Wetland Delineation Review

WI-Waukesha-Summit / ML53108I

3031 Summit Avenue
Waukesha, Wisconsin

EBI Project No. 6115003361

August 4, 2015

Prepared for:

Cellusite
c/o Parallel Infrastructure
103 Wilshire Court
Noblesville, IN 46062

Prepared by:

EBI Consulting
environmental | engineering | due diligence

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environmental | engineering | due diligence

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www.ebiconsulting.com

August 4, 2015

Mr. Derek McGrew
Cellusite
c/o Parallel Infrastrucure
103 Wilshire Court
Noblesville, IN 46062

RE: Proposed Telecommunications Facility
Site Identifier: WI-Waukesha-Summit / ML53108I
Site Address: 3031 Summit Avenue, Waukesha, Waukesha County, Wisconsin 53188
Latitude / Longitude: 43° 01' 08.75" N / 88° 16' 44.24" W
EBI Project No. 6115003361

Dear Mr. McGrew,

EBI Consulting (EBI) has prepared the following Wetland Delineation Review (the *Review*) for the above-referenced property (herein, the Subject Property) on behalf of Cellusite. This *Review* was completed as a part of EBI's Section 404 of the Clean Water Act (CWA) review of potential jurisdictional waters of the U.S., including wetlands, as defined by the CWA and regulated by the U.S. Army Corps of Engineers (USACE). The *Review* is necessary to determine the potential extent of impacts to such waters as a result of the proposed tower installation. This wetland study was completed in accordance with the three parameter approach to a wetland delineation as published by the USACE 1987 edition (Technical Report Y-87-1) and the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) which was published in August 2010**.**

Please note that EBI prepared this *Review* using readily-available online resources and visual observations made during EBI's wetland survey at the Subject Property on July 29, 2015. At the time of the survey, the weather was sunny and approximately 80º Fahrenheit. This *Review* is designed to provide ecological information on the Subject Property with respect to any potential permitting and consultation requirements.

PROJECT SUMMARY

Note that EBI focused this investigation on the portions of the Subject Property that are proposed to be occupied by Cellusite (herein, the Project Site). Cellusite proposes to construct a tower facility on the central portion of the Subject Property. The facility will include a 140-foot monopole communications tower (145 feet with all appurtenances) and associated equipment platform situated within a 70-foot by 70-foot lease area. Coax cables will be routed from the equipment shelter to the tower along a proposed coax ice bridge. The lease area will be enclosed by a chain link fence topped with barbed wire. Telecommunications and electric cables will be routed within proposed subsurface conduits from existing sources at the north end of the Subject Property to the proposed telecommunications facility via a proposed 20-foot wide access/utility easement. All development activities will take place within the existing property boundaries on grass-covered land.

PROPERTY AND VICINITY DESCRIPTION

The Subject Property, known as WI-Waukesha-Summit / ML53108I, consists of an approximately 28.7-acre lot that is improved with a church. Church buildings are located on the northeastern portion of the Subject Property, and undeveloped, grass-covered and wooded land is located on the southern portion of the Subject Property. The Subject Property is located at 3031 Summit Avenue in Waukesha, Waukesha County, Wisconsin. Waukesha is

located in southern Wisconsin, and the Subject Property is approximately 2.5 miles west of downtown Waukesha. The current tenancy is commercial use. Since at least the early 1940s, the Subject Property has consisted of agricultural land, with a farmstead located on the northern portion of the Subject Property. In the 1970s, the Subject Property was removed from agricultural use and the row crop fields were converted to undeveloped land. The farmstead was demolished and the church buildings were constructed in approximately 2000. Since the early 1940s, the surrounding areas have historically consisted of agricultural land seasonally engaged in row-crop production. Residential development of the surrounding areas began in approximately 1950.

JURISDICTIONAL WETLANDS REVIEW

EBI reviewed available online resources to determine if the proposed telecommunications facility is located within or in an area of influence of any federally-protected wetlands and/or waterways. A desktop ecological resource review was conducted using historic aerial photography, the Wisconsin Wetland Inventory map, USFWS National Wetlands Inventory (NWI) data, National Resource Conservation Service (NRCS) Soil Survey data, FEMA flood zone data, and historic U.S. Geological Survey (USGS) topographic quadrangle maps prior to performing a wetland delineation field survey.

Wisconsin Wetland Inventory

EBI reviewed the Wisconsin Wetland Inventory map depicting the Project Site and immediate vicinity (see attached). The map depicts a forested, emergent/wet meadow wetland in an area immediately east of the Project Site.

NWI Review

EBI reviewed the NWI map depicting the Project Site and immediate vicinity (see attached). The NWI map depicts a palustrine forested broad-leaved deciduous wetland with a saturated water regime and organic soils in an area immediately east of the Project Site.

NRCS County Soil Survey

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS) website (http://websoilsurvey.nrcs.usda.gov/app/), the dominant soil composition in the vicinity of the Project Site is classified as Knowles silt loam, 2 to 6 percent slopes. This soil consists of moderately deep, well drained soils formed in the underlying loamy till on ground moraines. Permeability is moderate to slow, and the potential for surface runoff is low to high. The depth to bedrock is typically around 40 inches. The depth to the water table is typically more than 80 inches. This soil type is classified by the NRCS (http://soils.usda.gov/use/hydric/) as hydrologic soil group C. Group C soils have low infiltration rates when thoroughly wetted and consist of soils with a layer that impedes downward movement of water. A copy of the NRCS Soil Survey map is included as an attachment to this *Review.*

FEMA Flood Zone

Based on EBI's review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (www.fema.gov) for the proposed Subject Property, the Project Site Flood Zone Determination appears to be Zone X, defined as an area outside the 100-year and 500-year floodplains, as depicted on the First American Flood Data Services Flood Hazard Certification, Community Map #55133C0194G, Panel #194, dated November 5, 2014. A copy of the Flood Zone Map is included in the Appendices of this Report.

FIELD INVESTIGATION

The Subject Property reconnaissance was conducted by Ms. Alaina McDavid, EBI Project Scientist, on July 29, 2015. The Subject Property reconnaissance consisted of visual and physical investigation of the Project Site and improvements, adjoining properties as viewed from the Subject Property boundaries, and the surrounding area based on visual observations and land owner information for any wetland or other Waters of the United States (WOUS) that may be directly impacted by the proposed Project Site installation. Wetland areas were flagged to distinguish these areas from the upland areas surrounding the Project Site. At the time of the survey, the weather was sunny and approximately 80º Fahrenheit. Exterior ground surfaces were observed to be dry. There were no portions of the Project Site that were inaccessible or excluded from this survey.

Field Methodologies

EBI conducted an on-site wetland delineation and investigated the full extent of the proposed leased area and assessed it for areas that might possess the three mandatory wetland criteria as set by the USACE. USACE wetland

data forms, which document the presence, or lack thereof, of the three mandatory wetland criteria, were completed for two (2) different locations adjacent to the lease area and one (1) within the proposed lease area location. At each data point location a soil sample was retrieved, hydrology tests performed, and vegetative communities accessed in accordance with the three parameter approach to wetland delineation as published by the USACE 1987 edition (Technical Report Y-87-1) and the Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) which was published in August 2010. All completed data forms are included as an attachment to this report. Upon completing the wetland delineation, the wetland area and data points were indicated on a Wetland Delineation Map that can be found as an attachment to this report.

Vegetative Communities

The entire Project Site and areas in the immediate vicinity are located in a grassy field with vegetation typical of an upland prairie community. Vegetation typical of a prairie pothole wetland system was observed approximately 70 feet east of the Project Site.

The upland prairie area was dominated by various upland grasses such as switchgrass (*Panicum virgatum*), Canada thistle (*Cirsium arvense*), goldenrod (*Solidago sp.*), and avens (*Geum sp.*). The prairie pothole wetland area was dominated by cattails (*Typha latifolia*).

Soils

The soils underlain the Project Site have been moderately disturbed due to the historical agricultural activities. The area was found consistent with the Knowles complex and did not contain signs of hydric indicators. Please refer to attached wetland determination data forms for a complete soils analysis as observed during the field investigation.

Hydrology

EBI analyzed hydrology data at the three data point locations. None of the three data points showed indications of wetland hydrology.

Results of investigation of each data point can be found on table below:

Wetland Data Points Please refer to Appendices for Wetland GPS Survey	*Within a wetland area?*	
	YES	NO
Data Point 1 (S-1) Wetland vegetation absent; Hydrology indicators absent; And hydric soils absent.	☐	☒
Data Point 2 (S-2) Wetland vegetation absent; Hydrology indicators absent; And hydric soils absent.	☐	☒
Data Point 3 (S-3) Wetland vegetation absent; Hydrology indicators absent; And hydric soils absent.	☐	☒

FINDINGS AND CONCLUSIONS

Based on the results of EBI's *Review* as summarized herein, the proposed telecommunications facility and access road are not anticipated to have an effect on jurisdictional wetland systems. Thus, consultation with the USACE will not be necessary for the proposed Project Site location.

It is important to note that these conclusions are based on the currently proposed project limits, a desktop analysis, and a field reconnaissance performed by EBI. The presence of wetlands within the project limits is the opinion of EBI and has not been verified by the USACE. The USACE is the only agency that can provide an official determination of the jurisdictional extent of WOUS, including wetlands and waterbodies.

EBI is an independent contractor, not an employee of either the property owner or the project proponent, and its compensation was not based on the findings or recommendations made in this *Review* or on the closing of any business transaction.

Sincerely,

Alaina McDavid
Project Scientist

Tony Maguire, PWS
Senior Wetland Scientist

Attachments: References
Figures & Drawings
Photographs
Supporting Documentation
Qualifications

References

Environmental Laboratory. 1987. U.S. Army Corps of Engineers Wetlands Delineation Manual. (Technical Report Y-87-1). U.S. Army Waterways Experiment Station, Vicksburg, MS.

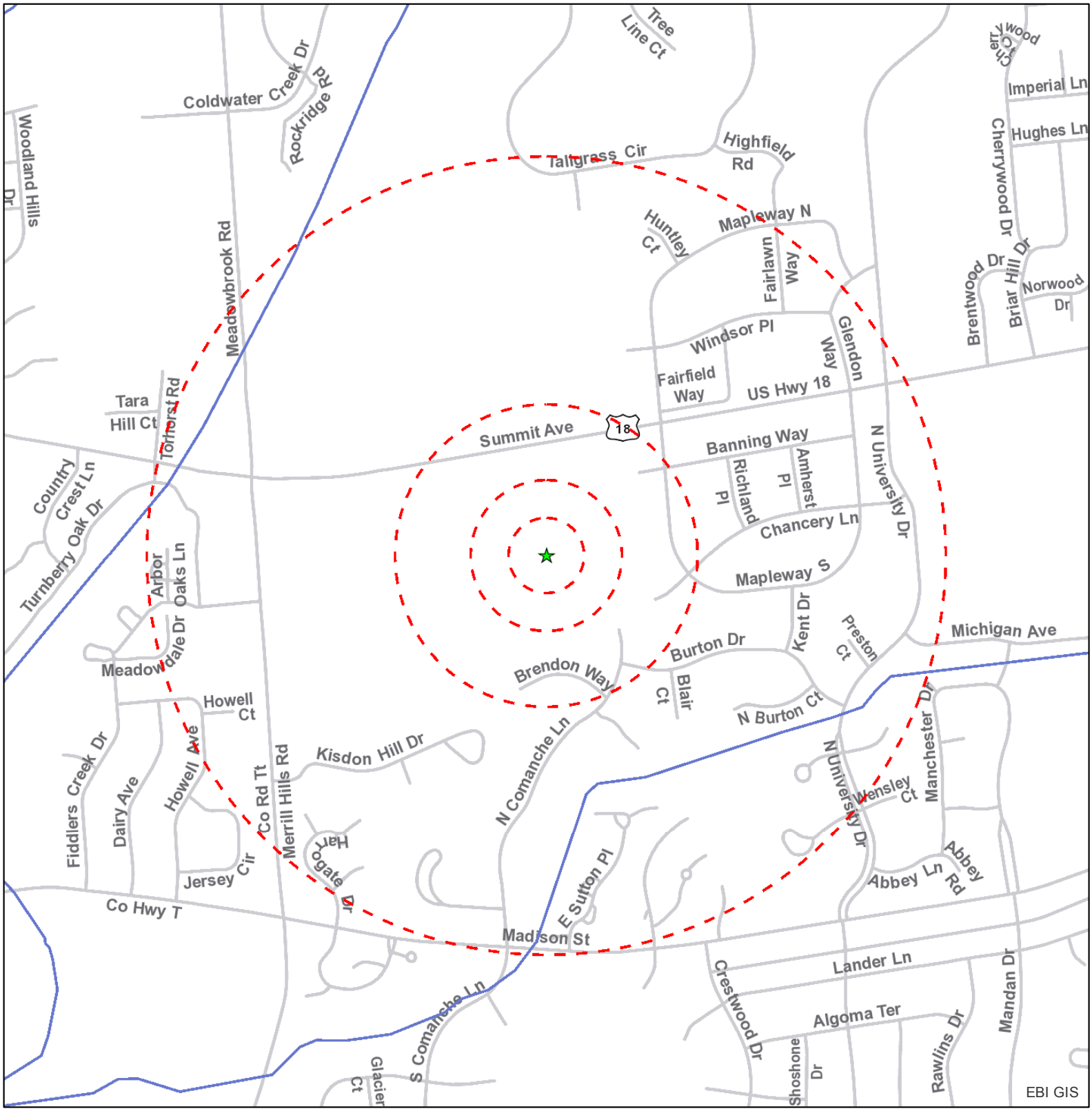
United States Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0). Vicksburg, MS: U.S. Army Engineer Research and Development Center.

United States Department of Agriculture. 2014. Web Soil Survey. <http://websoilsurvey.nrcs.usda.gov/app/>

Wetland Training Institute, Inc. 1995. Field Guide for Wetland Delineation; 1987 Corps of Engineers Manual, Glenwood, NM. WTI 02-1.

Wetland Training Institute, Inc. 2006. Pocket Guide to Hydric Soil Field Indicators v. 6.0. Robert J. Pierce (ed.). Wetland Training Institute, Inc., Glenwood, NM. WTI 2006-1.

FIGURES & DRAWINGS



Legend

- Project Site
- Site Radius at 250', 500', 1000' and ½ mile

Source: Selected data from ESRI, EBI & USGS

N

Date: 7/1/2015

Figure 1: Site Location Map

0 500 1,000 2,000 3,000 Feet

ML53108-I CHRIST THE LIFE EVANGELICAL
3031 SUMMIT AVENUE
WAUKESHA, WI 53188

PN: 6115003361

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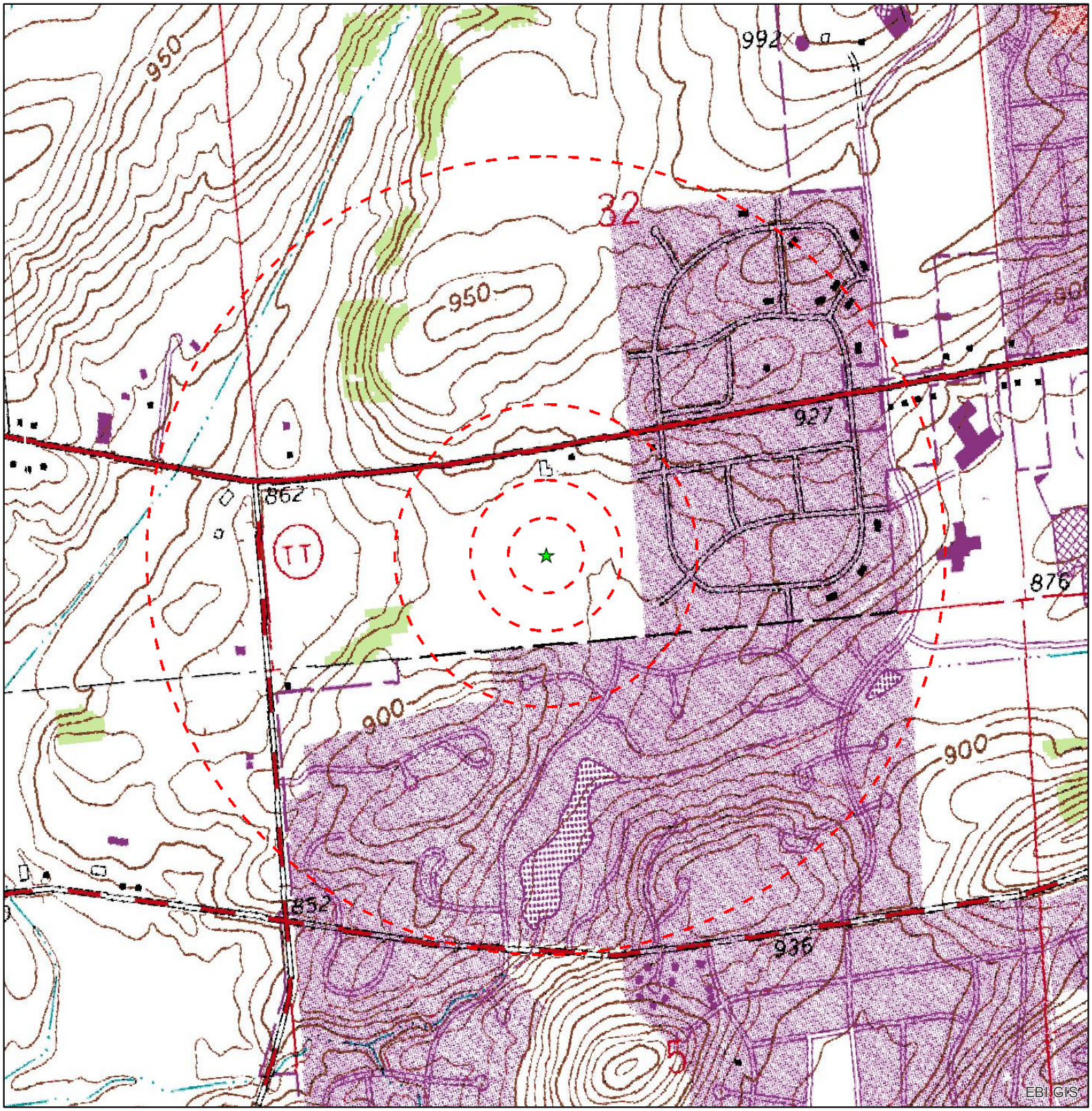


Legend

★ Project Site

Site Radius at 250', 500', 1000' and ½ mile

Source: Selected data from ESRI, EBI & USGS

N

USGS 24K Quad: Hartland, WI 1978

Date: 7/1/2015

Figure 2 - Topographic Map

0 500 1,000 2,000 3,000 Feet

ML53108-I CHRIST THE LIFE EVANGELICAL
3031 SUMMIT AVENUE
WAUKESHA, WI 53188

PN: 6115003361

EBI Consulting
environmental | engineering | due diligence

T-Mobile® stick together®

SITE NUMBER: ML53108I

SITE NAME: CHRIST THE LIFE EVANGELICAL

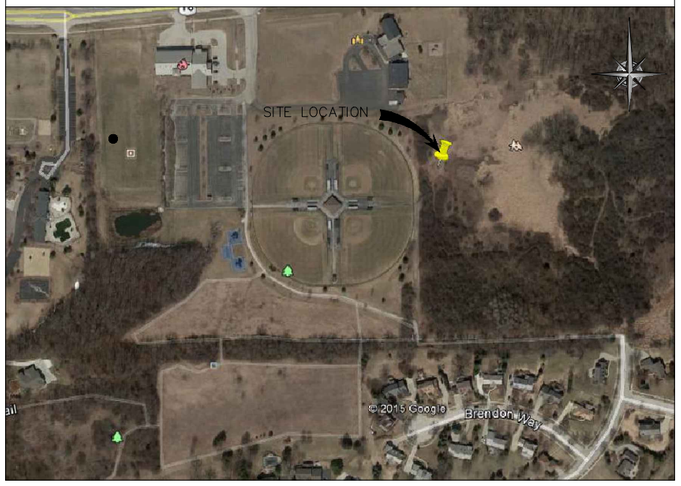
SITE TYPE: 140' MONOPOLE

JURISDICTION: CITY OF WAUKESHA

CITY: WAUKESHA

COUNTY: WAUKESHA COUNTY

LOCATION MAP



AERIAL MAP

PROJECT DESCRIPTION

INSTALL T-MOBILE EQUIPMENT CABINET ON NEW CONCRETE PAD AT GRADE. NO NEW WATER OR SEWER IS REQUIRED AS FACILITY IS UNMANNED.

