EXTERIOR CONCRETE TO BE AIR ENTRAINED WITH 6% +/- 1% AIR CONTENT. CONTRACTOR TO PERFORM CONCRETE SLUMP TEST (4" MAX SLUMP). NO WATER TO BE ADDED AFTER SLUMP HAS BEEN MEASURED.
3. ALL CONCRETE REINFORCING SHALL BE ASTM A615 GRADE 60 AND PLACED IN ACCORDANCE WITH ACI STANDARDS
4. REMOVE ALL ORGANIC MATERIAL, SOFT AND/OR UNSUITABLE SOILS WITHIN FOUNDATION FOOTPRINT. DO NOT UTILIZE THESE SOILS FOR BACKFILL.
5. CONSULT GEOTECHNICAL INVESTIGATION REPORT FOR ANTICIPATED SOIL CONDITIONS AND CONSTRUCTION CONSIDERATIONS.
6. FOUNDATION DESIGN BASED ON A PRESUMPTIVE SOIL BEARING CAPACITY OF 2000 PSF AND MAX. PLASTICITY INDEX OF 20, CONTRACTOR TO CONFIRM BEARING SOILS MEET THESE CONDITIONS BEFORE INSTALLATION.
7. SOILS NOT MEETING THE DESIGN BEARING STRENGTH SHALL BE UNDERCUT AND REPLACED WITH 3-INCH BREAKER STONE. UNDERCUT ONE FOOT ON EACH SIDE OF THE FOOTING FOR EVERY FOOT IN DEPTH. CONSULT WITH ENGINEER FOR REQUIRED UNDERCUT DEPTH.
8. CONTRACTOR TO ENSURE POSITIVE DRAINAGE FROM ALL FOUNDATIONS.
9. FOUNDATION DESIGN BASED ON INFORMATION PROVIDED BY SHELTER MFG. (WEIGHT, LIVE LOAD, ETC.). CONTRACTOR TO VERIFY EXACT SHELTER SIZE AND TYPE.

CONSULTANT:

**Edge**  
Consulting Engineers, Inc.  
624 WATER STREET  
PRAIRIE DU SAC, WI 53578  
608.644.1449 VOICE  
608.644.1549 FAX  
www.edgesconsult.com

CLIENT:

**RACOM**  
critical communications

**SHELTER FOUNDATION DETAILS**  
FENNIMORE GF2 (31987)  
FENNIMORE, WISCONSIN

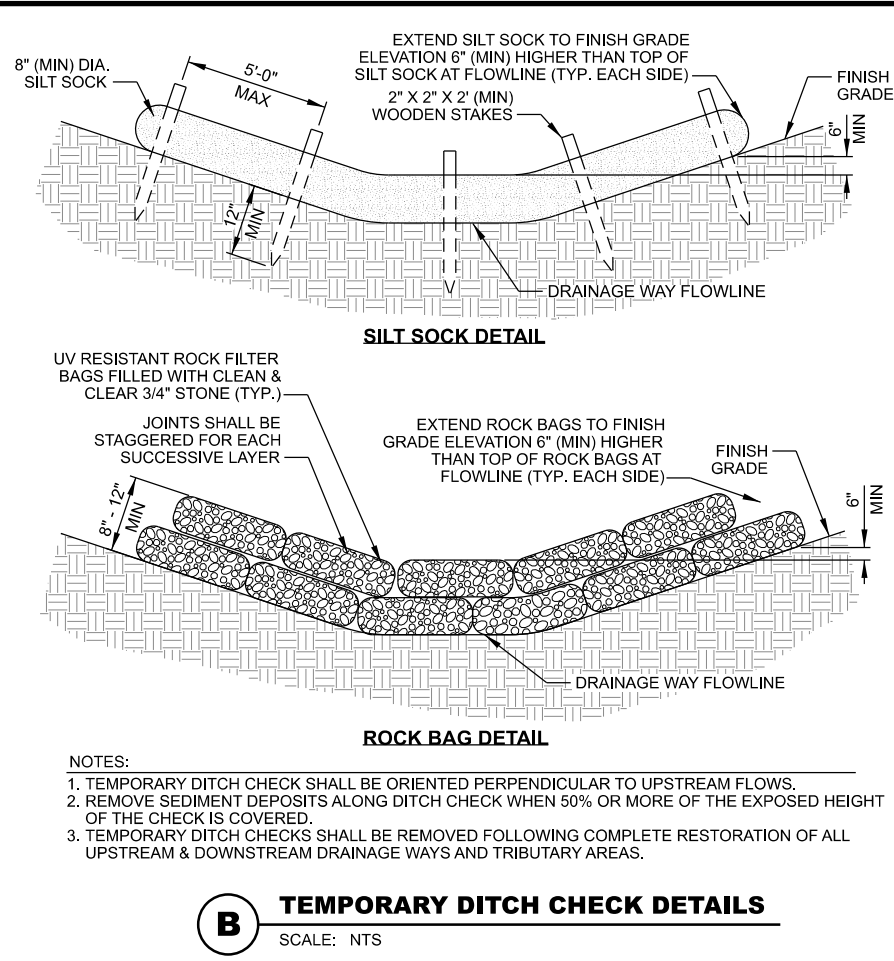
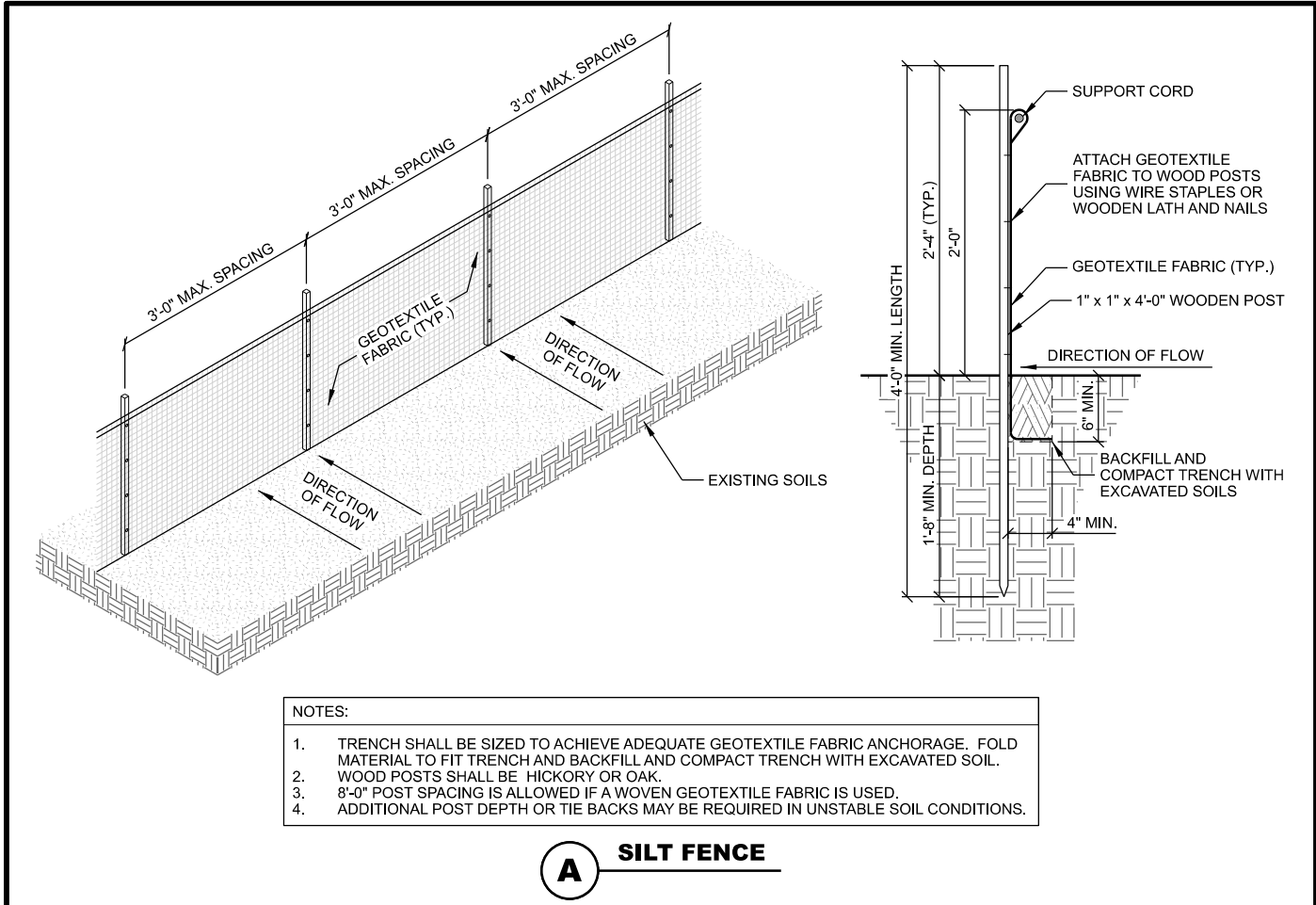
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INT.	DATE:	DESCRIPTION:

CHECKED BY:	AJO
PLOT DATE:	6/20/2022
PROJECT NUMBER:	31987
SET TYPE:	BD
SHEET NUMBER:	<b>C-503</b>







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**GRADING AND EROSION CONTROL DETAILS**  
**FENNIMORE GF2 (31987)**  
**FENNIMORE, WISCONSIN**

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PROJECT NUMBER:		31987
SET TYPE:		BD
SHEET NUMBER:		<b>C-505</b>



- A. RADIO EQUIPMENT RACK
- B. (1) 2" CONDUIT TO SHELTER;  
ELECTRIC SERVICE
- C. (1) 2" CONDUIT TO GENERATOR;  
GENERATOR POWER
- D. (1) 1" CONDUIT TO GENERATOR;  
GENERATOR CONTROL & ALARM
- E. (1) 1" CONDUIT TO GENERATOR;  
GENERATOR LOAD CENTER
- F. (1) 1" CONDUIT TO LP TANK;  
LP TANK LEVEL MONITOR
- G. QUICKNET FIBER ENCLOSURE (FWME8);  
20.25" W x 16.11" H x 3.52" D, (2 TOTAL)
- H. (2) 1-1/4" CONDUITS TO FIBER HANDOFF  
BY CONTRACTOR

1. CONTRACTOR TO FIELD VERIFY PENETRATION LOCATION  
DIMENSIONS WITH SUPPLIED BUILDING. DIMENSIONS  
SHOWN ARE APPROXIMATE.



©

4" PENETRATION &  
JUNCTION BOX

SHELTER DOOR —

## **A SHELTER FLOOR PLAN**

SCALE: 11" x 17" - 1/2" = 1'-0"  
22" x 34" - 1" = 1'-0"



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**SHELTER FLOOR PLAN**  
**FENNIMORE GF2 (31987)**  
**FENNIMORE, WISCONSIN**

SUBMITTAL:		
INT.	DATE:	DESCRIPTION:
CHECKED BY	AJO	
PLOT DATE	6/20/2022	
PROJECT NUMBER	31987	
SET TYPE	BD	
SHEET NUMBER	<b>A-101</b>	

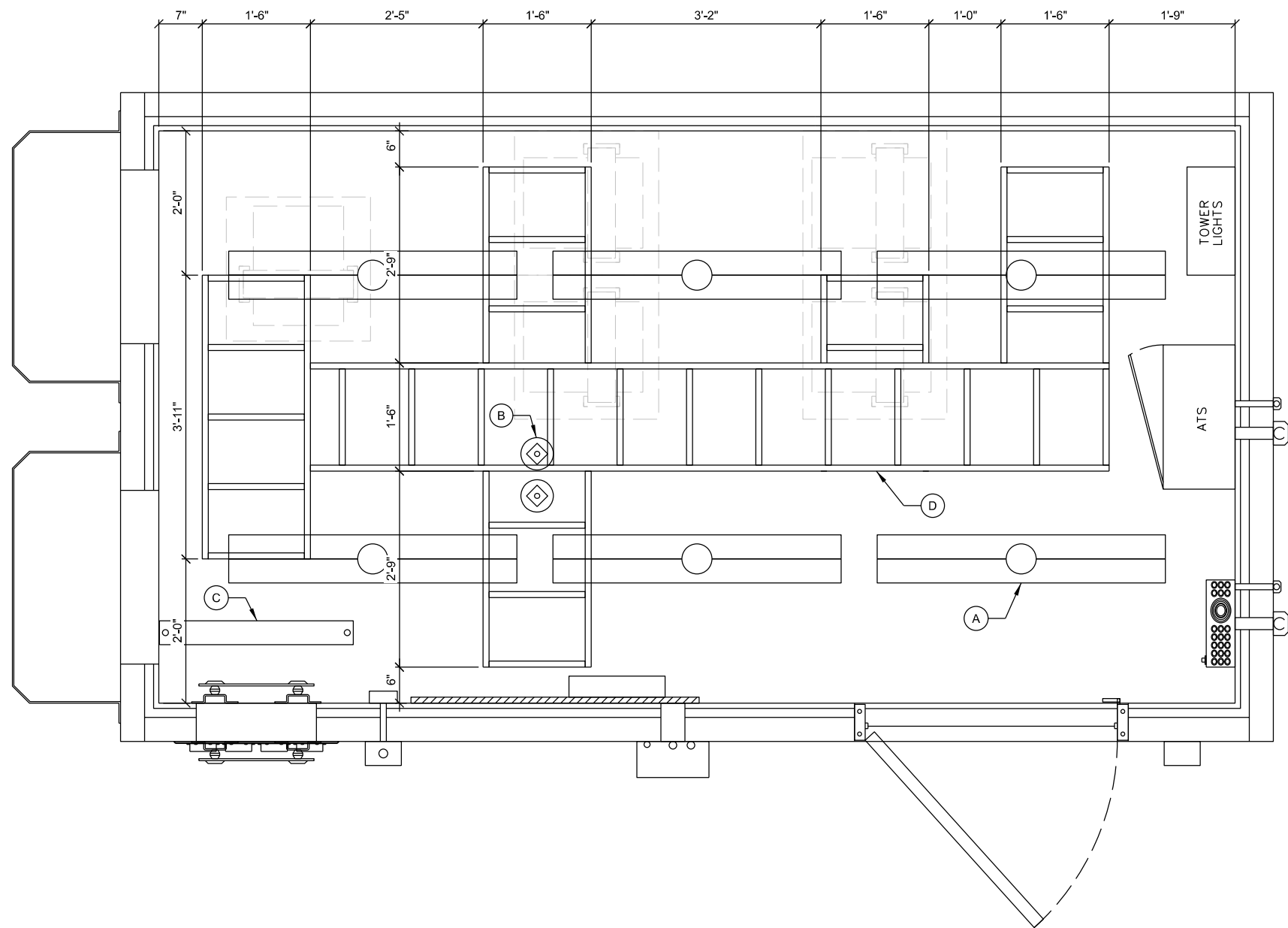


KEYNOTES: (THIS SHEET)

- A. 48" 2-BULB LIGHT FIXTURE
- B. SMOKE DETECTOR
- C. COAXIAL SURGE ARRESTOR TRAPEZE
- D. CABLE TRAY

GENERAL NOTES: (THIS SHEET)

- CONTRACTOR TO FIELD VERIFY PENETRATION LOCATION DIMENSIONS WITH SUPPLIED BUILDING. DIMENSIONS SHOWN ARE APPROXIMATE.



