



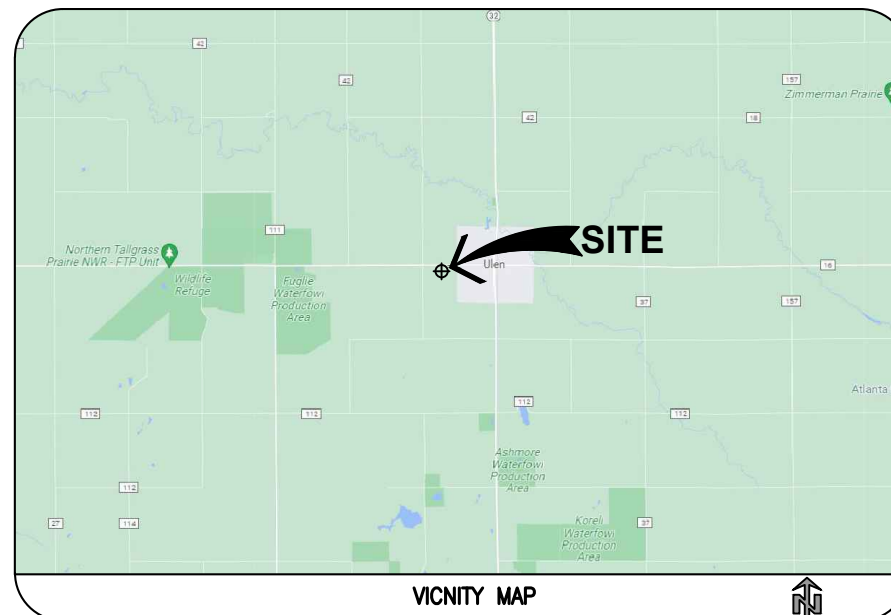
**US-MN-5126  
ULEN  
A100345A**

**195' MONOPOLE**

**CONSTRUCTION DRAWINGS**



LOCATION MAP



VICINITY MAP

**SHEET INDEX**

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**BUILDING CODES AND STANDARDS**

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

MINNESOTA BUILDING CODE: IBC 2018  
 BUILDING/DWELLING CODE: IBC 2018  
 STRUCTURAL CODE: IBC 2018  
 PLUMBING CODE: IBC 2018  
 MECHANICAL CODE: IBC 2018  
 ELECTRIC CODE: NEC 2017  
 FIRE/LIFE SAFETY CODE: NFPA 1-2018 FIRE CODE  
 DESIGN WIND SPEED: 110 MPH  
 RISK CATEGORY: II  
 EXPOSURE CATEGORY: C

RISK CATEGORY DESIGN WIND SPEEDS ARE BASED ON ASCE 7-10 CRITERIA FOR A 3-SECOND GUST. REFER TO STRUCTURAL ANALYSIS IN THE EVENT A CONFLICT ARISES BETWEEN STANDARD REQUIREMENTS AND LISTED CODES, THE MORE RESTRICTIVE REQUIREMENT WILL TAKE PRECEDENCE.



THE CONTRACTOR MUST VERIFY ALL FIELD MEASUREMENTS AND CONDITIONS PRIOR TO BID AND TO COMMENCEMENT OF CONSTRUCTION.

**SITE INFORMATION**

**APPLICANT:** VERTICAL BRIDGE DEVELOPMENT, LLC  
**CONTACT:** DANIEL KALINA  
**VERTICAL BRIDGE SITE NAME:** ULEN  
**VERTICAL BRIDGE SITE NUMBER:** US-MN-5126  
**SITE ADDRESS:** 160TH AVE N  
 ULEN TOWNSHIP, MN 56585  
**COUNTY:** CLAY  
**JURISDICTION:** CLAY COUNTY  
**SITE COORDINATES:** 47° 04' 41.03" N (LAT)  
 96° 16' 24.64" W (LON)  
**STRUCTURE TYPE:** MONOPOLE  
**TOWER HEIGHT:** 195'  
**OVERALL STRUCTURE HEIGHT:** 199'  
**PROPERTY OWNER NAME:** RONDA & JIM AMUNDSON  
**PROPERTY OWNER ADDRESS:** 17502 HWY 32 N  
 ULEN, MN 56585  
**PARCEL NUMBER:** 29.033.2100  
**POWER COMPANY:** N/A  
 N/A  
**KHA PM:** TONY DAWSON

**SPECIAL NOTES:**

**HANDICAPPED REQUIREMENTS:**  
 FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION, THEREFORE, HANDICAPPED ACCESS REQUIREMENTS NOT REQUIRED.

**PLUMBING REQUIREMENTS:**  
 FACILITY HAS NO PLUMBING OR REFRIGERANTS.

**FAA AND FCC REQUIREMENTS:**  
 THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REQUIREMENTS.

**CONSTRUCTION REQUIREMENTS:**  
 ALL WORK MUST CONFORM TO VERTICAL BRIDGE CONSTRUCTION INSTALLATION STANDARDS AND ALL APPLICABLE CODES AND ORDINANCES.

**PROJECT SCOPE OF WORK:**

THIS PROJECT CONSISTS OF A PROPOSED MONOPOLE WITH FOUNDATION (REFER TO TOWER DRAWINGS PROVIDED BY TOWER MANUFACTURER), SITE WORK, THE INSTALLATION OF NEW EQUIPMENT CABINETS, NEW LINES AND ANTENNAS, NEW CHAIN LINK FENCE, AND ALL ASSOCIATED WORK.

**DRIVING DIRECTIONS:**

FROM HECTOR INTERNATIONAL AIRPORT: HEAD SOUTH ON DAKOTA DR TOWARD OLD HWY 81/OLD US HWY 81N (0.3 MI), TAKE 90TH AVE N AND STATE HWY 9 N/140TH ST N TO 160TH AVE N IN ULEN TOWNSHIP (37.7 MI).



700 PARK OF COMMERCE DRIVE #200  
 BOCA RATON FL, 33487  
 TEL: (561) 948-6367

PLANS PREPARED BY:



201 NORTH FRANKLIN STREET, SUITE 1400  
 TAMPA, FL 33602  
 PHONE (813) 620-1460  
 WWW.KIMLEY-HORN.COM

REV: DATE: DESCRIPTION: BY:

REV	DATE	DESCRIPTION	BY
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DRAWN BY: CHECKED BY:

SEW TD

KHA PROJECT NUMBER:

140064151.1.100

ENGINEER SEAL:

PROJECT INFORMATION:

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 ULEN  
 A100345A  
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 ULEN TOWNSHIP, MN 56585  
 CLAY COUNTY

SHEET TITLE:

TITLE SHEET

SHEET NUMBER:

T-1

## GENERAL PROJECT NOTES

- THE ENGINEER SHALL BE RESPONSIBLE FOR PROVIDING ALL FIELD LAYOUT ON A ONE TIME BASIS.
- THE CONTRACTOR SHALL TOPSOIL AND SEED ALL DISTURBED AREAS.
- THE PLANS SHOW SOME KNOWN SUBSURFACE STRUCTURES, ABOVE-GROUND STRUCTURES AND/OR UTILITIES BELIEVED TO EXIST IN THE WORKING AREA, EXACT LOCATION OF WHICH MAY VARY FROM THE LOCATIONS INDICATED. IN PARTICULAR, THE CONTRACTOR IS WARNED THAT THE EXACT OR EVEN APPROXIMATE LOCATION OF SUCH PIPELINES, SUBSURFACE STRUCTURES AND/OR UTILITIES IN THE AREA MAY BE SHOWN OR MAY NOT BE SHOWN; AND IT SHALL BE HIS RESPONSIBILITY TO PROCEED WITH GREAT CARE IN EXECUTING ANY WORK. 48 HOURS BEFORE YOU DIG, DRILL OR BLAST, CALL 811.
- THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY CONDITIONS THAT VARY FROM THOSE SHOWN ON THE PLANS. THE CONTRACTOR'S WORK SHALL NOT VARY FROM THE PLANS WITHOUT THE EXPRESSED APPROVAL OF THE ENGINEER.
- THE CONTRACTOR IS INSTRUCTED TO COOPERATE WITH ANY AND ALL OTHER CONTRACTORS PERFORMING WORK ON THIS JOB SITE DURING THE PERFORMANCE OF THIS CONTRACT.
- THE CONTRACTOR SHALL RESTORE ALL PUBLIC OR PRIVATE PROPERTY DAMAGED OR REMOVED TO AT LEAST AS GOOD OF CONDITION AS BEFORE DISTURBED AS DETERMINED BY THE ENGINEER.
- THE CONTRACTOR SHALL COMPLY WITH ALL REQUIRED PERMITS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING, AND INCURRING THE COST OF ALL REQUIRED PERMITS, INSPECTIONS, CERTIFICATES, ETC.
- THE CONTRACTOR SHALL PROTECT EXISTING PROPERTY LINE MONUMENTATION. ANY MONUMENTATION DISTURBED OR DESTROYED, AS JUDGED BY THE ENGINEER OR OWNER SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE UNDER THE SUPERVISION OF THE STATE LICENSED LAND SURVEYOR.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO EXAMINE ALL PLAN SHEETS AND SPECIFICATIONS, AND COORDINATE WORK WITH ALL CONTRACTS FOR THE SITE.
- ALL TRENCH EXCAVATION AND ANY REQUIRED SHEETING AND SHORING SHALL BE DONE IN ACCORDANCE WITH THE LATEST REVISIONS OF THE JURISDICTIONS STATE CODE AND OSHA REGULATIONS FOR CONSTRUCTION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR DEWATERING AND THE MAINTENANCE OF SURFACE DRAINAGE DURING THE COURSE OF WORK.
- ALL UTILITY WORK INVOLVING CONNECTIONS TO EXISTING SYSTEMS SHALL BE COORDINATED WITH THE ENGINEER AND THE UTILITY OWNER. NOTIFY THE ENGINEER AND THE UTILITY OWNER 24 HOURS BEFORE EACH AND EVERY CONNECTION TO EXISTING SYSTEMS IS MADE.
- MAINTAIN FLOW FOR ALL EXISTING UTILITIES.
- ALL SITE FILL SHALL MEET SELECTED FILL STANDARDS UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- CONTRACTOR TO GRADE ALL AREAS ON THE SITE TO PROVIDE POSITIVE DRAINAGE AWAY FROM THE COMPOUND AND THE TOWER.
- THE CONTRACTOR SHALL TAKE TIES TO ALL UTILITY CONNECTIONS AND PROVIDE MARKED-UP AS-BUILT PLANS. AS-BUILT PLANS SHALL BE REVIEWED BY THE OWNER AND HIS REPRESENTATIVES, AND THE CONTRACTOR SHALL PROVIDE ANY CORRECTION OR ADMISSIONS TO THE SATISFACTION OF THE OWNER AND HIS REPRESENTATIVES BEFORE UTILITIES WILL BE ACCEPTED. AS-BUILTS SHALL INCLUDE ALL POWER, TELEPHONE, GROUNDING, ETC.
- TOWER FOOTING DIMENSIONS SHALL BE VERIFIED WITH THE TOWER MANUFACTURER AND THE TOWER PLANS.

## GENERAL CONSTRUCTION NOTES

- GENERAL
  - THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY.
  - CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE UNDERGROUND UTILITIES.
  - INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE OWNER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE APPROVAL.
  - EACH CONTRACTOR SHALL COOPERATE WITH THE OWNER'S REPRESENTATIVE, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
  - PAINT ALL ANTENNAS, MOUNTING HARDWARE, CABLES, CABLE TRAYS, ETC. TO MATCH EXISTING STRUCTURE PER OWNER REQUIREMENTS. OWNER SHALL APPROVE COLOR.
  - ALL DAMAGED, MARRED, SCRAPED, ABRADED, ETC. AREAS OF EXISTING PAINT SHALL BE REPAIRED PER OWNERS REQUIREMENTS. OWNER SHALL APPROVE COLOR.

## 2. EXCAVATIONS/FOUNDATION

- FOUNDATION EXCAVATION SHALL BE HAND-TRIMMED TO REMOVE LOOSE MATERIALS.
- EXTERIOR FOUNDATION BACKFILL SHALL BE SELECTED GRANULAR FILL.
- ALL STRUCTURAL BACKFILL AND SUBBASE UNDER SLABS-ON-GRADE AND FOOTINGS SHALL BE "SW" OR BETTER PER ASTM D-2487 COMPACTED TO A MINIMUM 95% STANDARD PROCTOR DENSITY PER ASTM D 698.
- DO NOT PLACE FOOTINGS IN WATER OR ON FROZEN GROUND.
- SOIL BEARING SURFACES, PREVIOUSLY ACCEPTED BY GEOTECHNICAL ENGINEER, WHICH ARE ALLOWED TO BECOME SATURATED, FROZEN OR DISTURBED SHALL BE REWORKED TO SATISFACTION OF GEOTECHNICAL ENGINEER.
- DO NOT ALLOW GROUND BENEATH FOOTINGS TO FREEZE.
- FOOTING EXCAVATIONS SHALL BE CUT NEAT.

## 3. CONCRETE

- DESIGN AND CONSTRUCTION OF ALL CONCRETE ELEMENTS SHALL CONFORM TO THE LATEST EDITIONS OF THE FOLLOWING APPLICABLE CODES: ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS"; ACI 318, "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE";
- MIX DESIGN SHALL BE APPROVED BY OWNER'S REPRESENTATIVE PRIOR TO PLACING CONCRETE.
- CONCRETE SHALL BE NORMAL WEIGHT, 6% AIR ENTRAINED ( $\pm 1.5\%$ ) WITH A MAXIMUM 4" SLUMP, AND HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI UNLESS OTHERWISE NOTED.
- MAXIMUM AGGREGATE SIZE SHALL BE 1".
- THE FOLLOWING MATERIALS SHALL BE USED:
 

PORTLAND CEMENT:	ASTM C 150, TYPE I
REINFORCEMENT:	ASTM A 615, GRADE 60
NORMAL WEIGHT AGGREGATE:	ASTM C 33
WATER:	DRINKABLE
ADMIXTURES:	NON-CHLORIDE CONTAINING
- REINFORCING SHALL CONFORM TO ASTM A-615 WITH SUPPLEMENT. MINIMUM YIELD STRENGTH  $F_y = 60$  KSI. REINFORCING DETAILS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF ACI 315.
- CONCRETE COVER AROUND REINFORCING BARS (U.N.O.) SHALL BE:
  - CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED EARTH.....3"
  - CONCRETE EXPOSED TO EARTH, WEATHER.....2"
  - SLABS.....3/4"
  - ALL OTHER CONCRETE.....1 1/2"
- UNLESS INDICATED OTHERWISE ON THE DRAWINGS, REINFORCEMENT SPLICES SHALL MEET CLASS B, TENSION LAP REQUIREMENTS IN ACCORDANCE WITH ALL PROVISIONS OF ACI 318 LATEST EDITION, UNLESS NOTED OTHERWISE.

















## GENERAL CONSTRUCTION NOTES CONT.

- CURING COMPOUNDS SHALL CONFORM TO ASTM C-309.
  - ADMIXTURES SHALL CONFORM TO THE APPROPRIATE ASTM STANDARD AS REFERENCED IN ACI-301.
  - DO NOT WELD OR TACKWELD REINFORCING STEEL.
  - ALL DOWELS, ANCHOR BOLTS, EMBEDDED STEEL, ELECTRICAL CONDUITS, PIPE SLEEVES, PIPING, WATERSTOPS, INSERTS, GROUNDS AND ALL OTHER EMBEDDED ITEMS AND FORMED DETAILS SHALL BE IN PLACE BEFORE START OF CONCRETE PLACEMENT.
  - LOCATE ADDITIONAL CONSTRUCTION JOINTS REQUIRED TO FACILITATE CONSTRUCTION AS ACCEPTABLE TO ENGINEER. PLACE REINFORCEMENT CONTINUOUSLY THROUGH JOINT.
  - REINFORCEMENT SHALL BE COLD BENT WHENEVER BENDING IS REQUIRED.
  - PLACE CONCRETE IN A UNIFORM MANNER TO PREVENT THE FORMATION OF COLD JOINTS AND OTHER PLANES OF WEAKNESS. VIBRATE THE CONCRETE TO FULLY EMBED REINFORCING. DO NOT USE VIBRATORS TO TRANSPORT CONCRETE THROUGH CHUTES OR FORMWORK.
  - DO NOT PLACE CONCRETE IN WATER, ICE, OR ON FROZEN GROUND.
  - DO NOT ALLOW CONCRETE SUBBASE TO FREEZE DURING CONCRETE CURING AND SETTING PERIOD, OR FOR A MINIMUM OF 14 DAYS AFTER PLACEMENT.
  - FOR COLD-WEATHER AND HOT-WEATHER CONCRETE PLACEMENT, CONFORM TO APPLICABLE ACI CODES AND RECOMMENDATIONS. IN EITHER CASE, MATERIALS CONTAINING CHLORIDE, CALCIUM, SALTS, ETC. SHALL NOT BE USED. PROTECT FRESH CONCRETE FROM WEATHER FOR 7 DAYS MINIMUM.
  - PROVIDE A STEEL TROWEL FINISH TO THE SLAB.
- ANTENNA SUPPORT BRACKET NOTES (IF APPLICABLE)
    - DESIGN RESPONSIBILITY OF ANTENNA MOUNTING BRACKETS AND POLES AND ALL COMPONENTS THERE OF AND ATTACHMENT THERE TO SHALL BE THE RESPONSIBILITY OF THE MANUFACTURER. MFR SHALL PROVIDE TO THE ENGINEER FOR APPROVAL, DRAWINGS DETAILING ALL COMPONENTS OF THE ASSEMBLY, INCLUDING CONNECTIONS, DESIGN LOADS, AND ALL OTHER PERTINENT DATA.
    - BRACKETS SHALL BE DESIGNED TO SUPPORT CURRENT AND FUTURE PANEL ANTENNAS AND COAXIAL CABLES AS SHOWN.















## 5. STRUCTURAL STEEL NOTES

- STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
- STEEL ANGLES, BASE PLATES, BEARING PLATES AND MISC. FABRICATION SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF ASTM-A36 WITH A MINIMUM YIELD STRESS OF 36 KSI. ALL STEEL TUBES AND PIPES SHALL BE A500 STEEL MINIMUM.
- ALL DINGS, SCRAPES, MARS, AND WELDS IN THE FINISHED AREAS SHALL BE REPAIRED BY FIELD TOUCH-UP PRIOR TO COMPLETION OF THE WORK.
- ALL EXTERIOR STRUCTURAL STEEL SHALL BE, WHEN DELIVERED, HOT-DIP GALVANIZED ACCORDING TO ASTM A123. TOUCH-UP FIELD WELDS AND ABRADED AREAS W/2 COATS OF GALVANIZED PAINT, ZRC COLD GALVANIZING COMPOUND OR APPROVED EQUAL.
- DO NOT PLACE HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
- CONNECTIONS:
  - BOLTED CONNECTIONS SHALL USE BEARING TYPE GALVANIZED ASTM A325 BOLTS AND SHALL HAVE A MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
  - NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. GALVANIZED ASTM A307 BOLTS UNLESS NOTED OTHERWISE.
- SAFETY NOTES:
  - THE CONTRACTOR WILL ADHERE TO ALL SAFETY REGULATIONS, LOCAL, STATE AND FEDERAL.
  - THE CONTRACTOR WILL CONDUCT DAILY SAFETY TAILGATE MEETINGS IN ADDITION TO WEEKLY SAFETY MEETINGS. THESE REPORTS WILL BE MADE AVAILABLE TO THE OWNER UPON REQUEST.
  - ALL WORKERS & VISITORS TO THE SITE SHALL WEAR HARD HATS & ANY OTHER SAFETY EQUIPMENT REQUIRED BY THE WORK BEING PERFORMED ON THE SITE.

## LEGEND

---	EXISTING CONTOUR LINE		NORTH ARROW
-x-x-x-x-x-x-x-x-x-x-	EXISTING CHAIN LINK FENCE		ELEVATION
---	EXISTING PROPERTY LINE		SECTIONS & DETAILS
--- OHU --- OHU --- OHU ---	EXISTING OVERHEAD UTILITIES		BRICK
--- S --- S ---	EXISTING SANITARY SEWER LINE		CONCRETE
--- SD --- SD ---	EXISTING STORM DRAIN LINE		EARTH
-x-x-x-x-x-x-x-x-x-x-	PROPOSED CHAIN LINK FENCE		GRAVEL
---	PROPOSED LEASE AREA		STEEL
--- OHU --- OHU --- OHU ---	PROPOSED OVERHEAD UTILITIES		GROUND
--- T --- T ---	PROPOSED UNDERGROUND TELCO		REVISION
--- E --- E ---	PROPOSED UNDERGROUND ELECTRIC		KEYNOTE
--- F --- F --- F ---	PROPOSED UNDERGROUND FIBER		MATCH LINE
---	PROPOSED EASEMENT		WORK POINT
--- S/F --- S/F ---	PROPOSED SILT FENCE		MECHANICAL BONDING CONNECTION
---	PROPOSED GROUNDING		EXOTHERMICALLY WELDED BONDING CONNECTION
---	FUTURE FEATURES		POWER POLE

## ABBREVIATIONS

CIGBE	COAX ISOLATED GROUND BAR EXTERNAL		MATCH LINE
MIGB	MASTER ISOLATED GROUND BAR		WORK POINT
SST	SELF SUPPORTING TOWER		MECHANICAL BONDING CONNECTION
GPS	GLOBAL POSITIONING SYSTEM		EXOTHERMICALLY WELDED BONDING CONNECTION
TYP.	TYPICAL		POWER POLE
DWG	DRAWING		DISCONNECT SWITCH
BCW	BARE COPPER WIRE		DOUBLE-THROW MANUAL TRANSFER SWITCH
BFG	BELOW FINISH GRADE		CIRCUIT BREAKER
W/	WITH		EMERGENCY GENERATOR RECEPTACLE
PVC	POLYVINYL CHLORIDE		TELCO PEDESTAL
CAB	CABINET		GROUND ROD
C	CONDUIT		GROUND ROD INSPECTION WELL
SS	STAINLESS STEEL		REPRESENTS DETAIL NUMBER
G	GROUND		REF. DRAWING NUMBER
AWG	AMERICAN WIRE GAUGE		
RGS	RIGID GALVANIZED STEEL		
AHJ	AUTHORITY HAVING JURISDICTION		
TTLNA	TOWER TOP LOW NOISE AMPLIFIER		
UNO	UNLESS NOTED OTHERWISE		
EMT	ELECTRICAL METALLIC TUBING		



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ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

SHEET TITLE:

GENERAL NOTES  
AND LEGEND

SHEET NUMBER:

N-1

**GENERAL NOTES**

1. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITY COMPANY OR OTHER PUBLIC AUTHORITIES.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
3. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK. MINOR OMISSIONS OR ERRORS IN THE BID DOCUMENTS SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR THE OVERALL INTENT OF THESE DRAWINGS.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED AS A RESULT OF CONSTRUCTION OF THIS FACILITY.
5. THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
6. THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING A BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
7. THE CONTRACTOR SHALL VERIFY ANTENNA ELEVATION AND AZIMUTH WITH RF ENGINEERING PRIOR TO INSTALLATION.
8. TRANSMITTER EQUIPMENT AND ANTENNAS ARE DESIGNED TO MEET ANSI/EIA/TIA 222-G REQUIREMENTS.
9. ALL STRUCTURAL ELEMENTS SHALL BE HOT DIPPED GALVANIZED STEEL.
10. CONTRACTOR SHALL MAKE A UTILITY "ONE CALL" TO LOCATE ALL UTILITIES PRIOR TO EXCAVATING.
11. IF ANY UNDERGROUND UTILITIES OR STRUCTURES EXIST BENEATH THE PROJECT AREA, CONTRACTOR MUST LOCATE THEM AND CONTACT THE APPLICANT AND OWNER'S REPRESENTATIVE.
12. OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION BY TECHNICIANS APPROXIMATELY TWICE A MONTH.
13. PRIOR TO THE INSTALLATION OF THE PROPOSED EQUIPMENT OR MODIFICATION TO THE EXISTING STRUCTURE, A STRUCTURAL ANALYSIS SHALL BE PERFORMED BY THE OWNER'S AGENT TO CERTIFY THAT THE EXISTING/PROPOSED COMMUNICATION STRUCTURE AND COMPONENTS ARE STRUCTURALLY ADEQUATE TO SUPPORT ALL EXISTING AND PROPOSED ANTENNAS, COAXIAL CABLES AND OTHER APPURTENANCES.
14. PROPERTY LINE INFORMATION WAS PREPARED USING DEEDS, TAX MAPS AND PLANS OF RECORD AND SHOULD NOT BE CONSTRUED AS AN ACCURATE BOUNDARY SURVEY.
15. THIS PLAN IS SUBJECT TO ALL EASEMENTS AND RESTRICTIONS OF RECORD.
16. THE PROPOSED FACILITY WILL CAUSE ONLY A "DE MINIMIS" INCREASE IN STORM WATER RUNOFF, THEREFORE NO DRAINAGE STRUCTURES ARE PROPOSED.
17. NO SIGNIFICANT NOISE, SMOKE, DUST OR ODOR WILL RESULT FROM THIS FACILITY.
18. THE FACILITY IS UNMANNED AND NOT INTENDED FOR HUMAN HABITATION (NO HANDICAP ACCESS IS REQUIRED).
19. THE FACILITY IS UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SANITARY SERVICE.
20. POWER TO THE FACILITY WILL BE MONITORED BY A SEPARATE METER.