INITIAL BUILD OUT:

6 NEW ANTENNAS, 1 HCS, 2 COVP'S, 1 CABINET, 5 TOWER MODULES, 2 GROUND MODULES

PROJECT LOCATION

COORDINATES (NAD83):

LAT: 43° 1' 8.75"
LONG: -88° 16' 44.24"
AMSL: 879.91'

*PER 1A DATED 6/03/15

SITE ADDRESS:

3031 SUMMIT AVE.
WAUKESHA, WI 53188
WAUKESHA COUNTY

PROPERTY SUMMARY

PROPERTY ADDRESS:

3031 SUMMIT AVE.
WAUKESHA, WI 53188

ZONING:

WAUKESHA COUNTY, IL

ASSESSOR'S PARCEL NUMBER (APN):

TBD

APPLICABLE CODES

BUILDING CODE: INTERNATIONAL BUILDING CODE 2012 WITH AMENDMENTS
ELECTRICAL CODE: NATIONAL ELECTRICAL CODE 2011

DRIVING DIRECTIONS

DEPART T-MOBILE OFFICE [8550 W BRYN MAWR AVE, CHICAGO, IL 60631] ON W BRYN MAWR AVE (EAST) 0.3 MI. TURN LEFT (NORTH) ONTO IL-171 [N CUMBERLAND AVE] 0.4 MI. TAKE RAMP (RIGHT) ONTO I-90 [KENNEDY EXPY W] 0.8 MI. *TOLL ROAD* KEEP LEFT TO STAY ON I-90 [JANE ADDAMS MEMORIAL TOLLWAY] *TOLL ROAD* TAKE RAMP (RIGHT) ONTO I-294 [TRI-STATE TOLLWAY] 12.7 MI. *TOLL ROAD* MERGE ONTO I-94 [TRI-STATE TOLLWAY] 23.9 MI STAY ON I-94 [US-41] (NORTH) 33.4 MI. ENTERING WISCONSIN AT EXIT 316, TAKE RAMP (LEFT) ONTO I-43 [I-894] 5.2 MI. KEEP LEFT ONTO I-894 [ZOO FWY] 4.3 MI. AT EXIT 1B, TAKE RAMP (LEFT) ONTO I-94 13.1 MI. AT EXIT 291, TURN OFF ONTO RAMP 0.3 MI. ROAD NAME CHANGES TO LOCAL ROAD(S) 21 YDS. TURN LEFT (SOUTH) ONTO CR-TT [MEADOWBROOK RD] 2.0 MI. TURN LEFT (EAST) ONTO US-18 [SUMMIT AVE] 0.4 MI. TURN RIGHT (SOUTH) ONTO LOCAL ROAD(S) 164 YDS. ARRIVE ML53108-I CHRIST THE LIFE.

ISSUED FOR PERMIT

CONTACTS

APPLICANT

T-MOBILE USA
8550 BRYN MAWR AVE., SUITE 100
CHICAGO, ILLINOIS 60631
TEL: (773) 444-5400
CONTACT: TBD

PROPERTY OWNER CONTACT:

PROPERTY OWNER: CHRIST THE LIFE EVANGELICAL LUTHERN CHURCH
CONTACT: CARLTON MANSKE
3031 SUMMIT AVE.
WAUKESHA WI 53188
TEL: (262) 547-7232
ALTERNATE: (262) 547-7394 FAX

UTILITIES

ELECTRIC:

WE ENERGY
TEL: 414-221-2345
CONTACT: N/A

TELEPHONE:

AT&T
TEL: 855-327-0860
CONTACT: N/A

PROJECT TEAM

LEAD ENGINEER

JACOB GORALSKI, P.E.
IRISH TOWER, LLC
4603 BERMUDA DR.
SUGAR LAND, TX 77479

LEAD SITE ACQ.

CELLUSITE, LLC
103 WILSHIRE COURT,
NOBLESVILLE, IN 46062
TEL: (317) 507-4541
FAX: N/A

SHEET INDEX

SHEET NUMBER:	DESCRIPTION:
T-1	TITLE SHEET
T-2	GENERAL NOTES & SPECIFICATIONS
T-3	GENERAL NOTES & SPECIFICATIONS
SURV.	SITE SURVEY
C-1	OVERALL SITE PLAN
C-2	ENLARGED SITE PLANS
C-3	EQUIPMENT ELEVATION
C-4	ICE BRIDGE, GPS AND HYBRID CABLE DETAILS
C-5	PLATFORM ELEVATIONS
C-6	PLATFORM DETAILS
C-7	PLATFORM NOTES
C-8	FENCE DETAILS
A-1	TOWER ELEVATION
A-2	ANTENNA PLAN
A-3	EQUIPMENT SPECIFICATIONS
A-4	RF DATA SHEET
A-5	RISER DIAGRAM
A-6	ANTENNA CONFIGURATION SHEET
E-1	UTILITY PLANS
E-2	H-FRAME & UTILITY PLANS
E-3	UTILITY RISER DIAGRAM & PANEL SCHEDULE
GR-1	GROUNDING PLAN
GR-2	GROUNDING RISER
GR-3	GROUNDING DETAILS
REV	REVISIONS PAGE

REVIEW

PENDING APPROVAL OF THE JURISDICTION, THE FOLLOWING PARTIES HAVE REVIEWED THE DESIGN WITHIN THEIR FUNCTIONAL RESPONSIBILITIES AND HAVE APPROVED THIS PROJECT FOR CONSTRUCTION. CONTRACTORS MAY NOT START CONSTRUCTION WITHOUT A NOTICE TO PROCEED (NTP) FROM T-MOBILE.

	PRINT NAME	SIGNATURE	DATE
LANDLORD			
PRECON. MGR			
DEVELOP. MGR			
CONST. INSP.			
A&E MGR			
RF ENGINEER			
OPERATIONS			
ZONING REP			
UTILITIES			

Parallel INFRASTRUCTURE

PLANS PREPARED BY:

CelluSite, LLC

ENGINEERING LICENSE:

DATE:	DESCRIPTION:	BY:	REV.:
06/03/15	REVIEW CD	BMW	A
06/04/15	REVIEW CD	BMW	B
07/21/15	REVIEW CD	BMW	C

SITE INFORMATION:

ML53108I
Christ the Life Evangelical Lutheran Church
WI-Waukesha-Summit
3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

SHEET TITLE:

TITLE SHEET

SHEET NUMBER:

T-1

PLOT SCALE: 1:1 @ 11"x17"

CITY OF CHICAGO DEPARTMENT OF CONSTRUCTION AND PERMITS GENERAL BUILDING REQUIREMENTS PER CHICAGO ZONING ORDINANCE (CZO) AND CHICAGO BUILDING CODE (CBC) 2014 EDITION

ITEM	ISSUE	CHAPTER/ARTICLE	ORDINANCE REQUIREMENT	ACTUAL	REQUIREMENT N/A	LOCATION/ SHEET NO.	AGENCY/ TEST NO.	REMARKS
PART 1– ZONING REQUIREMENTS								
1.01	ZONING DISTRICT	CHAPTER 17-1-800	N/A	M1-2	N/A	N/A	N/A	
1.02	LOT AREA	N/A	N/A	N/A	N/A	N/A	N/A	
1.03	MAXIMUM FLOOR AREA RATIO	N/A	N/A	N/A	N/A	N/A	N/A	
1.04	TOTAL BUILDING AREA	N/A	N/A	N/A	N/A	N/A	N/A	
1.05	BUILDING HEIGHT-NO. OF FLOORS	N/A	N/A	N/A	N/A	N/A	N/A	
1.06	MINIMUM YARDS	N/A	N/A	N/A	N/A	N/A	N/A	
1.07	GRADE ELEVATION (CCD)	N/A	N/A	TBD	N/A	N/A	N/A	
1.08	OFF STREET LOADING	CHAPTER 17-10-1101	N/A	N/A	N/A	N/A	N/A	
1.09	OFF STREET PARKING	CHAPTER 17-10-0207	N/A	N/A	N/A	N/A	N/A	
1.10	LANDSCAPING	CHAPTER 17-11-0050	N/A	N/A	N/A	N/A	N/A	
			N/A	N/A	N/A	N/A	N/A	
			N/A	N/A	N/A	N/A	N/A	
			N/A	N/A	N/A	N/A	N/A	
			N/A	N/A	N/A	N/A	N/A	
PART 2– BUILDING REQUIREMENTS								
2.01	OCCUPANCY CLASSIFICATION	3 (13-56) PAGE 115	N/A	N/A	N/A	N/A	N/A	
2.02	HEIGHT AND AREA LIMITATIONS	5 (13-48) PAGE 323	N/A	N/A	N/A	N/A	N/A	
	A) EXCEPTIONS TO AREA LIMITATIONS	5 (13-48-090) PAGE 325	N/A	N/A	N/A	N/A	N/A	
	B) MIXED OCCUPANCY BUILDINGS	5 (13-48-100) PAGE 326	N/A	N/A	N/A	N/A	N/A	
2.03	TYPES OF CONSTRUCTION	6 (13-60) PAGE 329	N/A	N/A	N/A	N/A	N/A	
2.04	MIXED OCCUPANCY SEPARATIONS	3 (13-56-280) PAGE 118	N/A	N/A	N/A	N/A	N/A	
2.05	REQ. HRS OF FIRE RESISTANCE	6 (13-60-100) PAGE 330	N/A	N/A	N/A	N/A	N/A	
	EXTERIOR BEARING WALLS	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	EXTERIOR-NONBEARING WALLS	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	INTERIOR BEARING WALLS	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	INTERIOR NONBEARING WALLS	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	COLUMNS	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	COLUMNS SUPPORTING ROOFS ONLY	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	BEAMS	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	BEAMS SUPPORTING ROOFS ONLY	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	FLOOR CONSTRUCTION	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	ROOF CONSTRUCTION	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
2.06	ELEVATOR FRAMING	6 (13-60-130) PAGE 331	N/A	N/A	N/A	N/A	N/A	
2.07	MEZZANINE FLOORS	6 (13-60-160) PAGE 332	N/A	N/A	N/A	N/A	N/A	
2.08	BASEMENT CONSTRUCTION	6 (13-60-170) PAGE 332	N/A	N/A	N/A	N/A	N/A	
2.09	DRIVEWAYS AND LOADING SPACES	6 (13-60-210) PAGE 332	N/A	N/A	N/A	N/A	N/A	
2.10	FIRE-RESISTIVE REQUIREMENTS	7 (15-8) PAGE 335	N/A	N/A	N/A	N/A	N/A	
	A) FIRE WALLS-CONSTRUCTION	7 (15-8-010) PAGE 335	N/A	N/A	N/A	N/A	N/A	
	B) PARAPETS	7 (15-8-100) PAGE 335&336	N/A	N/A	N/A	N/A	N/A	
	C) STAIRWAY ENCLOSURES	7 (15-8-140) PAGE 337	N/A	N/A	N/A	N/A	N/A	
	D) ELEVATOR ENCLOSURES	7 (15-8-150) PAGE 337	N/A	N/A	N/A	N/A	N/A	
	E) ENCLOSURES OF HEATING ROOMS	7 (15-8-190) PAGE 338	N/A	N/A	N/A	N/A	N/A	
	F) ENCLOSURES OF WELLS & CHUTES	7 (15-8-170) PAGE 338	N/A	N/A	N/A	N/A	N/A	
	G) OTHER ENCLOSURES	7 (15-8-240) PAGE 339	N/A	N/A	N/A	N/A	N/A	
	H) INTERIOR WALL AND CLG. FINISHES	7 (15-8-380) PAGE 341	N/A	N/A	N/A	N/A	N/A	
	I) STORAGE ROOMS OVER 100SQ.FT	7 (15-8-240)(B) PAGE 339	N/A	N/A	N/A	N/A	N/A	
2.11	FIRE-RESISTIVE MATERIALS AND CONSTRUCTION	7 (15-12) PAGE 348	N/A	N/A	N/A	N/A	N/A	
2.12	ACCEPTED ENGINEERING PRACTICE RECOGNIZED AGENCIES	7 (15-12-050)	N/A	N/A	N/A	N/A	N/A	
2.13	FIRE PROTECTION EQUIPMENT	9 (15-16) PAGE 361	N/A	N/A	N/A	N/A	N/A	
	A) SPRINKLER SYSTEMS	9 (15-16-010) PAGE 362	N/A	N/A	N/A	N/A	N/A	
	B) SPECIAL REQUIREMENTS	9 (15-16-030) PAGE 362	N/A	N/A	N/A	N/A	N/A	
PART 3– EXIT REQUIREMENTS								
3.01	TYPES OF EXITS	10(13-160-040) PAGE 388	N/A	N/A	N/A	N/A	N/A	
3.02	MINIMUM NUMBER OF EXITS	10(13-160-050) PAGE 388	N/A	N/A	N/A	N/A	N/A	
3.03	TRAVEL DISTANCE TO EXITS	10(13-160-110) PAGE 389	N/A	N/A	N/A	N/A	N/A	
	A) INCREASES PERMITTED	10(13-160-150) PAGE 390	N/A	N/A	N/A	N/A	N/A	
	B) DEAD END CORRIDOR	10(13-160-160) PAGE 390	N/A	N/A	N/A	N/A	N/A	
3.04	CAPACITY OF EXITS	10(13-160-210) PAGE 390	N/A	N/A	N/A	N/A	N/A	
3.05	MINIMUM WIDTH OF EXITS	10(13-160-220) PAGE 391	N/A	N/A	N/A	N/A	N/A	
3.06	SWING OF EXIT DOORS	10(13-160-250) PAGE 391	N/A	N/A	N/A	N/A	N/A	
3.07	HARDWARE	10(13-160-260) PAGE 392	N/A	N/A	N/A	N/A	N/A	
3.08	REVOLVING DOORS	10(13-160-270) PAGE 393	N/A	N/A	N/A	N/A	N/A	
3.09	LANDINGS	10(13-160-310) PAGE 394	N/A	N/A	N/A	N/A	N/A	
3.10	HANDRAILS	10(13-160-320) PAGE 394	N/A	N/A	N/A	N/A	N/A	
3.11	CONSTRUCTION	10(13-160-330) PAGE 394	N/A	N/A	N/A	N/A	N/A	
3.12	ENCLOSURES	7 (15-8-140) PAGE 337	N/A	N/A	N/A	N/A	N/A	
3.13	HEAD ROOM	10(13-160-350) PAGE 394	N/A	N/A	N/A	N/A	N/A	

Parallel INFRASTRUCTURE

PLANS PREPARED BY:

CelluSite, LLC

ENGINEERING LICENSE:

DATE:	DESCRIPTION:	BY:	REV.:
06/03/15	REVIEW CD	BMW	A
06/04/15	REVIEW CD	BMW	B
07/21/15	REVIEW CD	BMW	C

SITE INFORMATION:

ML53108I
Christ the Life Evangelical Lutheran Church
WI-Waukesha-Summit
3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

SHEET TITLE:

CODE MATRIX SCHEDULE

SHEET NUMBER:

T-2

PLOT SCALE: 1:1 @ 11"x17"

GENERAL REQUIREMENTS:

1.1 INTENT
1. THESE SPECIFICATIONS AND CONSTRUCTION DRAWINGS ACCOMPANYING THEM DESCRIBE THE WORK TO BE DONE AND THE MATERIALS TO BE FURNISHED FOR CONSTRUCTION.

2. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY. HOWEVER, SHOULD ANYTHING BE SHOWN, INDICATED OR SPECIFIED ON ONE AND NOT THE OTHER, IT SHALL BE DONE THE SAME AS IF SHOWN, INDICATED OR SPECIFIED IN BOTH.

3. THE INTENTION OF THE DOCUMENTS IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT.

4. THE PURPOSE OF THE SPECIFICATIONS IS TO INTERPRET THE INTENT OF THE DRAWINGS AND TO DESIGNATE THE METHOD OF THE PROCEDURE, TYPE AND QUALITY OF MATERIALS REQUIRED TO COMPLETE THE WORK.

5. MINOR DEVIATIONS FROM THE DESIGN LAYOUT ARE ANTICIPATED AND SHALL BE CONSIDERED AS PART OF THE WORK. NO CHANGES THAT ALTER THE CHARACTER OF THE WORK WILL BE MADE OR PERMITTED BY THE OWNER WITHOUT ISSUING A CHANGE ORDER.

1.2 CONFLICTS
1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL MEASUREMENTS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK. NO EXTRA CHARGE OR COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND DIMENSIONS INDICATED ON THE CONSTRUCTION DRAWINGS. ANY SUCH DISCREPANCY IN DIMENSION WHICH MAY BE FOUND SHALL BE SUBMITTED TO THE OWNER FOR CONSIDERATION BEFORE THE CONTRACTOR PROCEEDS WITH THE WORK IN THE AFFECTED AREAS.

2. THE BIDDER, IF AWARDED THE CONTRACT, WILL NOT BE ALLOWED ANY EXTRA COMPENSATION BY REASON OF ANY MATTER OR THING CONCERNING WHICH SUCH BIDDER MIGHT HAVE FULLY INFORMED THEMSELVES PRIOR TO THE BIDDING.

3. NO PLEA OF IGNORANCE OF CONDITIONS THAT EXIST, OR OF DIFFICULTIES OR CONDITIONS THAT MAY BE ENCOUNTERED OR OF ANY OTHER RELEVANT MATTER CONCERNING THE WORK TO BE PERFORMED IN THE EXECUTION OF THE WORK WILL BE ACCEPTED AS AN EXCUSE FOR ANY FAILURE OR OMISSION ON THE PART OF THE CONTRACTOR TO FULFILL EVERY DETAIL OF ALL THE REQUIREMENTS OF THE CONTRACT DOCUMENTS GOVERNING THE WORK.

1.3 CONTRACTS AND WARRANTIES
1. CONTRACTOR IS RESPONSIBLE FOR APPLICATION AND PAYMENT OF CONTRACTOR LICENSES AND BONDS.

1.4 STORAGE
1. ALL MATERIALS MUST BE STORED IN A LEVEL AND DRY FASHION AND IN A MANNER THAT DOES NOT NECESSARILY OBSTRUCT THE FLOW OF OTHER WORK. ANY STORAGE METHOD MUST MEET ALL RECOMMENDATIONS OF THE ASSOCIATED MANUFACTURER.

2. THE BTS MUST BE STORED INSIDE UNTIL THERE IS POWER ON SITE.

1.5 CLEAN UP
1. THE CONTRACTORS SHALL AT ALL TIMES KEEP THE SITE FREE FROM ACCUMULATION OF WASTE MATERIALS OR RUBBISH CAUSED BY THEIR EMPLOYEES AT WORK AND AT THE COMPLETION OF THE WORK, THEY SHALL REMOVE ALL RUBBISH FROM AND ABOUT THE BUILDING AREA, INCLUDING ALL THEIR TOOLS, SCAFFOLDING AND SURPLUS MATERIALS AND SHALL LEAVE THEIR WORK CLEAN AND READY FOR USE.

2. EXTERIOR: VISUALLY INSPECT EXTERIOR SURFACES AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER.
   A. REMOVE ALL TRACES OF SPLASHED MATERIALS FROM ADJACENT SURFACES.
   B. IF NECESSARY TO ACHIEVE A UNIFORM DEGREE OF CLEANLINESS, HOSE DOWN THE EXTERIOR OF THE STRUCTURE.

