

DAVID A. BALL

Please Reply To Bridgeport
E-Mail: dball@cohenandwolf.com

November 8, 2021

Via e-mail and overnight mail

Attorney Melanie Bachman
Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: Docket No. 500 - ARX Wireless Infrastructure, LLC application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a telecommunications facility located at 1061-1063 Boston Post Road, Milford, Connecticut – ARX Development and Management Plan

Dear Attorney Bachman:

On behalf of ARX Wireless Infrastructure, LLC (“ARX”), I’ve enclosed an original and fifteen (15) copies of ARX’s Development and Management Plan pertaining to the telecommunications facility approved by the Connecticut Siting Council (“Council”) in the above-captioned docket (the “D&M Plan”). ARX submits this D&M Plan in accordance with the Council’s Decision and Order dated September 23, 2021 (“Decision”).

Development and Management Plan

Pursuant to Order Number 1, the telecommunications facility to be located at 1061-1063 Boston Post Road, Milford, Connecticut (“Facility”) includes a monopole at a height of 115 feet above ground level (“AGL”). The monopole will accommodate the antennas of Cellco Partnership

d/b/a Verizon Wireless (“Verizon”), New Cingular Wireless PCS, LLC d/b/a AT&T (“AT&T”), and other co-locators, both public and private. Verizon’s antennas will be located at a centerline height of 112 feet AGL. AT&T’s antennas will be located at a centerline height of 100 feet AGL.

Pursuant to Order Number 2, ARX has prepared a D&M Plan in accordance with the Decision and applicable Regulations.

The proposed D&M Plan includes:

- a) Pursuant to Condition 2(a) of the Order, ARX has provided certified letters from Verizon and AT&T with firm commitments to install and operate their wireless equipment on the facility approved in Docket No. 500 after completion of construction.
- b) Pursuant to Condition 2(b) of the Order, ARX has provided final site plans for the development of the facility that employ the governing standard in the State of Connecticut for tower design in accordance with the 2015 International Building Code Design Standard ANSI/TIA-222-G-2, and include specifications for the tower, tower foundation, antennas, equipment compound and chain link fence design, ground equipment, access installation and emergency backup power.
- c) Pursuant to Condition 2(c) of the Order, ARX has provided the enclosed Tapp Tower Drawings providing a tower and foundation design that incorporates a yield point to ensure that the tower setback radius remains within the boundaries of the subject property.
- d) Pursuant to Condition 2(d) of the Order, ARX has provided construction plans for site clearing, grading, water drainage and stormwater control, and erosion and sedimentation controls consistent with the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*, as amended, and has also provided a Geotechnical Study dated October 4, 2021 prepared by Welte Geotechnical, P.C.
- e) Pursuant to Condition 2(e) of the Order, ARX has provided “Rare Species Protection Measures” which include DEEP-recommended construction practices to reduce potential impact to turtle populations, in particular the Eastern Box Turtle. These protective measures include provisions relating to construction work/activities between April 1 and October 30, the turtle’s active period.

- f) Pursuant to Condition 2(f) of the Order, ARX has provided plans demonstrating the feasibility of a natural gas connection for the emergency backup generators, and a cost comparison between natural-gas fueled and diesel-fueled emergency backup generation.
- g) Pursuant to Condition 2(g) of the Order, ARX has provided a proposed construction schedule. Construction will occur Mondays through Fridays, 7:30 a.m. to 6:00 p.m. ARX will coordinate with the City of Milford, as necessary.

Pursuant to Order Number 3, prior to commencement of operation, ARX will provide the Council with worst-case modeling of electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base.

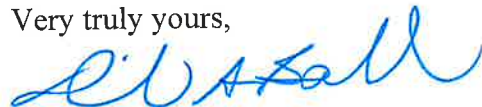
Conclusion

ARX respectfully requests that this matter be included on the Council's next agenda for review and approval.

As indicated below, a copy of this D&M submittal has been provided to the service list and the City of Milford.

Please contact me if you have any questions.

Very truly yours,



David A. Ball

Enclosures

cc: Service List



October 31, 2021

Ms. Melanie Bachman,
Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

**Re: DOCKET NO. 500 – ARX Wireless Infrastructure, LLC application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility located a 1061-1063 Boston Post Rd Milford, Connecticut.
*Certification Letter***

Dear Attorney Bachman:

In accordance with condition 2a of the Siting Council's Decision and Order ("D&O") in Docket No. 500, this letter serves as AT&T's commitment to install and operate its wireless facility on the approved monopole facility upon completion of construction by ARX Wireless Infrastructure, LLC. AT&T anticipated that this Milford facility will be operational within the eighteen-month timeframe included in the D&O.

Thank you for your consideration of this information.

Very truly yours,

Brian
Leyden
Digitally signed by
Brian Leyden
Date: 2021.11.01
10:53:30 -04'00'

Brian Leyden
Sr. Manager, Real Estate & Construction
AT&T Mobility New England

AT&T Mobility New England
84 Deerfield Lane
Meriden CT 06450



October 31, 2021

Ms. Melanie Bachman,
Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: DOCKET NO. 500 – ARX Wireless Infrastructure, LLC application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility located a 1061-1063 Boston Post Rd Milford, Connecticut. *Certification Letter*

Dear Attorney Bachman:

Pursuant to a Lease Agreement, which is yet to be signed between ARX Wireless Infrastructure, LLC and Cellco Partnership d/b/a Verizon Wireless, Verizon will install its equipment once the tower is tenant ready.

A handwritten signature in black ink, appearing to read "Anthony R. Befera", written over a horizontal line.

Anthony R. Befera
Principal Engineer – Real Estate/Regulatory

verizon[✓]
508-330-6678

anthony.befera@verizonwireless.com



Project
MILFORD
1063 BOSTON POST ROAD
MILFORD CT 06460

Prepared For:
ARX WIRELESS
110 Washington Avenue
Fourth Floor
North Haven, CT 06473

Project No.: 2021.10
DOUGLAS J. ROBERTS - ARCHITECT
110 Washington Avenue
Fourth Floor
North Haven, CT 06473
Tel: 203.234.6348
www.djroberts.com



Douglas J. Roberts
Professional Engineer
No. 12874
Civil Engineering
State of Connecticut
110 Washington Avenue
Fourth Floor
North Haven, CT 06473
Tel: 203.234.6348
www.djroberts.com

DEVELOPMENT AND MANAGEMENT



WIRELESS COMMUNICATIONS FACILITY
DOCKET NUMBER 500
CT0030 MILFORD
1063 BOSTON POST ROAD
MILFORD, CONNECTICUT



VICINITY MAP



CODE REFERENCES

- 2018 Connecticut State Building Code
- 2015 International Building Code
- 2015 International Plumbing Code
- 2015 International Residential Code
- 2015 International Energy Conservation Code
- National Electrical Code (NECA 70)
- 2009 ICC A117.1 Accessible and Usable Buildings & Facilities

PROJECT SUMMARY

PROJECT NAME: CT0030 MILFORD
SITE ADDRESS: 1063 BOSTON POST ROAD
MILFORD, CT 06460
PARCEL ID: 077 613 25
ARX WIRELESS CONTACT: KEITH COPPINS
1063 BOSTON POST ROAD
FOURTH FLOOR
NORTH HAVEN, CT 06473
203.623.3267
LEGAL/REGULATORY COUNSEL: COHEN AND WOLF, P.C.
1115 BROAD STREET
BRIARCLIFF, CT 06604
203.597.4134
LAND LORD CONTACT: LEE PARTNERS LLP
1000 MAIN STREET
NEW HAVEN, CT 06511-4827

ARCHITECT:

DOUGLAS J. ROBERTS - ARCHITECT
110 WASHINGTON AVENUE
FOURTH FLOOR
NORTH HAVEN, CT 06473

SURVEYOR:

WESTON & SAMPSON
SUITE 103
ROCKY HILL, CT 06867
N 41° - 13' - 54.32"
W 73° - 02' - 34.55"

LATITUDE

W 73° - 02' - 34.55"

LONGITUDE

33° - 0' - *'- AMSL

GRADE (PROPOSED)

SHEET NUMBER	SHEET NAME	CURRENT REVISION	CURRENT REVISION DATE
T-001	TITLE SHEET		
GA-101	GENERAL NOTES		
C-102	SITE PLAN		
C-103	COMPOUND PLAN AND COMPOUND ISOMETRIC VIEW		
C-104	EAST ELEVATION		
C-105	SITE DETAILS		
A-101	EROSION CONTROL NOTES AND DETAILS		
A-102	VEHICULAR EQUIPMENT AND DETAILS AT&T EQUIPMENT AND DETAILS		

SCOPE OF WORK

- ARX WIRELESS IS PROPOSING TO INSTALL THE FOLLOWING IMPROVEMENTS ON PROPOSED TELECOMMUNICATION SITE:
- 6' X 8' FENCED COMPOUND WITH A 7' X 7' LEASE AREA.
 - 15' MONOPOLE EXPANDABLE TO 40' DESIGNED FOR FOUR CARRIER PLATFORMS WITH ANTENNAS
 - POWER AND TELCO SERVICES WILL BE ROUTED UNDERGROUND FROM EXISTING UTILITY POLE ON HOME ACRES AVENUE TO PROPOSED ELECTRICAL METER AND UTILITY BOX ON PROPOSED 1/4 ACRE.
 - EXISTING UTILITY POLES TO BE REMOVED UNDERGROUND FROM THE EXISTING GAS LINE WITHIN HOME ACRES AVENUE TO NATURAL GAS METER CENTER AT CORNER.
- VERIZON IS PROPOSING TO INSTALL THE FOLLOWING EQUIPMENT
- RADIO EQUIPMENT CABINET AND 25 KW NATURAL GAS GENERATOR ON A CONCRETE PAD
 - THREE (3) ANTENNAS PER SECTOR FOR A TOTAL OF NINE (9) ANTENNAS, SIX (6) COAXIAL CABLES, TWO (2) HYBRID CABLES, ONE (1) OVER BOX, NINE (9) REMOTE RADIO HEADS
- AT&T IS PROPOSING TO INSTALL THE FOLLOWING EQUIPMENT
- WALK IN CABINET (6'0" X 6'4") AND 15 KW NATURAL GAS GENERATOR ON A CONCRETE PAD
 - TWO (2) ANTENNAS PER SECTOR FOR A TOTAL OF SIX (6) ANTENNAS, TWO (2) HYBRID CABLES, THREE (3) LIQUID SURGE ARRESTOR (FIFTEEN (15) REMOTE RADIO HEADS

TITLE SHEET

Drawn By: Zachary J. Roberts
Reviewed By: [Name]
Project No: 2021.10
Scale: [Scale]

Sheet Title: [Title]
Client: [Client Name]
Project: [Project Name]
Date: [Date]

T - 001



Project
MILFORD
1023 BOSTON POST ROAD
MILFORD, CT 06460

Prepared For:
ARX WIRELESS
110 Washington Avenue
Fourth Floor
North Haven, CT 06473

Project No.: 2021.10

DOUGLAS J. ROBERTS - ARCHITECT
318 Main Avenue
Fourth Floor
North Haven, CT 06473
Tel: 937.234.6288
Email: droberts@arxwireless.com



Douglas
J Roberts
Architect
Professional Seal No. 012021151

Key Plan

REVISION SCHEDULE

NO.	DATE	DESCRIPTION	BY

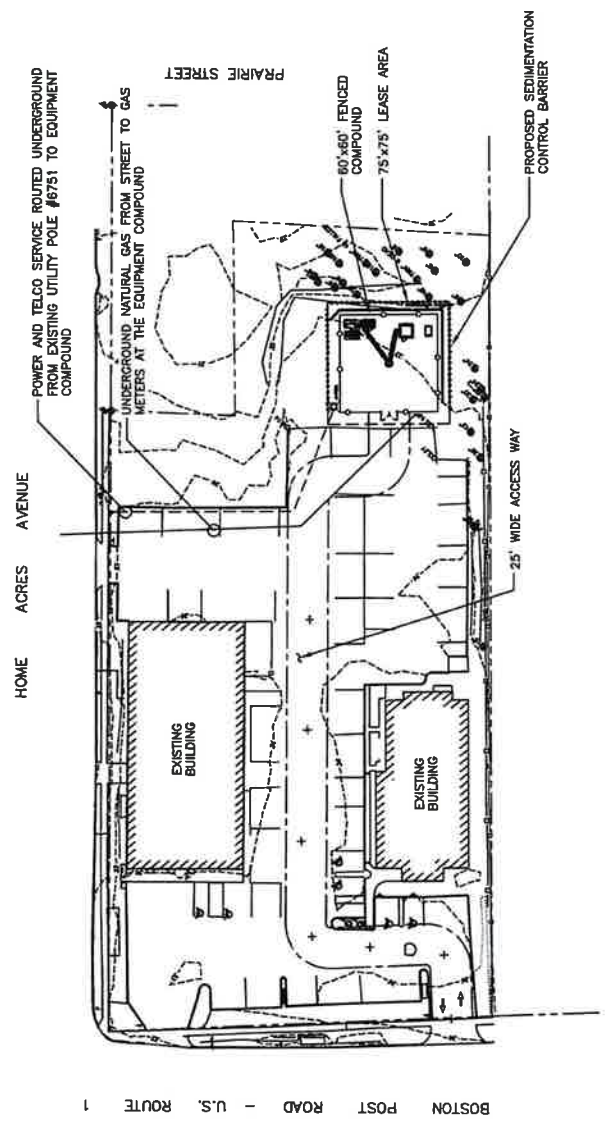
Drawn By: Anthony J. Roberts
Checked By: Douglas J. Roberts
Reviewed By: Michael Stone
Project No.: 2021.10
Scale:

Sheet Title
SITE PLAN

Date of Issue: 04/29/21
Drawing Number: 010101
Sheet Number: Revision

C - 101

DEVELOPMENT AND MANAGEMENT



1
C-1

SITE PLAN
22x34 SCALE: 1"=40'-0"
11x17 SCALE: 1"=80'-0"



DEVELOPMENT AND MANAGEMENT



Project: **MILFORD**
 1895 BROWN POST ROAD
 MILFORD CT 06460

Prepared For: **ARX WIRELESS**
 16 Newington Avenue
 South Plainfield, NJ 07080
 North Haven, CT 06473

Project No.: 202110
DOUGLAS J. ROBERTS - ARCHITECT
 16 Newington Avenue
 South Plainfield, NJ 07080
 North Haven, CT 06473
 Tel: 203 234-8368
 Email: d.roberts - architect@outlook.com



Douglas J Roberts
 Key Plan

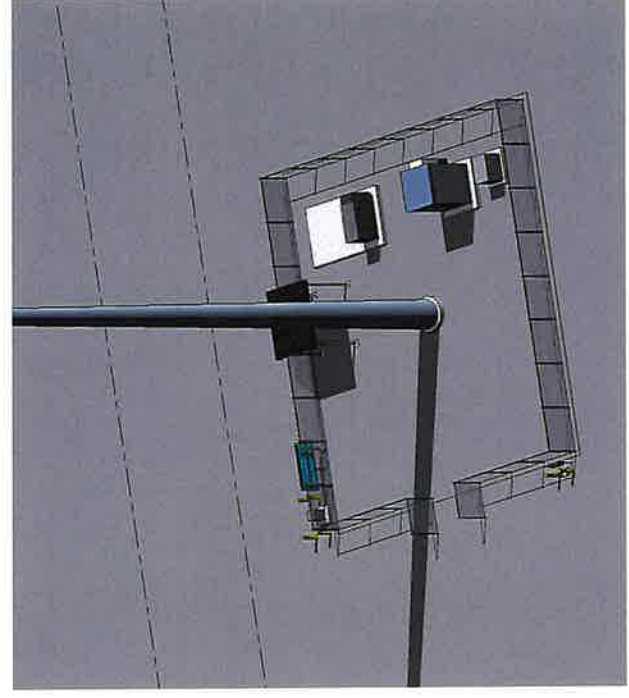
The user of this drawing is advised that the design is based on the information furnished by the owner and the user of this drawing shall be responsible for its use.

SECTION	DESCRIPTION	DATE

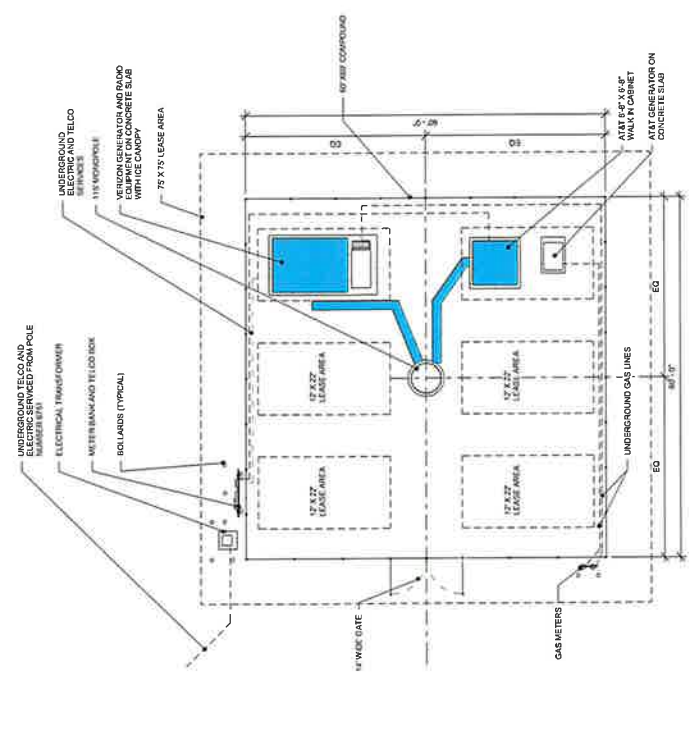
Drawn By: Zachary J. Roberts
 Checked By: Douglas J. Roberts
 Project No.: 202110
 Scale: 1" = 10'-0"

COMPOUND PLAN AND COMPOUND AND COMPOUND ISOMETRIC VIEW

C - 102



1. COMPOUND ISOMETRIC VIEW



2. COMPOUND PLAN VIEW

DEVELOPMENT AND MANAGEMENT



Project:
MILFORD
1065 BOSTON POST ROAD
MILFORD CT 06460

Prepared For:
ARX WIRELESS
Four Kings Avenue
North Haven, CT 06473

Project No.: 2021 10
DOUGLAS J. ROBERTS - ARCHITECT
100 Kings Avenue
Fourth Floor
North Haven, CT 06473
Tel: 303.224.6346
E-mail: djaroberts@architecturalgroup.com



Douglas
J Roberts
Architect

Key Plan

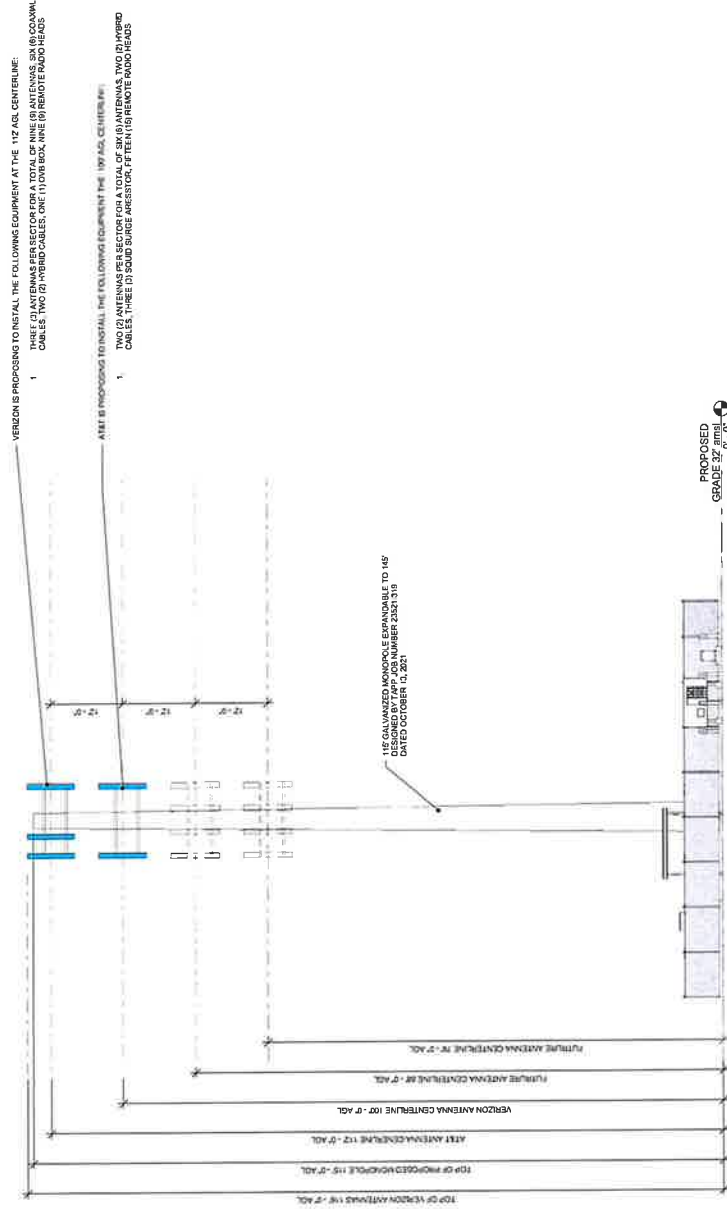
Drawn by: Zachary J. Roberts
Drawing Date: OCT. 26, 2021
Checked by: Douglas J. Roberts
Project No.: 2021 10
Scale: 1" = 10'-0"

REVISION	DESCRIPTION	DATE

Street Title
EAST ELEVATION

Overall dimensions: Aerial ID
Sheet Number: Revision:

C - 103





Project
MILFORD
1083 BOSTON POST ROAD
MILFORD CT 06460

Prepared For
ARX WIRELESS
1083 Washington Avenue
Fourth Floor
North Haven, CT 06473

Project No: 2021.10
Douglas J. Roberts - ARCHITECT
111 Washington Avenue
Fourth Floor
North Haven, CT 06473
Tel: 203.234.6588
Email: jroberts@architect.com



Douglas
J. Roberts
Key Plans

Drawing By: Zachary J. Roberts
Drawing Date: OCT. 26, 2021
Drawing Title: Erosion Control
Project No: 2021.10
Scale: As Indicated

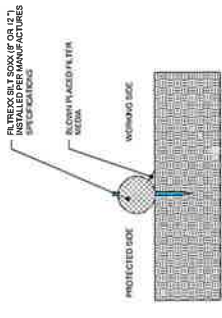
REVISION	DESCRIPTION	DATE

Drawing Title
EROSION CONTROL NOTES AND DETAILS

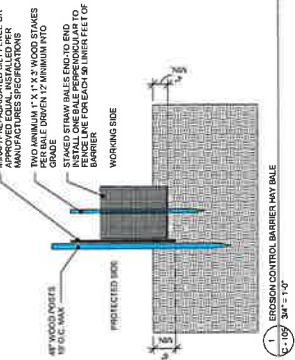
Sheet Number: C-105
Revision:

GENERAL CONSTRUCTION SEQUENCE

- THIS IS A GENERAL CONSTRUCTION SEQUENCE OUTLINING SOME ITEMS OF WHICH MAY NOT APPLY TO THIS SITE
- 1 CLEAR AND GRUB AREAS OF PROPOSED CONSTRUCTION AS REQUIRED
 - 2 INSTALL TEMPORARY SEDIMENTATION AND EROSION CONTROL MEASURES AS REQUIRED
 - 3 REMOVE AND STOCKPILE TOPSOIL TO LOCATION AS SHOWN ON THE DRAWING. STOCKPILE SHALL BE SEGGED TO PREVENT EROSION
 - 4 CONSTRUCT CLOSED DRAINAGE SYSTEM, PROTECT CULVERT INLETS AND CATCH BASINS WITH SEDIMENTATION BARRIERS



- SILT SOXX NOTES**
- 1 USE SILT SOXX WHERE CONDITIONS DO NOT ALLOW STAKES TO BE DRIVEN
 - 2 STRAW BALES TO BE TIED WITH BIODEGRADABLE TWINE
 - 3 SILT SOXX FILL TO MEET FILTER SPECIFICATIONS AND APPLICATION REQUIREMENTS
 - 4 SILT SOXX COMPOSE MATERIAL TO BE DISPERSED ON SITE OR AS DETERMINED BY THE ARCHITECT



- EROSION CONTROL MEASURE NOTES**
- 1 DISTURBED AREAS SHALL BE KEPT TO THE MINIMUM AREA NECESSARY TO CONDUCT THE ROADWAYS AND ASSOCIATED DRAINAGE FACILITIES.
 - 2 HAY BALE BARRIERS AND SEDIMENT TRAPS SHALL BE INSTALLED AS SHOWN ON THE DRAWING AND MAINTAINED UNTIL CLEARED UNTIL ALL SLOPES HAVE A HEALTHY STAND OF GRASS.
 - 3 RAIED HAY AND HULCH SHALL BE MOWINGS OF ACCEPTABLE HERACIOUS GROWTH, FREE FROM NOXIOUS WEEDS OR WOODY STEMS, AND SHALL BE DRY. NO SALT THAT SHALL BE USED.
 - 4 FILL MATERIAL SHALL BE FREE FROM STUMPS, WOOD, ROOTS, ETC.
 - 5 STOCKPILED MATERIALS SHALL BE PLACED ONLY IN AREAS SHOWN ON THE DRAWING. STOCKPILES SHALL BE SEGGED TO PREVENT EROSION AND SEEGED TO PREVENT EROSION. THESE MEASURES SHALL REMAIN UNTIL ALL MATERIAL HAS BEEN PLACED OR DISPOSED OFF SITE.
 - 6 ALL DISTURBED AREAS SHALL BE LOAMED AND SEEGED. A MINIMUM APPLICATION RATE SHALL BE NOT LESS THAN ONE POUND OF SEED PER 10 SQUARE YARDS OF AREA.
 - 7 APPLICATION OF GRASS SEED, FERTILIZERS AND MULCH SHALL BE ACCOMPLISHED BY BROADCAST SEEDING OR HYDROSEEDING AT THE RATES OUTLINED.
 - 8 AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED THE TEMPORARY EROSION CONTROL MEASURES ARE TO BE REMOVED.
 - 9 PAVED ROADWAYS MUST BE KEPT CLEAN AT ALL TIMES.
 - 10 ALL CATCH BASIN INLETS WILL BE PROTECTED WITH LOW POINT SEDIMENTATION BARRIERS.
 - 11 ALL STORM DRAINAGE OUTLETS WILL BE STABILIZE AND CLEARED AS REQUIRED, BEFORE THE DISCHARGE POINTS BECOME OPERATIONAL.
 - 12 ALL DRAINAGE OPERATIONS MUST DISCHARGE DIRECTLY INTO A SEDIMENT FILTER AREA.
 - 13 NO DISCHARGE SHALL BE DIRECTED TOWARDS ANY PROPOSED DITCHES, SWALES, OR PONDS UNTIL THEY HAVE BEEN PROPERLY STABILIZED.



Project
MILFORD
 1083 BOSTON POST ROAD
 MILFORD CT 06460

Prepared For:
ARX WIRELESS
 110 Washington Avenue
 Fourth Floor
 North Haven, CT 06474

Project No.: 2021.10

DOUGLAS J. ROBERTS - ARCHITECT
 110 Washington Avenue
 Fourth Floor
 North Haven, CT 06474
 Tel: 203.234.6388
 Email: d.roberts@arxwireless.com



Douglas J. Roberts
 Registered Professional Engineer
 No. 12345, State of Connecticut
 May 19th, 2011

NO.	DESCRIPTION	DATE
1	ISSUED FOR PERMIT	12/15/2021
2	REVISION SCHEDULE	01/20/2022
3	REVISED FOR PERMIT	02/01/2022
4	REVISED FOR PERMIT	02/01/2022
5	REVISED FOR PERMIT	02/01/2022
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49	REVISED FOR PERMIT	02/01/2022
50	REVISED FOR PERMIT	02/01/2022

Drawn By: Zolinda J. Roberts
 Checked By: Douglas J. Roberts
 Project No.: 2021.10
 Scale: As Indicated

**VERIZON
 EQUIPMENT AND
 DETAILS**

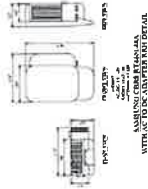
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 Project No.: 2021.10
 Date: 01/20/2022

A - 101

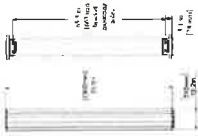
DEVELOPMENT AND MANAGEMENT



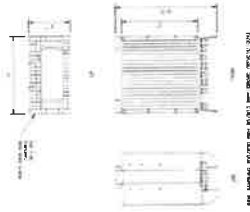
VERIZON - OVP BOX RCHDC-6627-PF-48				
MODEL NUMBER	WIDTH	DEPTH	HEIGHT	WEIGHT
OVP BOX RCHDC-6627-PF-48	21"	18"	33"	45.13 LBS



VERIZON - SAMSUNG CBRS RRH - RT4401-48A				
MODEL NUMBER	WIDTH	DEPTH	HEIGHT	WEIGHT
SAMSUNG CBRS RRH - RT4401-48A	11.4"	5.5"	16.2"	28.66 LBS



VERIZON - JMA MX10FT665				
MODEL NUMBER	WIDTH	DEPTH	HEIGHT	WEIGHT
JMA MX10FT665	32.3"	7.5"	31.3"	52.4 LBS



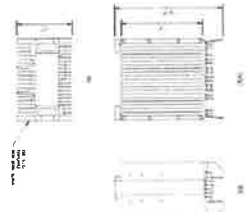
VERIZON - SAMSUNG/RRH BS B13 RRH-BR04C				
MODEL NUMBER	WIDTH	DEPTH	HEIGHT	WEIGHT
SAMSUNG/RRH BS B13 RRH-BR04C	13"	8.1"	19.73"	82 LBS



VERIZON RADIO CABINET SPECIFICATIONS				
MODEL NUMBER	WIDTH	DEPTH	HEIGHT	WEIGHT
RRH EQUIPMENT CABINET	32"	33.4"	85.2"	1,955 LBS



VERIZON - JMA MX06FT665-02				
MODEL NUMBER	WIDTH	DEPTH	HEIGHT	WEIGHT
JMA MX06FT665-02	12.2"	10.3"	71.3"	51 LBS



VERIZON - SAMSUNG RRH B2/66A RRH-BR049				
MODEL NUMBER	WIDTH	DEPTH	HEIGHT	WEIGHT
SAMSUNG RRH B2/66A RRH-BR049	10"	10"	19.73"	98 LBS



VERIZON GENERATOR SPECIFICATIONS				
MODEL NUMBER	LENGTH	WIDTH	HEIGHT	WEIGHT
Q1035A - 35kW	77"	34"	48"	1,114 LBS

Michael F. Plahovinsak, P.E.

18301 State Route 161, Plain City, Ohio 43064

(614) 398-6250 - mike@mfpeng.com

November 3, 2021

ARX

Re: Proposed 115-ft Monopole
Located in New Haven Co., CT: CT0030 Milford
MFP Project #: 23521-319 / TAPP Project Number: TP-20260

I understand that there may be some concern on the part of local building officials regarding the potential for failure of the proposed communication monopole. Communication structures are designed in accordance with the Telecommunications Industry Association ANSI/TIA-222-G, "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures". This Structure is to be fabricated by TransAmerican Power Products

I have designed this monopole to withstand a 3-sec. gusted wind speed of 112 mph as recommended by ANSI/TIA-222-G for New Haven Co., CT. The design also conforms to the requirements of the 2016 Connecticut Building Code for an equivalent ultimate wind speed of 145 mph (Vult).

This monopole has been designed to accommodate a theoretical fall radius. The upper 61' of the pole has been designed to meet the wind loads of the design, however, the lower portion of the pole has been designed with a minimum 10% extra capacity. Assuming the pole has been fabricated according to my design, and well maintained, in the event of a failure due to extreme wind and comparable appurtenance antenna load (winds in excess of the design wind load), it would yield/buckle at the 54' elevation. The yielded section would result in a maximum 61' fall radius, but would most likely remain connected and hang from the standing section.

The structure has been designed with all of the applicable factors as required by the code. A properly designed, constructed and maintained pole has never collapsed; monopoles are safe structures with a long history of reliable operation.

I hope this review of the monopole design has given you a greater degree of comfort regarding the design capacity inherent in pole structures. If you have any additional questions please call me at 614-398-6250 or email mike@mfpeng.com.

Sincerely,

Michael F. Plahovinsak, P.E.



Michael F. Plahovinsak, P.E.
Sole Proprietor - Independent Engineer
P.E. Licensed in 48 Jurisdictions

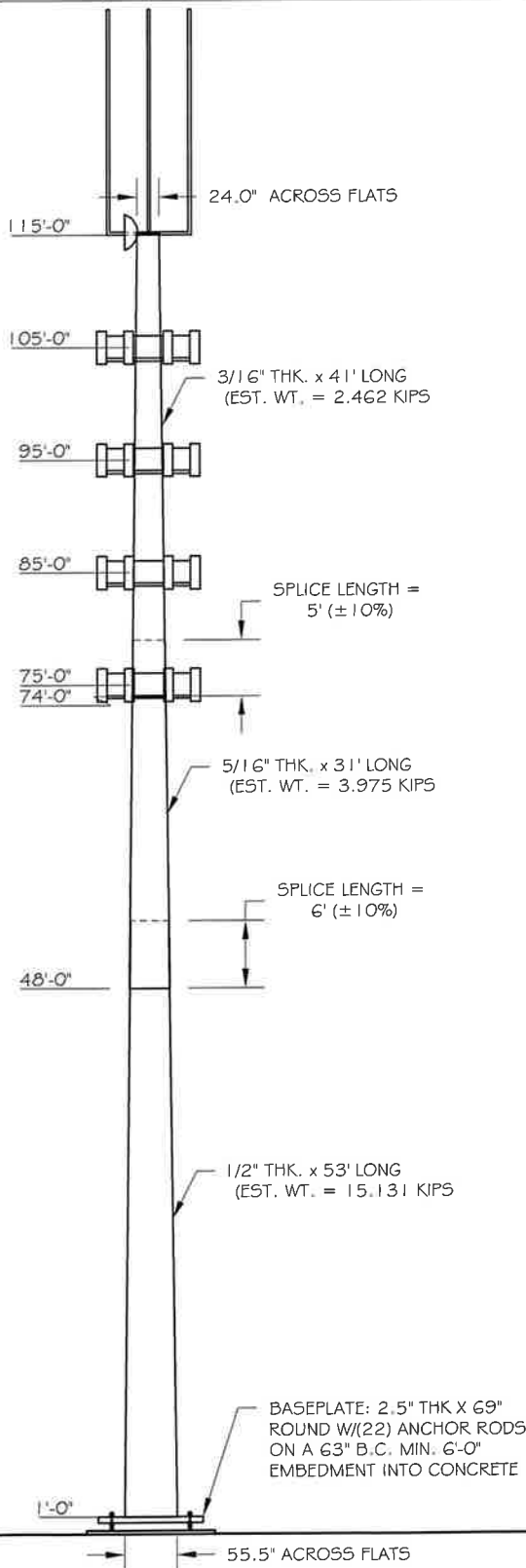




TAPP

2427 Kelly Lane
Houston, Texas 77066
281-444-8277

QUALITY STEEL POLES. DELIVERED.



Page 1 of 2	Job Number: 23521-319
Eng: MFP	Customer Ref: TP-20260
	Date: 11/3/2021
Structure: 115-FT MONOPOLE	
Site: CTO030 MILFORD	
Location: NEW HAVEN CO., CT / 41°13'54.32", -73°2'34.55"	
Owner: ARX	
Revision No.: Revision Date:	

DESIGN

Building Code: 2016 CONNECTICUT BUILDING CODE			
Design Standard: ANSI/TIA-222-G			
Wind Speed Load Cases: ASCE-7-05 CONVERTED TO ASCE-7-10			
Load Case #1: 112 MPH Design Wind Speed - V_{ASD} (V_{UL} = 145 MPH)			
Load Case #2: 50 MPH Wind with 0.75" Ice Accumulation			
Load Case #3: 60 MPH Service Wind Speed			
Structure Class Risk Category: III	Exposure Cat.: C	Topography Cat.: I	Crest Height

STRUCTURE MEETS THE MINIMUM REQUIREMENTS OF TIA-222-H

EQUIPMENT LIST

Elev.	Description
125	(3) 20-FT x Ø3" WHIP ANTENNA + (1) 2-FT DISH
115	6-FT STAND OFF MOUNTS
105	(12) ANTENNAS + MOUNTING (EPA 120 FT2 / 3,000 LBS)
105	GENERIC ANTENNA MOUNT
95	(12) ANTENNAS + MOUNTING (EPA 120 FT2 / 3,000 LBS)
95	GENERIC ANTENNA MOUNT
85	(12) ANTENNAS + MOUNTING (EPA 120 FT2 / 3,000 LBS)
85	GENERIC ANTENNA MOUNT
75	(12) ANTENNAS + MOUNTING (EPA 120 FT2 / 3,000 LBS)
75	GENERIC ANTENNA MOUNT

ANTENNA FEED LINES ROUTED ON THE INSIDE OF THE POLE
POLE DESIGNED FOR A MAX 61-FT FALL RADIUS

STRUCTURE PROPERTIES

Cross-Section: 18-Sided	Taper: 0.28509 in/ft				
Shaft Steel: ASTM A572 GR 65	Baseplate Steel: ASTM A572 GR 50				
Anchor Rods: 2.25 in. A615 GR. 75 X 7'-0"					
Sect.	Length (ft)	Thickness (in)	Splice (ft)	Top Dia. (in)	Bot Dia. (in)
1	41.00	0.1875	5.00	24.00	35.69
2	31.00	0.3125	6.00	33.89	42.73
3	53.00	0.5000	0.00	40.39	55.50



BASE REACTIONS FOR FOUNDATION DESIGN

Moment: 6778 ft-kip
Shear: 83 kip
Axial: 47 kip

Page 2 of 2	Job Number: 23521-319
Eng: MFP	Customer Ref: TP-20260
	Date: 11/3/2021
Structure: 115-FT MONOPOLE	
Site: CT0030 MILFORD	
Location: NEW HAVEN CO., CT / 41°13'54.32", -73°2'34.55"	
Owner: ARX	
Revision No.:	Revision Date:

FOUNDATION NOTES:

1. ALL FOUNDATION CONCRETE SHALL USE TYPE II CEMENT AND ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 4500 PSI AT 28 DAYS. CONCRETE SHALL HAVE A MAXIMUM WATER/CEMENT RATIO OF 0.45 AND SHALL BE AIR ENTRAINED 6% (± 1.5%). ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH ACI 318, "THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", LATEST EDITION.

2. ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615 VERTICAL BARS SHALL BE GRADE 60, AND TIES OR STIRRUPS SHALL BE A MINIMUM OF GRADE 40. THE PLACEMENT OF ALL REINFORCEMENT SHALL CONFORM TO ACI 315, "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES", LATEST EDITION.

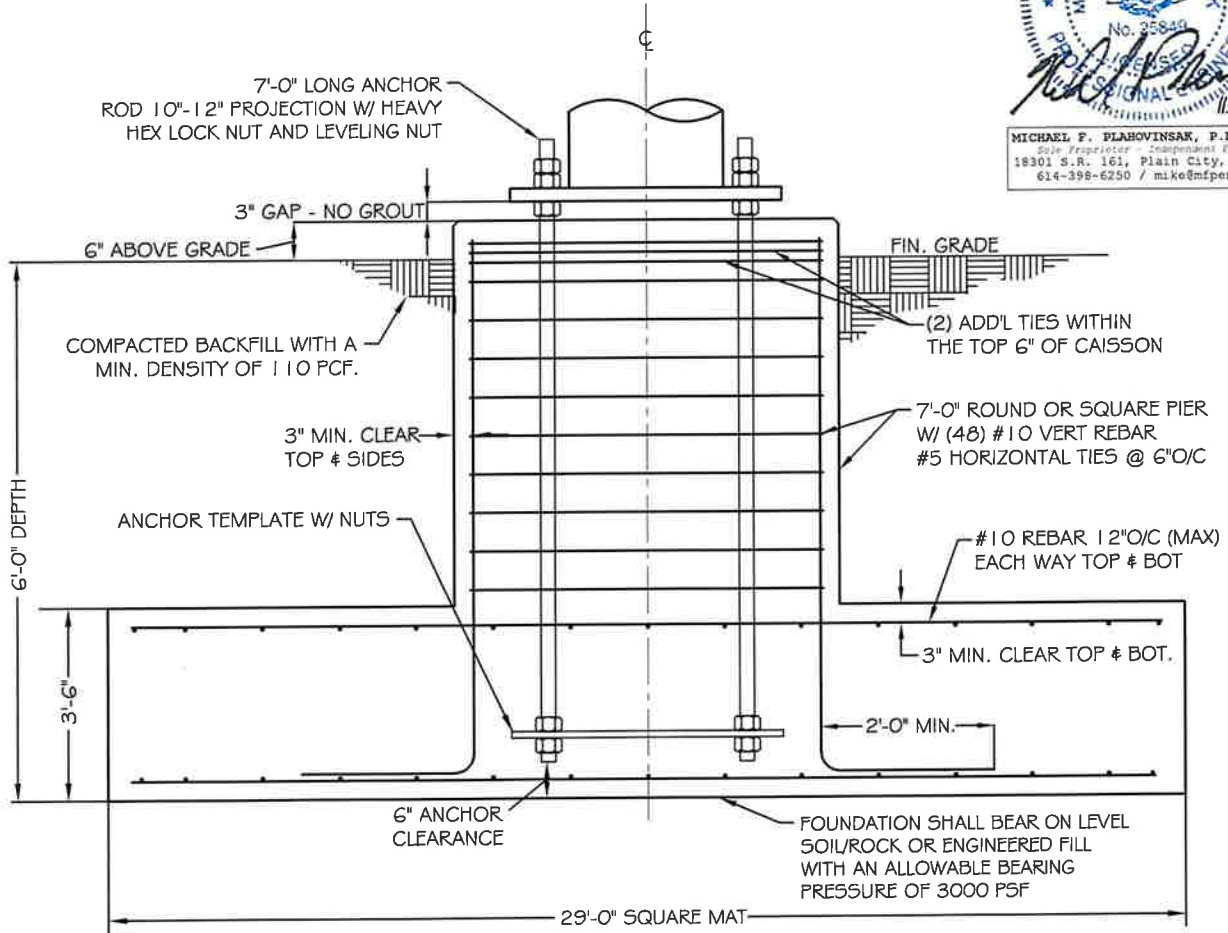
3. THE CONTRACTOR SHALL DETERMINE THE MEANS AND METHODS TO SUPPORT THE EXCAVATION DURING CONSTRUCTION. THE CONTRACTOR SHALL READ THE GEOTECHNICAL REPORT AND SHALL CONSULT THE GEOTECHNICAL ENGINEER AS NECESSARY PRIOR TO CONSTRUCTION.

4. FOUNDATION DESIGN IS BASED ON GEOTECHNICAL REPORT BY:
ENGINEER: WELTI GEOTECHNICAL
REPORT NO.: N/A (DATED 10/4/21)

5. ESTIMATED CONCRETE VOLUME = 114.5 CUBIC YARDS.

6. THE FOUNDATION HAS BEEN DESIGNED TO RESIST THE FOLLOWING FACTORED LOADS:

MOMENT: 6778 FT*KIPS
SHEAR: 83 KIPS
AXIAL: 47 KIPS



SPREAD FOOTING

NOT TO SCALE

tnxTower Michael Plahovinsak, P.E. 18301 State Route 161 Plain City, OH 43064 Phone: 614-398-6250 FAX: mike@mjpeng.com	Job 115-ft Pole - MFP #23521-319 r1	Page 1 of 6
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	Client TP-20260	Designed by JC

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

- Basic wind speed of 112 mph.
- Structure Class III.
- Exposure Category C.
- Topographic Category 1.
- Crest Height 0.00 ft.
- Nominal ice thickness of 0.7500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	115.00-74.00	41.00	5.00	18	24.0000	35.6886	0.1875	0.7500	A572-65 (65 ksi)
L2	74.00-48.00	31.00	6.00	18	33.8882	42.7259	0.3125	1.2500	A572-65 (65 ksi)
L3	48.00-1.00	53.00		18	40.3904	55.5000	0.5000	2.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	I/Q in ²	w in	w/t
L1	24.3413	14.1714	1015.2211	8.4534	12.1920	83.2694	2031.7780	7.0871	3.8940	20.768
	36.2102	21.1276	3364.1157	12.6029	18.1298	185.5572	6732.6580	10.5658	5.9512	31.74
L2	35.8102	33.3029	4743.1624	11.9194	17.2152	275.5220	9492.5659	16.6546	5.4143	17.326
	43.3368	42.0688	9560.9920	15.0567	21.7047	440.5024	19134.5645	21.0384	6.9698	22.303
L3	42.6732	63.3060	12726.7628	14.1611	20.5183	620.2641	25470.2718	31.6590	6.2287	12.457
	56.2790	87.2850	33358.1875	19.5250	28.1940	1183.1662	66760.2686	43.6508	8.8880	17.776

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 115.00-74.00				1	1	1			
L2 74.00-48.00				1	1	1			
L3 48.00-1.00				1	1	1			

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Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
1 5/8"	C	No	Yes	Inside Pole	115.00 - 1.00	6	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
1 5/8"	C	No	Yes	Inside Pole	105.00 - 1.00	18	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
1 5/8"	C	No	Yes	Inside Pole	95.00 - 1.00	18	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
1 5/8"	C	No	Yes	Inside Pole	85.00 - 1.00	18	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92
1 5/8"	C	No	Yes	Inside Pole	75.00 - 1.00	18	No Ice	0.00	0.92
							1/2" Ice	0.00	0.92
							1" Ice	0.00	0.92

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	115.00-74.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.28
L2	74.00-48.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.86
L3	48.00-1.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.36

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	115.00-74.00	A	2.081	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.28
L2	74.00-48.00	A	1.992	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.86
L3	48.00-1.00	A	1.820	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.36

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Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz Lateral	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
20 ft x 3" dia whip	A	From Face	3.00	0.00	0.0000	125.00	No Ice	5.56	5.56	0.06
			0.00	0.00			1/2" Ice	8.03	8.03	0.10
			0.00	0.00			1" Ice	10.08	10.08	0.16
20 ft x 3" dia whip	B	From Face	3.00	0.00	0.0000	125.00	No Ice	5.56	5.56	0.06
			0.00	0.00			1/2" Ice	8.03	8.03	0.10
			0.00	0.00			1" Ice	10.08	10.08	0.16
20 ft x 3" dia whip	C	From Face	3.00	0.00	0.0000	125.00	No Ice	5.56	5.56	0.06
			0.00	0.00			1/2" Ice	8.03	8.03	0.10
			0.00	0.00			1" Ice	10.08	10.08	0.16
(3) 6' Side Arm Mount	C	None			0.0000	115.00	No Ice	1.56	1.56	0.08
							1/2" Ice	2.46	2.46	0.09
							1" Ice	2.83	2.83	0.11
**										
EPA 120 ft2 / 3,000 lbs	C	None			0.0000	105.00	No Ice	120.00	120.00	3.00
							1/2" Ice	130.00	130.00	3.50
							1" Ice	140.00	140.00	4.00
EPA 120 ft2 / 3,000 lbs	C	None			0.0000	95.00	No Ice	120.00	120.00	3.00
							1/2" Ice	130.00	130.00	3.50
							1" Ice	140.00	140.00	4.00
EPA 120 ft2 / 3,000 lbs	C	None			0.0000	85.00	No Ice	120.00	120.00	3.00
							1/2" Ice	130.00	130.00	3.50
							1" Ice	140.00	140.00	4.00
EPA 120 ft2 / 3,000 lbs	C	None			0.0000	75.00	No Ice	120.00	120.00	3.00
							1/2" Ice	130.00	130.00	3.50
							1" Ice	140.00	140.00	4.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:		Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight	
				Horz Lateral	Vert							
			ft	ft	°	°	ft	ft	ft ²	K		
2 ft standard	A	Paraboloid w/o Radome	From Face	1.00	0.00	0.0000		115.00	2.00	No Ice	3.14	0.01
				0.00	0.00					1/2" Ice	3.41	0.06
				0.00	0.00					1" Ice	3.68	0.10

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 90 deg - No Ice
5	0.9 Dead+1.6 Wind 90 deg - No Ice
6	1.2 Dead+1.6 Wind 180 deg - No Ice
7	0.9 Dead+1.6 Wind 180 deg - No Ice
8	1.2 Dead+1.0 Ice+1.0 Temp
9	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp

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Comb. No.	Description
10	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
11	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
12	Dead+Wind 0 deg - Service
13	Dead+Wind 90 deg - Service
14	Dead+Wind 180 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	115 - 74	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-25.70	0.29	0.16
			Max. Mx	4	-13.23	-629.17	-7.43
			Max. My	6	-13.23	-12.06	-626.44
			Max. Vy	4	35.15	-629.17	-7.43
			Max. Vx	6	35.07	-12.06	-626.44
			Max. Torque	2			0.30
L2	74 - 48	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-40.35	0.29	0.16
			Max. Mx	4	-23.19	-1741.40	-12.66
			Max. My	6	-23.20	-20.56	-1736.74
			Max. Vy	4	47.70	-1741.40	-12.66
			Max. Vx	6	47.63	-20.56	-1736.74
			Max. Torque	2			0.30
L3	48 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-68.84	0.29	0.16
			Max. Mx	4	-46.69	-4472.82	-23.61
			Max. My	6	-46.69	-38.34	-4464.13
			Max. Vy	4	55.07	-4472.82	-23.61
			Max. Vx	6	55.00	-38.34	-4464.13
			Max. Torque	2			0.30

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	115 - 74	7.689	13	0.5832	0.0001
L2	79 - 48	3.604	13	0.4489	0.0000
L3	54 - 1	1.630	13	0.2838	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.00	20 ft x 3" dia whip	13	7.689	0.5832	0.0004	63470
115.00	2 ft standard	13	7.689	0.5832	0.0004	63470
105.00	EPA 120 ft2 / 3,000 lbs	13	6.479	0.5546	0.0003	31735
95.00	EPA 120 ft2 / 3,000 lbs	13	5.307	0.5216	0.0002	15867
85.00	EPA 120 ft2 / 3,000 lbs	13	4.210	0.4799	0.0001	10578
75.00	EPA 120 ft2 / 3,000 lbs	13	3.227	0.4254	0.0001	8541

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Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	115 - 74	54.688	4	4.1350	0.0023
L2	79 - 48	25.692	4	3.1975	0.0005
L3	54 - 1	11.629	4	2.0239	0.0001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.00	20 ft x 3" dia whip	4	54.688	4.1350	0.0028	9108
115.00	2 ft standard	4	54.688	4.1350	0.0028	9108
105.00	EPA 120 ft2 / 3,000 lbs	4	46.104	3.9374	0.0021	4553
95.00	EPA 120 ft2 / 3,000 lbs	4	37.786	3.7083	0.0014	2275
85.00	EPA 120 ft2 / 3,000 lbs	4	29.999	3.4162	0.0009	1515
75.00	EPA 120 ft2 / 3,000 lbs	4	23.006	3.0306	0.0005	1218

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A	P _u	φP _n	Ratio P _n
						in ²	K	K	φP _n
L1	115 - 74 (1)	TP35.6886x24x0.1875	41.00	0.00	0.0	20.2793	-13.23	1198.08	0.011
L2	74 - 48 (2)	TP42.7259x33.8882x0.3125	31.00	0.00	0.0	40.3721	-23.19	2772.40	0.008
L3	48 - 1 (3)	TP55.5x40.3904x0.5	53.00	0.00	0.0	87.2850	-46.69	6323.23	0.007

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux}	φM _{ux}	Ratio M _{ux}	M _{uy}	φM _{uy}	Ratio M _{uy}
			kip-ft	kip-ft	φM _{ux}	kip-ft	kip-ft	φM _{uy}
L1	115 - 74 (1)	TP35.6886x24x0.1875	629.21	841.47	0.748	0.00	841.47	0.000
L2	74 - 48 (2)	TP42.7259x33.8882x0.3125	1741.44	2320.88	0.750	0.00	2320.88	0.000
L3	48 - 1 (3)	TP55.5x40.3904x0.5	4472.88	7142.72	0.626	0.00	7142.72	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V _u	φV _n	Ratio V _u	Actual T _u	φT _n	Ratio T _u
			K	K	φV _n	kip-ft	kip-ft	φT _n
L1	115 - 74 (1)	TP35.6886x24x0.1875	35.15	599.04	0.059	0.03	1686.40	0.000
L2	74 - 48 (2)	TP42.7259x33.8882x0.3125	47.70	1386.20	0.034	0.03	4652.81	0.000
L3	48 - 1 (3)	TP55.5x40.3904x0.5	55.08	3161.62	0.017	0.03	14322.50	0.000

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Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		ϕP_n	ϕM_{ux}	ϕM_{uy}	ϕV_n	ϕT_n			
L1	115 - 74 (1)	0.011	0.748	0.000	0.059	0.000	0.762 ✓	1.000	4.8.2 ✓
L2	74 - 48 (2)	0.008	0.750	0.000	0.034	0.000	0.760 ✓	1.000	4.8.2 ✓
L3	48 - 1 (3)	0.007	0.626	0.000	0.017	0.000	0.634 ✓	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail	
L1	115 - 74	Pole	TP35.6886x24x0.1875	1	-13.23	1198.08	76.2	Pass	
L2	74 - 48	Pole	TP42.7259x33.8882x0.3125	2	-23.19	2772.40	76.0	Pass	
L3	48 - 1	Pole	TP55.5x40.3904x0.5	3	-46.69	6323.23	63.4	Pass	
							Summary		
							Pole (L1)	76.2	Pass
							RATING =	76.2	Pass

Michael F. Plahovinsak, P.E. 18301 State Route 161 W Plain City, OH 43064 Phone: 614-398-6250 email: mike@mfpeng.com	Job 115-ft monopole - MFP #23521-319	Page BP & AB Calc
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	Client TAPP TP-20260	Designed by Mike

Anchor Rod and Base Plate Calculation

ANSI/TIA-222-G

Factored Base Reactions:	Pole Shape:	Anchor Rods:	Base Plate:
Moment: 4473 ft-kips	18-Sided	(22) 2.25 in. A615 GR. 75	2.5 in. x 69 in. Round
Shear: 55 kips	Pole Dia. (D_f):	Anchor Rods Evenly Spaced	$f_y = 50$ ksi
Axial: 47 kips	55.50 in	On a 63 in Bolt Circle	

Anchor Rod Calculation According to TIA-222-G section 4.9.9

$\phi_t, \phi_v = 0.80$ TIA 4.9.9
 $I_{bolts} = 10914.75 \text{ in}^2$ Moment of Inertia
 $P_u = 157 \text{ kips}$ Compr Force
 $V_u = 2.5 \text{ kips}$ Shear Force
 $R_{nt} = 325.00 \text{ kips}$ Nominal Tensile Strength
 $n = 0.50$ for detail type (d)
Stress Rating = 62.3% Satisfies TIA-G 4.9.9

Base Plate Calculation According to TIA-222-G

$\phi = 0.90$ TIA 4.7
 $M_{PL} = 354.9 \text{ in-kip}$ Plate Moment
 $L = 7.9 \text{ in}$ Section Length
 $Z = 12.4$ Plastic Section Modulus
 $M_p = 619.2 \text{ in-kip}$ Plastic Moment
 $\phi M_n = 557.3 \text{ in-kip}$ Factored Resistance

Calculated Moment vs Factored Resistance

$354.89 \text{ in-kip} \leq 557 \text{ in-kip}$

Stress Rating = 63.7%

Anchor Rods Are Adequate	62.3% <input checked="" type="checkbox"/>
Base Plate is Adequate	63.7% <input checked="" type="checkbox"/>

Monopole Spread Footing Calculation

ANSI/TIA-222-G

Factored Base Reactions:	Footing Dimensions:		Concrete:
Moment: 6778 ft-kips	29 ft x 29 ft	7 ft Square Pier	$f_c = 4500$ psi
Shear: 83 kips	x 3.5 ft thick	w/6 in Reveal	Steel $f_y = 60$ ksi
Axial: 47 kips	Bearing 6 ft B.G.	114.5 Yd3 Concrete	$f = 0.75$
Soil Backfill 100 pcf	Ultimate Bearing:	6000 psf	Water Table n/a

Foundation Weight

Weight of Pole	47.0 kips
Weight of Concrete	463.575 kips
Weight of Soil	198 kips
Bouyancy of Water	0.0 kips
Total	708.6 kips

Overturning Resistance:

Overturning Moment (M_u)	7317.5 ft-kips	6778 ft-kips + (83 kips x 6.5 ft)
Resisting Moment (R_s)	10274.338 ft-kips	708.575 kips x 29 ft / 2
$\phi \times R_s > M_u$	$M_{\text{overturning}} / f M_{\text{resist}}$	95.0% OK

Soil Bearing Pressure:

Eccentricity (e)	10.33 ft	7317.5 ft-kips / 708.575 kips
$6(e)$	62.0 ft >	29.0 ft $6e > 29$
Maximum Soil Bearing	3683.6704 psf	Calculated across corners
Soil Overburden	-600 psf	
Net Soil Bearing	3083.6704 psf	
Resisting Soil Bearing (R_s)	6000 psf	
Net Soil Bearing $< \phi \times R_s$	Net Bearing / $f R_s$	68.5% OK

Bending Moment in Pier:

Bending Moment	7027 ft-kips	6778 ft-kips + (83 kips x 3 ft)
Min. Pier Steel	35.28 in ²	1/2% (Based on Square Pier)

Bending Moment in Footing:

Max Bending Moment	4842.7676 ft-kips	Σ Moments about pier face
Footing Steel Req'd (Loads)	1.24 in ² /ft	
Min. Footing Steel	0.91 in ² /ft	0.18%

WELTI GEOTECHNICAL, P.C.

227 Williams Street · P.O. Box 397
Glastonbury, CT 06033-0397

(860) 633-4623 / FAX (860) 657-2514

October 4, 2021

Mr. Keith Coppins
ARX Wireless
110 Washington Avenue
North Haven, CT 06473

**Ref: Geotechnical Study for Proposed Cell Tower Site CT0030
1063 Boston Post Road, Milford, CT**

Dear Keith:

1.0 Herewith are the data from the test boring taken at the above referenced site. One boring was taken at the proposed tower location. The boring was drilled to a depth of 36.5 feet. A tower/boring location plan is included with boring logs. *The boring was drilled by Clarence Welti Associates, Inc. and sampling was conducted by this firm solely to obtain indications of subsurface conditions as part of a geotechnical exploration program. No services were performed to evaluate subsurface environmental conditions.*

2.0 The **Subject Project** will include the construction of a 115 foot monopole tower.

3.0 The **Soils Cross Section** from the boring is generally as follows:

FILL; fine to coarse SAND, some Gravel, little Silt to 2.5 feet, medium compact

Possible FILL; fine to medium SAND, some Silt, trace Gravel to 3.5 feet, loose

Fine to coarse SAND, trace Silt 8.5 feet, loose to medium compact

Fine to medium SAND, trace Silt to 21.5 feet, medium compact

SILT, some fine Sand to 31 feet, medium compact

SILT, trace fine Sand to 36+ feet, medium compact to loose

Groundwater was at 14 feet below the existing grade at the completion of the boring

4.0 In general the criteria for tower support is that the foundation capacity would exceed the loads, which might collapse the tower. **Movements from strains in the soils should be limited to differential settlement (or lateral movements of less than ½").**

5.0 The foundation for the tower could be one of the following:

1. **A large mat designed to prevent overturning by gravity resistance of the mat and soil cover.**
2. **A caisson/drilled pier foundation**

5.1 In **alternate (1)** the weight of the mat and soil cover (if any) would provide the required resistance to over turning. The mat foundation can be placed on the natural inorganic soils at least 6 feet below the existing grade or on a controlled fill placed after the removal of any existing fills and organic soils. There should be a minimum 6" layer of 3/8" crushed stone atop a geotextile beneath the foundations on the natural soils. The allowable bearing pressure on the crushed stone atop the natural soils can be 2.0 Tons/sf.

5.2 In **summary** the following soil properties and design values would apply to alternate 1.

Soil Property/Parameter	Value
Soil Unit Weight (Backfill)	125 pcf
Soil Unit Weight (Natural)	120 pcf
Soil Unit Weight Submerged (Natural)	58 pcf
Angle of Internal Friction (ö)	30°
Cohesion	0
Pull Out Angle from Vertical	30°
Sliding Coefficient	0.6
Frost Protection Depth (by code)	3.5 feet
Allowable Soil Bearing Pressure on the natural soil inorganic at 6+ feet below the existing grade or on controlled fill	2.0 Tons/sf

5.3 **Alternate 2** would be a caisson foundation. The depth of the caissons is to be determined by the designer to provide the required resistance to uplift and overturning forces as well as maintaining the allowable lateral deflection**. The following is summary of design parameters which can be used in the design of the drilled pier/caisson type foundation using the L-Pile computer program.

stratum depth	Total Unit Weight (pcf)	Effective (submerged) Unit Weight (pcf)	Friction Angle degrees	Soil Modulus Parameter, k - above groundwater (pci)	Soil Modulus Parameter, k - below groundwater (pci) *	Allowable Bearing Pressure at 8+ feet (Tst)
0 to 6.0 feet; FILL or loose disturbed soils	120	58	30	60	40	-
6.0 to 21.5 feet; fine to coarse SAND, trace Silt	120	58	32	90	60	2.0
21.5 to 36+ feet; fine SAND and SILT; or SILT, trace fine Sand	120	58	32	-	60	4.0

The lateral deflection can be analyzed from Lpile Program or from a empirical formulas in Drilled Pier Foundations; Woodward Gardener Greer; McGraw Hill 1972. The soils to about 2 feet below the finished grades should be ignored in the calculating the lateral resistance.

** Typically this value would be about 1/2"

6.0 Regarding **backfill of foundations**, the material should conform to the following or be 3/8" crushed stone.

Percent Passing	Sieve Size
100	3.5"
50 - 100	3/4"
25 - 85	No.4

The fraction, passing the No.4 sieve should have less than 15% passing the No. 200 sieve.

All backfill and fill must be compacted to at least 95% of modified optimum density in accordance with ASTM D-1557.

7.0 The soils at the subject site are generally in OSHA class C which would require excavations that are in excess of 5 feet to have slopes which are less than 34° (i.e., 1.5H to1.0V).

8.0 This report has been prepared for specific a application to the subject project in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made. In the event that any changes in the nature, design and location of structures are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

The analyses and recommendations submitted in this report are based in part upon data obtained from referenced explorations. The extent of variations between explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

Wolti Geotechnical, P.C., should perform a general review of the final design and specifications in order that geotechnical design recommendations may be properly interpreted and implemented as

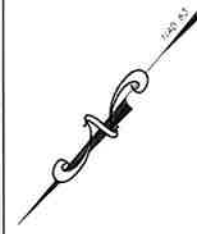
they were intended.

If you have any questions please call me.

Very truly yours,

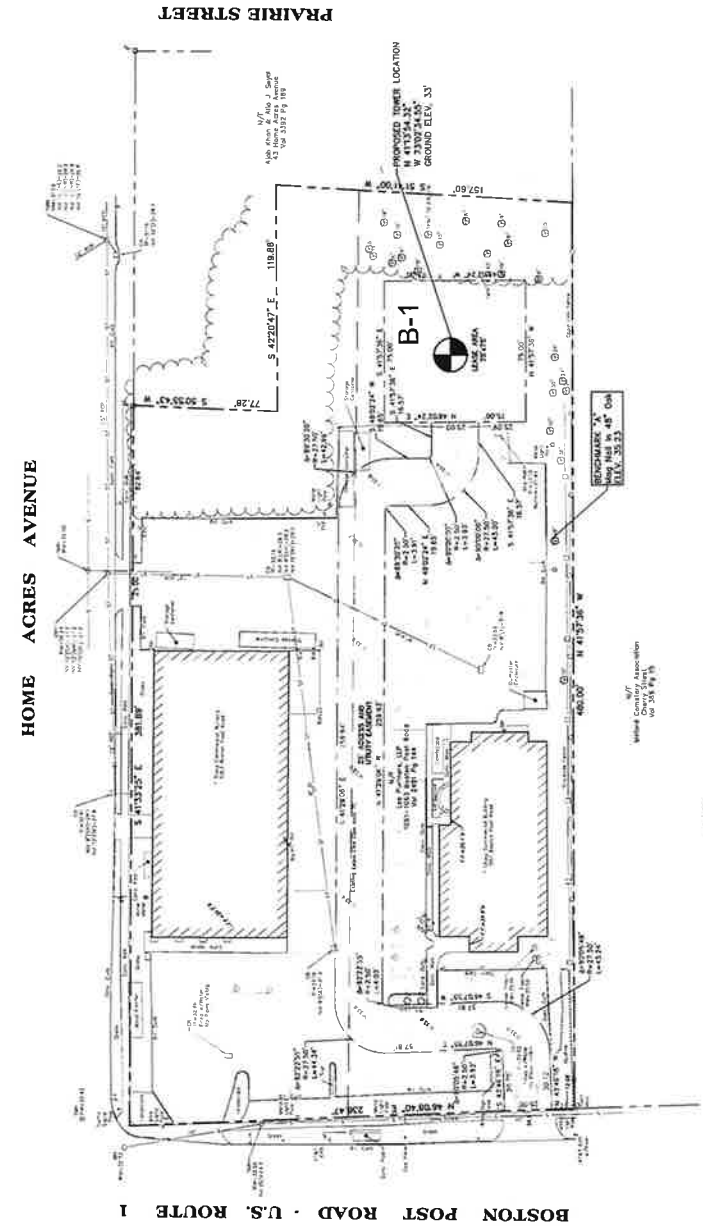
Max Welte
Max Welte, P. E.
President, Welte Geotechnical, P.C.

APPENDIX
TEST BORING LOCATION PLAN
+
TEST BORING LOG



LOCATION MAP

- NOTES:**
1. THE CLIENT HAS PROVIDED ALL NECESSARY INFORMATION FOR THE PREPARATION OF THIS PLAN. THE CLIENT HAS REPRESENTED THAT ALL INFORMATION IS TRUE AND CORRECT AND THAT THE CLIENT HAS OBTAINED ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES.
 2. THE ENGINEER HAS CONDUCTED A VISUAL INSPECTION OF THE SITE AND HAS FOUND NO OBVIOUS OBSTRUCTIONS TO THE PROPOSED WORK.
 3. THE ENGINEER HAS CONDUCTED A VISUAL INSPECTION OF THE SURROUNDING AREAS AND HAS FOUND NO OBVIOUS OBSTRUCTIONS TO THE PROPOSED WORK.
 4. THE ENGINEER HAS CONDUCTED A VISUAL INSPECTION OF THE PROPOSED WORK AND HAS FOUND NO OBVIOUS OBSTRUCTIONS TO THE PROPOSED WORK.
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TEST BORING LOCATION
CLARENCE WELTI ASSOCIATES, INC.
9/30/21



EXISTING CONDITIONS LEGEND

- 1. CONCRETE WALL
- 2. CONCRETE COLUMN
- 3. CONCRETE FOOTING
- 4. CONCRETE SLAB
- 5. CONCRETE BEAM
- 6. CONCRETE GIRDER
- 7. CONCRETE JOIST
- 8. CONCRETE DECK
- 9. CONCRETE CURB
- 10. CONCRETE CURB AND GUTTER
- 11. CONCRETE CURB AND GUTTER WITH SLOPE
- 12. CONCRETE CURB AND GUTTER WITH SLOPE AND CURB
- 13. CONCRETE CURB AND GUTTER WITH SLOPE AND CURB AND GUTTER
- 14. CONCRETE CURB AND GUTTER WITH SLOPE AND CURB AND GUTTER AND GUTTER
- 15. CONCRETE CURB AND GUTTER WITH SLOPE AND CURB AND GUTTER AND GUTTER AND GUTTER
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- 18. CONCRETE CURB AND GUTTER WITH SLOPE AND CURB AND GUTTER AND GUTTER AND GUTTER AND GUTTER AND GUTTER AND GUTTER
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- 20. CONCRETE CURB AND GUTTER WITH SLOPE AND CURB AND GUTTER AND GUTTER AND GUTTER AND GUTTER AND GUTTER AND GUTTER AND GUTTER AND GUTTER

PROPERTY AND TOPOGRAPHIC SURVEY
PROPOSED TOWER SITE
1000 BOSTON POST ROAD - U.S. ROUTE 1
 COUNTY OF NEW HAVEN CITY OF MILFORD
Weston
 STATE OF CONNECTICUT
 DATE: 09/30/21
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 PROJECT NO.: [Number]


NO.	DATE	DESCRIPTION
1	09/30/21	ISSUED FOR PERMITTING
2	09/30/21	ISSUED FOR PERMITTING
3	09/30/21	ISSUED FOR PERMITTING
4	09/30/21	ISSUED FOR PERMITTING
5	09/30/21	ISSUED FOR PERMITTING
6	09/30/21	ISSUED FOR PERMITTING
7	09/30/21	ISSUED FOR PERMITTING
8	09/30/21	ISSUED FOR PERMITTING
9	09/30/21	ISSUED FOR PERMITTING
10	09/30/21	ISSUED FOR PERMITTING

DATE: 09/30/21
 TIME: 10:00 AM
 LOCATION: 1000 BOSTON POST ROAD - U.S. ROUTE 1
 PROJECT NO.: [Number]

CLARENCE WELTI ASSOCIATES, INC.
 1000 BOSTON POST ROAD - U.S. ROUTE 1
 MILFORD, CT 06455
 TEL: 860.379.1234
 FAX: 860.379.1235
 WWW.CWELTI.COM

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033				CLIENT ARX WIRELESS			PROJECT NAME PROPOSED CELL TOWER		
							LOCATION 1063 BOSTON POST ROAD, MILFORD, CT		
	AUGER	CASING	SAMPLER	CORE BAR	OFFSET	SURFACE ELEV.		HOLE NO. B-1	
TYPE	HSA		SS		LINE & STA.	GROUND WATER OBSERVATIONS		START DATE 9/30/21	
SIZE I.D.	3.75"		1.375"		N. COORDINATE	AT 14.0 FT. AFTER 0 HOURS			
HAMMER WT.			140lbs		E. COORDINATE	AT FT. AFTER HOURS		FINISH DATE 9/30/21	
HAMMER FALL			30"						
DEPTH	SAMPLE			A	STRATUM DESCRIPTION + REMARKS	ELEV.			
	NO.	BLOWS/6"	DEPTH						
0	1	12-10-6-4	0.0'-2.0'		DARK BR.FINE-CRS.SAND, SOME GRAVEL, LITTLE SILT - FILL				
	2	3-2-3-3	2.0'-4.0'		BR.FINE-MED.SAND, SOME SILT, TRACE GRAVEL	2.5			
					BR.FINE-CRS.SAND, TRACE SILT	3.5			
5	3	1-1-3-6	5.0'-7.0'						
	4	6-7-9-15	7.0'-9.0'						
					BR.FINE-MED.SAND, TRACE SILT	8.5			
10	5	6-9-11	10.0'-11.5'						
15	6	8-9-9	15.0'-16.5'						
20	7	10-12-15	20.0'-21.5'		GREY/BR.SILT, SOME FINE SAND	21.5			
25	8	9-10-13	25.0'-26.5'						
30	9	8-9-14	30.0'-31.5'		GREY SILT, TRACE TO LITTLE FINE SAND	31.0			
35									
LEGEND: COL. A: SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%						DRILLER: J. BREWER INSPECTOR:			
						SHEET 1 OF 2		HOLE NO. B-1	

CLARENCE WELTI ASSOC., INC. P.O. BOX 397 GLASTONBURY, CONN 06033	CLIENT ARX WIRELESS	PROJECT NAME PROPOSED CELL TOWER
		LOCATION 1063 BOSTON POST ROAD, MILFORD, CT

DEPTH	SAMPLE			A	ELEV.	STRATUM DESCRIPTION + REMARKS
	NO.	BLOWS/6"	DEPTH			
	10	2-2-3	35.0'-36.5'		36.5	 BOTTOM OF BORING @ 36.5'
40						
45						
50						
55						
60						
65						
70						
75						

LEGEND: COL. A: SAMPLE TYPE: D=DRY A=AUGER C=CORE U=UNDISTURBED PISTON S=SPLIT SPOON PROPORTIONS USED: TRACE=0-10% LITTLE=10-20% SOME=20-35% AND=35-50%	DRILLER: J. BREWER INSPECTOR: <hr/> SHEET 2 OF 2 HOLE NO. B-1
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ENVIRONMENTAL NOTES: RARE SPECIES PROTECTION MEASURES

Eastern Box Turtle (*Terrapene carolina carolina*), a State Special Concern species afforded protection under the Connecticut Endangered Species Act, are known to occur within the vicinity of the proposed communications tower facility. The following rare species protection measures satisfy requirements from the Connecticut Department of Energy & Environmental Protection ("DEEP") Wildlife Division in accordance with their Natural Diversity Data Base ("NDDDB") determination letter (No. 202009138) dated August 6, 2020; this determination is valid until August 6, 2022 provided the scope of the project has not changed and work has begun on the project prior to the expiration date.

It is of the utmost importance that the Contractor complies with the requirement for implementation of these protective measures and the education of its employees and subcontractors performing work on the project site.

All-Points Technology Corporation, P.C. ("APT") will serve as the Environmental Monitor for this project to ensure that these protection measures are implemented properly and will provide an education session on rare species that may be encountered and the project's proximity to sensitive habitat prior to the start of construction activities. The Contractor shall contact Dean Gustafson, Senior Environmental Scientist at APT, at least 5 business days prior to the start of any construction activities. Mr. Gustafson can be reached by phone at (860) 552-2033 or via email at dgustafson@allpointstech.com.

Eastern Box Turtle Protection Program

This turtle protection plan shall be implemented conditioned on work activities limited to occur only during the turtle's active period (April 1st to October 30th). Therefore, protection measures during the turtle's inactive period (October 1st through March 30th) are not necessary for this project.

The proposed protection program consists of several components: education of all contractors and sub-contractors prior to initiation of work on the site; protective measures; periodic inspection of the construction project; and, reporting.

1. Isolation Measures & Sedimentation and Erosion Controls

- a. Plastic netting used in a variety of erosion control products (i.e., erosion control blankets, fiber rolls [wattles], reinforced silt fence) has been found to entangle wildlife, including reptiles, amphibians, birds and small mammals, but particularly snakes. No permanent erosion control products or reinforced silt fence will be used on the project. Temporary erosion control products will use either erosion control blankets and fiber rolls composed of processed fibers mechanically bound together to form a continuous matrix (netless) or netting composed of planar woven natural biodegradable fiber to avoid/minimize wildlife entanglement.
- b. Installation of sedimentation and erosion controls, required for erosion control compliance and creation of a barrier to possible migrating/dispersing turtles, shall be performed by the Contractor following clearing activities and prior to any earthwork. The Environmental Monitor will inspect the work zone area prior to and following erosion control barrier installation to ensure the area is free of Eastern Box Turtle and document barriers have been satisfactorily installed. The intent of the barrier is to segregate the majority of the work zone and isolate it from foraging/migrating/dispersing turtles, snakes and other herpetofauna. Oftentimes complete isolation of a work zone is not feasible due to accessibility needs and locations of staging/material storage areas, etc. Although the barriers may not completely isolate the work zone, they will be positioned to deflect migrating/dispersal routes away from the work zone to minimize potential encounters with turtles, snakes and other herpetofauna.

- c. The Contractor is responsible for daily inspections of the sedimentation and erosion controls for tears or breeches and accumulation levels of sediment, particularly following storm events that generate a discharge. APT will provide periodic inspections of the sedimentation and erosion controls throughout the duration of construction activities only as it pertains to protection of rare species. Third party monitoring of sedimentation and erosion controls will be performed by other parties, as necessary, under applicable local, state and/or federal regulations.
- d. The extent of the sedimentation and erosion controls will be as shown on the site plans. The Contractor shall have additional sedimentation and erosion controls stockpiled on site should field or construction conditions warrant extending the controls as directed by APT.
- e. No equipment, vehicles or construction materials shall be stored outside of the sedimentation and erosion controls within 100 feet of wetlands or watercourses.
- f. All sedimentation and erosion controls shall be removed within 30 days of completion of work and permanent stabilization of site soils so that reptile and amphibian movement between uplands and wetlands is not restricted.

2. Contractor Education

- a. Prior to work on site, the Contractor shall attend an educational session at the pre-construction meeting with APT. This orientation and educational session will consist of an introductory meeting with APT providing photos of Eastern Box Turtle emphasizing the non-aggressive nature of these species, the absence of need to destroy animals that might be encountered and the need to follow Protective Measures as described in Section 4 below. Workers will also be provided information regarding the identification of other turtles, snakes and common herpetofauna species that could be encountered.
- b. The education session will also focus on means to discriminate between the species of concern and other native species to avoid unnecessary "false alarms". Encounters with any species of turtles or snakes will be documented.
- c. The Contractor will be provided with cell phone and email contacts for APT personnel to immediately report any encounters with eastern box turtle or other species. Educational poster materials will be provided by APT and displayed on the job site to maintain worker awareness as the project progresses.

3. Petroleum Materials Storage and Spill Prevention

- a. Certain precautions are necessary to store petroleum materials, refuel and contain and properly clean up any inadvertent fuel or petroleum (i.e., oil, hydraulic fluid, etc.) spill to avoid possible impact to nearby habitats.
- b. A spill containment kit consisting of a sufficient supply of absorbent pads and absorbent material will be maintained by the Contractor at the construction site throughout the duration of the project. In addition, a waste drum will be kept on site to contain any used absorbent pads/material for proper and timely disposal off site in accordance with applicable local, state and federal laws.
- c. The following petroleum and hazardous materials storage and refueling restrictions and spill response procedures will be adhered to by the Contractor.
 - i. Petroleum and Hazardous Materials Storage and Refueling

1. Refueling of vehicles or machinery shall occur a minimum of 100 feet from wetlands or watercourses and shall take place on an impervious pad with secondary containment designed to contain fuels.
2. Any fuel or hazardous materials that must be kept on site shall be stored on an impervious surface utilizing secondary containment a minimum of 100 feet from wetlands or watercourses.

ii. Initial Spill Response Procedures

1. Stop operations and shut off equipment.
2. Remove any sources of spark or flame.
3. Contain the source of the spill.
4. Determine the approximate volume of the spill.
5. Identify the location of natural flow paths to prevent the release of the spill to sensitive nearby waterways or wetlands.
6. Ensure that fellow workers are notified of the spill.

iii. Spill Clean Up & Containment

1. Obtain spill response materials from the on-site spill response kit. Place absorbent materials directly on the release area.
2. Limit the spread of the spill by placing absorbent materials around the perimeter of the spill.
3. Isolate and eliminate the spill source.
4. Contact the appropriate local, state and/or federal agencies, as necessary.
5. Contact a disposal company to properly dispose of contaminated materials in accordance with all local, state and federal regulations.

iv. Reporting

1. Complete an incident report.
2. Submit a completed incident report to the appropriate Town of Farmington, Connecticut Siting Council and other applicable local, state and federal officials.

4. Turtle Protective Measures

- a. Prior to the start of construction each day, the Contractor shall search the entire work area for turtles.
- b. If a turtle is found, it shall be immediately moved, unharmed, by carefully grasped in both hands, one on each side of the shell, between the turtle's forelimbs and the hind limbs, and placed just outside of the isolation barrier in the same approximate direction it was walking.
- c. Special care shall be taken by the Contractor during early morning and evening hours so that possible basking or foraging turtles are not harmed by construction activities.

5. Herbicide and Pesticide Restrictions

- a. The use of herbicides and pesticides at the proposed communications tower facility shall be avoided when possible. In the event herbicides and/or pesticides are

required at the proposed facility, their use will be used in accordance with Integrated Pest Management ("IPM") principles with particular attention to minimize applications within 100 feet of wetland or watercourse resources.

6. Reporting

- a. Compliance Monitoring Reports (brief narrative and applicable photos) documenting each APT inspection will be submitted to the permittee for compliance verification. Any observations of turtles will be included in the reports.
- b. Following completion of the construction project, APT will provide a final Compliance Monitoring Report to the permittee documenting implementation of the rare species protection program, monitoring and any species observations. The permittee is responsible for providing a copy of the final Compliance Monitoring Report to the Connecticut Siting Council for compliance verification.
- c. Any observations of Eastern Box Turtle will be reported to CTDEEP by APT, with photo-documentation (if possible) and with specific information on the location and disposition of the animal.

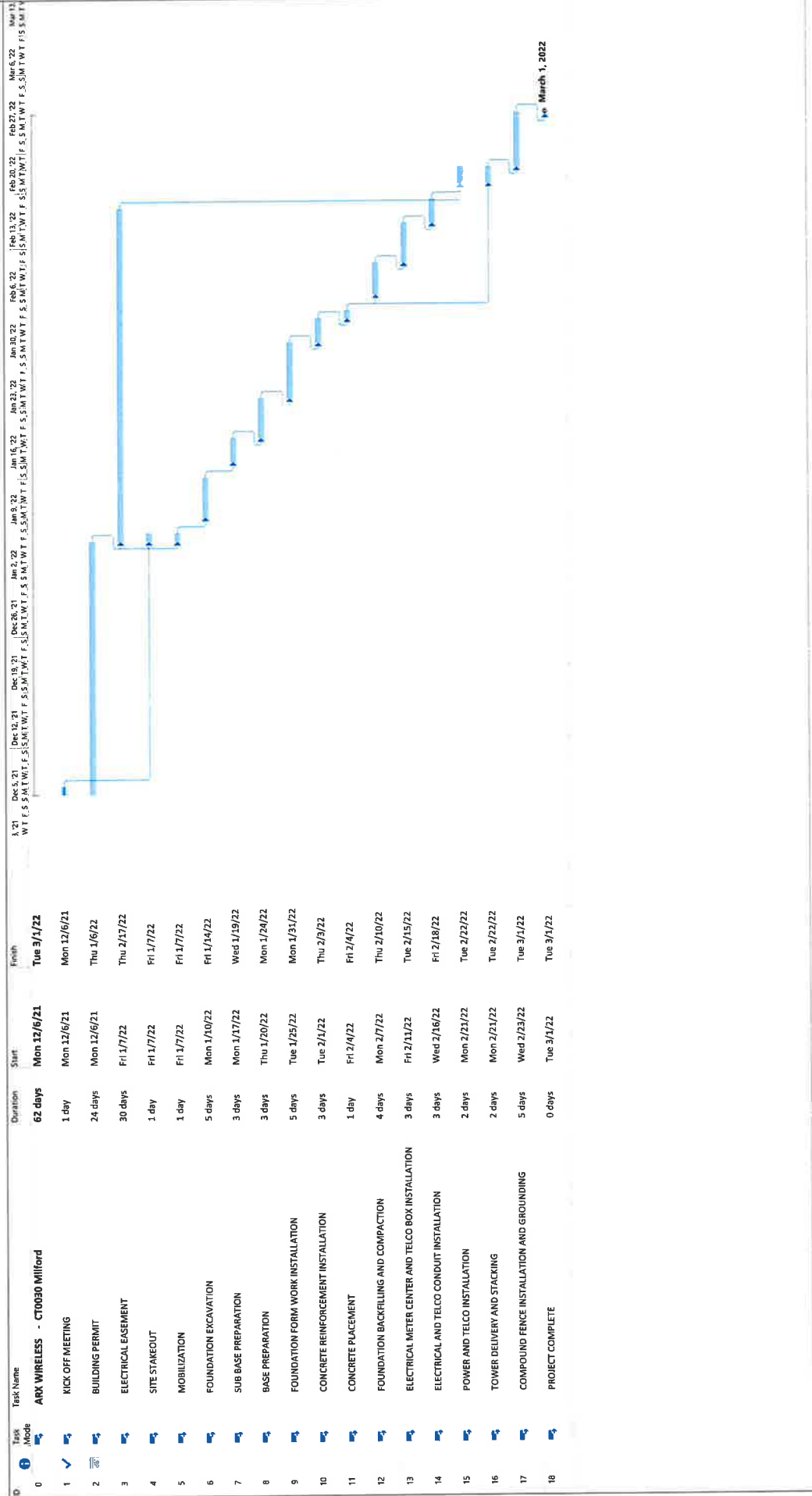
COST COMPARISON BETWEEN DIESEL-FUELED AND NATURAL GAS-FUELED BACK UP GENERATORS

	FUEL TYPE		COST TO BRING NATURAL GAS FROM METER CENTER TO GENERATOR	COST TO BRING NATURAL GAS FROM THE STREET TO THE COMPOUND
	DIESEL FUELED	NATURAL GAS FUELED		
AT&T GENERATOR COSTS	\$7,000	\$6,500	\$1,200	
VERIZON GENERATOR COST	\$15,000	\$14,250	\$1,200	
ARX WIRELESS COST FOR NATURAL GAS SERVICE				\$12,000

CT0030 MILFORD

CONSTRUCTION SCHEDULE

ARX WIRELESS



Summary Project Summary Inactive Task
 Task Milestone
 Inactive Milestone Inactive Summary Manual Task
 Duration-only Manual Summary Rollup Manual Summary
 Start-only Finish-only External Tasks
 External Milestone Milestone Progress
 Manual Progress

Project: ARX WIRELESS - CTO
 Date: Mon 11/1/21
 Page 1
 Mon 11/1/21