

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

IN RE: :
: :
APPLICATION OF CELLCO PARTNERSHIP : DOCKET NO. 469
D/B/A VERIZON WIRELESS FOR A :
CERTIFICATE OF ENVIRONMENTAL :
COMPATIBILITY AND PUBLIC NEED FOR :
THE CONSTRUCTION, MAINTENANCE :
AND OPERATION OF A WIRELESS :
TELECOMMUNICATIONS FACILITY AT :
520 BAILEY HILL ROAD IN KILLINGLY, :
CONNECTICUT : MARCH 15, 2017

**RESPONSES OF CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS TO
CONNECTICUT SITING COUNCIL D&M PLAN INTERROGATORIES, SET ONE**

On March 2, 2017, the Connecticut Siting Council (“Council”) issued D&M Plan Interrogatories to Cellco Partnership d/b/a Verizon Wireless (“Cellco”), relating to the above-captioned docket. Below are Cellco’s responses.

Question No. 1

In Cellco Partnership d/b/a Verizon Wireless’ (Cellco) Development and Management Plan (D&M Plan) dated February 23, 2017, did Cellco consider the mitigation of fire risk in its site clearing plan, in accordance with Condition No. 2b of the Council’s Decision and Order (D&O) dated December 22, 2016?

Response

Yes. The mitigation of fire risk was addressed by the project engineers by proposing to clear and install a 3” crushed stone surface over a fabric material over the entire 100’ x 100’ leased area. Typically, this type of surface treatment is limited to the (50’ x 50’) facility compound.

Question No. 2

Condition No. 2a of the D&O requires the emergency backup generator information including its fuel tank and run time. Would the proposed backup generator still be a 15-kilowatt diesel generator with a 54-gallon double-walled fuel tank with about 60 to 65 hours of run time under normal conditions? If these specifications have changed, please update accordingly.

Without the generator, about how long could the battery backup alone operate?

Response

Cellco still plans to install the 15 kW diesel generator described in the Docket No. 469 Application. Specifications for this generator are included in Attachment 7 of the Application. The back-up battery system proposed for the Dayville facility can keep a cell site operating from 4 to 8 hours depending upon load if the batteries are not recharged. As discussed in recent proceedings, the generator is principally used to recharge the back-up batteries.

Question No. 3

Would the proposed erosion and sedimentation control measures be consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control?

Response

Yes.

Question No. 4

Provide the proposed construction hours and days of the week. Approximately when would construction commence and when would it be completed?

Response

Typically, construction activity would occur between 7 a.m. and 5 p.m., Monday through

Friday. Construction may also occur, occasionally, on Saturday depending on the stage of construction activity, weather conditions or other similar variables. Cellco expects construction of the Dayville Facility to commence within one month of receiving D&M Plan approval following the issuance of local building permits. The Dayville Facility should take 12 to 16 weeks to complete.

Question No. 5

Sheet T-1 notes that, “Final utility routing to be determined/verified by the utility companies.” If the D&M Plan is approved, should the utility route significantly change post-approval, would Cellco file a D&M Plan Modification?

Response

Since the filing of the D&M Plan with the Council, Cellco representatives met with Eversource engineers at the project site. The final routing of the utilities will not change from that described in the Docket No. 469 Application. Eversource did however, ask that Cellco install a security fence around the electric transformer and utility backboard adjacent to the facility compound. Cellco’s D&M Plan has been revised accordingly. Copies of the revised D&M Plan (Rev. 3) are attached.

Question No. 6

If the D&M Plan is approved, could a final copy of the monopole and foundation design stamped by a Professional Engineer duly licensed in the State of the Connecticut be submitted prior to construction?

Response

Attached are 15 copies of the stamped tower and foundation design drawings.

Question No. 7

Sheet A-7, General Construction Sequence note #10 and Erosion Control Measures note #9 mention “paving” or “paved.” Is it correct to say that the access drive would not be paved (i.e. asphalt)? Would the existing gravel access drive require improvement with additional gravel?

Response

Correct. The access drive will not be paved. The driveway’s gravel surface will be repaired following the construction of the facility and the installation of utilities.

Question No. 8

Sheet C-2 indicates that about 139 cubic yards of cut and 8.5 cubic yards of fill would be required for the compound. Given a net amount of cut, would excess cut be hauled off site?

Response

Yes.

Question No. 9

Page 4 of the Geotechnical Evaluation of Subsurface Conditions (Geotech Report) indicates that, “The foundation shall be placed on sound bedrock and broken or foliated layers of bedrock shall be blasted, hoe-hammered, ripped, and removed until massive bedrock is found and a level base has been established.” Does Cellco anticipate that blasting would be necessary, or would Cellco utilize mechanical means to remove broken bedrock? If the D&M Plan is approved and blasting is required, would Cellco file a blasting plan with the Council?

Response

Cellco does not anticipate the need to blast bedrock to establish a level area for development of the Dayville Facility. Rock removal necessary to install the tower foundation will be completed using mechanical methods, rather than blasting.

CELLCO PARTNERSHIP

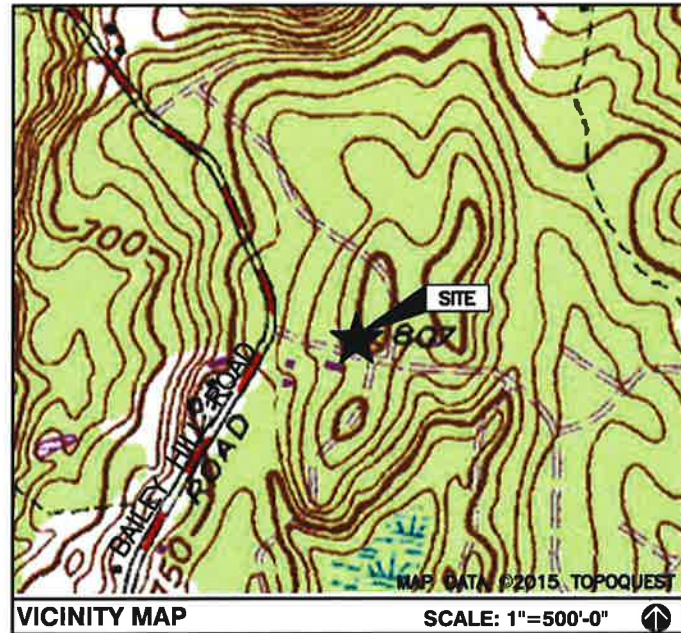
d.b.a. **verizon** ✓

WIRELESS COMMUNICATIONS FACILITY

DAYVILLE CT

DEVELOPMENT & MANAGEMENT PLAN - DOCKET NO. 469

**520 BAILEY HILL ROAD
KILLINGLY, CT 06241**



DIRECTIONS TO SITE:
 99 E RIVER DR, EAST HARTFORD, CT 06108
 HEAD NORTHEAST ON E RIVER DR
 TURN LEFT ONTO THE CT-2 E RAMP TO NORWICH
 FOLLOW I-84 E TO CT-74 E IN TOLLAND.
 MERGE ONTO I-84 E
 TAKE EXIT 69 FOR CONNECTICUT 74 TOWARD U.S. 44/WILLINGTON/PUTNAM
 TURN RIGHT ONTO CT-74 E
 TURN LEFT ONTO US-44 E
 CONTINUE STRAIGHT ONTO CT-101 E
 TURN RIGHT ONTO BAILEY HILL RD
 SLIGHT LEFT TO STAY ON BAILEY HILL RD
 TURN LEFT, 520 BAILEY HILL RD, DAYVILLE, CT 06241

CONSULTANT TEAM	
PROJECT ENGINEER	
HUDSON DESIGN GROUP, LLC 1600 OSGOOD STREET BUILDING 20 NORTH, SUITE 3090 NORTH ANDOVER, MA 01845 TEL: 1-(978)-557-5553 FAX: 1-(978)-336-5586	
MEP ENGINEER	
HUDSON DESIGN GROUP, LLC 1600 OSGOOD STREET BUILDING 20 NORTH, SUITE 3090 NORTH ANDOVER, MA 01845 TEL: 1-(978)-557-5553 FAX: 1-(978)-336-5586	

PROJECT SUMMARY	
SITE NAME:	DAYVILLE CT
SITE ADDRESS:	520 BAILEY HILL ROAD KILLINGLY, CT 06241
PROPERTY OWNER:	TRI LAKES, LLC P.O. BOX 28 WATERTOWN, CT 06795
APPLICANT:	CELLCO PARTNERSHIP d/b/a VERIZON 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
SITE ACQUISITION CONTACT:	HOLLIS REDDING STRUCTURE CONSULTING GROUP 99 EAST RIVER DRIVE, 9TH FL EAST HARTFORD, CT 06108
LEGAL/REGULATORY COUNSEL:	KENNETH C. BALDWIN ESQ. ROBINSON + COLE LLP (860)275-8345
LATITUDE:	N41° 49' 56.76"
LONGITUDE:	W71° 48' 33.23"

SHEET INDEX	
SHT. NO.	DESCRIPTION
T-1	TITLE SHEET
C-1	ABUTTERS PLAN
C-2	SITE PLAN
A-1	COMPOUND PLAN
A-2	ELEVATION
A-3	EQUIPMENT FRAME PLAN
A-4	ICE CANOPY FRAME PLAN
A-5	ICE CANOPY ELEVATIONS
A-6	CONCRETE PIER DETAILS & NOTES
A-7	SITE DETAILS
A-8	SITE SURFACE & EROSION CONTROL DETAILS

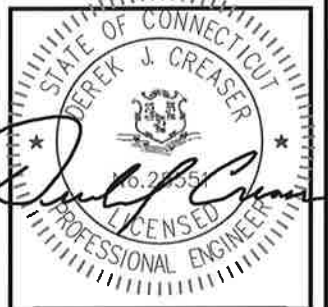
SCOPE OF WORK INFO.
VERIZON WIRELESS IS PROPOSING TO INSTALL THE FOLLOWING IMPROVEMENTS ON PROPOSED TELECOMMUNICATION SITE:
<ul style="list-style-type: none"> NEW 100'x100' FENCED/LEASE AREA ON EXISTING PARCEL OF LAND. NEW PANEL ANTENNAS: (3) ANTENNA PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (9) ANTENNAS. NEW RRHs: (3) RRHs PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (9) RRHs NEW JUNCTION BOXES: (2) JUNCTION BOX TOTAL. ITEMS LISTED ABOVE TO BE MOUNTED ON PROPOSED VERIZON MONOPOLE.
<ul style="list-style-type: none"> NEW EQUIPMENT CABINETS: (2) CABINETS WITH GENERATOR ON PROPOSED 12'x26' EQUIPMENT STEEL PLATFORM. ITEMS LISTED ABOVE TO BE INSTALLED WITHIN THE PROPOSED 100'x100' FENCED COMPOUND.
<ul style="list-style-type: none"> NEW POWER AND TELCO SERVICES WILL BE ROUTED OVERHEAD FROM EXISTING UTILITY POLE TO PROPOSED UTILITY POLE, THEN ROUTED UNDERGROUND TO PROPOSED ELECTRICAL METER AND HOFFMAN BOX ON PROPOSED H-FRAME. FINAL UTILITY ROUTING TO BE DETERMINED/VERIFIED BY UTILITY COMPANIES.

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.

verizon ✓



1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586



CHECKED BY: DJR

APPROVED BY: DPH

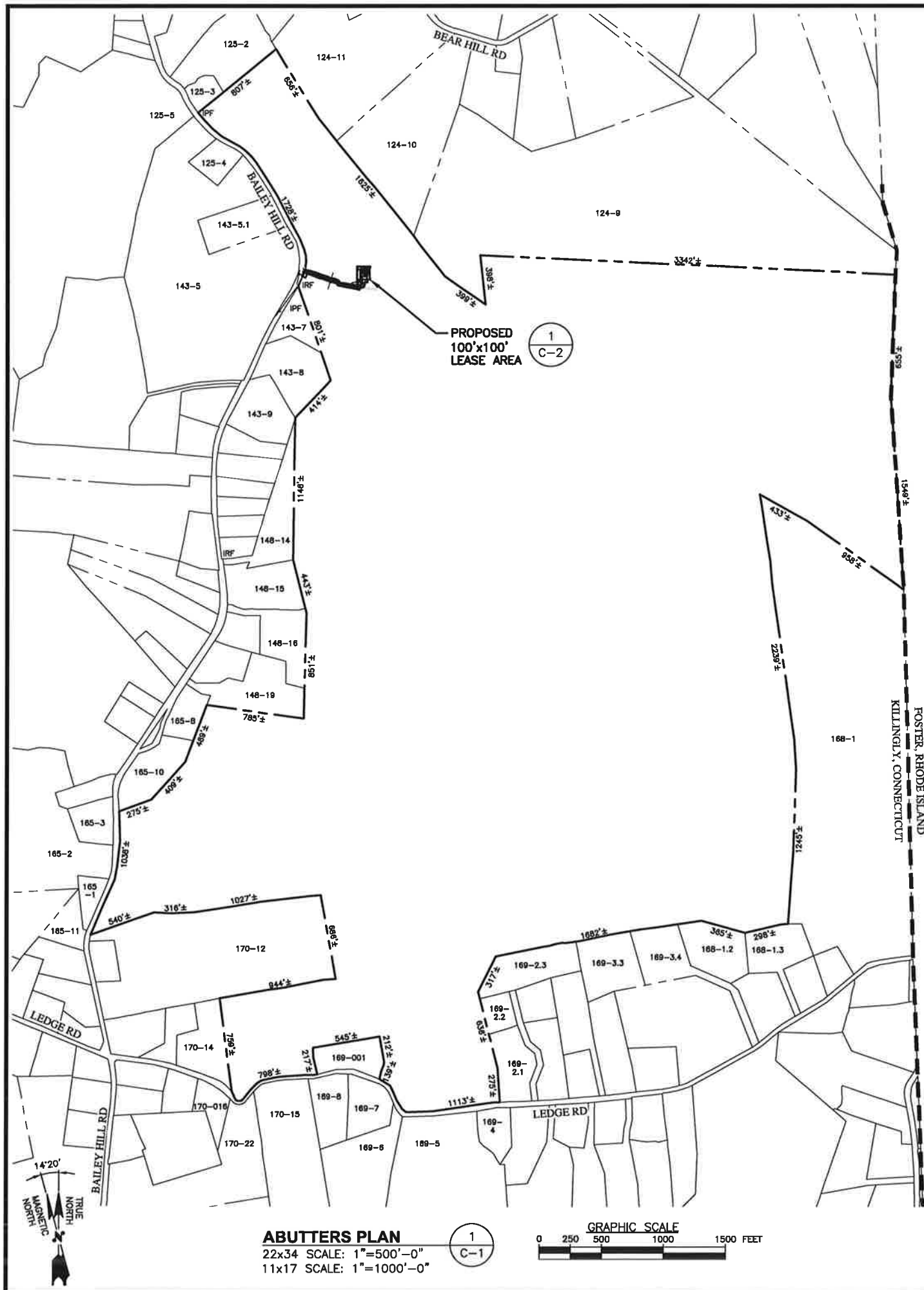
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REV.	DATE	DESCRIPTION	BY
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2	01/09/17	REVISED PER COMMENTS	SLY
1	01/09/16	REVISED PER COMMENTS	SLY
0	03/10/17	ISSUED FOR REVIEW	GC

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DAYVILLE CT

SITE ADDRESS:
520 BAILEY HILL ROAD
KILLINGLY, CT 06241

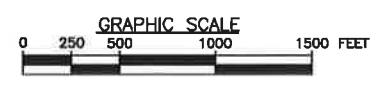
SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1



ABUTTERS PLAN
 22x34 SCALE: 1"=500'-0"
 11x17 SCALE: 1"=1000'-0"

1
C-1



ABUTTERS LIST

- 124-009
239 Bear Hill Rd
Frances E. & Robert Pechie
225 Bear Hill Rd
Dayville, CT 06241
- 124-010
199 Bear Hill Rd
Julie A. Jussaume
P.O. Box 339
Dayville, CT 06241-0339
- 124-011
189 Bear Hill Rd
Frances Pechie
225 Bear Hill Rd
Dayville, CT 06241
- 125-002
810 Bailey Hill Rd
Roland D. Jacques
810 Bailey Hill Rd
Dayville, CT 06241
- 125-003
806 Bailey Hill Rd
Theresa R. Bernier
806 Bailey Hill Rd
Dayville, CT 06241
- 125-004
779 Bailey Hill Rd
Robert, Virginia &
Susan Griswold
P.O. Box 273
East Killingly, CT
06243-0273
- 125-005
817 Bailey Hill Rd
Theresa R. Bernier
806 Bailey Hill Rd
Dayville, CT 06241
- 143-005
721 Bailey Hill Rd
Walter P. Hall, III
721 Bailey Hill Rd
Dayville, CT 06241
- 143-5.001
755 Bailey Hill Rd
Walter P. & June R. Hall
P.O. Box 48
East Killingly, CT 06243
- 143-007
724 Bailey Hill Rd
Walter P. Hall, III
721 Bailey Hill Rd
Dayville, CT 06241
- 143-008
710 Bailey Hill Rd
Larry V. & Judith Lawrence
710 Bailey Hill Rd
Dayville, CT 06241
- 143-007
688 Bailey Hill Rd
Walter E. & Debra Gene
Opperman
688 Bailey Hill Rd
Dayville, CT 06241
- 148-014
642 Bailey Hill Rd
William W. Gould, Jr.
642 Bailey Hill Rd
Dayville, CT 06241
- 148-015
630 Bailey Hill Rd
Jennifer Chapman
630 Bailey Hill Rd
Dayville, CT 06241
- 148-016
624 Bailey Hill Rd
Arthur P. & Geraldine Rickey
624 Bailey Hill Rd
Dayville, CT 06241
- 165-001
509 Bailey Hill Rd
Jean E. & Donald J. Carter
509 Bailey Hill Rd
Dayville, CT 06241
- 165-002
525 Bailey Hill Rd
Herbert A. & Karen M. Oatley
525 Bailey Hill Rd
Dayville, CT 06241
- 165-003
539 Bailey Hill Rd
Michael Oatley, Michelle Klein
& Roberta Flaherty
160 Creamery Brook Rd
Brooklyn, CT 06234
- 143-007
582 Bailey Hill Rd
David T. & Judith E. Rzucidlo
582 Bailey Hill Rd
Dayville, CT 06241
- 165-010
566 Bailey Hill Rd
Ronald J. & Judith M.
Rousselle
566 Bailey Hill Rd
Dayville, CT 06241
- 165-011
495 Bailey Hill Rd
Jason Robert & Valerie Smith
495 Bailey Hill Rd
Dayville, CT 06241
- 148-019
594 Bailey Hill Rd
David T. Rzucidlo
582 Bailey Hill Rd
Dayville, CT 06241
- 168-1
430 Ledge Rd
George M. & Starlet M. Lenth
375 Ledge Rd
Dayville, CT 06241
- 168-1.002
402 Ledge Rd
George M. & Starlet M. Lenth
375 Ledge Rd
Dayville, CT 06241
- 168-1.003
400 Ledge Rd
George M. & Starlet M. Lenth
375 Ledge Rd
Dayville, CT 06241
- 169-001
226 Ledge Rd
Timothy G. Verraneault
36 Kara Rd
Brooklyn, CT 06234
- 169-2.001
304 Ledge Rd
Paul J. & Erin A. Romani
304 Ledge Rd
Dayville, CT 06241
- 165-008
306 Ledge Rd
Eric M. Quirn
306 Ledge Rd
Dayville, CT 06241
- 169-2.003
308 Ledge Rd
Jeffrey Ferron
308 Ledge Rd
Dayville, CT 06241
- 169-3.003
390 Ledge Rd
George M. & Starlet M. Lenth
375 Ledge Rd
Dayville, CT 06241
- 169-3.004
386 Ledge Rd
George M. & Starlet M. Lenth
375 Ledge Rd
Dayville, CT 06241
- 169-004
295 Ledge Rd
Todd & Justin Loomis
265 Ledge Rd
Dayville, CT 06241
- 169-005
275 Ledge Rd
Harold J. & Patricia S.
Swaine
255 Ledge Rd
Dayville, CT 06241
- 169-006
255 Ledge Rd
Wendy L. Brennan
255 Ledge Rd
Dayville, CT 06241
- 169-007
247 Ledge Rd
Harold J. & Patricia S.
Swaine
255 Ledge Rd
Dayville, CT 06241
- 169-008
225 Ledge Rd
Susan E. Erskine
P.O. Box 606
Dayville, CT 06241-0606
- 170-012
476 Bailey Hill Rd
Gabrielle Labonte
P.O. Box 709
Brooklyn, CT 06234
- 170-014
172 Ledge Rd
Joseph G. Keller, Jr.
172 Ledge Rd
Dayville, CT 06241
- 170-015
203 Ledge Rd
Susan E. Erskine
P.O. Box 606
Dayville, CT 06241-0606
- 170-016
181 Ledge Rd
Robert J. Gifford &
Elaine E. Nusser
181 LEDGE Rd
Dayville, CT 06241
- 170-022
408 Bailey Hill Rd
Thomas Cader
408 Bailey Hill Rd
Killingly, CT 06239

SOURCE:
 NORTHEAST SURVEY CONSULTANTS, ABUTTERS PLAN
 AND EXISTING CONDITIONS DATED 8/26/15

SITE SPECIFIC NOTES:
 1. VERIFY AZIMUTHS W/ RF ENGINEER.

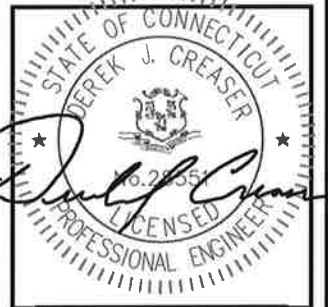
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	PROPERTY LINE-ABUTTERS
	STATE LINE
	CONTOUR LINE
	DELINEATED WETLAND LINE
	(E) BUILDING
	ASSESSORS MAP-BLOCK-LOT NO.
	(E) TREE LINE

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



1600 OSGOOD STREET
 BUILDING 20 NORTH, SUITE 3090 N. ANDOVER, MA 01845
 TEL: (978) 557-5553
 FAX: (978) 336-5586



CHECKED BY: DJR

APPROVED BY: DPH

SUBMITTALS

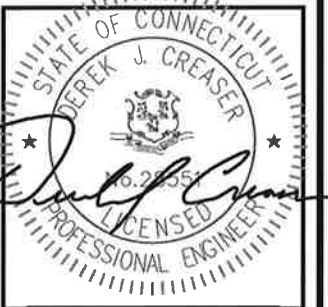
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2	01/09/17	REVISED PER COMMENTS	SLY
1	01/09/16	REVISED PER COMMENTS	SLY
0	03/10/17	ISSUED FOR REVIEW	GC

SITE NAME:
DAYVILLE CT

SITE ADDRESS:
 520 BAILEY HILL ROAD
 KILLINGLY, CT 06241

SHEET TITLE
ABUTTERS PLAN

SHEET NUMBER
C-1



CHECKED BY: DJR

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
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2	01/09/17	REVISED PER COMMENTS	SLY
1	01/09/16	REVISED PER COMMENTS	SLY
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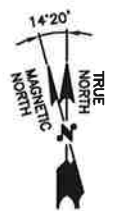
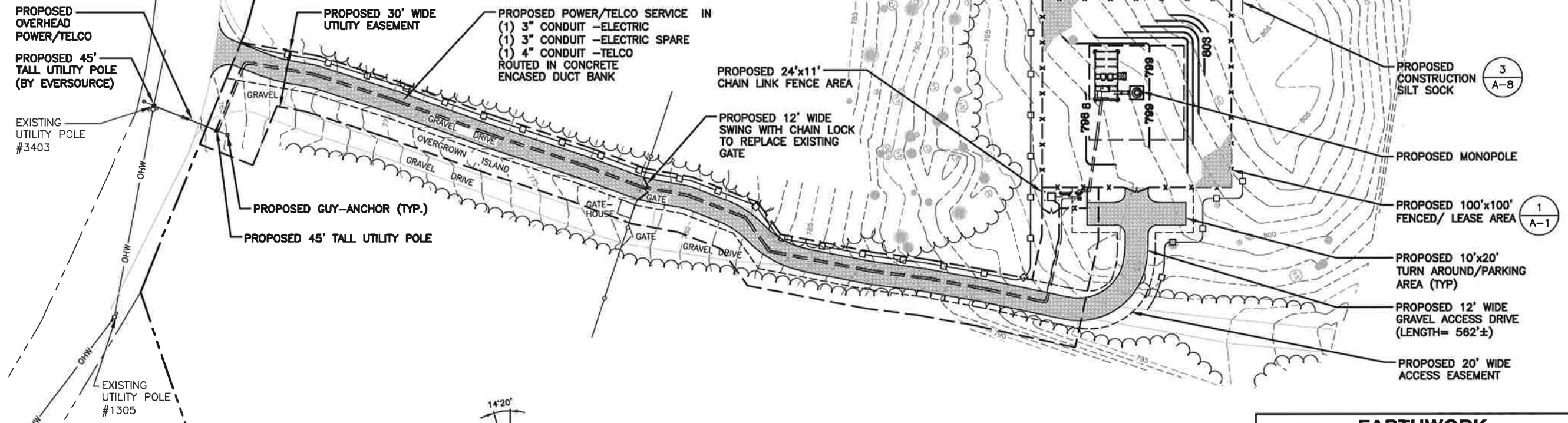
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DAYVILLE CT

SITE ADDRESS:
520 BAILEY HILL ROAD
KILLINGLY, CT 06241

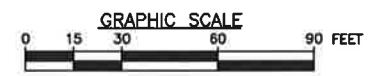
SHEET TITLE
SITE PLAN

SHEET NUMBER
C-2

LOCUS
143-6
520 BAILEY HILL ROAD
N/F
TRI LAKES, LLC
P.O. BOX 28
WATERTOWN, CT 06795
DEED 753-204
PLAN HF48A
AREA = 648 AC. ±



SITE PLAN
22x34 SCALE: 1"=30'-0"
11x17 SCALE: 1"=60'-0"



EARTHWORK:

APPROXIMATE VOLUME OF CUT WITHIN COMPOUND:	138.64 CU YD
APPROXIMATE VOLUME OF FILL WITHIN COMPOUND:	8.48 CU YD
APPROXIMATE # OF TREES TO BE REMOVED >/=6" DBH:	2
TOTAL IMPACT AREA OF THE DISTURBED CONSTRUCTION SITE:	11,313.6 ± SQ. FT. OR 0.26± ACRE

LEGEND:

	PROPERTY LINE-SUBJECT PARCEL
	PROPERTY LINE-ABUTTERS
	STATE LINE
	CONTOUR LINE
	DELINEATED WETLAND LINE
	(E) BUILDING
	ASSESSORS MAP-BLOCK-LOT NO.
	(E) TREE LINE

CHECKED BY: DJR

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
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2	01/06/17	REVISED PER COMMENTS	SKY
1	01/09/16	REVISED PER COMMENTS	SKY
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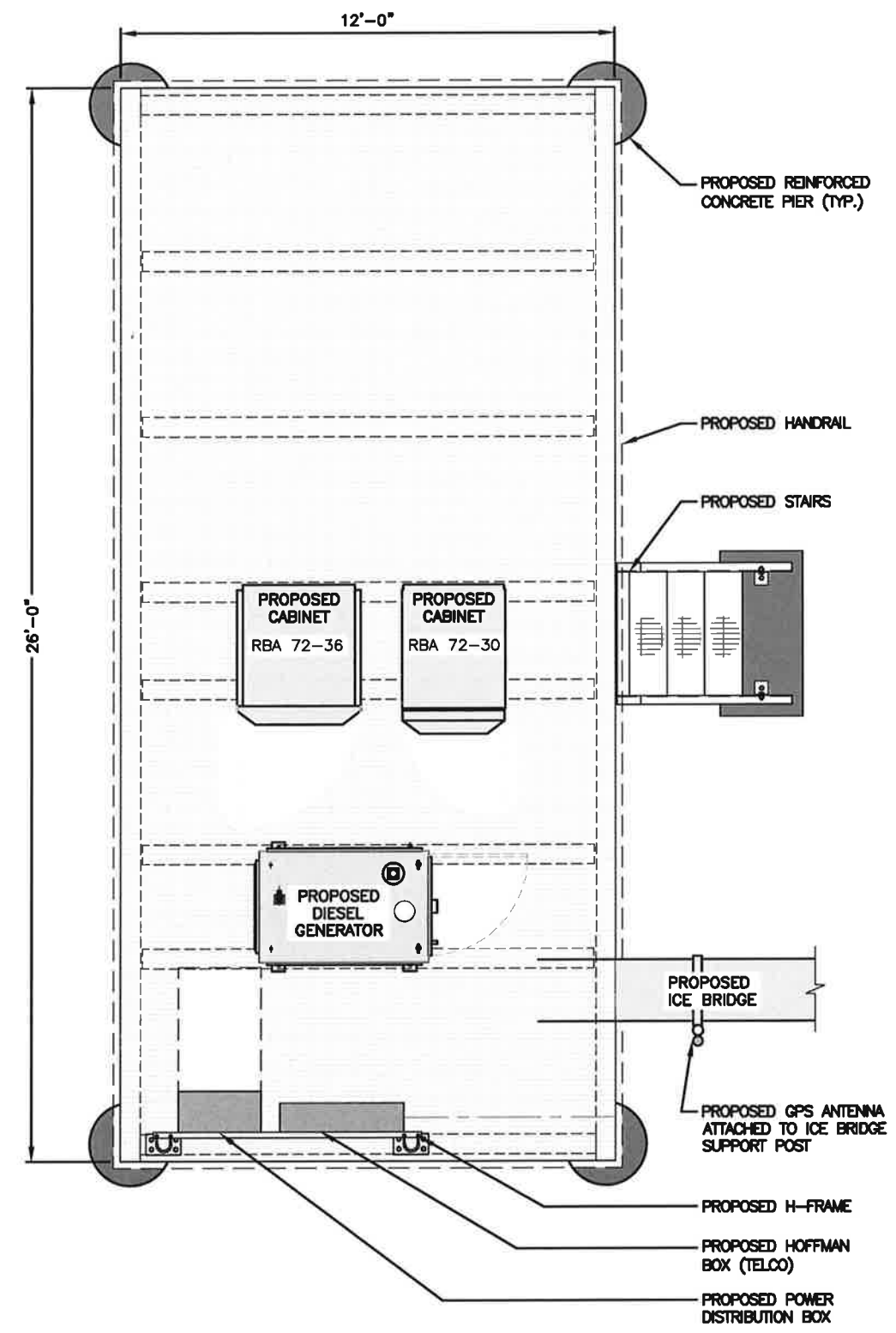
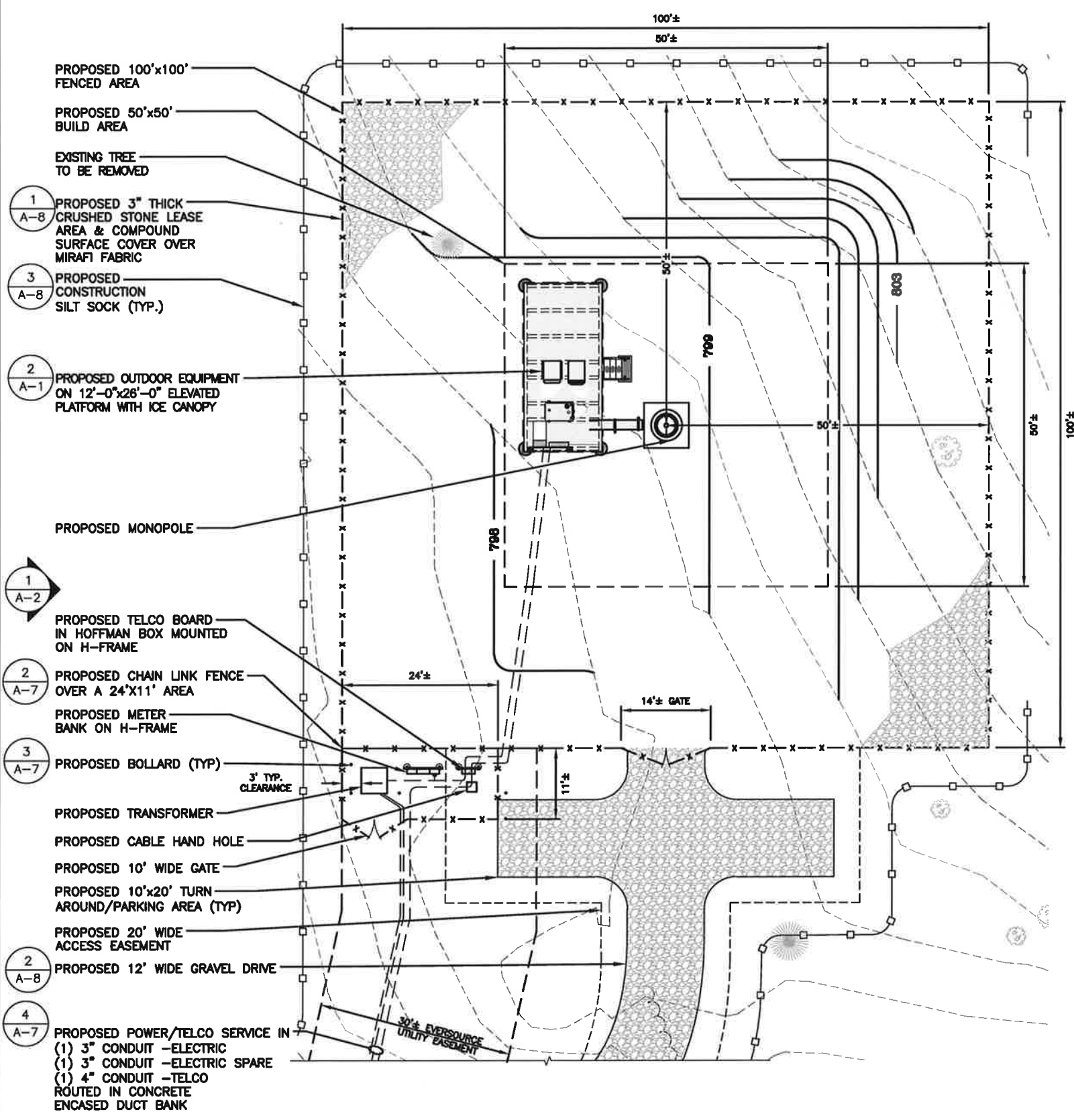
SITE NAME:
DAYVILLE CT

SITE ADDRESS:
520 BAILEY HILL ROAD
KILLINGLY, CT 06241

SHEET TITLE
COMPOUND PLAN

SHEET NUMBER

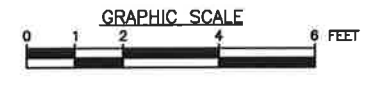
A-1



COMPOUND PLAN
22x34 SCALE: 1"=10'-0"
11x17 SCALE: 1"=20'-0"



EQUIPMENT PLAN
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"



PROPOSED ANTENNA INFORMATION

SECTOR	STATUS	AZIMUTH	CABLE LENGTH
ALPHA	PROPOSED	0	206'
BETA	PROPOSED	190	206
GAMMA	PROPOSED	280	206

NOTE: CABLE LENGTH = EXACT LENGTH PLUS 25'

NOTE:

1. PROPOSED NEW TOWER AND FOUNDATION DESIGN BY OTHERS
2. VERIFY AZIMUTHS W/ RF ENGINEER.

TOWER NOTES:

- 1.) TOWER ELEVATION IS SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL REFER TO TOWER MANUFACTURER DRAWINGS FOR COMPLETE INSTALLATION AND BILL OF MATERIAL INFORMATION.
- 2.) TOWER MINIMUM DESIGN SPECIFICATIONS SHALL BE IN ACCORDANCE WITH ANSI/TIA/EIA 222-G "STRUCTURAL STANDARDS FOR SUPPORTING STRUCTURES AND ANTENNAS, REVISION G" AND GOVERNING FEDERAL, STATE, AND LOCAL CODE REQUIREMENTS
- 3.) TOWER MANUFACTURER SHALL BE RESPONSIBLE FOR DESIGN AND STRUCTURAL COMPONENTS OF THE TOWER.
- 4.) FINAL UTILITY CONNECTIONS SHALL BE COORDINATED WITH THE LOCAL UTILITIES.

TOP OF PROPOSED MONOPOLE
ELEV: 150'-0" ± (AGL)
ELEV: 949'-0" ± (AMSL)

Q OF PROPOSED ANTENNAS
ELEV: 150'-0" ± (AGL)
ELEV: 949'-0" ± (AMSL)

TOP OF PROPOSED ANTENNAS
ELEV: 153'-0" ± (AGL)
ELEV: 952'-0" ± (AMSL)

PROPOSED PANEL ANTENNAS MOUNTED TO PLATFORM FRAME (3 PER SECTOR, TOTAL OF 9)

PROPOSED JUNCTION BOX MOUNTED PIPE MATST (TYP. OF 2)

PROPOSED RRH MOUNTED BEHIND ANTENNA (3 PER SECTOR, TOTAL OF 9)

PROPOSED MONOPOLE

PROPOSED RRH MOUNTED TO ANTENNA PIPE MAST (TYP. 3 PER SECTOR, TOTAL OF 9)

PROPOSED LOW PROFILE PLATFORM WITH HANDRAIL (VALMONT #MC-PKK12S4-B OR APPROVED EQUAL)

PROPOSED OUTDOOR EQUIPMENT ON 12'-0"x26'-0" ELEVATED PLATFORM WITH ICE CANOPY

GROUND LEVEL
ELEV: 0'-0" ± (AGL)
ELEV: 799'-0" ± (AMSL)

WEST ELEVATION

22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"

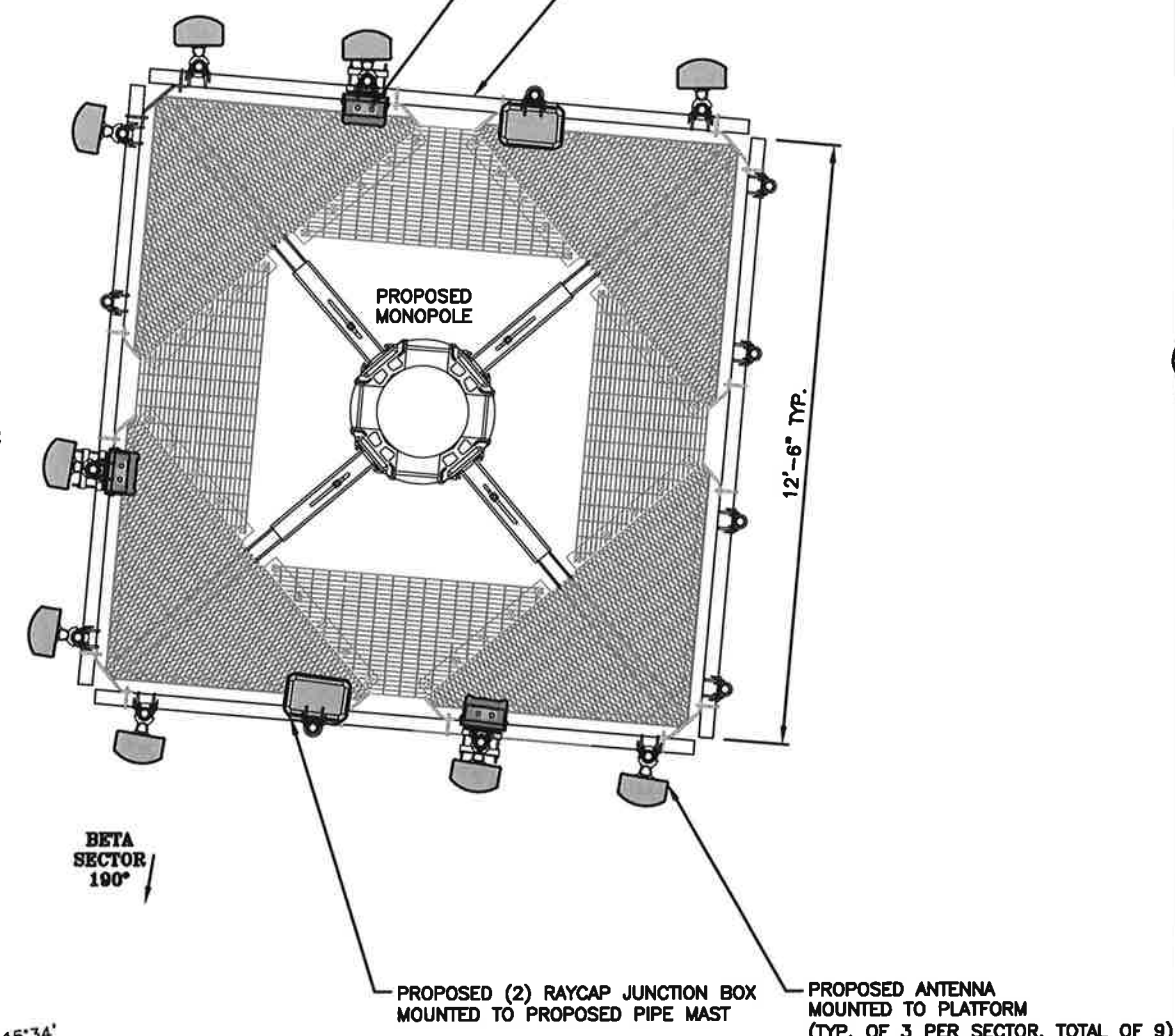
1
A-2



GAMMA SECTOR 280°

BETA SECTOR 190°

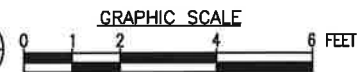
ALPHA SECTOR 0°



ANTENNA, RRH & JUNCTION BOX PLAN

22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

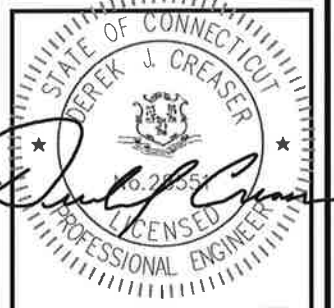
2
A-2



PREPARED FOR: CELCO PARTNERSHIP D.B.A.



1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586



CHECKED BY: DJR

APPROVED BY: DPH

SUBMITTALS

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SITE NAME:
DAYVILLE CT

SITE ADDRESS:
520 BAILEY HILL ROAD
KILLINGLY, CT 06241

SHEET TITLE

ELEVATION

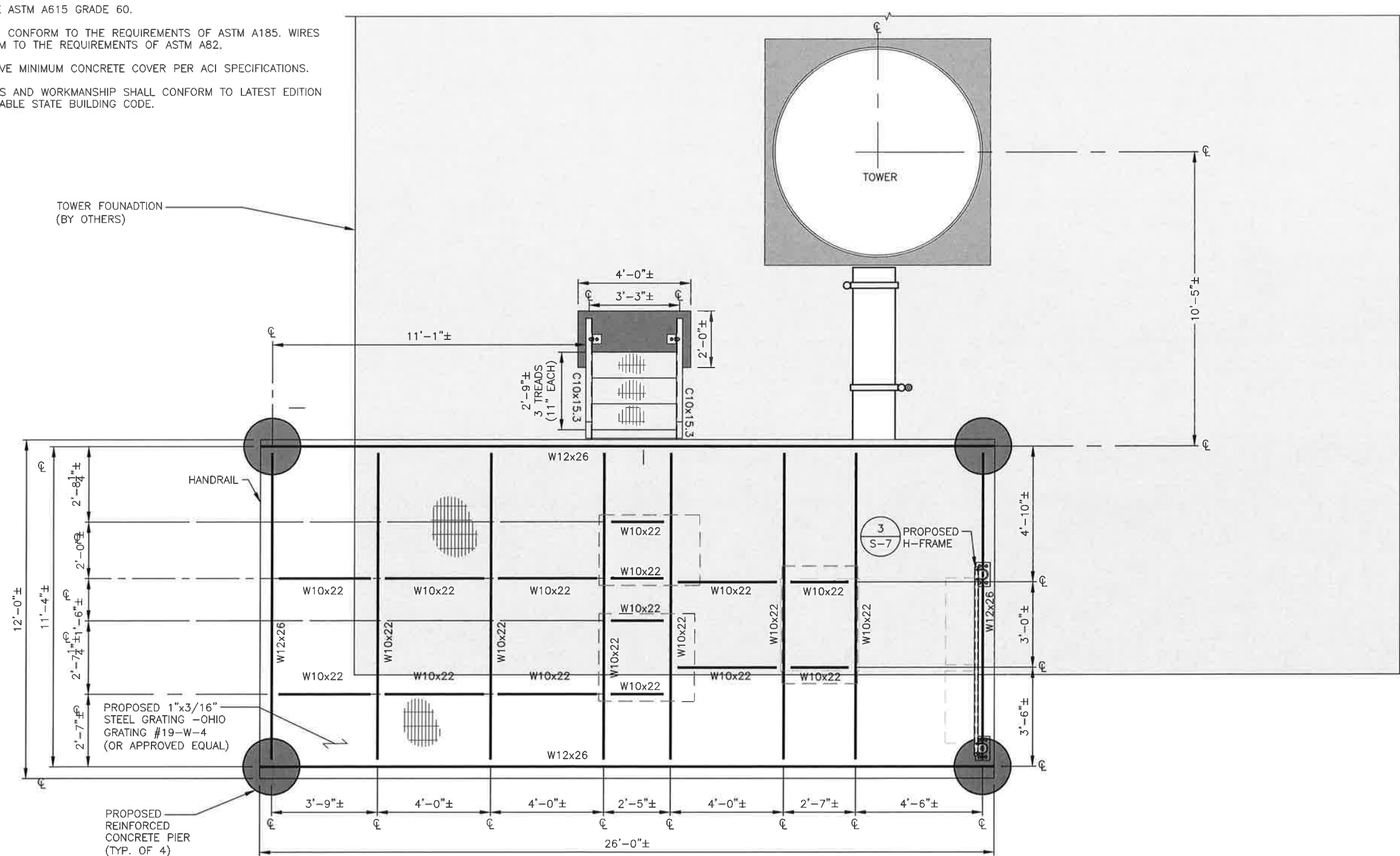
SHEET NUMBER

A-2

FOUNDATION NOTES & CONCRETE SPECIFICATIONS:

- FOUNDATION AREA SHALL BE EXCAVATED TO THE DEPTH AND DIMENSIONS SHOWN ON THE PLANS. EXISTING LEDGE AND ALL OTHER EXISTING UNSUITABLE MATERIAL SHALL BE REMOVED AND LEGALLY DISPOSED OF OFF-SITE. THE SUBGRADE SHALL BE ROLLED WITH A 1-TON, VIBRATORY, WALK-BEHIND ROLLER AT A SPEED OF LESS THAN 2 FPS, 6 PASSES MINIMUM, TO PROVIDE UNYIELDING SURFACE.
- UNDERCUT SOFT OR "WEAVING" AREAS A MINIMUM OF 12 INCHES DEEP. BACKFILL UNDERCUT AREA WITH FILL MEETING THE SPECIFICATIONS OF STRUCTURAL FILL.
- CONCRETE TO HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH (f'_c)=4000 psi. CONCRETE TO BE AIR ENTRAINED, DESIRED AIR CONTENT TO BE 6% (PLUS OR MINUS 2%)
- REINFORCING BAR TO BE ASTM A615 GRADE 60.
- WELDED WIRE FABRIC TO CONFORM TO THE REQUIREMENTS OF ASTM A185. WIRES FOR FABRIC TO CONFORM TO THE REQUIREMENTS OF ASTM A82.
- ALL REINFORCING TO HAVE MINIMUM CONCRETE COVER PER ACI SPECIFICATIONS.
- ALL CONCRETE MATERIALS AND WORKMANSHIP SHALL CONFORM TO LATEST EDITION OF ACI 318 AND APPLICABLE STATE BUILDING CODE.

NOTES:
 1. ALL CONNECTIONS TO BE SHOP WELDED & FIELD BOLTED USING 3/4"Ø A325-X BOLTS, UNLESS OTHERWISE NOTIFIED.
 2. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED BEFORE ORDERING MATERIAL.



STEEL PLATFORM FRAME PLAN 1
 22x34 SCALE: 1/2"=1'-0"
 11x17 SCALE: 1/4"=1'-0"
 GRAPHIC SCALE 0 1 2 4 6 FEET

PREPARED FOR: CELCO PARTNERSHIP D.B.A.



Hudson Design Group LLC

1600 OSGOOD STREET
 BUILDING 20 NORTH, SUITE 3090
 N. ANDOVER, MA 01845

TEL: (978) 557-5553
 FAX: (978) 336-5586



CHECKED BY: DJR
 APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	03/13/17	REVISED PER COMMENTS	SLY
2	01/09/17	REVISED PER COMMENTS	SLY
1	01/09/16	REVISED PER COMMENTS	SLY
0	03/10/17	ISSUED FOR REVIEW	GC

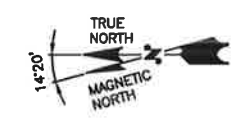
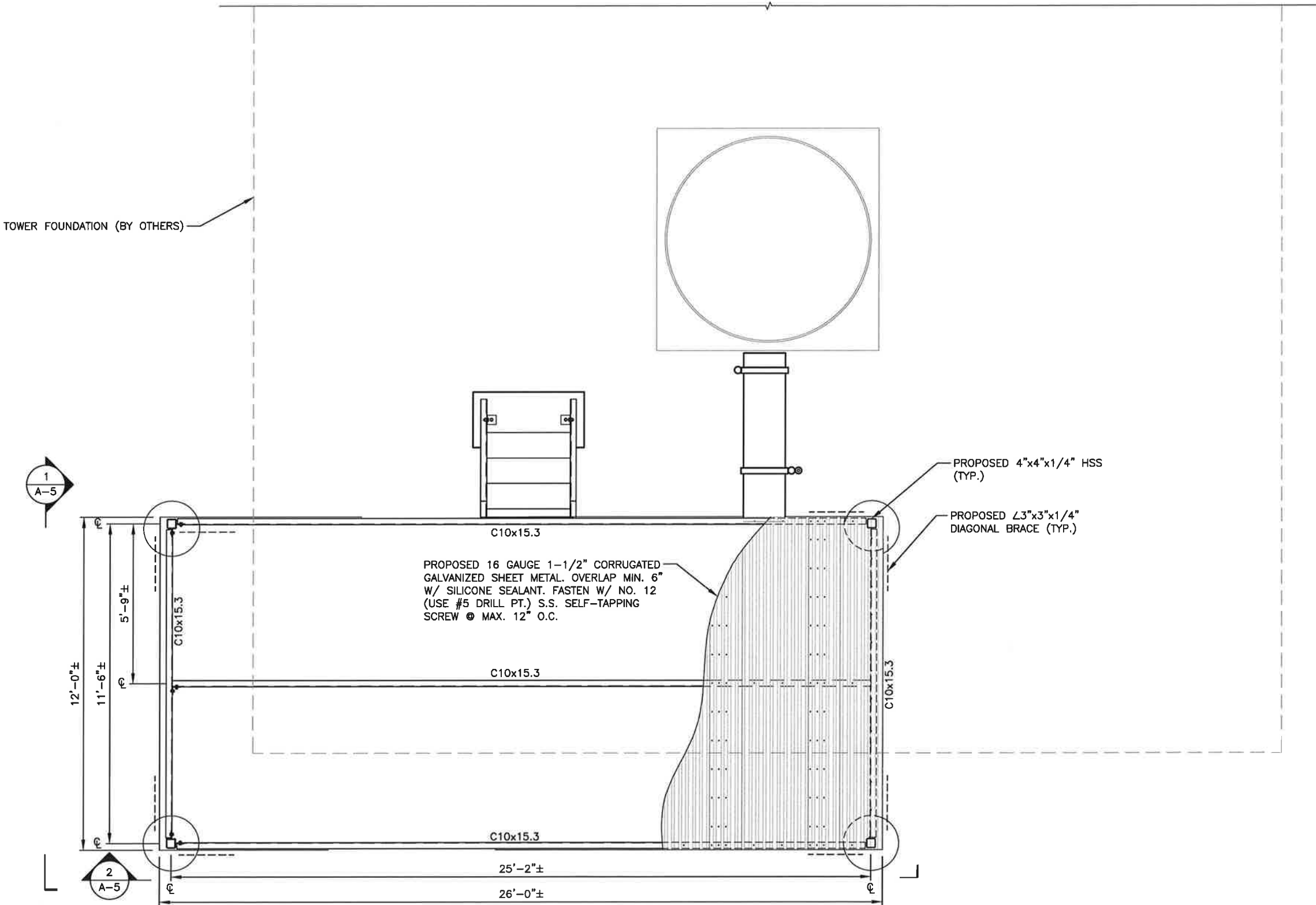
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DAYVILLE CT

SITE ADDRESS:
 520 BAILEY HILL ROAD
 KILLINGLY, CT 06241

SHEET TITLE
EQUIPMENT FRAME PLAN

SHEET NUMBER
A-3

NOTES:
 1. ALL CONNECTIONS TO BE SHOP WELDED & FIELD BOLTED USING 3/4"Ø A325-X BOLTS, UNLESS OTHERWISE NOTIFIED.
 2. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED BEFORE ORDERING MATERIAL.



ICE CANOPY FRAME PLAN 1 A-4
 22x34 SCALE: 1/2"=1'-0"
 11x17 SCALE: 1/4"=1'-0"
 GRAPHIC SCALE 0 1 2 4 6 FEET

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



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CHECKED BY: DJR

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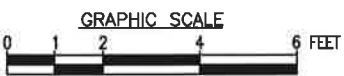
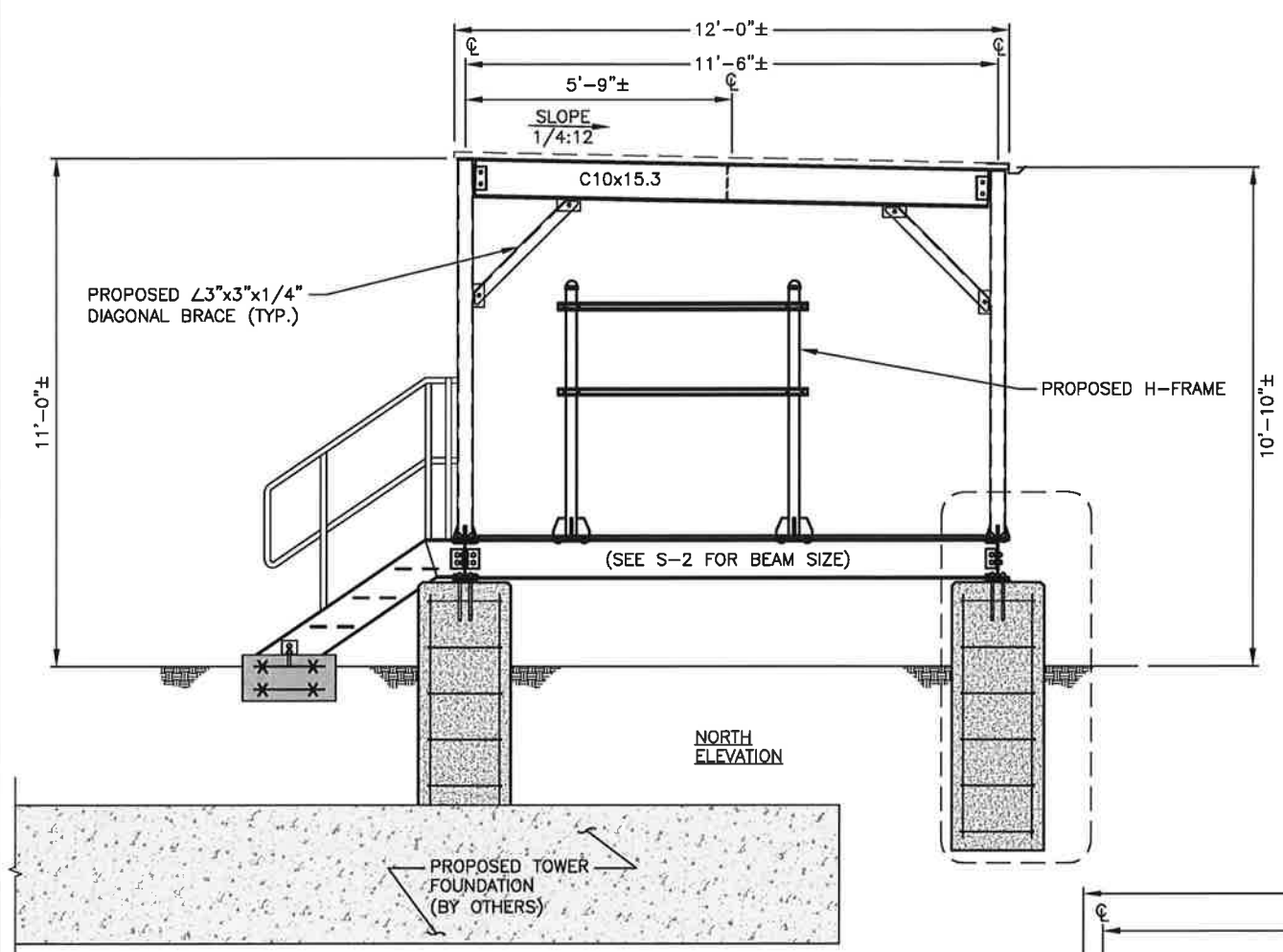
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DAYVILLE CT

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 KILLINGLY, CT 06241

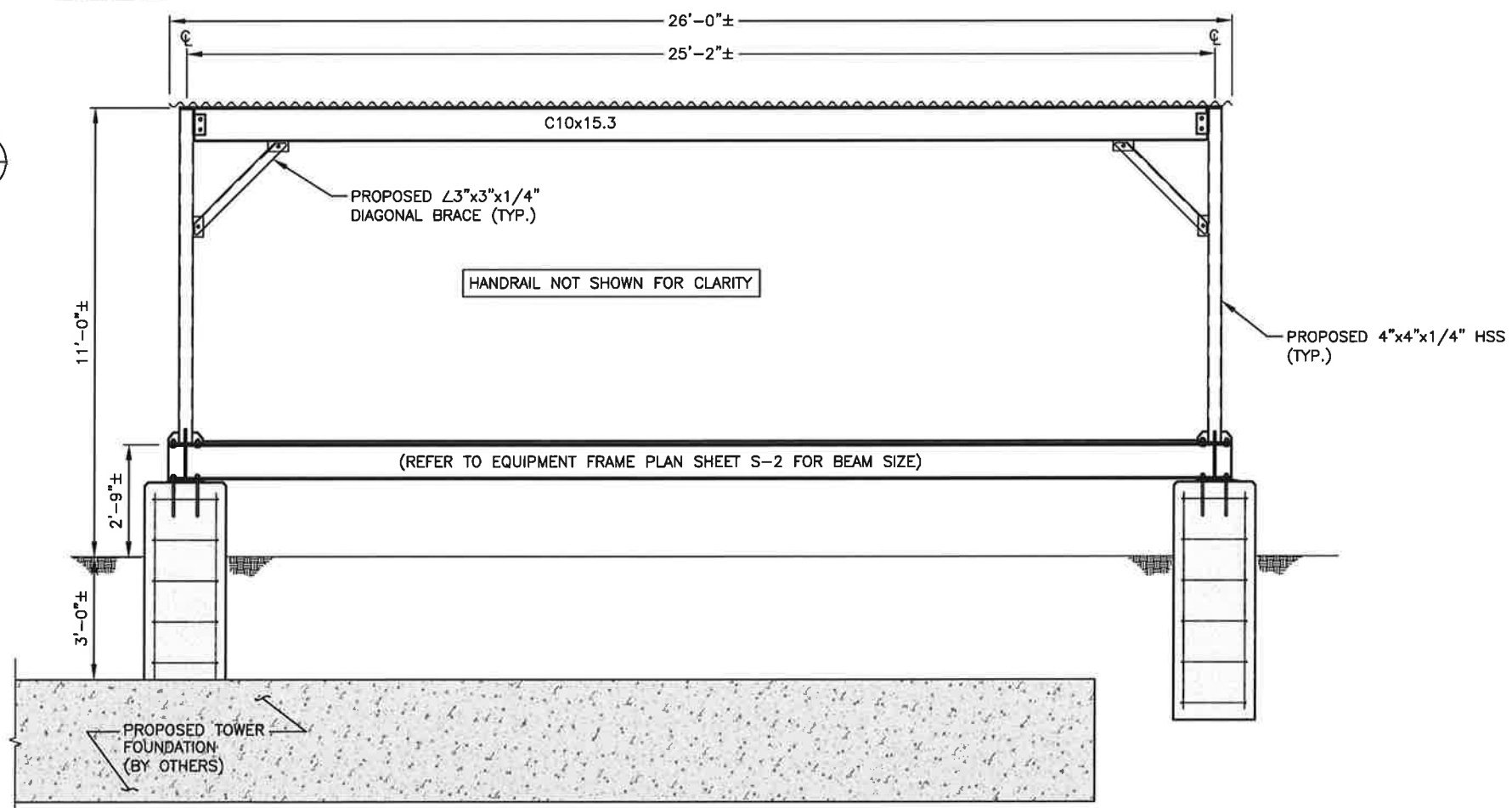
SHEET TITLE
ICE CANOPY FRAME PLAN

SHEET NUMBER
A-4

NOTES:
 1. ALL CONNECTIONS TO BE SHOP WELDED & FIELD BOLTED USING 3/4"Ø A325-X BOLTS, UNLESS OTHERWISE NOTIFIED.
 2. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED BEFORE ORDERING MATERIAL.



EQUIPMENT FRAME ELEVATION 1
 22x34 SCALE: 1/2"=1'-0"
 11x17 SCALE: 1/4"=1'-0"
 A-5



EQUIPMENT FRAME ELEVATION 2
 22x34 SCALE: 1/2"=1'-0"
 11x17 SCALE: 1/4"=1'-0"
 A-5

PREPARED FOR: CELCO PARTNERSHIP D.B.A.



1400 OSGOOD STREET
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SITE NAME:
DAYVILLE CT

SITE ADDRESS:
 520 BAILEY HILL ROAD
 KILLINGLY, CT 06241

SHEET TITLE
ICE CANOPY ELEVATIONS

SHEET NUMBER
A-5



CHECKED BY: DJR

APPROVED BY: DPH

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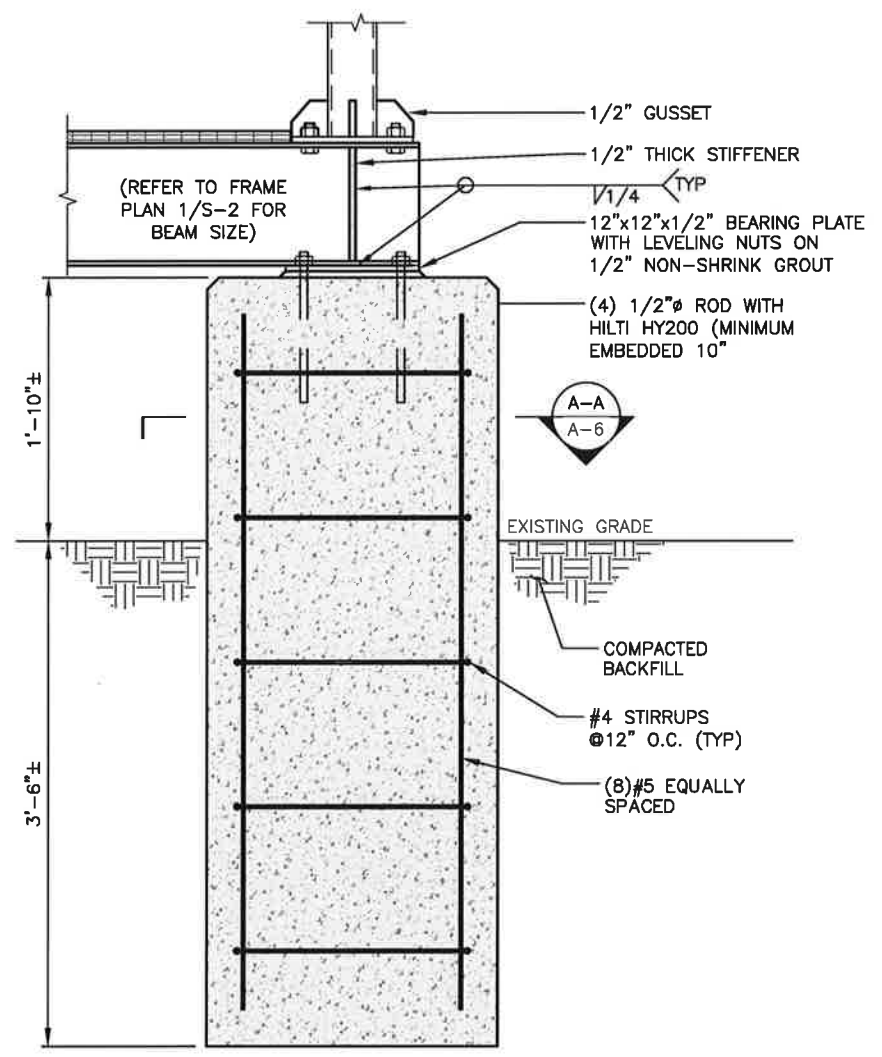
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SITE ADDRESS:
520 BAILEY HILL ROAD
KILLINGLY, CT 06241

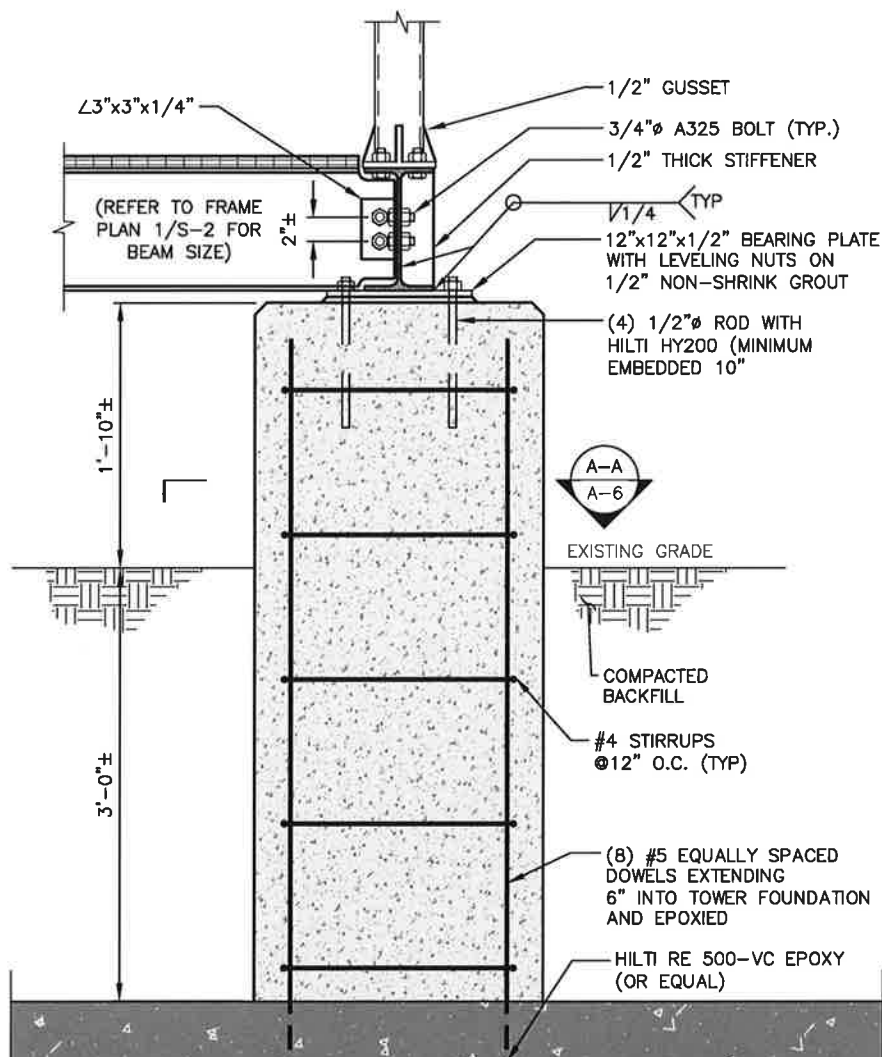
SHEET TITLE
CONCRETE PIER DETAILS

SHEET NUMBER

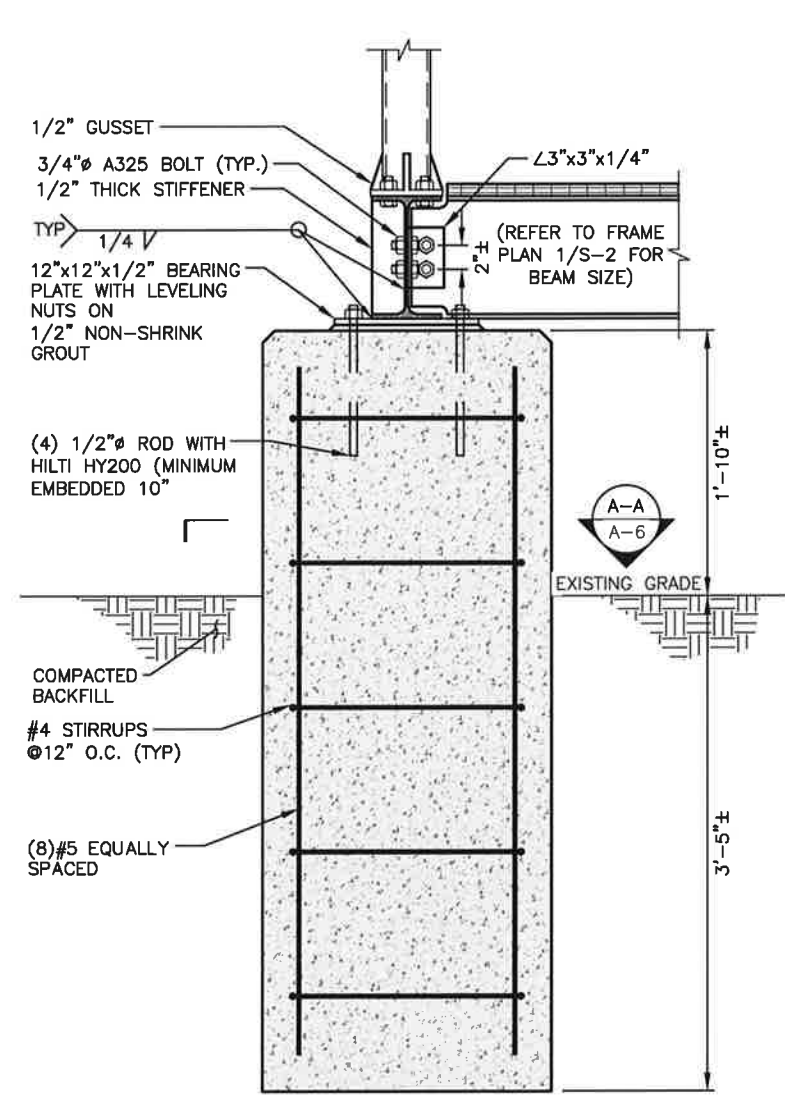
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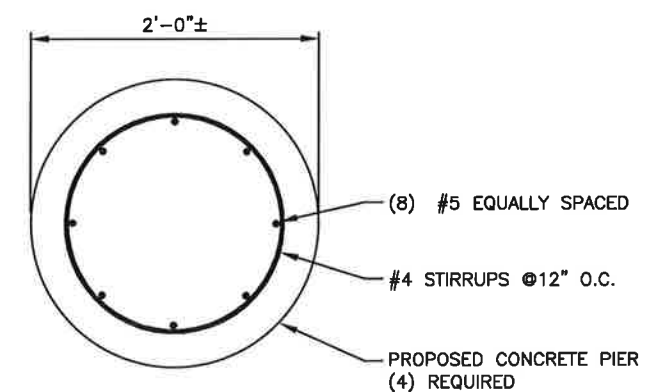
REINFORCED PIER DETAIL (LONG SECTION) 1
22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"
GRAPHIC SCALE: 0 0'-4" 0'-8" 1'-4" 2'-0"



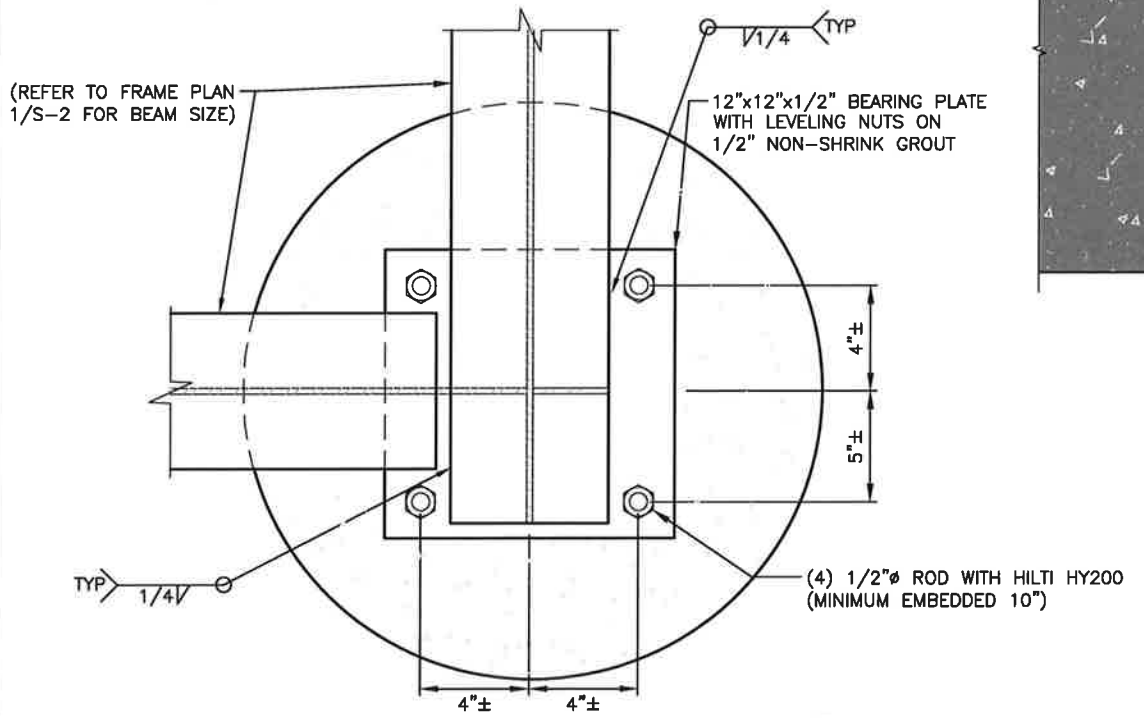
REINFORCED PIER SECTION ON TOWER FOUNDATION 2
22x34 SCALE: 3"=1'-0"
11x17 SCALE: 1-1/2"=1'-0"
GRAPHIC SCALE: 0 0'-2" 0'-4" 0'-8" 1'-0"



REINFORCED PIER DETAIL (CROSS SECTION) 3
22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"
GRAPHIC SCALE: 0 0'-4" 0'-8" 1'-4" 2'-0"



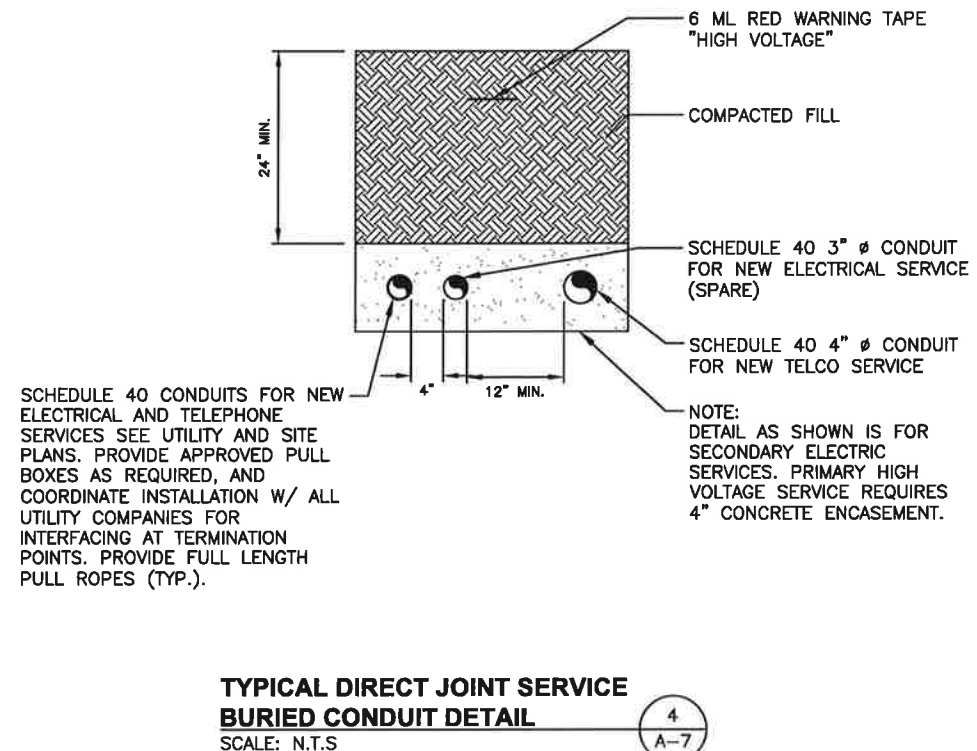
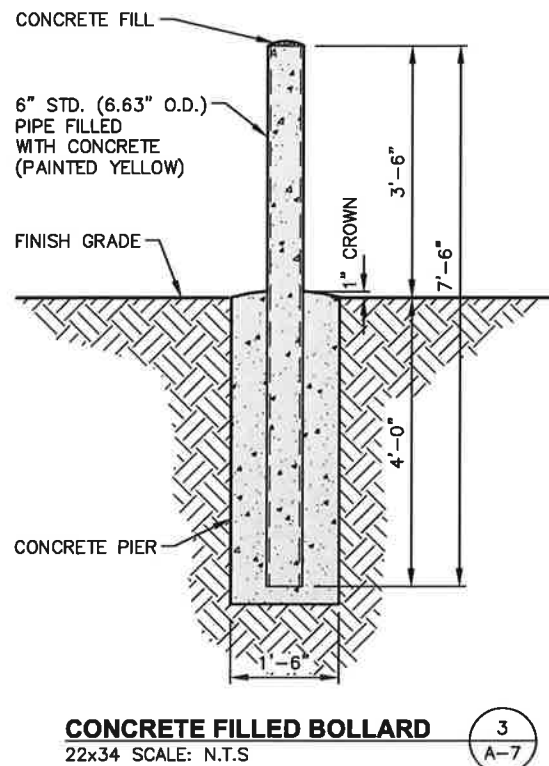
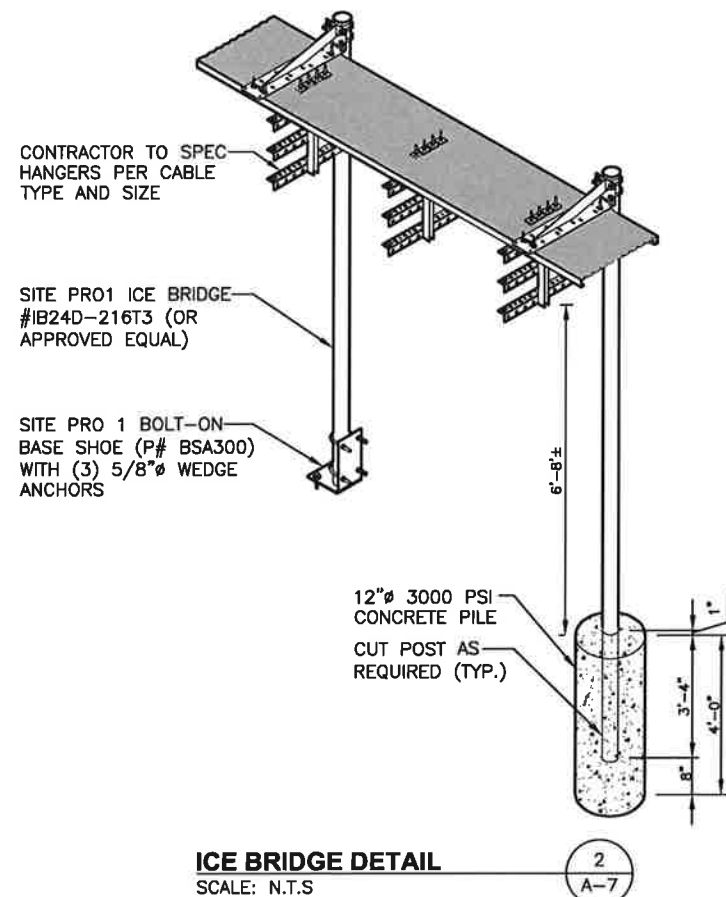
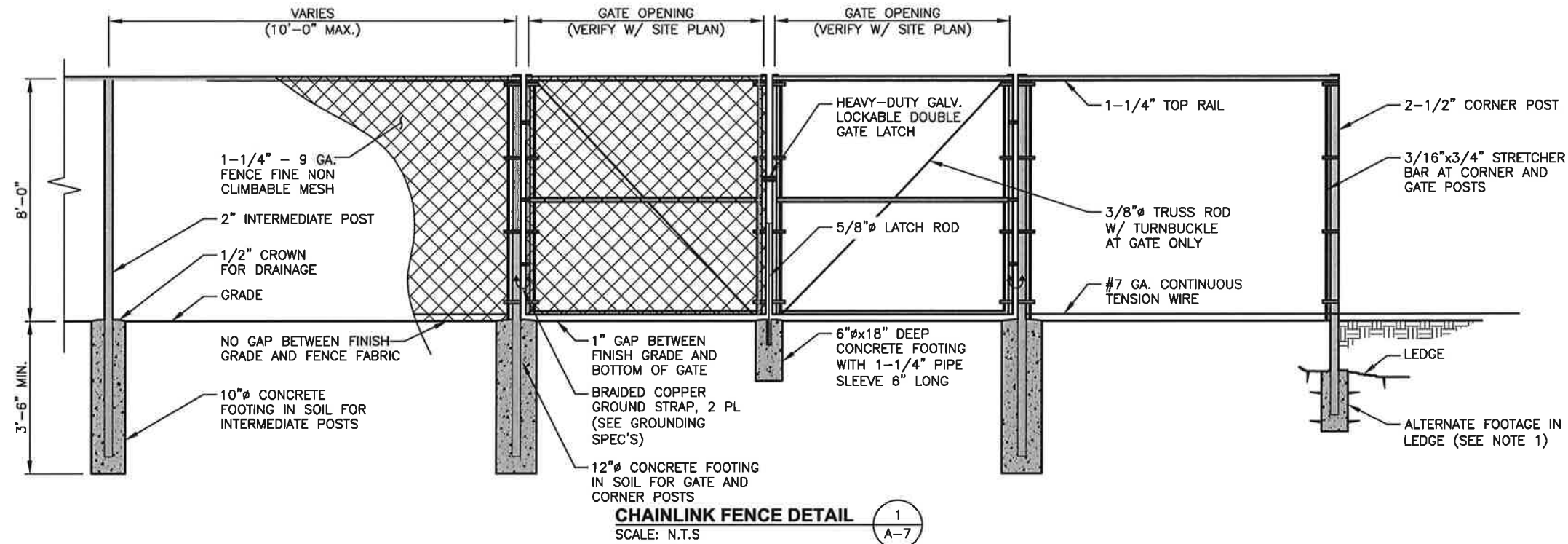
SECTION A-A CONCRETE PIER SECTION A-A A-6
22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"
GRAPHIC SCALE: 0 0'-4" 0'-8" 1'-4" 2'-0"



FRAME CONNECTION SECTION AT PIERS 3
22x34 SCALE: 3"=1'-0"
11x17 SCALE: 1-1/2"=1'-0"
GRAPHIC SCALE: 0 0'-2" 0'-4" 0'-8" 1'-0"

FENCE NOTES

1. ALTERNATE FOOTINGS FOR ALL FENCE POSTS IN LEDGE: IF LEDGE IS ENCOUNTERED AT GRADE, OR AT A DEPTH SHALLOWER THAN 3'-6", CORE DRILL AN 8" DIA HOLE 18" INTO THE LEDGE. CENTER POST IN THE HOLE AND FILL WITH CONCRETE OR GROUT. IF LEDGE IS BELOW FINISH GRADE, COAT BACKFILLED SECTION OF POST WITH COAL TAR, AND BACKFILL WITH WELL-DRAINING GRAVEL.
2. ATTACH EACH GATE WITH 1-1/2" PAIR OF NON-LIFT-OFF TYPE, MALLEABLE IRON OR FORGING, PIN-TYPE HINGES. ASSEMBLIES SHALL ALLOW FOR 180° OF GATE TRAVEL.



SUBMITTALS

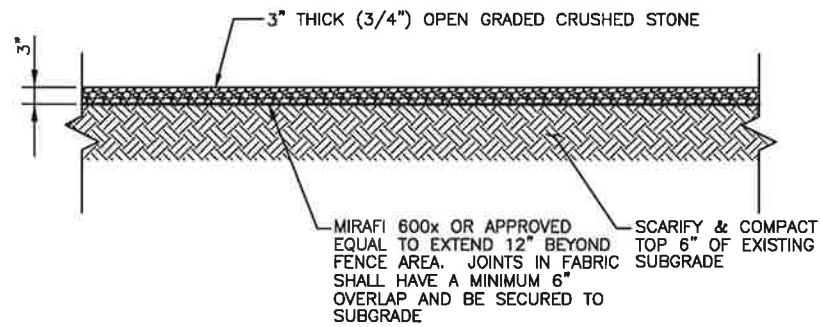
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SITE NAME:
DAYVILLE CT

SITE ADDRESS:
520 BAILEY HILL ROAD
KILLINGLY, CT 06241

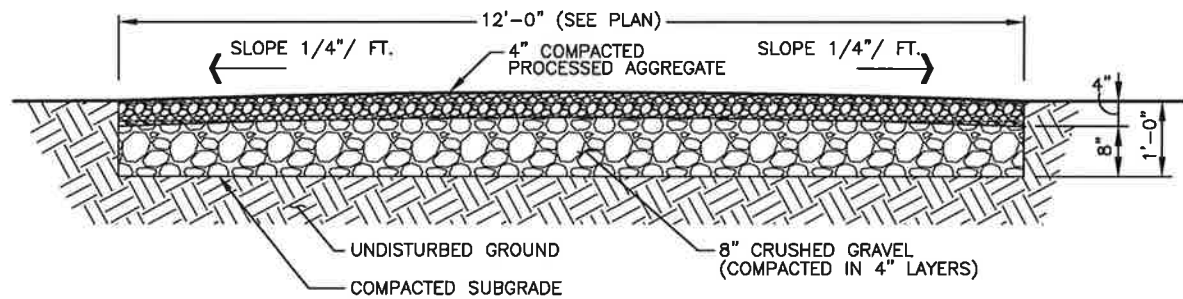
SHEET TITLE
SITE DETAILS

SHEET NUMBER
A-7

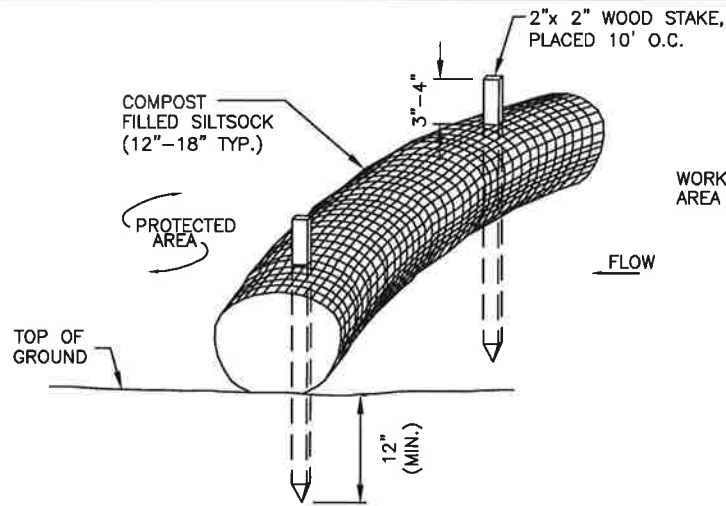


COMPOUND SURFACE DETAIL 1
 22x34 SCALE: 1"=1'-0"
 11x17 SCALE: 1/2"=1'-0" A-B

CRUSHED GRAVEL		PROCESSED AGGREGATE	
SIEVE	% PASSING BY WEIGHT	SIEVE	% PASSING BY WEIGHT
5"	100	2 1/4"	100
3 1/2"	90-100	2"	95-100
1 1/2"	55-95	3/4"	50-75
1/4"	25-60	1/4"	25-45
#10	15-45	#40	5-20
#40	5-25	#100	2-12
#100	0-10		
#200	0-5		



GRAVEL ACCESS DRIVE 2
 SCALE: N.T.S. A-B



SILT SOCK DETAIL 3
 SCALE: N.T.S. A-B

NOTES:

- SILT SOCK SHALL BE FILTREXX SILT SOCK, OR APPROVED EQUAL.
- COMPOST MATERIAL SHALL BE DISPERSED ON SITE, AS DETERMINED BY THE ENGINEER.
- SILT SOCK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS, AND REPAIR OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.
- SEE SPECIFICATIONS FOR SOCK SIZE, AND COMPOST FILL, REQUIREMENTS.

GENERAL CONSTRUCTION SEQUENCE:

THIS IS A GENERAL CONSTRUCTION SEQUENCE OUTLINE SOME ITEMS OF WHICH MAY NOT APPLY TO PARTICULAR SITES.

- CLEAR AND GRUB AREAS OF PROPOSED CONSTRUCTION.
- INSTALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES AS REQUIRED.
- REMOVE AND STOCKPILE TOPSOIL. STOCKPILE SHALL BE SEEDED TO PREVENT EROSION.
- CONSTRUCT CLOSED DRAINAGE SYSTEM. PROTECT CULVERT INLETS AND CATCH BASINS WITH SEDIMENTATION BARRIERS.
- CONSTRUCT ROADWAYS AND PERFORM SITE GRADING, PLACING HAY BALES AND SILTATION FENCES AS REQUIRED TO CONTROL SOIL EROSION.
- INSTALL UNDERGROUND UTILITIES.
- BEGIN TEMPORARY AND PERMANENT SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED OR MULCHED IMMEDIATELY AFTER THEIR CONSTRUCTION. NO AREA SHALL BE LEFT UNSTABILIZED FOR A TIME PERIOD OF MORE THAN 30 DAYS.
- DAILY, OR AS REQUIRED, CONSTRUCT, INSPECT, AND IF NECESSARY, RECONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, SILT FENCES AND SEDIMENT TRAPS INCLUDING MULCHING AND SEEDING.
- BEGIN EXCAVATION FOR AND CONSTRUCTION OF TOWERS AND PLATFORMS.
- FINISH PAVING ALL ROADWAYS, DRIVES, AND PARKING AREAS.
- COMPLETE PERMANENT SEEDING AND LANDSCAPING.
- NO STORM WATER FLOW SHALL BE DIVERTED TO ANY WETLANDS UNTIL A HEALTHY STAND OF GRASS HAS BEEN ESTABLISHED IN REGRADED AREAS.
- AFTER GRASS HAS BEEN FULLY GERMINATED IN ALL SEEDED AREAS, REMOVE ALL TEMPORARY EROSION CONTROL MEASURES.

EROSION CONTROL MEASURES:

- DISTURBED AREAS SHALL BE KEPT TO THE MINIMUM AREA NECESSARY TO CONSTRUCT THE ROADWAYS AND ASSOCIATED DRAINAGE FACILITIES.
- HAY BALE BARRIERS AND SEDIMENT TRAPS SHALL BE INSTALLED AS REQUIRED. BARRIERS AND TRAPS ARE TO BE MAINTAINED AND CLEANED UNTIL ALL SLOPES HAVE A HEALTHY STAND OF GRASS.
- BALED HAY AND MULCH SHALL BE MOWINGS OF ACCEPTABLE HERBACEOUS GROWTH, FREE FROM NOXIOUS WEEDS OR WOODY STEMS, AND SHALL BE DRY. NO SALT HAY SHALL BE USED.
- FILL MATERIAL SHALL BE FREE FROM STUMPS, WOOD, ROOTS, ETC.
- STOCKPILED MATERIALS SHALL BE PLACED ONLY IN AREAS SHOWN ON THE PLANS. STOCKPILES SHALL BE PROTECTED BY SILTATION FENCE AND SEEDED TO PREVENT EROSION. THESE MEASURES SHALL REMAIN UNTIL ALL MATERIAL HAS BEEN PLACED OR DISPOSED OFF SITE.
- ALL DISTURBED AREAS SHALL BE LOAMED AND SEEDED. A MINIMUM OF 4 INCHES OF LOAM SHALL BE INSTALLED WITH NOT LESS THAN ONE POUND OF SEED PER 50 SQUARE YARDS OF AREA.
- APPLICATION OF GRASS SEED, FERTILIZERS AND MULCH SHALL BE ACCOMPLISHED BY BROADCAST SEEDING OR HYDROSEEDING AT THE RATES OUTLINED BELOW:

LIMESTONE: 75-100 LBS./1,000 SQUARE FEET.
 FERTILIZER: RATE RECOMMENDED BY MANUFACTURER.
 MULCH: HAY MULCH APPROXIMATELY 3 TONS/ACRE UNLESS EROSION CONTROL MATTING IS USED.

SEED MIX (SLOPES LESS THAN 4:1)	LBS./ACRE
CREeping RED FESCUE	20
TALL FESCUE	20
REDTOP	2
	42

SLOPE MIX (SLOPES GREATER THAN 4:1)	LBS./ACRE
CREeping RED FESCUE	20
TALL FESCUE	20
BIRDSFOOT TREFOLI	8
	48

TREATMENT SWALE PLANTING SPECIFICATIONS

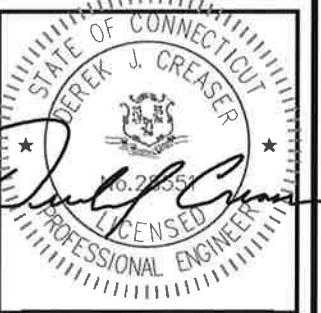
TALL FESCUE	20 LBS/ACRE	OR	0.45 LBS/10,000 SF
CREeping RED FESCUE	20 LBS/ACRE	OR	0.45 LBS/10,000 SF
BIRDSFOOT TREFOLI	8 LBS/ACRE	OR	0.20 LBS/10,000 SF

LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT TIME OF SEEDING AND INCORPORATED INTO THE SOIL. THE FOLLOWING RATES ARE RECOMMENDED:

AGRICULTURAL LIMESTONE	2 TONS/ACRE	OR	100 LBS/1,000 SF
NITROGEN (N)	50 LBS/ACRE	OR	1.1 LBS/10,000 SF
PHOSPHATE (P205)	100 LBS/ACRE	OR	2.2 LBS/10,000 SF
POTASH (K20)	100 LBS/ACRE	OR	2.2 LBS/10,000 SF

(THIS IS EQUIVALENT TO 500 LBS/ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS/ACRE OF 5-10-10).

- AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED THE TEMPORARY EROSION CONTROL MEASURES ARE TO BE REMOVED.
- PAVED ROADWAYS MUST BE KEPT CLEAN AT ALL TIMES.
- ALL CATCH BASIN INLETS WILL BE PROTECTED WITH LOW POINT SEDIMENTATION BARRIER.
- ALL STORM DRAINAGE OUTLETS WILL BE STABILIZE AND CLEANED AS REQUIRED, BEFORE THE DISCHARGE POINTS BECOME OPERATIONAL.
- ALL DEWATERING OPERATIONS MUST DISCHARGE DIRECTLY INTO A SEDIMENT FILTER AREA.
- NO DISCHARGE SHALL BE DIRECTED TOWARDS ANY PROPOSED DITCHES, SWALES, OR PONDS UNTIL THEY HAVE BEEN PROPERLY STABILIZED.



CHECKED BY: DJR

APPROVED BY: DPH

SUBMITTALS

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SITE NAME:
DAYVILLE CT

SITE ADDRESS:
 520 BAILEY HILL ROAD
 KILLINGLY, CT 06241

SHEET TITLE
SITE SURFACE & EROSION CONTROL DETAILS

SHEET NUMBER

A-8

150' 4C EXT 170' 6C MONOPOLE VERIZON WIRELESS DAYVILLE CT WINDHAM COUNTY, CT

TABLE OF CONTENTS

- T1 - BILL OF MATERIAL & NOTES
- A1 - ELEVATION VIEWS & DETAILS
- ABT - ANCHOR BOLTS & TEMPLATES

SYMBOL LEGEND

- AGL = ABOVE GROUND LEVEL
- BC = BOLT CIRCLE
- CL = CENTERLINE
- ELEV = ELEVATION
- (E) = EXISTING
- FV = FIELD VERIFY
- FW = FLAT WASHER
- HN = HEX NUT
- LW = LOCK WASHER
- OC = ON CENTER
- OD = OUTSIDE DIAMETER
- (P) = PROPOSED
- TBD = TO BE DETERMINED
- TOS = TOP OF STEEL
- TYP = TYPICAL
- NTS = NOT TO SCALE

DESIGN NOTES

1. MONOPOLE IS DESIGNED IN ACCORDANCE WITH TIA-222G FOR 110 MPH BASIC WIND & 90 MPH BASIC WIND SPEED WITH 1" ICE TOWER STRUCTURE CLASS-II EXPOSURE - C TOPOGRAPHIC CATEGORY - 1 WITH CREST HEIGHT OF 0.60 FT.

COATING NOTES

1. ALL APPLICABLE MATERIALS SHALL BE HOT DIPPED GALVANIZED PER ASTM A153. ALL HARDWARE SHALL BE HOT DIPPED GALVANIZED PER ASTM A153, UNLESS OTHERWISE NOTED.

STRUCTURE NOTES

1. EE WILL NOT HONOR ANY BACKCHARGES WHICH HAVE NOT RECEIVED PRIOR WRITTEN AUTHORIZATION. CONTACT EE AT (440) 564-5484
2. THE INSTALLER SHALL THOROUGHLY REVIEW EER'S STRUCTURAL ASSEMBLY & ERECTION PROCEDURES PRIOR TO INITIATING THE INSTALLATION OF THE MONOPOLE.

3. THE ORIENTATION OF THE MONOPOLE SHALL BE VERIFIED PRIOR TO INSTALLATION.

4. FOR MULTIPLE SECTION MONOPOLES:

- 4.1. FOR PROPER SECTION TO SECTION ALIGNMENT A 2" HORIZONTAL WELD BEAD AND A MARK ARE POSITIONED ON EACH SECTION AT EACH SPICE. THE 2" HORIZONTAL WELD BEAD ARE ON THE MATCHING CORNERS. THE MARK NUMBER IS ON THE ADJACENT FLAT. THE CORNERS WITH WELD BEADS SHALL BE ADJUSTED FROM TOP TO BOTTOM OF THE MONOPOLE MARK NUMBERS SHALL BE MATCHED FOR EACH SIDE & THE DISTANCE BETWEEN WELD BEADS SHOULD BE AS CLOSE AS POSSIBLE WITH A MINIMUM JACKING FORCE OF 10,000 LB APPLIED TO EACH SIDE. FOR MAXIMUM RECOMMENDED JACKING FORCE, SPURCE LENGTH TOLERANCE AND AIR GAP BETWEEN SECTIONS REFER TO EER STRUCTURE ASSEMBLY & ERECTION PROCEDURES.
- 4.3. 1" FIELD ASSEMBLY JACKING NUTS FOR JACKING SECTIONS TOGETHER ARE LOCATED ON OPPOSING SECTION FLATS ABOVE AND BELOW THE SPURCES. ALL JACKING EQUIPMENT SHALL BE SUPPLIED BY THE INSTALLER.
- 4.4. ALL LONGITUDINAL SEAM WELDS WITHIN THE SUP-JOINT AREA IN THE FEMALE SECTION SHALL BE 100% PENETRATION.

5. ALL BOLTED CONNECTIONS WITH A325 HIGH-STRENGTH BOLTS SHALL BE ASSEMBLED IN ACCORDANCE WITH SPECIFICATIONS FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS. HIGH STRENGTH BOLTS SHALL BE LIMITED TO SNUG-TIGHT CONDITION PER ASTM A325/A490 AND THEN PRE-TENSION AS REQUIRED. TURN-OF-NUT METHOD IS RECOMMENDED BUT IS NOT LIMITED TO.

6. SHIMS WILL BE SUPPLIED BY EE, IF REQUIRED.

7. MONOPOLE BASE PLATE SHALL HAVE FULL PENETRATION WELD TO SHAFT.

8. ANCHOR RODS SHALL BE TIGHTENED AFTER THE MONOPOLE IS PLUMB. BOTH TOP & BOTTOM NUT SHALL BE TIGHTENED. FOR DETAIL OF ANCHOR ROD INSTALLATION INSTRUCTIONS, REFER TO EER STRUCTURE ASSEMBLY & ERECTION PROCEDURES.

9. MATERIALS

- 9.1. STRUCTURAL STEEL - REFER TO DRAWING.
- 9.2. BOLTS
- 9.2.1. STRUCTURAL STEEL: A325 HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.
- 9.2.2. ANCHOR RODS: A615-GR75 UNLESS OTHERWISE NOTED.

10. WELDING

- 10.1. ALL WELDING SHALL MEET AWS LATEST D.1.1 EDITION

11. ASSEMBLY MARKING PROCEDURE

- 11.1. EACH INDIVIDUAL ASSEMBLY SHALL HAVE A METAL TAG WELDED TO IT WHICH WILL BE ENGRAVED WITH THE ASSEMBLY MARK NO. AS SHOWN IN THE MATERIAL BLOCK. (MINIMUM OF 50" HIGH LETTERS).

BILL OF MATERIALS 18068-E01

Item	Part Number	Qty	Description	Weight Per	Wt Per Row
1	18068-E01-GS01	1	150' 4C EXT 170' 6C MONOPOLE	47775.67	47775.67
2	18068-E01-GS02	1	SHAFT ASSY. (TOP SECTION)	8205.40	8205.40
3	18068-E01-GS03	1	SHAFT ASSY. (MIDDLE SECTION)	13669.69	13669.69
4	K12461	1	SHAFT ASSY. (BOTTOM SECTION)	21262.77	21262.77
5	K12111	1	12' SQUARE ANTENNA PLATFORM 'H'	2132.72	2132.72
6	K12484	1	HANDRAIL KIT FOR 12' SQUARE PLATFORM	954.00	954.00
7	K12431	1	4-SECTOR UNIVERSAL BRACKET	350.14	350.14
8	K10062	12	10'-0" ADJUSTABLE ANTENNA MOUNT FOR STANDARD PLATFORM W/ HANDRAILS	52.20	626.40
9	K10333	1	BUSS BAR	7.50	7.50
10	K12064	1	7'-0" LIGHTNING ROD	28.60	28.60
11	18068-E01-P36-01	1	5'-0" LIGHTNING ROD EXTENSION MOUNT FOR STANDARD PLATFORM	38.02	38.02
30	DBI-160	1	COVER PLATE	56.81	56.81
31	10000-A01-A394-01	1	160'-0" SAFETY CLIMB KIT		
32	K11499	114	Ø5/8" X 7" LG. BUTTTON HEAD STEP BOLT w/(7) H.N. & (1) SQUARE NUT EACH	1.08	123.12
33	K11497	12	6" X 18" HANDHOLE COVER PLATE & BOLTS	10.48	125.76
34	A-BX-A325-G-1X3.00	6	10" X 30" ACCESS PORT COVER PLATE & BOLTS	31.39	188.34
40	ANCHOR BOLT	4	1" DIA X 3" LG. (A325) HEX BOLT w/ (1) H.N. (A194-2H) & (2) F.W. (F436)	1.60	6.40
41	HD-INS-MONOPOLE	1	FOR ANCHOR BOLTS REFER TO DWG. 18068-E01-ABT STRUCTURE ASSEMBLY AND ERECTION PROCEDURE		



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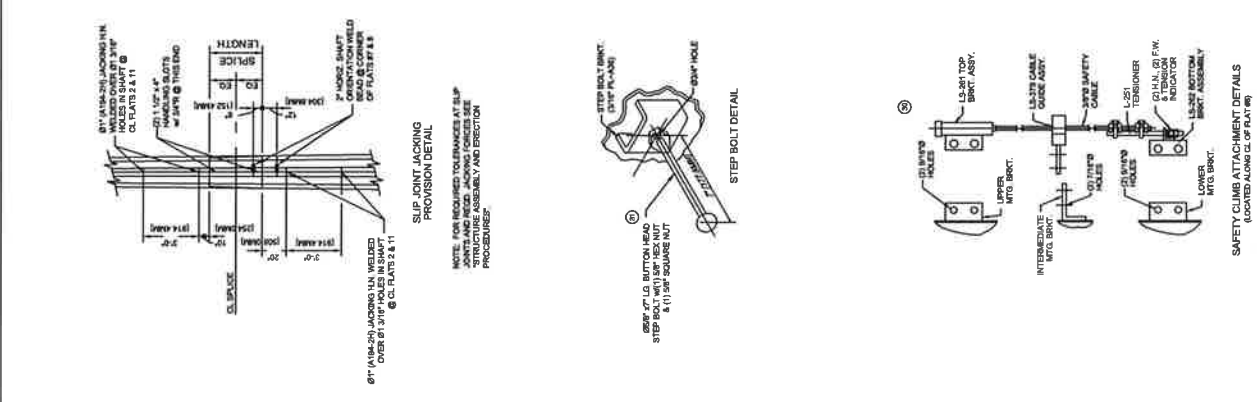
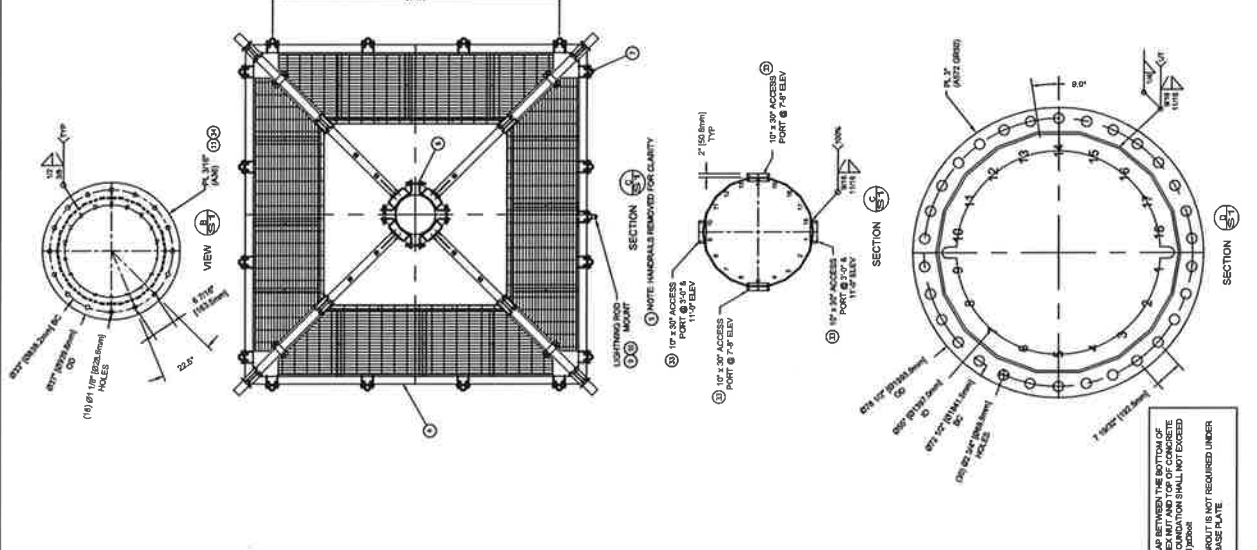
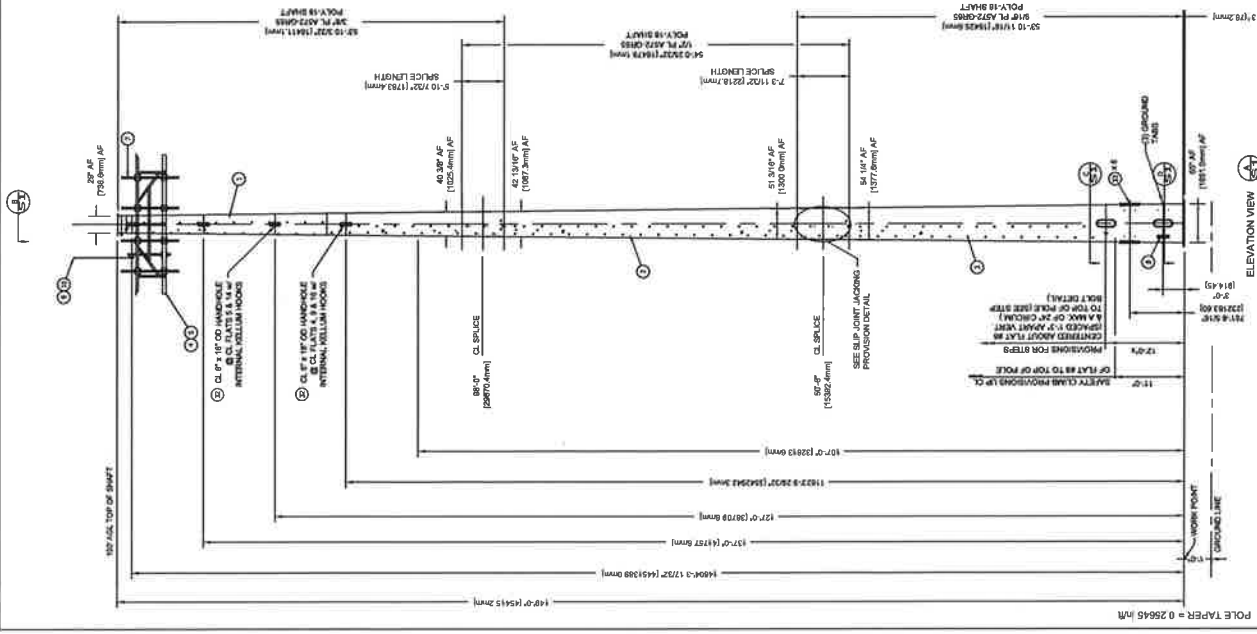
REVISION HISTORY

REV #	DATE	BY	DESCRIPTION
0	1/26/17	EPH	ISSUED FOR REVIEW

150' 4C EXT 170' 6C MONOPOLE
 VERIZON WIRELESS
 DAYVILLE CT
 WINDHAM COUNTY, CT

BILL OF MATERIALS & NOTES

DRAWN BY	CREATED	PROJECT NUMBER
EPH	1/26/17	18068
DRAWING NUMBER	18068-E01-T1	



STATE OF CONNECTICUT
BOB FAIVAN
REGISTERED PROFESSIONAL ENGINEER
01-26-2017

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The Experienced Team of Five
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REV. #	DATE	BY	DESCRIPTION
1	1/26/17	EPH	ISSUED FOR REVIEW

**150' 4C EXT 170' 6C MONOPOLE
VERIZON WIRELESS
DAYVILLE CT
WINDHAM COUNTY, CT**

ELEVATION VIEW & DETAILS

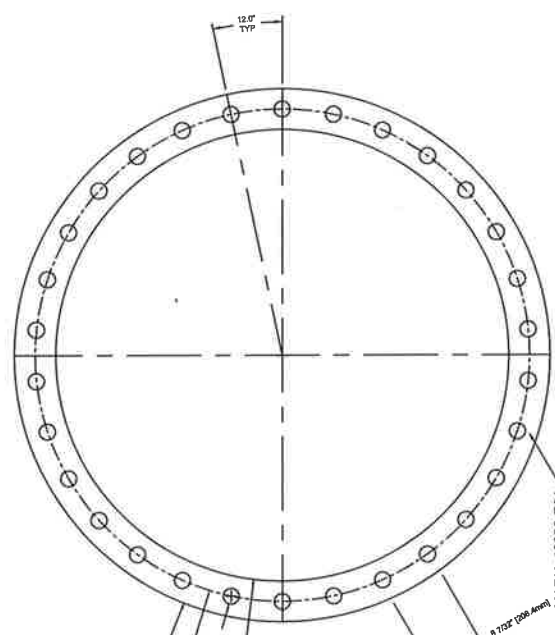
DRAWN BY: RPH
CHECKED: 1/26/17
PROJECT NUMBER: 15058
DRAWING NUMBER: 18068-E01-S1



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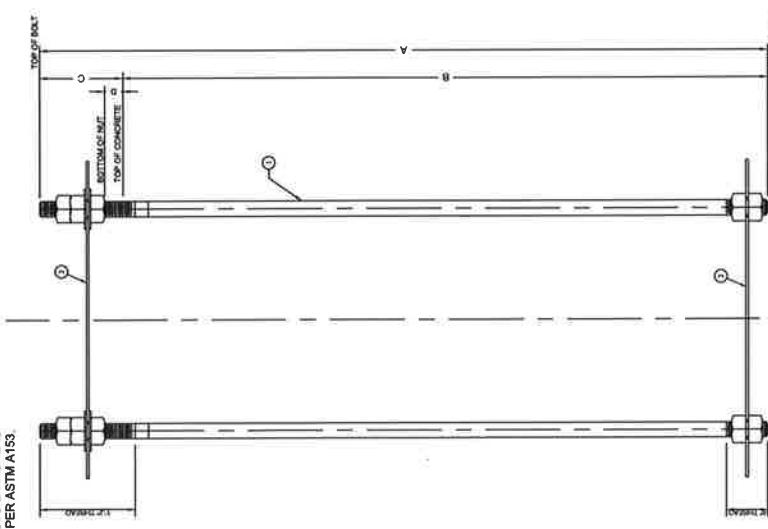
BILL OF MATERIALS			
Part Number	Description	Qty	Weight Per Foot
1	2.25-AB6.0-SDE	30	98.90
2	30-78.50-2.25	2	130.93
ANCHOR RODS & TEMPLATES			3228.86

ANCHOR BOLT INSTALLATION TABLE			
ANCHOR BOLT DIA, in "A"	ANCHOR BOLT LENGTH, ft "A"	EMBED IN CONCRETE, ft "B"	CLEARANCE UNDER BOTTOM NUT, in "D"
2 1/4	6'-0"	7'-0"	2 1/4
2 1/4	6'-0"	5'-0"	2 1/4
1 3/4	6'-0"	5'-0"	1 3/4
1 1/2	6'-0"	5'-2"	1 1/2



TOP & BOTTOM PLATE (MIN 3/8" THICK A36) (A) (B) (C) (D)

ENTIRE BOLT AND ALL NUTS & WASHERS GALVANIZED PER ASTM A153.



ANCHOR BOLT CAGE ASSEMBLY (A) (B) (C) (D)

STAMP



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REVISION HISTORY

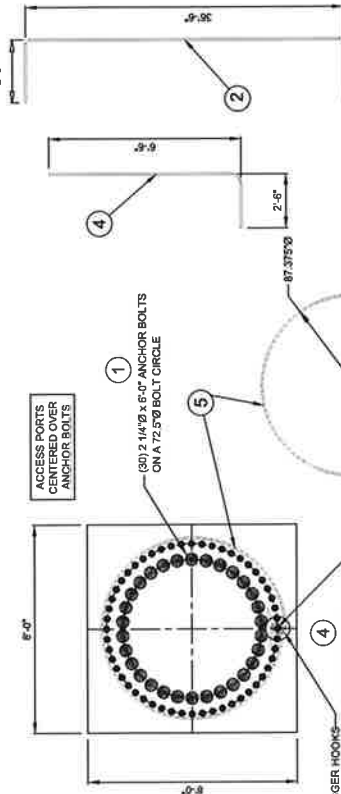
REV. #	DATE	BY	DESCRIPTION
0	1/26/17	RPH	ISSUED FOR REVIEW

150' 4C EXT 170' 6C MONOPOLE
VERIZON WIRELESS
DAYVILLE CT
WINDHAM COUNTY, CT

ANCHOR BOLTS & TEMPLATES

DRAWN BY	CREATED	PROJECT NUMBER
RPH	1/26/17	18068
DRAWING NUMBER	18068-E01-ABT	

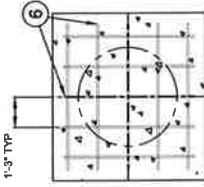
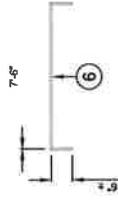
MAXIMUM OFF-SET BETWEEN THE CENTER OF ANCHOR BOLTS SHALL NOT EXCEED 2" IN ANY DIRECTION.



#4 REBAR SEISMIC HOOK (135° to 180°) MIN LENGTH = 4" AND BEND RADIUS = 2"

FOUNDATION LOADING
(PER TIA-222G W/OCLF)

MOMENT	10643 kip-ft
SHEAR	82.1 kips
AXIAL	83.6 kips



INSTALL 2" BELOW TOP OF CONCRETE

MATERIAL LIST

ITEM	QTY.	DESCRIPTION
1	30	2-1/4" x 6'-0" (A615-GR75) ANCHOR BOLTS
2	72	#8 REBAR x 41'-6" (ASTM A615-GR 60)
3	116	#8 REBAR x 36'-6" (ASTM A615-GR 60)
4	62	#10 REBAR x 9'-0" (ASTM A615-GR 60)
5	8	#4 REBAR x 24'-0" (ASTM A615-GR 60)
6	10	#4 REBAR x 8'-5" (ASTM A615-GR 60)

VOL. CONCRETE @ 4000 psl (TYPE II CEMENT)	162 yd ³
STEEL (ASTM A615-GR 60)	26188 lbs

- GENERAL NOTES:**
- FOUNDATION DESIGN IS BASED ON THE FOLLOWING: EE-2081-1008, DRAWING# 10088-P11 SOIL REPORT BY HUDSON DESIGN GROUP LLC, DATE - 1/22/16.
 - FOUNDATION EMBEDMENT IS SHOWN FROM THE GROUND LEVEL AT THE TIME OF SOIL INVESTIGATION AS DEPICTED IN THE SOIL REPORT. FOUNDATION EMBEDMENT SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. FOUNDATION DESIGNER SHALL BE NOTIFIED IN ORDER TO RE-EVALUATE THE FOUNDATION DESIGN.
 - SOIL REPORT SHOULD BE CONSULTED PRIOR TO CONSTRUCTION. CONCRETE REINFORCEMENT TO INCLUDE SEISMIC HOOKS.
 - THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUE, SEQUENCES AND PROCEDURES.
 - SPECIAL INSPECTION IS REQUIRED IN ACCORDANCE WITH 2015 IBC AND 780 CT.
 - 5.1. FOUNDATION EXCAVATION SHALL BE INSPECTED PRIOR TO INSTALLATION OF REINFORCEMENT.
 - 5.1.1. VERIFY DEPTH AND DIAMETER OF THE EXCAVATION.
 - 5.1.2. VERIFY ACTUAL SOIL CONDITIONS AGAINST THE GEOTECHNICAL REPORT.
 - 5.2. REINFORCING STEEL SHALL BE INSPECTED FOR CORROSION, DAMAGE, AND QUANTITY OF REBAR AND COMPLIANCE WITH THE DRAWINGS.
 - 5.2.1. VERIFY GRADE, LENGTH, DIAMETER, AND QUANTITY OF REBAR AND BOLT PATTERN ON THE TEMPLATES.
 - 5.3. CONCRETE
 - 5.3.1. VERIFY STRENGTH, SLUMP, AIR, TEMPERATURE OF CONCRETE, AND DESIGN MIX.
 - 5.4. REINFORCING STEEL
 - 5.4.1. REINFORCING STEEL SHALL BE CONFORM TO ASTM A615, TYPE II.
 - 5.4.2. WELDED REBAR SHALL BE CONFORM TO ASTM A706, TYPE I.
 - 5.4.3. MINIMUM SPlice LENGTH FOR LONGITUDINAL BARS: No. 6 BARS AND SMALLER - 44 x DEVELOP. BARS AND LARGER - 48 x DEVELOP.
 - 5.4.4. HORIZONTAL STIRRUPS SHALL BE STAGGERED ALONG THE REBAR CAGE WITH NO MORE THAN 50% OF SPLICES IN ONE PLACE.
 - 5.4.5. ALL STATE AND LOCAL CODES.
 - 5.4.6. ALL REBAR SHALL BE 90° BENT AS SHOWN ON THE DRAWINGS.
 - 5.4.7. ALL REBAR SHALL BE WELDED TO THE TEMPLATES.
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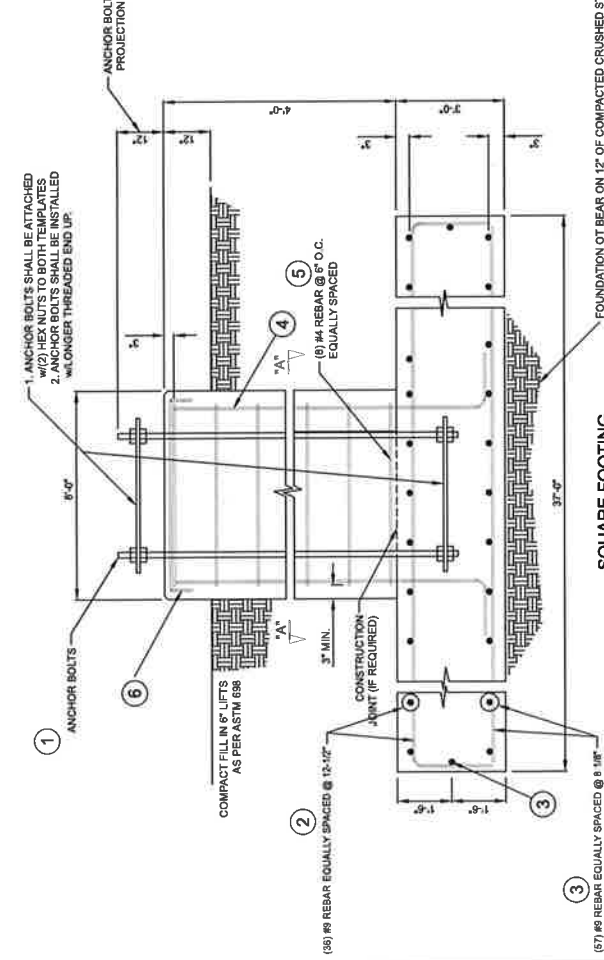
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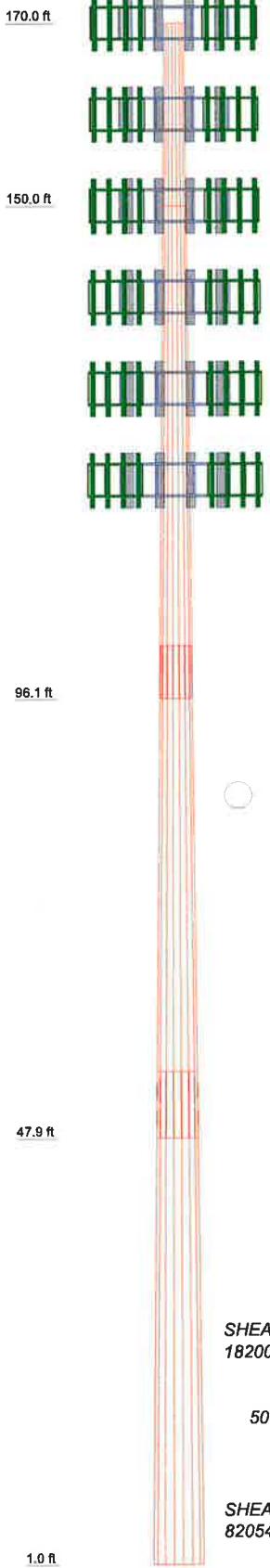
VERIZON WIRELESS
150' TO 170' MONOPOLE
DAYVILLE CT
KILLINGLY, CT

SCALE: N.T.S.	PROJECT NO: 180688
SHEET 1 of 1	DRAWING NO: 180688-170.0

REV	DESCRIPTION	DATE	DWN	CHK
0	COMPLETED DRAWING	10/26/17	GEF	



Section	1	2	3	4
Length (ft)	20.00	53.92	54.06	54.15
Number of Slides	18	18	18	18
Thickness (in)	0.1875	0.3750	0.5000	0.5625
Socket Length (ft)		5.85	7.28	
Top Dia (in)	24.0000	29.0000	40.5528	51.3635
Bot Dia (in)	29.0000	42.8000	54.2000	65.0000
Grade		A572-65		
Weight (lb)	1065.7	7758.1	13664.9	18953.6
				41462.3



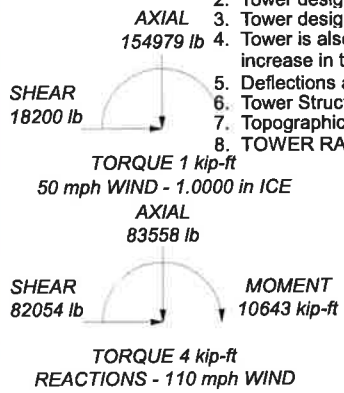
DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(3) LNX-6514DS-VTM W/MOUNTING PIPE	170	(3) LNX-6514DS-VTM W/MOUNTING PIPE	140
(3) SBNH-1D65B W/MOUNTING PIPE	170	(3) SBNH-1D65B W/MOUNTING PIPE	140
(3) SBNHH-1D65B W/MOUNTING PIPE	170	(3) SBNHH-1D65B W/MOUNTING PIPE	140
(2) RRUS A2 (20.4" x 18.5" x 10.8")	170	(2) RRUS A2 (20.4" x 18.5" x 10.8")	140
(2) RRUS A2 (20.4" x 18.5" x 10.8")	170	(2) RRUS A2 (20.4" x 18.5" x 10.8")	140
(2) RRUS A2 (20.4" x 18.5" x 10.8")	170	(2) RRUS A2 (20.4" x 18.5" x 10.8")	140
(2) 20" x 12.5" x 12" RRH	170	(2) 20" x 12.5" x 12" RRH	140
(2) 20" x 12.5" x 12" RRH	170	(2) 20" x 12.5" x 12" RRH	140
(2) 20" x 12.5" x 12" RRH	170	(2) 20" x 12.5" x 12" RRH	140
37" x 12" x 6" RRH	170	37" x 12" x 6" RRH	140
37" x 12" x 6" RRH	170	37" x 12" x 6" RRH	140
37" x 12" x 6" RRH	170	37" x 12" x 6" RRH	140
EE 12' Platform w/Handrails (K10994A + K12076)	170	EE 12' Platform w/Handrails (K10994A + K12076)	140
(3) LNX-6514DS-VTM W/MOUNTING PIPE	160	(3) LNX-6514DS-VTM W/MOUNTING PIPE	130
(3) SBNH-1D65B W/MOUNTING PIPE	160	(3) SBNH-1D65B W/MOUNTING PIPE	130
(3) SBNHH-1D65B W/MOUNTING PIPE	160	(3) SBNHH-1D65B W/MOUNTING PIPE	130
(2) RRUS A2 (20.4" x 18.5" x 10.8")	160	(2) RRUS A2 (20.4" x 18.5" x 10.8")	130
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(2) 20" x 12.5" x 12" RRH	160	(2) 20" x 12.5" x 12" RRH	130
(2) 20" x 12.5" x 12" RRH	160	(2) 20" x 12.5" x 12" RRH	130
(2) 20" x 12.5" x 12" RRH	160	(2) 20" x 12.5" x 12" RRH	130
37" x 12" x 6" RRH	160	37" x 12" x 6" RRH	130
37" x 12" x 6" RRH	160	37" x 12" x 6" RRH	130
37" x 12" x 6" RRH	160	37" x 12" x 6" RRH	130
EE 12' Platform w/Handrails (K10994A + K12076)	160	EE 12' Platform w/Handrails (K10994A + K12076)	130
(3) LNX-6514DS-VTM W/MOUNTING PIPE	150	(3) LNX-6514DS-VTM W/MOUNTING PIPE	120
(3) SBNH-1D65B W/MOUNTING PIPE	150	(3) SBNH-1D65B W/MOUNTING PIPE	120
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(2) 20" x 12.5" x 12" RRH	150	(2) 20" x 12.5" x 12" RRH	120
(2) 20" x 12.5" x 12" RRH	150	(2) 20" x 12.5" x 12" RRH	120
(2) 20" x 12.5" x 12" RRH	150	(2) 20" x 12.5" x 12" RRH	120
37" x 12" x 6" RRH	150	37" x 12" x 6" RRH	120
37" x 12" x 6" RRH	150	37" x 12" x 6" RRH	120
37" x 12" x 6" RRH	150	37" x 12" x 6" RRH	120
EE 12' Square Platform w/Handrails (K11130 + K11914)	150	EE 12' Platform w/Handrails (K10994A + K12076)	120

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65000 psi	80000 psi			

ALL REACTION ARE FACTORED



TOWER DESIGN NOTES

1. Tower is located in Windham County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 110 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 99.7%



01-26-2017

Engineered Endeavors	Job: 18068-E01 /Dayville/CT
10975 Kinsman Road	Project: 150' to 170' Monopole
Newbury, OH 44065-9787	Client: Verizon Wireless Drawn by: gfisher App'd:
Phone: (440) 564-5484	Code: TIA-222-G Date: 01/24/17 Scale: N
FAX: (440)564-5489	Path: T:\JOBS\180001\18068-E01\18068-E01.dwg Dwg No.:

tnxTower Engineered Endeavors 10975 Kinsman Road Newbury, OH 44065-9787 Phone: (440) 564-5484 FAX: (440)564-5489	Job 18068-E01 /Dayville/CT	Page 1 of 21
	Project 150' to 170' Monopole	Date 16:13:30 01/24/17
	Client Verizon Wireless	Designed by gfisher

Tower Input Data

There is a pole section.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Tower is located in Windham County, Connecticut.

Basic wind speed of 110 mph.

Structure Class II.

Exposure Category C.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 1.0000 in.

Ice thickness is considered to increase with height.

Ice density of 56.00 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.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist.
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Use TIA-222-G Tension Splice
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Exemption
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Poles
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Include Shear-Torsion Interaction
SR Members Are Concentric		Always Use Sub-Critical Flow
		Use Top Mounted Sockets

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Numbe r of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	170.00-150.00	20.00	0.00	18	24.0000	29.0000	0.1875	0.7500	A572-65 (65000 psi)

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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
L2	150.00-96.08	53.92	5.85	18	29.0000	42.8000	0.3750	1.5000	A572-65 (65000 psi)
L3	96.08-47.87	54.06	7.28	18	40.5528	54.2000	0.5000	2.0000	A572-65 (65000 psi)
L4	47.87-1.00	54.15		18	51.3635	65.0000	0.5625	2.2500	A572-65 (65000 psi)

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	24.3702	14.1714	1015.221 1	8.4534	12.1920	83.2694	2031.778 0	7.0871	3.8940	20.768
	29.4474	17.1470	1798.409 0	10.2284	14.7320	122.0750	3599.184 4	8.5751	4.7740	25.461
L2	29.4474	34.0709	3527.054 1	10.1619	14.7320	239.4145	7058.749 3	17.0387	4.4440	11.851
	43.4603	50.4964	11482.62 53	15.0609	21.7424	528.1213	22980.35 97	25.2530	6.8728	18.327
L3	42.6780	63.5638	12882.86 45	14.2187	20.6008	625.3571	25782.68 05	31.7879	6.2573	12.515
	55.0361	85.2219	31048.25 77	19.0635	27.5336	1127.649	62137.36 8 95	42.6190	8.6592	17.318
L4	54.0163	90.6988	29572.12 82	18.0343	26.0926	1133.351	59183.16 82	45.3580	8.0500	14.311
	66.0027	115.0451	60350.78 83	22.8753	33.0200	1827.704	120780.9 1 877	57.5335	10.4500	18.578

Tower Elevation	Gusset Area (per face)	Gusset Thickness	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
ft	ft ²	in							
L1 170.00-150.00				1	1	1			
L2 150.00-96.08				1	1	1			
L3 96.08-47.87				1	1	1			
L4 47.87-1.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

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Description	Face or Ledger	Allow Shiel d	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
AVA7-50 (1-5/8 LOW DENS. FOAM)	C	No	Inside Pole	170.00 - 8.00	15	No Ice	0.00	0.72
						1/2" Ice	0.00	0.72
						1" Ice	0.00	0.72
AVA7-50 (1-5/8 LOW DENS. FOAM)	C	No	Inside Pole	160.00 - 4.00	15	No Ice	0.00	0.72
						1/2" Ice	0.00	0.72
						1" Ice	0.00	0.72
AVA7-50 (1-5/8 LOW DENS. FOAM)	C	No	Inside Pole	150.00 - 8.00	15	No Ice	0.00	0.72
						1/2" Ice	0.00	0.72
						1" Ice	0.00	0.72
AVA7-50 (1-5/8 LOW DENS. FOAM)	C	No	Inside Pole	140.00 - 8.00	15	No Ice	0.00	0.72
						1/2" Ice	0.00	0.72
						1" Ice	0.00	0.72
AVA7-50 (1-5/8 LOW DENS. FOAM)	C	No	Inside Pole	130.00 - 4.00	15	No Ice	0.00	0.72
						1/2" Ice	0.00	0.72
						1" Ice	0.00	0.72
AVA7-50 (1-5/8 LOW DENS. FOAM)	C	No	Inside Pole	120.00 - 8.00	15	No Ice	0.00	0.72
						1/2" Ice	0.00	0.72
						1" Ice	0.00	0.72

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 lb
L1	170.00-150.00	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	324.00
L2	150.00-96.08	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	2846.02
L3	96.08-47.87	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	3124.01
L4	47.87-1.00	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	2669.98

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 lb
L1	170.00-150.00	A	2.342	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	324.00
L2	150.00-96.08	A	2.279	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	2846.02
L3	96.08-47.87	A	2.160	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	3124.01
L4	47.87-1.00	A	1.943	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00

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	Client		Verizon Wireless		Designed by		gfisher	

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustme nt °	Placement ft	CAA Front ft ²	CAA Side ft ²	Weight lb	
(2) RRUS A2 (20.4" x 18.5" x 10.8")	B	None		0.00	170.00	No	3.15	1.84	71.40
						Ice	3.36	2.01	98.89
						1/2"	3.59	2.20	129.79
						Ice 1"			
(2) RRUS A2 (20.4" x 18.5" x 10.8")	C	None		0.00	170.00	No	3.15	1.84	71.40
						Ice	3.36	2.01	98.89
						1/2"	3.59	2.20	129.79
						Ice 1"			
(2) 20" x 12.5" x 12" RRH	C	None		0.00	170.00	No	2.08	2.00	50.00
						Ice	2.27	2.18	72.22
						1/2"	2.46	2.37	97.51
						Ice 1"			
(2) 20" x 12.5" x 12" RRH	C	None		0.00	170.00	No	2.08	2.00	50.00
						Ice	2.27	2.18	72.22
						1/2"	2.46	2.37	97.51
						Ice 1"			
(2) 20" x 12.5" x 12" RRH	C	None		0.00	170.00	No	2.08	2.00	50.00
						Ice	2.27	2.18	72.22
						1/2"	2.46	2.37	97.51
						Ice 1"			
37" x 12" x 6" RRH	C	None		0.00	170.00	No	3.78	2.10	55.00
						Ice	4.05	2.34	80.73
						1/2"	4.32	2.58	110.22
						Ice 1"			
37" x 12" x 6" RRH	C	None		0.00	170.00	No	3.78	2.10	55.00
						Ice	4.05	2.34	80.73
						1/2"	4.32	2.58	110.22
						Ice 1"			
37" x 12" x 6" RRH	C	None		0.00	170.00	No	3.78	2.10	55.00
						Ice	4.05	2.34	80.73
						1/2"	4.32	2.58	110.22
						Ice 1"			
EE 12' Platform w/Handrails (K10994A + K12076)	C	None		0.00	170.00	No	38.00	38.00	1300.00
						Ice	48.00	48.00	1800.00
						1/2"	58.00	58.00	2400.00
						Ice 1"			
***** (3) LNX-6514DS-VTM W/MOUNTING PIPE	A	From Leg	4.00 0.00	0.00	160.00	No	8.30	7.27	68.94
						Ice	8.79	8.20	139.71

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	Client		Verizon Wireless					Designed by		gfisher

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustme nt	Placement	CAA Front	CAA Side	Weight
			ft ft ft	°	ft	ft ²	ft ²	lb
			0.00			9.29	9.06	219.25
					1/2" Ice 1"			
(3) SBNH-1D65B W/MOUNTING PIPE	B	From Leg	4.00	0.00	160.00	8.19	7.14	75.34
			0.00			8.65	7.96	144.64
			0.00			9.11	8.80	222.56
					1/2" Ice 1"			
					Ice			
(3) SBNH-1D65B W/MOUNTING PIPE	C	From Leg	4.00	0.00	160.00	8.86	7.84	89.82
			0.00			9.58	9.18	166.66
			0.00			10.22	10.25	252.91
					1/2" Ice 1"			
					Ice			
(2) RRUS A2 (20.4" x 18.5" x 10.8")	A	None		0.00	160.00	3.15	1.84	71.40
						3.36	2.01	98.89
						3.59	2.20	129.79
					1/2" Ice 1"			
					Ice			
(2) RRUS A2 (20.4" x 18.5" x 10.8")	B	None		0.00	160.00	3.15	1.84	71.40
						3.36	2.01	98.89
						3.59	2.20	129.79
					1/2" Ice 1"			
					Ice			
(2) RRUS A2 (20.4" x 18.5" x 10.8")	C	None		0.00	160.00	3.15	1.84	71.40
						3.36	2.01	98.89
						3.59	2.20	129.79
					1/2" Ice 1"			
					Ice			
(2) 20" x 12.5" x 12" RRH	C	None		0.00	160.00	2.08	2.00	50.00
						2.27	2.18	72.22
						2.46	2.37	97.51
					1/2" Ice 1"			
					Ice			
(2) 20" x 12.5" x 12" RRH	C	None		0.00	160.00	2.08	2.00	50.00
						2.27	2.18	72.22
						2.46	2.37	97.51
					1/2" Ice 1"			
					Ice			
(2) 20" x 12.5" x 12" RRH	C	None		0.00	160.00	2.08	2.00	50.00
						2.27	2.18	72.22
						2.46	2.37	97.51
					1/2" Ice 1"			
					Ice			
37" x 12" x 6" RRH	C	None		0.00	160.00	3.78	2.10	55.00
						4.05	2.34	80.73
						4.32	2.58	110.22
					1/2" Ice 1"			

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustme nt °	Placement ft	Ice	CAA Front ft ²	CAA Side ft ²	Weight lb
37" x 12" x 6" RRH	C	None		0.00	160.00	No	3.78	2.10	55.00
						Ice	4.05	2.34	80.73
						1/2"	4.32	2.58	110.22
						Ice 1"			
37" x 12" x 6" RRH	C	None		0.00	160.00	No	3.78	2.10	55.00
						Ice	4.05	2.34	80.73
						1/2"	4.32	2.58	110.22
						Ice 1"			
EE 12' Platform w/Handrails (K10994A + K12076)	C	None		0.00	160.00	No	38.00	38.00	1300.00
						Ice	48.00	48.00	1800.00
						1/2"	58.00	58.00	2400.00
						Ice 1"			
***** (3) LNX-6514DS-VTM W/MOUNTING PIPE	A	From Leg	4.00 0.00 0.00	0.00	150.00	No	8.30	7.27	68.94
						Ice	8.79	8.20	139.71
						1/2"	9.29	9.06	219.25
						Ice 1"			
(3) SBNH-1D65B W/MOUNTING PIPE	B	From Leg	4.00 0.00 0.00	0.00	150.00	No	8.19	7.14	75.34
						Ice	8.65	7.96	144.64
						1/2"	9.11	8.80	222.56
						Ice 1"			
(3) SBNH-1D65B W/MOUNTING PIPE	C	From Leg	4.00 0.00 0.00	0.00	150.00	No	8.86	7.84	89.82
						Ice	9.58	9.18	166.66
						1/2"	10.22	10.25	252.91
						Ice 1"			
(2) RRUS A2 (20.4" x 18.5" x 10.8")	A	None		0.00	150.00	No	3.15	1.84	71.40
						Ice	3.36	2.01	98.89
						1/2"	3.59	2.20	129.79
						Ice 1"			
(2) RRUS A2 (20.4" x 18.5" x 10.8")	B	None		0.00	150.00	No	3.15	1.84	71.40
						Ice	3.36	2.01	98.89
						1/2"	3.59	2.20	129.79
						Ice 1"			
(2) RRUS A2 (20.4" x 18.5" x 10.8")	C	None		0.00	150.00	No	3.15	1.84	71.40
						Ice	3.36	2.01	98.89
						1/2"	3.59	2.20	129.79
						Ice 1"			
(2) 20" x 12.5" x 12" RRH	C	None		0.00	150.00	No	2.08	2.00	50.00
						Ice			

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustme nt °	Placement ft	CAA Front ft ²	CAA Side ft ²	Weight lb	
						Ice 1/2"	2.27	2.18	72.22
						Ice 1"	2.46	2.37	97.51
(2) 20" x 12.5" x 12" RRH	C	None		0.00	150.00	Ice No	2.08	2.00	50.00
						Ice 1/2"	2.27	2.18	72.22
						Ice 1"	2.46	2.37	97.51
(2) 20" x 12.5" x 12" RRH	C	None		0.00	150.00	Ice No	2.08	2.00	50.00
						Ice 1/2"	2.27	2.18	72.22
						Ice 1"	2.46	2.37	97.51
37" x 12" x 6" RRH	C	None		0.00	150.00	Ice No	3.78	2.10	55.00
						Ice 1/2"	4.05	2.34	80.73
						Ice 1"	4.32	2.58	110.22
37" x 12" x 6" RRH	C	None		0.00	150.00	Ice No	3.78	2.10	55.00
						Ice 1/2"	4.05	2.34	80.73
						Ice 1"	4.32	2.58	110.22
37" x 12" x 6" RRH	C	None		0.00	150.00	Ice No	3.78	2.10	55.00
						Ice 1/2"	4.05	2.34	80.73
						Ice 1"	4.32	2.58	110.22
EE 12' Square Platform w/Handrails (K11130 + K11914)	C	None		0.00	150.00	Ice No	75.00	75.00	3131.00
						Ice 1/2"	75.00	75.00	3131.00
						Ice 1"	75.00	75.00	3131.00
						Ice			

(3) LNX-6514DS-VTM W/MOUNTING PIPE	A	From Leg	4.00 0.00 0.00	0.00	140.00	Ice No	8.30	7.27	68.94
						Ice 1/2"	8.79	8.20	139.71
						Ice 1"	9.29	9.06	219.25
(3) SBNH-1D65B W/MOUNTING PIPE	B	From Leg	4.00 0.00 0.00	0.00	140.00	Ice No	8.19	7.14	75.34
						Ice 1/2"	8.65	7.96	144.64
						Ice 1"	9.11	8.80	222.56
(3) SBNHH-1D65B W/MOUNTING PIPE	C	From Leg	4.00 0.00 0.00	0.00	140.00	Ice No	8.86	7.84	89.82
						Ice 1/2"	9.58	9.18	166.66
						Ice 1"	10.22	10.25	252.91

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	Client		Verizon Wireless					Designed by		gfisher

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustme nt °	Placement ft	CAA Front ft ²	CAA Side ft ²	Weight lb	
(2) RRUS A2 (20.4" x 18.5" x 10.8")	A	None		0.00	140.00	Ice 1"			
						No	3.15	1.84	71.40
						Ice	3.36	2.01	98.89
						1/2"	3.59	2.20	129.79
(2) RRUS A2 (20.4" x 18.5" x 10.8")	B	None		0.00	140.00	Ice 1"			
						No	3.15	1.84	71.40
						Ice	3.36	2.01	98.89
						1/2"	3.59	2.20	129.79
(2) RRUS A2 (20.4" x 18.5" x 10.8")	C	None		0.00	140.00	Ice 1"			
						No	3.15	1.84	71.40
						Ice	3.36	2.01	98.89
						1/2"	3.59	2.20	129.79
(2) 20" x 12.5" x 12" RRH	C	None		0.00	140.00	Ice 1"			
						No	2.08	2.00	50.00
						Ice	2.27	2.18	72.22
						1/2"	2.46	2.37	97.51
(2) 20" x 12.5" x 12" RRH	C	None		0.00	140.00	Ice 1"			
						No	2.08	2.00	50.00
						Ice	2.27	2.18	72.22
						1/2"	2.46	2.37	97.51
(2) 20" x 12.5" x 12" RRH	C	None		0.00	140.00	Ice 1"			
						No	2.08	2.00	50.00
						Ice	2.27	2.18	72.22
						1/2"	2.46	2.37	97.51
37" x 12" x 6" RRH	C	None		0.00	140.00	Ice 1"			
						No	3.78	2.10	55.00
						Ice	4.05	2.34	80.73
						1/2"	4.32	2.58	110.22
37" x 12" x 6" RRH	C	None		0.00	140.00	Ice 1"			
						No	3.78	2.10	55.00
						Ice	4.05	2.34	80.73
						1/2"	4.32	2.58	110.22
37" x 12" x 6" RRH	C	None		0.00	140.00	Ice 1"			
						No	3.78	2.10	55.00
						Ice	4.05	2.34	80.73
						1/2"	4.32	2.58	110.22

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	Project	150' to 170' Monopole	Date	16:13:30 01/24/17
	Client	Verizon Wireless	Designed by	gfisher

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAA Front ft ²	CAA Side ft ²	Weight lb	
EE 12' Platform w/Handrails (K10994A + K12076)	C	None		0.00	140.00	No Ice 1/2" Ice 1" Ice	38.00 48.00 58.00	38.00 48.00 58.00	1300.00 1800.00 2400.00

(3) LNX-6514DS-VTM W/MOUNTING PIPE	A	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	8.30 8.79 9.29	7.27 8.20 9.06	68.94 139.71 219.25
(3) SBNH-1D65B W/MOUNTING PIPE	B	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	8.19 8.65 9.11	7.14 7.96 8.80	75.34 144.64 222.56
(3) SBNHH-1D65B W/MOUNTING PIPE	C	From Leg	4.00 0.00 0.00	0.00	130.00	No Ice 1/2" Ice 1" Ice	8.86 9.58 10.22	7.84 9.18 10.25	89.82 166.66 252.91
(2) RRUS A2 (20.4" x 18.5" x 10.8")	A	None		0.00	130.00	No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.84 2.01 2.20	71.40 98.89 129.79
(2) RRUS A2 (20.4" x 18.5" x 10.8")	B	None		0.00	130.00	No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.84 2.01 2.20	71.40 98.89 129.79
(2) RRUS A2 (20.4" x 18.5" x 10.8")	C	None		0.00	130.00	No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.84 2.01 2.20	71.40 98.89 129.79
(2) 20" x 12.5" x 12" RRH	C	None		0.00	130.00	No Ice 1/2" Ice 1" Ice	2.08 2.27 2.46	2.00 2.18 2.37	50.00 72.22 97.51
(2) 20" x 12.5" x 12" RRH	C	None		0.00	130.00	No Ice 1/2" Ice 1" Ice	2.08 2.27 2.46	2.00 2.18 2.37	50.00 72.22 97.51
(2) 20" x 12.5" x 12" RRH	C	None		0.00	130.00	No Ice	2.08 2.27	2.00 2.18	50.00 72.22

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	Project		150' to 170' Monopole					Date		16:13:30 01/24/17
	Client		Verizon Wireless					Designed by		gfisher

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustme nt °	Placement ft	CAA Front ft ²	CAA Side ft ²	Weight lb	
						1/2"	2.46	2.37	97.51
						Ice			
						1"			
						Ice			
37" x 12" x 6" RRH	C	None		0.00	130.00	No	3.78	2.10	55.00
						Ice	4.05	2.34	80.73
						1/2"	4.32	2.58	110.22
						Ice			
						1"			
						Ice			
37" x 12" x 6" RRH	C	None		0.00	130.00	No	3.78	2.10	55.00
						Ice	4.05	2.34	80.73
						1/2"	4.32	2.58	110.22
						Ice			
						1"			
						Ice			
37" x 12" x 6" RRH	C	None		0.00	130.00	No	3.78	2.10	55.00
						Ice	4.05	2.34	80.73
						1/2"	4.32	2.58	110.22
						Ice			
						1"			
						Ice			
EE 12' Platform w/Handrails (K10994A + K12076)	C	None		0.00	130.00	No	38.00	38.00	1300.00
						Ice	48.00	48.00	1800.00
						1/2"	58.00	58.00	2400.00
						Ice			
						1"			
						Ice			
*****						Ice			
(3) LNX-6514DS-VTM W/MOUNTING PIPE	A	From Leg	4.00 0.00 0.00	0.00	120.00	No	8.30	7.27	68.94
						Ice	8.79	8.20	139.71
						1/2"	9.29	9.06	219.25
						Ice			
						1"			
						Ice			
(3) SBNH-1D65B W/MOUNTING PIPE	B	From Leg	4.00 0.00 0.00	0.00	120.00	No	8.19	7.14	75.34
						Ice	8.65	7.96	144.64
						1/2"	9.11	8.80	222.56
						Ice			
						1"			
						Ice			
(3) SBNHH-1D65B W/MOUNTING PIPE	C	From Leg	4.00 0.00 0.00	0.00	120.00	No	8.86	7.84	89.82
						Ice	9.58	9.18	166.66
						1/2"	10.22	10.25	252.91
						Ice			
						1"			
						Ice			
(2) RRUS A2 (20.4" x 18.5" x 10.8")	A	None		0.00	120.00	No	3.15	1.84	71.40
						Ice	3.36	2.01	98.89
						1/2"	3.59	2.20	129.79
						Ice			
						1"			
						Ice			
(2) RRUS A2 (20.4" x 18.5" x 10.8")	B	None		0.00	120.00	No	3.15	1.84	71.40
						Ice	3.36	2.01	98.89
						1/2"	3.59	2.20	129.79
						Ice			
						1"			
						Ice			

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	Project		150' to 170' Monopole		Date		16:13:30 01/24/17	
	Client		Verizon Wireless		Designed by		gfisher	

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustme nt °	Placement ft	CAA Front ft ²	CAA Side ft ²	Weight lb	
(2) RRUS A2 (20.4" x 18.5" x 10.8")	C	None		0.00	120.00	1"			
						Ice			
						No	3.15	1.84	71.40
						Ice	3.36	2.01	98.89
(2) 20" x 12.5" x 12" RRH	C	None		0.00	120.00	1/2"	3.59	2.20	129.79
						Ice			
						1"			
						Ice	2.08	2.00	50.00
(2) 20" x 12.5" x 12" RRH	C	None		0.00	120.00	Ice	2.27	2.18	72.22
						1/2"	2.46	2.37	97.51
						1"			
						Ice	2.08	2.00	50.00
(2) 20" x 12.5" x 12" RRH	C	None		0.00	120.00	Ice	2.27	2.18	72.22
						1/2"	2.46	2.37	97.51
						1"			
						Ice	2.08	2.00	50.00
(2) 20" x 12.5" x 12" RRH	C	None		0.00	120.00	Ice	2.27	2.18	72.22
						1/2"	2.46	2.37	97.51
						1"			
						Ice	2.08	2.00	50.00
37" x 12" x 6" RRH	C	None		0.00	120.00	Ice	3.78	2.10	55.00
						No	4.05	2.34	80.73
						1/2"	4.32	2.58	110.22
						Ice			
37" x 12" x 6" RRH	C	None		0.00	120.00	Ice	3.78	2.10	55.00
						No	4.05	2.34	80.73
						1/2"	4.32	2.58	110.22
						Ice			
37" x 12" x 6" RRH	C	None		0.00	120.00	Ice	3.78	2.10	55.00
						No	4.05	2.34	80.73
						1/2"	4.32	2.58	110.22
						Ice			
EE 12' Platform w/Handrails (K10994A + K12076)	C	None		0.00	120.00	Ice	38.00	38.00	1300.00
						No	48.00	48.00	1800.00
						1/2"	58.00	58.00	2400.00
						Ice			
						1"			
						Ice			

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	Client Verizon Wireless	Designed by gfisher

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 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	170 - 150	Pole	Max Tension	26	0.00	-0.00	0.00
			Max. Compression	26	-27669.64	1.71	-0.96
			Max. Mx	20	-5393.68	318.92	-0.41
			Max. My	14	-5394.31	0.30	-318.91
			Max. Vy	20	-21995.94	318.92	-0.41
			Max. Vx	14	21992.08	0.30	-318.91
			Max. Torque	12			-1.20
L2	150 - 96.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-91501.28	5.54	-3.14
			Max. Mx	20	-28977.88	2934.02	-1.09
			Max. My	14	-28979.23	0.87	-2933.72
			Max. Vy	20	-69349.93	2934.02	-1.09
			Max. Vx	14	69339.49	0.87	-2933.72
			Max. Torque	24			3.57
L3	96.08 - 47.87	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-117074.01	5.61	-3.18
			Max. Mx	20	-50801.93	6341.18	-0.67
			Max. My	14	-50802.65	0.51	-6340.41
			Max. Vy	20	-76102.69	6341.18	-0.67
			Max. Vx	14	76091.87	0.51	-6340.41
			Max. Torque	24			3.55
L4	47.87 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-154978.53	5.61	-3.18
			Max. Mx	20	-83468.45	10642.69	-0.12
			Max. My	14	-83468.47	-0.04	-10641.39
			Max. Vy	20	-82138.08	10642.69	-0.12
			Max. Vx	14	82128.26	-0.04	-10641.39
			Max. Torque	24			3.52

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	36	154978.53	18177.11	18.44
	Max. H _x	20	83557.83	82047.15	10.20
	Max. H _z	3	62668.37	10.20	82037.35
	Max. M _x	2	10638.10	10.20	82037.35
	Max. M _z	8	10639.67	-82047.15	-10.20
	Max. Torsion	24	3.52	41032.39	71051.53
	Min. Vert	13	62668.37	-41032.39	-71051.53
	Min. H _x	8	83557.83	-82047.15	-10.20
	Min. H _z	15	62668.37	-10.20	-82037.35
	Min. M _x	14	-10641.39	-10.20	-82037.35
	Min. M _z	20	-10642.69	82047.15	10.20
	Min. Torsion	12	-3.52	-41032.39	-71051.53

Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	69631.52	0.00	0.00	1.29	1.19	0.00

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<i>Load Combination</i>	<i>Vertical lb</i>	<i>Shear_x lb</i>	<i>Shear_y lb</i>	<i>Overturning Moment, M_x kip-ft</i>	<i>Overturning Moment, M_y kip-ft</i>	<i>Torque kip-ft</i>
1.2 Dead+1.6 Wind 0 deg - No Ice	83557.83	-10.20	-82037.35	-10638.10	3.02	-3.32
0.9 Dead+1.6 Wind 0 deg - No Ice	62668.37	-10.20	-82037.35	-10530.95	2.61	-3.28
1.2 Dead+1.6 Wind 30 deg - No Ice	83557.83	41014.72	-71041.32	-9211.88	-5317.80	-2.23
0.9 Dead+1.6 Wind 30 deg - No Ice	62668.37	41014.72	-71041.32	-9119.16	-5264.40	-2.21
1.2 Dead+1.6 Wind 60 deg - No Ice	83557.83	71049.79	-41009.84	-5316.89	-9213.30	-0.54
0.9 Dead+1.6 Wind 60 deg - No Ice	62668.37	71049.79	-41009.84	-5263.55	-9120.52	-0.56
1.2 Dead+1.6 Wind 90 deg - No Ice	83557.83	82047.15	10.20	3.18	-10639.67	1.29
0.9 Dead+1.6 Wind 90 deg - No Ice	62668.37	82047.12	10.20	2.73	-10532.49	1.25
1.2 Dead+1.6 Wind 120 deg - No Ice	83557.83	71059.99	41027.51	5322.83	-9214.80	2.77
0.9 Dead+1.6 Wind 120 deg - No Ice	62668.37	71059.99	41027.51	5268.59	-9122.01	2.72
1.2 Dead+1.6 Wind 150 deg - No Ice	83557.83	41032.39	71051.53	9216.68	-5320.43	3.52
0.9 Dead+1.6 Wind 150 deg - No Ice	62668.37	41032.39	71051.53	9123.08	-5267.01	3.46
1.2 Dead+1.6 Wind 180 deg - No Ice	83557.83	10.20	82037.35	10641.39	-0.04	3.31
0.9 Dead+1.6 Wind 180 deg - No Ice	62668.37	10.20	82037.35	10533.37	-0.42	3.28
1.2 Dead+1.6 Wind 210 deg - No Ice	83557.83	-41014.72	71041.32	9215.19	5320.77	2.23
0.9 Dead+1.6 Wind 210 deg - No Ice	62668.37	-41014.72	71041.32	9121.59	5266.60	2.21
1.2 Dead+1.6 Wind 240 deg - No Ice	83557.83	-71049.79	41009.84	5320.21	9216.30	0.54
0.9 Dead+1.6 Wind 240 deg - No Ice	62668.37	-71049.79	41009.84	5265.99	9122.73	0.56
1.2 Dead+1.6 Wind 270 deg - No Ice	83557.83	-82047.15	-10.20	0.12	10642.69	-1.29
0.9 Dead+1.6 Wind 270 deg - No Ice	62668.37	-82047.12	-10.20	-0.30	10534.71	-1.25
1.2 Dead+1.6 Wind 300 deg - No Ice	83557.83	-71059.99	-41027.51	-5319.55	9217.82	-2.77
0.9 Dead+1.6 Wind 300 deg - No Ice	62668.37	-71059.99	-41027.51	-5266.18	9124.23	-2.72
1.2 Dead+1.6 Wind 330 deg - No Ice	83557.83	-41032.39	-71051.53	-9213.41	5323.42	-3.52
0.9 Dead+1.6 Wind 330 deg - No Ice	62668.37	-41032.39	-71051.53	-9120.67	5269.22	-3.46
1.2 Dead+1.0 Ice+1.0 Temp	154978.53	-0.03	0.02	3.18	5.61	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	154978.53	-18.44	-18186.25	-2446.14	8.94	-1.22
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	154978.53	9072.41	-15740.23	-2116.53	-1215.51	-0.82
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	154978.53	15732.32	-9076.98	-1218.83	-2112.67	-0.20
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	154978.53	18177.11	18.44	6.35	-2442.08	0.47
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	154978.53	15750.75	9108.91	1230.74	-2115.63	1.02
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	154978.53	9104.34	15758.67	2126.27	-1220.65	1.30

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Load Combination	Vertical lb	Shear _x lb	Shear _y lb	Overturning Moment, M _x kip-ft	Overturning Moment, M _y kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	154978.53	18.43	18186.25	2452.91	3.01	1.22
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	154978.53	-9072.41	15740.23	2123.31	1227.46	0.82
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	154978.53	-15732.32	9076.98	1225.61	2124.63	0.20
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	154978.53	-18177.11	-18.44	0.42	2454.03	-0.47
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	154978.53	-15750.75	-9108.91	-1223.98	2127.59	-1.02
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	154978.53	-9104.35	-15758.67	-2119.50	1232.60	-1.30
Dead+Wind 0 deg - Service	69631.52	-1.70	-13649.11	-1762.73	1.52	-0.56
Dead+Wind 30 deg - Service	69631.52	6823.90	-11819.62	-1526.26	-880.69	-0.38
Dead+Wind 60 deg - Service	69631.52	11821.03	-6823.08	-880.46	-1526.58	-0.09
Dead+Wind 90 deg - Service	69631.52	13650.73	1.70	1.63	-1763.09	0.22
Dead+Wind 120 deg - Service	69631.52	11822.73	6826.02	883.65	-1526.84	0.47
Dead+Wind 150 deg - Service	69631.52	6826.84	11821.32	1529.27	-881.13	0.59
Dead+Wind 180 deg - Service	69631.52	1.70	13649.11	1765.49	1.01	0.56
Dead+Wind 210 deg - Service	69631.52	-6823.90	11819.62	1529.01	883.22	0.38
Dead+Wind 240 deg - Service	69631.52	-11821.03	6823.08	883.21	1529.11	0.09
Dead+Wind 270 deg - Service	69631.52	-13650.73	-1.70	1.12	1765.62	-0.22
Dead+Wind 300 deg - Service	69631.52	-11822.73	-6826.02	-880.90	1529.37	-0.47
Dead+Wind 330 deg - Service	69631.52	-6826.84	-11821.32	-1526.51	883.66	-0.59

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.00	-69631.52	0.00	0.00	69631.52	0.00	0.000%
2	-10.20	-83557.83	-82037.34	10.20	83557.83	82037.35	0.000%
3	-10.20	-62668.37	-82037.34	10.20	62668.37	82037.35	0.000%
4	41014.72	-83557.83	-71041.32	-41014.72	83557.83	71041.32	0.000%
5	41014.72	-62668.37	-71041.32	-41014.72	62668.37	71041.32	0.000%
6	71049.78	-83557.83	-41009.84	-71049.79	83557.83	41009.84	0.000%
7	71049.78	-62668.37	-41009.84	-71049.79	62668.37	41009.84	0.000%
8	82047.12	-83557.83	10.20	-82047.15	83557.83	-10.20	0.000%
9	82047.12	-62668.37	10.20	-82047.12	62668.37	-10.20	0.000%
10	71059.99	-83557.83	41027.51	-71059.99	83557.83	-41027.51	0.000%
11	71059.99	-62668.37	41027.51	-71059.99	62668.37	-41027.51	0.000%
12	41032.39	-83557.83	71051.53	-41032.39	83557.83	-71051.53	0.000%
13	41032.39	-62668.37	71051.53	-41032.39	62668.37	-71051.53	0.000%
14	10.20	-83557.83	82037.34	-10.20	83557.83	-82037.35	0.000%
15	10.20	-62668.37	82037.34	-10.20	62668.37	-82037.35	0.000%
16	-41014.72	-83557.83	71041.32	41014.72	83557.83	-71041.32	0.000%
17	-41014.72	-62668.37	71041.32	41014.72	62668.37	-71041.32	0.000%
18	-71049.78	-83557.83	41009.84	71049.79	83557.83	-41009.84	0.000%
19	-71049.78	-62668.37	41009.84	71049.79	62668.37	-41009.84	0.000%
20	-82047.12	-83557.83	-10.20	82047.15	83557.83	10.20	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
21	-82047.12	-62668.37	-10.20	82047.12	62668.37	10.20	0.000%
22	-71059.99	-83557.83	-41027.51	71059.99	83557.83	41027.51	0.000%
23	-71059.99	-62668.37	-41027.51	71059.99	62668.37	41027.51	0.000%
24	-41032.39	-83557.83	-71051.53	41032.39	83557.83	71051.53	0.000%
25	-41032.39	-62668.37	-71051.53	41032.39	62668.37	71051.53	0.000%
26	0.00	-154978.53	0.00	0.03	154978.53	-0.02	0.000%
27	-18.44	-154978.53	-18185.84	18.44	154978.53	18186.25	0.000%
28	9072.39	-154978.53	-15740.18	-9072.41	154978.53	15740.23	0.000%
29	15732.27	-154978.53	-9076.95	-15732.32	154978.53	9076.98	0.000%
30	18176.70	-154978.53	18.44	-18177.11	154978.53	-18.44	0.000%
31	15750.71	-154978.53	9108.89	-15750.75	154978.53	-9108.91	0.000%
32	9104.32	-154978.53	15758.62	-9104.34	154978.53	-15758.67	0.000%
33	18.44	-154978.53	18185.84	-18.43	154978.53	-18186.25	0.000%
34	-9072.39	-154978.53	15740.18	9072.41	154978.53	-15740.23	0.000%
35	-15732.27	-154978.53	9076.95	15732.32	154978.53	-9076.98	0.000%
36	-18176.70	-154978.53	-18.44	18177.11	154978.53	18.44	0.000%
37	-15750.71	-154978.53	-9108.89	15750.75	154978.53	9108.91	0.000%
38	-9104.32	-154978.53	-15758.62	9104.35	154978.53	15758.67	0.000%
39	-1.70	-69631.52	-13649.10	1.70	69631.52	13649.11	0.000%
40	6823.89	-69631.52	-11819.62	-6823.90	69631.52	11819.62	0.000%
41	11821.03	-69631.52	-6823.08	-11821.03	69631.52	6823.08	0.000%
42	13650.73	-69631.52	1.70	-13650.73	69631.52	-1.70	0.000%
43	11822.73	-69631.52	6826.02	-11822.73	69631.52	-6826.02	0.000%
44	6826.83	-69631.52	11821.32	-6826.84	69631.52	-11821.32	0.000%
45	1.70	-69631.52	13649.10	-1.70	69631.52	-13649.11	0.000%
46	-6823.89	-69631.52	11819.62	6823.90	69631.52	-11819.62	0.000%
47	-11821.03	-69631.52	6823.08	11821.03	69631.52	-6823.08	0.000%
48	-13650.73	-69631.52	-1.70	13650.73	69631.52	1.70	0.000%
49	-11822.73	-69631.52	-6826.02	11822.73	69631.52	6826.02	0.000%
50	-6826.83	-69631.52	-11821.32	6826.84	69631.52	11821.32	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00007081
3	Yes	4	0.00000001	0.00097905
4	Yes	6	0.00000001	0.00008300
5	Yes	5	0.00000001	0.00075560
6	Yes	6	0.00000001	0.00008488
7	Yes	5	0.00000001	0.00077511
8	Yes	4	0.00000001	0.00080710
9	Yes	4	0.00000001	0.00040404
10	Yes	6	0.00000001	0.00008644
11	Yes	5	0.00000001	0.00079058
12	Yes	6	0.00000001	0.00008226
13	Yes	5	0.00000001	0.00074791
14	Yes	5	0.00000001	0.00006898
15	Yes	4	0.00000001	0.00095060
16	Yes	6	0.00000001	0.00008618
17	Yes	5	0.00000001	0.00078791
18	Yes	6	0.00000001	0.00008427
19	Yes	5	0.00000001	0.00076815
20	Yes	4	0.00000001	0.00075714
21	Yes	4	0.00000001	0.00037590

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22	Yes	6	0.0000001	0.00008275
23	Yes	5	0.0000001	0.00075300
24	Yes	6	0.0000001	0.00008694
25	Yes	5	0.0000001	0.00079589
26	Yes	4	0.0000001	0.00002888
27	Yes	5	0.0000001	0.00074781
28	Yes	6	0.0000001	0.00018360
29	Yes	6	0.0000001	0.00018720
30	Yes	5	0.0000001	0.00073583
31	Yes	6	0.0000001	0.00019383
32	Yes	6	0.0000001	0.00018510
33	Yes	5	0.0000001	0.00075138
34	Yes	6	0.0000001	0.00019558
35	Yes	6	0.0000001	0.00019136
36	Yes	5	0.0000001	0.00074325
37	Yes	6	0.0000001	0.00018744
38	Yes	6	0.0000001	0.00019675
39	Yes	4	0.0000001	0.00009967
40	Yes	4	0.0000001	0.00062900
41	Yes	4	0.0000001	0.00066228
42	Yes	4	0.0000001	0.00005664
43	Yes	4	0.0000001	0.00069999
44	Yes	4	0.0000001	0.00062252
45	Yes	4	0.0000001	0.00009963
46	Yes	4	0.0000001	0.00069793
47	Yes	4	0.0000001	0.00066089
48	Yes	4	0.0000001	0.00005655
49	Yes	4	0.0000001	0.00062949
50	Yes	4	0.0000001	0.00071050

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	170 - 150	28.31	47	1.51	0.00
L2	150 - 96.08	22.11	47	1.42	0.00
L3	101.93 - 47.87	9.78	47	0.95	0.00
L4	55.145 - 1	2.72	47	0.46	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
170.00	(3) LNX-6514DS-VTM W/MOUNTING PIPE	47	28.31	1.51	0.00	31588
160.00	(3) LNX-6514DS-VTM W/MOUNTING PIPE	47	25.18	1.47	0.00	15794
150.00	(3) LNX-6514DS-VTM W/MOUNTING PIPE	47	22.11	1.42	0.00	8159
140.00	(3) LNX-6514DS-VTM W/MOUNTING PIPE	47	19.19	1.35	0.00	7086
130.00	(3) LNX-6514DS-VTM W/MOUNTING PIPE	47	16.44	1.26	0.00	6427
120.00	(3) LNX-6514DS-VTM	47	13.88	1.16	0.00	5880

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Elevation	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
ft	W/MOUNTING PIPE					

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	170 - 150	169.98	20	9.06	0.02
L2	150 - 96.08	132.88	20	8.56	0.01
L3	101.93 - 47.87	58.86	20	5.74	0.00
L4	55.145 - 1	16.38	20	2.80	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
170.00	(3) LNX-6514DS-VTM W/MOUNTING PIPE	20	169.98	9.06	0.02	5573
160.00	(3) LNX-6514DS-VTM W/MOUNTING PIPE	20	151.21	8.85	0.01	2785
150.00	(3) LNX-6514DS-VTM W/MOUNTING PIPE	20	132.88	8.56	0.01	1434
140.00	(3) LNX-6514DS-VTM W/MOUNTING PIPE	20	115.39	8.14	0.01	1236
130.00	(3) LNX-6514DS-VTM W/MOUNTING PIPE	20	98.90	7.59	0.01	1113
120.00	(3) LNX-6514DS-VTM W/MOUNTING PIPE	20	83.51	6.97	0.01	1011

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio P _u / φP _n
L1	170 - 150 (1)	TP29x24x0.1875	20.00	0.00	0.0	17.147 0	-5394.41	1102700.00	0.005
L2	150 - 96.08 (2)	TP42.8x29x0.375	53.92	0.00	0.0	48.714 3	-28978.90	3536830.00	0.008
L3	96.08 - 47.87 (3)	TP54.2x40.5528x0.5	54.06	0.00	0.0	82.307 3	-50801.90	6058820.00	0.008
L4	47.87 - 1 (4)	TP65x51.3635x0.5625	54.14	0.00	0.0	115.04 50	-83468.50	8236630.00	0.010

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Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	170 - 150 (1)	TP29x24x0.1875	319.04	654.20	0.488	0.00	654.20	0.000
L2	150 - 96.08 (2)	TP42.8x29x0.375	2934.13	2972.79	0.987	0.00	2972.79	0.000
L3	96.08 - 47.87 (3)	TP54.2x40.5528x0.5	6341.17	6450.23	0.983	0.00	6450.23	0.000
L4	47.87 - 1 (4)	TP65x51.3635x0.5625	10642.67	10904.50	0.976	0.00	10904.50	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	170 - 150 (1)	TP29x24x0.1875	21990.20	551349.00	0.040	0.75	1310.01	0.001
L2	150 - 96.08 (2)	TP42.8x29x0.375	69338.30	1768420.00	0.039	0.55	5952.85	0.000
L3	96.08 - 47.87 (3)	TP54.2x40.5528x0.5	76102.70	3029410.00	0.025	1.29	12916.25	0.000
L4	47.87 - 1 (4)	TP65x51.3635x0.5625	82138.10	4118320.00	0.020	1.29	21835.67	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u ϕP_n	Ratio M_{ux} ϕM_{nx}	Ratio M_{uy} ϕM_{ny}	Ratio V_u ϕV_n	Ratio T_u ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	170 - 150 (1)	0.005	0.488	0.000	0.040	0.001	0.494	1.000	4.8.2 ✓
L2	150 - 96.08 (2)	0.008	0.987	0.000	0.039	0.000	0.997	1.000	4.8.2 ✓
L3	96.08 - 47.87 (3)	0.008	0.983	0.000	0.025	0.000	0.992	1.000	4.8.2 ✓
L4	47.87 - 1 (4)	0.010	0.976	0.000	0.020	0.000	0.987	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capaci ty	Pass Fail
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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$\emptyset P_{allow}$ lb	% Capacity	Pass Fail	
L1	170 - 150	Pole	TP29x24x0.1875	1	-5394.41	1102700.00	49.4	Pass	
L2	150 - 96.08	Pole	TP42.8x29x0.375	2	-28978.90	3536830.00	99.7	Pass	
L3	96.08 - 47.87	Pole	TP54.2x40.5528x0.5	3	-50801.90	6058820.00	99.2	Pass	
L4	47.87 - 1	Pole	TP65x51.3635x0.5625	4	-83468.50	8236630.00	98.7	Pass	
							Summary		
							Pole (L2)	99.7	Pass
							RATING	99.7	Pass
							=		

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: _____
 Site Name: _____
 App #: _____

Reactions		
Mu	320	ft-kips
Axial, Pu	5.4	kips
Shear, Vu	22	kips
Elevation:	150	feet

Bolt Threads:
X-Excluded
$\phi V_n = \phi(0.55 \cdot A_b \cdot F_u)$
$\phi = 0.75, \phi \cdot V_n$ (kips):
38.88

Pole Manufacturer: **Other**

If No stiffeners, Criteria: **TIA G** <-Only Applicable to Unstiffened Cases

Bolt Data

Qty:	16		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	75	<-- Disregard	
N/A:	55	<-- Disregard	
Circle (in.):	33		

Flange Bolt Results

Bolt Tension Capacity, $\phi \cdot T_n, B1$: 54.54 kips
 Adjusted $\phi \cdot T_n$ (due to $V_u = V_u/Q_t$), **B**: 54.51 kips
 Max Bolt directly applied T_u : 28.75 Kips
 Min. PL "tc" for **B** cap. **w/o Pry**: 0.922 in
 Min PL "treq" for actual **T w/ Pry**: 0.497 in
 Min PL "t1" for actual **T w/o Pry**: 0.670 in
 T allowable w/o Prying: 54.54 kips $\alpha' < 0$ case
 Prying Force, q: 0.00 kips
 Total Bolt Tension = $T_u + q$: 28.75 kips
 Non-Prying Bolt Stress Ratio, T_u/B : 52.8% **Pass**

Rigid
$\phi \cdot T_n$
$\phi T_n [(1 - (V_u / \phi V_n)^2)^{0.5}]$

Plate Data

Diam:	37	in
Thick, t:	1	in
Grade (Fy):	50	ksi
Strength, Fu:	75	ksi
Single-Rod B-eff:	5.75	in

Exterior Flange Plate Results

Flexural Check
 Compression Side Plate Stress: 23.5 ksi
 Allowable Plate Stress: 45.0 ksi
 Compression Plate Stress Ratio: 52.2% **Pass**
No Prying
 Tension Side Stress Ratio, $(treq/t)^2$: 24.7% **Pass**

Rigid
TIA G
$\phi \cdot F_y$
Comp. Y.L. Length:
15.75

Stiffener Data (Welding at Both Sides)

Config:	0	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	18	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

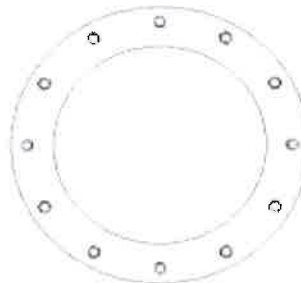
n/a

Stiffener Results

Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$: n/a
 Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

Pole Punching Shear Check: n/a



Pole Data

Diam:	29	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

EI Job #:	18068-E01
Site Name:	Dayville CT
Structure:	150ft to 170ft Pole

Client:	Verizon Wireless
Site #:	
Location:	Killingly, CT

Base Reactions	
Moment, M_u =	10643 ft-kip
Shear, V_u =	82.1 kip
Vertical, P_u =	83.6 kip

Base Plate Properties	
Base Plate Material =	A572GR50
Outside Diameter =	78.5 in
Inside Diameter =	55 in
Weight =	2042 lbf

Pole Properties at Base	
Pole Diameter =	65 in
Pole Thickness =	0.5625 in
Yield Strength =	65 ksi
Monopole Shape =	18-Sided

Effective Base Plate Bend Line	
Desantis' Bend Line =	44.01 in
% Reduction =	60 %
Reduced Bend Line =	20.91 in
Brinker's Bend Line =	8.99 in
Effective Bend Line =	8.99 in

Anchor Rod Properties & Bolt Circle Diam	
Anchor Material =	A615GR75
Anchor Diameter =	2.25 in
Minimum Bolt Circle \emptyset =	72.50 in
Actual Bolt Circle \emptyset =	72.5 in
Spacing =	7.59 in
Anchor Length =	6 ft
No. of Anchors =	30
Weight =	2679 lbs

Base Plate Thickness	
Section Modulus: Plastic	
Φ_b =	0.9
Minimum Thickness =	2.97 in
Actual Thickness =	3 in
M_{ub} =	891 in-k
ΦM_n =	910 in-kip
Usage ratio, % =	97.9%

Anchor Rod Inter. Eq. 1 (4.9.9)	
P_{ub} =	238 kip
V_{ub} =	2.74 kip
η =	0.5
Φ_t =	0.80
$\Phi_t R_{nt}$ =	260 kip
Inter. Eq. 1 =	0.94

Setting Template Properties	
Outside Diameter =	78.5 in
Inside Diameter =	66.5 in
Thickness =	0.375 in
Template Hole \emptyset =	2.375 in
Template Weight =	131.2 lbs
Bottom Template Must Be Bolted	

Anchor Rod Inter. Eq. 2 (4.9.9)	
L_{ar} =	2.25 in
V_{ub} =	2.74 kip
P_{ub} =	238 kip
M_{ub} =	4.00 kip-in
$\Phi_v R_{nv}$ =	134 kip
$\Phi_t R_{nt}$ =	260 kip
$\Phi_f R_{nm}$ =	95 kip-in
Inter. Eq. 2 =	0.94

Summary Table	
Anchor Material =	A615GR75
Anchor Diameter =	2.25 in
No. of Anchors =	30
Actual Bolt Circle \emptyset =	72.5 in
Anchor Length =	6 ft
Base Plate Material =	A572GR50
Actual Thickness =	3 in
Outside Diameter =	78.5 in
Inside Diameter =	55 in



**DESIGN CALCULATIONS
FOR
SPREAD FOOTER FOUNDATION**

**Verizon Wireless
150-ft to 170ft Monopole
Dayville, CT / Site**

Killingly, CT

EEI Project Number 18068-E01, Rev. 0

January 25, 2017

10975 Kinsman Road & Newbury, Ohio 44065
Phone: (440) 564-5484 & Phone: (888) 270-3855
Fax: (440) 564-5489 & www.engend.com

FOUNDATION DESIGN CALCULATIONS FOR A SPREAD FOOTER FOUNDATION



CUSTOMER: Verizon Wireless

DATE: 1/25/2017

LOCATION: Killingly, CT

150-ft to 170ft Monopole

SITE NAME: Dayville, CT

JOB NUMBER: 18068-E01

SITE NUMBER:

STATUS: Rev. 0

FOUNDATION DESIGN LOADS

DESIGN CODE		TIA-222-G		
	OVERTURNING MOMENT, kip-ft	SHEAR, kips	AXIAL, kips	
TIA/EIA 222F	0.0	0	0	
TIA-222-G	10643.00	82.1	83.6	
FACTORED w/φ=0.75	14190.7	109.5	111.5	

ANCHOR BOLT DATA

QUANTITY	LENGTH	BOLT CIRCLE Ø	PROJECTION
30	6.0 ft	72.5 in	12.0 in

SOIL UNIT WEIGHT, pcf **110.00**

CONCRETE UNIT WEIGHT, pcf **150.00**

MINIMUM FOUNDATION PARAMETERS

PEDESTAL MINIMUM WIDTH 96.0 in
FOUNDATION MINIMUM HEIGHT 5.50 ft

PEDESTAL PROJECTION **12.0 in**

ACTUAL FOUNDATION SIZE

	HEIGHT, ft	WIDTH, ft
SLAB	3.00	37.00
PEDESTAL	4.00	8.00

STABILITY

Foundation Weight, kips 654.45
Concrete, cub.yd. 161.59
Soil Weight, kips 430.65
Total weight foundation and soil (unfactored), kips 1085.10

Total Vertical Load, kips 1051.83
Total Overturning Moment, kip-ft 11217.70
Total Resisting Moment, kip-ft 19458.86

OVERTURNING SAFETY FACTOR **1.73**

Kern of Eccentricity, ft 6.17
Actual Eccentricity, ft 10.66

uplift exists!
(min SF=1.5)
Per Soil Report
(Include. OLF)

Allowable Net Soil Pressure, ksf (see soil report) **12.0**
Max soil pressure, ksf per TIA-222-G **3.2**
per TIA/EIA-222-F **n/a**

CONCRETE REINFORCEMENT

	BAR SIZE	BAR WEIGHT (lbs/ft)	QUANTITY	LENGTH (ft)	WEIGHT (lbs)
TOP PAD	# 9	3.40	72	41.50	10159.20
BOTTOM PAD	# 9	3.40	114	36.50	14147.40
VERTICAL BARS	# 10	3.40	52	9.00	1591.20
HORIZONTAL TIES	# 4	1.50	8	24.12	289.46

TOTAL STEEL WEIGHT (lbs) **26187.26**

FOOTING STRENGTH DESIGN

Concrete, psi 3000
Steel, ksi 60

Concrete cover, in 3
Distance, d (slab), in 32

NOTES

TWO-WAY SHEAR IN THE SLAB

Vertical Load, kips	83.60	
Bearing Soil Pressure, ksf	0.06	
Shear in the slab, kips	76.87	
Design shear V_n , kips	1525.56	$\phi = 0.85$ OK

ONE-WAY SHEAR IN THE SLAB

Max soil pressure, ksf	2.42	
Actual Eccentricity, ft	10.66	
Kern of Eccentricity, ft	6.17	
Pressure Distribution Zone, ft	23.51	
Effective Pressure Zone, ft	11.83	
Max Shear Force, kips	1058.8	
Design Shear, kips	1322.9	$\phi = 0.85$ OK

SLAB DESIGN IN FLEXURE

Max Soil Pressure, ksf	2.42	
Actual Eccentricity, ft	10.66	
Kern of Eccentricity, ft	6.17	
Pressure Distribution Zone, ft	23.51	
Effective Pressure Zone, ft	14.50	
Soil Pressure at Effective Zone Edge	0.93	
Shear Force at Critical Section, kip	897.2	
Bending Moment, k-ft	7471.9	
Coefficient of Resistance, R_n	219.1	$\phi = 0.90$
Min. Required Reinf. Ratio by Analysis	0.00382	
Min. Reinf. Ratio per ACI 318, 200/Fy	0.00330	
Min. Reinf. Ratio per ACI 318	0.00382	ACI-318 Sect.10.5.3
Design Reinforcement Ratio	0.00382	
Min. Steel Area, sq.in.	54.33	
Bar size	9	
Bar section area, in ²	1.00	

BOTTOM BARS

Min. No. of Bars/One direction	55.00	
Actual No. of Bars/One direction	55	OK
Actual Steel Area, sq.in.	55.00	
Steel Ratio Actual	0.00387	OK
Revised Coefficient of Resistance, R_n	232.24	
Design Moment, kip-ft	7919.10	
Total bottom bars	114	
Horizontal Spacing (shor), in	8.11	OK

TOP BARS

Min. Steel Area, sq.in (0.18%)	25.57	
Minimum Number of Bars REQUIRED	26	One Direction
Actual Number of Bars	36	OK
Top Steel Area, sq.in	36.00	
Total Top Bars	72	
Horizontal Spacing, in	12.51	OK

PEDESTAL DESIGN

Pedestal Width, in	96
Concrete Strength, ksi	3
Reinforcement Strength, ksi	60
Actual Rebars QTY	52
Nominal Bars QTY	12
Minimum reinforcement ratio	0.0033
Actual reinforcement ratio	0.0072
Concrete cover, in	3
Rebar layout radius, in	44.50

Ultimate Moment 10971.4 ft-kips

Rebar	10
Area, sq.in	1.27
Area, sq.in	5.50
Rebar space, in	5.38
ϵ_u	0.003
ϵ_y	0.00207

BENDING ABOUT THE MAJOR AXIS

Rebar Number	Angle degrees	Coordinate in	Edge Dist. in
1	0	44.50	3.50
2	30	38.54	9.46
3	60	22.25	25.75
4	90	0.00	48.00
5	120	-22.25	70.25
6	150	-38.54	86.54

Rebar Number	Angle degrees	Coordinate in	Edge Dist. in
7	180	-44.50	92.50
8	210	-38.54	86.54
9	240	-22.25	70.25
10	270	0.00	48.00
11	300	22.25	25.75
12	330	38.54	9.46

Location of Neutral Axis
Compression Zone

c = 11.79 in
a = 10.02 in

Rebar Number	ϵ in/in	Force kips
1	0.0021	330.20

Rebar Number	ϵ in/in	Force kips
2	-0.0006	-94.46
3	0.0036	330.20
4	0.0092	330.20
5	0.0149	330.20
6	0.0190	330.20
7	0.0205	330.20
8	0.0190	330.20
9	0.0149	330.20
10	0.0092	330.20
11	0.0036	330.20
12	-0.0006	-94.46

Concrete, kips 2452.69

Total Compression, kips 2782.89

Total Tension, kips 2782.89

Moment Due to Compression

Rebar Number	Force kips	Arm in	Moment k-ft
1	330.20	44.50	1224.49
2	0.00	38.54	0.00
12	0.00	38.54	0.00

Moment Due to Tension

Rebar Number	Force kips	Arm in	Moment k-ft
2	-94.46	38.54	303.34
3	330.20	22.25	-612.25
4	330.20	0.00	0.00
5	330.20	-22.25	612.25
6	330.20	-38.54	1060.44
7	330.20	-44.50	1224.49
8	330.20	-38.54	1060.44
9	330.20	-22.25	612.25
10	330.20	0.00	0.00
11	330.20	22.25	-612.25
12	-94.46	38.54	303.34

Concrete	2452.69	42.99	8786.85
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Total in Compression 10011.34

Total in Tension 3952.06

Design Moment about the Major Axis, kip-ft 12567.06 OK

BENDING ABOUT THE DIAGONAL

Rebar Number	Angle, deg phi	Coord., in c1	Edge Dist., in di
1	0	44.50	23.38
2	30	38.54	29.34
3	60	22.25	45.63
4	90	0.00	67.88
5	120	-22.25	90.13
6	150	-38.54	106.42

Rebar Number	Angle, deg phi	Coord., in c1	Edge Dist., in di
7	180	-44.50	112.38
8	210	-38.54	106.42
9	240	-22.25	90.13
10	270	0.00	67.88
11	300	22.25	45.63
12	330	38.54	29.34

Location of Neutral Axis
Compression Zone

c = 34.26 in
a = 29.12 in

Compression Zone

Rebar Number	ϵ in/in	Force kips
1	0.000952	330.20

Concrete, kips 2161.93

Total Compression, kips 2492.13

Tension Zone

Rebar Number	ϵ in/in	Force kips
2	-0.0004	-68.65
3	0.0010	159.01
4	0.0029	330.20
5	0.0049	330.20
6	0.0063	330.20
7	0.0068	330.20
8	0.0063	330.20
9	0.0049	330.20
10	0.0029	330.20
11	0.0010	159.01
12	-0.0004	-68.65

Total tension, kips 2492.13

Moment Due to Compression

Rebar Number	Force kips	Arm in	Moment k-ft
1	330.20	44.50	1224.49
2	0.00	38.54	0.00
12	0.00	38.54	0.00

Concrete	2161.93	58.18	10481.11
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Total in Compression, kips 11705.60

Moment Due to Tension

Rebar Number	Force kips	Arm in	Moment k-ft
3	159.01	22.25	-294.83
4	330.20	22.25	-612.25
5	330.20	0.00	0.00
6	330.20	-22.25	612.25
7	330.20	-44.50	1224.49
8	330.20	-38.54	1060.44
9	330.20	-22.25	612.25
10	330.20	0.00	0.00
11	159.01	22.25	-294.83

Total in Tension, kips 2307.51

Design Moment, kip-ft 12611.80

Pedestal Design Moment, kip-ft 12567.06 OK