**A** **SHELTER CEILING PLAN**  
SCALE: 11" x 17" - 1/2" = 1'-0"  
22" x 34" - 1" = 1'-0"

CONSULTANT:

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**SHELTER CEILING PLAN**  
**FENNIMORE GF2 (31987)**  
**FENNIMORE, WISCONSIN**

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PROJECT NUMBER:	31987
SET TYPE:	BD
SHEET NUMBER:	<b>A-102</b>

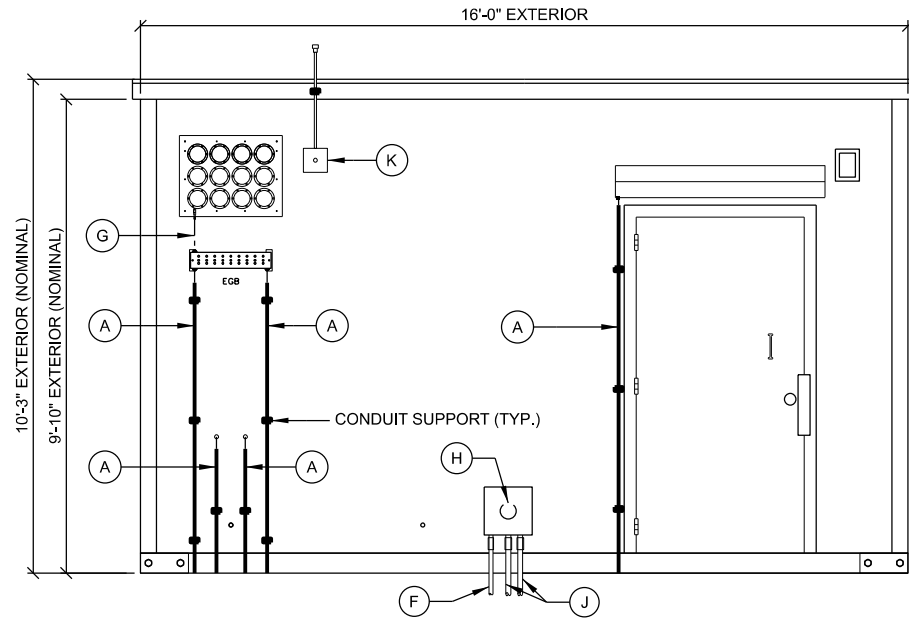


KEYNOTES: (THIS SHEET)

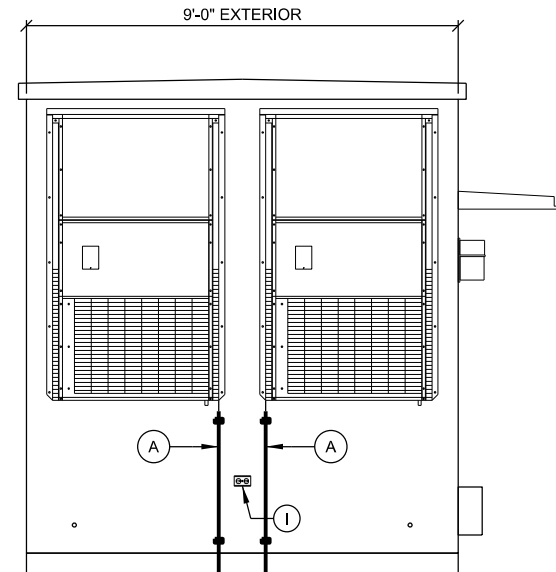
- A. #2 SOLID TINNED GROUND LEAD TO SITE GROUND SYSTEM. LEAD TO BE INSTALLED WITHIN CARFLEX CONDUIT. PROVIDE CONDUIT SUPPORT EVERY 30-INCHES. SECURE FASTENERS TO SHELTER WALL.
- B. 2" CONDUIT TO UTILITY RACK (AC POWER)
- C. 2" CONDUIT TO GENERATOR (AC POWER)
- D. 1" CONDUIT TO GENERATOR (CONTROL & ALARM)
- E. 1" CONDUIT TO GENERATOR (CONVENIENCE OUTLET)
- F. 1" CONDUIT TO LP TANK (REMOTE LEVEL MONITOR); CONNECT TO JUNCTION BOX
- G. #6 STRANDED INSULATED BONDING JUMPER TO ENTRY PORT PLATE
- H. 4" PENETRATION AND JUNCTION BOX
- I. EXTERIOR GFCI RECEPTACLE
- J. (2) 1-1/4" CONDUITS TO FIBER HANDHOLE BY CONTRACTOR
- K. TOWER LIGHTING JUNCTION BOX AND PHOTOCELL; SEE DETAIL D/E-504

GENERAL NOTES: (THIS SHEET)

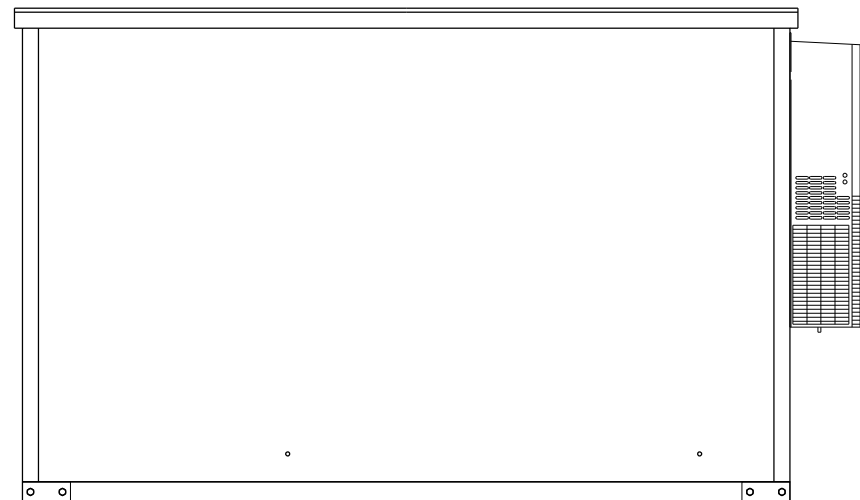
1. ALL PVC CONDUITS TO BUILDING TO INCLUDE SLIP JOINTS WHEN EXITING GRADE.
2. ALL CONDUITS ALONG SHELTER WALL TO BE PROVIDED WITH CONDUIT SUPPORTS AT +/- 30" INTERVALS.
3. ALL MECHANICAL GROUND CONNECTIONS TO UTILIZE 2-HOLE LUGS AND STAINLESS-STEEL HARDWARE. PROVIDE ANTI-OXIDANT COMPOUND BETWEEN LUG & CONNECTION POINT. USE COPPER ANTI-OXIDANT FOR COPPER-TO-COPPER CONNECTION.
4. SELF TAPPING SCREW GROUND CONNECTIONS ARE NOT ALLOWED.
5. ALL EXTERIOR METALLIC CONDUITS AND BOXES TO BE PROVIDED WITH GROUND BOND CONNECTION VIA THROUGH WALL HUB CONNECTION TO EXTERIOR GROUNDED DEVICE OR OTHER DIRECT CONNECTION TO GROUND SYSTEM.



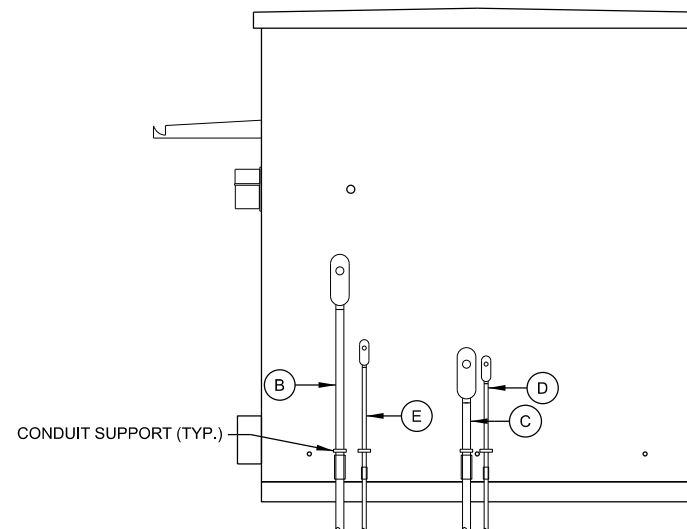
**A** EXTERIOR ELEVATION  
SCALE: 11" x 17" - 1/4" = 1'-0"  
22" x 34" - 1/2" = 1'-0"



**B** EXTERIOR ELEVATION  
SCALE: 11" x 17" - 1/4" = 1'-0"  
22" x 34" - 1/2" = 1'-0"



**C** EXTERIOR ELEVATION  
SCALE: 11" x 17" - 1/4" = 1'-0"  
22" x 34" - 1/2" = 1'-0"



**D** EXTERIOR ELEVATION  
SCALE: 11" x 17" - 1/4" = 1'-0"  
22" x 34" - 1/2" = 1'-0"

CONSULTANT:

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**SHELTER ELEVATIONS: EXTERIOR**  
**FENNIMORE GF2 (31987)**  
**FENNIMORE, WISCONSIN**

SUBMITTAL:

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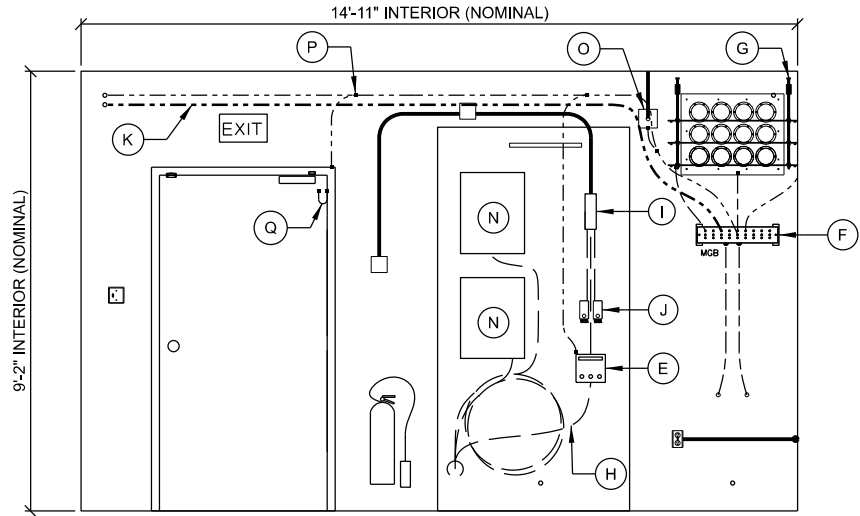
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PLOT DATE	6/20/2022
PROJECT NUMBER	31987
SET TYPE	BD
SHEET NUMBER	<b>A-201</b>

KEYNOTES: (THIS SHEET)

- A. AUTOMATIC TRANSFER SWITCH (ATS)  
INSTALL AT 6'-0" ABOVE FINISH FLOOR
- B. CONDUIT/RACEWAY BETWEEN ELECTRIC SERVICE  
DISCONNECT (SD), ATS & MTS
- C. BOND ALL DEVICE BOXES (ATS, TOWER LIGHTS, SPD1 &  
SPD2) TO HALO (#6 STRANDED INSULATED)
- D. GROUNDING HALO (#2 STRANDED INSULATED) MOUNTED ON  
NON-CONDUCTIVE STAND-OFFS 2-INCHES FROM WALL AND  
6-INCHES BELOW CEILING
- E. LP TANK REMOTE LEVEL MONITOR
- F. MASTER GROUND BAR. FOLLOW PANI SYSTEM FOR  
ORGANIZATION OF CONNECTIONS TO BAR
- G. COAXIAL SURGE PROTECTOR TRAPEZE GROUND SYSTEM
- H. ALARM WIRING
- I. R66 ALARM BLOCK
- J. HIGH & LOW TEMP ENVIRONMENTAL ALARMS
- K. NEUTRAL-GROUND BOND CONNECTION TIE TO MGB (#2  
STRANDED INSULATED). ROUTE ALONG PERIMETER WALL  
BELOW HALO OR ALONG CABLE TRAY
- L. POWER FAIL ALARM RELAY
- M. TOWER LIGHT CONTROLLER
- N. QUICKNET FIBER ENCLOSURE (FWME8);  
20.25" W x 16.11" H x 3.52" D, (2 TOTAL);  
(BY GRANT COUNTY)
- O. TOWER LIGHT JUNCTION BOX AND PENETRATION
- P. DOOR FRAME GROUND
- Q. DOOR PANEL GROUND (HINGE SIDE)

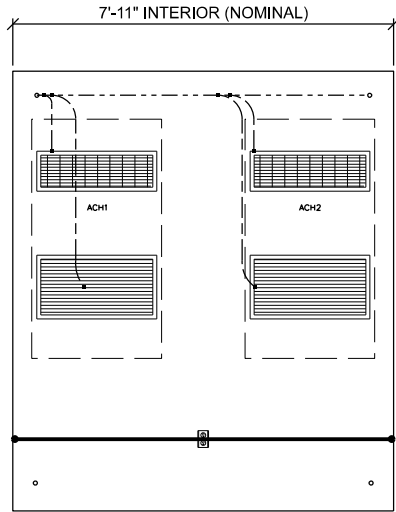
GENERAL NOTES: (THIS SHEET)

1. ALL INTERIOR CONDUITS TO BE RGS OR EMT. UTILIZE  
COMPRESSION FITTINGS FOR EMT INSTALLATIONS.
2. ALL MECHANICAL GROUND CONNECTIONS TO UTILIZE 2-  
HOLE LUGS AND STAINLESS-STEEL HARDWARE. PROVIDE  
ANTI-OXIDANT COMPOUND BETWEEN LUG & CONNECTION  
POINT. USE COPPER ANTI-OXIDANT FOR COPPER-TO-  
COPPER CONNECTION.
3. PROVIDE EMT CONDUIT FOR ALL ALARM AND LOW VOLTAGE  
WIRING FROM DEVICE TO ALARM BOARD. CONDUITS NEED  
NOT BE FULL LENGTH AND MAY UTILIZE CABLE TRAY FOR  
HORIZONTAL RUNS. CONDUITS SHALL EXTEND ABOVE AND  
OVER TO CABLE TRAY AND PROVIDE BUSHINGS ON ENDS.
4. ALL METALLIC CONDUITS AND BOXES TO BE GROUND  
BONDED TO HALO.