700 PARK OF COMMERCE DRIVE #200  
BOCA RATON FL, 33487  
TEL: (561) 948-6367

PLANS PREPARED BY:



201 NORTH FRANKLIN STREET, SUITE 1400  
TAMPA, FL 33602  
PHONE (813) 620-1460  
WWW.KIMLEY-HORN.COM

REV: DATE: DESCRIPTION: BY:

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A	06/22/23	ISSUED FOR REVIEW	SEW

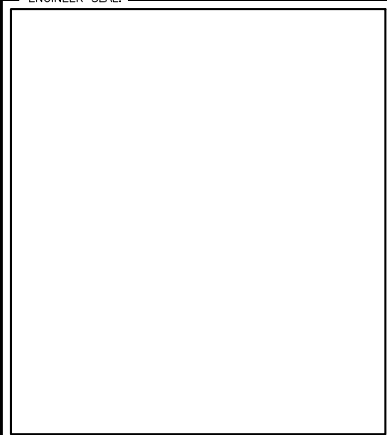
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SEW	TD
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KHA PROJECT NUMBER:

140064151.1.100

ENGINEER SEAL:



PROJECT INFORMATION:

US-MN-5126  
ULEN  
A100345A  
160TH AVE N  
ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

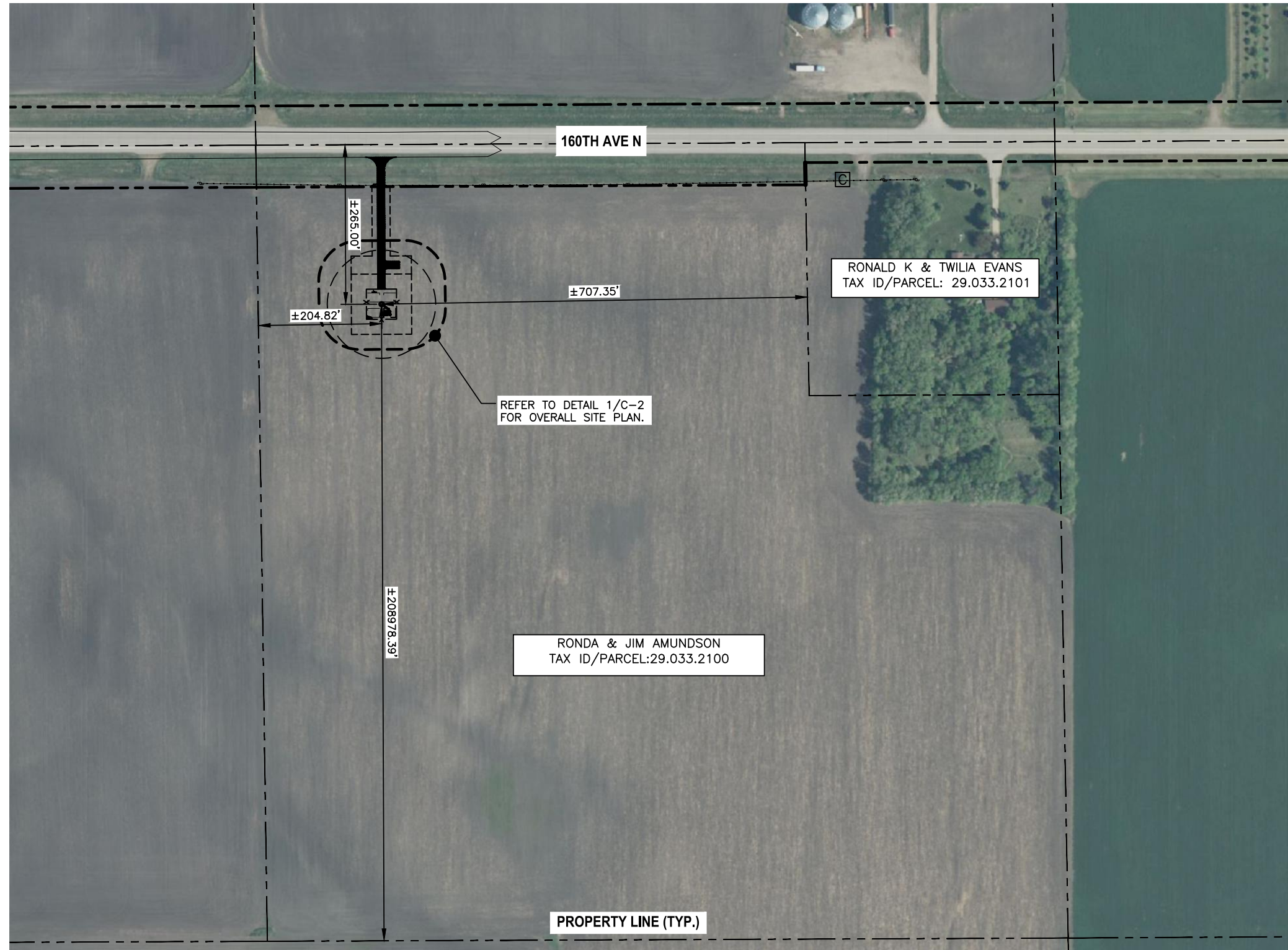
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**GENERAL NOTES**

SHEET NUMBER:

N-2





1  
C-1 **AERIAL SITE PLAN**  
SCALE: NTS  
SCALE BASED ON 11"x17" ONLY



700 PARK OF COMMERCE DRIVE #200  
BOCA RATON FL, 33487  
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PLANS PREPARED BY:



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A100345A  
160TH AVE N  
ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

SHEET TITLE:

AERIAL SITE PLAN

SHEET NUMBER:

C-1



**NOTES:**

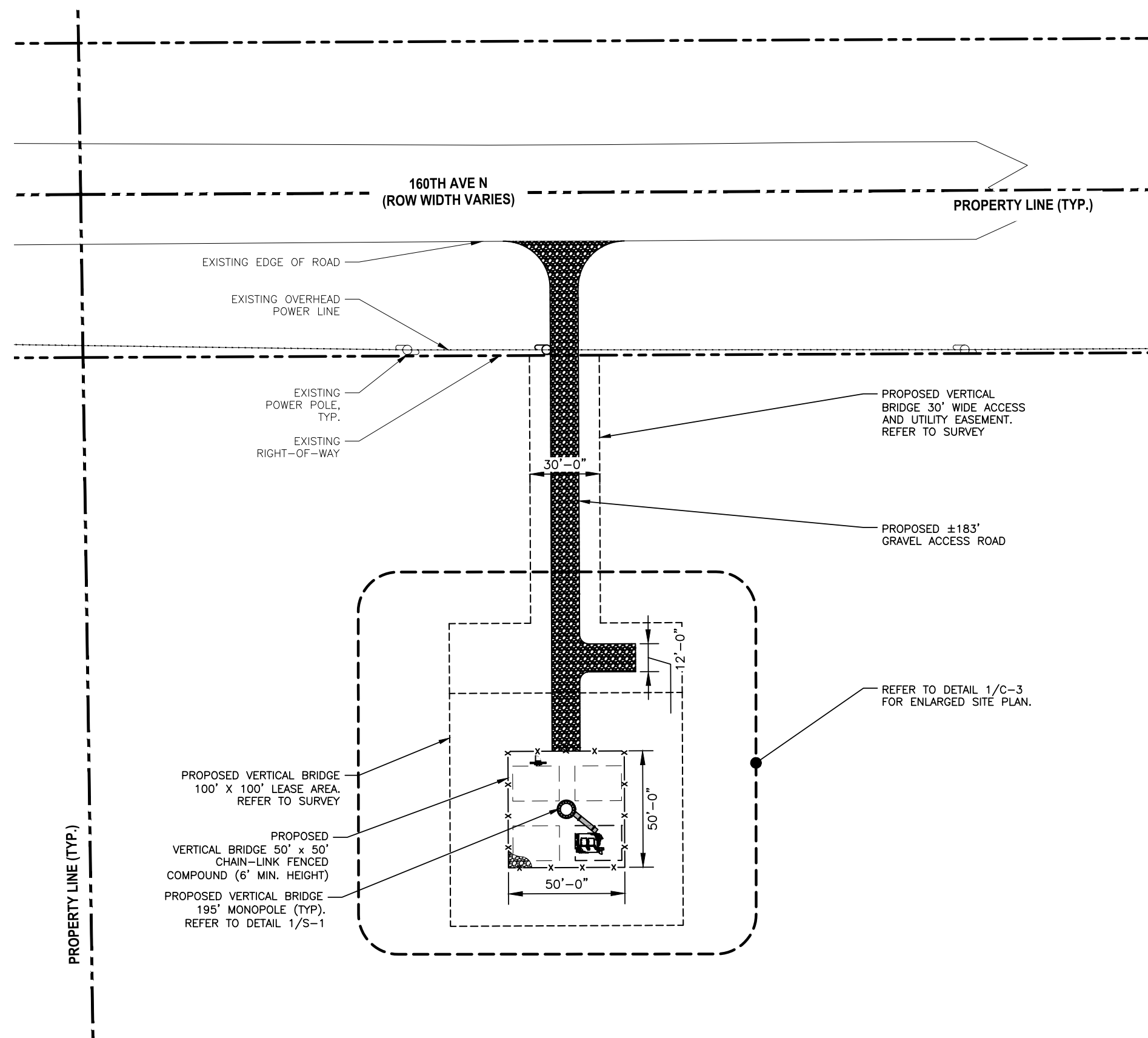
1. FENCED SITE AREA SHALL BE CLEARED AND GRUBBED. REMOVE UNSUITABLE SOFT OR LOOSE SOILS, ORGANIC MATERIAL AND OR RUBBLE TO FIRM SUBGRADE. FILL UNDERCUT UP TO 6 INCHES BELOW FINISH GRADE.
2. THE CONTRACTOR MUST CONTACT THE SURVEYOR TO STAKE OUT THE LEASE AREA AND ALL EASEMENTS PRIOR TO CONSTRUCTION. ALL FEES ARE THE RESPONSIBILITY OF THE CONTRACTOR.
3. IF ANY ARCHAEOLOGICAL MATERIALS ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL STOP WORK IMMEDIATELY AND NOTIFY THE CLIENT.
4. THE CONTRACTOR IS TO ENSURE THAT NO DAMAGE OR DEBRIS OCCURS ON THE ADJACENT PROPERTIES.
5. THE CONTRACTOR SHALL SEED ALL DISTURBED AREAS WITH LOW MAINTENANCE NATIVE GRASS AND COVER WITH APPROVED STRAW.
6. UNTIL THE COMPOUND IS SURROUNDED BY A PERMANENT FENCE, THE CONTRACTOR MUST ERECT A TEMPORARY FENCE AROUND THE TOWER AND POST A "NO TRESPASSING" SIGN. ALL CLIMBING PEGS MUST BE REMOVED UP TO 20' UNTIL A PERMANENT FENCE IS INSTALLED.
7. THE CONTRACTOR MUST ENSURE THAT ALL DELIVERY TRUCKS WILL BE ABLE TO DELIVER THE MATERIAL TO THE COMPOUND. IF THE DELIVERY TRUCKS CAN NOT ACCESS THE COMPOUND THEN THE CONTRACTOR MUST MAKE OTHER ARRANGEMENTS TO GET THE MATERIAL TO THE COMPOUND. IF THIS IS REQUIRED THE CONTRACTOR MUST CONTACT KIMLEY-HORN AND ASSOCIATES IMMEDIATELY. NO ADDITIONAL FEES WILL BE PASSED ON TO THE CLIENT.
8. PROPOSED TOWER AND FOUNDATION TO BE INSTALLED IN ACCORDANCE WITH THE TOWER MANUFACTURER PLANS PROVIDED BY CLIENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE UNLOADING OF TOWER MATERIALS DELIVERED TO SITE BY THE TOWER MANUFACTURER.
9. CONTRACTOR MUST REFER TO THE GEOTECH REPORT FOR ALL COMPACTED FILL RECOMMENDATIONS. IF THE GEOTECH REPORT CONFLICTS WITH THE CONSTRUCTION DRAWINGS THEN STOP WORK AND CONTACT THE CLIENT AS SOON AS POSSIBLE.
10. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL DOT AND/OR COUNTY SPECIFICATIONS PRIOR TO BID AND CONSTRUCTION. IF THE SPECIFICATIONS DIFFER FROM THE CONSTRUCTION DRAWINGS, THEN THE SPECIFICATIONS WILL GOVERN. NO ADDITIONAL COSTS FOR ADHERING TO THE SPECIFICATIONS WILL BE ALLOWED AFTER THE BID HAS BEEN ISSUED AND ACCEPTED NOR WILL PROJECT DELAYS BE TOLERATED.
11. AT THE TIME THE CONSTRUCTION DRAWINGS WERE COMPLETED, KIMLEY-HORN AND ASSOCIATES DID NOT POSSES THE PROPOSED TOWER MANUFACTURER DRAWINGS. THE EXACT SIZE OF THE OVERALL TOWER FOOTPRINT IS UN KNOWN. THE CONTRACTOR MUST COMPARE THE CONSTRUCTION DRAWINGS WITH THE TOWER DRAWINGS PRIOR TO BID AND/OR CONSTRUCTION AND IF THEY FIND ANY DISCREPANCIES OR POSSIBLE ISSUES THEY MUST NOTIFY THE CLIENT IMMEDIATELY.



**DEVELOPED AREA:**  
 PROPOSED 50' x 50' GRAVEL COMPOUND = ±2,500 S.F.  
 PROPOSED ACCESS ROAD = ±3,095 S.F.  
 TOTAL IMPERVIOUS = ±5,595 S.F.

**FLOOD ZONE INFORMATION:**

FLOOD ZONE: X  
 PARCEL NUMBER: 27027C0260E  
 EFFECTIVE DATE: 2017  
 BASE FLOOD EL. N/A

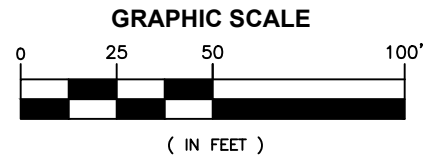


PROPOSED VERTICAL BRIDGE  
 100' X 100' LEASE AREA.  
 REFER TO SURVEY

PROPOSED  
 VERTICAL BRIDGE 50' x 50'  
 CHAIN-LINK FENCED  
 COMPOUND (6' MIN. HEIGHT)

PROPOSED VERTICAL BRIDGE  
 195' MONOPOLE (TYP).  
 REFER TO DETAIL 1/S-1

**1 OVERALL SITE PLAN**  
 SCALE: 1:50  
 SCALE BASED ON 11"x17" ONLY



700 PARK OF COMMERCE DRIVE #200  
 BOCA RATON FL, 33487  
 TEL: (561) 948-6367

PLANS PREPARED BY:



201 NORTH FRANKLIN STREET, SUITE 1400  
 TAMPA, FL 33602  
 PHONE (813) 620-1460  
 WWW.KIMLEY-HORN.COM

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KHA PROJECT NUMBER:  
 140064151.1.100

ENGINEER SEAL:

PROJECT INFORMATION:

US-MN-5126  
 ULEN  
 A100345A  
 160TH AVE N  
 ULEN TOWNSHIP, MN 56585  
 CLAY COUNTY

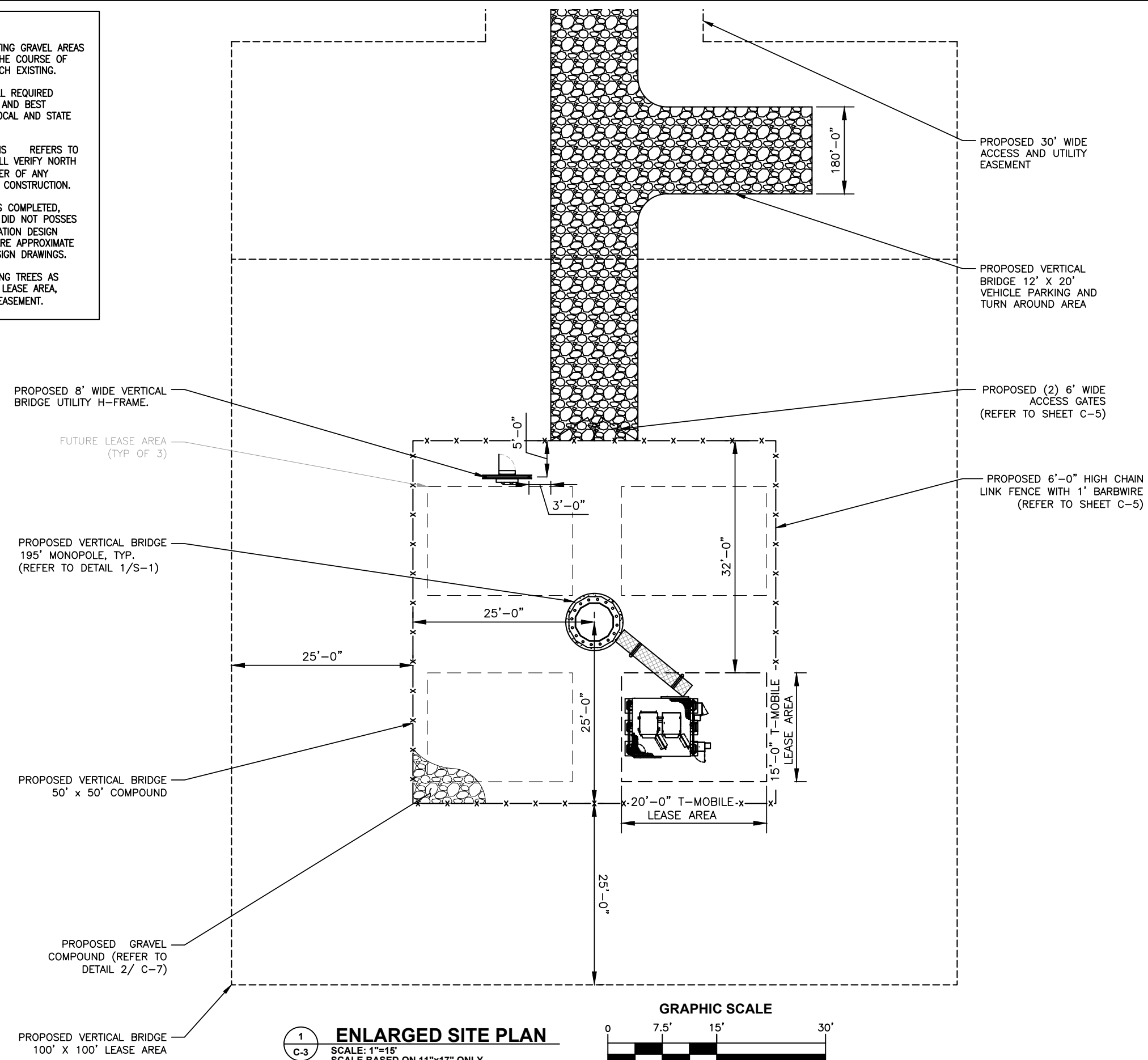
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**OVERALL SITE PLAN**

SHEET NUMBER:

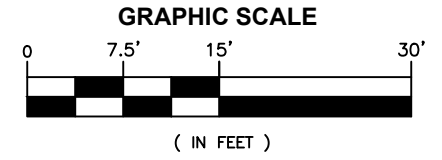
**C-2**

- NOTES:**
- CONTRACTOR TO FILL ANY EXISTING GRAVEL AREAS THAT ARE DISTURBED DURING THE COURSE OF CONSTRUCTION, GRAVEL TO MATCH EXISTING.
  - CONTRACTOR SHALL PROVIDE ALL REQUIRED EROSION CONTROL TECHNIQUES AND BEST MANAGEMENT PRACTICES PER LOCAL AND STATE REQUIREMENTS AS APPLICABLE.
  - NORTH ARROW SHOWN ON PLANS REFERS TO TRUE NORTH. CONTRACTOR SHALL VERIFY NORTH AND INFORM ARCHITECT/ENGINEER OF ANY DISCREPANCY BEFORE STARTING CONSTRUCTION.
  - AT THE TIME THIS DRAWING WAS COMPLETED, KIMLEY-HORN AND ASSOCIATES DID NOT POSSES A COPY OF THE TOWER/FOUNDATION DESIGN DRAWINGS. THE SIZES SHOWN ARE APPROXIMATE PENDING RECEIPT OF FINAL DESIGN DRAWINGS.
  - CONTRACTOR TO REMOVE EXISTING TREES AS NEEDED WITHIN THE PROPOSED LEASE AREA, INGRESS/EGRESS, AND UTILITY EASEMENT.



1  
C-3

**ENLARGED SITE PLAN**  
SCALE: 1"=15'  
SCALE BASED ON 11"x17" ONLY



700 PARK OF COMMERCE DRIVE #200  
BOCA RATON FL, 33487  
TEL: (561) 948-6367

PLANS PREPARED BY:



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TAMPA, FL 33602  
PHONE (813) 620-1460  
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KHA PROJECT NUMBER: 140064151.1.100

ENGINEER SEAL:

PROJECT INFORMATION:

US-MN-5126  
ULEN  
A100345A  
160TH AVE N  
ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

SHEET TITLE:

**ENLARGED SITE PLAN**

SHEET NUMBER:

C-3



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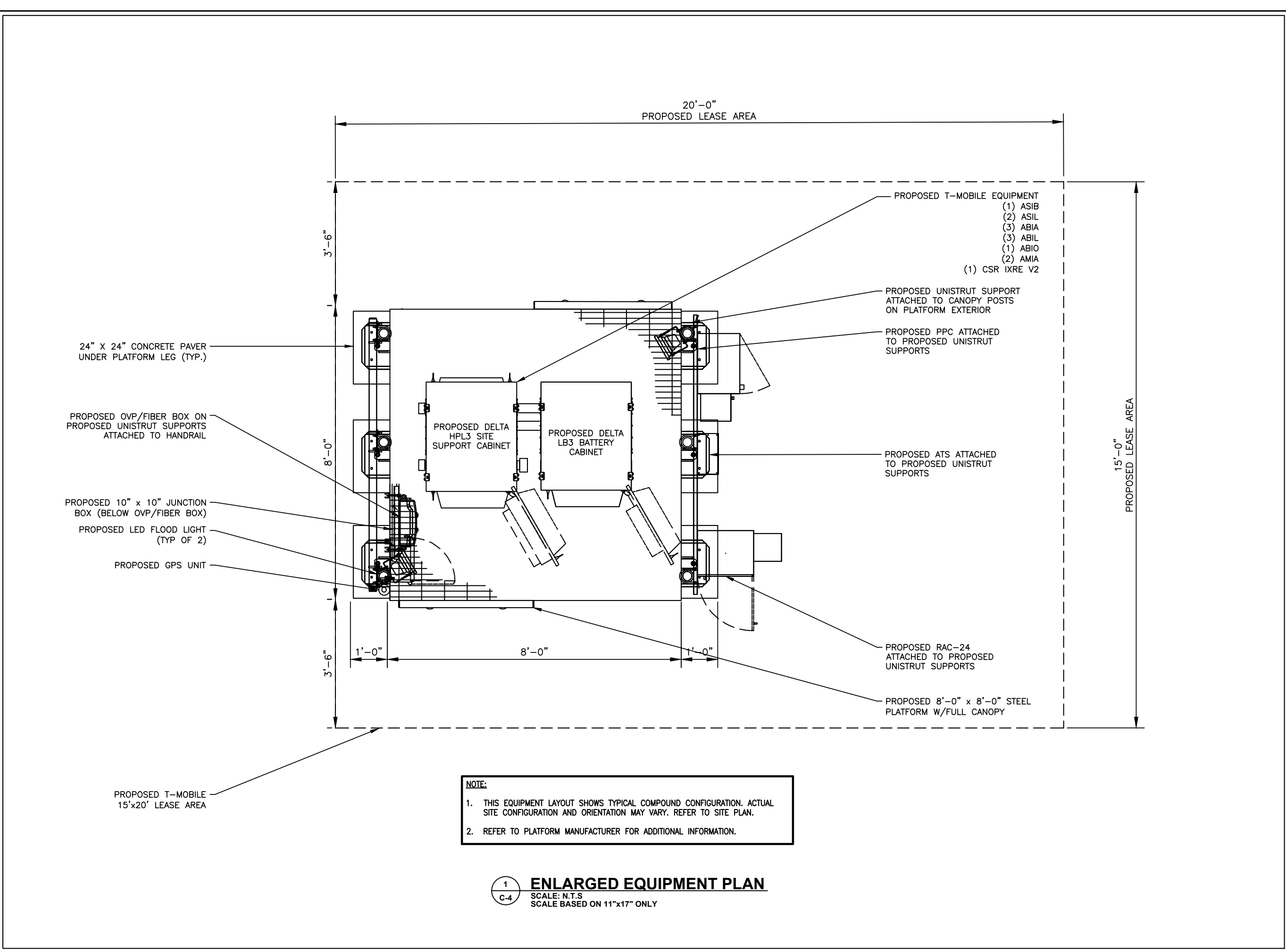
ENGINEER SEAL:
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PROJECT INFORMATION:
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US-MN-5126  
ULEN  
A100345A  
160TH AVE N  
ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

SHEET TITLE:  
**ENLARGED EQUIPMENT PLAN**

SHEET NUMBER:  
**C-4**



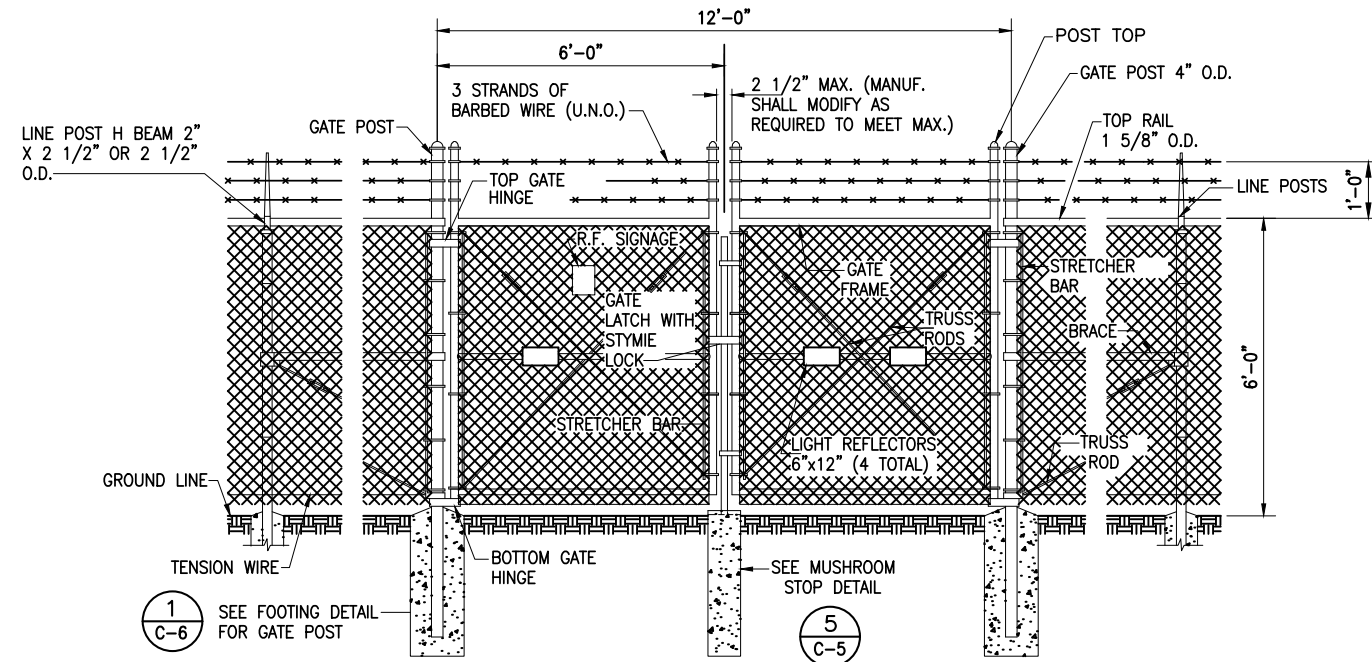
**NOTE:**

- THIS EQUIPMENT LAYOUT SHOWS TYPICAL COMPOUND CONFIGURATION. ACTUAL SITE CONFIGURATION AND ORIENTATION MAY VARY. REFER TO SITE PLAN.
- REFER TO PLATFORM MANUFACTURER FOR ADDITIONAL INFORMATION.

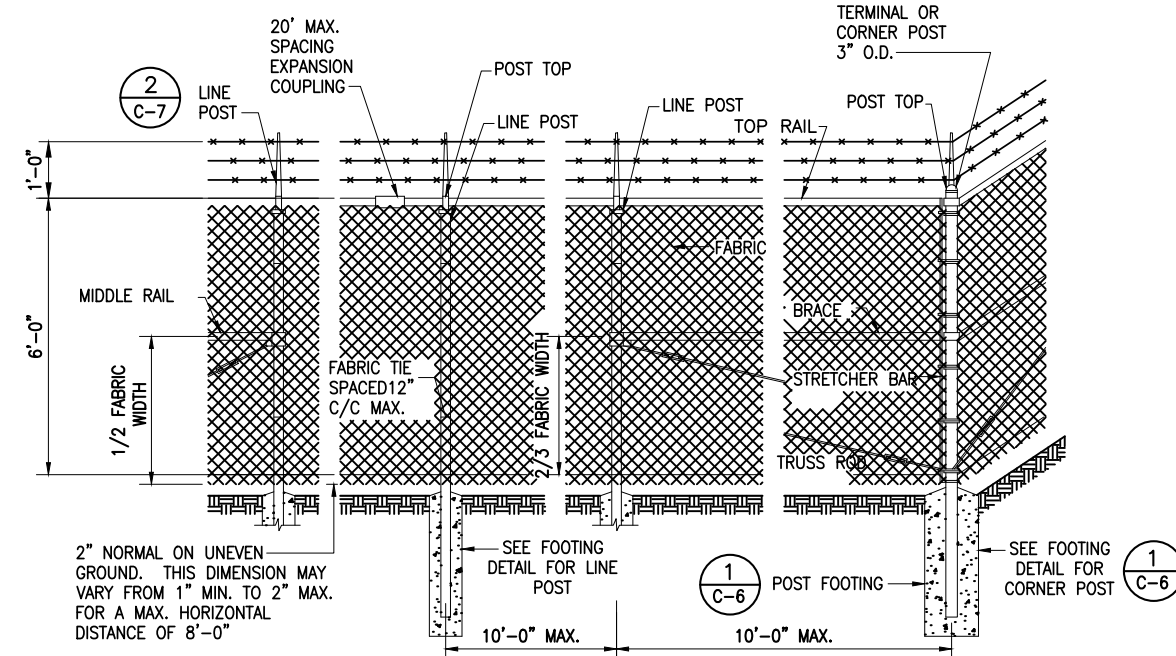
**1**  
**C-4**  
**ENLARGED EQUIPMENT PLAN**  
SCALE: N.T.S  
SCALE BASED ON 11"x17" ONLY

**SECURITY FENCE NOTE:**

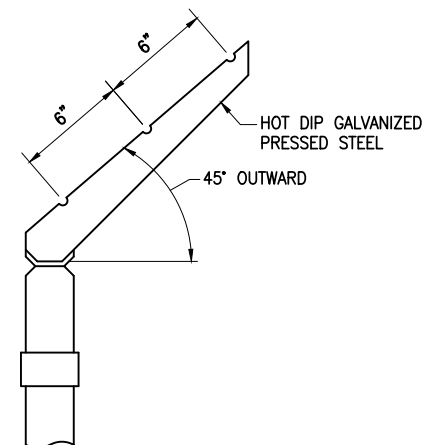
NUTS ON ALL BOLTS SHALL BE TOWARD THE INTERIOR OF THE COMPOUND



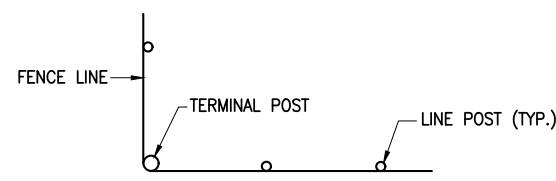
**1 VEHICLE GATE ARRANGEMENT**



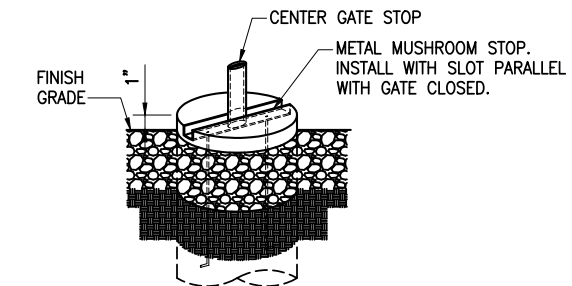
**2 POST/CORNER POST ARRANGEMENT**



**3 BARBED WIRE ARM OF LINE POST**



**4 INSTALLATION AT CORNERS**



**5 MUSHROOM STOP DETAIL**



700 PARK OF COMMERCE DRIVE #200  
BOCA RATON FL, 33487  
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TAMPA, FL 33602  
PHONE (813) 620-1460  
WWW.KIMLEY-HORN.COM

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ENGINEER SEAL:

PROJECT INFORMATION:

US-MN-5126  
ULEN  
A100345A  
160TH AVE N  
ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

SHEET TITLE:

FENCE DETAILS

SHEET NUMBER:

C-5



**NOTES:**

ZINC COATING – THE WEIGHT OF THE COATING SHALL NOT BE LESS THAN 1.2 OUNCES PER SQUARE FOOT OF ACTUAL SURFACE COVERED. ALL FERROUS METALS USED AS PART OF THE FENCE INSTALLATION SHALL BE HOT DIP GALVANIZED OR STAINLESS STEEL. ALL SCREWS, BOLTS, LOCK WASHERS, NUTS, ETC. SHALL BE HOT DIP GALVANIZED OR MADE OF STAINLESS STEEL.

FABRIC – STANDARD INDUSTRIAL GRADE #9 GAUGE WITH 2 INCH MESH ZINC COATED CHAIN LINK WITH A BREAKING STRENGTH OF NOT LESS THAN 1290 POUNDS SHALL BE USED. THE FABRIC SHALL BE ZINC COATED BY THE HOT DIP PROCESS AFTER FABRICATION.

METAL POSTS – METAL POSTS (LINE, CORNER, TERMINAL, GATE POSTS, MIDDLE RAILS, BRACES AND TOP RAIL) SHALL BE HOT DIP GALVANIZED SCHEDULE 40 TUBULAR STEEL WITH AN OUTSIDE DIAMETER AS INDICATED ON THIS DRAWING. A POST TOP FITTING OF GALVANIZED STEEL WILL BE INSTALLED TO EXCLUDE MOISTURE.

POST CAPS – ALL POST CAPS TO USE THE BARBED WIRE OUTRIGGER BRACKET AND SHALL BE ATTACHED TO THE POST WITH TAMPER RESISTANT SCREWS, BRADS, OR BOLTS.

TOP RAIL – A MINIMUM OF ONE COUPLING IN EACH STRAIGHT RUN OF TOP RAIL, SHALL HAVE A HEAVY SPRING INSERTED WITHIN THE COUPLING TO TAKE UP EXPANSION AND CONTRACTION OF THE TOP RAIL. THE TOP RAIL SHALL BE FASTENED TO TERMINAL POSTS WITH PRESSED STEEL CONNECTIONS.

MIDDLE RAIL – THE MIDDLE RAIL SHALL BE OF THE SAME MATERIAL AS THE TOP RAIL AND INSTALLED WITH HOT DIP GALVANIZED FITTINGS ATTACHED TO THE POSTS.

BRACE RAIL – BRACE RAIL MATERIAL SHALL BE OF THE MATERIAL AS THE TOP RAIL AND LOCATED 2/3 OF THE DISTANCE UP FROM THE BOTTOM OF THE FABRIC. BRACE RAILS SHALL BE SECURELY FASTENED TO POSTS BY SUITABLE PRESSED STEEL CONNECTIONS.

TRUSS RODS – SHALL BE 3/8" ROUND GALVANIZED STEEL RODS WITH GALVANIZED TURNBUCKLES. THE ZINC COATING SHALL BE NOT LESS THAN 1.2 OUNCES PER SQUARE FOOT OF SURFACE.

TENSION WIRE – THE TENSION WIRE SHALL BE OF #7 GAUGE HOT DIP GALVANIZED SPRING TENSION WIRE WITH A BREAKING STRENGTH OF NOT LESS THAN 1900 POUNDS. THIS WIRE SHALL BE KEPT TAUT WITH GALVANIZED TURNBUCKLES AND ATTACHED TO POSTS WITH GALVANIZED HARDWARE OR CABLE CLAMPS.

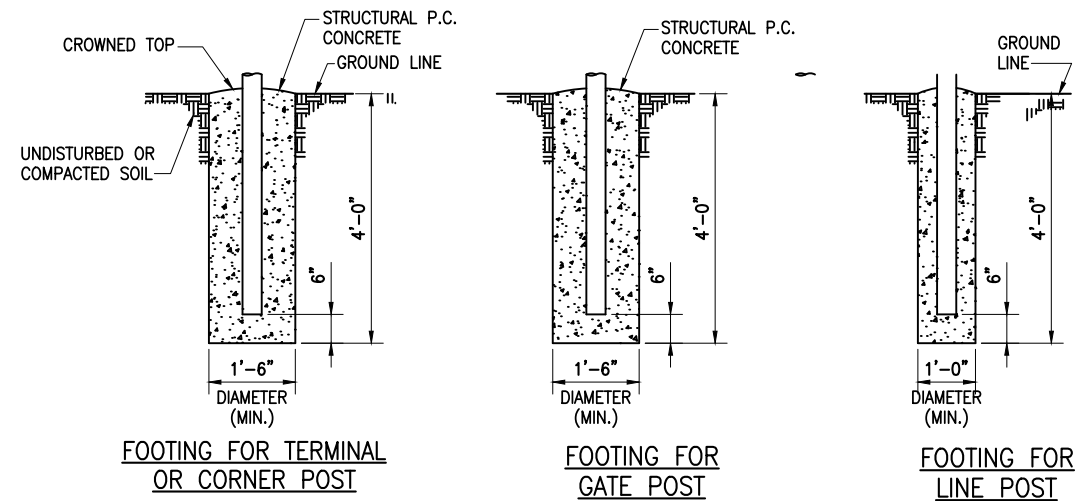
FABRIC TIES – THE FABRIC TIES SHALL BE ALUMINUM WIRE. NOT LESS THAN #9 GAGE.

STRETCHER BARS – THE STRETCHER BARS SHALL BE FLAT GALVANIZED STEEL BARS NOT LESS THAN 5/16" X 3/4" AND NOT LESS THAN 2" SHORTER THAN THE FABRIC. STRETCHER BAR BANDS SHALL BE FLAT GALVANIZED STEEL BARS NOT LESS THAN 5/16" X 1 1/2" WITH 5/16" DIAMETER GALVANIZED CARRIAGE BOLT.

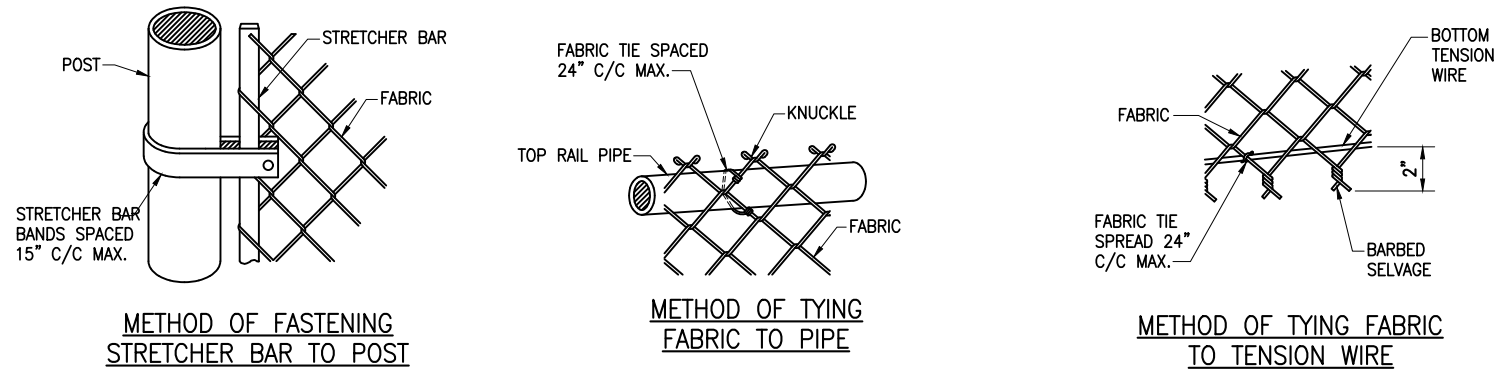
BARBED WIRE – BARBED WIRE OF GALVANIZED STEEL (OR ALUMINUM) CONSISTING OF 12 1/2 GAUGE WIRE WITH 4-POINT BARBS OF 14 GAUGE WIRE SPACED 5 INCHES APART.

GATE FRAMES SHALL BE CONSTRUCTED OF 2 1/2 INCH OUTSIDE DIAMETER HEAVY DUTY GALVANIZED STEEL PIPE. THE GATES SHALL BE ASSEMBLED USING CORNER FITTINGS OF HEAVY PRESSED STEEL OR MALLEABLE CASTINGS OR MAY BE WELDED IF THE ENTIRE GATE FRAME IS HOT DIP GALVANIZED AFTER THE WELDING. ALL GATES SHALL BE EQUIPPED WITH HEAVY DUTY GALVANIZED STEEL TYPE HINGES WITH LARGE BEARING SURFACES OF ADEQUATE STRENGTH TO SUPPORT THE GATE. THE HINGES SHALL NOT TWIST OR TURN UNDER THE ACTION OF THE GATE. GATES WILL PROVIDE A FULL RANGE OF MOTION AND BE EASILY OPENED AND CLOSED BY ONE PERSON. GATE LATCH SHALL BE CARGO PROTECTORS, INC. MODEL FL-100. LATCH SHALL BE EQUIPPED TO RECEIVE A PADLOCK.

PROVIDE R.F. WARNING SIGNAGE ON ALL GATES.



**1 POST FOOTINGS**



**2 FABRIC/BAR CONNECTIONS**



700 PARK OF COMMERCE DRIVE #200  
BOCA RATON FL, 33487  
TEL: (561) 948-6367

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TAMPA, FL 33602  
PHONE (813) 620-1460  
WWW.KIMLEY-HORN.COM

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KHA PROJECT NUMBER:

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ENGINEER SEAL:

PROJECT INFORMATION:

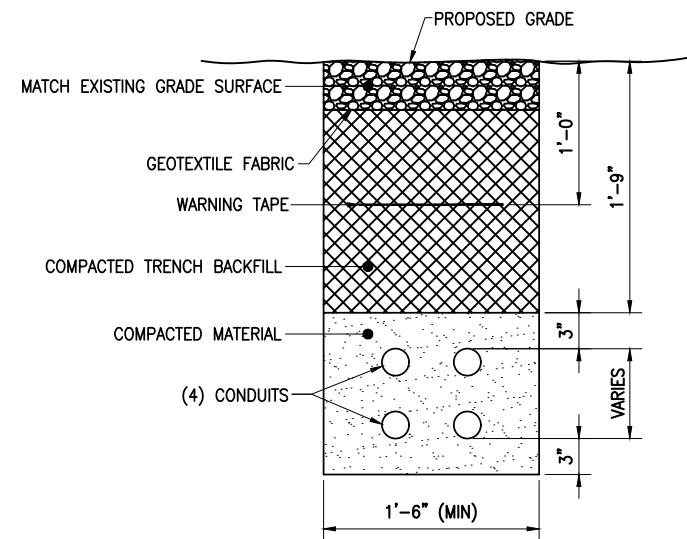
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ULEN  
A100345A  
160TH AVE N  
ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

SHEET TITLE:

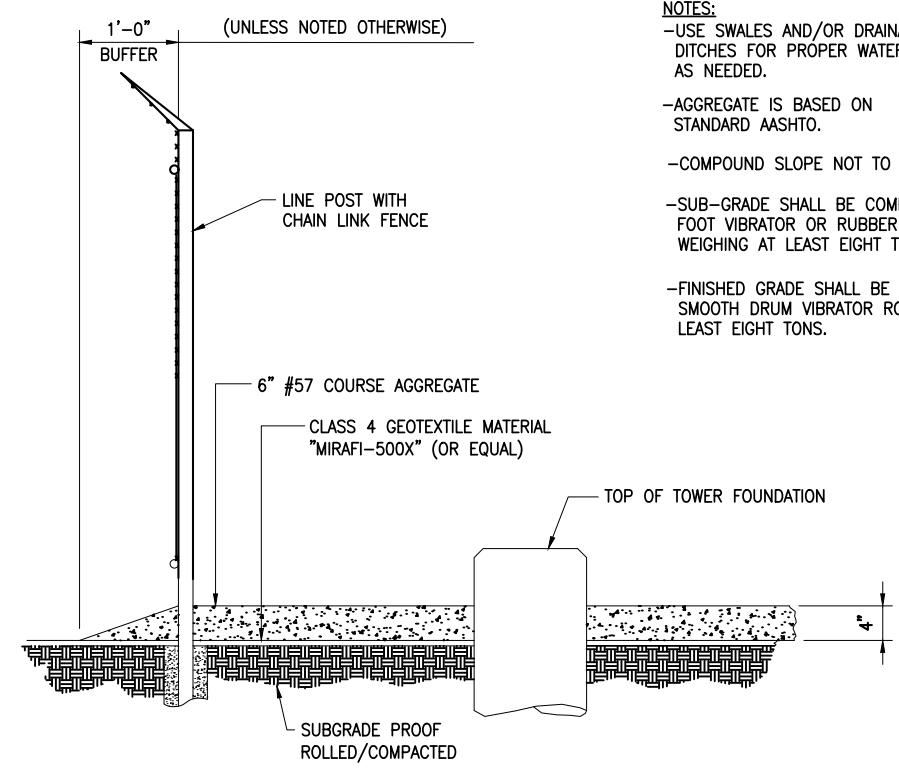
FENCE DETAILS

SHEET NUMBER:

C-6

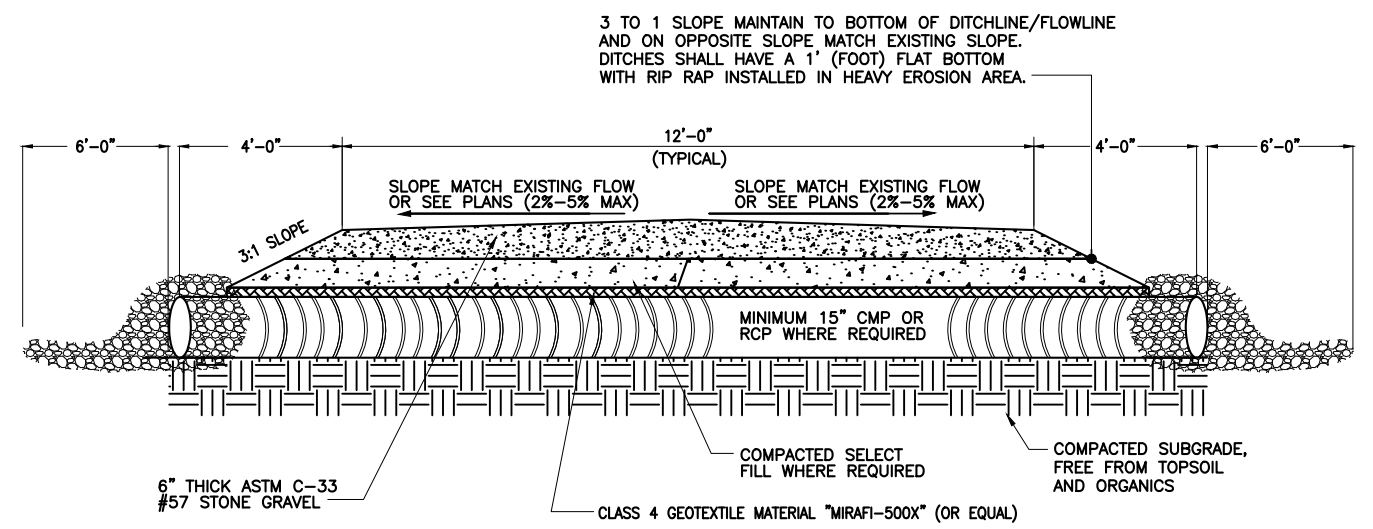


**1 ELECTRICAL/UTILITY COMMUNICATION TRENCH SECTION**  
 C-7 NOT TO SCALE



**NOTES:**  
 -USE SWALES AND/OR DRAINAGE DITCHES FOR PROPER WATER RUNOFF AS NEEDED.  
 -AGGREGATE IS BASED ON STANDARD AASHTO.  
 -COMPOUND SLOPE NOT TO EXCEED 5%  
 -SUB-GRADE SHALL BE COMPACTED BY SHEEPS FOOT VIBRATOR OR RUBBER TIED ROLLERS WEIGHING AT LEAST EIGHT TONS.  
 -FINISHED GRADE SHALL BE COMPACTED BY SMOOTH DRUM VIBRATOR ROLLERS WEIGHING AT LEAST EIGHT TONS.

**2 SITE COMPOUND SURFACING DETAIL**  
 C-7 NOT TO SCALE



**NOTES:**  
 -USE OF SWALES AND/OR DRAINAGE DITCHES FOR PROPER WATER RUNOFF AS NEEDED.  
 -AGGREGATE IS BASED ON STANDARD AASHTO.  
 -2" CROWN IN CENTER OF ACCESS, UNLESS IN CURVES, THEN ACCESS SHOULD BE SLOPED TO INSIDE OF TURN / CURVE  
 -PIPE SHALL BE AT A MINIMUM OF 4' LONGER THEN ACCESS ROAD WIDTH ON EACH SIDE FOR PROPER SHOULDERING.  
 -ALL CROSSDRAINS SHALL BE INSTALLED ON A 45° ANGLE WITH THE FALL OF THE GRADE.

**3 DRIVEWAY SECTION (GRAVEL)**  
 C-7 SCALE: N.T.S.

**VERTICAL BRIDGE DEVELOPMENT, LLC**  
 750 PARK OF COMMERCE DR., STE#200  
 BOCA RATON, FL 33487  
 (561) 948-6367  
 Site #: US-MN-5126  
 Site Name: ULEN  
 FCC#:  
 FAA:

**NO TRESPASSING**  
 TRESPASSERS WILL BE PROSECUTED

**4 SITE SIGNAGE**  
 C-7 SCALE: N.T.S.

**verticalbridge**  
 700 PARK OF COMMERCE DRIVE #200  
 BOCA RATON FL, 33487  
 TEL: (561) 948-6367

PLANS PREPARED BY:  
**Kimley»Horn**  
 201 NORTH FRANKLIN STREET, SUITE 1400  
 TAMPA, FL 33602  
 PHONE (813) 620-1460  
 WWW.KIMLEY-HORN.COM

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DRAWN BY: SEW CHECKED BY: TD  
 KHA PROJECT NUMBER: 140064151.1.100  
 ENGINEER SEAL:

PROJECT INFORMATION:  
 US-MN-5126  
 ULEN  
 A100345A  
 160TH AVE N  
 ULEN TOWNSHIP, MN 56585  
 CLAY COUNTY

SHEET TITLE:  
**COMPOUND/DRIVEWAY DETAILS**

SHEET NUMBER:  
**C-7**





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US-MN-5126  
ULEN  
A100345A  
160TH AVE N  
ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

SHEET TITLE:

OVERALL GRADING  
PLAN

SHEET NUMBER:

C-8

EXISTING UTILITY POLE WITH  
METER (END OF EXISTING  
OVERHEAD POWER)

PROPOSED 12' WIDE  
ACCESS GRAVEL ROAD  
PROPOSED 30' ACCESS  
AND UTILITY EASEMENT

PARENT PARCEL  
DESCRIPTION:  
RURAL/AGRICULTURAL RESIDENCE  
PARCEL NUMBER: 14932

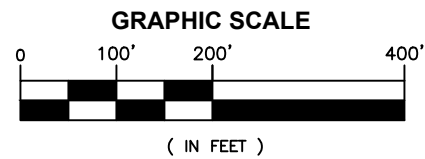
PROPOSED VERTICAL BRIDGE  
DEVELOPMENT, LLC  
75' x 75' LEASE AREA

PROPOSED VERTICAL BRIDGE  
DEVELOPMENT, LLC 150'  
MONOPOLE

1  
C-8

### OVERALL GRADING PLAN

SCALE: 1"=200'  
SCALE BASED ON 11"x17" ONLY



LEGEND	
--- xxx' ---	PROPOSED CONTOUR LINE
--- xxx' ---	EXISTING CONTOUR LINE
--- S/F ---	PROPOSED SILT FENCE
⊠ - 1459.5	PROPOSED SPOT ELEVATION
⊠ - 1459.5	EXISTING SPOT ELEVATION
⊠ - ME	MATCH EXISTING
→	FLOW ARROW
→ 2.00%	SLOPE ARROW

**GRADING & EXCAVATING NOTES:**

1. ALL EXCAVATIONS ON WHICH CONCRETE IS TO BE PLACED SHALL BE SUBSTANTIALLY HORIZONTAL ON UNDISTURBED AND UNFROZEN SOIL AND BE FREE FROM LOOSE MATERIAL AND EXCESS GROUNDWATER. DEWATERING FOR EXCESS GROUNDWATER SHALL BE PROVIDED IF REQUIRED.
2. CONCRETE FOUNDATIONS SHALL NOT BE PLACED ON ORGANIC MATERIAL. IF SOUND SOIL IS NOT REACHED AT THE DESIGNATED EXCAVATION DEPTH, THE UNSATISFACTORY SOIL SHALL BE EXCAVATED TO ITS FULL DEPTH AND EITHER BE REPLACED WITH MECHANICALLY COMPACTED GRANULAR MATERIAL OR THE EXCAVATION BE FILLED WITH CONCRETE OF THE SAME QUALITY SPECIFIED FOR THE FOUNDATION.
3. ANY EXCAVATION OVER THE REQUIRED DEPTH SHALL BE FILLED WITH EITHER MECHANICALLY COMPACTED GRANULAR MATERIAL OR CONCRETE OF THE SAME QUALITY SPECIFIED FOR THE FOUNDATION. CRUSHED STONE MAY BE USED TO STABILIZE THE BOTTOM OF THE EXCAVATION. STONE, IF USED, SHALL NOT BE USED AS COMPILING CONCRETE THICKNESS.
4. AFTER COMPLETION OF THE FOUNDATION AND OTHER CONSTRUCTION BELOW GRADE, AND BEFORE BACKFILLING, ALL EXCAVATIONS SHALL BE CLEAN OF UNSUITABLE MATERIAL SUCH AS VEGETATION, TRASH, DEBRIS, AND SO FORTH.
5. -USE APPROVED MATERIALS CONSISTING OF EARTH, LOAM, SANDY CLAY, SAND -BE FREE FROM CLODS OR STONES OVER 2-1/2" MAXIMUM DIMENSIONS -BE PLACED IN 6" LAYERS AND COMPACTED TO 95% STANDARD PROCTOR EXCEPT IN GRASSED/LANDSCAPED AREAS, WHERE 90% STANDARD PROCTOR
6. REMOVE ALL VEGETATION, TOPSOIL, DEBRIS, WET AND UNSATISFACTORY SOIL MATERIALS, OBSTRUCTIONS, AND DELETERIOUS MATERIALS FROM GROUND SURFACE PRIOR TO PLACING FILLS. PLOW, STRIP, OR BREAK UP SLOPED SURFACES STEEPER THAN THAN 1 VERTICAL TO 4 HORIZONTAL SO FILL MATERIAL WILL BOND WITH EXISTING SURFACE. WHEN SUBGRADE OR EXISTING GROUND SURFACE TO RECEIVE FILL HAS A DENSITY LESS THAN THAT REQUIRED FOR FILL, BREAK UP GROUND SURFACE TO DEPTH REQUIRED, PULVERIZE, MOISTURE-CONDITION OR AERATE SOIL AND RECOMPACT TO REQUIRED DENSITY.
7. PROTECT EXISTING GRAVEL SURFACING AND SUBGRADE IN AREAS WHERE EQUIPMENT LOADS WILL OPERATE. USE PLANKING OR OTHER SUITABLE MATERIALS DESIGNED TO SPREAD EQUIPMENT LOADS. REPAIR DAMAGE TO EXISTING GRAVEL SURFACING OR SUBGRADE WHERE SUCH DAMAGE IS DUE TO THE CONTRACTOR'S OPERATIONS. DAMAGED GRAVEL SURFACING SHALL BE RESTORED TO MATCH THE ADJACENT UNDAMAGED GRAVEL SURFACING AND SHALL BE OF THE SAME THICKNESS.
8. REPLACE EXISTING GRAVEL SURFACING ON AREAS FROM WHICH GRAVEL SURFACING IS REMOVED DURING CONSTRUCTION OPERATIONS. GRAVEL SURFACING SHALL BE REPLACED TO MATCH EXISTING ADJACENT GRAVEL SURFACING AND SHALL BE OF THE SAME THICKNESS. SURFACES OF GRAVEL SURFACING SHALL BE FREE FROM CORRUGATIONS AND WAVES. EXISTING GRAVEL SURFACING MAY BE EXCAVATED SEPARATELY AND REUSED IF INJURIOUS AMOUNTS OF EARTH, ORGANIC MATTER, OR OTHER DELETERIOUS MATERIALS ARE REMOVED PRIOR TO REUSE. FURNISH ALL ADDITIONAL GRAVEL RESURFACING MATERIAL AS REQUIRED. BEFORE GRAVEL SURFACING IS REPLACED, SUBGRADE SHALL BE GRADED TO CONFORM TO REQUIRED SUBGRADE ELEVATIONS, AND LOOSE OR DISTURBED MATERIALS SHALL BE THOROUGHLY COMPACTED. DEPRESSIONS IN THE SUBGRADE SHALL BE FILLED AND COMPACTED WITH APPROVED SELECTED MATERIAL. GRAVEL SURFACING MATERIAL MAY BE USED FOR FILLING DEPRESSIONS IN THE SUBGRADE, SUBJECT TO ENGINEER'S APPROVAL.
9. DAMAGE TO EXISTING STRUCTURES AND UTILITIES RESULTING FROM CONTRACTOR'S NEGLIGENCE SHALL BE REPAIRED/REPLACED TO OWNER'S SATISFACTION AT CONTRACTOR'S EXPENSE.
10. CONTRACTOR SHALL COORDINATE THE CONSTRUCTION SCHEDULE WITH PROPERTY OWNER SO AS TO AVOID INTERRUPTIONS TO PROPERTY OWNER'S OPERATIONS.
11. ENSURE POSITIVE DRAINAGE DURING AND AFTER COMPLETION OF CONSTRUCTION.
12. ALL CUT AND FILL SLOPES SHALL BE MAXIMUM 2 HORIZONTAL TO 1 VERTICAL.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR MONITORING SITE VEHICLE TRAFFIC AS TO NOT ALLOW VEHICLES LEAVING THE SITE TO TRACK MUD ONTO PUBLIC STREETS. THE CONTRACTOR IS RESPONSIBLE FOR CLEANING PUBLIC STREETS DUE TO MUDDY VEHICLES LEAVING THE SITE.

**GENERAL EROSION & SEDIMENT CONTROL NOTES:**

1. THE SOIL EROSION AND SEDIMENT CONTROL MEASURES AND DETAILS AS SHOWN HEREIN AND STIPULATED WITHIN STATE STANDARDS SHALL BE FOLLOWED AND INSTALLED IN A MANNER SO AS TO MINIMIZE SEDIMENT LEAVING THE SITE.
2. PRIOR TO COMMENCING LAND DISTURBANCE ACTIVITY, THE LIMITS OF LAND DISTURBANCE SHALL BE CLEARLY AND ACCURATELY DEMARCATED WITH STAKES, RIBBONS, OR OTHER APPROPRIATE MEANS.
3. EROSION CONTROL DEVICES SHALL BE INSTALLED BEFORE GROUND DISTURBANCE OCCURS. THE LOCATION OF SOME OF THE EROSION CONTROL DEVICES MAY HAVE TO BE ALTERED FROM SHOWN ON THE APPROVED PLANS IF DRAINAGE PATTERNS DURING CONSTRUCTION ARE DIFFERENT FROM THE FINAL PROPOSED DRAINAGE PATTERNS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ACCOMPLISH EROSION CONTROL FOR ALL DRAINAGE PATTERNS CREATED AT VARIOUS STAGES DURING CONSTRUCTION. ANY DIFFICULTY IN CONTROLLING EROSION DURING ANY PHASE OF CONSTRUCTION SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.
4. THE LOCATION OF SOME OF THE EROSION CONTROL DEVICES MAY HAVE TO BE ALTERED FROM THAT SHOWN ON THE PLANS IF DRAINAGE PATTERNS DURING CONSTRUCTION ARE DIFFERENT FROM THE FINAL PROPOSED DRAINAGE PATTERNS. ANY DIFFICULTY IN CONTROLLING EROSION DURING ANY PHASE OF CONSTRUCTION SHALL BE REPORTED TO THE ENGINEER IMMEDIATELY.
5. CONTRACTOR SHALL MAINTAIN ALL EROSION CONTROL MEASURES UNTIL PERMANENT VEGETATION HAS BEEN ESTABLISHED. CONTRACTOR SHALL CLEAN OUT ALL SEDIMENT PONDS WHEN REQUIRED BY THE ENGINEER OR THE LOCAL JURISDICTION INSPECTOR. CONTRACTOR SHALL INSPECT EROSION CONTROL MEASURES AT THE END OF EACH WORKING DAY TO ENSURE MEASURES ARE FUNCTIONING PROPERLY.
6. THE CONTRACTOR SHALL REMOVE ACCUMULATED SILT WHEN THE SILT IS WITHIN 12" OF THE TOP OF THE SILT FENCE.
7. FAILURE TO INSTALL, OPERATE OR MAINTAIN ALL EROSION CONTROL MEASURES WILL RESULT IN ALL CONSTRUCTION BEING STOPPED ON THE JOB SITE UNTIL SUCH MEASURES ARE CORRECTED.
8. SILT BARRIERS TO BE PLACED AT DOWNSTREAM TOE OF ALL CUT AND FILL SLOPES.
9. ALL CUT AND FILL SLOPES MUST BE SURFACED ROUGHENED AND VEGETATED WITHIN SEVEN (7) DAYS OF THEIR CONSTRUCTION.
10. CONTRACTOR SHALL REMOVE ALL EROSION & SEDIMENT CONTROL MEASURES AFTER COMPLETION OF CONSTRUCTION AND ESTABLISHMENT OF PERMANENT GROUND COVER.
11. THE ESCAPE OF SEDIMENT FROM THE SITE SHALL BE PREVENTED BY THE INSTALLATION OF EROSION CONTROL MEASURES AND PRACTICES PRIOR TO, OR CONCURRENT WITH, LAND-DISTURBING ACTIVITIES.

**SEEDING GUIDELINES:**

FINAL STABILIZATION OF ALL DISTURBED AREAS, UNLESS OTHERWISE NOTED, SHALL BE LOAMED AND SEEDED. LOAM SHALL BE PLACED AT A MINIMUM COMPACTED DEPTH OF 4". RECOMMENDED SEEDING DATES FOR PERMANENT VEGETATION SHALL BE BETWEEN JUNE 15 THROUGH AUGUST 1 AND SEPTEMBER 15 THROUGH OCTOBER 15. TEMPORARY VEGETATIVE MEASURES SHALL CONSIST OF AN ANNUAL OR PERENNIAL RYE GRASS WITH RECOMMENDED SEEDING DATES BEING FROM JUNE 1 THROUGH AUGUST 15 AND SEPTEMBER 30 THROUGH NOVEMBER 30.

**EVALUATE PROPOSED COVER MATERIAL**

BEFORE SPREADING COVER MATERIAL OVER THE DESIGNATED AREA, OBTAIN A REPRESENTATIVE SOIL SAMPLE AND SUBMIT TO A REPUTABLE SOIL TESTING LABORATORY FOR CHEMICAL AND PHYSICAL ANALYSIS. THE PRELIMINARY TEST IS NECESSARY TO DETERMINE THE REQUIRED INORGANIC AND/OR ORGANIC AMENDMENTS THAT ARE NEEDED TO ASSIST IN ESTABLISHING THE SEED MIXTURE IN AN ENVIRONMENTALLY AND ECONOMICALLY SOUND MANNER. THE RESULTS WILL GIVE THE COVER MATERIAL CHARACTERISTICS SUCH AS pH AND FERTILIZATION NEEDS. THESE RESULTS SHALL BE KEPT ON-SITE BY THE CONTRACTOR AND AVAILABLE FOR REVIEW BY THE COUNTY.

**SEED BED PREPARATION**

PROPOSED COVER MATERIAL SHOULD BE SPREAD EVENLY OVER THE SITE AREA IN A MINIMUM 4" LIFT VIA BULLDOZER/BUCKET LOADER. USING THE INFORMATION FROM THE SOIL ANALYSIS, CAREFULLY CALCULATE THE QUANTITIES OF LIMESTONE AND PRE-PLANT FERTILIZER NEEDED PRIOR TO APPLYING. PRE-PLANT AMENDMENTS CAN BE APPLIED WITH A BROADCAST AND/OR DROP SEEDER AND INCORPORATED WITH AN OFFSET DISK, YORK RAKE, AND/OR HAND RAKE. AFTER INCORPORATION THE PRE-PLANT SOIL AMENDMENTS, THE SEED BED SHOULD BE SMOOTH AND FIRM PRIOR TO SEEDING. THE FOLLOWING SEED MIXTURES SHALL BE USED AS NOTED:

**SEED MIXTURE**

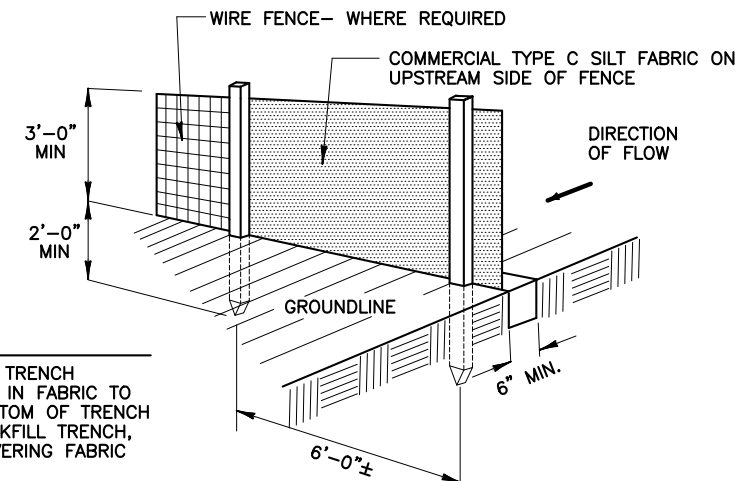
SPECIES/VARIETY	LBS/ACRE
CREEPING RED FESCUE	20
KENTUCKY BLUEGRASS	20
PERENNIAL RYEGRASS	5

**SEED TIME AND METHOD**

THE PREFERRED TIME FOR SEEDING THE COOL SEASON MIXTURE IS LATE SUMMER. SOIL AND AIR TEMPERATURES ARE IDEAL FOR SEED GERMINATION AND SEEDING GROWTH. WEED COMPETITION IS REDUCED BECAUSE SEEDS OF MANY WEED SPECIES GERMINATE EARLIER IN THE GROWING SEASON. ADDITIONALLY, HERBICIDE USE IS GREATLY REDUCED. HOWEVER, SEEDING MAY BE DONE AT ANY OF THE ABOVE NOTED TIMES.

**MULCHING**

NEWLY SEEDED AREAS SHOULD BE MULCHED TO INSURE ADEQUATE MOISTURE FOR SUCCESSFUL TURF ESTABLISHMENT AND TO PROTECT AGAINST SURFACE MOVEMENT OF SEDIMENT-BOUND AGROCHEMICALS AND SOIL EROSION. IF MULCHING PROCEDURES ARE NOT SPECIFIED ON PLANS, APPLY GOOD QUALITY STRAW OR HAY AT A RATE OF 2 BALES/1000 SQ. FT. OTHER COMMERCIALY AVAILABLE MULCHES CAN BE USED.



- NOTE:**
1. DIG TRENCH
  2. LAY IN FABRIC TO BOTTOM OF TRENCH
  3. BACKFILL TRENCH, COVERING FABRIC

**CONSTRUCTION NOTES FOR FABRICATED SILT FENCE**

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY POSTS: STEEL EITHER T OR U TYPE TO FENCE POSTS WITH WIRE TIES OR STAPLES.
  2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
  3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
  4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.
  5. ALL SILT FENCE MATERIALS MUST BE LISTED ON THE CURRENT STATES. D.O.T. QUALIFIED PRODUCTS LIST.
- FENCE: WOVEN WIRE, 14 GA. 6" MAX. MESH OPENING.
- FILTER CLOTH: FILTER X, MIRAFI 100X' STABILINKA T140N OR APPROVED EQUAL.
- PREFABRICATED UNIT: GEOFAB, ENVIROFENCE OR APPROVED EQUAL.

**1 SILT FENCE DETAIL**  
C-9 NOT TO SCALE



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DRAWN BY: CHECKED BY:

SEW TD

KHA PROJECT NUMBER:

140064151.1.100

ENGINEER SEAL:

PROJECT INFORMATION:

US-MN-5126  
ULEN  
A100345A  
160TH AVE N  
ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

SHEET TITLE:

GRADING NOTES  
AND DETAILS

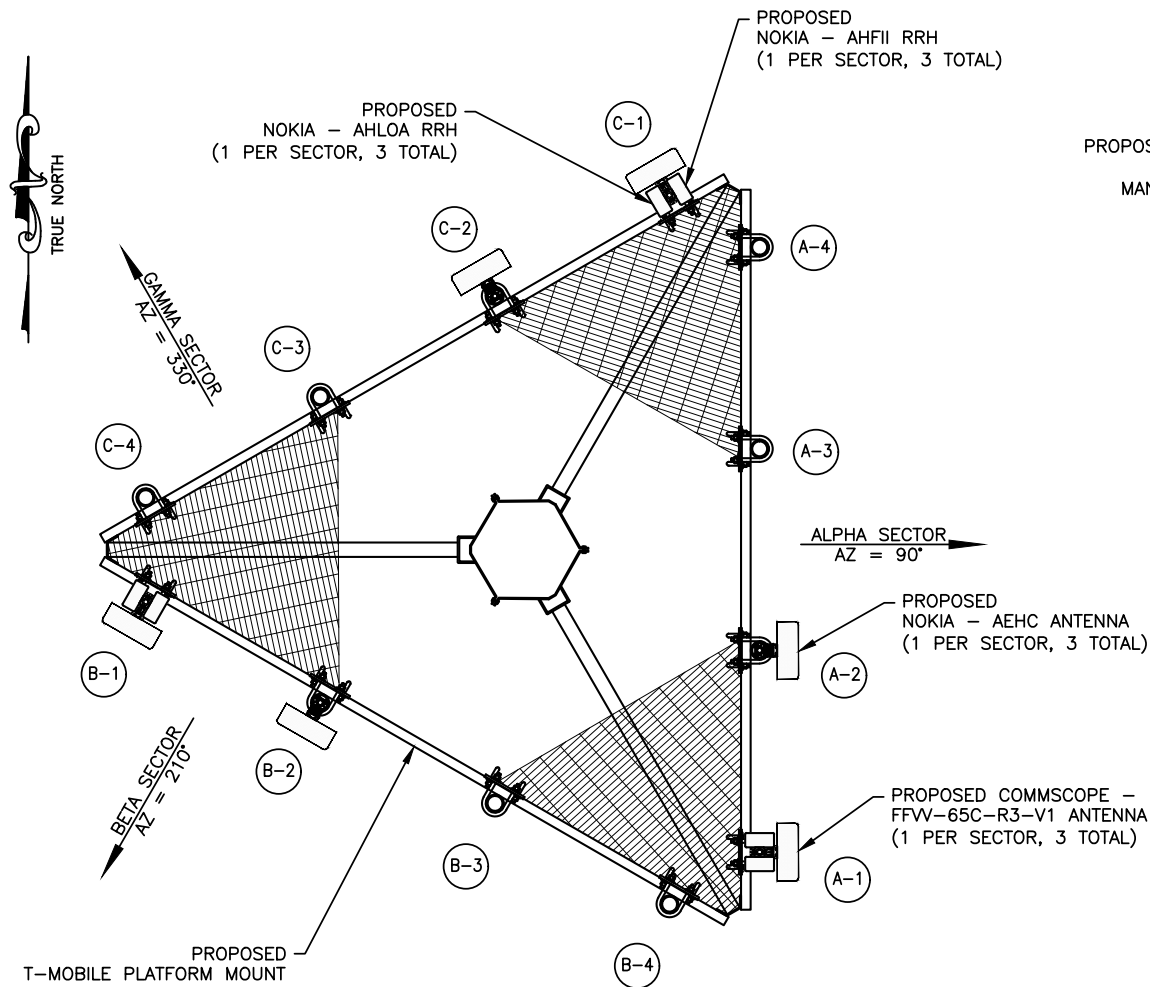
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C-9

**NOTES:**

1. THESE DRAWINGS SHALL NOT BE RELIED UPON AS AN INDICATION THAT THE TOWER STRUCTURE, ITS COMPONENTS, AND ITS FOUNDATION HAVE ADEQUATE STRUCTURAL CAPACITY TO SUPPORT ALL EXISTING AND PROPOSED ANTENNAS, MOUNTS, EQUIPMENT, AND COAXIAL CABLES. KIMLEY-HORN HAS NOT PERFORMED A STRUCTURAL ANALYSIS ON THE TOWER, FOUNDATION, ANTENNA MOUNT, AND ALL ITS COMPONENTS. IT IS THE RESPONSIBILITY OF THE OWNER TO HAVE A STRUCTURAL ANALYSIS PERFORMED IN ACCORDANCE WITH ALL APPLICABLE CODES AND STANDARDS PRIOR TO THE INSTALLATION OF ANY PROPOSED EQUIPMENT, COAXIAL CABLES, ANTENNAS, OR APPURTENANCES ON THE TOWER. THIS STRUCTURAL ANALYSIS SHALL BE SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
2. IF ANY WORK IS PERFORMED AT THIS SITE THAT REQUIRES THE SITE TO BE OFF AIR OR TURNED DOWN, THE SWITCH IS TO BE NOTIFIED 48 HOURS PRIOR TO CONSTRUCTION VIA NCR/CTS.
3. INSTALLATION SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF RADIO ANTENNAS, TRANSMISSION LINES, AND SUPPORT STRUCTURES. ANTENNA WORK TO BE INSTALLED PER THE REQUIREMENTS OF THE TOWER MANUFACTURER'S SPECIFICATION.
4. ANTENNA AND MOUNT DESIGN MUST COMPLY WITH TIA-EIA-222-H AND ALL LOCAL CODES.
5. CONTRACTOR TO PROVIDE THE PROPER COAX JUMPER SUPPORT ATTACHMENTS TO THE TOWER AND ANTENNA MOUNT.

THE CONTRACTOR MUST FIELD VERIFY ALL MEASUREMENTS AND FIELD CONDITIONS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.



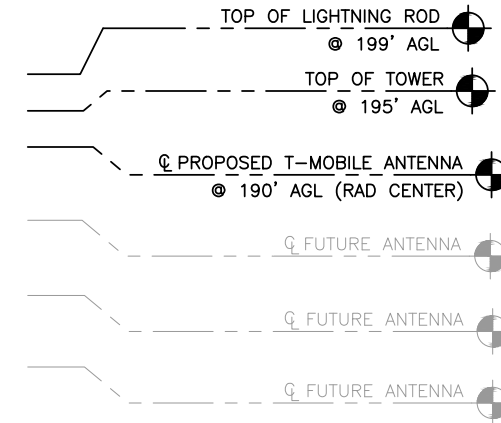
**2 ANTENNA CONFIGURATION**  
SCALE: N.T.S.  
SCALE BASED ON 11"x17" ONLY

TOWER EQUIPMENT SCHEDULE									
SECTOR	POSITION	QTY	ANTENNA MANUFACTURER	ANTENNA MODEL	RAD CENTER	AZ	M TILT	RRH (QTY) MODEL	HYBRID
ALPHA	1	1	COMMSCOPE	FFW-65C-R3-V1	190'-0"	90°	0	(1) AHLOA (1) AHFII	(2) HCS 2.0 250'
	2	1	NOKIA	AEHC	190'-0"	90°	0	-	
	3	-	-	-	-	-	-	-	
	4	-	-	-	-	-	-	-	
BETA	1	1	COMMSCOPE	FFW-65C-R3-V1	190'-0"	210°	0	(1) AHLOA (1) AHFII	
	2	1	NOKIA	AEHC	190'-0"	210°	0	-	
	3	-	-	-	-	-	-	-	
	4	-	-	-	-	-	-	-	
GAMMA	1	1	COMMSCOPE	FFW-65C-R3-V1	190'-0"	330°	0	(1) AHLOA (1) AHFII	
	2	1	NOKIA	AEHC	190'-0"	330°	0	-	
	3	-	-	-	-	-	-	-	
	4	-	-	-	-	-	-	-	

INSTALLATION NOTES:  
 1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.  
 2. ANTENNA AND RRH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. ALL EQUIPMENT CHANGES MUST BE APPROVED AND REMAIN IN COMPLIANCE WITH THE PROPOSED DESIGN AND STRUCTURAL ANALYSIS.

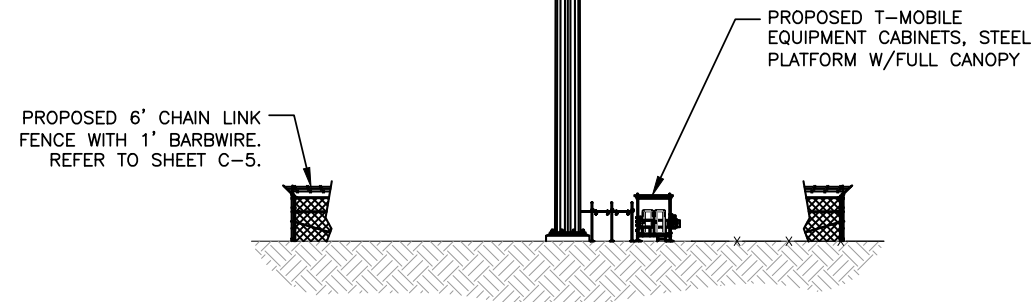
**3 ANTENNA SCHEDULE**  
SCALE: N.T.S.  
SCALE BASED ON 11"x17" ONLY

PROPOSED LIGHTNING ROD INSTALLED BY CONTRACTOR PER TOWER MANUFACTURER'S SPECIFICATIONS.



PROPOSED VERTICAL BRIDGE 195' MONOPOLE (DESIGNED BY OTHERS)

PROPOSED T-MOBILE CABLE ROUTED UP TOWER (PER TOWER MANUFACTURER)



**1 TOWER ELEVATION**  
SCALE: N.T.S.  
SCALE BASED ON 11"x17" ONLY



700 PARK OF COMMERCE DRIVE #200  
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TEL: (561) 948-6367

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DRAWN BY: SEW CHECKED BY: TD

KHA PROJECT NUMBER: 140064151.1.100

ENGINEER SEAL:

PROJECT INFORMATION:

US-MN-5126  
ULEN  
A100345A  
160TH AVE N  
ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

SHEET TITLE:

**TOWER ELEVATION AND DETAILS**

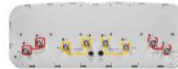
SHEET NUMBER:

S-1



# FFVV-65B-R3-V1

8-port sector antenna, 4x 617-894 and 4x 1695-2690 MHz, 65° HPBW, 3x RET



## General Specifications

<b>Antenna Type</b>	Sector
<b>Band</b>	Multiband
<b>Color</b>	Light gray
<b>Grounding Type</b>	RF connector inner conductor and body grounded to reflector and mounting bracket
<b>Performance Note</b>	Outdoor usage
<b>Radome Material</b>	Fiberglass, UV resistant
<b>Radiator Material</b>	Low loss circuit board
<b>Reflector Material</b>	Aluminum
<b>RF Connector Interface</b>	4.3-10 Female
<b>RF Connector Location</b>	Bottom
<b>RF Connector Quantity, high band</b>	4
<b>RF Connector Quantity, low band</b>	4
<b>RF Connector Quantity, total</b>	8

## Dimensions

<b>Width</b>	640 mm   25.197 in
<b>Depth</b>	235 mm   9.252 in
<b>Length</b>	1828 mm   71.969 in
<b>Net Weight, without mounting kit</b>	45.5 kg   100.31 lb

### 1 ANTENNA SPECIFICATIONS

SCALE: N.T.S.  
SCALE BASED ON 11"x17" ONLY

# AEHC AirScale MAA 64T64R 192AE n41 240W

## Preliminary Technical datasheet

<b>Specification</b>	3GPP/FCC compliant, TDD
<b>Frequency range</b>	2496 - 2690 MHz
<b>Max. supported modulation</b>	256 QAM
<b>Number of TX/RX paths</b>	64T / 64R
<b>MIMO streams</b>	16
<b>Instantaneous bandwidth IBW</b>	194 MHz
<b>Occupied bandwidth OBW</b>	194 MHz
<b>Total average EIRP</b>	79.3 dBm
<b>Max. output power per TRX</b>	3.75 W / TRX (240 W total)
<b>Antenna configuration</b>	12 rows, 8 columns, 2 (±45° X-polarized)
<b>Max. Antenna gain</b>	25.5dBi
<b>Horizontal beamwidth</b>	15° (boresight)
<b>Vertical beamwidth</b>	6° (boresight)
<b>Horizontal coverage angle</b>	±45° (3 dB), ±60° (5 dB)
<b>Vertical steering angle</b>	±6°
<b>Dimensions</b>	TBD: 900 mm (H) x 580 mm (W) x 210 mm (D)
<b>Volume / Windward area</b>	TBD: ~110 L / ~0.6m <sup>2</sup>
<b>Weight</b>	~45kg (without mounting brackets)
<b>Supply voltage / Connector type</b>	DC -40.5 V ... -57 V / 2 pole connector
<b>Power consumption</b>	900 W typical (75% DL duty cycle, 30% RF load) 1300 W max (75% DL duty cycle, 100% RF load)



<b>Optical ports</b>	4 x SFP28, 10/25GE eCPRI (with R2CT)
<b>Other interfaces / Connector type</b>	Control AISG RF monitor port / SMA Female External Alarms / MDR26 status LED
<b>Operational temperature range</b>	-40 °C ... +55 °C
<b>Cooling</b>	Natural convection cooling
<b>Ingress protection class</b>	IP65
<b>Installation options</b>	Pole / Wall, ± 5° vertical adjustment
<b>Surge protection</b>	Class II 20 kA

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### 2 ANTENNA SPECIFICATIONS

SCALE: N.T.S.  
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# AirScale Dual RRH 4T4R B12/71 240W AHLOA



<b>Product Code:</b>	474331A
<b>Supported Frequency bands</b>	3GPP Band 12/71
<b>Frequencies</b>	Band 12 adjusted: UL 698 - 716 MHz, DL 728 - 746 MHz Band 71: UL 663 MHz - 698 MHz, DL 617 MHz - 652 MHz
<b>Number of TX/RX paths/pipes</b>	4 pipes; 2T2R, 2T4R, 4T4R for both bands
<b>Instantaneous Bandwidth IBW</b>	17 MHz for B12 and 35MHz for B71 1 MHz below B12 NB to T future use
<b>Occupied Bandwidth OBW</b>	UL 53MHz contiguous DL B12 17MHz + 1 MHz NB to T future use, B71 35MHz
<b>Output Power</b>	60W per TX shared between bands
<b>Supply Voltage / Range</b>	DC -48 V / -36 V to -60 V
<b>Typical Power Consumption</b>	640W [ETSI Busy Hour Load at 4TX@60W] 450W [ETSI Busy Hour Load at 4TX@20W]
<b>Antenna Ports</b>	4 ports, 4.3-10+
<b>Optical Ports</b>	2 x CPRI 9.8 Gbps
<b>ALD Control Interfaces</b>	AISG3.0 and RET (DC on ANT1 & ANT3)
<b>Other Interfaces</b>	External Alarm MDR-26 (4 inputs, 1 Output) DC Circular Power Connector
<b>Physical</b>	560 mm x 308 mm x 189 mm Approximately 38kg with no covers or brackets
<b>Operating Temperature Range</b>	-40°C to 55°C (with no solar load)
<b>Surge Protection</b>	Class II 5A
<b>Installation Options</b>	Pole, Wall, Book Mount

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### 3 RRU SPECIFICATIONS

SCALE: N.T.S.  
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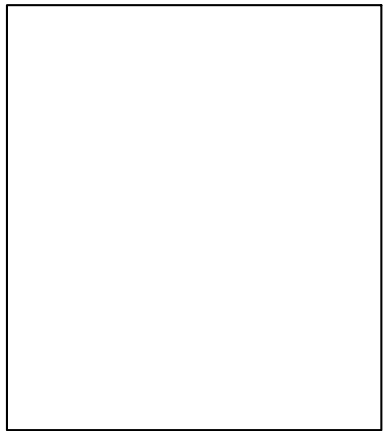
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ENGINEER SEAL:



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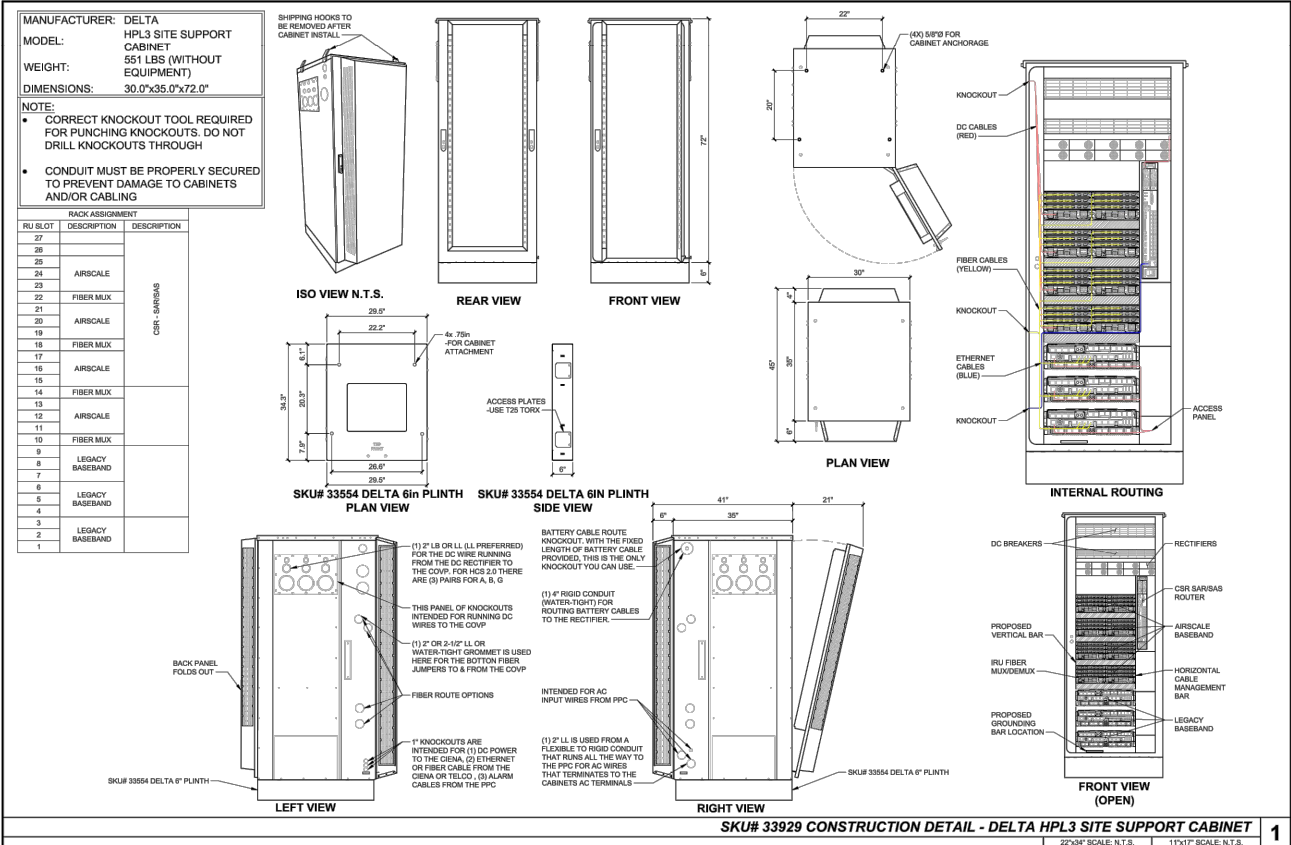
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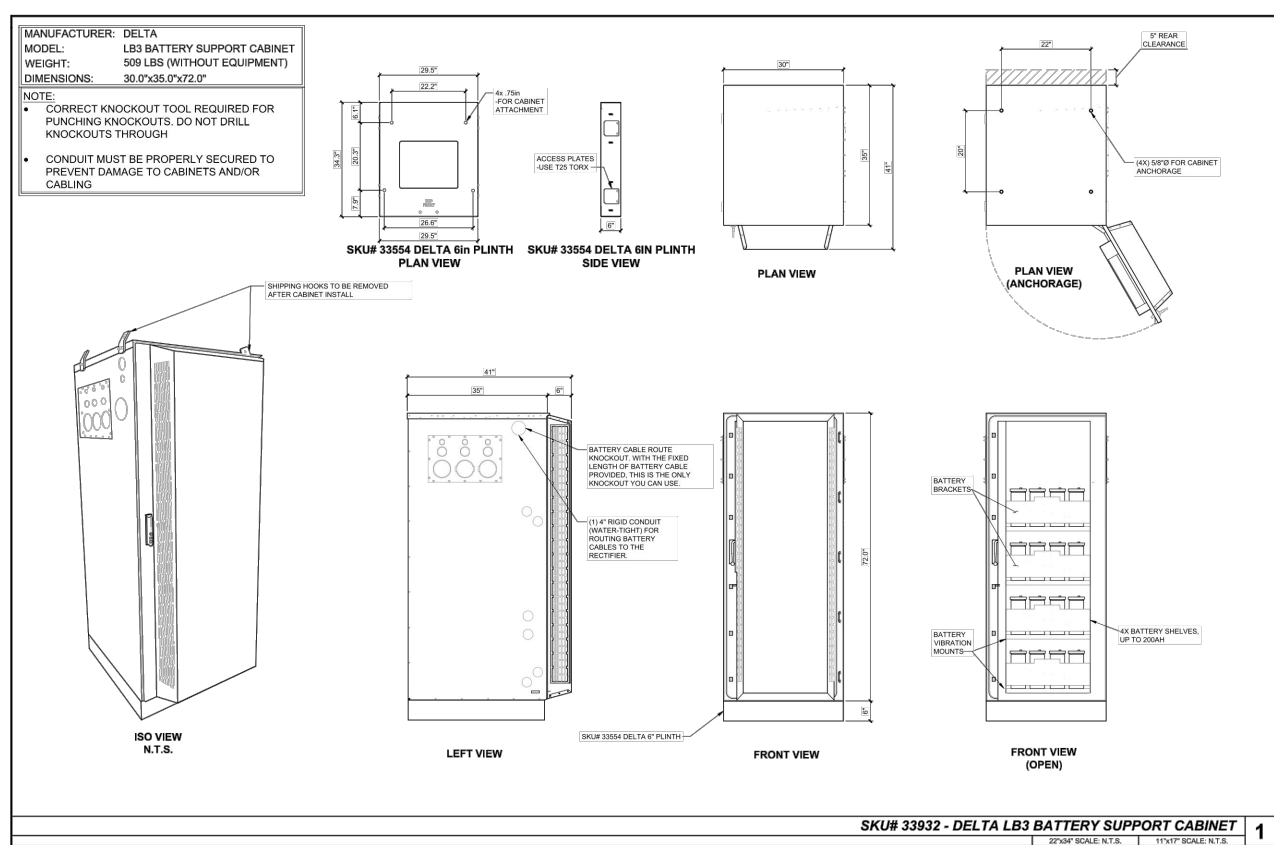
ANTENNA SPECIFICATIONS

SHEET NUMBER:

S-2



**1**  
**DELTA HPL3 SITE SUPPORT CABINET**  
 SCALE: N.T.S.  
 SCALE BASED ON 11"x17" ONLY



**2**  
**DELTA LB3 BATTERY CABINET**  
 SCALE: N.T.S.  
 SCALE BASED ON 11"x17" ONLY



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A	06/22/23	ISSUED FOR REVIEW	SEW

DRAWN BY: SEW CHECKED BY: TD

KHA PROJECT NUMBER:

140064151.1.100

ENGINEER SEAL:

PROJECT INFORMATION:

US-MN-5126  
 ULEN  
 A100345A  
 160TH AVE N  
 ULEN TOWNSHIP, MN 56585  
 CLAY COUNTY

SHEET TITLE:

**MOUNTING DETAILS**

SHEET NUMBER:

S-3

PLANS PREPARED BY:

REV: DATE: DESCRIPTION: BY:

REV	DATE	DESCRIPTION	BY
B	06/26/23	REVISED PER COMMENTS	BCL
A	06/22/23	ISSUED FOR REVIEW	SEW

DRAWN BY: CHECKED BY:

SEW	TD
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KHA PROJECT NUMBER:

140064151.1.100
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ENGINEER SEAL:

PROJECT INFORMATION:

US-MN-5126 ULEN A100345A 160TH AVE N ULEN TOWNSHIP, MN 56585 CLAY COUNTY
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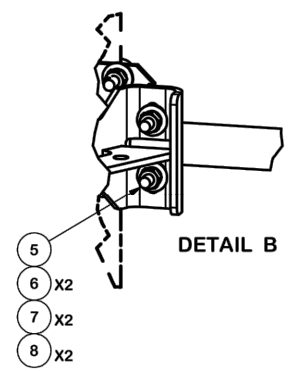
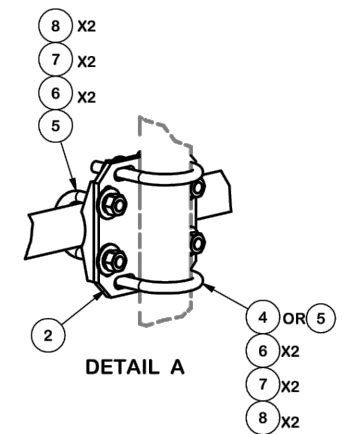
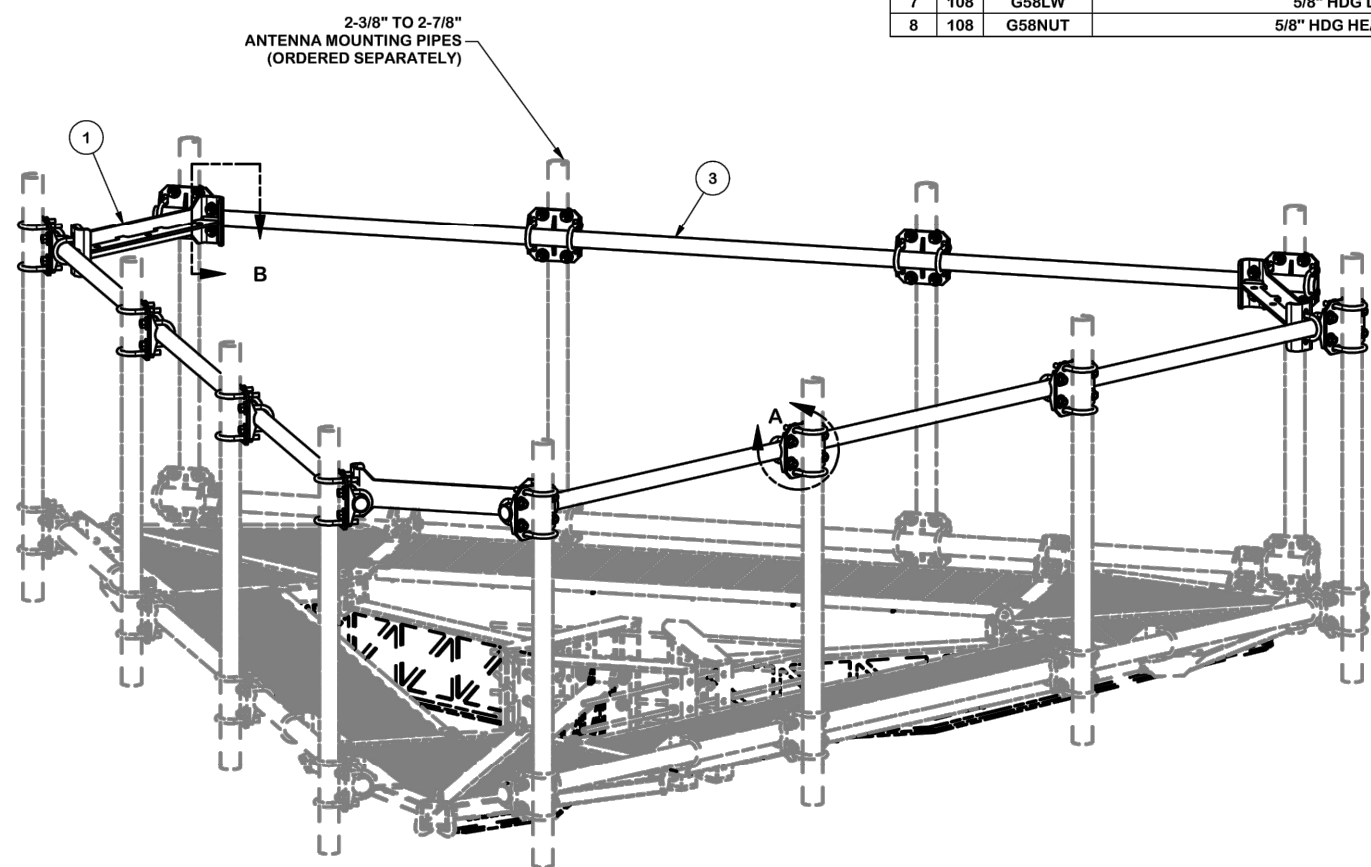
SHEET TITLE:

PLATFORM DETAILS
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SHEET NUMBER:

S-4
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PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-F3PHRW	CORNER WELDMENT FOR 3-SIDED FORTRESS PLATFORM HADNRAIL KITS		27.72	83.15
2	12	X-SCX3-FR	FORTRESS CROSSOVER PLATE		6.61	79.37
3	3	P2174	2-3/8" OD X 174" SCH 40 GALVANIZED PIPE	174 in	55.75	167.24
4	24	X-UB5300	5/8" X 3" X 5-1/4" X 2-1/2" U-BOLT (HDG.)		1.15	27.59
5	54	X-UB5258	5/8" X 2-5/8" X 4-1/2" X 2" U-BOLT (HDG.)		1.00	54.01
6	108	G58FW	5/8" HDG USS FLATWASHER	1/8 in	0.07	7.61
7	108	G58LW	5/8" HDG LOCKWASHER		0.03	2.82
8	108	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	14.03
TOTAL WT. #						435.81



**TOLERANCE NOTES**  
TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:  
SAWED, SHEARED AND GAS CUT EDGES ( $\pm 0.030"$ )  
DRILLED AND GAS CUT HOLES ( $\pm 0.030"$ ) - NO CONING OF HOLES  
LASER CUT EDGES AND HOLES ( $\pm 0.010"$ ) - NO CONING OF HOLES  
BENDS ARE  $\pm 1/2$  DEGREE  
ALL OTHER MACHINING ( $\pm 0.030"$ )  
ALL OTHER ASSEMBLY ( $\pm 0.060"$ )

PROPRIETARY NOTE:  
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DESCRIPTION <b>HANDRAIL KIT FOR 14' FORTRESS™ PLATFORM</b>		<p>Locations: New York, NY Atlanta, GA Los Angeles, CA Plymouth, IN Salem, OR Dallas, TX</p> <p>Engineering Support Team: 1-888-753-7446</p> <p>A valmont COMPANY</p>	PART NO. <b>F3P-HRK14</b>	PAGE <b>1 OF 2</b>
CPD NO.	DRAWN BY <b>CEK 8/29/2017</b>			
CLASS <b>81</b>	SUB <b>02</b>	DRAWING USAGE <b>CUSTOMER</b>	CHECKED BY <b>BMC 9/14/2017</b>	DWG. NO. <b>F3P-HRK14</b>

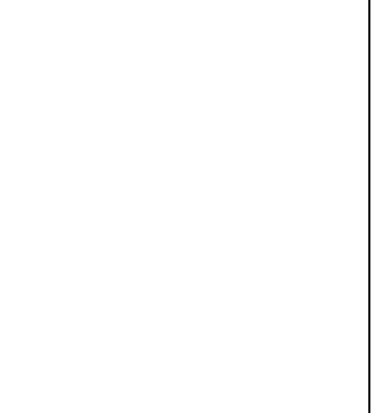
**1**  
S-5 **PLATFORM DETAILS**  
SCALE: N.T.S.  
SCALE BASED ON 11"x17" ONLY



B	06/26/23	REVISED PER COMMENTS	BCL
A	06/22/23	ISSUED FOR REVIEW	SEW

SEW	TD
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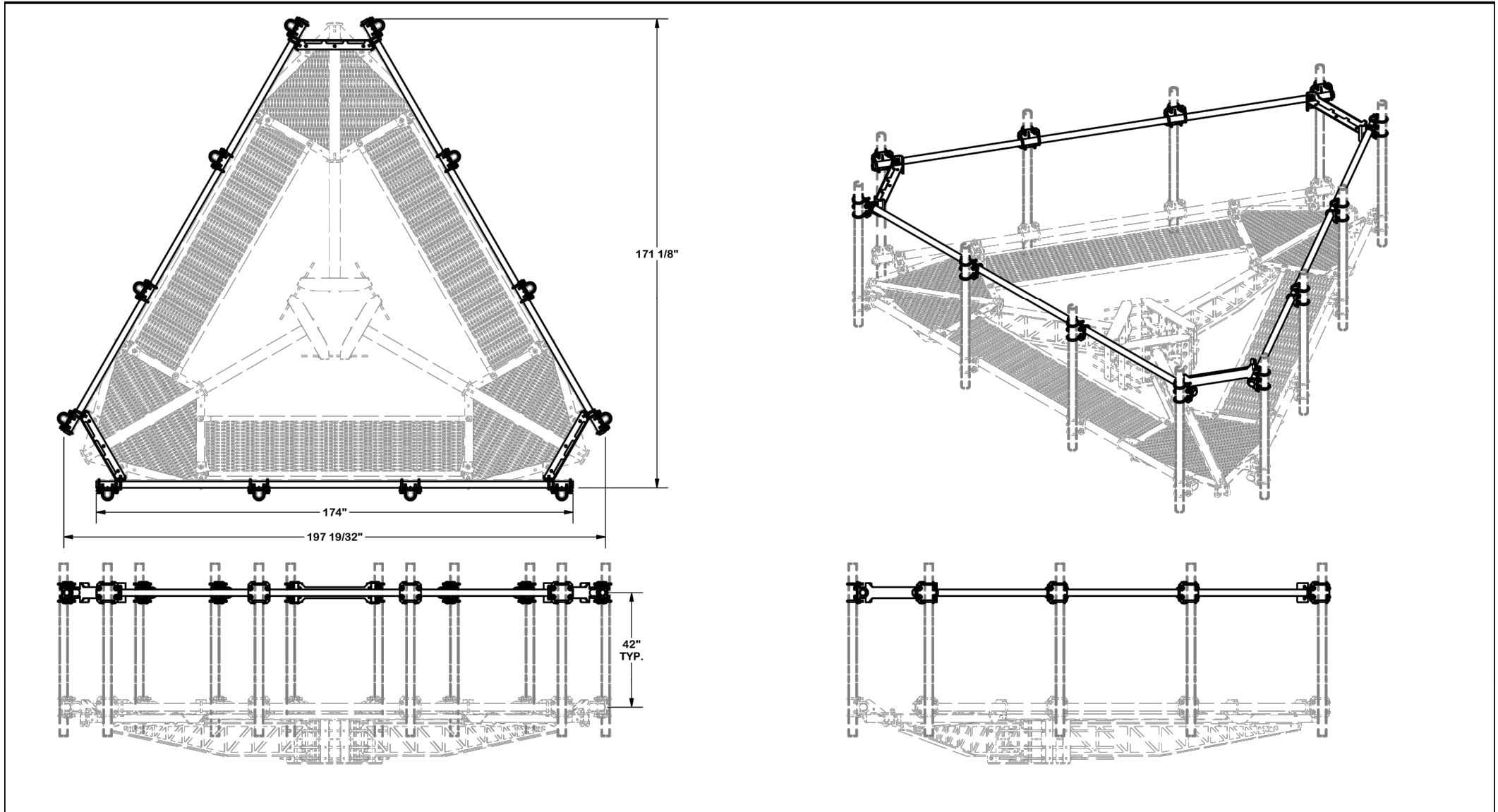
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US-MN-5126  
ULEN  
A100345A  
160TH AVE N  
ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

PLATFORM DETAILS

S-5



**TOLERANCE NOTES**  
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SAWED, SHEARED AND GAS CUT EDGES ( $\pm 0.030$ " )  
DRILLED AND GAS CUT HOLES ( $\pm 0.030$ " ) - NO CONING OF HOLES  
LASER CUT EDGES AND HOLES ( $\pm 0.010$ " ) - NO CONING OF HOLES  
BENDS ARE  $\pm 1/2$  DEGREE  
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DESCRIPTION <b>HANDRAIL KIT FOR 14' FORTRESS™ PLATFORM</b>		
CPD NO.	DRAWN BY <b>CEK 8/29/2017</b>	ENG. APPROVAL
CLASS <b>81</b>	SUB <b>02</b>	DRAWING USAGE <b>CUSTOMER</b>
	CHECKED BY <b>BMC 9/14/2017</b>	

**SITE PRO 1**  
A valmont COMPANY

Locations:  
New York, NY  
Atlanta, GA  
Los Angeles, CA  
Plymouth, IN  
Salem, OR  
Dallas, TX

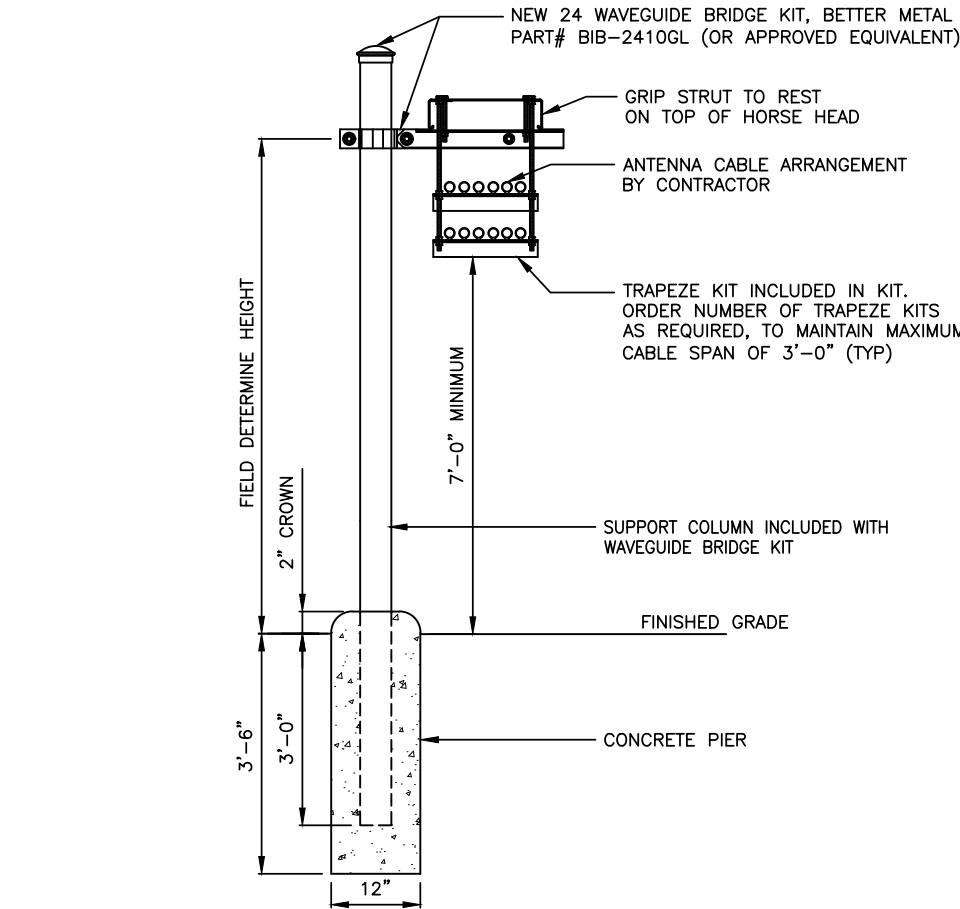
Engineering Support Team:  
1-888-753-7446

PART NO. <b>F3P-HRK14</b>	PAGE 2 OF 2
DWG. NO. <b>F3P-HRK14</b>	

**1** **PLATFORM DETAILS**  
SCALE: N.T.S.  
SCALE BASED ON 11"x17" ONLY

**STRUCTURAL NOTES:**

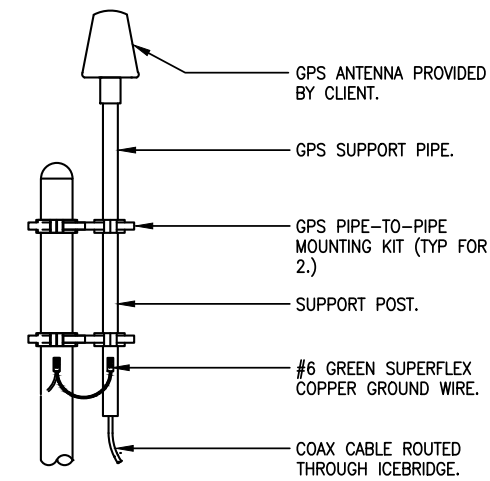
1. INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED BY FIELD MEASUREMENT. THE GENERAL CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND NOTIFY THE ARCHITECT/ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIALS OR PROCEEDING WITH CONSTRUCTION.
2. THE GENERAL CONTRACTOR AND HIS SUB CONSULTANTS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK.
3. STRUCTURAL STEEL SHALL CONFORM TO SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS, AISC 360-05 INCLUDING THE COMMENTARY AND THE AISC CODE OF STANDARD PRACTICE.
4. STRUCTURAL STEEL PLATES, ANGLES, AND CHANNELS SHALL CONFORM TO ASTM A36. STRUCTURAL STEEL PIPES SHALL CONFORM TO ASTM A53 GRADE B. STRUCTURAL STEEL BEAMS SHALL CONFORM TO ASTM A992, GRADE 50. ALL STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM A500 GRADE B. ALL STRUCTURAL STEEL COMPONENTS AND FABRICATED ASSEMBLIES SHALL BE HOT DIP GALVANIZED-ASTM A123 AFTER FABRICATION. FIELD TOUCH UP WITH 3 COATS OF ZINC RICH PAINT ALL RAW EDGES AND/OR AREAS WHERE THE GALVANIZED FINISH HAS BEEN DISTURBED (ALL EXISTING AND NEW AREAS).
5. WELDING SHALL BE IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY (AWS 01.1). STRUCTURAL WELDING CODE-STEEL WELD ELECTRODES SHALL BE E70XX. FIELD TOUCH UP WITH ZINC RICH PAINT (ALL EXISTING AND NEW AREAS) AFTER WELDING IS COMPLETE.
6. ALL THREADED STRUCTURAL FASTENERS FOR ANTENNA SUPPORT ASSEMBLIES SHALL CONFORM TO ASTM A307 OR ASTM A36. ALL STRUCTURAL FASTENERS FOR STRUCTURAL STEEL FRAMING SHALL CONFORM TO ASTM A325. FASTENERS SHALL BE 5/8 INCH MIN. UNLESS NOTED OTHERWISE, DIAMETER BEARING TYPE CONNECTIONS WITH THREADS EXCLUDED IN THE SHEAR PLANE. ALL EXPOSED FASTENERS, NUTS AND WASHERS SHALL BE GALVANIZED UNLESS OTHERWISE NOTED. CONCRETE EXPANSION ANCHORS SHALL BE HILTI KWIK BOLTS UNLESS OTHERWISE NOTED. ALL ANCHORS INTO CONCRETE SHALL BE STAINLESS STEEL.
7. ALL REINFORCING STEEL SHALL CONFORM TO ASTM 615 GRADE 60, DEFORMED BILLET STEEL BARS. WELDED WIRE FABRIC REINFORCING SHALL CONFORM TO ASTM A185.
8. CONCRETE FOR THE FOUNDATION PAD SHALL BE 4000 PSI NORMAL WEIGHT CONCRETE. CONCRETE STRENGTH SHALL BE VERIFIED BY CONCRETE CYLINDER TESTS (A MINIMUM SET OF FOUR CYLINDERS). PROVIDE 4 TO 6% AIR ENTRAINMENT FOR ALL CONCRETE SUBJECT TO FREEZE - THAW CYCLE.
9. MINIMUM CONCRETE COVER REINFORCEMENT SHALL BE 2" UNLESS NOTED OTHERWISE. CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH SHALL HAVE A MINIMUM CONCRETE COVER OF 3".
10. CONTRACTOR SHALL COORDINATE ALL PENETRATIONS, CONDUIT, CHAMFERS, AND EMBEDDED ITEMS PRIOR TO CONCRETE PLACEMENT AND/OR STEEL ERECTION. CONTRACTOR SHALL VERIFY ALL SIZES AND LOCATIONS.
11. DO NOT IMPOSE SERVICE LOAD (i.e. FLOOR DEAD AND LIVE LOADS, BACKFILL, ETC.) UNTIL THE CONCRETE HAS REACHED ITS SPECIFIED MINIMUM COMPRESSIVE STRENGTH.
12. BACKFILL SHALL BE CLEAN SAND FILL APPROVED FOR USE BY THE ENGINEER. NO UNAPPROVED MATERIAL WILL BE ALLOWED. CLEAN SAND FILL SHALL BE FREE OF ALL ROOTS, BOULDERS, OR OTHER DELETERIOUS MATERIAL.
13. SOIL SHALL BE COMPACTED TO 95% OF THE MODIFIED PROCTOR MAXIMUM DRY DENSITY TO A MINIMUM OF 2 FEET BELOW THE BOTTOM OF THE FOOTINGS, AND SHALL OBTAIN A 2000 PSF MINIMUM ALLOWABLE BEARING CAPACITY.



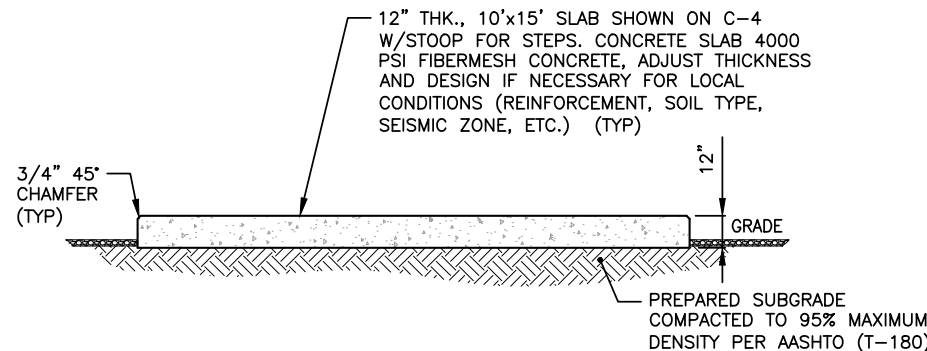
**1 WAVEGUIDE BRIDGE DETAIL**  
S-6 N.T.S.

**NOTES:**

1. CONTRACTOR TO SUPPLY ALL MATERIAL UNLESS OTHERWISE NOTED.
2. GPS ANTENNA MUST BE IN A LOCATION TO BE ABLE TO RECEIVE CLEAR SIGNALS FROM A MINIMUM OF 4 SATELLITES.
3. LOCATION OF ANTENNA MUST BE IN CLEAR VIEW OF THE SKY, WITHOUT ANY OBSTRUCTION OR BLOCKAGE EXCEEDING 25% OF THE SURFACE AREA OF A HEMISPHERE AROUND THE GPS ANTENNA.



**2 GPS ANTENNA DETAIL**  
S-6 SCALE: N.T.S.



**NOTE:**

1. INSTALL EQUIPMENT AND GENERATOR ON FOUNDATION PER MANUFACTURERS SPECIFICATIONS.

**3 FOUNDATION SECTION**  
S-6 SCALE: N.T.S.



700 PARK OF COMMERCE DRIVE #200  
BOCA RATON FL, 33487  
TEL: (561) 948-6367

PLANS PREPARED BY:



201 NORTH FRANKLIN STREET, SUITE 1400  
TAMPA, FL 33602  
PHONE (813) 620-1460  
WWW.KIMLEY-HORN.COM

REV: DATE: DESCRIPTION: BY:

REV	DATE	DESCRIPTION	BY
B	06/26/23	REVISED PER COMMENTS	BCL
A	06/22/23	ISSUED FOR REVIEW	SEW

DRAWN BY: CHECKED BY:

SEW TD

KHA PROJECT NUMBER:

140064151.1.100

ENGINEER SEAL:

PROJECT INFORMATION:

US-MN-5126  
ULEN  
A100345A  
160TH AVE N  
ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

SHEET TITLE:

DETAILS

SHEET NUMBER:

S-6

PLANS PREPARED BY:

REV: DATE: DESCRIPTION: BY:

REV	DATE	DESCRIPTION	BY
B	06/26/23	REVISED PER COMMENTS	BCL
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DRAWN BY: CHECKED BY:

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ULEN  
A100345A  
160TH AVE N  
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CLAY COUNTY

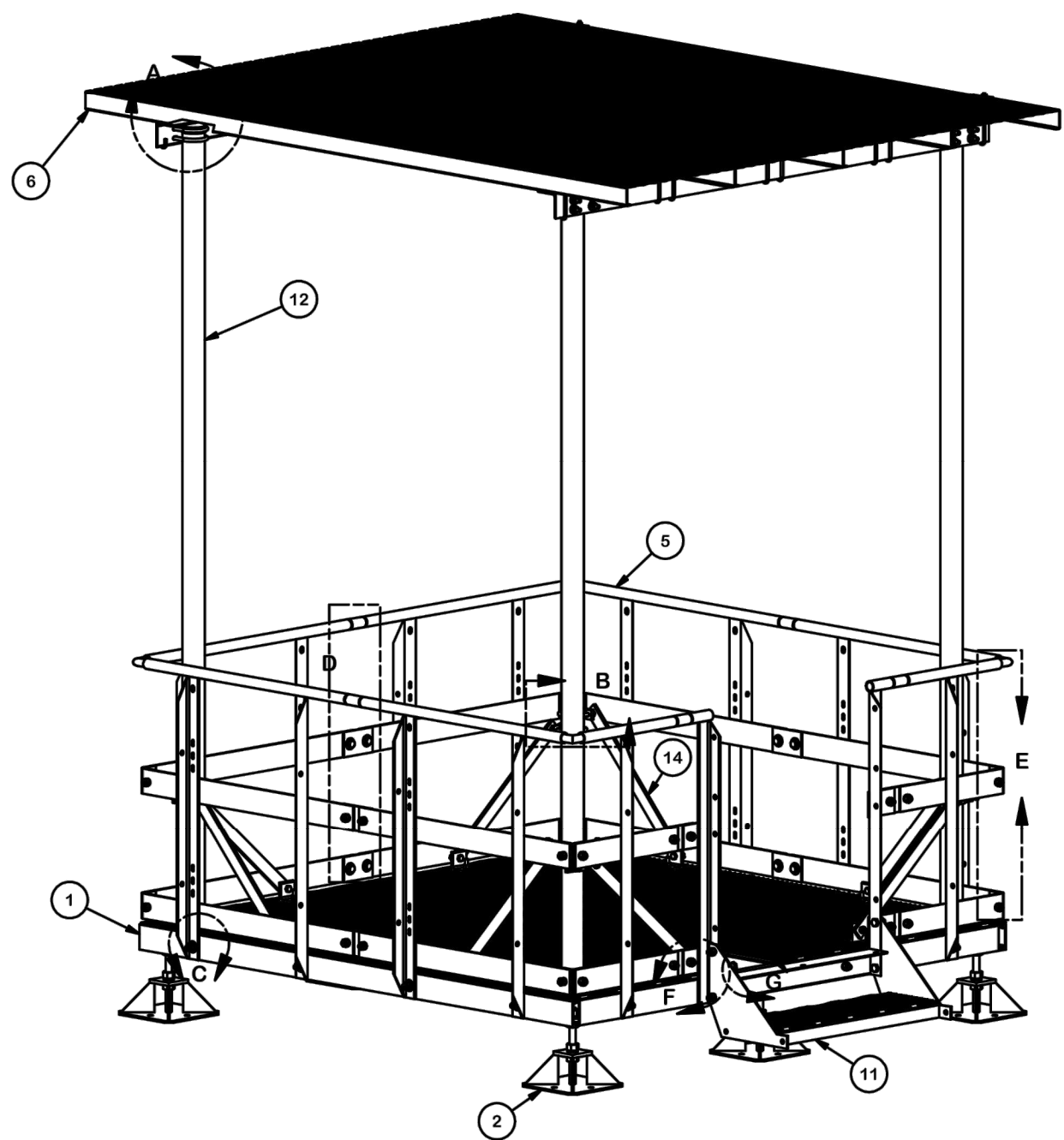
SHEET TITLE:

EQUIPMENT SPECIFICATIONS

SHEET NUMBER:

S-7

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	X-MEP48	4' X 8' WELDED EQUIPMENT RACK BASE		377.38	754.75
2	6	X-MPADS	1' SQAURE MODULAR PLATFORM FOOTPAD		17.50	105.02
3	1	X-MAW	MODULAR EQUIPMENT PLATFORM ACCESS WELDMENT		53.54	53.54
4	2	X-MRAIL2	2' HANDRAIL WELDMENT FOR MODULAR EQUIPMENT PLATFORM		29.50	59.00
5	6	X-MRAIL4	4' HANDRAIL WELDMENT FOR MODULAR EQUIPMENT PLATFORM		60.49	362.92
6	4	GRS24	24" X 10' GRIP SPAN BRIDGE CHANNEL		87.48	349.93
7	4	X-MTRC	MODULAR TOP RAIL CORNER SPLICE		1.25	5.02
8	8	X-MKPC	MODULAR KICKER PLATE CORNER SPLICE	4 in	1.66	13.25
9	5	X-MTRS	MODULAR TOP RAIL STRAIGHT SPLICE		1.88	9.39
10	10	X-MKPS	MODULAR KICKER PLATE STRAIGHT SPLICE	6 5/16 in	1.86	18.59
11	1	X-MSWS	WELDED STEP FOR 1 LEVEL MODULAR STEP		52.77	52.77
12	4	X-MPOST	SUPPORT POST FOR EQUIPMENT PLATFORM ICE BRIDGE KITS		92.99	371.97
13	4	X-MBPB	BACKING PLATE FOR X-MPOST	8 in	8.48	33.90
14	8	X-232698	TRPD-HD SUPPORT PLATE - SITE PRO 1	29 1/2 in	8.72	69.77
15	4	PC312	3-1/2" FENCE POST CAP		0.59	2.34
16	8	SCP	CLAMP HALF, 1/2" X 5-3/4"		1.29	10.34
17	8	SHCM-T	CHAIN MOUNT TIGHTENER BRACKET	3 in	1.86	14.87
18	16	X-JB8	J-BOLT, 3/8" X 8" X 6" THREADED		0.33	5.29
19	16	SQW38	3/8" SQUARE WASHER	2 in	0.29	4.63
20	16	G38LW	3/8" HDG LOCKWASHER		0.01	0.11
21	16	G38NUT	3/8" HDG HEAVY 2H HEX NUT		0.03	0.54
22	8	X-124312	1/2" X 2" X 2" ANGLE SPACER; WITH 9/16" HOLE	2 in	0.53	4.26
23	6	G1R-12	1" X 12" THREADED ROD (HDG.)	12 in	2.68	16.06
24	12	G1LW	1" LOCK WASHER		0.09	1.13
25	24	G1NUT	1" HDG HEAVY HEX NUT		0.47	11.29
26	16	G58312	5/8" X 3-1/2" HDG HEX BOLT GR5		0.40	6.41
27	60	G58134	5/8" X 1-3/4" HDG BOLT	1 3/4 in	0.27	16.13
28	82	G58FW	5/8" HDG USS FLATWASHER	1/8 in	0.07	5.78
29	76	G58LW	5/8" HDG LOCKWASHER		0.03	1.98
30	76	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	9.87
31	16	X-UB1358	1/2" X 3-5/8" X 5-1/2" X 3" GALV U-BOLT		0.77	12.36
32	8	G1203	1/2" X 3" HDG HEX BOLT GR5 FULL THREAD	3 in	0.22	1.74
33	8	G1202	1/2" X 2" HDG HEX BOLT GR5	2 in	0.18	1.41
34	32	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	1.09
35	48	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	0.67
36	56	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	4.01
37	2	X-COV8	8' HORIZONTAL COV SUPPORT ANGLE	96 in	53.00	106.00
<b>TOTAL WT. #</b>						<b>2419.69</b>



\*\* FOR DETAILS, SEE PAGE 2 \*\*

**TOLERANCE NOTES**

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SAWED, SHEARED AND GAS CUT EDGES ( $\pm 0.030"$ )  
DRILLED AND GAS CUT HOLES ( $\pm 0.030"$ ) - NO CONING OF HOLES  
LASER CUT EDGES AND HOLES ( $\pm 0.010"$ ) - NO CONING OF HOLES  
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DESCRIPTION  
8' X 8' MODULAR EQUIPMENT PLATFORM WITH SMALL FOOTPADS, 1 STEP AND 8' COV

**SITE PRO 1**  
A valmont COMPANY  
Engineering Support Team: 1-888-753-7446  
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL
	CEK 12/1/2016	
CLASS	SUB	DRAWING USAGE
81	02	CUSTOMER
	CHECKED BY	
	BMC 12/13/2016	

PART NO.	MEP88-8SH32S1C
DWG. NO.	MEP88-8SH32S1C

1 OF 4  
PAGE

**1 EQUIPMENT PLATFORM DETAIL**  
S-7 SCALE: N.T.S.



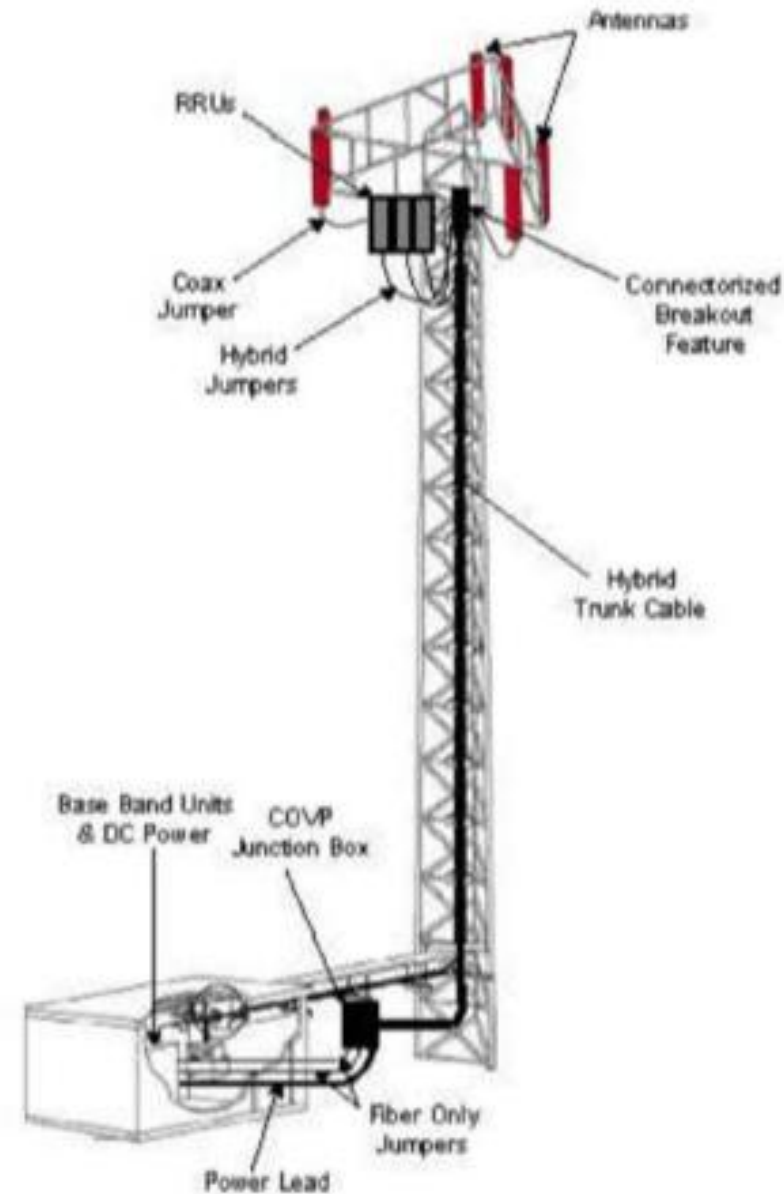
# Tower Application

## ■ Main Components

- Hybrid trunk cable with integral breakout feature at the top
- Bottom OVP junction box
- Hybrid jumper cables
- In-line OVP (if needed)
- Installation hardware

## ■ Applications

- Nokia Airscale AAFIA, AHFIB, AHLOA
- Nokia legacy Flexi FRIE, FXFB, FRIA/B, FRIG, FSME/F, ESMB, FHOA, FXFA, FXFB, FXFC, FRIJ



Slide / 8

T-Mobile Internal



700 PARK OF COMMERCE DRIVE #200  
BOCA RATON FL, 33487  
TEL: (561) 948-6367

PLANS PREPARED BY:



201 NORTH FRANKLIN STREET, SUITE 1400  
TAMPA, FL 33602  
PHONE (813) 620-1460  
WWW.KIMLEY-HORN.COM

REV: DATE: DESCRIPTION: BY:

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B	06/26/23	REVISED PER COMMENTS	BCL
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SEW TD

KHA PROJECT NUMBER:

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ENGINEER SEAL:

PROJECT INFORMATION:

US-MN-5126  
ULEN  
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ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

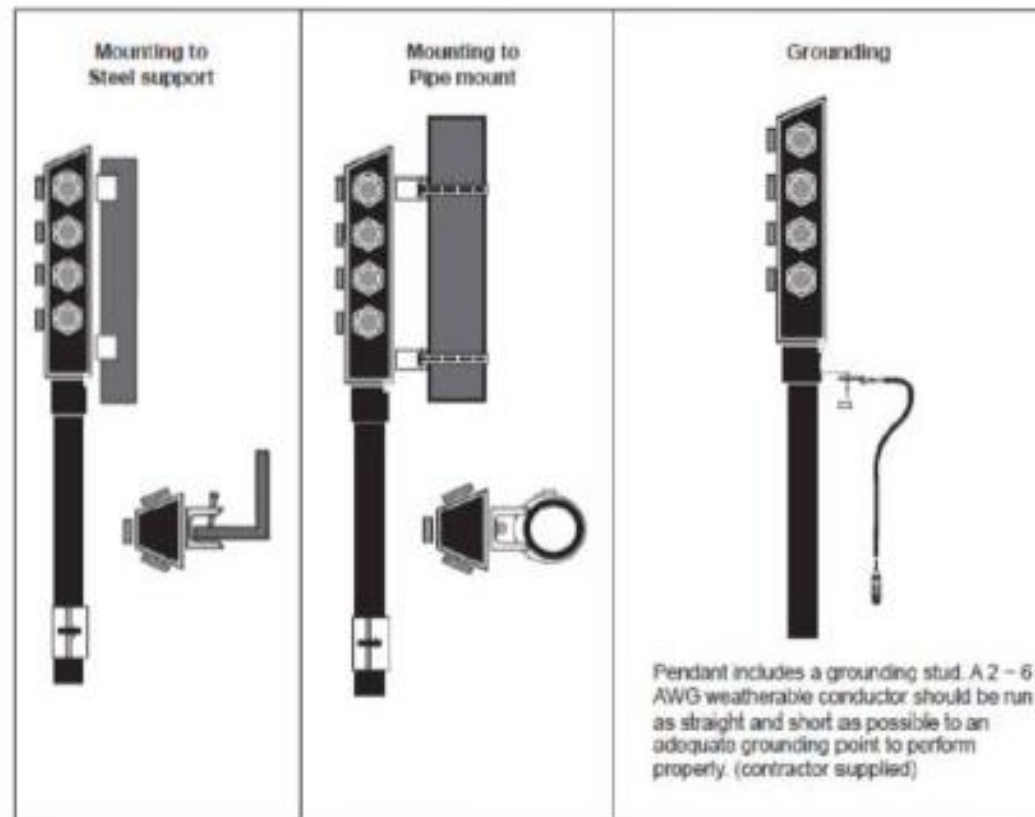
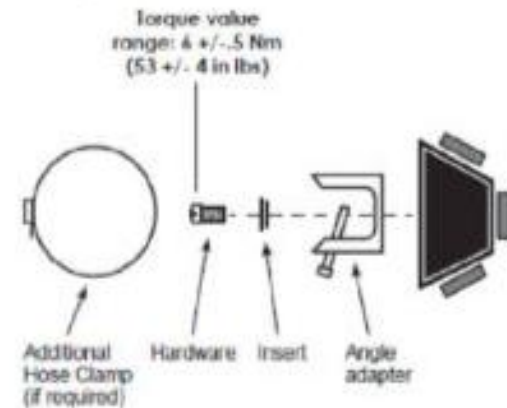
SHEET TITLE:

EQUIPMENT  
SPECIFICATIONS

SHEET NUMBER:

S-8

Section 4: Mounting / Grounding



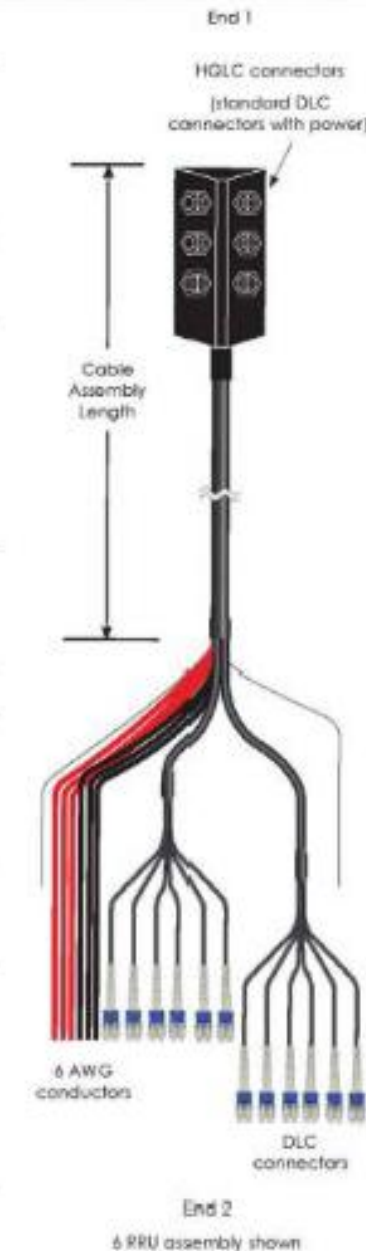
1 **CABLE & PENDANT MOUNT DETAILS**  
SCALE: N.T.S.

Section 2: General Specifications

Cable Type	F02206-2653-10X
Brand	HELIAX® FiberFeed®
Center Conductor Gauge	6 AWG
Conductors, quantity	6
Total Fiber Quantity	24
Shielding Type	Corrugated aluminum
Fiber Type	Bend insensitive single mode fiber (G.657.A2)
Construction Type	Direct Breakout
<b>Dimensions</b>	
Cable Weight	1450.0 kg/km   900.0 lb/kt
Diameter Over Jacket	30.50 mm   1.20 in
Breakout Length, Fiber, end 1	HQ&C Connectors
Breakout Length, Power, end 1	HQ&C Connectors
Breakout Length, Fiber, end 2	826 mm   33 in
Breakout Length, Power, end 2	775 mm   31 in
Breakout Length, Power, end 2	610 mm   24 in
<b>Physical Specifications</b>	
Minimum Bend Radius, loaded	609.6 mm   24 in
Minimum Bend Radius, unloaded	304.8 mm   12 in
Tensile Load, long term, maximum	1068 N   240 lbf
Tensile Load, short term, maximum	3529 N   800 lbf

Cable Type	F021206-48555-30X
Brand	HELIAX® FiberFeed®
Center Conductor Gauge	6 AWG
Conductors, quantity	12
Total Fiber Quantity	48
Shielding Type	Corrugated aluminum
Fiber Type	Bend insensitive single mode fiber (G.657.A2)
Construction Type	Direct Breakout
<b>Dimensions</b>	
Cable Weight	2544.0 kg/km   1710.0 lb/kt
Diameter Over Jacket	39.26 mm   1.55 in
Breakout Length, Fiber, end 1	HQ&C Connectors
Breakout Length, Power, end 1	HQ&C Connectors
Breakout Length, Fiber, end 2	826 mm   33 in
Breakout Length, Power, end 2	775 mm   31 in
Breakout Length, Power, end 2	610 mm   24 in
<b>Physical Specifications</b>	
Minimum Bend Radius, loaded	761.4 mm   31.0 in
Minimum Bend Radius, unloaded	472.4 mm   18.6 in
Tensile Load, long term, maximum	801 N   180 lbf
Tensile Load, short term, maximum	2669 N   600 lbf

2 **CABLE & PENDANT SPECIFICATIONS**  
SCALE: N.T.S.



PLANS PREPARED BY:

REV: DATE: DESCRIPTION: BY:

B	06/26/23	REVISED PER COMMENTS	BCL
A	06/22/23	ISSUED FOR REVIEW	SEW

DRAWN BY: CHECKED BY:

SEW	TD
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ENGINEER SEAL:

PROJECT INFORMATION:

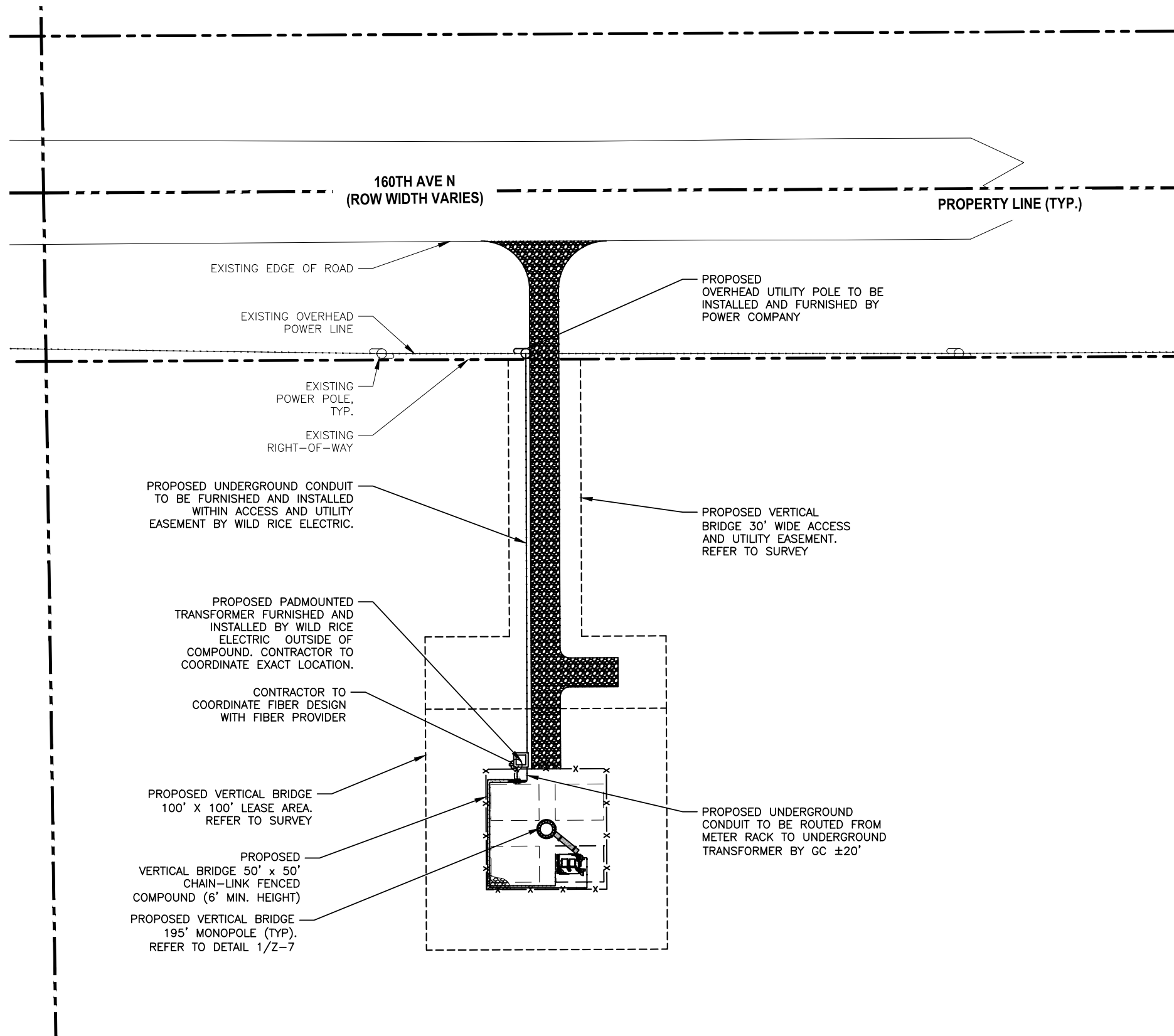
US-MN-5126 ULEN A100345A 160TH AVE N ULEN TOWNSHIP, MN 56585 CLAY COUNTY
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SHEET TITLE:

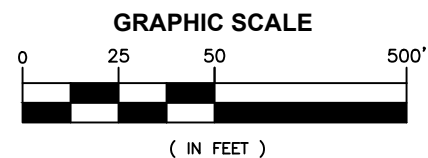
<b>EQUIPMENT SPECIFICATIONS</b>
---------------------------------

SHEET NUMBER:

S-9
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**1**  
E-1  
**OVERALL UTILITY PLAN**  
SCALE: 1:50  
SCALE BASED ON 11"x17" ONLY



700 PARK OF COMMERCE DRIVE #200  
BOCA RATON FL, 33487  
TEL: (561) 948-6367

PLANS PREPARED BY:



201 NORTH FRANKLIN STREET, SUITE 1400  
TAMPA, FL 33602  
PHONE (813) 620-1460  
WWW.KIMLEY-HORN.COM

REV: DATE: DESCRIPTION: BY:

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DRAWN BY: CHECKED BY:

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KHA PROJECT NUMBER:

140064151.1.100

ENGINEER SEAL:

PROJECT INFORMATION:

US-MN-5126  
ULEN  
A100345A  
160TH AVE N  
ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

SHEET TITLE:

**OVERALL UTILITY PLAN**

SHEET NUMBER:

E-1





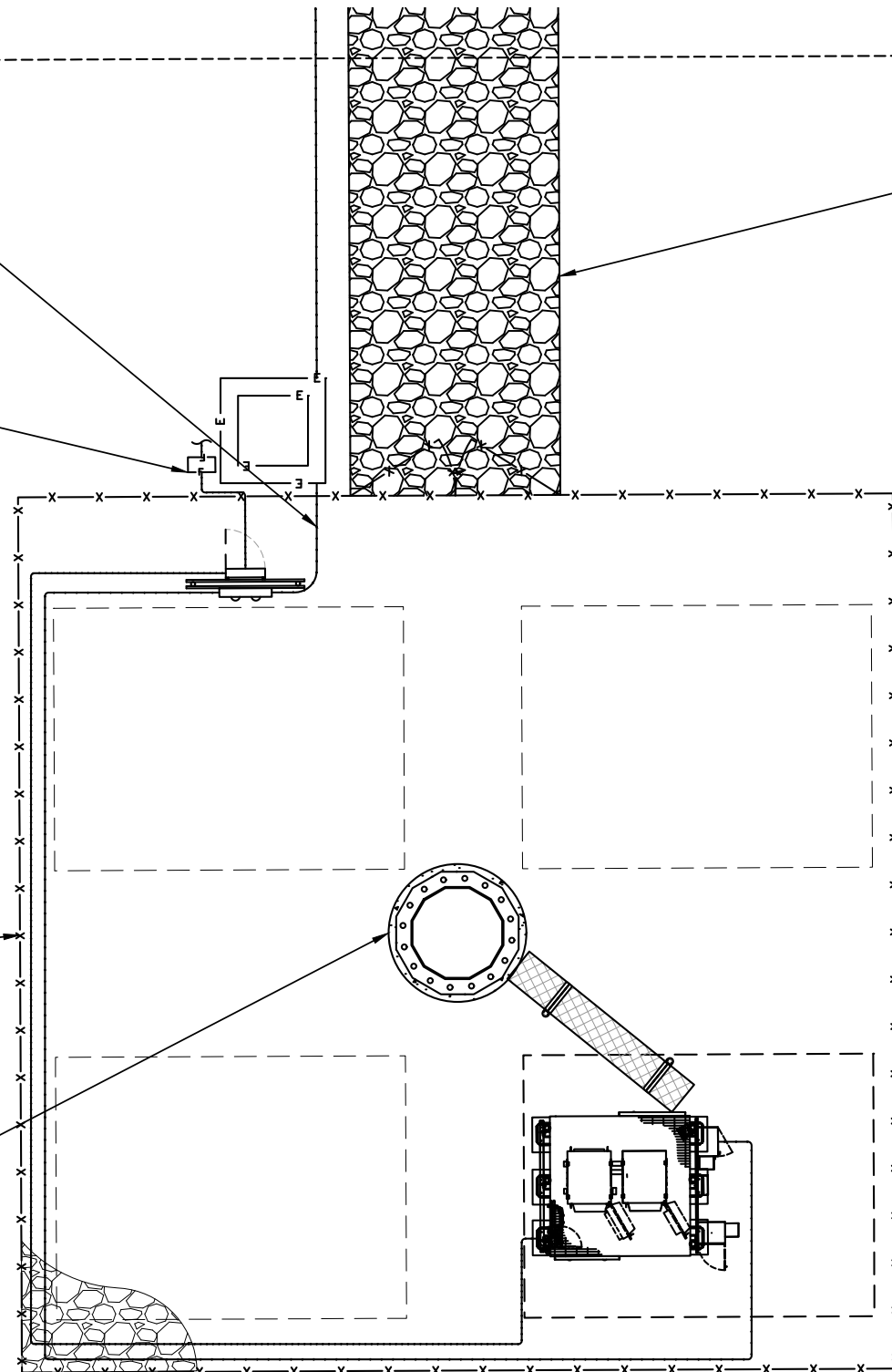
PROPOSED UNDERGROUND  
CONDUIT TO BE ROUTED FROM  
METER RACK TO UNDERGROUND  
TRANSFORMER BY GC ±20'

CONTRACTOR TO  
COORDINATE FIBER  
DESIGN/ROUTE WITH  
FIBER PROVIDER

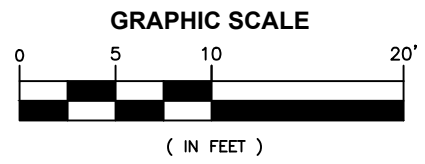
PROPOSED 12' WIDE  
GRAVEL ROAD.

PROPOSED  
VERTICAL BRIDGE 50' x 50'  
CHAIN-LINK FENCED  
COMPOUND (6' MIN. HEIGHT)

PROPOSED VERTICAL BRIDGE  
195' MONOPOLE (TYP).  
REFER TO DETAIL 1/Z-7



**1**  
E-2 **ENLARGED UTILITY PLAN**  
SCALE: 1"=10'  
SCALE BASED ON 11"x17" ONLY



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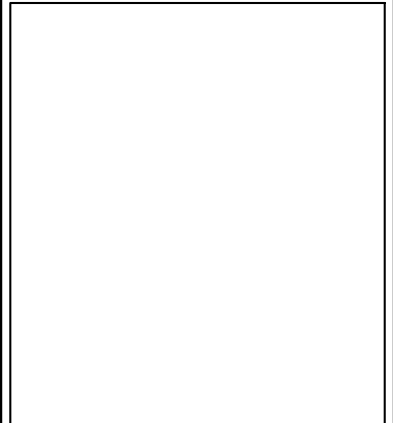
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PROJECT INFORMATION:

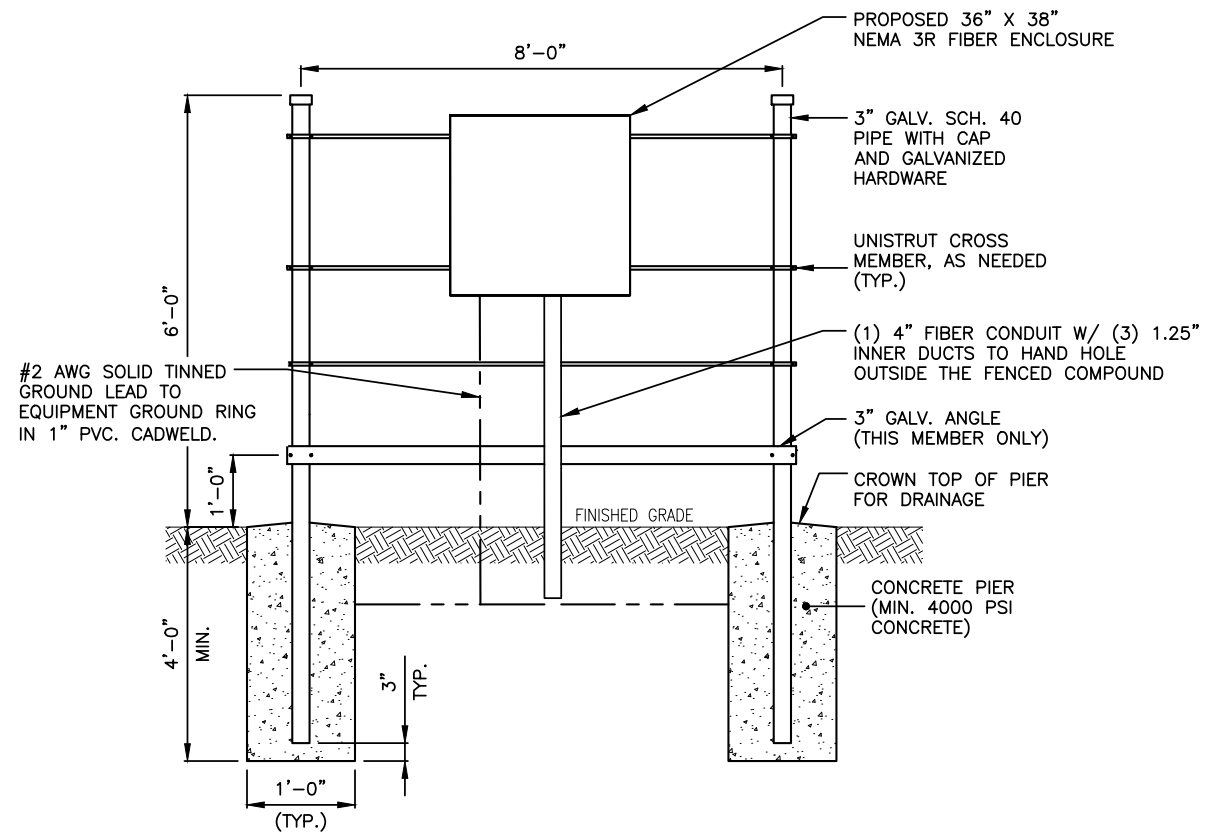
US-MN-5126  
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ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

SHEET TITLE:

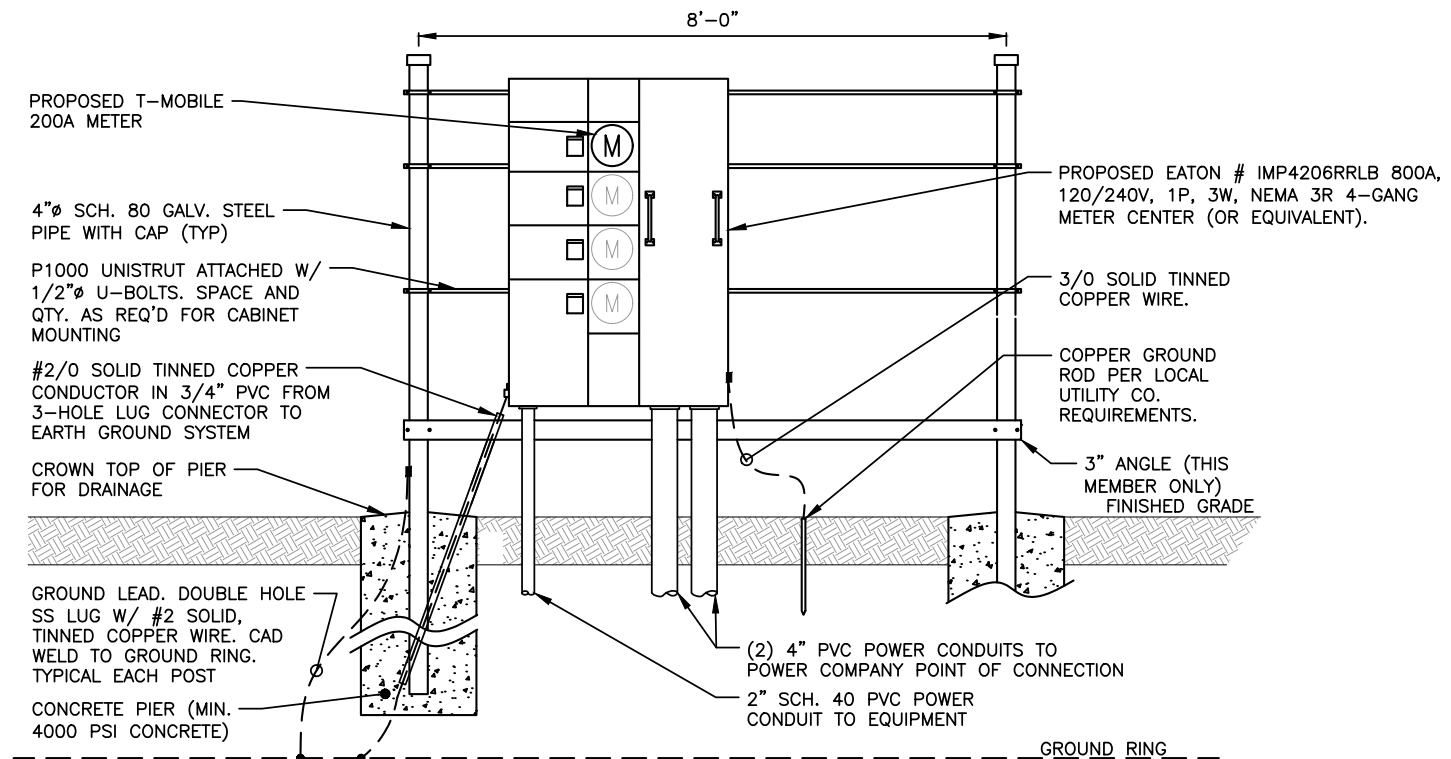
**ENLARGED UTILITY  
PLAN**

SHEET NUMBER:

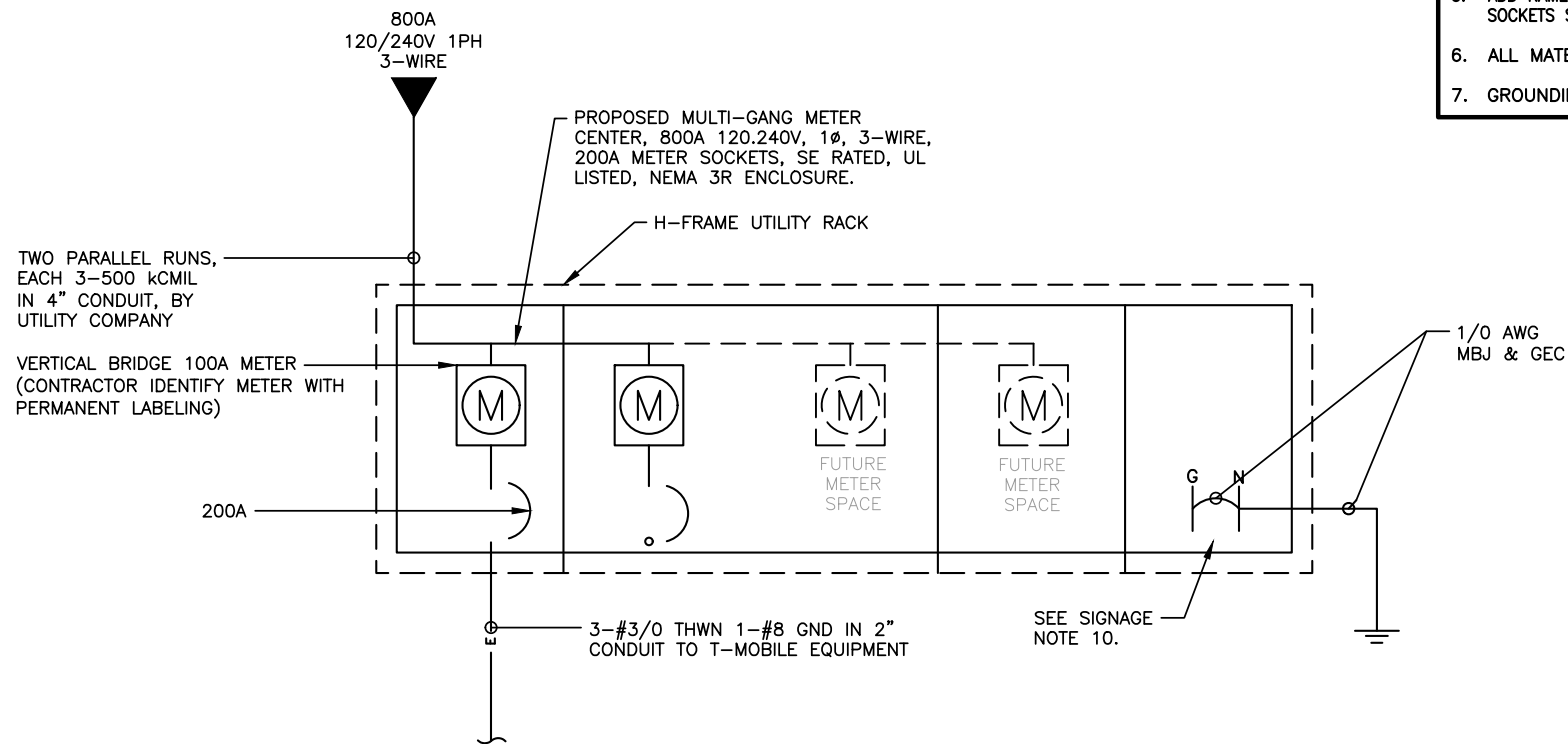
E-2



**1 UTILITY RACK DETAIL**  
SCALE: N.T.S.



- NOTES:**
1. STEEL SHALL BE HOT-DIPPED GALVANIZED.
  2. CONTRACTOR TO SUPPLY ALL MATERIAL UNLESS OTHERWISE NOTED.
  3. ALL HARDWARE TO BE STAINLESS STEEL.
  4. CONTRACTOR TO PROVIDE AND INSTALL LUG CONNECTION AT METER CENTER.
  5. ADD NAMEPLATES TO INDICATE METERS. COORDINATE TO MATCH METER WITH BREAKER SWITCH. UNUSED METER SOCKETS SHALL BE COVERED W/ LEXAN METER COVER.
  6. ALL MATERIALS FURNISHED BY CONTRACTOR UNLESS OTHERWISE NOTED.
  7. GROUNDING NOT SHOWN FOR CLARITY.



**3 ELECTRICAL ONE-LINE DIAGRAM**  
SCALE: N.T.S.

**2 UTILITY H-FRAME**  
SCALE: N.T.S.

- KEY NOTES:**
- 1 TOWER LIGHTING CONTROLLER
  - 2 1/2" CONDUIT FROM LIGHTING CONTROLLER TO PRE-WIRED PHOTOCELL.
  - 3 2 7/8" X 4 9/16" CAST ALUMINUM WEATHERPROOF OUTLET BOX (GFCI) OR "C" CONDUIT WITH BLANK WEATHERPROOF COVER
  - 4 PHOTOELECTRIC CELL (FURNISHED W/ TOWER LIGHTING CONTROLLER)
  - 5 TOWER LIGHTING SO CORDS
  - 6 2" CONDUIT FROM METER TO ELECTRICAL PANEL.
  - 7 ELECTRICAL WEATHER HEAD (TYP. FOR BOTH STUB UPS)
  - 8 2" CONDUIT TO BASE OF TOWER
  - 9 TOWER MONITORING BOX
  - 10 PER NEC ART 702 PROVIDE SIGNAGE AS FOLLOWS:  
A. AT SHELTER PANEL PP1: "EMERGENCY POWER IS SUPPLIED BY STAND-BY GENERATOR LOCATED IN ADJACENT ROOM"  
B. AT SERVICE DISCONNECT:
- WARNING - SHOCK HAZARD EXISTS IF GROUNDING ELECTRODE CONDUCTOR OR BONDING JUMPER CONNECTION IN THIS EQUIPMENT IS REMOVED WHILE ALTERNATE SOURCE(S) IS ENERGIZED**



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ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

SHEET TITLE:

**ELECTRICAL DETAILS**

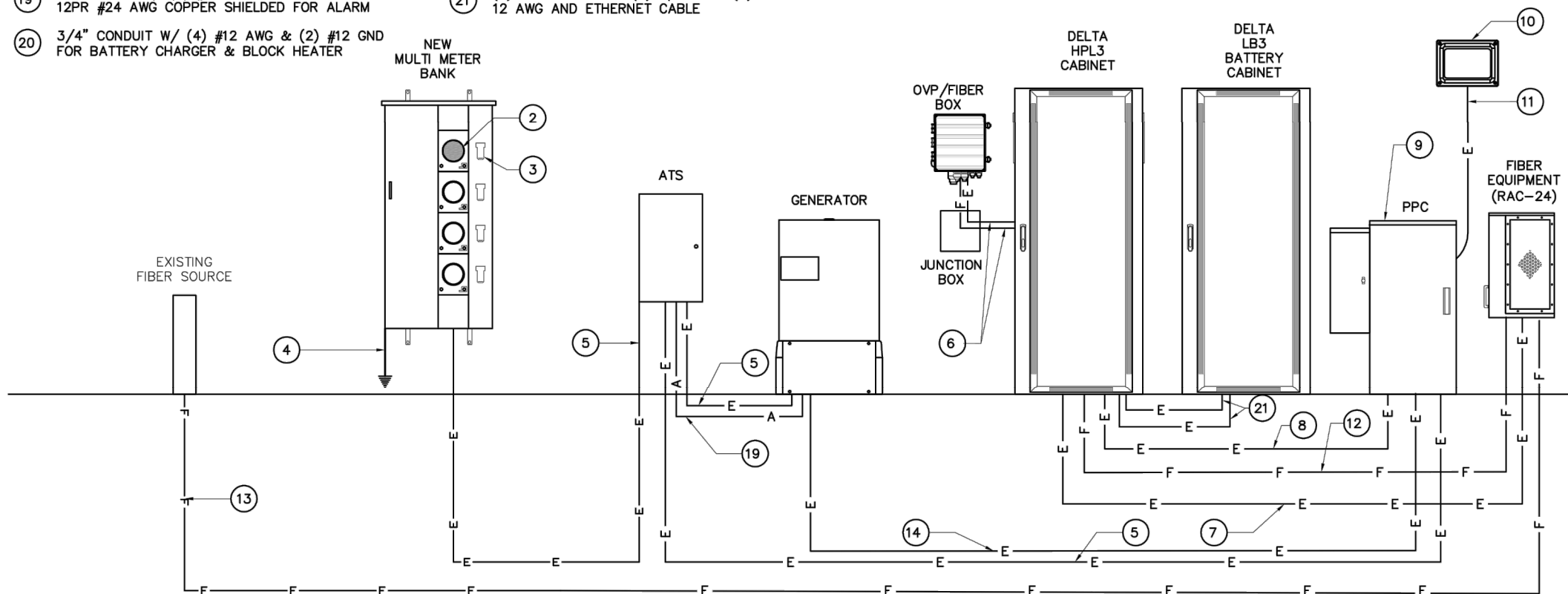
SHEET NUMBER:

E-3

**SYMBOL LEGEND:**

- ① NOT USED
- ② METER (BY UTILITY COMPANY)
- ③ INSTALL 200A C/B SERVICE DISCONNECT
- ④ #4 SERVICE GROUND
- ⑤ 2" CONDUIT W/ (3) #3/0 AND #4 GROUND
- ⑥ (2) 2" FLEXIBLE CONDUITS W/ DC CABLE(S)
- ⑦ 1" RIGID CONDUIT W/ DC CABLE(S)
- ⑧ 2" CONDUIT W/ (3) #3/0 AND #4 AWG GND
- ⑨ INSTALL 15A DISCONNECT BREAKER INSIDE PPC
- ⑩ 26W LED SERVICE LIGHT MOUNTED ON NEMA 3R JUNCTION BOX (PATRIOT DEFENDER LED 5.25")
- ⑪ 3/4" RIGID CONDUIT W/ (2) #12 AND (1) #12 GROUND WIRE
- ⑫ 1" RIGID CONDUIT W/ FIBER CABLE(S) AND CAT-6 TELCO CABLE
- ⑬ 2" CONDUIT W/ MULE-TAPE TYPE PULL STRING
- ⑭ 1" LIQUID TIGHT CONDUIT W/ (1) CAT5E CABLE
- ⑮ 2" SCH.80 OR LIQUID TIGHT (AG) CONDUIT W/ 2/0 TELCOFLEX CABLE
- ⑯ SHUTOFF VALVE
- ⑰ 2" CONDUIT W/ #6 TELCOFLEX DC CABLE

- ⑱ 2" CONDUIT W/ (2) #14 AWG & GENERAL CABLE 12PR #24 AWG COPPER SHIELDED FOR ALARM
- ⑲ 3/4" CONDUIT W/ (4) #12 AWG & (2) #12 GND FOR BATTERY CHARGER & BLOCK HEATER
- ⑳ (2) 4"ø CONDUIT W (4) 4/0 AWG, (5) 12 AWG AND ETHERNET CABLE



**1 T-MOBILE SINGLE LINE DIAGRAM**  
E-4 SCALE: N.T.S.

**VOLTAGE:** 120/240 Vac  
**PHASE:** 1  
**WIRE:** 3W  
**BUSS RATING:** 200  
**MAIN BREAKER:** 200  
**PANEL STATUS:** NEW  
**ENCLOSURE TYPE:** NEMA 1  
**MOUNT:** SURFACE  
**AIC:** 22kA  
**PANEL POSITIONS:** 30

<b>Total kVA</b>	<b>19.79</b>
<b>Total AMPS</b>	<b>82.47</b>

CKT	LOAD DESCRIPTION	BREAKER AMPS	BREAKER POLES	BREAKER STATUS	SERVICE LOAD	USAGE FACTOR	Phase A (VA) 81.75A	Phase B (VA) 83.25A	USAGE FACTOR	SERVICE LOAD	BREAKER STATUS	BREAKER POLES	BREAKER AMPS	LOAD DESCRIPTION	CKT
1	SURGE ARRESTOR	30	2	ON	25	1	25	9750	1	9750	ON	2	200	SITE SUPPORT CABINET	2
3					25	1	9750	25	1	9750					4
5	SERVICE LIGHT	20	1	ON	25	1.25	31	180	1	180	ON	1	20	GIF OUTLET	6
7	SERVICE LIGHT	20	1	ON	25	1.25	0	31							8
9	BATTERY	20	1	ON		0	0	0							10
11						0	0	0							12
13						0	0	0							14
15						0	0	0							16
17						0	0	0							18
19						0	0	0							20
21						0	0	0							22
23						0	0	0							24
25						0	0	0							26
27						0	0	0							28
29						0	0	0							30

DESCRIPTION	ESTIMATED DISTANCE (FT)	WIRE SIZE	VOLTAGE DROP (%)	VOLTAGE AT THE PANEL
FROM ELECTRIC SERVICE CONNECTION POINT TO NEW PPC	40	3/0	0.47	238.85

**1 T-MOBILE PANEL SCHEDULE**  
E-4 SCALE: N.T.S.



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ENGINEER SEAL:

PROJECT INFORMATION:

US-MN-5126  
ULEN  
A100345A  
160TH AVE N  
ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

SHEET TITLE:

**ELECTRICAL DETAILS**

SHEET NUMBER:

E-4



THE CONTRACTOR MUST FIELD VERIFY ALL MEASUREMENTS AND FIELD CONDITIONS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

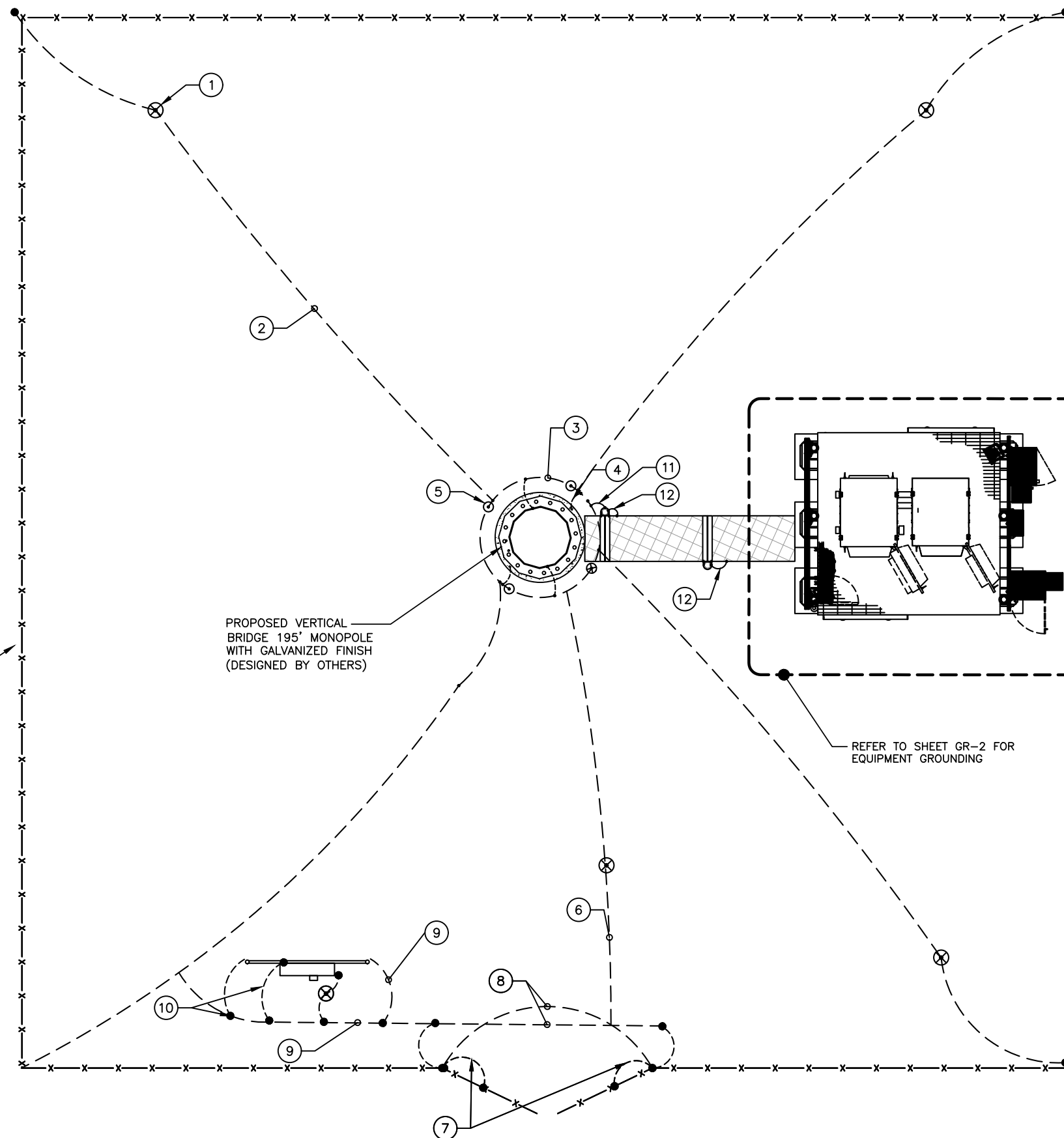
**KEY NOTES:**

- ① 5/8" x 8' LONG COPPER GROUND ROD WITH TEST WELL (TYP). REFER TO DETAIL 3/GR-3.
- ② #2 BARE, TINNED, SOLID COPPER GROUND WIRE FROM FENCE CORNER POSTS TO TOWER GROUND RING. (TYP OF 4).
- ③ PROPOSED TOWER GROUND RING BURIED 30" DEEP OR 6" BELOW FROST LEVEL, WHICHEVER IS GREATER.
- ④ #2 BARE, TINNED, SOLID COPPER GROUND WIRE FROM TOWER TO TOWER GROUND RING. (TYP OF 4).
- ⑤ 5/8" x 8' LONG COPPER GROUND ROD (TYP). REFER TO DETAIL 1/GR-3.
- ⑥ #2 BARE, TINNED, SOLID COPPER GROUND WIRE FROM GATE FENCE POST TO TOWER GROUND RING.
- ⑦ #2 BARE, TINNED, FLEXIBLE STRANDED COPPER GROUND WIRE FROM GATE FENCE POST TO GATE. (TYP OF 2).
- ⑧ #2 BARE, TINNED, SOLID COPPER GROUND WIRE FROM GATE FENCE POST TO GATE FENCE POST.
- ⑨ #2 BARE, TINNED, SOLID COPPER GROUND WIRE FROM UTILITY FRAME POST TO TOWER GROUND RING. (TYP OF 2).
- ⑩ #2 BARE, TINNED, SOLID COPPER GROUND WIRE FROM SERVICE ENTRANCE TO GROUND ROD PER LOCAL UTILITY COMPANY REQUIREMENTS. DO NOT CONNECT THIS GROUND ROD TO ANY OTHER GROUND WIRES.
- ⑪ #2 BARE, TINNED, SOLID COPPER GROUND WIRE FROM WAVEGUIDE BRIDGE POST TO GROUND RING.
- ⑫ BOND ALL WAVEGUIDE BRIDGE POSTS TO WAVEGUIDE BRIDGE CHANNEL.

PROPOSED VERTICAL BRIDGE 50' x 50' CHAIN-LINK FENCED COMPOUND (6' MIN. HEIGHT)

PROPOSED VERTICAL BRIDGE 195' MONOPOLE WITH GALVANIZED FINISH (DESIGNED BY OTHERS)

REFER TO SHEET GR-2 FOR EQUIPMENT GROUNDING



**1**  
GR-1 **GROUNDING PLAN**  
SCALE: N.T.S.

**NOTE:**  
1. THIS GROUNDING DIAGRAM SHOWS TYPICAL COMPOUND GROUNDING CONNECTIONS FOR FENCE, GATE, TOWER AND UTILITY H-FRAME. ACTUAL SITE CONFIGURATION AND ORIENTATION MAY VARY.



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ULEN TOWNSHIP, MN 56585  
CLAY COUNTY

SHEET TITLE:

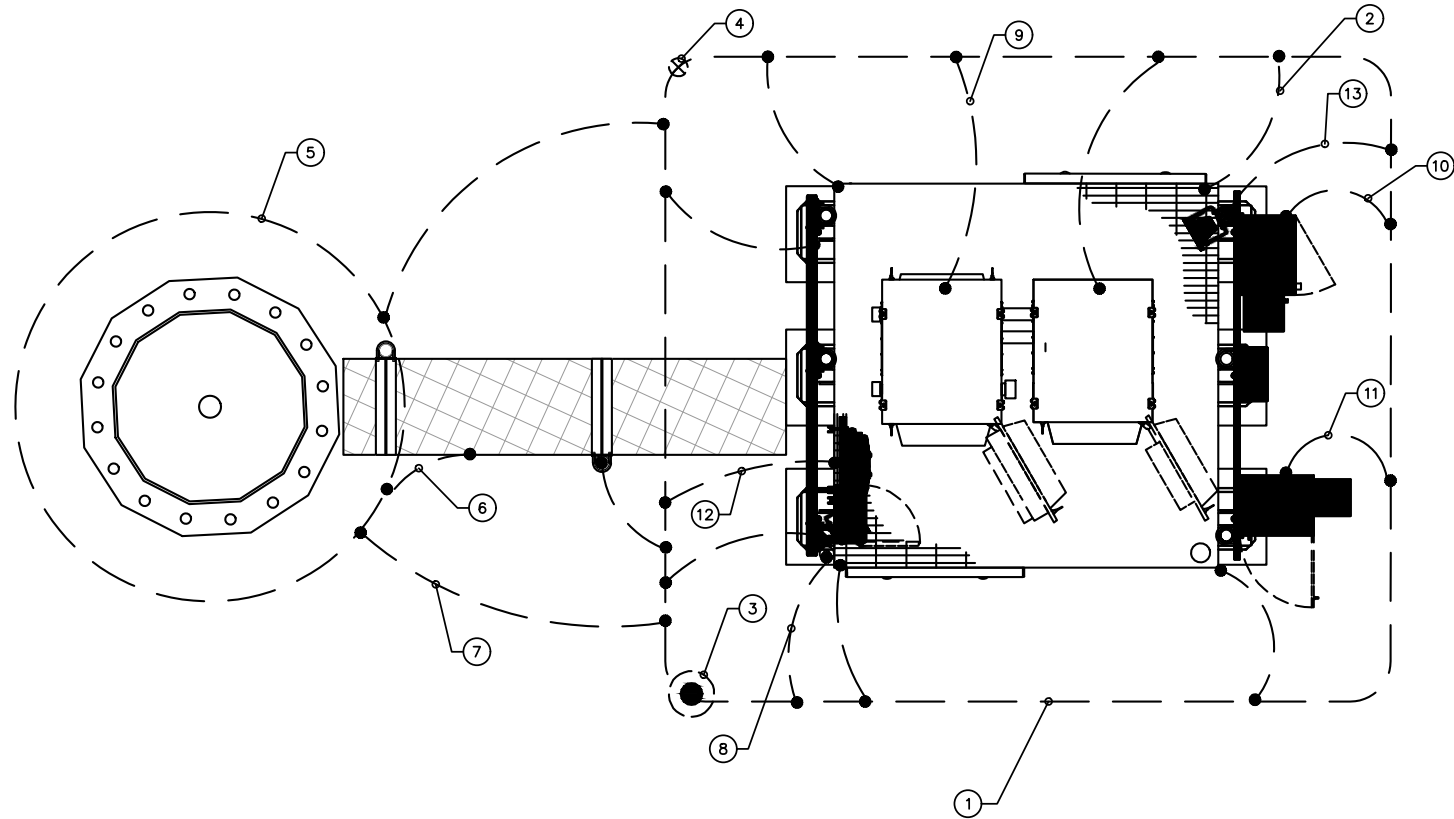
**GROUNDING PLAN**

SHEET NUMBER:

GR-1

**KEY NOTES:**

- ① ##### EQUIPMENT GROUND RING: #2 TINNED CU WIRE BURIED 30" BELOW THE FROST LINE.
- ② PROPOSED #2 AWG GROUND FROM EQUIPMENT PLATFORM TO GROUND RING (TYP.)
- ③ PROPOSED ##### TEST WELL
- ④ GROUND ROD: COPPERCLAD STEEL 3/8" DIA 8' LONG, GROUND ROD (TYP.)
- ⑤ PROPOSED VERTICAL BRIDGE TOWER GROUND RING
- ⑥ PROPOSED #2 AWG GROUND FROM ICE BRIDGE TO TOWER GROUND RING (TYP.)
- ⑦ PROPOSED #2 AWG GROUND FROM GROUND RING TO TOWER GROUND RING (TYP.)
- ⑧ PROPOSED #2 AWG GROUND FROM GPS TO MAIN GROUND RING (TYP.)
- ⑨ PROPOSED #2 AWG GROUND FROM CABINETS TO MAIN GROUND RING (TYP.)
- ⑩ PROPOSED #2 AWG GROUND FROM PPC TO MAIN GROUND RING (TYP.)
- ⑪ PROPOSED #2 AWG GROUND FROM RAC24 TO MAIN GROUND RING (TYP.)
- ⑫ PROPOSED #2 AWG GROUND FROM 2.0 JUNCTION BOX TO MAIN GROUND RING (TYP.)
- ⑬ PROPOSED #2 AWG GROUND FROM SERVICE LIGHTS TO MAIN GROUND RING (TYP.)

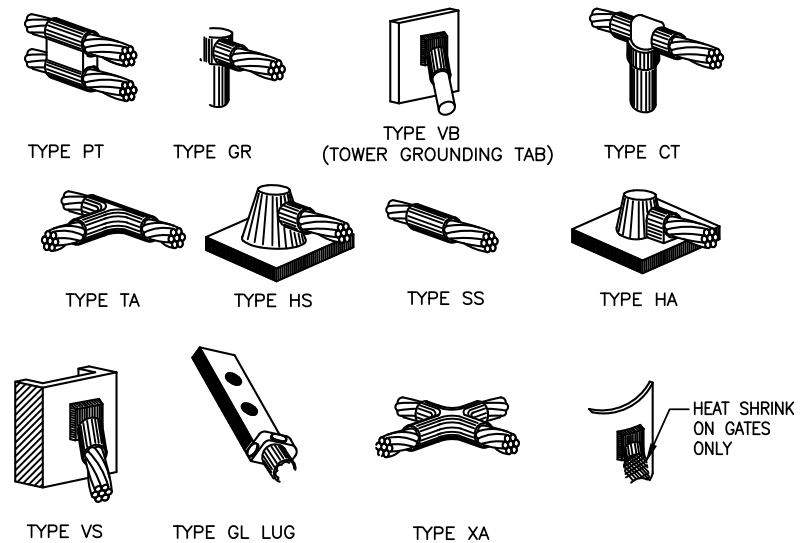


**NOTES:**  
1. TYPICAL GROUNDING DIAGRAM. REFER TO SITE PLAN FOR ACTUAL LAYOUT.

**1 EQUIPMENT GROUNDING PLAN**  
SCALE: N.T.S.

**GENERAL GROUNDING NOTES AND SPECIFICATIONS:**

1. THE GROUND RING SHALL CONSIST OF #2 BARE SOLID TINNED COPPER CONDUCTOR, UNLESS NOTED OTHERWISE, BURIED AT 30" BELOW FINISHED GRADE AND 18 INCHES OUTSIDE OF EQUIPMENT PAD.
2. ALL GROUNDING CONNECTIONS SHALL BE MADE USING AN EXOTHERMIC WELD, UNLESS NOTED OTHERWISE. EXCEPT FOR EQUIPMENT CONNECTIONS WHICH SHALL BE MECHANICALLY FASTENED. CLEAN ALL SURFACES PRIOR TO CONNECTION. SPRAY EXOTHERMICALLY WELDED CONNECTIONS WITH ANTI-OXIDATION PAINT.
3. ALL GROUNDING DEVICES SHALL BE UL APPROVED OR LISTED FOR THEIR INTENDED USE.
4. ROUTE ALL GROUND CONDUCTORS ALONG THE SHORTEST ROUTE AND AVOID SHARP BENDS. THE BEND RADIUS SHALL NOT BE LESS THAN 12".
5. ALL GROUND RODS SHALL BE A MINIMUM OF 10 FEET LONG, COPPER CLAD STEEL (302 OR 304), 3/8" DIAMETER. GROUND ROD SPACING AS SHOWN.
6. PRIOR TO INSTALLING LUGS ON GROUND CONDUCTORS OR BOLTING GROUND LUGS, APPLY THOMAS & BETTS KOPR-SHIELD OR EQUIVALENT.
7. SPLIT BOLTS SHALL NOT BE USED.
8. ENSURE THAT NO CONTINUOUS METAL RING SURROUNDS A GROUNDING CONDUCTOR. USE PVC SUPPORT CLAMPS. ENSURE ANY GROUNDING CONDUCTORS RUN THROUGH METAL CONDUIT ARE BONDED TO THE CONDUIT AT BOTH ENDS.
9. ANY METAL OBJECT WITHIN 6' OF THE GROUND RING SHALL BE BONDED DIRECTLY TO THE RING.
10. ALL GROUNDING COMPONENTS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
11. ALL GROUNDING/BONDING CONDUCTORS RUN FROM ABOVE GRADE TO THE GROUND RING SHALL BE INSTALLED IN 3/4" PVC CONDUIT FROM 1 FOOT ABOVE GRADE AND SEALED WITH A SILICONE SEALANT.
12. CONTRACTOR SHALL NOTIFY THE TOWER OWNER/CARRIER CONSTRUCTION MANAGERS TO ALLOW THE CONSTRUCTION MANAGERS TO INSPECT THE GROUNDING SYSTEM PRIOR TO BACKFILLING.
13. ALL BONDING JUMPERS SHALL BE SOLID #2 COPPER.
14. ALL BONDING JUMPERS SHALL BE INSTALLED OVER TOP OF SLAB. NO JUMPERS SHALL BE RUN THROUGH SLAB.
15. GROUND SYSTEM SHALL BE TESTED AND SHALL HAVE A RESISTANCE OF 5 OHMS OR LESS. IF RESISTANCE VALUE IS EXCEEDED, NOTIFY ##### FOR FURTHER INSTRUCTIONS. SUBMIT A COPY OF THE TEST REPORT TO #####.



**NOTES:**  
1. CADWELD "TYPES" SHOWN ABOVE ARE EXAMPLES. PROVIDE APPROPRIATE TYPES AS REQUIRED.

**2 TYPICAL CAD WELDS**  
SCALE: N.T.S.



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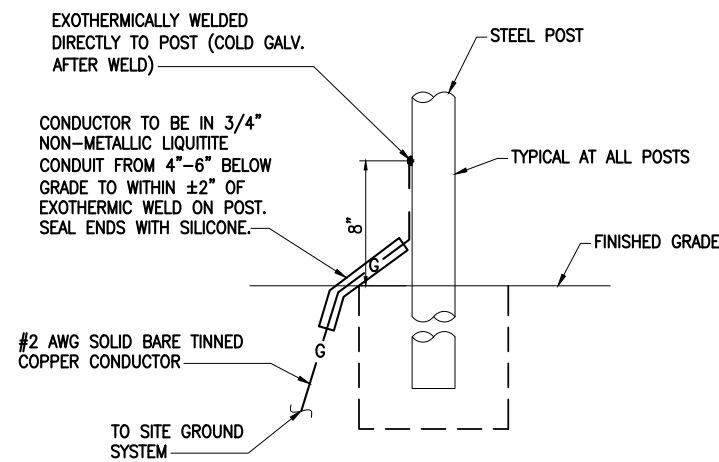
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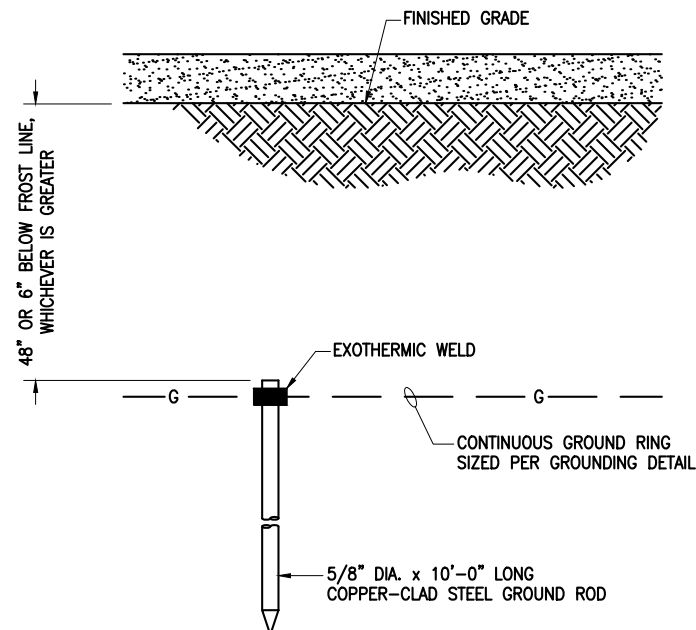
**GROUNDING NOTES**

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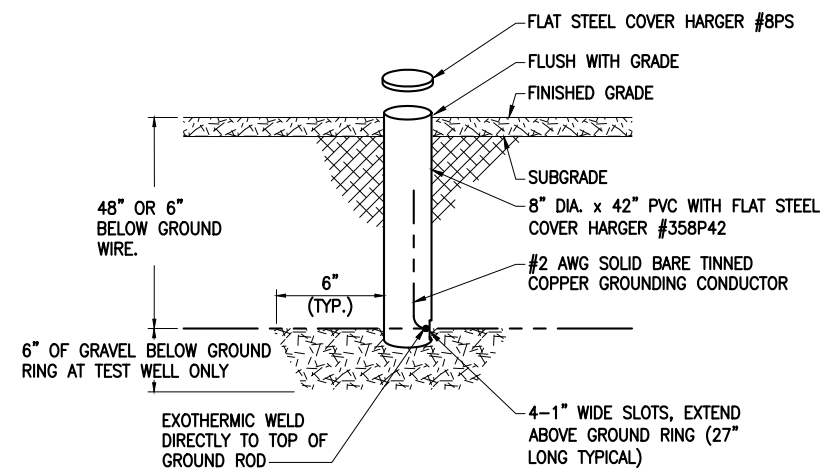
**GR-2**



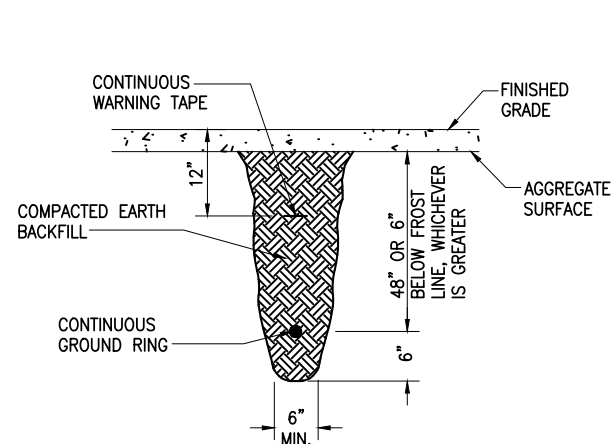
**1 POST GROUNDING DETAIL**  
GR-3 NOT TO SCALE



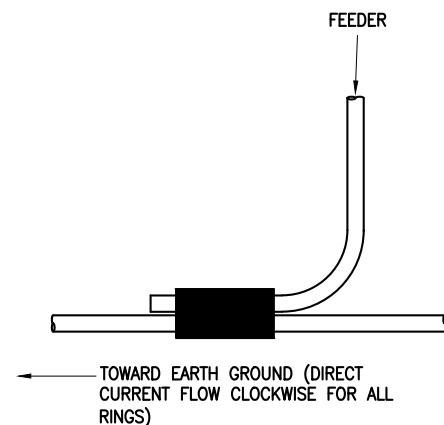
**2 GROUND ROD DETAIL**  
GR-3 NOT TO SCALE



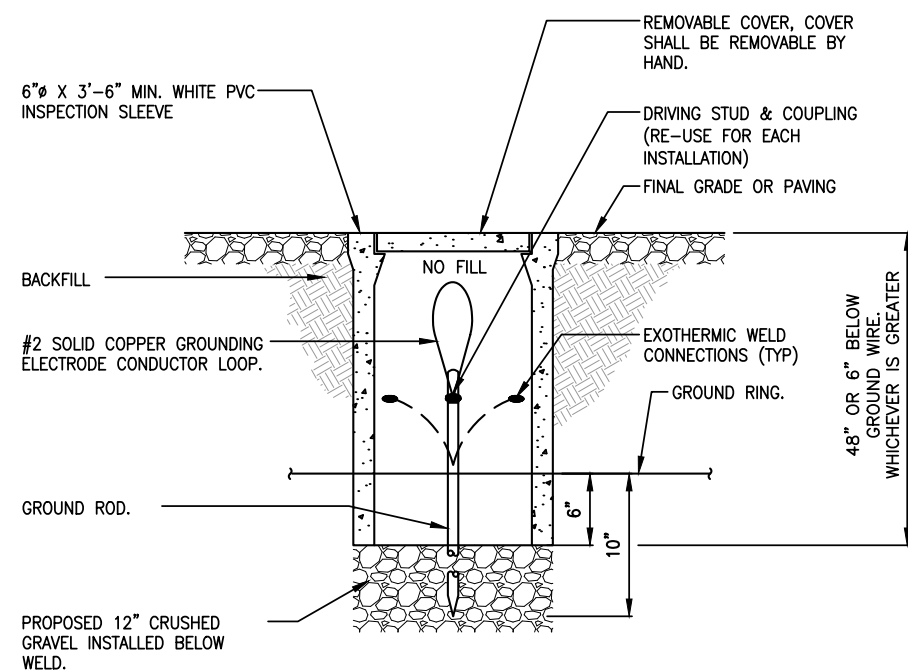
**3 GROUND TEST WELL DETAIL**  
GR-3 NOT TO SCALE



**4 TRENCH DETAIL FOR GROUND RING**  
GR-3 NOT TO SCALE



**5 GROUND CONDUCTOR CONNECTION**  
GR-3 NOT TO SCALE



**NOTE:**

1. ANY INSPECTION WELL SHALL LINE UP WITH THE ELEVATED DECK COLUMNS SO THAT THEY ARE OUTSIDE OF A PARKING AISLE.
2. ALL RING AND RADIAL DEPTH AT 48\"/>

**6 INSPECTION SLEEVE DETAIL**  
GR-3 SCALE: N.T.S.

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**GROUNDING DETAILS**

**GR-3**