3. INTERIOR: VISUALLY INSPECT INTERIOR SURFACE AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER FROM WALLS/FLOOR/CEILING.
   A. REMOVE ALL TRACES OF SPLASHED MATERIAL FROM ADJACENT SURFACES.
   B. REMOVE PAINT DROPPINGS, SPOTS, STAINS AND DIRT FROM FINISHED SURFACES.

1.6 CHANGE ORDER PROCEDURE
1. CHANGE ORDERS MAY BE INITIATED BY THE OWNER AND/OR THE CONTRACTOR INVOLVED. THE CONTRACTOR, UPON VERBAL REQUEST FROM THE OWNER SHALL PREPARE A WRITTEN PROPOSAL DESCRIBING THE CHANGE IN WORK OR MATERIALS AND ANY CHANGES IN THE CONTRACT AMOUNT AND PRESENT TO THE OWNER WITHIN 72 HRS FOR APPROVAL. SUBMIT REQUESTS FOR SUBSTITUTIONS IN THE FORM AND IN ACCORDANCE WITH PROCEDURES REQUIRED FOR CHANGE ORDER PROPOSALS. ANY CHANGES IN SCOPE OF WORK OR MATERIALS WHICH ARE PERFORMED BY THE CONTRACTOR WITHOUT A WRITTEN CHANGE ORDER AS DESCRIBED AND APPROVED BY THE OWNER SHALL PLACE FULL RESPONSIBILITY OF THESE ACTIONS ON THE CONTRACTOR.

1.7 RELATED DOCUMENTS AND COORDINATION
1. GENERAL CARPENTRY, ELECTRICAL AND ANTENNA DRAWINGS ARE INTERRELATED. IN PERFORMANCE OF THE WORK, THE CONTRACTOR MUST REFER TO ALL DRAWINGS. ALL COORDINATION TO BE THE RESPONSIBILITY OF THE CONTRACTOR.

1.8 SHOP DRAWINGS
1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AS REQUIRED AND LISTED IN THESE SPECIFICATIONS TO THE OWNER FOR APPROVAL.

2. ALL SHOP DRAWINGS SHALL BE REVIEWED, CHECKED AND CORRECTED BY CONTRACTOR PRIOR TO SUBMITTAL TO THE OWNER.

1.9 PRODUCTS AND SUBSTITUTIONS
1. SUBMIT 3 COPIES OF EACH REQUEST FOR SUBSTITUTION. IN EACH REQUEST IDENTIFY THE PRODUCT OR FABRICATION OR INSTALLATION METHOD TO BE REPLACED BY THE SUBSTITUTION. INCLUDE RELATED SPECIFICATION SECTION AND DRAWING NUMBERS AND COMPLETE DOCUMENTATION SHOWING COMPLIANCE WITH THE REQUIREMENTS FOR SUBSTITUTIONS.

2. SUBMIT ALL NECESSARY PRODUCT DATA AND CUT SHEETS WHICH PROPERLY INDICATE AND DESCRIBE THE ITEMS, PRODUCTS AND MATERIALS BEING INSTALLED. THE CONTRACTOR SHALL, IF DEEMED NECESSARY BY THE OWNER SUBMIT ACTUAL SAMPLES TO THE OWNER FOR APPROVAL IN LIEU OF CUT SHEETS.

1.10 QUALITY ASSURANCE
1. ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. THESE SHALL INCLUDE BUT NOT BE LIMITED TO THE LATEST VERSION OF THE COOK COUNTY BUILDING CODE.

1.11 ADMINISTRATION
1. BEFORE THE COMMENCEMENT OF ANY WORK, THE CONTRACTOR WILL ASSIGN A PROJECT MANAGER WHO WILL ACT AS A SINGLE POINT OF CONTACT FOR ALL PERSONNEL INVOLVED IN THIS PROJECT. THIS PROJECT MANAGER WILL DEVELOP A MASTER SCHEDULE FOR THE PROJECT WHICH WILL BE SUBMITTED TO THE OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK.

2. SUBMIT A BAR TYPE PROGRESS CHART NOT MORE THAN 3 DAYS AFTER THE DATE ESTABLISHED FOR COMMENCEMENT OF THE WORK ON THE SCHEDULE, INDICATING A TIME BAR FOR EACH MAJOR CATEGORY OR UNIT OF WORK TO BE PERFORMED AT SITE, PROPERLY SEQUENCED AND COORDINATED WITH OTHER ELEMENTS OF WORK AND SHOWING COMPLETION OF THE WORK SUFFICIENTLY IN ADVANCE OF THE DATE ESTABLISHED FOR SUBSTANTIAL COMPLETION OF THE WORK.

3. PRIOR TO COMMENCING CONSTRUCTION, THE OWNER SHALL SCHEDULE AN ON-SITE MEETING WITH ALL MAJOR PARTIES. THIS WOULD INCLUDE (THOUGH NOT LIMITED TO) THE OWNER, PROJECT MANAGER, CONTRACTOR, LAND OWNER REPRESENTATIVE, LOCAL TELEPHONE COMPANY, TOWER ERECTION FOREMAN (IF SUBCONTRACTED).

4. CONTRACTOR SHALL BE EQUIPPED WITH SOME MEANS OF CONSTANT COMMUNICATIONS, SUCH AS A MOBILE PHONE OR A BEEPER. THIS EQUIPMENT WILL NOT BE SUPPLIED BY THE OWNER, NOR WILL WIRELESS SERVICE BE ARRANGED.

5. DURING CONSTRUCTION, CONTRACTOR MUST ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AT ALL TIMES. CONTRACTOR WILL COMPLY WITH ALL SAFETY REQUIREMENTS IN THEIR AGREEMENT.

6. PROVIDE WRITTEN DAILY UPDATES ON SITE PROGRESS TO THE OWNER.

7. COMPLETE INVENTORY OF CONSTRUCTION MATERIALS AND EQUIPMENT IS REQUIRED PRIOR TO START OF CONSTRUCTION.

8. NOTIFY THE OWNER / PROJECT MANAGER IN WRITING NO LESS THAN 48 HOURS IN ADVANCE OF CONCRETE POURS, TOWER ERECTIONS, AND EQUIPMENT CABINET PLACEMENTS.

1.12 INSURANCE AND BONDS
1. CONTRACTOR SHALL AT THEIR OWN EXPENSE CARRY AND MAINTAIN FOR THE DURATION OF THE PROJECT ALL INSURANCE AS REQUIRED AND LISTED AND SHALL NOT COMMENCE WITH THEIR WORK UNTIL THEY HAVE PRESENTED AN ORIGINAL CERTIFICATE OF INSURANCE STATING ALL COVERAGES TO THE OWNER. REFER TO THE MASTER AGREEMENT FOR REQUIRED INSURANCE LIMITS.

2. THE OWNER SHALL BE NAMED AS AN ADDITIONAL INSURED ON ALL POLICIES.

3. CONTRACTOR MUST PROVIDE PROOF OF INSURANCE.

TOWER & ANTENNA INSTALLATION:

1.1 WORK INCLUDED
1. IF REQUIRED, ERECT FURNISHED TOWER.

2. GROUND TOWER TEMPORARILY DURING ERECTION. GROUNDING SHALL INCLUDE BASE(S) AND ANCHORS.

3. IF REQUIRED, INSTALL THREE (3) SIDE ARMS, CONSISTING OF THREE (3) 6'-0" AS INDICATED ON DRAWINGS – CONFIRM WITH OWNER REPRESENTATIVE.

4. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND OWNER SPECIFICATIONS.

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

6. INSTALL FURNISHED GALVANIZED STEEL WAVEGUIDE LADDER.

7. INSTALL WAVEGUIDE BRIDGE AS INDICATED ON DRAWING.

8. SUPPLY AND INSTALL ONE INSULATED GROUND BAR AT EQUIPMENT CABINET.

9. SUPPLY AND INSTALL GROUNDING STRAP KITS WITH LONG BARREL COMPRESSION LUGS (SIM. TO ANDREW-223700TBD OR APPROVED EQUAL) ATOP TOWER BASE BEFORE ENTERING THE EQUIPMENT. GROUNDING STRAPS TO BE CONNECTED TO INSULATED GROUND BAR.

10. ASSIST OWNER TECHNICIANS IN PERFORMING SWEEP TEST OF INSTALLED COAX.

11. CONCRETE PIERS FOR FOUNDATIONS SHALL BE DRILLED AND POURED ON THE SAME DAY.

1.2 REQUIREMENTS OF REGULATOR AGENCIES
1. FURNISH U.L. LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE, INSTALL IN CONFORMANCE WITH U.L. STANDARDS WHERE APPLICABLE.

2. INSTALL ANTENNA, ANTENNA CABLES, GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATION IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL BUILDING CODES, SPECIAL CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THIS INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:
   A. TIA – TELECOMMUNICATIONS INDUSTRY ASSOCIATION TIA-222-G. STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.
   B. FAA – FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 70/7460-IH, OBSTRUCTION MARKING AND LIGHTING.
   C. FCC – FEDERAL COMMUNICATIONS COMMISSION RULES AND REGULATIONS FORM 715, OBSTRUCTION MARKING AND LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES AND FORM 715A, HIGH INTENSITY OBSTRUCTION LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES.
   D. AISC – AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS.
   E. NEC – NATIONAL ELECTRICAL CODE – ON TOWER LIGHTING KITS.
   F. UL – UNDERWRITER'S LABORATORIES APPROVED ELECTRICAL PRODUCTS.
   G. IN ALL CASES, PART 77 OR THE FAA RULES AND PARTS 17 AND 22 OF THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDE ANY OTHER STANDARDS OR SPECIFICATIONS.
   H. 2012 LIFE SAFETY CODE NFPA -101.

GENERAL ELECTRIC PROVISION:

1. SUBMITTAL OF BID INDICATES CONTRACTOR IS COGNIZANT OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED UNDER THIS CONTRACT.

2. CONTRACTOR SHALL PERFORM ALL VERIFICATION OBSERVATIONS TEST, AND EXAMINATION WORK PRIOR TO THE ORDERING OF THE ELECTRICAL EQUIPMENT AND THE ACTUAL CONSTRUCTION. CONTRACTOR SHALL ISSUE A WRITTEN NOTICE OF ALL FINDINGS TO THE ARCHITECT LISTING ALL MALFUNCTIONS, FAULTY EQUIPMENT AND DISCREPANCIES.

3. HEIGHTS SHALL BE VERIFIED WITH OWNER PRIOR TO INSTALLATION.

4. THESE PLANS ARE DIAGRAMMATIC ONLY, FOLLOW AS CLOSELY AS POSSIBLE.

5. ELECTRICAL SERVICE 120 / 208 VAC 3-PHASE 4-WIRE 100 AMP SERVICE 120 / 240 VAC SINGLE PHASE 3-WIRE 200 AMP SERVICE

6. EACH CONDUCTOR OF EVERY SYSTEM SHALL BE PERMANENTLY TAGGED IN EACH PANEL BOARD, PULL BOX, J-BOX, SWITCH BOX, ETC., IN COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ACT (O.S.H.A.).

7. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC., FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON DRAWINGS, AS SPECIFIED HEREIN AND/OR AS OTHERWISE REQUIRED.

8. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN PERFECT 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 SUBJECT TO SUCH APPROVAL. MATERIALS SHALL MEET WITH APPROVAL OF THE DIVISION OF INDUSTRIAL SAFETY AND ALL GOVERNING BODIES HAVING JURISDICTION. MATERIALS SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA AND NBFU.

9. ALL CONDUIT INSTALLED SHALL BE SURFACE MOUNTED OR DIRECT BURIAL UNLESS OTHERWISE NOTED.

10. CONTRACTOR SHALL CARRY OUT THEIR WORK IN ACCORDANCE WITH ALL GOVERNING STATE, COUNTY AND LOCAL CODES AND O.S.H.A.

11. CONTRACTOR TO OBTAIN ALL PERMITS, PAY PERMIT FEES, AND BE RESPONSIBLE FOR SCHEDULING INSPECTIONS.

12. COMPLETE JOB SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER THE DATE OF JOB ACCEPTANCE BY OWNER. ANY WORK, MATERIAL OR EQUIPMENT FOUND TO BE FAULTY DURING THAT PERIOD SHALL BE CORRECTED AT ONCE, UPON WRITTEN NOTIFICATION, AT THE EXPENSE OF THE CONTRACTOR.

13. ALL CONDUIT SHALL HAVE A PULL WIRE OR ROPE.

14. PROVIDE PROJECT MANAGER WITH ONE SET OF COMPLETE ELECTRICAL "AS INSTALLED" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL DIMENSIONS, ROUTINGS AND CIRCUITS.

15. ALL BROCHURES, OPERATING MANUALS, CATALOGS, SHOP DRAWINGS, ETC., SHALL BE TURNED OVER TO THE OWNER AT JOB COMPLETION.

16. USE T-TAP CONNECTIONS ON ALL MULTI-CIRCUITS WITH COMMON NEUTRAL CONDUCTOR FOR LIGHTING FIXTURES.

17. ALL CONDUCTORS SHALL BE COPPER.

18. 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.

19. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.

20. PATCH, REPAIR AND PAINT ANY AREA THAT HAS BEEN DAMAGED IN THE COURSE OF THE ELECTRICAL WORK.

21. PENETRATIONS IN FIRE RATED WALLS SHALL BE FIRE STOPPED IN ACCORDANCE WITH APPLICABLE LOCAL BUILDING CODES.

22. WIRE AND CABLE CONDUCTORS SHALL BE COPPER #12 AWG MINIMUM UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.

23. GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER UNLESS OTHERWISE NOTED.

24. METER SOCKET AMPERES, VOLTAGE, NUMBER OF PHASES SHALL BE AS NOTED ON THE DRAWINGS, MANUFACTURED BY "SQUARE D COMPANY", OR APPROVED EQUAL.

25. ALL MATERIALS SHALL BE U.L. LISTED.

26. CONDUIT
   A. RIGID CONDUIT SHALL BE U.L. LABEL GALVANIZED ZINC COATED WITH 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. EMT SHALL BE USED ONLY FOR INTERIOR RUNS.
   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, SEAL TIGHT FLEXIBLE CONDUIT. ALL CONDUIT SHALL HAVE FULL SIZE EQUIPMENT GROUND WIRE.
   D. CONDUIT RUNS SHALL BE SURFACE MOUNTED IN CEILINGS OR WALLS UNLESS INDICATED OTHERWISE. CONDUIT INDICATED SHALL RUN PARALLEL OR AT RIGHT ANGLES TO CEILING, FLOOR OR BEAMS. VERIFY EXACT ROUTING OF ALL EXPOSED CONDUIT WITH THE OWNER PRIOR TO INSTALLING. NO HORIZONTAL CONDUITS SHALL BE BELOW 7'-6" A.F.F. NO BX OR ROMEX CABLE IS PERMITTED.
   E. PARALLEL UNDERGROUND CONDUIT SHALL BE PVC SCHEDULE 40 (UNLESS NOTED OTHERWISE) AT A MINIMUM DEPTH OF 30" BELOW GRADE – STACKED UNDERGROUND CONDUIT SHALL BE PVC SCHEDULE 40 (UNLESS NOTED OTHERWISE) AT A MINIMUM DEPTH OF 24" BELOW GRADE.
   F. ABOVE GROUND CONDUIT SHALL BE P.V.C. SCHEDULE 80 (UNLESS NOTED OTHERWISE).

27. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS.

28. CONTRACTOR TO PROVIDE DAILY UPDATES TO PM UNTIL FINAL ELECTRICAL SERVICE IS EFFECTED.

29. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL OF POTENTIAL GROUND TESTS 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.

30. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY FOR CONNECTION OF TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL HOOKUP COSTS TO BE PAID BY CONTRACTOR.

GROUNDING STANDARDS:

1.0 DEFINITIONS

AGB:	ANTENNA GROUND BAR
AWG:	AMERICAN WIRE GAUGE
CADWELDING:	AN EXOTHERMIC WELDING PROCESS WHICH CREATES POSITIVE CONTACT OF POSITIVE CONTACT OF GROUNDING CONDUCTORS
EMT:	ELECTRICAL METAL TUBING (LIGHT GAUGE METALLIC CONDUIT)
MGB:	MASTER GROUND BAR
PVC:	POLYVINYL CHLORIDE CONDUIT
RFI:	RADIO FREQUENCY INTERFERENCE
TGB:	TOWER GROUND BAR
THWN:	LETTER TYPE DESIGNATION FOR CONDUCTOR INSULATION THAT IS A MOISTURE AND HEAT RESISTANT THERMOPLASTIC WITH A MAXIMUM OPERATING TEMPERATURE OF 75 DEGREES CELSIUS OR 167 DEGREES FAHRENHEIT
T/I:	TENANT IMPROVEMENT

2.0 BACKGROUND

2.1 AREAS OF CONCERN: WHEN DESIGNING A GROUNDING SYSTEM FOR A MOBILE RADIO FACILITY THERE ARE FOUR INTERRELATED AREAS OF CONCERN. THE BASIC OBJECTIVE FOR EACH IS:
1. LIGHTNING PROTECTION –TO MAINTAIN ALL EQUIPMENT AT THE SAME POTENTIAL DURING A LIGHTNING IMPULSE.
2. RFI FOR NOISE INDUCTION CONTROL –TO ESTABLISH THE LOWEST POSSIBLE IMPEDANCE AMONG ALL EQUIPMENT.
3. ELECTROSTATIC CONTROL –TO REDUCE ELECTROSTATIC DISCHARGE PROBLEMS.
4. PERSONNEL SAFETY –TO MAINTAIN A MINIMUM VOLTAGE DIFFERENCE BETWEEN ANY TWO METALLIC OBJECTS WHICH PERSONNEL MIGHT CONTACT SIMULTANEOUSLY.

2.2 A/C GROUNDING: IN THIS GROUNDING SYSTEM THE A/C SERVICE GROUND SHALL BE KEPT ISOLATED FROM THE EQUIPMENT FRAME WORK AND LIGHTNING PROTECTION GROUND SYSTEMS EXCEPT FOR ONE SPECIFIC POINT. THIS POINT IS THE MAIN GROUNDING POINT OF THE SYSTEM. THIS WOULD TYPICALLY BE CONNECTING THE A/C SERVICE GROUND AT THE COMMERCIAL POWER RISER POLE DISCONNECT/METER BASE TO THE EXTERNAL GROUND RING. ALL GROUNDING CONNECTIONS INSIDE OF CABINETS SHALL BE SCRAPED TO BARE METAL AND COATED WITH NOALOX.

2.3 LIGHTNING CONSIDERATIONS: LIGHTNING DAMAGE OCCURS FROM EITHER INDUCTION OR FROM AN ACTUAL DIRECT STRIKE TO THE BUILDING, USUALLY TAKEN THROUGH THE TOWER AND/OR ANTENNAS, STRIKES TO OTHER NEARBY OBJECTS INDUCE HIGH ENERGY INTO POWER OR TELEPHONE CABLES ENTERING THE BUILDING. THIS TYPE OF EFFECT HISTORICALLY CAUSES MOST OF THE DAMAGE TO THE BUILDING AND ITS CONTENTS.

