

June 8, 2018

Via Federal Express

Melanie A. Bachman, Esq.
Executive Director/Staff Attorney
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Docket No. 475 – Application of Cellco Partnership 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 Located off Folly Lane, Coventry, Connecticut**

Development and Management Plan Submission

Dear Ms. Bachman:

Enclosed please find fifteen (15) copies of the following:

1. Final Development and Management (“D&M”) Plans prepared by Hudson Design Group LLC for the approved telecommunications facility off Folly Lane in Coventry, Connecticut incorporating the Council’s conditions of approval. Also enclosed are four (4) full size (24” x 36”) sets of D&M plans.
2. Tower and Foundation Design drawings prepared by Engineered Endeavors.
3. Geotechnical Evaluation of Subsurface Conditions prepared by Hudson Design Group LLC, dated October 2, 2017.

Melanie A. Bachman, Esq.
June 8, 2018
Page 2

Together, this information constitutes the final D&M Plan submission for the approved telecommunications facility off Folly Lane in Coventry.

We respectfully request that this information be reviewed and this matter be placed on the next available Siting Council agenda for approval. Please feel free to contact me if you have any questions or require additional information. Thank you.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Kenneth C. Baldwin', is written over a light blue horizontal line.

Kenneth C. Baldwin

Enclosures

Copy to:

John Elsesser, Coventry Town Manager
Andrew Candiello, Verizon Wireless
Eric Campbell, SAI

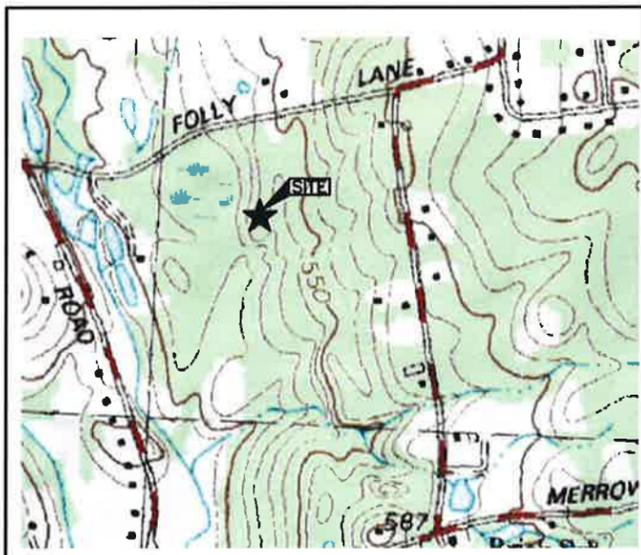
CELLCO PARTNERSHIP
d.b.a. Verizon

WIRELESS COMMUNICATIONS FACILITY

COVENTRY NORTHWEST CT

DEVELOPMENT & MANAGEMENT PLAN - DOCKET No. 475

**FOLLY LANE
 COVENTRY, CT 06238**



VICINITY MAP

SCALE: N.T.S.

DIRECTIONS TO SITE:

20 ALEXANDER DRIVE, WALLINGFORD, CT 06492

HEAD NORTH ON ALEXANDER DR TOWARD BARNES INDUSTRIAL RD S
 TURN RIGHT ONTO BARNES INDUSTRIAL RD S
 TURN RIGHT ONTO CT-68 E
 SHARP LEFT TO MERGE ONTO I-91 N TOWARD HARTFORD
 TAKE EXIT 29 TO MERGE ONTO CT-15 N/US-5 N TOWARD I-84 E/E
 HARTFORD/BOSTON
 CONTINUE ONTO CT-15 N
 USE THE LEFT 2 LANES TO MERGE ONTO I-84 E TOWARD BOSTON
 TAKE EXIT 68 FOR CT-195 TOWARD TOLLAND/MANSFIELD
 TURN RIGHT ONTO CT-195 S (SIGNS FOR MANSFIELD/UNIVERSITY OF
 CONNECTICUT)
 TURN RIGHT ONTO GOOSE LN
 SLIGHT RIGHT ONTO FOLLY LN
 TURN LEFT, FOLLY LANE, COVENTRY, CT 06238

CONSULTANT TEAM	
PROJECT ENGINEER	
HUDSON DESIGN GROUP, LLC 45 BEECHWOOD DRIVE NORTH ANDOVER, MA 01845 TEL: 1-(978)-557-5553 FAX: 1-(978)-336-5586	
SURVEYOR	
NORTHEAST SURVEY CONSULTANTS 116 PLEASANT ST. SUITE 302 EASTHAMPTON, MA 01027 TEL: 1-(413)-203-5144	

PROJECT SUMMARY	
SITE NAME:	COVENTRY NORTHWEST CT
SITE ADDRESS:	FOLLY LANE COVENTRY, CT 06238
PROPERTY OWNER:	JOHN MOTCYKA 104 FOLLY LANE COVENTRY, CT 06238
APPLICANT:	CELLCO PARTNERSHIP d/b/a VERIZON WIRELESS 20 ALEXANDER DRIVE WALLINGFORD, CT 06492
SITE ACQUISITION CONTACT:	ERIC CAMPBELL SAI COMMUNICATIONS 225 CEDAR HILL STREET, SUITE 118 MARLBOROUGH, MA 01752
LEGAL/REGULATORY COUNSEL:	KENNETH C. BALDWIN ESQ. ROBINSON + COLE LLP (860)275-8345
LATITUDE:	N 41° 49' 26.39"
LONGITUDE:	W 72° 20' 53.74"

SCOPE OF WORK INFO.	
VERIZON WIRELESS IS PROPOSING TO INSTALL THE FOLLOWING IMPROVEMENTS ON PROPOSED TELECOMMUNICATION SITE:	
<ul style="list-style-type: none"> NEW 2,200 SQ. FT. FENCED COMPOUND WITHIN PROPOSED 100'x100' LEASE AREA ON EXISTING PARCEL OF LAND. NEW PANEL ANTENNAS: (2) ANTENNA PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (6) ANTENNAS. NEW RRHs: (2) RRHs PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (6) 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 ON PROPOSED 4'-0"x7'-6" CONCRETE PAD AND GENERATOR ON PROPOSED 3'-6"x8'-0" CONCRETE PAD. ITEMS LISTED ABOVE TO BE INSTALLED WITHIN THE PROPOSED 2,200 SQ. FT. FENCED COMPOUND.	
<ul style="list-style-type: none"> NEW POWER AND TELCO SERVICES WILL BE ROUTED UNDERGROUND FROM PROPOSED UTILITY POLE TO PROPOSED ELECTRICAL METER AND HOFFMAN BOX ON PROPOSED H-FRAME. FINAL UTILITY ROUTING TO BE DETERMINED/VERIFIED BY UTILITY COMPANIES. 	

SHEET INDEX	
SHT. NO.	DESCRIPTION
T-1	TITLE SHEET
C-1	ABUTTER'S PLAN
C-2	SITE PLAN
C-3	COMPOUND PLAN
A-1	ELEVATION AND ANTENNA PLAN
A-2	EQUIPMENT PLAN AND DETAILS
A-3	FENCE DETAILS
A-4	CABLE SUPPORT DETAILS
A-5	SITE SURFACE COVER AND EROSION CONTROL DETAILS
A-6	PROPANE TANK DETAILS
A-7	FOUNDATION DETAILS
A-8	ENVIRONMENTAL NOTES

72 HOURS

CALL BEFORE YOU DIG

CALL TOLL FREE 1-800-922-4455
 OR CALL 811

UNDERGROUND SERVICE ALERT

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.

verizon

HGD HUDSON Design Group LLC

45 BEECHWOOD DRIVE N. ANDOVER, MA 01845 TEL: (978) 557-5553 FAX: (978) 336-5586

STATE OF CONNECTICUT
 DEREK J. GREASER
 LICENSED PROFESSIONAL ENGINEER

CHECKED BY: DJR

APPROVED BY: DJC

SUBMITTALS

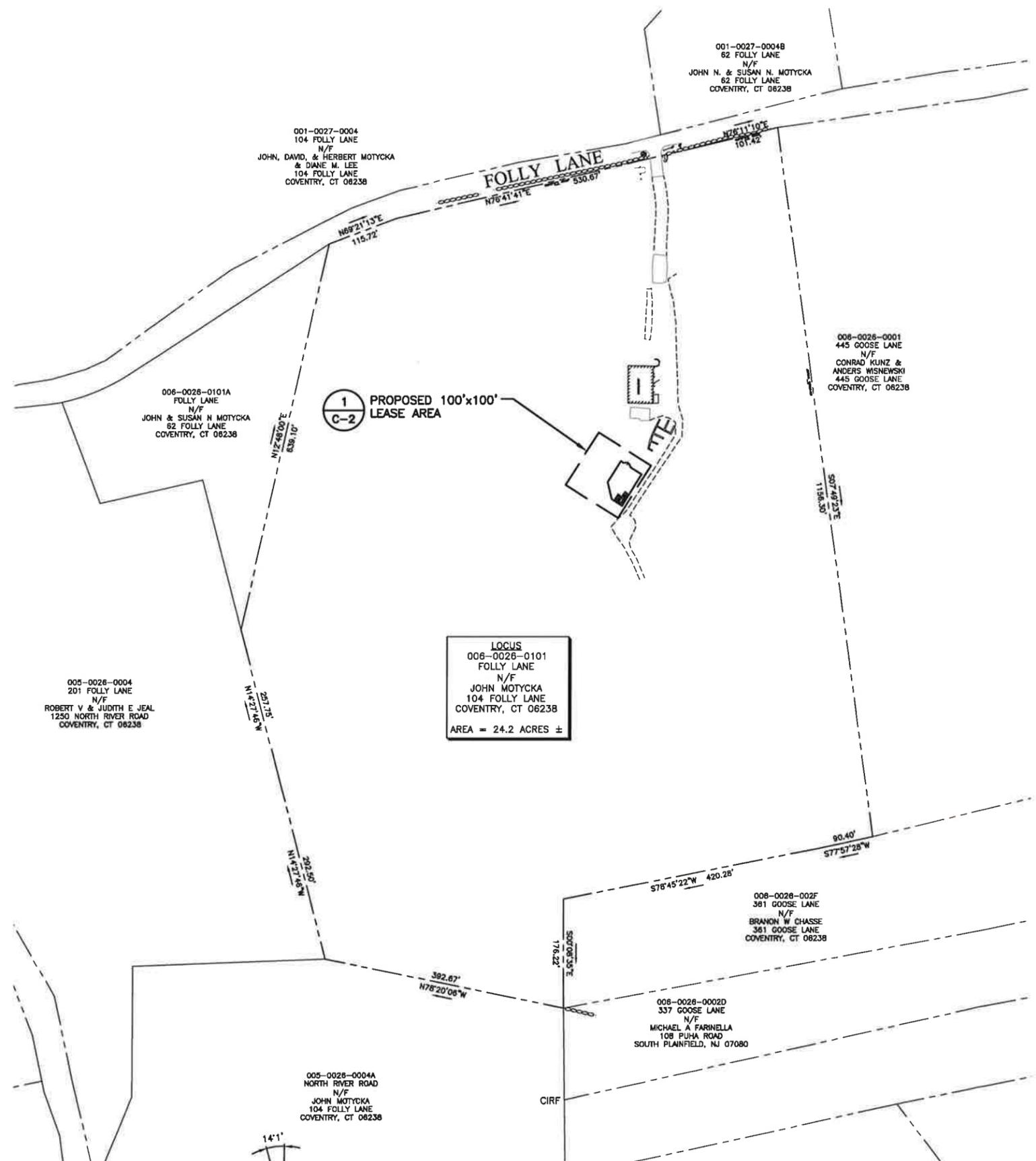
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2	05/21/18	REVISED PER COMMENTS	JS
1	05/02/18	REVISED PER COMMENTS	JS
0	01/02/18	ISSUED FOR REVIEW	JS

SITE NAME:
COVENTRY NORTHWEST CT

SITE ADDRESS:
 FOLLY LANE
 COVENTRY, CT. 06238

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1



SOURCE:
NORTHEAST SURVEY CONSULTANTS,
ABUTTERS PLAN AND EXISTING
CONDITIONS DATED 10/07/16

LEGEND

- PROPERTY LINE - SUBJECT PARCEL
- - - ABUTTERS PROPERTY LINE
- - - EXISTING CONTOUR LINE
- ~ ~ ~ TREE LINE
- BARBED WIRE FENCE REMAINS
- OHW --- OVERHEAD WIRE
- EXISTING RAIL FENCE
- WETLAND FLAG LINE
- 1-22 WETLAND FLAG NUMBER
- ☀ CONIFEROUS TREE
- ☀ DECIDUOUS TREE
- STONE WALL
- TOWER CONTROL POINT
- WELL
- ♂ UTILITY POLE
- 542 --- PROPOSED CONTOUR LINE
- TOW --- TOP OF WALL
- BOW --- BOTTOM OF WALL
- EXISTING BUILDING
- SILT SOCK
- PROPOSED FENCE

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



45 BEECHWOOD DRIVE TEL: (978) 557-5553
N. ANDOVER, MA 01845 FAX: (978) 336-5586



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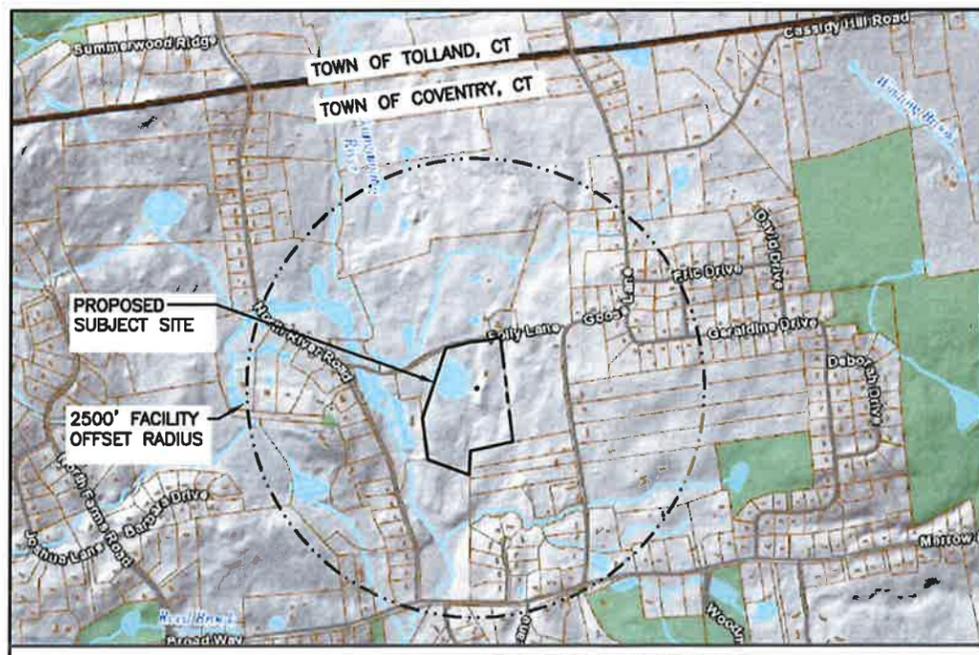
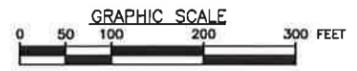
SITE NAME:
**COVENTRY
NORTHWEST CT**

SITE ADDRESS:
FOLLY LANE
COVENTRY, CT. 06238

SHEET TITLE
ABUTTER'S PLAN

SHEET NUMBER
C-1

ABUTTER'S PLAN
22x34 SCALE: 1"=100'-0"
11x17 SCALE: 1"=200'-0"

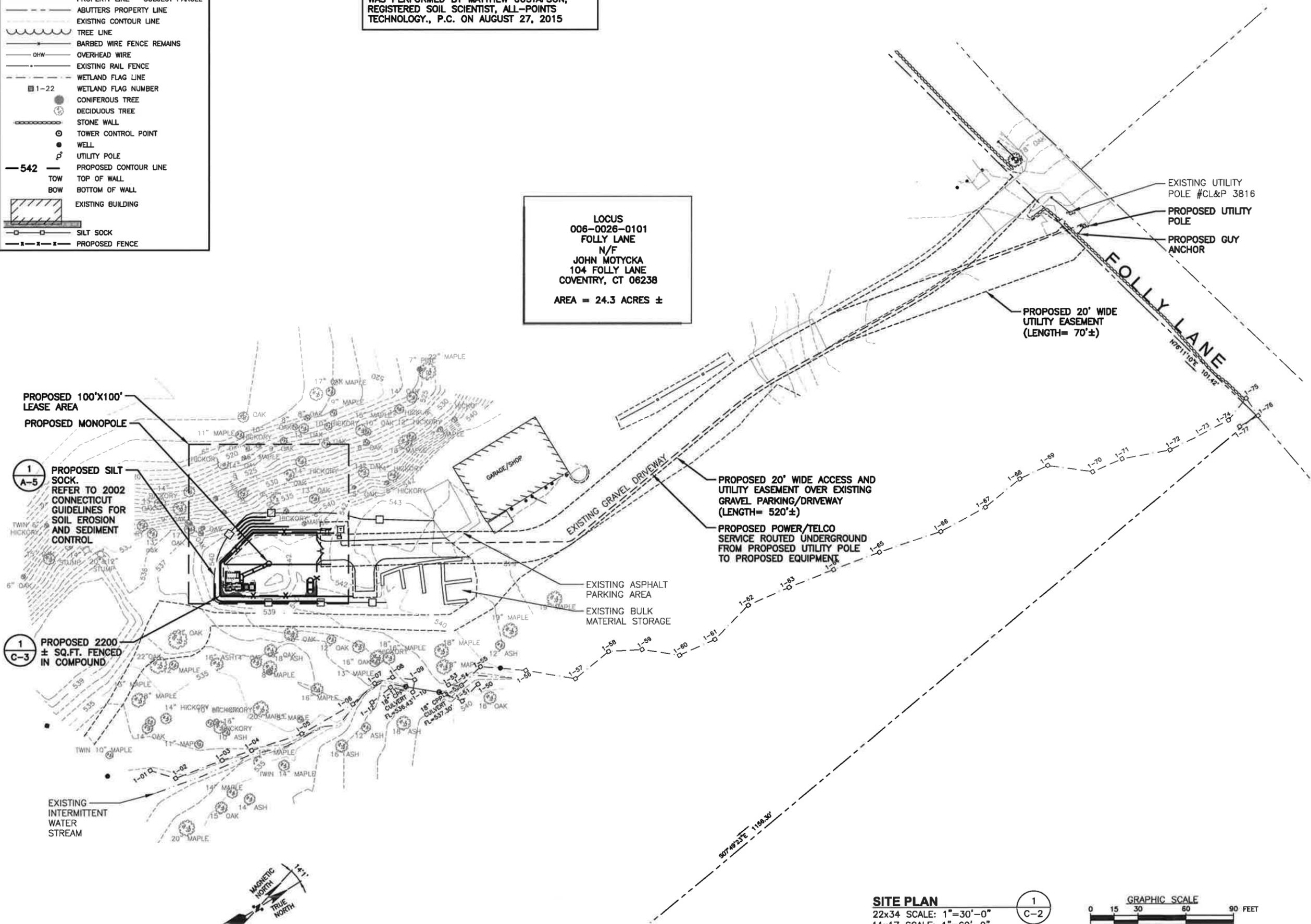


LEGEND

- PROPERTY LINE - SUBJECT PARCEL
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- 542 --- PROPOSED CONTOUR LINE
- TOW TOP OF WALL
- BOW BOTTOM OF WALL
- EXISTING BUILDING
- SILT SOCK
- PROPOSED FENCE

NOTE:
 DELINEATION OF WETLAND RESOURCE AREA
 WAS PERFORMED BY MATTHEW GUSTAFSON,
 REGISTERED SOIL SCIENTIST, ALL-POINTS
 TECHNOLOGY, P.C. ON AUGUST 27, 2015

LOCUS
 006-0026-0101
 FOLLY LANE
 N/F
 JOHN MOTYCKA
 104 FOLLY LANE
 COVENTRY, CT 06238
 AREA = 24.3 ACRES ±



PREPARED FOR: CELCO PARTNERSHIP D.B.A.



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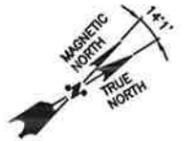
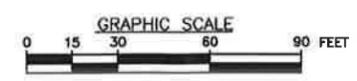
SITE NAME:
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 NORTHWEST CT**

SITE ADDRESS:
 FOLLY LANE
 COVENTRY, CT. 06238

SHEET TITLE
SITE PLAN

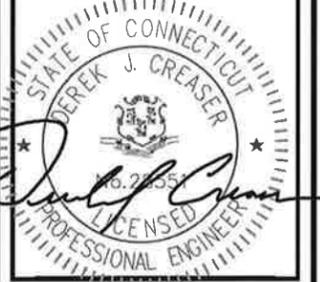
SHEET NUMBER
C-2

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





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SITE NAME:
**COVENTRY
NORTHWEST CT**

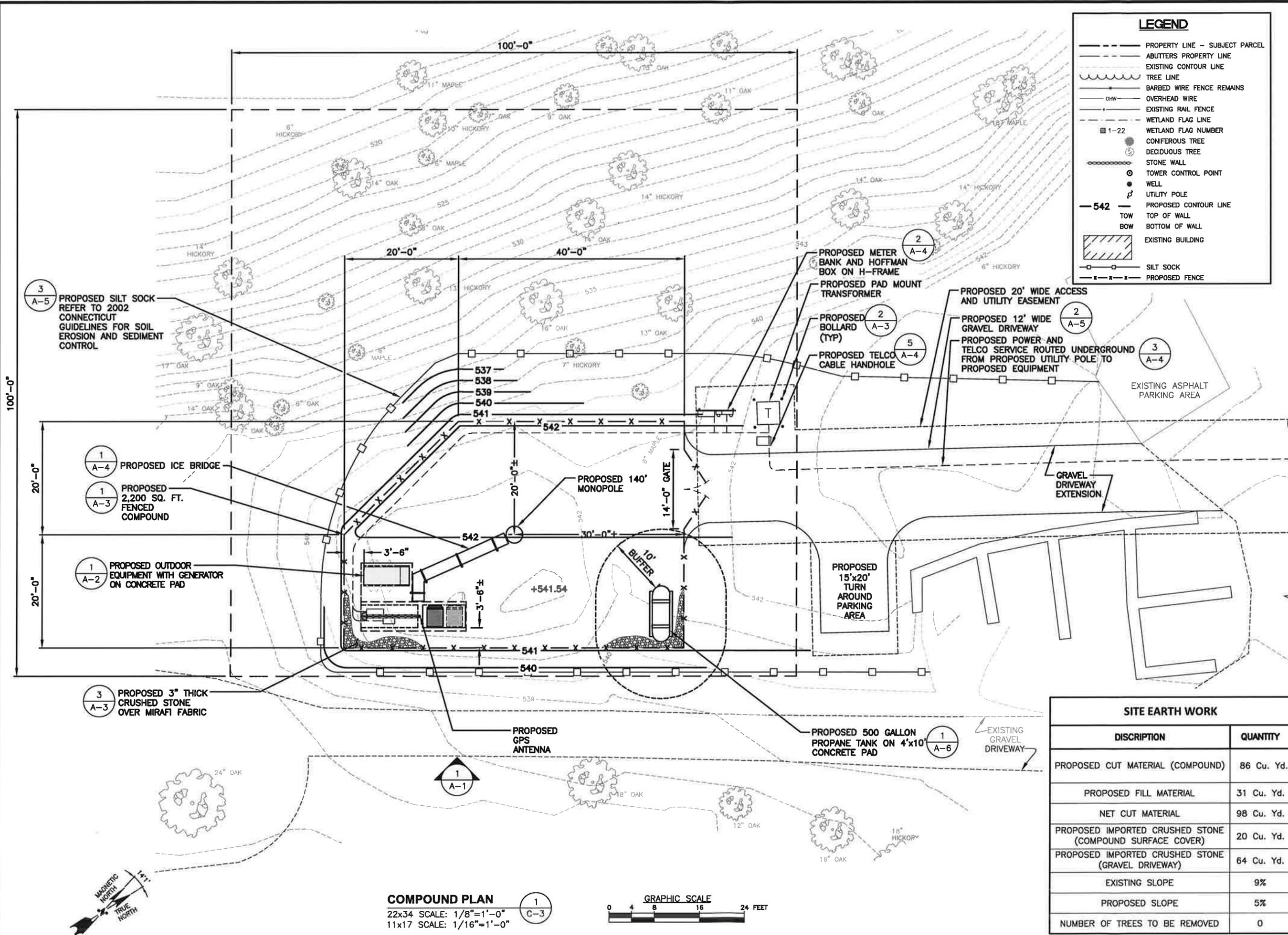
SITE ADDRESS:
FOLLY LANE
COVENTRY, CT. 06238

SHEET TITLE
COMPOUND PLAN

SHEET NUMBER
C-3

LEGEND

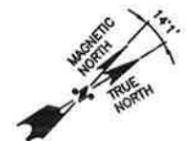
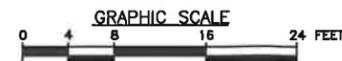
- PROPERTY LINE - SUBJECT PARCEL
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- BOW BOTTOM OF WALL
- EXISTING BUILDING
- SILT SOCK
- PROPOSED FENCE



SITE EARTH WORK

DISCRIPTION	QUANTITY
PROPOSED CUT MATERIAL (COMPOUND)	86 Cu. Yd.
PROPOSED FILL MATERIAL	31 Cu. Yd.
NET CUT MATERIAL	98 Cu. Yd.
PROPOSED IMPORTED CRUSHED STONE (COMPOUND SURFACE COVER)	20 Cu. Yd.
PROPOSED IMPORTED CRUSHED STONE (GRAVEL DRIVEWAY)	64 Cu. Yd.
EXISTING SLOPE	9%
PROPOSED SLOPE	5%
NUMBER OF TREES TO BE REMOVED	0

COMPOUND PLAN 1 C-3
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"





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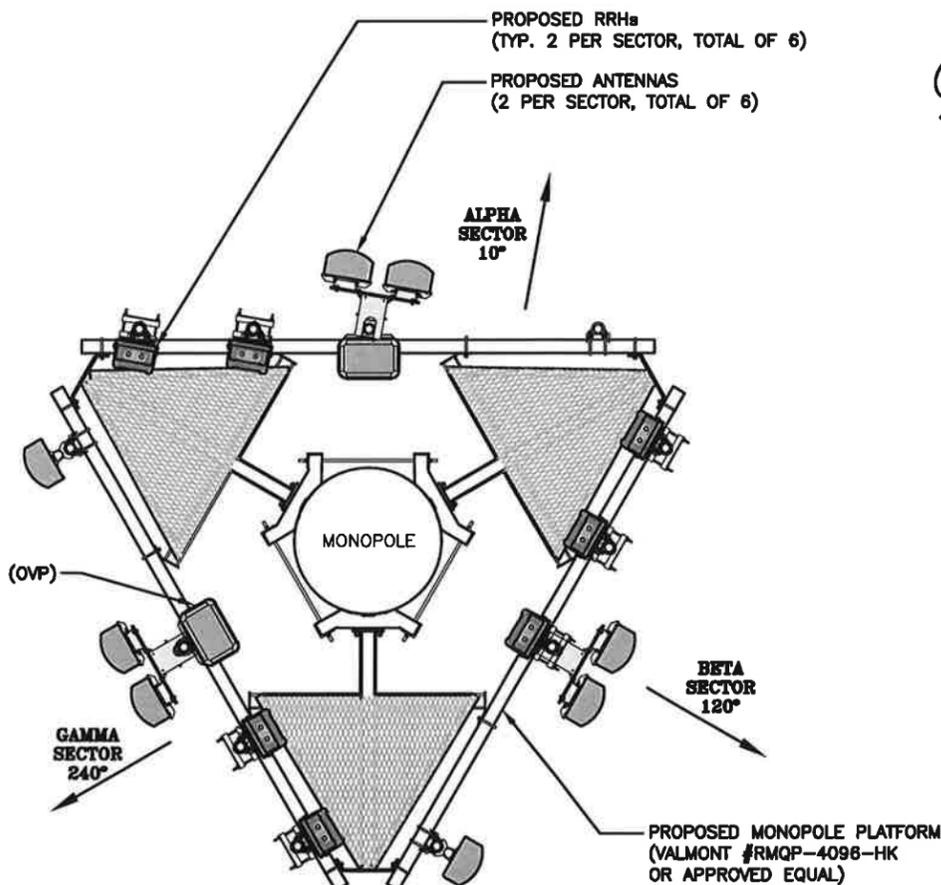
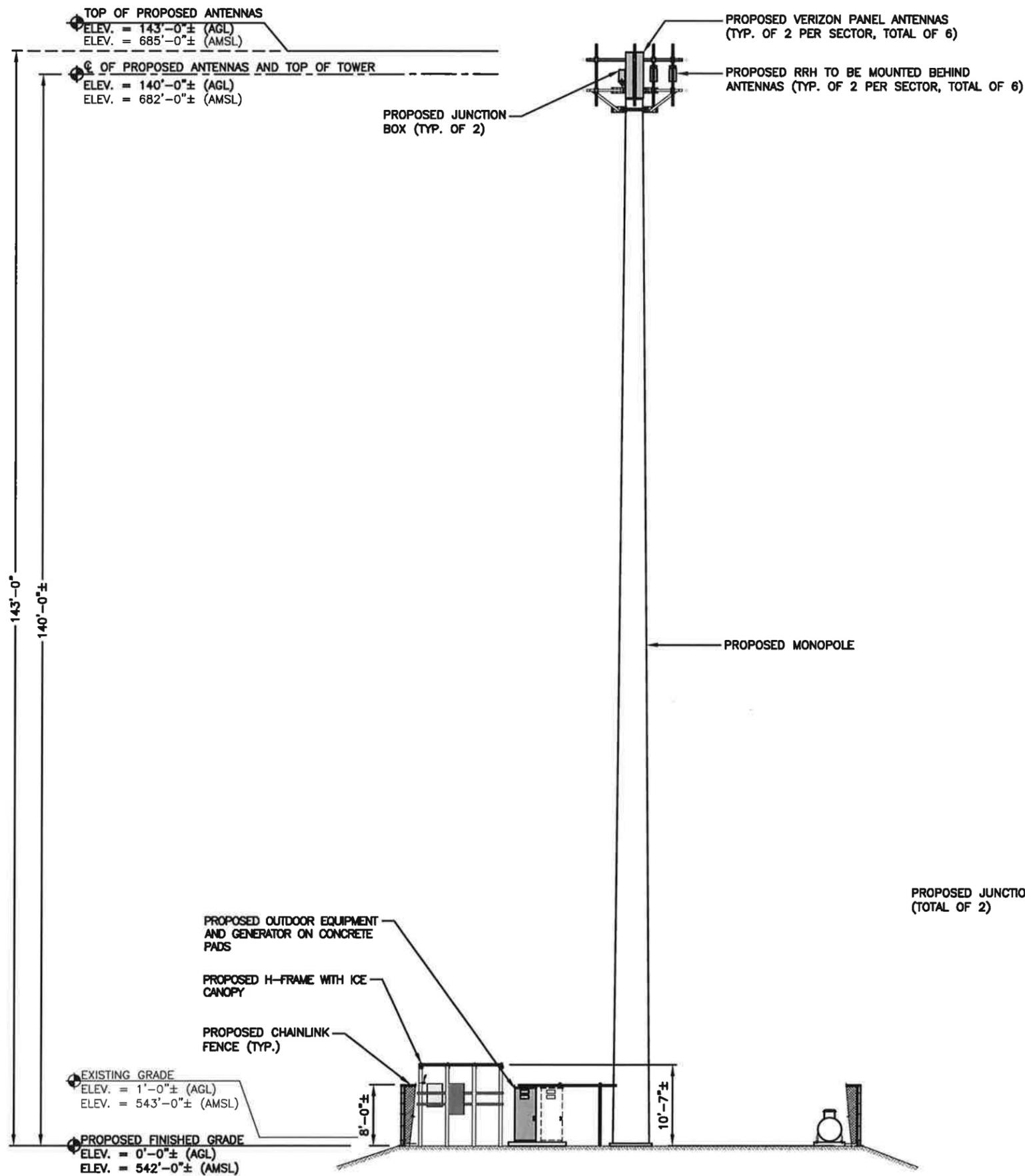
SHEET TITLE
ELEVATION AND
ANTENNA PLAN

SHEET NUMBER

A-1

- 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.



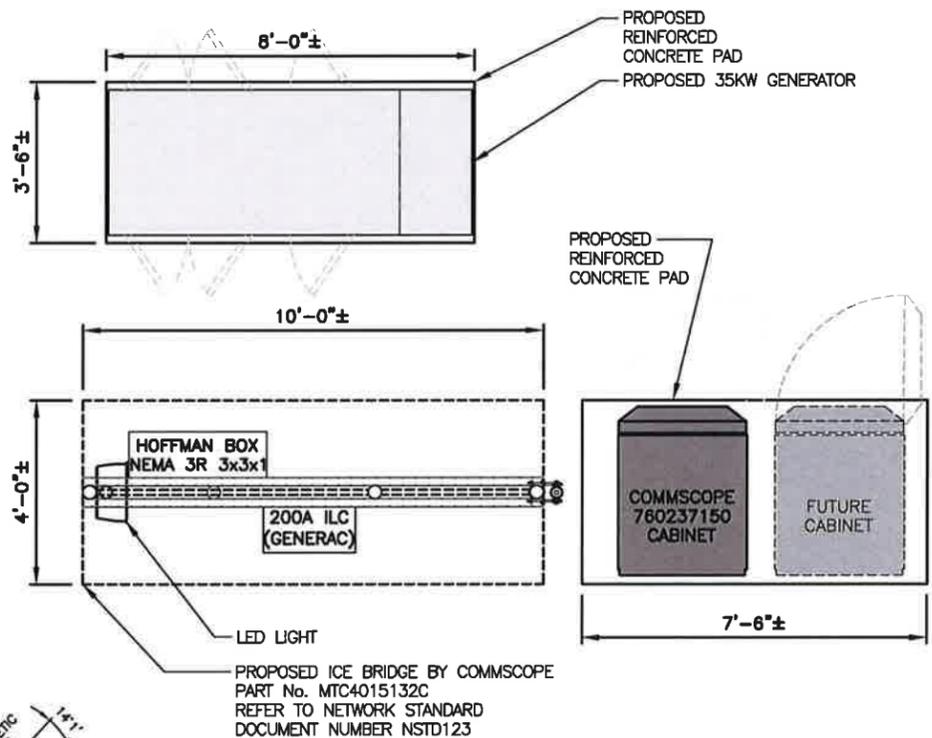
ANTENNA ORIENTATION PLAN 2
SCALE: N.T.S. A-1

EAST ELEVATION

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



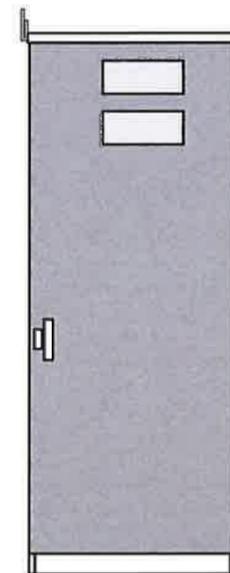
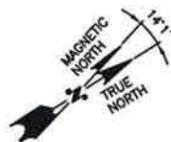
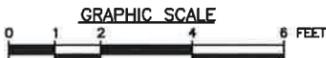
GRAPHIC SCALE
0 4 8 16 24 FEET



EQUIPMENT PLAN

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

1
A-2



SPECIFICATIONS:
MANUFACTURER: COMMSCOPE
PART NO.: 760237150
SIZE: 86"x33"x44"

NOTE:
ANCHOR CABINET TO CONCRETE
PAD PER MANUFACTURERS
RECOMMENDATIONS

EQUIPMENT CABINET DETAIL

SCALE: N.T.S

2
A-2



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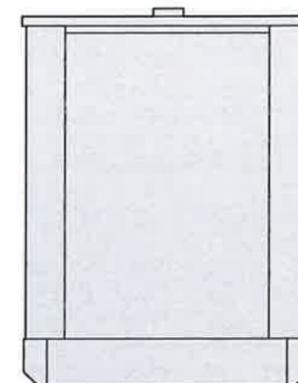
SITE NAME:
**COVENTRY
NORTHWEST CT**

SITE ADDRESS:
FOLLY LANE
COVENTRY, CT. 06238

SHEET TITLE
**EQUIPMENT PLAN
AND DETAILS**

SHEET NUMBER

A-2



SPECIFICATIONS:
MANUFACTURER: GENERAC
PART NO.: SG035
SIZE: 94.8"x38"49.5"
WEIGHT: 2639 LB.

NOTE:
ANCHOR GENERATOR TO
CONCRETE PAD PER
MANUFACTURERS
RECOMMENDATIONS

GENERATOR DETAIL

SCALE: N.T.S

5
A-2



COOPER LIGHTING NFFLD NIGHT FALCON
NFFLD-A25-E-UNV-66-S-BK
SLIPFITTER MOUNT AND VANDAL SHIELD
MOUNT PER MANUFACTURER'S SPECIFICATIONS.



INTERMATIC WP1220C

TYPE: DOUBLE GANG
HINGE: VERTICAL
INSERT: WP217
DEPTH: 2-1/4"
COLOR: CLEAR

OR APPROVED EQUIVALENT



INTERMATIC FF6H

TIME CYCLE: 6 HOURS
SWITCH: SPST
HOLD: NO

OR APPROVED EQUIVALENT

LED FLOOD LIGHT DETAIL

SCALE: N.T.S

3
A-2

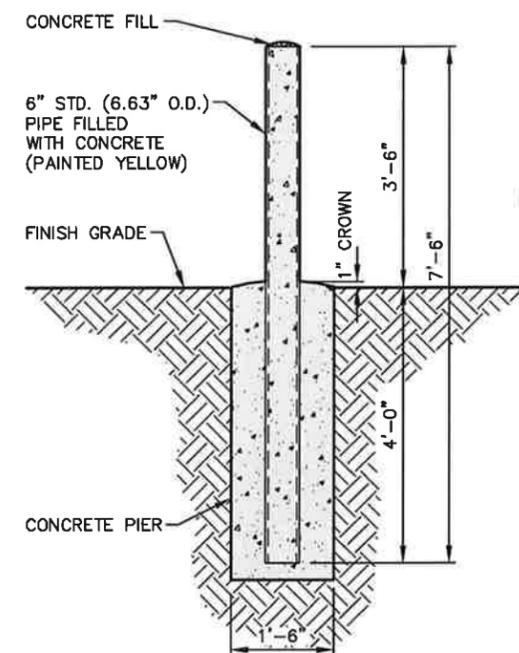
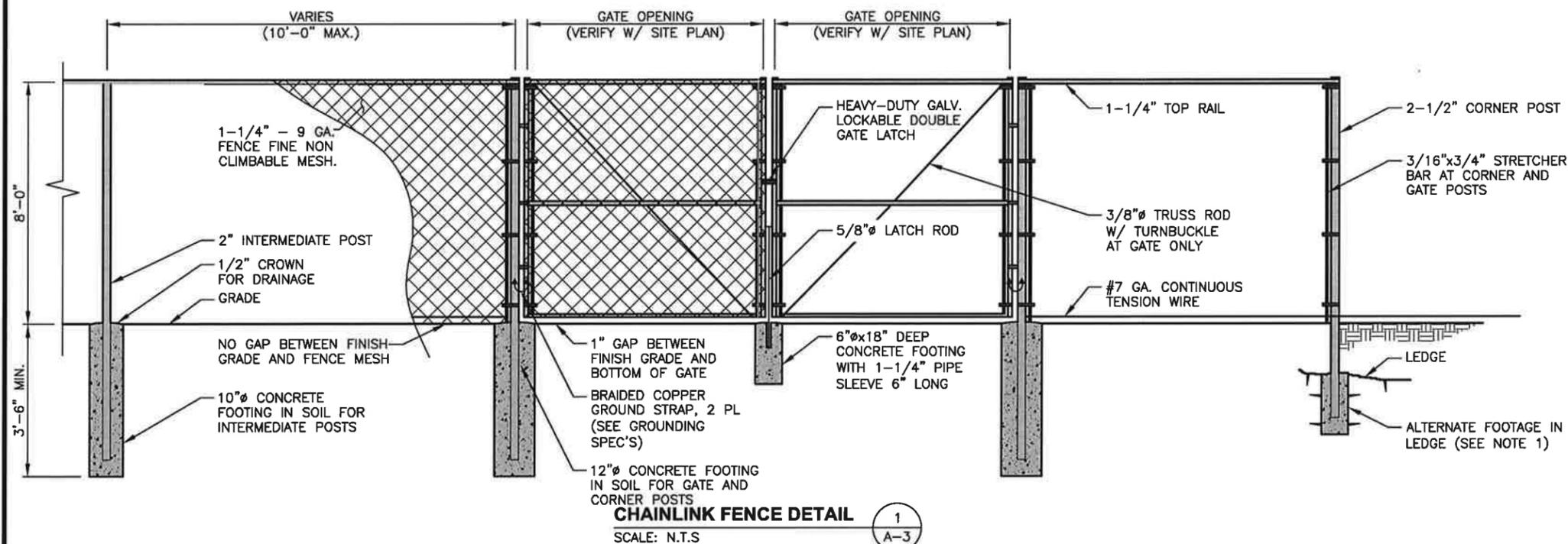
SWITCH DETAIL

SCALE: N.T.S

4
A-2

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.



CHECKED BY: DJR

APPROVED BY: DJC

SUBMITTALS

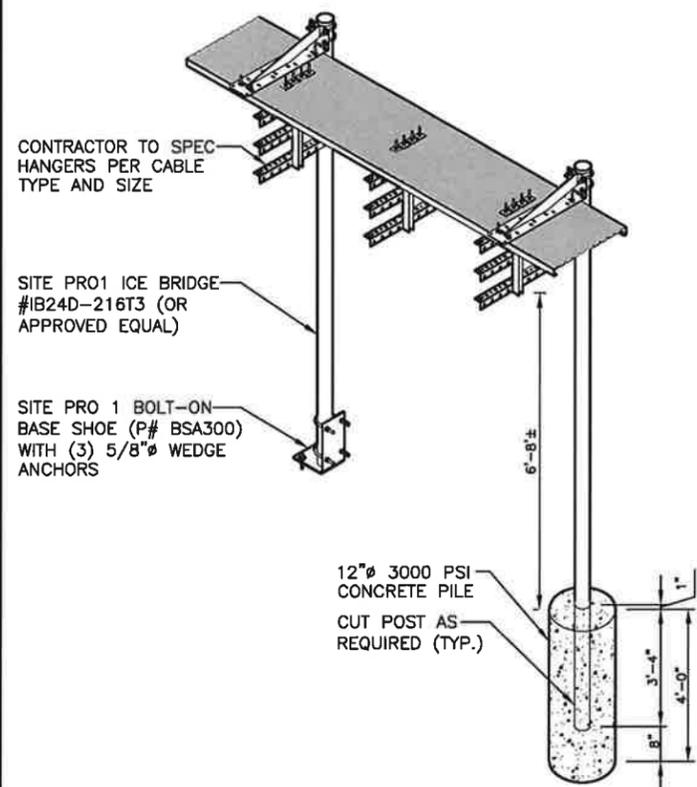
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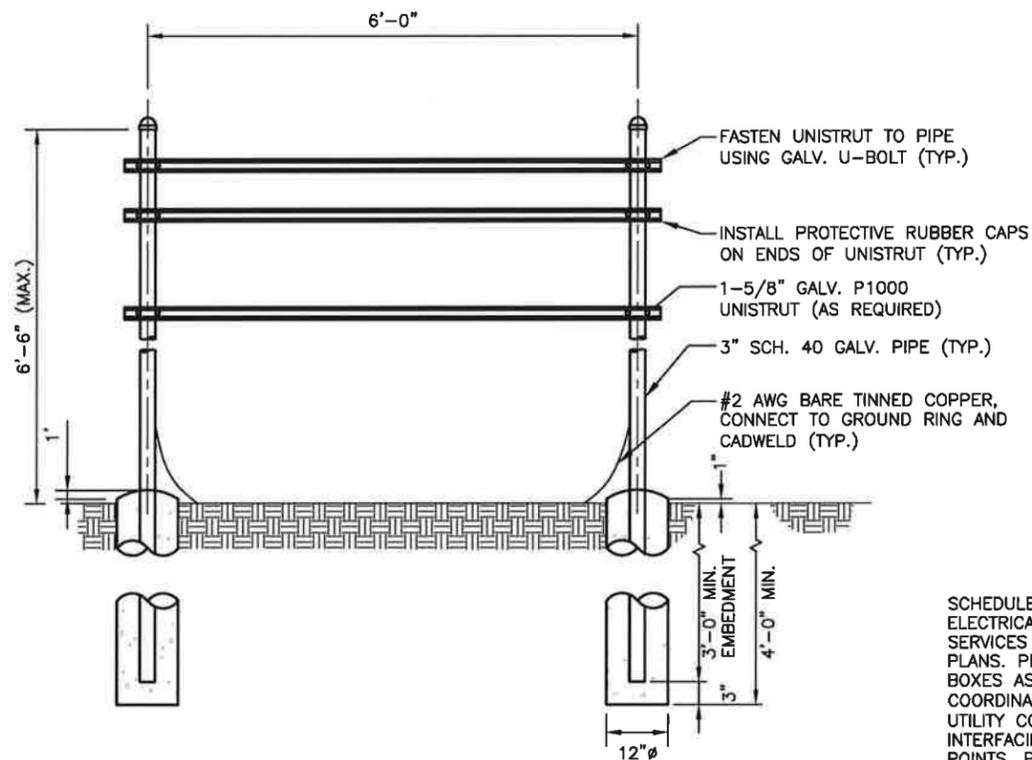
SHEET TITLE
FENCE DETAILS

SHEET NUMBER
A-3



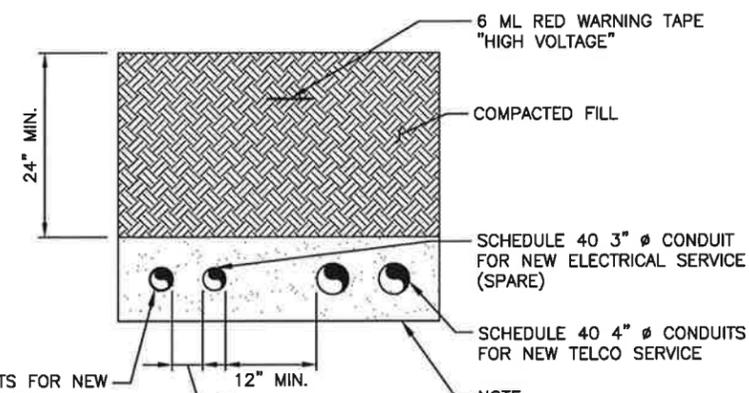
ICE BRIDGE DETAIL
SCALE: N.T.S

1
A-4



TYPICAL H-FRAME DETAIL
SCALE: N.T.S

2
A-4

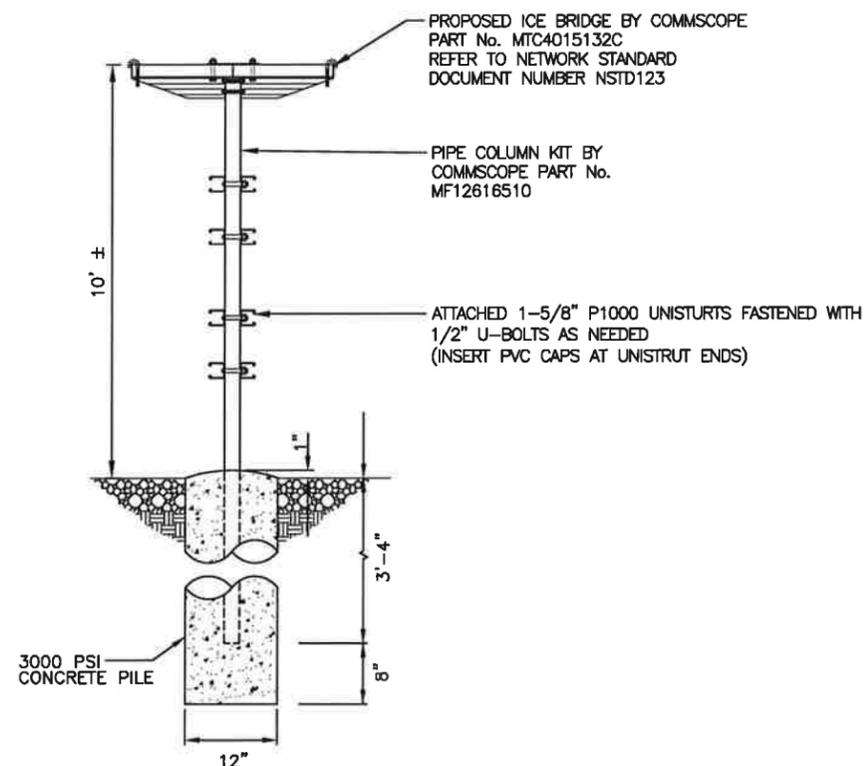


SCHEDULE 40 CONDUITS FOR NEW ELECTRICAL AND TELEPHONE SERVICES SEE UTILITY AND SITE PLANS. PROVIDE APPROVED PULL BOXES AS REQUIRED, AND COORDINATE INSTALLATION W/ ALL UTILITY COMPANIES FOR INTERFACING AT TERMINATION POINTS. PROVIDE FULL LENGTH PULL ROPES (TYP.).

NOTE: DETAIL AS SHOWN IS FOR SECONDARY ELECTRIC SERVICES. PRIMARY HIGH VOLTAGE SERVICE REQUIRES 4" CONCRETE ENCASEMENT.

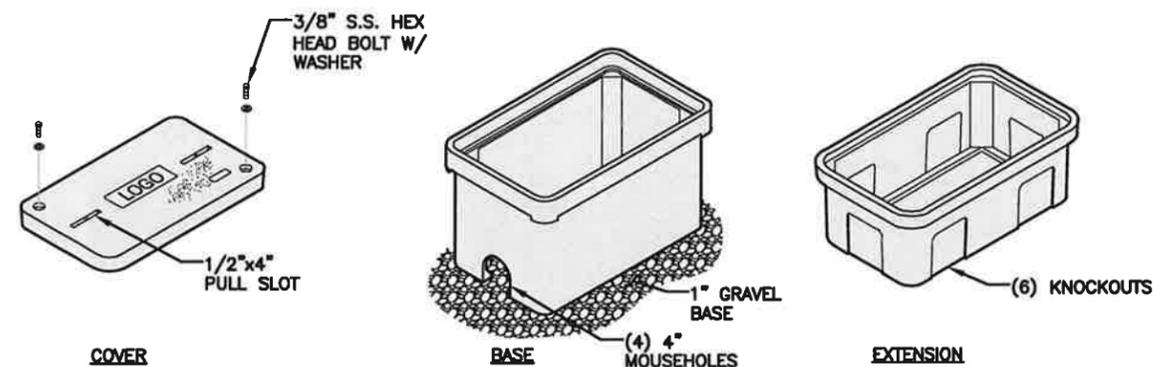
TYPICAL DIRECT JOINT SERVICE BURIED CONDUIT DETAIL
SCALE: N.T.S

3
A-4



ICE CANOPY DETAIL
SCALE: N.T.S

4
A-4



NOTE:
1. THIS INFORMATION MAY NOT CONTAIN ALL DETAILS REQUIRED FOR CONSTRUCTION. APPROPRIATE MODIFICATION MAY BE REQUIRED TO ENSURE SUITABILITY OF THESE DRAWINGS FOR THE SPECIFIC APPLICATION. SEE SPECIFICATION PROVIDED BY ELECTRICAL DESIGNER FOR FURTHER DETAIL AND INSTALLATION.
2. PROVIDE STANDARD HANDHOLE. COVER COLOR SHALL BE AS SPECIFIED BY THE NIH.
3. PROVIDE 25mm (1") X 10mm (3/8") BELL PULL SLOT FOR EACH HANDHOLE.
4. COVER, RING AND BOX SHALL BE MADE OF SAME MATERIAL.
5. PROVIDE IMPRINTED LOGO TO MATCH.

HANDHOLE DETAIL
22x34 SCALE: N.T.S

5
A-4



CHECKED BY: DJR

APPROVED BY: DJC

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COVENTRY, CT. 06238

SHEET TITLE
CABLE SUPPORT DETAILS

SHEET NUMBER
A-4



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SUBMITTALS

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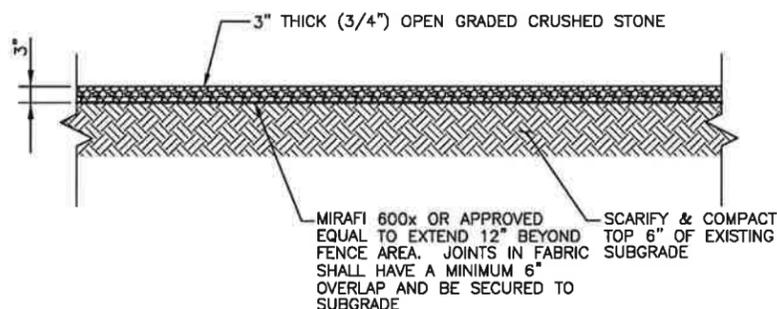
SITE NAME:
**COVENTRY
NORTHWEST CT**

SITE ADDRESS:
FOLLY LANE
COVENTRY, CT. 06238

SHEET TITLE
**SITE SURFACE
COVER AND EROSION
CONTROL DETAILS**

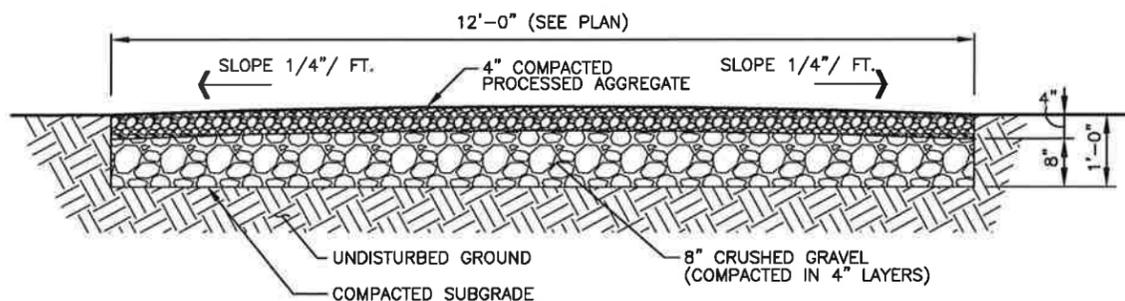
SHEET NUMBER

A-5



COMPOUND SURFACE DETAIL 1
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0" A-5

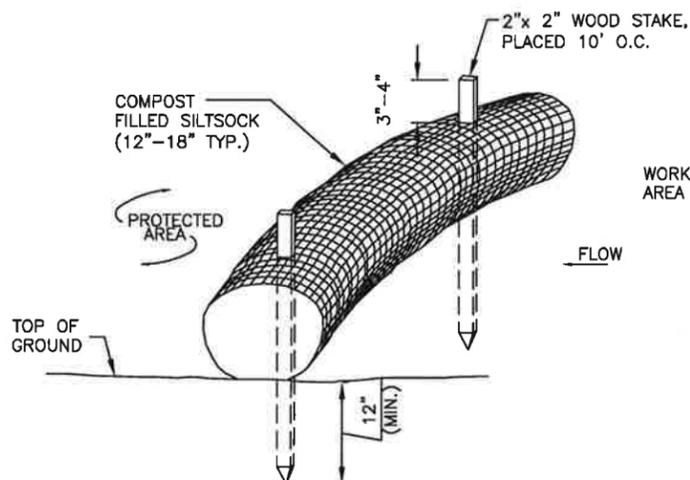
CRUSHED GRAVEL		PROCESSED AGGREGATE	
SIEVE	% PASSING BY WEIGHT	SIEVE	% PASSING BY WEIGHT
5"	100	2 1/4"	100
3 1/2"	90-100	2"	95-100
1 1/2"	55-95	3/4"	50-75
1/4"	25-60	1/4"	25-45
#10	15-45	#40	5-20
#40	5-25	#100	2-12
#100	0-10		
#200	0-5		



GRAVEL ACCESS DRIVE 2
SCALE: N.T.S. A-5

HOURS OF CONSTRUCTION:
BETWEEN 8:00 AM TO 4:30 PM MONDAY THROUGH FRIDAY

REFER TO 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL



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.

SILT SOCK DETAIL 3
SCALE: N.T.S. A-5

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 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 TREEFOIL	8
	48

TREATMENT SWALE PLANTING SPECIFICATIONS

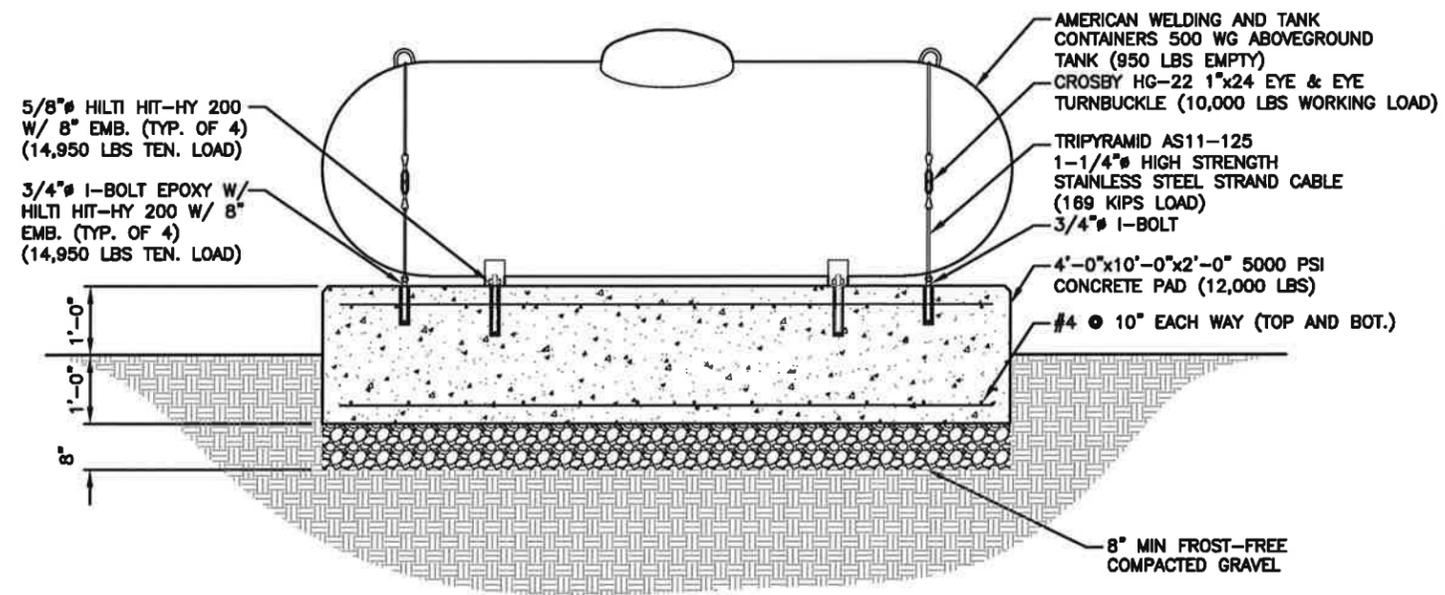
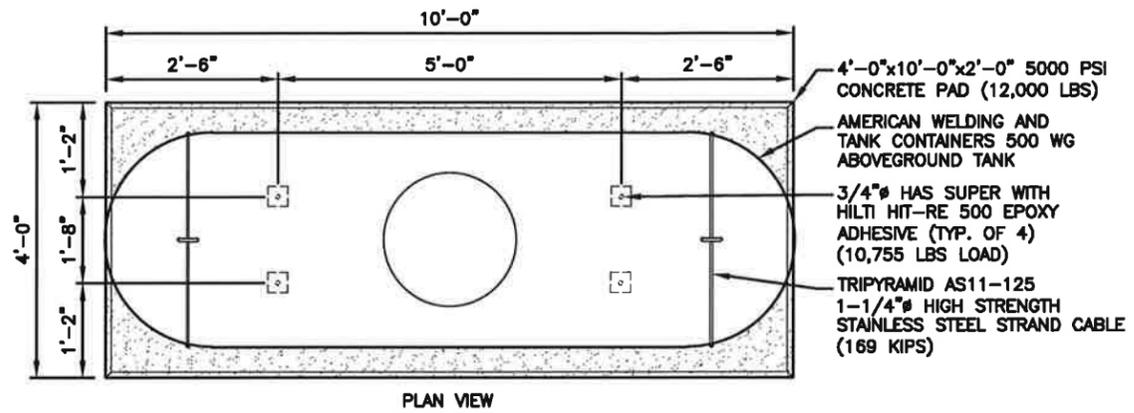
TALL FESCUE	20 LBS/ACRE	OR	0.45 LBS/10,000 SF
CREeping RED FESCUE	20 LBS/ACRE	OR	0.45 LBS/10,000 SF
BIRDSFOOT TREFOIL	8 LBS/ACRE	OR	0.20 LBS/10,000 SF

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 (K2O)	100 LBS/ACRE	OR	2.2 LBS/10,000 SF

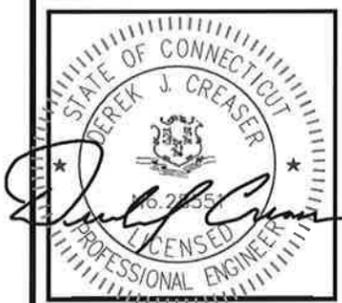
(THIS IS EQUIVALENT TO 500 LBS/ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS/ACRE OF 5-10-10).

- 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.



ELEVATION VIEW
PROPANE TANK MOUNTING
SCALE: N.T.S

NOTE:
PROPANE TANK TO BE PAINTED WHITE
PER VERIZON STANDARDS



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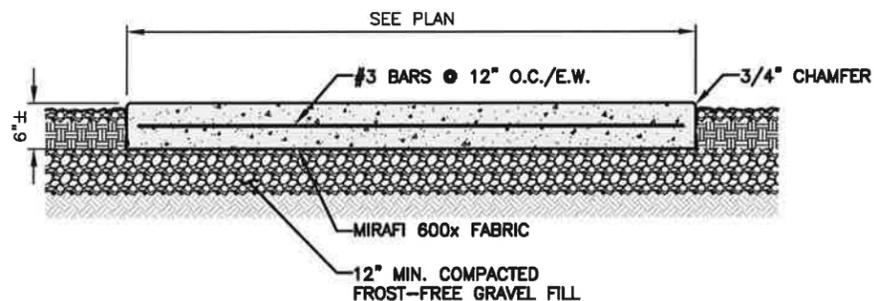
SITE ADDRESS:
FOLLY LANE
COVENTRY, CT. 06238

SHEET TITLE
**PROPANE
TANK DETAILS**

SHEET NUMBER
A-6

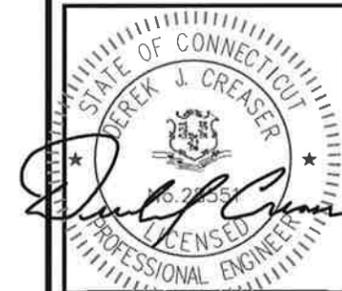
FOUNDATION NOTES & CONCRETE SPECIFICATIONS:

1. 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.
2. UNDERCUT SOFT OR "WEAVING" AREAS A MINIMUM OF 12 INCHES DEEP. BACKFILL UNDERCUT AREA WITH FILL MEETING THE SPECIFICATIONS OF STRUCTURAL FILL.
3. 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%)
4. REINFORCING BAR TO BE ASTM A615 GRADE 60.
5. WELDED WIRE FABRIC TO CONFORM TO THE REQUIREMENTS OF ASTM A185. WIRES FOR FABRIC TO CONFORM TO THE REQUIREMENTS OF ASTM A82.
6. ALL REINFORCING TO HAVE MINIMUM CONCRETE COVER PER ACI SPECIFICATIONS.
7. ALL CONCRETE MATERIALS AND WORKMANSHIP SHALL CONFORM TO LATEST EDITION OF ACI 318 AND APPLICABLE STATE BUILDING CODE.



CONCRETE PAD DETAIL
22x34 SCALE: N.T.S

1
A-7



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SITE NAME:
**COVENTRY
NORTHWEST CT**

SITE ADDRESS:
FOLLY LANE
COVENTRY, CT. 06238

SHEET TITLE
**FOUNDATION
DETAILS**

SHEET NUMBER

A-7

ENVIRONMENTAL NOTES

HOGNOSE SNAKE PROTECTION PROGRAM

HOGNOSE SNAKE, A STATE SPECIAL CONCERN SPECIES AFFORDED PROTECTION UNDER THE CONNECTICUT ENDANGERED SPECIES ACT, IS KNOWN TO OCCUR ON OR WITHIN THE VICINITY OF THE SITE. IT IS OF THE UTMOST IMPORTANCE THAT THE CONTRACTOR COMPLIES WITH THESE PROTECTIVE MEASURES AND THE EDUCATION OF ITS EMPLOYEES AND SUBCONTRACTORS PERFORMING WORK ON THE PROJECT SITE. ALL-POINTS TECHNOLOGY CORPORATION, P.C. ("APT") WILL SERVE AS THE ENVIRONMENTAL MONITOR FOR THIS PROJECT TO ENSURE THAT HOGNOSE SNAKE PROTECTION MEASURES ARE IMPLEMENTED PROPERLY AND WILL PROVIDE AN EDUCATION SESSION ON THIS RARE SNAKE SPECIES PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL CONTACT DEAN GUSTAFSON, SENIOR ENVIRONMENTAL SCIENTIST AT APT, AT LEAST 5 BUSINESS DAYS PRIOR TO THE PRE-CONSTRUCTION MEETING. MR. GUSTAFSON CAN BE REACHED BY PHONE AT (860) 663-1697 EXT. 201 OR VIA EMAIL AT DGUSTAFSON@ALLPOINTSTECH.COM.

THE PROPOSED SNAKE PROTECTION PROGRAM CONSISTS OF EDUCATION OF ALL CONTRACTORS AND SUB-CONTRACTORS PRIOR TO INITIATION OF WORK ON THE SITE AND MONITORING OF REMOVAL OF ANY LOGS, STUMPS OR OTHER MATERIALS THAT SNAKES MAY HAVE TAKEN COVER UNDER.

1. CONTRACTOR ENVIRONMENTAL AWARENESS TRAINING

- a. PRIOR TO WORK ON SITE, THE CONTRACTOR SHALL ATTEND AN ENVIRONMENTAL AWARENESS TRAINING SESSION AT THE PRE-CONSTRUCTION MEETING WITH APT. THIS ORIENTATION AND EDUCATIONAL SESSION WILL CONSIST OF AN INTRODUCTORY MEETING WITH APT PROVIDING PHOTOS OF HOGNOSE SNAKES AND EMPHASIZING THE NON-AGGRESSIVE NATURE OF THESE SNAKES, THE ABSENCE OF NEED TO DESTROY ANIMALS THAT MIGHT BE ENCOUNTERED.
- b. THE ENVIRONMENTAL AWARENESS TRAINING SESSION WILL ALSO FOCUS ON MEANS TO DISCRIMINATE BETWEEN THE SPECIES OF CONCERN AND OTHER NATIVE SPECIES TO AVOID UNNECESSARY "FALSE ALARMS". ENCOUNTERS WITH ANY SPECIES OF SNAKES WILL BE DOCUMENTED.
- c. THE CONTRACTOR WILL BE PROVIDED WITH CELL PHONE AND EMAIL CONTACTS FOR THE APT ENVIRONMENTAL MONITOR TO IMMEDIATELY REPORT ANY ENCOUNTERS WITH HOGNOSE SNAKE OR OTHER SNAKE SPECIES. EDUCATIONAL POSTER MATERIALS WILL BE PROVIDED BY APT AND DISPLAYED ON THE JOB SITE TO MAINTAIN WORKER AWARENESS AS THE PROJECT PROGRESSES.

2. SNAKE PROTECTIVE MEASURES

- a. APT WILL MONITOR THE REMOVAL OF LOGS, STUMPS AND OTHER MATERIAL CURRENTLY LOCATED AT THE CONSTRUCTION SITE WHICH MAY SERVE AS COVER FOR HOGNOSE SNAKES. MATERIAL WILL BE CAREFULLY REMOVED TO AVOID INJURY TO ANY POSSIBLE SNAKES THAT MAY BE USING THIS MATERIAL FOR COVER. ANY OBSERVATIONS OF SNAKES WILL BE REPORTED.
- b. IF A SNAKE IS FOUND, IT SHALL BE IMMEDIATELY MOVED, UNHARMED, AND PLACED JUST OUTSIDE OF THE ISOLATION BARRIER IN THE SAME APPROXIMATE DIRECTION IT WAS MOVING. SINCE WILD SNAKES CAN BE SOMETIMES DIFFICULT TO HANDLE WITHOUT INJURY BY AN UNTRAINED INDIVIDUAL, APT WILL PROVIDE SNAKE HANDLING TRAINING TO A DEDICATED MEMBER OF THE CONTRACTOR.
- c. PRIOR TO THE START OF CONSTRUCTION EACH DAY, THE CONTRACTOR SHALL SEARCH THE ENTIRE WORK AREA FOR SNAKES. SPECIAL CARE SHALL BE TAKEN BY THE CONTRACTOR DURING EARLY MORNING AND EVENING HOURS SO THAT POSSIBLE BASKING OR FORAGING SNAKES ARE NOT HARMED BY CONSTRUCTION ACTIVITIES.

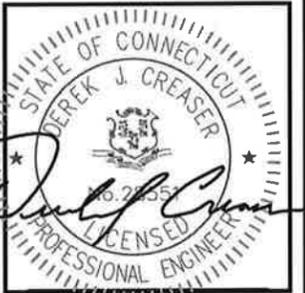
3. REPORTING

- a. A MONITORING REPORT (BRIEF NARRATIVE AND APPLICABLE PHOTOS DOCUMENTING THE REMOVAL OF POTENTIAL SNAKE COVER MATERIALS) WILL BE SUBMITTED BY APT TO VERIZON WIRELESS FOR COMPLIANCE VERIFICATION. ANY OBSERVATIONS OF SNAKES WILL BE INCLUDED IN THE REPORT. VERIZON WIRELESS WILL PROVIDE A COPY OF THE MONITORING REPORT TO THE CONNECTICUT SITING COUNCIL FOR COMPLIANCE VERIFICATION.
- b. ANY OBSERVATIONS OF HOGNOSE SNAKE WILL BE REPORTED TO CTDEEP BY APT, WITH PHOTO-DOCUMENTATION (IF POSSIBLE) AND WITH SPECIFIC INFORMATION ON THE LOCATION AND DISPOSITION OF THE ANIMAL.

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



45 BEECHWOOD DRIVE N. ANDOVER, MA 01845 TEL: (978) 557-5553 FAX: (978) 336-5586



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NORTHWEST CT**

SITE ADDRESS:
FOLLY LANE
COVENTRY, CT. 06238

SHEET TITLE
**ENVIRONMENTAL
NOTES**

SHEET NUMBER
A-8

**140' 4C EXT 160' 6C MONOPOLE
VERIZON WIRELESS
COVENTRY NORTHWEST CT
TOLLAND COUNTY, CT**

TABLE OF CONTENTS
T1 - BILL OF MATERIAL & NOTES
S1 - ELEVATION VIEW & DETAILS
ABT - ANCHOR BOLTS & TEMPLATES

SYMBOL LEGEND

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

DESIGN NOTES

- MONOPOLE IS DESIGNED IN ACCORDANCE WITH TIA-222G FOR 105 MPH BASIC WIND AND 50 MPH WITH 1.00" ICE. TOWER STRUCTURE CLASS- II EXPOSURE - C TOPOGRAPHIC CATEGORY - 1 WITH CREST HEIGHT OF 0.00 ft.

COATING NOTES

- ALL APPLICABLE MATERIALS SHALL BE HOT DIPPED GALVANIZED PER ASTM A123. ALL HARDWARE SHALL BE HOT DIPPED GALVANIZED PER ASTM A153, UNLESS OTHERWISE NOTED.

STRUCTURE NOTES

- EE WILL NOT HONOR ANY BACKCHARGES WHICH HAVE NOT RECEIVED PRIOR WRITTEN AUTHORIZATION. CONTACT EE AT (440) 970.5004
- THE INSTALLER SHALL THOROUGHLY REVIEW EE'S STRUCTURAL ASSEMBLY & ERECTION PROCEDURES PRIOR TO INITIATING THE INSTALLATION OF THE STRUCTURE.
- THE ORIENTATION OF THE STRUCTURE SHALL BE VERIFIED PRIOR TO INSTALLATION.
- FOR MULTIPLE SECTION STRUCTURES:
 - FOR PROPER SECTION TO SECTION ALIGNMENT A 2" HORIZONTAL WELD BEAD AND A MARK ARE POSITIONED ON EACH SECTION AT EACH SPLICE. 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 ALIGNED FROM TOP TO BOTTOM OF THE STRUCTURE / MARK NUMBERS SHALL BE MATCHED FOR EACH SIDE & THE DISTANCE BETWEEN TWO WELD BEADS SHOULD BE 18" (±4").
 - ALL SECTIONS OF THE STRUCTURE SHALL BE JACKED TOGETHER WITH A MINIMUM JACKING FORCE OF 10,000 lbf APPLIED TO EACH SIDE. FOR MAXIMUM RECOMMENDED JACKING FORCE, SPLICE LENGTH TOLERANCE AND AIR GAP BETWEEN SECTIONS REFER TO EE'S STRUCTURE ASSEMBLY & ERECTION PROCEDURES.
 - 1" FIELD ASSEMBLY JACKING NUTS FOR JACKING SECTIONS TOGETHER ARE LOCATED ON OPPOSING SECTION FLATS ABOVE AND BELOW THE SPLICES. ALL JACKING EQUIPMENT SHALL BE SUPPLIED BY THE INSTALLER.
 - ALL LONGITUDINAL SEAM WELDS WITHIN THE SLIP-JOINT AREA IN THE FEMALE SECTION SHALL BE 100% PENETRATION.
- 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 INSTALLED 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.
- SHIMS WILL BE SUPPLIED BY EE, IF REQUIRED.
- STRUCTURE BASE PLATE SHALL HAVE FULL PENETRATION WELD TO SHAFT.
- 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 EE'S STRUCTURE ASSEMBLY & ERECTION PROCEDURES.
- MATERIALS
 - STRUCTURAL STEEL - REFER TO DRAWING.
 - BOLTS
 - STRUCTURAL STEEL: A325 HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.
 - ANCHOR RODS: A615-GR75 UNLESS OTHERWISE NOTED.
- WELDING
 - ALL WELDING SHALL MEET AWS LATEST D.1.1 EDITION
- ASSEMBLY MARKING PROCEDURE
 - 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 5/8" HIGH LETTERS).

BILL OF MATERIALS 18312-P01

Item	Part Number	Qty	Description	Weight Per	Wt Per Row
	18312-P01		140' 4C EXT 160' 6C MONOPOLE	39584.16	39584.16
1	18312-P01-GS01	1	SECTION ASSY. (3/8" A572-GR65 POLY-18)	5994.73	5994.73
2	18312-P01-GS02	1	SECTION ASSY. (1/2" A572-GR65 POLY-18)	11565.51	11565.51
3	18312-P01-GS03	1	SECTION ASSY. (9/16" A572-GR65 POLY-18)	18561.11	18561.11
4	K12443	1	12' LOW PROFILE ANTENNA PLATFORM 'H'	1128.68	1128.68
5	K12076	1	HANDRAIL KIT FOR 12' PLATFORM	577.53	577.53
6	K12446	1	UNIVERSAL BRACKET (22" to 38" AF)	352.47	352.47
7	K12062	12	8'-6" ADJUSTABLE ANTENNA MOUNT FOR STANDARD PLATFORM w/ HANDRAILS	48.59	583.08
8	K10875	1	UNIVERSAL BRACKET (22" to 40")	165.99	165.99
9	K12488	1	TRIANGULAR KICKER SUPPORT	123.87	123.87
10	K10062	1	BUSS BAR	7.50	7.50
11	K10333	1	7'-0" LIGHTNING ROD	28.60	28.60
12	18312-P01-P36-01	1	COVER PLATE	49.47	49.47
13	DBI-140	1	140'-0" SAFETY CLIMB KIT	33.60	33.60
14	10000-A01-A394-01	107	5/8" dia.x 7" LG. BUTTON HEAD STEP BOLT w/(1) H.N. & (1) SQUARE NUT EACH	1.08	125.76
15	K11499	12	6" x 18" HANDHOLE COVER PLATE & BOLTS	10.48	94.32
16	K11497	6	10" x 30" ACCESS PORT COVER PLATE & BOLTS	31.39	188.34
17	A-BX-A325-G-1.00X3.50	2	1" DIA X 3 1/2" HEX BOLT (A325) w/ (1) HHN (A194-2H) & (2) FW (F436) - GALVANIZED FINISH	1.80	3.60
18	18312-P01-ABT	1	FOR ANCHOR BOLTS REFER TO DWG. 18312-P01-ABT		
19	HD-INS-MONOPOLE	1	STRUCTURE ASSEMBLY AND ERECTION PROCEDURE		
20	HD-INS-INSPLAT	1	INTERMEDIATE PLATFORM ASSEMBLY PROCEDURE		
21	18312-P01-CNT	1	GALVANIZED FINISH		

STAMP



ENGINEERED ENDEAVORS

The Experienced Point of View
15175 Kinsman Road • Burton, OH 44062
Ph: (440) 970-5004
www.engend.com

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REVISION HISTORY

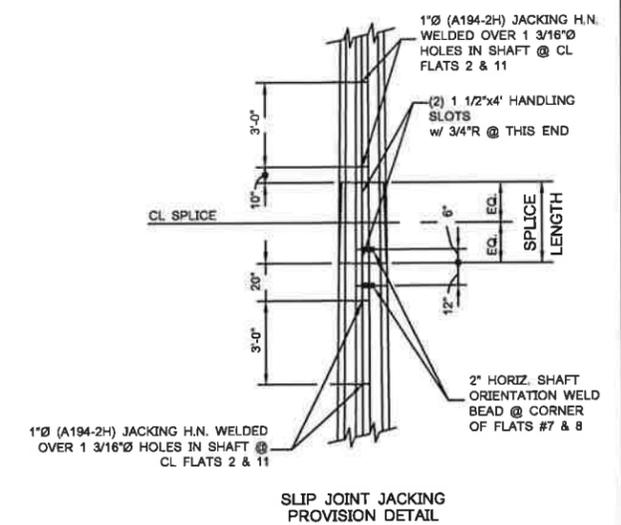
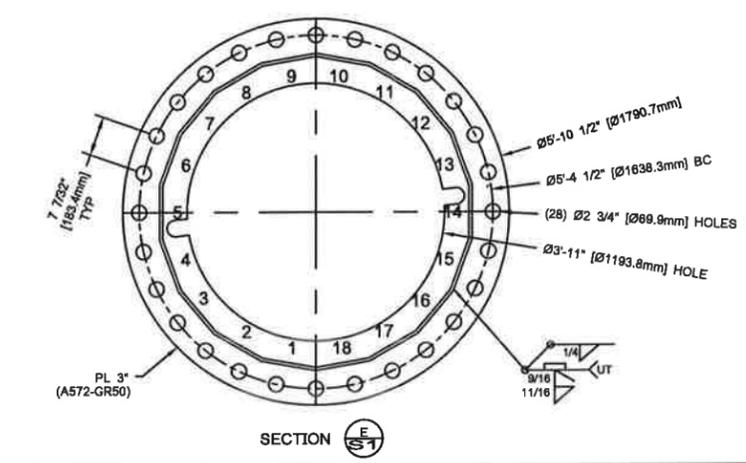
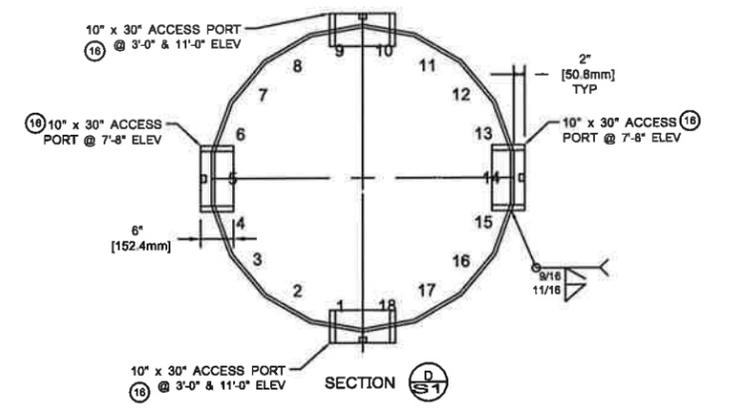
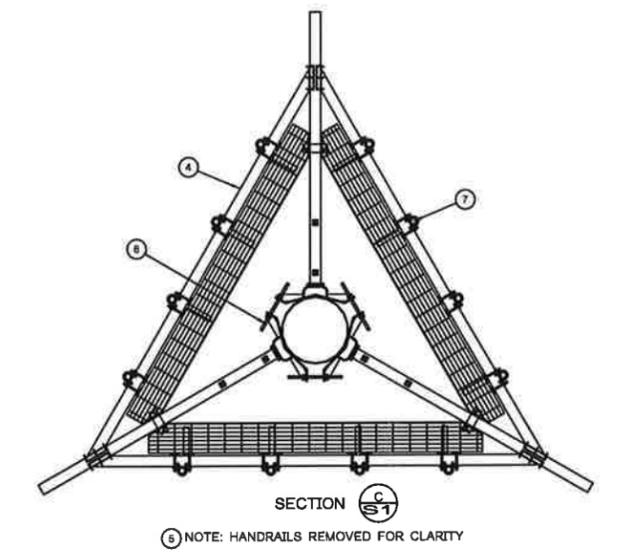
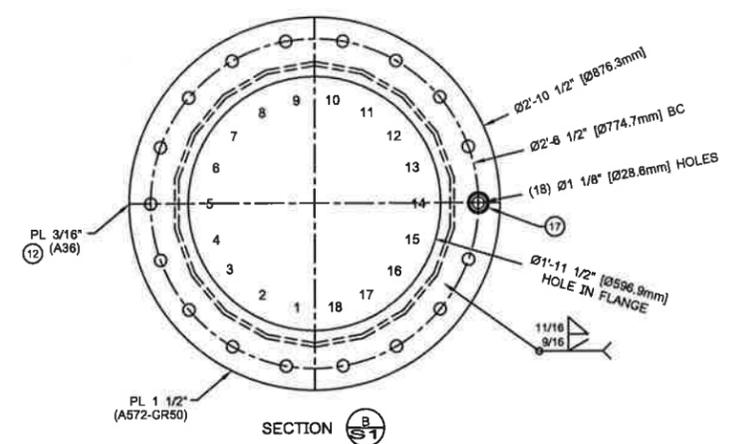
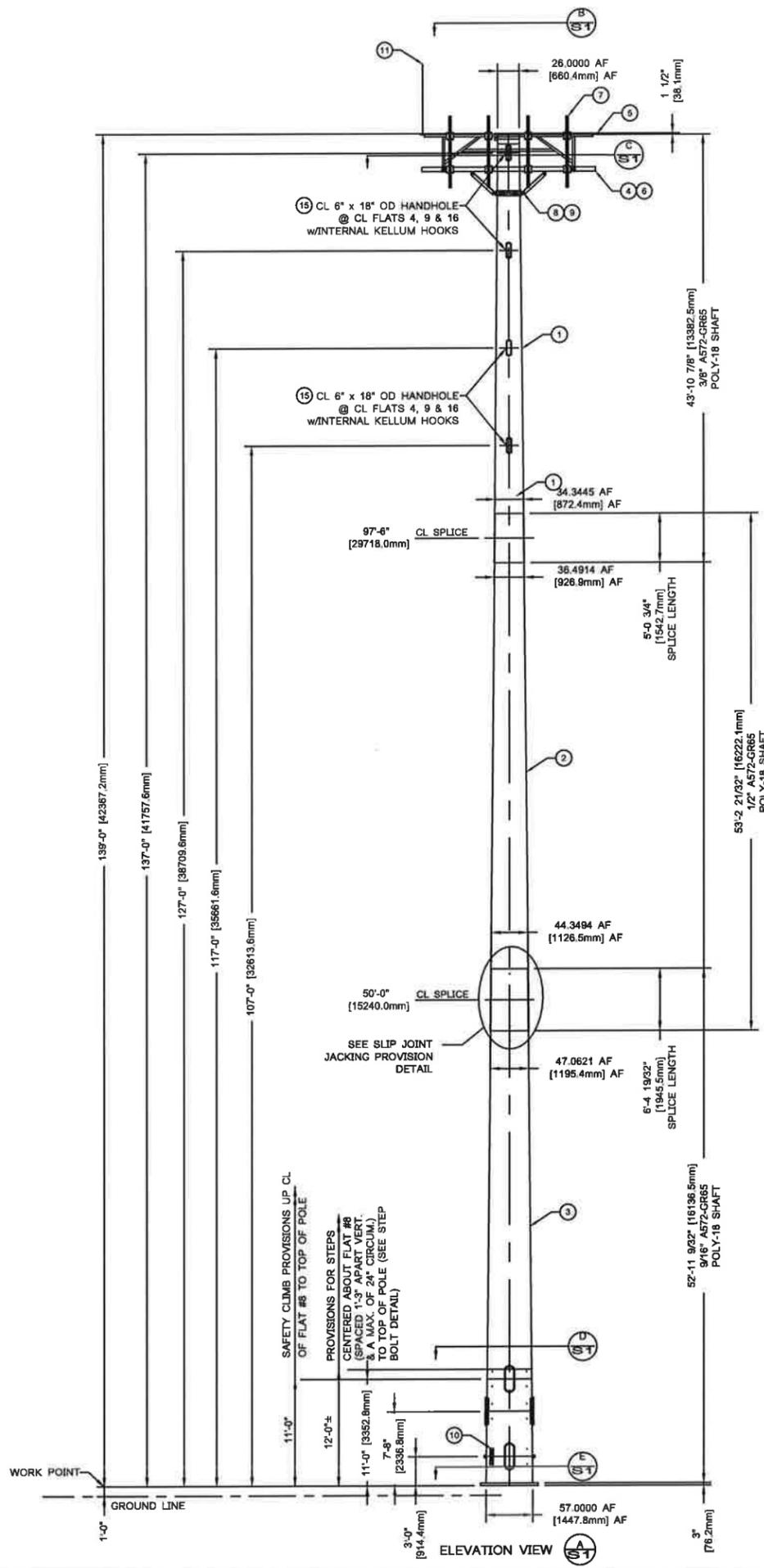
REV. #	DATE	BY	DESCRIPTION
0	5/15/18	TS	ISSUED FOR APPROVAL

**140' 4C EXT 160' 6C MONOPOLE
VERIZON WIRELESS
COVENTRY NORTHWEST CT
TOLLAND COUNTY, CT**

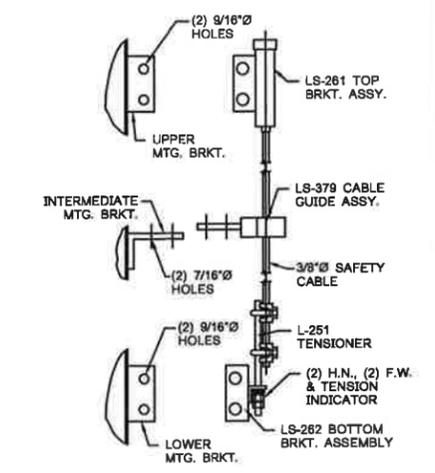
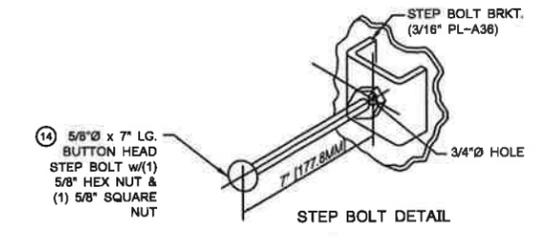
BILL OF MATERIALS & NOTES

DRAWN BY TS	CREATED 5/15/18	PROJECT NUMBER 18312
DRAWING NUMBER 18312-P01-T1		

POLE TAPER = 0.23895 in/ft



NOTE: FOR REQUIRED TOLERANCES AT SLIP JOINTS AND REQD. JACKING FORCES SEE "STRUCTURE ASSEMBLY AND ERECTION PROCEDURES".



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REVISION HISTORY				
REV. #	DATE	BY	DESCRIPTION	
0	5/15/18	TS	ISSUED FOR REVIEW	

**140' 4C EXT 160' 6C MONOPOLE
 VERIZON WIRELESS
 COVENTRY NORTHWEST CT
 TOLLAND COUNTY, CT
 ELEVATION VIEW & DETAILS**

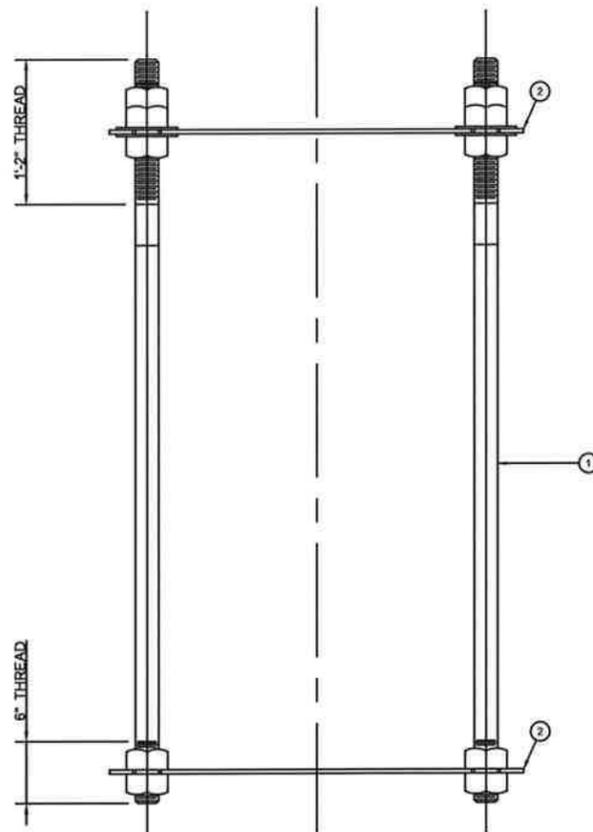
DRAWN BY	CREATED	PROJECT NUMBER
TS	5/15/18	18312
DRAWING NUMBER		
18312-P01-S1		

BILL OF MATERIALS				18312-P01-TS	
Item	Part Number	Qty	Description	Weight Per	Wt Per Row
1	2.25-AB6.0-5DE	28	2 1/4" x 6'-0" LG (A615-GR75) ANCHOR ROD w/(5) HEX NUTS (A194-GR2H) & (2) FLAT WASHERS (F436)	99.80	2794.40
2	28-64.50-2.25	2	TOP & BOTTOM SETTING TEMPLATE	115.86	231.72
UNCAGED ANCHOR RODS & TEMPLATE WEIGHT					3026.12

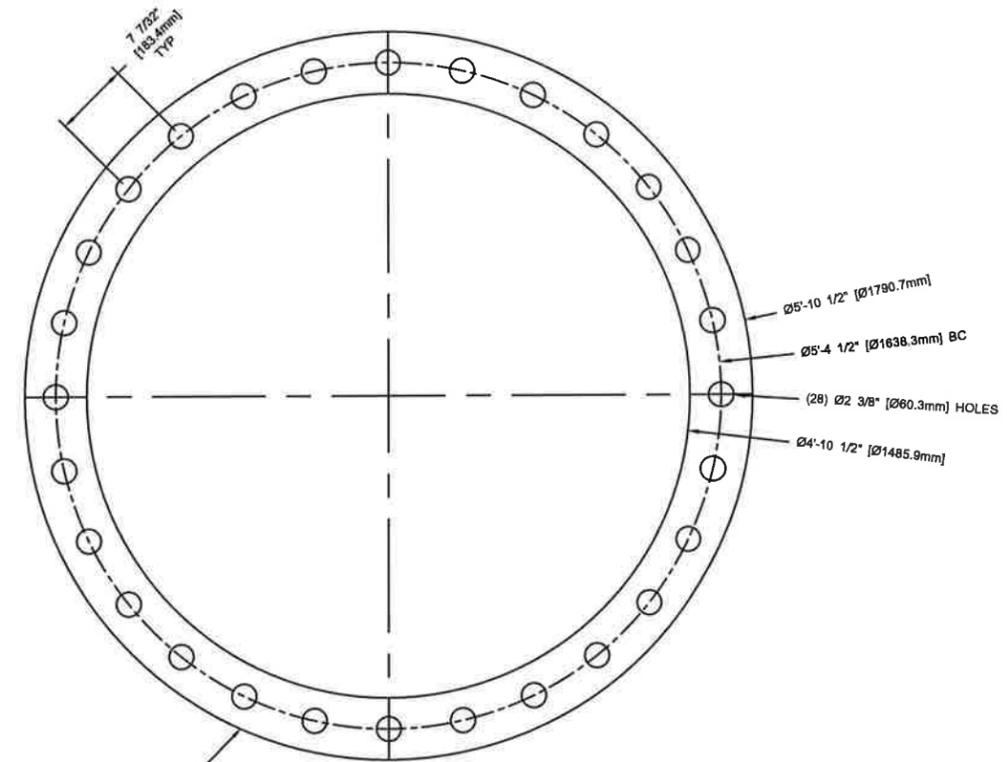
TOTAL OF (1) ASSEMBLY REQ'D PER STRUCTURE



PROJECTION OF 12" ABOVE CONCRETE, ENTIRE BOLT AND ALL NUTS & WASHERS GALVANIZED PER ASTM A153.



ANCHOR BOLT CAGE ASSEMBLY A
ABT



MARK: 18312-P01

TOP & BOTTOM PLATE (MIN 3/8" THICK. A36) B
ABT ②

STAMP

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REVISION HISTORY

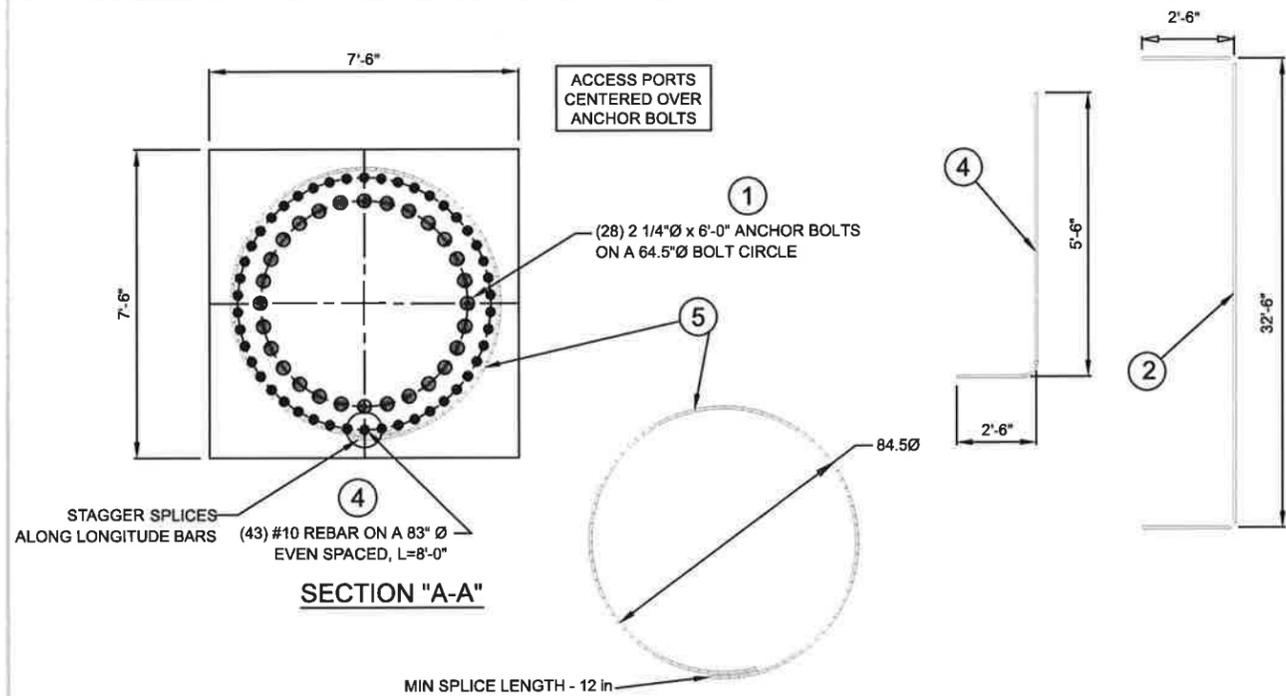
REV. #	DATE	BY	DESCRIPTION
0	5/15/18	TS	ISSUED FOR APPROVAL

140' 4C EXT 160' 6C MONOPOLE
VERIZON WIRELESS
COVENTRY NORTHWEST CT
TOLLAND COUNTY, CT

ANCHOR BOLTS & TEMPLATES

DRAWN BY	CREATED	PROJECT NUMBER
TS	5/15/18	18312

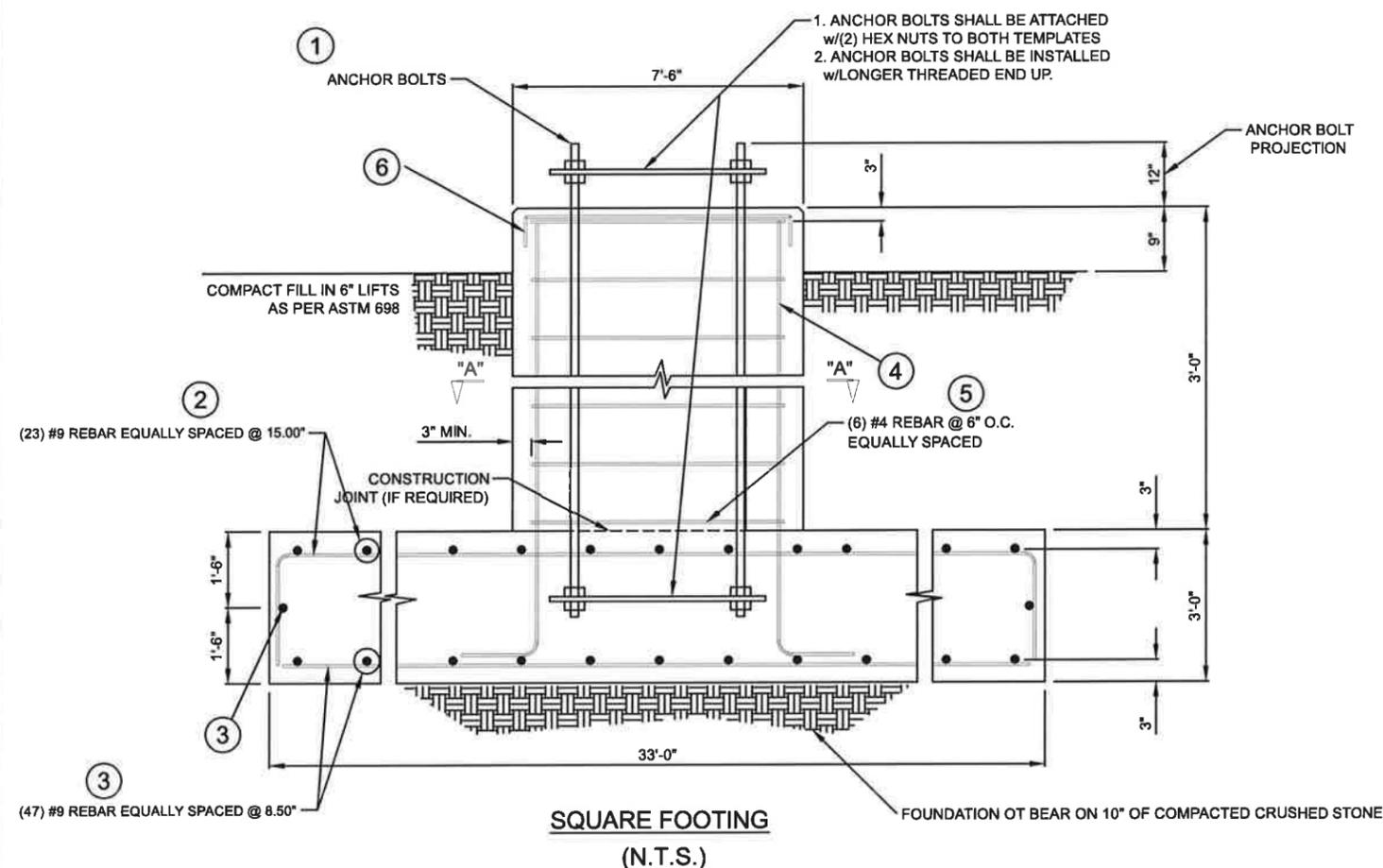
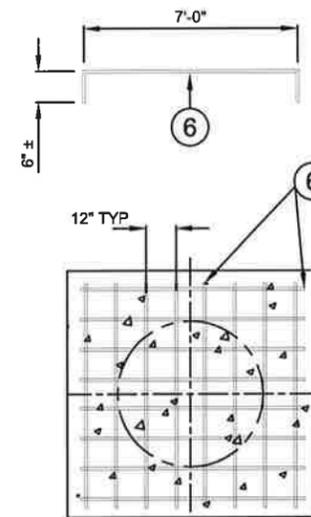
DRAWING NUMBER
18312-P01-ABT



FOUNDATION LOADING (PER TIA-222G w/OLF)	
MOMENT	8222 kip-ft
SHEAR	67 kips
AXIAL	70 kips

MATERIAL LIST		
ITEM	QTY.	DESCRIPTION
1	28	2 1/4"Ø x 6'-0" (A615-GR.75) ANCHOR BOLTS
2	54	#9 REBAR x 37'-6" (ASTM A615-GR.60)
3	98	#9 REBAR x 32'-6" (ASTM A615-GR.60)
4	43	#10 REBAR x 8'-0" (ASTM A615-GR.60)
5	6	#4 REBAR x 23'-6" (ASTM A615-GR.60)
6	16	#4 REBAR x 8'-0" (ASTM A615-GR.60)

VOL. CONCRETE @ 4000 psi (TYPE II CEMENT)	128 yd ³
STEEL (ASTM A615-GR.60)	19000 lbs



GENERAL NOTES:

- FOUNDATION DESIGN IS BASED ON THE FOLLOWING: EEI JOB# 18312. SOIL REPORT BY HUDSON DESIGN GROUP, LLC, REPORT DATED 3/02/2018. FOUNDATION IS DESIGNED TO INCLUDE A FUTURE 20-FT EXTENSION. MAX HEIGHT - 160 FT
- FOUNDATION EMBEDMENT IS SHOWN FROM THE GROUND LEVEL AT THE TIME OF SOIL INVESTIGATION AS DEPICTED IN THE SOIL REPORT. SHOULD THE ACTUAL SOIL CONDITIONS DIFFER FROM THOSE IN THE REPORT, THE GEOTECHNICAL ENGINEER AND FOUNDATION DESIGNER SHOULD 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, TECHNIQUES, SEQUENCES, AND PROCEDURES.
- SPECIAL INSPECTION IS REQUIRED IN ACCORDANCE WITH 2015 IBC AND CT BC.
 - SOIL.
 - FOUNDATION EXCAVATION SHALL BE INSPECTED PRIOR TO INSTALLATION OF REINFORCEMENT.
 - VERIFY DEPTH AND DIAMETER OF THE EXCAVATION.
 - VERIFY ACTUAL SOIL CONDITIONS AGAINST THE GEOTECHNICAL REPORT.
 - REINFORCING STEEL.
 - VERIFY GRADE, LENGTH, DIAMETER, AND QUANTITY OF REBARS AND COMPLIANCE WITH THE DRAWINGS.
 - VERIFY GRADE, LENGTH, DIAMETER, AND QUANTITY OF ANCHOR BOLTS AND BOLT PATTERN ON THE TEMPLATES.
 - CONCRETE.
 - VERIFY STRENGTH, SLUMP, AIR, TEMPERATURE OF CONCRETE, AND DESIGN MIX.
- REINFORCING STEEL.
 - REINFORCING STEEL SHALL CONFORM TO ASTM A615-87, Fy=60 ksi.
 - ALL REINFORCEMENT SHALL BE ASSEMBLED USING STEEL WIRE. WELDING IS NOT PERMITTED.
 - MINIMUM SPLICE LENGTH FOR LONGITUDINAL BARS: No. 6 BARS AND SMALLER - 44 x Øbar, No. 7 BARS AND LARGER - 55 x Øbar.
 - HORIZONTAL STIRRUPS SHALL BE STAGGERED ALONG THE REBAR CAGE WITH NO MORE THAN 50% OF SPLICES IN ONE PLACE.
- CONCRETE.
 - MIX DESIGN AND CONSTRUCTION PROCEDURE SHALL BE IN COMPLIANCE WITH ACI 318-05, ACI 336.3R-93, AND ALL APPLICABLE STATE AND LOCAL CODES.
 - MINIMUM COMPRESSIVE STRENGTH - 4000 psi AT 28 DAYS AND TYPE II CEMENT SHALL BE USED UNLESS STATED OTHERWISE.
 - SLUMP: DRILLED PIER - 7" (±1"), MAT FOUNDATION - 3" (±1").
 - CONCRETE SHALL BE DEPOSITED AS NEARLY AS PRACTICAL IN ITS FINAL POSITION TO AVOID SEGREGATION DUE TO REHANDLING OR FLOWING.
 - CONCRETE SHALL BE THOROUGHLY CONSOLIDATED BY ALL SUITABLE MEANS DURING PLACEMENT AND SHALL BE THOROUGHLY WORKED AROUND REINFORCEMENT AND EMBEDDED FIXTURES AND INTO CORNERS OF FORMS.
- ANCHOR BOLT INSTALLATION. ANCHOR BOLT ORIENTATION SHALL BE VERIFIED WITH THE SITE PLANS AND MONOPOLE DRAWING FOR PROPER ACCESS PORT ORIENTATION AND ANCHOR BOLT ALIGNMENT PRIOR TO CONCRETE PLACEMENT.



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Verizon Wireless
140-ft / 160-ft Monopole
Coventry NW
Coventry, CT

SCALE: N.T.S.	PROJECT NO. 18312
SHEET 1 of 1	DRAWING NO. 18312S-0.0

REV	DESCRIPTION	DATE	DWN	CHK
0	FOR REVIEW/CONSTRUCTION	05/15/18	BF	

Section	1	2	3	4
Length (ft)	20.00	44.03	53.22	53.19
Number of Sides	18	18	18	18
Thickness (in)	0.1875	0.3750	0.5000	0.5625
Socket Length (ft)		5.06	6.38	
Top Dia (in)	21.0000	26.0000	34.5345	44.5320
Bot Dia (in)	26.0000	36.4900	47.0300	57.0000
Grade				A572-65
Weight (K)	0.9	5.5	11.6	16.2



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(4) GENERIC ANTENNA 8'X1'	160	(4) GENERIC ANTENNA 8'X1'	130
(4) GENERIC ANTENNA 8'X1'	160	(4) GENERIC ANTENNA 8'X1'	130
(4) GENERIC ANTENNA 8'X1'	160	(4) GENERIC ANTENNA 8'X1'	130
EE PLATFORM W/H-RAILS	160	EE PLATFORM W/H-RAILS	130
(4) GENERIC ANTENNA 8'X1'	150	(4) GENERIC ANTENNA 8'X1'	120
(4) GENERIC ANTENNA 8'X1'	150	(4) GENERIC ANTENNA 8'X1'	120
(4) GENERIC ANTENNA 8'X1'	150	(4) GENERIC ANTENNA 8'X1'	120
EE PLATFORM W/H-RAILS	150	EE PLATFORM W/H-RAILS	120
(4) GENERIC ANTENNA 8'X1' (VZW)	140	(4) GENERIC ANTENNA 8'X1'	110
(4) GENERIC ANTENNA 8'X1' (VZW)	140	(4) GENERIC ANTENNA 8'X1'	110
(4) GENERIC ANTENNA 8'X1' (VZW)	140	(4) GENERIC ANTENNA 8'X1'	110
EE PLATFORM W/H-RAILS	140	EE PLATFORM W/H-RAILS	110

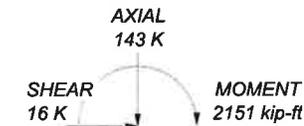
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

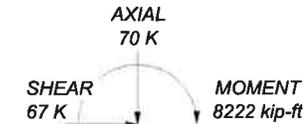
TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 105 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: 98%

ALL REACTIONS ARE FACTORED



50 mph WIND - 1.0000 in ICE



REACTIONS - 105 mph WIND



05-16-2018

Engineered Endeavors 15175 Kinsman Road Burton, OH Consulting Engineers Phone: 440.970.5004 FAX: www.engend.com		Job: 18312
		Project: 140-ft/160-ft Monopole, Coventry Northwest
Client: Verizon Wireless	Drawn by: bfayman	App'd:
Code: TIA-222-G	Date: 05/14/18	Scale: N
Path:		Dwg No.:

tnxTower Engineered Endeavors 15175 Kinsman Road Burton, OH Phone: 440.970.5004 FAX: www.engend.com	Job 18312	Page 1 of 10
	Project 140-ft/160-ft Monopole. Coventry Northwest	Date 14:19:57 05/14/18
	Client Verizon Wireless	Designed by bfayman

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 Tolland County, Connecticut.

Basic wind speed of 105 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 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	160.00-140.00	20.00	0.00	18	21.0000	26.0000	0.1875	0.7500	A572-65 (65 ksi)
L2	140.00-95.97	44.03	5.06	18	26.0000	36.4900	0.3750	1.5000	A572-65 (65 ksi)
L3	95.97-47.81	53.22	6.38	18	34.5345	47.0300	0.5000	2.0000	A572-65 (65 ksi)
L4	47.81-1.00	53.19		18	44.5320	57.0000	0.5625	2.2500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	21.3240	12.3860	677.8263	7.3884	10.6680	63.5383	1356.544	6.1942	3.3660	17.952
	26.4011	15.3617	1293.111	9.1634	13.2080	97.9036	2587.923	7.6823	4.2460	22.645
L2	26.4011	30.5002	2530.272	9.0969	13.2080	191.5712	5063.874	15.2530	3.9160	10.443
	37.0529	42.9859	7083.346	12.8208	18.5369	382.1210	14176.01	21.4970	5.7622	15.366

tnxTower Engineered Endeavors 15175 Kinsman Road Burton, OH Phone: 440.970.5004 FAX: www.engend.com	Job 18312	Page 2 of 10
	Project 140-ft/160-ft Monopole. Coventry Northwest	Date 14:19:57 05/14/18
	Client Verizon Wireless	Designed by bfayman

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
L3	36.2736	54.0127	7904.4458	12.0822	17.5435	450.5623	15819.2925	27.0115	5.1981	10.396
	47.7555	73.8431	20198.2403	16.5181	23.8912	845.4245	40423.0579	36.9286	7.3973	14.795
L4	46.7376	78.5021	19174.4380	15.6092	22.6223	847.5910	38374.1063	39.2585	6.8476	12.174
	57.8793	100.7621	40548.0714	20.0353	28.9560	1400.3340	81149.4970	50.3906	9.0420	16.075

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 Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
L1 160.00-140.00				1	1	1			
L2 140.00-95.97				1	1	1			
L3 95.97-47.81				1	1	1			
L4 47.81-1.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Ledger	Allow Shiel d	Component Type	Placement ft	Total Number		C _{AA} ft ² /ft	Weight plf
1 5/8"	C	No	Inside Pole	140.00 - 1.00	18	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
1 5/8"	C	No	Inside Pole	130.00 - 1.00	18	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
1 5/8"	C	No	Inside Pole	110.00 - 1.00	18	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
1 5/8"	C	No	Inside Pole	90.00 - 1.00	18	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	160.00-140.00	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	0.00

tnxTower Engineered Endeavors 15175 Kinsman Road Burton, OH Phone: 440.970.5004 FAX: www.engend.com	Job 18312	Page 3 of 10
	Project 140-ft/160-ft Monopole. Coventry Northwest	Date 14:19:57 05/14/18
	Client Verizon Wireless	Designed by bfayman

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L2	140.00-95.97	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	1.52
L3	95.97-47.81	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.08
L4	47.81-1.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	3.09

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
L1	160.00-140.00	A	2.326	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	0.00
L2	140.00-95.97	A	2.270	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	1.52
L3	95.97-47.81	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	3.08
L4	47.81-1.00	A	1.942	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	3.09

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
(4) GENERIC ANTENNA 8'X1'	A	From Face	4.00	0.0000	160.00	No	11.47	6.80	0.10
			0.00			Ice	12.07	7.37	0.16
			0.00			1/2"	12.68	7.95	0.23
						Ice 1"			
(4) GENERIC ANTENNA 8'X1'	B	From Face	4.00	0.0000	160.00	No	11.47	6.80	0.10
			0.00			Ice	12.07	7.37	0.16
			0.00			1/2"	12.68	7.95	0.23

tnxTower Engineered Endeavors 15175 Kinsman Road Burton, OH Phone: 440.970.5004 FAX: www.engend.com	Job		18312		Page		4 of 10	
	Project		140-ft/160-ft Monopole. Coventry Northwest		Date		14:19:57 05/14/18	
	Client		Verizon Wireless		Designed by		bfayman	

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustme nt	Placement	CAA Front	CAA Side	Weight
			ft ft ft	°	ft	ft ²	ft ²	K
(4) GENERIC ANTENNA 8'X1'	C	From Face	4.00 0.00 0.00	0.0000	160.00	No Ice Ice 1/2"	11.47 6.80 12.07 7.37 12.68 7.95	0.10 0.16 0.23
EE PLATFORM W/H-RAILS	C	None		0.0000	160.00	No Ice Ice 1/2"	38.00 38.00 45.00 45.00 50.00 50.00	1.50 2.40 4.00
** (4) GENERIC ANTENNA 8'X1'	A	From Face	4.00 0.00 0.00	0.0000	150.00	No Ice Ice 1/2"	11.47 6.80 12.07 7.37 12.68 7.95	0.10 0.16 0.23
(4) GENERIC ANTENNA 8'X1'	B	From Face	4.00 0.00 0.00	0.0000	150.00	No Ice Ice 1/2"	11.47 6.80 12.07 7.37 12.68 7.95	0.10 0.16 0.23
(4) GENERIC ANTENNA 8'X1'	C	From Face	4.00 0.00 0.00	0.0000	150.00	No Ice Ice 1/2"	11.47 6.80 12.07 7.37 12.68 7.95	0.10 0.16 0.23
EE PLATFORM W/H-RAILS	C	None		0.0000	150.00	No Ice Ice 1/2"	38.00 38.00 45.00 45.00 50.00 50.00	1.50 2.40 4.00
** (4) GENERIC ANTENNA 8'X1' (VZW)	A	From Face	4.00 0.00 0.00	0.0000	140.00	No Ice Ice 1/2"	11.47 6.80 12.07 7.37 12.68 7.95	0.10 0.16 0.23
(4) GENERIC ANTENNA 8'X1' (VZW)	B	From Face	4.00 0.00 0.00	0.0000	140.00	No Ice Ice 1/2"	11.47 6.80 12.07 7.37 12.68 7.95	0.10 0.16 0.23
(4) GENERIC ANTENNA 8'X1' (VZW)	C	From Face	4.00 0.00 0.00	0.0000	140.00	No Ice Ice 1/2"	11.47 6.80 12.07 7.37 12.68 7.95	0.10 0.16 0.23

tnxTower Engineered Endeavors 15175 Kinsman Road Burton, OH Phone: 440.970.5004 FAX: www.engend.com	Job 18312	Page 7 of 10
	Project 140-ft/160-ft Monopole. Coventry Northwest	Date 14:19:57 05/14/18
	Client Verizon Wireless	Designed by bfayman

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	160 - 140	Pole	Max Tension	8	0.00	0.00	0.00
			Max. Compression	8	-27.54	0.00	0.00
			Max. Mx	4	-4.55	-292.03	0.00
			Max. My	6	-4.55	0.00	-292.03
			Max. Vy	4	19.83	-292.03	0.00
			Max. Vx	6	19.83	0.00	-292.03
L2	140 - 95.97	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-87.68	0.00	0.00
			Max. Mx	4	-21.44	-1949.27	0.00
			Max. My	2	-21.44	0.00	1949.27
			Max. Vy	4	57.24	-1949.27	0.00
			Max. Vx	2	-57.24	0.00	1949.27
L3	95.97 - 47.81	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-109.88	0.00	0.00
			Max. Mx	4	-40.68	-4761.09	0.00
			Max. My	6	-40.68	0.00	-4761.09
			Max. Vy	4	62.62	-4761.09	0.00
			Max. Vx	6	62.62	0.00	-4761.09
L4	47.81 - 1	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-143.00	0.00	0.00
			Max. Mx	4	-69.68	-8222.41	0.00
			Max. My	2	-69.68	0.00	8222.41
			Max. Vy	4	66.96	-8222.41	0.00
			Max. Vx	2	-66.96	0.00	8222.41

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 140	31.230	13	1.7620	0.0000
L2	140 - 95.97	24.017	13	1.6431	0.0000
L3	101.03 - 47.81	12.185	13	1.1932	0.0000
L4	54.19 - 1	3.325	13	0.5831	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	(4) GENERIC ANTENNA 8'X1'	13	31.230	1.7620	0.0000	23832
150.00	(4) GENERIC ANTENNA 8'X1'	13	27.573	1.7096	0.0000	11916
140.00	(4) GENERIC ANTENNA 8'X1'	13	24.017	1.6431	0.0000	6171
130.00	(4) GENERIC ANTENNA 8'X1'	13	20.649	1.5518	0.0000	5494
120.00	(4) GENERIC ANTENNA 8'X1'	13	17.499	1.4393	0.0000	5097
110.00	(4) GENERIC ANTENNA 8'X1'	13	14.585	1.3128	0.0000	4754

Maximum Tower Deflections - Design Wind

tnxTower Engineered Endeavors 15175 Kinsman Road Burton, OH Phone: 440.970.5004 FAX: www.engend.com	Job	18312	Page	8 of 10	
	Project	140-ft/160-ft Monopole. Coventry Northwest		Date	14:19:57 05/14/18
	Client	Verizon Wireless		Designed by	bfayman

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 140	171.050	4	9.6667	0.0000
L2	140 - 95.97	131.646	4	9.0177	0.0000
L3	101.03 - 47.81	66.891	4	6.5546	0.0000
L4	54.19 - 1	18.274	4	3.2049	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.00	(4) GENERIC ANTENNA 8'X1'	4	171.050	9.6667	0.0000	4597
150.00	(4) GENERIC ANTENNA 8'X1'	4	151.076	9.3811	0.0000	2296
140.00	(4) GENERIC ANTENNA 8'X1'	4	131.646	9.0177	0.0000	1185
130.00	(4) GENERIC ANTENNA 8'X1'	4	113.229	8.5184	0.0000	1048
120.00	(4) GENERIC ANTENNA 8'X1'	4	95.995	7.9028	0.0000	966
110.00	(4) GENERIC ANTENNA 8'X1'	4	80.039	7.2099	0.0000	895

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio P _u / φP _n
L1	160 - 140 (1)	TP26x21x0.1875	20.00	0.00	0.0	15.361 7	-4.55	1033.67	0.004
L2	140 - 95.97 (2)	TP36.49x26x0.375	44.03	0.00	0.0	41.551 0	-21.44	3087.03	0.007
L3	95.97 - 47.81 (3)	TP47.03x34.5345x0.5	53.22	0.00	0.0	71.465 8	-40.68	5309.56	0.008
L4	47.81 - 1 (4)	TP57x44.532x0.5625	53.19	0.00	0.0	97.669 0	-66.36	7256.31	0.009

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} kip-ft	φM _{ux} kip-ft	Ratio M _{ux} / φM _{ux}	M _{uy} kip-ft	φM _{uy} kip-ft	Ratio M _{uy} / φM _{uy}
L1	160 - 140 (1)	TP26x21x0.1875	292.04	548.99	0.532	0.00	548.99	0.000
L2	140 - 95.97 (2)	TP36.49x26x0.375	1949.27	2209.72	0.882	0.00	2209.72	0.000
L3	95.97 - 47.81 (3)	TP47.03x34.5345x0.5	4761.09	4900.91	0.971	0.00	4900.91	0.000
L4	47.81 - 1 (4)	TP57x44.532x0.5625	7729.60	8143.16	0.949	0.00	8143.16	0.000

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	Project 140-ft/160-ft Monopole. Coventry Northwest	Date 14:19:57 05/14/18
	Client Verizon Wireless	Designed by bfayman

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	160 - 140 (1)	TP26x21x0.1875	19.83	516.84	0.038	0.00	1099.32	0.000
L2	140 - 95.97 (2)	TP36.49x26x0.375	57.24	1543.52	0.037	0.00	4424.83	0.000
L3	95.97 - 47.81 (3)	TP47.03x34.5345x0.5	62.62	2654.78	0.024	0.00	9813.83	0.000
L4	47.81 - 1 (4)	TP57x44.532x0.5625	66.70	3666.46	0.018	0.00	16306.25	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	160 - 140 (1)	0.004	0.532	0.000	0.038	0.000	0.538	1.000	4.8.2 ✓
L2	140 - 95.97 (2)	0.007	0.882	0.000	0.037	0.000	0.890	1.000	4.8.2 ✓
L3	95.97 - 47.81 (3)	0.008	0.971	0.000	0.024	0.000	0.980	1.000	4.8.2 ✓
L4	47.81 - 1 (4)	0.009	0.949	0.000	0.018	0.000	0.959	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	θP_{allow} K	% Capaci ty	Pass Fail	
L1	160 - 140	Pole	TP26x21x0.1875	1	-4.55	1033.67	53.8	Pass	
L2	140 - 95.97	Pole	TP36.49x26x0.375	2	-21.44	3087.03	89.0	Pass	
L3	95.97 - 47.81	Pole	TP47.03x34.5345x0.5	3	-40.68	5309.56	98.0	Pass	
L4	47.81 - 1	Pole	TP57x44.532x0.5625	4	-66.36	7256.31	95.9	Pass	
							Summa ry		
							Pole (L3)	98.0	Pass
							RATING	98.0	Pass

<p>tnxTower</p> <p>Engineered Endeavors 15175 Kinsman Road</p>	<p>Job</p> <p>18312</p>	<p>Page</p> <p>10 of 10</p>
<p>Program Version: 7.0.0 ENG/18312.dtl Phone: 440.970.5004 FAX: www.engend.com</p>	<p>Project</p> <p>140-ft/160-ft Monopole. Coventry Northwest</p>	<p>Date</p> <p>14:19:57 05/14/18</p>
<p>Program Version: 7.0.0 ENG/18312.dtl Phone: 440.970.5004 FAX: www.engend.com</p>	<p>Client</p> <p>Wireless Jobs/18000/18312 - VZW_CT - 140' 4C ext 160' 6C Monopole - Coventry Northwest Verizon Wireless</p>	<p>Designed by</p> <p>bfayman</p>

EEI Job #:	18312
Site Name:	Coventry NW
Structure:	14-ft/160-ft Monopole

5/14/2018

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

Pole Properties at Base

Pole Diameter =	57 in
Pole Thickness =	0.5625 in
Yield Strength =	65 ksi
Monopole Shape =	18-Sided

Base Reactions

M_u =	8222 ft-kip
V_u =	67 kip
P_u =	70 kip

Anchor Rod Properties

Anchor Material =	A615GR75
Anchor Diameter =	2.25 in
Anchor Length =	6 ft
No. of Anchors =	28
Weight =	2500 lbs

Bolt Circle Diameter & Spacing

Minimum Bolt Circle ϕ =	64.38 in
Actual Bolt Circle ϕ =	64.5 in
Spacing =	7.24 in

Anchor Rod Inter. Eq. 1 (4.9.9)

P_{ub} =	221 kip
V_{ub} =	2.39 kip
η =	0.5
Φ_t =	0.80
$\Phi_t R_{nt}$ =	260 kip
Inter. Eq. 1 =	0.87

Anchor Rod Inter. Eq. 2 (4.9.9)

L_{ar} =	1.5 in
V_{ub} =	2.39 kip
P_{ub} =	221 kip
M_{ub} =	2.33 kip-in
$\Phi_v R_{nv}$ =	134 kip
$\Phi_t R_{nt}$ =	260 kip
$\Phi_f R_{nm}$ =	95 kip-in
Inter. Eq. 2 =	0.87

Base Plate Properties

Base Plate Material =	A572GR50
Outside Diameter =	70.5 in
Inside Diameter =	47 in
Weight =	1789 lbf

Effective Base Plate Bend Line

Desantis' Bend Line =	41.49 in
% Reduction =	60 %
Reduced Bend Line =	19.39 in
Brinker's Bend Line =	8.73 in
Effective Bend Line =	8.73 in

Base Plate Thickness

Section Modulus:	Plastic
Φ_b =	0.9
Minimum Thickness =	2.90 in
Actual Thickness =	3 in
M_{ub} =	829 in-k
ΦM_n =	884 in-kip
Capacity Usage =	93.7%

Setting Template Properties

Outside Diameter =	70.5 in
Inside Diameter =	58.5 in
Thickness =	0.375 in
Template Hole ϕ =	2.375 in
Template Weight =	116.1 lbs
<i>*Bottom Template Must Be Bolted*</i>	

Summary Table

Anchor Material =	A615GR75
Anchor Diameter =	2.25 in
Anchor Length =	6 ft
No. of Anchors =	28
Actual Bolt Circle ϕ =	64.5 in
Base Plate Material =	A572GR50
Actual Thickness =	3 in
Outside Diameter =	70.5 in
Inside Diameter =	47 in

⚠ This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

ATC Hazards by Location

Search Information

Address: 104 Folly Ln, Coventry, CT 06238, USA
Coordinates: 41.826684, -72.35000100000002
Timestamp: 2018-05-14T18:22:43.389Z
Hazard Type: Wind

Map Results



Text Results

ASCE 7-16

MRI 10-Year	75 mph
MRI 25-Year	84 mph
MRI 50-Year	91 mph
MRI 100-Year	98 mph
Risk Category I	109 mph
Risk Category II	119 mph
Risk Category III	128 mph
Risk Category IV	⚠ 133 mph

You are in a wind-borne debris region if you are also within 1 mile of the coastal mean high water line.

ASCE 7-10

MRI 10-Year	78 mph
MRI 25-Year	87 mph
MRI 50-Year	94 mph
MRI 100-Year	102 mph
Risk Category I	115 mph
Risk Category II	126 mph
Risk Category III-IV	⚠ 135 mph

If the structure under consideration is a healthcare facility, you are in a wind-borne debris region. If other occupancy, use the Risk Category II basic wind speed contours to determine if you are in a wind-borne debris region.

ASCE 7-05

ASCE 7-05 Wind Speed **101 mph**

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

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DESIGN CALCULATIONS
FOR A
SPREAD FOOTER FOUNDATION

Verizon Wireless

Coventry NW

Coventry, CT

EI Project Number 18312, Rev. 0

May 14, 2018

15175 Kinsman Road, Burton, Ohio 44062

Phone: (440) 970-5004* (888) 270-3855

www.engend.com

FOUNDATION DESIGN CALCULATIONS FOR A SPREAD FOOTER FOUNDATION



CUSTOMER: Verizon Wireless

DATE: 5/14/2018

LOCATION: Coventry, CT

SITE NAME: Coventry NW

JOB NUMBER: 18312

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	8222.00	67	70
FACTORED $w/\phi=0.75$	10962.7	89.3	93.3

ANCHOR BOLT DATA

QUANTITY	LENGTH	BOLT CIRCLE Ø	PROJECTION
28	6.0 ft	64.5 in	12.0 in

SOIL UNIT WEIGHT, pcf **120.00**

CONCRETE UNIT WEIGHT, pcf **150.00**

MINIMUM FOUNDATION PARAMETERS

PEDESTAL MINIMUM WIDTH 90.0 in
FOUNDATION MINIMUM HEIGHT 5.50 ft

PEDESTAL PROJECTION **12.0 in**

ACTUAL FOUNDATION SIZE

	HEIGHT, ft	WIDTH, ft
SLAB	3.00	33.00
PEDESTAL	3.00	7.50

STABILITY

Foundation Weight, kips 515.36
Concrete, cub.yd. 127.25
Soil Weight, kips 247.86
Total weight foundation and soil (unfactored), kips 763.22

Total Vertical Load, kips 749.90
Total Overturning Moment, kip-ft 8624.00
Total Resisting Moment, kip-ft 12373.35

OVERTURNING SAFETY FACTOR **1.43**

Kern of Eccentricity, ft 5.50
Actual Eccentricity, ft 11.50
Allowable Gross Soil Pressure, ksf (see soil report) 5.25
Allowable Net Soil Pressure, ksf (see soil report) 4.0
Max soil pressure, ksf per TIA-222-G 4.0
per TIA/EIA-222-F n/a

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

CONCRETE REINFORCEMENT

	BAR SIZE	BAR WEIGHT (lbs/ft)	QUANTITY	LENGTH (ft)	WEIGHT (lbs)
TOP PAD	# 9	3.40	54	37.50	6885.00
BOTTOM PAD	# 9	3.40	98	32.50	10829.00
VERTICAL BARS	# 10	3.40	43	7.25	1059.95
HORIZONTAL TIES	# 4	1.50	6	22.03	198.25

TOTAL STEEL WEIGHT (lbs) 18972.20

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	70.00	
Bearing Soil Pressure, ksf	0.06	
Shear in the slab, kips	63.57	
Design shear Vn, kips	1454.05	$\phi = 0.85$ OK

ONE-WAY SHEAR IN THE SLAB

Max soil pressure, ksf	3.03	
Actual Eccentricity, ft	11.50	
Kern of Eccentricity, ft	5.50	
Pressure Distribution Zone, ft	15.00	
Effective Pressure Zone, ft	10.08	
Max Shear Force, kips	1008.0	
Design Shear, kips	1179.9	$\phi = 0.85$ OK

SLAB DESIGN IN FLEXURE

Max Soil Pressure, ksf	3.03	
Actual Eccentricity, ft	11.50	
Kern of Eccentricity, ft	5.50	
Pressure Distribution Zone, ft	15.00	
Effective Pressure Zone, ft	12.75	
Soil Pressure at Effective Zone Edge	0.45	
Shear Force at Critical Section, kip	732.9	
Bending Moment, k-ft	5823.1	
Coefficient of Resistance, Rn	191.5	$\phi = 0.90$
Min. Required Reinf. Ratio by Analysis	0.00332	
Min. Reinf. Ratio per ACI 318, 200/Fy	0.00330	
Min. Reinf. Ratio per ACI 318	0.00332	ACI-318 Sect.10.5.3
Design Reinforcement Ratio	0.00332	
Min. Steel Area, sq.in.	42.08	
Bar size	9	
Bar section area, in ²	1.00	

BOTTOM BARS

Min. No. of Bars/One direction	43.00	
Actual No. of Bars/One direction	47	OK
Actual Steel Area, sq.in.	47.00	
Steel Ratio Actual	0.00371	OK
Revised Coefficient of Resistance, Rn	222.51	
Design Moment, kip-ft	6767.26	
Total bottom bars	98	
Horizontal Spacing (shor), in	8.48	OK

TOP BARS

Min. Steel Area, sq.in (0.18%)	22.81	
Minimum Number of Bars REQUIRED	23	One Direction
Actual Number of Bars	27	OK
Top Steel Area, sq.in	27.00	
Total Top Bars	54	
Horizontal Spacing, in	15.00	OK

PEDESTAL DESIGN

Pedestal Width, in	90
Concrete Strength, ksi	3
Reinforcement Strength, ksi	60
Actual Rebars QTY	43
Nominal Bars QTY	12
Minimum reinforcement ratio	0.0033
Actual reinforcement ratio	0.0067
Concrete cover, in	3
Rebar layout radius, in	41.50

Ultimate Moment 8423.0 ft-kips

Rebar	10
Area, sq.in	1.27
Area, sq.in	4.55
Rebar space, in	6.06
ϵ_u	0.003
ϵ_y	0.00207

BENDING ABOUT THE MAJOR AXIS

Rebar Number	Angle degrees	Coordinate in	Edge Dist. in
1	0	41.50	3.50
2	30	35.94	9.06
3	60	20.75	24.25
4	90	0.00	45.00
5	120	-20.75	65.75
6	150	-35.94	80.94

Rebar Number	Angle degrees	Coordinate in	Edge Dist. in
7	180	-41.50	86.50
8	210	-35.94	80.94
9	240	-20.75	65.75
10	270	0.00	45.00
11	300	20.75	24.25
12	330	35.94	9.06

Location of Neutral Axis
Compression Zone

c = 9.04 in
a = 7.68 in

Compression Zone

Rebar Number	ϵ in/in	Force kips
1	0.0018	231.03
2	-0.000007	231.03
12	-0.000007	231.03

Tension Zone

Rebar Number	ϵ in/in	Force kips
3	0.0050	273.05
4	0.0119	273.05
5	0.0188	273.05
6	0.0239	273.05
7	0.0257	273.05
8	0.0239	273.05
9	0.0188	273.05
10	0.0119	273.05
11	0.0050	273.05

Concrete, kips 1763.48

Total Compression, kips 2456.57

Total Tension, kips 2457.45

Moment Due to Compression

Rebar Number	Force kips	Arm in	Moment k-ft
1	231.03	41.50	798.98
2	0.00	35.94	0.00
12	0.00	35.94	0.00

Moment Due to Tension

Rebar Number	Force kips	Arm in	Moment k-ft
2	0.00	35.94	0.00
3	273.05	20.75	-472.15
4	273.05	0.00	0.00
5	273.05	-20.75	472.15
6	273.05	-35.94	817.79
7	273.05	-41.50	944.30
8	273.05	-35.94	817.79
9	273.05	-20.75	472.15
10	273.05	0.00	0.00
11	273.05	20.75	-472.15
12	0.00	35.94	0.00

Concrete	1763.48	41.16	6048.44
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Total in Compression 6847.41

Total in Tension 2579.87

Design Moment about the Major Axis, kip-ft 8484.55 OK

BENDING ABOUT THE DIAGONAL

Rebar Number	Angle, deg phi	Coord., in c1	Edge Dist., in di
1	0	41.50	22.14
2	30	35.94	27.70
3	60	20.75	42.89
4	90	0.00	63.64
5	120	-20.75	84.39
6	150	-35.94	99.58

Rebar Number	Angle, deg phi	Coord., in c1	Edge Dist., in di
7	180	-41.50	105.14
8	210	-35.94	99.58
9	240	-20.75	84.39
10	270	0.00	63.64
11	300	20.75	42.89
12	330	35.94	27.70

Location of Neutral Axis
Compression Zone

c = 31.78 in
a = 27.01 in

Compression Zone

Rebar Number	ϵ in/in	Force kips
1	0.00091	108.50
2	0.000385	108.50
12	0.00039	108.50

Concrete, kips 1860.74

Total Compression, kips 2186.23

Tension Zone

Rebar Number	ϵ in/in	Force kips
3	0.0010	138.41
4	0.0030	273.05
5	0.0050	273.05
6	0.0064	273.05
7	0.0069	273.05
8	0.0064	273.05
9	0.0050	273.05
10	0.0030	273.05
11	0.0010	138.41

Total tension, kips 2188.16

Moment Due to Compression

Rebar Number	Force kips	Arm in	Moment k-ft
1	108.50	41.50	375.22
2	0.00	35.94	0.00
12	0.00	35.94	0.00

Concrete	1860.74	54.64	8471.84
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Total in Compression, kips 8847.06

Moment Due to Tension

Rebar Number	Force kips	Arm in	Moment k-ft
3	138.41	20.75	-239.33
4	273.05	20.75	-472.15
5	273.05	0.00	0.00
6	273.05	-20.75	472.15
7	273.05	-41.50	944.30
8	273.05	-35.94	817.79
9	273.05	-20.75	472.15
10	273.05	0.00	0.00
11	138.41	20.75	-239.33

Total in Tension, kips 1755.58

Design Moment, kip-ft 9542.37

Pedestal Design Moment, kip-ft 8484.55 OK

GEOTECHNICAL EVALUATION of SUBSURFACE CONDITIONS

for

COVENTRY NW, CT

104 Folly Lane
Coventry, CT 06238



Prepared for:

verizon[✓]

20 Alexander Drive
Wallingford, CT 06492

Rev 1: March 2, 2018
February 23, 2018

Prepared by:

HGD **HUDSON**
Design Group LLC

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PROJECT LOCATION & DESCRIPTION

The site and project of concern is located at 104 Folly Lane, in Coventry CT. The proposed personal cellular communications antenna tower and compound will be located approximately 530 feet south from the edge of road and 130 feet south from the Skungamaug River Golf Club maintenance garage. The proposed project can be generally located at 41° 49' 26.39" N and 72° 20' 53.74" W on the Coventry, CT USGS quadrangle (1983), viewed in Google Earth, or other internet based geographic mapping software.

The proposed Verizon Wireless communications facility and antenna tower will consist of a lease area, 40'x60' crushed stone surface compound with chain-link perimeter security fence, exterior mounted communications equipment on raised platform, a small cabinet style emergency electrical generator, and additional supporting infrastructure. The proposed cellular communications antenna tower will consist of a 140' monopole with two (2) Verizon panel antennas per sector located at 143' above ground level. The proposed monopole antenna tower can accommodate additional commercial carriers or emergency / first responder's antennas.

The property is owned by John Motcyka and the communications compound and designated access areas will be leased by Verizon Wireless.

PROJECT PURPOSE

The purpose of this Geotechnical Evaluation of Subsurface Conditions is to determine the subsurface soil conditions and properties to be used in the structural analysis and design of the proposed cellular communication antenna tower foundation. The soil investigation and report were completed for Verizon Wireless.

The Geotechnical Evaluation was completed in accordance with standard practice, ANSI /TIA-222-G Structural Standards for Steel Antennas Towers and Supporting Structures (2009), International Building Code (IBC) 2009, and CT State Building Code (2016), as applicable.

METHODS OF INVESTIGATION

Hudson Design Group (HDG) completed a limited document review consisting of USDA-NRCS Soil Survey data, USGS Coventry, CT topographic map or quadrangle, and USGS Bedrock Geologic Map of Connecticut (1985) for the area of interest. The on-site investigation consisted of a primary soil boring with two auger probes at the proposed antenna tower.

The soil boring was performed in general accordance with ASTM D 1586. The soil boring was completed with a Diedrich D50 tracked drill vehicle with safety hammer rigging system. The primary soil boring included Standard Penetration Testing (SPT) with split spoon soil sampling.

Those present during the Geotechnical field or on site investigation of 2/12/18 include Orrin Cone and Mike Gionfrido of New England Boring Company (NEBC). No field or laboratory tests were completed on the recovered soil samples or rock core for this project.

RESULTS

USDA SOIL DATA

Based on review of the USDA, Natural Resource Conservation Service (NRCS) Soil Survey for Tolland County, CT, HDG determined that the reported soils located within the proposed communications compound consist primarily of Hinckley Loamy Sand, with 3% to 15% natural terrain ground slopes, Map unit 38C.

The hydrologic soil group rating or classification for the Hinckley Loamy Sand soil is A. Group A soils having a very rapid infiltration rate (low runoff potential) when thoroughly wet. These soils consist of deep, drained to excessively drained sands and gravelly sands. The reported depth to water table and any restrictive layer are both greater than 78 inches below grade.

Based on further on-line or internet based review of the USDA-NRCS soil survey data, the soil of interest at the proposed cellular communications facility with the Hinckley Loamy Sand has a reported sand, silt, and clay content of 91%, 7.8%, and 1.2%, respectively. The surface soil was classified or rated as PT, according to the Unified Soil Classification (USC) system.

USGS BEDROCK DATA

Based on review of the USGS Bedrock Geological Map of Connecticut (1985) for the area of interest, the anticipated bedrock appears to be within the Bronson Hill Anticlinorium. Based on the bedrock mapping color legend and identification labels, SOs, the bedrock is reported as the Southbridge Formation and is likely a dark to light gray, rusty, granofel or schist from the Silurian to Ordovician Geologic Period. Granofels and Schist are metamorphic bedrock. The depth to bedrock is not listed on the USGS bedrock map.

SOIL BORING

Based on soil boring B-1, the soil encountered was classified by the driller as very dense brown fine to medium grained sand, little fine to coarse gravel, with traces of silt and cobbles. Bedrock was not encountered, but groundwater or saturated soil was reported at 12 feet below grade for the date and location of testing. Soil boring B-1 was completed at the proposed antenna tower.

Due to the dense nature of the soil, very limited and useable second and third increment Standard Penetration Testing (SPT) data are available. However, based on repeated SPT technical refusal and textural description of the soil, the following

interpolated and empirical soil properties and shallow bearing capacity are estimated for the granular soil.

Table 1. Empirically estimated soil properties and mat foundation bearing capacity.

Depth (ft)	Ncorr*	Soil Description	Density (pcf) (moist)	Ø (deg)	Tanδ	Pp (psf/ft)	qa net (tsf)
10	70	Very Dense sand	125	35	0.35	200	4

Ncorr = Blowcount corrected for overburden and hammer energy efficiency

* interpolated corrected N value

Density = Moist or Buoyant soil density per on-site conditions (lbs/ft³ = pcf)

Ø = soil internal friction angle.

Tanδ = Coefficient of lateral sliding for cement concrete on specific soil.

Pp = Allowable lateral passive pressure per foot of depth.

qa net = empirically estimated net allowable soil bearing capacity (tons/ft² = tsf).

It shall be understood that the bearing capacity of a shallow mat foundation on granular soil is dependent on depth of embedment, foundation dimensions, soil density, and moist or saturated soil conditions. As such, an assumed 30'x30' foundation at the depth of embedment listed above with **moist** soil conditions were used in Meyerhof's shallow bearing capacity equation. If saturated soil (buoyant) conditions can exist, the mat foundation design bearing capacity listed above should be reduced by half.

CONCLUSIONS & RECOMMENDATIONS

Based on the USDA-NRCS Soil Survey data, USGS Geologic Bedrock map and descriptions, on-site investigations and empirical relations, the estimated soil properties and bearing capacities are listed in the table above. In the event an empirical relation could not be established or determined, a presumptive value will be listed and stated as such and be according to the International Building Code (2009) and Connecticut Building Code amendments (2016), as applicable.

SOIL

Although soil bearing capacity generally increases with increasing depth of embedment and foundation dimensions for a shallow mat foundation, HDG recommends using a **maximum net allowable soil bearing capacity of 4 TSF**, or 8,000 lbs per square foot for design purposes of the antenna tower foundation. It shall be understood that bearing capacity listed assumes that the groundwater table is well below the bottom of foundation or moist in situ soil conditions.

However, since the groundwater table elevation can change and will likely be close to the proposed antenna tower foundation bottom, the soil bearing capacity listed above should be reduced to a **maximum net allowable soil bearing capacity of 2 TSF**, or 4,000 lbs per square foot for design purposes of the proposed shallow mat antenna tower foundation. For this condition or case it shall be understood that bearing capacity listed assumes that the groundwater table is at or above the bottom of foundation with saturated or buoyant in situ soil conditions.

Please note that the bearing capacities or soil strengths listed in the tables above are for static vertical conditions.

FOUNDATION DESIGN & ALTERNATIVES

Based on the existing and favorable soil conditions, HDG recommends the use of a shallow mat foundation with the dimensions and depth below ground as listed in Table 1. The foundation should be of sufficient mass or cement concrete weight to resist the maximum design compressive, tensile, and moment loads. The tower foundation design should ensure foundation settlement does not exceed 1-inch.

The proposed cement concrete foundation should be designed in accordance with ANSI /TIA-222-G Structural Standards for Steel Antennas Towers and Supporting Structures (2009), International Building Code (IBC) 2009, and CT State Building Code (2016), as applicable.

ADDITIONAL DESIGN CRITERIA

Based on review of the UBC United States Seismic Zones Map, the project location is within the Zone 2A (0.15g) Seismic Zone (ground acceleration). The average frost design depth for this location is approximately 42 inches below finished grade.

Permanent measures to facilitate groundwater drainage below the foundation bottom should be implemented to the greatest extent practicable. Temporary measures for adequate de-watering and maintaining the groundwater table well below the proposed antenna tower foundation subgrade or base elevation shall be completed prior to foundation excavation and be maintained throughout foundation construction.

All backfill should be placed in layers not exceeding 12-inches in uncompacted thickness and compacted in place to 95% of maximum dry density and optimum moisture content established by the Modified Proctor Test, ASTM D 1557-12, for the specific backfill material or soil. Soil used in backfilling shall be moist (not saturated) and free of organics, cobbles, rocks, and refuse, and be well graded.

The overall project general contractor and subcontractor (as applicable) selected for antenna tower foundation construction should contact the Verizon project manager, Hudson Design Group Project manager, and Foundation Designer in writing regarding any requested foundation design changes, including foundation bottom elevation, prior to completing any foundation fabrication or foundation construction modifications on their own.

LIMITATIONS

As applicable, our recommendations are based on limited field observations, investigations, analysis, empirical relationships, and field or laboratory testing completed to date and limited to contractual arrangements for authorized tasks. It is important to understand that the soil investigation completed is very limited in scope and breadth and that subsurface soil conditions can vary greatly, or remain consistent with the soils identified in the soil logs during the investigation and incorporated into the calculations or estimates and report. It shall be understood that the soil boring and rock core, as applicable, were completed at the proposed tower location, and soil

conditions and depth of bedrock, as applicable, may vary from those reported in the drillers bore log.

If during the construction of the foundation soil conditions are found to be greatly different from those identified in the soil logs, HDG shall not be held liable or responsible in any way for foundation design modifications or limitations that may be required as a result of differing or unforeseen conditions. Furthermore, the opinions and estimated values are based on professional experience, formal education, and a standard level of care and due-diligence practiced within the profession. No guarantee or warranty of work is explicitly or implicitly implied. This report is solely for the use of our client.



Figure 1. View of Diedrich D-50 used for soil boring (file photograph).



Figure 2. View of boring location.

(603) 437-1610

New England Boring Contractors
P.O. Box 165
Derry, NH 03038

Fax: (603) 437-0034

Boring # B-1 (Pg 1 of 2)

Project: Hudson Design Group
Tower Site

Project # C08071

Project Address: 104 Folly

City: Coventry

State: CT Zip:

Date Start: 02/12/18

Date End: 02/12/18

Location: See Plan

Casing: HW

Sampler: S/S

Weight: 140lbs

Sampler: 1-3/8 in. I.D.

Size: 4"

Fall: 30'

30 in.

Hammer: 300lb. Fall: 24"

GROUNDWATER OBSERVATION

Date:	Depth:	Casing:				Stabilization Period	
02/12/18	+ 12'						
DP	S./#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
-						3"	TOPSOIL
-	S-1	0' - 2'	24"	5"	6-10-15-22		Dry, medium dense, brown FINE TO MEDIUM SAND, little fine to coarse gravel, trace silt, trace cobbles.
-							
5'0"	S-2	5' - 5'5"	5"	4"	100/5"		Dry, very dense, brown FINE TO MEDIUM SAND, little fine to coarse gravel, trace silt, trace cobbles
-							
10'0"	S-3	10' - 11'6"	18"	10"	37-40-100/6"		Moist, very dense, FINE TO MEDIUM SAND, little fine to coarse gravel, trace silt, trace cobbles
-							
15'0"	S-4	15' - 15'11"	11"	6"	75-100/6"		Wet, very dense, FINE TO MEDIUM SAND, little fine to coarse gravel, trace silt, trace cobbles
-							
20'0"	S-5	20' - 21'6"	18"	5"	49-60-100/5"		Wet, very dense, FINE TO MEDIUM SAND, little fine to coarse gravel, trace silt, trace cobbles
-							
25'0"	S-6	25' - 25'5"	5"	2"	100/5"		Wet, very dense, FINE TO MEDIUM SAND, little fine to coarse gravel, trace silt, trace cobbles
-							
30'0"	S-7	30' - 30'6"	6"	3"	100/6"		Wet, very dense, FINE TO MEDIUM SAND, little fine to coarse gravel, trace silt, trace cobbles
-							
-							

Drillers: Orrin Cone Helper: Mike Gionfrido Inspector: None - HDG

Remarks: There were 2 probes completed to 15' each.

S/#: Sample PEN: Penetration REC: Recovery S/C: Strata Change

(603) 437-1610

New England Boring Contractors

Fax: (603) 437-0034

P.O. Box 165
Derry, NH 03038

Boring # B-1 (Pg 2 of 2)

Project: Hudson Design Group
Tower Site

Project # C08071

Project Address: 104 Folly

City: Coventry

State: CT Zip:

Date Start: 02/12/18

Date End: 02/12/18

Location: See Plan

Casing; HW

Sampler:

Weight: 140lbs

Sampler:

Size: 4"

S/S

Fall: 30'

1-3/8 in. I.D.

Hammer: 300lb. Fall: 24"

30 in.

G R O U N D W A T E R O B S E R V A T I O N

Date: 02/12/18	Depth: + 12'	Casing:	Stabilization Period
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DP	S./#	DEPTH	PEN	REC	BLOWS/6"	S/C	SAMPLE DESCRIPTION
-							
-							
-							
-							
35'0"	S-8	35' - 35'6"	6"	3"	100/6"		Wet, very dense, FINE TO MEDIUM SAND, little fine to coarse gravel, trace silt, trace cobbles
-							
-							
-							
40'0"	S-9	40' - 40'4"	4"	3"	100/4"		Wet, very dense, FINE TO MEDIUM SAND, little fine to coarse gravel, trace silt, trace cobbles
-							
-							
-							
45'0"	S-10	45' - 46'	12"	4"	50-100/6"		Wet, very dense, FINE TO MEDIUM SAND, little fine to coarse gravel, trace silt, trace cobbles
-							
-							
50'0"	S-11	50' - 50'6"	6"	5"	100/6"	50'6"	Wet, very dense, FINE TO MEDIUM SAND, little fine to coarse gravel, trace silt, trace cobbles
-							Bottom of Exploration = 50'6"
-							
-							
-							
55'0"							
-							
-							
-							
-							
-							
-							

Drillers: Orrin Cone **Helper:** Mike Gionfrido **Inspector:** None - HDG

Remarks:

S/#: Sample **PEN:** Penetration **REC:** Recovery **S/C:** Strata Change