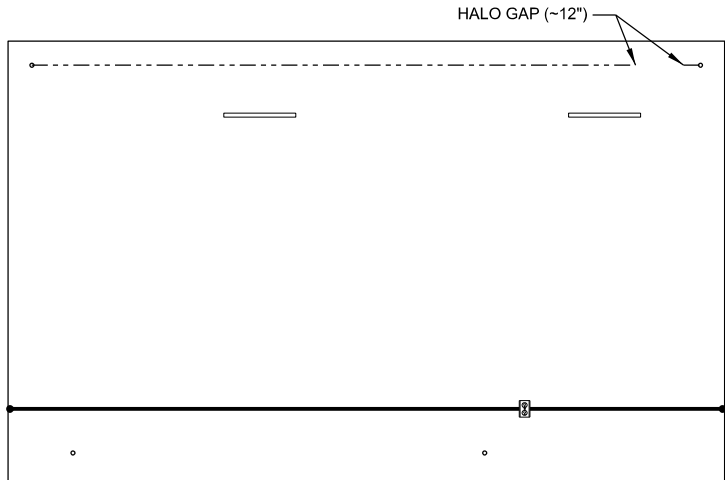
A INTERIOR ELEVATION

SCALE: 11" x 17" - 1/4" = 1'-0"  
22" x 34" - 1/2" = 1'-0"



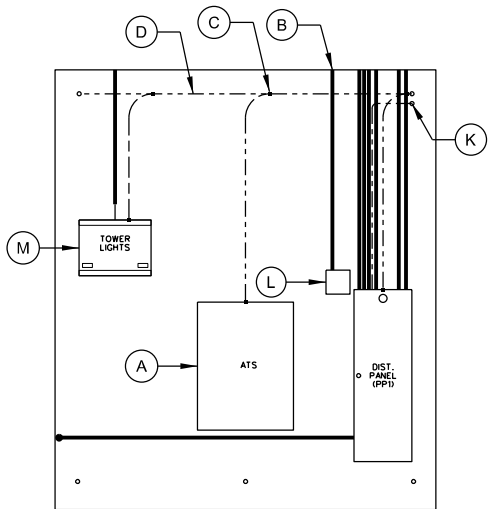
B INTERIOR ELEVATION

SCALE: 11" x 17" - 1/4" = 1'-0"  
22" x 34" - 1/2" = 1'-0"



C INTERIOR ELEVATION

SCALE: 11" x 17" - 1/4" = 1'-0"  
22" x 34" - 1/2" = 1'-0"



D INTERIOR ELEVATION

SCALE: 11" x 17" - 1/4" = 1'-0"  
22" x 34" - 1/2" = 1'-0"

CONSULTANT:



CLIENT:



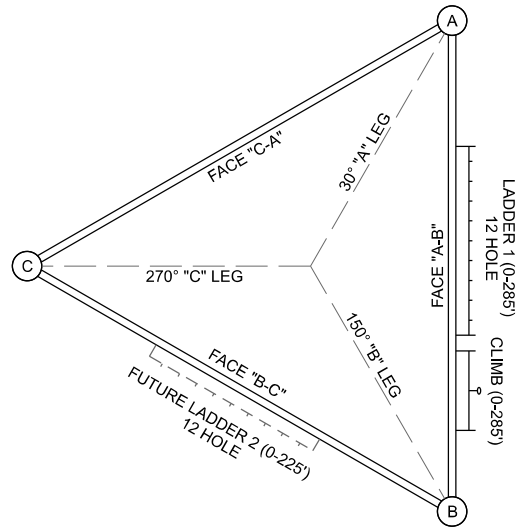
SHELTER ELEVATIONS: INTERIOR  
FENNIMORE GF2 (31987)  
FENNIMORE, WISCONSIN

SUBMITTAL:

INT.	DATE:	DESCRIPTION:

CHECKED BY:	AJO
PLOT DATE:	6/20/2022
PROJECT NUMBER:	31987
SET TYPE:	BD
SHEET NUMBER:	A-202





**A** TOWER ORIENTATION

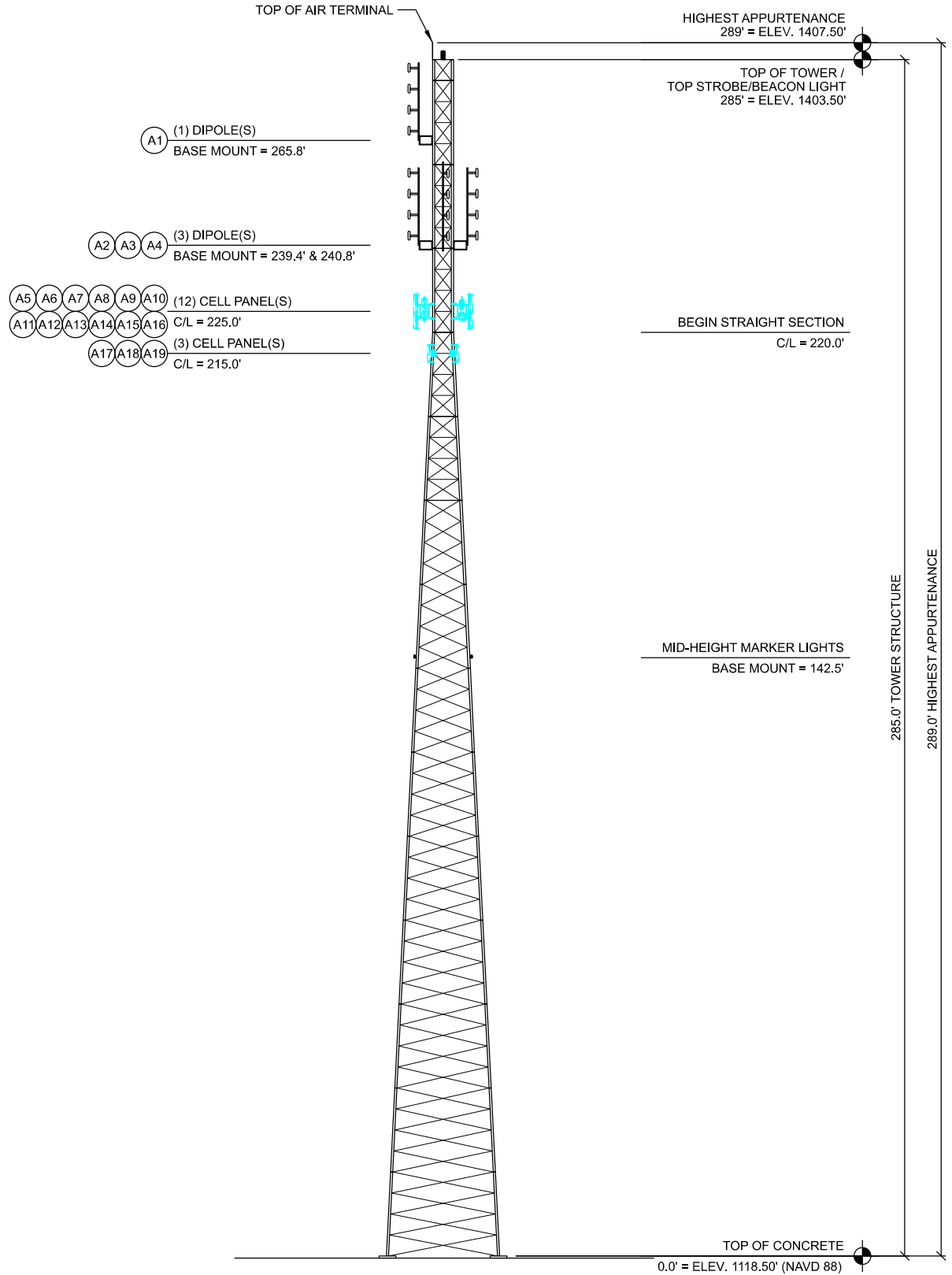
**TOWER LOADING**

ANTENNA ID	ANTENNA TYPE	(QTY.) ANTENNA MODEL SIZE & WEIGHT	TOWER LEG	ANTENNA MOUNT SIZE & WEIGHT	MOUNT HEIGHT (T.O.C.)	C/L HEIGHT (T.O.C.)	C/L ELEV. (NAVD 88)	ANTENNA AZIMUTH	TLT (+/-)	Tx LINE (QTY.) SIZE	FREQUENCY (MHz)	OWNER USE	NOTES
A1	Dipole	Sinclair SD214-HF2P2LDF(D00B) 18.5' tall, 4 bays 109 lbs.	A	S-300 Stand-Off 36" long, 24" high 28 lbs.	265.8'	275.0'	1393.5'	0°	0°	(1) 7/8"		Grant Co. P25 Rx	
A2	Dipole	Sinclair SD214-HF2P2LDF(D00B) 18.5' tall, 4 bays 109 lbs.	A	S-300 Stand-Off 36" long, 24" high 28 lbs.	240.8'	250.0'	1368.5'	0°	0°	(1) 7/8"		Grant Co. P25 Tx	
A3	Dipole	Sinclair SD214-HF2P2LDF(D00B) 18.5' tall, 4 bays 109 lbs.	C	S-300 Stand-Off 36" long, 24" high 28 lbs.	240.8'	250.0'	1368.5'	0°	0°	(1) 7/8"		Grant Co. Fire Paging Tx	
A4	Dipole	Commscope DB-224A 21.25' tall, 4 bays 35 lbs.	B	S-300 Stand-Off 36" long, 24" high 28 lbs.	239.4'	250.0'	1368.5'			(1) 7/8"		Grant Co. IFFRN	
A5 - A16	Panel	(12) Panel Antennas 8' x 20" x 8"	A, B, C	(3) 12'-6" V-Frames	225.0'	225.0'	1343.5'			(12) 1-5/8"		Future	(9) RRUs
A17 - A19	Panel	(3) Panel Antennas 4' x 20" x 8"	A, B, C	Leg Mounted	215.0'	215.0'	1333.5'			(2) 1-5/8"		Future	(2) RRUs

NOTES:

- TOWER TO BE ANALYZED FOR FULL CAPACITY LOADING (PROPOSED AND FUTURE).
- TOWER TO BE DESIGNED AS STRUCTURE CLASS III. REFER TO SPECS FOR OTHER REQUIREMENTS.
- ANTENNA LOADING IS BASED ON GRANT CO - PHASE 3 - ANTENNA & LINE DETAILS - REV 5.

**B** TOWER LOADING SUMMARY



NOTES:

- ALL DIMENSIONS SHOWN ARE REFERENCED FROM THE TOP OF TOWER FOUNDATION.
- TOWER TO BE EQUIPPED WITH E-1 LIGHTING KIT. LIGHTING SYSTEM TO BE COMPLETELY LED BASED. SPECIFICALLY DESIGNED FOR USE IN RF ENVIRONMENTS WITH NO INTERFERENCE. LIGHTS TO INCLUDE INFRARED EMITTERS AS REQUIRED BY CURRENT FAA LIGHTING REQUIREMENTS.
- AIR TERMINAL MOUNT TO BE BOLTED DIRECTLY TO TOWER STEEL. AIR TERMINAL TO BE BONDED TO AIR TERMINAL MOUNT.
- CONTRACTOR TO INSTALL TEMPORARY TOWER LIGHTING WHEN TOWER CONSTRUCTION REACHES 200'.
- TOP TOWER LIGHT TO BE INSTALLED ON MAST PIPE ABOVE TOP ANTENNA. NOTHING THAT IS 7/8" DIA OR MORE SHALL EXTEND ABOVE TOWER LIGHT.