3.0 STATION GROUNDING SYSTEM

3.1 MATERIALS:
1. #2 AWG, BARE SOLID TINNED COPPER WIRE, FOR ALL EXTERIOR CONDUCTORS AND TOWER GROUND BAR CONDUCTORS OR AS OTHERWISE SPECIFIED. GROUNDS TO THE LNAS SHALL BE NO. 6 STANDARD GREEN INSULATED JUMPERS. THE GROUND WIRE TO THE MGB SHALL BE GREEN JACKETED STRANDED #2 TINNED WIRE BURNDY CONNECTED TO THE BUSS BAR AND CONNECTED TO THE GROUND RING ON A GROUND ROD.
2. #2 AWG, INSULATED STRANDED COPPER CABLE IS ACCEPTABLE FOR INTERIOR GROUND BAR CONDUCTORS ON TENANT IMPROVEMENT SITES.
3. 5/8" X 10" GROUND RODS OF SOLID COPPER, STAINLESS STEEL OR COPPER CLAD HIGH STRENGTH STEEL.
4. ABOVE GRADE CONNECTIONS SHALL BE BURNDY HYGROUND COMPRESSION. BELOW GRADE CONNECTIONS SHALL BE CAD WELD OR OTHER APPROVED EXOTHERMIC WELDING SYSTEM FOR BONDING AS SPECIFIED.
5. XIT OR ADVANCED GROUNDING ELECTRODE (AGE), ALL CHEMICAL GROUND RODS SHALL BE UL APPROVED.
6. SOLID COPPER PLATES OF MINIMUM 3"X3"X1/4" SIZE AS SPECIFIED.
7. NOALOX OR APPROVED EQUAL CONDUCTIVE MEDIUM MATERIAL SHALL BE USED IN ALL MECHANICAL CONNECTIONS.
8. #2 AWG STRANDED INSULATED (GREEN) FOR ALL INTERNAL EQUIPMENT GROUNDING.
9. MECHANICAL FASTENERS (I.E., DOUBLE LUGS, SPLIT BOLTS PARALLEL CONNECTORS) SHALL BE BRONZE, BRASS, COPPER OR STAINLESS STEEL AND HAVE NOALOX BETWEEN CONDUCTOR AND CONNECTION.
10. BOLTS, NUTS AND SCREWS USED TO FASTEN MECHANICAL CONNECTORS SHALL BE STAINLESS STEEL WITH STAR TYPE STAINLESS STEEL LOCK WASHERS.
11. ALL LUG TUBE FASTENERS SHALL PROVIDE TWO HOLES TO ALLOW A DOUBLE BOLT CONNECTION.

3.2 MASTER GROUND BAR (MGB): THE PURPOSE OF THE MASTER GROUND BAR IS TO GROUND THE BTS AND ANY OTHER METALLIC OBJECTS AROUND THE BTS. IF AN MGB IS NOT PROVIDED WITH THE BTS, THE MGB SHALL BE AS FOLLOWS: THE MGB IS A COPPER BAR MEASURING 4"W X 24"L X 1/4" LOCATED AS CLOSE TO THE BTS AS POSSIBLE. THE MGB SHALL HAVE A MINIMUM NUMBER OF (28) 3/8" HOLES. GROUND BAR SHALL BE SUPPORTED BY MOUNTING BRACKETS WITH INSULATOR STANDOFFS. (2) #2 TINNED SHALL BE MECHANICALLY ATTACHED (2-HOLE COMPRESSION LUG 3/8" HOLES, 1" CENTER TO CENTER SPACING) TO THE MGB AND DOWN LEADS THEN TAKEN THROUGH CONDUIT TO THE GROUND RING. THIS CONDUCTOR SHALL BE KEPT SEPARATE AND ISOLATED UNTIL TERMINATING AT THE MAIN GROUNDING POINT, (I.E. EXTERIOR GROUND RING OR BUILDING STEEL).

3.3 ANTENNA GROUND BAR (AGB): THE PURPOSE OF THE ANTENNA GROUND BAR IS PRIMARILY FOR LIGHTNING PROTECTION. COAXIAL CABLE IS USUALLY THE ONLY ITEM GROUNDED TO THIS BAR. HOWEVER IT IS ACCEPTABLE TO BOND EXTERIOR; CABLE TRAY, WAVE GUIDE PORTS AND CANTILEVERED WAVE GUIDE BRIDGES TO THE AGB. THE AGB IS A COPPER BAR MEASURING 4"W X 24"L X 1/4". THERE SHALL BE TWO AGBS, ONE LOCATED AT THE TOP OF THE TOWER AT THE START OF THE VERTICAL RUN OF COAX, THE OTHER AT THE BOTTOM OF THE VERTICAL RUN OF COAX BEFORE IT MAKES ITS BEND. (IF THE TOWER IS OVER 200' THERE SHALL BE A THIRD AGB LOCATED AT HE MIDDLE OF THE TOWER).THE AGB SHALL HAVE A MINIMUM OF (28) 3/8" HOLES. GROUND BARS SHALL BE SUPPORTED BY MOUNTING BRACKETS WITH INSULATOR STANDOFFS. USE #2 AWG SOLID TINNED WIRE W/ 2-HOLE SHORT BARREL COMPRESSION LUGS 3/8" HOLES, 1" CENTER TO CENTER SPACING). THIS CONDUCTOR SHALL BE KEPT SEPARATE AND ISOLATED UNTIL TERMINATING AT THE MAIN GROUNDING POINT (I.E. EXTERIOR GROUND RING, OR BUILDING STEEL.)

Parallel INFRASTRUCTURE

PLANS PREPARED BY:
CelluSite, LLC
www.cellusite.net
QUESTO OPTIMUS SOLITO

ENGINEERING LICENSE:

DATE:	DESCRIPTION:	BY:	REV:
06/03/15	REVIEW CD	BMW	A
06/04/15	REVIEW CD	BMW	B
07/21/15	REVIEW CD	BMW	C

SITE INFORMATION:
ML53108I
Christ the Life Evangelical Lutheran Church
WI-Waukesha-Summit
3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

SHEET TITLE:
GENERAL NOTES & SPECIFICATIONS

SHEET NUMBER:
T-2

PLOT SCALE: 1:1 @ 11"x17"

GROUNDING STANDARDS (CONT.):

3.4 SURGE ARRESTOR GROUND BAR: THE PURPOSE OF THE SURGE ARRESTOR GROUND BAR IS FOR LIGHTING PROTECTION. THE SURGE ARRESTOR GROUND BAR IS A BENT (3" X 3") X 1/4" X 24" COPPER BAR. IT IS LOCATED ON THE WAVEGUIDE BRIDGE SUPPORT CLOSEST TO THE EQUIPMENT. ONE FACE OF THE BAR SHALL HAVE A MINIMUM OF (28) 3/8" DIA. HOLES. HOLES SHALL BE IN PAIRS THAT ARE 1" CENTER TO CENTER. THE OTHER FACE SHALL HAVE 3/8" DIA. HOLES AS REQUIRED TO ATTACH AND GROUND COAXIAL SURGE ARRESTORS. THE GROUND BAR SHALL BE SUPPORTED BY MOUNTING BRACKETS WITH INSULATOR STANDOFFS.

3.5 GROUND ROD AND GROUND RING PLACEMENT: THE OUTSIDE GROUND RING SHALL BE PLACED AROUND THE BTS AT A DISTANCE OF TWO (2) FEET FROM THE BTS AT A DEPTH OF 2'-6" OR 6" BELOW THE FROST LINE, WHICHEVER IS DEEPER. RODS SHALL BE DRIVEN TO A DEPTH SUCH THAT THE TOP OF THE RODS IS AT THE LEVEL OF THE GROUND RING CONDUCTOR. THE RODS SHALL BE PLACED MINIMALLY ALONG THE RING AT THE FOLLOWING LOCATIONS:

A. BELOW THE AREA OF THE INTERNAL MASTER GROUND BAR FOR CONNECTION TO THE MGB.

B. BELOW THE UTILITY RACK FOR CONNECTION TO THE MAIN BUILDING COMMERCIAL POWER DISCONNECT.

C. BELOW THE CORNERS OF THE BTS.

D. AS REQUIRED TO ACHIEVE A RECOMMENDED SPACING OF TWENTY (20) FEET BETWEEN GROUND RODS ALONG THE RING PERIMETER.

E. AS REQUIRED ALONG THE RING PERIMETER TO ACHIEVE 5 OHMS OR LESS RESISTANCE WHEN TESTED.

F. TWO RODS LOCATED ON OPPOSITE SIDES AT EACH TOWER LEG OR MONOPOLE.

G. ONE ROD LOCATED BENEATH EACH END OF THE WAVE GUIDE BRIDGE OR CABLE TRAY.

H. ONE ROD LOCATED ADJACENT TO THE STANDBY GENERATOR, AND IF SEPARATED BY MORE THAN TEN (10) FEET, ONE LOCATED ADJACENT TO THE FUEL TANK.

I. ONE ROD LOCATED AT THE BASE OF THE TOWER FOR THE TGB.

3.6 TOWER GROUNDING: ALL MONOPOLES SHALL HAVE TWO GROUND RODS (MINIMUM). ALL OTHER TOWERS SHALL HAVE TWO GROUND RODS PLACED AT THE BASE OF EACH TOWER LEG. EACH MONOPOLE OR TOWER LEG SHALL BE BONDED TO THE SYSTEM VIA TWO #2 BARE TINNED SOLID COPPER CONDUCTORS. BURNDY CONNECT THE CONDUCTORS TO ONLY STRUCTURAL BASE PLATES OR LUGS OR EARS AS MAY BE PROVIDED. NO BURNDY CONNECTIONS SHALL BE MADE TO THE VERTICAL WALLS OF THE STRUCTURE. NEVER GROUND TO HOLLOW LEG MEMBERS.

3.7 ANTENNA GROUNDING: EACH ANTENNA COAXIAL CABLE SHALL TYPICALLY BE GROUNDED AT THREE POINTS USING A HARD-SHELL COAXIAL CABLE KIT FROM THE MANUFACTURER OFTHE ANTENNA CABLE. A TYPICAL INSTALLATION SHALL BE AS FOLLOWS:

A. THE FIRST GROUND CONNECTION SHALL OCCUR AS CLOSE TO THE ANTENNA AS POSSIBLE, BELOW THE FIRST POINT THE COAX CABLE BEGINS TO RUN VERTICAL DOWN THE TOWER. THIS GROUND SHALL TERMINATE DIRECT TO THE TOP AGB. ON A T/I, GROUND TO THE AGB AT THE ANTENNA MOUNTS.

B. THE SECOND GROUND SHALL BE MADE AT THE BOTTOM OF THE VERTICAL RUN OF THE COAXIAL CABLE AS IT TURNS OUT AWAY FROM THE TOWER TOWARDS THE BTS. THIS GROUND SHALL BE TERMINATED AT THE TGB. THE TGB SHALL HAVE TWO (2) LEADS OF #2 AWG BARE TINNED SOLID COPPER WIRE, AND SHALL TERMINATE AT THE TOWER GROUND RING. THESE SHALL BE ENCASED IN PVC PIPE.

C. THE THIRD GROUND SHALL BE ON THE SURGE ARRESTOR. GROUND TO BE ATTACHED TO THE CABLE ON STRAIGHT RUNS (NOT WITHIN BENDS) AND BE WEATHERPROOFED PER THE MANUFACTURER'S SPECIFICATIONS. THE SURGE ARRESTORS SHALL BE GROUNDED TO THE GROUND BAR. THE SAGB SHALL HAVE TWO (2) LEADS OF #2 AWG BARE TINNED SOLID COPPER WIRE, AND SHALL TERMINATE AT THE TOWER GROUND RING. THESE SHALL BE ENCASED IN PVC PIPE.

3.8 PERIMETER FENCE GROUNDING:

A. ALL FENCE CORNER AND END POSTS (MINIMUM OF TWO) SHALL HAVE ONE #2 SOLID TINNED COPPER GROUND WIRE CONNECTED TO A 5/8" X 10' SOLID COPPER CLAD GROUND ROD NEXT TO THE POST. THESE POSTS SHALL BE CONNECTED TO THE GROUND RING WITH A #2 SOLID TINNED COPPER GROUND WIRE AND INTERMEDIATE GROUND RODS IF THE DISTANCE FROM THE POST TO THE GROUND RING EXCEEDS 10 FEET. IN NO CASE SHALL ANY PORTION OF THE SAME FENCE REMAIN DISCONNECTED FROM THE GROUND RING.

B. GATE POSTS SHALL BE GROUNDED TO EACH OTHER TO ENSURE THE ENTIRE FENCE HAS ELECTRICAL CONTINUITY. CONNECTIONS SHALL BE DRILL AND TAP WITH BURNDY TYPE KC22 TO THE POST WITH A #2 AWG BARE SOLID TINNED COPPER WIRE.

C. GATES SHALL BE BONDED TO GATE POSTS WITH A 18" BRAIDED STRAP TYPE BD18G92. THE CONNECTIONS SHALL BE BURNDY 2-HOLE LUGS (3/8" HOLES, 1" CENTER TO CENTER) BOLTED THROUGH EACH POST.

D. ALL DOWN LEADS TO EARTH WILL BE ENCASED IN 3/4 INCH PVC NON-METALLIC AND SEALED WITH SILICONE.

3.9 GENERATOR FUEL TANK GROUNDING: THE GENERATOR FUEL TANK, IF REQUIRED, SHALL BE CONNECTED IN AT LEAST ONE PLACE TO THE MAIN EXTERIOR GROUND RING. #2 AWG BARE SOLID TINNED COPPER WIRE SHALL BE BURNDY CONNECTED TO ONE SUPPORT LEG OF THE FUEL TANK AND CAD WELD TO THE NEAREST EXTERIOR GROUND RING/GROUND ROD.

3.10 EQUIPMENT ROOM GROUNDING: THE MASTER GROUND BAR (MGB) SERVES AS THE COLLECTION POINT FOR THE BTS AS WELL AS ALL INTERIOR NON-ELECTRICAL GROUNDED METAL MATERIALS (HVAC GRILLS, DOOR FRAMES/DOORS, TELCO BOARD, UNISTRUTS, CABLE TRAYS, ALARM JUNCTION BOX, ETC.,) SHALL BE GROUNDED WITH #6 AWG STRANDED (GREEN) GROUND WIRES WITH INDIVIDUAL RUNS BACK TO THE MGB. (THE CABLE TRAY, DOOR/FRAME AND UNISTRUT MAY BE JUMPERED TOGETHER AND HAVE A SINGLE GROUND WIRE CONNECTION TO THE MGB.)

3.11 WALL PENETRATIONS SLEEVES: INSTALL PER CONSTRUCTION DRAWINGS.

3.12 A/C COMMERCIAL POWER GROUNDING CONNECTIONS: AT THE ON-SITE RISER POLE LOCATION OR UNDERGROUND SERVICE ENTRANCE LOCATION, THE A/C SERVICE SHALL BE MECHANICALLY BONDED TO THE A/C SERVICE ENTRANCE GROUND AS SPECIFIED BY THE NATIONAL ELECTRIC CODE, ARTICLE 250, AND/OR APPROPRIATE LOCAL CODES. A SEPARATE GROUND ROD SHALL BE PROVIDED AT THIS POINT, AND SHALL BE CONNECTED TO THE EXTERIOR GROUND RING. A SEPARATE A/C SERVICE GROUND AND NEUTRAL SHALL THEN BE ROUTED TO AND CONNECTED TO THE MAIN DISCONNECT INSIDE THE BUILDING OR AS REQUIRED BY LOCAL AUTHORITY.

3.13 GENERATOR RECEPTACLE GROUNDING: THE GENERATOR RECEPTACLE (HUBBLE PLUG) SHALL BE GROUNDED TO THE EGR.

3.14 COAX BRIDGE / CABLE TRAY GROUNDING : BOND THE COAX BRIDGE OR CABLE TRAY TO THE AGB WITH #2 SOLID TINNED GROUND WIRE. THESE CONNECTIONS SHALL BE DOUBLE LUG BOLTED / SCREWED MECHANICAL CONNECTIONS WITH STAR LOCK WASHERS AND NOALOX. ALL BRIDGE SPLICES SHALL HAVE JUMPERS OF #2 SOLID WITH COMPRESSION LUGS.

3.15 CAD WELD & BURNDY CONNECTION:
CAD WELDS (EXOTHERMIC WELDS) AND BURNDY CONNECTIONS SHALL BOND ALL UNDERGROUND AND DAMP LOCATION CONNECTIONS, SHELTER SKID GROUNDS, TOWER OR MONOPOLE GROUNDS, FENCING CORNER AND GATE POSTS, ANTENNA GROUND BARS, (AGB) SURGE ARRESTER GROUND BAR, AND THE MASTER GROUND BAR (MGB). MECHANICAL CONNECTIONS SHALL BE TYPICALLY USED TO BOND ALL INTERIOR EQUIPMENT, COAX CABLE BRIDGES AND COAXIAL CABLE GROUND KITS. ALL LUG TYPE MECHANICAL CONNECTORS TO THE MGB OR AGB SHALL BE TWO HOLE TYPE CONNECTED WITH STAINLESS STEEL BOLTS AND NUTS WITH STAINLESS STEEL LOCK WASHERS AND NOALOX ON EITHER SIDE OF THE BUSS BAR.

3.16 CHEMICAL GROUND RODS: CHEMICAL GROUND RODS SHALL NOT BE INSTALLED ON GROUND RING INSTALLATIONS WITH NORMAL SOIL. CHEMICAL GROUND RODS SHALL BE INSTALLED ONLY FOR SPECIAL DESIGN APPLICATIONS THAT REQUIRE SINGLE POINT GROUNDING DUE TO SPECIFIC SITE CONDITIONS.

3.17 TENANT IMPROVEMENT SITE GROUNDING: FOR ROOF TOP ANTENNA INSTALLATIONS ADDITIONAL ANTENNA GROUND BARS MAY HAVE TO BE INSTALLED AT EACH ANTENNA MOUNT LOCATION. ALL ANTENNA MOUNTS SHALL BE GROUNDED WITH A #2 AWG CONDUCTOR CONNECTED TO THE NEAREST BUILDING STEEL OR THE AGB INSTALLED AT THE MOUNT. ALL BUSS BARS, BOTH MGB AND AGB(S), SHALL BE INDEPENDENTLY TIED TO THE NEAREST BUILDING STEEL OR DESIGNATED GROUNDING SYSTEM. AGB(S) MAY BE HOME RUN BACK TO THE MGB WHERE NO BUILDING STEEL IS AVAILABLE.

3.18 LIMITS OF BEND RADIUS: IT IS IMPORTANT THAT THE GROUNDING CONDUCTOR CONNECTING THE INSIDE AND OUTSIDE GROUND SYSTEMS BE AS STRAIGHT AS POSSIBLE, WITH NO TURN OR BEND SHORTER THAN ONE FOOT RADIUS WITH A THREE FOOT RADIUS PREFERRED. NO RIGHT ANGLE OR SHARP BENDS SHALL BE ALLOWED.

3.19 BONDING PREPARATION & FINISH: ALL SURFACES REQUIRE PREPARATION PRIOR TO BONDING OF EITHER CAD WELD OR BURNDY FASTENERS. GALVANIZED SURFACES SHALL BE GROUND OR SANDED TO THE POINT OF EXPOSING THE STEEL SURFACE BELOW, PRIOR TO BONDING THE GROUND CONDUCTOR. FOR OTHER SURFACES INCLUDING COPPER BUSS BARS ALL PAINT, RUST TARNISH AND GREASE SHALL BE REMOVED PRIOR TO BONDING THE GROUND CONDUCTOR. CAD WELD TYPE BONDS SHALL BE FINISHED WITH THE APPLICATION OF COLD GALVANIZATION AND WHEN APPLICABLE, FINISH PAINTED WITH AN APPROPRIATE COLOR AS REQUIRED. MECHANICAL TYPE BONDS ON BUSS BARS SHALL BE FINISHED WITH THE APPLICATION OF NOALOX OR OTHER APPROVED CONDUCTIVE MEDIUM MATERIAL BETWEEN CONNECTOR AND BUSS BAR. MECHANICAL TYPE BONDS ON ALL OTHER SURFACES SHALL BE FINISHED WITH THE APPLICATION OF COLD GALVANIZATION AND/OR THE APPROPRIATE PAINT TO MATCH AS REQUIRED.

3.20 TESTING: THE OUTSIDE GROUND RING SHALL BE TESTED AFTER INSTALLATION BUT PRIOR TO BACKFILLING THE GROUND RING TRENCH. THE GROUND FIELD RESISTANCE SHALL MEASURE 5 OHMS OR LESS TO GROUND. ANY DIFFICULTY IN ACHIEVING THIS LEVEL OF RESISTANCE MUST BE BROUGHT TO THE ATTENTION OF THE PROJECT MANAGER. THE RESISTANCE TO GROUND SHALL BE MEASURED USING THE FALL OF POTENTIAL METHOD. TESTING SHALL BE PERFORMED BY AN OWNER PROVIDED INDEPENDENT TESTING LABORATORY FROM WHICH A WRITTEN REPORT SHALL BE PRODUCED FOR REVIEW BY THE PROJECT MANAGER.

