CONSULTANT TEAM

PROJECT CONSULTANT: TERRA CONSULTING GROUP, LTD.
600 BUSSE HIGHWAY
PARK RIDGE, IL 60068
(847) 698-6400

SURVEYOR: WILLIAMS AND WORKS
549 OTTAWA AVE NW
GRAND RAPIDS, MI 49503
(616) 224-1500

APPROVALS

REAL ESTATE: _____

RF: _____

CONSTRUCTION: _____

OPERATIONS: _____

EQUIPMENT ENGINEERING: _____

PROJECT TYPE:

PROPOSED LESSEE ANTENNAS TO BE MOUNTED ON EXISTING SELF-SUPPORT TOWER WITH PROPOSED 11'-6" x 21'-9 1/2" EQUIPMENT ENCLOSURE AT BASE.

SITE COORDINATES:

LATITUDE: 41° 36' 53.28" N (FROM 1A)

LONGITUDE: 87° 53' 27.88" W (FROM 1A)

ELEVATION: ±786' (FROM 1A)

DRIVING DIRECTIONS:

FROM LESSEE OFFICE: Head east on E Woodfield Rd toward Access Rd/Mall Dr (0.6 mi). Turn right onto W Frontage Rd (0.5 mi). Take the Interstate 290 E ramp to Chicago (0.4 mi). Merge onto I-290 E (4.2 mi). Keep left to continue on I-355 S, follow signs for Interstate 355 S/Joliet Partial toll road (27.5 mi). Take the 159th St/IL-7 exit Partial toll road (0.4 mi). Turn left onto IL-7 N/W 159th St (6.2 mi). Turn left onto IL-7 N/Wolf Rd Destination will be on the right (1.0 mi).

EQUIPMENT ENCLOSURE:

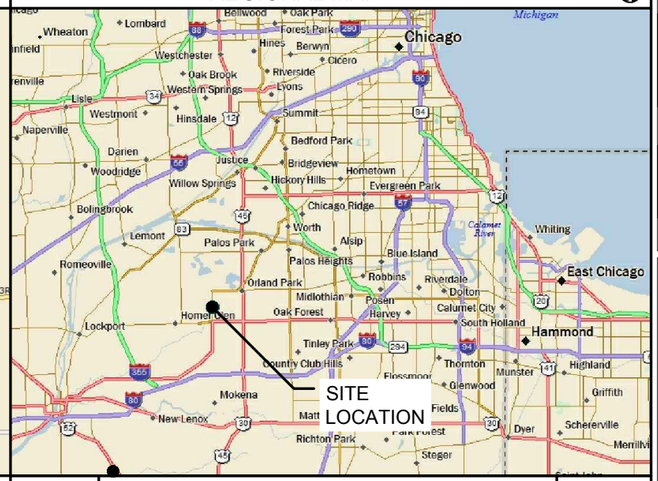
FIBREBOND
1300 Davenport Drive, Minden, Louisiana 71055 318-377-1030

VICINITY MAP

N.T.S.

REGIONAL MAP

N.T.S.



CHICAGO SMSA

limited partnership

CHICAGO SMSA LIMITED PARTNERSHIP
d/b/a VERIZON WIRELESS
1515 WOODFIELD ROAD, SUITE 1400
SCHAUMBURG, ILLINOIS 60173
PHONE: (847) 619-5397 FAX: (847) 706-7415

LOCATION NUMBER: 187771

SITE NAME: RT 7 & WEST

15101 WOLF RD.
ORLAND PARK, IL 60467

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A DAY 365 DAYS A YEAR

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PROJECT INFORMATION

P.I.N. #:	27-17-100-006-0000
ADDRESS:	15101 WOLF RD. ORLAND PARK, IL 60467
UTILITIES:	POWER: COMED KATHRYN SUGRUE 708-235-2337
	FIBER: AT&T JIM DELLAMANO (815) 727-8015
JURISDICTION:	VILLAGE OF ORLAND PARK
OCCUPANCY:	UNINHABITED
ZONING:	R-3
CONSTRUCTION TYPE:	CO LO
PROPERTY OWNER:	ORLAND PARK FIRE DEPARTMENT / CHIEF DANIEL SMITH 708-873-2707 9790 151ST STREET, ORLAND PARK, IL 60462
TOWER OWNER:	VILLAGE OF ORLAND PARK
CONTACT PERSON:	CHIEF DANIEL SMITH 708-873-2707
APPLICANT:	VERIZON WIRELESS PERSONAL COMMUNICATIONS LP d/b/a VERIZON WIRELESS 1515 WOODFIELD ROAD, SUITE 1400 SCHAUMBURG, IL 60173 (920) 841-1263
CONSTRUCTION MANAGER:	MICHAEL EISENMENGER (847) 619-3043
REAL ESTATE MANAGER:	DANIEL PEREZ (847) 706-1747

LICENSED PROFESSIONAL ENGINEER
THOMAS A. ZIMMERMANN
062-053210
Exp 11/30/15
STATE OF ILLINOIS
8/24/15

DRAWING INDEX

SHEET		REVISION
T-1	TITLE SHEET	E
LP	LOCATION PLAN	E
C-1	ENLARGED SITE PLAN	E
C-2	SITE GRADING PLAN (SHEET 1 OF 1)	E
C-3	EQUIPMENT ENCLOSURE FOUNDATION PLAN	E
C-4	FENCE DETAILS	G
C-5	CABLE ENCLOSURE DETAILS	-
ANT-1	SITE ELEVATION	E
ANT-2	ANTENNA INFORMATION	B
ANT-3	ANTENNA MOUNTING DETAILS	-
ANT-4	ANTENNA MOUNTING DETAILS	-
B-1	EQUIPMENT ENCLOSURE PLAN AND SECTION	E
B-2	EQUIPMENT ENCLOSURE ELEVATIONS	E
E-1	UTILITY ROUTING PLAN	E
E-2	SITE GROUNDING PLAN	E
E-3	ELECTRICAL AND GROUNDING DETAILS	-
E-4	ELECTRICAL AND GROUNDING DETAILS	-
SP-1	SPECIFICATIONS	-
SP-2	SPECIFICATIONS	-

FULL SCALE PRINT IS ON 24"x36" MEDIA

ATTACHMENTS

1 OF 1	SITE SURVEY	-
1 OF 3	STRUCTURAL ANALYSIS	E
2 OF 3	STRUCTURAL ANALYSIS	E
3 OF 3	STRUCTURAL ANALYSIS	E
T-1	MOD. PACKAGE - TITLE SHEET	E
N-1	MOD. PACKAGE - GENERAL NOTES	E
N-2	MOD. PACKAGE - SITE SPECIFIC NOTES	E
S-1	MOD. PACKAGE - SELF SUPPORT TOWER ELEVATION	E
S-2	MOD. PACKAGE - LEG SPLICE REINFORCEMENT DETAILS	E
S-3	MOD. PACKAGE - ANGLE SPLICE REINFORCEMENT DETAILS	E
S-4	MOD. PACKAGE - ANGLE LEG REINFORCEMENT DETAILS	E
S-5	MOD. PACKAGE - HALF-PIPE LEG REINFORCEMENT DETAILS	E
S-6	MOD. PACKAGE - BOLT-ON BRACE DETAILS	E

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PARK RIDGE, IL 60068
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FAX: 847-698-6401

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G	UPDATE PER VILLAGE COMMENTS	08/21/15	JTM

LOC. #187771

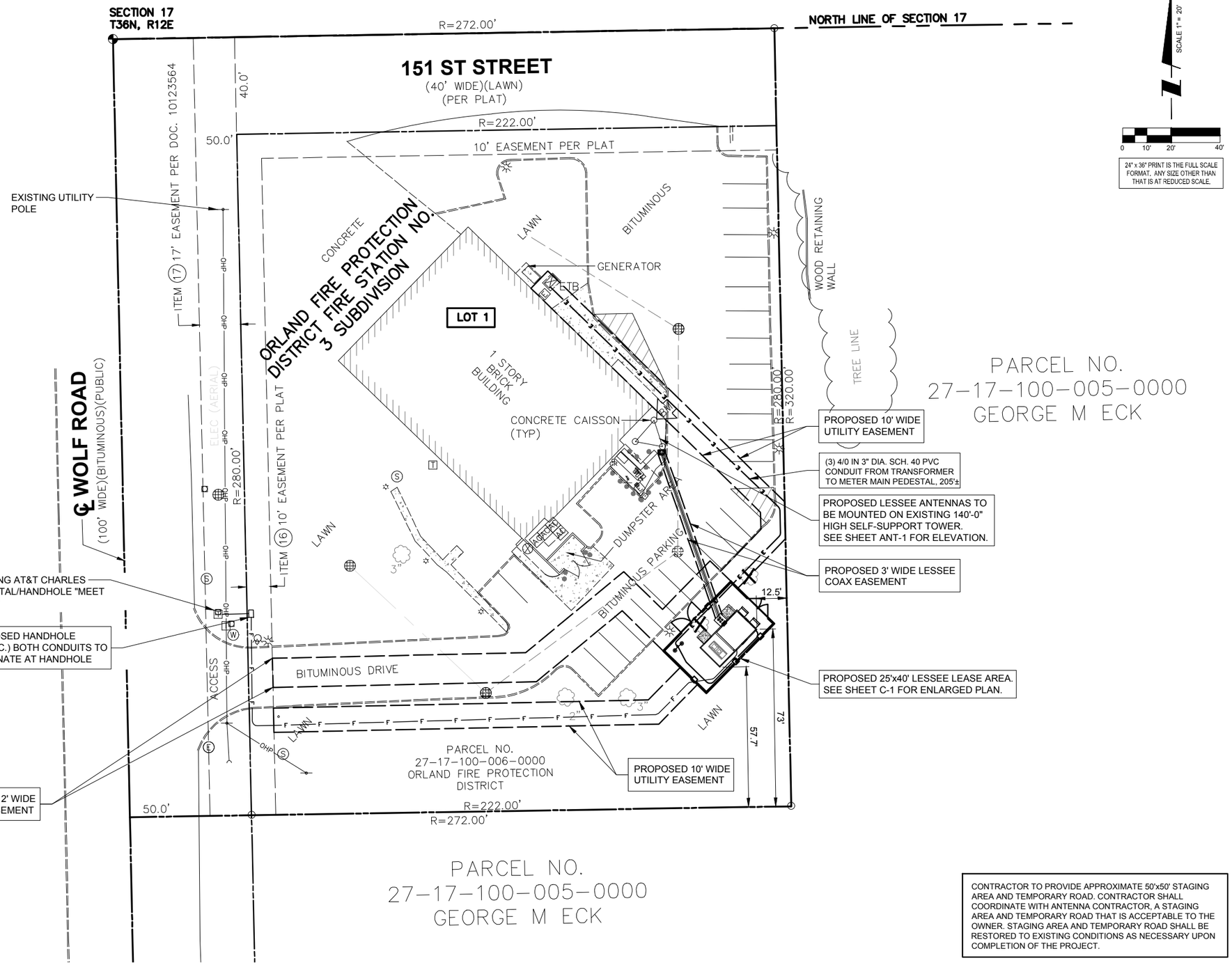
RT 7 & WEST

15101 WOLF RD
ORLAND PARK, IL 60467

DRAWN BY:	PP
CHECKED BY:	TAZ
DATE:	05/22/14
PROJECT #:	33-1300

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1



PARCEL NO.
27-17-100-005-0000
GEORGE M ECK

1 LOCATION PLAN
SCALE: 1" = 20'

CONTRACTOR TO PROVIDE APPROXIMATE 50'x50' STAGING AREA AND TEMPORARY ROAD. CONTRACTOR SHALL COORDINATE WITH ANTENNA CONTRACTOR, A STAGING AREA AND TEMPORARY ROAD THAT IS ACCEPTABLE TO THE OWNER. STAGING AREA AND TEMPORARY ROAD SHALL BE RESTORED TO EXISTING CONDITIONS AS NECESSARY UPON COMPLETION OF THE PROJECT.

CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING PAVEMENT. CONTRACTOR SHALL PHOTOGRAPH AND VIDEOTAPE EXISTING PAVEMENT PRIOR TO CONSTRUCTION. ANY DAMAGE CAUSED DURING CONSTRUCTION SHALL BE REPLACED TO EXISTING OR BETTER CONDITION AT NO ADDITIONAL COST.

THE CONTRACTOR WILL, UPON BECOMING AWARE OF SUBSURFACE OR LATENT PHYSICAL CONDITIONS DIFFERING FROM THOSE DISCLOSED BY THE ORIGINAL SOIL INVESTIGATION WORK, PROMPTLY NOTIFY THE OWNER VERBALLY AND IN WRITING, AS TO THE NATURE OF THE DIFFERING CONDITIONS. NO CLAIM BY THE CONTRACTOR FOR ANY CONDITIONS DIFFERING FROM THOSE ANTICIPATED IN THE PLANS AND SPECIFICATIONS AND DISCLOSED BY THE SOIL STUDIES WILL BE ALLOWED UNLESS THE CONTRACTOR HAS SO NOTIFIED THE OWNER, VERBALLY AND IN WRITING, AS REQUIRED ABOVE, OF SUCH DIFFERING SUBSURFACE CONDITIONS.

BEFORE AND DURING CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE ADEQUATE EROSION CONTROL AS NECESSARY IN THE FORM OF SILT FENCES FOR THE SITE AND BALES AROUND ANY EXISTING MANHOLES, INLETS, OR CATCHBASINS SUSCEPTIBLE TO EROSION. EROSION CONTROL MEASURES SHALL BE PERIODICALLY INSPECTED TO ENSURE PROPER FUNCTION. EROSION CONTROL SHALL BE REMOVED UPON COMPLETION OF WORK.

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Williams & Works
engineers . planners . surveyors . a coalition of firms
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549 Ottawa Ave NW . Grand Rapids, MI 49503

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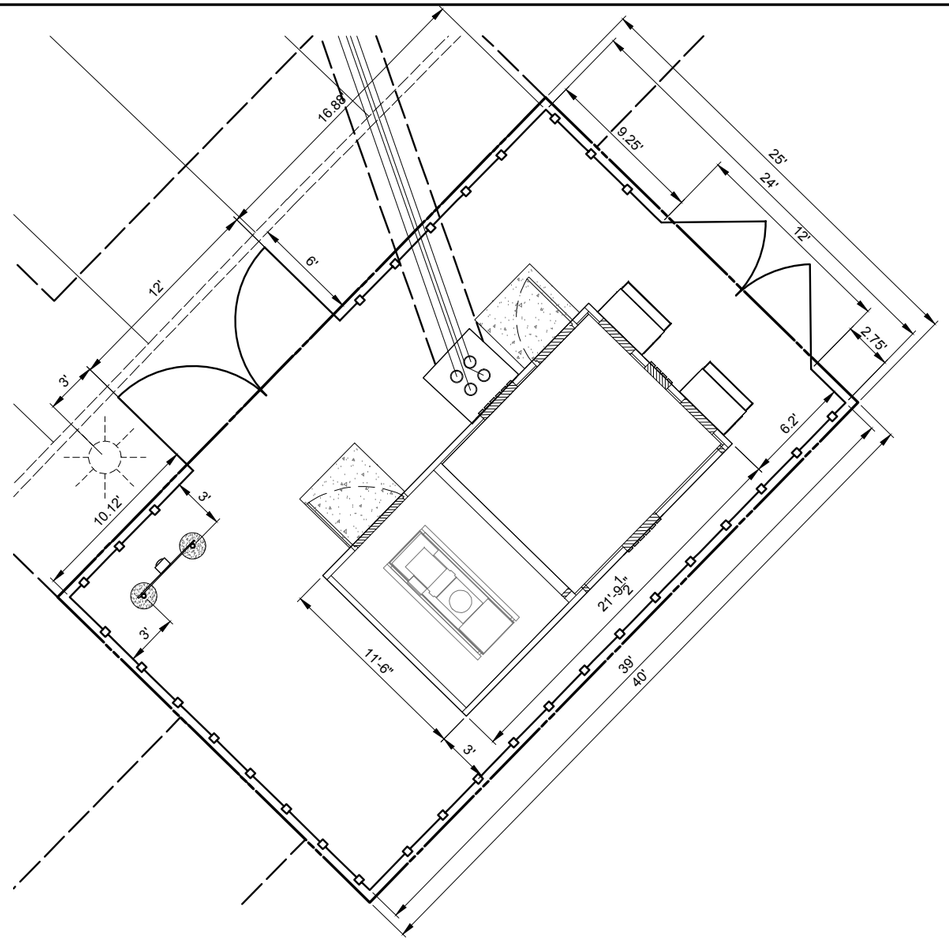
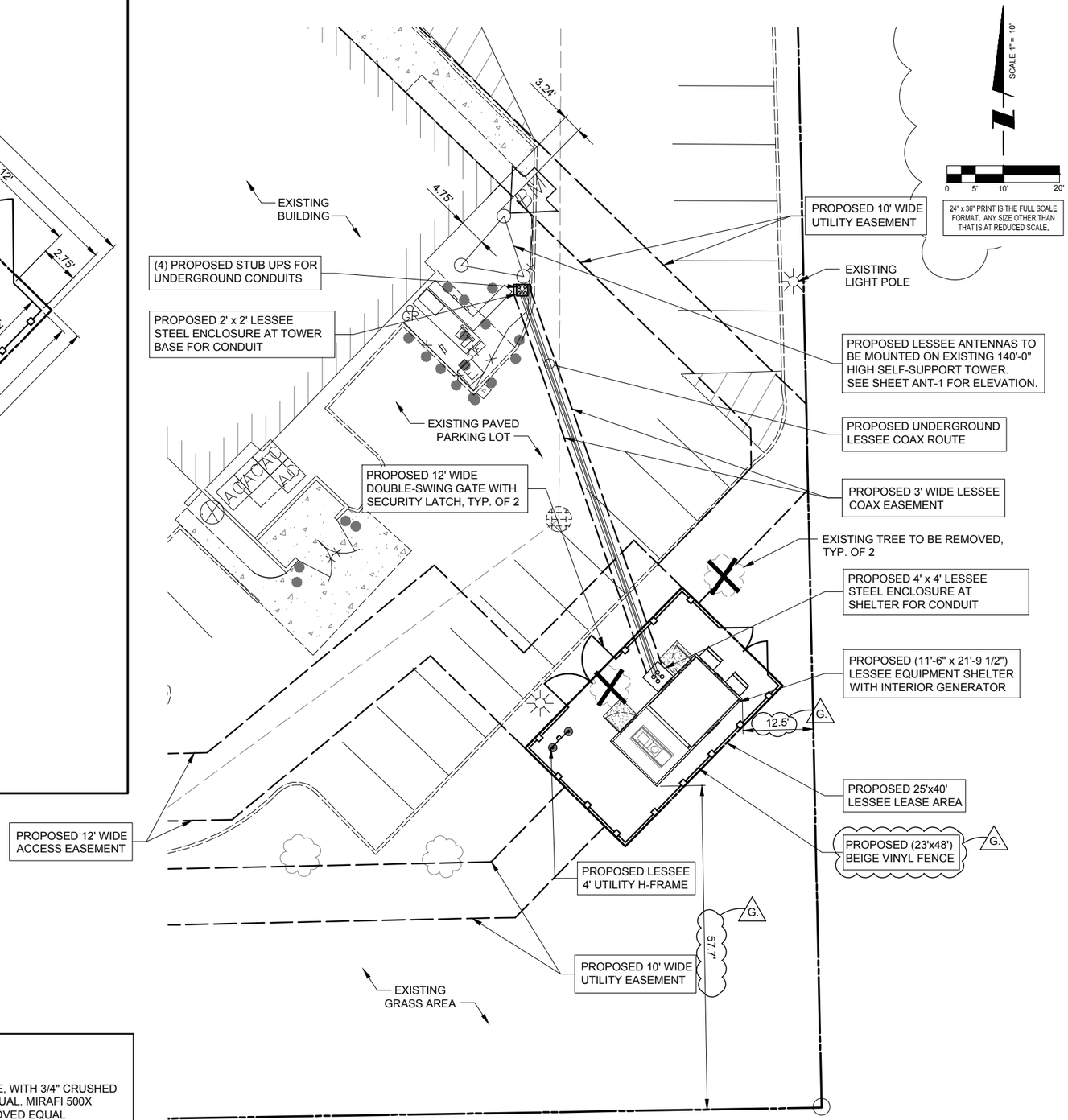
SHEET TITLE
LOCATION PLAN

SHEET NUMBER
LP



1 SITE DIMENSION PLAN
SCALE: 1" = 4'



1 ENLARGED SITE PLAN
SCALE: 1" = 10'

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PAVEMENT MATERIAL

LEASE SITE
111 S.Y.
8" COMPACTED AGGREGATE BASE COURSE, WITH 3/4" CRUSHED AGGREGATE, NO FINES. OR APPROVED EQUAL. MIRAFI 500X SUBGRADE GEOTEXTILE FABRIC OR APPROVED EQUAL
126 L.F. OF FENCING

THE CONTRACTOR SHALL INCLUDE AS PART OF THE BID, THE COST OF REMOVAL OF ANY SURFACE VEGETATION AND ORGANIC SOILS OR OTHER DELETERIOUS MATERIALS AND THE REPLACEMENT WITH ENGINEERED BACKFILL FOR THE AGGREGATE ACCESS DRIVE AND LEASE SITE, IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT.

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G	UPDATE PER VILLAGE COMMENTS	08/21/15	JTM

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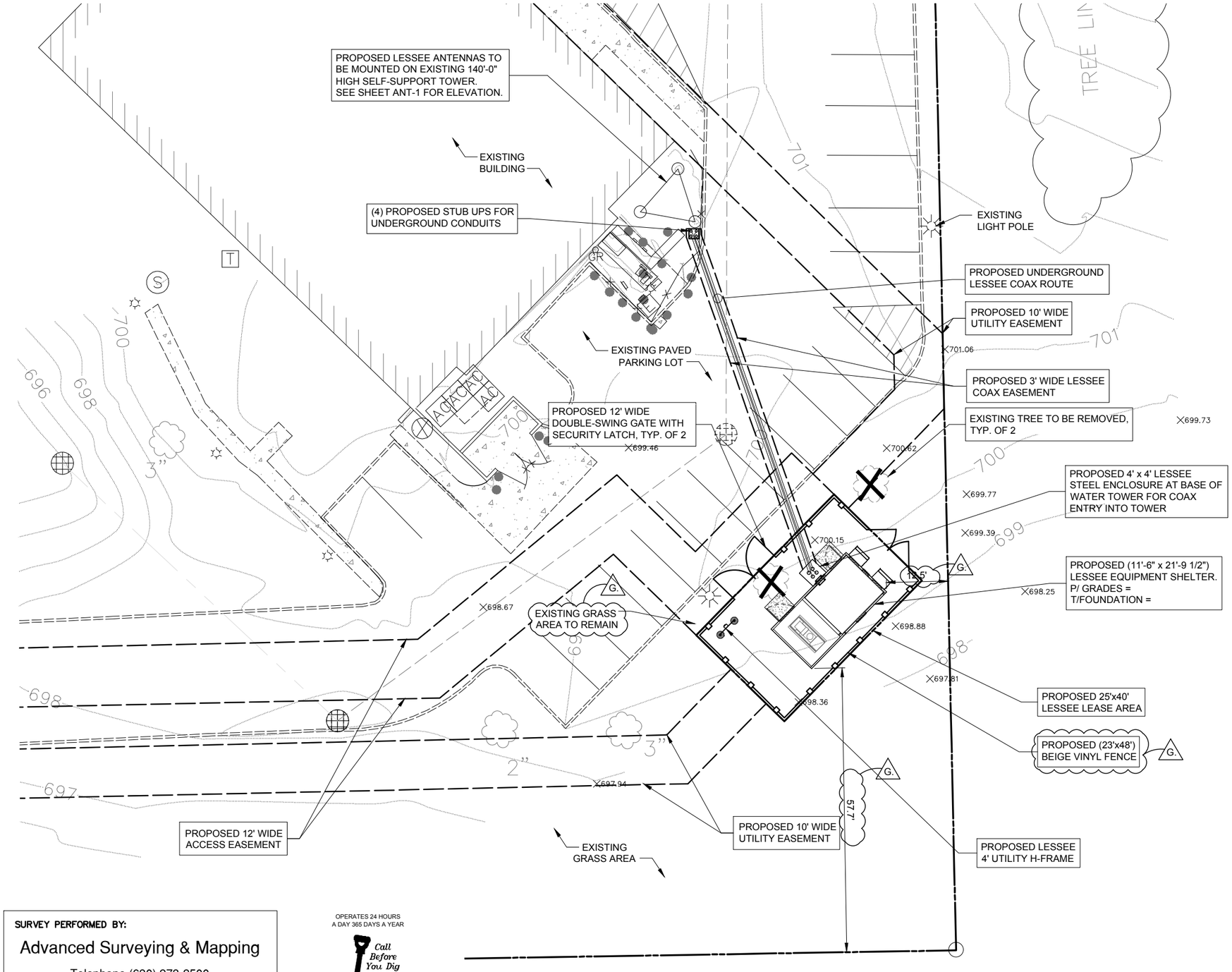
SHEET TITLE
ENLARGED SITE PLAN

SHEET NUMBER
C-1



1 SITE GRADING PLAN
SCALE: 1" = 10'

SCALE 1" = 10'

0 5' 10' 20'

24" x 36" PRINT IS THE FULL SCALE FORMAT. ANY SIZE OTHER THAN THAT IS AT REDUCED SCALE.

SURVEY PERFORMED BY:

Advanced Surveying & Mapping

Telephone (630) 273-2500
Fax (630) 273-2600
E-MAIL advanced@advct.com

SITE BENCHMARK
RR SPIKE EAST FACE OF A POWER POLE
ELEVTION = 847.02' (NAVD 88)

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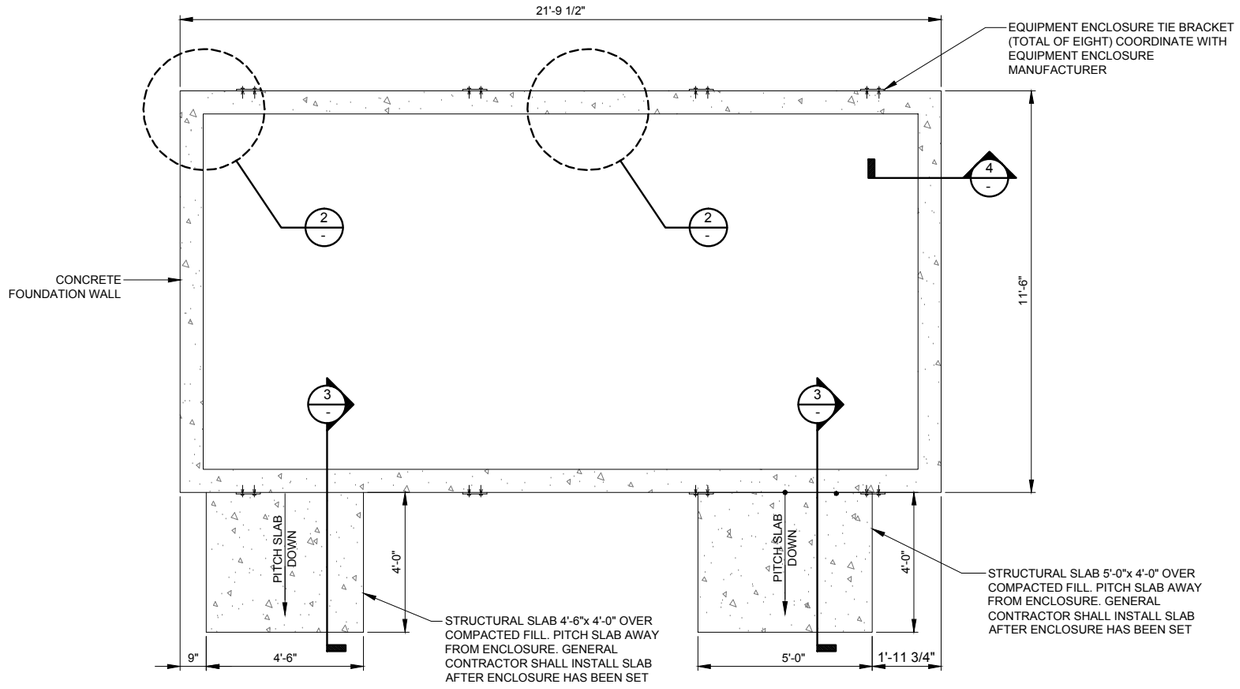
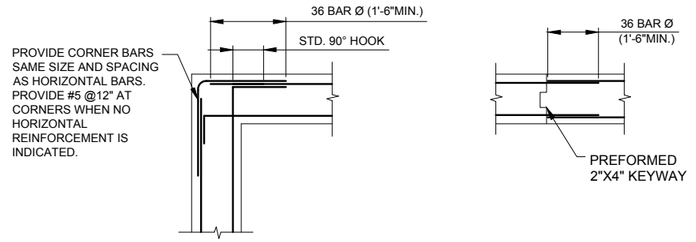
PROJECT #:	33-1300

SHEET TITLE
SITE GRADING PLAN
(SHEET 1 OF 1)

SHEET NUMBER
C-2



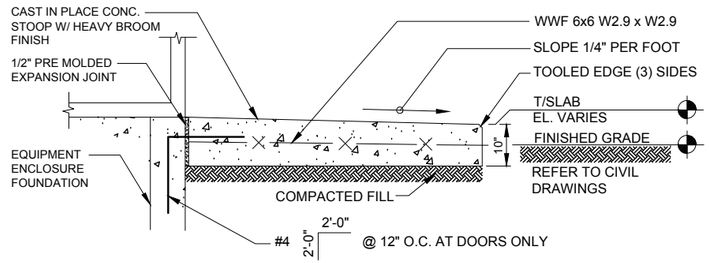
1 EQUIPMENT ENCLOSURE FOUNDATION PLAN
N.T.S.



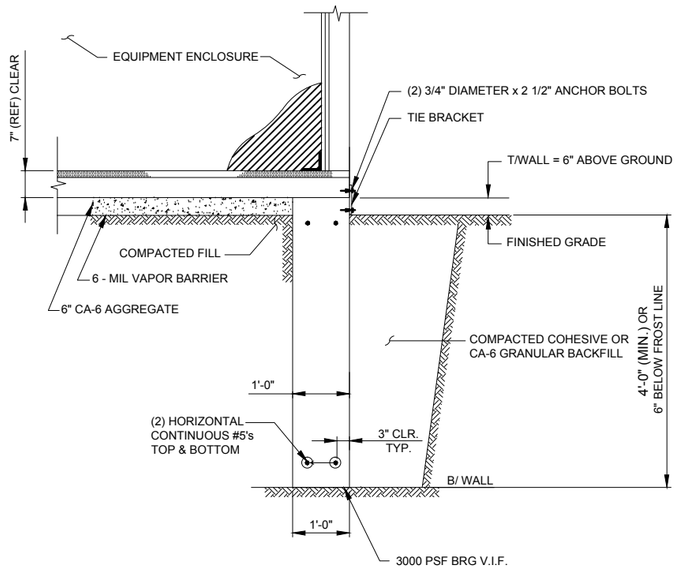
CORNER

CONSTRUCTION JOINT

2 CONCRETE WALL REINFORCEMENT DETAILS
N.T.S.



3 STOOP DETAIL
N.T.S.



4 FOUNDATION WALL SECTION
N.T.S.

NOTE:
LOCALIZED AREAS OF SOFT OR LOOSE MATERIALS MAY BE ENCOUNTERED AT THE PROPOSED BEARING ELEVATION. THE SOILS MAY REQUIRE COMPACTION USING A PLATE COMPACTOR IN THE FOOTING TRENCH IF FIELD CONDITIONS INDICATE LOOSE GRANULAR SOILS. THE SOILS MAY REQUIRE REMOVAL AND REPLACEMENT WITH AN APPROVED ENGINEERED FILL. FOUNDATION DEPTH AND OVER DIG REQUIREMENTS SHALL BE VERIFIED WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT AND INCLUDED IN THE BID BEFORE CONSTRUCTION. THE EVALUATION OF THE SUB GRADE AND SELECTION OF FILL MATERIALS SHALL BE MONITORED AND TESTED BY A QUALIFIED REPRESENTATIVE OF THE SOILS ENGINEER.

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A. EQUIPMENT ENCLOSURE FOUNDATION

1. REFER TO CIVIL DRAWINGS FOR ORIENTATION OF THE FOUNDATIONS.
2. EQUIPMENT ENCLOSURE FOUNDATION IS DESIGNED FOR THE FOLLOWING LOADS:
   ENCLOSURE DEAD LOAD: 70,000 LBS.
   ROOF LIVE LOAD: 105 PSF
   FLOOR LIVE LOAD: 150 PSF
3. THE CONTRACTOR SHALL NOTIFY THE CLIENT'S GEOTECHNICAL ENGINEER TO COORDINATE HAVING A FIELD REPRESENTATIVE ON SITE FOR TESTING AND INSPECTION.
4. FOOTINGS SHALL BEAR ON VIRGIN SOIL OR COMPACTED FILL MATERIAL CAPABLE OF SUPPORTING A MINIMUM SOIL BEARING PRESSURE OF 3000 PSF.
5. SUBGRADE PREPARATION:
   A. REMOVE ALL SOILS CONTAINING TOPSOIL: ORGANIC MATERIALS, AND/OR FILL MATERIALS FROM WITHIN AREA OF ENCLOSURE FOUNDATION.
   B. PROOF ROLL RESULTING SUBGRADE WITH A HEAVILY LOADED SINGLE AXLE ROLLER OR SIMILAR VEHICLE. (20 TON LOAD). CONTRACTOR SHALL UNDERCUT AND REPLACE WITH ENGINEERED FILL. ALL LOOSE SOFT OR UNSTABLE AREAS REVEALED DURING PROOFROLLING AS DIRECTED BY THE TESTING AGENCY. CONTRACTOR SHALL INCLUDE ANTICIPATED UNDERCUT AND REPLACEMENT AS INDICATED IN THE GEOTECHNICAL REPORT AS PART OF THE BID.
   C. BACKFILL AND COMPACT THE AREA WITHIN THE BUILDING FOUNDATION. BETWEEN RESULTANT SUBGRADE AND FOUNDATION WALL WITH APPROVED GRANULAR MATERIAL.
6. FOUNDATION WALLS SHALL BE BACKFILLED EVENLY ON EACH SIDE OF THE WALL OR WALLS SHALL BE ADEQUATELY BRACED BY THE CONTRACTOR UNTIL FLOOR SLAB HAS BEEN PLACED AND CURED FOR 72 HOURS MINIMUM.
7. ENCLOSURE SHALL NOT BE SET UNTIL FLOOR SLAB HAS BEEN CURED FOR 72 HOURS MINIMUM.
8. CONTRACTOR TO ENSURE FOUNDATION / SLAB ARE POURED TO MEET FLATNESS LEVEL TOLERANCES AS INDICATED IN ACI 4.5.6 AND 4.5.7.

B. EQUIPMENT ENCLOSURE

THE EQUIPMENT ENCLOSURE IS A PRE-FABRICATED BUILDING MANUFACTURED BY FIBREBOND, MINDEN, LOUISIANA.

THE EQUIPMENT ENCLOSURE BUILDING SHALL BE FURNISHED AND INSTALLED BY THE OWNER UNDER SEPARATE CONTRACT PER THE OWNER AND MANUFACTURER SPECIFICATIONS.