**C** TOWER PROFILE (ELEVATION)

CONSULTANT:



CLIENT:



**TOWER LOADING / ELEVATION**  
**FENNIMORE GF2 (31987)**  
**FENNIMORE, WISCONSIN**

SUBMITTAL:

INT.	DATE	DESCRIPTION:

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PLOT DATE:	6/20/2022
PROJECT NUMBER:	31987
SET TYPE:	BD
SHEET NUMBER:	<b>T-201</b>

LEGEND: (THIS SHEET)

SIZE	SYMBOL	O.D.	MIN. BEND RAD.
1-5/8"		1.98"	20"
1-1/4"		1.55"	15"
7/8"		1.09"	10"
1/2"		0.63"	5"
CAT5		0.35"	3"
EW63		2"x1.16"	20"
EWP90-107		1.3"x0.8"	13"
LMR-400		0.4"	1"

LADDER #1 (COUNTY) 0' - 285'

LADDER #2 (FUTURE) 0' - 225'

ANTENNA ID:  
SEE T-201 FOR DETAILS

NOTES:

1. REFER TO SHEET T-201 FOR ANTENNA ID REFERENCE AND LADDER INSTALLATION LOCATION.

2. DOUBLE STACKING OF 1-5/8" AND TRIPLE STACKING OF 7/8" COAX IS ALLOWED.

3. DOUBLE STACKING OF WAVEGUIDE IS ALLOWED WHEN USING CUSHION TYPE SNAP IN HANGERS.

4. GROUP LINES WITHIN LADDERS FOR SIMILAR TERMINATION LEVEL. SEPARATE WAVEGUIDE FROM COAX.

5. PROVIDE & INSTALL PROPERLY SIZED SNAP-INS FOR EACH COAX.

6. TOWER LOADING DESIGN SHALL ASSUME (3) COAX LADDERS INSTALLED

A

TRANSMISSION LINE LADDER ROUTING

ENTRY PANEL 1  
(AS VIEWED FROM INSIDE SHELTER)

ENTRY PANEL PORT ASSIGNMENT

PORT #	ANTENNA ID	ANTENNA SYSTEM	(QTY.) CABLE SIZE
1	N/A	GPS	
2			
3			
4	N/A	GPS	
5	A4	IFERN	(1) 7/8"
6	A3	FIRE PAGING	(1) 7/8"
7	A2	GRANT CO P25 Tx	(1) 7/8"
8	A1	GRANT CO P25 Rx	(1) 7/8"
9			
10			
11			
12			

NOTES:

1. REFER TO SHEET T-201 FOR ANTENNA ID REFERENCE

2. PORT OPENINGS ARE 4" DIA UNLESS OTHERWISE NOTED.

3. PROVIDE AND INSTALL PROPERLY SIZED BOOTS, CUSHIONS AND PLUGS FOR EACH PORT OPENING INSIDE AND OUTSIDE OF SHELTER.

4. ALL UNUSED PORTS ON ALL ENTRY PANELS TO BE CAPPED & SECURED IN PLACE W/ BLACK CABLE TIE.

B

ENTRY PANEL ROUTING

3/4" DIA. HOLES FOR SNAP-IN TYPE COAX HANGERS

HARDWARE PROVIDED FOR FOUR ATTACHMENT POINTS PER SECTION

TOWER GIRT OR DIAGONAL

20' MAX. SECTION LENGTH

5" MAX.

C

VERTICAL TRANSMISSION LINE LADDER

INDOOR

OUTDOOR

12" +/-

SHELTER ROOF

INTERIOR GROUND HALO

SURGE PROTECTION DEVICE (POLYPHASERS)

COAX ROUTING INSIDE BUILDING

ARRESTOR TRAPEZE SYSTEM & CONNECTION TO INTERIOR MASTER GROUND BAR (BY CONTRACTOR) SITE PRO 1 MODEL #: ATK306U OR APPROVED EQUAL

INDEPENDENT GROUND LEADS TO MGB (#2 STRANDED INSULATED); 1 LEAD REQUIRED IF BONDED SYSTEM

INTERIOR MASTER GROUND BAR

SHELTER WALL

ENTRY PANEL PORT

GROUND KIT

GROUND CABLE BEFORE ENTERING BUILDING USING #6 AWG GROUND LEAD

EXTERIOR SHELTER GROUND BAR

D

CABLE ENTRY

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CONSULTANT:

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TRANSMISSION LINE INSTALLATION DETAILS

FENNIMORE GF2 (31987)

FENNIMORE, WISCONSIN

SUBMITTAL:

INT.	DATE:	DESCRIPTION:

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AJO

PLOT DATE:

6/20/2022

PROJECT NUMBER:

31987

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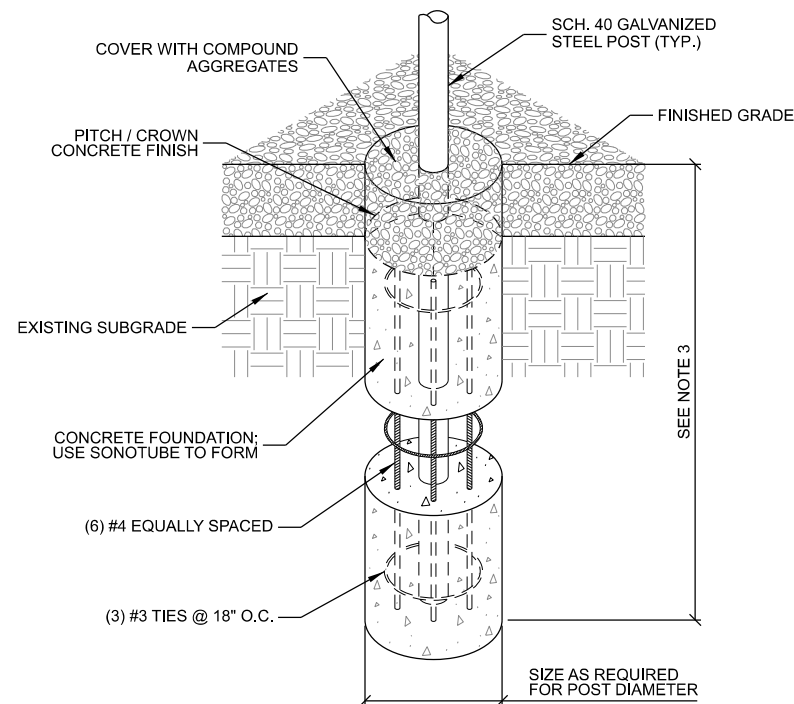
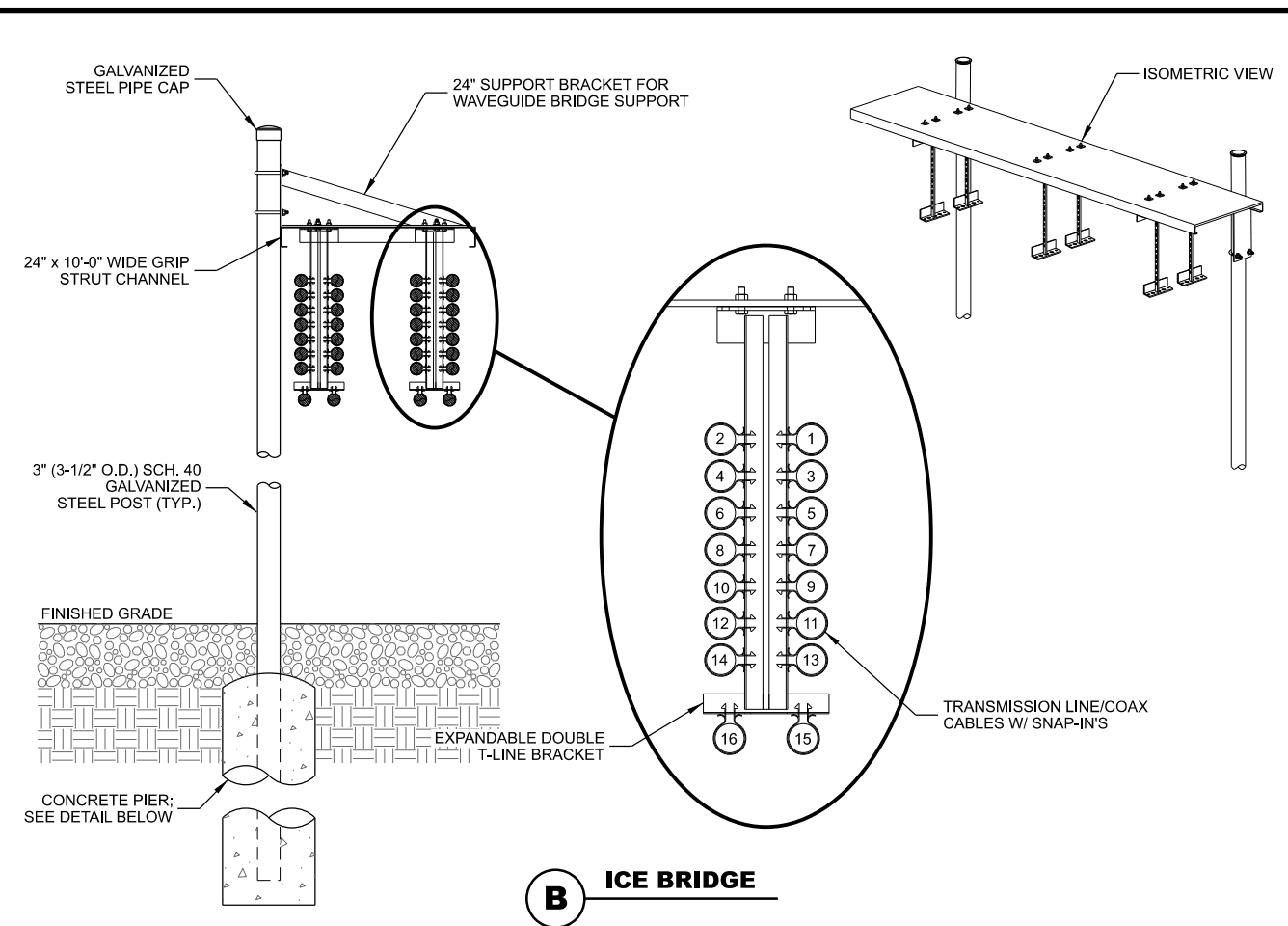
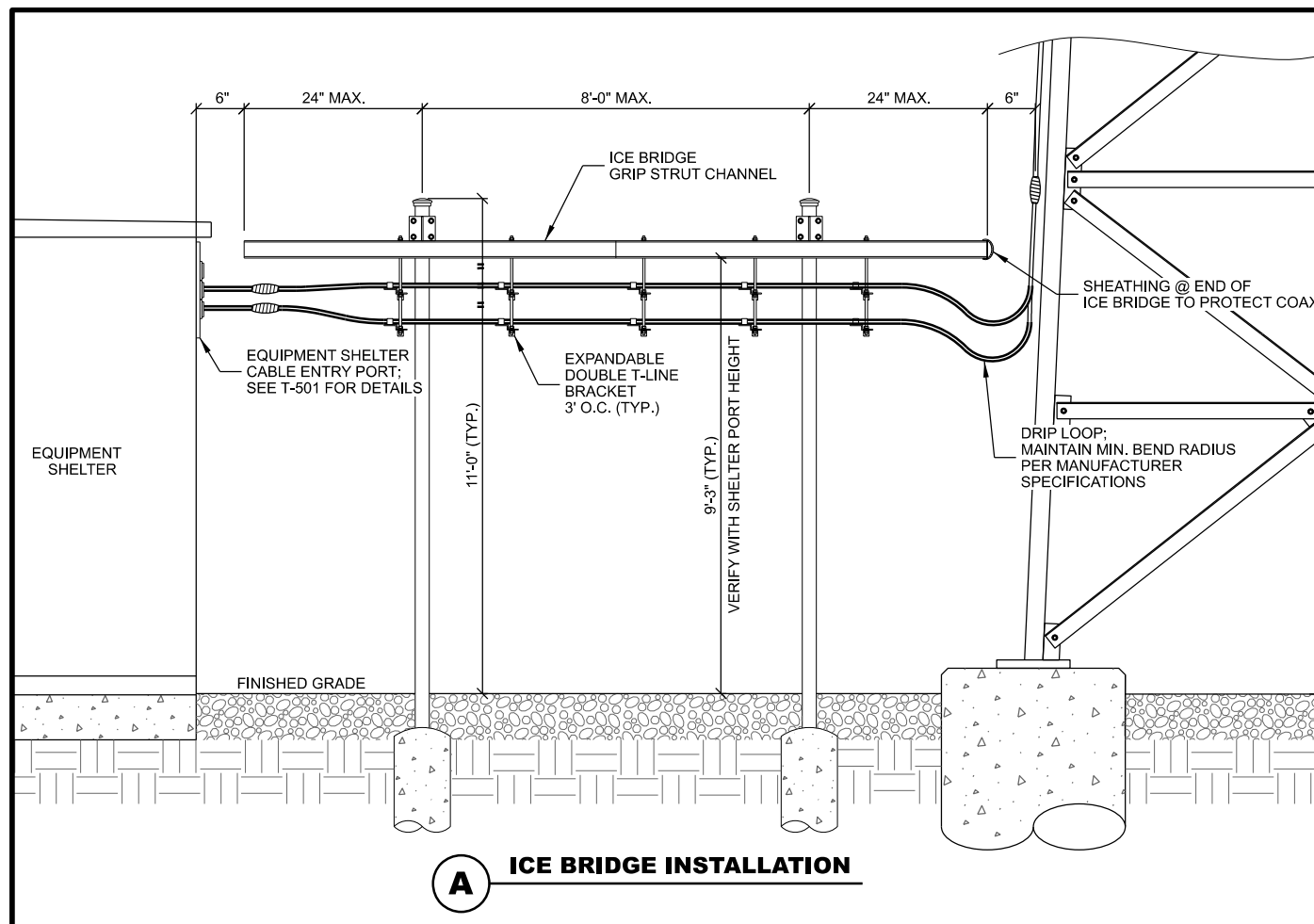
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SHEET NUMBER:

T-501

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- ICE BRIDGE NOTES : (THIS SHEET)**

1. FOR COMPONENTS AS SHOWN IN STANDARD DETAILS, MAXIMUM ALLOWABLE SPAN BETWEEN SUPPORTS ON A CONTINUOUS SINGLE SECTION OF BRIDGE CHANNEL SHALL BE 8' FOR A 10' SECTION.
2. SPLICES IN SECTIONS OF BRIDGE CHANNEL SHALL BE INSTALLED AT SUPPORTS, WHERE POSSIBLE, OR AT MOST 2' FROM A SUPPORT.
3. FREE ENDS OF ICE BRIDGE CHANNELS SHALL NOT EXCEED A CANTILEVER DISTANCE OF 2' FROM A SUPPORT.
4. CUT BRIDGE CHANNEL SECTIONS SHALL HAVE RAW EDGES TREATED WITH COLD GALVANIZING SPRAY.
5. DEVIATIONS FROM STANDARDS FOR COMPONENT INSTALLATIONS ARE PERMITTED WITH MANUFACTURER'S AND ENGINEER'S APPROVAL.
6. DEVIATIONS FROM ICE BRIDGE FOUNDATIONS SHOWN ON SITE SPECIFIC DRAWINGS OR STANDARD DETAILS REQUIRE ENGINEERING APPROVAL.
7. INSTALL PROTECTIVE SHEATHING AT TOWER END OF ICE BRIDGE TO PROTECT CABLING.

CONSULTANT:

CLIENT:



**ICE BRIDGE DETAILS**  
**FENNIMORE GF2 (31987)**  
**FENNIMORE, WISCONSIN**

SUBMITTAL:		
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SHEET NUMBER	<b>T-502</b>	

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GROUNDING LEGEND: (THIS SHEET)

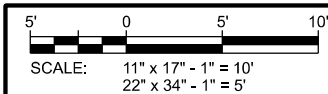
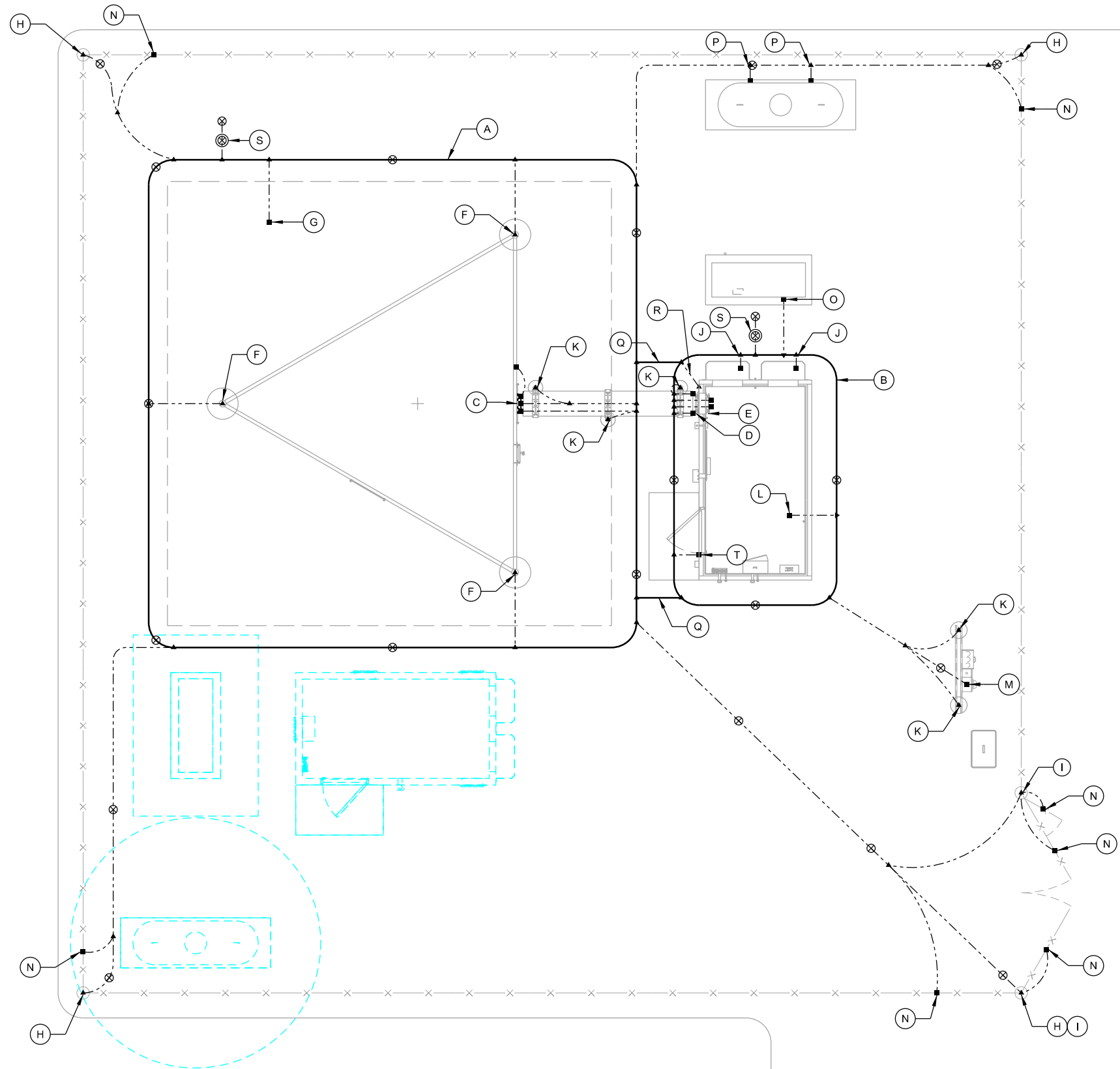
- ⊗ GROUND TEST WELL, SEE E-502 FOR DETAILS
- ⊗ COPPER CLAD GROUND ROD, (5/8" DIA. x 10' LONG)  
SPACE @ 2X GOUND ROD LENGTH (20' O.C. MAX., 6' MIN.)
- ⊗ COPPER PLATE, (18" x 18" x 0.032" THK)  
SPACE @ 2X GOUND ROD LENGTH (20' O.C. MAX., 6' MIN.)
- ▲ EXOTHERMIC OR UL RATED IRREVERSIBLE CONNECTION  
(CADWELD OR HYGROUND)
- MECHANICAL CONNECTION  
(BURNDY 2-HOLE LUG OR APPROVED EQUAL)
- #2 AWG BARE SOLID TINNED COPPER CONDUCTOR  
IN STANDARD GROUND TRENCH, SEE E-502 FOR DETAILS
- #2/0 AWG BARE STRANDED TINNED COPPER CONDUCTOR  
IN STANDARD GROUND TRENCH, SEE E-502 FOR DETAILS
- #2/0 AWG BARE STRANDED TINNED COPPER CONDUCTOR  
IN ENHANCED GROUND TRENCH, SEE E-502 FOR DETAILS

KEYNOTES: (THIS SHEET)

- A. TOWER GROUND RING, MAINTAIN 2' SEPARATION FROM TOWER FOUNDATION
- B. SHELTER GROUND RING, MAINTAIN 2' SEPARATION FROM SHELTER FOUNDATION
- C. TOWER GROUND BAR, (2) LEADS TO TOWER GROUND RING & (1) TO TOWER STEEL; SEE DETAIL D/E-501
- D. EXTERIOR SHELTER GROUND BAR, (2) LEADS TO SHELTER GROUND RING; SEE DETAIL F/E-502
- E. INTERIOR SHELTER GROUND BAR (MGB), (2) LEADS TO SHELTER GROUND RING; SEE DETAIL F/E-502
- F. TOWER STEEL GROUND, (1) PER LEG REQ'D. EXOTHERMIC WELD TO LEG GROUND TAB; SEE E-501 FOR DETAILS
- G. TOWER FOUNDATION GROUND; SEE E-502 FOR DETAILS
- H. FENCE CORNER POST GROUND; SEE E-502 FOR DETAILS
- I. FENCE GATE GROUND; SEE E-502 FOR DETAILS
- J. SHELTER EXTERIOR AC UNIT GROUND; SEE A-201 FOR DETAILS
- K. ICE BRIDGE/UTILITY POST GROUND; SEE E-501 FOR DETAILS
- L. SHELTER FOUNDATION GROUND; SEE E-502 FOR DETAILS
- M. A/C METER BOX GROUND
- N. FENCE FABRIC & DETERRENT WIRING BONDING; SEE E-502 FOR DETAILS
- O. GENERATOR ENCLOSURE GROUND, (1) LEAD
- P. LP TANK LEG GROUND (EACH LEG), 2-HOLE LUG
- Q. SHELTER GROUND RING TO TOWER GROUND RING, (2) LEADS
- R. SHELTER ANCHOR TAB GROUND. CLOSEST TAB TO RF ENTRY PORT (1 REQ'D)
- S. GROUND TEST WELL; SEE DETAIL C/E-502 FOR DETAILS
- T. SHELTER AWNING GROUND. TIE TO SHELTER GROUND RING.

GENERAL NOTES: (THIS SHEET)

1. ALL EXTERIOR GROUNDING SHALL MEET OR EXCEED THE CURRENT HARRIS SITE GROUNDING AND LIGHTNING PROTECTION GUIDELINES. REFER TO INSTALLATION MANUAL AE/LZT 123 4618/1 REV F (JUNE 2017).
2. THE GROUNDING SYSTEM & CONDUCTORS SHALL BE TESTED BY CONTRACTOR PRIOR TO BACKFILLING. SYSTEM SHALL PROVIDE 3 OHM OR LESS RESISTANCE UPON COMPLETION.
3. ALL NON-INSULATED GROUND LEADS EXTENDING ABOVE GROUND LEVEL SHALL BE ENCASED IN 1/2" PVC & SEALED WITH SILICONE.
4. GROUND RINGS & TOP OF RODS SHALL BE INSTALLED AT 30" BELOW FINISHED GRADE. (SEE DETAIL A/E-501)
5. INSTALL 18"X18" COPPER PLATES IN LIEU OF GROUND RODS WHEN INSTALLING OVER TOWER FOUNDATION OR WHERE DRIVING GROUND RODS IS NOT FEASIBLE. REFER TO GEOTECH REPORT FOR SOIL CONDITIONS.
6. ALL MECHANICAL GROUND CONNECTIONS TO UTILIZE 2-HOLE LUGS AND STAINLESS-STEEL HARDWARE. PROVIDE ANTI-OXIDANT COMPOUND BETWEEN LUG & CONNECTION POINT. USE COPPER ANTI-OXIDANT FOR COPPER-TO-COPPER CONNECTIONS. SELF-TAPPING SCREWS ARE NOT ALLOWED.
7. ALL ABOVE GRADE CADWELD CONNECTIONS (TO GALVANIZED ITEMS) SHALL BE SPRAYED WITH COLD GALVANIZING COMPOUND TO PREVENT CORROSION.



CONSULTANT:



CLIENT:



**GROUNDING PLAN**  
**FENNIMORE GF2 (31987)**  
**FENNIMORE, WISCONSIN**

SUBMITAL:

INT.	DATE:	DESCRIPTION:

CHECKED BY:	AJO
PLOT DATE:	6/20/2022
PROJECT NUMBER:	31987
SET TYPE:	BD

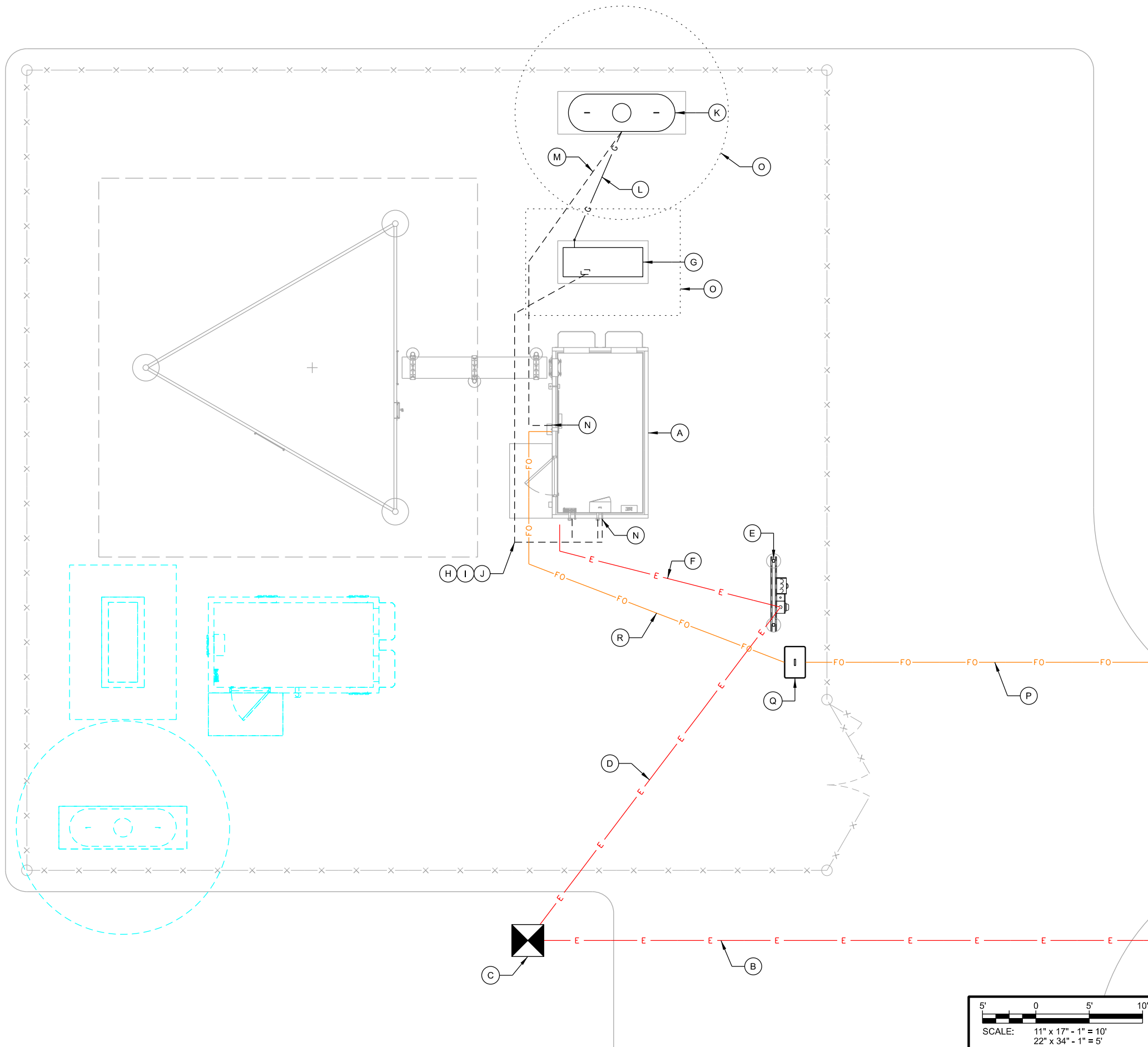
SHEET NUMBER **E-101**

KEYNOTES: (THIS SHEET)

- A. EQUIPMENT SHELTER
- B. PRIMARY ELECTRIC UTILITY SERVICE (SEE C-102 FOR DETAILS) INSTALLED BY UTILITY PROVIDER
- C. GROUND MOUNTED ELECTRIC TRANSFORMER INSTALLED BY UTILITY PROVIDER
- D. 600A 120/240V 1P SECONDARY ELECTRIC SERVICE TO UTILITY RACK. (2) 4" CONDUITS (RNMC) INSTALLED BY CONTRACTOR; COORDINATE INSTALLATION WITH UTILITY PROVIDER
- E. UTILITY RACK INSTALLED BY CONTRACTOR; SEE E-505 FOR DETAILS
- F. 200A 120/240V 1P ELECTRIC SERVICE TO EQUIPMENT BUILDING; (1) 2" CONDUIT (RNMC) INSTALLED BY CONTRACTOR
- G. 36kW GENERATOR ON CONCRETE SUPPORT SLAB; SEE C-504 FOR DETAILS
- H. GENERATOR AC ELECTRIC; (1) 2" CONDUIT (RNMC)
- I. GENERATOR CONTROL & ALARM; (1) 1" CONDUIT (RNMC)
- J. GENERATOR LOAD CENTER; (1) 1" CONDUIT (RNMC)
- K. 500 GAL. LP TANK, SEE C-504 FOR DETAILS
- L. LP FUEL LINE, SEE E-505 FOR DETAILS
- M. REMOTE LP FUEL TANK LEVEL MONITOR CONDUIT; (1) 1" CONDUIT (RNMC)
- N. STUB ALL CONDUITS ON OUTSIDE OF CONCRETE FOUNDATION. ALL OUTSIDE BUILDING PENETRATIONS TO BE WEATHERPROOF LB, SEE E-503 FOR DETAILS
- O. UTILITY SETBACK / CLEARANCES. 3' AROUND GENERATOR. 10' AROUND LP TANK VALVE
- P. FIBER OPTIC CONDUITS BY GRANT COUNTY (2) 1-1/4" CONDUITS (RNMC)
- Q. FIBER HANDHOLE BY GRANT COUNTY; SEE DETAIL E/E-504
- R. FIBER OPTIC CONDUITS BY CONTRACTOR; (2) 1-1/4" CONDUITS (RNMC)

GENERAL NOTES: (THIS SHEET)

- CONTRACTOR SHALL FIELD VERIFY DEPTHS, LOCATIONS, & SIZES OF ALL EXISTING UTILITIES.
- ALL UTILITIES SHALL BE INSTALLED ACCORDING TO STATE AND LOCAL REQUIREMENTS.
- ALL ELECTRICAL WORK SHALL CONFORM TO NATIONAL, STATE, AND LOCAL CODES.
- ALL UNDERGROUND TRENCHING, PIPE AND CONDUIT INSTALLATION TO BE COMPLETED PRIOR TO FINAL SUBGRADE COMPACTION AND AGGREGATE INSTALLATION.
- ALL CONDUCTORS TO BE COPPER.
- ALL UNDERGROUND ELECTRICAL & TELCO CONDUITS TO BE SCH. 80 PVC UNLESS OTHERWISE REQUIRED BY THE UTILITY PROVIDER.
- ALL OUTDOOR ABOVE GRADE EXPOSED ELECTRICAL CONDUIT RUNS TO BE RIGID GALVANIZED STEEL (RGS). ALL BELOW GRADE CONDUIT STUB UPS TO BE SCH 80 PVC WITH SLIP JOINT.
- REFERENCE MANUFACTURER AND CATALOG NUMBERS ARE USED FOR QUALITY AND PERFORMANCE ONLY. EQUIPMENT MFR. BY OTHERS ARE EQUALLY ACCEPTABLE PROVIDED THEY MEET OR EXCEED THE SPEC.
- PROVIDE AND INSTALL ALL NECESSARY WIRING AND CONDUITS FROM EXTERIOR ELECTRICAL ITEMS TO DISTRIBUTION PANEL WITHIN EQUIPMENT BUILDING.
- ALL CONDUIT STUBS IN BUILDINGS & PULL BOXES TO BE IDENTIFIED AND LABELED.
- PROVIDE PULL STRINGS IN ALL CONDUITS.
- ALL INDOOR EXPOSED CONDUIT TO BE METALLIC (EMT OR RGS). COMPRESSION FITTINGS ARE REQUIRED FOR EMT CONDUITS.
- SEE E-503 FOR CONDUIT INSTALLATION REQUIREMENTS.



CONSULTANT:



CLIENT:



UTILITY PLAN  
FENNIMORE GF2 (31987)  
FENNIMORE, WISCONSIN

SUBMITTAL:

INT.	DATE:	DESCRIPTION:

CHECKED BY:	AJO
PLOT DATE:	6/20/2022
PROJECT NUMBER:	31987
SET TYPE:	BD

SHEET NUMBER  
**E-102**



KEYNOTES: (THIS SHEET)

- A. MASTER GROUND BAR, SEE F/E-502

B. EXTERIOR GROUND BAR, SEE F/E-502

C. COAXIAL SURGE ARRESTOR TRAPEZE

D. #2 STRANDED INSULATED HALO MOUNTED ON NON-CONDUCTIVE STAND-OFFS 3-INCHES FROM WALL AND 6-INCHES BELOW CEILING

E. #2 STRANDED INSULATED SERVICE DISCONNECT NEUTRAL-GROUND BOND LEAD TO MGB

F. #2 STRANDED INSULATED RACK GROUNDS (1) PER RACK

G. #2 STRANDED INSULATED CABLE TRAY SYSTEM GROUND
- H. #6 STRANDED INSULATED CABLE TRAY SECTION GROUNDS

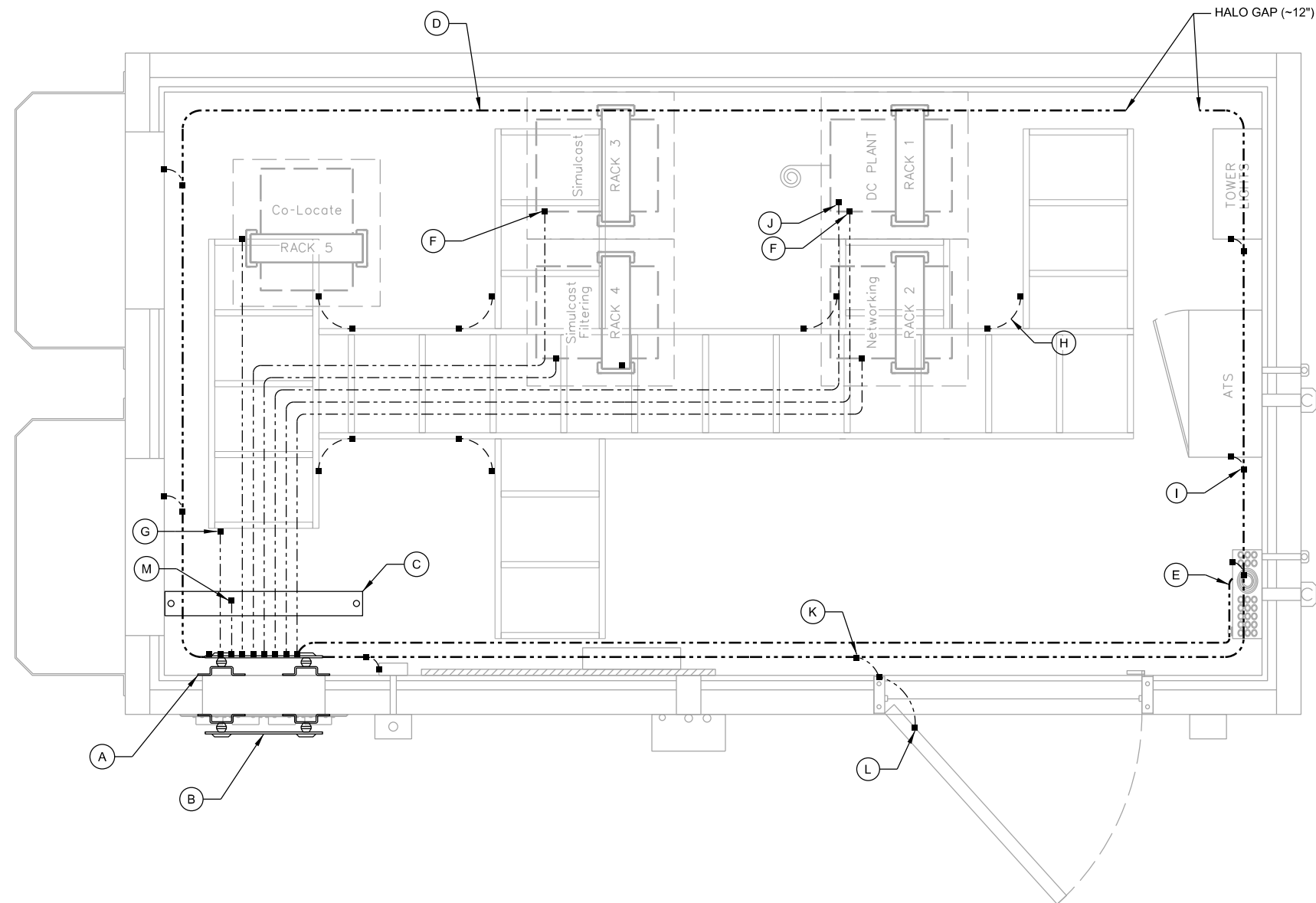
I. #6 STRANDED INSULATED METAL DEVICE/ BOX BONDS

J. (1) #2 STRANDED INSULATED DC PLANT GROUND

K. #6 OR LARGER STRANDED INSULATED DOOR FRAME GROUND

L. #6 OR LARGER STRANDED OR SHORT BRAIDED INSULATED DOOR PANEL GROUND (HINGE SIDE)

M. #2 STRANDED INSULATED COAXIAL SURGE ARRESTOR TRAPEZE GROUND



**A** **SHELTER GROUNDING PLAN**  
SCALE: 11" x 17" - 1/2" = 1'-0"  
22" x 34" - 1" = 1'-0"

CONSULTANT:

**Edge**  
Consulting Engineers, Inc.  
624 WATER STREET  
PRAIRIE DU SAC, WI 53578  
608.644.1449 VOICE  
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www.edgeconsult.com

CLIENT:

**RACOM**  
critical communications

**SHELTER GROUNDING PLAN**  
**FENNIMORE GF2 (31987)**  
**FENNIMORE, WISCONSIN**

SUBMITTAL:

INT.	DATE:	DESCRIPTION:

CHECKED BY: AJO

PLOT DATE: 6/20/2022

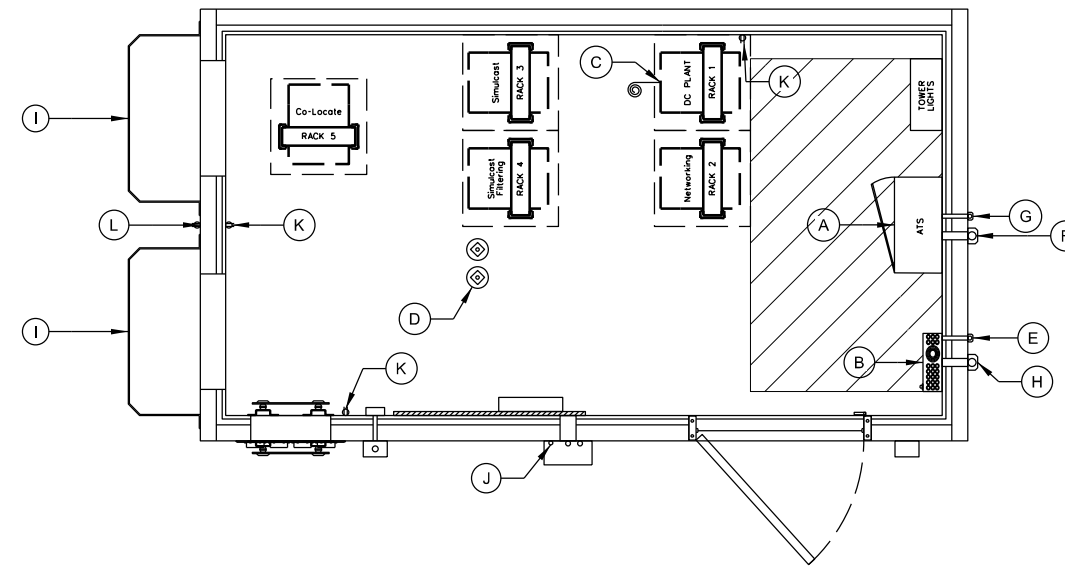
PROJECT NUMBER: 31987

SET TYPE: BD

SHEET NUMBER: **E-103**

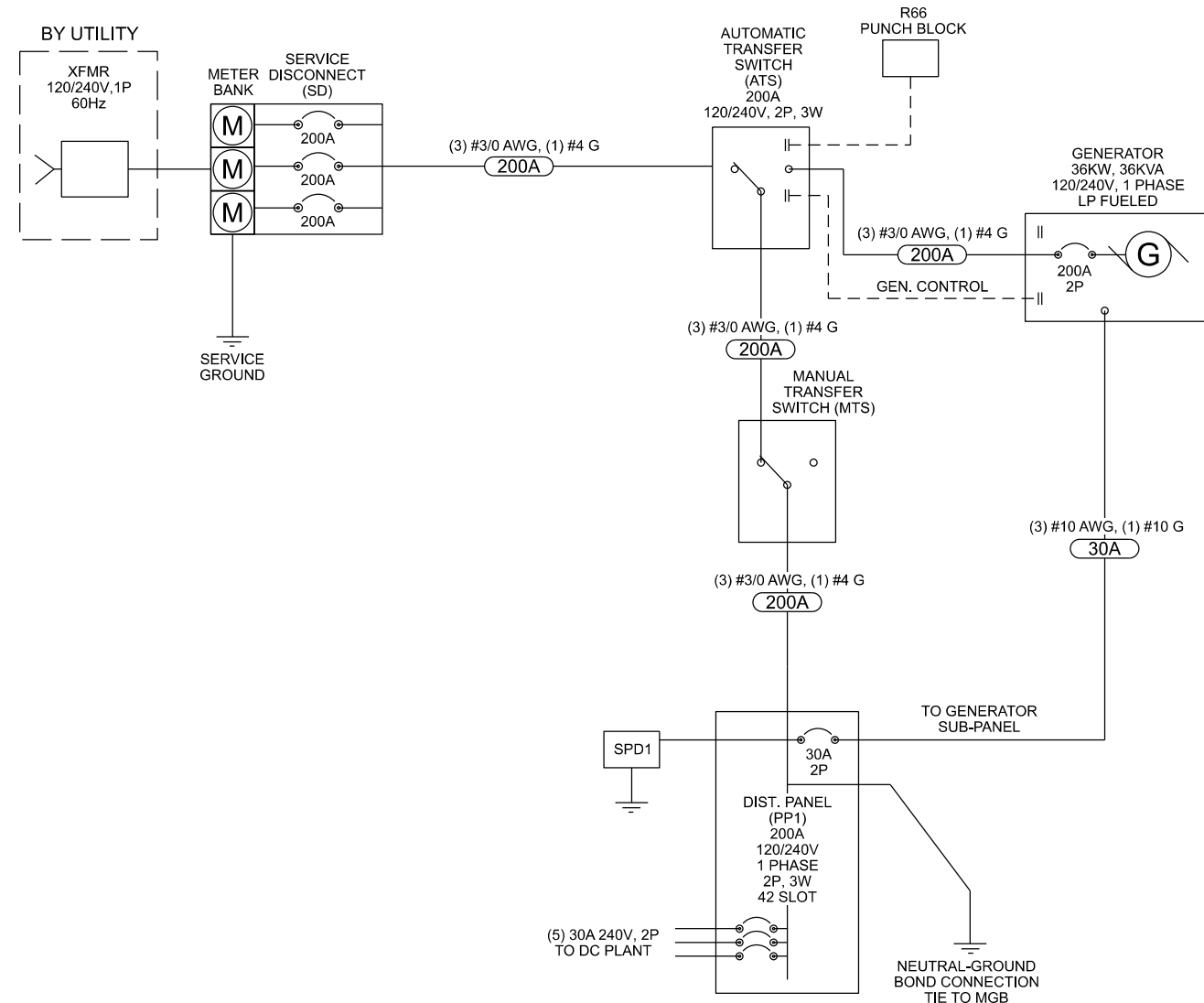
- A. AUTOMATIC TRANSFER SWITCH (ATS)
- B. DISTRIBUTION PANEL (PP1)
- C. (5) DC PLANT POWER FEEDS
- D. SMOKE ALARM
- E. GENERATOR SUB PANEL FEED
- F. GENERATOR A/C POWER FEED
- G. GENERATOR CONTROL WIRING FEED
- H. ELECTRIC UTILITY SERVICE FEED
- I. HVAC UNIT
- J. LP TANK LEVEL MONITOR RECEPTACLE
- K. INTERIOR CONVENIENCE OUTLET
- L. EXTERIOR CONVENIENCE OUTLET

1. ALL ELECTRICAL WORK SHALL CONFORM TO NATIONAL, STATE AND LOCAL CODES.
2. ALL WIRE AND CONDUIT SIZES SPECIFIED ARE MINIMUMS. LARGER SIZES MAY BE REQUIRED BY CODE. ANY DISCREPANCIES BETWEEN THE DRAWINGS AND CODE REQUIREMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
3. ALL CONDUCTORS SHALL BE COPPER.
4. ALL INDOOR RACEWAY TO BE EMT OR RGS. EMT INSTALLATIONS SHALL UTILIZE COMPRESSION FITTINGS.
5. CONTRACTOR SHALL PROVIDE AND INSTALL ALL NECESSARY WIRING AND CONDUITS FROM ELECTRICAL DEVICES REQUIRED ON PROJECT TO THE DISTRIBUTION PANELS.
6. ALL ELECTRICAL WORK SHALL BE COMPLETED UNDER THE DIRECT SUPERVISION OF A LICENSED MASTER ELECTRICIAN.



**A** **SHELTER ELECTRICAL PLAN**

SCALE: 11" x 17" - 1/4" = 1'-0"  
22" x 34" - 1/2" = 1'-0"



## **B ELECTRICAL ONE LINE DIAGRAM**

DIST. PANEL (PP1)	PHASE/WIRE				BUS SIZE				MAIN				AIC RATING	
120/240VAC	1/3				200A				LUGS				10,000	
LOAD	WIRE	POLE	TRIP	CK#	A	B	CK#	TRIP	POLE	WIRE	LOAD			
HVAC #1	8	2	35	1							INT/EXT EMER. LIGHT			
	-	-	-	3				2	15	1		12		
HVAC #2	8	2	35	5							SPARE			
	-	-	-	7				6	20	1	12	RECEPTACLES		
POWER FAIL RELAY	-	2	15	9				8	20	1	12	RECEPTACLES		
	-	-	-	11				10	20	1	-	GFCI RECEPTACLE		
RECTIFIER #1	10	2	30	13							TOWER LTG			
	-	-	-	15				14	15	1	-	SMOKE DETECTOR		
RECTIFIER #3	10	2	30	17							SPARE			
	-	-	-	19				18	30	2	10	RECTIFIER #2		
RECTIFIER #5	10	2	30	21				20	-	-	-			
	-	-	-	23				22	-	-	-	SPARE		
SPARE	-	-	-	25				24	-	-	-	SPARE		
SPARE	-	-	-	27				26	-	-	-	SPARE		
SPARE	-	-	-	29				28	-	-	-	SPARE		
SPARE	-	-	-	31				30	-	-	-	SPARE		
SPARE	-	-	-	33				32	-	-	-	SPARE		
SPARE	-	-	-	35				34	-	-	-	SPARE		
SPARE	-	-	-	37				36	-	-	-	SPARE		
SPARE	-	-	-	39				38	-	-	-	SPARE		
SPARE	-	-	-	41				40	-	-	-	SPARE		
								42	-	-	-	SPARE		

## **C** ELECTRIC DISTRIBUTION PANEL DIRECTORY



**Edge**  
Consulting Engineers, Inc.

624 WATER STREET  
PRAIRIE DU SAC, WI 53578  
608.644.1449 VOICE  
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**SHELTER ELECTRICAL PLAN**  
**FENNIMORE GF2 (31987)**  
**FENNIMORE, WISCONSIN**

[illegible]

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PLOT DATE	6/20/2022
PROJECT NUMBER	31987
SET TYPE	BD
SHEET NUMBER	<b>E-104</b>



A. AIR TERMINAL:  
EXTEND 2" ABOVE HIGHEST ANTENNA MIN. ON MAST PIPE  
MECHANICALLY FASTEN AIR TERMINAL TO MAST PIPE MAST  
PIPE TO BE MECHANICALLY CONNECTED TO TOWER STEEL

B. COAX / WAVEGUIDE TRANSMISSION LINE GROUND KIT;  
SEE DETAIL THIS SHEET

C. GROUND KIT JUMPER;  
CONNECT TO GROUND BAR WITH 2 HOLE LONG BARREL LUG

D. ANTENNA GROUND BAR (TINNED);  
FOR CONNECTION OF MULTIPLE GROUND KITS AT ONE  
LEVEL MOUNT TO TOWER STEEL;  
INSTALL #2 STRANDED LEAD FROM GROUND BAR TO TOWER  
STEEL

E. FOR SINGLE ANTENNAS AT ONE LEVEL OMIT ANTENNA  
GROUND BAR CONNECT GROUND KIT JUMPER DIRECTLY TO  
TOWER STEEL WITH UL LISTED BONDING CLAMP

F. UL LISTED BONDING CLAMP:  
- HARGER BGC41.25-2 PIPE CLAMPS FOR  
1-1/4" TO 2" DIA. ROUND MEMBERS  
OR  
- HARGER #223T HEAVY DUTY TINNED FLANGE  
BONDING PLATE  
- USE EXTERNAL ANTI-OXIDATION COMPOUND.  
- PAINT WITH COLD GALV. COMPOUND AFTER BONDING.

G. TOWER GROUND BAR (TGB) (TINNED);  
4" x 18" x 1/4" - SIZED FOR (30) 2 HOLE GROUND LUGS MOUNT  
DIAGONALLY FOR EASIER HOOK-UP OF GROUNDING KIT  
LEADS INSTALL ON TOWER WITH INSULATORS AT 12" (ABOVE  
ICE BRIDGE)

H. TGB GROUNDS:  
#2 BARE SOLID TINNED ENCASED IN CARFLEX CONDUIT  
FROM TGB TO TOWER GROUND RING (2) REQ'D AND FROM  
TGB TO TOWER STEEL (1) REQ'D:  
CONDUIT TO BE SUPPORTED EVERY +/- 30-INCHES TO  
GRADE. SUPPORT ALONG TRANSMISSION LADDER WITH  
COAX SNAP-IN HANGERS OR ANGLE ADAPTERS CONNECTED  
TO TOWER STEEL.

I. TOWER STEEL GROUNDS:  
#2 BARE SOLID TINNED ENCASED IN CARFLEX CONDUIT  
FROM TOWER STEEL TO TOWER GROUND RING (3) REQ'D.

J. TOWER FOUNDATION GROUND, (1 REQ'D);  
SEE E-502 FOR DETAILS

K. SHELTER EXTERIOR GROUND BAR (EGB) (TINNED);  
SEE DETAIL THIS SHEET

L. EGB GROUNDS:  
#2 BARE SOLID TINNED  
SEE DETAIL THIS SHEET & F/E-502.  
ENCASE IN CARFLEX CONDUIT FROM EGB TO SHELTER  
GROUND RING (2) REQ'D.  
CONDUIT TO BE SUPPORTED EVERY +/- 30-INCHES TO  
GRADE.

M. SURGE ARRESTOR/POLY PHASER

N. INTERIOR SHELTER GROUND BAR / MASTER GROUND BAR  
(MGB);  
SEE DETAIL THIS SHEET & F/E-502.

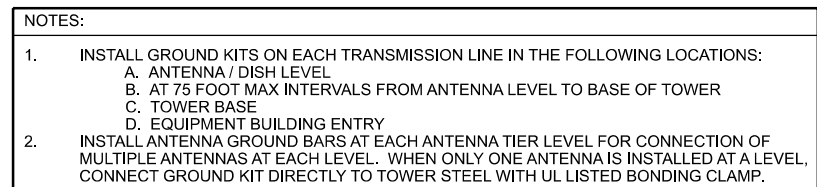
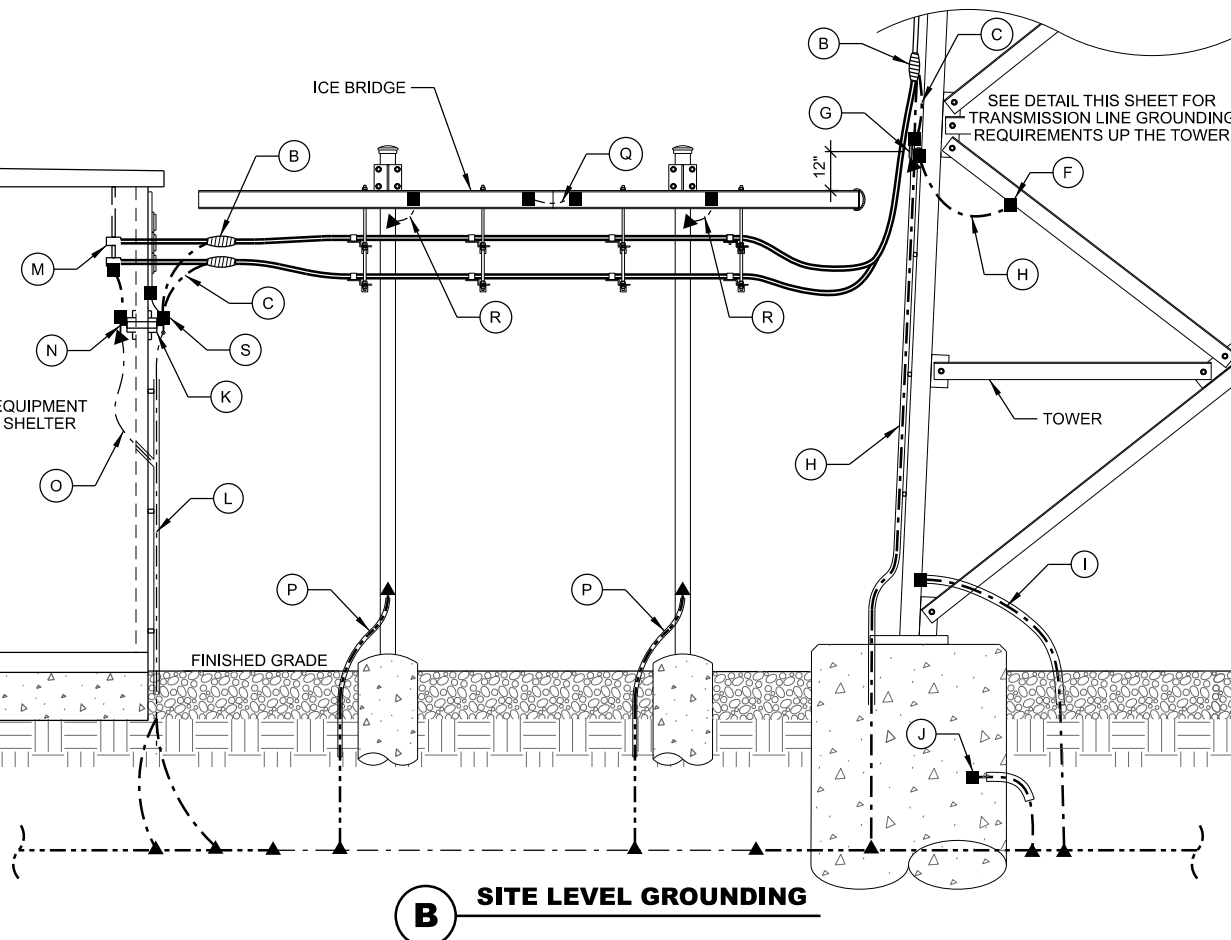
O. #2 BARE SOLID TINNED, ENCASE IN CARFLEX CONDUIT  
FROM MGB TO SHELTER GROUND RING (2) REQ'D.;  
SEE DETAIL THIS SHEET

P. ICE BRIDGE POST GROUNDS;  
#2 BARE SOLID TINNED ENCASE IN CARFLEX CONDUIT TO 24"  
BELOW GRADE;  
SEE E-502 FOR DETAILS

Q. ICE BRIDGE SECTION GROUNDS;  
#6 STRANDED INSULATED  
2 HOLE LONG BARREL ON EACH END (TYP.)

R. ICE BRIDGE SECTION TO POST GROUNDS;  
#6 STRANDED INSULATED  
2 HOLE LONG BARREL ON SECTION & CADWELD TO POST  
ORIENT LEAD WITH HIGH SIDE TOWARDS TOWER

S. ENTRY PANEL GROUND;  
#6 STRANDED INSULATED  
2 HOLE LONG BARREL ON EACH END (TYP.)



**GROUNDING DETAILS**  
**FENNIMORE GF2 (31987)**  
**FENNIMORE, WISCONSIN**

SUBMITTAL:		
INT.	DATE:	DESCRIPTION:
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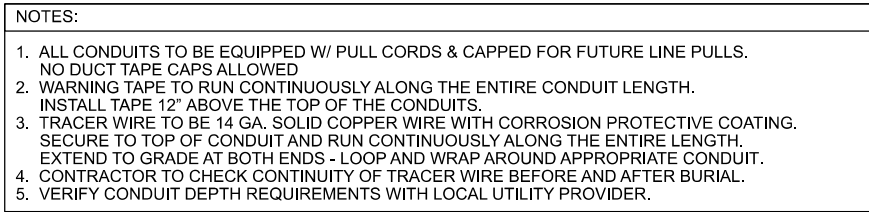


Diagram illustrating the installation of a buried conduit and tracer wire for a shelter exterior.

Labels and components shown:

- SHELTER EXTERIOR
- LB
- CONDUIT SUPPORT (AS REQUIRED)
- SLIP JOINT
- SECURE TRACER WIRE TO CONDUIT
- FINISHED GRADE
- TRACER WIRE SECURED TO TOP OF CONDUIT
- BURIED CONDUIT; SEE UTILITY PLAN FOR SIZE AND MATERIAL TYPE
- SHELTER FOUNDATION

Diagram illustrating the installation of the lighting system for the Ice Bridge. The components and connections are labeled as follows:

- PHOTOCELL**: Mounted on the exterior wall.
- 1/2" NPT FEMALE THREADS**: Connects the photocell to the RMC conduit.
- 1/2" RMC FOR PHOTO CELL**: Rigid Metal Conduit running vertically from the photocell.
- SECURE RMC TO SHELTER WITH BUTTERFLY CLAMP OR OTHER APPROVED METHOD**: The RMC is secured to the shelter wall.
- 1" RMC CONDUIT SLEEVE THROUGH SHELTER WALL**: A sleeve for the RMC conduit passing through the shelter wall.
- 4 1/16" SQUARE (5S) BOX SECURED TO INTERIOR WALL; SEE NOTE #1**: A square electrical box mounted on the interior wall.
- CONDUIT TO LIGHTING CONTROLLER FOR FLASHER CABLE AND PHOTO CELL WIRES**: A conduit connecting the square box to the lighting controller.
- LIGHTING CONTROLLER MOUNTED TO INTERIOR WALL PER MANUFACTURER SPECIFICATIONS; SEE NOTE #1**: The lighting controller is mounted on the interior wall.
- 6" x 6" x 4" NEMA 3R METALLIC JUNCTION BOX SECURED TO EXTERIOR WALL**: A junction box mounted on the exterior wall.
- ICE BRIDGE**: The structure being illuminated.
- 1/2" CABLE ACROSS ICE BRIDGE; ROUTE FLASHER CABLE WITHIN CONDUIT SLEEVE ACROSS ICE BRIDGE**: The flasher cable is routed across the ice bridge within a conduit sleeve.
- FLASHER CABLE**: The cable connecting the junction box to the lighting controller.

NOTES:

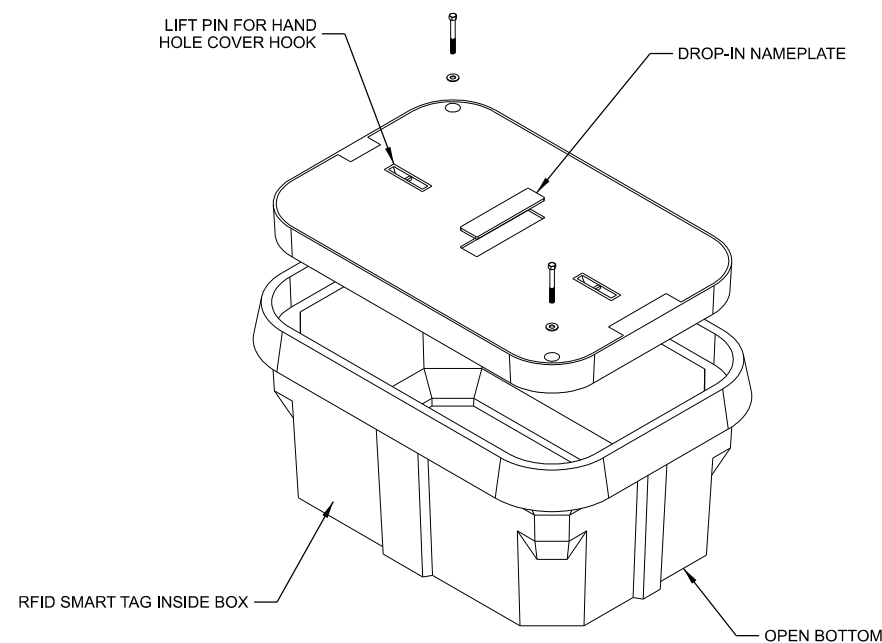
1. PROVIDE GROUND BOND FROM LIGHTING CONTROLLER BOX AND INTERIOR JUNCTION BOX TO INTERIOR GROUND HALO SYSTEM.

**FIBERGLASS POLYMER CONCRETE UTILITY VAULT**

**DIMENSIONS:** 30" x 42" x 24"; CUSTOMER TO ID H, W, & D

**LOAD RATINGS:** INCIDENTAL TRAFFIC

NON-CONDUCTIVE, UV RESISTANT, & IMPERVIOUS TO  
CHEMICALS & MOISTURE



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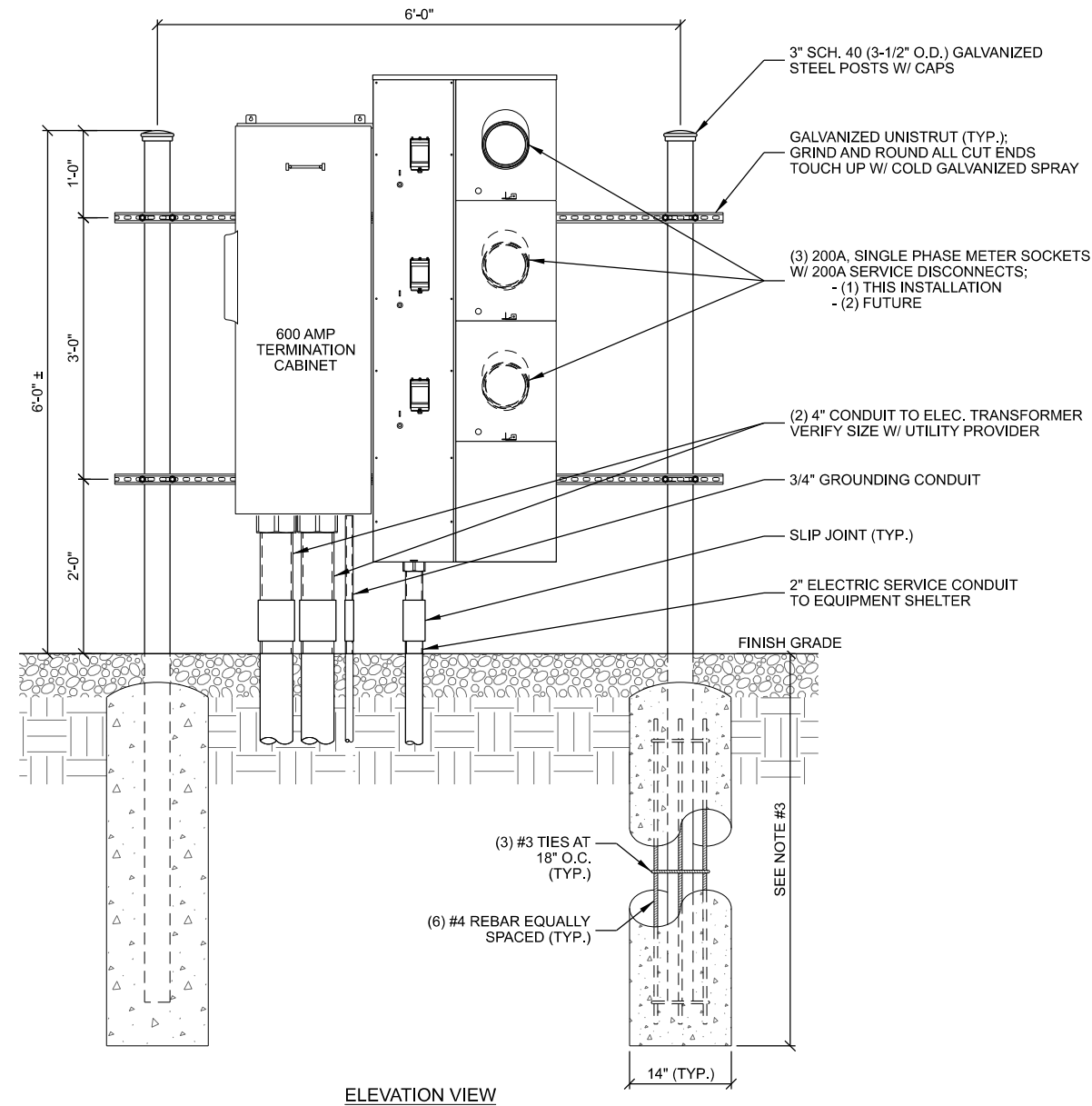
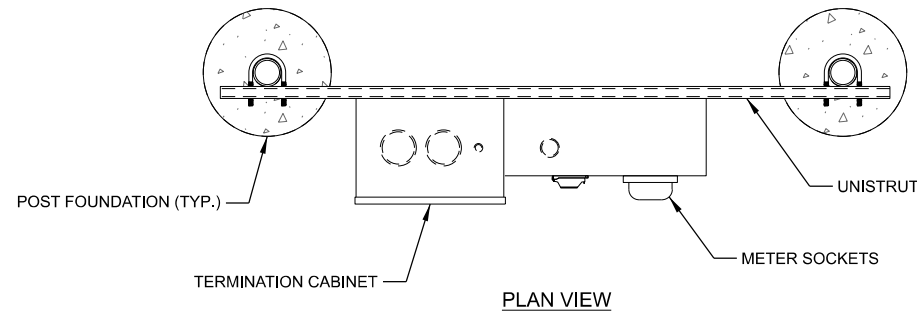
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 **RACOM**  
critical communications

**UTILITY DETAILS**  
**FENNIMORE GF2 (31987)**  
**FENNIMORE, WISCONSIN**

[illegible]





NOTES:

1. CONCRETE FOR PIER TO BE A MINIMUM OF 4,000 PSI AT 28 DAYS.
2. MAINTAIN 3" MINIMUM REBAR COVER IN ALL DIRECTIONS.
3. PIER FOUNDATION DEPTH TO BE A MINIMUM OF 48"; DEPTH TO EXCEED LOCAL FROST DEPTH.

**A MULTI-METER UTILITY RACK**  
 SCALE: 11" x 17" - 1/2" = 1'-0"  
 22" x 34" - 1" = 1'-0"

CONSULTANT:

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CLIENT:

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 critical communications

**UTILITY RACK DETAILS**  
**FENNIMORE GF2 (31987)**  
**FENNIMORE, WISCONSIN**

SUBMITTAL:

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