3.21 SPECIAL CONDITIONS: WHEN SOIL CONDITIONS EXIST (I.E., NON-COMPACTABLE ROCK, GRAVEL, SHALE, ETC.) THAT PREVENTS THE INSTALLATION OF THE STANDARD GROUNDING SYSTEM AND PROCEDURES, THEN VERBAL PROCEDURES SHALL BE REQUESTED BY THE PM.

3.22 EXTERNAL GROUND RING: THE EXTERNAL GROUND RING SHALL EXTEND TO THE MAXIMUM ALLOWABLE DEPTH IN 95% COMPACTED SOIL

3.23 GROUND RODS (REPLACEMENT): WHEN GROUND RODS CANNOT BE DRIVEN INTO THE SOIL VERTICALLY TO A DEPTH DESCRIBED IN PARAGRAPH 3.5, AND REMAIN IN 95% COMPACTACTED SOIL, THEN THE FOLLOWING METHODS OF SUBSTITUTION MAY BE USED. THESE ARE SUGGESTED METHODS ONLY, AND EACH CASE SHOULD BE REVIEWED BY THE T-MOBILE PROJECT MANAGER. THE PURPOSE IS TO ACHIEVE THE LOWEST IMPEDANCE TO GROUND, IN ANY CASE, EQUAL TO OR LESS THAN 5 OHMS.

3.24 ROCK WITH SOME OR NO SOIL COVER: FOR SITES WHICH HAVE SOIL CONDITIONS WHICH CONSIST OF SOLID OR SEMI SOLID ROCK BELOW ABOUT THREE FEET OF COMPATIBLE SOIL, A COMBINATION OF METHODS MAY BE USED:

A. A COMBINATION OF SHORT GROUND RODS MAY BE USED WITH 3' BSQUARE 1/4" COPPER PLATES. A MINIMUM OF TWO PLATES SHOULD BE USED AND SHOULD REPLACE GROUND RODS ON AN EQUIVALENCY OF TWO GROUND ROD LENGTHS PER COPPER PLATE. THE COPPER PLATE SHOULD BE PLACED IN A MINIMUM 3" BENTONITE BASE AND COVERED WITH 3" OF BENTONITE FILL PRIOR TO BACKFILL.

B. AN ACTIVE TYPE CHEMICAL ROD SYSTEM MAY BE USED. THIS IS AN ENGINEERING JUDGMENT AND SHOULD BE USED ONLY WHERE NECESSARY, DUE TO EXPENSE. IN ALL CASES, THE STANDARD PRACTICES OUTLINED IN THIS DOCUMENT SHOULD BE FOLLOWED TO THE EXTENT THAT IS APPLICABLE, AND SHOULD BE MODIFIED AS TO THE QUANTITY OF GROUND RODS AND CONDUCTOR SIZE ONLY AS RECOMMENDED BY THE MANUFACTURER OF THE GROUND ROD SYSTEM.

C. A SYSTEM UTILIZING CORED SHAFTS, STANDARD GROUND RODS ON A TYPICAL LAYOUT, WITH A BENTONITE (CLAY) BACKFILL. IN THIS CASE EACH GROUND ROD SHOULD BE TESTED INDIVIDUALLY, AND EACH ROD SHOULD HAVE AN ACCESS BOX PLACED FOR FUTURE TESTING.

3.24 HIGH RISE BUILDING:

A. HIGH RISE BUILDINGS PRESENT A UNIQUE PROBLEM IN GROUNDING. A FACILITY INVESTIGATION SHOULD BE MADE INTO THE STRUCTURE OF THE BUILDING, AND AS TO THE POSSIBLE PRESENCE OF AN EXISTING LIGHTNING PROTECTION SYSTEM. IF ONE IS IN PLACE AND APPEARS ADEQUATE IN DESIGN, IT MAY BE NECESSARY TO CONNECT THE ANTENNA SYSTEM TO THE EXISTING SYSTEM, WITH A TEST TO THE SYSTEM AFTER INSTALLATION TO ENSURE THAT IT HAS NOT CAUSED THE SYSTEM TO EXCEED 5 OHMS.

B. STRUCTURAL STEEL BUILDINGS: IF THE BUILDING IS BUILT OF STRUCTURAL STEEL, IT MAY BE POSSIBLE TO GROUND THE ANTENNAS TO THE BUILDING SITE. IT IS PREFERABLE TO GROUND THE ANTENNAS AND THE SITE TO A DIRECT EARTH CONNECTION, BY USE OF SEPARATE DOWN LEADS OF CONSIDERABLE SIZE (250 MCM OR LARGER) COMING FROM GROUND BUSS BARS TO COLLECT THE GROUND INPUT, AND RUN DOWN A VERTICAL SHAFT OR STAIRWELL TO A PATTERN OF NO LESS THAN FOUR GROUND RODS. WHERE PRACTICAL, THE BUILDING STEEL SHOULD BE BONDED TO THE GROUND RING WITH A SEPARATE LEAD TO THE GROUND ROD FIELD.

C. A SYSTEM STRUCTURAL CONCRETE BUILDINGS ARE MORE DIFFICULT TO GROUND PROPERLY. THE ANTENNAS SHOULD BE GROUNDED TO A SEPARATE BUSS BAR AND DOWN LEAD WHERE THE COAXIAL CABLES ENTER THE BUILDING. THE DOWN LEAD SHOULD BE RUN IN A SIMILAR FASHION AS IN THE STRUCTURAL STEEL EQUIPMENT ROOM. THE DOWN LEADS SHOULD BE PROTECTED IN CONDUIT AND SHOULD BE INSTALLED AS FAR APART AS IS PRACTICAL FROM EACH OTHER. THE SEPARATE DOWN LEADS SHOULD NOT CONTACT EACH OTHER UNTIL CONNECTION WITH THE FIRST GROUND ROD

811 Know what's **below.** **Call** before you dig.

Parallel INFRASTRUCTURE

PLANS PREPARED BY:
CelluSite, LLC

ENGINEERING LICENSE:

DATE:	DESCRIPTION:	BY:	REV:
06/03/15	REVIEW CD	BMW	A
06/04/15	REVIEW CD	BMW	B
07/21/15	REVIEW CD	BMW	C

SITE INFORMATION:
ML53108I
Christ the Life Evangelical Lutheran Church
WI-Waukesha-Summit
3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

SHEET TITLE:
GENERAL NOTES & SPECIFICATIONS

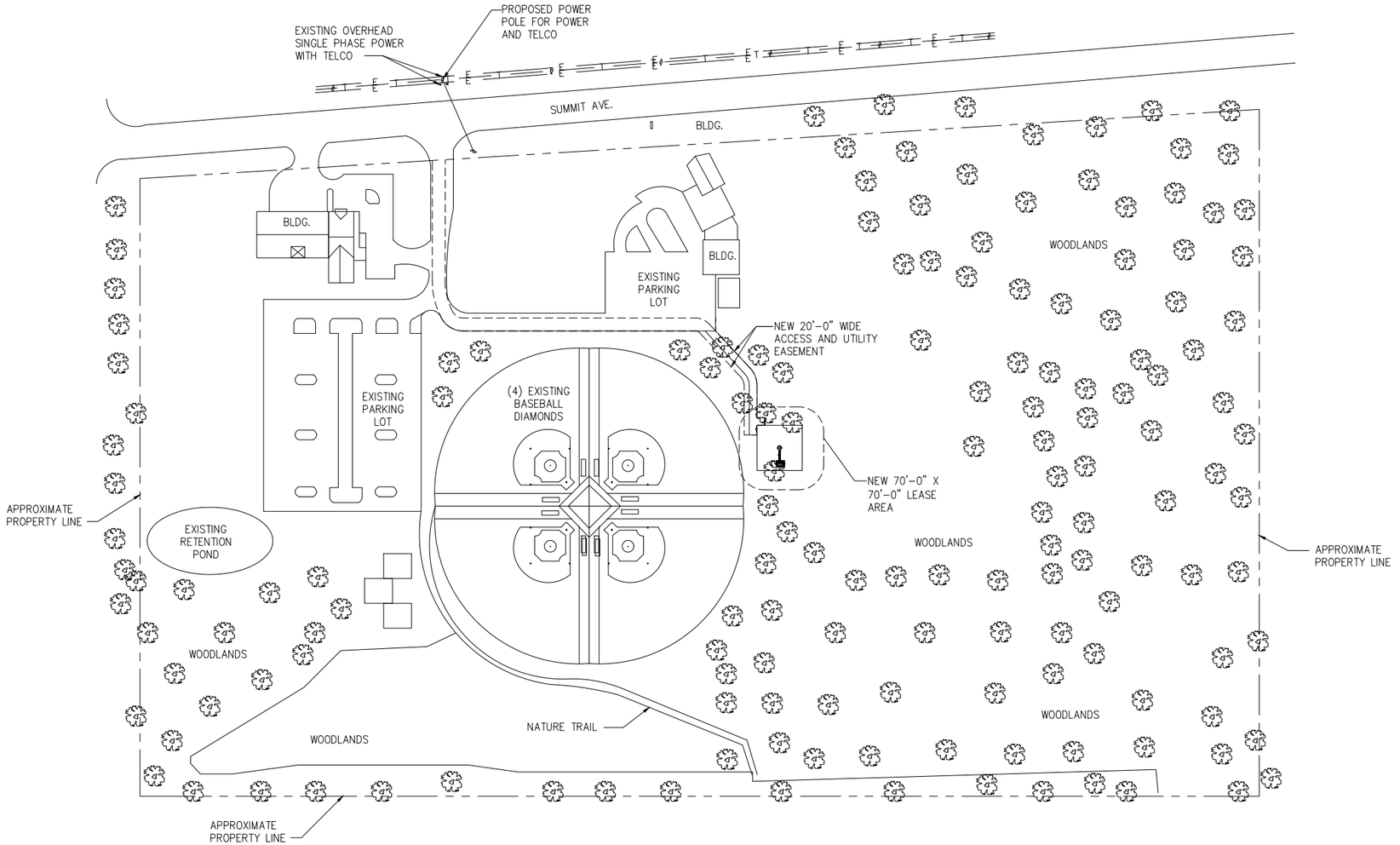
SHEET NUMBER:
T-3

PLOT SCALE: 1:1 @ 11"x17"

IMPORTANT SITE NOTES:

1. GENERAL CONTRACTOR WILL NOT START CONSTRUCTION UNTIL AFTER THEY HAVE RECEIVED THE PRE-CON PACKAGE AND HAVE A PRE-CON WALK WITH THE PROJECT MANAGER.
2. GENERAL CONTRACTOR TO HIRE PUBLIC (811) AND PRIVATE LOCATING SERVICE IN ORDER TO LOCATE AND PROTECT ALL SURFACE UTILITIES. DO NOT SCALE OFF THESE PLANS FOR ANY BELOW GRADE UTILITIES
3. CONTRACTOR SHALL VERIFY ALL EXISTING BURIED AND OVERHEAD UTILITIES PRIOR TO EXCAVATION. CONTRACTOR SHALL REPAIR ALL DAMAGED UTILITIES AT HIS OWN COST AND COORDINATE ANY REPAIRS WITH RESPECTIVE UTILITY COMPANY.
4. CONTRACTOR TO VERIFY ALL HEIGHTS AND AZIMUTHS IN FIELD PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY T-MOBILE AND ENGINEERING FIRM OF ANY DISCREPANCIES BEFORE PROCEEDING.
5. CONTRACTOR SHALL RESTORE AND REPAIR ANY DAMAGED AREAS CAUSED BY CONSTRUCTION

SETBACK DIMENSIONS TO PROPERTY LINES



OVERALL SITE PLAN

SCALE: 1"=80'-0"

1

Parallel INFRASTRUCTURE

PLANS PREPARED BY:

CelluSite, LLC

ENGINEERING LICENSE:

DATE:	DESCRIPTION:	BY:	REV:
06/03/15	REVIEW CD	BMW	A
06/04/15	REVIEW CD	BMW	B
07/21/15	REVIEW CD	BMW	C

SITE INFORMATION:

ML53108I
Christ the Life Evangelical Lutheran Church
WI-Waukesha-Summit
3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

SHEET TITLE:

OVERALL SITE PLAN

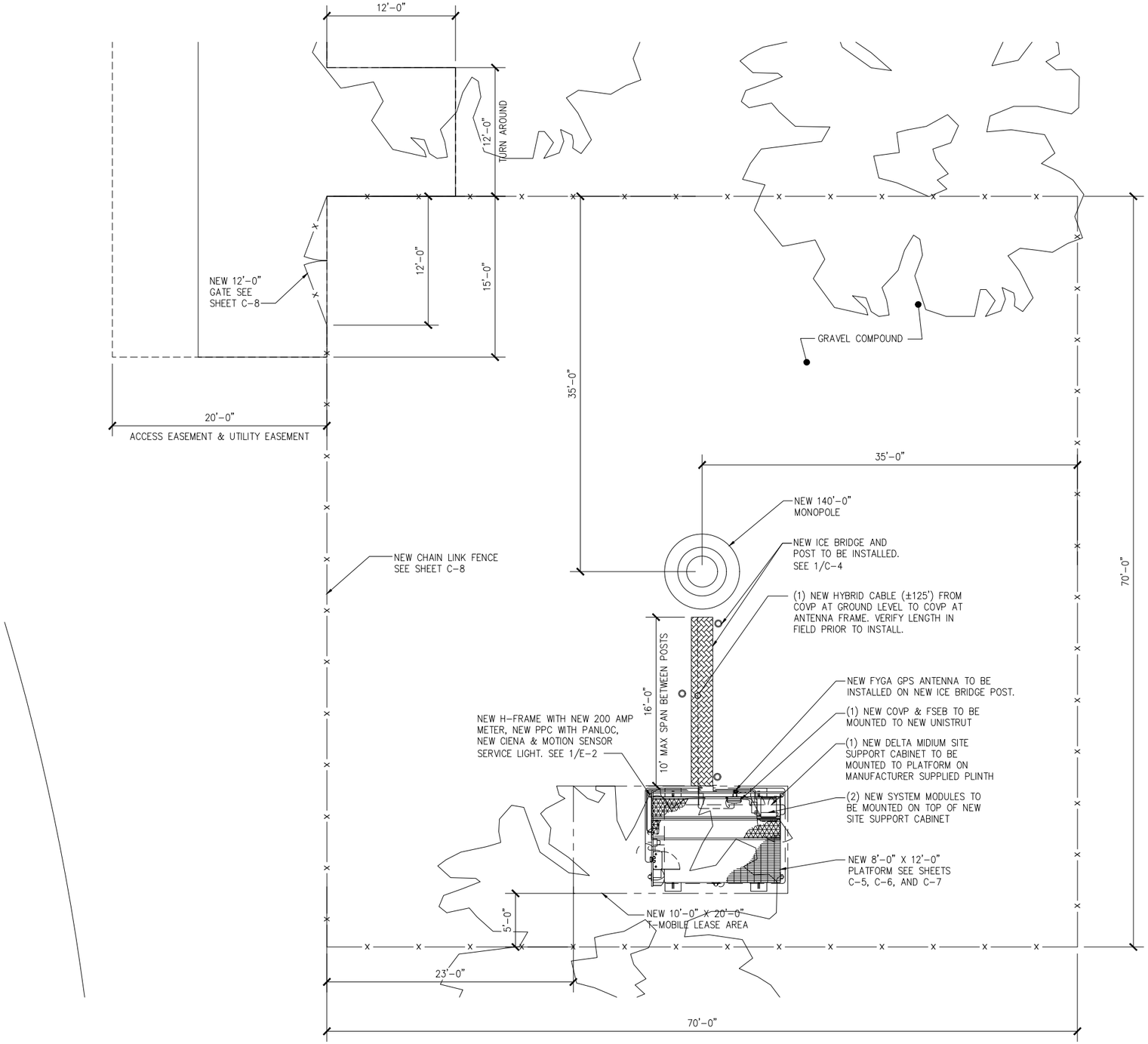
SHEET NUMBER:

C-1

PLOT SCALE: 1:1 @ 11"x17"

NOTE:
ALL UNISTRUT, FASTENERS, HARDWARE, ETC, ARE TO BE EITHER HOT-DIPPED GALVANIZED OR STAINLESS STEEL. GENERAL CONTRACTOR IS NOT TO USE ZINC-PLATED OR PRE-GALVANIZED.

ALL TREES TO BE REMOVED AS NECESSARY.



N

ENLARGED SITE PLAN
SCALE: 3/16"=1'-0"

1

Parallel INFRASTRUCTURE

PLANS PREPARED BY:
CelluSite, LLC

ENGINEERING LICENSE:

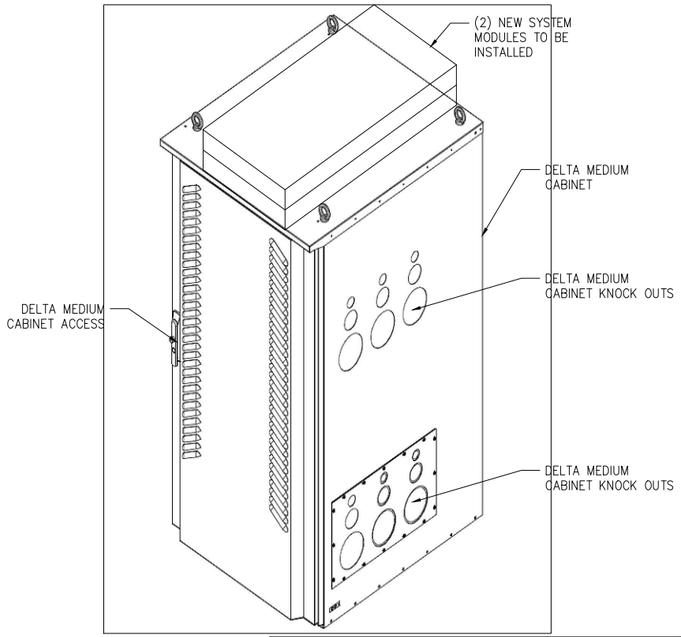
DATE:	DESCRIPTION:	BY:	REV:
06/03/15	REVIEW CD	BMW	A
06/04/15	REVIEW CD	BMW	B
07/21/15	REVIEW CD	BMW	C

SITE INFORMATION:
ML53108I
Christ the Life Evangelical Lutheran Church
WI-Waukesha-Summit
3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

SHEET TITLE:
ENLARGED SITE PLAN

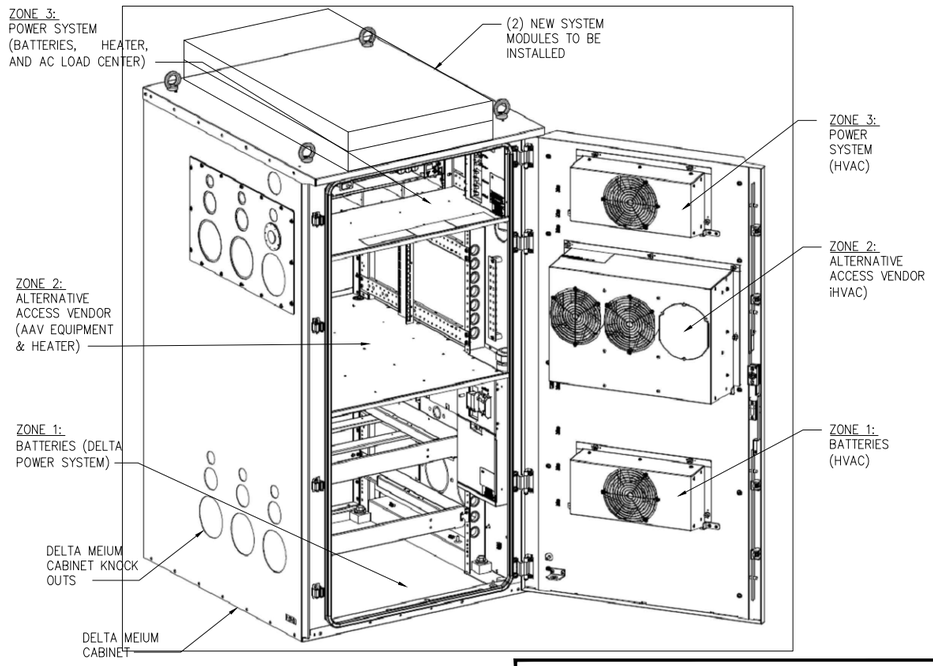
SHEET NUMBER:
C-2

PLOT SCALE: 1:1 @ 11"x17"