C. CONCRETE NOTES

1. ALL CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF ACI 318 AND ACI 301, LATEST EDITION. THESE DOCUMENTS SHALL BE AVAILABLE IN THE FIELD OFFICE.
2. EXCEPT WHERE OTHERWISE INDICATED, CONCRETE SHALL BE NORMAL WEIGHT AND WITH MINIMUM 28-DAY COMPRESSIVE STRENGTHS OF F'c=3000 PSI. ALL EXTERIOR EXPOSED CONCRETE SHALL BE AIR ENTRAINED.
3. REINFORCING BARS SHALL CONFORM TO ASTM A615, GRADE 60. ALL WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.

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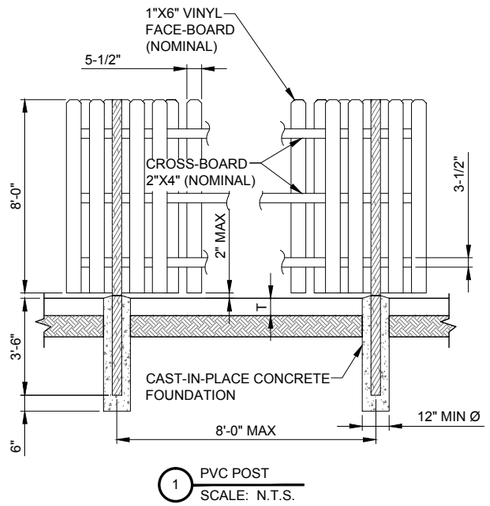
SHEET TITLE
EQUIPMENT ENCLOSURE FOUNDATION PLAN

SHEET NUMBER
C-3



1 PVC POST
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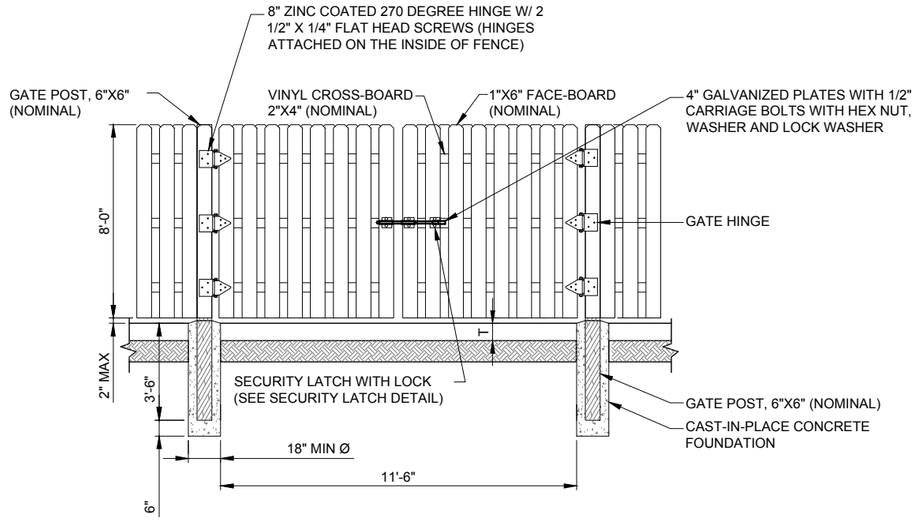
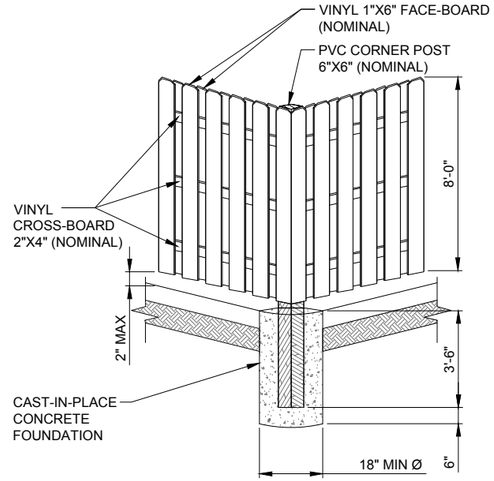


2 12'-0" DOUBLE SWING GATE
SCALE: N.T.S.



3 CORNER POST
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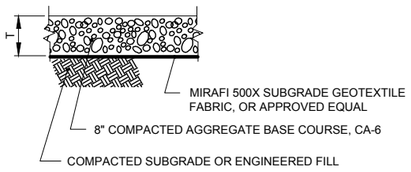
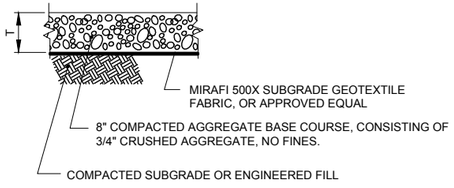
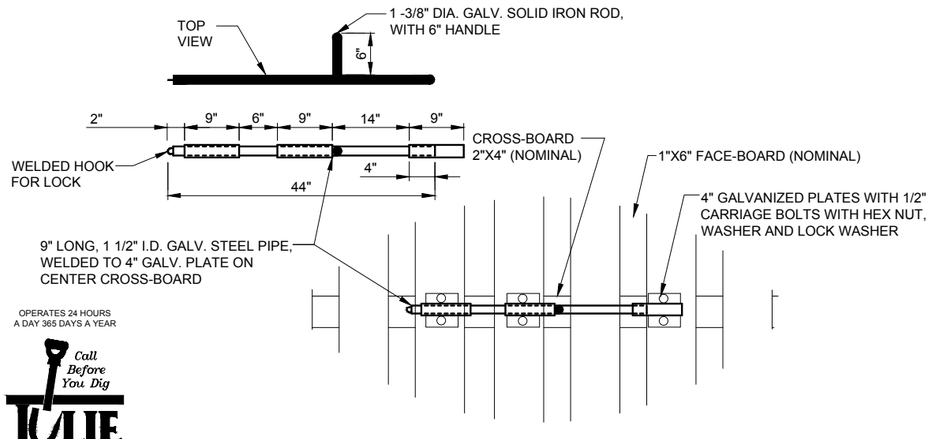


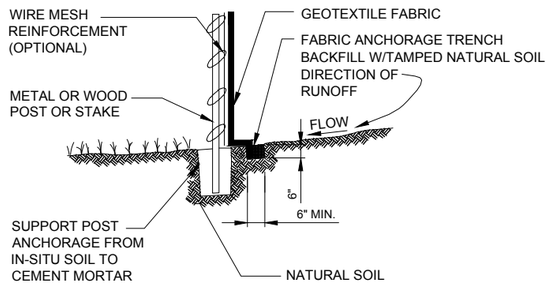
4 AGGREGATE CROSS-SECTION
N.T.S. ACCESS EASEMENT



5 AGGREGATE CROSS-SECTION
N.T.S. LEASE SITE



6 SECURITY LATCH
SCALE: N.T.S.



NOTE:
DEPENDING UPON CONFIGURATION, ATTACH FABRIC TO WIRE MESH W/HOG RINGS, STEEL POSTS W/ TIE WIRES, WOOD POSTS W/ NAILS.

7 EROSION CONTROL SILT FENCE DETAIL
N.T.S.

FENCING NOTES:
1. CONTRACTOR TO PROVIDE A 12"x 12" CUT-OUT IN THE VINYL FENCING OPPOSITE THE METER LOCATION FOR METER READING. FRAME OUT THE CUT-OUT WITH VINYL 2'x4's ON THE INSIDE OF FENCE PRIOR TO MAKING PENETRATION.
2. FACE-BOARDS CAN BE NAILED OR SCREWED TO CROSS-BOARDS. ALL CROSS-BOARDS WILL BE SCREWED TO POSTS. ALL CONCRETE FOOTING SHALL BE 6.1 BAG MIX 2500 PSI CONCRETE.

GENERAL NOTES

1) REFER TO THE PROJECT MANUAL FOR ADDITIONAL INFORMATION AND REQUIREMENTS RELATED TO CONSTRUCTION.
2) THE OWNER HAS CAUSED A GEOTECHNICAL EXPLORATION TO BE PERFORMED AT THE SITE.
3) THE CONTRACTOR SHALL NOTIFY THE CLIENT'S GEOTECHNICAL ENGINEER TO COORDINATE HAVING A FIELD REPRESENTATIVE ON SITE FOR TESTING AND INSPECTION.

COPIES OF THE REPORT ARE ISSUED TO THE CONTRACTOR FOR CONVENIENCE ONLY. THE REPORT IS NOT A PART OF THE CONTRACT DOCUMENTS. NEITHER THE OWNER NOR THE ENGINEER/ARCHITECT GUARANTEE THE ACCURACY OR VALIDITY OF THE DATA CONTAINED THEREIN, NOR DO THEY ASSUME ANY RESPONSIBILITY FOR THE CONTRACTOR'S USE OR INTERPRETATION OF THE DATA CONTAINED THEREIN.

GEOTEXTILE PARAMETERS		
PROPERTY	MINIMUM VALUE (a)	TEST METHOD
GRAB STRENGTH	180 LBS.	ASTM D-4632-91
PUNCTURE STRENGTH	75 LBS.	ASTM D-4833-88
BURST STRENGTH	290 LBS.	ASTM D-3786
TRAPEZOIDAL TEAR	50 LBS.	ASTM D-4571-87
(a) ALL VALUES REPRESENT MINIMUM ROLL VALUES		

NOTES:
THE FABRIC SHOULD BE PLACED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS. INTERSECTIONS OF SHEETS MUST BE SEWN OR SUFFICIENTLY OVERLAPPED (AT LEAST 24 INCHES) OR AS SPECIFIED BY THE MANUFACTURER). THE GEOTEXTILE SHEETS SHOULD ALSO BE PLACED TAUT TO REDUCE WRINKLES OR FOLDS. CARE MUST BE EXERCISED TO PREVENT PHYSICAL DAMAGE OF THE GEOTEXTILE PRIOR TO, DURING AND AFTER INSTALLATION. UTILITIES SHOULD BE INSTALLED BEFORE PLACING THE FABRIC.

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FAX: 847-698-6401

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C	UPDATE WITH NEW ECR	06/01/15	MAP
D	ISSUED PER FIBER COORDINATION	07/20/15	MT
E	UPDATE WITH NEW SHELTER & LATEST MOD DESIGN	07/22/15	BTE
F	UPDATE PER POWER COORDINATION	07/24/15	JTM
G	UPDATE PER VILLAGE COMMENTS	08/21/15	JTM

LOC. #187771

RT 7 & WEST

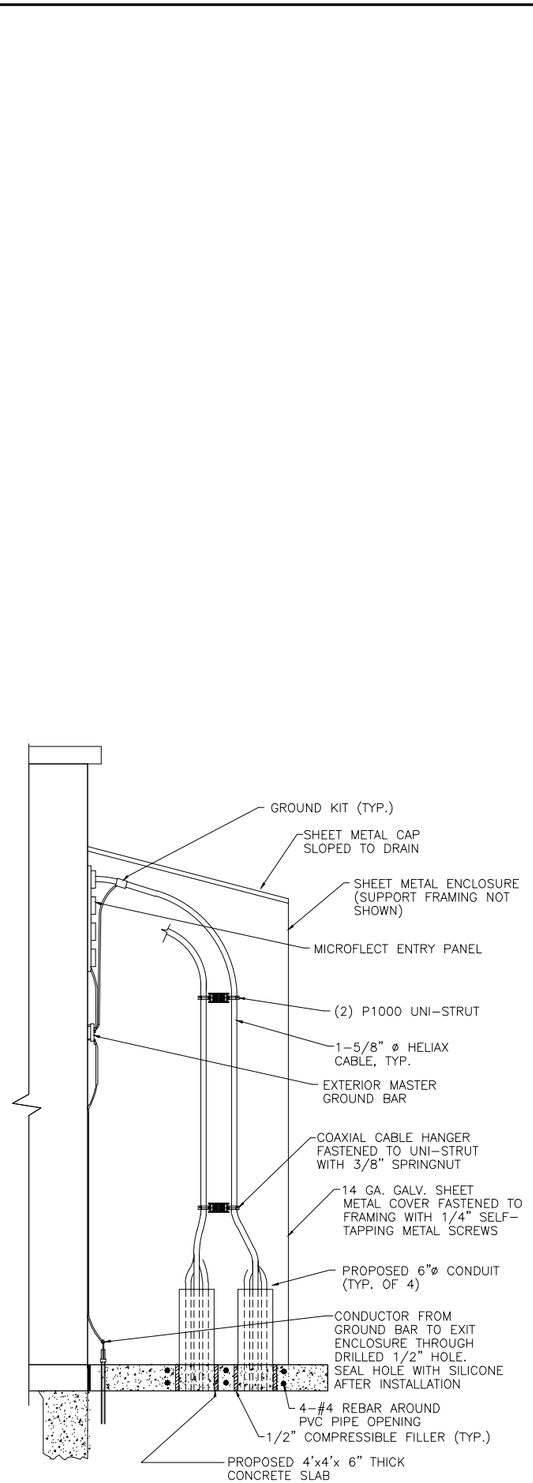
15101 WOLF RD
ORLAND PARK, IL 60467

DRAWN BY:	PP
CHECKED BY:	TAZ
DATE:	05/22/14
PROJECT #:	33-1300

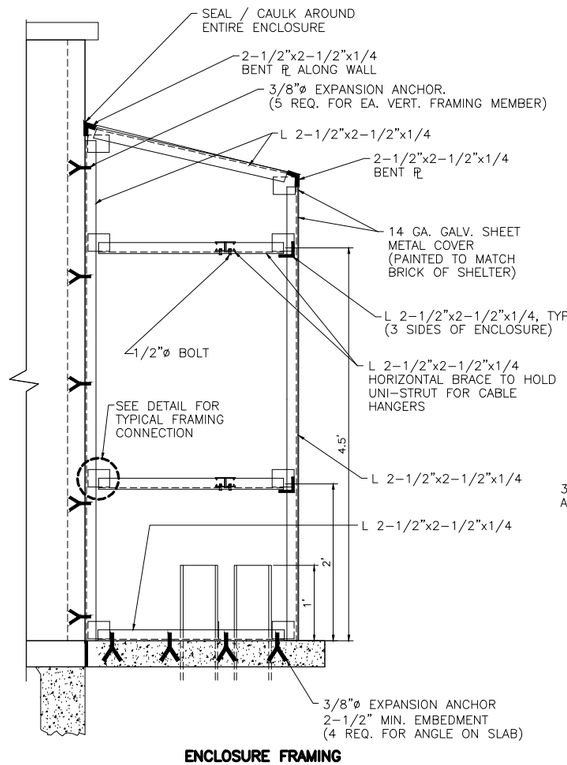
SHEET TITLE
SITE DETAILS

SHEET NUMBER
C-4

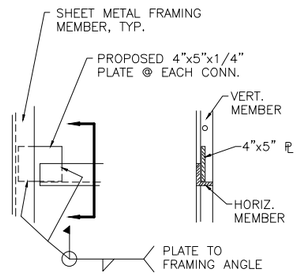
NOTE:
G.C. TO FILL PENETRATIONS WITH CAULK / SEALENT JUST BEFORE INSERTING ANCHOR (TO HELP WEATHER PROOF OPENING).



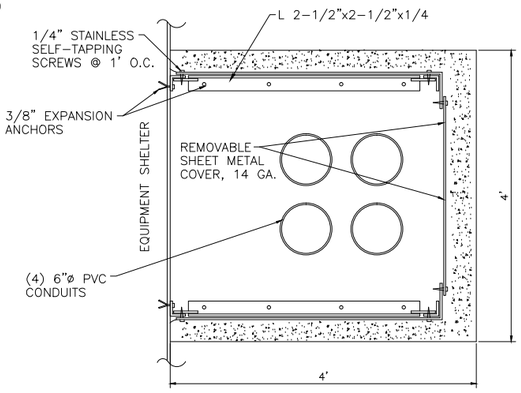
ENCLOSURE PROFILE



ENCLOSURE FRAMING



TYPICAL FRAMING CONNECTION



ENCLOSURE PLAN

1 CABLE ENCLOSURE ⊙ SHELTER

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RT 7 & WEST

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ORLAND PARK, IL 60467

DRAWN BY:	PP
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PROJECT #:	33-1300

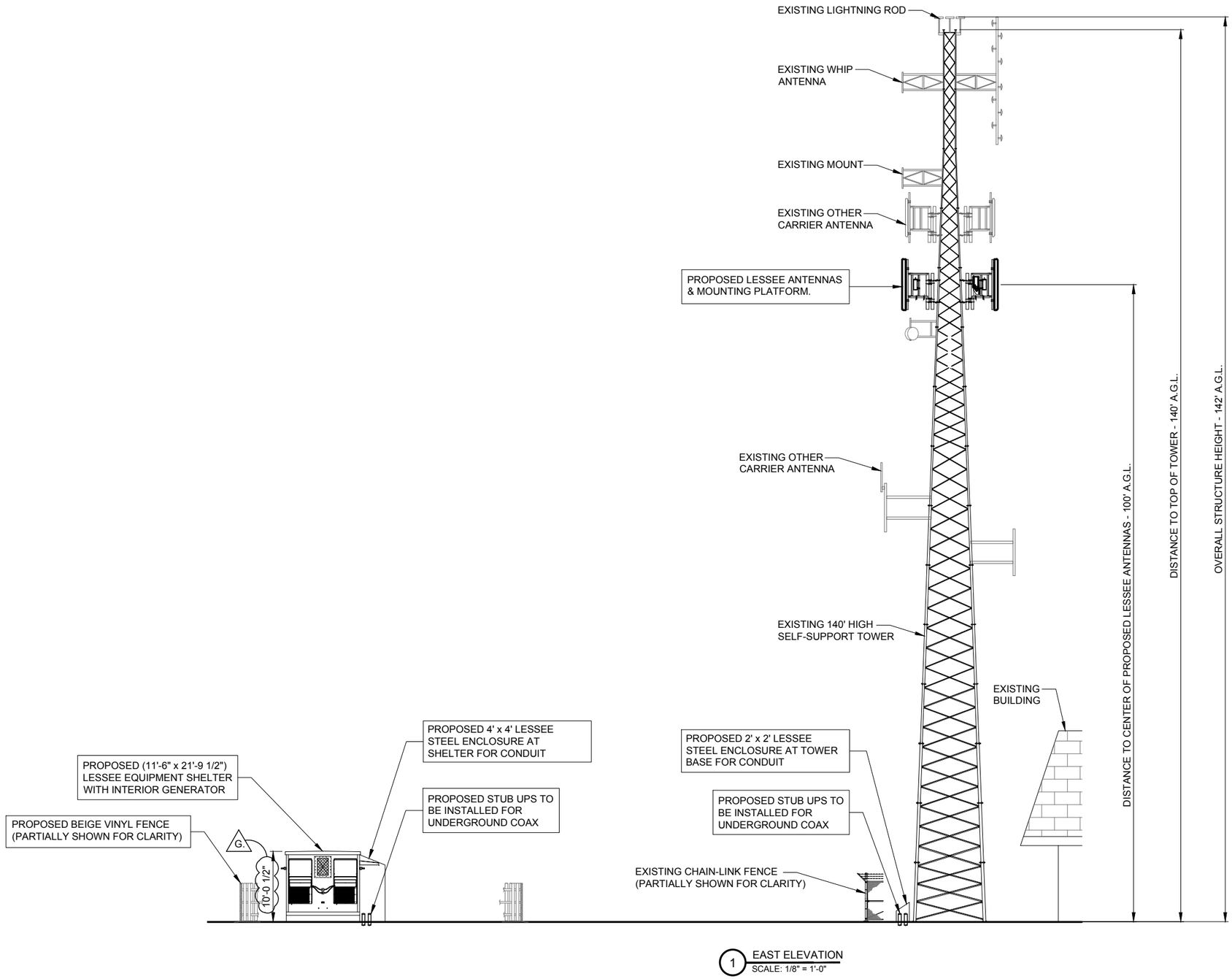
SHEET TITLE
CABLE ENCLOSURE DETAILS

SHEET NUMBER
C-5

0 1/2" 1" 2"

SCALE: 1/8" = 1'

24" x 36" PRINT IS THE FULL SCALE FORMAT. ANY SIZE OTHER THAN THAT IS AT REDUCED SCALE.



1 EAST ELEVATION
SCALE: 1/8" = 1'-0"

NOTE:
PRIOR TO ANTENNA INSTALLATION, TOWER MODIFICATIONS ARE TO BE PERFORMED. REFER TO STRUCTURAL ANALYSIS AND MOD DESIGN BY SEMAAN ENGINEERING ATTACHED TO THIS SET AS GUIDE

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PROJECT #:	33-1300

SHEET TITLE
SITE ELEVATION

SHEET NUMBER
ANT-1

EQUIPMENT CHANGE REQUEST FORM- ECR

Cell Name	Rt 7 and West	RF Engineer	Opubo Agiobenebo	Cell ID	569
Location Number	187771	Market	0	Address	15101 Wolf Road
Date of Request	6/20/2014			City/State/Zip	Orland Park, IL, 60462

PROPOSED CONFIGURATION — Configuration: Option-A2

Antenna Sector	Pos	Port	RF Path	Antenna Manufacturer	Antenna Model	Antenna Serial Number	Centerline	Azimuth	Variable Tilt	Mechanical Tilt	Action
Alpha	A1	L1 (-45)	LTE C - RxTx0	ANDREW	SBNHH-1D65A_PORT 1 - +45_02D		100	0	2	0	Change-Install
		L2 (+45)	LTE C - RxTx1								
		H1 (-45)	PCS Future - RxTx0						0		
		H2 (+45)	PCS Future - RxTx1								
		H3 (+45)	AWS - RxTx0						0		
		H4 (+45)	AWS - RxTx1								
	A2	L1 (-45)	Unused at this time								
		L2 (+45)	Unused at this time								
		H1 (-45)	Unused at this time								
		H2 (+45)	Unused at this time								
		H3 (+45)	Unused at this time								
		H4 (+45)	Unused at this time								
	A3	L1 (-45)	LTE C - RxTx0	ANDREW	SBNHH-1D65A_PORT 1 - +45_02D		100	0	2	0	Change-Install
		L2 (+45)	LTE C - RxTx1								
		H1 (-45)	PCS Future - RxTx0						0		
		H2 (+45)	PCS Future - RxTx1								
		H3 (+45)	AWS - RxTx0						0		
		H4 (+45)	AWS - RxTx1								
	A4	L1 (-45)	Unused at this time								
		L2 (+45)	Unused at this time								
		H1 (-45)	Unused at this time								
		H2 (+45)	Unused at this time								
		H3 (+45)	Unused at this time								
		H4 (+45)	Unused at this time								
Beta	B1	L1 (-45)	LTE C - RxTx0	ANDREW	SBNHH-1D65A_PORT 1 - +45_02D		100	110	2	0	Change-Install
		L2 (+45)	LTE C - RxTx1								
		H1 (-45)	PCS Future - RxTx0						0		
		H2 (+45)	PCS Future - RxTx1								
		H3 (+45)	AWS - RxTx0						0		
		H4 (+45)	AWS - RxTx1								
	B2	L1 (-45)	Unused at this time								
		L2 (+45)	Unused at this time								
		H1 (-45)	Unused at this time								
		H2 (+45)	Unused at this time								
		H3 (+45)	Unused at this time								
		H4 (+45)	Unused at this time								
	B3	L1 (-45)	LTE C - RxTx0	ANDREW	SBNHH-1D65A_PORT 1 - +45_02D		100	110	2	0	Change-Install
		L2 (+45)	LTE C - RxTx1								
		H1 (-45)	PCS Future - RxTx0						0		
		H2 (+45)	PCS Future - RxTx1								
		H3 (+45)	AWS - RxTx0						0		
		H4 (+45)	AWS - RxTx1								
	B4	L1 (-45)	Unused at this time								
		L2 (+45)	Unused at this time								
		H1 (-45)	Unused at this time								
		H2 (+45)	Unused at this time								
		H3 (+45)	Unused at this time								
		H4 (+45)	Unused at this time								
GAMMA	G1	L1 (-45)	LTE C - RxTx0	ANDREW	SBNHH-1D65A_PORT 1 - +45_04DT_072S		100	260	4	0	Change-Install
		L2 (+45)	LTE C - RxTx1								
		H1 (-45)	PCS Future - RxTx0						0		
		H2 (+45)	PCS Future - RxTx1								
		H3 (+45)	AWS - RxTx0						0		
		H4 (+45)	AWS - RxTx1								
	G2	L1 (-45)	Unused at this time								
		L2 (+45)	Unused at this time								
		H1 (-45)	Unused at this time								
		H2 (+45)	Unused at this time								
		H3 (+45)	Unused at this time								
		H4 (+45)	Unused at this time								
	G3	L1 (-45)	LTE C - RxTx0	ANDREW	SBNHH-1D65A_PORT 1 - +45_04DT_072S		100	260	4	0	Change-Install
		L2 (+45)	LTE C - RxTx1								
		H1 (-45)	PCS Future - RxTx0						0		
		H2 (+45)	PCS Future - RxTx1								
		H3 (+45)	AWS - RxTx0						0		
		H4 (+45)	AWS - RxTx1								
	G4	L1 (-45)	Unused at this time								
		L2 (+45)	Unused at this time								
		H1 (-45)	Unused at this time								
		H2 (+45)	Unused at this time								
		H3 (+45)	Unused at this time								
		H4 (+45)	Unused at this time								

Comments

PPC CONNECTORS ONLY

1 PROPOSED ANTENNA CONFIGURATION
N.T.S.

ESTIMATED MAIN LINE HYBRID LENGTH			
ANTENNA CENTERLINE (±)	UNDERGROUND COAX LENGTH (±)	SHELTER (±)	TOTAL (±)
100'	85'	15'	200'

Combiner - Cable Data

Existing

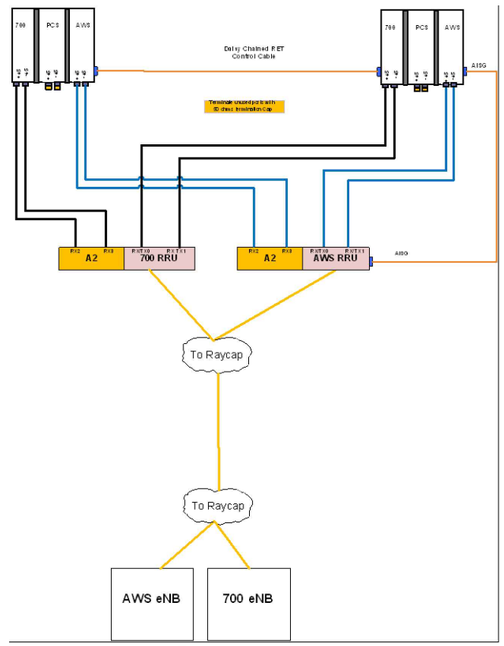
	Location	Diplexer Manufacturer	Diplexer Model		Count
Diplexer	Top (Platform)				
	Bottom (Shelter)				
Coax	**Sector**	**Coax Manufacturer**	**Type**	**Size**	**Count**
	Alpha				
	Beta				
	Gamma				

Proposed

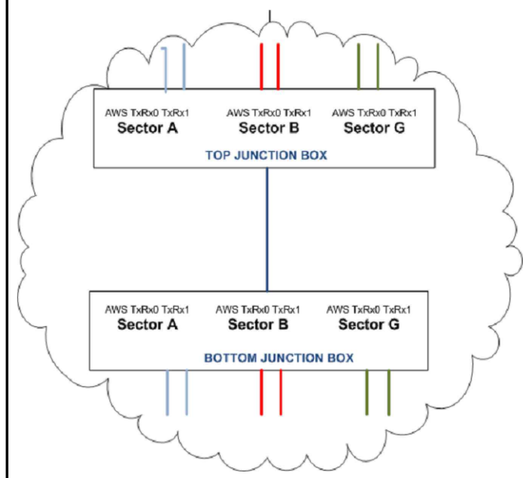
	Location	Manufacturer	Component Model		Count	Action
Passive Components	Top (Platform)					
	Bottom (Shelter)					
	Top (Platform)	Ericsson	RRU12 (AWS)		3	Install
	Top (Platform)	Ericsson	RRU12 (700)		3	Install
	Top (Platform)					
	Top (Platform)	Ericsson	RRUS A2 (700)		3	Install
	Top (Platform)	Ericsson	RRUS A2 (AWS)		3	Install
	Top (Platform)	Raycap	RCMDC-3315-PF-48		1	Install
	Bottom (Shelter)	Raycap	RCMDC-3315-PF-48		1	Install
Coax	**Sector**	**Coax Manufacturer**	**Type**	**Size**	**Count**	**Action**
	Alpha					
	Beta					
	Gamma					
	AWS	Andrew	HFT1206-24S28-XXX	1 5/8	2	Install

Comments

2 COMBINER CABLE DATA INFORMATION
N.T.S.



3 CABLE DIAGRAM
N.T.S.



2 CABLE DIAGRAM @ JUNCTION BOX
N.T.S.

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RT 7 & WEST

15101 WOLF RD
ORLAND PARK, IL 60467

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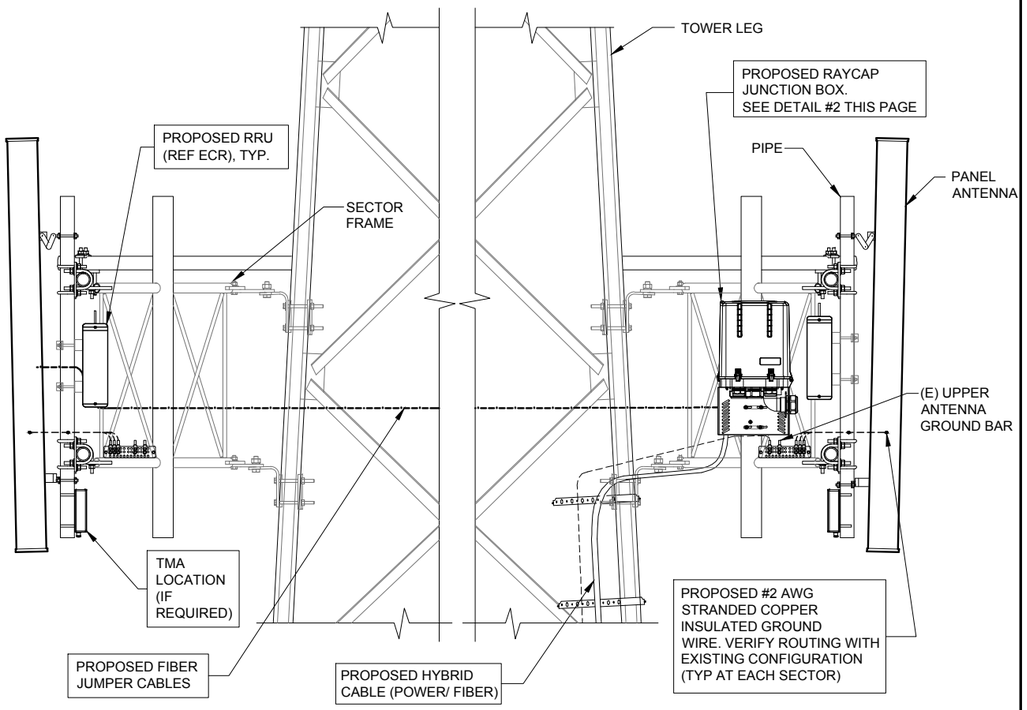
SHEET TITLE
ANTENNA INFORMATION

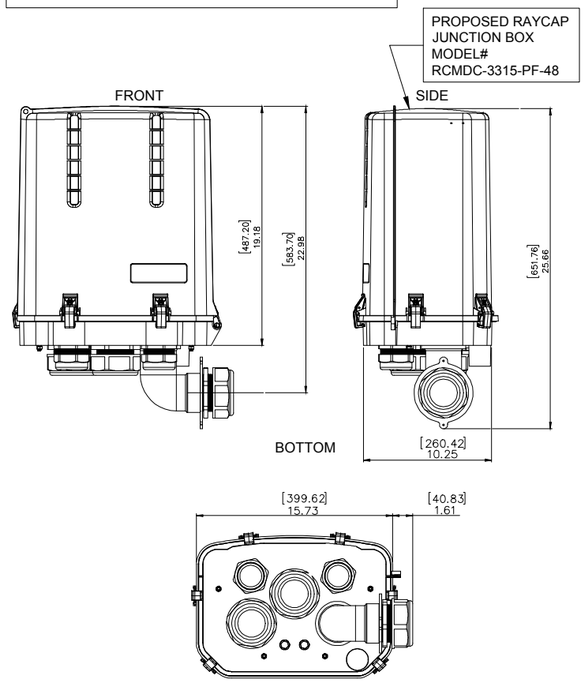
SHEET NUMBER
ANT-2



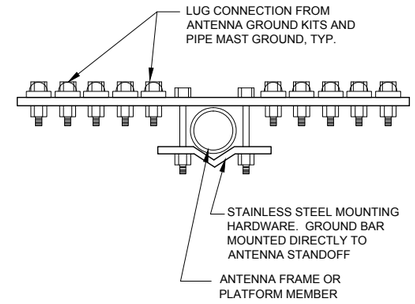
1 ANTENNA & RAYCAP JUNCTION BOX MOUNTING DETAIL
SCALE: N.T.S.

SPECIFICATIONS	DC SURGE PROTECTION FOR RRU/INTEGRATED ANTENNA RADIO HEAD
APPLICATION:	TOWER / BASE / ROOFTOP / ROOFTOP DISTRIBUTION MODELS
WEIGHT:	32LBS (14.51 KG)

[mm]
INCHES

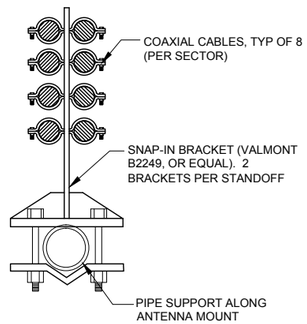


2 RAYCAP JUNCTION BOX DETAIL
SCALE: N.T.S.



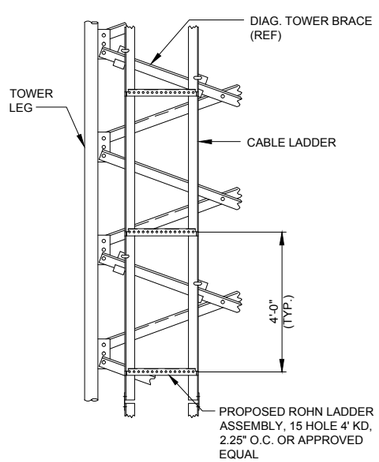
SECTION A-A

3 GROUND BAR AT SECTOR
N.T.S.

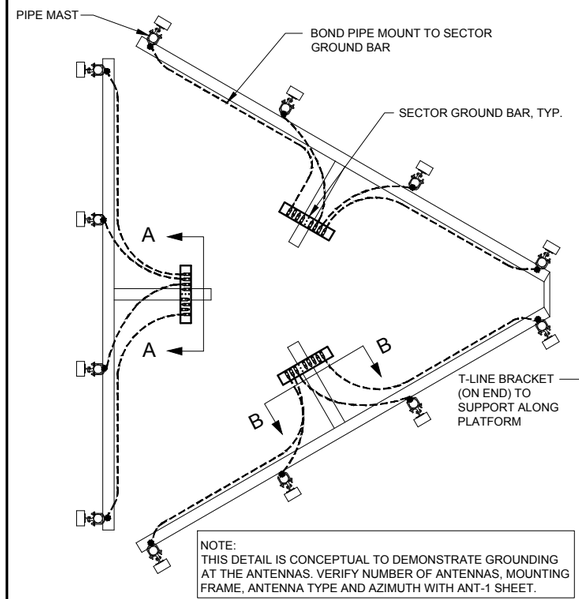


SECTION B-B

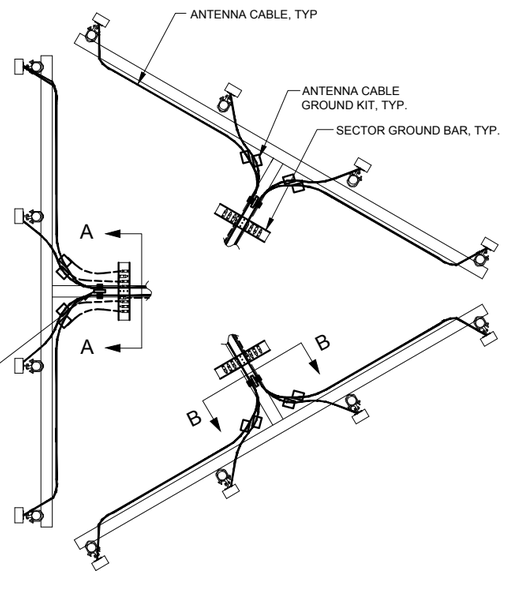
4 SNAP-IN BRACKET AT ANTENNA MOUNT
N.T.S.



