

cricket

communications

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1233 N. Mayfair Road
Suite 203
Milwaukee, Wisconsin 53226



SELECTIVE SITE CONSULTANTS, INC.
A Site Acquisition, Engineering, and Construction Quality Assurance Company

8500 W. 110th Street, Suite 300 Phone: 913-438-7700
Overland Park, Kansas 66210 Fax: 913-438-7777

PROPOSED USAGE OF DEVELOPMENT

UNMANNED TELECOMMUNICATION SITE

PROVIDER OF ELECTRICAL SERVICES:

WISCONSIN ELECTRIC
PHONE: (414) 881-3435
CONTACT: BRIAN WILLIAMS

PROVIDER OF TELEPHONE SERVICES:

AT&T
PHONE: (800) 286-8313
CONTACT: BEV WALLACE

LOCAL BUILDING AUTHORITY:

MILWAUKEE, WISCONSIN

PREPARED FOR:

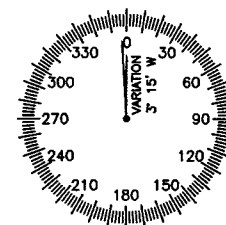
CRICKET COMMUNICATIONS
1233 N. MAYFAIR ROAD, SUITE 203
MILWAUKEE, WISCONSIN 53226

GENERAL NOTES:

1. CONTRACTOR TO OBTAIN FINAL INSPECTION APPROVAL AS SOON AS POSSIBLE.
2. CONTRACTOR RESPONSIBLE FOR CLEANING THE COMPOUND PRIOR TO LEAVING PROJECT.

DESIGN TEAM:

SELECTIVE SITE CONSULTANTS, INC.
H.A. NOVIN, LEAD CIVIL/STRUCTURAL
T.M. SUPER, LEAD ELECTRICAL
J.M. BRISCOE, DESIGNER



MAGNETIC DECLINATION

SITE NAME :
LOCKWOOD PARK

SITE NUMBER :
MKE-124-C

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL CONSTRUCTION DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND ANY CHANGES OR MODIFICATIONS THEY MAY IMPOSE.

CRICKET PROPERTY MANAGER	DATE
CRICKET RF ENGINEER	DATE
CRICKET NET OPS	DATE
CRICKET CONSTRUCTION MANAGER	DATE
INTERCONNECT	DATE
CRICKET SITE DEVELOPMENT MANAGER	DATE
PROPERTY OWNER	DATE
PLANNING	DATE
ZONING	DATE
PERMITTING	DATE
SAC	DATE

APPROVALS

CRICKET SITE NO.:
MKE-124-C

CRICKET SITE NAME:
LOCKWOOD PARK

SITE ADDRESS:
**4300 GRACELAND BLVD
RACINE, WISCONSIN 53403**

CHECKED BY: CPH
APPROVED BY: HAN/TMS

REVISIONS:

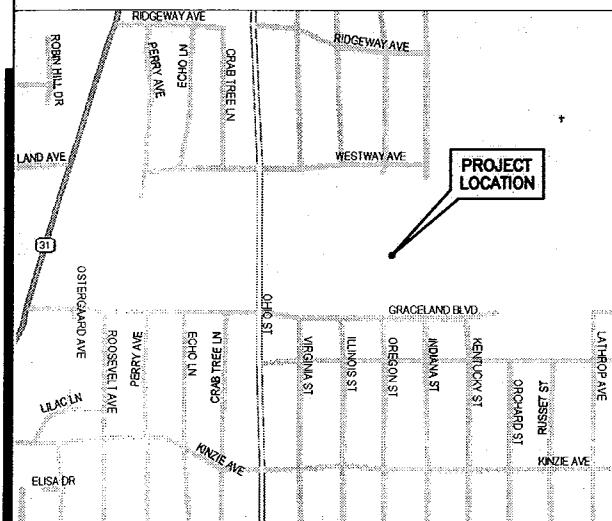
NO.	DATE:	DESCRIPTION:	BY:
A	11/19/07	ISSUED FOR REVIEW	JMB
B	06/24/08	REVISED SITE LAYOUT	TES

DRAWING TITLE:
TITLE SHEET

DRAWING NO.:
T-1

DRIVING DIRECTIONS

DEPARTING THE CRICKET OFFICE ON NORTH MAYFAIR RD: TAKE WATERTOWN PLANK RD EAST (.43 MILES) TO US 45. TAKE US 45 SOUTH (1.46 MILES) TO I-894. TAKE I-894 SOUTH 3.50 MILES TO I-43. TAKE I-43 EAST 5.33 MILES TO I-94. TAKE I-94 SOUTH 16.63 MILES TO SR 20 (EXIT 333). TAKE SR 20 EAST 5.56 MILES TO SR 31. TURN LEFT (NORTH) AND TAKE SR31 0.51 MILES TO GRACELAND BLVD. TURN RIGHT (EAST) AND TAKE GRACELAND BLVD 0.53 MILES TO SITE.



VICINITY MAP

SITE ADDRESS:
STREET: 4300 GRACELAND BLVD
CITY: RACINE
STATE: WISCONSIN
ZIP: 53403
COUNTY: RACINE

DESIGN RAD CENTER:
80'-0"

TOWER HEIGHT:
90'-0"

GROUND ELEVATION:
682.5' AMSL

LATITUDE:
42° 43' 36.72" N (NAD83)

LONGITUDE:
87° 49' 57.54" W (NAD83)

SITE TYPE:
RAW-LOCATE

EQUIPMENT TYPE:
HUAWEI BTS3606AE

SUPPORT STRUCTURE:
PROPOSED LIGHTPOLE

ANTENNA TYPE:
PANEL

LANDLORD:
NAME: CITY PUBLIC SERVICE
CONTACT: DONNIE SNOW
PHONE: (262) 636-9131
FAX: (262) 636-9277
STREET: 800 CENTER STREET
CITY: RACINE
STATE: WISCONSIN
ZIP: 53403
E.C.:

A.D.A COMPLIANCE:
FACILITY IS UNMANNED AND NOT FOR HUMAN OCCUPANCY

THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS

PROJECT SUMMARY

SHT. NO.	DESCRIPTION	REV.	RESPONSIBLE ENGINEER
T-1	TITLE SHEET	B	HAN/TMS
	SURVEY		
A-1	OVERALL SITE PLAN	B	HAN
A-2	COMPOUND PLAN & TOWER ELEVATION	B	HAN
A-3	GRADING PLAN	B	HAN
A-4	DETAILS	A	HAN
A-5	FENCING DETAILS	A	HAN
E-1	ELECTRICAL PLAN & ONE-LINE DIAGRAM	B	TMS
E-2	ELECTRICAL DETAILS	A	TMS
E-3	UTILITY RACK DETAILS	A	TMS
G-1	GROUNDING PLAN & DETAILS	B	TMS
G-2	GROUNDING DETAILS (1 OF 2)	A	TMS
G-3	GROUNDING DETAILS (2 OF 2)	A	TMS
SP1	SPECIFICATIONS (1 of 4)	A	HAN
SP2	SPECIFICATIONS (2 of 4)	A	HAN
SP3	SPECIFICATIONS (3 of 4)	A	HAN
SP4	SPECIFICATIONS (4 of 4)	A	HAN/TMS

SHEET INDEX

PROJECT: LOCKWOOD PARK COLO. MKE-124-D

PROPERTY OWNER:
CITY OF RACINE
730 WASHINGTON AVENUE
RACINE, WI 53403

PARCEL NO.: 276 000022869008

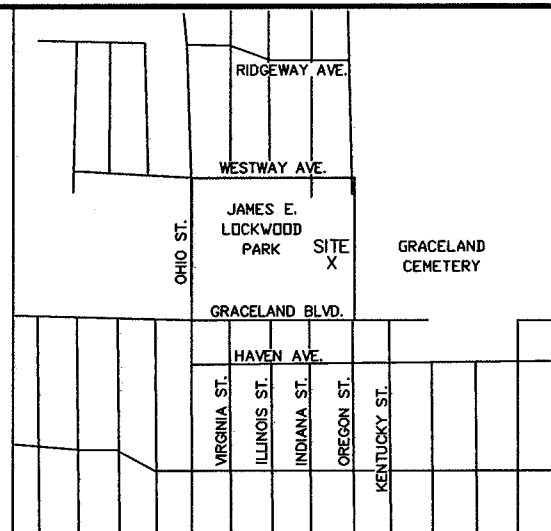
ZONED: RESIDENTIAL

DEED: VOL. 427, PG. 309

PARCEL NO.:
276000022869008

PROPERTY OWNER:
CITY OF RACINE

"LOCKWOOD PARK"



-VICINITY MAP-

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1515 S. 108th Street
Milwaukee, Wisconsin 53214



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MERIDIAN
SURVEYING, LLC

N8774 Firelane 1
Menasha, WI 54952
Office: 920-993-0881
Fax: 920-273-6037

SITE SURVEY
FOR
CRICKET COMMUNICATIONS
BEING A PART OF THE S1/2 OF THE
SW1/4, SECTION 7, T.3N., R.23E., CITY
OF RACINE, RACINE COUNTY, WISCONSIN

CRICKET SITE NO.:
MKE-124-D

CRICKET SITE NAME:
LOCKWOOD PARK COLO.

SITE ADDRESS:
4300 GRACELAND BLVD.
RACINE, WI 53403

CHECKED BY: CAK
APPROVED BY: CAK

REVISIONS:

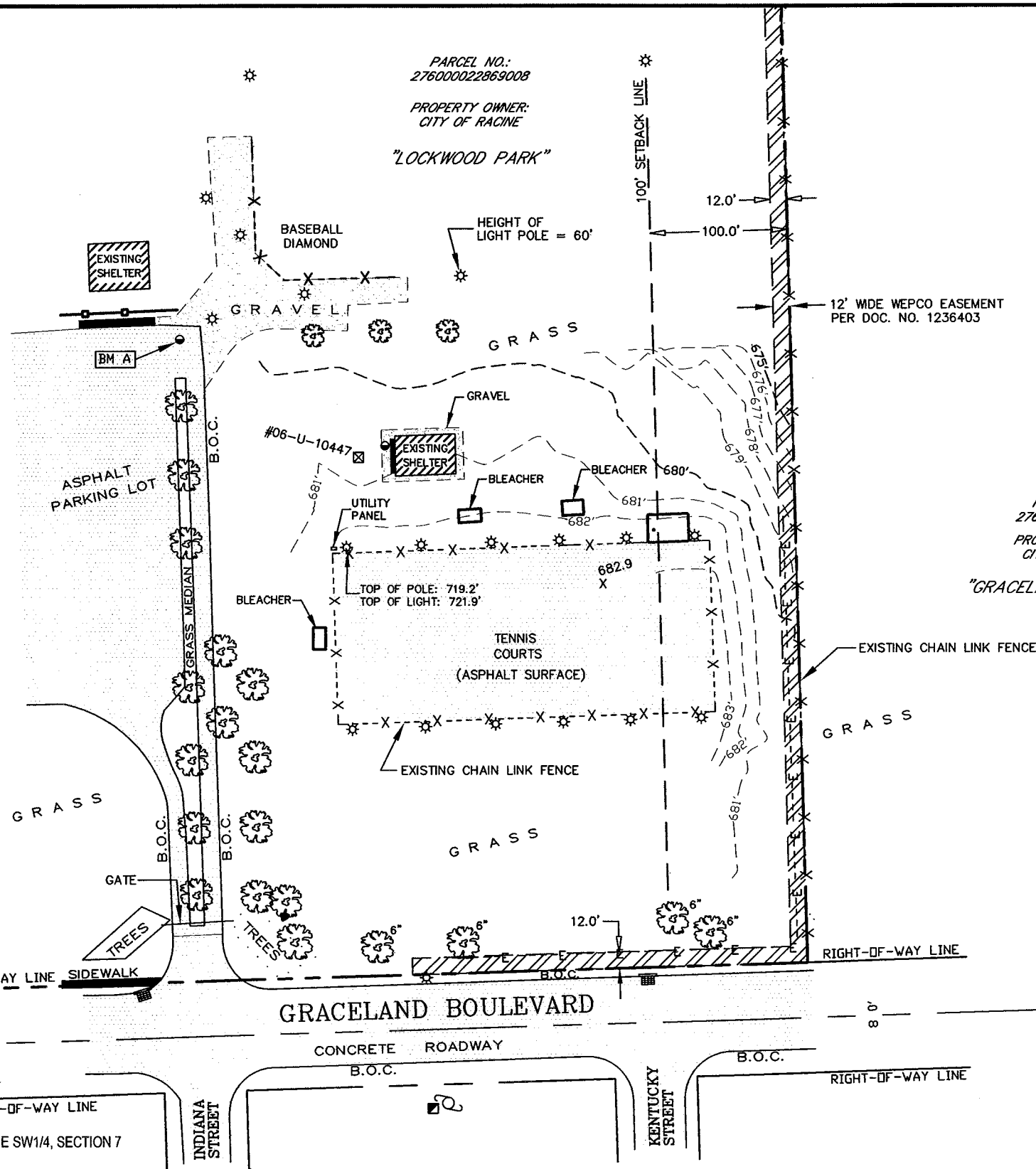
NO.	DATE	DESCRIPTION	BY

DRAWING TITLE:
SURVEY

DRAWING NO.:
SHEET 1

-LEGEND-

- = 1" X 24" IRON PIPE SET
- = 1" IRON PIPE FOUND
- = 8" NAIL SET
- ⊕ = COUNTY MONUMENT FOUND
- ⊞ = TELEPHONE PEDESTAL
- ⊛ = LIGHT POLE
- ⊞ = CURB STORM INLET
- ⊙ = SANITARY SEWER
- ⊞ = ELECTRIC TRANSFORMER
- ⊞ = EXISTING POWER POLE
- = PROPERTY LINE
- - - - x - - - - = WOOD FENCE
- E - = BURIED ELECTRIC
- B.O.C. = BACK OF CURB
- ⊙ = EXISTING TREE



PARCEL NO.:
276000022869001
PROPERTY OWNER:
CITY OF RACINE

"GRACELAND CEMETERY"

BEARINGS REFERENCED TO THE
WISCONSIN STATE PLANE COORDINATE
SYSTEM (NAD27) - SOUTH ZONE

SW CORNER
SECTION 7
T.3N., R.23E.
(SEWRPC MON. FND.)

S1/4 CORNER
SECTION 7
T.3N., R.23E.

GRACELAND BOULEVARD

CONCRETE ROADWAY

INDIANA STREET

KENTUCKY STREET

GRAPHIC SCALE



1 inch = 100 ft.

CALL DIGGERS HOTLINE TOLL FREE
1(800)242-8511
OPERATES 24 HOURS A
DAY 365 DAYS A YEAR



BENCHMARK INFORMATION

SITE BENCHMARK: (BM A)
TOP OF NORTH SIDE OF MANHOLE RIM;
LOCATED AT THE NE CORNER OF PARKING LOT
ELEVATION: 679.77'

DRAWN BY: J.D.	DATE: 11-13-07
CHECKED BY: C.A.K.	FIELD BOOK: M-4, PG. 47-48
JOB NO.: 5371-B252	SHEET 1 OF 2

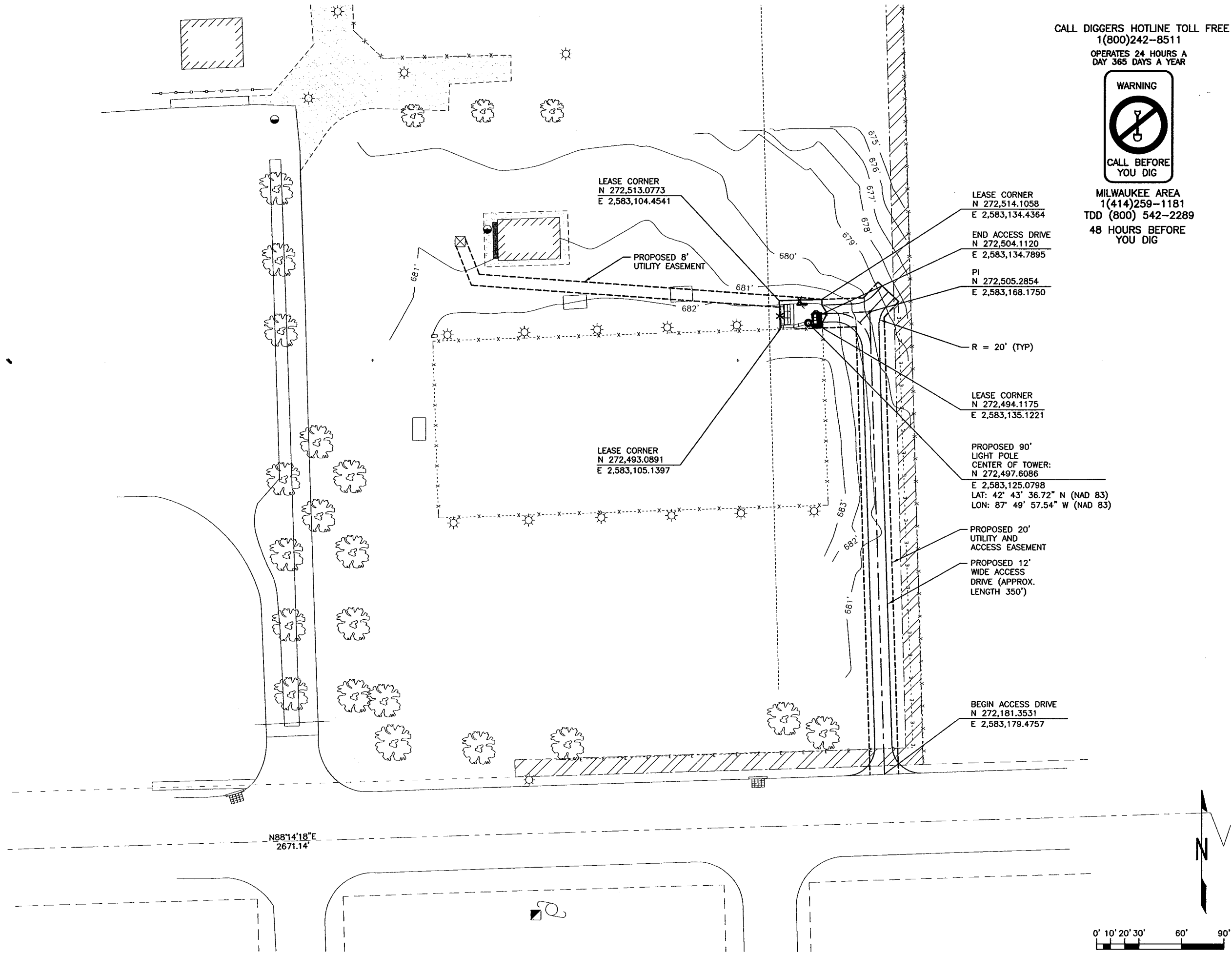
I, Craig A. Keach, hereby certify that none of the property described hereon is within a flood plane or wetlands area as defined by FEMA or Wisconsin DNR.

SURVEYOR'S CERTIFICATE

I, Craig A. Keach, Wisconsin Registered Land Surveyor of Meridian Surveying, LLC., certify that I have surveyed the described property and that the map shown is a true and accurate representation thereof to the best of my knowledge and belief.

Dated this _____ day of _____, 2007.

WISCONSIN REGISTERED LAND SURVEYOR
Craig A. Keach, S-2333



CALL DIGGERS HOTLINE TOLL FREE
 1(800)242-8511
 OPERATES 24 HOURS A DAY
 365 DAYS A YEAR



MILWAUKEE AREA
 1(414)259-1181
 TDD (800) 542-2289
 48 HOURS BEFORE YOU DIG

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SSC
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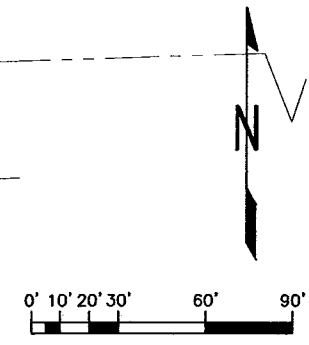
APPROVED BY: HAN/TMS

REVISIONS:

NO:	DATE:	DESCRIPTION:	BY:
A	11/19/07	ISSUED FOR REVIEW	JMB
B	06/24/08	REVISED SITE LAYOUT	YES

DRAWING TITLE:
OVERALL SITE PLAN

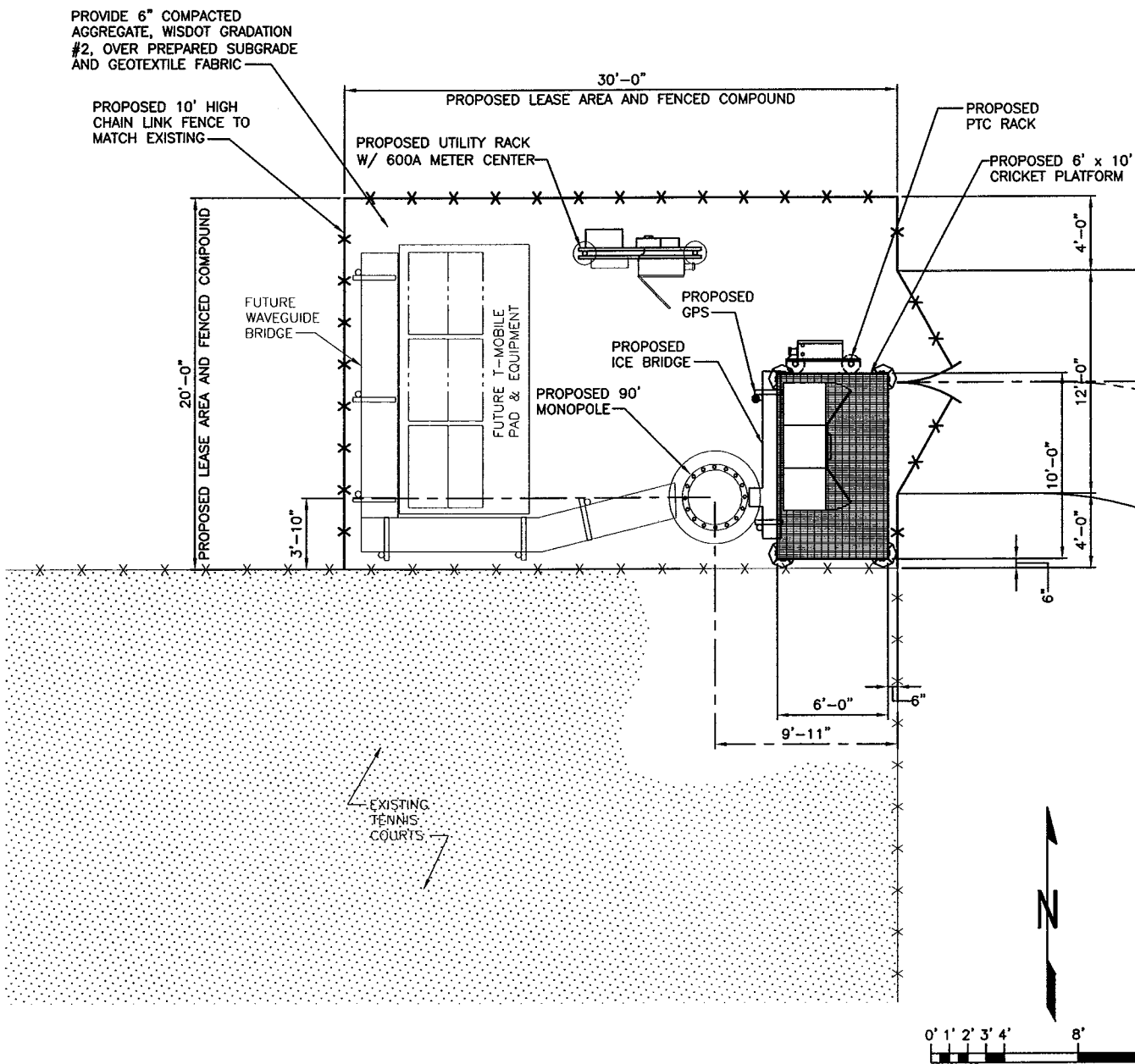
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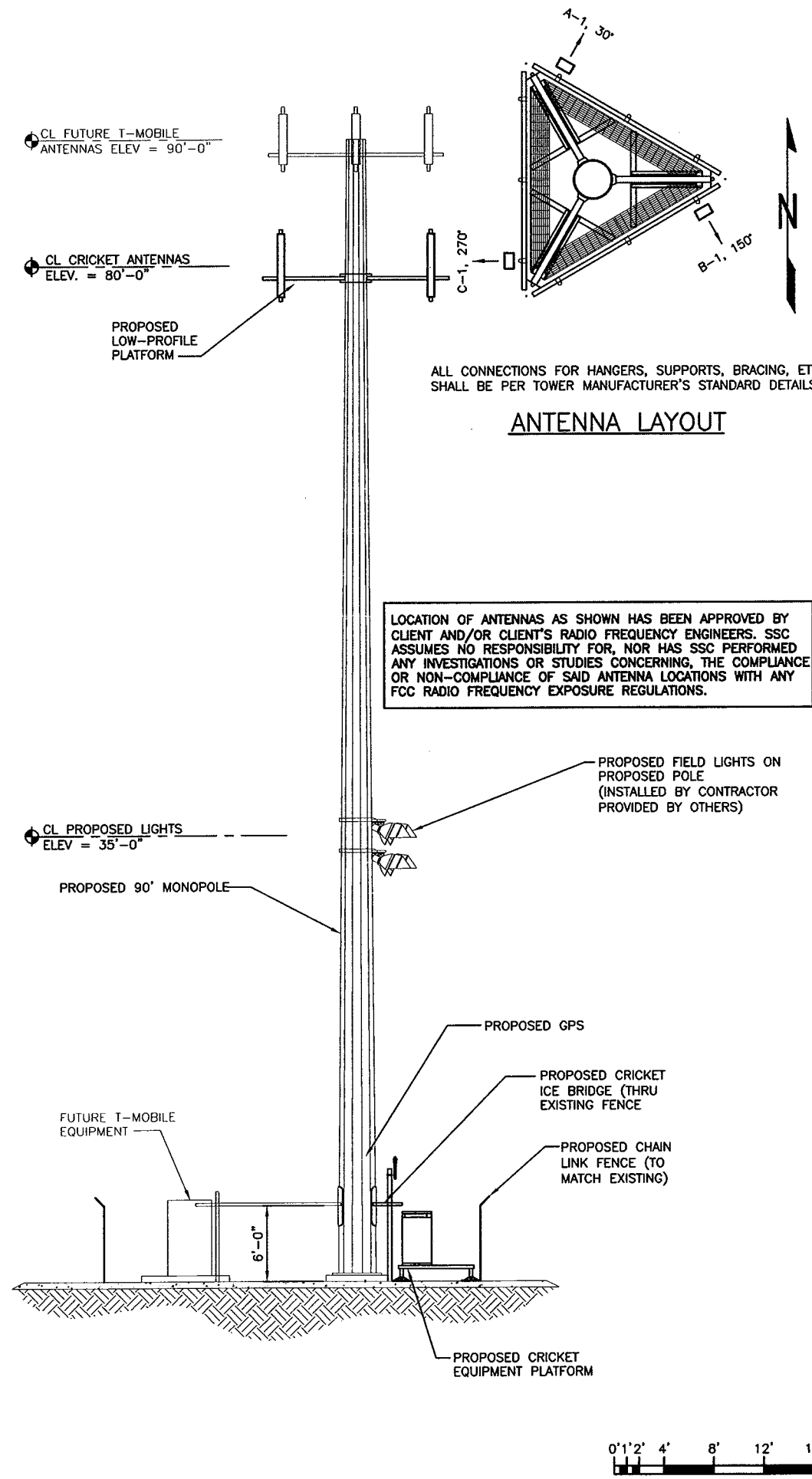
OVERALL SITE PLAN

ANTENNA KEY

	ANTENNA NUMBER	COAX COLOR CODE	BEAM WIDTH	ANTENNA TYPE	ANTENNA VENDOR	AZIMUTH	ELECTRICAL DOWNTILT	MECHANICAL TILT	HEIGHT TO THE CENTER OF ANTENNA FROM GROUND LEVEL	COAXIAL FEEDER	
										SIZE	LENGTH
ALPHA	A-1	YELLOW/ORANGE	65	CMA-B/6521-2	CELLMAX	30°	0	0	80'-0"	7/8"	100'-0"
		YELLOW/WHITE								7/8"	100'-0"
BETA	B-1	RED/ORANGE	65	CMA-B/6521-2	CELLMAX	150°	0	0	80'-0"	7/8"	100'-0"
		RED/WHITE								7/8"	100'-0"
GAMMA	C-1	GREEN/ORANGE	65	CMA-B/6521-2	CELLMAX	270°	0	0	80'-0"	7/8"	100'-0"
		GREEN/WHITE								7/8"	100'-0"



COMPOUND PLAN



TOWER ELEVATION

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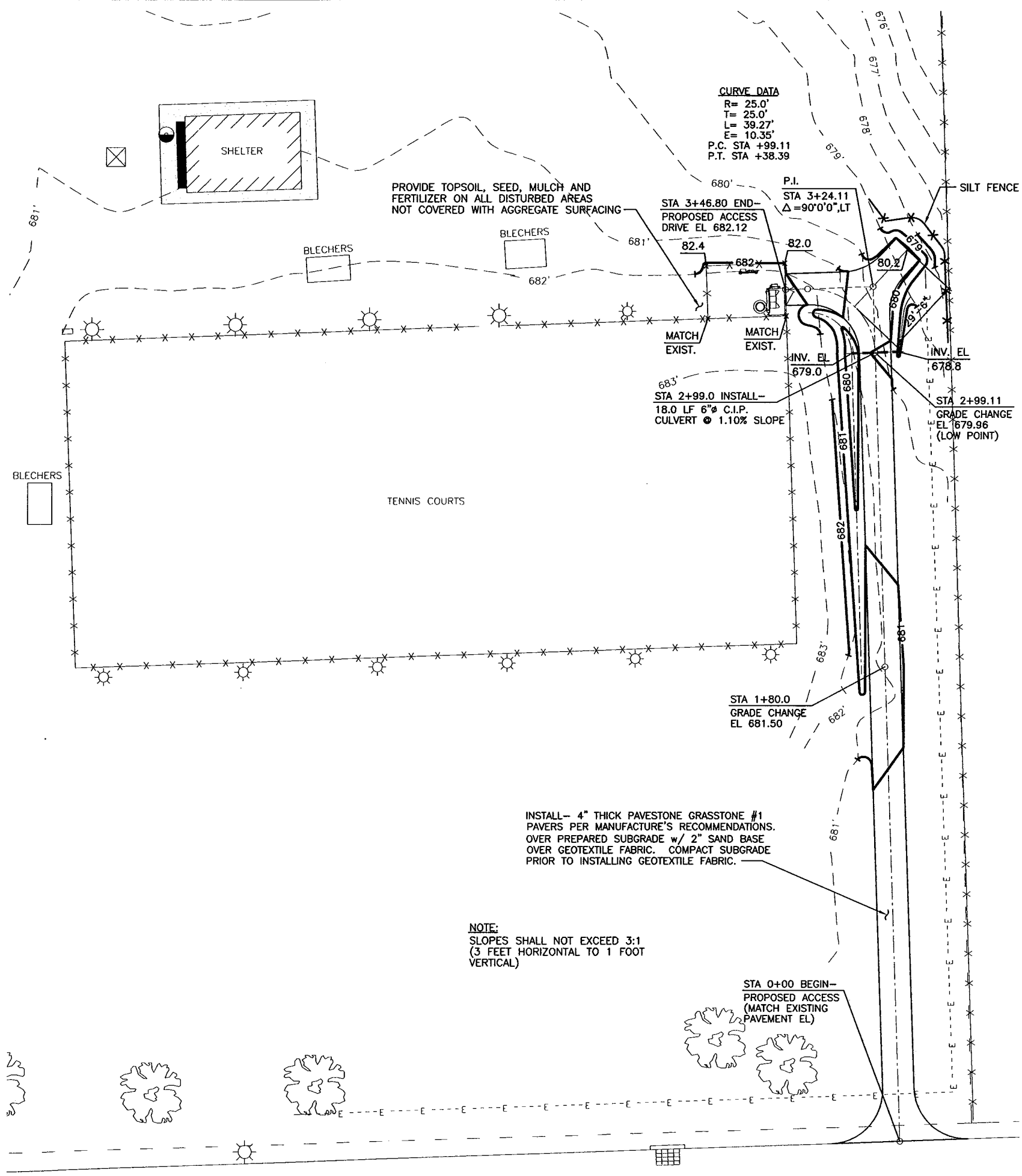
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NO:	DATE:	DESCRIPTION:	BY:
A	11/19/07	ISSUED FOR REVIEW	JMB
B	06/24/08	REVISED SITE PLAN	YES

DRAWING TITLE:
COMPOUND PLAN & TOWER ELEVATION

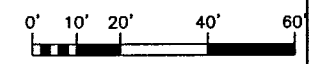
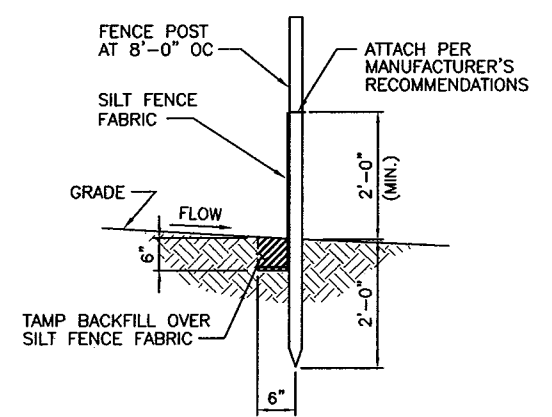
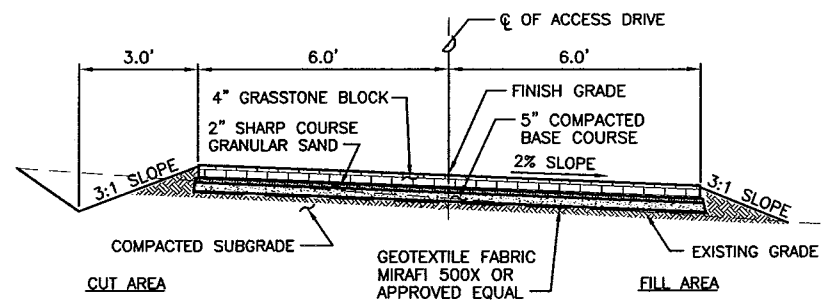
DRAWING NO.:
A-2



NOTE:
 FOR COORDINATE LOCATION OF TOWER COMPOUND AND ACCESS DRIVE, SEE DRAWING A-1.

- GRADING NOTES:**
1. STRIP THE GROUND OF ALL VEGETATION AND DEBRIS.
 2. PROOF ROLL WITH LOADED TANDEM TRUCKS TO IDENTIFY SOFT SPOTS.
 3. REMOVE SOFT SPOT MATERIAL AND COMPACT TO 95% AT STRUCTURE, 90% ELSEWHERE.
 4. INSTALL GEOTEXTILE FABRIC ON PREPARED SUBGRADE.
 5. PLACE AND COMPACT 6" AGGREGATE SURFACING.
 6. SEE SPECIFICATIONS DRAWINGS FOR REQUIREMENTS OF BACKFILL MATERIAL.
 7. MAINTAIN REASONABLE DUST CONTROL METHODS DURING CONSTRUCTION.
 8. ENTIRE DRIVE LENGTH SHALL BE POSITIVE DRAINING DURING, AND AT COMPLETION OF CONSTRUCTION.

- SILTATION NOTES:**
1. SILTRATION CONTROL DEVICES TO REMAIN IN PLACE UNTIL ADEQUATE VEGETATION GROWTH INSURES NO FURTHER EROSION OF THE SOIL.
 2. SILTRATION FENCES SHALL BE INSPECTED PERIODICALLY FOR DAMAGE AND FOR THE AMOUNT OF SEDIMENTATION WHICH HAS ACCUMULATED. REMOVAL OF SEDIMENT WILL BE REQUIRED WHEN IT REACHES 1/2 FENCE HEIGHT.
 3. ATTACHMENT OF GEOTEXTILE FABRIC TO BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
 4. SILT FENCING TO BE USED AT ALL AREAS OF EXCAVATION.



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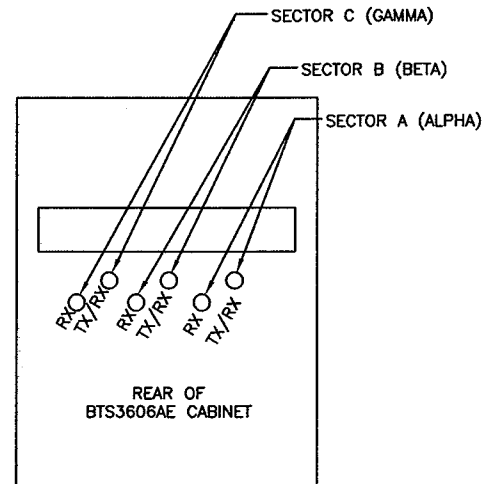
CHECKED BY: CPH
 APPROVED BY: HAN/TMS

REVISIONS:

NO:	DATE:	DESCRIPTION:	BY:
A	11/19/07	ISSUED FOR REVIEW	JMB
B	06/24/08	REVISED SITE LAYOUT	TES

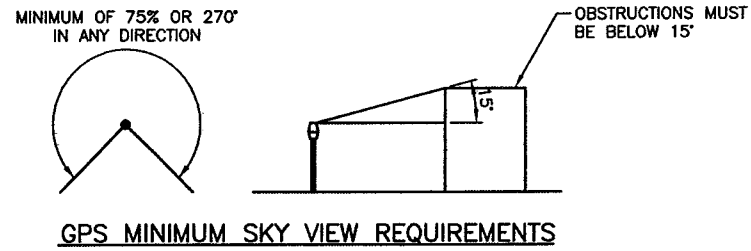
DRAWING TITLE:
GRADING PLAN

DRAWING NO.:
A-3



CABINET TO COAX CONFIGURATION DETAIL

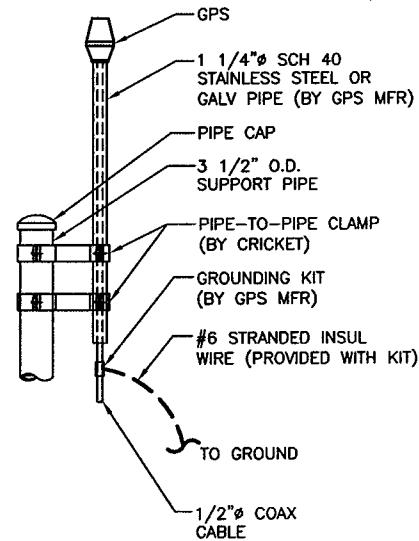
5



GPS MINIMUM SKY VIEW REQUIREMENTS

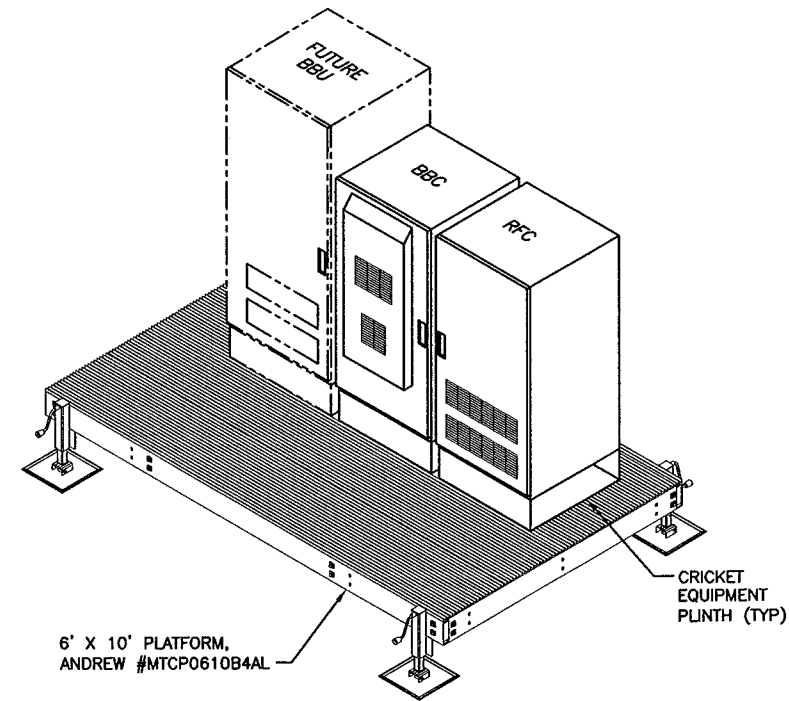
NOTES

1. THE ELEVATION AND LOCATION OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT.
2. THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 1-1/4" DIAMETER, SCHEDULE 40 GALVANIZED STEEL OR STAINLESS STEEL PIPE. THE PIPE MUST NOT BE THREADED AT THE ANTENNA MOUNT END. THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH (MINIMUM OF 18 INCHES) USING A HAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH AND PERPENDICULAR CUT. A HACK SAW SHALL NOT BE USED. THE CUT PIPE END SHALL BE DEBURRED AND SMOOTH IN ORDER TO SEAL AGAINST THE NEOPRENE GASKET ATTACHED TO THE ANTENNA MOUNT.
3. IT IS CRITICAL THAT THE GPS ANTENNA IS MOUNTED SUCH THAT IT IS WITHIN 2 DEGREES OF VERTICAL AND THE BASE OF THE ANTENNA IS WITHIN 2 DEGREES OF LEVEL.
4. DO NOT SWEEP TEST GPS ANTENNA.



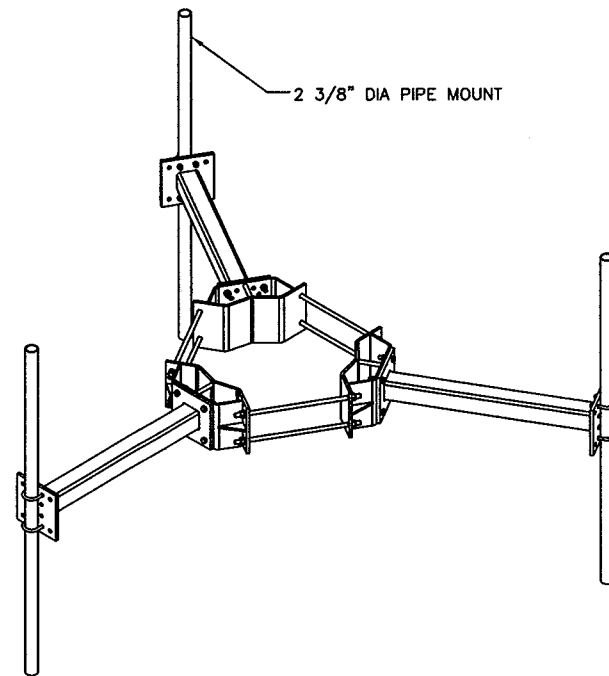
GPS MOUNTING DETAILS

3



EQUIPMENT PAD

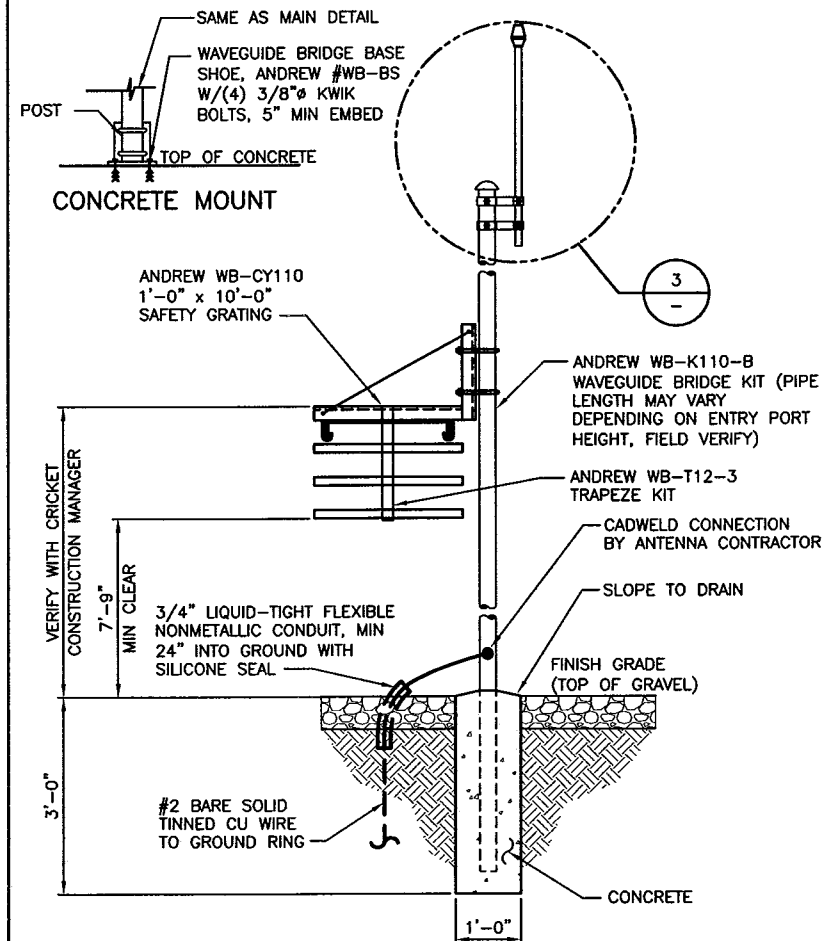
1



PROPOSED ANDREW/MTS PART #MTC9651S72 FOR 3 ANTENNAS OR APPROVED EQUAL.

ANTENNA MOUNTING DETAIL

6



ICE BRIDGE SUPPORT POST

2

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RACINE, WISCONSIN 53403**

CHECKED BY: CPH

APPROVED BY: HAN/TMS

REVISIONS:

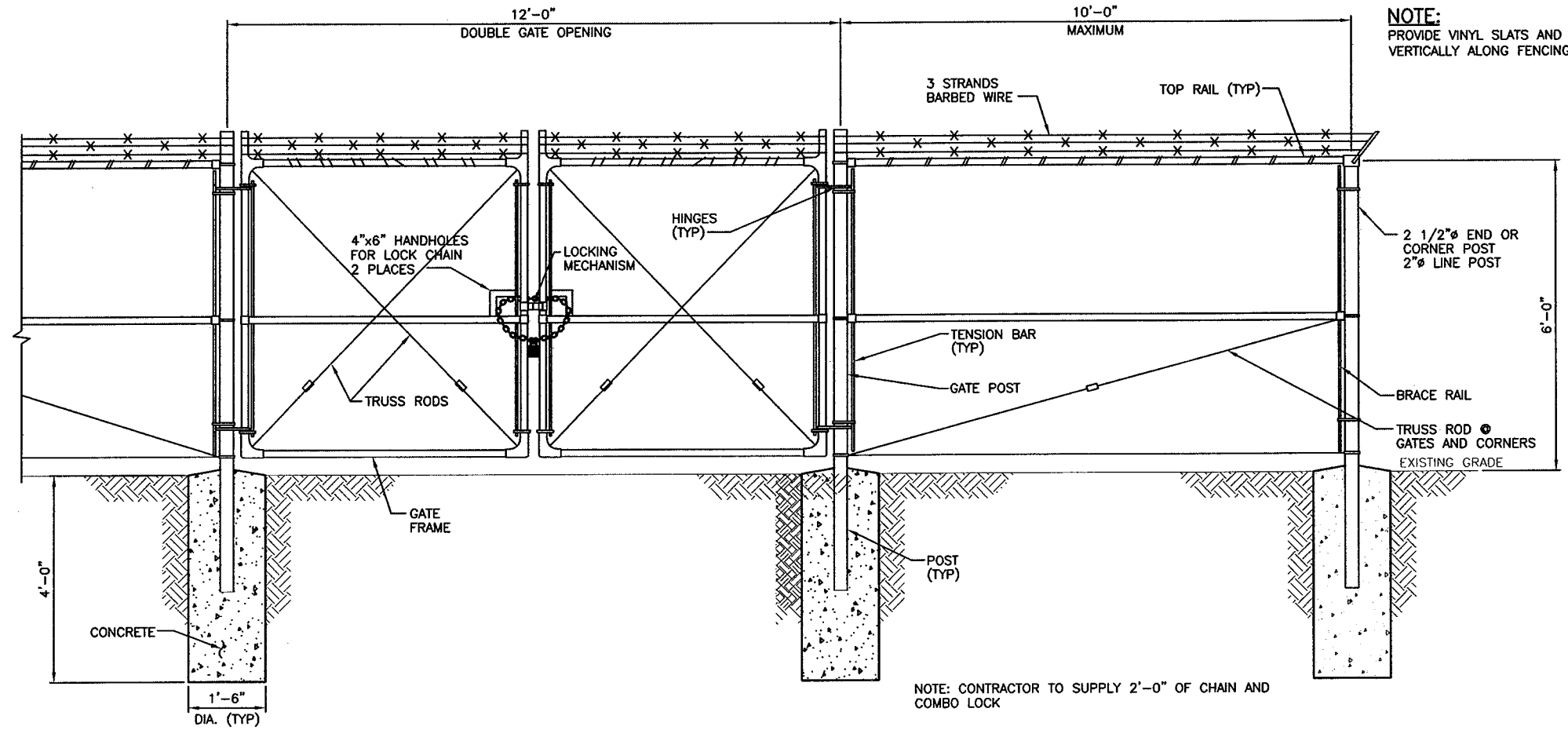
NO:	DATE:	DESCRIPTION:	BY:
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DRAWING TITLE:

DETAILS

DRAWING NO.:

A-4



GATE & FENCE DETAIL

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DRAWING TITLE:

**FENCING
DETAILS**

DRAWING NO.:

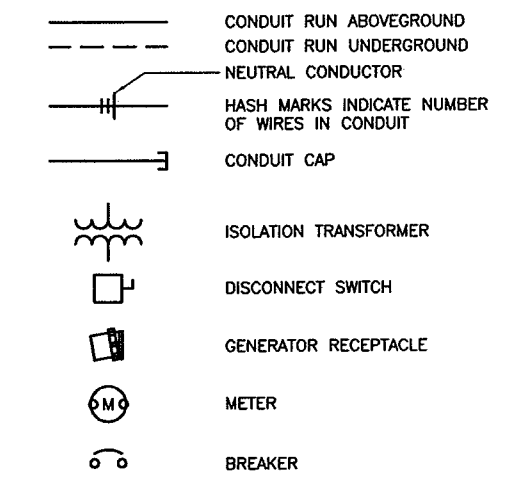
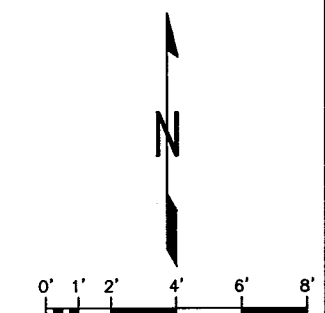
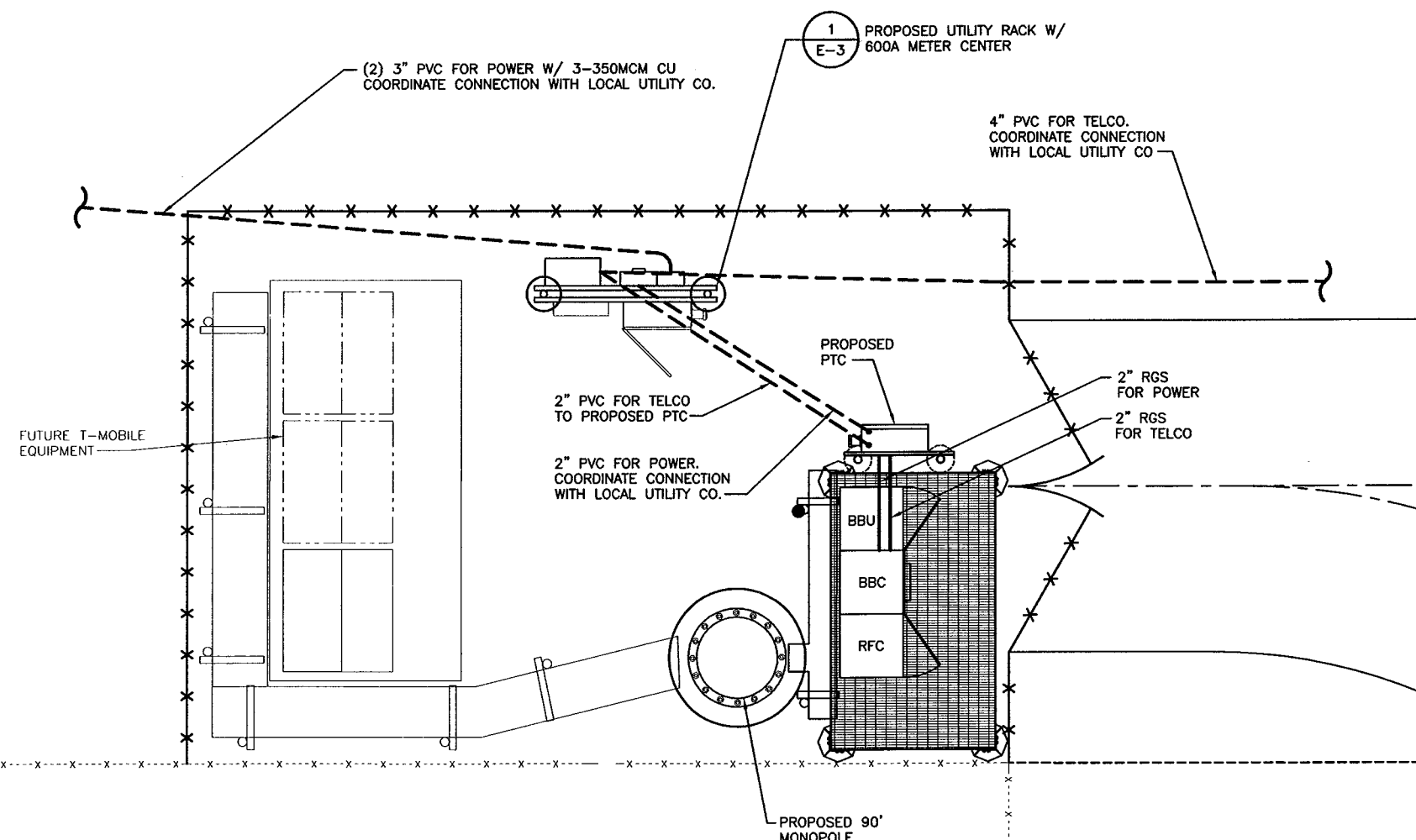
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4

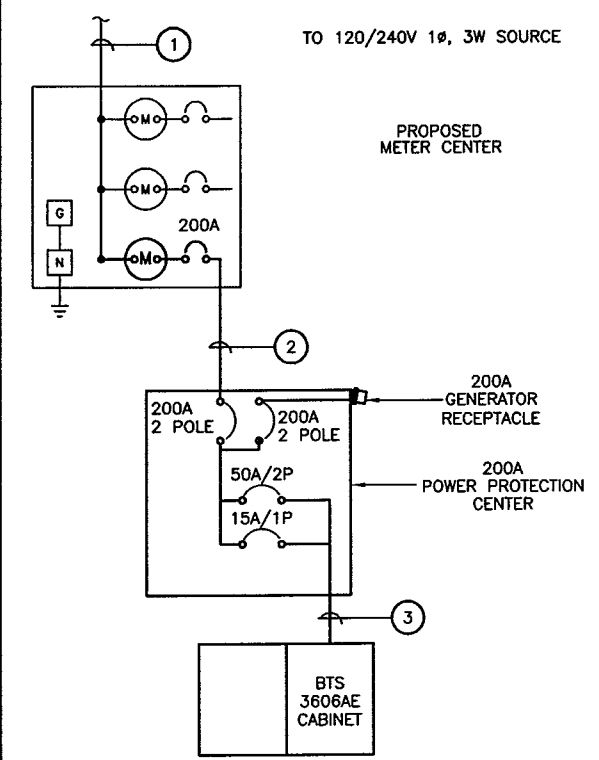
3

2

NOTE:
SEE DRAWING E-2 FOR ELECTRICAL NOTES.



ELECTRICAL SYMBOLS 1



ONE-LINE DIAGRAM 2

NO.	FROM	TO	CONFIGURATION
①	SOURCE	METER CENTER	(2) 3-350KCMIL, 3" PVC
②	METER	PTC	3#3/0, 1#6G, 2" PVC
③	PTC	BTS 3606AE	2#6, 1#6 GND, 2#12, 1#12 GND, 2" RGS

ELECTRICAL PLAN 4

CIRCUIT SCHEDULE 3

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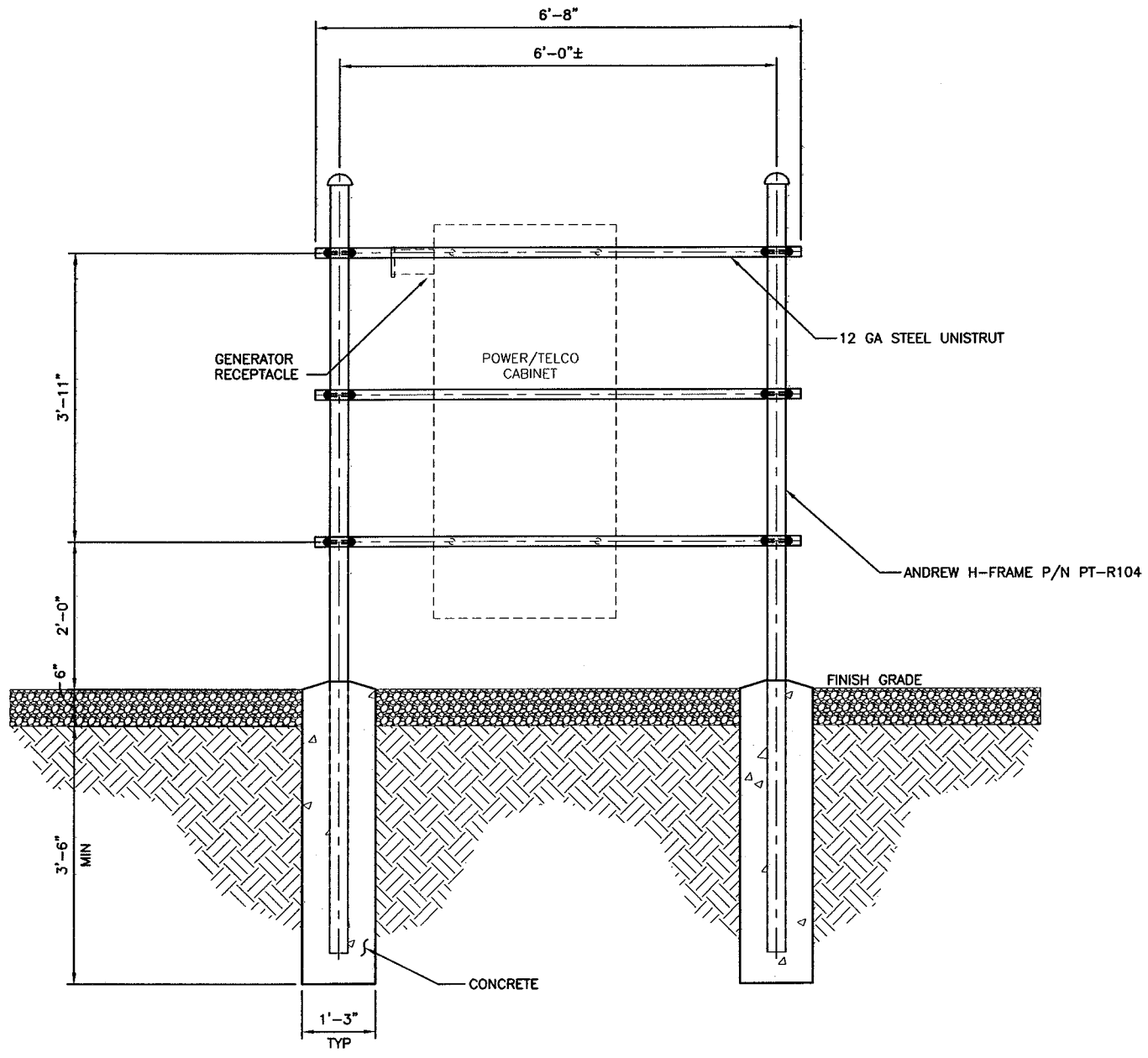
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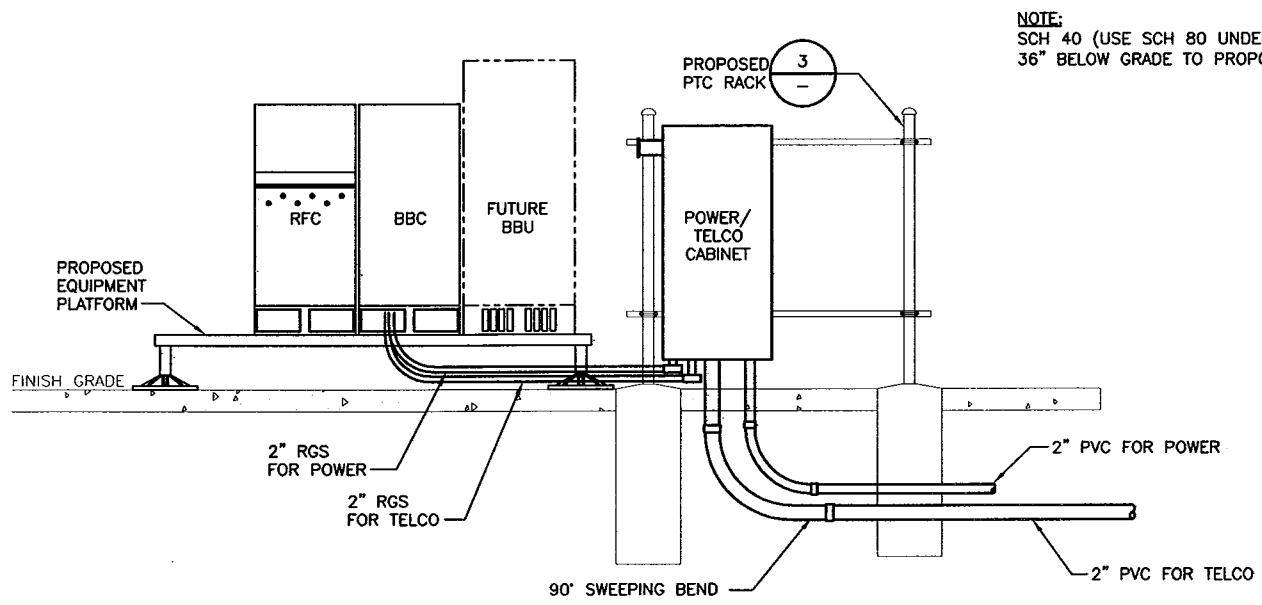
DRAWING TITLE:
ELECTRICAL PLAN & ONE-LINE DIAGRAM

DRAWING NO.:
E-1



PTC RACK

3



NOTE:
SCH 40 (USE SCH 80 UNDER ROAD BED) MIN 36" BELOW GRADE TO PROPOSED EQUIPMENT

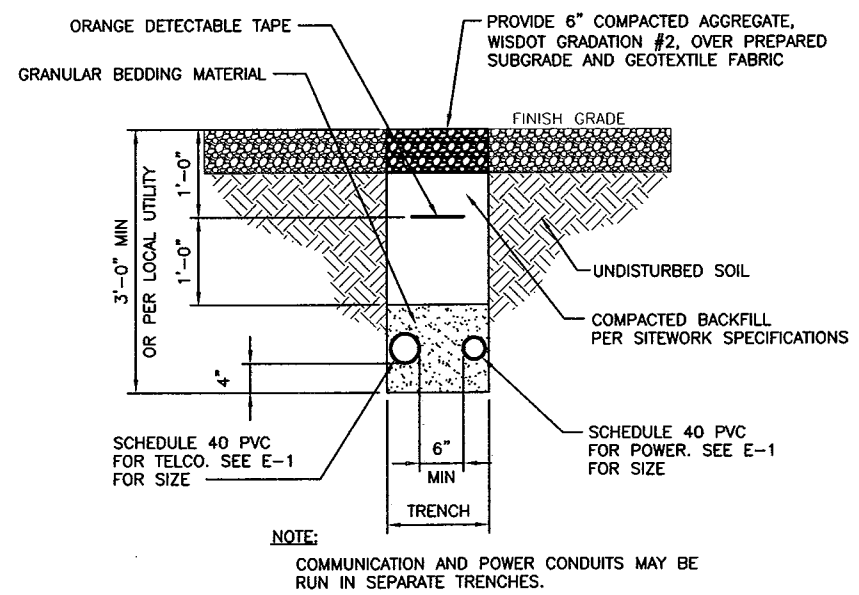
ELECTRICAL AND COMMUNICATION RISER

4

- 1: OBTAIN THE ELECTRICAL PERMIT.
- 2: SUPPLY ALL THE MATERIALS NEEDED TO COMPLETE THE WORK AT HAND.
- 3: COORDINATE WITH LOCAL POWER COMPANY AS TO INSTALLATION REQUIREMENTS, METER SPECS, ETC. (CRICKET WILL FILL OUT THE APPLICATION FOR SERVICE, MAKE THE INITIAL CONTACT WITH THE POWER COMPANY AND SUPPLY THE ELECTRICIAN WITH A CONTACT NAME AND PHONE NUMBER AT THE POWER CO.)
- 4: SET AND ANCHOR (1) POWER TELCO CABINET (PTC) ON RACK PROVIDED (IF INSTALLATION PRIOR TO FOUNDATION INSTALLATION THEN THE ELECTRICIAN WILL BE RESPONSIBLE FOR INSTALLING RACK PER DETAIL 3).
- 5: INSTALL PERMANENT POWER TO THE PTC, THEN FROM THE PTC TO THE 3606AE BTS CABINET.
- 6: REMOVE (OR DO NOT INSTALL) NEUTRAL-TO-GROUND BOND IN PTC
- 7: INSTALL (1) 4" MINIMUM SCH. 40 PVC CONDUIT WITH SWEEPING BENDS, AND PULL STRINGS FROM THE TELCO PEDESTAL/SOURCE TO THE TELCO ENCLOSURE IN THE PTC.
- 8: INSTALL TYPE LB CONDUIT FITTINGS AT THE BASE OF THE PTC FOR EACH CONDUIT ENTRANCE.
- 9: INSTALL (2) 2" RGS CONDUITS FROM THE PTC TO THE 3606AE BTS CABINET (FOR TELCO AND POWER). CONTRACTOR TO SUPPLY (2) 2" LB (OR 90 DEGREE) FITTINGS AND (2) 2" TO 3/4" REDUCERS WITH WATER PROOF GASKETS FOR FINAL ATTACHMENT OF FLEXIBLE CONDUITS TO THE 3606AE BTS BY HUAWEI. FITTINGS TO BE LEFT "THREADED" ON TO 3' PIGTAIL OF WIRING EXTENDING FROM THE 3606AE BTS END OF THE FLEXIBLE CONDUITS.
10. ALL TELCO CABLING (T-1 AND B-1) BETWEEN THE PTC AND THE 3606AE BTS CABINET TO BE INSTALLED BY THE CONTRACTOR, WEATHERIZED 100 OHM SHIELDED CABLE MINIMUM, CAT 5
11. BACKFILL AND COMPACT ALL EXCAVATIONS.

ELECTRICAL NOTES

1



TYPICAL CONDUIT TRENCH DETAIL

2



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CRICKET SITE NO.:

MKE-124-C

CRICKET SITE NAME:

LOCKWOOD PARK

SITE ADDRESS:

4300 GRACELAND BLVD
RACINE, WISCONSIN 53403

CHECKED BY: CPH

APPROVED BY: HAN/TMS

REVISIONS:

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DRAWING TITLE:

ELECTRICAL
DETAILS

DRAWING NO.:

E-2

PARTS LIST	
ITEM	DESCRIPTION
1	10'-0" x 3-1/2" O.D. PIPE GALV.
2	7'-0" HORIZONTAL MEMBER 1 5/8"x1 5/8" GALV. 12 GA. UNISTRUT
3	VERTICAL MEMBER 1 5/8"x1 5/8" GALV. 12 GA. UNISTRUT
4	3-1/2" O.D. PIPE CAP GALV.
5	3/8" ANGLE ADAPTOR E. GALV.
6	1/2 x 3-5/8 x 5" GALV. U-BOLT ASSY.
7	1/2 x 1-1/2" GALV. BOLT ASSY.
8	3/8 x 3/4" GALV. BOLT ASSY.
9	3/8" GALV. FLAT WASHER

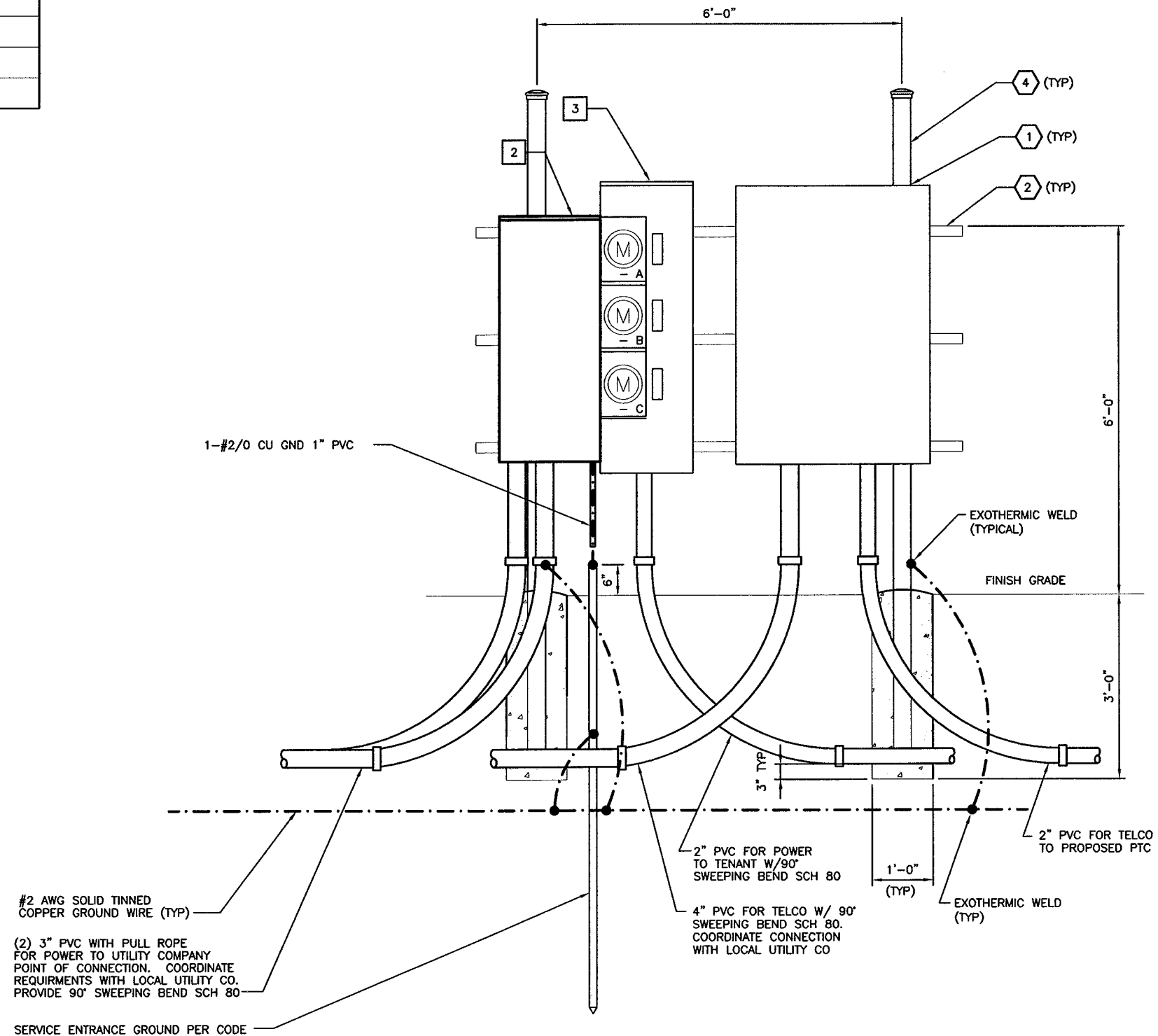
* NOT SHOWN

GENERAL

- UNLESS OTHERWISE NOTED, ALL UNDERGROUND PVC TO BE SCH 40. 90° SWEEPING BENDS SHALL BE SCH 80.
- ALL ABOVE GRADE PVC TO BE SCH 80. ALL CONNECTIONS TO BE SCH 40 PVC OR SEALTIGHT. VERIFY WITH CONSTRUCTION MANAGER PRIOR TO BID.
- ALL WIRE CONNECTIONS & CONDUITS TO BE SUPPLIED BY CONTRACTOR UNLESS OTHERWISE NOTED OR SPECIFIED BY CONSTRUCTION MANAGER.
- REFER TO DETAILS 1, 2 & 3 SHEET E-1 FOR CIRCUIT IDENTIFICATION.

KEYNOTES

- ADDITIONAL ANGLE ADAPTORS (NOT SHOWN) ARE USED TO MOUNT SERVICE BOXES TO THE VERTICAL MEMBERS.
- FURNISH & INSTALL A CUTLER-HAMMER MAIN SERVICE MODULE CATALOG NUMBER: 1MTB800R, 800A, 120/240 V, 1Ø, 3W.
- FURNISH & INSTALL ONE (1) CUTLER-HAMMER 3-GANG, 5 JAW METER STACK MODULES, CATALOG NUMBER: 35MM320R12, 225A, 120/240 V, 1Ø.



ELEVATION

UTILITY RACK DETAIL

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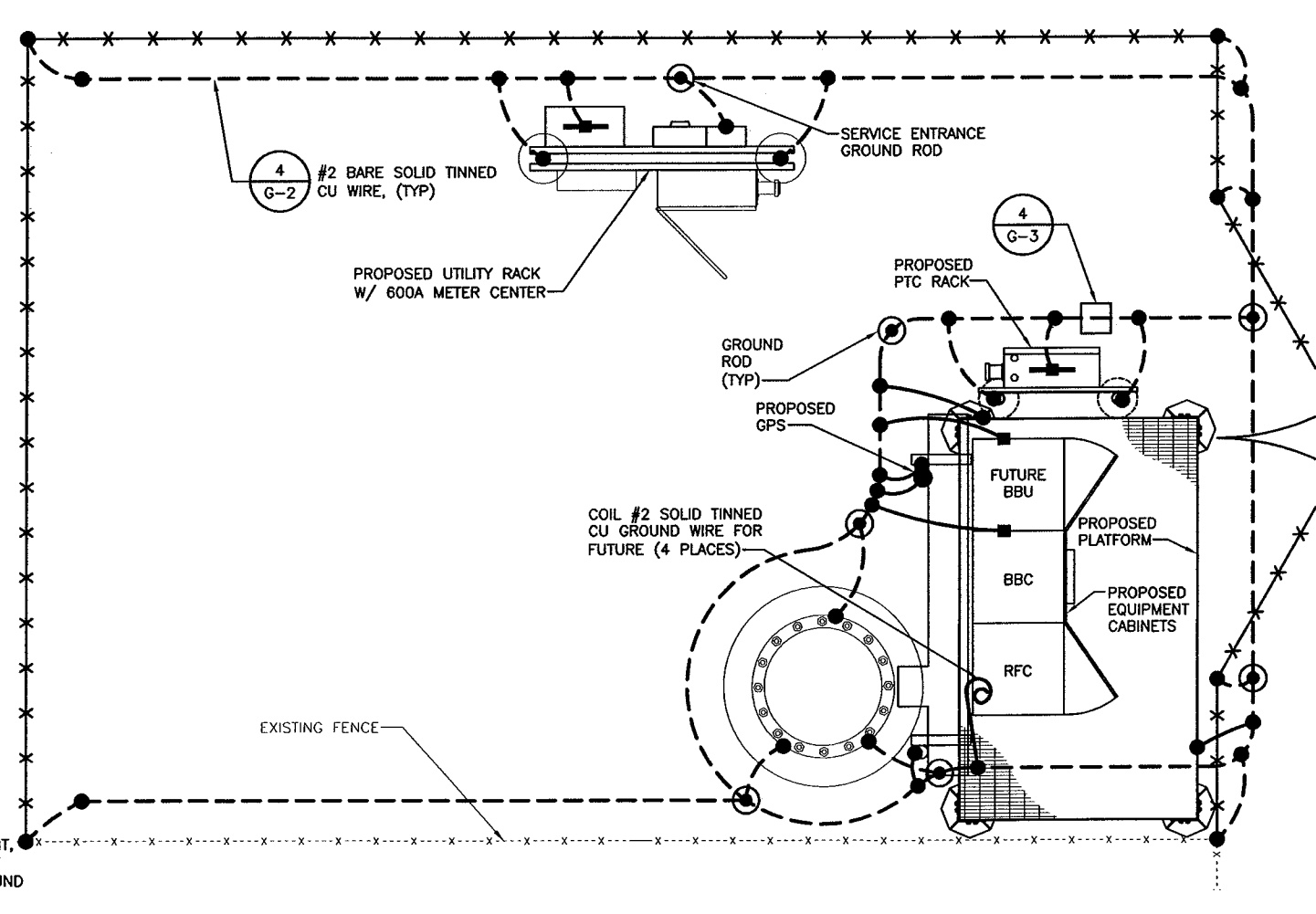
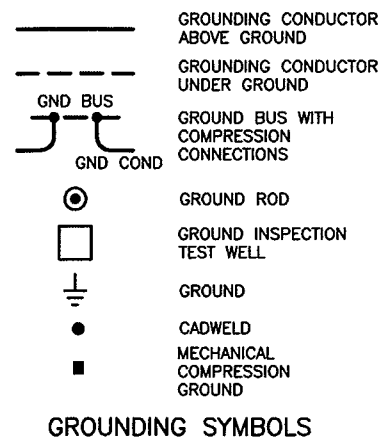
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DRAWING TITLE:

**UTILITY RACK
DETAILS**

DRAWING NO.:

E-3



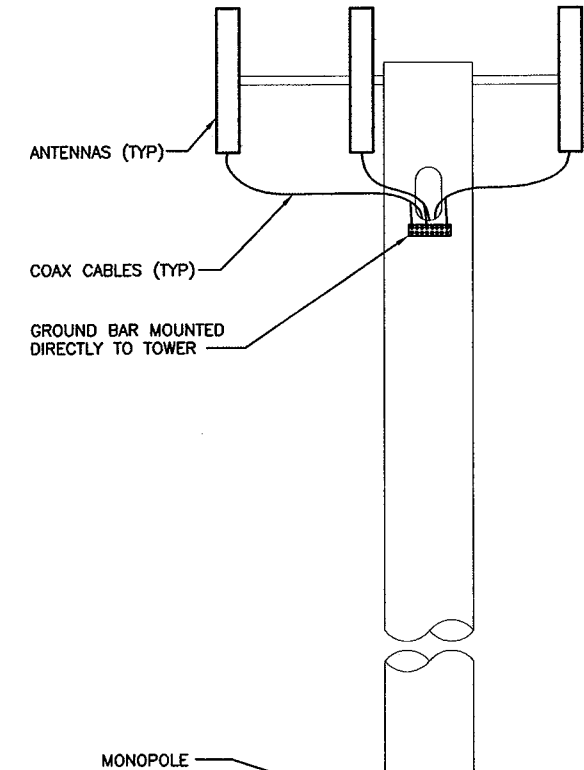
NOTE:
 1 GROUNDING TIE-IN'S TO EXISTING CELL SITE GROUND LOOP, FENCING, EXISTING EQUIPMENT, ETC ARE TO BE ROUTED THRU A TRENCH AT THE SAME ELEVATION AS THE EXISTING GROUND LOOP. MIN 2 CONNECTIONS

GROUNDING PLAN

2

NOTES:

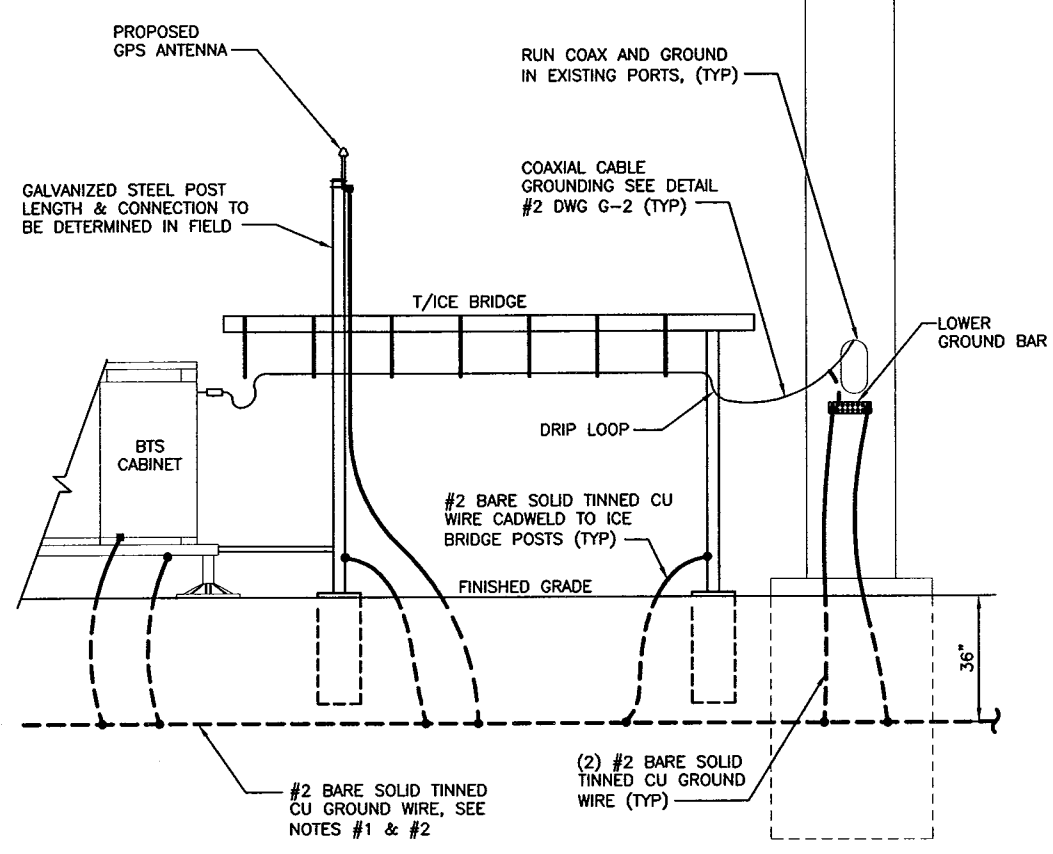
1. NEW #2 BARE SOLID TINNED CU GROUND LOOP INSTALLED AROUND PLATFORM.
2. GROUNDING TIE-IN'S TO EXISTING CELL SITE GROUND LOOP, FENCING, EXISTING EQUIPMENT, ETC ARE TO BE ROUTED THRU A TRENCH AT THE SAME ELEVATION AS THE EXISTING GROUND LOOP. MIN 2 CONNECTIONS



1. ALL GROUNDING SYSTEM CONDUCTORS AND CONNECTIONS BELOW GRADE SHALL BE THERMAL WELDS AT GROUND RODS AT A MINIMUM OF 36" BELOW GRADE.
2. ALL INSTALLATIONS SHALL BE FIELD VERIFIED.
3. ALL GROUND WIRE SHALL BE #2 BARE SOLID TINNED CU WIRE UNLESS NOTED OTHERWISE.
4. ALL NUTS, BOLTS, AND WASHERS SHALL BE STAINLESS STEEL.
5. ALL COMPRESSION CONNECTIONS SHALL BE LONG BARREL, 2-HOLE LUGS, CRIMPED AT (3) LOCATIONS. COAT COMPRESSION LUG (ON BAR SIDE AND INSIDE BEFORE CRIMPING) WITH KOPR-SHIELD ANTI-OXIDANT BEFORE AND AFTER ASSEMBLY.
6. ALL METALLIC OBJECTS WITHIN SIX (6) FEET OF GROUNDED EQUIPMENT SHALL BE BOUNDED TO THE GROUNDING SYSTEM.
7. ALL GROUND WIRES SHALL PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND WITH GRADUAL BENDS AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
8. THE CONTRACTOR SHALL COORDINATE INSTALLATION OF GROUNDS RODS AND GROUND RING WITH FOUNDATION AND UNDERGROUND CONDUIT.
9. ANTENNA GROUND KITS SHALL BE FURNISHED BY CRICKET AND INSTALL BY ANTENNA CONTRACTOR.
10. KOPR-SHIELD ANTI-OXIDATION COMPOUND SHALL BE USED ON ALL BOLTED GROUNDING CONNECTIONS.
11. ALL EXOTHERMIC CONNECTIONS SHALL BE INSTALLED UTILIZING THE PROPER CONNECTION/MOLD AND MATERIALS FOR THE PARTICULAR APPLICATION.
12. ALL BOLTED GROUNDING CONNECTIONS SHALL BE INSTALLED WITH A FLAT WASHER & BOLT HEAD ON BACK SIDE OF BUS BAR THEN LUG, FLATWASHER, LOCKWASHER, AND NUT ON THE FRONT SIDE. HARDWARE FOR BOLTED CONNECTIONS SHALL BE 3/8" DIAMETER AND SHALL BE STAINLESS STEEL.
13. GROUNDING WIRE SHALL NOT BE INSTALLED OR ROUTED THROUGH HOLES IN ANY METAL OBJECTS OR SUPPORTS TO PRECLUDE ESTABLISHING A "CHOKE" POINT.
14. PLASTIC CLIPS OR METAL CLIPS WHICH DO NOT COMPLETELY SURROUND THE GROUNDING CONDUCTORS SHALL BE USED TO FASTEN AND SUPPORT GROUNDING CONDUCTORS. FERROUS METAL WHICH COMPLETELY SURROUNDS THE GROUNDING CONDUCTOR SHALL NOT BE USED.
15. STANDARD BUS BARS (CIGBE AND MIGB) SHALL BE FURNISHED AND INSTALLED. THEY SHALL NOT BE FABRICATED OR MODIFIED IN THE FIELD.
16. THE GROUNDING CONNECTION TO THE POWER AND TELCO SECTIONS OF THE PTC CABINET SHALL BE MADE BY CONNECTING A CONDUCTOR FROM THE GROUND RING TO THE FACTORY-FURNISHED BUS BAR IN EACH COMPARTMENT.
17. THE CONTRACTOR SHALL SUPPLY CRICKET WITH RESULTS FROM PRE-CONSTRUCTION (CO-LO ONLY) AND POST-CONSTRUCTION OHM TESTING (GROUND) RESULTS.

GENERAL NOTES

3



TYP COAX CABLE & ICE BRIDGE GROUNDING

1

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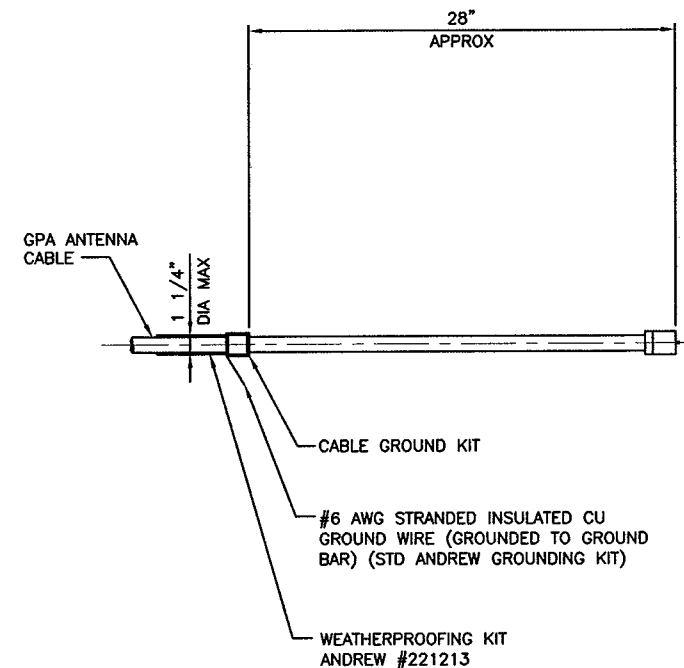
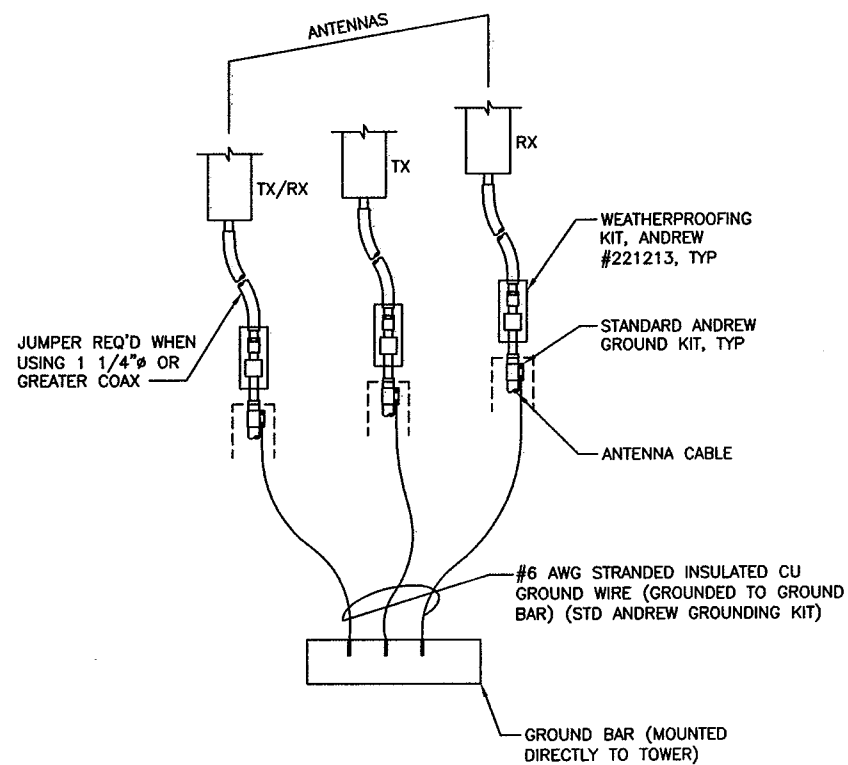
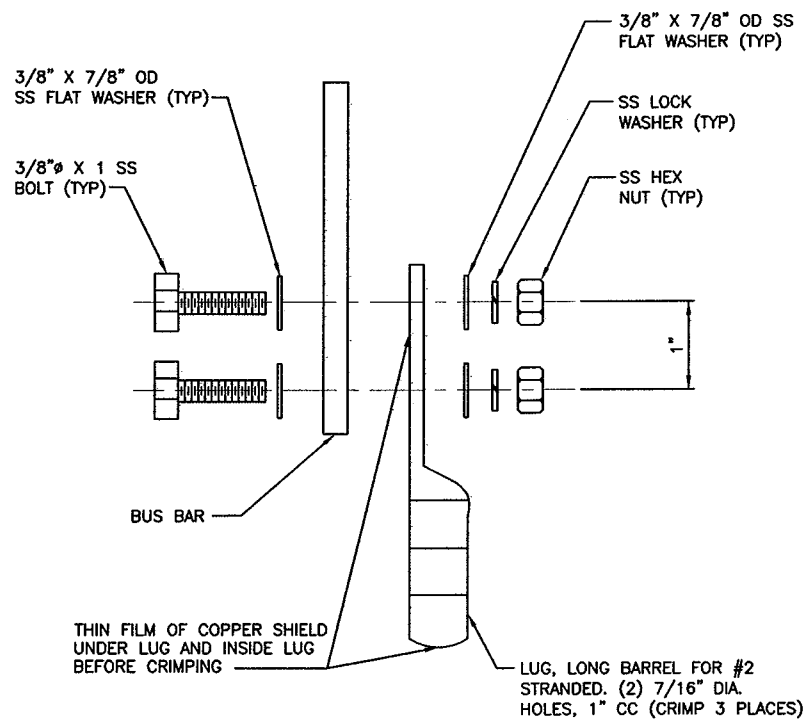
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DRAWING TITLE:

**GROUNDING PLAN
& DETAILS**

DRAWING NO.:

G-1



* SEE GENERAL NOTES #5 AND #12 ON DRAWING G-1

STANDARD BUS BAR CONNECTION

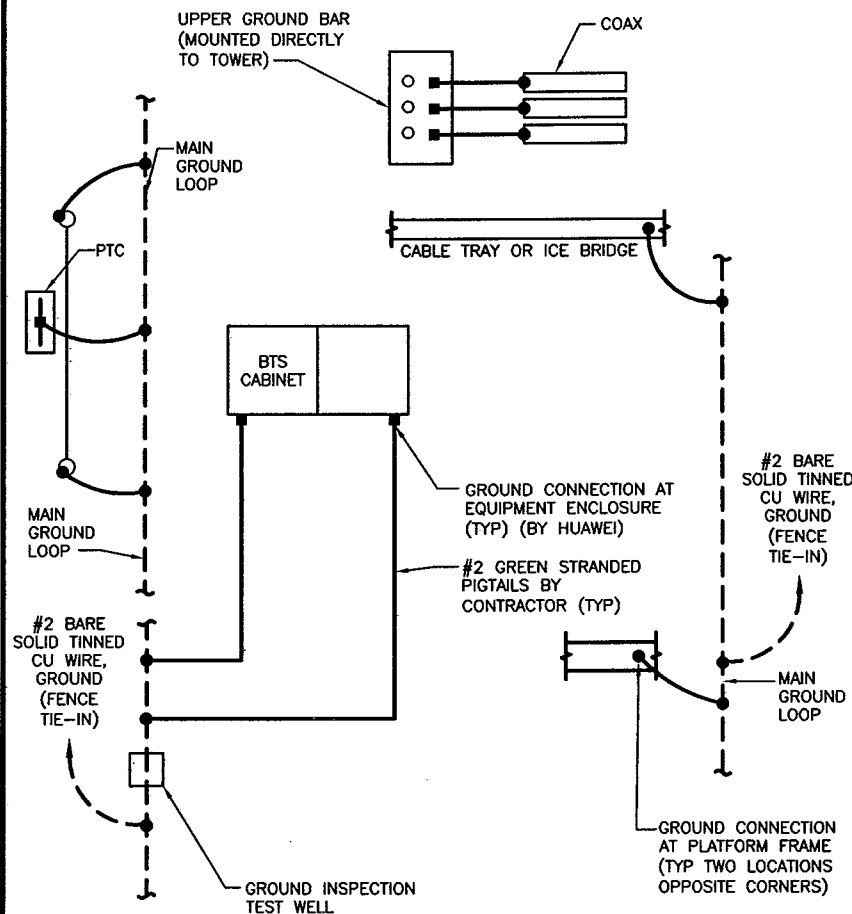
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ANTENNA GROUNDING DETAIL

3

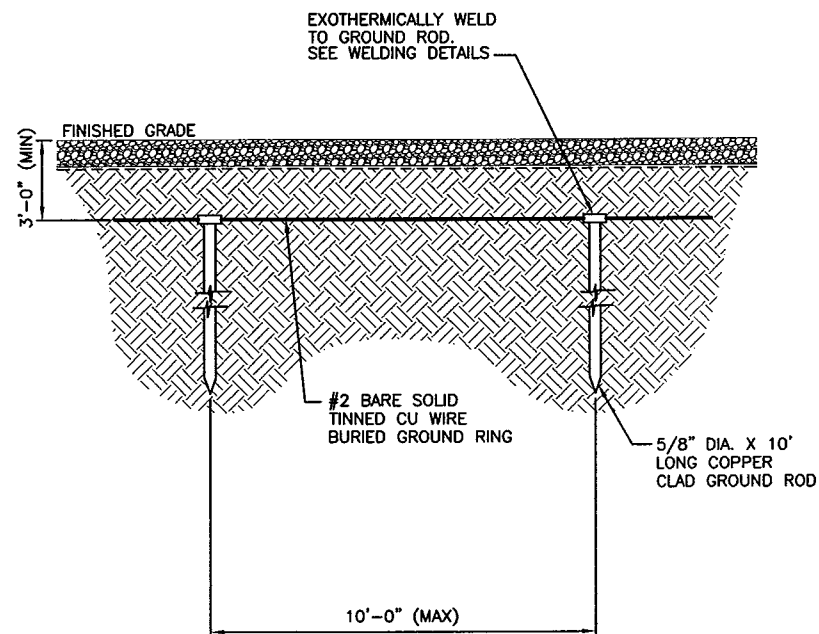
GPS CABLE GROUND

1



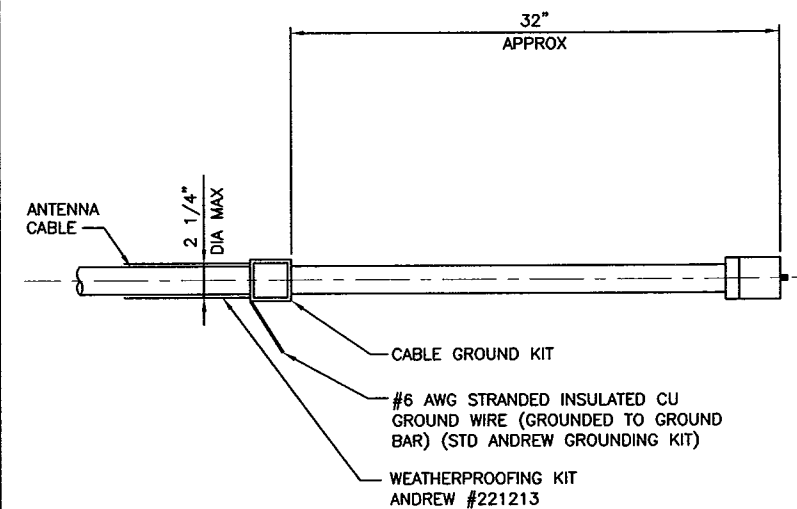
GROUNDING RISER

6



EXTERNAL GROUND RING DETAIL

4



NOTE: DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT THE GROUND WIRE DOWN TO GROUND BAR

ANTENNA CABLE GROUND

2

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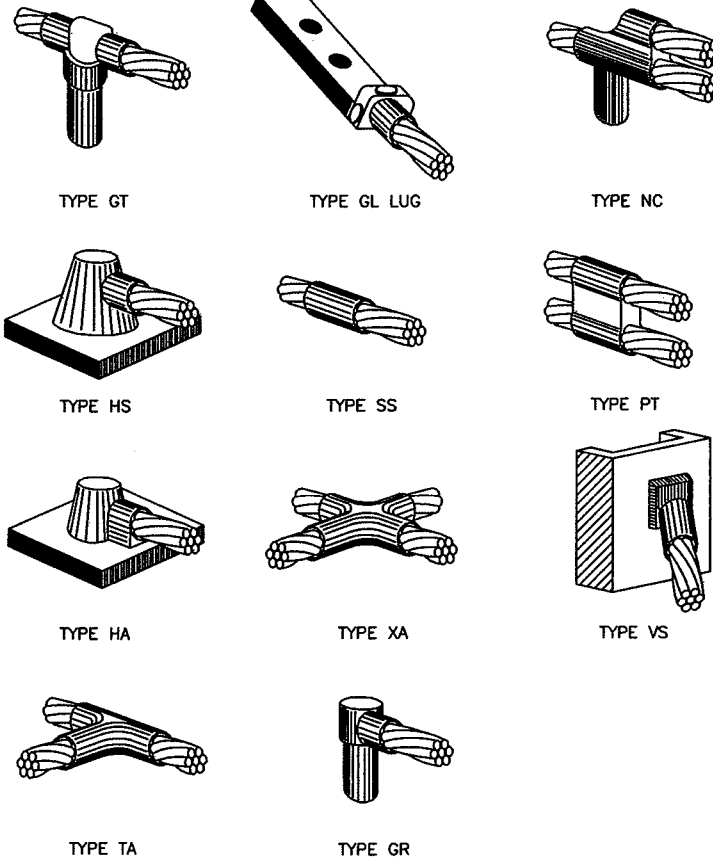
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DRAWING TITLE:

**GROUNDING
DETAILS (1 OF 2)**

DRAWING NO.:

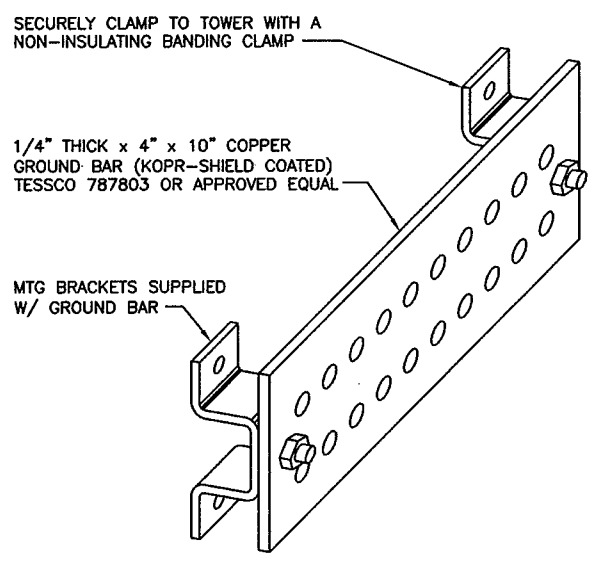
G-2



CADWELD CONNECTIONS

5

GROUND LEADS
#6 AWG FROM ANTENNA CABLE GROUND KITS

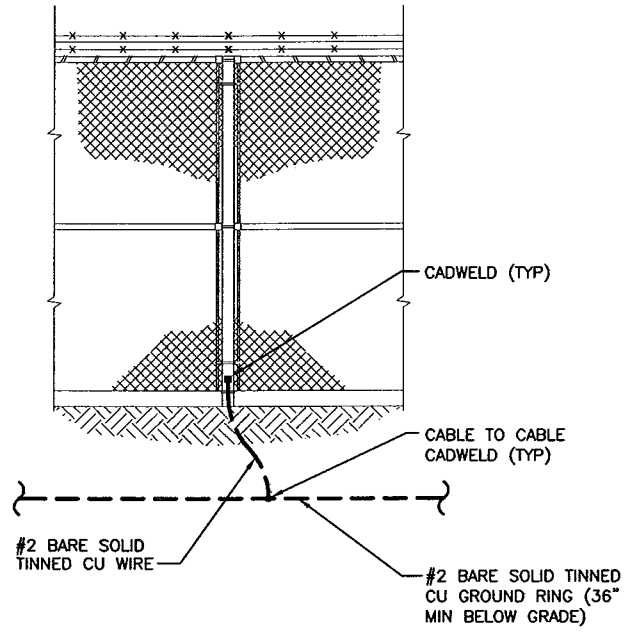


CONTRACTOR TO UTILIZE KOPR-SHIELD (THOMAS & BETTS) ON ALL LUG CONNECTIONS

UPPER TOWER GROUND BAR DETAIL

1

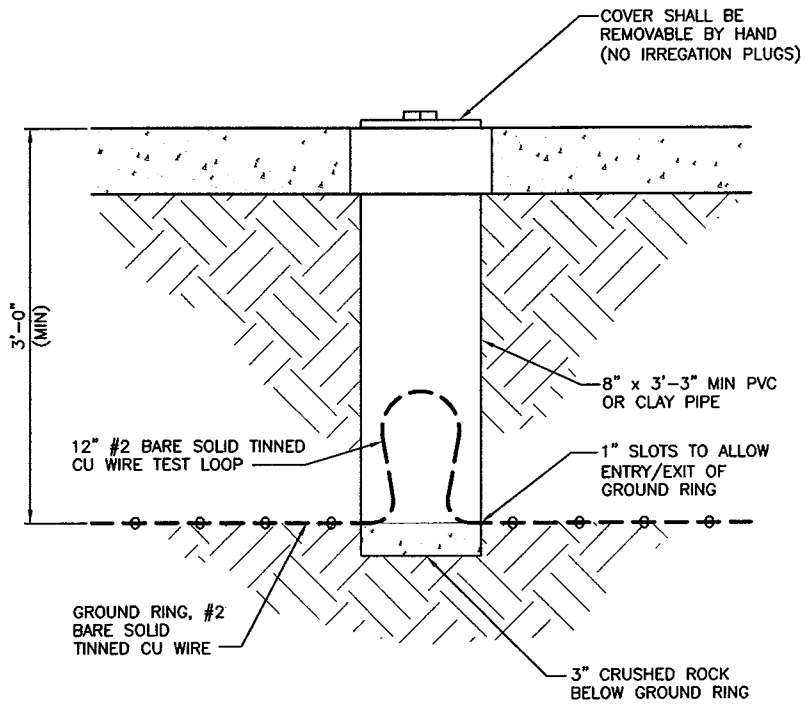
- NOTE:**
1. VERTICAL POST SHALL BE BONDED TO THE RING AT EACH CORNER AND AT EACH GATE POST. AS A MINIMUM ONE VERTICAL POST SHALL BE BONDED TO THE GROUND RING IN EVERY 100 FOOT STRAIGHT RUN OF FENCE.
 2. HORIZONTAL POLES SHALL BE BONDED TO EACH OTHER.
 3. BOND EACH HORIZONTAL POLE/BRACE TO EACH OTHER AND TO EACH VERTICAL POST THAT IS BONDED TO THE GROUND RING.



FENCE GROUNDING DETAIL (IF APPLICABLE)

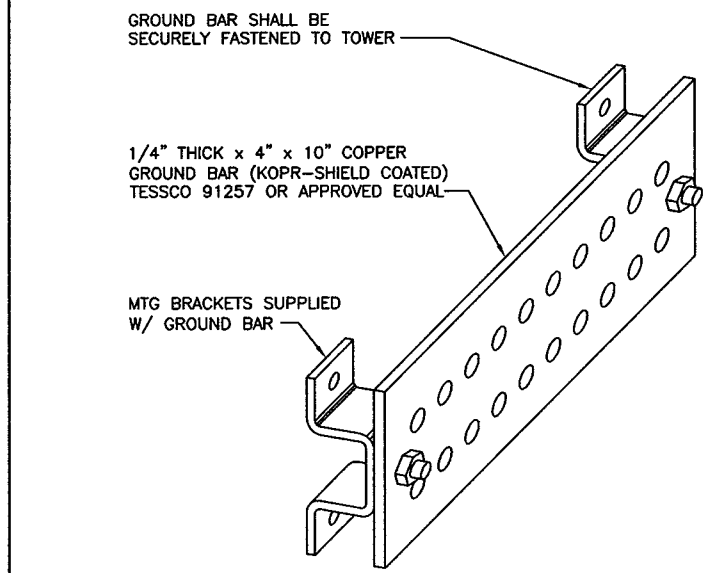
6

GROUND LEADS
(2) TWO HOLE LUG TO BE USED WITH #2 BARE SOLID TINNED CU WIRE TO GROUND RING.



GROUND TEST WELL DETAIL

4



CONTRACTOR TO UTILIZE KOPR-SHIELD (THOMAS & BETTS) ON ALL LUG CONNECTIONS

LOWER TOWER GROUND BAR DETAIL

2

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DRAWING TITLE:
**GROUNDING
DETAILS (2 OF 2)**

DRAWING NO.:
G-3

IMPORTANT NOTE:

THE CONTRACTOR MUST PROVIDE CLOSE-OUT DOCUMENTS AT THE FINAL INSPECTION WALK BEFORE PAYMENTS WILL BE MADE.

GENERAL REQUIREMENTS

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDER OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAS MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) CRICKET'S REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO SUBMITTAL OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED THEREIN.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT.
6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
8. THE CONTRACTOR SHALL MAINTAIN A FULL SET OF CONSTRUCTION DOCUMENTS AT THE JOB SITE UPDATED WITH THE LATEST REVISIONS OR ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
11. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
12. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PLAIN SPOTS, DUST OR SMUDGES OF ANY KIND.
13. THE CONTRACTOR SHALL COMPLY WITH ALL SECTIONS OF THE BUILDING CODES AND OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
14. THE CONTRACTOR SHALL NOTIFY CRICKET'S REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY CRICKET'S REPRESENTATIVE.
15. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.
16. THE CONTRACTOR SHALL NOTIFY THE RF ENGINEER FOR AZIMUTH VERIFICATION (DURING ANTENNA INSTALLATION) PRIOR TO COORDINATING SITE SWEEPING.
17. THE CONTRACTOR SHALL SUBMIT, AT THE END OF THE PROJECT, A COMPLETE SET OF AS-BUILT DRAWINGS TO CRICKET'S PROJECT MANAGER.

**SITE WORK AND DRAINAGE
EARTHWORK, EXCAVATION, AND GRADING**

PART 1 GENERAL

- 1.01 WORK INCLUDED: REFER TO SURVEY AND SITE PLAN FOR WORK INCLUDED
- 1.02 RELATED WORK
 - A. CONSTRUCTION OF EQUIPMENT FOUNDATIONS
 - B. INSTALLATION OF ANTENNA SYSTEM
- 1.03 DESCRIPTIONS
 - A. ACCESS ROAD, TURNAROUND AREAS, AND APRONS ARE CONSTRUCTED TO PROVIDE A WELL DRAINED, EASILY MAINTAINED, EVEN SURFACE FOR MATERIAL AND EQUIPMENT DELIVERIES AND MAINTENANCE PERSONNEL ACCESS.
- 1.04 QUALITY ASSURANCE
 - A. APPLY SOIL STERILIZER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS (USE AS NEEDED)
 - B. VEGETATION LANDSCAPING, IF INCLUDED WITHIN THE CONTRACT WILL BE PLACED AND MAINTAINED AS RECOMMENDED BY NURSERY INDUSTRY STANDARDS.
- 1.05 SEQUENCING
 - A. CONTRACTOR IS RESPONSIBLE FOR LAYOUT AND CONSTRUCTION STAKING.
 - B. GRUB THE COMPLETE ROAD AND SITE AREA PRIOR TO FOUNDATION CONSTRUCTION OR PLACEMENT OF BACKFILL OR SUB-BASE MATERIAL.
 - C. CONSTRUCT TEMPORARY CONSTRUCTION ZONE ALONG ACCESS DRIVE.
 - D. THE SITE WILL BE BROUGHT TO SUB-BASE COURSE ELEVATION AND THE ACCESS ROAD TO BASE COURSE ELEVATION PRIOR TO FORMING FOUNDATIONS.
 - E. APPLY SILT STERILIZER PRIOR TO PLACING BASE MATERIALS.
 - F. IF REQUIRED, GRADE, SEED, FERTILIZE AND MULCH DISTURBED AREAS IMMEDIATELY AFTER BRINGING THE SITE AND ACCESS ROAD TO BASE ELEVATION. WATER TO ENSURE GROWTH.
 - G. REMOVE EXCESS GRAVEL FROM TEMPORARY CONSTRUCTION ZONE.
 - H. AFTER APPLICATION OF FINAL SURFACES, APPLY SOIL STERILIZER TO THE STONE SURFACES.
- 1.06 SUBMITTALS
 - A. BEFORE CONSTRUCTION
 1. IF LANDSCAPING IS APPLICABLE TO THE CONTRACT, SUBMIT TWO COPIES OF THE LANDSCAPING PLAN UNDER NURSERY LETTERHEAD. IF A LANDSCAPE ALLOWANCE IS INCLUDED IN THE CONTRACT, PROVIDE AN ITEMIZED LISTING OF PROPOSED COSTS UNDER NURSERY LETTERHEAD (REFER TO SITE PLAN FOR LANDSCAPING REQUIREMENT).
 2. SUBMIT FOR APPROVAL 1/2 CUBIC FOOT OF THE PROPOSED SURFACE COARSE MATERIAL.
 3. LANDSCAPE WARRANTY STATEMENT, IF REQUIRED.

PART 2 PRODUCTS

2.01 MATERIALS

- A. ROAD AND SITE MATERIALS; FILL MATERIALS SHALL BE ACCEPTABLE, SELECT. FILL SHALL BE IN ACCORDANCE WITH LOCAL DEPARTMENT OF HIGHWAY AND PUBLIC TRANSPORTATION STANDARD SPECIFICATIONS.
- B. SOIL STERILIZER SHALL BE EPA REGISTERED OF LIQUID COMPOSITION AND OF PRE-EMERGENCE DESIGN.
- C. SOIL STABILIZER FABRIC SHALL BE MIRAFI OR EQUAL - 500X AT ACCESS ROAD AND COMPOUND.
- D. GRAVEL FILL; WELL GRADED, HARD, DURABLE, NATURAL SAND AND GRAVEL, FREE FROM ICE AND SNOW, ROOTS, SOD RUBBISH, AND OTHER DELETERIOUS OR ORGANIC MATTER. MATERIAL SHALL CONFORM TO THE FOLLOWING GRADATION REQUIREMENTS:

U.S. SIEVE NO.	% PASSING BY WEIGHT
4"	100
1/2"	50-85
#4	40-75
#10	30-60
#40	10-30
#100	5-20
#200	0-8

OR WISDOT GRADATION #2

GRAVEL FILL TO BE PLACED IN LIFTS OF 9" MAXIMUM THICKNESS AND COMPACTED TO 95% DENSITY.

2.02 EQUIPMENT

- A. COMPACTION SHALL BE ACCOMPLISHED BY MECHANICAL MEANS. LARGER AREAS SHALL BE COMPACTED BY SHEEP'S FOOT, VIBRATORY OR RUBBER TIERED ROLLERS WEIGHING AT LEAST FIVE (5) TONS. SMALLER AREAS SHALL BE COMPACTED BY POWER-DRIVEN, HAND HELD TAMPERS.
- B. PRIOR TO OTHER EXCAVATION AND CONSTRUCTION EFFORTS, GRUB ORGANIC MATTER TO A MINIMUM OF 6" BELOW ORIGINAL GROUND LEVEL.
- C. UNLESS OTHERWISE INSTRUCTED BY CRICKET COMMUNICATIONS, REMOVE TREES, BRUSH AND DEBRIS FROM THE PROPERTY TO AN AUTHORIZED DISPOSAL LOCATION.
- D. PRIOR TO PLACEMENT OF FILL OR BASE MATERIALS, ROLL THE SOIL.
- E. WHERE UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED, LINE THE GRUBBED AREAS WITH STABILIZER MAT PRIOR TO PLACEMENT OF FILL OR BASE MATERIAL.

3.03 INSTALLATION

- A. THE SITE AND TURNAROUND AREAS SHALL BE AT THE SUB-BASE COURSE ELEVATION PRIOR TO FORMING FOUNDATIONS. GRADE OR FILL THE SITE AND ACCESS ROAD AS REQUIRED TO PRODUCE EVEN DISTRIBUTION OF SPOILS RESULTING FROM THE FOUNDATION EXCAVATIONS. THE RESULTING GRADE SHALL CORRESPOND WITH SAID SUB-BASE COURSE. ELEVATIONS ARE TO BE CALCULATED FROM FINISHED GRADE OR SLOPE INDICATED.
- B. CLEAR EXCESS SPOILS, IF ANY, FROM JOB SITE AND DO NOT SPREAD BEYOND THE LIMITS OF CRICKET INC.'S LEASE PROPERTY UNLESS AUTHORIZED BY PROJECT MANAGER.
- C. THE ACCESS ROAD SHALL BE BROUGHT TO BASE COURSE ELEVATION PRIOR TO FOUNDATION CONSTRUCTION.
- D. DO NOT CREATE DEPRESSIONS WHERE WATER MAY POND.
- E. THE CONTRACT INCLUDES ALL NECESSARY GRADING, BANKING, DITCHING AND COMPLETE SURFACE COURSE FOR ACCESS ROAD. ALL ROADS OR ROUTES UTILIZED FOR ACCESS TO PUBLIC THOROUGHFARE ARE INCLUDED IN SCOPE OF WORK UNLESS OTHERWISE INDICATED.
- F. WHEN IMPROVING AN EXISTING ACCESS ROAD, GRADE THE EXISTING ROAD TO REMOVE ANY ORGANIC MATERIAL AND SMOOTH THE SURFACE BEFORE PLACING FILL OR STONE.
- G. PLACE FILL OR STONE IN 3" MAXIMUM LIFTS AND COMPACT BEFORE PLACING NEXT LIFT.
- H. THE FINISHED GRADE, INCLUDING TOP SURFACE COURSE, SHALL EXTEND A MINIMUM OF 12" BEYOND THE SITE FENCE AND SHALL COVER THE AREA AS INDICATED.
- I. RIPRAP SHALL BE APPLIED TO THE SIDES OF SLOPES OF ALL FENCED AREAS, PARKING AND TO ALL OTHER SLOPES GREATER THAN 2:1.
- J. RIPRAP SHALL BE APPLIED TO THE SIDE OF DITCHES OR DRAINAGE SWALES AS INDICATED ON PLANS.
- K. RIPRAP ENTIRE DITCH FOR 6'-0" IN ALL DIRECTIONS AT CULVERT OPENINGS.
- L. SEED, FERTILIZER AND STRAW COVER SHALL BE APPLIED TO ALL OTHER DISTURBED AREAS AND DITCHES, DRAINAGE, SWALES, NOT OTHERWISE RIP-RAPPED.
- M. UNDER NO CIRCUMSTANCES SHALL DITCHES, SWALES, OR CULVERTS BE PLACED SO THEY DIRECT WATER TOWARDS THE SITE, OR PERMIT STANDING WATER IMMEDIATELY ADJACENT TO THE SITE. IF DESIGN ELEVATIONS CONFLICT WITH THIS GUIDANCE, ADVISE CRICKET'S PROJECT MANAGER IMMEDIATELY.
- N. IF A DITCH LIES WITH SLOPES GREATER THAN TEN PERCENT, MOUND DIVERSIONARY HEADWALLS IN THE DITCH FOR 6'-0" ABOVE THE CULVERT ENTRANCE.
- O. SEED AND FERTILIZER SHALL BE APPLIED TO SURFACE CONDITIONS WHICH WILL ENCOURAGE ROOTING. RAKE AREAS TO BE SEED TO EVEN THE SURFACE AND LOOSEN THE SOIL.
- P. SOW SEED IN TWO DIRECTIONS IN TWICE THE QUANTITY RECOMMEND BY THE SEED PRODUCER.
- Q. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE GROWTH OF SEED AND LANDSCAPED AREAS BY WATERING UP TO THE POINT OF RELEASE FROM THE CONTRACT. CONTINUE TO REWORK BARE AREAS UNTIL COMPLETE COVERAGE IS OBTAINED.

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3.04 FIELD QUALITY CONTROL

A. COMPACTION SHALL BE 90% MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D-1557 FOR SITE WORK AND 95% MAXIMUM DENSITY UNDER SLAB AREAS. AREAS OF SETTLEMENT WILL BE EXCAVATED AND REFILLED AT CONTRACTOR'S EXPENSE.

3.05 PROTECTION

A. PROTECT SEEDED AREAS FROM EROSION BY SPREADING STRAW TO A UNIFORM LOOSE DEPTH OF 1"-2". STAKE AND TIE DOWN AS REQUIRED. USE OF EROSION CONTROL MESH OR MULCH NET SHALL BE AN ACCEPTABLE ALTERNATIVE.

B. ALL TREES PLACED IN CONJUNCTION WITH A LANDSCAPE CONTRACT SHALL BE WRAPPED, TIED WITH HOSE PROTECTED WIRE AND SECURED TO STAKES EXTENDING 2'-0" INTO THE GROUND ON FOUR SIDES OF THE TREE.

C. ALL EXPOSED AREAS SHALL BE PROTECTED AGAINST WASHOUTS AND SOIL EROSION. STRAW BALES SHALL BE PLACED AT THE INLET APPROACH TO ALL NEW OR EXISTING CULVERTS.

CHAIN LINK FENCE

PART 1 - GENERAL

4.01 SEQUENCING

A. IF THE SITE AREA HAS BEEN BROUGHT UP TO SURFACE COURSE ELEVATION PRIOR TO FENCE CONSTRUCTION, FENCE POST EXCAVATION SPOILS MUST BE CONTROLLED TO PRECLUDE CONTAMINATION OF SAID SURFACE COURSE.

4.02 APPLICABLE STANDARDS

ASTM-A120 SPECIFICATION FOR PIPE, STEEL BLACK AND HOT-DIPPED ZINC COATED (GALVANIZED) WELDED AND SEAMLESS FOR ORDINARY USES.

ASTM-A123 ZINC (HOT-DIPPED GALVANIZED) COATING ON IRON AND STEEL PRODUCTS.

ASTM-A525 STANDARD SPECIFICATION FOR SHEET STEEL ZINC COATED (GALVANIZED) BY THE HOT-DIPPED PROCESS.

FEDERAL SPECIFICATION RR-F-191-FENCING, WIRE AND POST METAL (AND GATES, CHAIN LINK FENCE FABRIC AND ACCESSORIES).

PART 2 - PRODUCTS

4.03 FENCE MATERIALS

A. ALL FABRIC WIRE, RAILS, POSTS, HARDWARE AND OTHER STEEL MATERIALS SHALL BE HOT-DIPPED GALVANIZED.

B. FABRIC SHALL BE 2" CHAIN LINK MESH OF NO. 9 GAUGE (0.148) WIRE, OF HEIGHT INDICATED ON DRAWINGS. THE FABRIC SHALL HAVE A TWISTED AND BARBED FINISH FOR THE TOP EDGE AND A KNUCKLED FINISH FOR THE BOTTOM EDGE. FABRIC SHALL CONFORM TO THE SPECIFICATIONS OF ASTM-A392 CLASS 1.

C. BARBED WIRE SHALL BE DOUBLE-STRAND, 12 GAUGE TWISTED WIRE, WITH 14 GAUGE 4 POINT ROUND BARBS SPACED AT 5" O.C.

D. ALL POSTS SHALL BE SCHEDULE 20-GALVANIZED STEEL PIPE AND SHALL BE TYPE 1 ASTM-A-123 AND OF THE FOLLOWING DIAMETER

LINE	2-3/8"
CORNER	3"
GATE	3"

E. EXTEND GATE AND CORNER POSTS 12", INCLUDING DOME CAP, TO PROVIDE FOR ATTACHMENT OF BARBED WIRE.

F. ALL TOP BRACED RAIL SHALL BE 1 5/8" DIAMETER SCHEDULE-20 MECHANICAL-SERVICE PIPE. FRAMES SHALL HAVE WELDED CORNER.

G. GATE FRAMES SHALL HAVE A FULL-HEIGHT VERTICAL BRACE AND A FULL WIDTH HORIZONTAL BRACE, SECURED IN PLACE BY USE OF GATE BRACE CLAMPS.

H. GATE HINGES SHALL BE MERCHANTS METAL MODEL 64386 HINGE ADAPTER WITH MODEL 6409, 188 DEGREE ATTACHMENT, OR EQUAL.

I. THE GUIDE (LATCH ASSEMBLY) SHALL BE TAMPER PROOF.

J. LATCHES, STOPS, AND KEEPERS SHALL BE PROVIDED FOR ALL GATES.

K. ALL STOPS SHALL HAVE FULL-HEIGHT PLUNGER BAR WITH DOME CAP.

L. DOUBLE GATES SHALL HAVE A FULL-HEIGHT PLUNGER BAR WITH DOME CAP.

M. A NO. 7 GAUGE ZINC COATED TENSION WIRE SHALL BE USED AT THE BOTTOM OF THE FABRIC, TERMINATED WITH BAND CLIPS AT CORNER AND GATE POSTS.

N. A 6" x 1/2" EYE-BOLT TO HOLD TENSION WIRE WILL BE PLACED AT LINE POSTS.

O. STRETCHER BARS SHALL BE 3/16" x 3/4" OR WILL HAVE EQUIVALENT CROSS-SECTIONAL AREA.

P. ALL CORNER, GATE AND END PANELS SHALL HAVE A 3/8" TRUSS ROD WITH TURNBUCKLES AND BE BRACED WITH 1-5/8" HORIZONTAL COMPRESSION MEMBER, SECURELY ATTACHED WITH IRON FITTINGS.

Q. PROVIDE OTHER HARDWARE INCLUDING BUT NOT LIMITED TO CLIPS, BAND CLIPS AND TENSION BAND CLIPS.

R. BARBED WIRE GATE GUARDS SHALL BE FITTED WITH DOME CAPS.

S. BARBED WIRE SUPPORT ARMS SHALL BE CAST IRON WITH SET BOLT AND LOCK WIRE IN THE ARM.

T. ALL CAPS SHALL BE CAST STEEL

PART 3 - EXECUTION

4.04 EQUIPMENT: EXCAVATE POST HOLES WITH MECHANICAL AUGER EQUIPMENT.

4.05 INSPECTION: EXCAVATE POST HOLES PER CONSTRUCTION DOCUMENT. CONFIRM PROPER DEPTH AND DIAMETER OF POST HOLES EXCAVATIONS.

4.06 INSTALLATION

A. POST FOUNDATION SHALL HAVE A MINIMUM 6" CONCRETE COVER UNDER POST.

B. ALL FENCE POSTS SHALL BE VERTICALLY PLUMB WITHIN 1/4" IN 8'-0".

C. AT CORNER POSTS, GATE POSTS AND SIDES OF GATE FRAME, FABRIC SHALL BE ATTACHED WITH STRETCHER AND TENSION BAND CLIPS AT 1'-3" INTERVALS.

D. AT LINE POSTS, FABRIC SHALL BE ATTACHED WITH BAND CLIPS AT 1'-3" INTERVALS.

E. ATTACH FABRIC TO BRACE RAILS, TENSION WIRE AND TRUSS RODS WITH TIE CLIPS AT 2'-0" INTERVALS.

F. A MAXIMUM GAP OF 1" WILL BE PERMITTED BETWEEN THE CHAIN LINK FABRIC AND THE FINAL GRADE.

G. GATES SHALL BE INSTALLED SO LOCKS ARE ACCESSIBLE FROM BOTH SIDES.

H. GATE HINGE BOLTS SHALL HAVE THEIR THREADS PEENED OR WELDED TO PREVENT UNAUTHORIZED REMOVAL.

4.07 PROTECTION: UPON COMPLETION OF ERECTION, INSPECT FENCE MATERIAL AND PAINT FIELD CUTS OR GALVANIZING BREAKS WITH ZINC-BASE PAINT COLOR TO MATCH THE GALVANIZING PROCESS.

CONCRETE

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION

WORK INCLUDES CONSTRUCTION OF CAST-IN-PLACE CONCRETE FOUNDATIONS, INCLUDING FURNISHING AND INSTALLING READY-MIX CONCRETE, REINFORCING, FORMWORK, AND ACCESSORY MATERIALS AS SHOWN ON THE DRAWINGS. CAST-IN-PLACE CONCRETE INCLUDES ALL SITE CONCRETE, INCLUDING FOUNDATIONS, SLABS ON GRADE, EQUIPMENT PADS, AND GUARDPOST FOUNDATIONS.

1.02 RELATED WORK

A. COORDINATE UNDER-SLAB CONDUITS.

B. COORDINATE WITH GROUNDING.

1.03 APPLICABLE STANDARDS

A. ACI-301 - SPECIFICATIONS FOR STRUCTURAL CONCRETE BUILDING

B. ACI-347 - GUIDE TO TO FORMWORK FOR CONCRETE

C. ASTM C33 - CONCRETE AGGREGATES

D. ASTM C94 - READY-MIXED CONCRETE

E. ASTM C150 - PORTLAND CEMENT

F. ASTM C260 - AIR-ENTRAINING ADMIXTURES FOR CONCRETE

G. ASTM C309 - LIQUID MEMBRANE FORMING COMPOUNDS/ FORMING COMPOUNDS FOR CURING CONCRETE

H. ASTM C494 - CHEMICAL ADMIXTURES FOR CONCRETE

I. ASTM A615 - STEEL WELDED WIRE FABRIC FOR CONCRETE REINFORCEMENT.

J. ASTM A185 - STEEL WELD WIRE FABRIC FOR CONCRETE REINFORCEMENT

1.04 QUALITY ASSURANCE

CONCRETE MATERIALS AND OPERATIONS SHALL BE TESTED AND INSPECTED BY THE ENGINEER.

1.05 TESTS

CONCRETE MATERIALS AND OPERATIONS SHALL BE TESTED AND INSPECTED BY THE ENGINEER AS THE WORK PROGRESSES. FAILURE TO DETECT ANY DEFECTIVE WORK OR MATERIAL SHALL NOT IN ANY WAY PREVENT LATER MATERIAL REJECTION WHEN SUCH DEFECT IS DISCOVERED NOR SHALL IT OBLIGATE THE ENGINEER FOR FINAL ACCEPTANCE.

A. FIVE (5) CONCRETE TEST CYLINDERS SHALL BE TAKEN OF THE TOWER AND PIER FOUNDATION. TWO (2) SHALL BE TESTED @ THREE DAYS, TWO (2) @ TWENTY-EIGHT DAYS. THE FIFTH CYLINDER SHALL BE KEPT SEPARATELY, IF REQUIRED, TO BE USED IN THE FUTURE.

B. ONE ADDITIONAL TEST CYLINDER SHALL BE TAKEN DURING COLD WEATHER AND CURED ON SITE UNDER SAME CONDITIONS AS THE CONCRETE IT REPRESENTS.

C. ONE SLUMP TEST SHALL BE TAKEN FOR EACH SET OF TEST CYLINDERS TAKEN.

PART 2 - PRODUCT

2.01 CONCRETE MATERIALS

CONCRETE SHALL BE COMPOSED OF PORTLAND CEMENT, WATER, FINE AND COARSE AGGREGATES, AND ADMIXTURES AS SPECIFIED BELOW. ALL WELL MIXED AND BROUGHT TO PROPER CONSISTENCY.

A. CEMENT: CEMENT SHALL BE TYPE II, GRAY COLOR, LOW-ALKALI PORTLAND CEMENT CONFORMING TO ASTM C150.

B. FINE AND COARSE AGGREGATES: AGGREGATES FOR USE IN CONCRETE SHALL COMPLY WITH ASTM C33.

C. WATER: WATER FOR MIXING AND CURING CONCRETE SHALL BE FREE FROM SEWAGE, OIL, ACID, ALKALI, AND SALTS AND SHALL BE FREE FROM OBJECTIONABLE QUANTITIES OF SILT AND OTHER DELETERIOUS SUBSTANCES.

2.02 ADMIXTURES

A. THE CONCRETE SHALL CONTAIN AN AIR-ENTRAINING ADMIXTURE COMPLYING WITH THE REQUIREMENTS OF ASTM C-260 AND ACI 212.1R AND A WATER-REDUCING ADMIXTURE COMPLYING WITH THE REQUIREMENTS OF ASTM C-494 AND ACI 212.1R. ADMIXTURES SHALL BE PURCHASED AND BATCHED IN LIQUID SOLUTION. THE USE OF CALCIUM CHLORIDE OR AN ADMIXTURE CONTAINING CALCIUM CHLORIDE IS PROHIBITED. ADMIXTURES SHALL BE OF THE SAME MANUFACTURER TO ASSURE COMPATIBILITY.

B. CHEMICAL ADMIXTURES: ASTM 494, TYPE A - WATER REDUCING AND RETARDING.

2.03 CURING COMPOUND: ASTM C309, TYPE I, CLASS B; TRANSLUCENT.

2.04 ACCESSORIES

A. NON-SHRINK GROUT: PREMIXED COMPOUND CONSISTING OF NONMETALLIC AGGREGATE, CEMENT, WATER REDUCING AND PLASTICIZING AGENTS; CAPABLE OF DEVELOPING MINIMUM COMPRESSIVE STRENGTH OF 7,000 PSI IN 28 DAYS.

B. JOINT FILLERS BITUMINOUS TYPE, ASTM D1751 OR NON-BITUMINOUS TYPE, ASTM D1752.

C. ANCHOR BOLTS: ASTM A307, UNPRIMED

2.05 CONCRETE MIX

A. CONCRETE SHALL BE PROPORTIONED FOR WORKABILITY, MAXIMUM DENSITY, STRENGTH, AND DURABILITY REQUIREMENTS IN ACCORDANCE WITH ACI 301. THE 28-DAY DESIGN COMPRESSIVE STRENGTH OF THE CONCRETE SHALL BE AS SPECIFIED ON THE DRAWINGS. CONCRETE FURNISHED MAY BE A COMMERCIAL READY-MIX PROVIDED THAT DELIVERY TO THE PLACING LOCATION IS SATISFACTORILY ESTABLISHED AS OCCURRING NOT MORE THAN 45 MINUTES AFTER ADDITION OF WATER TO THE MIX. SLUMP OF DELIVERED CONCRETE SHALL NOT EXCEED 5".

B. THE FOLLOWING STRENGTHS SHALL BE USED:

1. FENCE POST FOUNDATIONS - DESIGN COMPRESSIVE STRENGTH AT 28 DAYS OF 2,800 PSI.
2. EQUIPMENT FOUNDATIONS - DESIGN COMPRESSIVE STRENGTH AT 28 DAYS OF 4,000 PSI.
3. ALL OTHER CONCRETE NOT SPECIFIED - DESIGN COMPRESSIVE STRENGTH AT 28 DAYS OF 3,000 PSI.
4. CONCRETE SPECIFICATION FOR MONOPOLE OR TOWER FOUNDATION SHALL CONFORM TO MANUFACTURER'S RECOMMENDATIONS.

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C. USE ACCELERATING ADMIXTURES IN COLD WEATHER ONLY WHEN APPROVED BY THE ENGINEER. USE OF ADMIXTURES WILL NOT RELAX COLD WEATHER PLACEMENT REQUIREMENTS.

D. USE SET-RETARDING ADMIXTURES DURING HOT WEATHER ONLY WHEN APPROVED BY THE ENGINEER.

E. ALL CONCRETE SHALL HAVE FOUR (4) TO SEVEN (7) PERCENT ENTRAINED AIR.

PART 3 - EXECUTION

3.01 INSPECTION

THE CONTRACTOR SHALL VERIFY THAT ANCHORS, SEATS, PENETRATIONS, PLATES, REINFORCEMENT, AND OTHER ITEMS TO BE CAST INTO CONCRETE ARE ACCURATELY PLACED, HELD SECURELY, AND SHALL NOT CAUSE HARDSHIP IN PLACING CONCRETE.

3.02 PREPARATION

A. THE CONTRACTOR SHALL PREPARE PREVIOUSLY PLACED CONCRETE BY CLEANING WITH STEEL BRUSH AND APPLYING BONDING AGENT. APPLY BONDING AGENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

3.03 PLACING CONCRETE

A. THE ENGINEER SHALL BE NOTIFIED NOT LESS THAN 24 HOURS IN ADVANCE OF CONCRETE PLACEMENT. UNLESS INSPECTION IS WAIVED, IN EACH CASE, PLACING OF CONCRETE SHALL BE PERFORMED ONLY IN THE PRESENCE OF THE ENGINEER.

CONCRETE SHALL NOT BE PLACED UNTIL ALL FORM WORK, EMBEDDED PARTS, STEEL REINFORCEMENT, FOUNDATION SURFACES, AND JOINTS INVOLVED IN THE PLACING HAVE BEEN APPROVED, AND UNTIL FACILITIES ACCEPTABLE TO THE CRICKET REPRESENTATIVE HAVE BEEN PROVIDED AND MADE READY FOR ACCOMPLISHMENT OF THE WORK AS SPECIFIED. CONCRETE MAY NOT BE ORDERED FOR PLACEMENT UNTIL ALL ITEMS HAVE BEEN APPROVED AND CRICKET HAS PERFORMED A FINAL INSPECTION AND GIVEN APPROVAL TO START PLACEMENT TESTING.

B. PLACEMENT OF CONCRETE SHALL BE IN ACCORDANCE WITH ACI 301.

C. THE CONTRACTOR SHALL ENSURE THAT REINFORCEMENT, INSERTS, EMBEDDED PARTS, FORMED JOINTS, AND VAPOR BARRIERS ARE NOT DISTURBED DURING CONCRETE PLACEMENT.

3.04 SURFACE FINISHES

A. SURFACES AGAINST WHICH BACKFILL OR CONCRETE SHALL BE PLACED REQUIRE NO TREATMENT EXCEPT REPAIR OF DEFECTIVE AREAS.

B. SURFACES THAT WILL BE PERMANENTLY EXPOSED SHALL PRESENT A UNIFORM FINISH PROVIDED BY THE REMOVAL OF FINS AND FILLING OF HOLES AND OTHER IRREGULARITIES WITH DRY PACK GROUT, OR BY PACKING WITH UTILITY OR ORDINARY GROUT.

C. SURFACES THAT WOULD NORMALLY BE LEVEL AND WHICH WILL BE PERMANENTLY EXPOSED TO WEATHER SHALL BE SLOPED FOR DRAINAGE. UNLESS THE ENGINEER'S DESIGN DRAWING SPECIFIES A HORIZONTAL SURFACE (SUCH AS STAIR TREADS), WALLS, CURBS AND PARAPET SHALL BE SLOPED APPROXIMATELY 1/4" PER FOOT.

D. SURFACES THAT WILL BE COVERED BY BACKFILL OR CONCRETE SHALL BE SMOOTH SCREEDED.

E. EXPOSED SLAB SURFACES SHALL BE CONSOLIDATED, SCREEDED, FLOATED, AND STEEL TROWELED. HAND OR POWER-DRIVEN EQUIPMENT MAY BE USED FOR FLOATING. FLOATING SHALL BE STARTED AS SOON AS THE SCREEDED SURFACE HAS ATTAINED A STIFFNESS TO PERMIT FINISHING OPERATIONS. FLOATING SHALL BE CONTINUED THE MAXIMUM TIME REQUIRED TO PRODUCE A SURFACE UNIFORM IN TEXTURE AND FREE FROM SCREED MARKS OR OTHER IMPERFECTIONS. THE FINAL FINISH SHALL BE PRODUCED BY USE OF STEEL-BLADED FINISHING TROWELS. STEEL TROWLING SHALL COMMENCE ONLY AFTER THE SURFACES TO BE FINISHED HAVE BEEN BROUGHT TO CORRECT ELEVATION AND ALL SURFACE IMPERFECTIONS CORRECTED, AND SHALL BE CONTINUED ONLY UNTIL THE SURFACE IS SMOOTH AND UNIFORM IN TEXTURE AND APPEARANCE. IF FREE WATER IS BROUGHT TO THE SURFACE DURING THE FINISHING OPERATIONS, IT SHALL BE REMOVED BY SPONGING. FINISHING SHALL BE TIMED AND PERFORMED SO THAT EXTRA WATER NEED NOT BE APPLIED TO THE SURFACE BEING TROWELED.

3.05 PATCHING

THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY UPON REMOVAL OF THE FORMS TO OBSERVE CONCRETE SURFACE CONDITIONS. IMPERFECTIONS SHALL BE PATCHED ACCORDING TO THE ENGINEER'S DIRECTION.

3.06 DEFECTIVE CONCRETE

THE CONTRACTOR SHALL REPLACE CONCRETE NOT CONFORMING TO THE REQUIRED LEVELS AND LINES, DETAILS, AND ELEVATIONS SPECIFIED IN ACI 301.

3.07 PROTECTION

A. IMMEDIATELY AFTER PLACEMENT, THE CONTRACTOR SHALL PROTECT THE CONCRETE FROM PREMATURE DRYING, EXCESSIVE HOT OR COLD TEMPERATURES, AND MECHANICAL INJURY. FINISH WORK SHALL BE PROTECTED.

B. CONCRETE SHALL BE MAINTAINED WITH MINIMAL MOISTURE LOSS AT RELATIVELY CONSTANT TEMPERATURE FOR PERIOD NECESSARY FOR HYDRATION OF CEMENT AND HARDENING OF CONCRETE.

C. ALL CONCRETE SHALL BE WATER CURED BY CONTINUOUS (NOT PERIODIC) FINE MIST SPRAYING OR SPRINKLING ALL EXPOSED SURFACES. WATER SHALL BE CLEAN AND FREE FROM ACID, ALKALI, SALTS, OIL, SEDIMENT, OR ORGANIC MATTER. SUCCESSFUL CURING SHALL BE ASSURED BY USE OF AN AMPLE WATER SUPPLY UNDER PRESSURE IN IN PIPES, WITH ALL NECESSARY APPLIANCES OF HOSE, SPRINKLERS, AND SPRAYING DEVICES.

METALS

PART 1 - GENERAL

1.01 WORK INCLUDED

A. THE WORK CONSISTS OF THE FABRICATION AND INSTALLATION OF ALL MATERIALS TO BE FURNISHED, AND WITHOUT LIMITING THE GENERALITY THEREOF, INCLUDES ALL EQUIPMENT, LABOR AND SERVICES REQUIRED FOR ALL STRUCTURAL STEEL WORK INCLUDING ALL ITEMS INCIDENTAL THERETO AS SPECIFIED HEREIN AND AS SHOWN ON THE DRAWINGS. INCLUDING:

1. STEEL FRAMING INCLUDING BEAMS, ANGLES, CHANNELS, AND PLATES.
2. WELDING AND BOLTING OF ATTACHMENTS, AND FIELD DRILLING AND PREPARATION OF SAID MEMBERS.

1.02 REFERENCE STANDARDS

A. THE WORK SHALL CONFORM TO THE CODES AND STANDARDS OF THE FOLLOWING AGENCIES AS FURTHER CITED HEREIN:

1. ASTM: THE AMERICAN SOCIETY FOR TESTING AND MATERIALS, 196 RACE STREET, PHILADELPHIA, PA 19103, USA AS PUBLISHED IN "COMPILATION OF ASTM STANDARDS IN BUSINESS CODES".
2. AWS: AMERICAN WELDING SOCIETY INC., 2501 NW 7TH STREET, MIAMI, FL 33125, USA AS PUBLISHED IN "CODE FOR STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"; "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL BUILDINGS".

PART 2 - PRODUCTS

2.01 MATERIALS

A. STRUCTURAL STEEL: SHALL COMPLY WITH THE REQUIREMENTS OF ASTM A36 AND A50 FOR STRUCTURAL STEEL.

2.02 WELDING

A. ALL WELDING SHALL BE DONE BY CERTIFIED WELDERS. CERTIFICATION DOCUMENTS SHALL BE MADE AVAILABLE FOR ENGINEER'S AND/OR OWNER'S REVIEW IF REQUESTED.

B. WELDING ELECTRODES FOR MANUAL SHIELDED METAL ARC WELDING SHALL CONFORM TO ASTM 1-233, E70 SERIES. BARE ELECTRODES AND GRANULAR FLUX USED IN SUBMERGED ARC PROCESS SHALL COMFORM TO AISC SPECIFICATIONS.

C. FIELD WELDING SHALL BE DONE AS PER AWS D1.1 REQUIREMENTS. VISUAL INSPECTION IS ACCEPTABLE.

D. STUD WELDING SHALL BE ACCOMPLISHED BY CAPACITOR DISCHARGE (CD) WELDING TECHNIQUE USING MIDWEST FASTENERS, INC. CD100 CAPACITOR DISCHARGE STUD WELDER OR EQUAL.

2.2 PROVIDE STUD FASTENERS OF MATERIALS AND SIZES SHOWN ON DRAWINGS OR AS RECOMMEND BY MANUFACTURER FOR STRUCTURAL LOADING REQUIRED.

2.3 FOLLOW MANUFACTURER'S SPECIFICATIONS AND INSTRUCTIONS TO PROPERLY SELECT AND INSTALL STUD WELDS.

2.03 BOLTING

A. BOLTS SHALL CONFORM TO ASTM A325 AND BE HOT-DIPPED GALVANIZED PER ASTM A153. NUTS SHALL BE HEAVY HEX TYPE.

B. ALL BOLTS SHALL BE INSTALLED IN SLIP CRITICAL CONNECTIONS CONFORMING TO AISC METHOD, CONFORMING TO THE 1/4 TURN METHOD.

2.04 FABRICATION

A. FABRICATION OF STEEL SHALL CONFORM TO THE AISC AND AWS STANDARDS AND CODES.

2.05 FINISH

A. STRUCTURAL STEEL EXPOSED TO WEATHER SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123.

2.06 PROTECTION

A. UPON COMPLETION OF ERECTION, INSPECT ALL GALVANIZED STEEL AND PAINT ANY FIELD CUTS, WELDS, OR GALVANIZED BREAKS WITH ZINC-BASED PAINT, COLOR TO MATCH GALVANIZING PROCESS.

3.01 ERECTION OF STEEL

A. PROVIDE ALL ERECTION EQUIPMENT, BRACING, PLANKING, FIELD BOLTS, NUTS, WASHERS, DRIFT PINS, AND SIMILAR MATERIALS WHICH DO NOT FORM A PART OF THE COMPLETED CONSTRUCTION, BUT ARE NECESSARY FOR ITS PROPER ERECTION.

B. ERECT AND ANCHOR ALL STRUCTURAL STEEL IN ACCORDANCE WITH AISC REFERENCE STANDARDS. ALL WORK SHALL BE ACCURATELY SET TO ESTABLISHED ATTACHMENTS TO THE CONSTRUCTION OF THE BUILDING.

C. TEMPORARY BRACING, GUYING, AND SUPPORT SHALL BE PROVIDED TO KEEP THE STRUCTURE SET AND ALIGNED AT ALL TIMES DURING CONSTRUCTION, AND TO PREVENT DANGER TO PERSONS AND PROPERTY. CHECK ALL TEMPORARY LOADS AND STAY WITHIN SAFE CAPACITY OF ALL BUILDING COMPONENTS.

**SPECIAL CONSTRUCTION
ANTENNA INSTALLATION**

PART 1 - GENERAL

1.01 WORK INCLUDED

A. ANTENNA AND COAXIAL CABLES ARE FURNISHED BY CRICKET UNDER SEPARATE CONTRACT. THE CONTRACTOR SHALL ASSIST ANTENNA INSTALLATION CONTRACTOR IN TERMS OF COORDINATION AND SITE ACCESS. ERECTION SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPERTY.

B. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND CRICKET COMMUNICATIONS SPECIFICATIONS.

C. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS.

D. INSTALL FURNISHED GALVANIZED STEEL OR ALUMINUM WAVEGUIDE AS INDICATED ON DRAWINGS.

E. CONTRACTOR SHALL PROVIDE FOUR (4) SETS OF SWEEP TESTS UNDER HEWLETT-PACKARD 8713B RF SCALAR NETWORK ANALYZER. SUBMIT FREQUENCY DOMAIN REFLECTOMETER (FDR) TEST RESULTS TO THE PROJECT MANAGER. TESTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING SERVICE AND BE BOUND AND SUBMITTED WITHIN ONE WEEK OF WORK COMPLETION.

F. INSTALL COAXIAL CABLES AND TERMINATORS BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTORS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS. TERMINATE ALL COAXIAL CABLE THREE (3) FEET IN EXCESS OF ENTRY PORT LOCATION UNLESS OTHERWISE STATED.

G. ANTENNA AND COAXIAL CABLE GROUNDING:

1. ALL EXTERIOR #6 GREEN GROUND WIRE DAISY CHAIN CONNECTIONS ARE TO BE WEATHER SEALED WITH ANDREWS CONNECTOR/SPLICE WEATHERPROOFING KIT TYPE 3221213 OR EQUIVALENT.

2. ALL COAXIAL CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF COAXIAL CABLE (NOT WITHIN BENDS).

1.02 RELATED WORK

FURNISH THE FOLLOWING WORK AS SPECIFIED UNDER CONSTRUCTION DOCUMENTS, BUT COORDINATE WITH OTHER TRADES PRIOR TO BID:

1. FLASHING OF OPENING INTO OUTSIDE WALLS
2. SEALING AND CAULKING ALL OPENINGS
3. PAINTING
4. CUTTING AND PATCHING

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1.03 REQUIREMENTS OF REGULATORY AGENCIES

- A. FURNISH U.L. LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE. INSTALL IN CONFORMANCE WITH U.L. STANDARDS WHERE APPLICABLE.
- B. INSTALL ANTENNA, ANTENNA CABLES, GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL BUILDING CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THE WORK INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:
 - 1. EIA - ELECTRICAL INDUSTRIES ASSOCIATION RS-22. STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.
 - 2. FAA - FEDERAL AVATION ADMINISTRATION ADVISORY CIRCULAR AC 70/7480-IH, CONSTRUCTION MARKING AND LIGHTING.
 - 3. FCC - FEDERAL COMMUNICATION COMMISSION RULES AND REGULATIONS FORM 715, OBSTRUCTION MARKING AND LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES
 - 4. AISC - AMERICAN INSTITUTE OF STEEL CONSTRUCTION FOR STRUCTURAL JOINTS USING ASTM 1325 OR A490 BOLTS.
 - 5. NEC - NATIONAL ELECTRIC CODE - ON TOWER LIGHTING KITS.
 - 6. UL - UNDERWRITER'S LABORATORIES APPROVED ELECTRICAL PRODUCTS.
 - 7. IN ALL CASES, PART 77 OF THE FAA RULES AND PARTS 17 AND 22 OF THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDE ANY OTHER STANDARDS OR SPECIFICATIONS.
 - 8. LIFE SAFETY CODE NFPA, LATEST EDITION.

ELECTRICAL SPECIFICATIONS

GENERAL PROPERTIES

- A. REQUIREMENTS: FURNISH ALL LABOR, MATERIALS, SERVICE, EQUIPMENT, AND APPLIANCES REQUIRED TO COMPLETE THE INSTALLATION OF THE COMPLETE ELECTRICAL SYSTEM IN ACCORDANCE WITH SPECIFICATIONS AND CONTRACT DRAWINGS.
- B. REQUIREMENTS OF REGULATORY AGENCIES AND STANDARDS: INSTALLATION, MATERIAL, EQUIPMENT AND WORKMANSHIP SHALL CONFORM TO THE APPLICABLE PROVISIONS OF THE NATIONAL ELECTRIC CODE (NEC) - APPLICABLE STATE ELECTRIC CODES, THE NATIONAL ELECTRIC SAFETY CODES (NESC), AND THE TERMS AND THE CONDITIONS OF THE AUTHORITIES HAVING LAWFUL JURISDICTION PERTAINING TO THE WORK REQUIRED. ALL MODIFICATIONS REQUIRED BY THESE CODES, RULES, REGULATIONS, AND AUTHORITIES SHALL BE MADE BY THE CONTRACTOR WITHOUT ADDITIONAL CHARGE TO THE OWNER. UNDERWRITER'S LABORATORIES (UL): ALL MATERIALS, APPLIANCES, OR DEVICES SHALL CONFORM TO THE APPLICABLE STANDARDS OF UNDERWRITER'S LABORATORIES. THE LABEL OF, OR LISTING BY: U.L. IS REQUIRED.
- C. MATERIALS: ALL SIMILAR MATERIALS AND EQUIPMENT SHALL BE THE PRODUCT OF THE SAME MANUFACTURER WHERE NO SPECIFIC MATERIAL APPARATUS OR APPLIANCE IS MENTIONED. MANUFACTURER MAY BE USED PROVIDING IT CONFORMS TO THE CONTRACT REQUIREMENTS AND MEETS THE APPROVAL OF THE OWNER. MATERIAL AND EQUIPMENT SHALL BE THE STANDARD PRODUCTS OF MANUFACTURER'S REGULARLY ENGAGED IN THE PRODUCTION OF SUCH MATERIAL AND SHALL BE THE MANUFACTURER'S CURRENT IN STANDARD AND DESIGN.
- D. EXECUTION: FABRICATION, ERECTION, AND INSTALLATION OF THE COMPLETE ELECTRICAL SYSTEM SHALL BE DONE IN A FIRST CLASS WORKMANLIKE MANNER BY QUALIFIED PERSONNEL EXPERIENCED IN SUCH WORK AND SHALL PROCEED IN AN ORDERLY MANNER SO AS NOT TO HOLD UP THE PROGRESS OF THE PROJECT.
- E. PERFORMANCE TESTS: THOROUGHLY TEST FEEDERS, EQUIPMENT AND ALL CIRCUITS FOR PROPER OPERATING CONDITION AND FREEDOM FROM GROUNDS AND SHORT CIRCUITS BEFORE ACCEPTANCE IS REQUESTED. ALL EQUIPMENT, APPLIANCES, AND DEVICES SHALL BE OPERATED UNDER LOAD CONDITIONS.
- F. AS-BUILT DRAWINGS: DURING PROCESS OF THE WORK, MAINTAIN AN ACCURATE RECORD OF THE INSTALLATION OF THE SYSTEM, LOCATING EACH CIRCUIT PRECISELY BY DIMENSION. UPON COMPLETION OF THE INSTALLATION, TRANSFER ALL RECORD DATA TO BLACK LINE PRINT OF THE ORIGINAL DRAWINGS.

RACEWAYS, BOXES AND FITTINGS

- A. CONDUITS, ELECTRICAL METALLIC TUBING (EMT): MILLED STEEL, ZINC COATED ON THE OUTSIDE AND EITHER ZINC COATED OR COATED WITH AN APPROVED CORROSION RESISTANT COATING ON THE INSIDE. MAXIMUM SIZE 2 ELECTRICAL TRADE SIZE UNLESS NOTED ON THE DRAWINGS OR SPECIFICALLY APPROVED FOR EQUIPMENT CONNECTIONS. SIZES NOTED ON DRAWINGS SHALL BE AS REQUIRED BY NEC.
- B. CONDUIT FITTINGS: CONNECTORS AND COUPLINGS: EMT COUPLINGS AND CONNECTORS, EITHER STEEL OR MALLEABLE IRON ONLY. CONCRETE TIGHT OR RAIN TIGHT AND EITHER GLAND AND RING COMPRESSION TYPE OR THE STAINLESS STEEL MULTIPLE LOCKING TYPE, CONNECTORS TO HAVE INSULATED THROATS. EMT FITTINGS HAVING SET SCREWS OR INDENTATIONS AS A MEANS OF ATTACHMENT ARE NOT PERMITTED. BUSHINGS: INSULATED TYPE, DESIGNED TO PREVENT ABRASION OF WIRES WITHOUT IMPAIRING THE CONTINUITY OF THE CONDUIT, IMC AND RIGID ALUMINUM CONDUIT.

C. CONDUIT INSTALLATION: CONDUIT SYSTEMS, EMT OR RIGID NONMETALLIC CONDUIT UNLESS NOTED OTHERWISE. INSTALL CONCEALED CONDUIT AND EMT IN AS DIRECT ROUTES AS POSSIBLE. INSTALL EXPOSED CONDUITS AND EMT PARALLEL TO OR AT RIGHT ANGLES TO THE LINES OF THE BUILDING. RIGHT ANGLE BENDS IN EXPOSED CONDUIT AND EMT RUNS SHALL BE MADE WITH STANDARD ELBOWS, SCREW JOINTED CONDUIT FITTINGS OR CONDUIT BENT TO RADIUS NO LESS THAN THOSE OF STANDARD ELBOWS.

D. CONDUIT SUPPORTS: PROVIDE SUPPORTS FOR HORIZONTAL CONDUITS AND EMT NOT MORE THAN 8 FEET APART WITH NOT LESS THAN TWO ELBOW OR BENDS INCLUDING RUNS ABOVE SUSPENDED CEILINGS AND WITHIN 3 FEET OF ALL JUNCTION BOXES, SWITCHES, FITTINGS, ETC. INSTALL ONE HOLD PIPE STRAPS ON CONDUITS 1 INCH OR SMALLER. INSTALL INDIVIDUAL PIPE HANGERS FOR CONDUITS LARGER THAN 1 INCH. SPRING STEEL FASTENERS WITH HANGER RODS MAY BE USED IN DRY LOCATIONS IN LIEU OF PIPE STRAPS.

CONDUCTORS

- A. WIRES AND CABLES (600 VOLTS): CONFORM TO THE APPLICABLE UL AND IPCEA STANDARDS FOR THE USE INTENDED. COPPER CONDUCTORS WITH 600 VOLT INSULATION UNLESS OTHERWISE SPECIFIED OR NOTED ON THE DRAWINGS. STRANDED CONDUCTORS FOR NO. 8 OR LARGER WHERE SPECIFIED ELSEWHERE OR NOTED ON THE DRAWINGS. USE OF ALUMINUM CONDUCTORS WILL NOT BE PERMITTED. INSULATION SHALL BE TYPE THHN/THWN INSULATION 75° C FOR ALL CONDUCTORS, OTHERWISE SPECIFIED CONDUCTORS COLOR-CODED IN ACCORDANCE WITH NEC. CONNECT ALL CONDUCTORS OF THE SAME PHASE CONDUCTOR. COLOR CODING SHALL BE A-BLACK, B-RED, N-WHITE, WITH GREEN FOR ALL GROUND CONDUCTORS.
- B. CONNECTORS AND LUGS: FOR COPPER CONDUCTORS NO.6 AND SMALLER: 3M SCOTCH-LOK OR T & B STA-KON COMPRESSION OR INDENT TYPE CONNECTORS WITH INTEGRAL OR SEPARATE INSULATING CAPS. FOR COPPER CONDUCTORS LARGER THAN NO. 6 SOLDERLESS, INDENT HEX SCREW OR BOLT TYPE PRESSURE CONDUCTORS, PROPERLY TAPED OR INSULATED.
- C. SPLICES: (480 VOLTS AND UNDER): CONDUCTOR LENGTHS SHALL BE CONTINUOUS FROM TERMINATION TO TERMINATION WITHOUT SPLICES UNLESS APPROVED BY THE BUILDING INSPECTOR.

CIRCUIT BREAKERS:

A. PROVIDE MOLDED CASE, BOLT-ON, THERMAL MAGNETIC TRIP, SINGLE, TWO, OR THREE POLE BRANCH CIRCUIT BREAKERS AS SHOWN ON THE DRAWINGS. MULTIPLE POLE BREAKER SHALL BE SINGLE HANDLE, COMMON TRIP. A/C RATING TO MATCH EXISTING OR AS REQUIRED FOR AVAILABLE FAULT CURRENTS.

GROUNDING

- A. ALL ELECTRICAL AND GROUNDING AT THE CELL SITE SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 780 (LATEST EDITION), AND MANUFACTURER.
- B. IF THE AC PANEL IN THE POWER CABINET IS WIRED AS SERVICE ENTRANCE, THE AC SERVICE GROUND CONDUCTOR SHALL BE CONNECTED TO GROUND ELECTRODE SYSTEM. WHEN THE AC PANEL IN THE POWER CABINET IS CONSIDERED A SUB-PANEL, THE GROUND WIRE SHALL BE INSTALLED IN THE AC POWER CIRCUIT. THE INSTALLATION SHALL BE PER LOCAL AND NATIONAL ELECTRICAL CODE (NFPA-70).
- C. EXOTHERMIC WELDING IS RECOMMENDED FOR GROUNDING CONNECTION WHERE PRACTICAL. OTHERWISE, THE CONNECTION SHALL BE MADE USING COMPRESSION TYPE-2 HOLE, LONG BARREL LUGS OR DOUBLE CRIMP "C" CLAMP. THE COPPER CABLES SHALL BE COATED WITH ANTIOXIDANT (COPPER SHIELD) BEFORE MAKING THE CRIMP CONNECTIONS. THE MANUFACTURER'S TORQUING RECOMMENDATIONS ON THE BOLT ASSEMBLY TO SECURE CONNECTIONS ARE TO BE FOLLOWED.

D. THE ANTENNA CABLES SHALL BE GROUNDED AT THE TOP AND BOTTOM OF THE VERTICAL RUN FOR LIGHTNING PROTECTION. THE ANTENNA CABLE SHIELD MUST BE BONDED TO A COPPER GROUND BUS AT THE LOWERMOST POINT OF THE VERTICAL RUN JUST BEFORE IT BEGINS TO BEND TOWARD THE HORIZONTAL PLANE. WIRE RUNS TO GROUND SHALL BE KEPT AS STRAIGHT AND SHORT AS POSSIBLE. THE ANTENNA CABLE SHIELD SHALL BE GROUNDED JUST BEFORE ENTERING THE CELL CABINET. ANY ANTENNA CABLES OVER 200 FEET IN LENGTH SHALL ALSO BE EQUIPPED WITH ADDITIONAL GROUNDING AT MID-POINT.

E. ALL GROUNDING CONDUCTORS INSIDE THE BUILDING SHALL BE RUN IN A CONDUIT RACEWAY SYSTEM, AND SHALL BE INSTALLED AS STRAIGHT AS PRACTICAL WITH MINOR BENDS TO AVOID OBSTRUCTION. THE MINIMUM BENDING RADIUS OF ANY #2 GROUNDING CONDUCTOR IS 8". PVC RACEWAY MAY BE FLEXIBLE OR RIGID PER THE FIELD CONDITIONS. GROUNDING CONDUCTORS SHALL NOT MAKE CONTACT WITH ANY METALLIC CONDUITS, SURFACES, OR EQUIPMENT.

F. PROVIDE PVC SLEEVES WHERE GROUNDING CONDUCTORS PASS THROUGH THE BUILDING WALLS AND/OR CEILINGS.

G. INSTALL GROUND BUSHINGS ON ALL METALLIC CONDUITS AND BOND TO THE EQUIPMENT BUS IN THE PANELBOARD.

H. GROUND ANTENNA BASES, FRAMES, CABLE RACKS, AND OTHER METALLIC COMPONENTS WITH #2 GROUNDING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNDING.

I. GROUND COAXIAL SHIELD AT BOTH ENDS USING MANUFACTURER'S GUIDELINES.

J. GROUND FILED TEST PROCEDURE

THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE A "FALL OF POTENTIAL" TEST ON THE NEW SUPPLEMENTAL GROUND FIELD PRIOR TO FINAL CONNECTION OF THE GROUNDING SYSTEM TO EQUIPMENT. THE TEST SHALL BE PERFORMED BY A QUALIFIED AND CERTIFIED TESTING AGENT. PROVIDE INDEPENDENT TEST RESULTS TO THE PROJECT MANAGER FOR REVIEW. THE GROUND SYSTEM RESISTANCE TO EARTH GROUND SHALL NOT EXCEED TEN (10) OHMS. THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ADDITIONAL GROUND CONNECTIONS AS REQUIRED TO MEET THE 10 OHMS MAXIMUM.

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