ISOMETRIC EQUIPMENT VIEW — 1

SCALE: NOT TO SCALE



ISOMETRIC EQUIPMENT VIEW — 2

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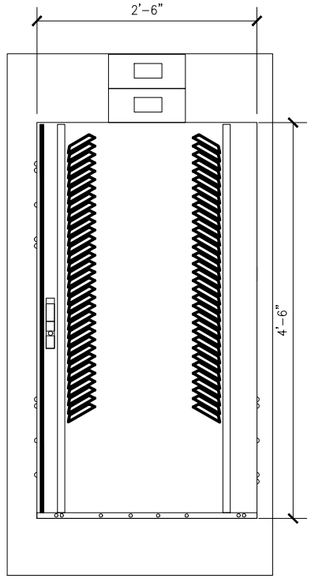

FRONT EQUIPMENT VIEW — 3

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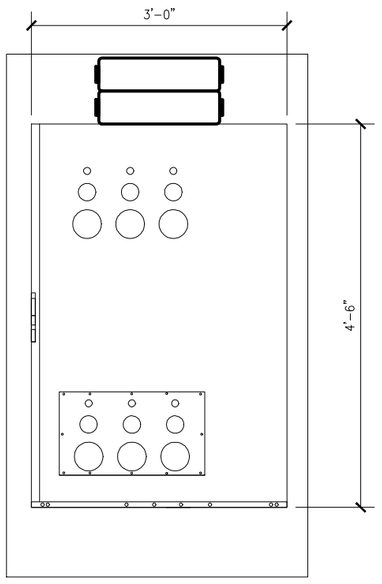
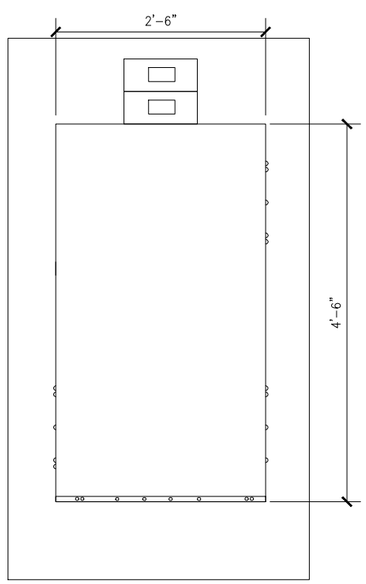


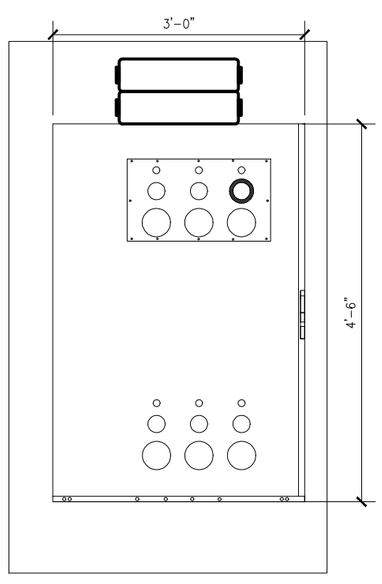
RIGHT EQUIPMENT VIEW — 4

SCALE: NOT TO SCALE



BACK EQUIPMENT VIEW — 5

SCALE: NOT TO SCALE



LEFT EQUIPMENT VIEW — 6

SCALE: NOT TO SCALE

Parallel INFRASTRUCTURE

PLANS PREPARED BY:

CelluSite, LLC

ENGINEERING LICENSE:

DATE:	DESCRIPTION:	BY:	REV.:
06/03/15	REVIEW CD	BMW	A
06/04/15	REVIEW CD	BMW	B
07/21/15	REVIEW CD	BMW	C

SITE INFORMATION:

ML53108I
Christ the Life Evangelical Lutheran Church
WI-Waukesha-Summit
3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

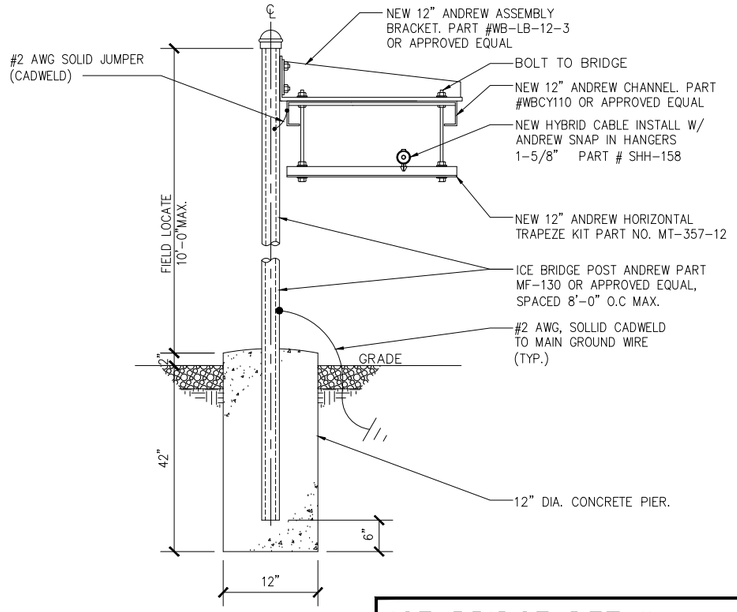
SHEET TITLE:

EQUIPMENT ELEVATION

SHEET NUMBER:

C-3

PLOT SCALE: 1:1 @ 11"x17"



ICE BRIDGE DETAIL

SCALE: NONE

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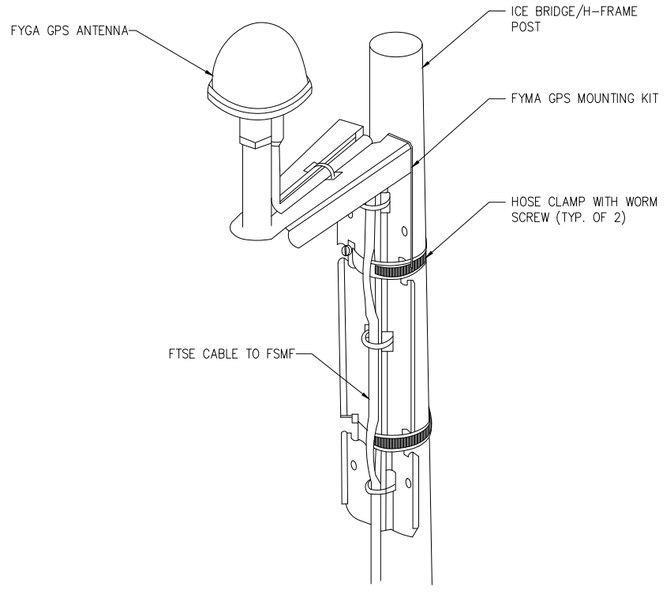

FYGA GPS ANTENNA DETAIL

SCALE: NONE

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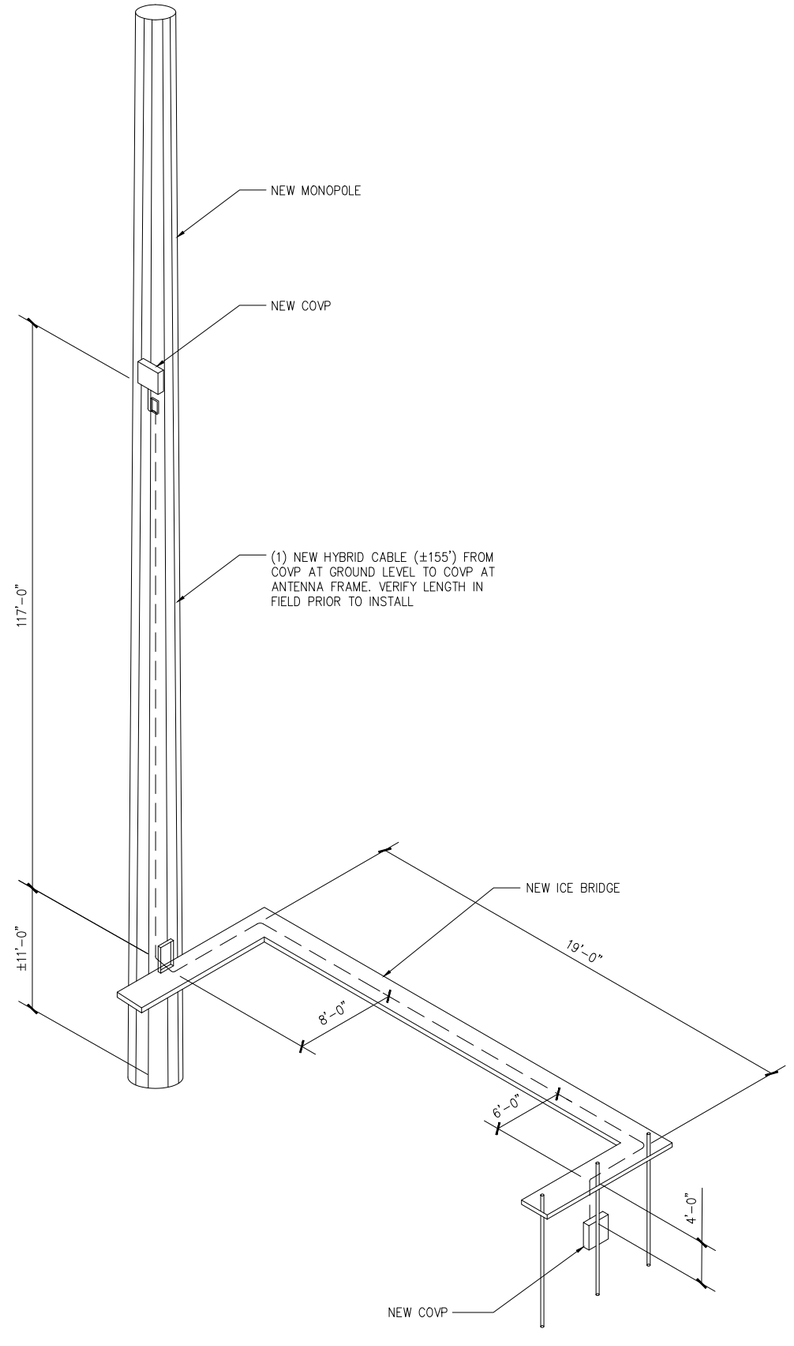

HYBRID CABLE ISO RISER DIAGRAM

SCALE: NONE

3

Parallel INFRASTRUCTURE

PLANS PREPARED BY:

CelluSite, LLC

ENGINEERING LICENSE:

DATE:	DESCRIPTION:	BY:	REV.:
06/03/15	REVIEW CD	BMW	A
06/04/15	REVIEW CD	BMW	B
07/21/15	REVIEW CD	BMW	C

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Waukesha COUNTY

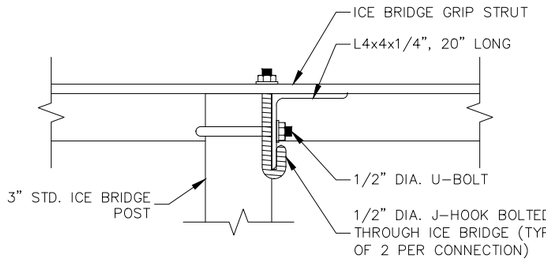
SHEET TITLE:

ICE BRIDGE, GPS AND HYBRID CABLE DETAILS

SHEET NUMBER:

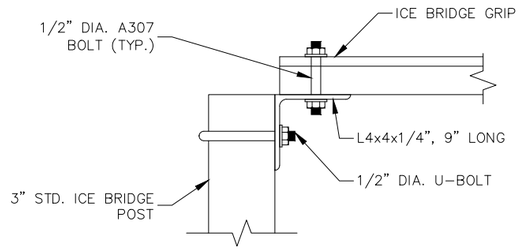
C-4

PLOT SCALE: 1:1 @ 11"x17"



CONNECTION DETAIL 2

SCALE: 1 1/2" = 1'-0"

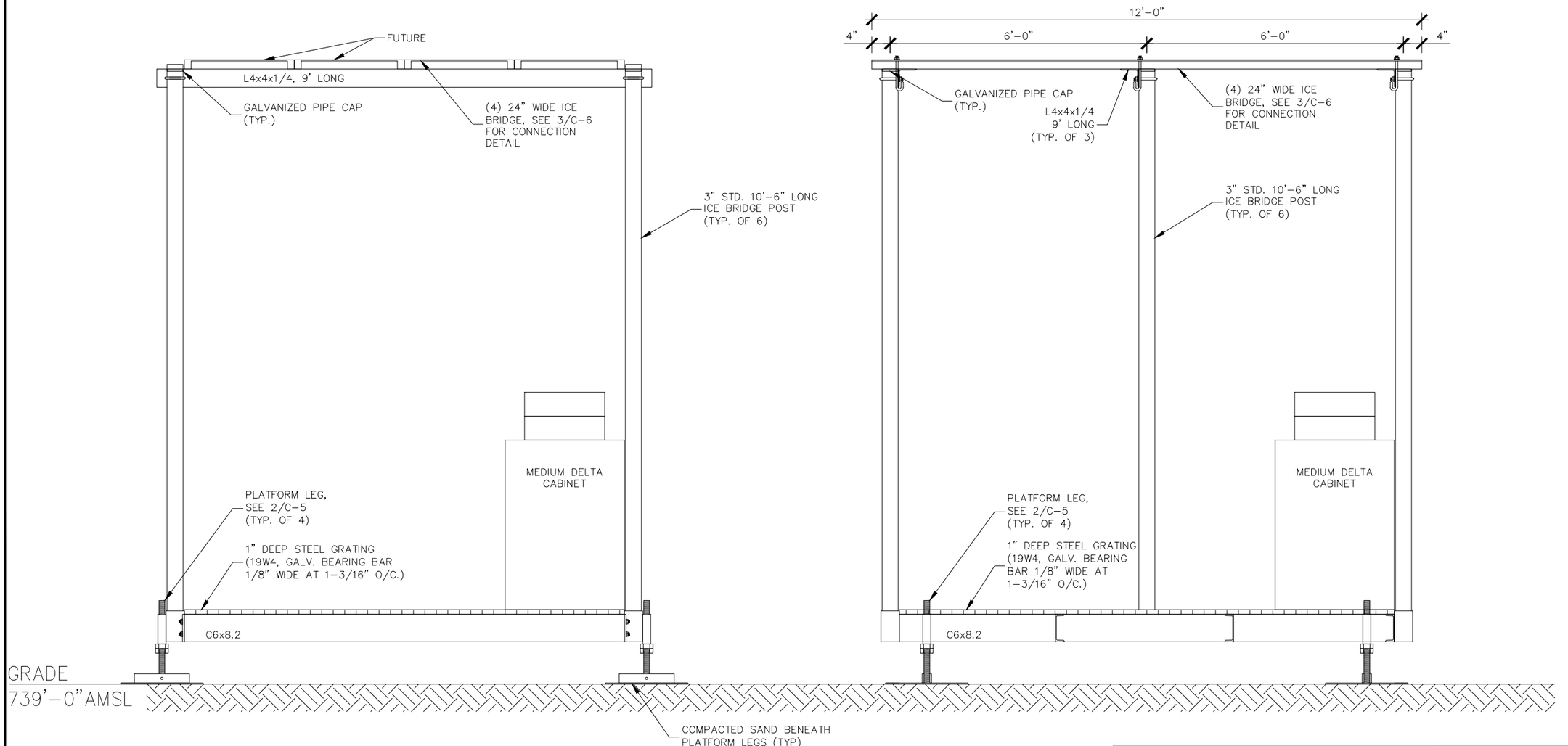


CONNECTION DETAIL 3

SCALE: 1 1/2" = 1'-0"

NOTES:

1. EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED IN FIELD BY THE CONTRACTOR PRIOR TO FABRICATION AND INSTALLATION. IF SIGNIFICANT DEVIATIONS OR DETERIORATION ARE ENCOUNTERED AT THE TIME OF CONSTRUCTION, A REPAIR PERMIT SHALL BE OBTAINED AND CONTRACTOR SHALL NOTIFY STRUCTURAL ENGINEER IMMEDIATELY.
2. FOUNDATIONS ARE DESIGNED FOR AN ASSUMED MINIMUM NET ALLOWABLE SOIL BEARING CAPACITY OF 2000 PSF. IT IS RECOMMENDED THAT A GEOTECHNICAL INVESTIGATION BE COMPLETED PRIOR TO CONSTRUCTION. IF SOIL BEARING CAPACITY IS LESS THAN WHAT IS SPECIFIED HERE, CONTACT ARCHITECT/ENGINEER FOR A REDESIGN.
3. DO NOT SCALE DRAWINGS.