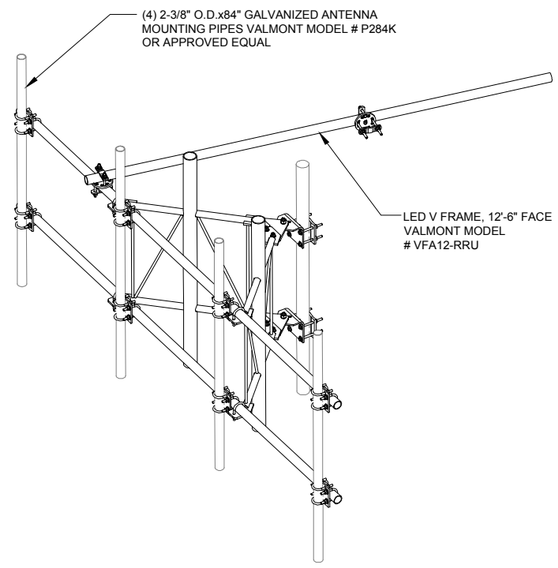
5 TRANSMISSION LINE HANGER
N.T.S.



6 PIPE MAST GROUNDING AT ANTENNA ELEVATION
N.T.S.



7 ANTENNA CABLE GROUNDING AT ANTENNA ELEVATION
N.T.S.



8 TYPICAL LED SECTOR V-FRAME DETAIL
N.T.S.

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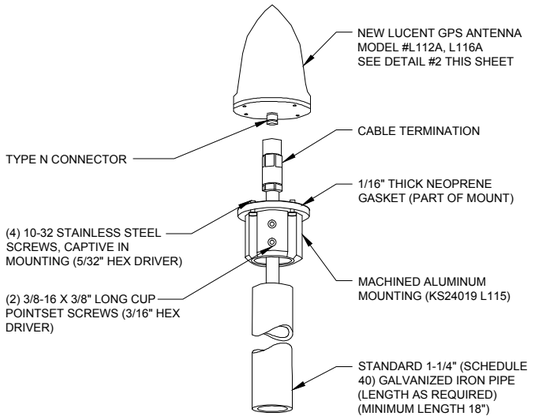
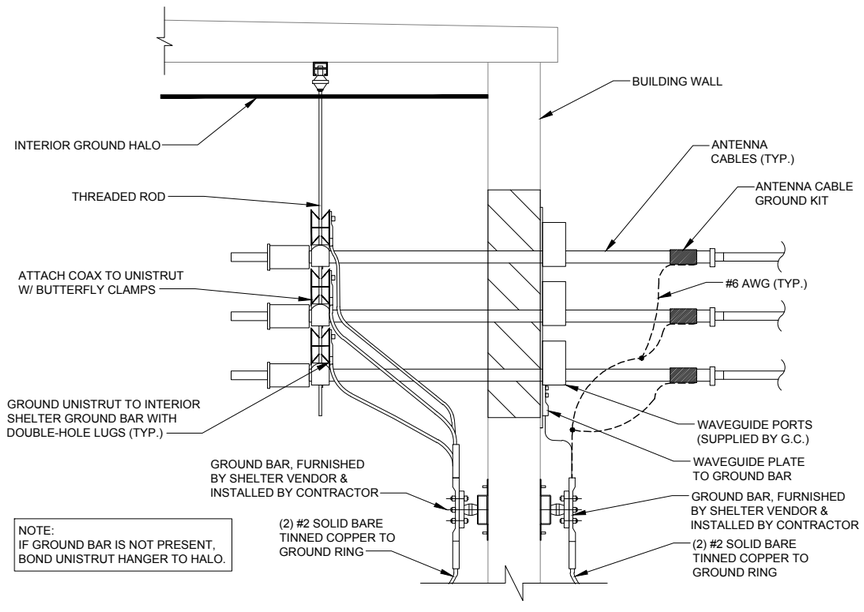
SHEET TITLE
ANTENNA MOUNTING DETAILS

SHEET NUMBER
ANT-3

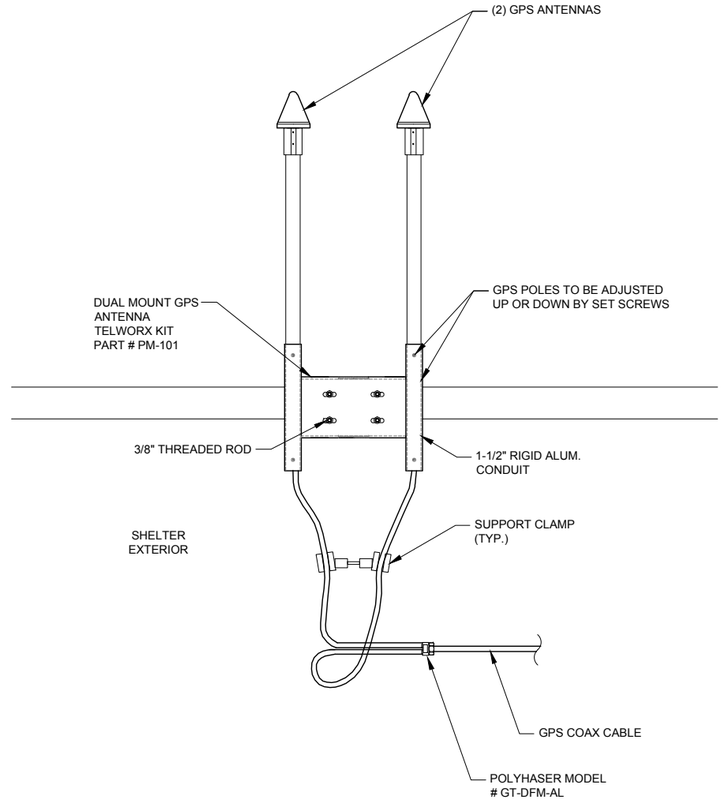
NOTE:
INSTALL EACH GPS ON THE CLOSEST ICE BRIDGE POSTS TO SHELTER (TYP. AT 2 LOCATIONS).



3 TYPICAL GPS DETAIL
N.T.S.



1 ENCLOSURE ENTRY PANEL GROUNDING DETAIL
N.T.S.



2 GPS MOUNTING DETAIL
N.T.S.

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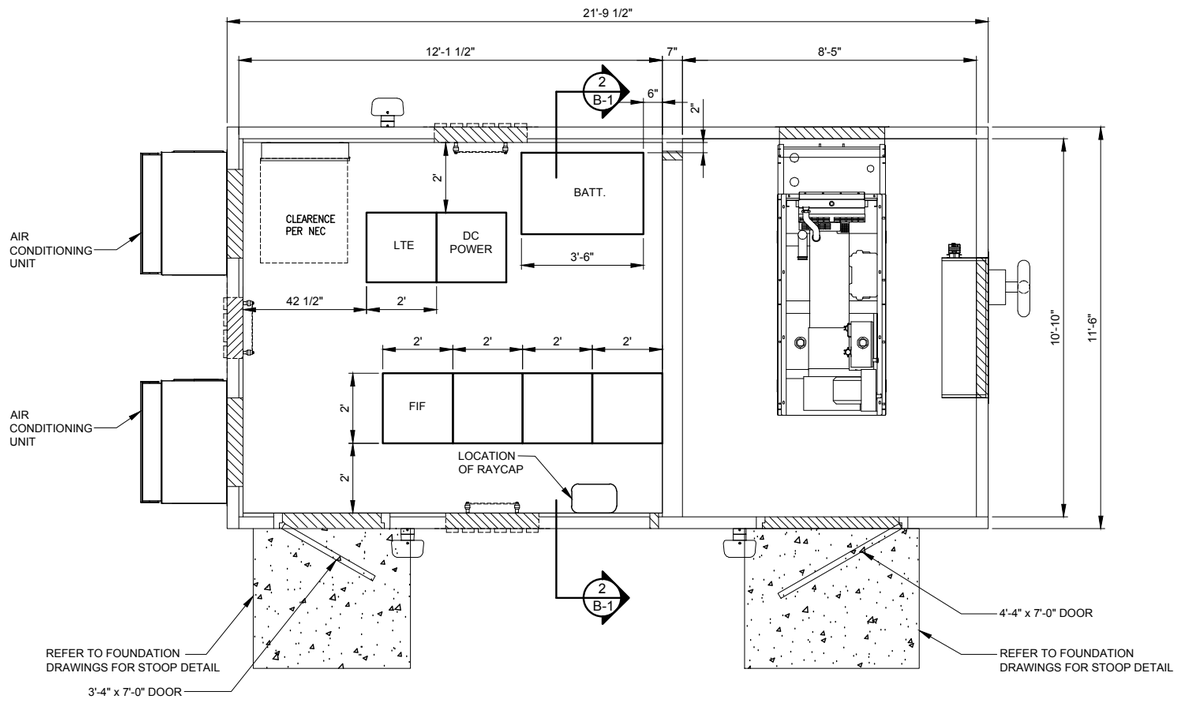
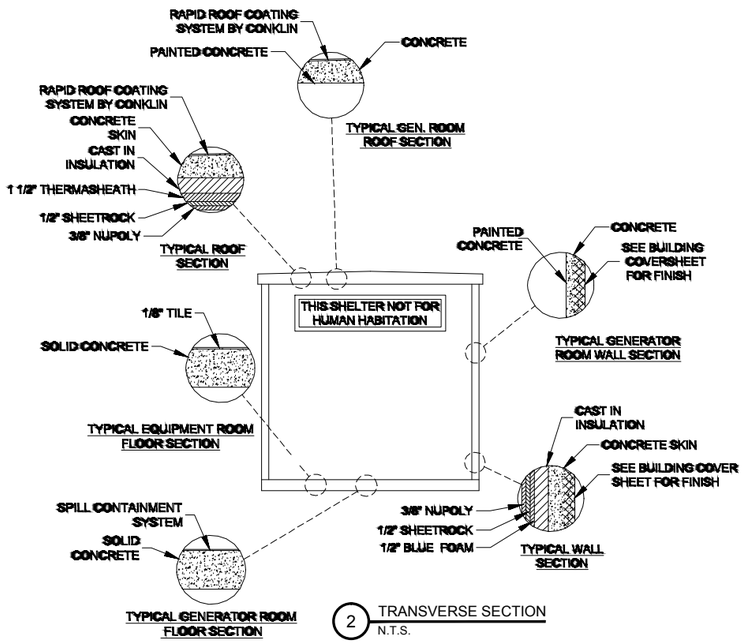
SHEET TITLE
ANTENNA MOUNTING DETAILS

SHEET NUMBER
ANT-4



1 FLOOR PLAN-EQUIPMENT ENCLOSURE
SCALE: 1/2" = 1'-0"

NOTE:
GENERAL CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL EXTERIOR ATTACHMENTS FOR GENERATOR (HOODS, MUFFLER, VENT, FILL, ETC.)



2 TRANSVERSE SECTION
N.T.S.

VENTILATION NOTES:

1. AIR CONDITIONING IS PROVIDED BY A BARD WALL MOUNTED SELF-CONTAINED ENERGY EFFICIENT COOLING SYSTEM, MODEL # WA602-A05EX2XI,5 TON, 120/240 VOLT, 30 AMP, SINGLE PHASE, 57,500 BTUH COOLING CAPACITY, 10.20 SEER, 24" DIA. FAN, 2600 CFM WITH FILTER
2. ELECTRIC HEAT IS PROVIDED BY 5 KW, 18,840 BTUH, 240 VOLT, SINGLE PHASE HEAT STRIP, WITHIN BARD UNIT LISTED ABOVE.

VENTILATION SCHEDULE

ROOM PURPOSE	AREA	VENTILATION				REMARKS
		NATURAL		MECHANICAL		
		ACTUAL	REQUIRED	ACTUAL	REQUIRED	
WIRELESS TELEPHONE EQUIPMENT ENCLOSURE (NON-INHABITED)	225.21 S.F.	0 CFM	0 CFM	2600 CFM	0 CFM	SEE NOTE 1.

NOTES:

1. EQUIPMENT ENCLOSURE IS PRE MANUFACTURED. THIS SHEET IS PROVIDED AS GUIDE ONLY. REFER TO ACTUAL DRAWINGS BY SHELTER MANUFACTURE FOR FULL BUILDING PLANS.
2. EPS BOARD INSULATION IS LISTED TO HAVE A FLAME SPREAD OF 25 OR LESS AND SMOKE DEVELOPED OF 450 OR LESS WITH A MAXIMUM THICKNESS OF 2 INCHES AT 1 PCF DENSITY. POLYISOCYANURATE FOAM INSULATION HAS BEEN TESTED TO A MAXIMUM THICKNESS OF 3 INCHES AT 1.9 PCF AND HAS A FLAME SPREAD OF 25 AND A SMOKE PRODUCT OF 395.
3. INTERIOR PANELING IS LISTED TO HAVE A FLAMESPREAD OF 200 OR LESS.
4. THIS ENCLOSURE IS CLASSIFIED AS USE GROUP S-2, TYPE 5B CONSTRUCTION; AND IS IN COMPLIANCE WITH 2003 INTERNATIONAL BUILDING CODE, 2003 INTERNATIONAL MECHANICAL CODE, 2002 NEC AND ILLINOIS ASHRAE 90.1.
5. DESIGN CRITERIA
   WIND LOAD = 125 MPH — FLOOR DEAD LOAD = 35 PSF
   ROOF LIVE LOAD = 105 PSF — WALL DEAD LOAD = 35 PSF
   FLOOR LIVE LOAD = 150 PSF — SNOW LOAD = 80 PSF
   ROOF DEAD LOAD = 45 PSF — SEISMIC EXPOSURE GROUP = III
6. F_c' = 5000 PSI @ 28 DAYS (EQUIPMENT ENCLOSURE)
7. ENCLOSURE AND ASSOCIATED EQUIPMENT IS PROVIDED BY OWNER UNDER SEPARATE CONTRACT. EQUIPMENT ENCLOSURE INFORMATION INDICATED HEREIN IS PROVIDED FOR REFERENCE ONLY AND IS TAKEN FROM MANUFACTURER'S AVAILABLE DATA. REFER TO CIVIL, STRUCTURAL AND ELECTRICAL DRAWINGS FOR WORK TO BE PERFORMED UNDER THIS CONTRACT.
8. PRIOR TO PROJECT CLOSE OUT AND SHELTER INSTALLATION, THE GENERAL CONTRACTOR IS TO CLEAN THE SHELTER FLOOR AND APPLY A STATIC- FREE WAX TO THE FLOORS.

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TERRA CONSULTING GROUP, LTD.
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PARK RIDGE, IL 60068
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REVISIONS

NO.	DESCRIPTION	DATE	BY
A	ISSUED FOR REVIEW	08/5/14	JLR
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C	UPDATE WITH NEW ECR	06/01/15	MAP
D	ISSUED PER FIBER COORDINATION	07/20/15	MT
E	UPDATE WITH NEW SHELTER & LATEST MOD DESIGN	07/22/15	BTE
F	UPDATE PER POWER COORDINATION	07/24/15	JTM
G	UPDATE PER VILLAGE COMMENTS	08/21/15	JTM

LOC. #187771

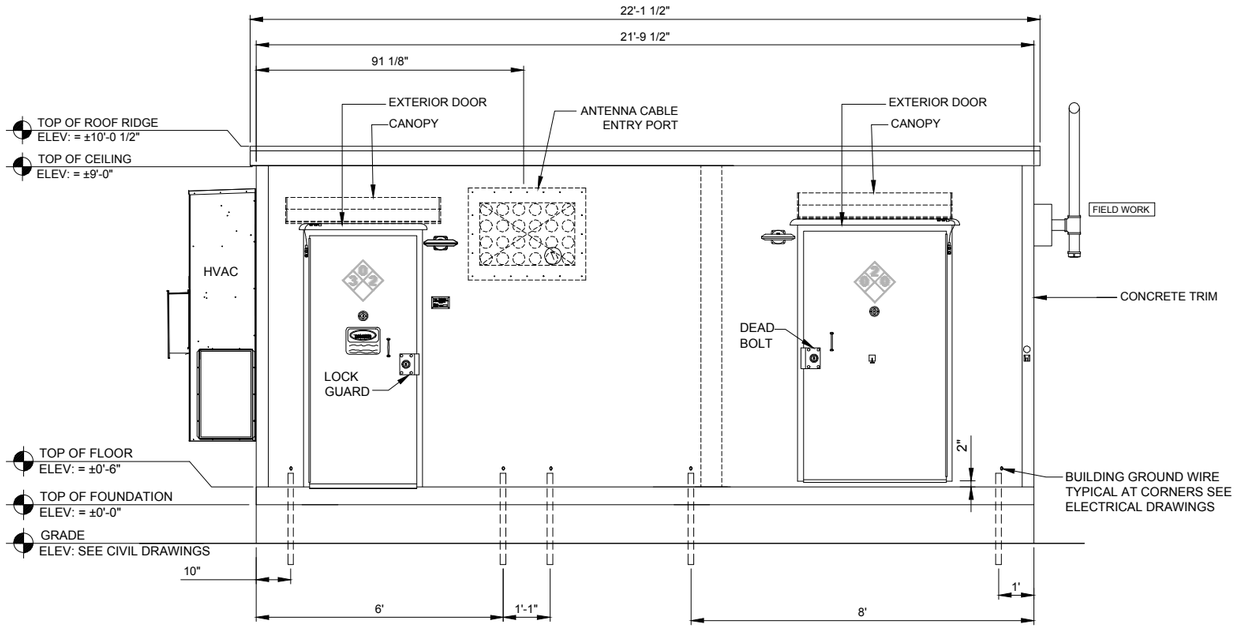
RT 7 & WEST

15101 WOLF RD
ORLAND PARK, IL 60467

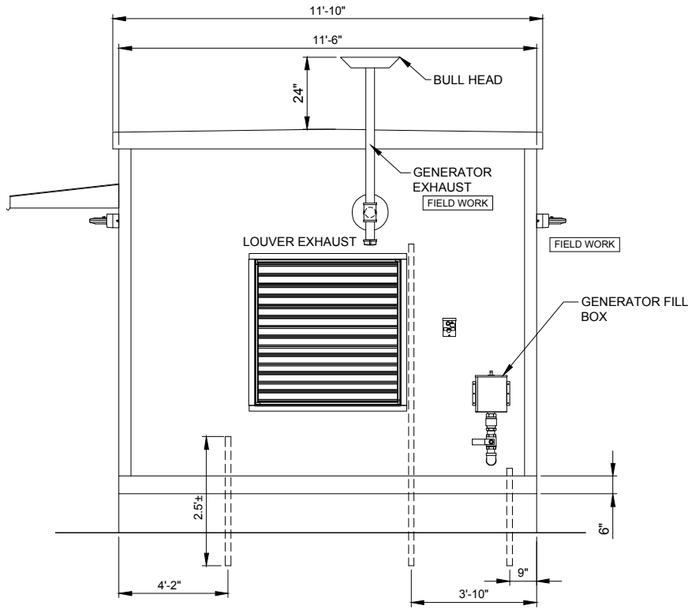
DRAWN BY:	PP
CHECKED BY:	TAZ
DATE:	05/22/14
PROJECT #:	33-1300

SHEET TITLE
EQUIPMENT ENCLOSURE PLAN & SECTION

SHEET NUMBER
B-1



1 ELEVATION-EQUIPMENT ENCLOSURE
SCALE: 1/2" = 1'-0"



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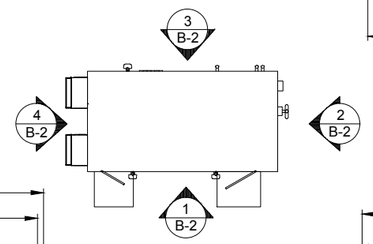
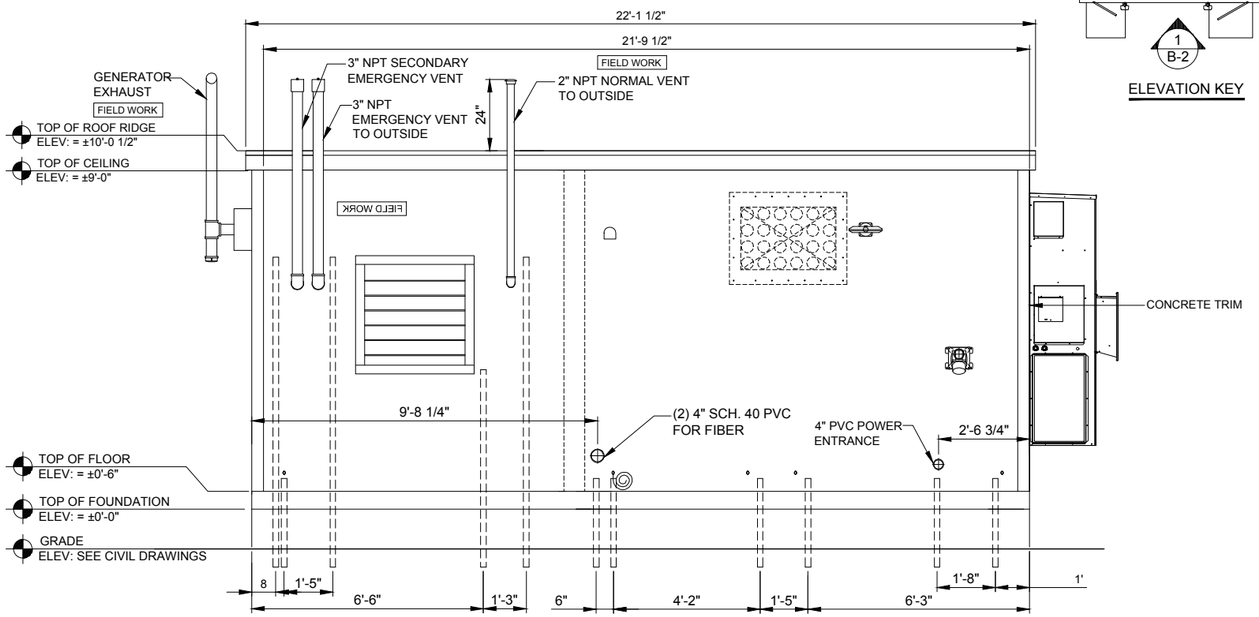
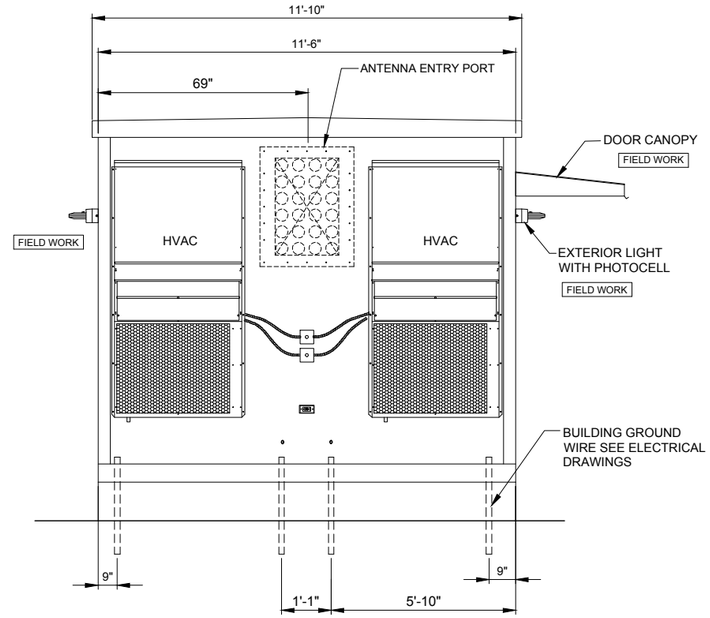


ELEVATION KEY



3 ELEVATION-EQUIPMENT ENCLOSURE
SCALE: 1/2" = 1'-0"



4 ELEVATION-EQUIPMENT ENCLOSURE
SCALE: 1/2" = 1'-0"

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SHEET TITLE
EQUIPMENT ENCLOSURE ELEVATIONS

SHEET NUMBER
B-2

UTILITY NOTES:

WORK INCLUDES:

THESE NOTES AND ACCOMPANYING DRAWINGS COMPLEMENT THE PROVISIONS AND INSTALLATIONS BY THE ELECTRICAL CONTRACTOR, OF ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED TO INSTALL THE ELECTRICAL WORK COMPLETE IN CONNECTION WITH THIS VERIZON WIRELESS SITE AND SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:

1. THE PROVISIONS, INSTALLATION, AND CONNECTION OF A GROUNDING ELECTRODE SYSTEM COMPLETE WITH A BUILDING AND SECONDARY GROUNDING, CELLULAR TELEPHONE COMMUNICATIONS TOWER AND CONNECTIONS TO THE INCOMING ELECTRICAL DISTRIBUTION EQUIPMENT.
2. THE PROVISION AND INSTALLATION OF AN OVERHEAD ELECTRICAL SERVICE OR UNDERGROUND ELECTRICAL SERVICE AND ALL ASSOCIATED WIRE AND CONDUIT AS REQUIRED AND/OR INDICATED ON PLANS.
3. THE PROVISION, INSTALLATION OF CONDUIT AND CONNECTIONS FOR LOCAL TELEPHONE SERVICE.
4. THE FURNISHING AND INSTALLATION OF THE ELECTRICAL SERVICE ENTRANCE CONDUCTORS, CONDUITS, METER SOCKET, AND CONNECTIONS TO THE SERVICE EQUIPMENT WITHIN THE ENCLOSURE.
5. TWO INCH (2") AND THREE INCH (3") DIAMETER PVC CONDUITS SCHEDULE 40.
6. ALL PVC CONDUITS SHOULD BE LEFT WITH NYLON PULL CORD FOR FUTURE USE.
7. EXCAVATION, TRENCHING, AND BACKFILLING FOR CONDUIT(S), CABLE(S), AND EXTERNAL GROUNDING SYSTEM.

CODES, PERMITS, AND FEES:

1. ALL REQUIRED PERMITS, LICENSES, INSPECTIONS AND APPROVALS SHALL BE SECURED AND ALL FEES FOR SAME PAID BY CONTRACTOR.
2. THE INSTALLATION SHALL COMPLY WITH ALL APPLICABLE CODES: STATE, LOCAL AND NATIONAL, AND THE DESIGN, PERFORMANCE CHARACTERISTICS AND METHODS OF CONSTRUCTION OF ALL ITEMS AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE LATEST ISSUE OF THE VARIOUS APPLICABLE STANDARD SPECIFICATIONS OF THE FOLLOWING AUTHORITIES:

N.E.C.	NATIONAL ELECTRIC CODE
A.N.S.I.	AMERICAN NATIONAL STANDARDS INSTITUTE
I.E.E.E.	INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS
A.S.T.M.	AMERICAN SOCIETY FOR TESTING MATERIALS
N.E.M.A.	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
U.L.	UNDERWRITERS LABORATORIES, INC.
N.F.P.A.	NATIONAL FIRE PROTECTION ASSOCIATION

RACEWAYS AND WIRING:

1. WIRING OF EVERY KIND MUST BE INSTALLED IN CONDUIT, UNLESS NOTED OTHERWISE, OR AS APPROVED BY THE ENGINEER.
2. UNLESS OTHERWISE SPECIFIED, ALL WIRING SHALL BE COPPER (CU) TYPE THWN, SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.
3. RACEWAYS SHALL BE GALVANIZED STEEL, SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, UNLESS OTHERWISE NOTED. ALL RACEWAYS SHALL BE APPROVED FOR THE INSTALLATION.
4. PULL OR JUNCTION BOXES SHALL BE PROVIDED AS REQUIRED TO FACILITATE INSTALLATION OF RACEWAYS AND WIRING. PROVIDE JUNCTION AND PULLBOXES FOR CONDUIT RUNS WITH MORE THAN (360) DEGREES OF BENDS.
5. PROVIDE A COMPLETE RACEWAY AND WIRING INSTALLATION, PERMANENTLY AND EFFECTIVELY GROUNDED IN ACCORDANCE WITH ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE AND LOCAL CODES.
6. ELECTRICAL PANELBOARD SHALL BE FURNISHED AND INSTALLED BY OTHERS. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION.
7. ALL STEEL CONDUIT SHALL BE BONDED AT BOTH ENDS WITH GROUNDING BUSHING.

GENERAL NOTES:

SEE DETAILS AND SCHEDULES ON DRAWINGS AND SPECIFICATIONS FOR MEANING OF ABBREVIATIONS AND ADDITIONAL REQUIREMENTS AND INFORMATION. CHECK ARCHITECTURAL, STRUCTURAL AND OTHER MECHANICAL AND ELECTRICAL DRAWINGS FOR SCALE, SPACE LIMITATIONS, COORDINATION, AND ADDITIONAL INFORMATION, ETC. REPORT ANY DISCREPANCIES, CONFLICTS, ETC. TO ENGINEER BEFORE SUBMITTING BID. ALL EQUIPMENT FURNISHED BY OTHERS (FBO) SHALL BE PROVIDED WITH PROPER MOTOR STARTERS, DISCONNECTS, CONTROLS, ETC. BY THE ELECTRICAL CONTRACTOR UNLESS SPECIFICALLY NOTED OTHERWISE. THE ELECTRICAL CONTRACTOR SHALL INSTALL AND COMPLETELY WIRE ALL ASSOCIATED EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S WIRE DIAGRAMS AND AS REQUIRED FOR A COMPLETE OPERATING INSTALLATION. ELECTRICAL CONTRACTOR SHALL VERIFY AND COORDINATE ELECTRICAL CHARACTERISTICS AND REQUIREMENTS OF (FBO) EQUIPMENT PRIOR TO ROUGH-IN OF CONDUIT AND WIRING TO AVOID CONFLICTS.

COORDINATION WITH UTILITY COMPANY:

THE ELECTRICAL CONTRACTOR SHALL COORDINATE COMPLETE ELECTRICAL SERVICE WITH LOCAL UTILITY COMPANY FOR A COMPLETE OPERATIONS SYSTEM, INCLUDING TRANSFORMER CONNECTIONS, CONCRETE TRANSFORMER PADS, IF REQUIRED, METER SOCKETS, PRIMARY CABLE RACEWAY REQUIREMENTS, SECONDARY SERVICE, ETC. PRIOR TO SUBMITTING BID TO INCLUDE ALL LABOR AND MATERIALS. THE ELECTRICAL CONTRACTOR SHALL INCLUDE IN THE BID ANY OPTIONAL OR EXCESS FACILITY CHARGES ASSOCIATED WITH PROVIDING ELECTRICAL SERVICE FROM LOCAL UTILITY COMPANY. VERIFY BEFORE BIDDING TO INCLUDE ALL COSTS. THE ELECTRICAL CONTRACTOR SHALL VERIFY THE AVAILABLE FAULT CURRENT WITH THE LOCAL UTILITY COMPANY PRIOR TO SUBMITTING BID. ADJUST A.I.C. RATINGS OF ALL OVER CURRENT PROTECTION DEVICES IN DISTRIBUTION EQUIPMENT AS REQUIRED TO COORDINATE WITH AVAILABLE FAULT CURRENT FROM LOCAL UTILITY COMPANY. ALL GROUNDING RODS PROVIDED BY THE POWER OR TELEPHONE UTILITY COMPANIES MUST BE TIED INTO THE MAIN EXTERNAL GROUND RING.

UTILITY CONTACTS:

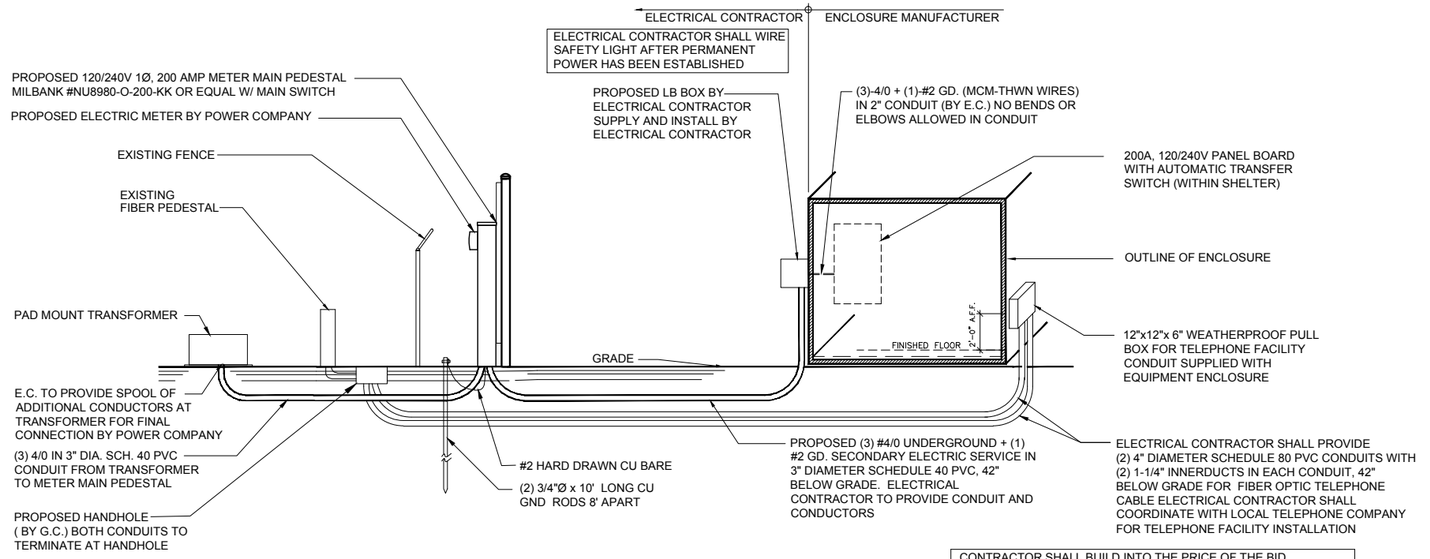
POWER: COMED

KATHRYN SUGRUE
708-235-2337
ACCT: 05251-69199

ELECTRICAL CONTRACTOR SHALL COORDINATE WITH POWER COMPANY FOR ENTRY INTO FENCED AREA BY EITHER MAILING A KEY TO A SLAVE LOCKED CHAIN AT THE FENCE GATE OR CALLING AND LEAVING A COMBINATION.

FIBER: AT&T
JIM DELLAMANO
(815) 727-8015

FOR CONTINUATION AND CONNECTION OF ELECTRIC AND TELEPHONE SERVICE. COORDINATE WITH ELECTRIC AND PHONE COMPANY

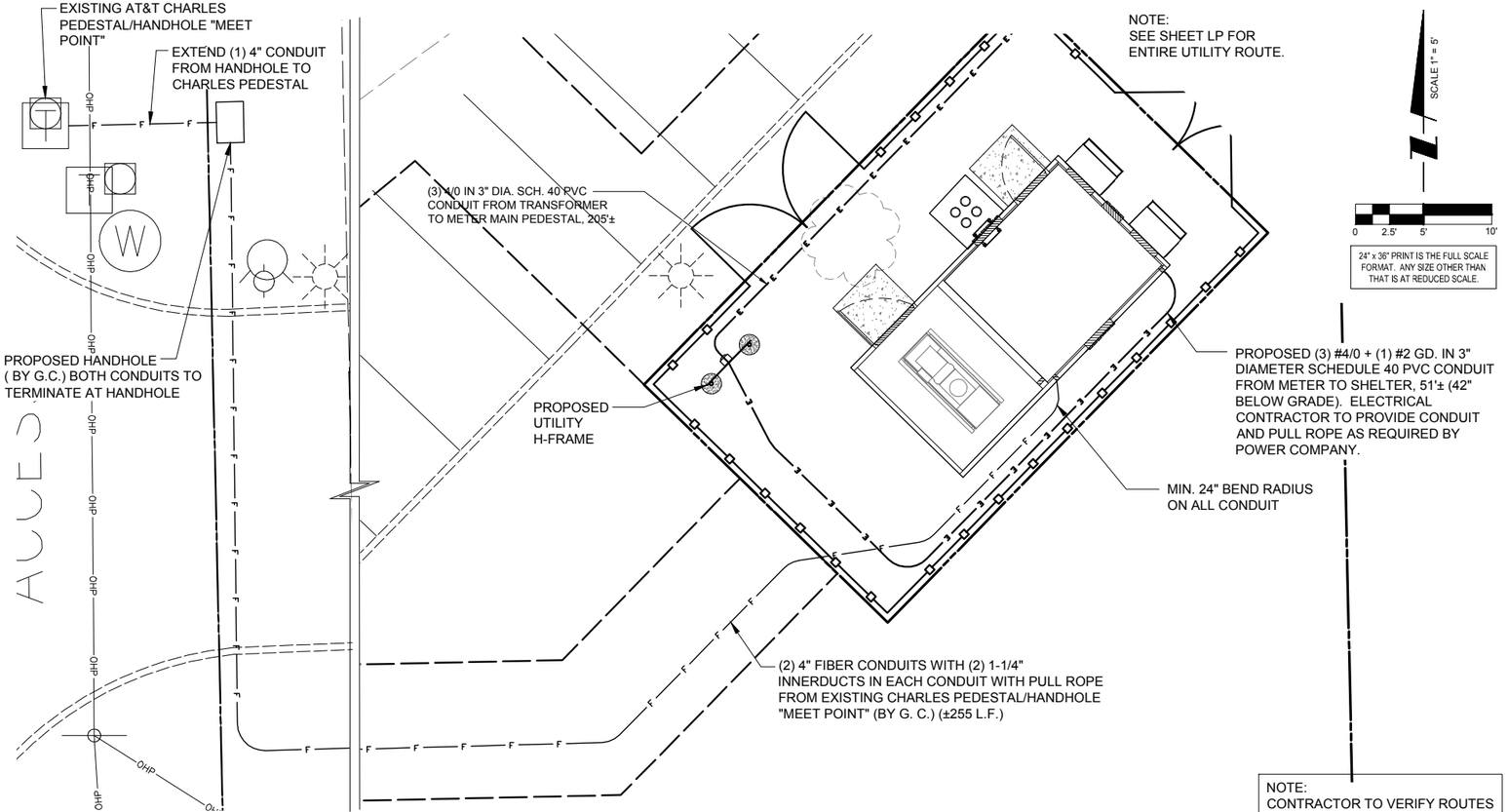


ELECTRICAL SERVICE: 200 AMP 120/240V SINGLE PHASE 3 WIRE

NOTE: VERIFY TELEPHONE ROUTING REQUIREMENTS WITH LOCAL TELEPHONE COMPANY

CONTRACTOR SHALL BUILD INTO THE PRICE OF THE BID THE COST OF TWO (2) MOBILIZATIONS:
1) POWER/TELCO PERMIT PULLED PRIOR TO BUILDING PERMIT AND PRELIMINARY WORK (SMART JACK ON A STICK, ETC) COMPLETED PRIOR TO GENERAL CONSTRUCTION
2) RETURN TO COMPLETE GENERAL ELECTRICAL CONSTRUCTION

2 ELECTRICAL RISER DIAGRAM
SCALE: N.T.S.



1 SITE UTILITY ROUTING PLAN
SCALE: 1" = 5'

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SHEET TITLE

UTILITY ROUTING PLAN

SHEET NUMBER

E-1

GROUNDING ELECTRODE SYSTEM NOTES:

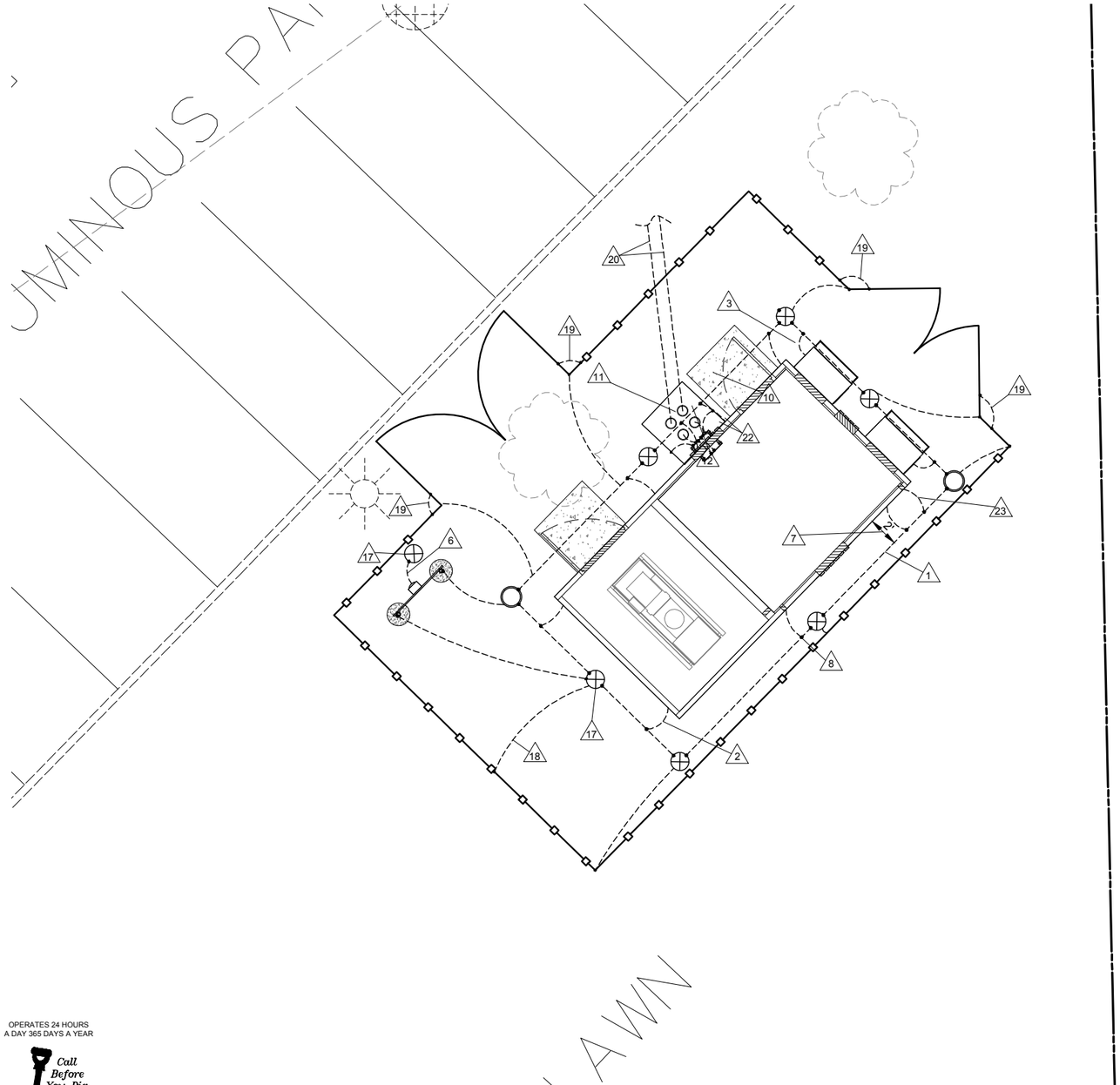
1. ALL GROUNDING CONNECTIONS SHALL BE MADE BY THE EXOTHERMIC PROCESS CONNECTIONS SHALL INCLUDE ALL CABLE TO CABLE, SPLICES, ETC. ALL CABLE TO GROUND RODS, GROUND RODS SPLICES AND LIGHTNING PROTECTION SYSTEM AS INDICATED. GROUND FOUNDATION ONLY AS INDICATED BY PM. ALL MATERIALS USED (MOLDS, WELDING, METAL, TOOLS, ETC.) SHALL BE BY EXOTHERMIC PROCESS AND INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND PROCEDURES. GROUND CONDUCTOR SHALL HAVE A MINIMUM 24" BENDING RADIUS.
2. ALL EXOTHERMIC CONNECTIONS ON GALVANIZED SURFACES SHALL BE CLEANED THOROUGHLY AND COLORED TO MATCH SURFACE WITH (2) TWO COATS OF SHERWIN-WILLIAMS GALVITE (WHITE) PAINT B50W3 (OR EQUAL) OR SHERWIN- WILLIAMS SILVERBRITE (ALUMINUM) B69S11 (OR EQUAL).
3. ALL ELECTRICAL & MECHANICAL GROUND CONNECTIONS SHALL HAVE ANTI-OXIDANT COMPOUND APPLIED TO CONNECTION

LEGEND	
SYMBOL	DESCRIPTION
⊗	5/8" DIAMETER x 10'-0" LONG COPPER CLAD GROUND ROD (HARGER-5810)
O	5/8" DIAMETER X 10'-0" LONG COPPER CLAD GROUND ROD WITH INSPECTION WELL
– – – – – –	#2 AWG TNND SOLID BARE COPPER WIRE MINIMUM 42" BELOW GRADE (HARGER-L2)
– – – UE– – –	UNDERGROUND ELECTRICAL
– – – UT– – –	UNDERGROUND TELEPHONE
– – – F – – –	UNDERGROUND FIBER
———•———	EXOTHERMIC WELD
——OE——	OVERHEAD ELECTRICAL SERVICE
——OT——	OVERHEAD TELEPHONE SERVICE

4. FENCE/GATE: GROUND FENCE POSTS WITHIN 6 FEET OF ENCLOSURE AND 25 FEET OF TOWER AS INDICATED ON DRAWINGS. GROUND EACH GATE POST AND CORNER POST. GROUND CONNECTIONS TO FENCE POSTS SHALL BE MADE BY THE EXOTHERMIC PROCESS AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND PROCEDURES. ALL OTHER CONNECTIONS FOR THE GROUND GRID SYSTEM SHALL BE MADE BY THE EXOTHERMIC PROCESS, AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND PROCEDURES.
5. AFTER INSTALLATION OF THE CANOPY AT THE DOOR, GC/EC IS TO BOND THE CANOPY TO THE DOOR FRAME WITH A #2 CONDUCTOR. USE DOUBLE-LUG CONNECTION. PREP AND PAINT SURFACE TO MATCH AFTER INSTALLATION.
6. UTILITY COMPANY COORDINATION: ELECTRICAL CONTRACTOR SHALL CONFIRM THAT ALL WORK IS IN ACCORDANCE WITH THE RULES OF THE LOCAL UTILITY COMPANY BEFORE SUBMITTING THE BID, THE CONTRACTOR SHALL CHECK WITH THE UTILITY COMPANIES SUPPLYING SERVICE TO THIS PROJECT AND SHALL DETERMINE FROM THEM ALL EQUIPMENT AND CHARGES WHICH THEY WILL REQUIRE AND SHALL INCLUDE THE COST IN THE BID.
7. GROUND TEST: GROUND TESTS SHALL BE PERFORMED AS REQUIRED BY LESSEE STANDARD PROCEDURES. GROUND GRID RESISTANCE SHALL NOT EXCEED 5 OHMS.
8. CONTRACTOR SHALL SUBMIT THE GROUND RESISTANCE TEST REPORT AS FOLLOWS:
   1. ONE (1) COPY TO OWNER REPRESENTATIVE
   2. ONE (1) COPY TO ENGINEER
   3. ONE (1) COPY TO KEEP INSIDE EQUIPMENT ENCLOSURE

TYPICAL KEYED GROUNDING NOTES

1. #2 AWG TNND SOLID BARE COPPER CONDUCTOR 42" BELOW GRADE (TYPICAL) MINIMUM 24" BENDING RADIUS
2. ENCLOSURE GROUND (TYP.) IN 1/2" DIAMETER SCHEDULE 40 PVC CONDUIT
3. GROUND EQUIPMENT ENCLOSURE HVAC WITH MECHANICAL CLAMP (SEE DETAIL, SHEET E-3).
4. 24" x 30" x 24" FIBER OPTIC HAND HOLE (SEE DETAIL, SHEET E-3)
5. 4" x 12" x 1/4" GROUND BAR INSIDE OF HAND HOLE. G.C. TO DRIVE 10' GROUND ROD & CLAMP TO GROUND BAR (SEE DETAIL, SHEET E-3)
6. #2 AWG TNND SOLID BARE COPPER CONDUCTOR 42" BELOW GRADE (SEE DETAIL, SHEET E-3)
7. MAINTAIN TWO FOOT DISTANCE OFF OF STRUCTURES.
8. GROUND TELEPHONE SERVICE ENTRANCE (SEE DETAIL, SHEET E-3).
9. ELECTRIC METER AND ELECTRIC SERVICE GROUNDING (SEE DETAIL SHEET E-4), COORDINATE ALTERNATE WITH PM
10. GROUND COAXIAL ANTENNA CABLES TO GROUND BAR BY ANTENNA CONTRACTOR TERMINATE CABLES 1'-0" FROM ENCLOSURE AND INSTALL LIGHTNING SURGE ARRESTORS ON EACH CABLE GROUND.
11. EXOTHERMICALLY WELD COPPER GROUND BAR TAIL TO EXTERIOR HALO GROUND RING (EXOTHERMIC CONNECTION TYPE TA) BY ANTENNA CONTRACTOR. FINAL CONNECTION BY ELECTRICAL CONTRACTOR.
12. 4"X20"X1/4" TNND INSULATED COPPER GROUND BAR, NON ISOLATED WITH 10.0' LONG #2 AWG TNND SOLID COPPER WIRE WELDED TAILS (HARGER GBIT 14420VW)
13. GROUND CABLE WAVEGUIDE BRIDGE (TYP.) BY ELECTRICAL CONTRACTOR.
14. 4"x20"x1/4" TNND INSULATED COPPER GROUND BAR, NON-ISOLATED, WITH 10.0' LONG #2 AWG TNND SOLID COPPER WIRE WELDED TAILS (HARGER GBIT 14420VW)
15. GROUND ANTENNA CABLES TO GROUND BAR AT ANTENNA ELEVATION OF TOWER. GROUND BASE GROUND BAR TO GROUND HALO.
16. ASSUMED LOCATION OF EXISTING TOWER GROUND RING
17. 5/8" DIAMETER X 10'-0" LONG COPPER CLAD GROUND ROD (HARGER-5810) (SEE DETAIL, SHEET E-3) WITH EXOTHERMIC CONNECTION
18. GROUND CHAIN LINK FENCE (TYPICAL) EXOTHERMIC CONNECTION (TYPE VS) GROUND FENCE POSTS WITHIN 6 FEET OF ENCLOSURE AND 25 FEET OF TOWER. (SEE DETAIL, SHEET E-3.)
19. GATE JUMPERS (SEE DETAIL, SHEET E-4)
20. BOND EXISTING TOWER GROUND RING TO PROPOSED GROUND RING WITH #2 AWG TNND SOLID COPPER CONDUCTOR IN 2 LOCATIONS.
21. VERIFY SERVICE DISCONNECT GROUND IS IN PLACE AT EXISTING MULTI METER RACK.
22. TWO #2 LEADS FROM THE EGR TO THE MGB LOCATED IN THE SHELTER. CADWELD AT EGR AND DOUBLE HOLE LUGS IN SHELTER.
23. ELECTRIC SERVICE ENTRY GROUND
24. GROUND LEAD FROM MUFFLER/VENT PIPES
25. RE-BAR GROUND (UFER GROUND) #2 FROM BOTTOM RE-BAR TO GROUND RING.



SCALE 1" = 4'

0 2' 4' 8'

24" x 36" PRINT IS THE FULL SCALE FORMAT. ANY SIZE OTHER THAN THAT IS AT REDUCED SCALE.

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1 SITE GROUNDING PLAN
SCALE: 1" = 4'

NOTE:
SEE GROUNDING DETAILS ON SHEETS E-3 & E-4

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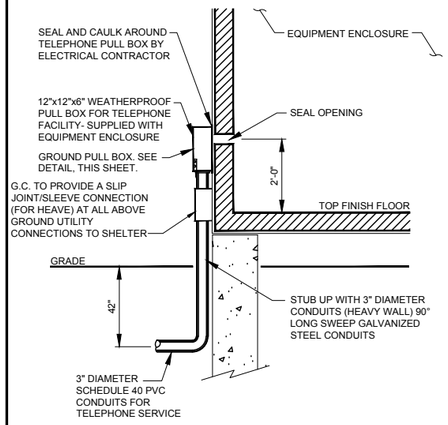
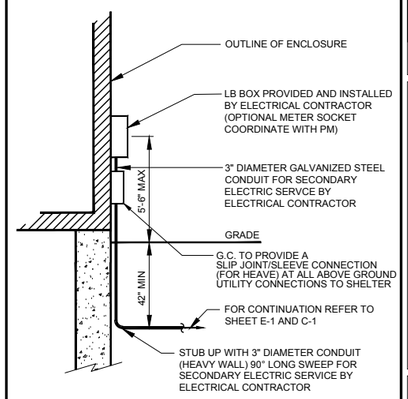
SHEET TITLE
SITE GROUNDING PLAN

SHEET NUMBER
E-2

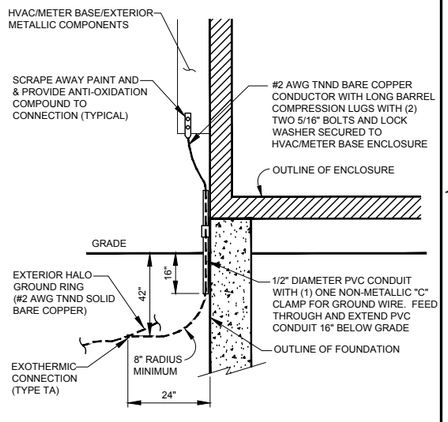
1 NOT USED
N.T.S.



2 TELEPHONE SERVICE ENTRANCE
N.T.S.



3 UNDERGROUND ELEC. SERVICE DETAIL
N.T.S.



4 HVAC/METER BASE/METALLIC COMPONETS GROUNDING DETAIL
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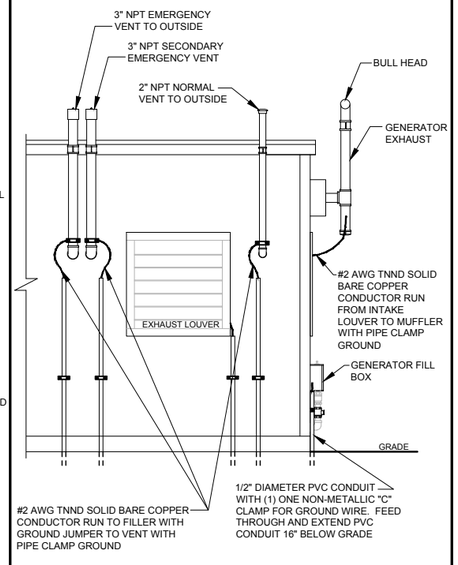
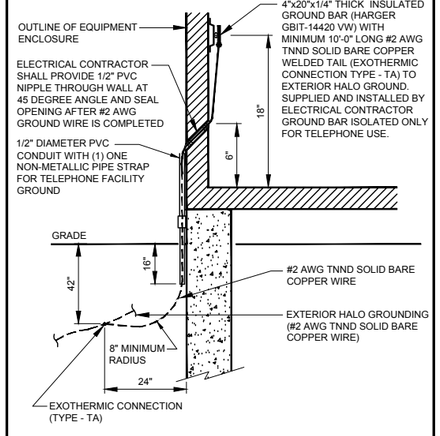


5 EQUIPMENT ENCLOSURE GROUNDING
N.T.S.



6 TELCO FACILITY GROUND
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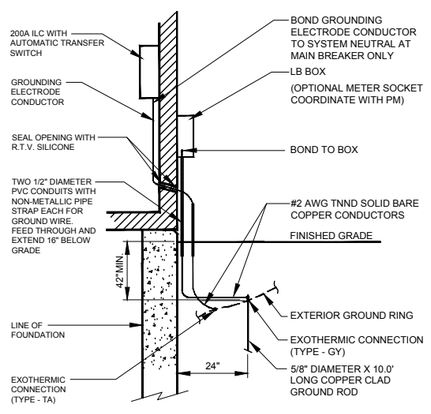
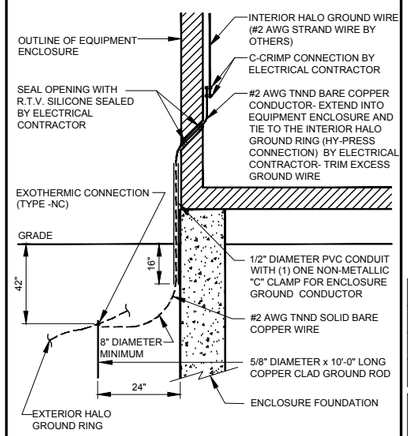


7 ELECTRIC SERVICE GROUNDING DETAIL
N.T.S.



8 ENCLOSURE GROUNDING DETAIL
N.T.S.

CHICAGO SMSA
limited partnership
d/b/a VERIZON WIRELESS

TERRA CONSULTING GROUP, LTD.
600 BUSSE HIGHWAY
PARK RIDGE, IL 60068
PH: 847-698-6400
FAX: 847-698-6401

REVISIONS

NO	DESCRIPTION	DATE	BY
A	ISSUED FOR REVIEW	08/5/14	JLR
B	UPDATE PER ECR	09/24/14	JTM
C	UPDATE WITH NEW ECR	06/01/15	MAP
D	ISSUED PER FIBER COORDINATION	07/20/15	MT
E	UPDATE WITH NEW SHELTER & LATEST MOD DESIGN	07/22/15	BTE
F	UPDATE PER POWER COORDINATION	07/24/15	JTM
G	UPDATE PER VILLAGE COMMENTS	08/21/15	JTM

LOC. #187771

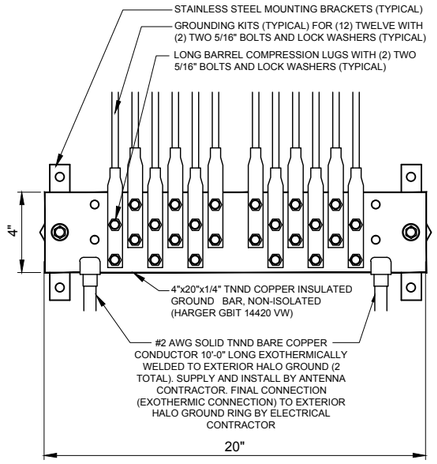
RT 7 & WEST

15101 WOLF RD
ORLAND PARK, IL 60467

DRAWN BY:	PP
CHECKED BY:	TAZ
DATE:	05/22/14
PROJECT #:	33-1300

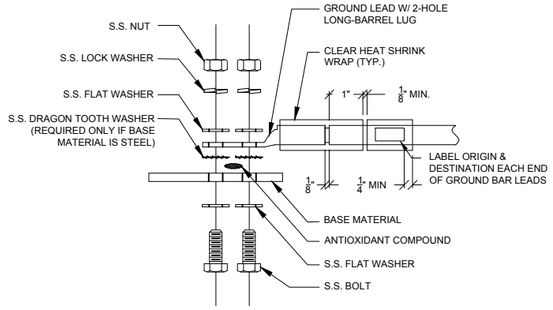
SHEET TITLE
ELECTRICAL AND GROUNDING DETAILS

SHEET NUMBER
E-3



1 EXTERIOR GROUND BAR DETAIL
N.T.S.

NOTES:
1. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING BELLEVILLES. COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A DRAGON TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
3. GROUND BARS, INSTALL BOLT HEAD TOWARD WALL
4. ENCLOSURES, INSTALL BOLT HEAD ON OUTSIDE OF ENCLOSURE



3 GROUND LIG INSTALLATION DETAIL
N.T.S.

Type GT
THROUGH CABLE TO TOP OF GROUND ROD.

Type TA
TEE OF HORIZONTAL RUN AND TAP CABLES.

Type HS
HORIZONTAL CABLE TAP TO HORIZONTAL STEEL SURFACE OR PIPE. CABLE OFF SURFACE.

Type VV
THROUGH VERTICAL CABLE TO VERTICAL STEEL SURFACE OR TO THE SIDE OF EITHER HORIZONTAL OR VERTICAL PIPE

Type XB
CROSS OF HORIZONTAL CABLES. LAPPED AND NOT CUT

Type VN
HORIZONTAL CABLE TAP TO VERTICAL STEEL SURFACE OR THE SIDE OF HORIZONTAL PIPE

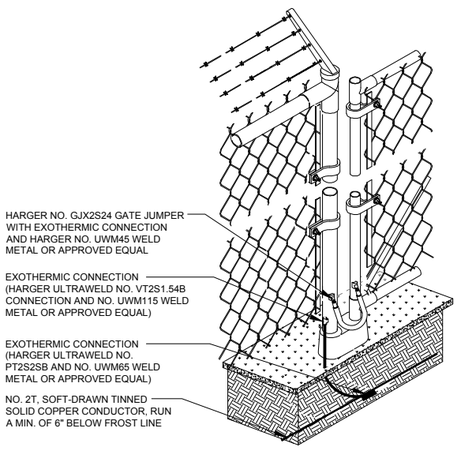
Type VS
CABLE TAP DOWN AT 45° TO VERTICAL STEEL SURFACE OR SIDE OF HORIZONTAL OR VERTICAL PIPE.

Type GY
THROUGH CABLE TO SIDE OF GROUND ROD

Type GR
CABLE TAP TO TOP OF GROUND ROD

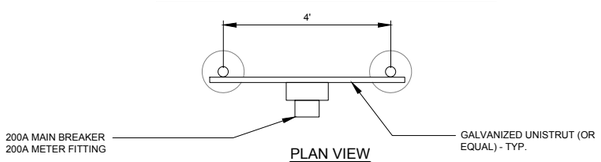
Type NC
THROUGH AND TAP CABLES TO GROUND ROD

4 EXOTHERMIC WELD DETAILS
EXOTHERMIC AND HARGER ULTRAWELD OR APPROVED EQUAL

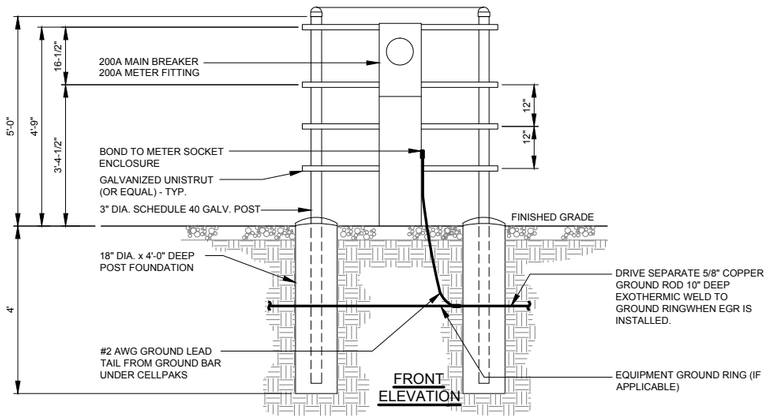


5 FENCE GROUNDING DETAIL
N.T.S.

NOTE:
CONTRACTOR SHALL PROVIDE UNDERGROUND APPROVED 25 PAIR CABLE, AWG #22 INSTALLED 5" INTO JUNCTION BOX AND 10' INTO ENCLOSURE. CONTRACTOR SHALL NOT TERMINATE CABLE.

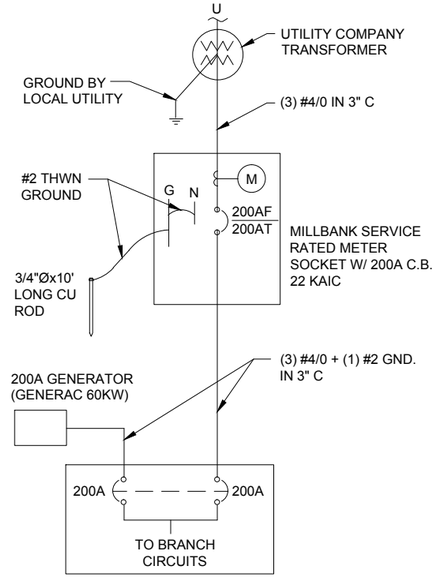


PLAN VIEW



FRONT ELEVATION

6 H-FRAME WITH METER / TELCO BOXES
N.T.S.



GENERAC 200A 120/240V, 1Ø PANEL BOARD WITH AUTOMATIC TRANSFER

7 SINGLE LINE DIAGRAM
N.T.S.

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SHEET TITLE
ELECTRICAL AND GROUNDING DETAILS

SHEET NUMBER
E-4

GENERAL

THE CONSTRUCTION DOCUMENT DRAWINGS ARE INTERRELATED. WHEN PERFORMING THE WORK, EACH CONTRACTOR MUST REFER TO ALL DRAWINGS. COORDINATION IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.

DIVISION 1: GENERAL REQUIRMENTS

SECTION 01700 – PROJECT CLOSEOUT

PART 1 – GENERAL

A. OBTAIN AND SUBMIT RELEASES ENABLING THE OWNER UNRESTRICTED USE OF THE WORK AND ACCESS TO SERVICES AND UTILITIES; INCLUDE OCCUPANCY PERMITS, OPERATING CERTIFICATES AND SIMILAR RELEASES.

B. SUBMIT RECORD DRAWINGS, DAMAGE OR SETTLEMENT SURVEY, PROPERTY SURVEY, AND SIMILAR FINAL RECORD INFORMATION.

C. COMPLETE FINAL CLEAN UP REQUIREMENTS, INCLUDING TOUCH–UP PAINTING. TOUCH UP AND OTHERWISE REPAIR AND RESTORE MARRED EXPOSED FINISHES.

PART 2 – FINAL CLEANING

1. COMPLETE THE FOLLOWING CLEANING OPERATIONS BEFORE REQUESTING INSPECTION FOR CERTIFICATION OF COMPLETION.
   A. CLEAN THE PROJECT SITE, YARD AND GROUNDS, IN AREAS DISTURBED BY CONSTRUCTION ACTIVITIES, INCLUDING LANDSCAPE DEVELOPMENT AREAS, OF RUBBISH, WASTE MATERIALS, LITTER AND FOREIGN SUBSTANCES. SWEEP PAVED AREAS BROOM CLEAN. REMOVE PETRO–CHEMICAL SPILLS, STAINS AND OTHER FOREIGN DEPOSITS. RAKE GROUNDS THAT ARE NEITHER PLANTED NOR PAVED, TO A SMOOTH EVEN–TEXTURED SURFACE.
   B. REMOVE TOOLS, CONSTRUCTION EQUIPMENT, MACHINERY AND SURPLUS MATERIAL FROM THE SITE.
   C. REMOVE SNOW AND ICE TO PROVIDE SAFE ACCESS TO THE SITE AND EQUIPMENT ENCLOSURE.
   D. CLEAN EXPOSED EXTERIOR AND INTERIOR HARD–SURFACED FINISHES TO A DIRT–FREE CONDITION, FREE OF STAINS, FILMS AND SIMILAR FOREIGN SUBSTANCES. AVOID DISTURBING NATURAL WEATHERING OF EXTERIOR SURFACES.
   E. REMOVE DEBRIS FROM LIMITED ACCESS SPACES, INCLUDING ROOFS, EQUIPMENT ENCLOSURE, MANHOLES, AND SIMILAR SPACES.
   F. REMOVE LABELS THAT ARE NOT PERMANENT LABELS.
   G. TOUCH–UP AND OTHERWISE REPAIR AND RESTORE MARRED EXPOSED FINISHES AND SURFACES. REPLACE FINISHES AND SURFACES THAT CAN NOT BE SATISFACTORILY REPAIRED OR RESTORED, OR THAT SHOW EVIDENCE OF REPAIR OR RESTORATION. DO NOT PAINT OVER "UL" AND SIMILAR LABELS, INCLUDING ELECTRICAL NAME PLATES.
   H. LEAVE THE PROJECT CLEAN AND READY FOR OCCUPANCY.
   I. DUST–OFF ALL EQUIPMENT, INCLUDING BATTERY PACKS, WITHIN EQUIPMENT ENCLOSURE.
   J. WASH AND WAX FLOOR WITHIN EQUIPMENT ENCLOSURE.

2. REMOVAL OF PROTECTION: REMOVE TEMPORARY PROTECTION AND FACILITIES INSTALLED DURING CONSTRUCTION TO PROTECT PREVIOUSLY COMPLETED INSTALLATIONS DURING THE REMAINDER OF THE CONSTRUCTION PERIOD.

DIVISION 2: SITE WORK

SECTION 02200 – EARTHWORK AND DRAINAGE

PART 1 – GENERAL

1. WORK INCLUDED: SEE SITE PLAN.
2. DESCRIPTIONS
   ACCESS DRIVE W/ TURNAROUND AREA, LEASE AREA, AND IF APPLICABLE UNDERGROUND UTILITY EASEMENTS ARE TO BE CONSTRUCTED TO PROVIDE A WELL DRAINED, EASILY MAINTAINED, EVEN SURFACE FOR MATERIAL AND EQUIPMENT DELIVERIES AND MAINTENANCE PERSONNEL ACCESS.
3. QUALITY ASSURANCE
   A. APPLY SOIL STERILIZER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS (AS NEEDED).
   B. APPLY AND MAINTAIN GRASS SEED AS RECOMMENDED BY THE SEED PRODUCER (IF REQUIRED).
   C. PLACE AND MAINTAIN VEGETATION LANDSCAPING, IF INCLUDED WITHIN THE CONTRACT, AS RECOMMENDED BY NURSERY INDUSTRY STANDARDS.
4. SEQUENCING
   A. CONFIRM SURVEY STAKES AND SET ELEVATION STAKES PRIOR TO ANY CONSTRUCTION.
   B. COMPLETELY GRUB THE ACCESS DRIVE W/ TURNAROUND, UNDERGROUND UTILITY EASEMENTS, (IF APPLICABLE) AND LEASE AREA PRIOR TO FOUNDATION CONSTRUCTION, PLACEMENT OF BACKFILL AND SUB–BASE MATERIAL.
   C. CONSTRUCT TEMPORARY CONSTRUCTION AREA ALONG ACCESS DRIVE.
   D. BRING THE LEASE AREA AND ACCESS DRIVE W/ TURNAROUND TO BASE COURSE ELEVATION PRIOR TO INSTALLING FOUNDATION.
   E. APPLY SOIL STERILIZER PRIOR TO PLACING BASE MATERIALS.
   F. GRADE, SEED, FERTILIZE, AND MULCH ALL AREAS DISTURBED BY CONSTRUCTION (INCLUDING UNDERGROUND UTILITY EASEMENTS) IMMEDIATELY AFTER BRINGING LEASE AREA AND ACCESS DRIVE W/ TURNAROUND TO BASE COURSE ELEVATION, WATER TO ENSURE GROWTH.
   G. REMOVE GRAVEL FROM TEMPORARY CONSTRUCTION ZONE TO AN AUTHORIZED AREA OR AS DIRECTED BY PROJECT MANAGER.
   H. AFTER APPLICATIONS OF FINAL SURFACES, APPLY SOIL STERILIZER TO STONE SURFACES.
5. SUBMITTALS
   A. BEFORE CONSTRUCTION
      IF LANDSCAPING IS APPLICABLE TO THE CONTRACT, SUBMIT TWO COPIES OF THE LANDSCAPE PLAN UNDER NURSERY LETTERHEAD. IF A LANDSCAPE ALLOWANCE WAS INCLUDED IN THE CONTRACT, PROVIDE AN ITEMIZED LISTING OF PROPOSED COSTS ON NURSERY LETTERHEAD (REFER TO PLANS FOR LANDSCAPING REQUIREMENTS).
   B. AFTER CONSTRUCTION
      1. MANUFACTURER'S DESCRIPTION OF PRODUCT AND WARRANTY STATEMENT ON SOIL STERILIZED.
      2. MANUFACTURER'S DESCRIPTION OF PRODUCT ON GRASS SEED AND FERTILIZER
      3. LANDSCAPING WARRANTY STATEMENT.
6. WARRANTY
   A. IN ADDITION TO THE WARRANTY ON ALL CONSTRUCTION COVERED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL REPAIR ALL DAMAGE AND RESTORE AREA AS CLOSE TO ORIGINAL CONDITION AS POSSIBLE AT SITE AND SURROUNDINGS.
   B. SOIL STERILIZATION APPLICATION TO GUARANTEE VEGETATION FREE ROAD AND SITE AREAS FOR ONE YEAR FROM DATE OF FINAL INSPECTION.
   C. DISTURBED AREAS WILL REFLECT GROWTH OF NEW GRASS COVER PRIOR TO FINAL INSPECTION.
   D. LANDSCAPING, IF INCLUDED WITHIN THE SCOPE OF THE CONTRACT, WILL BE GUARANTEED FOR ONE YEAR FROM DATE OF FINAL INSPECTION.

PART 2 – PRODUCTS

1. MATERIALS
   A. SOIL STERILIZER SHALL BE EPA–REGISTERED, PRE–EMERGENCE LIQUID:

TOTAL KILL PRODUCT 910 EPA 10292–7	PHASAR CORPORATION P.O. BOX 5123 DEARBORN, MI 48128 (313) 563–8000
AMBUSH HERBICIDE EPA REGISTERED	FRAMAR INDUSTRIAL PRODUCTS 1435 MORRIS AVE. UNION, NJ 07083 (800) 526–4924

   B. ROAD AND SITE MATERIALS SHALL CONFORM TO IDOT SPECIFICATIONS FILL MATERIAL (UNLESS OTHERWISE NOTED) – ACCEPTABLE SELECT FILL SHALL BE IN ACCORDANCE WITH STATE DEPARTMENT OF HIGHWAY AND TRANSPORTATION STANDARD SPECIFICATIONS..
   C. SOIL STABILIZER FABRIC SHALL BE MIRAFI – 500X.

PART 3 – EXECUTION

1. INSPECTIONS
   LOCAL BUILDING INSPECTORS SHALL BE NOTIFIED NO LESS THAN 48 HOURS IN ADVANCE OF CONCRETE POURS, UNLESS OTHERWISE SPECIFIED BY JURISDICTION.
2. PREPARATION
   A. CLEAR TREES, BRUSH AND DEBRIS FROM LEASE AREA, ACCESS DRIVE W/ TURN–AROUND AND UNDER GROUND UTILITY EASEMENTS AS REQUIRED FOR CONSTRUCTION.
   B. PRIOR TO OTHER EXCAVATION AND CONSTRUCTION, GRUB ORGANIC MATERIAL TO A MINIMUM OF SIX INCHES (6") BELOW GRADE.
   C. UNLESS OTHERWISE INSTRUCTED BY LESSEE, TRANSPORT ALL REMOVED TREES, BRUSH AND DEBRIS FROM THE PROPERTY TO AN AUTHORIZED LANDFILL.
   D. PRIOR TO PLACEMENT OF FILL OR BASE MATERIALS, ROLL THE SOIL.
   E. WHERE UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED, LINE THE AREAS WITH STABILIZER MAT PRIOR TO PLACEMENT OF FILL OR BASE MATERIAL.
3. INSTALLATION
   A. GRADE OR FILL THE LEASE AREA AND ACCESS DRIVE W/ TURNAROUND AS REQUIRED IN ORDER THAT UPON DISTRIBUTION OF SPOILS, RESULTING FROM EXCAVATIONS, THE RESULTING GRADE WILL CORRESPOND WITH SAID SUB–BASE COURSE. ELEVATIONS ARE TO BE CALCULATED FROM BENCHMARK, FINISHED GRADES, OR INDICATED SLOPES.
   B. CLEAR EXCESS SPOILS, IF ANY, FROM JOB SITE AND DO NOT SPREAD BEYOND THE LIMITS OF PROJECT AREA UNLESS AUTHORIZED BY PROJECT MANAGER AND AGREED TO BY LANDOWNER.
   C. BRING THE ACCESS DRIVE W/ TURNAROUND TO BASE COURSE ELEVATION TO FACILITATE CONSTRUCTION AND OBSERVATION DURING CONSTRUCTION OF THE SITE.
   D. AVOID CREATING DEPRESSIONS WHERE WATER MAY POND.
   E. THE CONTRACT SHALL INCLUDE GRADING, BANKING, AND DITCHING, UNLESS OTHERWISE INDICATED.
   F. WHEN IMPROVING AN EXISTING ACCESS DRIVE, GRADE THE EXISTING DRIVE TO REMOVE ANY ORGANIC MATTER AND SMOOTH THE SURFACE BEFORE PLACING FILL OR STONE.
   G. PLACE FILL OR STONE IN SIX INCH (6") MAXIMUM LIFTS, AND COMPACT BEFORE PLACING NEXT LIFT.
   H. THE TOP SURFACE COURSE, SHALL EXTEND A MINIMUM OF ONE FOOT (1') BEYOND THE SITE FENCE (UNLESS OTHERWISE NOTED) AND SHALL COVER THE AREA AS INDICATED.
   I. APPLY RIPRAP TO THE SIDE SLOPES OF ALL FENCED SITE AREAS, PARKING AREAS, AND ALL OTHER SLOPES GREATER THAN 2:1.
   J. APPLY RIPRAP TO THE SIDES OF DITCHES OR DRAINAGE SWALES.
   K. RIPRAP ENTIRE DITCH FOR SIX FEET (6') IN ALL DIRECTIONS AT CULVERT OPENINGS.
   L. APPLY SEED, FERTILIZER, AND STRAW COVER TO ALL OTHER DISTURBED AREAS, DITCHES, AND DRAINAGE SWALES, NOT OTHERWISE RIPRAPPED.
   M. UNDER NO CIRCUMSTANCES WILL DITCHES, SWALES, OR CULVERTS BE PLACED SO THAT THEY DIRECT WATER TOWARDS, OR PERMIT STANDING WATER IMMEDIATELY ADJACENT TO SHELTER OR EQUIPMENT. IF DESIGNS OR ELEVATIONS ARE IN CONFLICT WITH THIS, ADVISE CONSTRUCTION MANAGER IMMEDIATELY.
   N. IN DITCHES WITH SLOPES GREATER THAN 10%, MOUND DIVERSIONARY HEADWALLS IN THE DITCH AT CULVERT ENTRANCES. POSITION THE HEADWALL AT AN ANGLE NO GREATER THAT 60° OFF THE DITCH LINE. RIPRAP THE UPSTREAM SIDE OF THE HEADWALL AS WELL AS THE DITCH FOR SIX FEET (6') ABOVE THE CULVERT ENTRANCE.
   O. APPLY SEED AND FERTILIZER TO SURFACE CONDITIONS WHICH WILL ENCOURAGE ROOTING. RAKE AREAS TO BE SEEDED TO EVEN THE SURFACE AND LOOSEN THE SOIL.
   P. SOW SEED IN TWO DIRECTIONS IN TWICE THE QUANTITY RECOMMENDED BY THE SEED PRODUCER.
   Q. ENSURE GROWTH OF SEEDED AND LANDSCAPED AREAS, BY WATERING, UP TO THE POINT OF RELEASE FROM THE CONTRACT. CONTINUE TO REWORK THE BARE AREAS UNTIL COMPLETE COVERAGE IS OBTAINED.
4. FIELD QUALITY CONTROL
   COMPACT SOILS TO MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D–1557. AREAS OF SETTLEMENT WILL BE EXCAVATED AND REFILLED AT CONTRACTOR'S EXPENSE. INDICATE PERCENTAGE OF COMPACTION ACHIEVED ON AS–BUILT DRAWINGS.
5. PROTECTION
   A. PROTECT SEEDED AREAS FROM EROSION BY SPREADING STRAW TO A UNIFORM LOOSE DEPTH OF 1–2 INCHES, STAKE AND TIE DOWN AS REQUIRED. USE OF EROSION CONTROL MESH OR MULCH NET WILL BE AN ACCEPTABLE ALTERNATE.
   B. ALL TREES PLACED IN CONJUNCTION WITH A LANDSCAPE CONTRACT WILL BE WRAPPED, TIED WITH HOSE PROTECTED WIRE, AND SECURED TO 2" X 2" X 4'–0" WOODEN STAKES EXTENDING TWO–FEET INTO THE GROUND ON FOUR SIDES OF THE TREE.
   C. PROTECT ALL EXPOSED AREAS AGAINST WASHOUTS AND SOIL EROSION. PLACE STRAW BALES AT THE INLET APPROACH TO ALL NEW OR EXISTING CULVERTS. WHERE THE SITE OR ROAD AREAS HAVE BEEN ELEVATED IMMEDIATELY ADJACENT TO THE RAIL LINE, STAKE EROSION CONTROL FABRIC FULL LENGTH IN THE SWALE TO PREVENT CONTAMINATION OF THE RAIL BALLAST. ALL EROSION CONTROL METHODS SHALL CONFORM TO APPLICABLE BUILDING CODE REQUIREMENTS.

SECTION 02830 – FENCING AND GATE(S)

PART 1 – GENERAL

1. WORK INCLUDED
   SEE PLAN FOR SITE AND LOCATION OF FENCE AND GATE(S).
2. QUALITY ASSURANCE
   ALL STEEL MATERIALS UTILIZED IN CONJUNCTION WITH THIS SPECIFICATION WILL BE GALVANIZED OR STAINLESS STEEL. WEIGHT OF ZINC COATING ON THE FABRIC SHALL NOT BE LESS THAN 12 OUNCES PER SQUARE FOOT OF MATERIAL COVERED. POSTS SHALL BE HOT–DIPPED IN GRADE 'E' ZINC, 18 OUNCES PER SQUARE FOOT.
3. SEQUENCING
   IF THE SITE AREA HAS BEEN BROUGHT UP TO SURFACE COURSE ELEVATION (PRIOR TO THE FENCE CONSTRUCTION), FENCE POST EXCAVATION SPOILS MUST BE CONTROLLED TO PRECLUDE CONTAMINATION OF SAID SURFACE COURSE.
4. SUBMITTALS
   A. MANUFACTURER'S DESCRIPTIVE LITERATURE.
   B. CERTIFICATE OR STATEMENT OF COMPLIANCE WITH THE SPECIFICATIONS.

PART 2 – PRODUCTS

1. FENCE MATERIAL
   A. ALL FABRIC WIRE, RAILS, HARDWARE, AND OTHER STEEL MATERIALS SHALL BE HOT–DIPPED GALVANIZED.
   B. FABRIC SHALL BE SEVEN–FOOT (7') HIGH OR TO MATCH EXISTING FENCE TWO–INCH CHAIN LINK MESH OF NO. 9 GAUGE (0.148") WIRE. THE FABRIC SHALL HAVE A KNUCKLED FINISH FOR THE TOP SELVAGES. FABRIC SHALL CONFORM TO THE SPECIFICATIONS OF ASTM A–392 CLASS 1.
   C. BARBED WIRE SHALL BE DOUBLE–STRAND, 12–1/2 GAUGE TWISTED WIRE, WITH 14–GAUGE, 4–POINT ROUND BARBS SPACED ON FIVE–INCH CENTERS.
   D. ALL POSTS SHALL BE SCHEDULE – 40 MECHANICAL SERVICE PIPE AND SHALL BE TYPE 1 ASTM A–128 AND OF THE FOLLOWING DIAMETER

LINE	2" SCHEDULE 40 (2 3/8" O.D.)
CORNER	3" SCHEDULE 40 (3 1/2" O.D.)
GATE	3" SCHEDULE 40 (3 1/2" O.D.)

   E. GATE POSTS SHALL BE EXTENDED 12 INCHES, INCLUDING DOME CAP, TO PROVIDE FOR ATTACHMENT OF BARBED WIRE.
   F. ALL TOP AND BRACE RAILS SHALL BE 1| DIAMETER SCHEDULE – 40 MECHANICAL–SERVICE PIPE.
   G. GATE FRAMES AND BRACES SHALL BE 1.90 INCH DIAMETER SCHEDULE 40 MECHANICAL–SERVICE PIPE. FRAMES SHALL HAVE WELDED CORNERS.
   H. GATE FRAMES SHALL HAVE A FULL–HEIGHT VERTICAL BRACE, AND A FULL–WIDTH HORIZONTAL BRACE, SECURED IN PLACE BY USE OF GATE BRACE CLAMPS.
   I. GATE HINGES SHALL BE MERCHANTS METAL MODEL 64386 HINGE ADAPTER WITH MODEL 6409, 188–DEGREE ATTACHMENT.
   J. THE GUIDE (LATCH ASSEMBLY) SHALL BE HEAVY INDUSTRIAL DOUBLE GATE LATCH. SEE DETAIL.
   K. LATCHES AND STOPS SHALL BE PROVIDED FOR ALL GATES.
   L. PLUNGER ROD COMPLETE WITH RECEPTOR TO BE PROVIDED AT THE INACTIVE LEAF OF ALL DOUBLE GATE INSTALLATIONS.
   M. ALL STOPS SHALL HAVE KEEPERS CAPABLE OF HOLDING THE GATE LEAF IN THE OPEN POSITION
   N. 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.
   O. A SIX–INCH BY 1/2–INCH DIAMETER EYEBOLT TO HOLD TENSION WIRE SHALL BE PLACED AT LINE POSTS.
   P. STRETCHER BARS SHALL BE 3/16–INCH BY 3/4–INCH OR HAVE EQUIVALENT CROSS–SECTIONAL AREA.
   Q. ALL CORNER GATE AND PANELS SHALL HAVE A 3/8–INCH TRUSS ROD WITH TURNBUCKLES.
   R. ALL POSTS EXCEPT GATE POSTS SHALL HAVE A COMBINATION CAP AND BARBED WIRE SUPPORTING ARM. GATE POSTS SHALL HAVE A DOME CAP.
   S. OTHER HARDWARE INCLUDES BUT MAY NOT BE LIMITED TO TIE CLIPS, BAND CLIPS AND TENSION BAND CLIPS.
   T. BARBED WIRE GATE GUARDS SHALL BE FITTED WITH DOME CAPS.
   U. BARBED WIRE SUPPORT ARMS SHALL BE PRESSED STEEL COMPLETE WITH SET BOLT AND LOCK WIRE IN THE ARM.
   V. ALL CAPS SHALL BE MALLEABLE IRON, DOME OR ACORN SHAPED AS REQUIRED BY PIPE SIZE.
   W. WHERE THE USE OF CONCERTINA HAS BEEN SPECIFIED, 24–INCH DIAMETERS COIL BARBED TAPE, STAINLESS STEEL, CYCLONE FENCE MODEL G8P TO TYPE III SHALL

   BE FURNISHED. IT SHALL BE SUPPORTED ABOVE THE TOP RAIL BY USE OF SIX(6) WIRE BARBED WIRE ARMS POSITIONED ATOP EACH LINE/CORNER POST.

PART 3 – EXECUTION

1. INSPECTION
   TO CONFIRM PROPER DEPTH AND DIAMETER OF POST HOLE EXCAVATIONS. ALL POST HOLES WILL BE EXCAVATED AS PER CONSTRUCTION DOCUMENTS.
2. INSTALLATION
   A. FOUNDATIONS SHALL HAVE A MINIMUM SIX INCH (6") CONCRETE COVER UNDER POST.
   B. ALL FENCE POSTS SHALL BE VERTICALLY PLUMB ; ONE QUARTER INCH (1/4")
   C. AT CORNER POSTS, GATE POSTS, AND SIDES OF GATE FRAME, FABRIC SHALL BE ATTACHED WITH STRETCHER AND TENSION BAND–CLIPS AT FIFTEEN(15) INCH INTERVALS.
   D. AT LINE POSTS, FABRIC SHALL BE ATTACHED WITH BAND–CLIPS AT FIFTEEN INCH (15") INTERVALS.
   E. FABRIC SHALL BE ATTACHED TO BRACE RAILS, TENSION WIRE AND TRUSS RODS WITH TIE–CLIPS AT TWO FOOT (2') INTERVALS.
   F. A MAXIMUM GAP OF ONE INCH WILL BE PERMITTED BETWEEN TIE CHAIN LINE FABRIC AND THE FINAL GRADE.
   G. GATE 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.
   I. CONCRETE TO BE A MINIMUM OF 4,000 PSI AT 7 DAYS. CEMENT SHALL EXCEED ASTM C150, TYPE IIIA.
3. PROTECTION
   UPON COMPLETION OF ERECTION, INSPECT FENCE MATERIAL AND PAINT FIELD CUTS OR GALVANIZING BREAKS WITH ZINC–BASED PAINT, COLOR TO MATCH THE GALVANIZED METAL.

   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–DIP GALVANIZED) COATING ON IRON AND STEEL PRODUCTS.
ASTM–A153	STANDARD SPECIFICATION FOR ZINC COATING (HOT–DIP) ON IRON AND STEEL HARDWARE.
ASTM–A392	SPECIFICATION FOR ZINC–COATED STEEL CHAIN LINK FENCE FABRIC.
ASTM–A491	SPECIFICATION FOR ALUMINUM–COATED STEEL CHAIN LINK FENCE FABRIC
ASTM–A525	STANDARD SPECIFICATION FOR STEEL SHEET ZINC COATED (GALVANIZED) BY THE HOT–DIPPED PROCESS.
ASTM–A570	SPECIFICATION FOR HOT–ROLLED CARBON STEEL SHEET AND STRIP. STRUCTURAL QUALITY.
ASTM–A535	SPECIFICATION FOR ALUMINUM COATED STEEL BARBED WIRE.

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

DIVISION 3: CONCRETE

SECTION 03000 – BASIC CONCRETE MATERIALS AND METHODS

PART 1 – GENERAL

1. WORK INCLUDED
   FORMWORK, REINFORCEMENT, ACCESSORIES, CAST–IN–PLACE CONCRETE, FINISHING, AND CURING.
2. INSPECTIONS
   A. CONTRACTOR IS RESPONSIBLE FOR SCHEDULING BUILDING DEPARTMENT INSPECTIONS REQUIRED FOR HIS SCOPE OF WORK.
   B. ALL REINFORCING STEEL SHALL BE INSPECTED AND APPROVED BY THE LESSEE'S CONSTRUCTION MANAGER PRIOR TO PLACEMENT OF CONCRETE.
   C. THE LESSEE'S CONSTRUCTION MANAGER SHALL BE NOTIFIED NO LESS THAN 48 HOURS IN ADVANCE OF CONCRETE POURS.

   QUALITY ASSURANCE
3. A. CONSTRUCT AND ERECT CONCRETE FORMWORK IN ACCORDANCE WITH ACI 301 AND ACI 318.
   B. PERFORM CONCRETE REINFORCING WORK IN ACCORDANCE WITH ACI 301, ACI 318, AND ASTM A184.
   C. PERFORM CAST–IN–PLACE CONCRETE WORK IN ACCORDANCE WITH ACI 301, ACI 318, AND ACI 117–90.
   D. OPEN FOUNDATION TRENCHES SHALL BE INSPECTED BY MES PRIOR TO CONCRETE INSTALLATION.
4. SUBMITTALS
   SUBMIT CONCRETE MIX AND REINFORCING STEEL SHOP DRAWINGS FOR APPROVAL BY LESSEE CONSTRUCTION MANAGER/ENGINEER. THE SHOP DRAWINGS SHALL BE SUBMITTED IN THE FORM OF TWO (2) CONCRETE MIX DESIGN INFORMATION SHEETS AND TWO (2) BLUELINE DRAWINGS FOR REINFORCING STEEL.

PART 2 – PRODUCTS

1. REINFORCEMENT MATERIALS
   A. REINFORCEMENT STEEL, ASTM A615, 60 ksi YIELD GRADE, DEFORMED BILLET STEEL BARS, PLAIN FINISH.
   B. WELDED STEEL WIRE FABRIC ASTM A185 PLAIN TYPE, IN FLAT SHEETS, PLAIN FINISH.
   C. CHAIRS, BOLSTERS, BAR SUPPORTS, SPACERS. SIZED AND SHAPED FOR SUPPORTS OF REINFORCING.
   D. FABRICATE CONCRETE REINFORCING IN ACCORDANCE WITH ACI 315, ACI 318, ASTM A184
2. CONCRETE MATERIALS
   A. CEMENT: ASTM C150, PORTLAND TYPE
   B. FINE AND COURSE AGGREGATES: ASTM C33 – MAXIMUM SIZE OF CONCRETE AGGREGATE SHALL NOT EXCEED ; ONE INCH (1") SIZE SUITABLE FOR INSTALLATION METHOD UTILIZED OR ONE–THIRD (1/3) CLEAR DISTANCE BEHIND OR BETWEEN REINFORCING.
   C. WATER: CLEAN AND NOT DETRIMENTAL TO CONCRETE
   D. AIR ENTRAINING ADMIXTURE: ASTM C260
   E. BONDING AGENT: LATEX EMULSION FOR BONDING NEW TO OLD CONCRETE AS MANUFACTURED BY DAYTON SUPERIOR.
   F. NON–SHRINK GROUT: PREMIXED COMPOUND CONSISTING OF NONMETALLIC AGGREGATE, CEMENT, WATER REDUCING AND PLASTICISING AGENTS.
3. CONCRETE MIX
   A. CONCRETE MATERIALS SHALL CONFORM TO THE APPROPRIATE A.C.I. REQUIREMENTS FOR EXPOSED STRUCTURAL CONCRETE.
   B. MIX AND DELIVER CONCRETE IN ACCORDANCE WITH ASTM C94, ALT. 3.
   C. PROPORTIONS OF CONCRETE MATERIALS SHALL BE SUITABLE FOR THE INSTALLATION METHOD UTILIZED AND SHALL RESULT IN DURABLE CONCRETE FOR LOCAL ANTICIPATED AGGRESSIVE ACTIONS. THE DURABILITY REQUIREMENTS OF ACI 318 CHAPTER 4 SHALL BE SATISFIED BASED ON THE CONDITIONS EXPECTED AT THE SITE. PROVIDE CONCRETE AS FOLLOWS:
      1. COMPRESSIVE STRENGTH: 4000 psi AT 7 DAYS. SEE SHEET S–1 FOR CAISSON CONCRETE COMPRESSIVE STRENGTH
      2. SLUMP: 3 INCHES

PART 3 – EXECUTION

1. INSERTS, EMBEDDED COMPONENTS AND OPENINGS
   A. THE CONTRACTOR SHALL COORDINATE AND CROSS–CHECK ARCHITECTURAL, BUILDING & ELECTRICAL DRAWINGS FOR OPENINGS, SLEEVES, ANCHORS, HANGERS, AND OTHER ITEMS RELATED TO CONCRETE WORK AND SHALL ASSUME FULL RESPONSIBILITY FOR THE PROPER LOCATION BEFORE PLACING CONCRETE.
   B. PROVIDE FORMED OPENINGS WHERE REQUIRED FOR WORK TO BE EMBEDDED IN AND PASSING THROUGH CONCRETE MEMBERS.
   C. COORDINATE WORK OF OTHER SECTIONS IN FORMING AND SETTING OPENING, SLOTS, RECESSES, CHASES, SLEEVES, BOLTS, ANCHORS, AND OTHER INSERTS.
   D. INSTALL CONCRETE ACCESSORIES STRAIGHT, LEVEL AND PLUMB.
2. REINFORCEMENT PLACEMENT
   A. PLACE REINFORCEMENT, SUPPORTED AND SECURED AGAINST DISPLACEMENT.
   B. ENSURE REINFORCING IS CLEAN, FREE OF LOOSE SCALE, DIRT, OR OTHER FOREIGN COATINGS.
   C. WELDING IS PROHIBITED ON REINFORCING STEEL AND EMBEDMENTS.
   D. MINIMUM CONCRETE COVER FOR REINFORCING SHALL BE THREE INCHES (3") UNLESS OTHERWISE NOTED.
   E. CONCRETE COVER FROM TOP OF FOUNDATION TO ENDS OF VERTICAL REINFORCEMENT SHALL NOT EXCEED THREE INCHES (3") NOR BE LESS THAN TWO INCHES (2").
3. PLACING CONCRETE
   A. VIBRATE ALL CONCRETE.
   B. ALL CONCRETE WORK SHALL ADHERE TO THE LATEST A.C.I. STANDARDS FOR WINTER POURING AND CURING PROCEDURES IF SEASONAL CONDITIONS APPLY
4. CURING
   A. AFTER PLACEMENT, PROTECT CONCRETE FROM PREMATURE DRYING.
   B. MAINTAIN CONCRETE WITH MINIMAL MOISTURE LOSS AT RELATIVELY CONSTANT TEMPERATURE FOR A PERIOD NECESSARY FOR HYDRATION OF CEMENT AND HARDENING OF CONCRETE.
5. PROVIDE HAND RUBBED SMOOTH FINISH TO ALL EXPOSED VERTICAL FORMED CONCRETE SURFACES.
6. FIELD QUALITY CONTROL
   A. SUBMIT THREE (3) CONCRETE TEST CYLINDERS – TAKEN FOR EVERY 15 CUBIC YARD OR LESS. SUBMIT CONCRETE TESTS TO THE PROJECT MANAGER IN ACCORDANCE WITH ASTM , C–31 AND C–39.
   B. SUBMIT ONE (1) ADDITIONAL TEST CYLINDER – TAKEN DURING COLD WEATHER POURS, AND CURED ON JOB SITE UNDER SAME CONDITIONS AS CONCRETE IT REPRESENTS.
   C. SUBMIT ONE (1) SLUMP TEST – TAKEN FOR EACH SET OF TEST CYLINDERS TAKEN.
7. DEFECTIVE CONCRETE
   MODIFY OR REPLACE CONCRETE NOT CONFORMING TO REQUIRED LINES, DETAILS OR ELEVATIONS AT COST OF GC, AS DIRECTED BY ARCHITECT/ENGINEER.

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REVISIONS

NO	DESCRIPTION	DATE	BY
A	ISSUED FOR REVIEW	08/5/14	JLR
B	UPDATE PER ECR	09/24/14	JTM
C	UPDATE WITH NEW ECR	06/01/15	MAP
D	ISSUED PER FIBER COORDINATION	07/20/15	MT
E	UPDATE WITH NEW SHELTER & LATEST MOD DESIGN	07/22/15	BTE
F	UPDATE PER POWER COORDINATION	07/24/15	JTM
G	UPDATE PER VILLAGE COMMENTS	08/21/15	JTM

LOC. #187771

RT 7 & WEST

15101 WOLF RD
ORLAND PARK, IL 60467

DRAWN BY:	PP
CHECKED BY:	TAZ
DATE:	05/22/14
PROJECT #:	33-1300

SHEET TITLE
SPECIFICATIONS

SHEET NUMBER
SP-1

DIVISION 5: METALS

SECTION 05000 – METALS

PART 1 – GENERAL

1. SECTION INCLUDES:
   STRUCTURAL STEEL FRAMING MEMBERS, BASE PLATES, PLATES, BARS AND GROUTING UNDER BASE PLATES.
2. SUBMITTALS:
   SHOP DRAWINGS: INDICATE SIZES, SPACING, AND LOCATIONS OF STRUCTURAL MEMBERS, OPENINGS, CONNECTIONS, CAMBERS, LOADS, AND WELDED SECTIONS.
3. QUALITY ASSURANCE
   A. FABRICATE STRUCTURAL STEEL MEMBERS IN ACCORDANCE WITH AISC SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS.
   B. PERFORM DESIGN UNDER DIRECT SUPERVISION OF A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE.

PART 2 – PRODUCTS

1. MATERIALS:

A.	STRUCTURAL STEEL MEMBERS:	ASTM A572, GRADE 50
B.	STRUCTURAL TUBING:	ASTM A500, GRADE B
C.	PIPE:	ASTM A53, TYPE E OR S, GRADE B
D.	BOLTS, NUTS, AND WASHERS:	ASTM A325
E.	ANCHOR BOLTS:	ASTM A307
F.	WELDING MATERIALS:	AWS D1.1, TYPE REQUIRED FOR MATERIALS BEING WELDED
G.	GROUT:	NON–SHRINK TYPE, PREMIXED COMPOUND CONSISTING OF NONMETALLIC AGGREGATE, CEMENT, WATER REDUCING AND PLASTICIZING ADDITIVES, CAPABLE OF DEVELOPING A MINIMUM COMPRESSIVE STRENGTH OF 7000 psi AT 28 DAYS.
H.	SHOP AND TOUCH–UP PRIMER:	SSPC 15, TYPE 1, RED OXIDE
I.	TOUCH–UP PRIMER FOR GALV. SURFACES:	ZINC RICH TYPE

2. FABRICATION:
   CONTINUOUSLY SEAL JOINTED MEMBERS BY CONTINUOUS WELDS. GRIND EXPOSED WELDS SMOOTH.
3. FINISH:
   A. PREPARE STRUCTURAL COMPONENT SURFACES IN ACCORDANCE WITH SSPC SP–1 TO SP–10 PROCEDURES.
   B. STRUCTURAL STEEL MEMBERS SHALL BE HOT DIPPED GALVANIZED.

PART 3 – EXECUTION

1. EXAMINATION AND PREPARATION:
   VERIFY THAT THE FIELD CONDITIONS ARE ACCEPTABLE.
2. ERECTION:
   A. ALLOW FOR ERECTION LOADS. PROVIDE TEMPORARY BRACING TO MAINTAIN FRAMING IN ALIGNMENT UNTIL COMPLETION OF ERECTION AND INSTALLATION OF PERMANENT BRIDGING AND BRACING.
   B. FIELD WELD COMPONENTS INDICATED ON SHOP DRAWINGS.
   C. DO NOT FIELD CUT OR ALTER STRUCTURAL MEMBERS WITHOUT APPROVAL OF THE ARCHITECT/ENGINEER.
   D. AFTER ERECTION, TOUCH–UP WELDS, ABRASIONS, AND SURFACES NOT SHOP PRIMED OR GALVANIZED WITH TOUCH–UP PRIMERS AS SPECIFIED UNDER SECTION 05000,–METALS, PART 2 – PRODUCTS, H & I. SURFACES TO BE IN CONTACT WITH CONCRETE NOT INCLUDED.
3. FIELD QUALITY CONTROL:
   FIELD INSPECTION OF MEMBERS, CONNECTIONS, WELDS AND TORQUING.

DIVISION 16: ELECTRICAL

SECTION 16050 – BASIC ELECTRICAL MATERIALS AND METHODS

1. CONTRACTOR SHALL REVIEW THE CONTRACT DOCUMENTS PRIOR TO ORDERING THE ELECTRICAL EQUIPMENT AND STARTING THE ACTUAL CONSTRUCTION. CONTRACTOR SHALL ISSUE A WRITTEN NOTICE OF ALL FINDINGS TO THE ARCHITECT LISTING ANY DISCREPANCIES OR CONFLICTING INFORMATION.
2. ELECTRICAL PLANS, DETAILS AND DIAGRAMS ARE DIAGRAMMATIC ONLY. VERIFY EXACT LOCATIONS AND MOUNTING HEIGHTS OF ELECTRICAL EQUIPMENT WITH OWNER PRIOR TO INSTALLATION.
3. EACH CONDUCTOR OF EVERY SYSTEM SHALL BE PERMANENTLY TAGGED IN EACH PANELBOARD, PULLBOX, JUNCTION BOX, SWITCH BOX, ETC. THE TYPE OF TAGGING METHODS SHALL BE IN COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (O.S.H.A.).
4. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN GOOD WORKING CONDITION WHEN INSTALLED AND SHALL BE OF THE BEST GRADE AND OF THE SAME MANUFACTURER THROUGHOUT FOR EACH CLASS OR GROUP OF EQUIPMENT. MATERIALS SHALL BE LISTED "J" WHERE APPLICABLE. MATERIALS SHALL MEET WITH APPROVAL OF ALL GOVERNING BODIES HAVING JURISDICTION. MATERIALS SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA, NBFU AND "UL" LISTED.
5. ALL CONDUIT SHALL HAVE A PULL CORD.
6. PROVIDE PROJECT MANAGER WITH ONE SET OF COMPLETE ELECTRICAL "AS INSTALLED" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL DIMENSIONS, ROUTINGS, AND CIRCUITS.
7. ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 10,000 A.I.C.
8. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY UBC, NEC AND ALL APPLICABLE CODES.
9. PATCH, REPAIR AND PAINT ANY AREA THAT HAS BEEN DAMAGED IN THE COURSE OF THE ELECTRICAL WORK.
10. PLASTIC PLATES FOR ALL SWITCHES, RECEPTACLES, TELEPHONE AND BLANKED OUTLETS SHALL HAVE ENGRAVED LETTERING WHERE INDICATED ON THE DRAWINGS. WEATHERPROOF RECEPTACLES SHALL HAVE SIERRA #WPD–8 LIFT COVERPLATES.

SECTION 16400 – SERVICE AND DISTRIBUTION

1. WIRE AND CABLE CONDUCTORS SHALL BE COPPER, 600V, TYPE THHN OR THWN, WITH A MIN. SIZE OF #12 AWG, COLOR CODED. ALL RECTIFIER DROPS SHALL BE STRANDED TO ACCEPT CRIMP CONNECTORS.
2. ALL CHEMICAL GROUND RODS SHALL BE "UL" APPROVED.
3. METER SOCKET AMPERES, VOLTAGE, NUMBER OF PHASES SHALL BE AS NOTED ON THE DRAWINGS. MANUFACTURED BY MILBANK OR APPROVED EQUAL, AND SHALL BE UTILITY COMPANY APPROVED.
4. CONDUIT:
   A. RIGID CONDUIT SHALL BE U.L. LABEL GALVANIZED ZINC COATED WITH GALVANIZED ZINC INTERIOR AND SHALL BE USED WHEN INSTALLED IN OR UNDER CONCRETE SLABS, IN CONTACT WITH THE EARTH, UNDER PUBLIC ROADWAYS, IN MASONRY WALLS OR EXPOSED ON BUILDING EXTERIOR. RIGID CONDUIT IN CONTACT WITH EARTH SHALL BE 1/2 LAPPED WRAPPED WITH HUNTS WRAP PROCESS NO. 3.
   B. ELECTRICAL METALLIC TUBING SHALL HAVE U.L. LABEL, FITTING SHALL BE GLAND RING COMPRESSION TYPE.
   C. FLEXIBLE METALLIC CONDUIT SHALL HAVE U.L. LISTED LABEL AND MAY BE USED WHERE PERMITTED BY CODE. FITTINGS SHALL BE "JAKE" OR "SQUEEZE" TYPE. ALL FLEXIBLE CONDUITS SHALL HAVE FULL LENGTH GROUND WIRE.
   D. ALL UNDERGROUND CONDUIT SHALL BE AS NOTED ON THE DRAWINGS AT A MINIMUM DEPTH OF 42" BELOW GRADE. IT IS REQUIRED AND WILL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO NOTIFY J.U.L.I.E. AT 1–800–892–0123 OR OTHER SUCH NOTIFYING AGENCY FORTY–EIGHT (48) HOURS PRIOR TO DIGGING.
5. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY FOR CONNECTION OF TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL HOOKUP COSTS ARE TO BE PAID BY THE CONTRACTOR.
6. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS WITH WHITE ON BLUE BACKGROUND LETTERING (MINIMUM LETTER HEIGHT SHALL BE ONE FORTH INCH (1/4"). NAMEPLATES SHALL BE FASTENED WITH STAINLESS STEEL SCREWS, NOT ADHESIVE.
7. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL POTENTIAL GROUNDING TESTS BY AN INDEPENDENT TESTING SERVICE ENGAGED BY THE CONTRACTOR SHALL BE SUBMITTED FOR APPROVAL. SUBMIT TEST REPORTS TO PROJECT MANAGER. CLEAN PREMISES OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK IN A COMPLETE AND UNDAMAGED CONDITION.
8. GROUNDING ELECTRODE SYSTEM
   A. PREPARATION
      1. SURFACE PREPARATION:
         ALL CONNECTIONS SHALL BE MADE TO BARE METAL. ALL PAINTED SURFACES SHALL BE FIELD INSPECTED AND MODIFIED TO ENSURE PROPER CONTACT. NO WASHERS ARE ALLOWED BETWEEN THE ITEMS BEING GROUNDED. ALL CONNECTIONS ARE TO HAVE A NON–OXIDIZING AGENT APPLIED PRIOR TO INSTALLATION.
      2. GROUND BAR PREPARATION:
         ALL COPPER GROUND BARS SHALL BE CLEANED, POLISHED AND A NON–OXIDIZING AGENT APPLIED. NO FINGERPRINTS OR DISCOLORED COPPER WILL BE PERMITTED.
      3. SLEEVES:
         ALL GROUNDING CONDUCTORS SHALL RUN THROUGH PVC SLEEVES WHEREVER CONDUCTORS RUN THROUGH WALLS, FLOORS OR CEILINGS. IF CONDUCTORS MUST RUN THROUGH EMT, BOTH ENDS OF CONDUIT SHALL BE GROUNDED. SEAL BOTH ENDS OF CONDUIT WITH SILICONE CAULK.
   B. GROUND BARS
      1. ALL GROUND BARS SHALL BE ONE FORTH INCH (1/4") THICK TINNED COPPER PLATE AND OF SIZE INDICATED ON DRAWINGS.
      2. ALL CONNECTIONS TO THE GROUND BAR SHALL OBSERVE THE FOLLOWING SEQUENCE:
         A. BOLT–HEAD
         B. 2–HOLE LUG
         C. TINNED COPPER BUSS BAR
         D. STAR WASHER
         E. NUT
   C. EXTERNAL CONNECTIONS
      1. ALL BURIED GROUNDING CONNECTIONS SHALL BE MADE BY THE EXOTHERMIC WELD PROCESS. CONNECTIONS SHALL INCLUDE ALL CABLE TO CABLE, SPLICES, TEE'S, CROSSES, ETC. ALL CABLE TO GROUND RODS, GROUND ROD SPLICES AND LIGHTNING PROTECTION SYSTEMS ARE TO BE AS INDICATED. ALL MATERIALS USED (MOLDS, WELDING METAL, TOOLS, ETC.) SHALL BE BY "CADWELD" AND INSTALLED PER MANUFACTURER'S RECOMMENDED PROCEDURES.
      2. ALL ABOVE GRADE GROUNDING AND BONDING CONDUCTORS SHALL BE CONNECTED BY TWO HOLE CRIMP TYPE (COMPRESSION) CONNECTIONS (EXCEPT FOR THE ACEG AND GROUND ROD) MECHANICAL CONNECTIONS, FITTINGS OR CONNECTIONS THAT DEPEND SOLELY ON SOLDER SHALL NOT BE USED. ALL CABLE TO CABLE CONNECTIONS SHALL BE HIGH PRESSURE DOUBLE CRIMP TYPE CONNECTIONS. CONNECTIONS TO STRUCTURAL STEEL SHALL BE EXOTHERMIC WELDS.
   D. GROUND RODS
      ALL GROUND RODS SHALL BE 5/8–INCH DIAMETER X 10'–0" LONG "COPPERWELD" OR APPROVED EQUAL, OF THE NUMBER AND LOCATIONS INDICATED. GROUND RODS SHALL BE DRIVEN FULL LENGTH VERTICAL IN UNDISTURBED EARTH.
   E. GROUND CONDUCTORS
      ALL GROUND CONDUCTORS SHALL BE STANDARD TINNED SOLID BARE COPPER ANNEALED, AND OF SIZE INDICATED ON DRAWINGS UNLESS NOTED OTHERWISE.
   F. LUGS
      1. LUGS SHALL BE 2–HOLE, LONG BARREL, STRAND COPPER UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS. LUGS SHALL BE THOMAS AND BETTS SERIES #548_ _BE OR EQUIVALENT

A.	535 MCM DLO	54880BE
B.	262 MCM DLO	54872BE
C.	#1/0 DLO	54862BE
D.	#4/0 THWN AND BARE	54866BE
E.	#2/0 THWN	54862BE
F.	#2 THHN	54207BE
G.	#6 DLO	54205BE

      2. WHEN THE DIRECTION OF THE CONDUCTOR MUST CHANGE, IT SHALL BE DONE GRADUALLY. THE CURVATURE OF THE TURN SHALL BE DONE IN ACCORDANCE WITH THE FOLLOWING CHART:

GROUNDING CONDUCTOR SIZE	MINIMUM BENDING RADIUS TO INSIDE EDGE
NO. 6 AWG TO NO. 4 AWG	6 INCHES
NO. 2 AWG TO NO. 1/0 AWG	8 INCHES
NO. 2/0 AWG TO 4/0 MCM	12 INCHES
250 MCM TO 750 MCM	24 INCHES

   G. GROUND RING
      1. THE EXTERNAL GROUND RING ENCIRCLING THE TOWER (IF APPLICABLE) AND BETWEEN THE EQUIPMENT SHELTER PLATFORM ANCHORS SHALL BE MINIMUM NO. 2 A.W.G. SOLID TINNED BARE COPPER CONDUCTOR IN DIRECT CONTACT WITH THE EARTH AT THE DEPTH INDICATED ON THE DRAWINGS. CONDUCTOR BENDS SHALL HAVE A MINIMUM BENDING RADIUS OF EIGHT INCHES (8").
      2. ALL EXTERNAL GROUND RINGS ARE TO BE JOINED TOGETHER AND ALL CONNECTIONS MUST BE CADWELDED. NO LUGS OR CLAMPS WILL BE ACCEPTED.
   H. FENCE/GATE
      GROUND EACH GATE POST, CORNER POST AND GATE AS INDICATED ON DRAWING GROUND CONNECTIONS TO FENCE POSTS AND ALL OTHER CONNECTIONS FOR THE GROUND GRID SYSTEM SHALL BE MADE BY EXOTHERMIC WELD PROCESS, AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND PROCEDURES, AND SPRAYED WITH COLD–GALVANIZED PAINT.
9. I.E.E.E. FALL POTENTIAL TESTS
   A. FOR RAW LAND SITE
      1. GROUND TESTS SHALL BE PERFORMED AS INDICATED ON DRAWINGS. A BIDDLE GROUND OHMER OR THE METHOD OF USING TWO AUXILIARY GROUND RODS (AS DESCRIBED IN I.E.E.E. STANDARDS NO. 81–1983, PART 1) MAY BE USED. THE I.E.E.E. METHOD REQUIRES THE USE OF AN A.C. TEST CURRENT. THE AUXILIARY TEST RODS MUST BE SUFFICIENTLY FAR AWAY FROM THE ROD UNDER TEST SO THAT THE REGIONS IN WHICH THEIR RESISTANCE IS LOCALIZED DO NOT OVERLAP. THE TEST POINT WILL BE THE GROUND ROD AND WILL CONSIST OF THE THREE POINT FALL OF POTENTIAL MEGGER TEST METHOD, USING THE BIDDLE NULL–BALANCE EARTH TESTER (MEGGER #250220–2 OR EQUIVALENT)
      2. CONTRACTOR TO CONDUCT GROUND RESISTANCE TEST IN THE FORMAT AS FOLLOWS:
   B. EQUIPMENT PAD
      1. FIRST TEST – SHALL BE WITH FOUR GROUND RODS INSTALLED, ONE AT EACH CORNER OF THE PAD BUT NOT CONNECTED TO THE MAIN GROUNDING BUS. FURNISH WIRE TO CONNECT (TEMPORARY CLAMP) ALL FOUR GROUND RODS TOGETHER TO MAKE A SYSTEM TEST AFTER EACH ROD IS INDIVIDUALLY TESTED. IF ANY INDIVIDUAL ROD TESTS 25 OHMS OR MORE, THE ELECTRICAL CONTRACTOR AND OWNER'S REPRESENTATIVE SHOULD BE NOTIFIED SO THAT THE ROD CAN BE DRIVEN DEEPER UNTIL ALL FOUR RODS HAVE A RESISTANCE OF 10 OHMS OR LESS ON A DRY DAY.
      2. SECOND TEST – SHALL BE WITH THE GROUND RODS CONNECTED, WITH DRY SOIL AND WHEN NO STANDING WATER HAS BEEN PRESENT FOR THE PAST TEN (10) DAYS. THE MAXIMUM ALLOWABLE READING IS 5 OHMS TO GROUND. IF THE RESISTANCE OF THE ENTIRE SYSTEM EXCEEDS 5 OHMS, NOTIFY THE CONTRACTOR AND OWNER'S REPRESENTATIVE SO THAT ADDITIONAL AND/OR DEEPER RODS CAN BE INSTALLED.
   C. TOWER
      1. FIRST TEST – SHALL BE WITH THREE GROUND RODS INSTALLED (MINIMUM), EQUALLY SPACED AROUND THE TOWER FOUNDATION, BUT NOT CONNECTED TO THE SHELTER PAD EXTERNAL GROUND RING. FURNISH WIRE TO CONNECT (TEMPORARY CLAMP) ALL THREE GROUND RODS TOGETHER TO MAKE A SYSTEM TEST AFTER EACH ROD IS INDIVIDUALLY TESTED. IF ANY INDIVIDUAL ROD TESTS 25 OHMS OR MORE, NOTIFY THE CONTRACTOR AND OWNER'S REPRESENTATIVE SO THAT THE ROD CAN BE DRIVEN DEEPER UNTIL ALL THREE (3) RODS HAVE A RESISTANCE OF 10 OHMS OR LESS ON A DRY DAY.
      2. SECOND TEST – SHALL BE WITH THE GROUND RODS CONNECTED, WITH DRY SOIL AND WHEN NO STANDING WATER HAS BEEN PRESENT FOR THE PAST TEN (10) DAYS , THE MAXIMUM ALLOWABLE READING IS 5 OHMS TO GROUND. IF THE RESISTANCE OF THE ENTIRE SYSTEM EXCEEDS 5 OHMS THE ELECTRICAL CONTRACTOR AND OWNER'S REPRESENTATIVE SHOULD BE NOTIFIED SO THAT EITHER ADDITIONAL AND/OR DEEPER RODS CAN BE INSTALLED.
   D. EQUIPMENT PAD AND TOWER
      1. AFTER THE EQUIPMENT PAD AND TOWER GROUND RESISTANCE TEST IS COMPLETED, CONTRACTOR SHALL TIE EQUIPMENT PAD EXTERNAL GROUND RING AND TOWER EXTERNAL GROUND RING TOGETHER. AFTER FIRST AND SECOND TEST ALL CONNECTIONS MUST BE MADE USING EXOTHERMIC WELD. NO LUGS OR CLAMPS WILL BE ACCEPTED.
      2. AFTER ALL THE EXTERNAL GROUND RINGS ARE TIED TOGETHER, COMPLETE A MEGGER CHECK OF THE GROUND SYSTEM SHOULD BE DONE. THE MAXIMUM ALLOWABLE LEADING IS 5 OHMS TO GROUND.
10. GROUNDING RESISTANCE TEST REPORT
    UPON COMPLETION OF THE TESTING FOR EACH SITE, A TEST REPORT SHOWING RESISTANCE IN OHMS WITH AUXILIARY POTENTIAL ELECTRODES AT 5 FEET AND 10 FEET INTERVALS UNTIL THE AVERAGE RESISTANCE STARTS INCREASING AND ALSO NOTE THAT 10–15 PHOTOS MUST BE TAKEN TO PROOF ENTIRE EXTERNAL GROUND RING SYSTEM BEFORE BACKFILL. TWO (2) SETS OF TEST DOCUMENTS ARE OF THE INDEPENDENT TESTING SERVICE TO BE BOUND AND SUBMITTED WITHIN ONE (1) WEEK OF WORK COMPLETION.

SECTION 16503 – POLES, POSTS, AND STANDARDS (SINGLE MAST AND SELF SUPPORTING TOWERS)

1. GENERAL
   A. LIGHTNING ROD AND EXTENSION PIPE INCLUDING ALL APPURTENANCES, TO BE FURNISHED BY OWNER, IF REQUIRED.
   B. PROVIDE TEMPORARY LIGHTING FOR TOWER AS PER FAA REGULATIONS DURING CONSTRUCTION, IF REQUIRED.
   C. GROUNDING:
      GROUND TOWER WITH A MINIMUM OF #2 AWG TINNED SOLID BARE COPPER CONDUCTOR CADWELDED TO TOWER BASE PLATE. TWO (2) GROUNDING LEADS PER TOWER BASE PLATE.
      NO EXOTHERMIC WELDS SHALL BE ATTACHED DIRECTLY TO THE MONOPOLE TOWER SHAFT.

SECTION 16745 – TELECOMMUNICATIONS WIRING COMPONENTS (COAXIAL ANTENNA CABLE)

1. GENERAL
   A. ALL MATERIALS, PRODUCTS OR PROCEDURES INCORPORATED INTO WORK SHALL BE NEW AND OF STANDARD COMMERCIAL QUALITY.
   B. CERTAIN MATERIALS AND PRODUCTS WILL BE SUPPLIED BY THE OWNER (REFER TO GENERAL CONDITIONS FOR THE LIST OF OWNER FURNISHED EQUIPMENT, MATERIALS AND SUPPLIES FOR THESE ITEMS). THE CONTRACTOR IS RESPONSIBLE FOR PICKUP AND DELIVERY OF ALL SUCH MATERIALS
   C. ALL OTHER MATERIALS AND PRODUCTS SPECIFIED IN THE CONTRACT DOCUMENTS SHALL BE SUPPLIED BY THE CONTRACTOR.
2. MATERIALS:
   A. COAXIAL CABLE:
      1. INSTALL COAXIAL CABLE AND TERMINATIONS BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS WITH COAXIAL CABLES SUPPORTED AT NO MORE THAN 3'–0" O.C. WEATHERPROOF ALL CONNECTORS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURERS' REQUIREMENTS. TERMINATE ALL COAXIAL CABLE THREE FEET (3') IN EXCESS OF EQUIPMENT LOCATION UNLESS OTHERWISE STATED.
      2. ALL COAX RUN LENGTHS GREATER THAN 175 FEET SHALL BE 1–5/8", ALL COAX. RUN LENGTH BETWEEN 101 FEET AND 174 FEET SHALL BE 1–1/4", AND IN LENGTH LESS THAN OR EQUAL TO 100 FEET SHALL BE 7/8".
3. ANTENNA AND COAXIAL CABLE GROUNDING
   A. ALL COAXIAL CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF COAXIAL CABLE (NOT WITHIN BENDS)
4. COAXIAL CABLE IDENTIFICATION
   A. TO PROVIDE EASY IDENTIFICATION AND UNIFORM MARKING OF ANTENNA CABLING, PLASTIC TAGS SHALL BE USED AT THE FOLLOWING LOCATIONS:
      1. FIRST LOCATION IS AT THE END OF THE COAX NEAREST THE ANTENNA (WHERE THE COAXIAL CABLE AND JUMPER ARE CONNECTED).
      2. SECOND LOCATION IS INSIDE THE EQUIPMENT SHELTER NEAR THE WAVEGUIDE ENTRY PORT.
   B. USE ANDREW CABLE TIES (PT.# 27290) TO SECURE IDENTIFICATION TAGS.
5. TESTING
   LESSEE SHALL PROVIDE AN INDEPENDENT TESTING AGENCY TO PERFORM THE COAXIAL SWEEP TEST & REPORT. THE CONTRACTOR IS TO PROVIDE ONE CLIMBER / QUALIFIED PERSONNEL TO ASSIST IN ANY REPAIRS AND WEATHERPROOFING ONCE THE TEST IS COMPLETE. THE CONTRACTOR IS TO PROVIDE LESSEE WITH A MINIMUM OF 48 HOURS NOTICE PRIOR TO THE TIME OF THE SWEEP TEST.

CHICAGO SMSA
limited partnership
d/b/a VERIZON WIRELESS

TERRA CONSULTING GROUP, LTD.
600 BUSSE HIGHWAY
PARK RIDGE, IL 60068
PH: 847-698-6400
FAX: 847-698-6401

REVISIONS

NO	DESCRIPTION	DATE	BY
A	ISSUED FOR REVIEW	08/5/14	JLR
B	UPDATE PER ECR	09/24/14	JTM
C	UPDATE WITH NEW ECR	06/01/15	MAP
D	ISSUED PER FIBER COORDINATION	07/20/15	MT
E	UPDATE WITH NEW SHELTER & LATEST MOD DESIGN	07/22/15	BTE
F	UPDATE PER POWER COORDINATION	07/24/15	JTM
G	UPDATE PER VILLAGE COMMENTS	08/21/15	JTM

LOC. #187771

RT 7 & WEST

15101 WOLF RD
ORLAND PARK, IL 60467

DRAWN BY:	PP
CHECKED BY:	TAZ
DATE:	05/22/14
PROJECT #:	33-1300

SHEET TITLE
SPECIFICATIONS

SHEET NUMBER
SP-2

RT 7 & WEST
LOC. #187771

SURVEYOR'S NOTE

THE PARENT PARCEL BOUNDARY OF THIS DRAWING IS ILLUSTRATED FROM RECORD INFORMATION AND IS APPROXIMATE.

THE TOPOGRAPHICAL SURVEY FOR THIS MAP WAS PERFORMED ON APRIL 1, 2014.

NOT TO BE USED AS CONSTRUCTION DRAWINGS.

ELEVATION DATUM

ALL ELEVATIONS ARE BASED ON NAVD 88 DATUM. CONTOURS ARE ILLUSTRATED AT 1.0' INTERVALS.

BM(#1) ELEV. 700.97
DESCRIPTION: BENCHMARK ON THE EASTERLY SIDE OF THE MOST NORTHERLY CONCRETE CAISSON OF EXISTING SELF SUPPORT TOWER

FLOOD PLAIN INFORMATION

WE HAVE CONSULTED THE FEDERAL EMERGENCY MANAGEMENT AGENCY NATIONAL FLOOD INSURANCE MAP AS PREPARED FOR THE VILLAGE OF ORLAND PARK, COOK COUNTY, ILLINOIS, COMMUNITY PANEL NUMBER 17031C0682J DATED AUGUST 19, 2008, AND FIND THAT THE PROJECT SITE IS IN ZONE X (UNSHADED), AREAS DETERMINED TO BE OUTSIDE THE 500-YR FLOODPLAIN.

ZONING DATA

THIS SITE IS ZONED:
R-3
SETBACKS:
FRONT: N/A
REAR: N/A
SIDE: N/A

PROPRIETOR

ORLAND FIRE PROTECTION DISTRICT
15101 WOLF ROAD
ORLAND PARK, MICHIGAN
60462

BASIS OF BEARINGS

LATITUDE AND LONGITUDE OF SITE REFERENCE POINT ARE BASED ON THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD83 (CORS 96)

BEARINGS ARE BASED ON TRUE NORTH AS DETERMINED BY HARN (HIGH ACCURACY REFERENCE NETWORK) NAD83 (CORS 96)

EASEMENTS, COVENANTS, CONDITIONS, AND RESTRICTIONS

THE TITLE SEARCH ISSUED BY CHICAGO TITLE INSURANCE COMPANY AS ORDER NO. 1401 008936557 D1, DATED NOVEMBER 12, 2013 LISTS THE FOLLOWING EASEMENTS, COVENANTS, CONDITIONS, AND RESTRICTIONS, THAT ARE MATTERS OF SURVEY, AFFECTING THE PARENT PARCEL UNDER "SCHEDULE B":

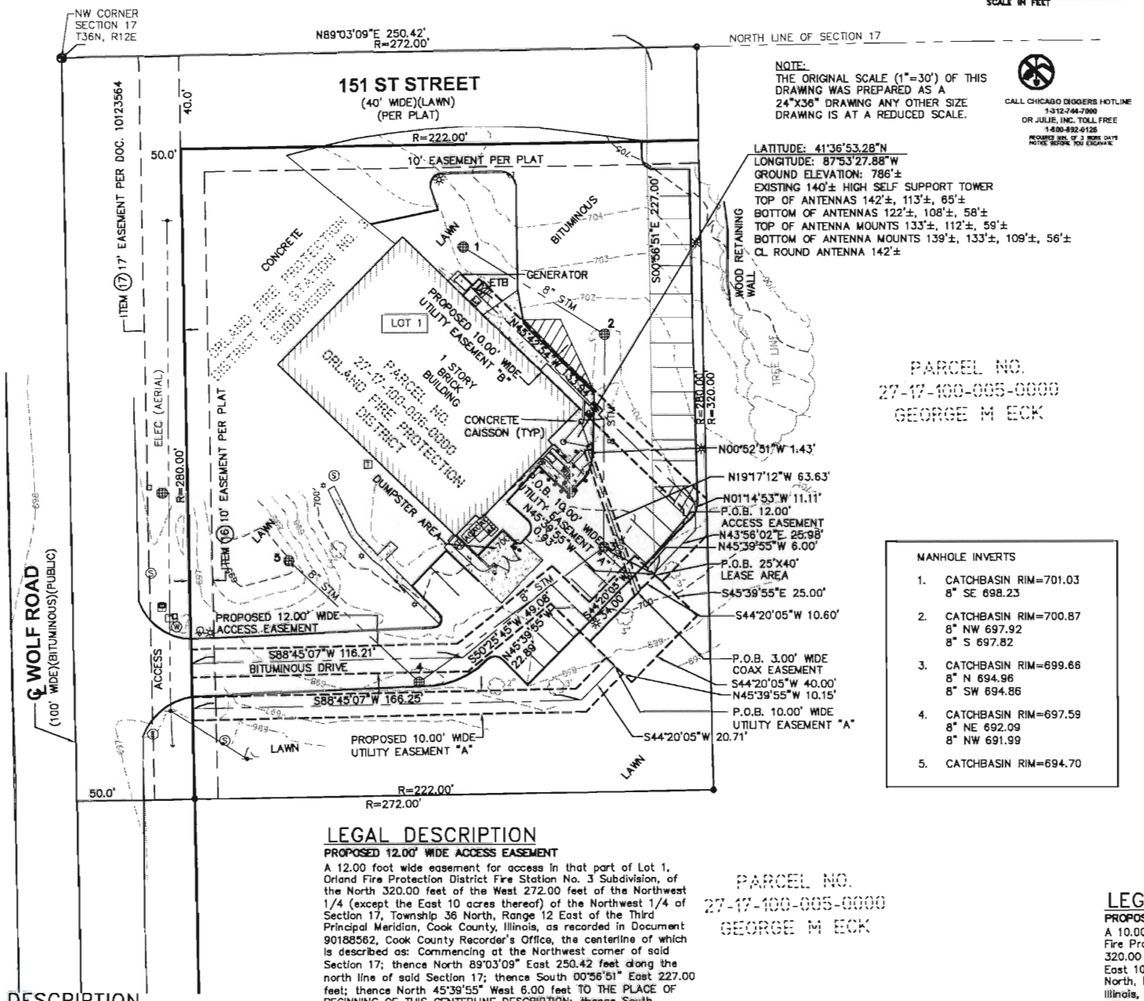
T 16. EASEMENT IN FAVOR OF VILLAGE OF ORLAND PARK, ILLINOIS BELL TELEPHONE COMPANY, NORTHERN, ILLINOIS GAS AND COMMONWEALTH EDISON COMPANY, AND ITS/THEIR RESPECTIVE SUCCESSORS AND ASSIGNS, TO INSTALL, OPERATE AND MAINTAIN ALL EQUIPMENT NECESSARY FOR THE PURPOSE OF SERVING THE LAND AND OTHER PROPERTY, TOGETHER WITH THE RIGHT OF ACCESS TO SAID EQUIPMENT, AND THE PROVISIONS RELATING THERETO CONTAINED IN THE PLAT RECORDED/FILED AS DOCUMENT NO. 90188562. AFFECTS SUBJECT PROPERTY AS SHOWN.

F 17. EASEMENT OVER THE EAST 17 FEET OF THE WEST 50 FEET OF THE LAND FOR RIGHT OF WAY FOR HIGHWAY PURPOSES AS GRANTED BY FRED E. YUNKER TO THE PUBLIC BY PLAT RECORDED AUGUST 20, 1928 AS DOCUMENT 10123564. BENEFITS SUBJECT PROPERTY AS SHOWN.

G 18. EASEMENT AND RIGHT OF WAY CREATED BY GRANT FROM FRED E. YUNKER AND AUGUSTA YUNKER, HIS WIFE, TO THE TEXAS PIPE LINE COMPANY, A CORPORATION OF TEXAS, DATED FEBRUARY 24, 1944 AND RECORDED APRIL 28, 1944 AS DOCUMENT 13273817 TO LAY, OPERATE AND MAINTAIN A PIPE LINE FOR THE TRANSPORTATION OF WATER, OIL OR GAS OR ANY PRODUCT OF OIL OR GAS UPON, OVER AND THROUGH THE NORTHWEST 1/4 OF THE NORTHWEST 1/4 OF SECTION 17, TOWNSHIP 36 NORTH, RANGE 12 EAST OF THE THIRD PRINCIPAL MERIDIAN ALSO THE RIGHT TO LAY, OPERATE AND MAINTAIN ADJACENT TO AND PARALLEL WITH THE FIRST, AND SECOND PIPE LINE TOGETHER WITH THE RIGHT OF INGRESS AND EGRESS.

ASSIGNED TO MARATHON PIPE LINE COMPANY BY DOCUMENT NUMBER 86015249. AFFECTS SUBJECT PROPERTY, NO DESCRIPTION, BLANKET IN NATURE.

ASSIGNED TO PARXAIR, INC BY DOCUMENT NUMBER 0512511023 AND 0512511024 AFFECTS SUBJECT PROPERTY, NO DESCRIPTION, BLANKET IN NATURE.



NOTE:
THE ORIGINAL SCALE (1"=30') OF THIS DRAWING WAS PREPARED AS A 24"X36" DRAWING ANY OTHER SIZE DRAWING IS AT A REDUCED SCALE.

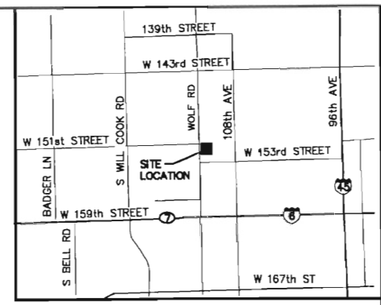
CALL CHICAGO DIGGERS HOTLINE 1-312-744-7000 OR JULIE, INC. TOLL FREE 1-800-892-0123 REQUIRES MIN. OF 3 WORK DAYS NOTICE BEFORE YOU EXCAVATE

LATITUDE: 41°36'53.28"N
LONGITUDE: 87°53'27.88"W
GROUND ELEVATION: 786'±
EXISTING 140'± HIGH SELF SUPPORT TOWER
TOP OF ANTENNAS 142'±, 113'±, 65'±
BOTTOM OF ANTENNAS 122'±, 108'±, 58'±
TOP OF ANTENNA MOUNTS 133'±, 112'±, 59'±
BOTTOM OF ANTENNA MOUNTS 139'±, 133'±, 109'±, 56'±
CL ROUND ANTENNA 142'±

PARCEL NO.
27-17-100-005-0000
GEORGE M ECK

MANHOLE INVERTS

1. CATCHBASIN RIM=701.03
   8" SE 698.23
2. CATCHBASIN RIM=700.87
   8" NW 697.92
   8" S 697.82
3. CATCHBASIN RIM=699.66
   8" N 694.96
   8" SW 694.86
4. CATCHBASIN RIM=697.59
   8" NE 692.09
   8" NW 691.99
5. CATCHBASIN RIM=694.70



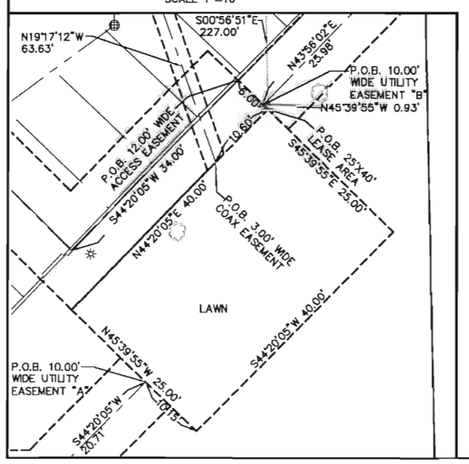
VICINITY MAP
N.T.S.

LEGEND

- TRAVERSE POINT
- WELL
- HIGHWAY
- MONUMENT
- MONUMENT BOX
- RIGHT OF WAY MARKER
- SET WOODSTAKE
- XCUT
- PK NAIL
- FOUND IRON STAKE
- SET IRON STAKE
- SIGN
- RR SIGN
- GUY POLE
- GUY ANCHOR
- UTILITY POLE
- LIGHT POLE
- ORNAMENTAL LIGHT POLE
- POST
- U.G. UTILITY MARKER
- GROUND ROD
- SOIL BORING
- MAILBOX
- SATELLITE DISH
- HAND HOLE
- AC UNIT
- U.G. UTILITY MARKER
- FIRE HYDRANT
- PIV - POST INDICATOR VALVE
- WATER VALVE
- GAS VALVE
- UST FILL PORT
- GAS PUMP
- GAS METER
- WATER METER
- TELEPHONE RISER
- ELECTRIC METER
- ELECTRIC TRANSFORMER
- CABLE TV RISER
- CATCH BASIN
- ROUND CATCH BASIN
- UTILITY MANHOLE
- STORM MANHOLE
- SANITARY MANHOLE
- ELECTRIC MANHOLE
- TELEPHONE MANHOLE
- WATER MANHOLE
- HANDICAP PARKING SPACE
- SHRUB
- TREE
- PINE TREE
- EXISTING CONTOURS
- TELEPHONE UTILITY LINE
- ELECTRIC UTILITY LINE
- WATER UTILITY LINE
- GAS UTILITY LINE
- STEAM UTILITY LINE
- STORM UTILITY LINE
- SANITARY UTILITY LINE
- FIBER OPTIC UTILITY LINE
- OVERHEAD UTILITY LINE
- FENCE LINE
- GUARD RAIL

All utilities as shown are approximate locations derived from actual measurements and available records. They should not be interpreted to be exact location nor should it assumed that they are the only utilities in the area.

PROPOSED LEASE AREA DETAIL
SCALE 1"=10'



LEGAL DESCRIPTION

PARENT PARCEL

LOT 1 IN THE ORLAND FIRE PROTECTION DISTRICT FIRE STATION NO.3 SUBDIVISION BEING A SUBDIVISION OF THE NORTH 320.00 FEET OF THE WEST 272.00 FEET OF THE NORTHWEST QUARTER (EXCEPT THE EAST 10 ACRES THEREOF) OF THE NORTHWEST QUARTER OF SECTION 17, TOWNSHIP 36 NORTH, RANGE 12 EAST OF THE 3RD PRINCIPAL MERIDIAN, IN COOK COUNTY ILLINOIS.

This map was made from the above legal description which was given to us as a complete description of the property. Both map and description should be compared with the Abstract of Title or Title Policy for any exceptions, easements or deficiencies in description.

LEGAL DESCRIPTION

PROPOSED 25'X40' LEASE AREA

All that part of Lot 1, Orland Fire Protection District Fire Station No. 3 Subdivision, of the North 320.00 feet of the West 272.00 feet of the Northwest 1/4 (except the East 10 acres thereof) of the Northwest 1/4 of Section 17, Township 36 North, Range 12 East of the Third Principal Meridian, Cook County, Illinois, as recorded in Document 90188562, Cook County Recorder's Office, described as: Commencing at the Northwest corner of said Section 17; thence North 89°03'09" East 250.42 feet along the north line of said Section 17; thence South 00°56'51" East 227.00 feet TO THE PLACE OF BEGINNING OF THIS DESCRIPTION; thence South 45°39'55" East 25.00 feet; thence South 44°20'05" West 40.00 feet; thence North 45°39'55" West 25.00 feet; thence North 44°20'05" East 40.00 feet to the place of beginning of this description.

LEGAL DESCRIPTION

PROPOSED 12.00' WIDE ACCESS EASEMENT

A 12.00 foot wide easement for access in that part of Lot 1, Orland Fire Protection District Fire Station No. 3 Subdivision, of the North 320.00 feet of the West 272.00 feet of the Northwest 1/4 (except the East 10 acres thereof) of the Northwest 1/4 of Section 17, Township 36 North, Range 12 East of the Third Principal Meridian, Cook County, Illinois, as recorded in Document 90188562, Cook County Recorder's Office, the centerline of which is described as: Commencing at the Northwest corner of said Section 17; thence North 89°03'09" East 250.42 feet along the north line of said Section 17; thence South 00°56'51" East 227.00 feet; thence North 45°39'55" West 6.00 feet TO THE PLACE OF BEGINNING OF THIS CENTERLINE DESCRIPTION; thence South 44°20'05" West 34.00 feet; thence North 45°39'55" West 22.89 feet; thence South 50°25'45" West 49.08 feet; thence South 88°45'07" West 116.21 feet to the easterly right of way line of Wolf Road (50' half right of way width) for the place of ending of this centerline description. Sidelines should be lengthened or shortened to intersect with the easterly right of way line of Wolf Road.

LEGAL DESCRIPTION

PROPOSED 10.00' WIDE UTILITY EASEMENT "A"

A 10.00 foot wide easement for utilities in that part of Lot 1, Orland Fire Protection District Fire Station No. 3 Subdivision, of the North 320.00 feet of the West 272.00 feet of the Northwest 1/4 (except the East 10 acres thereof) of the Northwest 1/4 of Section 17, Township 36 North, Range 12 East of the Third Principal Meridian, Cook County, Illinois, as recorded in Document 90188562, Cook County Recorder's Office, the centerline of which is described as: Commencing at the Northwest corner of said Section 17; thence North 89°03'09" East 250.42 feet along the north line of said Section 17; thence South 00°56'51" East 227.00 feet; thence South 45°39'55" East 25.00 feet; thence South 44°20'05" West 40.00 feet; thence North 45°39'55" West 10.15 feet TO THE PLACE OF BEGINNING OF THIS CENTERLINE DESCRIPTION; thence South 44°20'05" West 20.71 feet; thence South 88°45'07" West 166.25 feet to the easterly right of way line of Wolf Road (50' half right of way width) for the place of ending of this centerline description. Sidelines should be lengthened or shortened to intersect with the easterly right of way line of Wolf Road.

PARCEL NO.
27-17-100-005-0000
GEORGE M ECK

LEGAL DESCRIPTION

PROPOSED 3.00' WIDE COAX EASEMENT

A 3.00 foot wide easement for coax in that part of Lot 1, Orland Fire Protection District Fire Station No. 3 Subdivision, of the North 320.00 feet of the West 272.00 feet of the Northwest 1/4 (except the East 10 acres thereof) of the Northwest 1/4 of Section 17, Township 36 North, Range 12 East of the Third Principal Meridian, Cook County, Illinois, as recorded in Document 90188562, Cook County Recorder's Office, the centerline of which is described as: Commencing at the Northwest corner of said Section 17; thence North 89°03'09" East 250.42 feet along the north line of said Section 17; thence South 00°56'51" East 227.00 feet; thence South 44°20'05" West 10.60 feet TO THE PLACE OF BEGINNING OF THIS CENTERLINE DESCRIPTION; thence North 19°17'12" West 63.63 feet; thence North 00°52'51" West 1.43 feet to the place of ending of this centerline description.

LEGAL DESCRIPTION

PROPOSED 10.00' WIDE UTILITY EASEMENT "B"

A 10.00 foot wide easement for utilities in that part of Lot 1, Orland Fire Protection District Fire Station No. 3 Subdivision, of the North 320.00 feet of the West 272.00 feet of the Northwest 1/4 (except the East 10 acres thereof) of the Northwest 1/4 of Section 17, Township 36 North, Range 12 East of the Third Principal Meridian, Cook County, Illinois, as recorded in Document 90188562, Cook County Recorder's Office, the centerline of which is described as: Commencing at the Northwest corner of said Section 17; thence North 89°03'09" East 250.42 feet along the north line of said Section 17; thence South 00°56'51" East 227.00 feet; thence North 45°39'55" West 0.93 feet TO THE PLACE OF BEGINNING OF THIS CENTERLINE DESCRIPTION; thence North 43°56'02" East 25.98 feet; thence North 01°14'53" West 11.11 feet; thence North 45°42'54" West 133.94 feet to the place of ending of this centerline description.

I, Randy J. Kolehouse, do hereby certify that the drawing shown hereon is a correct representation of a survey performed at and under my direction.

All dimensions shown are in feet and decimal parts thereof.

Given under my hand and seal this 4th day of August, 2014.

Randy J. Kolehouse
Illinois Professional Land Surveyor No. 2986
Expires November 30, 2014

Note: This certification only applies to improvements within the lease site and easements as monumented shown hereon.

ILLINOIS REGISTERED DESIGN FIRM
LICENSE NUMBER 184.007034
LICENSE EXPIRES: APRIL 30, 2017

CHICAGO SMSA
limited partnership
d/b/a VERIZON WIRELESS

RT 7 & WEST
LOC. #187771

Survey Prepared for:

TERRA
Consultants Group, Ltd.
900 Busse Highway
Park Ridge, IL 60068
Ph: 847/696-8400
Fax: 847/696-8401

Project Manager: Tom Zimmermann

REVISIONS		
NO.	DESCRIPTION	DATE
1	ADDED 10.00' WIDE UTILITY EASEMENT "B"	08/04/15

Williams & Works
engineers · planners · surveyors
a tradition of service
616.224.1500 phone · 616.224.1501 facsimile
549 Ottawa Ave NW · Grand Rapids, MI 49503

PROFESSIONAL LAND SURVEYOR
RANDY J. KOLEHOUSE
2986
GRAND RAPIDS MICHIGAN
STATE OF ILLINOIS

NW | NE
SW | SE
17-36-12

DATE: 04/01/14	DWG. BY: MLM
SCALE: 1"=40'	SURVEYED: C.S.
UPDATE: WBM080414	CHKD BY: R.J.K.
PROJECT NO.: 211005.296	

SITE NAME

RT 7 & WEST

LOCATION NUMBER

LOC. #187771

SITE ADDRESS

15101 WOLF RD.
ORLAND PARK, IL
60487

SHEET TITLE

PS-1

Modification Package

Prepared for:

Terra Consulting Group
600 Busse Highway
Park Ridge, IL 60068

ATTN: Mr. Tom Zimmerman

Structure	:	**140 ft Andrew Self Supported Tower**
Proposed Carrier	:	**Verizon**
Site ID	:	**Rt 7 and West**
Site Location	:	**Orland Park Fire Protection District** **Orland Park, IL**
County	:	**Cook**
Date	:	**July 7, 2015 (Revised Drawing)**
Usage	:	**95.0% Legs, 87.0% Diagonals, 14.0% Horizontals, 99.8% Leg Splice** **(with mods)**

LICENSED STRUCTURAL ENGINEER
THOMAS LYNN TAYLOR
031-007124
STATE OF ILLINOIS
7.7.15
EXP. 11/30/2016

Semaan Engineering Solutions Holdings, LLC
1079 N. 205th Street, Elkhorn, NE 68022
Phone: 402-289-1888

Introduction

The purpose of this report is to summarize results of the structural analysis performed on the 140 ft Andrew Self Supported Tower located at Orland Park Fire Protection District, Or, Cook County (site #Rt 7 and West). The tower was originally designed and manufactured by Andrew (Drawing #LI-8545-02 dated July 11, 1985). **The analysis assumes modifications designed by W-T Communications dated August 7, 2014 are in place prior to adding the proposed load.**

Analysis

The tower was analyzed using Semaan Engineering Solutions, Inc., Software. The analysis assumes that the tower is in good, undamaged, and non-corroded condition. The analysis was performed in conformance with ANSI/TIA-222 Rev G and local building codes for a basic wind speed of 90 mph no ice and 40 mph with 3/4" radial ice (3-second gust), Structure Classification III, Exposure C. This is in conformance with the IBC 2009: Section 1609.1.1, Exception (5) and Section 3108.

Basic Wind Speed: 90.0 mph
Radial Ice: 40 mph w/ 0.75" ice
Code: ANSI/TIA-222 Rev G

Antenna Loads

The following antenna loads were used in the tower analysis.

Existing Antennas

Elev. (ft)	Qty	Antennas	Mount	Coax (in)	Carrier
139.0	2	10 ft Omni	(2) 6 ft Sidearm	(2) 7/8	Orland Park
110.0	3	CMA-B/6519	(3) Sector Frames	(6) 7/8 (1) 1.3" (1) 1.584	T-Mobile
	6	CMA-BDHH/6519			
	3	FRIG RRU			
	2	FXFB RRU			
	1	COVP			
	3	ETW200VS12UB			
95.0	1	3 ft Std Dish	Pipe	(1) 7/8	Orland Park
85.0	1	2 ft Std Dish	Pipe	(1) 1/2	
80.0	1	DB224	6 ft Sidearm	(1) 7/8	

Proposed Antennas

Elev. (ft)	Qty	Antennas	Mount	Coax (in)	Carrier
100.0	6	SBNHH-1D65A	(3) Sector Frames	(1) 1 5/8 Hybrid	Verizon
	3	RRUS12 - 700 w/ A2			
	3	RRUS12 - AWS w/ A2			
	1	RCMDC-3315-PF-48			

The transmission lines shall be stacked as indicated above.

Results

The existing tower is not structurally capable of supporting the proposed antennas. The legs are overstressed from elevation 0 ft to 80 ft. The leg splice connection is overstressed at elevation 40 ft. Additional reinforcing will be required in these areas. Refer to the attached drawings for additional information.

The maximum leg usage is: 133.0% (without mods) and 95.0% (with mods).
The maximum diagonal usage is: 88.0% (without mods) and 87.0% (with mods).
The maximum horizontal usage is: 14.0% (without mods) and 14.0% (with mods).
The maximum leg splice usage is: 112.0% (without mods) and 91.0% (with mods).

Leg Forces	Original Design Reactions	Current Analysis Reactions	% Of Design
Uplift (Kips)	70.60	161.39	139.9*
Axial (Kips)	87.50	182.29	154.3*
Shear (Kips)	7.80	14.73	139.9*

(*) The percentage is factored by 1.35 per TIA-EIA Rev G
The reactions calculated from the analysis exceed the ones indicated on the original structural design. The foundation has been investigated using the supplied documents and soils report and was found to be structurally adequate to support the required loads.

Conclusion

Based on the analysis results, the existing structure (with the proposed modifications installed and approved per the attached drawings) meets the requirements per the ANSI/TIA-222 Rev G standards for a basic wind speed of 90 mph no ice and 40 mph with 3/4" radial ice.

The latest modification package assumes modifications designed by W-T Communications dated August 7, 2014 are in place prior to adding the proposed load.

If you have any questions or require additional information, please call 402-289-1888.

Attachments

1. Drawing T-1, Revision 2, dated 07/07/2015.
2. Drawing N-1, Revision 2, dated 07/07/2015.
3. Drawing N-2, Revision 0, dated 11/06/2014.
4. Drawing S-1, Revision 1, dated 06/04/2015.
5. Drawing S-2, Revision 0, dated 11/06/2014.
6. Drawing S-3, Revision 0, dated 11/06/2014.
7. Drawing S-4, Revision 1, dated 07/07/2015.
8. Drawing S-5, Revision 0, dated 11/06/2014.
9. Drawing S-6, Revision 0, dated 06/04/2015.

PREPARED FOR

TERRA CONSULTING GROUP, LTD.

PREPARED BY

SEMAAN ENGINEERING SOLUTIONS

SEMAAN ENGINEERING SOLUTIONS HOLDINGS, LLC

MODIFICATION PACKAGE FOR A 140 FT ANDREW LST SELF SUPPORT TOWER

CLIENT SITE NAME/NUMBER

RT 7 AND WEST

PROPOSED CARRIER/SITE NUMBER/SITE NAME

VERIZON/569/RT 7 & WEST

SITE ADDRESS

15101 WOLF ROAD
ORLAND PARK, IL 60439
COOK COUNTY
N41° 36' 53.29", W87° 53' 27.87

DATE:

07/07/2015

CONTACT INFORMATION

ENGINEER OF RECORD

NAME: SEMAAN ENGINEERING SOLUTIONS HOLDINGS, LLC
ADDRESS: 1079 N 205TH STREET
ELKHORN, NE 68022

CONTACT: THOMAS TAYLOR

(402) 289-1888 x2416
EMAIL: TOMT SEMAANENG.COM

SHEET INDEX

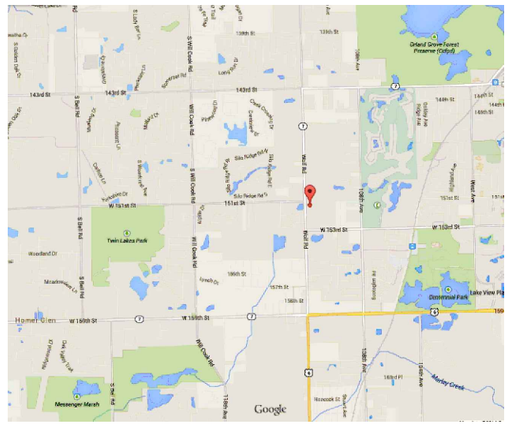
SHEET #	SHEET TITLE	REV #
T-1	TITLE SHEET	2
N-1	GENERAL NOTES	2
N-2	SITE SPECIFIC NOTES	0
S-1	SELF SUPPORT TOWER ELEVATION VIEW	1
S-2	LEG SPLICE REINFORCEMENT DETAILS	0
S-3	ANGLE SPLICE REINFORCEMENT DETAILS	0
S-4	ANGLE LEG REINFORCEMENT DETAILS	1
S-5	HALF-PIPE LEG REINFORCEMENT DETAILS	0
S-6	BOLT-ON BRACE DETAILS	0
S-7	SHEET DELETED	0

STAMP

LICENSED STRUCTURAL ENGINEER
THOMAS LYNN TAYLOR
031-007124
STATE OF ILLINOIS
EXP. 11/30/2016
7.7.15

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF ILLINOIS

VICINITY MAP



MODIFICATION OUTLINE

THE MODIFICATIONS PROVIDED IN THESE DRAWINGS ARE BASED ON THE RECOMMENDATIONS OUTLINED IN THE STRUCTURAL MODIFICATIONS ANALYSIS REPORT COMPLETED BY SEMAAN ENGINEERING SOLUTIONS HOLDINGS, LLC (SES) DATED 07/07/2015. THIS REPORT IS BASED ON A SPECIFIC ANTENNA LOADING AND COAX CONFIGURATION AS DEFINED IN THE REPORT. ANY OTHER ANTENNA OR COAX CONFIGURATION REQUIRES REVIEW BY SES

CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, QUANTITIES, PART NUMBERS AND COAX/ANTENNA PLACEMENTS PRIOR TO BIDDING, ORDERING MATERIALS, AND CONSTRUCTION.

GENERAL NOTES:

1. REFERENCE THE SEMAAN ENGINEERING SOLUTIONS ANALYSIS DATED 07/07/2015 FOR THE PROPOSED AND EXISTING LOADS CONSIDERED. THIS DRAWING IS NOT VALID IF LOADS OTHER THAN THOSE CONSIDERED IN THE ANALYSIS ARE ADDED TO OR REMOVED FROM THE STRUCTURE UNLESS APPROVED IN WRITING BY SEMAAN ENGINEERING SOLUTIONS HOLDINGS, LLC.
2. THE PROPOSED LOADS SHALL NOT BE ADDED TO THE STRUCTURE UNTIL ALL MODIFICATIONS HAVE BEEN COMPLETED, INSPECTED BY A 3RD PARTY, AND APPROVED BY THE ENGINEER OF RECORD.
3. ALL METHODS, MATERIALS AND WORKMANSHIP SHALL FOLLOW THE DICTATES OF GOOD CONSTRUCTION PRACTICE.
4. ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN TOWER AND FOUNDATION CONSTRUCTION.
5. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DIMENSIONS, ELEVATIONS AND CONDITIONS PRIOR TO FABRICATION. THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR THE PROPER FIT AND CLEARANCE IN THE FIELD. CONTACT SEMAAN ENGINEERING IF ANY DISCREPANCIES EXIST.
6. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD IMMEDIATELY OF ANY INSTALLATION INTERFERENCES. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. DETAILS NOT SPECIFICALLY SHOWN ON THE DRAWINGS SHALL FOLLOW SIMILAR DETAILS FOR THIS JOB.
7. THIS DRAWING DOES NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND INSPECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL THE CONSTRUCTION MEANS, TECHNIQUES, SEQUENCES AND PROCEDURES.
8. ALL WORK SHALL BE DONE IN ACCORDANCE WITH LOCAL CODES AND OSHA SAFETY REGULATIONS. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE ON-SITE SAFETY ASSOCIATED WITH THE WORK TO BE PERFORMED AS WELL AS THE PUBLIC AFFECTED BY THE WORK IN THE VICINITY OF THE JOB SITE.
9. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY, PER TIA-1019-A-2001, TO PROVIDE A COMPLETE AND STABLE STRUCTURE AS SHOWN ON THESE DRAWINGS.
10. THE CONTRACTOR'S PROPOSED INSTALLATION SHALL NOT INTERFERE, NOR DENY ACCESS TO, ANY EXISTING OPERATIONAL AND SAFETY EQUIPMENT.
11. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE PROTECTION OF THE PROPERTY IN THE VICINITY OF THE JOB SITE. THE CONTRACTOR SHALL USE THE PRECAUTIONARY MEANS NECESSARY FOR ADEQUATE PROTECTION.
12. ALL WORK SHALL BE PERFORMED IN CALM WIND CONDITIONS, WHERE SPEED DOES NOT EXCEED 10 MPH.
13. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR ONE YEAR FROM ACCEPTANCE DATE.
14. ALL TOWER MODIFICATION WORK SHALL BE IN ACCORDANCE WITH TIA-1019-A STANDARDS FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

APPLICABLE CODES AND STANDARDS:

1. ANSI/TIA-222 STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES, REV G.
2. 2009 INTERNATIONAL BUILDING CODE. WITH ILLINOIS STATE AMENDMENTS.
3. ACI 318: AMERICAN CONCRETE INSTITUTE, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, 318-11 (LATEST EDITION).
4. CRSI: CONCRETE REINFORCEMENT STEEL INSTITUTE, MANUAL OF STANDARD PRACTICE, (LATEST EDITION).
5. AISC: AMERICAN INSTITUTE OF STEEL CONSTRUCTION, MANUAL OF STEEL CONSTRUCTION, 14TH EDITION - 2011 (LATEST EDITION).
6. AWS: AMERICAN WELDING SOCIETY D1.1, STRUCTURAL WELDING CODE - 2011, (LATEST EDITION).

STEEL CONSTRUCTION:

1. STRUCTURAL STEEL SHALL CONFORM TO THE AISC MANUAL OF STEEL CONSTRUCTION, 14TH EDITION, FOR THE DESIGN, FABRICATION, AND ERECTION OF STEEL COMPONENTS.
2. UNLESS NOTED OTHERWISE, ALL STRUCTURAL ELEMENTS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS.
   - ANGLE: ASTM A36
   - PIPE/TUBE: ASTM A500 (46 □□YIELD)
   - PLATE: ASTM A36
   - A. ALL BOLTS, ASTMA325 GALVANIZED HIGH STRENGTH BOLTS.
   - B. ALL U-BOLTS, ASTM A36
   - C. ALL NUTS, A563 CARBON AND STEEL ALLOY NUTS.
   - D. ALL WASHERS, ASTM F436 HARDENED STEEL WASHERS
3. SHOP DRAWINGS SHALL BE SUBMITTED TO SES FOR APPROVAL PRIOR TO FABRICATION. SHOP DRAWINGS SHALL INCLUDE ALL FABRICATED STEEL ASSEMBLIES INCLUDING MONOPOLE/TOWER EXTENSIONS

STEEL CONSTRUCTION (CONT.):

4. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 FOR COMPONENTS AND ASTM A153 FOR HARDWARE, AND AS FOLLOWS, UNLESS OTHERWISE NOTED.
   A. GALVANIZING SHALL BE PERFORMED AFTER SHOP FABRICATION AND WELDING TO THE GREATEST EXTENT POSSIBLE
   B. ALL DINGS, SCRAPES, MARS AND WELDS IN THE GALVANIZED AREA SHALL BE COATED WITH (3) BRUSH COATS OF ZRC COLD GALVANIZING COMPOUND OR APPROVED EQUAL. THE COATING SHALL BE APPLIED IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
   C. IF THE STRUCTURE WAS ORIGINALLY PAINTED, AFTER ZINC-RICH COATING IS DRY, OVERCOAT WITH AN APPROPRIATE PAINT WITH THE SAME COLOR AS THE EXISTING.
5. NO TORCH CUTTING SHALL BE PERMITTED UNLESS APPROVED BY THE ENGINEER.
6. DO NOT PLACE HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON DRAWINGS.

WELDING NOTES:

1. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.1.
2. CONTRACTOR SHALL RETAIN AN AWS CERTIFIED WELD INSPECTOR TO PERFORM VISUAL INSPECTIONS ON ALL FIELD WELDS. A REPORT SHALL BE SUBMITTED TO SEMAAN ENGINEERING FOR FINAL APPROVAL.
3. ALL ELECTRODES SHALL BE LOW HYDROGEN E70XX ELECTRODES, PER AWS D1.1, UNLESS NOTED OTHERWISE.
4. MINIMUM WELD SIZE TO BE 0.1875 INCH FILLET WELDS, UNLESS NOTED OTHERWISE.
5. PRIOR TO FIELD WELDING GALVANIZED MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING AND ANY OTHER CONTAMINANTS 2" BEYOND ALL FIELD WELD SURFACES. AFTER WELDING, REPAIR ALL GROUND AND WELDED SURFACES WITH (3) BRUSH COATS OF ZRC COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS REQUIREMENTS.
6. ALL FULL PENETRATION WELDS ARE REQUIRED TO BE 100□ NDE INSPECTED BY ULTRASONIC TESTING (UT) IN ACCORDANCE WITH AWS D1.1.
7. ALL PARTIAL PENETRATION AND FILLET WELDS ARE REQUIRED TO BE 50□ NDE INSPECTED BY MAGNETIC PARTICLE (MT) IN ACCORDANCE WITH AWS D1.1.

BOLTING NOTES:

1. STRUCTURAL CONNECTIONS TO BE ASSEMBLED AND INSPECTED IN ACCORDANCE WITH RCSC-2009 (SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR ASTM A490 BOLTS.)
2. ALL CONNECTION BOLTS SHALL BE ASTM A325N (GALVANIZED). UNLESS NOTED OTHERWISE.
3. SPLICE/FLANGE BOLTS SUBJECT TO DIRECT TENSION SHALL BE INSTALLED AND TIGHTENED AS PER SECTION 8.2.1 OF THE AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS". LOCATED IN THE AISC MANUAL OF STEEL CONSTRUCTION. THE INSTALLATION PROCEDURE IS PARAPHRASED AS FOLLOWS:

   FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES AND TIGHTENED BY ONE OF THE METHODS DESCRIBED IN SUBSECTION 8.2.1 THROUGH 8.2.4.

   8.2.1 TURN-OF-NUT PRETENSIONING
   BOLTS SHALL BE INSTALLED IN ALL HOLES OF THE CONNECTION AND BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1, UNTIL ALL THE BOLTS ARE SIMULTANEOUSLY SNUG TIGHT AND THE CONNECTION IS FULLY COMPACTED. FOLLOWING THIS INITIAL OPERATION ALL BOLTS IN THE CONNECTION SHALL BE TIGHTENED FURTHER BY THE APPLICABLE AMOUNT OF ROTATION SPECIFIED IN THE TABLE PROVIDED. DURING THE TIGHTENING OPERATION THERE SHALL BE NO ROTATION OF THE PART NOT TURNED BY THE WRENCH. TIGHTENING SHALL PROGRESS SYSTEMATICALLY.

TURN-OF-NUT ROTATION FROM SNUG TIGHT CONDITION

BOLT LENGTH (UNDER SIDE OF HEAD TO END OF BOLT)	BOTH FACES NORMAL TO BOLT AXIS		
	NUT ROTATION	INITIAL MARKING POSITION	FINAL MARKING POSITION
UP TO AND INCLUDING 4 DIAMETERS	1/3 TURN		
OVER 4 DIAMETERS BUT NOT EXCEEDING 8 DIA.	1/2 TURN		
OVER 8 DIAMETERS BUT NOT EXCEEDING 12 DIA.	2/3 TURN		

USE A WATERPROOF BLACK MARKER TO MARK THE BOLT AND NUT AS SHOWN ON THE TABLE.

BOLTING NOTES (CONT.):

4. ALL OTHER BOLTED CONNECTIONS SHALL BE BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1 OF THE SPECIFICATION.
   ALL BOLT HOLES SHALL BE ALIGNED TO PERMIT INSERTION OF THE BOLTS WITHOUT UNDUE DAMAGE TO THE THREADS. BOLTS SHALL BE PLACED IN ALL HOLES WITH WASHERS POSITIONED AS REQUIRED AND NUTS THREADED TO COMPLETE THE ASSEMBLY. COMPACTING THE JOINT TO THE SNUG-TIGHT CONDITION SHALL PROGRESS SYSTEMATICALLY FROM THE MOST RIGID PART OF THE JOINT. THE SNUG-TIGHTENED CONDITION IS THE TIGHTNESS THAT IS ATTAINED WITH A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF AN IRONWORKER USING AN ORDINARY SPUD WRENCH TO BRING THE CONNECTED PLIES INTO FIRM CONTACT.
5. A NUT LOCKING DEVICE SHALL BE INSTALLED ON ALL PROPOSED AND/OR REPLACED BOLTS.
6. ALL NEW BOLTS SHALL BE LONG ENOUGH TO FULLY ENGAGE THE FULL DEPTH OF THE NUT AND LOCKING DEVICE.
7. GALVANIZED ASTM A325 BOLTS SHALL NOT BE REUSED.

CONCRETE CONSTRUCTION:

1. ALL CONCRETE SHALL CONFORM TO THE SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS, ACI 301
2. ALL CONCRETE SHALL BE MADE WITH STONE AGGREGATE & SHALL DEVELOP 4000 PSI MIN. COMPRESSIVE STRENGTH IN 28 DAYS. CONCRETE MIX DESIGN: 6 1/2 SACKS OF CEMENT MINIMUM PER CUBIC YARD, 3/4" MAXIMUM AGGREGATE. AIR ENTRAINMENT = 6% ± 1% AND SLUMP = 4" ± 1" (WITHOUT PLASTICIZER)
3. ALL REINFORCING SHALL BE HIGH STRENGTH DEFORMED BARS, GRADE 60, ASTM A615, WITH 60,000 PSI MINIMUM YIELD POINT.
4. REINFORCING PROTECTION: CONCRETE POURED AGAINST EARTH.....3"
5. ALL BAR LENGTHS ARE NOT DRAWN TO SCALE. NO SPLICES OF REINFORCEMENT SHALL BE MADE EXCEPT AS DETAILED OR AS AUTHORIZED BY THE STRUCTURAL ENGINEER. LAP SPLICES, WHERE PERMITTED, SHALL BE A MINIMUM OF 40 BAR DIAMETERS UNLESS NOTED.
6. DETAIL BARS IN ACCORDANCE WITH ACI DETAILING MANUAL & ACI BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.
7. PROVIDE ALL ACCESSORIES NECESSARY TO SUPPORT REINFORCING AT THE POSITIONS SHOWN ON THE PLANS.
8. BACKFILL AND COMPACT SOIL TO A MINIMUM 95□ OF STANDARD PROCTOR DENSITY PER ASTM D 698.THE COMPACTED SOIL SHALL PROVIDE A MINIMUM UNIT WEIGHT OF 120 POUNDS PER CUBIC FOOT FOR THE FILL MATERIAL.
9. AS APPLICABLE, ORIENT NEW ANCHORS IN LINE WITH EXISTING ANCHORS.
10. AS APPLICABLE, ANCHOR RODS TO PASS THROUGH CENTROID OF BLOCK.

EPOXY-GROUTED FASTENER INSTALLATION:

1. CONTRACTOR SHALL VERIFY THAT DRILLING CLEARANCE IS ADEQUATE PRIOR TO CONSTRUCTION. NOTIFY THE ENGINEER IF A CLEARANCE PROBLEM EXISTS.
2. ALL HOLES SHALL BE WIRE-BRUSHED TO PROFILE THE CONCRETE SURFACE, ALL CORED HOLES WITH SMOOTH WALLS SHALL BE ROUGHENED.
3. USE COMPRESSED AIR TO BLOW ANY REMAINING DEBRIS OUT OF THE NEWLY DRILLED HOLES.
4. EPOXY GROUT THE NEW ANCHOR BOLTS OR REBAR IN PLACE PER THE MANUFACTURER'S INSTRUCTIONS.

CONTINUOUS INSPECTION AND MAINTENANCE:

CONTINUOUS INSPECTION OF THE STRUCTURE AND THE ADDED REINFORCING CONSISTENT WITH THE CURRENT REQUIREMENTS OF THE LATEST TIA 222 STANDARD SHALL BE IMPLEMENTED BY THE OWNER. ANY FUTURE CORROSION OR OTHER DETERIORATION OF THE STRUCTURE OR ITS REINFORCING WILL REDUCE ITS CAPACITY TO WITHSTAND THE REQUIRED LOADS. ANY DEFECTS SHALL BE REPAIRED TO ENSURE THE STRUCTURAL INTEGRITY FOR THE LIFE OF THE STRUCTURE.

CLIENT

TERRA CONSULTING GROUP, LTD.

SITE NAME/NUMBER

RT 7 AND WEST

SITE ADDRESS

15101 WOLF ROAD
ORLAND PARK, IL 60439
N41° 36' 53.29", W87° 53' 27.87

DRAWINGS PREPARED BY:

SEMAAN ENGINEERING SOLUTIONS
SEMAAN ENGINEERING SOLUTIONS HOLDINGS, LLC

1079 NORTH 205TH STREET
OMAHA, NEBRASKA 68022
PHONE: (402) 289-1888
FAX: (402) 289-1861

STAMP

LICENSED STRUCTURAL ENGINEER
THOMAS LYNN TAYLOR
031-007124
STATE OF ILLINOIS
EXP. 11/30/2016
7.7.15

DRAWN BY: KRC
APPROVED BY: TLT

REV	DESCRIPTION	DATE
2	REVISED ANALYSIS	07/07/2015
1	REVISED ANALYSIS	06/04/2015
0	FIRST ISSUE	11/06/2014

DRAWING DESCRIPTION

GENERAL NOTES

SHEET NUMBER	REVISION
N-1	2

SPECIAL INSPECTION

1. A QUALIFIED INDEPENDENT INSPECTION FIRM, EMPLOYED BY THE OWNER, SHALL PERFORM INSPECTION AND TESTING IN ACCORDANCE WITH THE IBC 2009, SECTION 1704 AS REQUIRED BY PROJECT SPECIFICATIONS FOR THE FOLLOWING CONSTRUCTION WORK TO BE INCLUDED IN THE POST-MODIFICATION INSPECTION (PMI) REPORT.

   ☐ CONSTRUCTION INSPECTIONS

   ☐ HIGH STRENGTH BOLT INSPECTION

   ☐ CONTRACTOR'S CERTIFIED WELD INSPECTION AND NDE REPORTS
   GROOVE WELDS SHALL REQUIRE CONTINUOUS INSPECTION.
   MULTI PASS FILLET WELDS SHALL REQUIRE CONTINUOUS INSPECTION.
   SINGLE PASS FILLET WELDS ☐ 5/16".....CONTINUOUS
   SINGLE PASS FILLET WELDS ☐ 5/16".....PERIODIC INSPECTION
   ALL WELDS SHALL BE VISUALLY INSPECTED BY THE APPROVED WELD INSPECTOR.

   d. ON SITE COLD GALVANIZING VERIFICATION

   ☐ GENERAL CONTRACTOR AS-BUILT DOCUMENTS

2. THE INSPECTION AGENCY SHALL SUBMIT INSPECTION AND TEST REPORTS TO THE BUILDING DEPARTMENT, THE ENGINEER OF RECORD, AND THE OWNER IN ACCORDANCE WITH IBC 2009, 1704. THE INSPECTION FIRM SHALL ALSO PROVIDE A REDLINE SET OF THE AS-BUILT DRAWINGS AND COMPLETE PHOTO DOCUMENTATION OF THE MODIFICATIONS COMPLETED AT THE SITE.

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GENERAL NOTES

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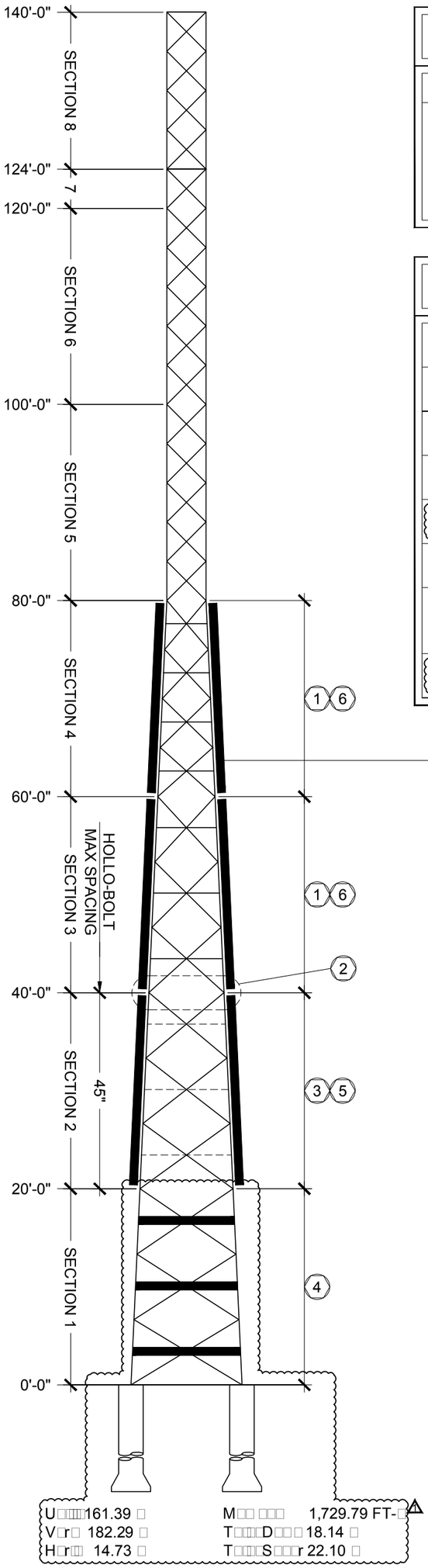
N-2	0



EXISTING 140 FT ANDREW LST SELF SUPPORT TOWER
(DWG # LI-8545-02 DATED 07/11/1985)

SECTION PROPERTIES

SECTION	LEG MEMBERS	DIAGONAL MEMBERS	HORIZONTAL MEMBERS
1	MOD 50 5PST	SAE 36 2.5x2.5x0.1875	
2	MOD 50 4PST L4x.3125	SAE 36 2x2x0.125	
3	MOD 50 3"PX /3.5PST	SAE 36 1.75x1.75x0.125	
4	MOD 50 3"PX /3.5PST	SAE 36 1.75x1.75x0.125	
5	MOD 50 2PXX /2.5 PX	SAE 36 1.75x1.75x0.125	
6	PX 50 2" DIA PIPE	SAE 36 1.5x1.5x0.125	
7 - 8	PST 50 2" DIA PIPE	SAE 36 1.5x1.5x0.125	SAE 36 1.5x1.5x0.125

MODIFICATION SCHEDULE

NO.	MODIFICATION DESCRIPTION	ELEVATIONS (FT)	SHEETS	DETAILS
1	ADD 4.00" DIA. x .226" HALF PIPE TO THE EXISTING 3.5" O.D. PIPE LEGS	40 - 60 60 - 80	S-5	A B
2	LEG SPLICE REINFORCEMENT	40	S-2	-
3	ADD (3) L 4 x 4 x 5/16 ANGLE TO THE EXISTING 4.50" O.D. PIPE LEGS	20 - 40	S-4	C D
4	ADD L2 1/2 x 2 1/2 x 3/16 ANGLE (A36-GALV) BOLT-ON LEG BRACES	0 - 20	S-6	-
5	REMOVE EXISTING BOLT-ON LEG BRACES AS THE NEW LEG REINFORCING IS INSTALLED	20 - 40	-	-
6	REMOVE AND REINSTALL EXISTING BOLT-ON LEG BRACES AS THE NEW LEG REINFORCING IS INSTALLED	40 - 80	-	-

TOWER ELEVATION
NOT TO SCALE

SHEET NUMBER S-1
REVISION 1

SELF SUPPORT TOWER ELEVATION VIEW
DRAWING DESCRIPTION

REV	DESCRIPTION	DATE
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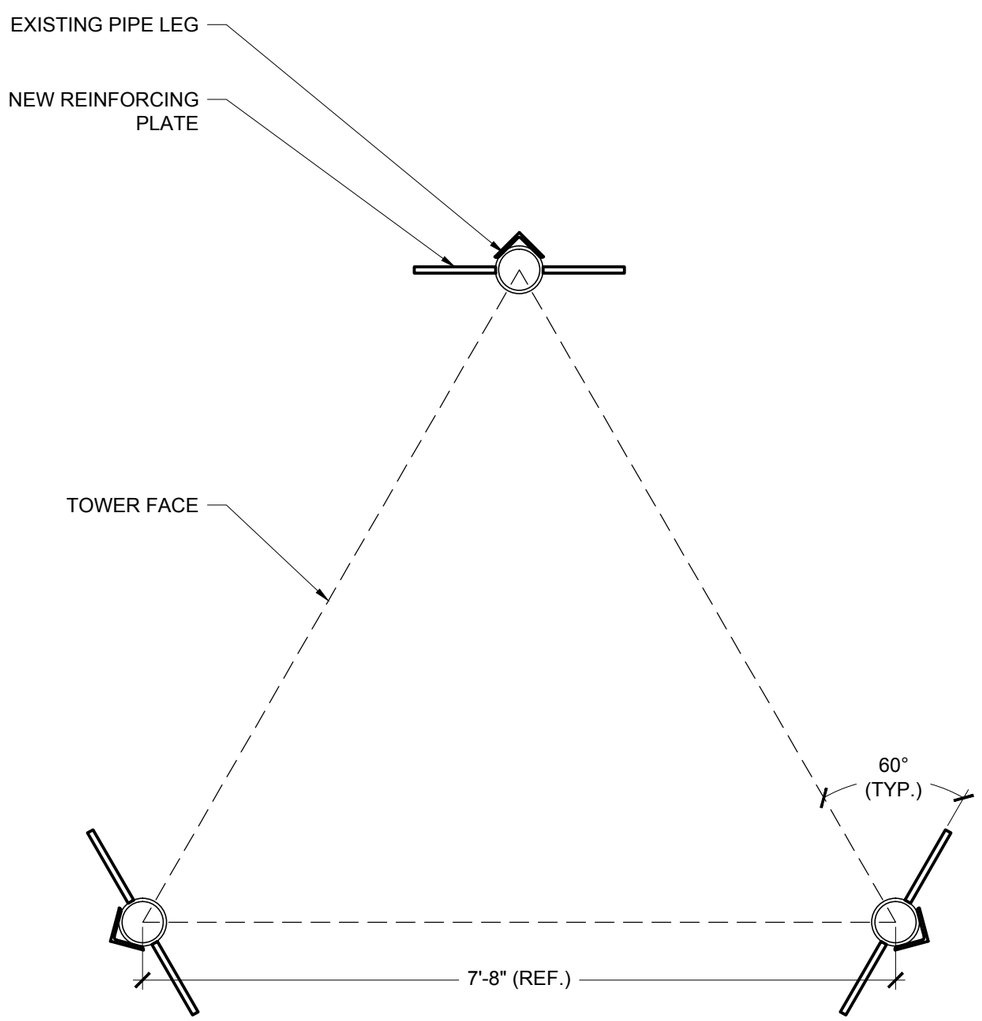
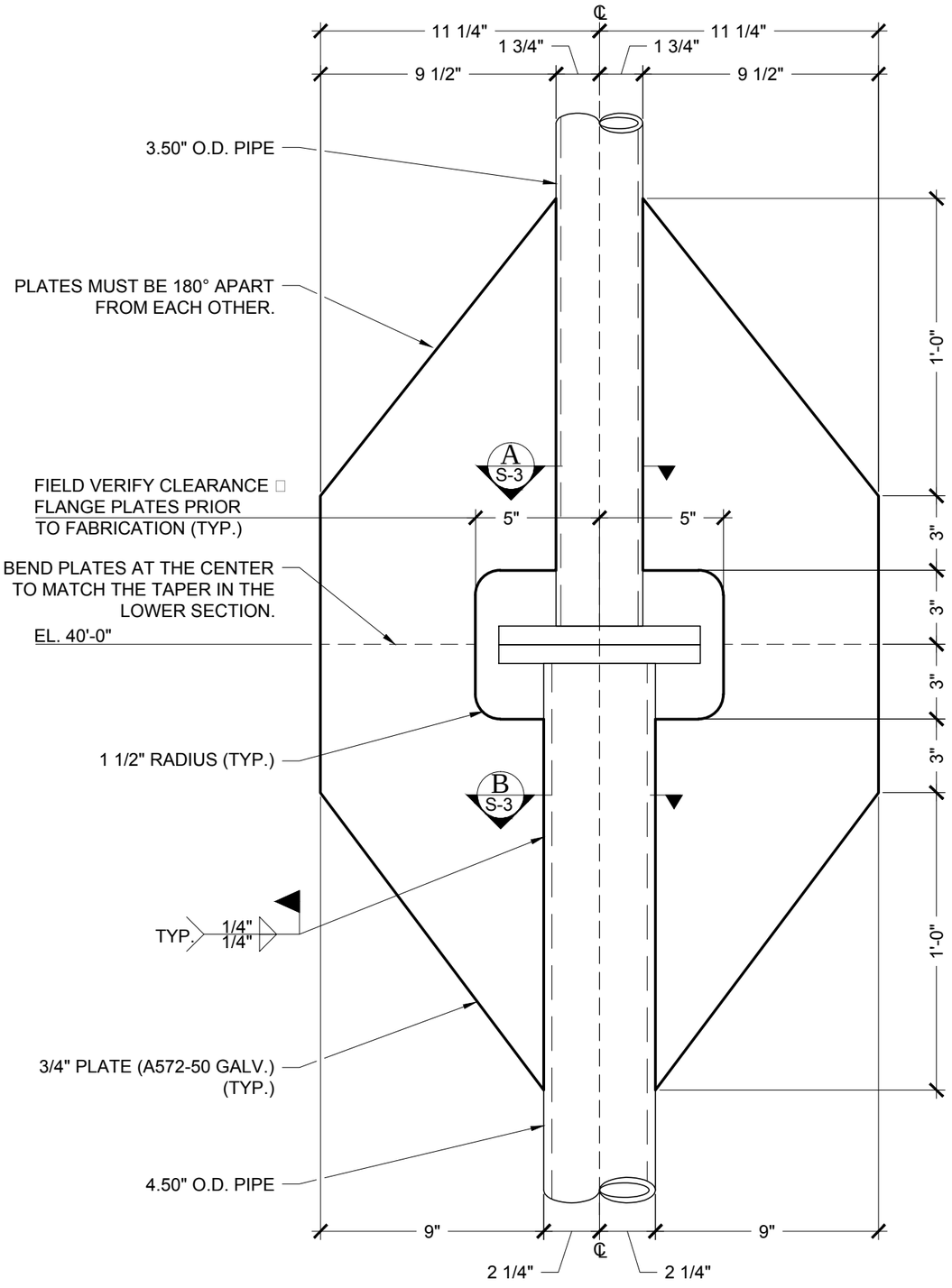


ORIENTATION PLAN
NOT TO SCALE



LEG SPLICE REINFORCEMENT PLATE □ EL. 40 FT
NOT TO SCALE

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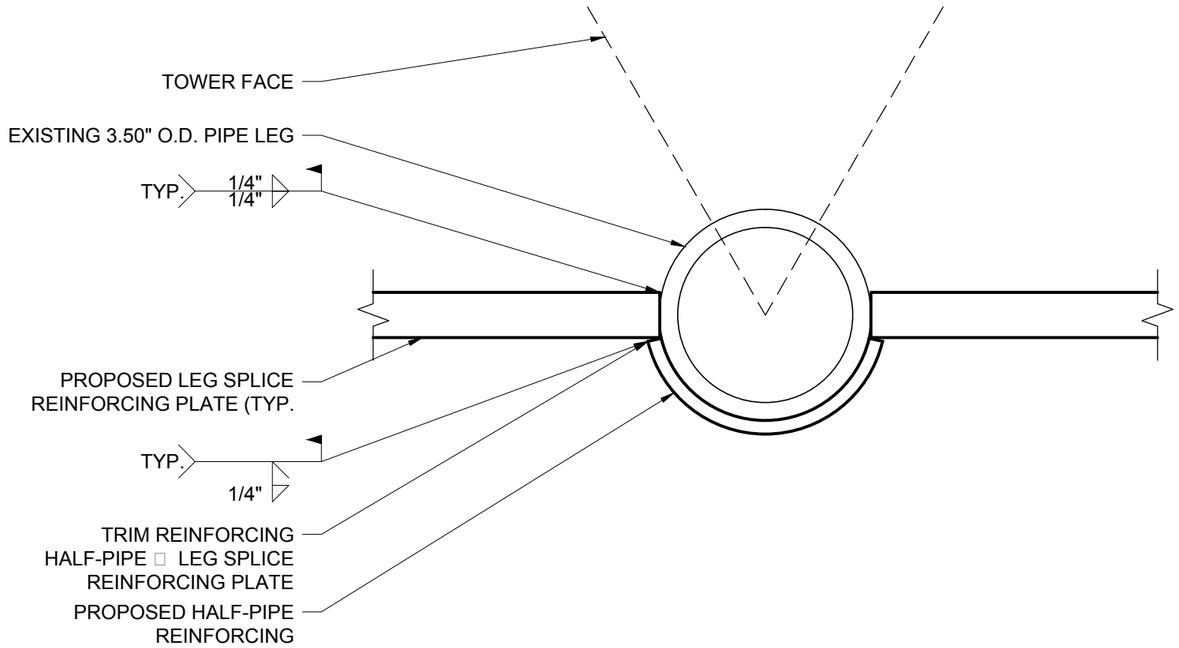
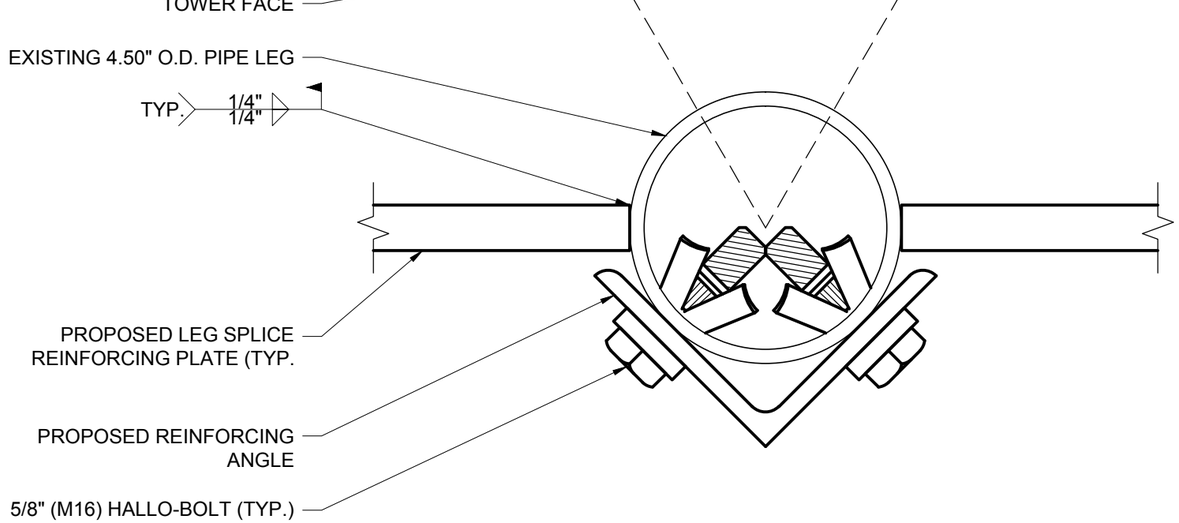
LEG SPLICE REINFORCEMENT DETAILS

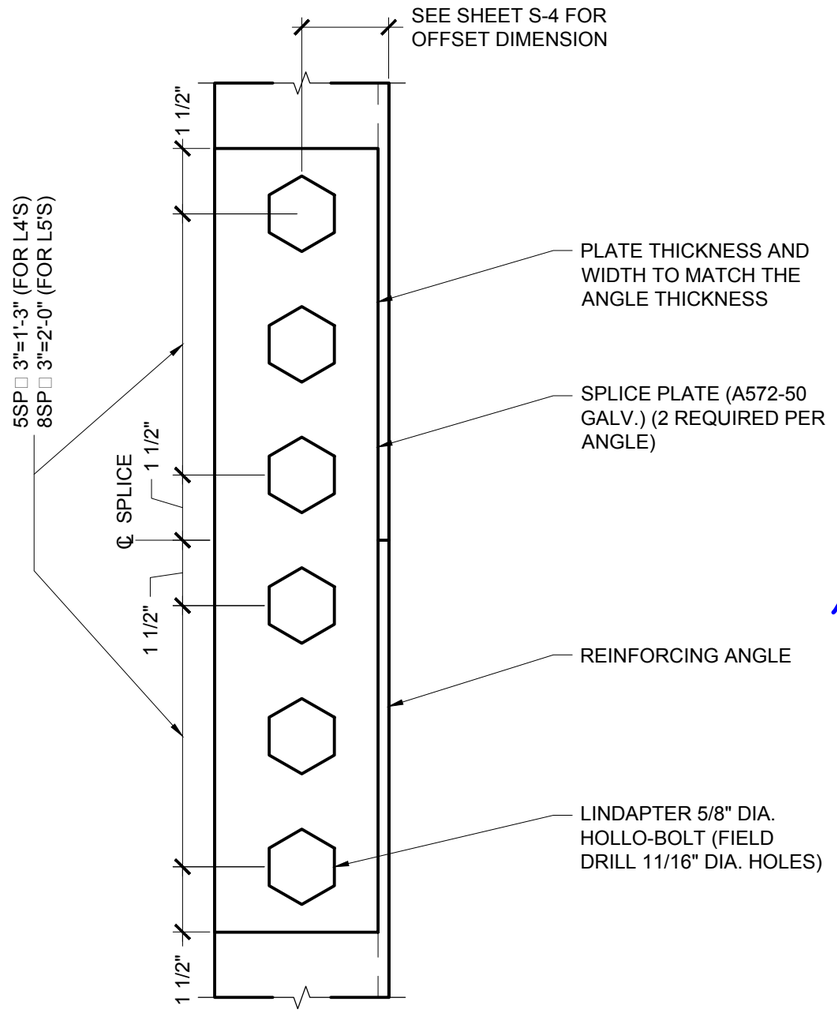
SHEET NUMBER	REVISION
S-2	0



A S-2 ORIENTATION PLAN
NOT TO SCALE



B S-2 ORIENTATION PLAN
NOT TO SCALE



ANGLE SPLICE DETAIL (AS REQUIRED)
NOT TO SCALE

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ANGLE SPLICE REINFORCEMENT DETAILS

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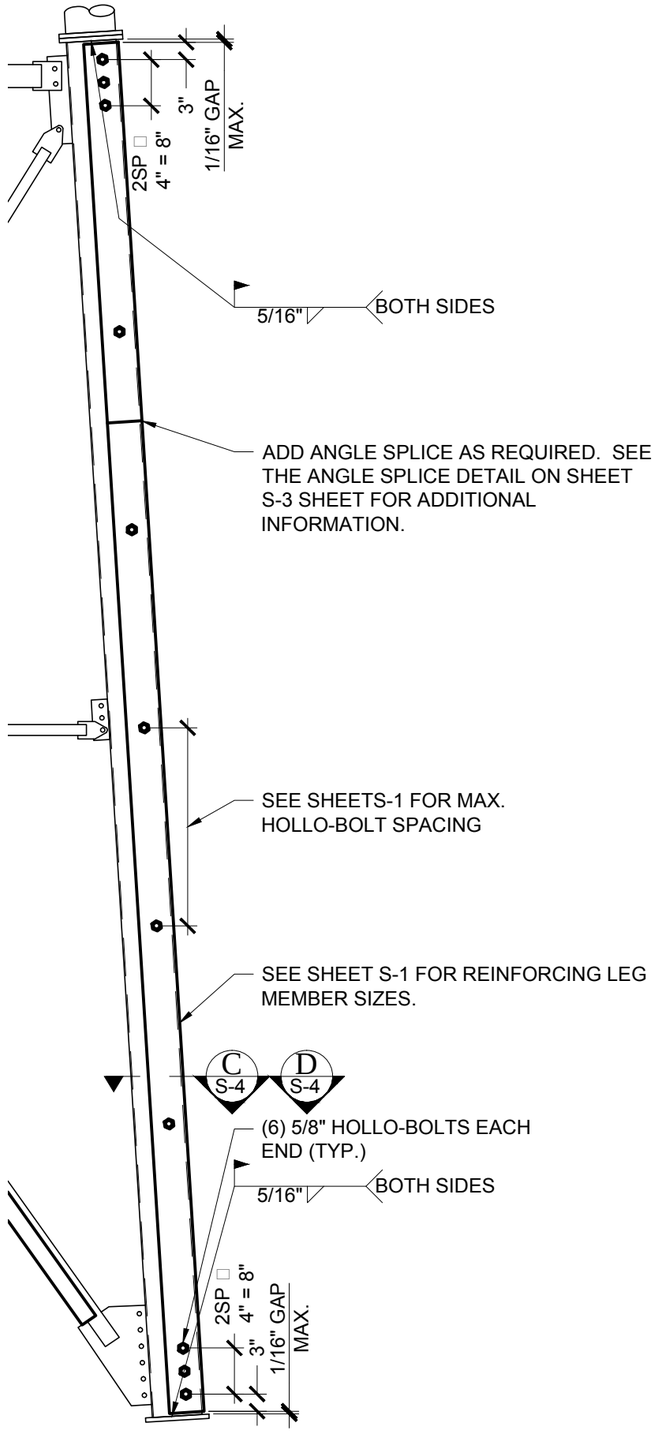
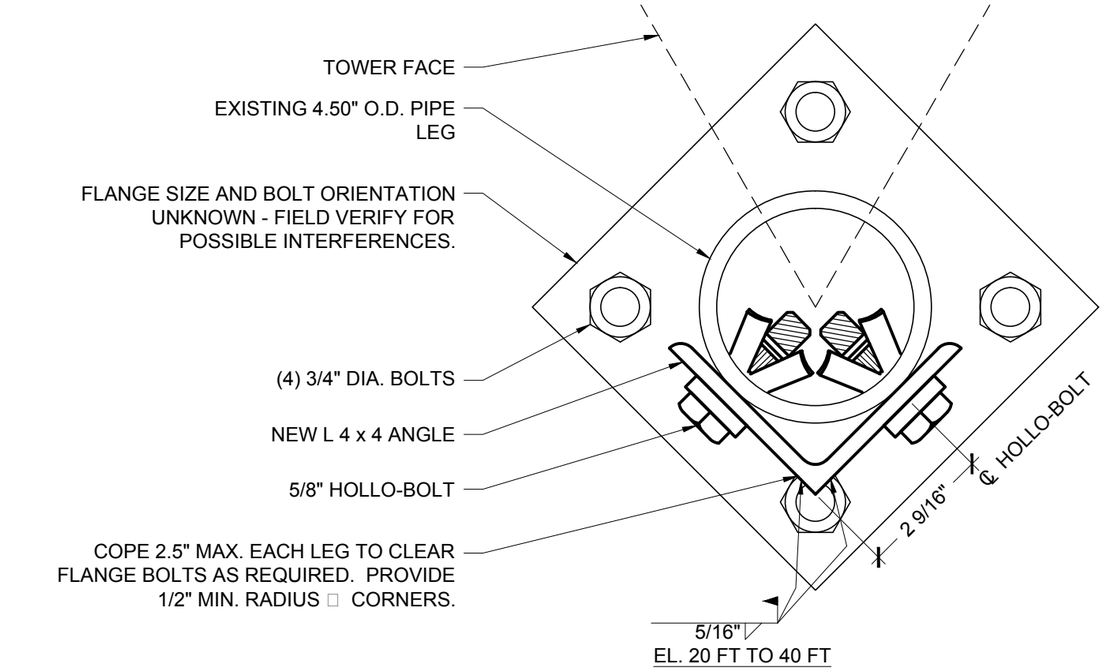
S-3	0



ORIENTATION PLAN
NOT TO SCALE

C S-2 SECTION
NOT TO SCALE



D S-2 SECTION
NOT TO SCALE

CLIENT

TERRA CONSULTING GROUP, LTD.

SITE NAME/NUMBER

RT 7 AND WEST

SITE ADDRESS

15101 WOLF ROAD
ORLAND PARK, IL 60439
N41° 36' 53.29", W87° 53' 27.87

DRAWINGS PREPARED BY:

SEMAAN ENGINEERING SOLUTIONS
SEMAAN ENGINEERING SOLUTIONS HOLDINGS, LLC

1079 NORTH 205TH STREET
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STAMP

LICENSED STRUCTURAL ENGINEER
THOMAS LYNN TAYLOR
031-007124
STATE OF ILLINOIS
7.7.15
EXP. 11/30/2016

DRAWN BY: KRC
APPROVED BY: TLT

REV	DESCRIPTION	DATE
1	REVISED ANALYSIS	07/07/2015
0	FIRST ISSUE	11/06/2014

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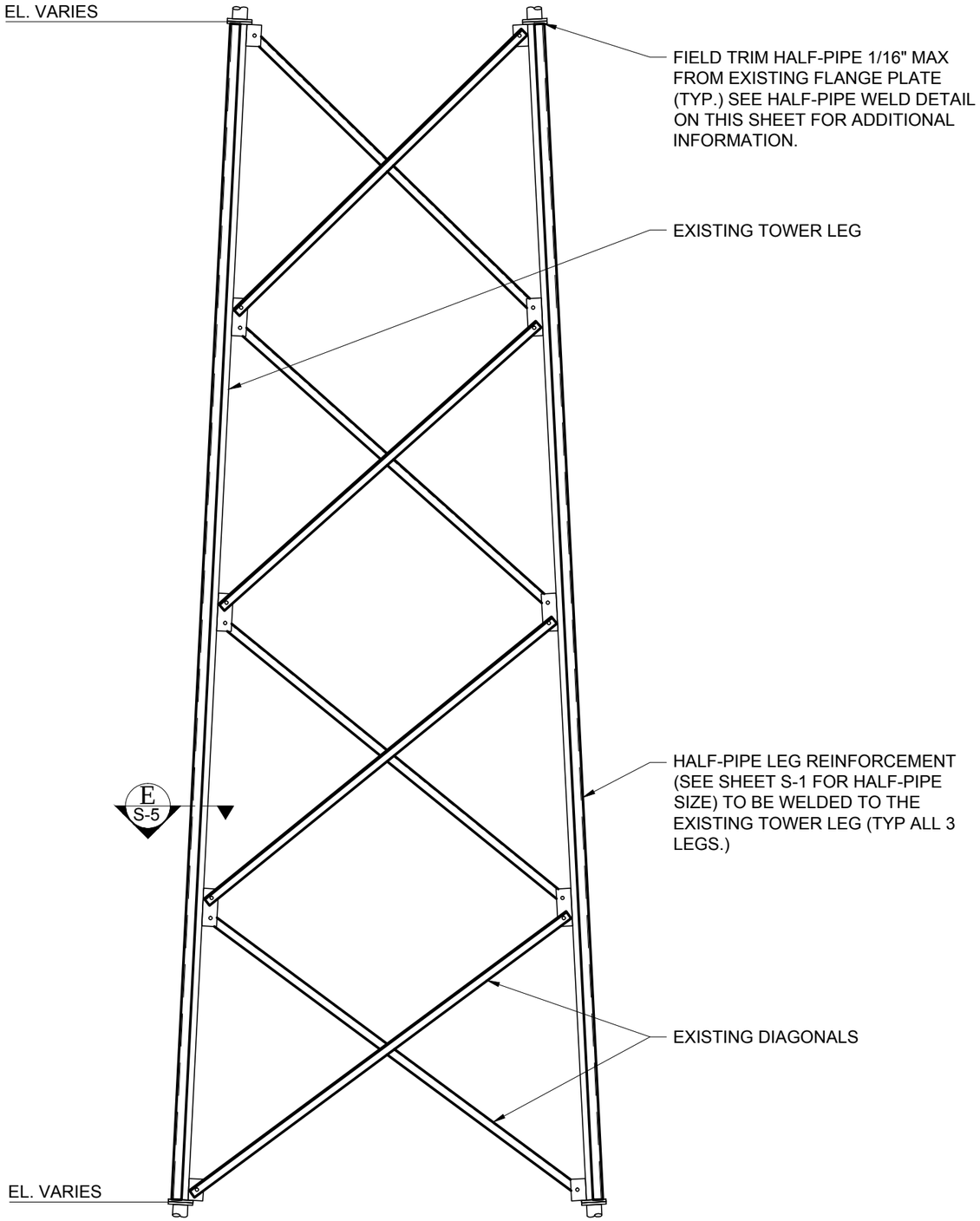
ANGLE LEG REINFORCEMENT DETAILS

SHEET NUMBER	REVISION
S-4	1



ORIENTATION PLAN
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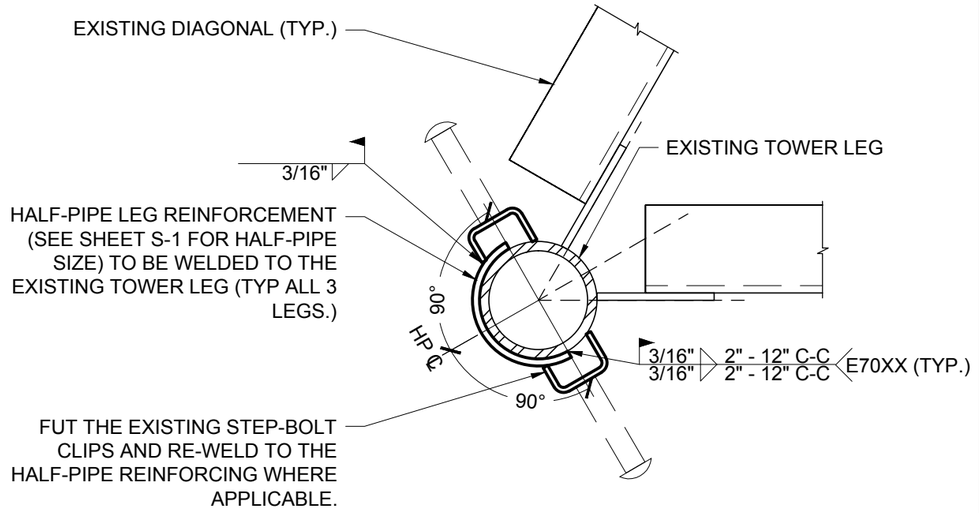

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S-5
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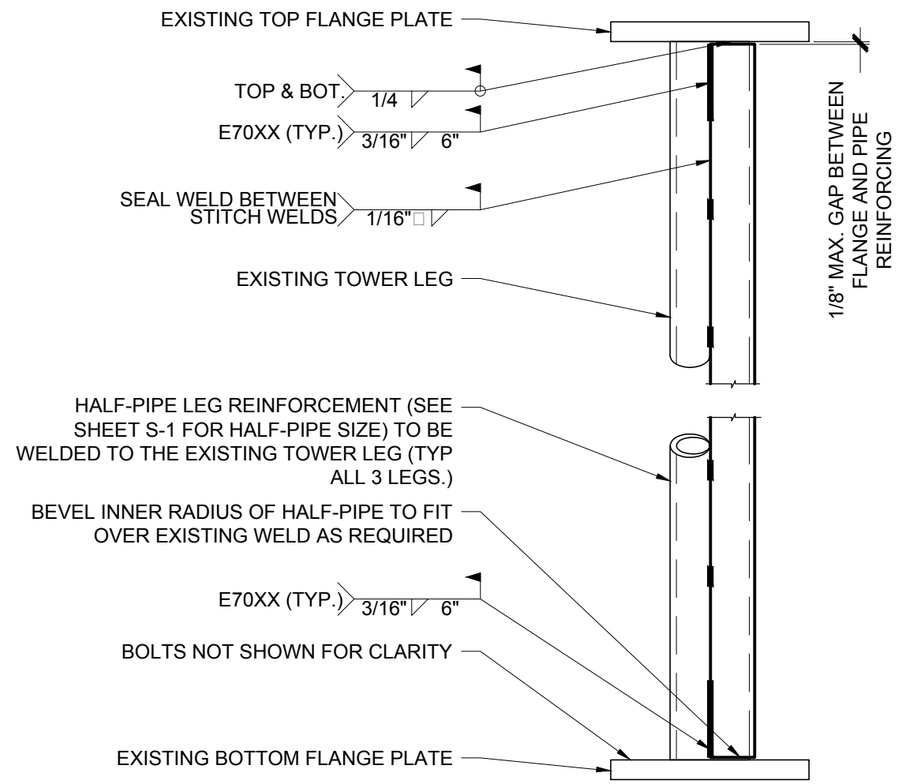

HALF-PIPE WELD DETAIL
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HALF-PIPE LEG REINFORCEMENT DETAILS

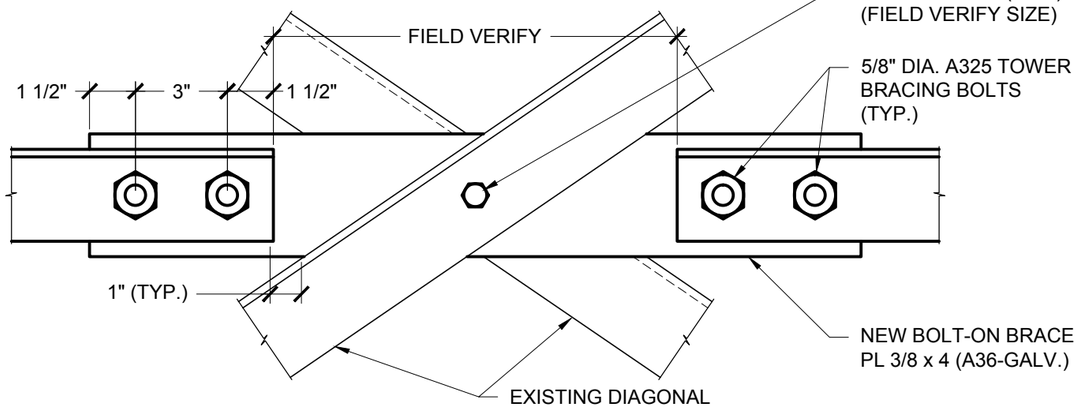
SHEET NUMBER	REVISION
S-5	0

BOLT-ON BRACE SCHEDULE

SECTION	ELEVATION	LEG O.D.	U-BOLT DIA.	PL THICKNESS	PL WIDTH
1	0 - 20	5.563	1/2	3/8	8

1. PRIOR TO FABRICATION AND INSTALLATION, CONTRACTOR SHALL FIELD VERIFY ALL LENGTHS AND QUANTITIES GIVEN.

2. ALL CONNECTIONS NOT FULLY DETAILED ON THESE PLANS SHALL BE DETAILED BY THE STEEL FABRICATOR IN ACCORDANCE WITH THE AISC SPECIFICATION FOR MANUAL OF STEEL CONSTRUCTION, LOAD AND RESISTANCE FACTOR DESIGN, 13TH EDITION.



TYPICAL PLATE CONNECTION DETAIL
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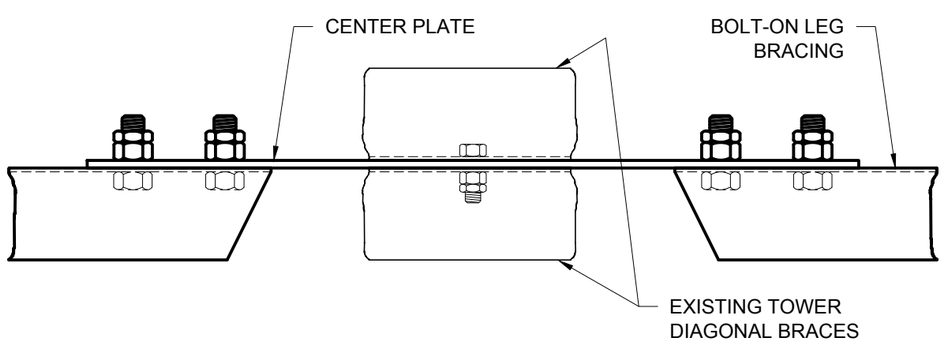

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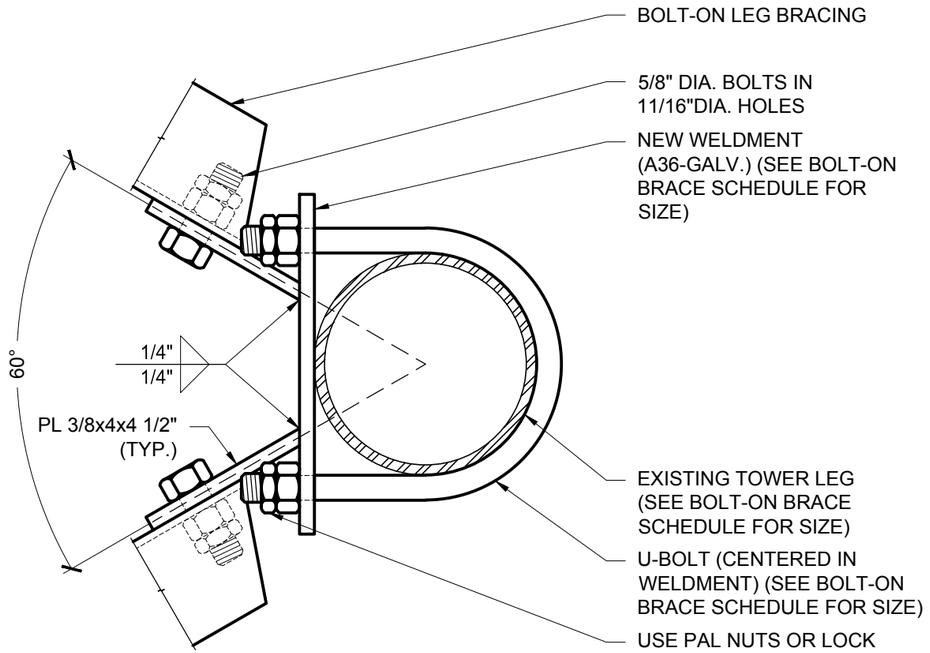

BOLT-ON GUSSET DETAIL
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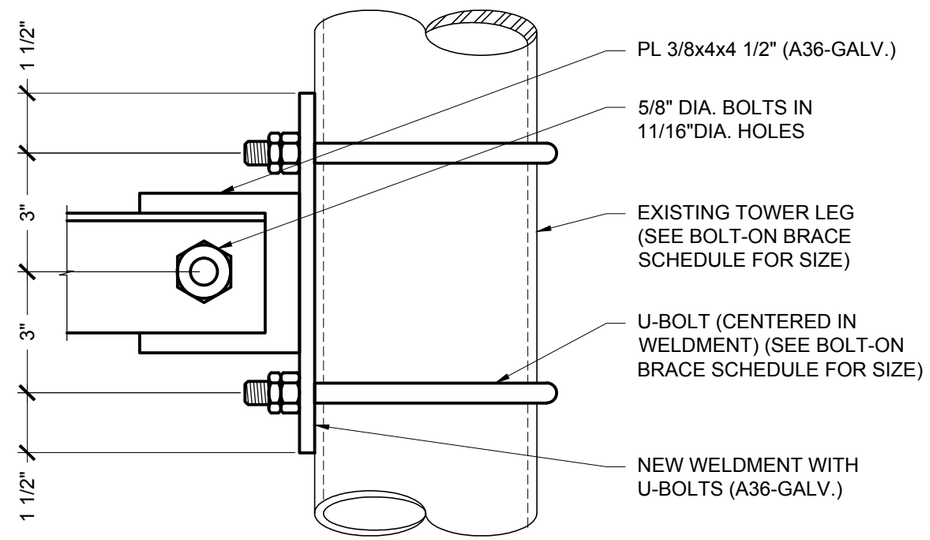

BOLT-ON GUSSET DETAIL
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BOLT-ON BRACE DETAILS

SHEET NUMBER	REVISION
S-6	0