12'-0"x8'-0" PLATFORM ELEVATIONS 1

SCALE: 1/2" = 1'-0"

Parallel INFRASTRUCTURE

PLANS PREPARED BY:

CelluSite, LLC

ENGINEERING LICENSE:

DATE:	DESCRIPTION:	BY:	REV.:
06/03/15	REVIEW CD	BMW	A
06/04/15	REVIEW CD	BMW	B
07/21/15	REVIEW CD	BMW	C

SITE INFORMATION:

ML53108I
Christ the Life Evangelical Lutheran Church
WI-Waukesha-Summit
3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

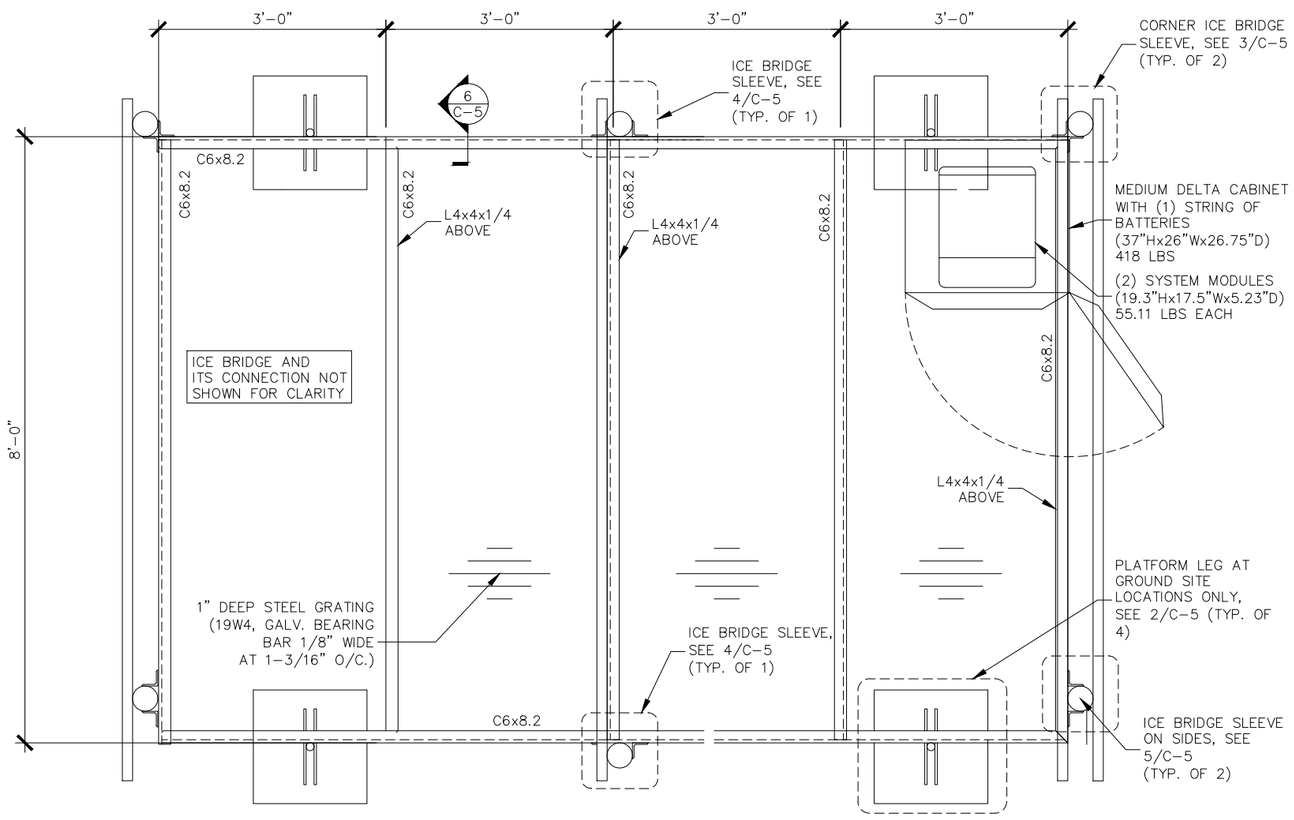
SHEET TITLE:

PLATFORM ELEVATIONS

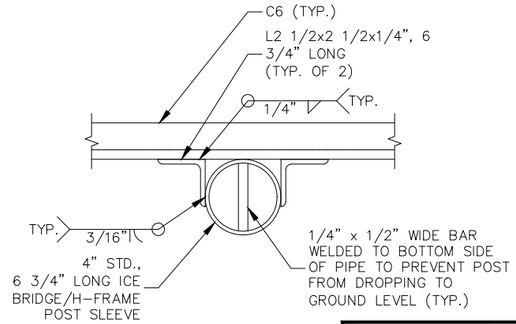
SHEET NUMBER:

C-5

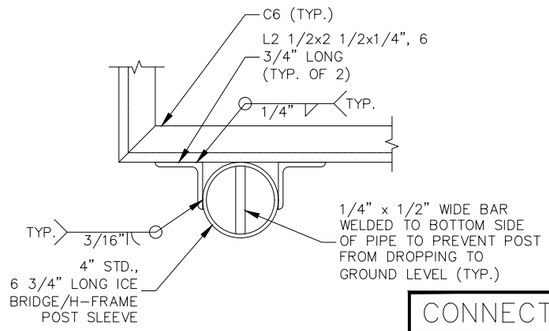
PLOT SCALE: 1:1 @ 11"x17"



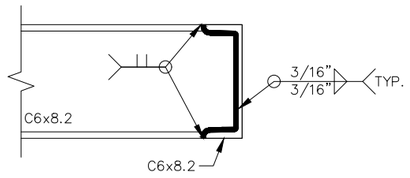
12'-0"x8'-0" PLATFORM PLAN | 1
SCALE: 1/2" = 1'-0"



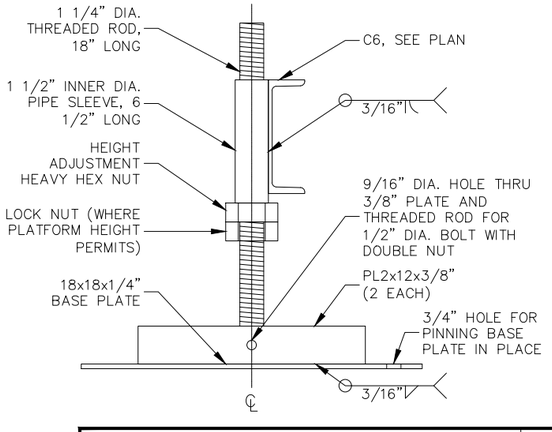
CONNECTION DETAIL | 4
SCALE: 1 1/2" = 1'-0"



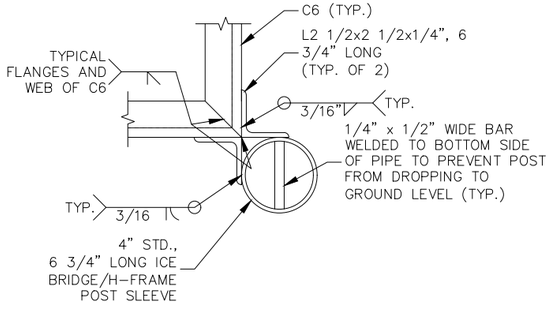
CONNECTION DETAIL | 5
SCALE: 1 1/2" = 1'-0"



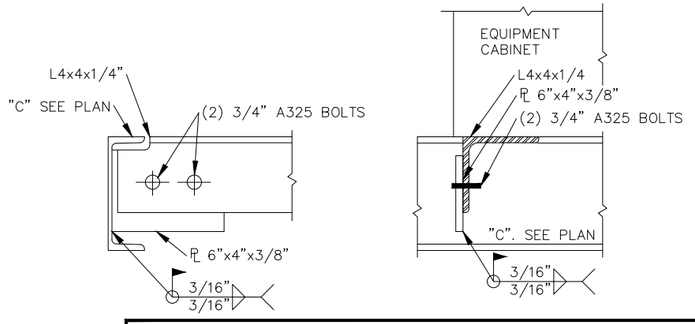
CONNECTION DETAIL | 6
SCALE: 1 1/2" = 1'-0"



PLATFORM LEG DETAIL | 2
SCALE: 1 1/2" = 1'-0"



CONNECTION DETAIL | 3
SCALE: 1 1/2" = 1'-0"



CABINET SUPPORT CONNECTION DETAIL | 7
SCALE: 1 1/2" = 1'-0"

Parallel INFRASTRUCTURE

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SHEET TITLE:
PLATFORM DETAILS

SHEET NUMBER:
C-6

PLOT SCALE: 1:1 @ 11"x17"

GENERAL STRUCTURAL NOTES

1.0 GENERAL CONDITIONS

1.1 DESIGN AND CONSTRUCTION OF WORK SHALL CONFORM TO 2012 INTERNATIONAL BUILDING CODE, ACI 318-11, AISC/ASD 14TH EDITION, ASCE 7-10, TIA/EIA-222-G. IN CASE OF CONFLICT BETWEEN THE CODES, STANDARDS, REGULATIONS, SPECIFICATIONS, GENERAL NOTES AND/OR MANUFACTURER'S REQUIREMENTS USE THE MOST STRINGENT PROVISION.

1.2 IT IS THE EXPRESS INTENT OF THE PARTIES INVOLVED IN THIS PROJECT THAT THE CONTRACTOR OR SUBCONTRACTOR OR INDEPENDENT CONTRACTOR OR THEIR RESPECTIVE EMPLOYEES SHALL EXCULPATE THE ARCHITECT, THE ENGINEER, THE CONSTRUCTION MANAGER, THE OWNER, AND THEIR AGENTS, FROM ANY LIABILITY WHATSOEVER AND HOLD THEM HARMLESS AGAINST LOSS, DAMAGES, LIABILITY OR ANY EXPENSE ARISING IN ANY MATTER FROM THE WRONGFUL OR NEGLIGENT ACT, OR FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, OR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES OR FAILURE TO CONFORM TO THE STATE SCAFFOLDING ACT IN CONNECTION WITH THE WORK.

1.3 DO NOT SCALE DRAWINGS.

1.4 VERIFY ALL EQUIPMENT MOUNTING DIMENSIONS PER MANUFACTURER DRAWINGS.

1.5 SUBMIT ONE COPY OF ALL STRUCTURAL SHOP DRAWINGS FOR REVIEW.

1.6 DESIGN LOADS ARE:

A. EQUIPMENT LOAD
-(1) NEW MEDIUM DELTA CABINET (54"Hx30"Wx36"D).....200 LBS
(MEDIUM CABINET WEIGHS 200 LBS. WITHOUT EQUIPMENT OR BATTERIES
-(2) NEW SYSTEM MODULE (19.3"Hx17.5"Wx5.23"D).....55.11 LBS
-(1) NEW FCOA CABINET (61"Hx30.3"Wx30.3"D).....789 LBS
-(2) FUTURE FCOA CABINET (61"Hx30.3"Wx30.3"D).....789 LBS

B. PLATFORM LOADS
-LIVE LOAD: 100 PSF
-PLATFORM DEAD LOAD: 15 PSF

2.0 EXISTING CONDITIONS

2.1 CONTRACTOR SHALL FIELD VERIFY THAT THE EXISTING CONSTRUCTION ADJACENT TO THIS CONSTRUCTION, OR TO WHICH THIS CONSTRUCTION SHALL BE CONNECTED, IS AS INDICATED ON THIS DRAWING.

2.2 EXISTING CONDITIONS WILL BE CHECKED AND VERIFIED IN FIELD. IF SIGNIFICANT DEVIATIONS OR DETERIORATION ARE ENCOUNTERED AT THE TIME OF CONSTRUCTION A REPAIR PERMIT WILL BE OBTAINED AND CONTRACTOR SHALL NOTIFY STRUCTURAL ENGINEER IMMEDIATELY.

3.0 STEEL NOTES

3.1 MEET OR EXCEED THE FOLLOWING CODES & STANDARDS EXCEPT AS NOTED:

A. STRUCTURAL STEEL.....	AISC SPECIFICATION ALLOWABLE STRESS DESIGN, 14TH EDITION
-W SHAPES & CHANNELS.....	ASTM A992 - 50KSI
-SHAPES AND PLATES.....	ASTM A36
-PLATES BENT OR COLD FORMED.....	ASTM A 283, GRADE C
-PIPES.....	ASTM A 500, GRADE B - 42 KSI
-TUBES.....	ASTM A 500, Fy= 46 KSI
-STRUCTURAL SHEETS, HOT ROLLED.....	ASTM A 570
-COLD-FORMED STEEL TUBING.....	ASTM A 500, GRADE B
-BOLTS, NUTS & WASHERS FOR FRAMING MEMBERS AND BRACINGS.....	ASTM A 325-X
-BOLTS, NUTS & WASHERS FOR ANCHOR BOLTS AND SECONDARY CONNECTIONS.....	ASTM A 307
B. WELDS.....	AWS E 70XX

EXCEPTION IS TAKEN TO AISC CODE OF STANDARD PRACTICE PARAGRAPH

3.2.1 REGARDING OWNERS AND FABRICATOR'S RESPONSIBILITY FOR CONNECTION DESIGN AND ADEQUACY OF SHOP DRAWINGS. COMPLIANCE WITH THE REQUIREMENTS SHOWN ON DRAWINGS AND/OR SPECIFICATIONS, CONNECTION DESIGN AND DETAILING IS THE CONTRACTOR'S RESPONSIBILITY. ENGINEER'S REVIEW OF SHOP DRAWINGS IS FOR GENERAL CONSIDERATIONS ONLY AND DOES NOT CONSTITUTE AN ACCEPTANCE OF THESE RESPONSIBILITY BY THE OWNER AND/OR ENGINEER.

3.2.2 ALL UNISTRUT, FASTENERS, HARDWARE, ETC. SHALL BE HOT DIPPED GALVANIZED OR SHALL BE STAINLESS STEEL. ZINC PLATED MATERIAL SHALL NOT BE USED

3.2.3 ALL STRUCTURAL STEEL, SHAPES, PLATES, SHALL BE GALVANIZED PER ASTM 123

4.0 GEOTECHNICAL NOTES

4.1 ALL FOOTINGS SHALL BE CONSTRUCTED UPON UNDISTURBED, NATURAL SUBGRADE OR COMPACTED GRANULAR FILL WITH A MINIMUM NET ALLOWABLE BEARING CAPACITY OF 2000 PSF.

4.2 THE SOIL SUBGRADE FOR ALL FOOTINGS AND SLABS SHALL BE INSPECTED AND APPROVED BY THE OWNER'S TESTING AGENCY IMMEDIATELY PRIOR TO PLACING FOUNDATION CONCRETE OR CONCRETE MUD SLABS.

4.3 ALL ORGANIC AND / OR OTHER UNSUITABLE MATERIAL SHALL BE REMOVED FROM FOUNDATION AND SLAB SUBGRADE AND BACKFILL AREAS, AND THEN BACKFILLED WITH ACCEPTABLE GRANULAR FILL COMPACTED TO 95 PERCENT OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT (ASTM D1557).

4.4 NO FOOTINGS OR STRUCTURAL SLABS SHALL BE PLACED INTO OR AGAINST SUBGRADES CONTAINING FREE WATER, FROST OR ICE. SHOULD WATER OR FROST ENTER A FOOTING/MUD SLAB/STRUCTURAL SLAB EXCAVATION AFTER SUBGRADE APPROVAL, THE SUBGRADE SHALL BE REINSPECTED BY THE OWNER'S SOIL TESTING LABORATORY AFTER REMOVAL OF WATER, FROST, OR ICE.

4.5 THE CONTRACTOR SHALL PROVIDE ALL NECESSARY MEASURES TO PREVENT ANY WATER, FROST, OR ICE FROM PENETRATING ANY FOOTING OR STRUCTURAL/ MUD SLAB SUBGRADE BEFORE AND AFTER PLACING OF CONCRETE, AND UNTIL SUCH SUBGRADES ARE FULLY PROTECTED BY THE PERMANENT BUILDING STRUCTURE.

4.6 ALL FOOTING MUD SLABS SHALL BE THOROUGHLY CLEANED IMMEDIATELY PRIOR TO CONCRETE PLACEMENT.

Parallel INFRASTRUCTURE

PLANS PREPARED BY:
CelluSite, LLC

ENGINEERING LICENSE:

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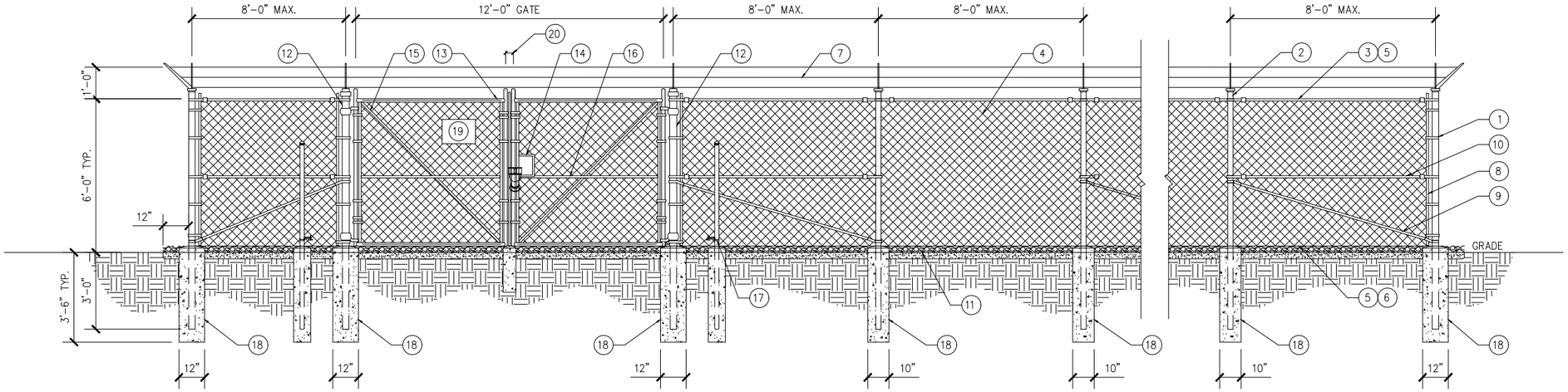
Waukesha,WI 53188
Waukesha COUNTY

SHEET TITLE:
PLATFORM NOTES

SHEET NUMBER:
C-7

PLOT SCALE: 1:1 @ 11"x17"



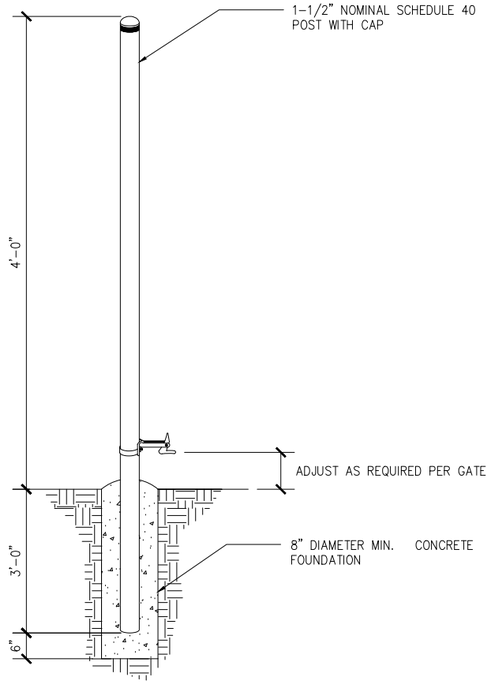
FENCE ELEVATION

SCALE: NOT TO SCALE

1

REFERENCE NOTES:

1. CORNER, END OR PULL POST: 3" NOMINAL SCHEDULE 40 PIPE.
2. LINE POST: 2-1/2" NOMINAL SCHEDULE 40 PIPE, PER ASTM F1083. LINE POSTS SHALL BE EQUALLY SPACED AT MAXIMUM 8'-0" O.C. (2-7/8" O.D.)
3. TOP RAIL & BRACE RAIL: 1-1/2" NOMINAL PIPE, PER ASTM F1083.
4. FABRIC: 9 GAUGE CORE WIRE SIZE 2" MESH, CONFORMING TO ASTM A392. GROUND CLEARANCE TO BE 2" MAX.
5. TIE WIRE: MINIMUM 11 GAUGE GALVANIZED STEEL. A SINGLE WRAP OF FABRIC TIE AT POSTS AND RAILS. BY HOG RINGS SPACED MAXIMUM 24" INTERVALS AT TENSION WIRE .
6. TENSION WIRE: 9 GAUGE GALVANIZED STEEL.
7. BARBED WIRE: DOUBLE STRAND 12 GAUGE TWISTED WIRE TO MATCH WITH FABRIC. 14 GAUGE 4 POINT BARBS SPACED APPROXIMATELY 5" ON CENTER. 45 DEGREE ARM ANGLED OUTWARD.
8. STRETCHER BAR: 3/16" X 3/4" X HEIGHT OF FENCE.
9. 3/8" DIAGONAL ROD WITH GALVANIZED STEEL TURNBUCKLE OR DIAGONAL THREADED ROD.
10. CORNER POST BRACE: 1-1/4" NOMINAL PIPE EACH CORNER EACH WAY.
11. FINISH GRADE SHALL BE UNIFORM, LEVEL AND EXTEND 12" BEYOND FENCE BOUNDARY.
12. GATE POST: 3-1/2" NOMINAL SCHEDULE 40 PIPE, FOR GATE WIDTHS UP THRU 10 FEET OR 20 FEET FOR DOUBLE SWING GATE, PER ASTM F1083.
13. GATE FRAME: 1-1/2" NOMINAL PIPE, PER ASTM F1083.
14. 4" X 6" HANDHOLE WITH 3/4" CHAIN AND LOCKS. WELD CHAIN TO THE GATE LEAF WITHOUT THE HANDHOLE.
15. GATE DIAGONAL: GALVANIZED STEEL 1-1/2" NOMINAL PIPE.
16. GATE FRAME BRACE: 1-5/8" NOMINAL PIPE.
17. DUCK BILL OPEN GATE HOLDER. VERIFY LOCATION IN FIELD PRIOR TO INSTALLATION.
18. POST CONCRETE FOUNDATION (2000 PSI).
19. SIGNAGE PROVIDED BY OWNER.
20. GAP BETWEEN GATES: 1" MIN. / 3" MAX.



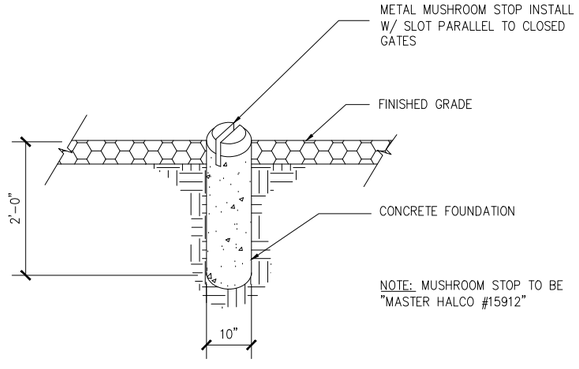
DUCKBILL GATE STOP

SCALE: NOT TO SCALE

2

GENERAL NOTES:

1. INSTALL FENCING PER ASTM F567.
2. INSTALL SWING GATES PER ASTM F900.
3. COMPLY WITH LOCAL ORDINANCE OF BARBED WIRE PERMIT REQUIREMENT, IF REQUIRED.
4. POST & GATE PIPE SIZES ARE INDUSTRY STANDARDS. ALL PIPE TO BE 1-1/4" NOMINAL SCHEDULE 40 GALVANIZED MINIMUM (HOT DIP, ASTM F1083 GRADE "A" STEEL). ALL GATE FRAMES SHALL BE WELDED. ALL WELDING SHALL BE COATED WITH (3) COATS OF COLD GALVANIZING (OR EQUAL).
5. ALL OPEN POSTS SHALL HAVE END-CAPS.
6. USE GALVANIZED HOG-RING WIRE TO MOUNT ALL SIGNS.
7. ALL SIGNS MUST BE MOUNTED ON INSIDE OF FENCE FABRIC.



MUSHROOM GATE STOP

SCALE: NOT TO SCALE

3

Parallel INFRASTRUCTURE

PLANS PREPARED BY:

CelluSite, LLC

ENGINEERING LICENSE:

DATE:	DESCRIPTION:	BY:	REV.:
06/03/15	REVIEW CD	BMW	A
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Waukesha,WI 53188
Waukesha COUNTY

SHEET TITLE:

FENCE DETAILS

SHEET NUMBER:

C-8

PLOT SCALE: 1:1 @ 11"x17"

PHOTOGRAPHS

	**1.** Project Site viewed from south, with location of proposed monopole tower marked.
	**2.** Data Point location (S-1).

	**3.** Soil Sample 1 (SS1).
	**4.** Data Point location (S-2).

	**5.** Soil Sample 2 (S-2).
	**6.** Data Point location (S-3).

	**7.** Soil Sample 3 (S-3).

ADDITIONAL SUPPORTING DOCUMENTATION

Surface Water Data Viewer Map

Legend

- Wetland Class Points
  - Dammed pond
  - Excavated pond
  - Filled excavated pond
  - Filled/drained wetland
  - Wetland too small to delineate
- Filled Points
- Wetland Class Areas
  - Wetland
  - Upland
- Filled Areas
- NRCS Wetspots
- Wetland Indicators
- Rivers and Streams
- Open Water
- Air Photo Index (2008 NAIP)

Notes

0.1 0 0.05 0.1 Miles

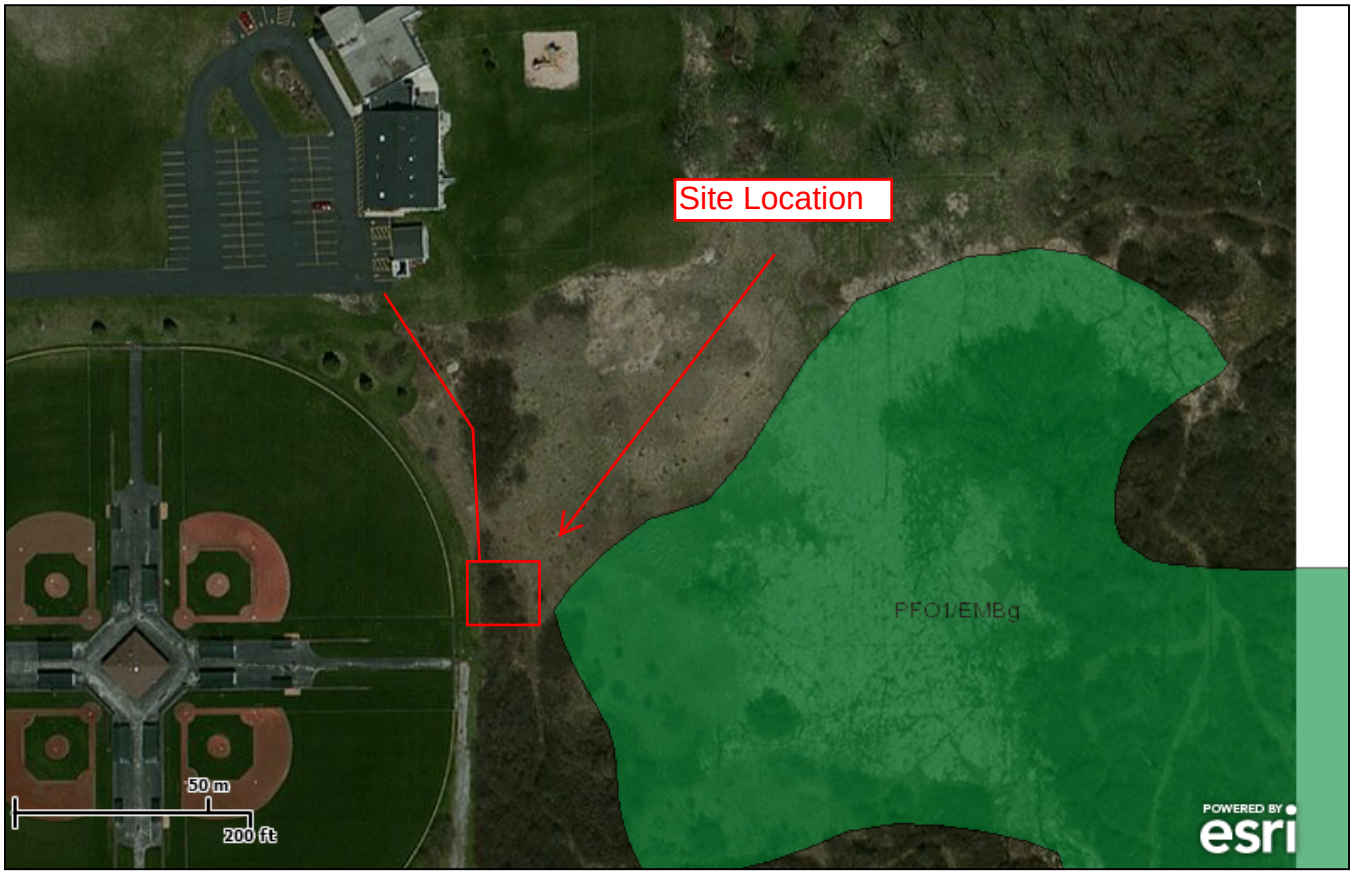
NAD_1983_HARN_Wisconsin_TM

U.S. Fish and Wildlife Service

National Wetlands Inventory

Christ the Life Evangelical / ML53108-I

Jul 1, 2015



Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

User Remarks:

United States Department of Agriculture

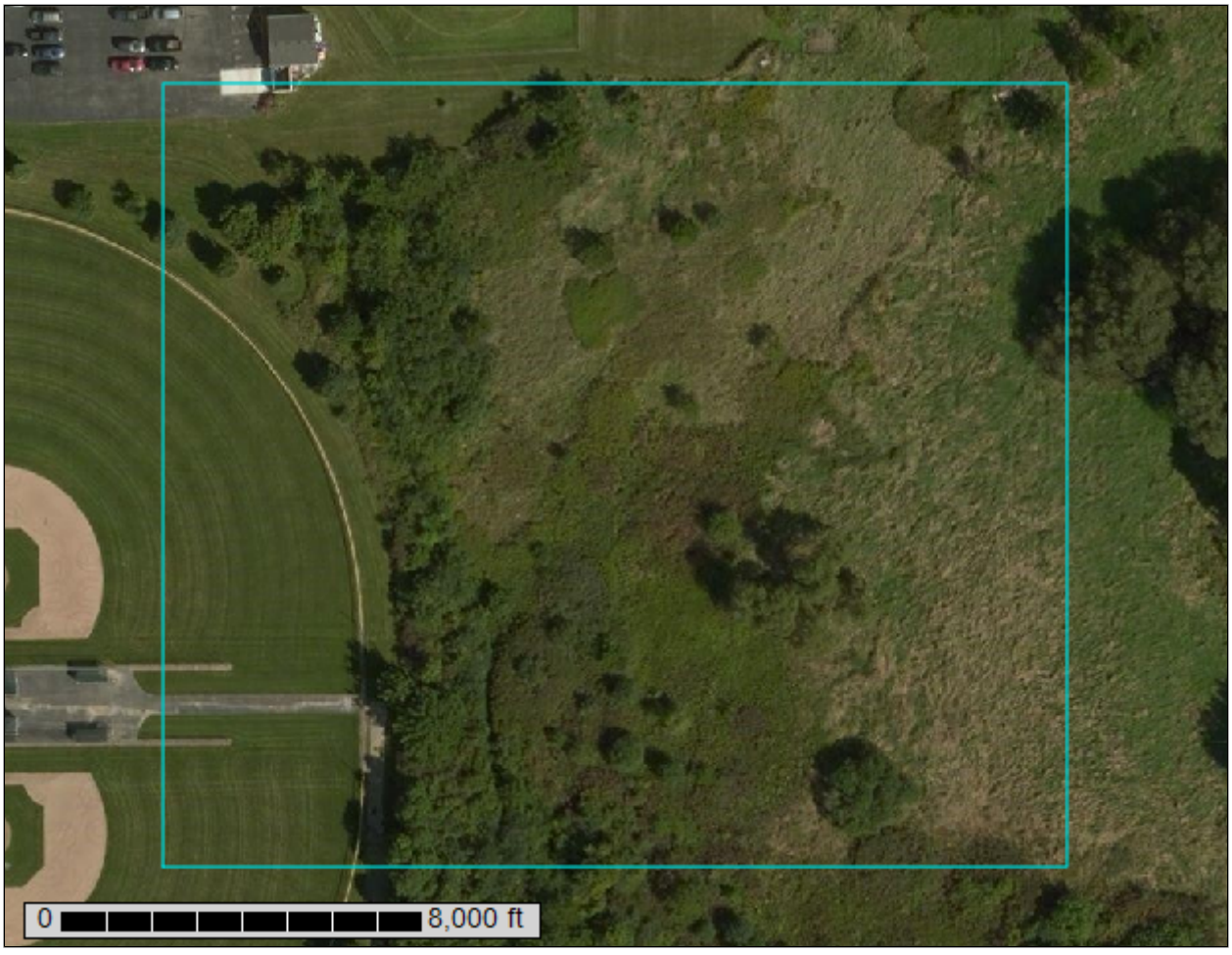
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

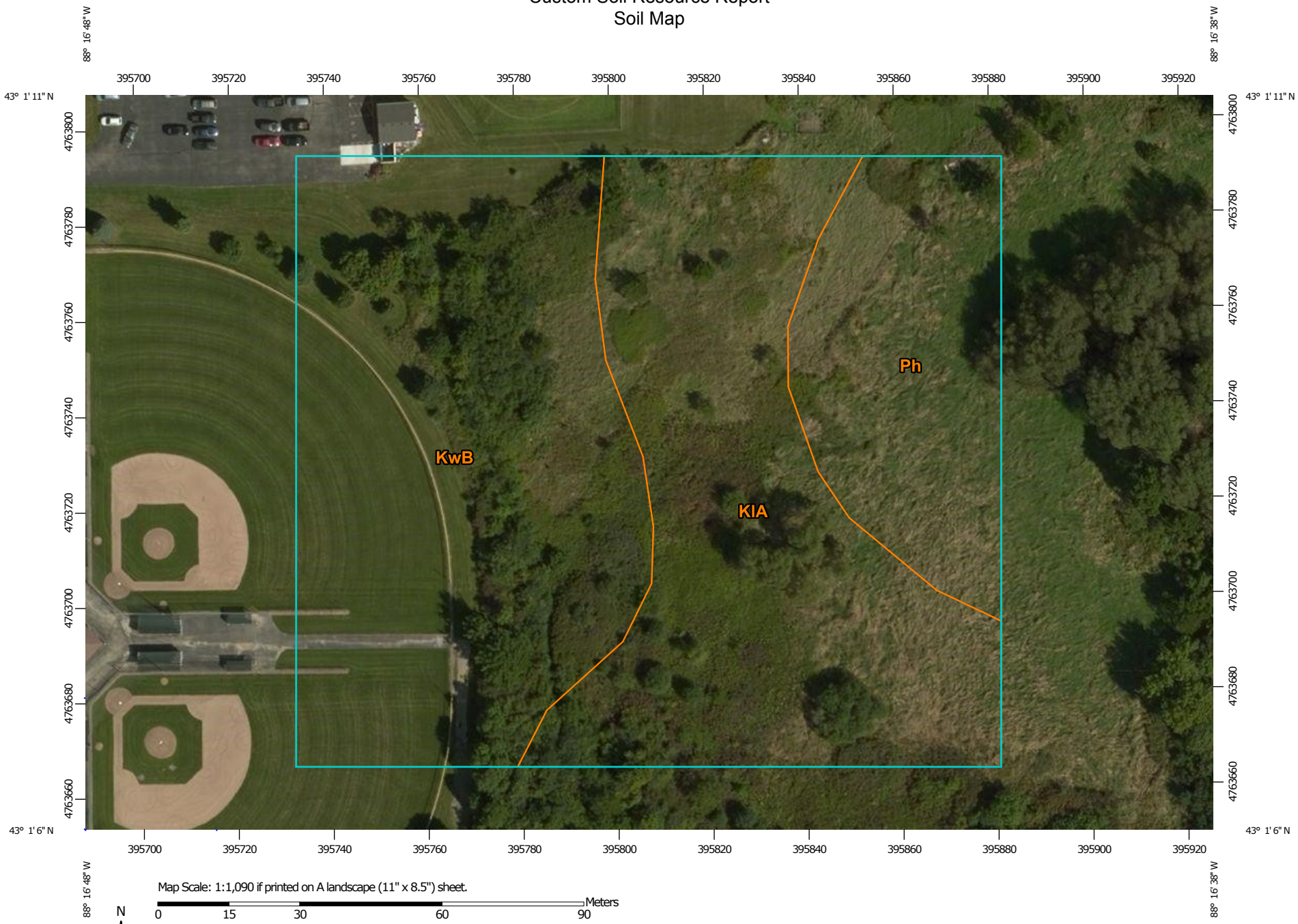
Custom Soil Resource Report for Milwaukee and Waukesha Counties, Wisconsin

Christ the Life Evangelical / ML53108-I



July 1, 2015

Custom Soil Resource Report
Soil Map



Map Scale: 1:1,090 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 15 30 60 90

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Milwaukee and Waukesha Counties, Wisconsin
Survey Area Data: Version 9, Sep 18, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 7, 2014—Sep 22, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Milwaukee and Waukesha Counties, Wisconsin (WI602)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
KlA	Kendall silt loam, 1 to 3 percent slopes	1.8	37.7%
KwB	Knowles silt loam, 2 to 6 percent slopes	2.1	44.5%
Ph	Pella silt loam, 0 to 2 percent slopes	0.8	17.9%
Totals for Area of Interest		**4.7**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments

Milwaukee and Waukesha Counties, Wisconsin

KlA—Kendall silt loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: g94h
Elevation: 670 to 1,100 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 37 to 55 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kendall and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kendall

Setting

Landform: Ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Loess over calcareous loamy till

Typical profile

Ap,BE - 0 to 15 inches: silt loam
Bt1,Bt2 - 15 to 39 inches: silty clay loam
2BC,2C - 39 to 60 inches: stratified sandy loam to silt loam

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 36 inches
Frequency of flooding: None
Frequency of ponding: Rare
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: High (about 11.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 1
Hydrologic Soil Group: C
Other vegetative classification: High AWC, high water table (G095BY007WI)

Minor Components

Pella soils

Percent of map unit:
Landform: Depressions

KwB—Knowles silt loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: g94m
Elevation: 670 to 1,100 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 37 to 55 degrees F
Frost-free period: 135 to 170 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Knowles and similar soils: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Knowles

Setting

Landform: Ground moraines
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope
Parent material: Loess over loamy till over dolomite

Typical profile

A,E - 0 to 7 inches: silt loam
BE - 7 to 11 inches: silty clay loam
2Bt1-2,2CB - 11 to 27 inches: clay loam
3R - 27 to 31 inches: bedrock

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to high (0.00 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent
Available water storage in profile: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Other vegetative classification: Mod AWC, adequately drained (G095BY005WI)

Ph—Pella silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2t044
Elevation: 590 to 1,240 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 37 to 55 degrees F
Frost-free period: 124 to 178 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Pella and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pella

Setting

Landform: Ground moraines, depressions, drainageways
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Silty glaciofluvial deposits over calcareous lacustrine deposits and/or calcareous loamy till

Typical profile

Ap - 0 to 11 inches: silt loam
Bg - 11 to 38 inches: silty clay loam
2Cg - 38 to 79 inches: stratified loamy sand to silty clay loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very high (about 12.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D

Minor Components

Kendall

Percent of map unit: 7 percent
Landform: Drainageways
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear

Lamartine

Percent of map unit: 6 percent
Landform: Drainageways on drumlins, depressions on ground moraines
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Linear, concave

Palms, muck

Percent of map unit: 2 percent
Landform: Depressions on interdrumlins
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave

Reset Form | Print Form

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: WI-Waukesha-Summit City/County: Waukesha/Waukesha County Sampling Date: July 29, 2015

Applicant/Owner: Cellusite State: WI Sampling Point: S-1

Investigator(s): Alaina McDavid Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): None

Slope (%): 0 Lat: 43-01-08.65 Long: -88-16-44.01 Datum: NAD83

Soil Map Unit Name: Knowles silt loam NWI or WWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 7' x 7')			
1. *Panicum virgatum*	70	Y	FAC
2. *Cirsium arvense*	30	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	70	x 3 =	210
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	100 (A)		330 (B)

Prevalence Index = B/A = 3.30

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: S-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					silty loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reset Form | Print Form

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: WI-Waukesha-Summit City/County: Waukesha/Waukesha County Sampling Date: July 29, 2015

Applicant/Owner: Cellusite State: WI Sampling Point: S-2

Investigator(s): Alaina McDavid Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): None

Slope (%): 0 Lat: 43-01-08.71 Long: -88-16-43.51 Datum: NAD83

Soil Map Unit Name: Knowles silt loam NWI or WWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 7' x 7')			
1. *Solidago sp.*	80	Y	FACU
2. *Geum sp.*	10	N	FACW
3. *Dipsacus laciniatus*	10	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	0	x 3 =	0
FACU species	90	x 4 =	360
UPL species	0	x 5 =	0
Column Totals:	100 (A)		380 (B)

Prevalence Index = B/A = 3.80

Hydrophytic Vegetation Indicators:

- Dominance Test is >50%
- Prevalence Index is ≤3.0[1]
- Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: S-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					silty loam	
4-8	10YR 4/2	100					silty loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reset Form | Print Form

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: WI-Waukesha-Summit City/County: Waukesha/Waukesha County Sampling Date: July 29, 2015

Applicant/Owner: Cellusite State: WI Sampling Point: S-3

Investigator(s): Alaina McDavid Section, Township, Range:

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): None

Slope (%): 0 Lat: 43-01-08.67 Long: -88-16-43.15 Datum: NAD83

Soil Map Unit Name: Knowles silt loam NWI or WWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 7' x 7')			
1. *Solidago sp.*	60	Y	FACU
2. *Dipsacus laciniatus*	20	Y	FACU
3. *Typha latifolia*	10	N	OBL
4. *Geum sp.*	5	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	5	x 2 =	10
FAC species	0	x 3 =	0
FACU species	80	x 4 =	320
UPL species	0	x 5 =	0
Column Totals:	95 (A)		340 (B)

Prevalence Index = B/A = 3.58

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: S-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					silty loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: