

July 17, 2015

Via Hand Delivery

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

Re: **Docket No. 455 – Application of Celco Partnership d/b/a Verizon Wireless for a Certificate of Environmental Compatibility and Public Need for the Construction of a Wireless Telecommunications Facility at 99 East Street, Southington, Connecticut Development and Management Plan**

Dear Ms. Bachman:

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


1. Final Development and Management (“D&M”) Plans for the approved telecommunications facility at 99 East Street in Southington, Connecticut incorporating the Council’s conditions of approval. In this filing we have enclosed fifteen (15) reduced sets of project plans and four (4) full size sets of project plans.
2. Geotechnical and Geophysical Testing Report prepared by DET dated December, 2014.
3. Tower and Foundation Design Plans prepared by Engineered Endeavors Incorporated.

Together, this information constitutes the final D&M Plan submission for the approved 99 East Street facility in Southington.

Melanie A. Bachman
July 17, 2015
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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,



Kenneth C. Baldwin

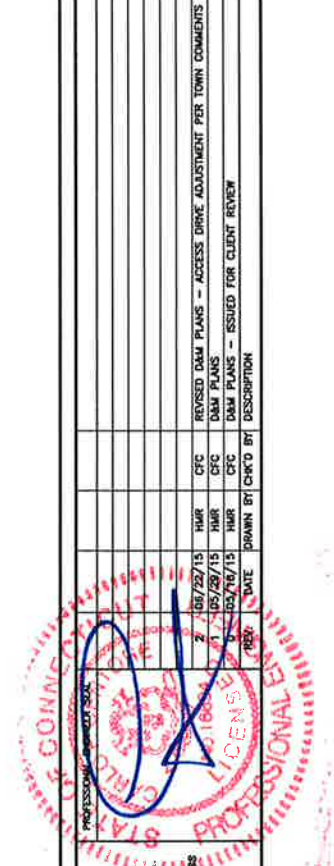
KCB/kmd
Enclosures
Copy to:

Mark Sciota, Deputy Town Manager and Town Attorney (*via Federal Express*)
John Tierney

Cellco Partnership

d.b.a. **verizon** wireless

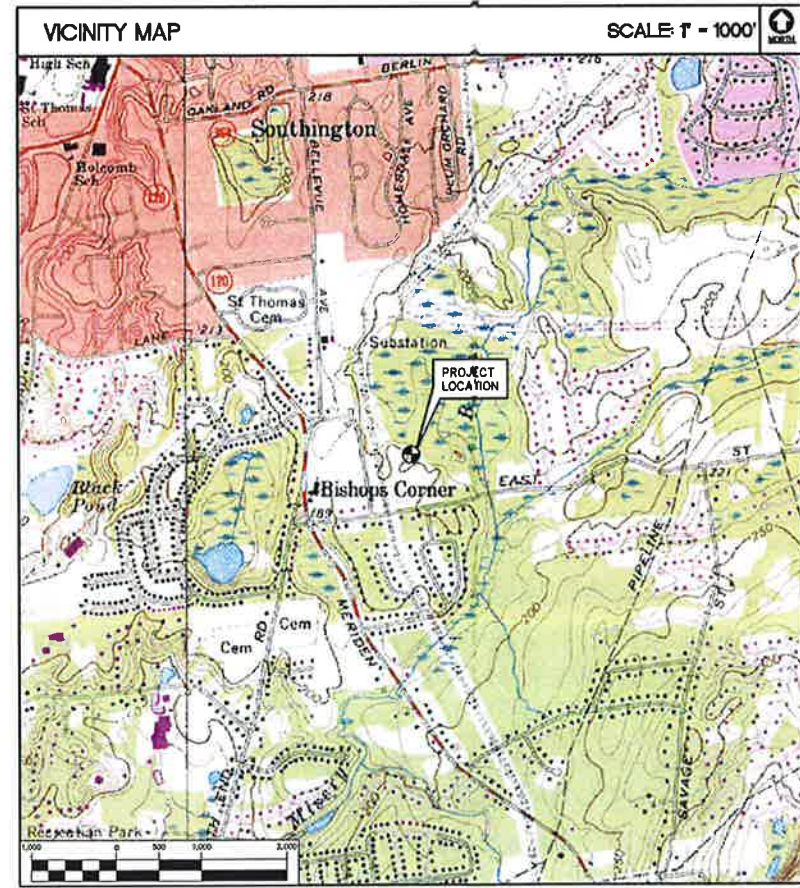
WIRELESS COMMUNICATIONS FACILITY DEVELOPMENT AND MANAGEMENT PLAN SOUTHINGTON - EAST STREET 99 EAST STREET SOUTHINGTON, CT 06489



SITE DIRECTIONS	
FROM: 99 EAST RIVER DRIVE EAST HARTFORD, CONNECTICUT	TO: 99 EAST STREET SOUTHINGTON, CONNECTICUT
1. HEAD EAST ON E RIVER DR TOWARD DARLIN ST	0.3 MI.
2. TURN LEFT TO STAY ON E RIVER DR	400 FT.
3. TAKE THE 1ST LEFT ONTO CONNECTICUT BLVD	0.2 MI.
4. TURN LEFT TO MERGE ONTO I-84	443 FT.
5. MERGE ONTO I-84	16.8 MI.
6. TAKE EXIT 32 FOR CT-10/QUEEN ST	0.3 MI.
7. TURN RIGHT ONTO CT-10 S/QUEEN ST	2.8 MI.
8. TURN LEFT ONTO CT-120 S	1.2 MI.
9. TURN LEFT ONTO EAST ST, AND THE DESTINATION WILL BE ON THE LEFT	0.2 MI.

GENERAL NOTES
1. PROPOSED ANTENNA LOCATIONS AND HEIGHTS PROVIDED BY CELCO PARTNERSHIP.

SITE INFORMATION
THE SCOPE OF WORK SHALL INCLUDE:
1. THE CONSTRUCTION OF A 50'x50' FENCED WIRELESS COMMUNICATIONS COMPOUND.
2. A TOTAL OF UP TO TWELVE (12) DIRECTIONAL PANEL ANTENNAS ARE PROPOSED TO BE MOUNTED AT A CENTERLINE ELEVATION OF 80'-0"± AGL ON A 90'-0"± PROPOSED STEEL MONOPINE TOWER.
3. TOTAL PROPOSED ACCESS DRIVE LENGTH IS 800'± OFF OF EAST STREET TO THE PROPOSED COMPOUND.
4. POWER AND TELCO UTILITIES SHALL BE ROUTED UNDERGROUND FROM EXISTING RESPECTIVE DEMARCS TO THE PROPOSED UTILITY BACKBOARD LOCATED ADJACENT TO THE PROPOSED FENCED COMPOUND. FINAL DEMARC LOCATION AND UTILITY ROUTING TO PROPOSED BACKBOARD WILL BE VERIFIED/DETERMINED BY LOCAL UTILITY COMPANIES. UTILITIES WILL BE ROUTED UNDERGROUND FROM UTILITY BACKBOARD TO THE PROPOSED NOMINAL 12'x26' WIRELESS EQUIPMENT SHELTER LOCATED WITHIN FENCED COMPOUND AREA.
5. THE PROPOSED WIRELESS FACILITY INSTALLATION WILL BE DESIGNED IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2009 CONNECTICUT SUPPLEMENT.
6. THERE WILL NOT BE ANY LIGHTING UNLESS REQUIRED BY THE FCC OR THE FAA.
7. THERE WILL NOT BE ANY SIGNS OR ADVERTISING ON THE ANTENNAS OR EQUIPMENT.



PROJECT SUMMARY	
SITE NAME:	SOUTHINGTON - EAST STREET
SITE ADDRESS:	99 EAST STREET SOUTHINGTON, CT 06489
PROPERTY OWNER:	TOWN OF SOUTHINGTON 75 MAIN STREET SOUTHINGTON, CT 06489
LESSEE/TENANT:	CELLCO PARTNERSHIP d.b.a. VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
VERIZON SITE ACQUISITION CONTACT:	ALEKSEY TYURIN CELLCO PARTNERSHIP (860) 803-8213
LEGAL/REGULATORY COUNSEL:	KENNETH C. BALDWIN, ESO. ROBINSON & COLE (860) 257-8345
TOWER COORDINATES:	LATITUDE: 41°-35'-01.117" LONGITUDE: 72°-51'-52.868" GROUND ELEVATION: 198.2'± A.M.S.L.
	COORDINATES AND GROUND ELEVATION BASED ON FAA 1-A SURVEY CERTIFICATION AS PREPARED FOR VERIZON WIRELESS BY MARTINEZ COUCH AND ASSOCIATES, DATED AUGUST 12, 2014, REVISED OCTOBER 20, 2014.

SHEET INDEX		
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Cellco Partnership
d.b.a. Verizon Wireless

CENITEK engineering
Continued on Plate
2031 488-0580
2031 488-8587 fax
43-2 North Branford Road
Branford, CT 06405
www.CenitekEng.com

Cellco Partnership d/b/a Verizon Wireless
WIRELESS COMMUNICATIONS FACILITY
SOUTHINGTON - EAST STREET
99 EAST STREET
SOUTHINGTON, CT 06489

DATE: 05/18/15
SCALE: AS NOTED
JOB NO. 14035.000

TITLE SHEET
T-1
Sheet No. 1 of 10

ESTIMATED TREE REMOVAL SUMMARY	
TREES PROPOSED TO BE REMOVED IN LOCATION ALONG PROPOSED CELCO PARTNERSHIP ACCESS OR UTILITY EASEMENT	0
TREES PROPOSED TO BE REMOVED WITHIN AND AROUND THE PROPOSED CELCO PARTNERSHIP LEASE AREA	4
TOTAL TREES PROPOSED TO BE REMOVED	4

SYMBOLS LEGEND	
---	PROPERTY LINE
- - - -	EASEMENT LINE (PROPOSED)
---	EXISTING ROAD
---	ACCESS DRIVE (PROPOSED)
---	CONTOUR LINE
---	GRADING LINE
○	UTILITY POLE
○	EXISTING DECIDUOUS TREE
○	EXISTING CONIFEROUS TREE
⊗	EXISTING DECIDUOUS TREE TO BE REMOVED
⊗	EXISTING CONIFEROUS TREE TO BE REMOVED
---	SILTATION FENCE/ HAYBALES/ SILTATION FENCE "SANDWICH"
---	FENCE LINE
*	SPOT ELEVATION (PROPOSED)
WF# 1-5	WETLAND BOUNDARY
---	SILTATION FENCE

SURVEY NOTES
 THIS SURVEY AND MAP HAS BEEN PREPARED IN ACCORDANCE WITH SECTIONS 20-300B-1 THRU 20-300B-20 OF THE REGULATIONS OF CONNECTICUT STATE AGENCIES - "MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" AS ENDORSED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPT. 26, 1996. THE TOPOGRAPHIC SURVEY PORTION OF THIS PLAN CONFORMS TO A VERTICAL ACCURACY OF CLASS T-2 AND IS INTENDED TO BE USED TO DEPICT A PROPOSED TELECOMMUNICATION SITE.

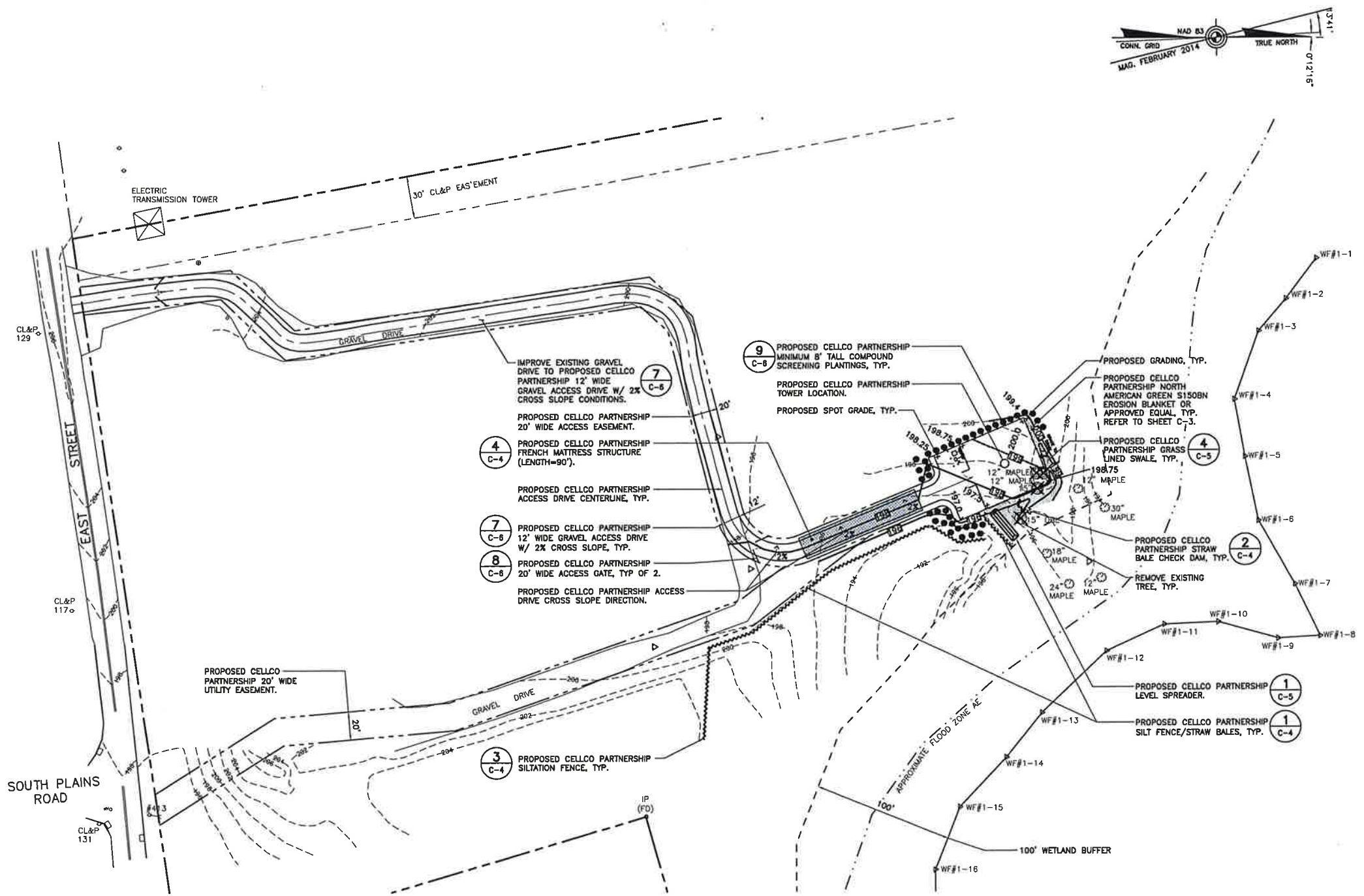
THE PROPERTY/BOUNDARY LINES DEPICTED HEREON ARE COMPILED FROM OTHER MAPS, DEEDS AND LIMITED FIELD SURVEY. THESE LINES ARE NOT TO BE CONSTRUED AS A BOUNDARY OPINION AND ARE SUBJECT TO CHANGE AS AN ACCURATE FIELD SURVEY MAY DISCLOSE. PROPERTY MAY BE SUBJECT TO ENCUMBRANCES, EASEMENTS, RIGHTS OF WAY AS A TITLE SEARCH REPORT MAY DISCLOSE.

COORDINATES BASED ON CONNECTICUT GRID SYSTEM NAD 83.
 ELEVATIONS REFER TO AN NOVD 1929 DATUM.
 PARCEL OWNER OF RECORD: TOWN OF SOUTHTONING.
 PARCELS KNOWN AS 99 EAST STREET, SOUTHTONING, CT.
 MBL 08/8/053
 PARCEL AREA = 27± ACRES
 A PORTION OF THE PARCEL IS IN FLOOD ZONE AE BASED ON THE FLOOD INSURANCE RATE MAP, HARTFORD COUNTY, CONNECTICUT, ALL JURISDICTIONS, PANELS 803 OF 875, COMMUNITY MAP NUMBER 09090C48BJ & 0900C0603F, EFFECTIVE DATE SEPTEMBER 28, 2008, BY FEDERAL EMERGENCY MANAGEMENT AGENCY.
 PARCEL IS SUBJECT TO UTILITY EASEMENT TO THE CONNECTICUT LIGHT & POWER COMPANY AS DEPICTED HEREON.
 ALL IMPROVEMENTS ARE NOT SHOWN.

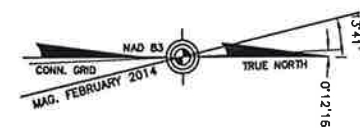
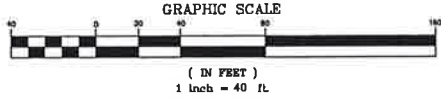
MAP REFERENCE
 1) MAP OF THE LEWIS FARM, BELLEVUE AVENUE - MERIDEN AVENUE - EAST STREET, SOUTHTONING, CONN., SCALE 1"=100', DATED OCTOBER 24, 1980, REVISED THROUGH JULY 22, 1992, BY RUSSELL S. ANDRES.

TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON
 THIS MAP IS NOT VALID WITHOUT A LIVE SIGNATURE AND SEAL

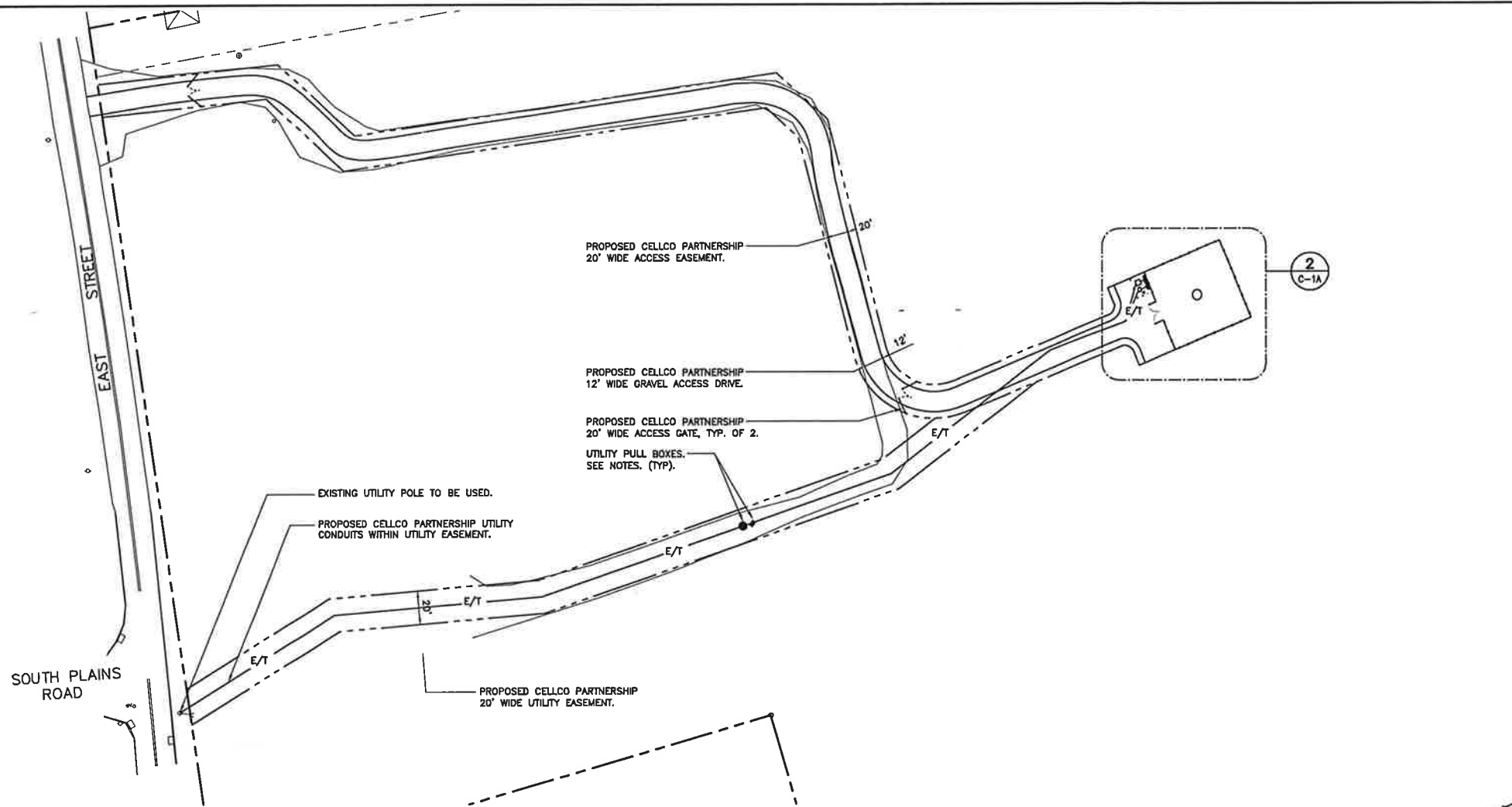
A. RAFAEL MARTINEZ, L.L.S. #18853 DATE 6/22/15



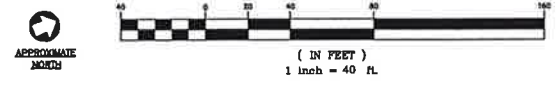
1 PARTIAL SITE PLAN
 C-1 SCALE: 1"=40'



Cellco Partnership d/b/a Verizon Wireless 99 EAST STREET SOUTHTONING, CT 06489	
CEN-tek engineering Wireless Communications Facility 203 468-0890 203 468-0897 fax Branford, CT 06460 www.CenTekEng.com	
Cellco Partnership d/b/a Verizon Wireless WIRELESS COMMUNICATIONS FACILITY SOUTHTONING - EAST STREET 99 EAST STREET SOUTHTONING, CT 06489	
DATE:	05/18/15
SCALE:	AS NOTED
JOB NO.:	14035.000
PARTIAL SITE PLAN C-1 Sheet No. 2 of 10	



1 SITE UTILITY PLAN
 SCALE: 1" = 40'

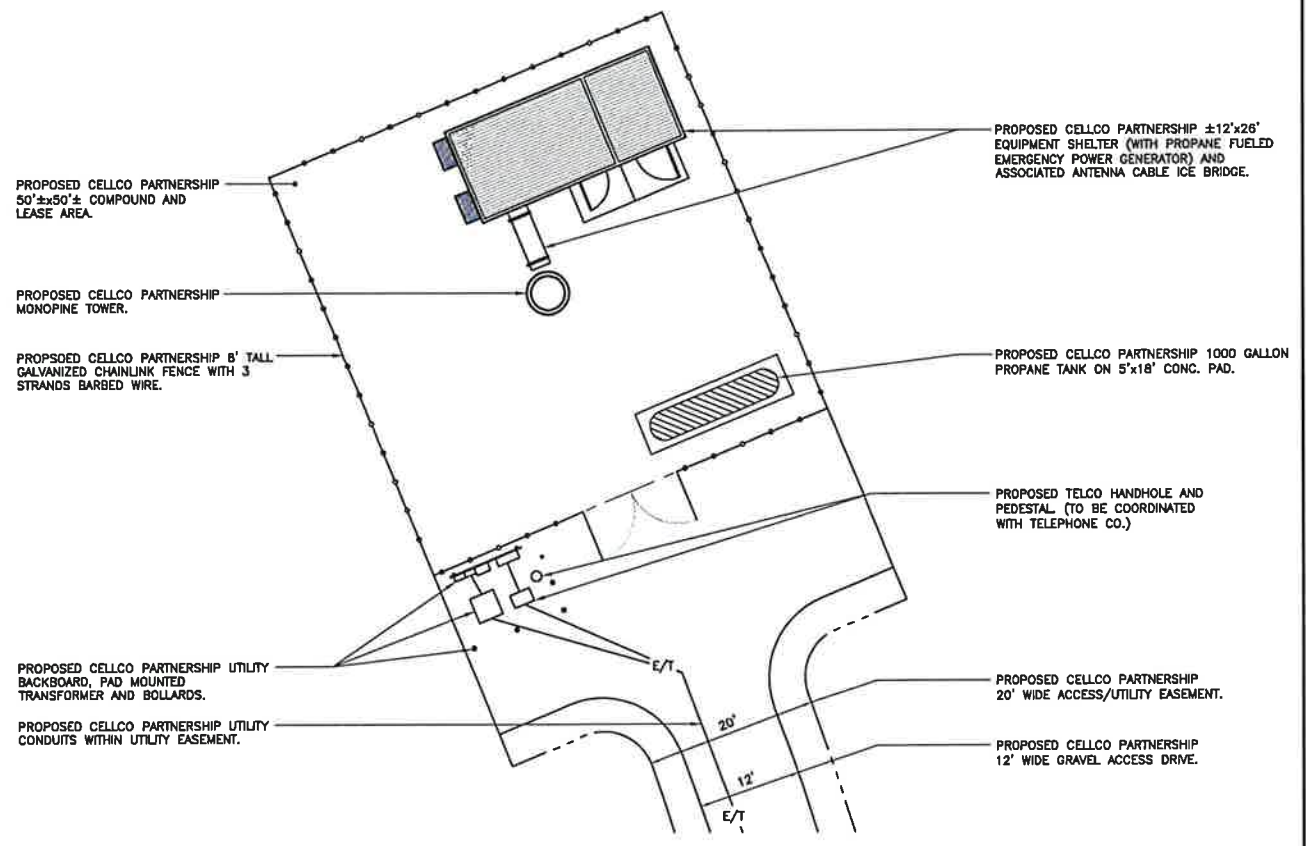


GENERAL NOTES

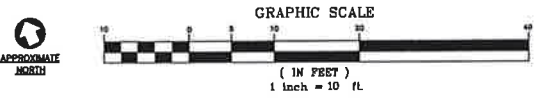
1. COORDINATE WITH OWNER FOR ALL EASEMENT DOCUMENTS.
2. UTILITY ROUTING SHOWN ON THIS PLAN IS SCHEMATIC. CONTRACTOR SHALL COORDINATE FINAL ROUTING WITH RESPECTIVE UTILITY COMPANIES PRIOR TO PERFORMING ANY UTILITY TRENCH WORK. ALL UTILITY CONDUITS AND PULL BOXES SHALL BE LOCATED WITHIN THE PROPOSED ACCESS/UTILITY EASEMENT.
3. UTILITY PULL BOXES/SILOS TO BE TRAFFIC RATED AND INSTALLED IN APPROXIMATE LOCATIONS SHOWN ON THIS PLAN, BUT NOT TO EXCEED 450' INTERVALS. CONTRACTOR TO COORDINATE FINAL PULL BOX LOCATIONS WITH RESPECTIVE LOCAL UTILITY COMPANIES.
4. CONTRACTOR SHALL COORDINATE ALL PERMITS AND PROCEDURES FOR CONDUIT INSTALLATION ALONG STREET.
5. PLAN IS FOR UTILITY ROUTING INFORMATION ONLY. SOME OTHER ELEMENTS NOT SHOWN FOR CLARITY. REFER TO CIVIL DRAWINGS FOR ALL OTHER EXISTING AND PROPOSED SITE INFORMATION.

ELECTRICAL LEGEND

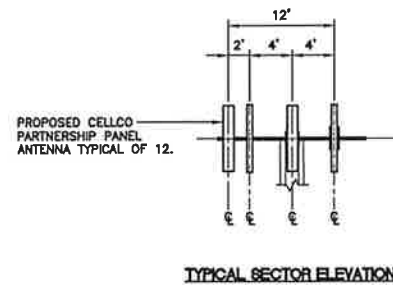
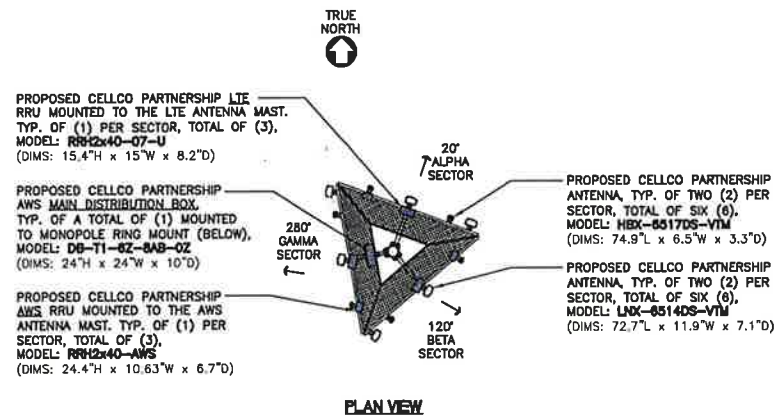
SYMBOL	DESCRIPTION
---	ACCESS/ UTILITY EASEMENT LINE
---	EXISTING DRIVEWAY
---	PROPERTY LINE
-T-----T-	UNDERGROUND COMMUNICATION CONDUIT
-E-----E-	UNDERGROUND ELECTRICAL CONDUIT AS INDICATED
○-----○	PERIMETER CHAIN LINK FENCE
●	UTILITY PULL BOX/SILO



2 PARTIAL SITE PLAN
 SCALE: 1" = 10'



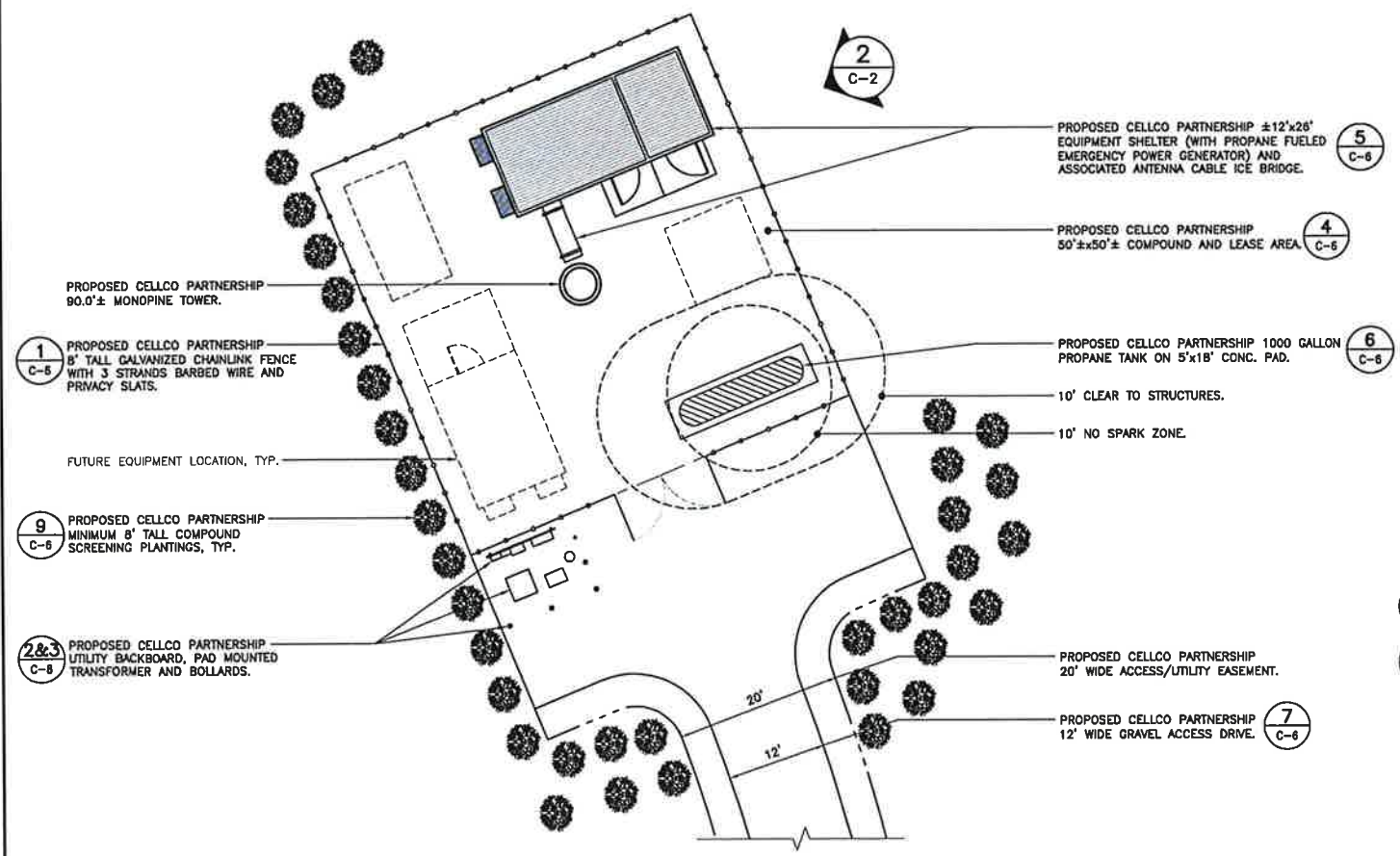
Cellco Partnership d/b/a Verizon Wireless	CENTEX engineering Created on 04/16/15	(203) 488-0080 (203) 488-0087 for 822 North Main Road Southington, CT 06488 www.CentexEng.com	Cellco Partnership d/b/a Verizon Wireless WIRELESS COMMUNICATIONS FACILITY SOUTHINGTON - EAST STREET 99 EAST STREET SOUTHINGTON, CT 06489		
		DATE: 05/18/15		SCALE: AS NOTED	
		JOB NO. 14033.000		SITE UTILITY PLAN	
		C-1A		Sheet No. 3 of 10	



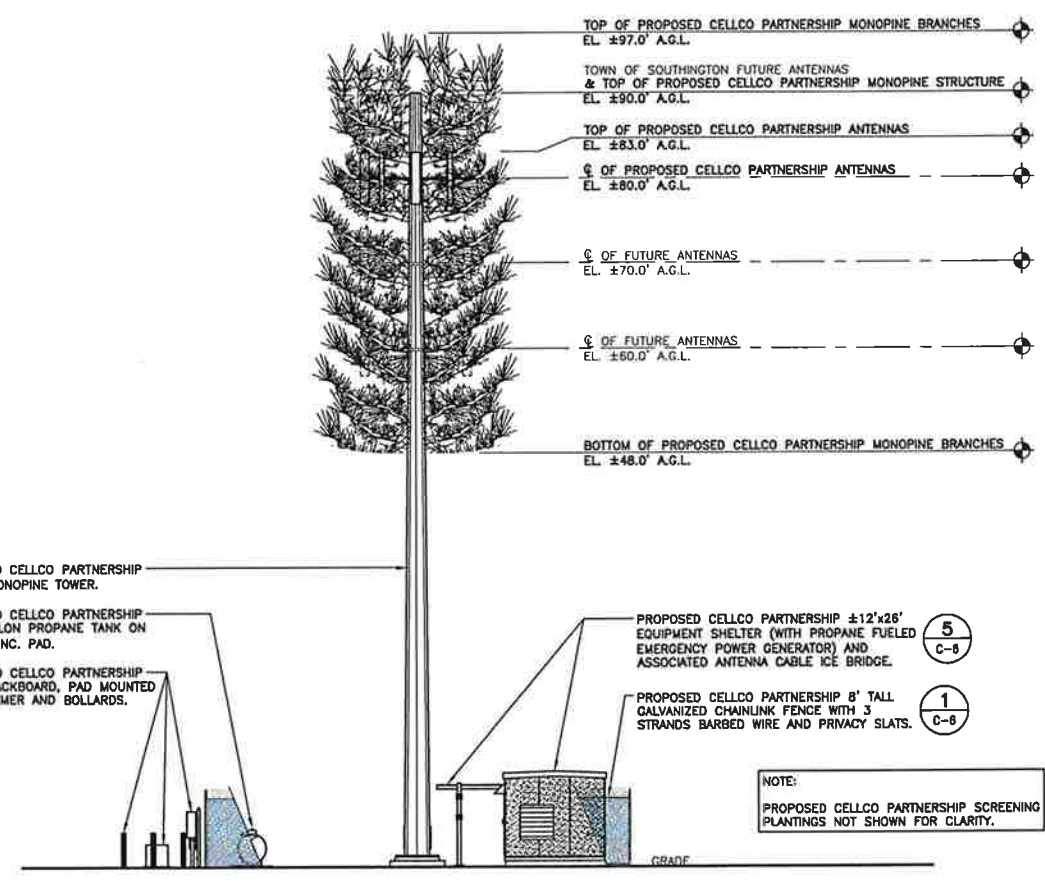
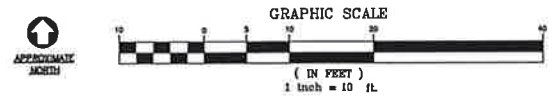
3 ANTENNA MOUNTING CONFIGURATION
C-2 NOT TO SCALE

TOWER AND GEOTECH NOTES:

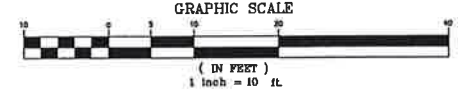
- 80' TALL MONOPILE TOWER STRUCTURE DESIGNED AND MANUFACTURED BY ENGINEERED ENDEAVORS, INC.
- REFER TO STRUCTURAL DESIGN ANALYSIS OF TOWER AND TOWER FOUNDATION AS PREPARED BY ENGINEERED ENDEAVORS, INC. DATED 02/11/15 (REV. 1) PROJECT NUMBER: 17382.
- REFER TO GEOTECHNICAL EVALUATION AS PREPARED BY DESIGN EARTH TECHNOLOGY (DET), DATED DECEMBER 13, 2014. DET JOB NO. 2014.21.



1 COMPOUND PLAN
C-2 SCALE: 1" = 10'

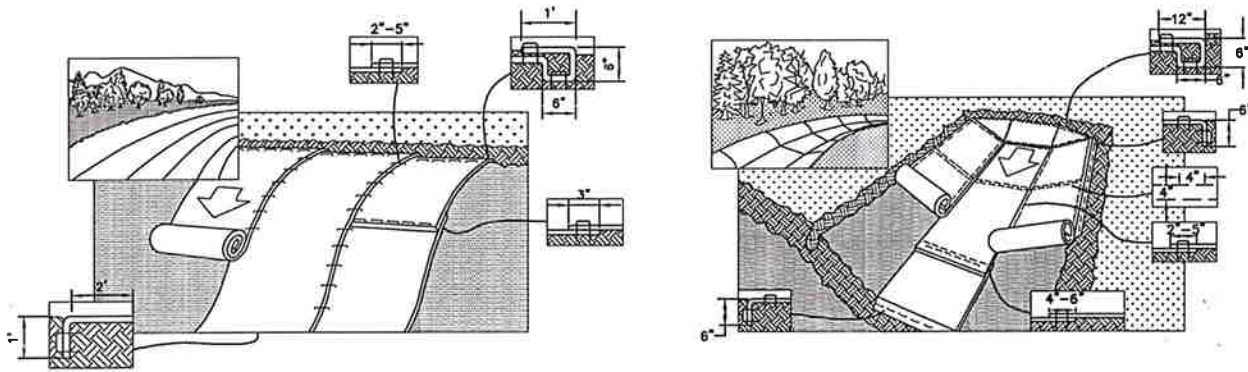


2 EAST ELEVATION
C-2 SCALE: 1" = 10'



PROFESSIONAL ENGINEER SEAL	REVISIONS	DATE	DESCRIPTION
	1	05/18/15	ISSUED FOR CLIENT REVIEW
	2	05/22/15	FOR CLIENT REVIEW
	3	05/29/15	FOR CLIENT REVIEW
	4	05/29/15	FOR CLIENT REVIEW
<p>Cellco Partnership d.b.a. Verizon Wireless</p> <p>CENITEK engineering 2031 485-0500 2031 485-6500 Fax 43-2 North Branford Road Branford, CT 06405 www.CenitekEng.com</p> <p>Cellco Partnership d/b/a Verizon Wireless WIRELESS COMMUNICATIONS FACILITY SOUTHWINGTON - EAST STREET 99 EAST STREET SOUTHWINGTON, CT 06489</p>			
<p>DATE: 05/18/15 SCALE: AS NOTED JOB NO. 14035.000 COMPOUND PLAN, ELEVATION AND ANTENNA MOUNTING CONFIG. C-2 Sheet No. 4 of 10</p>			

EROSION CONTROL BLANKET STABILIZATION



1 TYPICAL EROSION MAT INSTALLATION ON SLOPE
C-3 NOT TO SCALE

2 TYPICAL EROSION MAT INSTALLATION IN CHANNEL
C-3 NOT TO SCALE

STABILIZATION CRITERIA

- CONTRACTOR SHALL IMPLEMENT EROSION CONTROL BLANKET SLOPE STABILIZATION & SWALE CONSTRUCTION WHEN STABLE EARTH CUTS ARE PREVALENT (IN LOCATIONS WITHOUT LEDGE OR LARGE AMOUNTS OF SUBGRADE ROCK)

STABILIZATION PRODUCT SPECIFICATION

NORTH AMERICAN GREEN, PRODUCT NUMBER S150BN, 12 MONTH BIODEGRADABLE.

EROSION MAT ON SLOPES

- PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
- BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLE/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
- ROLL THE BLANKET DOWN OR HORIZONTALLY ACROSS THE SLOPE. BLANKET WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL ROLLED EROSION CONTROL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM(TM), STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
- THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY A 2"-5" OVERLAP DEPENDING ON BLANKET TYPE.
- CONSECUTIVE ROLLED EROSION CONTROL BLANKET SPICED DOWN THE SLOPE MUST BE PLACED END OVER END (SINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.
* IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE THE BLANKET.
- THE EDGE OF THE BLANKET IS TO EXTEND A MINIMUM 24 INCHES BEYOND THE TOE OF THE SLOPE AND ANCHORED BY PLACING THE STAPLES/STAKES IN A 12 INCH DEEP X 6 INCH WIDE ANCHOR TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12 INCH APART IN THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING (STONE OR SOIL MAY BE USED AS BACKFILL).
- REFER TO MANUFACTURERS STAPLE GUIDE FOR CORRECT STAPLE PATTERN. MINIMUM 4 SPIKES PER ONE SQ. FT.

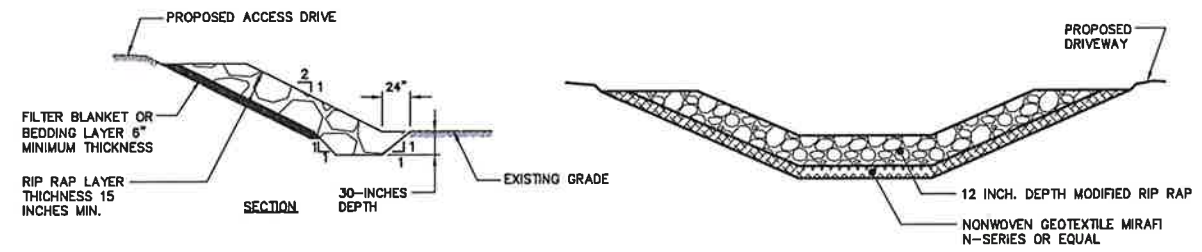
EROSION MAT IN CHANNEL

- PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
- BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE BLANKET IN A 6" DEEP BY 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLE/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
- ROLL CENTER BLANKET IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM(TM), STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
- PLACE CONSECUTIVE BLANKETS END OVER END (SHINGLE STYLE) WITH A 4"-6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE BLANKETS.
- FULL LENGTH EDGE OF BLANKETS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
- ADJACENT BLANKETS MUST BE OVERLAPPED APPROXIMATELY 2"- 5" AND STAPLED TO ENSURE PROPER SEAM ALIGNMENT. PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE COLORED SEAM STITCH(TM) ON THE BLANKET BEING OVERLAPPED.
- THE TERMINAL END OF THE BLANKETS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP BY 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
- REFER TO MANUFACTURERS STAPLE GUIDE FOR CORRECT STAPLE PATTERN. MINIMUM 4 SPIKES PER ONE SQ. FT. THE CONTRACTOR SHALL MAINTAIN THE BLANKET UNTIL ALL WORK ON THE CONTRACT HAS BEEN COMPLETED AND ACCEPTED. MAINTENANCE SHALL CONSIST OF THE REPAIR OF AREAS WHERE DAMAGED BY ANY CAUSE. ALL DAMAGED AREAS SHALL BE REPAIRED TO REESTABLISH THE CONDITIONS AND GRADE OF THE SOIL PRIOR TO APPLICATION OF THE COVERING AND SHALL BE REFERTILIZED, RESEDED, AND REMULCHED AS DIRECTED.

MAINTENANCE

THE CONTRACTOR SHALL MAINTAIN THE BLANKET UNTIL ALL WORK ON THE CONTRACT HAS BEEN COMPLETED AND ACCEPTED. MAINTENANCE SHALL CONSIST OF THE REPAIR OF AREAS WHERE DAMAGED BY ANY CAUSE. ALL DAMAGED AREAS SHALL BE REPAIRED TO RE-ESTABLISH THE CONDITIONS AND GRADE OF THE SOIL PRIOR TO APPLICATION OF THE COVERING AND SHALL BE REFERTILIZED, RESEDED, AND REMULCHED AS DIRECTED.

RIP RAP STABILIZATION



3 RIP RAP SLOPE STABILIZATION
C-3 NOT TO SCALE

4 RIP RAP DRAINAGE SWALE STABILIZATION
C-3 NOT TO SCALE (TYPICAL)

STABILIZATION CRITERIA

- CONTRACTOR SHALL IMPLEMENT RIP RAP SLOPE STABILIZATION & SWALE CONSTRUCTION IN LOCATIONS WHERE LEDGE OR UNSTABLE SUBGRADES WITH LARGE AMOUNTS OF ROCK ARE PREVALENT OR AS SPECIFICALLY INDICATED ON THE PLANS.

RIP RAP ON SLOPES AND CHANNELS

- PREPARE THE SUBGRADE FOR RIP RAP, BEDDING, FILTER OR GEOTEXTILE TO THE REQUIRED LINES AND GRADES. COMPACT ANY FILL REQUIRED IN THE SUBGRADE IN 12-INCHES LIFTS TO 95% OF STANDARD PROCTOR DENSITY. REMOVE BRUSH, TREES, STUMPS, AND OTHER OBJECTIONABLE MATERIAL.
- IMMEDIATELY AFTER SLOPE OR CHANNEL PREPARATION, INSTALL THE FILTER OR BEDDING MATERIALS. SPREAD THE FILTER OR BEDDING MATERIALS IN A UNIFORM LAYER TO THE SPECIFIED DEPTH.
- IMMEDIATELY AFTER PLACEMENT OF THE FILTER BLANKET, BEDDING, PLACE THE RIP RAP TO ITS FULL COURSE THICKNESS IN ONE OPERATION SO THAT IT PRODUCES A DENSE WELL GRADED MASS OF STONE WITH A MINIMUM OF VOIDS. THE DESIRED DISTRIBUTION OF STONES THROUGHOUT THE MASS MAY BE OBTAINED BY SELECTIVE LOADING AT THE QUARRY, CONTROLLED DUMPING OF SUCCESSIVE LOADS DURING THE FINAL PLACING, OR BY A COMBINATION OF THESE METHODS. DO NOT PLACE RIP RAP IN LAYERS OR USE CHUTES OR SIMILAR METHODS TO DUMP THE RIP RAP WHICH ARE LIKELY TO CAUSE SEGREGATION OF THE VARIOUS STONES.
- TAKE CARE NOT TO DISLodge THE UNDERLYING MATERIAL WHEN PLACING THE STONES. WHEN PLACING RIP RAP ON A FILTER FABRIC TAKE CARE NOT TO DAMAGE THE FABRIC. IF DAMAGE OCCURS, REMOVE AND REPLACE THE DAMAGED SHEET. FOR LARGE STONE, 12 INCHES OR GREATER, USE A 8 INCH LAYER OF FILTER OR BEDDING MATERIAL TO PREVENT DAMAGE TO THE MATERIAL FROM PUNCTURE.
- ENSURE THE FINISHED SLOPE OR CHANNEL IS FREE OF POCKETS OF SMALL STONES OR CLUSTERS OF LARGE STONES. HAND PLACING MAY BE NECESSARY TO ACHIEVE THE REQUIRED GRADES AND A GOOD DISTRIBUTION OF STONE SIZES. ENSURE THE FINAL THICKNESS OF THE RIP RAP BLANKET IS WITHIN PLUS OR MINUS 0.25 OF THE SPECIFIED THICKNESS.

MAINTENANCE

VERIZON WIRELESS SHALL PERIODICALLY INSPECT RIP RAP STABILIZED SLOPES & CHANNELS DETERMINE IF HIGH FLOWS HAVE CAUSED SCOUR BENEATH THE RIP RAP OR FILTER BLANKET MATERIALS. REMOVE TREES THAT DEVELOP IN THE PROTECTED SLOPES.

MODIFIED RIP RAP SIZE CHART

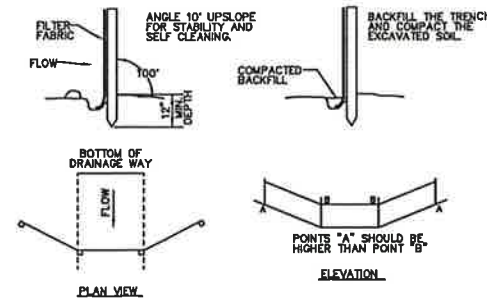
STONE SIZE	% OF MASS
10" AND OVER	0
6" TO 10"	30-50
4" TO 6"	30-50
2" TO 4"	20-30
1" TO 2"	10-20
LEES THAN 1"	0-10

PROFESSIONAL ENGINEER SEAL	DATE	05/18/15
PROFESSIONAL ENGINEER SEAL	SCALE	AS NOTED
PROFESSIONAL ENGINEER SEAL	JOB NO.	14035.000
PROFESSIONAL ENGINEER SEAL	S&E CONTROL NOTES & DETAILS	
PROFESSIONAL ENGINEER SEAL	C-3	
PROFESSIONAL ENGINEER SEAL	Sheet No. 5 of 10	

Cellco Partnership d/b/a Verizon Wireless
WIRELESS COMMUNICATIONS FACILITY

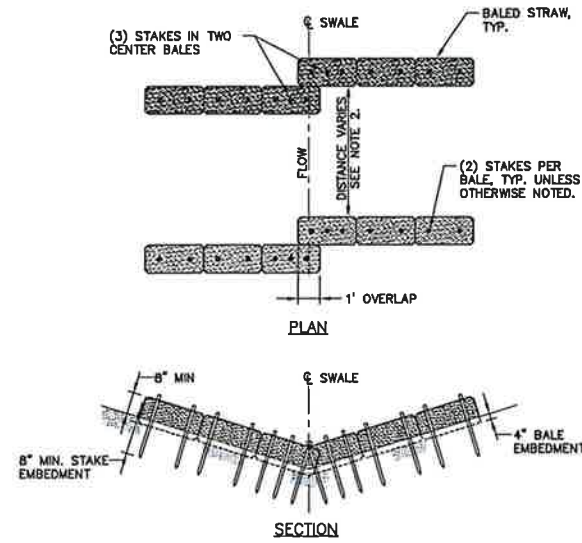
SOUTHINGTON - EAST STREET
89 EAST STREET
SOUTHINGTON, CT 06489

CENITEK engineering
Contractors & Engineers
201 484-0300
127 West Street
182 North Branford Road
Branford, CT 06405
www.cenitek.com



SOURCE: U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, STORRS, CONNECTICUT

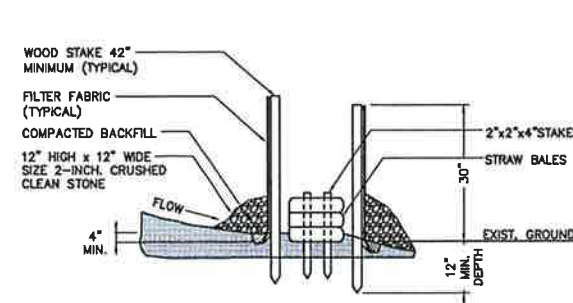
3 SILTATION FENCE DETAIL
C-4 NOT TO SCALE



NOTES:

- CHECKDAM SHALL BE INSTALLED IN LOCATIONS INDICATED ON SITE PLAN (SHEET C-1A) IN DRAINAGE SWALE WITH BED WIDTHS OF 2 FEET OR LESS.
- THE DISTANCE BETWEEN STRAW BALE CHECKDAMS SHALL BE DETERMINED BY THE SLOPE OF THE SWALE. CHECKDAMS SHALL BE SET AT EVERY 2 FEET DROP IN SWALE ELEVATION.
- BALES SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND REPAIR OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.
- INSTALL 3 STAKES PER BALE WITHIN SWALE BED AREAS.

2 TYP. STRAW BALE CHECKDAM (NARROW SWALE)
C-4 NOT TO SCALE



1 SILTATION FENCE/STRAW BALE SILTATION FENCE "SANDWICH" EROSION CONTROL
C-4 NOT TO SCALE

GENERAL CONSTRUCTION / PRE-CONSTRUCTION NOTES

- PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES, A MANDATORY ON-SITE PRE-CONSTRUCTION MEETING SHALL BE CONDUCTED WITH THE VERIZON WIRELESS CONSTRUCTION MANAGER, CONTRACTOR'S CONSTRUCTION MANAGER, THE PROJECT EROSION AND SEDIMENTATION CONTROL/ENVIRONMENTAL MONITOR AND THE ENGINEER OF RECORD.

GENERAL CONSTRUCTION SEQUENCE

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

- CUT AND STUMP 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. PRECEPT 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 FLOW SHALL BE DIVERTED TO ANY WETLANDS UNTIL A HEALTHY STAND OF GRASS HAS BEEN ESTABLISHED IN REGARDED AREAS.
- AFTER GRASS HAS BEEN FULLY GERMINATED IN ALL SEEDED AREAS, REMOVE ALL TEMPORARY EROSION CONTROL MEASURES.

SOIL EROSION AND SEDIMENT CONTROL SEQUENCE

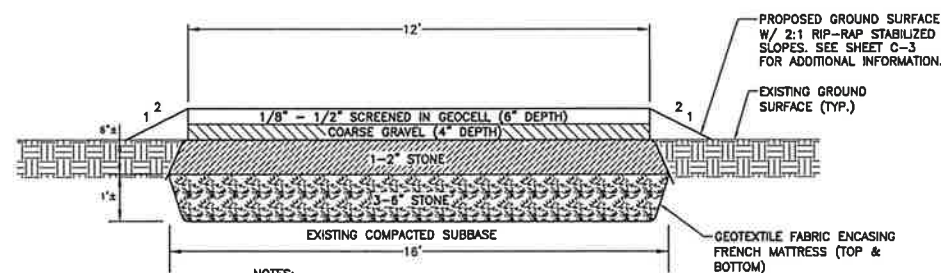
- ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES, SUCH AS CONSTRUCTION ENTRANCE / ANTI TRACKING PAD, SILTATION FENCE, AND SILTATION FENCE / HAY BALE SHALL BE IN PLACE PRIOR TO ANY GRADING ACTIVITY. INSTALLATION OF PROPOSED STRUCTURES OR UTILITIES. MEASURES SHALL BE LEFT IN PLACE AND MAINTAINED UNTIL CONSTRUCTION IS COMPLETED AND/OR AREA IS STABILIZED.
- THE ENTRANCE TO THE PROJECT SITE IS TO BE PROTECTED BY STONE ANTI TRACKING PAD OF ASTM C-33, SIZE NO. 2 OR 3, OR D.O.T. 2" CRUSHED GRAVEL. THE STONE ANTI TRACKING PAD IS TO BE MAINTAINED AT ALL TIMES DURING THE CONSTRUCTION PERIOD.
- LAND DISTURBANCE WILL BE KEPT TO A MINIMUM AND RESTABILIZATIONS WILL BE SCHEDULED AS SOON AS PRACTICAL.
- ALL SOIL EROSION AND SEDIMENT CONTROL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE CONNECTICUT GUIDELINES FOR EROSION AND SEDIMENT CONTROL INCLUDING THE LATEST DATE FROM THE COUNCIL ON SOIL AND WATER CONSERVATION.
- ANY ADDITIONAL EROSION/SEDIMENTATION CONTROL DEEMED NECESSARY BY TOWN STAFF DURING CONSTRUCTION, SHALL BE INSTALLED BY THE DEVELOPER. IN ADDITION, THE DEVELOPER SHALL BE RESPONSIBLE FOR THE REPAIR/REPLACEMENT/MAINTENANCE OF ALL EROSION CONTROL MEASURES UNTIL ALL DISTURBED AREAS ARE STABILIZED TO THE SATISFACTION OF THE TOWN STAFF.
- IN ALL AREAS, REMOVAL OF TREES, BUSHES AND OTHER VEGETATION AS WELL AS DISTURBANCE OF THE SOIL IS TO BE KEPT TO AN ABSOLUTE MINIMUM WHILE ALLOWING PROPER DEVELOPMENT OF THE SITE. DURING CONSTRUCTION, EXPOSE AS SMALL AN AREA OF SOIL AS POSSIBLE FOR AS SHORT A TIME AS POSSIBLE.
- SILTATION FENCE SHALL BE PLACED AS INDICATED BEFORE A CUT SLOPE HAS BEEN CREATED. SEDIMENT DEPOSITS SHOULD BE PERIODICALLY REMOVED FROM THE UPSTREAM SIDES OF SILTATION FENCE. THIS MATERIAL IS TO BE SPREAD AND STABILIZED IN AREAS NOT SUBJECT TO EROSION, OR TO BE USED IN AREAS WHICH ARE NOT TO BE PAVED OR BUILT ON. SILTATION FENCE IS TO BE REPLACED AS NECESSARY TO PROVIDE PROPER FILTERING ACTION. THE FENCE IS TO REMAIN IN PLACE AND BE MAINTAINED TO INSURE EFFICIENT SILTATION CONTROL UNTIL ALL AREAS ABOVE THE EROSION CHECKS ARE STABILIZED AND VEGETATION HAS BEEN ESTABLISHED.
- SWALE DISCHARGE AREA WILL BE PROTECTED WITH RIP RAP SPLASH PAD/ ENERGY DISSIPATER.
- ALL FILL AREAS SHALL BE COMPACTED SUFFICIENTLY FOR THEIR INTENDED PURPOSE AND AS REQUIRED TO REDUCE SLIPPING, EROSION OR EXCESS SATURATION.
- THE SOIL SHALL NOT BE PLACED WHILE IN A FROZEN OR MUDDY CONDITION, WHEN THE SUBGRADE IS EXCESSIVELY WET, OR IN A CONDITION THAT MAY OTHERWISE BE DETRIMENTAL TO PROPER GRADING OR PROPOSED SOODING OR SEEDING.
- AFTER CONSTRUCTION IS COMPLETE AND GROUND IS STABLE, REMOVE SILTS IN THE RIP RAP ENERGY DISSIPATERS. REMOVE OTHER EROSION AND SEDIMENT DEVICES.

CONSTRUCTION SPECIFICATIONS - SILT FENCE

- THE GEOTEXTILE FABRIC SHALL MEET THE DESIGN CRITERIA FOR SILT FENCES.
- THE FABRIC SHALL BE EMBEDDED A MINIMUM OF 8 INCHES INTO THE GROUND AND THE SOIL COMPACTED OVER THE EMBEDDED FABRIC.
- WOVEN WIRE FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIES OR STAPLES.
- FILTER CLOTH SHALL BE FASTENED SECURELY TO THE WOVEN WIRE FENCE WITH TIES SPACED EVERY 24 INCHES AT THE TOP, MID-SECTION AND BOTTOM.
- WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6 INCHES, FOLDED, AND STAPLED.
- FENCE POSTS SHALL BE A MINIMUM OF 36 INCHES LONG AND DRIVEN A MINIMUM OF 18 INCHES INTO THE GROUND. WOOD POSTS SHALL BE OF SOUND QUALITY HARDWOOD AND SHALL HAVE A MINIMUM CROSS SECTIONAL AREA OF 3.0 SQUARE INCHES.
- MAINTENANCE SHALL BE PERFORMED AS NEEDED TO PREVENT BUILD UP IN THE SILT FENCE DUE TO DEPOSITION OF SEDIMENT.

MAINTENANCE - SILT FENCE

- SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE MADE IMMEDIATELY.
- IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
- SEDIMENT SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACHED APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
- SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.



NOTES:

- PERFORATED GEOCELL TO BE USED.
- MATERIAL DEPTHS MAY VARY DEPENDING UPON LOADING.

4 FRENCH MATTRESS WETLAND CROSSING SECTION
C-4 NOT TO SCALE

PROFESSIONAL ENGINEER SEAL	REVISED DAM PLANS - ACCESS DRIVE ADJUSTMENT PER TOWN COMMENTS
DATE: 05/18/15	DAM PLANS
SCALE: AS NOTED	DAM PLANS - ISSUED FOR CLIENT REVIEW
JOB NO. 14035.000	DESCRIPTION
<p>Calcoo Partnership d/b/a Verizon Wireless 99 EAST STREET SOUTHINGTON, CT 06489</p>	
<p>DATE: 05/18/15 SCALE: AS NOTED JOB NO. 14035.000</p>	
<p>SITE CONSTRUCTION, S&E CONTROL NOTES & DETAILS</p>	
<p>C-4 Sheet No. 8 of 10</p>	

ENVIRONMENTAL NOTES: SPOTTED TURTLE AND AQUIFER PROTECTION PROGRAM

SPOTTED TURTLE, A STATE SPECIAL CONCERN SPECIES, IS KNOWN TO OCCUR ON OR WITHIN THE VICINITY OF THE SITE. THE FOLLOWING PROTECTIVE MEASURES SATISFY REQUIREMENTS FROM THE CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION (CTDEEP) WILDLIFE DIVISION AND FOLLOW PROTOCOLS DEVELOPED FROM PREVIOUS RARE TURTLE SPECIES CONSULTATIONS AND STATE-APPROVED PROTECTION PLANS. THIS PROTECTION PLAN IS VALID UNTIL DECEMBER 18, 2015, AT WHICH POINT IF CONSTRUCTION HAS NOT BEEN INITIATED, A NEW NATURAL DIVERSITY DATA BASE REVIEW REQUEST FROM CTDEEP IS REQUIRED.

THE PROJECT IS ALSO LOCATED WITHIN THE SOUTHWINGTON WATER DEPARTMENT'S (PWSID #CT1310011) AQUIFER PROTECTION AREA (APA) FOR WELLS #7 AND #8 AS IDENTIFIED BY THE CONNECTICUT DEPARTMENT OF PUBLIC HEALTH'S (DPH). THE SOUTHWINGTON WATER DEPARTMENT AND CONNECTICUT SITING COUNCIL WILL BE NOTICED AT LEAST 48 HOURS IN ADVANCE OF A PRE-CONSTRUCTION MEETING WITH AN INVITATION TO ATTEND. DURING THE PROJECT'S PRE-CONSTRUCTION MEETING, THE CONTRACTOR WILL BE MADE AWARE OF THE SPECIAL PROTECTIVE PRECAUTIONS NOTED ABOVE THAT ARE REQUIRED DUE TO THE PROJECT'S LOCATION IN THE APA. THE FOLLOWING PRECAUTIONS, PROTECTIVE MEASURES, MONITORING AND NOTIFICATIONS TO PROTECT THIS IMPORTANT RESOURCE ARE REQUIRED TO BE ADHERED TO BY THE CONTRACTOR. SOUTHWINGTON WATER DEPARTMENT PERSONNEL WILL BE ALLOWED ACCESS TO THE PROJECT DURING CONSTRUCTION FOR PERIODIC FIELD INSPECTIONS SHOULD THEY DESIRE.

IT IS OF THE UTMOST IMPORTANCE THAT THE CONTRACTOR COMPLIES WITH THE REQUIREMENT FOR THE INSTALLATION OF PROTECTIVE MEASURES AND THE EDUCATION OF ITS EMPLOYEES AND SUBCONTRACTORS PERFORMING WORK ON THE PROJECT SITE DUE TO ITS LOCATION IN AN APA AND IF WORK WILL OCCUR DURING THE SPOTTED TURTLE'S ACTIVE PERIOD (MARCH 1 TO NOVEMBER 15). ALL-POINTS TECHNOLOGY CORPORATION, P.C. (APT) WILL SERVE AS THE ENVIRONMENTAL MONITOR FOR THIS PROJECT TO ENSURE THAT SPOTTED TURTLE AND AQUIFER PROTECTION MEASURES ARE IMPLEMENTED PROPERLY AND WILL PROVIDE AN EDUCATION SESSION ON SPOTTED TURTLE AND SENSITIVE NATURE OF THE UNDERLYING PUBLIC WATER SUPPLY AQUIFER 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) 663-1897 EXT. 201 OR VIA EMAIL AT DGUSTAFSON@ALLPOINTSTECH.COM.

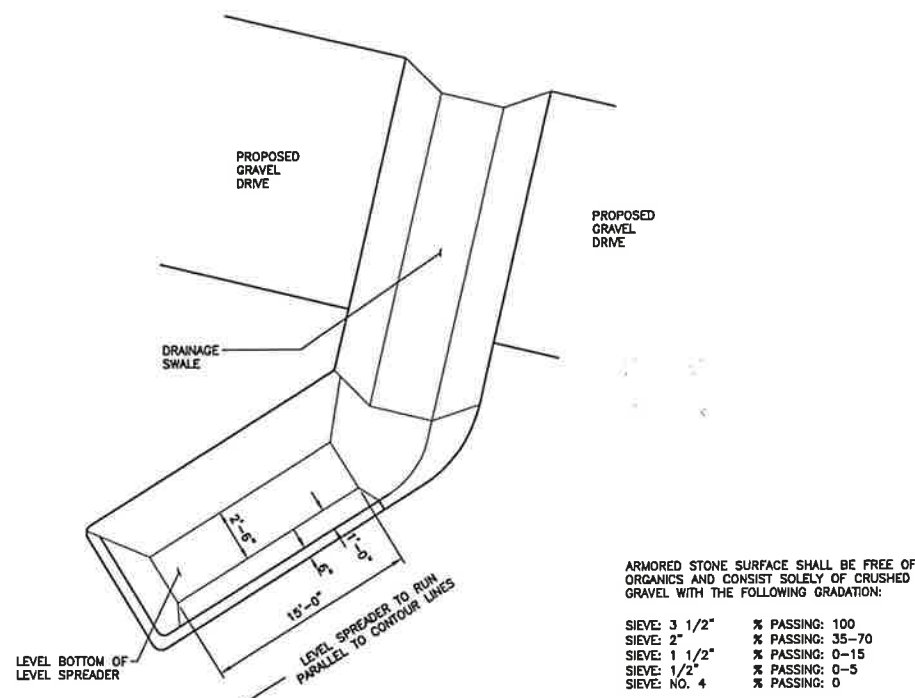
THE PROPOSED PROTECTION PROGRAM CONSISTS OF SEVERAL COMPONENTS: ISOLATION OF THE PROJECT PERIMETER; PERIODIC INSPECTION AND MAINTENANCE OF ISOLATION STRUCTURES; EDUCATION OF ALL CONTRACTORS AND SUB-CONTRACTORS PRIOR TO INITIATION OF WORK ON THE SITE; PETROLEUM STORAGE AND SPILL PREVENTION MEASURES; TURTLE PROTECTIVE MEASURES; AND, REPORTING.

1. ISOLATION MEASURES & EROSION AND SEDIMENTATION CONTROLS
 - a. PLASTIC NETTING USED IN A VARIETY OF EROSION CONTROL PRODUCTS (I.E., EROSION CONTROL BLANKETS, FIBER ROLLS [WATLES], REINFORCED SILT FENCE) HAS BEEN FOUND TO ENTANGLE WILDLIFE, INCLUDING REPTILES, AMPHIBIANS, BIRDS AND SMALL MAMMALS. NO PERMANENT EROSION CONTROL PRODUCTS OR REINFORCED SILT FENCE WILL BE USED ON THE VERIZON WIRELESS PROJECT. TEMPORARY EROSION CONTROL PRODUCTS WILL USE EITHER EROSION CONTROL BLANKETS AND FIBER ROLLS COMPOSED OF PROCESSED FIBERS MECHANICALLY BOUND TOGETHER TO FORM A CONTINUOUS MATRIX (NET LESS) OR NETTING COMPOSED OF PLANAR WOVEN NATURAL BIODEGRADABLE FIBER TO AVOID/MINIMIZE WILDLIFE ENTANGLEMENT.
 - b. INSTALLATION OF EROSION AND SEDIMENTATION CONTROLS (I.E., SILT FENCING), REQUIRED FOR EROSION CONTROL COMPLIANCE AND CREATION OF A BARRIER TO POSSIBLE MIGRATING/DISPERSING HERPETOFaUNA, SHALL BE PERFORMED BY THE CONTRACTOR FOLLOWING CLEARING ACTIVITIES AND PRIOR TO ANY EARTHWORK. THE ENVIRONMENTAL MONITOR WILL INSPECT THE WORK ZONE AREA PRIOR TO AND FOLLOWING EROSION CONTROL BARRIER INSTALLATION TO ENSURE THE AREA IS FREE OF TO ENSURE THE AREA IS FREE OF SPOTTED TURTLES AND SATISFACTORILY INSTALLED. THE INTENT OF THE BARRIER IS TO SEGREGATE THE MAJORITY OF THE WORK ZONE FROM FORAGING/MIGRATING/DISPERSING TURTLES. OFTIMINGS COMPLETE ISOLATION OF A WORK ZONE IS NOT FEASIBLE DUE TO ACCESSIBILITY NEEDS AND LOCATIONS OF STAGING/MATERIAL STORAGE AREAS, ETC. IN THOSE CIRCUMSTANCES, THE BARRIERS WILL BE POSITIONED TO DEFLECT MIGRATING/DISPERSAL ROUTES AWAY FROM THE WORK ZONE TO MINIMIZE POTENTIAL ENCOUNTERS WITH TURTLES.
 - c. THE FENCING WILL CONSIST OF NON-REINFORCED CONVENTIONAL EROSION CONTROL WOVEN FABRIC, INSTALLED APPROXIMATELY SIX INCHES BELOW SURFACE GRADE AND STAKED AT SEVEN TO TEN-FOOT INTERVALS USING FOUR-FOOT OAK STAKES OR APPROVED EQUIVALENT. IN ADDITION TO REQUIRED DAILY INSPECTION BY THE CONTRACTOR, THE FENCING WILL BE INSPECTED FOR TEARS OR BREACHES IN THE FABRIC FOLLOWING INSTALLATION AND AT EITHER ON A WEEKLY OR BIWEEKLY INSPECTION FREQUENCY BY APT. IF INSPECTIONS ARE PERFORMED ON A BIWEEKLY BASIS, SUCH INSPECTIONS WILL ALSO INCLUDE INSPECTIONS FOLLOWING STORM EVENTS OF 0.25 INCH OR GREATER. INSPECTIONS WILL BE CONDUCTED BY APT THROUGHOUT THE COURSE OF THE CONSTRUCTION PROJECT.
 - d. THE EXTENT OF THE BARRIER FENCING WILL BE AS SHOWN ON THE SITE PLANS. THE CONTRACTOR SHALL HAVE ADDITIONAL BARRIER FENCING SHOULD FIELD CONDITIONS WARRANT EXTENDING THE FENCING AS DIRECTED BY APT.
 - e. NO EQUIPMENT, VEHICLES OR CONSTRUCTION MATERIALS SHALL BE STORED OUTSIDE OF BARRIER FENCING.
 - f. ALL SILT FENCING SHALL BE REMOVED WITHIN 30 DAYS OF COMPLETION OF WORK AND PERMANENT STABILIZATION OF SITE SOILS SO THAT REPTILE AND AMPHIBIAN MOVEMENT BETWEEN UPLANDS AND WETLANDS IS NOT RESTRICTED.
 - g. EROSION AND SEDIMENTATION CONTROL ITEMS SUBJECT TO INSPECTION INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:
 - CONSTRUCTION ENTRANCE PAD
 - SEDIMENT TRAPS
 - SEDIMENT/ DETENTION BASINS
 - TEMPORARY SOIL STOCKPILE AREAS
 - SILT FENCING/HAY BALES
 - SEEDING & MULCHING
 - DRAINAGE SWALES
 - DRAINAGE SWALE CHECK DAMS
 - OTHER SITE-SPECIFIC EROSION CONTROL DEVICES

2. CONTRACTOR EDUCATION
 - a. PRIOR TO WORK ON SITE, THE CONTRACTOR SHALL ATTEND AN EDUCATIONAL SESSION AT THE PRE-CONSTRUCTION MEETING WITH APT. THIS ORIENTATION AND EDUCATIONAL SESSION WILL CONSIST OF AN INTRODUCTORY MEETING WITH APT PROVIDING PHOTOS OF SPOTTED TURTLES AND EMPHASIZING THE NON-AGGRESSIVE NATURE OF THESE TURTLES. THE ABSENCE OF NEED TO DESTROY ANIMALS THAT MIGHT BE ENCOUNTERED AND THE NEED TO FOLLOW PROTECTIVE MEASURES AS DESCRIBED IN SECTION 4 BELOW. WORKERS WILL ALSO BE PROVIDED INFORMATION REGARDING THE IDENTIFICATION OF OTHER TURTLE SPECIES THAT COULD BE ENCOUNTERED.
 - b. THE EDUCATION SESSION WILL ALSO FOCUS ON MEANS TO DISCRIMINATE BETWEEN THE SPECIES OF CONCERN AND OTHER NATIVE SPECIES TO AVOID UNNECESSARY "FALSE ALARMS". ENCOUNTERS WITH ANY SPECIES OF TURTLES WILL BE DOCUMENTED.
 - c. THE CONTRACTOR WILL BE PROVIDED WITH CELL PHONE AND EMAIL CONTACTS FOR APT PERSONNEL TO IMMEDIATELY REPORT ANY ENCOUNTERS WITH SPOTTED TURTLE OR OTHER TURTLE SPECIES. EDUCATIONAL POSTER MATERIALS WILL BE PROVIDED BY APT AND DISPLAYED ON THE JOB SITE TO MAINTAIN WORKER AWARENESS AS THE PROJECT PROGRESSES.

3. PETROLEUM MATERIALS STORAGE AND SPILL PREVENTION
 - a. CERTAIN PRECAUTIONS ARE NECESSARY TO STORE PETROLEUM MATERIALS, REFUEL AND CONTAIN AND PROPERLY CLEAN UP ANY INADVERTENT FUEL OR PETROLEUM (I.E., OIL, HYDRAULIC FLUID, ETC.) SPILL DUE TO THE PROJECT'S LOCATION IN AN APA AND PROXIMITY TO SENSITIVE WETLANDS.
 - b. A SPILL CONTAINMENT KIT CONSISTING OF A SUFFICIENT SUPPLY OF ABSORBENT PADS AND ABSORBENT MATERIAL WILL BE MAINTAINED BY THE CONTRACTOR AT THE CONSTRUCTION SITE THROUGHOUT THE DURATION OF THE PROJECT. IN ADDITION, A WASTE DRUM WILL BE KEPT ON SITE TO CONTAIN ANY USED ABSORBENT PADS/MATERIAL FOR PROPER AND TIMELY DISPOSAL OFF SITE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL LAWS.
 - c. THE FOLLOWING PETROLEUM AND HAZARDOUS MATERIALS STORAGE AND REFUELING RESTRICTIONS AND SPILL RESPONSE PROCEDURES WILL BE ADHERED TO BY THE CONTRACTOR.
 - c.a. PETROLEUM AND HAZARDOUS MATERIALS STORAGE AND REFUELING
 - c.a.a. SERVICING OF MACHINERY SHALL BE COMPLETED OUTSIDE OF THE APA. MACHINERY REPAIRS THAT CANNOT BE PERFORMED OFF SITE SHALL TAKE PLACE ON AN IMPERVIOUS PAD WITH SECONDARY CONTAINMENT DESIGNED TO CONTAIN FLUIDS.
 - c.a.b. REFUELING OF VEHICLES OR MACHINERY SHALL OCCUR A MINIMUM OF 100 FEET FROM WETLANDS OR WATERCOURSES AND SHALL TAKE PLACE ON AN IMPERVIOUS PAD WITH SECONDARY CONTAINMENT DESIGNED TO CONTAIN FUELS.
 - c.a.c. ANY FUEL OR HAZARDOUS MATERIALS THAT MUST BE KEPT WITHIN THE APA DURING WORKING HOURS SHALL BE STORED ON AN IMPERVIOUS SURFACE UTILIZING SECONDARY CONTAINMENT A MINIMUM OF 100 FEET FROM WETLANDS OR WATERCOURSES.
 - c.b. INITIAL SPILL RESPONSE PROCEDURES
 - c.b.a. STOP OPERATIONS AND SHUT OFF EQUIPMENT.
 - c.b.b. REMOVE ANY SOURCES OF SPARK OR FLAME.
 - c.b.c. CONTAIN THE SOURCE OF THE SPILL.
 - c.b.d. DETERMINE THE APPROXIMATE VOLUME OF THE SPILL.
 - c.b.e. IDENTIFY THE LOCATION OF NATURAL FLOW PATHS TO PREVENT THE RELEASE OF THE SPILL TO SENSITIVE NEARBY WATERWAYS OR WETLANDS.
 - c.b.f. ENSURE THAT FELLOW WORKERS ARE NOTIFIED OF THE SPILL.
 - c.c. SPILL CLEAN UP & CONTAINMENT
 - c.c.a. OBTAIN SPILL RESPONSE MATERIALS FROM THE ON-SITE SPILL RESPONSE KIT. PLACE ABSORBENT MATERIALS DIRECTLY ON THE RELEASE AREA.
 - c.c.b. LIMIT THE SPREAD OF THE SPILL BY PLACING ABSORBENT MATERIALS AROUND THE PERIMETER OF THE SPILL.
 - c.c.c. ISOLATE AND ELIMINATE THE SPILL SOURCE.
 - c.c.d. CONTACT THE SOUTHWINGTON WATER DEPARTMENT, IMMEDIATELY AT (860) 828-5593, ALONG WITH OTHER APPROPRIATE LOCAL, STATE AND/OR FEDERAL AGENCIES, AS NECESSARY.
 - c.c.e. CONTACT A DISPOSAL COMPANY TO PROPERLY DISPOSE OF CONTAMINATED MATERIALS.
 - c.d. REPORTING
 - c.d.a. COMPLETE AN INCIDENT REPORT.
 - c.d.b. SUBMIT A COMPLETED INCIDENT REPORT TO THE SOUTHWINGTON WATER DEPARTMENT AND CONNECTICUT SITING COUNCIL.

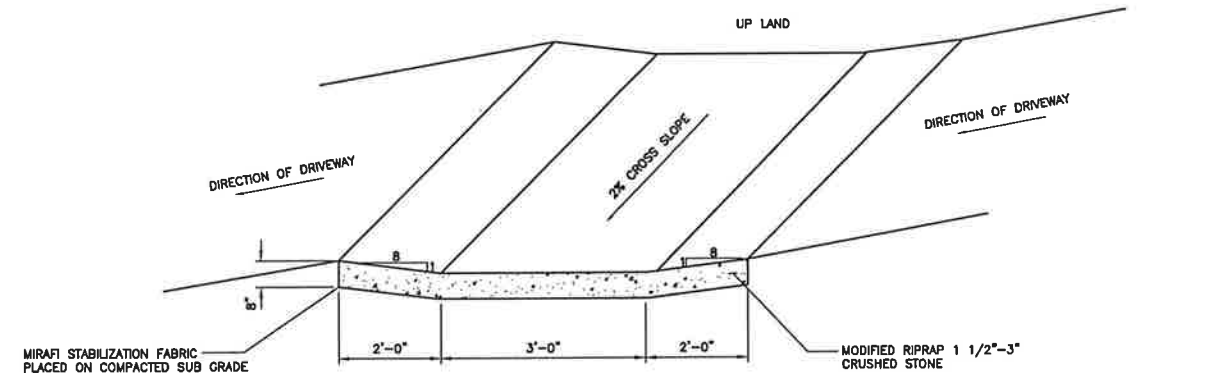
4. TURTLE PROTECTIVE MEASURES
 - a. PRIOR TO THE START OF CONSTRUCTION EACH DAY, THE CONTRACTOR SHALL SEARCH THE ENTIRE WORK AREA FOR TURTLES.
 - b. IF A TURTLE IS FOUND, IT SHALL BE IMMEDIATELY MOVED, UNHARMED, BY CAREFULLY GRASPED IN BOTH HANDS, ONE ON EACH SIDE OF THE SHELL, BETWEEN THE TURTLE'S FORELIMBS AND THE HIND LIMBS, AND PLACED JUST OUTSIDE OF THE ISOLATION BARRIER IN THE APPROXIMATE DIRECTION IT WAS WALKING.
 - c. SPECIAL CARE SHALL BE TAKEN BY THE CONTRACTOR DURING EARLY MORNING AND EVENING HOURS SO THAT POSSIBLE BASKING OR FORAGING TURTLES ARE NOT HARMED BY CONSTRUCTION ACTIVITIES.
5. HERBICIDE AND PESTICIDE RESTRICTIONS
 - a. THE USE OF HERBICIDES AND PESTICIDES AT THE PROPOSED WIRELESS TELECOMMUNICATIONS FACILITY AND ALONG THE PROPOSED ACCESS DRIVE ARE STRICTLY PROHIBITED.
6. REPORTING
 - a. MONTHLY INSPECTION REPORTS (BRIEF NARRATIVE AND APPLICABLE PHOTOS) WILL BE SUBMITTED TO THE CONNECTICUT SITING COUNCIL FOR COMPLIANCE VERIFICATION. ANY OBSERVATIONS OF TURTLES WILL BE INCLUDED IN THE REPORTS.
 - b. FOLLOWING COMPLETION OF THE CONSTRUCTION PROJECT, APT WILL PROVIDE A SUMMARY REPORT TO CTDEEP DOCUMENTING THE MONITORING AND MAINTENANCE OF THE BARRIER FENCE AND EROSION CONTROL MEASURES.
 - c. ANY OBSERVATIONS OF SPOTTED TURTLE WILL BE REPORTED TO CTDEEP BY APT, WITH PHOTO-DOCUMENTATION (IF POSSIBLE) AND WITH SPECIFIC INFORMATION ON THE LOCATION AND DISPOSITION OF THE ANIMAL.



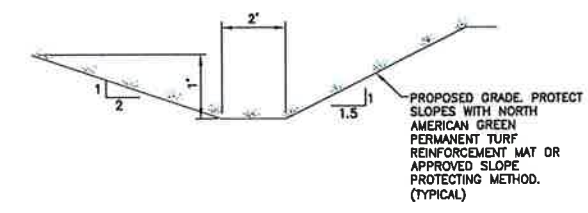
ARMORED STONE SURFACE SHALL BE FREE OF ORGANICS AND CONSIST SOLELY OF CRUSHED GRAVEL WITH THE FOLLOWING GRADATION:

SIEVE: 3 1/2"	% PASSING: 100
SIEVE: 2"	% PASSING: 35-70
SIEVE: 1 1/2"	% PASSING: 0-15
SIEVE: 1/2"	% PASSING: 0-5
SIEVE: NO. 4	% PASSING: 0

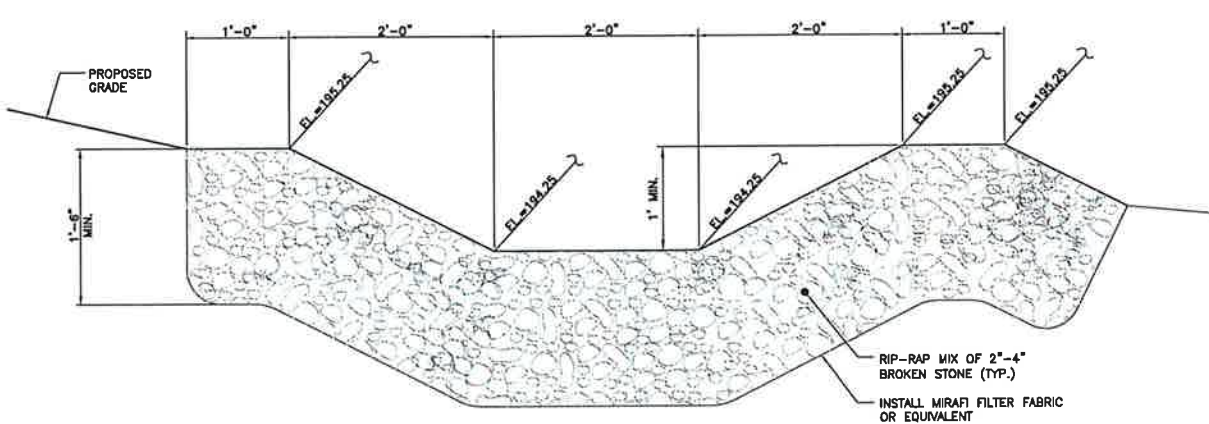
3 LEVEL SPREADER W/ CROSS DRAINAGE SWALE
C-5 NOT TO SCALE



2 CROSS DRAINAGE SWALE
C-5 NOT TO SCALE



4 TYPICAL SWALE SECTION
C-5 NOT TO SCALE

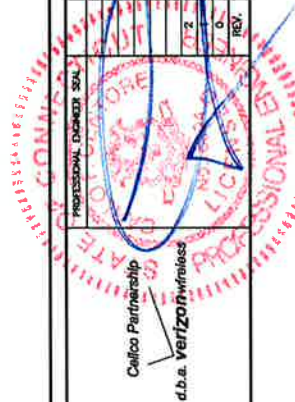


1 LEVEL SPREADER SECTION
C-5 NOT TO SCALE

PROFESSIONAL ENGINEER SEAL	DATE	05/18/15
SCALE	AS NOTED	
JOB NO.	14035.000	
DRAINAGE CONTROL DETAILS AND ENVIRONMENTAL NOTES		
C-5		
Sheet No. 7 of 10		

PROFESSIONAL ENGINEER SEAL	DATE	05/18/15
SCALE	AS NOTED	
JOB NO.	14035.000	
DRAINAGE CONTROL DETAILS AND ENVIRONMENTAL NOTES		
C-5		
Sheet No. 7 of 10		

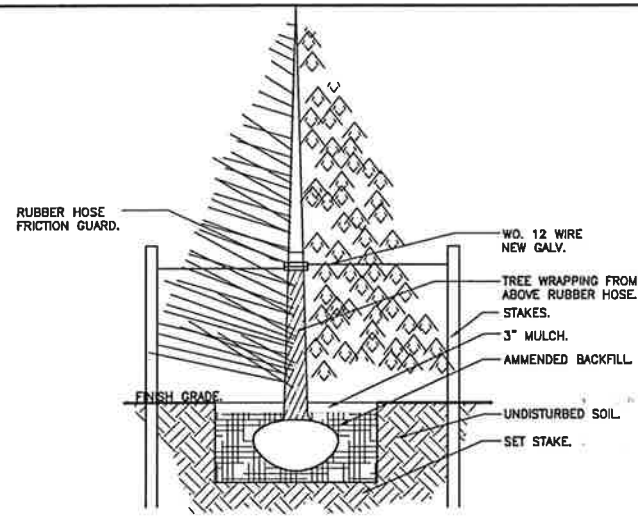
PROFESSIONAL ENGINEER SEAL	DATE	05/18/15
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DRAINAGE CONTROL DETAILS AND ENVIRONMENTAL NOTES		
C-5		
Sheet No. 7 of 10		



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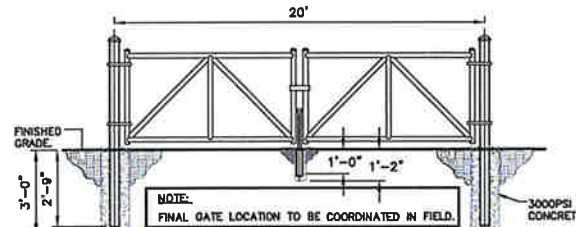
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SOUTHWINGTON - EAST STREET
89 EAST STREET
SOUTHWINGTON, CT 06489



9 TYPICAL TREE PLANTING DETAIL

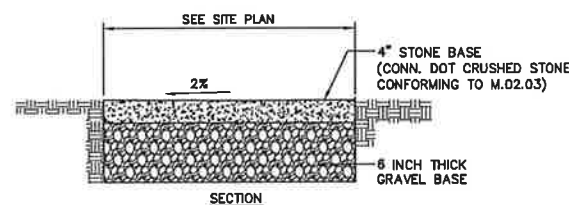
- GUY WIRES (WO.12 NEW GALV.) SHALL BE REQUIRED FOR ALL TREES 3 GAL. AND LARGER.
- SOIL MIX SHALL CONSIST OF: 3 PARTS TOP SOIL, 3 PART PEAT MOSS, 10 ONE PART COMPOSTED COW MANURE, AND 1 OZ. SOIL MOIST PER EVERY 12 IN. OF LINEAR DIM. OF ROOT BALL COVER WITH LANDSCAPE FABRIC, AND A MINIMUM OF 3" CEDAR MULCH.
- TREES 6' AND OVER SHALL BE STAKED WITH 2 OAK STAKES 2" X 2" X 6' AND GUY WIRE TO STAKES.
- ALL TREES AND SHRUBS MUST MEET OR EXCEED STANDARDS SET BY THE NATIONAL ASSOCIATION OF NURSERYMEN, YEAR OF LATEST REVISION.

9 TYPICAL TREE PLANTING DETAIL
C-6 NOT TO SCALE

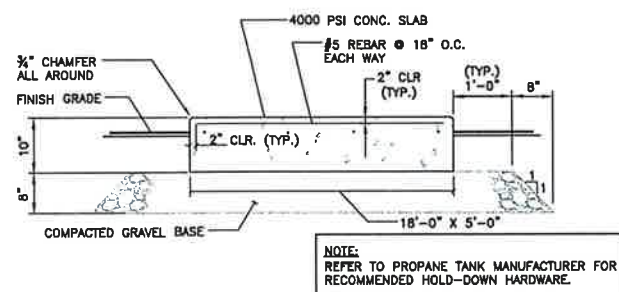


- BARRIER GATE CONSTRUCTION NOTES**
- GATE POST 3" # SCHEDULE 40 FOR GATE WIDTHS UP THRU 8 FEET OR 12 FEET FOR DOUBLE SWING BARRIER GATE PER ASTM-F1083.
 - GATE FRAME 2" # SCHEDULE 40 PIPE PER ASTM-F1083.
 - CENTER UPRIGHT AND ANGLE BRACES: 1 5/8" # SCHEDULE 40 PIPE PER ASTM-F1083.
 - HINGES: INDUSTRIAL OFFSET HINGES (I.O.H.).
 - INDUSTRIAL DROP ROD AND LATCH.
 - PROVIDE CAPS ON POSTS AND UPRIGHTS.

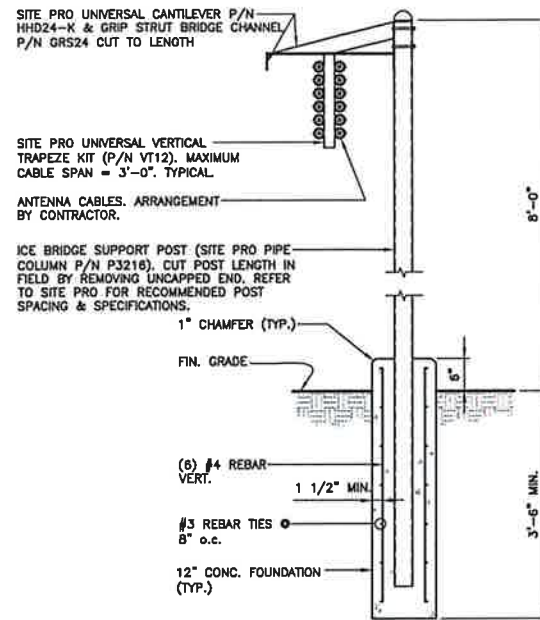
8 BARRIER GATE DETAIL
C-6 NOT TO SCALE



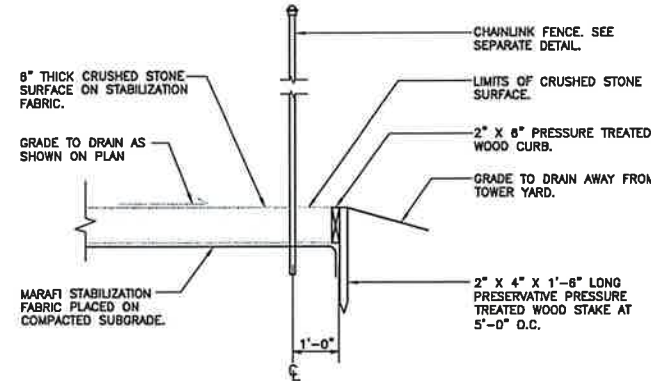
7 GRAVEL SURFACE PARKING AREA AND ACCESS DRIVE
C-6 NOT TO SCALE



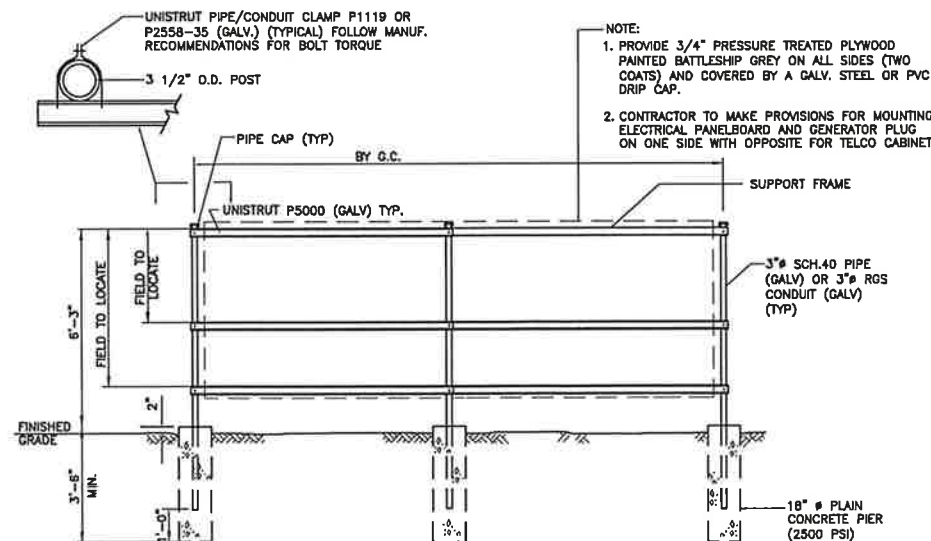
6 PROPANE TANK PAD DETAIL
C-6 NOT TO SCALE



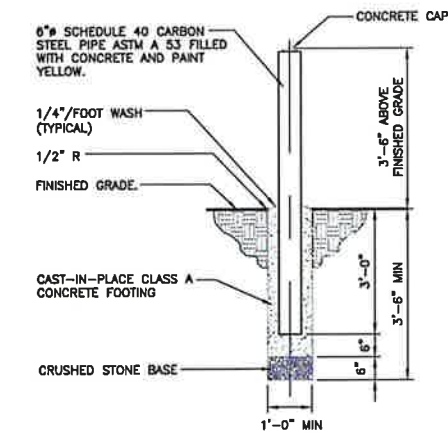
5 ICE BRIDGE DETAIL
C-6 NOT TO SCALE



4 COMPOUND SURFACING DETAIL
C-6 NOT TO SCALE



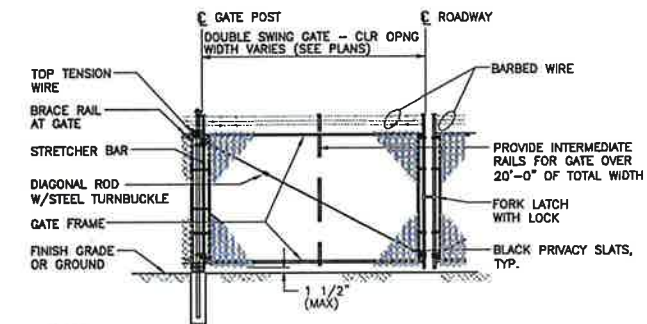
3 UTILITY SUPPORT FRAME (TYP)
C-6 NOT TO SCALE



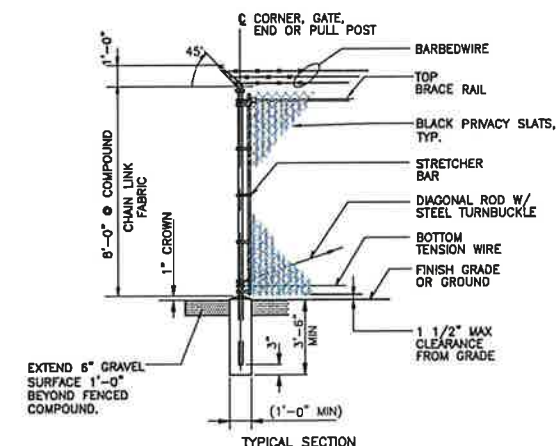
2 BOLLARD DETAIL
C-6 NOT TO SCALE

WOVEN WIRE FENCE NOTES

- GATE POST, CORNER, TERMINAL OR PULL POST 2 1/2" # SCHEDULE 40 FOR GATE WIDTHS UP THRU 8 FEET OR 12 FEET FOR DOUBLE SWING GATE PER ASTM-F1083.
- LINE POST: 2" # SCHEDULE 40 PIPE PER ASTM-F1083.
- GATE FRAME: 1 1/2" # SCHEDULE 40 PIPE PER ASTM-F1083.
- TOP RAIL & BRACE RAIL: 1 1/2" # SCHEDULE 40 PIPE PER ASTM-F1083.
- FABRIC: 12 GA. CORE WIRE SIZE 1 1/4" MESH, CONFORMING TO ASTM-A392.
- TIE WIRE: MINIMUM 11 GA. GALVANIZED STEEL AT POSTS AND RAILS A SINGLE WRAP OF FABRIC TIE AND AT TENSION WIRE BY HOG RINGS SPACED MAX 24" INTERVALS.
- TENSION WIRE: 7 GA. GALVANIZED STEEL.
- BARBED WIRE: DOUBLE STRAND 12-1/2" O.D. TWISTED WIRE TO MATCH W/FABRIC 14 GA. 4 PT. BARBS SPACED ON APPROXIMATELY 5" CENTERS.
- GATE LATCH: DROP DOWN LOCKABLE FORK LATCH AND LOCK, KEYED ALIKE FOR ALL SITES IN A GIVEN MTA.
- LOCAL ORDINANCE OF BARBED WIRE PERMIT REQUIREMENT SHALL BE COMPLIED WITH IF REQUIRED.
- COMPOUND FENCE HEIGHT = 8" VERTICAL + 1" BARBED WIRE VERTICAL DIMENSION.

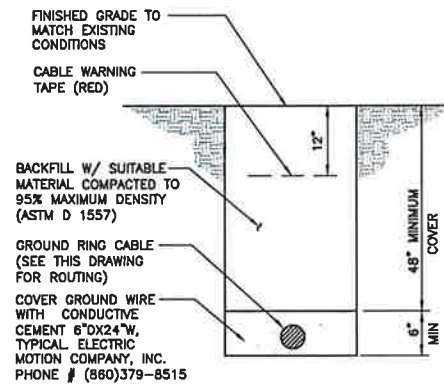


1A WOVEN WIRE SWING GATE-DOUBLE
C-6 NOT TO SCALE



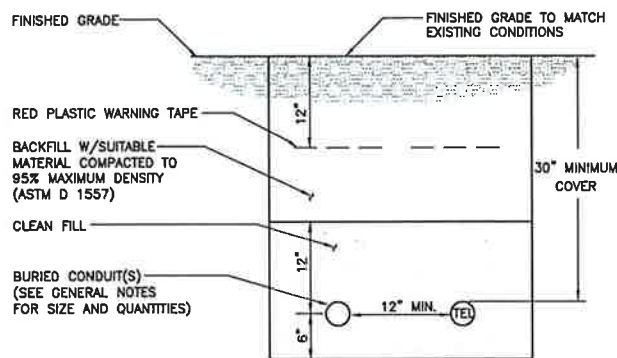
1 WOVEN WIRE FENCE DETAIL
C-6 NOT TO SCALE

PROFESSIONAL ENGINEER SEAL	DATE	05/18/15
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SOUTHINGTON - EAST STREET 99 EAST STREET SOUTHINGTON, CT 06489		
SITE DETAILS		
C-6		
Sheet No. 8 of 10		



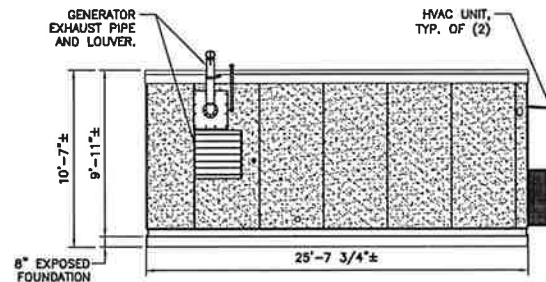
- NOTES:**
- BACK FILL SHALL NOT CONTAIN ASHES, CINDERS, SHELLS, FROZEN MATERIAL, LOOSE DEBRIS OR STONES LARGER THAN 2" IN MAXIMUM DIMENSION.
 - WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.

6 TYPICAL BURIAL GROUND CABLE DETAIL
C-7 NOT TO SCALE

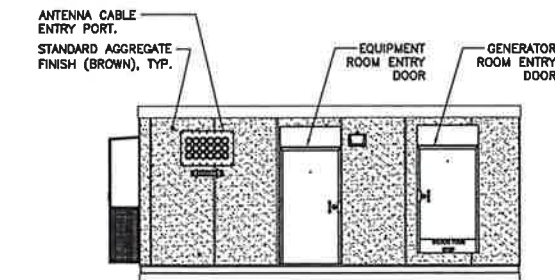


- NOTES:**
- THE CLEAN FILL SHALL PASS THROUGH A 3/8" MESH SCREEN AND SHALL NOT CONTAIN SHARP STONES. OTHER BACKFILL SHALL NOT CONTAIN ASHES, CINDERS, SHELLS, FROZEN MATERIAL, LOOSE DEBRIS OR STONES LARGER THAN 2" IN MAXIMUM DIMENSION.
 - WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.

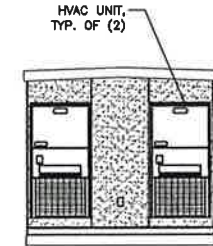
5 TYPICAL ELECTRICAL/TEL TRENCH DETAIL
C-7 NOT TO SCALE



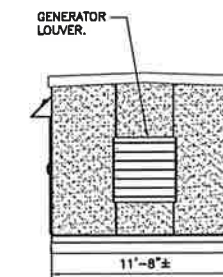
4 NORTHERN SHELTER ELEVATION
C-7 SCALE: 3/16" = 1'-0"



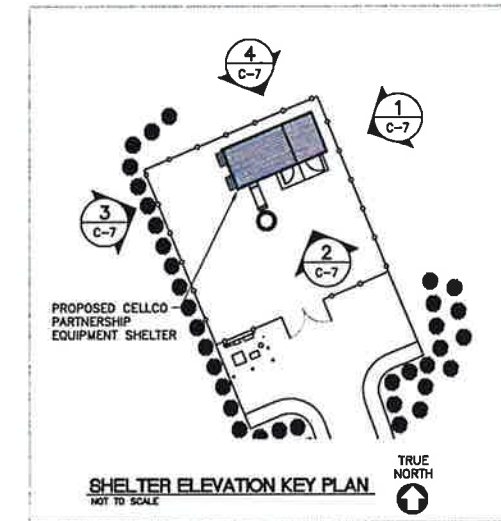
2 SOUTHERN SHELTER ELEVATION
C-7 SCALE: 3/16" = 1'-0"



3 WESTERN SHELTER ELEVATION
C-7 SCALE: 3/16" = 1'-0"



1 EASTERN SHELTER ELEVATION
C-7 SCALE: 3/16" = 1'-0"

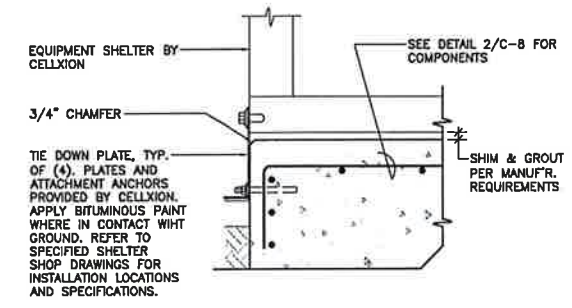


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DATE:	05/18/15
SCALE:	AS NOTED
JOB NO.:	14033.000
SITE DETAILS AND SHELTER ELEVATIONS	
C-7 Sheet No. 3 of 10	

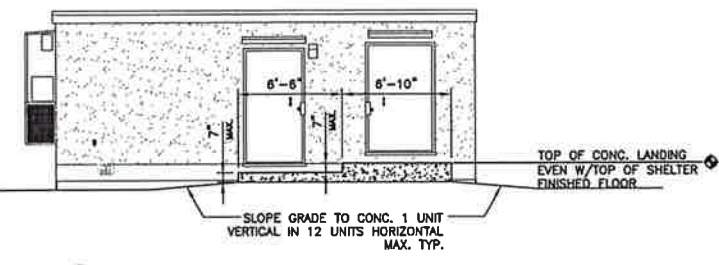
REV	DATE	BY	CHK'D BY	DESCRIPTION
2	05/22/15	HAR	CFC	REVISED DDM PLANS - ACCESS DRIVE ADJUSTMENT PER TOWN COMMENTS
1	05/20/15	HAR	CFC	DDM PLANS
0	05/19/15	HAR	CFC	DDM PLANS - ISSUED FOR CLIENT REVIEW

SLAB ON GRADE FOUNDATION DESIGN CONFORMS TO THE REQUIREMENTS OF THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CONNECTICUT STATE BUILDING CODE SUPPLEMENT SECTION 1805.2.1 'FROST PROTECTION' AND SEI/ASCE STANDARD 32-01 SECTION 7.1 'SLAB ON GRADE CONSTRUCTION'.

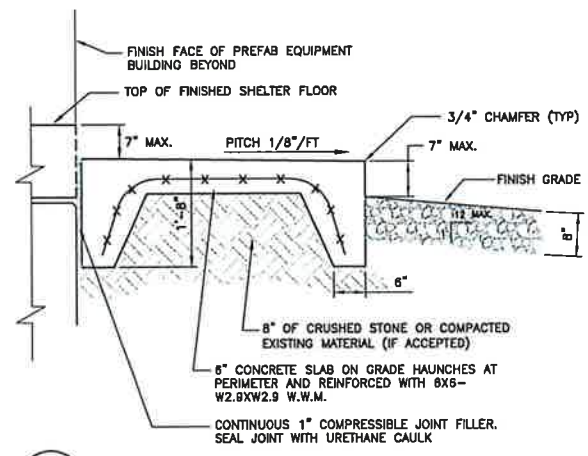
EQUIPMENT SHELTER BY CELLXION. VERIFY ALL SHELTER DIMENSIONS, EQUIPMENT DIMENSIONS, EQUIPMENT LOCATIONS AND UTILITY OPENINGS WITH BUILDING SHOP DRAWINGS PRIOR TO COMMENCEMENT OF WORK.



3 BUILDING TIE DOWN
C-8 SCALE: 1"=1'-0"



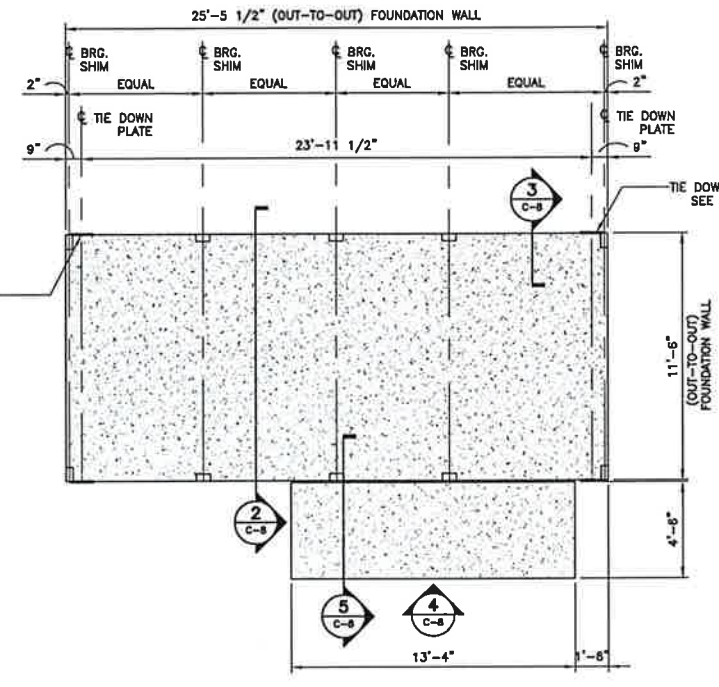
4 ENTRY STOOP DETAIL - ELEVATION
C-8 SCALE: 3/16"=1'-0"



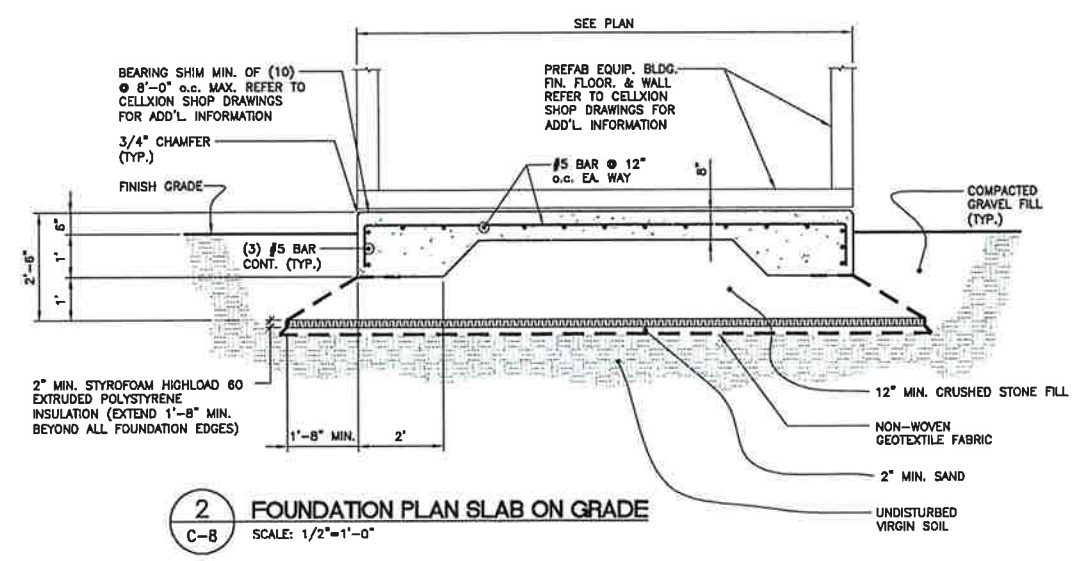
5 ENTRY STOOP DETAIL - SECTION
C-8 SCALE: 3/16"=1'-0"

NOTES:

- BEARING SHIMS, TIE-DOWN PLATES AND ASSOCIATED INSTALLATION ANCHORS PROVIDED BY CELLXION. CONTRACTOR SHALL VERIFY ALL SHIM & TIE-DOWN QUANTITIES AND LOCATIONS WITH CELLXION PRIOR TO PERFORMING FOUNDATION WORK.
- SLAB/ TOP OF WALL TOLERANCE IS 1/4"±
- TOP 8" OF FOUNDATION SIDES MUST BE FORMED FLAT TO ACCEPT TIE-DOWN PLATES.



1 FOUNDATION PLAN
C-8 SCALE: 1/4"=1'-0" APPROX. NORTH



2 FOUNDATION PLAN SLAB ON GRADE
C-8 SCALE: 1/2"=1'-0"

FOUNDATION NOTES:

- IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
- DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST THE PRE MANUFACTURED EQUIPMENT BUILDING SHOP DRAWINGS.
- THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.

SITE NOTES:

- THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
- ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY. PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- ALL RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED OFF SITE AND BE LEGALLY DISPOSED, AT NO ADDITIONAL COST.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE EQUIPMENT AND TOWER AREAS.
- NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
- THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
- THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
- CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
- IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.
- DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST THE PRE MANUFACTURED EQUIPMENT BUILDING SHOP DRAWINGS.
- THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.

COMPACTED GRAVEL FILL:

- COMPACTED GRAVEL FILL SHALL BE FURNISHED AND PLACED AS A FOUNDATION FOR STRUCTURES, WHERE SHOWN ON THE CONTRACT DRAWINGS OR DIRECTED BY THE ENGINEER.
- GRAVEL SHALL CONFORM TO THE REQUIREMENTS OF ARTICLE M.02.02 OF THE CONNECTICUT D.O.T. STANDARD SPECIFICATIONS. ADMIXTURES AND SURFACE PROTECTIVE MATERIALS USED TO PREVENT THE GRAVEL FROM FREEZING MUST MEET THE APPROVAL OF THE ENGINEER. THE LARGEST STONE SIZE SHALL BE 3-1/2 INCHES.
- SAMPLES OF THE MATERIAL TO BE USED SHALL BE DELIVERED TO THE JOB SITE 5 DAYS PRIOR TO ITS INTENDED USE SO IT MAY BE TESTED FOR APPROVAL.
- AFTER ALL EXCAVATION HAS BEEN COMPLETED, GRAVEL SHALL BE DEPOSITED IN LAYERS NOT EXCEEDING EIGHT (8) INCHES IN DEPTH OVER THE AREAS. IN EXCEPTIONAL CASES, THE ENGINEER MAY PERMIT THE FIRST LAYER TO BE THICKER THAN EIGHT (8) INCHES. EACH LAYER SHALL BE LEVELED OFF BY SUITABLE EQUIPMENT. THE ENTIRE AREA OF EACH LAYER SHALL BE COMPACTED BY USE OF APPROVED VIBRATORY, PNEUMATIC-TIRED OR TREAD-TYPE COMPACTION EQUIPMENT. COMPACTION SHALL BE CONTINUED UNTIL THE DRY DENSITY OVER THE ENTIRE AREA OF EACH LAYER IS NOT LESS THAN 95 PERCENT OF THE MAXIMUM DRY DENSITY ACHIEVED BY AASHTO T-99 METHOD C. THE MOISTURE CONTENT OF THE GRAVEL SHALL NOT VARY BY MORE THAN 3%+ FROM ITS OPTIMUM MOISTURE CONTENT. NO SUBSEQUENT LAYER SHALL BE DEPOSITED UNTIL THE SPECIFIED COMPACTION IS ACHIEVED FOR THE PREVIOUS LAYER. IF NECESSARY TO OBTAIN THE REQUIRED COMPACTION, WATER SHALL BE ADDED AND GENTLE PUDDLING PERFORMED IF AUTHORIZED. COMPACTED GRAVEL FILL SHALL BE PREVENTED FROM FREEZING BY USE OF APPROVED ADMIXTURES OR BY USE OF APPROVED PROTECTIVE MATERIALS ON THE SURFACE, OR BOTH.

CONCRETE AND REINFORCING STEEL NOTES:

- ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318.
- ALL CONCRETE SHALL BE NORMAL WEIGHT, 6% AIR ENTRAINED WITH A MAXIMUM SLUMP OF 4", AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE ON THE DRAWINGS.
- REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60, DEFORMED BARS, WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 WELDED STEEL WIRE FABRIC. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD UNLESS OTHERWISE INDICATED.
- THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS OTHERWISE NOTED ON THE DRAWINGS:

CONCRETE CAST AGAINST EARTH.....	3 IN.
CONCRETE EXPOSED TO EARTH OR WEATHER:	
#8 AND LARGER.....	2 IN.
#5 AND SMALLER & WWF.....	1 1/2 IN.
CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:	
SLAB AND WALL.....	3/4 IN.
BEAMS AND COLUMNS.....	1 1/2 IN.
- ALL EXPOSED EDGES OF CONCRETE TO RECEIVE A 3/4" CHAMFER IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
- CONCRETE EQUIPMENT PAD TO RECEIVE A BRUSHED FINISH.
- INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT DURING DRILLING WITHOUT PRIOR REVIEW BY THE ENGINEER.

REVISED DAM PLANS - ACCESS DRINK ADJUSTMENT PER TOWN COMMENTS	CFC	05/29/15	THUR
DAM PLANS	CFC	05/29/15	THUR
DAM PLANS	CFC	05/19/15	THUR
DAM PLANS	CFC	05/19/15	THUR
DRAWN BY CHKD BY	DATE	TIME	DAY

PROFESSIONAL ENGINEER SEAL

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SOUTHINGTON - EAST STREET
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SOUTHINGTON, CT 06489

DATE: 05/18/15
SCALE: AS NOTED
JOB NO. 14035.000

SHELTER FOUND.
PLAN, DETAILS
AND NOTES

C-8
Sheet No. 10 of 10



DESIGN EARTH TECHNOLOGY

P.O. Box 187, Guilford, CT 06437
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GENERAL CIVIL ENGINEERING ■ GEOTECHNICAL ENGINEERING ■ HYDROGEOLOGY ■ HYDROLOGY AND HYDRAULICS ■ TESTING—SOILS & MATERIALS ■ CONSTRUCTION ENGINEERING

GEOTECHNICAL AND GEOPHYSICAL TESTING REPORT

PROPOSED VERIZON WIRELESS COMMUNICATIONS FACILITY
SOUTHINGTON – EAST STREET
99 EAST STREET
SOUTHINGTON, CONNECTICUT

PREPARED FOR:

CENTEK ENGINEERING, Inc.

DECEMBER 2014



DESIGN EARTH TECHNOLOGY

P.O. Box 187, Guilford, CT 06437

Phone/Fax: (203) 458-9806 ■ Email: docdirt@aol.com

December 13, 2014

Mr. Carlo F. Centore, P.E.
Centek Engineering, Inc.
63-2 North Branford Road
Branford, CT 06405

Re: Proposed Verizon Wireless Communications Facility
Southington – East Street
99 East Street
Southington, Connecticut
DET Job No. 2014.21

Dear Mr. Centore:

Lawrence J. Marcik, Jr., P.E. dba Design Earth Technology (DET) has completed a geotechnical engineering study for the above referenced project. Included in this report is a summary of subsurface conditions, delineation of engineering characteristics of the foundation materials, and the implications of the conditions and characteristics with respect to the design and construction of the proposed communications facility. This report was prepared under our agreement dated December 1, 2014 and your subsequent authorization.

The purpose of this study is to develop geotechnical engineering recommendations for the proposed tower foundation design. The subsurface investigation and sampling program was conducted by **DET** for the sole purpose of obtaining subsurface information as part of a geotechnical study. No services were performed to evaluate subsurface environmental conditions.

SITE DESCRIPTION

The project site is located off of East Street in Southington, Connecticut. The project location is shown on the attached "Location Plan, Figure No. 1". The project is located in a farm field that harvests vegetables for a local farm market. This farm field has some relief near the proposed tower site on the order of about 10 feet. There are also wetlands soils located about 100 feet north and east of the proposed cell site. The specific cell site is located near the northeast edge of the farm field near a tree line.

PROJECT DESCRIPTION

The proposed project for this report consists of the construction of a +/-90' monopole wireless communications tower with the installation of new communications equipment. The tower is to be covered with artificial tree branches.

SUBSURFACE EXPLORATION

Associated Borings Company, Inc. performed the subsurface exploration work on December 2, 2014. Locations of the subsurface explorations are shown on Figure No. 2 and logs have been included in Appendix A. The subsurface exploration program consisted of a total of one boring and four (4) bedrock verification probes (power drill soundings). All subsurface penetrations were conducted in the area of the proposed communications tower. The tower location was staked out by the project surveyor.

The single auger boring was advanced to a depth of 51 feet below existing ground level while the probes were advanced 10 feet below existing ground.

The auger boring was drilled using a 3.25" inside diameter standard hollow-stem auger techniques. Standard Penetration Tests (SPT) were performed in the test boring with spilt spoon samples recovered. Spilt spoon samples were taken continuously from 1' below ground surface to 51' below ground surface. The SPT consists of driving a 1 3/8" inside diameter split spoon sampler with a 140-pound hammer falling 30 inches. The blows for 6 inches of penetration are recorded for a total of 24 inches. The sum of the blows required to drive the sampler from 6 inches to 18 inches penetration is referred to as the Standard Penetration Resistance (N).

Rock verification probes (power drill soundings) were drilled using solid stem auger technique.

Logs of the probes and soil boring are included in Appendix A. See attached photograph for a view of the drilling contractor at work.

RESISTIVITY TESTING

In place soil resistivity testing was conducted by **DET** personnel on December 5, 2014 within the vicinity of the proposed tower facility. One (1) test section was established in an approximate north-south direction and three (3) test sections were established in an approximate east-west direction. Approximate test section locations are illustrated in Figure 2. Each section was tested up to an electrode "A" spacing of 40 feet. Test results yielded resistivity values within acceptable ranges for the given soil/rock types and moisture conditions typically found in the New England geology. It should be noted, however, that resistivity measurements are strongly influenced by local variations in surface conductivity caused by soil/rock weathering, soil/rock moisture content, soil temperature, rugged topography and existing subsurface manmade conductive materials. Attempts were made (where possible) during field operations to minimize some of these effects on the test results. Results of the resistivity tests are summarized in Table 1 with detailed calculations shown in Appendix B. See attached photographs of a typical resistivity test.

LABORATORY TESTING

The laboratory testing program consisted of six (6) Gradation Analyses. All tests were conducted in accordance with applicable ASTM standards. Laboratory test results are included in Appendix C.

SUBSURFACE CONDITIONS

Based upon our review of the testing program, the site is covered with topsoil material underlain by red brown, loose to medium dense, natural sand deposit. This natural undisturbed sand deposit generally consists of fine gravel, sand, silt and clay in varying proportions underlain by bedrock. The natural sand deposit is at least +/-51' thick and most likely much deeper.

The natural deposit is from glacial origin and is called "Outwash Plain" as defined in the Geologic Map of the Meriden Quadrangle, Connecticut, Surficial Geology by Penelope M. Hanshaw dated 1962. This deposit is a accumulation of stratified sand and gravel which was deposited by glacial melt-water streams beyond the stagnant glacial ice.

The bedrock surface at the site is unknown. No bedrock was found to 51' below the ground surface.

Groundwater was observed in boring B1 at 23'. It should be noted, however, that groundwater levels vary depending upon season, precipitation and other conditions that may be different from those at the time of drilling.

GEOTECHNICAL DESIGN CONSIDERATIONS

Tower Foundation

The natural soil below about two (2') feet from existing grade is suitable for support for the monopole tower foundation on a spread footing (mat foundation). A mat foundation where the weight of the mat is used to resist over-turning wind and earthquake loads. The topsoil and subsoil material in general, has erratic density, composition, settlement potential, presence of voids and material subject to decomposition. The natural sands will become disturbed during the foundation excavation under normal excavation procedures, rainwater entering the excavation and typical weather conditions. To minimize this disturbance we recommend that the following procedures be used in the preparation of the foundation excavations:

- Excavate down to proposed foundation subgrade (> 2' below existing ground surface to natural undisturbed sand), which will be approximately 12" (min.) below bottom of proposed foundation.
- Remove all loose soil that was disturbed during the excavation process. This work is typical conducted with hand shovels.
- Obtain subgrade approval by the project geotechnical engineer.
- Install an 12" thick layer (min.) of ¾" size processed stone (in two 6" layers) and compact with a hand operated vibratory roller weighing at least 1000 lbs. and a centrifugal force of 14,000 lbs., making a minimum of 6 passes in two directions. This processed stone is used to minimize the softening of the subgrade soils and aid in developing uniform soil pressure. The ¾" size processed stone shall meet the CTDOT gradation and hardness requirements. The processed stone shall be compacted to 98% modified proctor ASTM D1557. See Figure No. 3 for additional details.

Provided that the foundations are prepared as recommended above, a maximum net allowable soil bearing of 1.0 tons per square foot (tsf) may be used to size the spread footing foundation. The net pressure is the pressure in excess of the minimum surrounding overburden pressure. Bearing pressures of up to one third in excess of the above value can be used for transient live loads due to wind and/or earthquakes. It is estimated that total settlements will not exceed about 1/2" with differential settlements of about half of the total settlement. All bottoms of footings **must** be a minimum of 42" below finished grade to provide for frost protection.

EARTHQUAKE DESIGN (SEISMIC)

Seismic design requirements for the State of Connecticut are based on the Connecticut Building Code (CBC), which incorporates the Seismic design Category approach from the International Building Code. The seismic design Category determination is based on a few category factors and one such category is the "Site Classification". This "Site Classification" incorporates a site soil profile determination extending to a depth of 100 feet. The scope of Professional Services dated December 1, 2014 did not include the 100 foot soil profile determination but from the results of the 51 feet deep test boring, a map entitled "Map Showing Depth to Bedrock, Meriden Quadrangle, Connecticut by Marilyn H. Ginsberg dated 1984 and the assumption that the same type and density of soil from 0 to 51' is the same from 51' to 100', we consider that the site subsurface conditions to match the site class "E"– Soft soil profile.

For transfer of ground shear into the natural soil, the friction factor between the concrete underlain by processed stone and natural sand deposit can be 0.35.

The proposed foundation is to bear on natural undisturbed sandy soil. There are small zones of loose soil below the ground surface, these zones may liquefy during a seismic event and will result in an estimated dynamic settlement of less than 1".

Passive earth pressure is not typically used in resisting sliding of structures due to the potential of this earthen material being removed in the future. If this material can be guaranteed to remain in place for the life of the structure, the following design parameters can be used for design:

- ⇒ Dry unit weight of gravel backfill soil should be 125 pound per cubic foot (pcf).
- ⇒ Ultimate passive earth pressure coefficient ($K_p = 3.0$)
- ⇒ A factor of safety of 3 or greater is to be used in the design to obtain "allowable" passive pressure from ultimate passive pressure.

OTHER CONSIDERATIONS

Surface drainage around the tower and equipment shelter shall be positive drainage where the stormwater flows away from the foundations. A minimum of two percent drainage away from the foundation is recommended.

GEOTECHNICAL CONSTRUCTION CONSIDERATIONS

General

This section provides comments related to foundation construction and other geotechnical aspects of the project. It will aid personnel responsible for preparation of Contract Plans and Specifications and those involved with the actual construction and construction monitoring. The contractor must evaluate potential construction problems on the basis of his own knowledge and experience in the area and on the basis of similar projects in other localities, taking into consideration his own proposed construction methods and procedures.

Excavation

Materials to be excavated are expected to be topsoil, subsoil and loose to medium dense sand; hence excavation is not expected to be difficult.

Dewatering/Groundwater

Normal groundwater levels are expected to be below the proposed bottom of foundation excavation. Therefore, dewatering is not expected as long as surface runoff and precipitation is directed away from the excavation.

Materials

Gravel backfill is material used to backfill the foundation and is to be obtained from off-site borrow sources. This material shall consist of inert material that is hard, durable stone and coarse stone, free from loam and clay, surface coatings and deleterious materials. These materials shall conform to the following gradation requirements:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
1-1 ¹ / ₂ "	100
3/4"	45 - 80
1/4"	25 - 60
No. 10	15 - 45
No. 40	5 - 25
No. 100	0 - 10
No. 200	0 - 5

Placement and Compaction of Foundation Backfill

- A. All backfill materials shall be placed in horizontal layers not exceeding 6". Each layer shall be spread evenly and thoroughly blade mixed during spreading to ensure uniformity of material in each layer. Each layer shall be evenly compacted with an approved hand operated compactor, making a minimum of at least five (5) passes.

- B. In no case shall fill be placed over frozen material or snow. No fill material shall be placed, spread, or compacted during unfavorable weather conditions where soil moisture precludes achievement of the specified compaction. When the work is interrupted by heavy rains or snow, fill operations shall not be resumed until the moisture content and the density of the previously placed fill are as specified.
- C. Gravel fill shall be compacted in individual layers (not exceeding 6") to 95% maximum dry density using ASTM D1557.

Site Safety

The contractor is the party responsible for providing a safe site. The geotechnical engineer will not direct the contractor's operations and cannot be responsible for the safety of personnel other than their own representative on-site.

LIMITATIONS

Explorations

The analysis and recommendations submitted in this report are based in part upon the data obtained from a limited number of widely spaced subsurface explorations. The nature and extent of variations between these explorations may not become evident until construction excavation. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report at that time.

The soil profiles described and shown in this report are generalized and are intended to convey trends in subsurface conditions. The boundaries between strata and bedrock are approximate and generalized. They have been developed by data that is limited in number and widely spaced.

Water level readings have been observed in the drill hole at times and under conditions stated on the boring log and in this report. This data has been reviewed, analyzed, and interpretations made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, time of the year and other factors not evident at the time measurements were taken.

Designer Review

In the event that any changes in the design or location of the tower, the conclusions and recommendations contained in this report shall not be considered valid unless these changes are reviewed by this office and conclusions of this report modified.

Construction

It is recommended that Design Earth Technology retained to provide geotechnical field monitoring services based on familiarity with the subsurface conditions, design concepts and specifications, technical expertise, and experience in monitoring of site development construction.

Carlo F. Centore, P.E.
December 13, 2014
Page 7

Use of This Report

This report has been prepared for specific application and use of the proposed Verizon Wireless Communications Tower to be located off of East Street in Southington, Connecticut and is in accordance with generally accepted soil and foundation engineering practices. No other warranty expressed or implied is made.

If you have any questions regarding the above information, please call.

Sincerely,

A handwritten signature in blue ink, reading "Lawrence J. Marcik, Jr., P.E.", written in a cursive style.

DESIGN EARTH TECHNOLOGY
Lawrence J. Marcik, Jr., P.E.

FIGURES



JOB TITLE: GEOTECHNICAL REPORT FOR A
 PROPOSED VERIZON WIRELESS COMMUNICATIONS FACILITY
 AT
 SOUTHINGTON EAST STREET, 99 EAST STREET
 SOUTHINGTON, CONNECTICUT

PREPARED FOR:
CEN TEK ENGINEERING, INC.

DATE:
 DECEMBER 13, 2014

SCALE:
 NTS

SOURCE:
 U.S.G.S. QUADRANGLE
 MERIDEN



**DESIGN EARTH
 TECHNOLOGY**
 P.O. Box 187 • Guilford, CT 06437
 Phone/Fax: (203) 458-9806
 Email: docdirt@aol.com

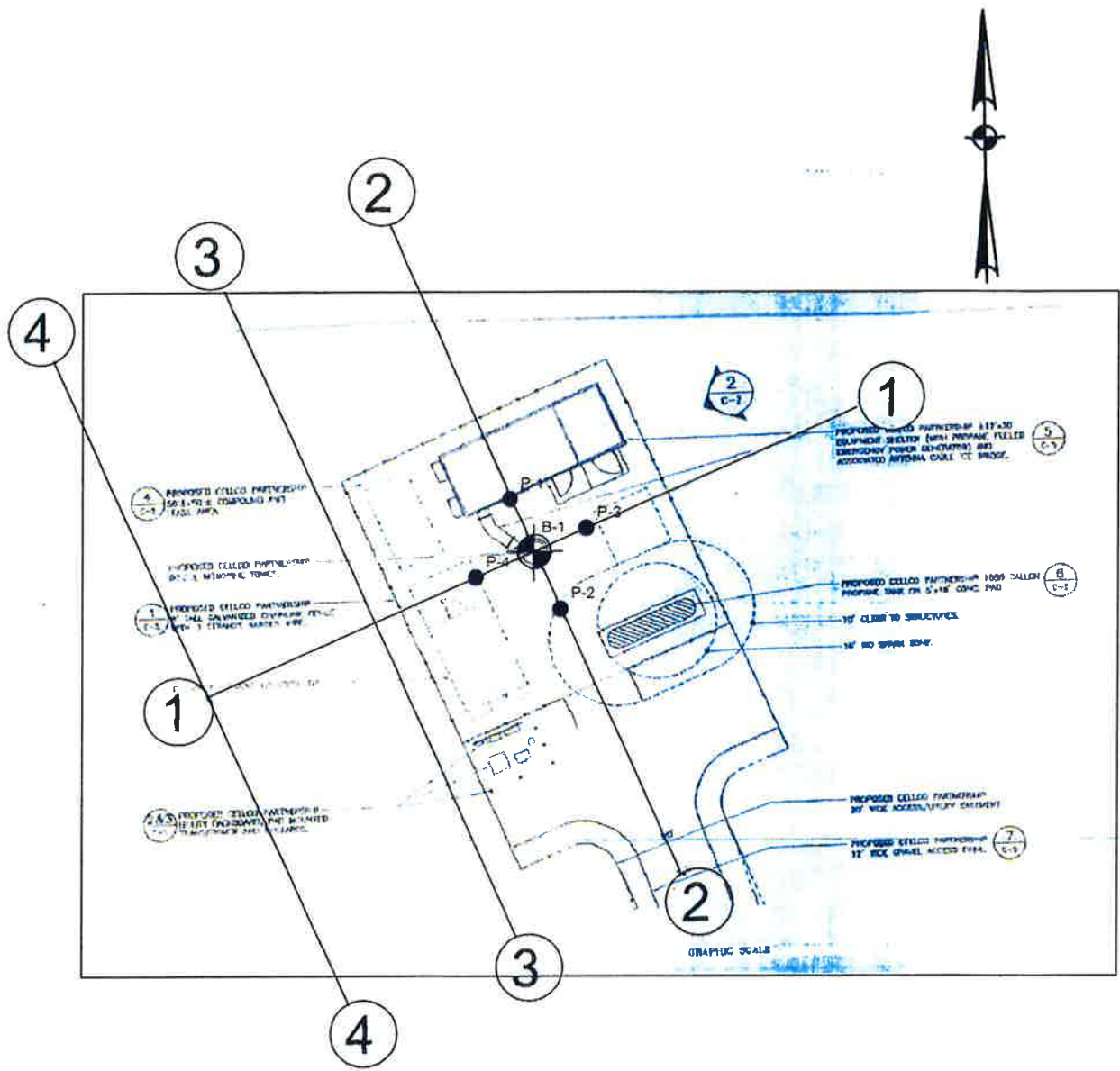
PROJECT No.:
 2014-21

DRAWN:
 LJM

FIGURE No.:

FIGURE TITLE:
 LOCATION PLAN

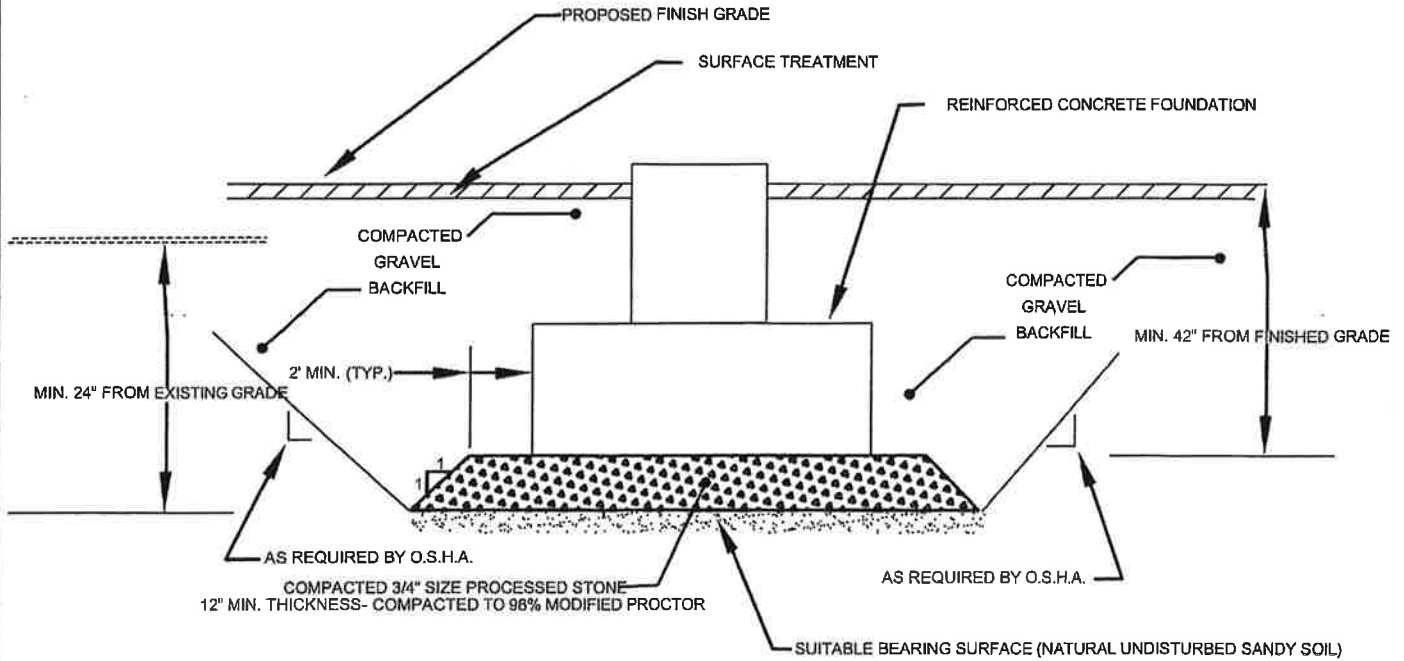
1
 CAD FILE: Location Plan



LEGEND

- B-1 — TYPICAL BORING
- P-1 — TYPICAL BEDROCK PROBE
- 1 — SECTION NUMBER RESISTIVITY TESTING

JOB TITLE: GEOTECHNICAL REPORT FOR A PROPOSED VERIZON WIRELESS COMMUNICATIONS FACILITY AT SOUTHINGTON EAST STREET, 99 EAST STREET SOUTHINGTON, CONNECTICUT	
PREPARED FOR: CEN TEK ENGINEERING, INC.	DATE: DECEMBER 13, 2014
	SCALE: 1" = 30' +/-
DESIGN EARTH TECHNOLOGY P.O. Box 187 • Guilford, CT 06437 Phone/Fax: (203) 458-9806 Email: dtedirt@aol.com	PROJECT No.: 2014-21
	DRAWN: LJM
	FIGURE No.: 2
FIGURE TITLE: SKETCH OF LOCATIONS OF SUBSURFACE EXPLORATIONS	
CAD FILE: Figures	



SECTION
FOUNDATION BEARING SURFACE PREPARATION
 NOT TO SCALE

JOB TITLE: GEOTECHNICAL REPORT FOR A PROPOSED VERIZON WIRELESS COMMUNICATIONS FACILITY AT SOUTHWINGTON EAST STREET, 99 EAST STREET SOUTHWINGTON, CONNECTICUT		DATE: DECEMBER 13, 2014
PREPARED FOR: CEN TEK ENGINEERING, INC.		SCALE: NTS
<div style="display: flex; align-items: center;"> <div> <p>DESIGN EARTH TECHNOLOGY</p> <p>P.O. Box 187 • Guilford, CT 06437 Phone/Fax: (203) 458-9806 Email: doedirt@aol.com</p> </div> </div>		PROJECT No.: 2014-21
FIGURE TITLE: FOUNDATION DETAILS		DRAWN: LJM
FIGURE No.: <div style="font-size: 24pt; font-weight: bold; text-align: center;">3</div>		CAD FILE: Figures

TABLES

TABLE 1

**PROPOSED VERIZON WIRELESS TOWER
SOUTHINGTON – EAST STREET
99 EAST STREET
SOUTHINGTON, CT 06489**

IN-SITU SOIL RESISTIVITY RESULTS¹

Section No.

ELECTRODE SPACING (ft)	1	2	3	4
5	15,205	14,343	10,982	5,400
10	27,060	27,308	17,982	10,130
20	47,913	36,002	26,657	17,158
30	56,531	36,366	28,955	21,429
40	49,330	49,024	28,419	24,206

- NOTES: 1. Resistivity values indicated are in OHM-CM
2. Test completed using Wenner Four Probe Method with an Det 2/2 Auto Earth Tester as manufactured by Avo, Inc.

APPENDICES

APPENDIX A

DRILLER
Larry Marcik, Jr.

INSPECTOR

ASSOCIATED BORINGS CO., INC.
119 MARGARET CIRCLE, NAUGATUCK, CT 06770
Tel (203) 729-5435 Fax (203) 729-5116

CME-45B

DRILLING EQUIPMENT
Design Earth Technology

CLIENT

SOILS ENGINEER

PROJECT NAME: 99 East St., Cell Tower

PROJECT NUMBER:

Surface Elevation:

LOCATION: Southington, Connecticut

Date Started: 12/2/2014

Auger Casing Sampler Core Bar

Hole No. **B-1**

Date Finished: 12/2/2014

Type HSA SS NQ-2

Line & Station

Groundwater Observations

Size I. D. 3 1/4 in

Offset

AT 23 ' AFTER 0 HRS

Hammer

N Coordinate

AT ' AFTER HRS

Fall

E. Coordinate

DEPTH	Casing blows per foot	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER				STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)
		DEPTH IN FEET FROM - TO	NO.	PEN. INCH	REC. INCH	TYPE						
							0-6	6-12	12-18	18-24		
5		1.0 - 3.0	1	24	7	D	3	4	8	9	1 17	Topsoil
		3.0 - 5.0	2	24	4	D	7	9	9	7		Red Br. M-F Sand, Little Silt
		5.0 - 7.0	3	24	0	D	4	4	4	4		
		7.0 - 9.0	4	24	10	D	3	4	3	5		
10		9.0 - 11.0	5	24	6	D	4	3	4	4		
		11.0 - 13.0	6	24	8	D	6	6	7	5		
		13.0 - 15.0	7	24	12	D	4	4	3	8		
15		15.0 - 17.0	8	24	11	D	6	6	11	15		
		17.0 - 19.0	9	24	9	D	15	17	17	19		
		19.0 - 21.0	10	24	14	D	15	15	14	11		
20		21.0 - 23.0	11	24	8	D	8	9	8	9		
		23.0 - 25.0	12	24	14	D	4	8	8	10		
25		25.0 - 27.0	13	24	15	D	15	13	11	12		
		27.0 - 29.0	14	24	7	D	15	11	12	15		
		29.0 - 31.0	15	24	10	D	5	5	5	6		
30		31.0 - 33.0	16	24	16	D	5	6	7	7		
		33.0 - 35.0	17	24	10	D	5	5	7	7		
35		35.0 - 37.0	18	24	20	D	5	5	6	7		
		37.0 - 39.0	19	24	22	D	7	8	8	7		
		39.0 - 41.0	20	24	16	D	3	3	4	3		

From Ground Surface to Feet Used Inch Casing Then Inch Casing For Feet

Footage in Earth 40.0 Footage in Rock 0.0 No. of Samples 20 Hole No. B-1

SAMPLE TYPE CODING: D = DRIVEN C = CORE A = AUGER UP = UNDISTURBED PISTON

PROPORTIONS USED: TRACE = 1-10% LITTLE = 10-20% SOME = 20-35% AND = 35-50%

Jaime Lioret DRILLER Larry Marcik, Jr.		ASSOCIATED BORINGS CO., INC. 119 MARGARET CIRCLE, NAUGATUCK, CT 06770 Tel (203) 729-5435 Fax (203) 729-5116				CME-45B		
INSPECTOR		PROJECT NAME: 99 East St., Cell Tower				DRILLING EQUIPMENT Design Earth Technology		
SOILS ENGINEER		PROJECT NUMBER:				CLIENT		
Surface Elevation:		LOCATION: Southington, Connecticut						
Date Started:	12/2/2014	. Auger	Casing	Sampler	Core Bar	Hole No.	B-1	
Date Finished:	12/2/2014	Type	HSA	SS	NQ-2	Line & Station		
Groundwater Observations		Size I. D.	3 1/4 in		2 in	Offset		
AT	23	'AFTER	0	HRS	Hammer	140 lb	Bit	
AT	23	'AFTER	0	HRS	Fall	30 in	E. Coordinate	

DEPTH	Casing blows per foot	SAMPLE					BLOWS PER 6 INCHES ON SAMPLER				STRATA CHANGE: DEPTH, ELEV.	FIELD IDENTIFICATION OF SOIL, REMARKS (INCL. COLOR, LOSS OF WASH WATER, ETC.)	
		DEPTH IN FEET FROM - TO	NO.	PEN. INCH	REC. INCH	TYPE	0 - 6	6 - 12	12-18	18-24			
45		41.0 - 43.0	21	24	20	D	4	5	5	6	51	Red Br. M-F Sand, Little Silt, Little C-F Sand, Tr. C. Gravel	
		43.0 - 45.0	22	24	17	D	3	5	4	4			
		45.0 - 47.0	23	24	0	D	4	3	4	4			
		47.0 - 49.0	24	24	12	D	4	3	5	5			
		49.0 - 51.0	25	24	14	D	3	6	5	5			
50													End of Boring - 51.0
55													
60													
65													
70													
75													
80													

From Ground Surface to	Feet Used	Inch Casing Then	Inch Casing For	Feet
Footage in Earth	11.0	Footage in Rock	0.0	No. of Samples
				5
Hole No.				B-1
SAMPLE TYPE CODING: D = DRIVEN		C = CORE		A = AUGER
PROPORTIONS USED: TRACE = 1-10%		LITTLE = 10-20%		SOME = 20-35%
				UP = UNDISTURBED PISTON
				AND = 35-50%

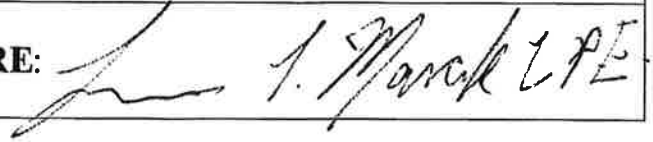
APPENDIX B

**RESISTIVITY
DATA**

SITE: Southington, Connecticut

DATE: December 5, 2014

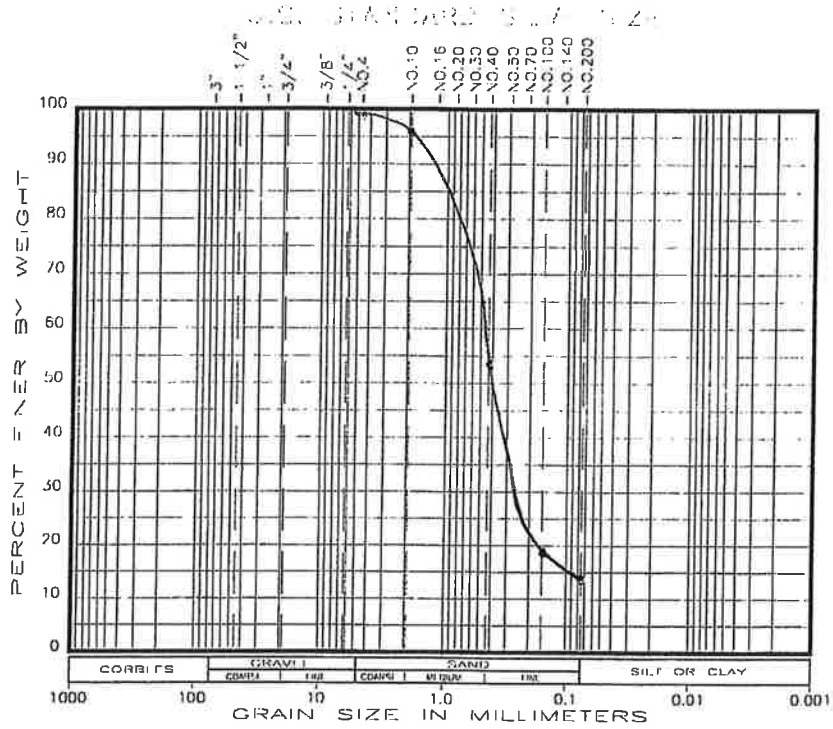
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A=(FT)	5	10	20	30	40
FORMULA □ = (OHM-CM)	957.5*R	1915*R	3830*R	5745*R	7660*R
AREA 1 MEASURED R (OHM)	15.88	14.13	12.51	9.74	6.44
AREA 1 CALCULATED (OHM-CM)	15,205	27,060	47,913	56,531	49,330
AREA 2 MEASURED R (OHM)	14.98	14.26	9.40	6.33	6.40
AREA 2 CALCULATED (OHM-CM)	14,343	27,308	36,002	36,366	49,024
AREA 3 MEASURED R (OHM)	11.47	9.39	6.96	5.04	3.71
AREA 3 CALCULATED (OHM-CM)	10,982	17,982	26,657	28,955	28,419
AREA 4 MEASURED R (OHM)	5.64	5.29	4.48	3.73	3.16
AREA 4 CALCULATED (OHM-CM)	5,400	10,130	17,158	21,429	24,206

APPENDIX C

REPORT OF GRADATION ANALYSIS



BORING NO. 1	SAMPLE NO. 4
ORIGIN OF MATERIAL: From Split Spoon Sampler	
VISUAL CLASSIFICATION: Medium to Fine Sand, Little Silt/Clay, Trace Coarse Sand, Trace Fine Gravel	
PROPOSED USE: Foundation Soil	
ASTM METHOD USED: D422	
DEVIATION FROM ASTM METHOD: Washed through the Nos. 100 & 200 sieves	
DESCRIPTION OF SAMPLING PROCEDURE USED: Split Spoon Sampler	
DESCRIPTION OF ANY MEASUREMENT UNCERTAINTY: NONE	
REMARKS: 1. Depth of sample 7 to 9 feet	

SIEVE SIZE	% PASSING
3/4"	100
No. 4	99
No. 10	96
No. 40	54
No. 100	19
No. 200	14



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 P.O. Box 187 • Guilford, CT 06437
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 Email: docdirt@aol.com

RESPECTFULLY SUBMITTED,

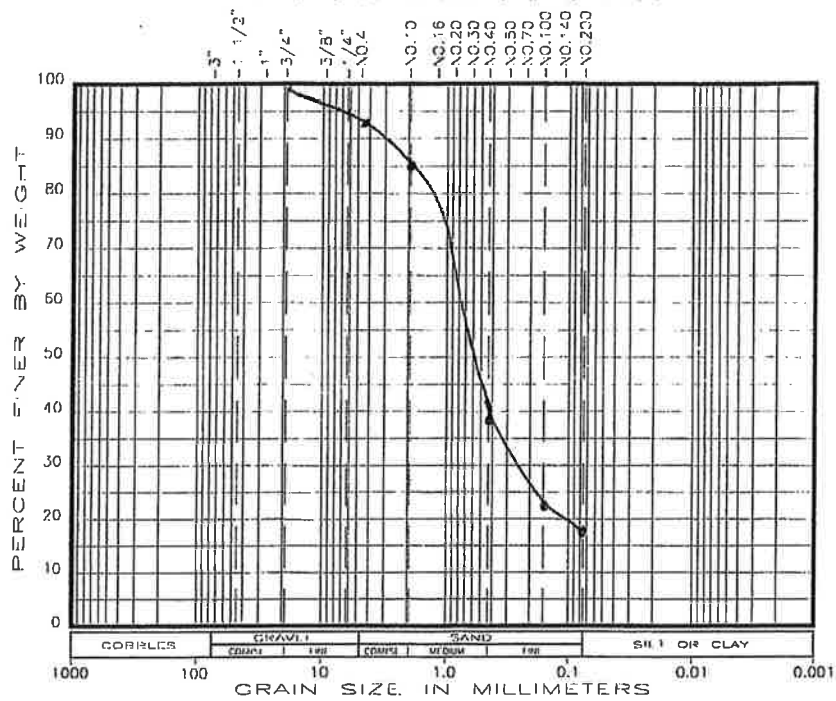
Lawrence J. Marcik, Jr., P.E.
 Lawrence J. Marcik, Jr., P.E.
 DESIGN EARTH TECHNOLOGY

Date: December 13, 2014	Project No.: 2014-21
Test By: LJM, Jr.	Checked By: LJM, Jr.
Project: Proposed Verizon Wireless Communications	
Facilities at Southington - East Street	
99 east street, Southington, Connecticut	
Prepared For: Centek Engineering, Inc.	

GA-1

THIS REPORT MUST NOT BE REPRODUCED EXCEPT IN FULL AND WITH THE WRITTEN APPROVAL OF THIS OFFICE.
 THIS REPORT RELATES ONLY TO THE ITEMS TESTED.

REPORT OF GRADATION ANALYSIS



BORING NO. 1	SAMPLE NO. 12
ORIGIN OF MATERIAL: From Split Spoon Sampler	
VISUAL CLASSIFICATION: Medium to Fine Sand, Little Silt/Clay, Trace Coarse Sand, Trace Fine Gravel	
PROPOSED USE: Foundation Soil	
ASTM METHOD USED: D422	
DEVIATION FROM ASTM METHOD: Washed through the Nos. 100 & 200 sieves	
DESCRIPTION OF SAMPLING PROCEDURE USED: Split Spoon Sampler	
DESCRIPTION OF ANY MEASUREMENT UNCERTAINTY: NONE	
REMARKS: 1. Depth of sample 23 to 25 feet	

SIEVE SIZE	% PASSING
¾"	100
No. 4	92
No. 10	85
No. 40	39
No. 100	22
No. 200	17



DESIGN EARTH TECHNOLOGY

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 Phone/Fax: (203) 458-9806
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RESPECTFULLY SUBMITTED,

Lawrence J. Marcik, Jr., P.E.

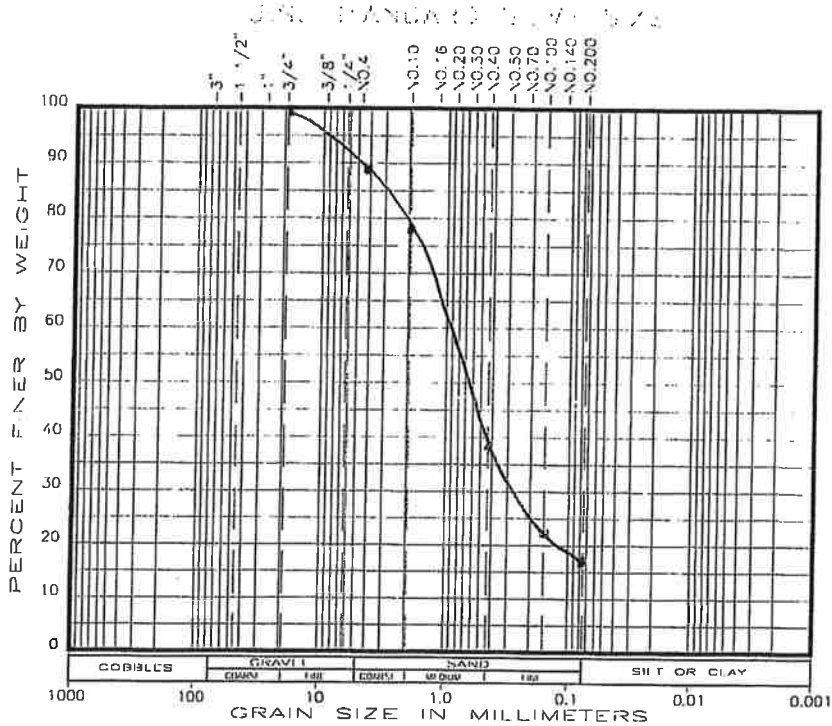
Lawrence J. Marcik, Jr., P.E.
 DESIGN EARTH TECHNOLOGY

Date:	December 13, 2014	Project No.:	2014-21
Test By:	LJM, Jr.	Checked By:	LJM, Jr.
Project:	Proposed Verizon Wireless Communications		
	Facilities at Southington - East Street		
	99 east street, Southington, Connecticut		
Prepared For:	Centek Engineering, Inc.		

GA-2

THIS REPORT MUST NOT BE REPRODUCED EXCEPT IN FULL AND WITH THE WRITTEN APPROVAL OF THIS OFFICE.
 THIS REPORT RELATES ONLY TO THE ITEMS TESTED.

REPORT OF GRADATION ANALYSIS



BORING NO. 1	SAMPLE NO. 15
ORIGIN OF MATERIAL: From Split Spoon Sampler	
VISUAL CLASSIFICATION: Coarse to Fine Sand, Little Silt/Clay, Little Fine Gravel	
PROPOSED USE: Foundation Soil	
ASTM METHOD USED: D422	
DEVIATION FROM ASTM METHOD: Washed through the Nos. 100 & 200 sieves	
DESCRIPTION OF SAMPLING PROCEDURE USED: Split Spoon Sampler	
DESCRIPTION OF ANY MEASUREMENT UNCERTAINTY: NONE	
REMARKS: 1. Depth of sample 29 to 31 feet	

SIEVE SIZE	% PASSING
3/4"	100
No. 4	89
No. 10	78
No. 40	38
No. 100	22
No. 200	17



DESIGN EARTH TECHNOLOGY
 P.O. Box 187 • Guilford, CT 06437
 Phone/Fax: (203) 458-9806
 Email: docdirt@aol.com

RESPECTFULLY SUBMITTED,

Lawrence J. Marcik, Jr., P.E.

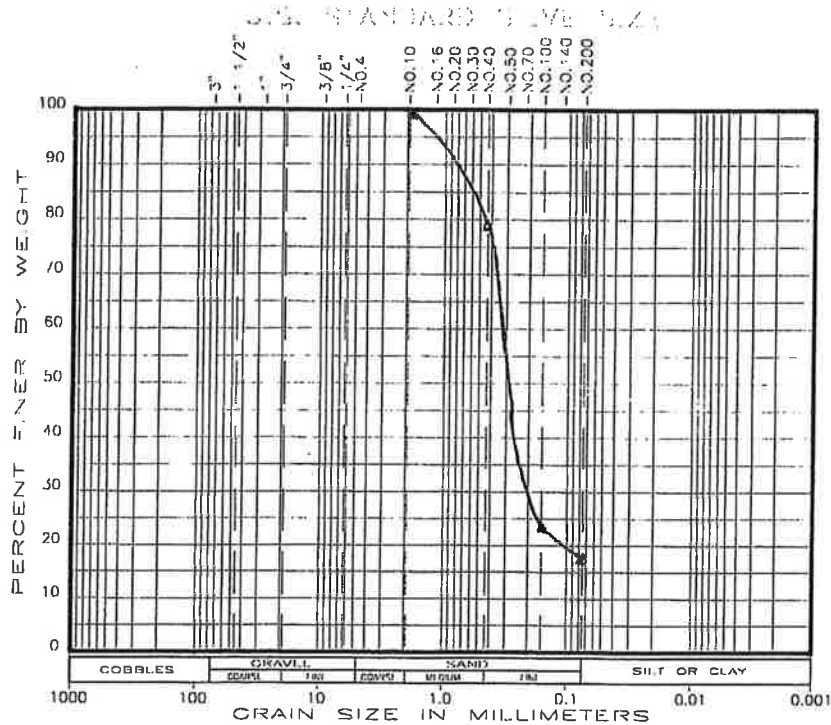
Lawrence J. Marcik, Jr., P.E.
 DESIGN EARTH TECHNOLOGY

Date:	December 13, 2014	Project No.:	2014-21
Test By:	LJM, Jr.	Checked By:	LJM, Jr.
Project:	Proposed Verizon Wireless Communications Facilities at Southington - East Street		
	99 east street, Southington, Connecticut		
Prepared For:	Centek Engineering, Inc.		

GA-3

THIS REPORT MUST NOT BE REPRODUCED EXCEPT IN FULL AND WITH THE WRITTEN APPROVAL OF THIS OFFICE.
 THIS REPORT RELATES ONLY TO THE ITEMS TESTED.

REPORT OF GRADATION ANALYSIS



BORING NO. 1	SAMPLE NO. 18
ORIGIN OF MATERIAL: From Split Spoon Sampler	
VISUAL CLASSIFICATION: Medium to Fine Sand, Little Silt/Clay	
PROPOSED USE: Foundation Soil	
ASTM METHOD USED: D422	
DEVIATION FROM ASTM METHOD: Washed through the Nos. 100 & 200 sieves	
DESCRIPTION OF SAMPLING PROCEDURE USED: Split Spoon Sampler	
DESCRIPTION OF ANY MEASUREMENT UNCERTAINTY: NONE	
REMARKS: 1. Depth of sample 35 to 37 feet	

SIEVE SIZE	% PASSING
3/4"	100
No. 4	100
No. 10	100
No. 40	79
No. 100	23
No. 200	17



DESIGN EARTH TECHNOLOGY

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 Email: doedirt@aol.com

RESPECTFULLY SUBMITTED,

Lawrence J. Marcik, Jr., P.E.

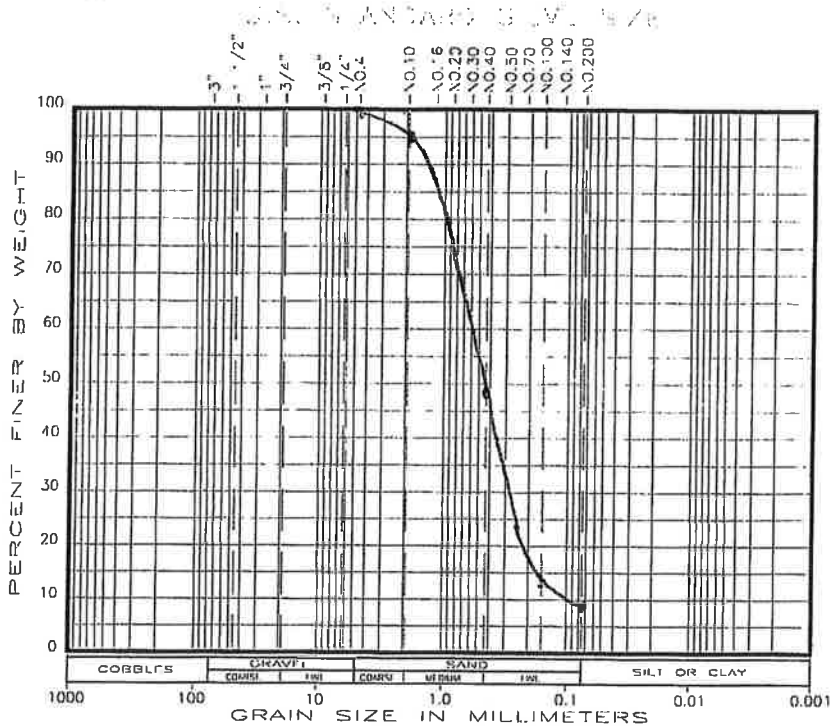
Lawrence J. Marcik, Jr., P.E.
 DESIGN EARTH TECHNOLOGY

Date:	December 13, 2014	Project No.:	2014-21
Test By:	LJM, Jr.	Checked By:	LJM, Jr.
Project:	Proposed Verizon Wireless Communications		
	Facilities at Southington - East Street		
	99 east street, Southington, Connecticut		
Prepared For:	Centek Engineering, Inc.		

GA-4

THIS REPORT MUST NOT BE REPRODUCED EXCEPT IN FULL AND WITH THE WRITTEN APPROVAL OF THIS OFFICE.
 THIS REPORT RELATES ONLY TO THE ITEMS TESTED.

REPORT OF GRADATION ANALYSIS



BORING NO. 1	SAMPLE NO. 20
ORIGIN OF MATERIAL: From Split Spoon Sampler	
VISUAL CLASSIFICATION: Medium to Fine Sand, Trace Coarse Sand, Trace Fine Gravel, Trace Silt/Clay	
PROPOSED USE: Foundation Soil	
ASTM METHOD USED: D422	
DEVIATION FROM ASTM METHOD: Washed through the Nos. 100 & 200 sieves	
DESCRIPTION OF SAMPLING PROCEDURE USED: Split Spoon Sampler	
DESCRIPTION OF ANY MEASUREMENT UNCERTAINTY: NONE	
REMARKS: 1. Depth of sample 39 to 41 feet	

SIEVE SIZE	% PASSING
3/4"	100
No. 4	99
No. 10	95
No. 40	48
No. 100	13
No. 200	9.4



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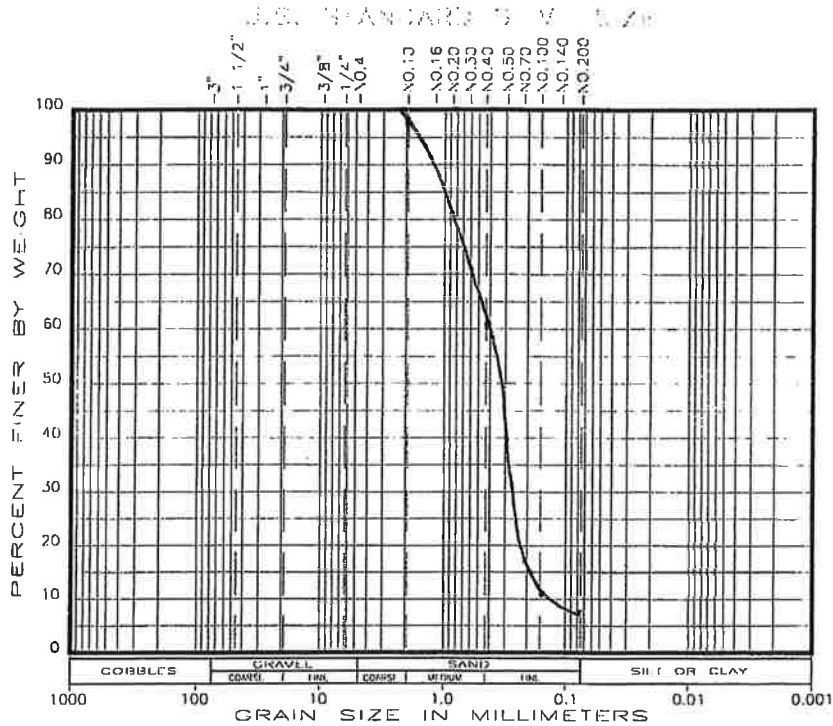
Lawrence J. Marcik, Jr., P.E.
 DESIGN EARTH TECHNOLOGY

Date:	December 13, 2014	Project No.:	2014-21
Test By:	LJM, Jr.	Checked By:	LJM, Jr.
Project:	Proposed Verizon Wireless Communications Facilities at Southington - East Street		
	99 east street, Southington, Connecticut		
Prepared For:	Centek Engineering, Inc.		

GA-5

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REPORT OF GRADATION ANALYSIS



BORING NO. 1	SAMPLE NO. 24
ORIGIN OF MATERIAL: From Split Spoon Sampler	
VISUAL CLASSIFICATION: Medium to Fine Sand, Trace Coarse Sand, Trace Silt/Clay	
PROPOSED USE: Foundation Soil	
ASTM METHOD USED: D422	
DEVIATION FROM ASTM METHOD: Washed through the Nos. 100 & 200 sieves	
DESCRIPTION OF SAMPLING PROCEDURE USED: Split Spoon Sampler	
DESCRIPTION OF ANY MEASUREMENT UNCERTAINTY: NONE	
REMARKS: 1. Depth of sample 47 to 49 feet	

SIEVE SIZE	% PASSING
3/4"	100
No. 4	100
No. 10	99
No. 40	61
No. 100	11
No. 200	7.2



**DESIGN EARTH
TECHNOLOGY**
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Phone/Fax: (203) 458-9806
Email: docdirt@aol.com

RESPECTFULLY SUBMITTED,

Lawrence J. Marcik, Jr., P.E.

Lawrence J. Marcik, Jr., P.E.
DESIGN EARTH TECHNOLOGY

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Date:	December 13, 2014	Project No.:	2014-21
Test By:	LJM, Jr.	Checked By:	LJM, Jr.
Project:	Proposed Verizon Wireless Communications		
	Facilities at Southington - East Street		
	99 east street, Southington, Connecticut		
Prepared For:	Centek Engineering, Inc.		

GA-6

PHOTOGRAPHS

PHOTOGRAPHS



TYPICAL DRILLING OPERATIONS AT BORING No.1



TYPICAL RESISTIVITY TESTING

90' PINE TREE POLE (Extendable To 110') VERIZON WIRELESS SOUTHINGTON EAST HARTFORD COUNTY, CT

TABLE OF CONTENTS

- T1 - BILL OF MATERIAL & NOTES
- S1 - ELEVATION VIEW & DETAILS
- S2 - DETAILS
- S3 - BRANCH ORIENTATION & ELEVATION
- ABT - ANCHOR BOLTS & TEMPLATES

SYMBOL LEGEND

- AGL = ABOVE GROUND LEVEL
- BC = BOLT CIRCLE
- CL = CENTERLINE
- ELEV = ELEVATION
- (E) = EXISTING
- FW = FIELD VERIFY
- 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-222-G FOR 100 MPH 3 SECOND GUST WIND SPEED.
STRUCTURE CLASSIFICATION - III
EXPOSURE - C
TOPOGRAPHIC CATEGORY - I

COATING NOTES

1. ALL APPLICABLE MATERIALS SHALL BE HOT DIPPED GALVANIZED PER ASTM A153. ALL HARDWARE SHALL BE HOT DIPPED GALVANIZED PER ASTM A563, UNLESS OTHERWISE NOTED.

STRUCTURE NOTES

1. THE ORIENTATION OF THE MONOPOLE SHALL BE VERIFIED PRIOR TO INSTALLATION.
2. FOR MULTIPLE SECTION MONOPOLES:
4.1. FOR PROPER SECTION TO SECTION ALIGNMENT A Z' HORIZONTAL WELD BEAD AND A MARK ARE POSITIONED ON EACH SECTION AT EACH SPICE. THE Z' HORIZONTAL WELD BEAD ARE ON THE MATCHING CORNERS. THE MARK NUMBER IS ON THE ADJACENT FLAT. THE CORNERS WITH WELD BEADS SHALL BE ADJACENT FROM TOP TO BOTTOM OF THE MONOPOLE/MARK NUMBERS SHALL BE MATCHED FOR EACH SIDE & THE DISTANCE BETWEEN TWO WELD BEADS SHOULD BE 16" (4').
- 4.2. ALL CORNERS ON THE MONOPOLE SHALL BE JACKED TOGETHER WITH A MINIMUM JACKING FORCE OF 10,000 LB/APPLIED TO EACH SIDE. FOR MAXIMUM RESISTANCE MONOPOLES SHALL BE JACKED TOGETHER WITH A MINIMUM JACKING FORCE OF 10,000 LB/APPLIED TO EACH SIDE. FOR ASSEMBLY & ERECTION PROCEDURES.
- 4.3. FIELD ASSEMBLY JACKING BOLTS FOR JACKING SECTIONS TOGETHER ARE LOCATED ON OPPOSING SECTION FLATS ABOVE AND BELOW THE SPICES. ALL JACKING EQUIPMENT SHALL BE SUPPLIED BY THE INSTALLER.
- 4.4. ALL LONGITUDINAL SEAM WELDS WITHIN THE SPLICE 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 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.

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

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

8. ANCHOR BOLTS 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 BOLTS: A615-GR55 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 80" HIGH LETTERS).

BILL OF MATERIALS

Item	Part Number	Qty	Description	Weight Per 1	Wt Per Row
1	17382-E01-GS-01	1	SHAFT ASSY. (TOP SECTION)	6971.42	6,971.42
2	17382-E01-GS-01	1	SHAFT ASSY. (BOTTOM SECTION)	17329.16	17,329.16
3	K10994A	1	12' LOW PROFILE ANTENNA PLATFORM	1,104.78	1,104.78
4	K12060	15	8'-6" ADJUSTABLE ANTENNA MOUNT	43.58	653.70
5	K10462	1	UNIVERSAL BRACKET (22" to 36" A.F.)	343.14	343.14
6	K10062	1	BUSS BAR	7.50	7.50
7	17382-E01-P36-01	1	COVER PLATE	43.78	43.78
8	PA-CPB-FSC-0129	39	FULL SIZE CURVED PINE BRANCH		
9	PA-CPB-HSC-0128	17	HALF SIZE PINE BRANCH		
10	PA-CPB-BSH-0130	52	PINE BUSHELS		
11	K12245	9	T-ARM BRANCH RECEPTOR 45°	17.62	158.58
12	WA14156	4	2'-0" BRANCH EXTENDER	13.32	53.28
13	WA14145	2	3'-0" BRANCH EXTENDER	19.79	39.58
14	WA14149	13	4'-0" BRANCH EXTENDER w/BUSHELS	27.69	359.97
15	K-----	4	BOLT ON BRANCH RECEPTOR @ 55° ANGLE		
16	K12139	4	BOLT ON BRANCH RECEPTOR @ 35° ANGLE	16.89	67.56
17	K10333	1	7'-0" LIGHTNING ROD KIT	28.60	28.60
18			FULLY PAINTED RICH BROWN		
19					
20					
30	DBL90	1	HARDWARE STARTS HERE		
31	S10006	65	90-0" SAFETY CLIMB KIT		
32				1.08	70.20
33					
34	K11497	5	10" x 30" ACCESS PORT COVER PLATE & BOLTS	31.39	156.95
35	K11499	9	6" x 18" HANDHOLE COVER PLATE & BOLTS	10.48	94.32
36	BX-A325-G-1.00 x 3.00	4	1"Ø x 3" HEX BOLT (A325) w/ (1) HRN AT 94-2R, (1) FW F438, 5/16" TK WASHER & (1) PALNUT	2.44	9.76
37	BX-GR5-G-500x6.00	99	Ø1/2" x 6" TAP BOLT (GR5) w/ (1) HEX NUT, (2) FW & (1) LW	0.40	39.60
38	SPH-SST-NFN-25x1.5	55	Ø1/4" - 14 - 7/16" SELF DRILL SCREW		
40	ANCHOR BOLT	1	FOR ANCHOR BOLTS REFER TO DWG. 17382-E01-ABT		
				STRUCTURE BLACK WEIGHT	20,560.46
				STRUCTURE GALV WEIGHT	21,794.09

90' PINE TREE POLE
(Extendable To 110')
VERIZON WIRELESS
SOUTHINGTON EAST
HARTFORD COUNTY, CT
BILL OF MATERIALS & NOTES

17382-E01-T1



2/11/15

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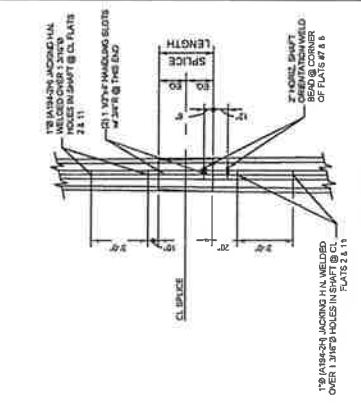
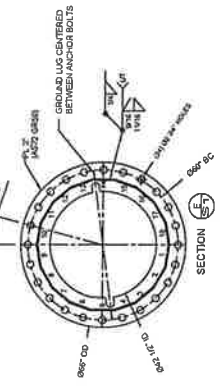
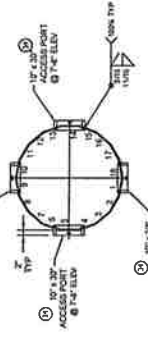
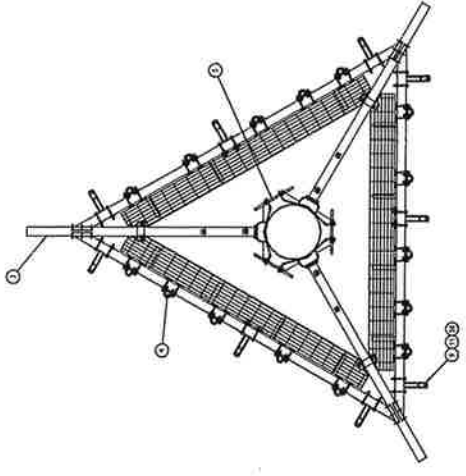
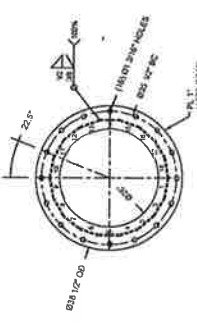
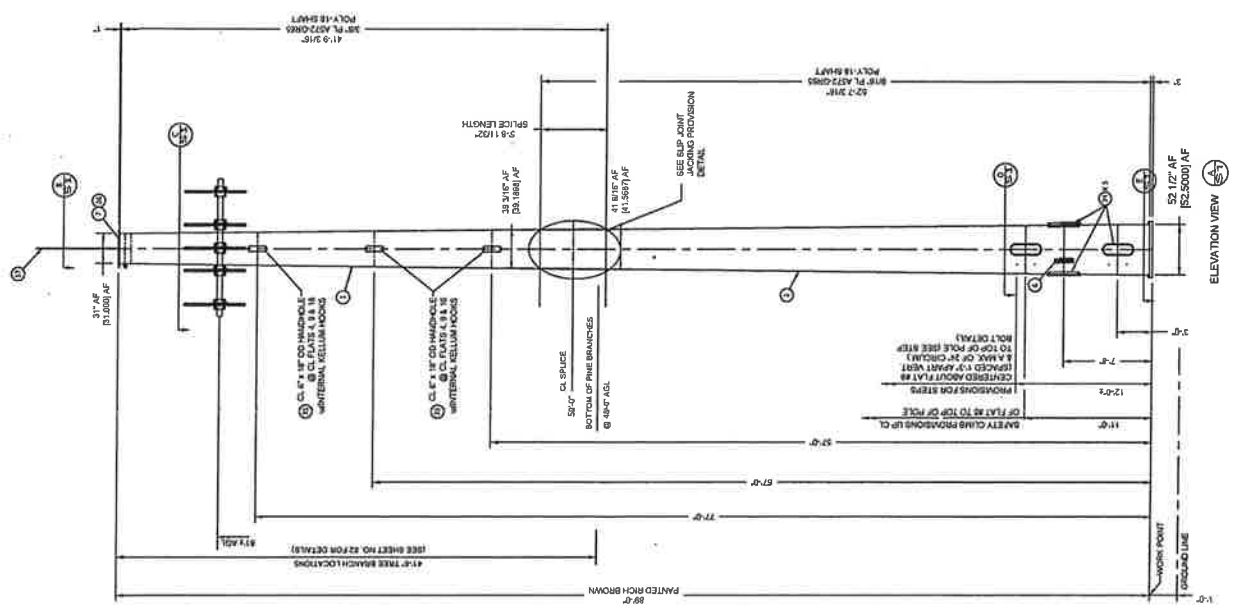
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REVISION HISTORY

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1	2/11/15	BWS	BUILD FOR APPROVAL
2	3/11/15	BWS	REVISED DESIGN

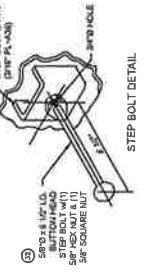
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CHECKED BY: [BLANK]
PROJECT NUMBER: 17382

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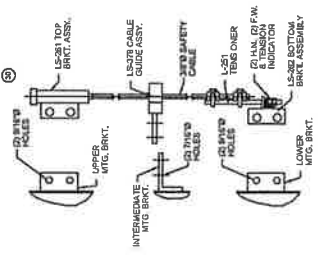


SLIP JOINT JACKING PROVISION DETAIL

NOTE: SEE REQUIRED TOLERANCES AT SLIP JOINTS AND THE ELEVATION AND ERECTION PROCEDURES.



STEP BOLT DETAIL



SAFETY CLIMB ATTACHMENT DETAILS
(LOCATED TO TOP OF POLE)



2/11/15

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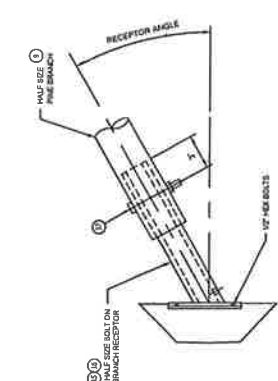
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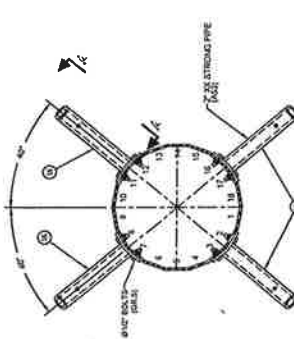
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1	3/7/15	MMH	REVISED DESIGN

90' PINE TREE POLE
(Extendable To 110')
VERIZON WIRELESS
SOUTHINGTON EAST
HARTFORD COUNTY, CT
ELEVATION & DETAILS

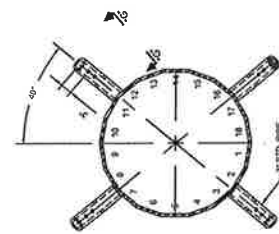
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RVM	1/30/15	17382
DRAWING NUMBER	17382-E01-S1	



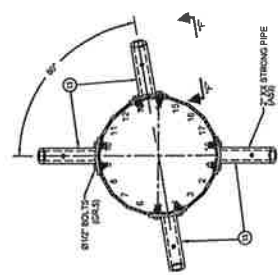
VIEW "E"
INSTALL BRANCH RECEPTOR
BEFORE ERECTING POLE



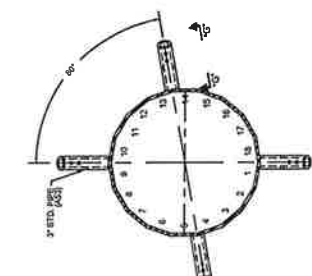
TYPICAL BRANCH RECEPTOR
INSTALL BEFORE ERECTING POLE



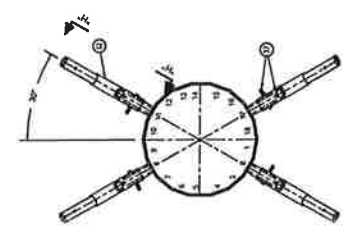
TYPICAL BRANCH RECEPTOR
DETAIL #4



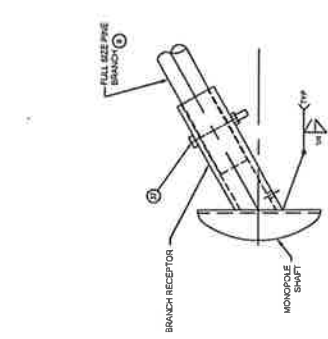
TYPICAL BRANCH RECEPTOR
DETAIL #1
INSTALL BEFORE ERECTING POLE



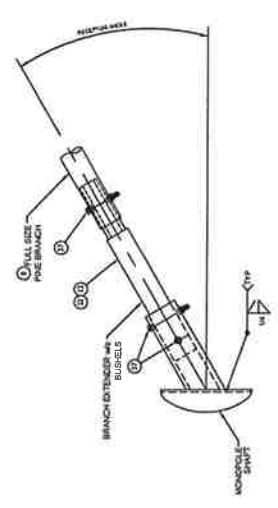
TYPICAL BRANCH RECEPTOR
DETAIL #3



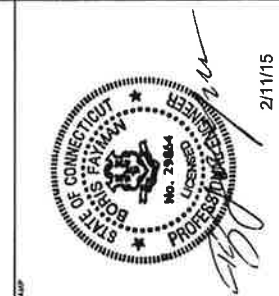
TYPICAL BOLT-ON BRANCH EXTENDER w/6 BUSHELS
DETAIL #5



VIEW "C-C"



VIEW "H-H"



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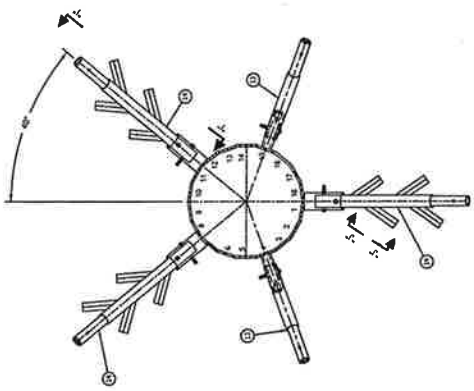
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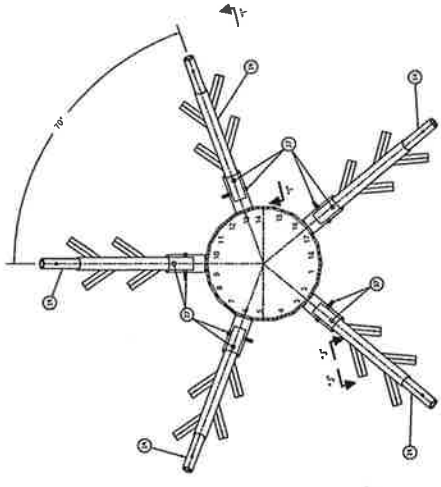
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90' PINE TREE POLE
(Extendable To 110')
VERIZON WIRELESS
SOUTHINGTON EAST
HARTFORD COUNTY, CT
SECTIONS & DETAILS

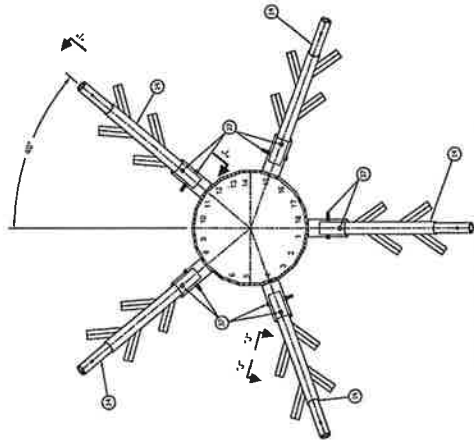
DRAWN BY	STATUS	PROJECT NUMBER
R/W	1/20/15	17382
CHECKED BY		
DRAWING NUMBER		17382-E01-S2



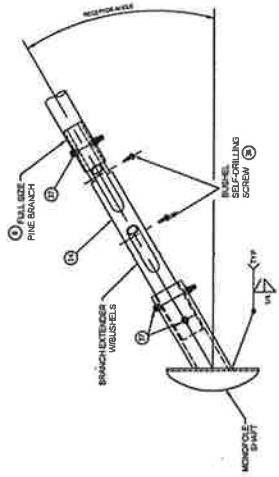
TYPICAL BOLT-ON BRANCH EXTENDER WITH & WITHOUT BUSHELS
DETAIL #6



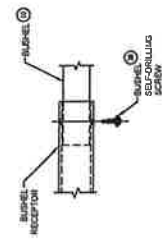
TYPICAL BOLT-ON BRANCH EXTENDER WITH BUSHELS
DETAIL #7



TYPICAL BOLT-ON BRANCH EXTENDER WITHOUT BUSHELS
DETAIL #8



VIEW 'Y-Y'



VIEW 'J-J'

PINE TREE CURVED BRANCH RECEPTOR LOCATIONS

BRANCH ELEV.	DIST FROM TOP	RECEPTOR ANGLE	RECEPTOR ORIENTATION	QUANTITY AT THIS ELEVATION	BRANCH PART #	DETAIL #
88'-6"	0'-6"	55°	0, 80, 180, 260	4	PA-CPB-HSC-0128	DETAIL 1
87'-0"	2'-0"	35°	40, 140, 220, 320	4	PA-CPB-HSC-0128	DETAIL 2
83'-0"	6'-0"	28°	0, 80, 180, 260	4	PA-CPB-FSC-0129	DETAIL 3
79'-0"	10'-0"	45°	ON PLATFORM	9	PA-CPB-HSC-0128	SEE SECTION C
75'-0"	14'-0"	30°	40, 140, 220, 320	4	PA-CPB-FSC-0129	DETAIL 4
71'-0"	18'-0"	28°	0, 80, 180, 260	4	PA-CPB-FSC-0129	DETAIL 3
67'-0"	22'-0"	26°	40, 140, 220, 320	4	PA-CPB-FSC-0129	DETAIL 4
63'-0"	26'-0"	24°	0, 80, 180, 260	4	PA-CPB-FSC-0129	DETAIL 3
59'-0"	30'-0"	22°	30, 150, 210, 330	4	PA-CPB-FSC-0129	DETAIL 5
55'-0"	34'-0"	18°	40, 180, 320	3	PA-CPB-FSC-0129	DETAIL 7
55'-0"	34'-0"	20°	110, 250	2	PA-CPB-FSC-0129	DETAIL 7
51'-0"	38'-0"	18°	0, 140, 280	3	PA-CPB-FSC-0129	DETAIL 8
51'-0"	38'-0"	15°	70, 220	2	PA-CPB-FSC-0129	DETAIL 8
47'-0"	42'-0"	15°	40, 160, 320	3	PA-CPB-FSC-0129	DETAIL 9
47'-0"	42'-0"	18°	110, 250	2	PA-CPB-FSC-0129	DETAIL 9



2/11/15

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REV #	DATE	BY	DESCRIPTION
1			ISSUED FOR APPROVAL
2			REVISED DESIGN

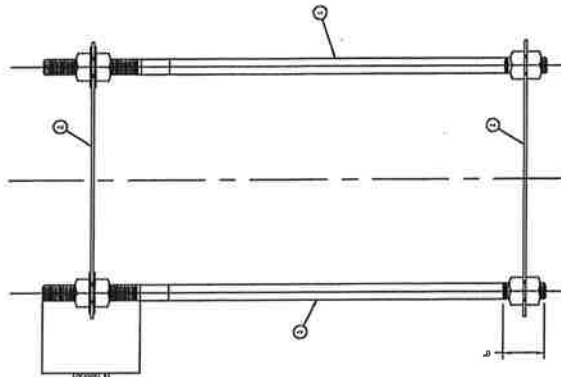
90' PINE TREE POLE
(Extendable To 110')
VERTIX WIRELESS
SOUTHINGTON EAST
HARTFORD COUNTY, CT
BRANCH ORIENTATION & ELEVATION

DRAWN BY: [Blank]
REVISED BY: [Blank]
DATE: 1/20/15
PROJECT NUMBER: 17382-E01-S3
DRAWING NUMBER: 17382-E01-S3

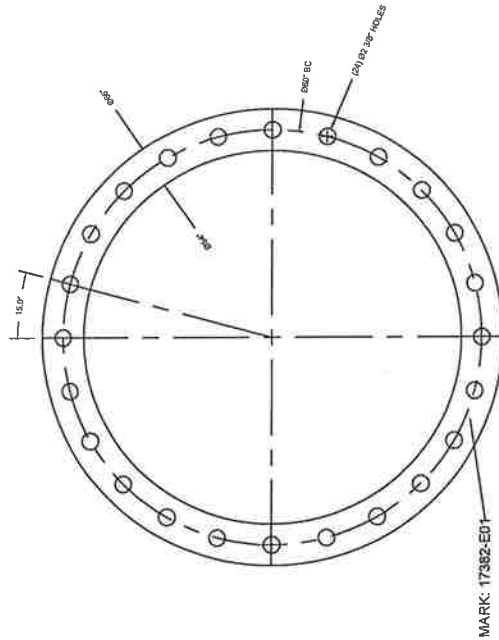
BILL OF MATERIALS

Rev	Item	Part Number	Qty	Description	Weight Ppl	Vol Ppl Row
1	2.25	AB6.0-DE	24	2 1/4" x 6.0" U.S. (ASTM A307) ANCHOR RODS WITH HEX NUTS (A194-GR50) & (2) FLAT WASHERS (F436)	95.70	2.2916 80
2	24	60.0-2.25	2	TOP & BOTTOM SETTING TEMPLATE	100.00	210.00
UNCAGED ANCHOR RODS & TEMPLATE WEIGHT						

PROJECTIONS OF 1/4" ABOVE CONCRETE ENTIRE BOLT AND ALL NUTS & WASHERS GALVANIZED PER ASTM A153.



ANCHOR BOLT CAGE ASSEMBLY (A/B/C)



MARK: 17382-E01

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

STAMP

ENGINEERED ENDEAVORS

The Designer/Peer or User
10875 Clearwater Highway, CT 06455-9787
Farmington, CT 06031
Tel: (404) 552-5284 Fax: (404) 552-5288 www.enr.com

FOR REVIEW

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REVISION HISTORY

REV #	DATE	BY	DESCRIPTION
1	2/20/15	RWH	ISSUED FOR APPROVAL
2	2/27/15	RWH	REWORK DESIGN

90" PINE TREE POLE (Extendable To 110')
VERIZON WIRELESS
SOUTHINGTON EAST
HARTFORD COUNTY, CT
ANCHOR BOLTS & TEMPLATES

DRAWN BY: RWH
CHECKED BY: JCB/15
PROJECT NUMBER: 17382
DRAWING NUMBER: 17382-E01-ABT

FOUNDATION LOADING	
MOMENT	7050 kip-ft
SHEAR	86.3 kips
AXIAL	56.5 kips

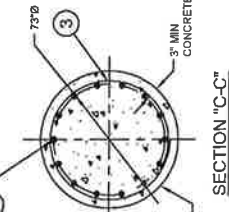
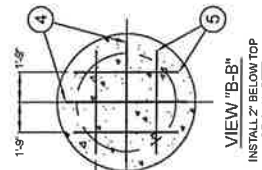
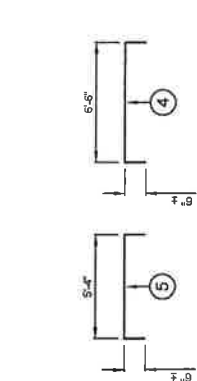
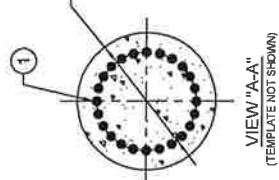
MATERIAL LIST		
ITEM	QTY.	DESCRIPTION
1	24	2 1/4"Ø x 6'-0" (A515-GR75) ANCHOR BOLTS
2	36	#11 REBAR x 31'-5" (ASTM A615-GR.60)
3	39	#5 REBAR x 20'-8" (ASTM A615-GR.60)
4	2	#6 REBAR x 7'-5" (ASTM A615-GR.60)
5	4	#5 REBAR x 6'-4" (ASTM A615-GR.60)

VOL. CONCRETE @ 4000 psi (TYPE II CEMENT)	46 yd ³
STEEL (ASTM A615-GR.60)	7265 lb

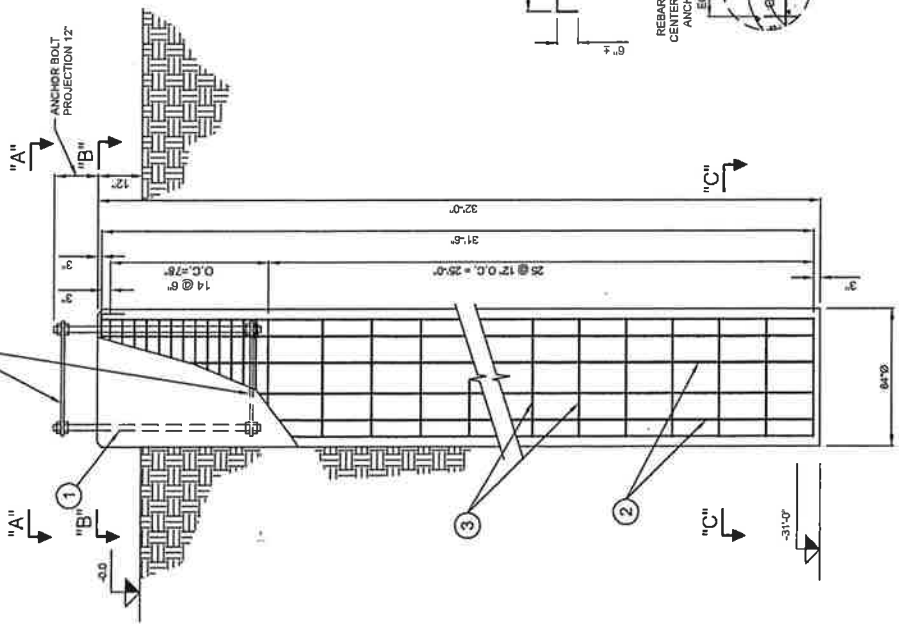
GENERAL NOTES:

- FOUNDATION DESIGN IS BASED ON THE FOLLOWING: EEL JOB# 17362, DRAWING 17362-001, SOIL REPORT BY DESIGN EARTH TECHNOLOGY, REPORT NO. 201421 - 12132014.
- 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. STEEL CASING SLS SURVEY METHOD MAY BE REQUIRED TO PREVENT SOIL FROM CAVING DURING CONSTRUCTION. THE CASING SHOULD BE REMOVED AFTER COMPLETION OF CONCRETING OR, IF LEFT IN THE GROUND, ALL VOIDS AROUND THE CASING SHALL BE FILLED WITH PRESSURIZED GROUT.
- THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES.
- SPECIAL INSPECTION IS REQUIRED IN ACCORDANCE WITH 2009 IBC CHAPTER 17, SECTION 1704.
 - SOIL
 - 5.1.a. FOUNDATION EXCAVATION SHALL BE INSPECTED PRIOR TO INSTALLATION OF REINFORCEMENT.
 - 5.1.b. VERIFY DEPTH AND DIAMETER OF THE EXCAVATION.
 - 5.1.c. VERIFY ACTUAL SOIL CONDITIONS AGAINST THE GEOTECHNICAL REPORT.
- REINFORCING STEEL
 - 5.2.a. VERIFY GRADE, LENGTH, DIAMETER, AND QUANTITY OF ANCHOR BOLTS AND BOLT PATTERN ON THE TEMPLATES.
 - 5.2.b. VERIFY GRADE, LENGTH, DIAMETER, AND QUANTITY OF ANCHOR BOLTS AND BOLT PATTERN ON THE TEMPLATES.
 - 5.3. CONCRETE
 - 5.3.a. VERIFY STRENGTH, SLUMP, AIR, TEMPERATURE OF CONCRETE, AND DESIGN MIX.
- REINFORCING STEEL
 - 6.1. REINFORCING STEEL SHALL CONFORM TO ASTM A615-07, Fy=60 ksi.
 - 6.2. ALL REINFORCEMENT SHALL BE ASSEMBLED USING STEEL WIRE WELDING IS NOT PERMITTED.
 - 6.3. SPICE LENGTH FOR LONGITUDINAL BARS: NO. 6 BARS AND SMALLER - 4d x 0.60; NO. 7 BARS AND LARGER - 5d x 0.60.
 - 6.4. HORIZONTAL STIRRUPS SHALL BE STAGGERED ALONG THE REBAR CAGE WITH NO MORE THAN 50% OF SPLICES IN ONE PLACE.
- CONCRETE
 - 7.1. FOUNDATION AND CONSTRUCTION PROCEDURE SHALL BE IN COMPLIANCE WITH ACI 318-05, ACI 308.3R-05, AND ALL APPLICABLE STATE AND LOCAL CODES.
 - 7.2. MINIMUM COMPRESSIVE STRENGTH - 4000 psi AT 28 DAYS AND TYPE II CEMENT SHALL BE USED UNLESS STATED OTHERWISE.
 - 7.3. SLUMP: DRILLED PIER - 7" (±1"), MAT FOUNDATION - 3" (±1").
 - 7.4. CONCRETE SHALL BE DEPOSITED AS NEARLY AS PRACTICAL IN ITS FINAL POSITION TO AVOID SEGREGATION DUE TO SEPARATION.
 - 7.5. 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.

ACCESS PORTS TO BE LOCATED BETWEEN ANCHOR BOLTS



- ANCHOR BOLTS SHALL BE ATTACHED w/ (2) HEX NUTS TO BOTH TEMPLATES
- ANCHOR BOLTS SHALL BE INSTALLED w/ LONGER THREADED END UP.

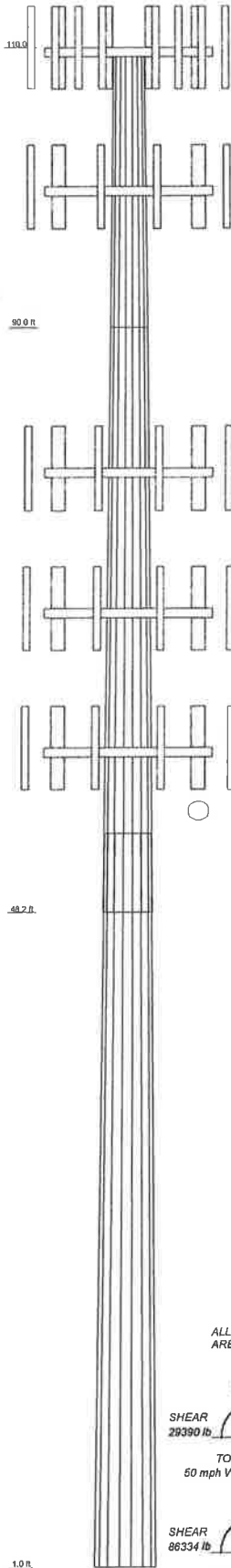


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VERIZON WIRELESS	
90'-0" PINE TREE POLE	
SOUTHINGTON EAST	
HARTFORD COUNTY, CT	
SCALE: N.T.S.	PROJECT NO. 17362
SHEET 1 of 1	DRAWING NO. 17362D-90.0

REV	DESCRIPTION	DATE	DWN	CHK
0	COMPLETED DRAWING		AM	

Section	3	2	1
Length (ft)	52.85	41.85	20.00
Number of Stakes	18	18	18
Thickness (in)	0.5625	0.3750	0.2500
Socket Length (ft)	39.3645	5.69	25.8679
Top Dia (in)	52.5000	41.5500	31.0000
Bot Dia (in)	1.4551.4	6004.6	1524.4
Grade	A57.405		
Weight (lb)	22172.4		



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Pine Branches	113	RRH2x40 AVS (25'x11'x7')	90
(3) EE 12 T-Arms (K10403)	110	DB-T1-6Z-8AB-0Z	90
(4) OPA-65R-LCLU-HB W/MOUNTING PIPE	110	EE 12 Low-Profile Platform (K105949)	90
(4) OPA-65R-LCLU-HB W/MOUNTING PIPE	110	(2) HBX-6517DS-VTM W/MOUNT PIPE	80
(4) OPA-65R-LCLU-HB W/MOUNTING PIPE	110	(2) HBX-6517DS-VTM W/MOUNT PIPE	80
(9) RRUS-11	110	Pine Branches	78
(9) RRUS-11	110	Pine Branches	73
(9) RRUS-11	110	(2) LNX-6514DS-VTM W/MOUNTING PIPE	70
(2) OCS-48-60-18-8F	110	(2) LNX-6514DS-VTM W/MOUNTING PIPE	70
OCS-48-60-18-8F	110	RRH2x40 GF-U	70
OCS-48-60-18-8F	110	RRH2x40 GF-U	70
Pine Branches	108	RRH2x40 GF-U	70
Pine Branches	103	RRH2x40 AVS (25'x11'x7')	70
(3) EE 12 T-Arms (K10403)	100	RRH2x40 AVS (25'x11'x7')	70
(2) HBX-6517DS-VTM W/MOUNT PIPE	100	RRH2x40 AVS (25'x11'x7')	70
(2) HBX-6517DS-VTM W/MOUNT PIPE	100	DB-T1-6Z-8AB-0Z	70
(2) HBX-6517DS-VTM W/MOUNT PIPE	100	(3) EE 12 T-Arms (K10403)	70
(2) LNX-6514DS-VTM W/MOUNTING PIPE	100	(2) HBX-6517DS-VTM W/MOUNT PIPE	70
(2) LNX-6514DS-VTM W/MOUNTING PIPE	100	(2) HBX-6517DS-VTM W/MOUNT PIPE	70
(2) LNX-6514DS-VTM W/MOUNTING PIPE	100	(2) HBX-6517DS-VTM W/MOUNT PIPE	70
RRH2x40 GF-U	100	(2) LNX-6514DS-VTM W/MOUNTING PIPE	70
RRH2x40 GF-U	100	Pine Branches	68
RRH2x40 GF-U	100	Pine Branches	63
RRH2x40 AVS (25'x11'x7')	100	RRH2x40 GF-U	60
RRH2x40 AVS (25'x11'x7')	100	RRH2x40 GF-U	60
DB-T1-6Z-8AB-0Z	100	RRH2x40 GF-U	60
Pine Branches	98	RRH2x40 AVS (25'x11'x7')	60
Pine Branches	93	RRH2x40 AVS (25'x11'x7')	60
Pine Branches	88	DB-T1-6Z-8AB-0Z	60
Pine Branches	83	(3) EE 12 T-Arms (K10403)	60
(2) HBX-6517DS-VTM W/MOUNT PIPE	80	(2) HBX-6517DS-VTM W/MOUNT PIPE	60
(2) LNX-6514DS-VTM W/MOUNTING PIPE	80	(2) HBX-6517DS-VTM W/MOUNT PIPE	60
(2) LNX-6514DS-VTM W/MOUNTING PIPE	80	(2) HBX-6517DS-VTM W/MOUNT PIPE	60
(2) LNX-6514DS-VTM W/MOUNTING PIPE	80	(2) LNX-6514DS-VTM W/MOUNTING PIPE	60
RRH2x40 GF-U	80	(2) LNX-6514DS-VTM W/MOUNTING PIPE	60
RRH2x40 GF-U	80	(2) LNX-6514DS-VTM W/MOUNTING PIPE	60
RRH2x40 GF-U	80	Pine Branches	58
RRH2x40 AVS (25'x11'x7')	80	Pine Branches	53
RRH2x40 AVS (25'x11'x7')	80	Pine Branches	48

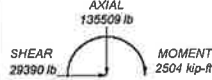
MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 100 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 III.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 97%

ALL REACTIONS ARE FACTORED



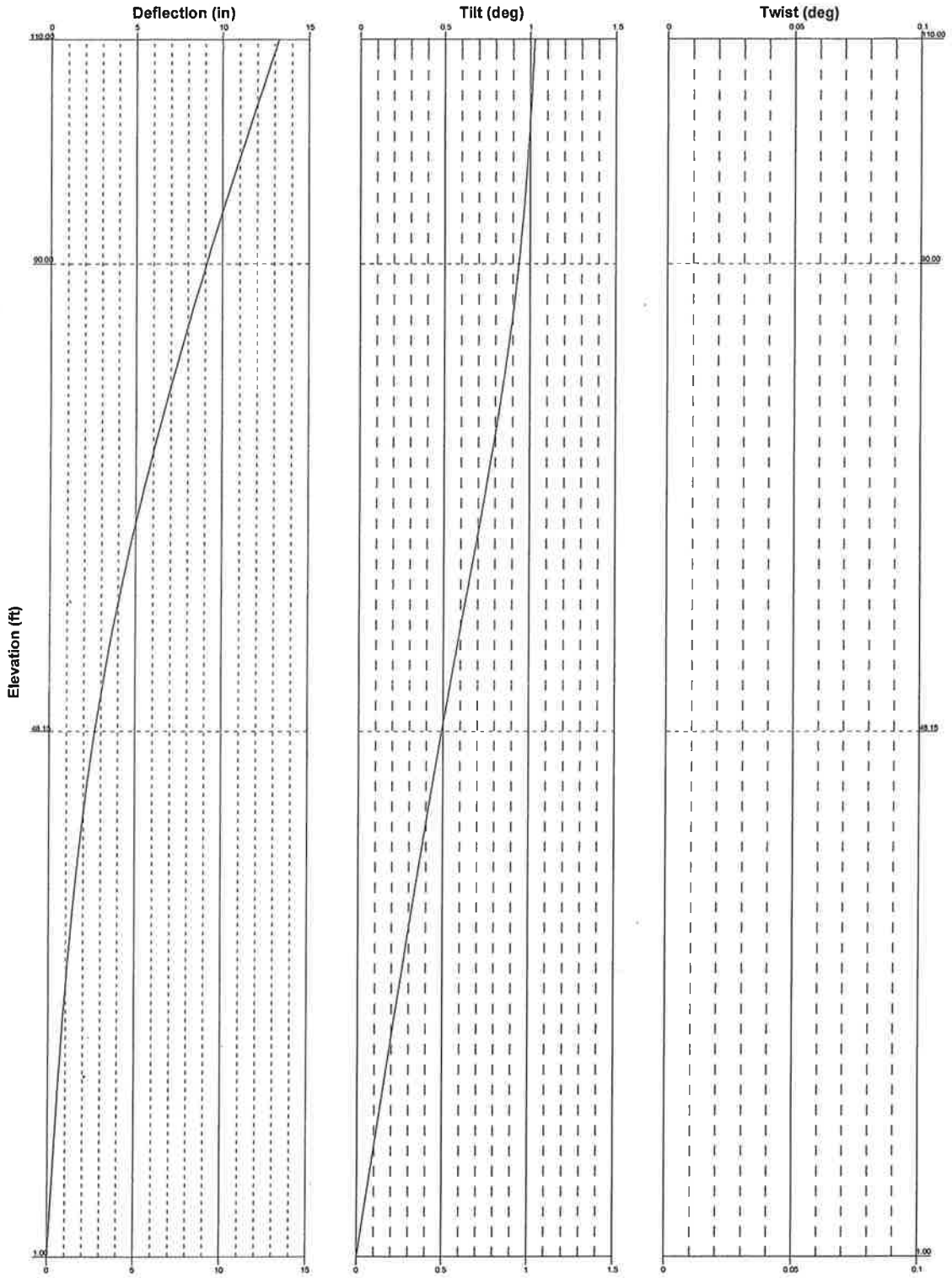
TORQUE 0 kip-ft
50 mph WIND - 1.0000 in ICE



TORQUE 1 kip-ft
REACTIONS - 100 mph WIND



<p>Engineered Endeavors 10975 Kinsman Rd Newbury, OH 44085 Phone: (440) 584-5484 FAX: (440) 584-5489</p>	<p>EET Job #17382/Southington East</p>
	<p>Project: 90' Pine Tree Pole (Extendable To 110')</p>
	<p>Client: Centek Drawn by Aleksandar Mrkajic</p>
	<p>Code: TIA-222-G Date: 02/08/15</p>
	<p>Scale: NTS Path: L:\06011000\17382-01-TRUCK POLE\DWG\ETL17382.dwg Dwg No: E-1</p>



	Engineered Endeavors		EEL Job #17382/Southington East		
	10875 Kinsman Rd		Project: 90° Pine Tree Pole (Extendable To 110')		
	Newbury, OH 44065		Client: Centek	Drawn by: Aleksandar Mrkajic	App'd:
	Phone: (440) 584-5484		Code: TIA-222-G	Date: 02/08/15	Scale: NTS
	FAX: (440) 584-5489		Path: I:\0811\2014\11282-27-TREE POLE-920VCTU128144	Dwg No: E-5	



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 Newbury, OH 44065
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 FAX: (440) 564-5489

Job	EEI Job #17382/Southington East	Page	1 of 20
Project	90' Pine Tree Pole (Extendable To 110')	Date	09:47:07 02/06/15
Client	Centek	Designed by	Aleksandar Mrkajic

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 Hartford County, Connecticut.
- Basic wind speed of 100 mph.
- Structure Class III.
- 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

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retention Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. Autocalc Torque Arm Areas SR Members Have Cut Ends Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Use TIA-222-G Tension Splice Capacity Exemption | <ul style="list-style-type: none"> Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation Consider Feedline Torque √ Include Angle Block Shear Check Poles Include Shear-Torsion Interaction 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	110.00-90.00	20.00	0.00	18	25.9579	31.0000	0.2500	1.0000	A572-65 (65000 psi)
L2	90.00-48.15	41.85	5.69	18	31.0000	41.5500	0.3750	1.5000	A572-65 (65000 psi)
L3	48.15-1.00	52.85		18	39.3645	52.5000	0.5625	2.2500	A572-65



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Job	EEI Job #17382/Southington East	Page	2 of 20
Project	90' Pine Tree Pole (Extendable To 110')	Date	09:47:07 02/06/15
Client	Centek	Designed by	Aleksandar Mrkajic

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
									(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	26.3583	20.3992	1703.264	9.1263	13.1866	129.1664	3408.770	10.2015	4.1286	16.514
	31.4782	24.4001	2914.873	10.9163	15.7480	185.0949	5833.582	12.2024	5.0160	20.064
L2	31.4782	36.4514	4319.206	10.8719	15.7480	274.2701	8644.095	18.2292	4.7960	12.789
	42.1910	49.0085	10497.27	14.6171	21.1074	497.3266	21008.35	24.5089	6.6528	17.741
L3	41.4089	69.2761	13177.37	13.7747	19.9972	658.9624	26372.09	34.6446	5.9382	10.557
	53.3099	92.7279	31601.66	18.4378	26.6700	1184.914	63244.92	46.3728	8.2500	14.667

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
ft	ft ²	in						
L1 110.00-90.00				1	1	1		
L2 90.00-48.15				1	1	1		
L3 48.15-1.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Shield	Allow Shield	Component Type	Placement ft	Total Number	C.A.A	Weight
	g	d			r	ft ² /ft	plf
AVA7-50 (1-5/8 LOW DENS. FOAM)	C	No	Inside Pole	110.00 - 4.00	10	No Ice	0.72
						1/2" Ice	0.72
						1" Ice	0.72
AVA7-50 (1-5/8 LOW DENS. FOAM)	C	No	Inside Pole	100.00 - 4.00	14	No Ice	0.72
						1/2" Ice	0.72
						1" Ice	0.72
AVA7-50 (1-5/8 LOW DENS. FOAM)	C	No	Inside Pole	80.00 - 4.00	14	No Ice	0.72
						1/2" Ice	0.72
						1" Ice	0.72
AVA7-50 (1-5/8 LOW DENS. FOAM)	C	No	Inside Pole	70.00 - 4.00	14	No Ice	0.72
						1/2" Ice	0.72



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Job	E EI Job #17382/Southington East	Page	3 of 20
Project	90' Pine Tree Pole (Extendable To 110')	Date	09:47:07 02/06/15
Client	Centek	Designed by	Aleksandar Mrkajic

Description	Face or Leg	Allow Shiel d	Component Type	Placement ft	Total Number	C _{AA}	Weight plf
AVA7-50 (1-5/8 LOW DENSIF, FOAM)	C	No	Inside Pole	60.00 - 4.00	14	1" Ice	0.72
						No Ice	0.00
						1/2" Ice	0.00
						1" Ice	0.00

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	110.00-90.00	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	244.80
L2	90.00-48.15	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	1383.77
L3	48.15-1.00	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	2098.15

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	110.00-90.00	A	2.792	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	244.80
L2	90.00-48.15	A	2.689	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	1383.77
L3	48.15-1.00	A	2.428	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	2098.15

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
L1	110.00-90.00	0.0000	0.0000	0.0000	0.0000
L2	90.00-48.15	0.0000	0.0000	0.0000	0.0000
L3	48.15-1.00	0.0000	0.0000	0.0000	0.0000



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Job	EEI Job #17382/Southington East	Page	4 of 20
Project	90' Pine Tree Pole (Extendable To 110')	Date	09:47:07 02/06/15
Client	Centek	Designed by	Aleksandar Mrkajic

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: Horiz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb	
Pine Branches	C	None		0.00	113.00	No Ice	45.00	45.00	600.00
						Ice 1/2"	65.00	65.00	800.00
						Ice 1"	85.00	85.00	1000.00
						Ice 1"			
Pine Branches	C	None		0.00	108.00	No Ice	45.00	45.00	600.00
						Ice 1/2"	65.00	65.00	800.00
						Ice 1"	85.00	85.00	1000.00
						Ice 1"			
Pine Branches	C	None		0.00	103.00	No Ice	45.00	45.00	600.00
						Ice 1/2"	65.00	65.00	800.00
						Ice 1"	85.00	85.00	1000.00
						Ice 1"			
Pine Branches	C	None		0.00	98.00	No Ice	45.00	45.00	600.00
						Ice 1/2"	65.00	65.00	800.00
						Ice 1"	85.00	85.00	1000.00
						Ice 1"			
Pine Branches	C	None		0.00	93.00	No Ice	45.00	45.00	600.00
						Ice 1/2"	65.00	65.00	800.00
						Ice 1"	85.00	85.00	1000.00
						Ice 1"			
Pine Branches	C	None		0.00	88.00	No Ice	45.00	45.00	600.00
						Ice 1/2"	65.00	65.00	800.00
						Ice 1"	85.00	85.00	1000.00
						Ice 1"			
Pine Branches	C	None		0.00	83.00	No Ice	45.00	45.00	600.00
						Ice 1/2"	65.00	65.00	800.00
						Ice 1"	85.00	85.00	1000.00
						Ice 1"			
Pine Branches	C	None		0.00	78.00	No Ice	45.00	45.00	600.00
						Ice 1/2"	65.00	65.00	800.00
						Ice 1"	85.00	85.00	1000.00
						Ice 1"			



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Job	EEI Job #17382/Southington East	Page	5 of 20
Project	90' Pine Tree Pole (Extendable To 110')	Date	09:47:07 02/06/15
Client	Centek	Designed by	Aleksandar Mrkajic

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
Pine Branches	C	None		0.00	73.00	Ice No 45.00 Ice 65.00 1/2" 85.00 Ice 1" 45.00 Ice 65.00 1/2" 85.00	45.00 65.00 85.00	600.00 800.00 1000.00
Pine Branches	C	None		0.00	68.00	Ice No 45.00 Ice 65.00 1/2" 85.00 Ice 1" 45.00 Ice 65.00 1/2" 85.00	45.00 65.00 85.00	600.00 800.00 1000.00
Pine Branches	C	None		0.00	63.00	Ice No 45.00 Ice 65.00 1/2" 85.00 Ice 1" 45.00 Ice 65.00 1/2" 85.00	45.00 65.00 85.00	600.00 800.00 1000.00
Pine Branches	C	None		0.00	58.00	Ice No 45.00 Ice 65.00 1/2" 85.00 Ice 1" 45.00 Ice 65.00 1/2" 85.00	45.00 65.00 85.00	600.00 800.00 1000.00
Pine Branches	C	None		0.00	53.00	Ice No 45.00 Ice 65.00 1/2" 85.00 Ice 1" 45.00 Ice 65.00 1/2" 85.00	45.00 65.00 85.00	600.00 800.00 1000.00
Pine Branches	C	None		0.00	48.00	Ice No 45.00 Ice 65.00 1/2" 85.00 Ice 1" 45.00 Ice 65.00 1/2" 85.00	45.00 65.00 85.00	600.00 800.00 1000.00
*** (3) EE 12' T-Arms (K10463)	C	None		0.00	100.00	Ice No 20.90 Ice 26.09 1/2" 31.28 Ice 1" 20.90 Ice 26.09 1/2" 31.28	20.90 26.09 31.28	995.22 1293.79 1592.35
(2) HBX-6517DS-VTM W/MOUNT PIPE	A	From Leg	4.00 0.00 0.00	0.00	100.00	Ice No 5.37 Ice 5.86 1/2" 6.36 Ice 1" 5.37 Ice 5.86 1/2" 6.36	5.22 6.17 7.03	52.30 100.34 156.75
(2) HBX-6517DS-VTM W/MOUNT PIPE	B	From Leg	4.00 0.00 0.00	0.00	100.00	Ice No 5.37 Ice 5.86 1/2" 6.36 Ice 1" 5.37 Ice 5.86 1/2" 6.36	5.22 6.17 7.03	52.30 100.34 156.75
(2) HBX-6517DS-VTM	C	From Leg	4.00	0.00	100.00	Ice No 5.37	5.22	52.30



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Job	EEL Job #17382/Southington East	Page	6 of 20
Project	90' Pine Tree Pole (Extendable To 110')	Date	09:47:07 02/06/15
Client	Centek	Designed by	Aleksandar Mrkajic

Description	Face or Leg	Offset Type	Offsets: Horiz Lateral Vert ft ft ft	Azimuth Adjustme nt °	Placement ft	CAA Front ft ²	CAA Side ft ²	Weight lb
W/MOUNT PIPE			0.00 0.00			Ice 1/2" 5.86 Ice 6.36 Ice 1"	6.17 7.03	100.34 156.75
(2) LNX-6514DS-VTM W/MOUNTING PIPE	A	From Leg	4.00 0.00 0.00	0.00	100.00	No Ice 8.54 Ice 9.12 1/2" 9.71 Ice 1"	7.27 8.20 9.06	68.94 139.71 219.25
(2) LNX-6514DS-VTM W/MOUNTING PIPE	B	From Leg	4.00 0.00 0.00	0.00	100.00	No Ice 8.54 Ice 9.12 1/2" 9.71 Ice 1"	7.27 8.20 9.06	68.94 139.71 219.25
(2) LNX-6514DS-VTM W/MOUNTING PIPE	C	From Leg	4.00 0.00 0.00	0.00	100.00	No Ice 8.54 Ice 9.12 1/2" 9.71 Ice 1"	7.27 8.20 9.06	68.94 139.71 219.25
RRH2X40-07-U	A	From Leg	4.00 0.00 0.00	0.00	100.00	No Ice 2.25 Ice 2.45 1/2" 2.66 Ice 1"	1.23 1.39 1.55	50.00 66.85 86.39
RRH2X40-07-U	B	From Leg	4.00 0.00 0.00	0.00	100.00	No Ice 2.25 Ice 2.45 1/2" 2.66 Ice 1"	1.23 1.39 1.55	50.00 66.85 86.39
RRH2X40-07-U	C	From Leg	4.00 0.00 0.00	0.00	100.00	No Ice 2.25 Ice 2.45 1/2" 2.66 Ice 1"	1.23 1.39 1.55	50.00 66.85 86.39
RRH2x40 AWS (25"x11"x7")	A	From Leg	4.00 0.00 0.00	0.00	100.00	No Ice 2.67 Ice 2.91 1/2" 3.16 Ice 1"	1.70 1.91 2.13	55.00 73.50 94.99
RRH2x40 AWS (25"x11"x7")	B	From Leg	4.00 0.00 0.00	0.00	100.00	No Ice 2.67 Ice 2.91 1/2" 3.16 Ice 1"	1.70 1.91 2.13	55.00 73.50 94.99
RRH2x40 AWS (25"x11"x7")	C	From Leg	4.00 0.00 0.00	0.00	100.00	No Ice 2.67 Ice 2.91 1/2" 3.16 Ice 1"	1.70 1.91 2.13	55.00 73.50 94.99



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Job	EEI Job #17382/Southington East	Page	7 of 20
Project	90' Pine Tree Pole (Extendable To 110')	Date	09:47:07 02/06/15
Client	Centek	Designed by	Aleksandar Mrkajic

Description	Face or Leg	Offset Type	Offsets: Horiz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAA Front ft ²	CAA Side ft ²	Weight lb
DB-T1-6Z-8AB-0Z	C	From Leg	1.00 0.00 0.00	0.00	100.00	1" Ice No Ice 1/2" Ice 1" Ice	5.60 2.33 5.92 2.56 6.24 2.79	50.00 86.13 126.22
*** EE 12' Low-Profile Platform (K10994A)	C	None		0.00	80.00	No Ice 1/2" Ice 1" Ice	25.73 25.73 32.17 32.17 38.61 38.61	1098.42 1427.95 1757.47
(2) HBX-6517DS-VTM W/MOUNT PIPE	A	From Leg	4.00 0.00 0.00	0.00	80.00	No Ice 1/2" Ice 1" Ice	5.37 5.22 5.86 6.17 6.36 7.03	52.30 100.34 156.75
(2) HBX-6517DS-VTM W/MOUNT PIPE	B	From Leg	4.00 0.00 0.00	0.00	80.00	No Ice 1/2" Ice 1" Ice	5.37 5.22 5.86 6.17 6.36 7.03	52.30 100.34 156.75
(2) HBX-6517DS-VTM W/MOUNT PIPE	C	From Leg	4.00 0.00 0.00	0.00	80.00	No Ice 1/2" Ice 1" Ice	5.37 5.22 5.86 6.17 6.36 7.03	52.30 100.34 156.75
(2) LNX-6514DS-VTM W/MOUNTING PIPE	A	From Leg	4.00 0.00 0.00	0.00	80.00	No Ice 1/2" Ice 1" Ice	8.54 7.27 9.12 8.20 9.71 9.06	68.94 139.71 219.25
(2) LNX-6514DS-VTM W/MOUNTING PIPE	B	From Leg	4.00 0.00 0.00	0.00	80.00	No Ice 1/2" Ice 1" Ice	8.54 7.27 9.12 8.20 9.71 9.06	68.94 139.71 219.25
(2) LNX-6514DS-VTM W/MOUNTING PIPE	C	From Leg	4.00 0.00 0.00	0.00	80.00	No Ice 1/2" Ice 1" Ice	8.54 7.27 9.12 8.20 9.71 9.06	68.94 139.71 219.25
RRH2X40-07-U	A	From Leg	4.00 0.00 0.00	0.00	80.00	No Ice 1/2" Ice 1" Ice	2.25 1.23 2.45 1.39 2.66 1.55	50.00 66.85 86.39



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Job	EEl Job #17382/Southington East	Page	8 of 20
Project	90' Pine Tree Pole (Extendable To 110')	Date	09:47:07 02/06/15
Client	Centek	Designed by	Aleksandar Mrkajic

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustme nt °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb	
RRH2X40-07-U	B	From Leg	4.00 0.00 0.00	0.00	80.00	No Ice 1/2" Ice 1"	2.25 2.45 2.66	1.23 1.39 1.55	50.00 66.85 86.39
RRH2X40-07-U	C	From Leg	4.00 0.00 0.00	0.00	80.00	No Ice 1/2" Ice 1"	2.25 2.45 2.66	1.23 1.39 1.55	50.00 66.85 86.39
RRH2x40 AWS (25"x11"x7")	A	From Leg	4.00 0.00 0.00	0.00	80.00	No Ice 1/2" Ice 1"	2.67 2.91 3.16	1.70 1.91 2.13	55.00 73.50 94.99
RRH2x40 AWS (25"x11"x7")	B	From Leg	4.00 0.00 0.00	0.00	80.00	No Ice 1/2" Ice 1"	2.67 2.91 3.16	1.70 1.91 2.13	55.00 73.50 94.99
RRH2x40 AWS (25"x11"x7")	C	From Leg	4.00 0.00 0.00	0.00	80.00	No Ice 1/2" Ice 1"	2.67 2.91 3.16	1.70 1.91 2.13	55.00 73.50 94.99
DB-T1-6Z-8AB-0Z	C	From Leg	1.00 0.00 0.00	0.00	80.00	No Ice 1/2" Ice 1"	5.60 5.92 6.24	2.33 2.56 2.79	50.00 86.13 126.22
*** (3) EE 12' T-Arms (K10463)	C	None		0.00	70.00	No Ice 1/2" Ice 1"	20.90 26.09 31.28	20.90 26.09 31.28	995.22 1293.79 1592.35
(2) HBX-6517DS-VTM W/MOUNT PIPE	A	From Leg	4.00 0.00 0.00	0.00	70.00	No Ice 1/2" Ice 1"	5.37 5.86 6.36	5.22 6.17 7.03	52.30 100.34 156.75
(2) HBX-6517DS-VTM W/MOUNT PIPE	B	From Leg	4.00 0.00 0.00	0.00	70.00	No Ice 1/2" Ice 1"	5.37 5.86 6.36	5.22 6.17 7.03	52.30 100.34 156.75
(2) HBX-6517DS-VTM W/MOUNT PIPE	C	From Leg	4.00 0.00	0.00	70.00	No Ice	5.37 5.86	5.22 6.17	52.30 100.34



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Job	EEI Job #17382/Southington East	Page	9 of 20
Project	90' Pine Tree Pole (Extendable To 110')	Date	09:47:07 02/06/15
Client	Centek	Designed by	Aleksandar Mrkajic

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	
			0.00			6.36	7.03	156.75	
						1/2" Ice 1" Ice			
(2) LNX-6514DS-VTM W/MOUNTING PIPE	A	From Leg	4.00 0.00 0.00	0.00	70.00	No Ice 1/2" Ice 1" Ice	8.54 9.12 9.71	7.27 8.20 9.06	68.94 139.71 219.25
(2) LNX-6514DS-VTM W/MOUNTING PIPE	B	From Leg	4.00 0.00 0.00	0.00	70.00	No Ice 1/2" Ice 1" Ice	8.54 9.12 9.71	7.27 8.20 9.06	68.94 139.71 219.25
(2) LNX-6514DS-VTM W/MOUNTING PIPE	C	From Leg	4.00 0.00 0.00	0.00	70.00	No Ice 1/2" Ice 1" Ice	8.54 9.12 9.71	7.27 8.20 9.06	68.94 139.71 219.25
RRH2X40-07-U	A	From Leg	4.00 0.00 0.00	0.00	70.00	No Ice 1/2" Ice 1" Ice	2.25 2.45 2.66	1.23 1.39 1.55	50.00 66.85 86.39
RRH2X40-07-U	B	From Leg	4.00 0.00 0.00	0.00	70.00	No Ice 1/2" Ice 1" Ice	2.25 2.45 2.66	1.23 1.39 1.55	50.00 66.85 86.39
RRH2X40-07-U	C	From Leg	4.00 0.00 0.00	0.00	70.00	No Ice 1/2" Ice 1" Ice	2.25 2.45 2.66	1.23 1.39 1.55	50.00 66.85 86.39
RRH2x40 AWS (25"x11"x7")	A	From Leg	4.00 0.00 0.00	0.00	70.00	No Ice 1/2" Ice 1" Ice	2.67 2.91 3.16	1.70 1.91 2.13	55.00 73.50 94.99
RRH2x40 AWS (25"x11"x7")	B	From Leg	4.00 0.00 0.00	0.00	70.00	No Ice 1/2" Ice 1" Ice	2.67 2.91 3.16	1.70 1.91 2.13	55.00 73.50 94.99
RRH2x40 AWS (25"x11"x7")	C	From Leg	4.00 0.00 0.00	0.00	70.00	No Ice 1/2" Ice 1" Ice	2.67 2.91 3.16	1.70 1.91 2.13	55.00 73.50 94.99



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Job	EEI Job #17382/Southington East
Project	90' Pine Tree Pole (Extendable To 110')
Client	Centek

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Date	09:47:07 02/06/15
Designed by	Aleksandar Mrkajic

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb	
DB-T1-6Z-8AB-0Z	C	From Leg	1.00 0.00 0.00	0.00	70.00	Ice No Ice 1/2" Ice 1" Ice	5.60 2.33	2.33 2.56 2.79	50.00 86.13 126.22
*** (3) EE 12' T-Arms (K10463)	C	None		0.00	60.00	No Ice 1/2" Ice 1" Ice	20.90 26.09 31.28	20.90 26.09 31.28	995.22 1293.79 1592.35
(2) HBX-6517DS-VTM W/MOUNT PIPE	A	From Leg	4.00 0.00 0.00	0.00	60.00	No Ice 1/2" Ice 1" Ice	5.37 5.86 6.36	5.22 6.17 7.03	52.30 100.34 156.75
(2) HBX-6517DS-VTM W/MOUNT PIPE	B	From Leg	4.00 0.00 0.00	0.00	60.00	No Ice 1/2" Ice 1" Ice	5.37 5.86 6.36	5.22 6.17 7.03	52.30 100.34 156.75
(2) HBX-6517DS-VTM W/MOUNT PIPE	C	From Leg	4.00 0.00 0.00	0.00	60.00	No Ice 1/2" Ice 1" Ice	5.37 5.86 6.36	5.22 6.17 7.03	52.30 100.34 156.75
(2) LNX-6514DS-VTM W/MOUNTING PIPE	A	From Leg	4.00 0.00 0.00	0.00	60.00	No Ice 1/2" Ice 1" Ice	8.54 9.12 9.71	7.27 8.20 9.06	68.94 139.71 219.25
(2) LNX-6514DS-VTM W/MOUNTING PIPE	B	From Leg	4.00 0.00 0.00	0.00	60.00	No Ice 1/2" Ice 1" Ice	8.54 9.12 9.71	7.27 8.20 9.06	68.94 139.71 219.25
(2) LNX-6514DS-VTM W/MOUNTING PIPE	C	From Leg	4.00 0.00 0.00	0.00	60.00	No Ice 1/2" Ice 1" Ice	8.54 9.12 9.71	7.27 8.20 9.06	68.94 139.71 219.25
RRH2X40-07-U	A	From Leg	4.00 0.00 0.00	0.00	60.00	No Ice 1/2" Ice 1" Ice	2.25 2.45 2.66	1.23 1.39 1.55	50.00 66.85 86.39
RRH2X40-07-U	B	From Leg	4.00	0.00	60.00	No	2.25	1.23	50.00



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Job	EEI Job #17382/Southington East	Page	11 of 20
Project	90' Pine Tree Pole (Extendable To 110')	Date	09:47:07 02/06/15
Client	Centek	Designed by	Aleksandar Mrkajic

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
			0.00			Ice 2.45	1.39	66.85
			0.00			1/2" 2.66	1.55	86.39
						Ice 1"		
RRH2X40-07-U	C	From Leg	4.00	0.00	60.00	No 2.25	1.23	50.00
			0.00			Ice 2.45	1.39	66.85
			0.00			1/2" 2.66	1.55	86.39
						Ice 1"		
						Ice 1"		
RRH2x40 AWS (25"x11"x7")	A	From Leg	4.00	0.00	60.00	No 2.67	1.70	55.00
			0.00			Ice 2.91	1.91	73.50
			0.00			1/2" 3.16	2.13	94.99
						Ice 1"		
						Ice 1"		
RRH2x40 AWS (25"x11"x7")	B	From Leg	4.00	0.00	60.00	No 2.67	1.70	55.00
			0.00			Ice 2.91	1.91	73.50
			0.00			1/2" 3.16	2.13	94.99
						Ice 1"		
						Ice 1"		
RRH2x40 AWS (25"x11"x7")	C	From Leg	4.00	0.00	60.00	No 2.67	1.70	55.00
			0.00			Ice 2.91	1.91	73.50
			0.00			1/2" 3.16	2.13	94.99
						Ice 1"		
						Ice 1"		
DB-T1-6Z-8AB-0Z	C	From Leg	1.00	0.00	60.00	No 5.60	2.33	50.00
			0.00			Ice 5.92	2.56	86.13
			0.00			1/2" 6.24	2.79	126.22
						Ice 1"		
						Ice 1"		

(3) EE 12' T-Arms (K10463)	C	None		0.00	110.00	No 20.90	20.90	995.22
						Ice 26.09	26.09	1293.79
						1/2" 31.28	31.28	1592.35
						Ice 1"		
						Ice 1"		
(4) OPA-65R-LCUU-H8 W/MOUNTING PIPE	A	From Leg	4.00	0.00	110.00	No 13.20	9.69	149.22
			0.00			Ice 13.98	11.14	246.90
			0.00			1/2" 14.74	12.33	355.46
						Ice 1"		
						Ice 1"		
(4) OPA-65R-LCUU-H8 W/MOUNTING PIPE	B	From Leg	4.00	0.00	110.00	No 13.20	9.69	149.22
			0.00			Ice 13.98	11.14	246.90
			0.00			1/2" 14.74	12.33	355.46
						Ice 1"		
						Ice 1"		
(4) OPA-65R-LCUU-H8 W/MOUNTING PIPE	C	From Leg	4.00	0.00	110.00	No 13.20	9.69	149.22
			0.00			Ice 13.98	11.14	246.90
			0.00			1/2" 14.74	12.33	355.46



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Job	EEI Job #17382/Southington East	Page	12 of 20
Project	90' Pine Tree Pole (Extendable To 110')	Date	09:47:07 02/06/15
Client	Centek	Designed by	Aleksandar Mrkajic

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustme nt	Placement	C _{AA} Front	C _{AA} Side	Weight
			ft ft ft	°	ft	ft ²	ft ²	lb
(9) RRUS-11	A	From Leg	4.00 0.00 0.00	0.00	110.00	Ice 1" Ice No 2.43 Ice 2.65 1/2" 2.87	2.33 2.55 2.77	50.00 72.22 97.51
(9) RRUS-11	B	From Leg	4.00 0.00 0.00	0.00	110.00	Ice 1" Ice No 2.43 Ice 2.65 1/2" 2.87	2.33 2.55 2.77	50.00 72.22 97.51
(9) RRUS-11	C	From Leg	4.00 0.00 0.00	0.00	110.00	Ice 1" Ice No 2.43 Ice 2.65 1/2" 2.87	2.33 2.55 2.77	50.00 72.22 97.51
(2) DC6-48-60-18-8F	A	From Leg	4.00 0.00 0.00	0.00	110.00	Ice 1" Ice No 2.20 Ice 2.50 1/2" 2.80	2.20 2.50 2.80	50.00 72.56 95.12
DC6-48-60-18-8F	B	From Leg	4.00 0.00 0.00	0.00	110.00	Ice 1" Ice No 2.20 Ice 2.50 1/2" 2.80	2.20 2.50 2.80	50.00 72.56 95.12
DC6-48-60-18-8F	C	From Leg	4.00 0.00 0.00	0.00	110.00	Ice 1" Ice No 2.20 Ice 2.50 1/2" 2.80	2.20 2.50 2.80	50.00 72.56 95.12

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



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Job	EEL Job #17382/Southington East	Page	13 of 20
Project	90' Pine Tree Pole (Extendable To 110')	Date	09:47:07 02/06/15
Client	Centek	Designed by	Aleksandar Mrkajic

Comb. No.	Description
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
L1	110 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45290.83	0.62	0.60
			Max. Mx	20	-10065.52	548.45	-0.55
			Max. My	2	-10083.27	-0.63	547.72
			Max. Vy	20	-36588.28	548.45	-0.55
			Max. Vx	2	-36504.43	-0.63	547.72
			Max. Torque	20			-0.67
L2	90 - 48.153	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-102130.69	2.65	-0.58
			Max. Mx	20	-29394.88	2599.94	-6.64



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Project	90' Pine Tree Pole (Extendable To 110')	Date	09:47:07 02/06/15
Client	Centek	Designed by	Aleksandar Mrkajic

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L3	48.153 - 1	Pole	Max. My	2	-29427.25	-6.16	2591.81
			Max. Vy	20	-76879.55	2599.94	-6.64
			Max. Vx	2	-76566.66	-6.16	2591.81
			Max. Torque	2			0.92
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-135509.18	2.65	-0.58
			Max. Mx	20	-56390.98	7037.83	-20.90
			Max. My	2	-56391.83	-20.40	7013.24
			Max. Vy	20	-86257.85	7037.83	-20.90
			Max. Vx	2	-85949.89	-20.40	7013.24
			Max. Torque	2			0.92

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	36	135509.18	29365.63	-41.68
	Max. H _x	20	56510.20	86179.80	-266.47
	Max. H _z	2	56510.20	-266.47	85872.11
	Max. M _x	2	7013.24	-266.47	85872.11
	Max. M _z	8	7036.80	-86179.80	266.47
	Max. Torsion	2	0.92	-266.47	85872.11
	Min. Vert	17	42382.65	43320.67	-74500.66
	Min. H _x	8	56510.20	-86179.80	266.47
	Min. H _z	14	56510.20	266.47	-85872.11
	Min. M _x	14	-7013.21	266.47	-85872.11
	Min. M _z	20	-7037.83	86179.80	-266.47
	Min. Torsion	14	-0.91	266.47	-85872.11

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	47091.83	0.00	0.00	-0.01	0.42	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	56510.20	266.47	-85872.11	-7013.24	-20.40	-0.92
0.9 Dead+1.6 Wind 0 deg - No Ice	42382.65	266.47	-85872.11	-6976.12	-20.43	-0.92
1.2 Dead+1.6 Wind 30 deg - No Ice	56510.19	43320.67	-74500.66	-6084.05	-3536.26	-0.86
0.9 Dead+1.6 Wind 30 deg - No Ice	42382.65	43320.67	-74500.66	-6051.85	-3517.68	-0.86
1.2 Dead+1.6 Wind 60 deg - No Ice	56510.19	74767.13	-43166.82	-3524.70	-6104.41	-0.57
0.9 Dead+1.6 Wind 60 deg - No Ice	42382.65	74767.13	-43166.82	-3506.04	-6072.24	-0.57
1.2 Dead+1.6 Wind 90 deg - No Ice	56510.20	86179.80	-266.47	-20.94	-7036.80	-0.13
0.9 Dead+1.6 Wind 90 deg - No Ice	42382.65	86179.80	-266.47	-20.83	-6999.69	-0.12
1.2 Dead+1.6 Wind 120 deg - No Ice	56510.19	74500.66	42705.29	3488.48	-6083.58	0.34

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Project	90' Pine Tree Pole (Extendable To 110')	Date	09:47:07 02/06/15
Client	Centek	Designed by	Aleksandar Mrkajic

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
No Ice						
0.9 Dead+1.6 Wind 120 deg - No Ice	42382.65	74500.66	42705.29	3470.01	-6051.51	0.35
1.2 Dead+1.6 Wind 150 deg - No Ice	56510.19	42859.13	74234.20	6063.18	-3500.07	0.73
0.9 Dead+1.6 Wind 150 deg - No Ice	42382.65	42859.13	74234.20	6031.09	-3481.68	0.73
1.2 Dead+1.6 Wind 180 deg - No Ice	56510.20	-266.47	85872.11	7013.21	21.44	0.91
0.9 Dead+1.6 Wind 180 deg - No Ice	42382.65	-266.47	85872.11	6976.10	21.20	0.91
1.2 Dead+1.6 Wind 210 deg - No Ice	56510.19	-43320.67	74500.66	6084.02	3537.29	0.86
0.9 Dead+1.6 Wind 210 deg - No Ice	42382.65	-43320.67	74500.66	6051.83	3518.45	0.85
1.2 Dead+1.6 Wind 240 deg - No Ice	56510.19	-74767.13	43166.82	3524.66	6105.44	0.57
0.9 Dead+1.6 Wind 240 deg - No Ice	42382.65	-74767.13	43166.82	3506.02	6073.01	0.57
1.2 Dead+1.6 Wind 270 deg - No Ice	56510.20	-86179.80	266.47	20.90	7037.83	0.14
0.9 Dead+1.6 Wind 270 deg - No Ice	42382.65	-86179.80	266.47	20.80	7000.46	0.13
1.2 Dead+1.6 Wind 300 deg - No Ice	56510.19	-74500.66	-42705.29	-3488.51	6084.61	-0.34
0.9 Dead+1.6 Wind 300 deg - No Ice	42382.65	-74500.66	-42705.29	-3470.04	6052.28	-0.35
1.2 Dead+1.6 Wind 330 deg - No Ice	56510.19	-42859.13	-74234.20	-6063.22	3501.11	-0.73
0.9 Dead+1.6 Wind 330 deg - No Ice	42382.65	-42859.13	-74234.20	-6031.12	3482.45	-0.73
1.2 Dead+1.0 Ice+1.0 Temp	135509.18	0.00	0.00	0.58	2.65	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	135509.18	41.68	-29317.51	-2494.50	-0.46	-0.21
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	135509.18	14718.91	-25410.55	-2161.92	-1249.53	-0.21
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	135509.18	25452.22	-14694.85	-1249.90	-2163.00	-0.16
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	135509.18	29365.63	-41.68	-2.80	-2496.10	-0.07
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	135509.18	25410.55	14622.66	1245.21	-2159.59	0.04
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	135509.18	14646.72	25368.87	2159.74	-1243.62	0.14
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	135509.18	-41.68	29317.51	2495.73	6.37	0.20
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	135509.18	-14718.91	25410.55	2163.15	1255.43	0.21
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	135509.18	-25452.22	14694.85	1251.13	2168.90	0.16
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	135509.18	-29365.63	41.68	4.03	2502.00	0.07
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	135509.18	-25410.55	-14622.66	-1243.98	2165.49	-0.04
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	135509.18	-14646.72	-25368.87	-2158.51	1249.52	-0.14
Dead+Wind 0 deg - Service	47091.83	46.65	-15032.53	-1225.21	-3.22	-0.16
Dead+Wind 30 deg - Service	47091.83	7583.59	-13041.88	-1062.89	-617.44	-0.15
Dead+Wind 60 deg - Service	47091.83	13088.52	-7556.66	-615.78	-1066.10	-0.10
Dead+Wind 90 deg - Service	47091.83	15086.40	-46.65	-3.67	-1228.99	-0.02
Dead+Wind 120 deg -	47091.83	13041.88	7475.87	609.42	-1062.45	0.06



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Job	EEI Job #17382/Southington East
Project	90' Pine Tree Pole (Extendable To 110')
Client	Centek

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Date	09:47:07 02/06/15
Designed by	Aleksandar Mrkajic

Load Combination	Vertical lb	Shear _x lb	Shear _y lb	Overturing Moment, M _x kip-ft	Overturing Moment, M _y kip-ft	Torque kip-ft
Service						
Dead+Wind 150 deg - Service	47091.83	7502.80	12995.23	1059.21	-611.11	0.13
Dead+Wind 180 deg - Service	47091.83	-46.65	15032.53	1225.18	4.09	0.16
Dead+Wind 210 deg - Service	47091.83	-7583.59	13041.88	1062.87	618.31	0.15
Dead+Wind 240 deg - Service	47091.83	-13088.52	7556.66	615.75	1066.97	0.10
Dead+Wind 270 deg - Service	47091.83	-15086.40	46.65	3.64	1229.85	0.02
Dead+Wind 300 deg - Service	47091.83	-13041.88	-7475.87	-609.45	1063.31	-0.06
Dead+Wind 330 deg - Service	47091.83	-7502.80	-12995.23	-1059.24	611.98	-0.13

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	-47091.83	0.00	0.00	47091.83	0.00	0.000%
2	266.47	-56510.19	-85872.11	-266.47	56510.20	85872.11	0.000%
3	266.47	-42382.65	-85872.11	-266.47	42382.65	85872.11	0.000%
4	43320.67	-56510.19	-74500.66	-43320.67	56510.19	74500.66	0.000%
5	43320.67	-42382.65	-74500.66	-43320.67	42382.65	74500.66	0.000%
6	74767.13	-56510.19	-43166.82	-74767.13	56510.19	43166.82	0.000%
7	74767.13	-42382.65	-43166.82	-74767.13	42382.65	43166.82	0.000%
8	86179.80	-56510.19	-266.47	-86179.80	56510.20	266.47	0.000%
9	86179.80	-42382.65	-266.47	-86179.80	42382.65	266.47	0.000%
10	74500.66	-56510.19	42705.29	-74500.66	56510.19	-42705.29	0.000%
11	74500.66	-42382.65	42705.29	-74500.66	42382.65	-42705.29	0.000%
12	42859.13	-56510.19	74234.20	-42859.13	56510.19	-74234.20	0.000%
13	42859.13	-42382.65	74234.20	-42859.13	42382.65	-74234.20	0.000%
14	-266.47	-56510.19	85872.11	266.47	56510.20	-85872.11	0.000%
15	-266.47	-42382.65	85872.11	266.47	42382.65	-85872.11	0.000%
16	-43320.67	-56510.19	74500.66	43320.67	56510.19	-74500.66	0.000%
17	-43320.67	-42382.65	74500.66	43320.67	42382.65	-74500.66	0.000%
18	-74767.13	-56510.19	43166.82	74767.13	56510.19	-43166.82	0.000%
19	-74767.13	-42382.65	43166.82	74767.13	42382.65	-43166.82	0.000%
20	-86179.80	-56510.19	266.47	86179.80	56510.20	-266.47	0.000%
21	-86179.80	-42382.65	266.47	86179.80	42382.65	-266.47	0.000%
22	-74500.66	-56510.19	-42705.29	74500.66	56510.19	42705.29	0.000%
23	-74500.66	-42382.65	-42705.29	74500.66	42382.65	42705.29	0.000%
24	-42859.13	-56510.19	-74234.20	42859.13	56510.19	74234.20	0.000%
25	-42859.13	-42382.65	-74234.20	42859.13	42382.65	74234.20	0.000%
26	0.00	-135509.18	0.00	0.00	135509.18	0.00	0.000%
27	41.68	-135509.18	-29317.43	-41.68	135509.18	29317.51	0.000%
28	14718.87	-135509.18	-25410.48	-14718.91	135509.18	25410.55	0.000%
29	25452.16	-135509.18	-14694.81	-25452.22	135509.18	14694.85	0.000%
30	29365.56	-135509.18	-41.68	-29365.63	135509.18	41.68	0.000%
31	25410.48	-135509.18	14622.62	-25410.55	135509.18	-14622.66	0.000%
32	14646.68	-135509.18	25368.80	-14646.72	135509.18	-25368.87	0.000%
33	-41.68	-135509.18	29317.43	41.68	135509.18	-29317.51	0.000%
34	-14718.87	-135509.18	25410.48	14718.91	135509.18	-25410.55	0.000%
35	-25452.16	-135509.18	14694.81	25452.22	135509.18	-14694.85	0.000%
36	-29365.56	-135509.18	41.68	29365.63	135509.18	-41.68	0.000%
37	-25410.48	-135509.18	-14622.62	25410.55	135509.18	14622.66	0.000%



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Project	90' Pine Tree Pole (Extendable To 110')	Date	09:47:07 02/06/15
Client	Centek	Designed by	Aleksandar Mrkajic

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
38	-14646.68	-135509.18	-25368.80	14646.72	135509.18	25368.87	0.000%
39	46.65	-47091.83	-15032.53	-46.65	47091.83	15032.53	0.000%
40	7583.59	-47091.83	-13041.88	-7583.59	47091.83	13041.88	0.000%
41	13088.52	-47091.83	-7556.66	-13088.52	47091.83	7556.66	0.000%
42	15086.39	-47091.83	-46.65	-15086.40	47091.83	46.65	0.000%
43	13041.88	-47091.83	7475.87	-13041.88	47091.83	-7475.87	0.000%
44	7502.80	-47091.83	12995.23	-7502.80	47091.83	-12995.23	0.000%
45	-46.65	-47091.83	15032.53	46.65	47091.83	-15032.53	0.000%
46	-7583.59	-47091.83	13041.88	7583.59	47091.83	-13041.88	0.000%
47	-13088.52	-47091.83	7556.66	13088.52	47091.83	-7556.66	0.000%
48	-15086.39	-47091.83	46.65	15086.40	47091.83	-46.65	0.000%
49	-13041.88	-47091.83	-7475.87	13041.88	47091.83	7475.87	0.000%
50	-7502.80	-47091.83	-12995.23	7502.80	47091.83	12995.23	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	4	0.00000001	0.00005319
3	Yes	4	0.00000001	0.00002591
4	Yes	5	0.00000001	0.00022067
5	Yes	5	0.00000001	0.00007519
6	Yes	5	0.00000001	0.00022462
7	Yes	5	0.00000001	0.00007692
8	Yes	4	0.00000001	0.00017356
9	Yes	4	0.00000001	0.00009170
10	Yes	5	0.00000001	0.00022149
11	Yes	5	0.00000001	0.00007593
12	Yes	5	0.00000001	0.00022094
13	Yes	5	0.00000001	0.00007565
14	Yes	4	0.00000001	0.00020088
15	Yes	4	0.00000001	0.00010695
16	Yes	5	0.00000001	0.00022489
17	Yes	5	0.00000001	0.00007702
18	Yes	5	0.00000001	0.00022074
19	Yes	5	0.00000001	0.00007524
20	Yes	4	0.00000001	0.00005072
21	Yes	4	0.00000001	0.00002435
22	Yes	5	0.00000001	0.00022206
23	Yes	5	0.00000001	0.00007612
24	Yes	5	0.00000001	0.00022282
25	Yes	5	0.00000001	0.00007646
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00033896
28	Yes	5	0.00000001	0.00073927
29	Yes	5	0.00000001	0.00074580
30	Yes	5	0.00000001	0.00033877
31	Yes	5	0.00000001	0.00073821
32	Yes	5	0.00000001	0.00073717
33	Yes	5	0.00000001	0.00033915
34	Yes	5	0.00000001	0.00075090
35	Yes	5	0.00000001	0.00074478
36	Yes	5	0.00000001	0.00034011
37	Yes	5	0.00000001	0.00074437
38	Yes	5	0.00000001	0.00074496



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Client	Centek	Designed by	Aleksandar Mrkajic

39	Yes	4	0.00000001	0.00001623
40	Yes	4	0.00000001	0.00015454
41	Yes	4	0.00000001	0.00016275
42	Yes	4	0.00000001	0.00001630
43	Yes	4	0.00000001	0.00015566
44	Yes	4	0.00000001	0.00015435
45	Yes	4	0.00000001	0.00001706
46	Yes	4	0.00000001	0.00016318
47	Yes	4	0.00000001	0.00015517
48	Yes	4	0.00000001	0.00001568
49	Yes	4	0.00000001	0.00015730
50	Yes	4	0.00000001	0.00015840

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 90	13.24	47	1.03	0.00
L2	90 - 48.153	9.07	47	0.93	0.00
L3	53.847 - 1	3.26	47	0.56	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
113.00	Pine Branches	47	13.24	1.03	0.00	30432
110.00	(3) EE 12' T-Arms (K10463)	47	13.24	1.03	0.00	30432
108.00	Pine Branches	47	12.81	1.02	0.00	30432
103.00	Pine Branches	47	11.75	1.00	0.00	21737
100.00	(3) EE 12' T-Arms (K10463)	47	11.12	0.99	0.00	15216
98.00	Pine Branches	47	10.70	0.98	0.00	12680
93.00	Pine Branches	47	9.67	0.95	0.00	8964
88.00	Pine Branches	47	8.68	0.92	0.00	7277
83.00	Pine Branches	47	7.73	0.88	0.00	6473
80.00	EE 12' Low-Profile Platform (K10994A)	47	7.18	0.85	0.00	6083
78.00	Pine Branches	47	6.82	0.83	0.00	5847
73.00	Pine Branches	47	5.97	0.78	0.00	5330
70.00	(3) EE 12' T-Arms (K10463)	47	5.48	0.74	0.00	5061
68.00	Pine Branches	47	5.17	0.72	0.00	4896
63.00	Pine Branches	47	4.43	0.66	0.00	4528
60.00	(3) EE 12' T-Arms (K10463)	47	4.02	0.63	0.00	4333
58.00	Pine Branches	47	3.76	0.61	0.00	4212
53.00	Pine Branches	47	3.17	0.55	0.00	4109
48.00	Pine Branches	47	2.64	0.49	0.00	4475

Maximum Tower Deflections - Design Wind



Engineered Endeavors
 10975 Kinsman Rd
 Newbury, OH 44065
 Phone: (440) 564-5484
 FAX: (440) 564-5489

Job	EEI Job #17382/Southington East	Page	19 of 20
Project	90' Pine Tree Pole (Extendable To 110')	Date	09:47:07 02/06/15
Client	Centek	Designed by	Aleksandar Mrkajic

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	110 - 90	75.62	18	5.88	0.00
L2	90 - 48.153	51.85	18	5.33	0.00
L3	53.847 - 1	18.66	18	3.20	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
113.00	Pine Branches	18	75.62	5.88	0.00	5438
110.00	(3) EE 12' T-Arms (K10463)	18	75.62	5.88	0.00	5438
108.00	Pine Branches	18	73.19	5.84	0.00	5438
103.00	Pine Branches	18	67.12	5.72	0.00	3884
100.00	(3) EE 12' T-Arms (K10463)	18	63.51	5.65	0.00	2718
98.00	Pine Branches	18	61.13	5.59	0.00	2264
93.00	Pine Branches	18	55.28	5.44	0.00	1600
88.00	Pine Branches	18	49.61	5.25	0.00	1296
83.00	Pine Branches	18	44.18	5.01	0.00	1150
80.00	EE 12' Low-Profile Platform (K10994A)	18	41.04	4.85	0.00	1079
78.00	Pine Branches	18	39.01	4.74	0.00	1036
73.00	Pine Branches	18	34.13	4.45	0.00	943
70.00	(3) EE 12' T-Arms (K10463)	18	31.36	4.26	0.00	895
68.00	Pine Branches	18	29.57	4.13	0.00	865
63.00	Pine Branches	18	25.37	3.81	0.00	799
60.00	(3) EE 12' T-Arms (K10463)	18	23.02	3.61	0.00	764
58.00	Pine Branches	18	21.54	3.47	0.00	742
53.00	Pine Branches	18	18.11	3.14	0.00	722
48.00	Pine Branches	18	15.11	2.82	0.00	786

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio P _u / φP _n
L1	110 - 90 (1)	TP31x25.9579x0.25	20.00	0.00	0.0	24.400	-10057.60	1708540.00	0.006
L2	90 - 48.153 (2)	TP41.55x31x0.375	41.85	0.00	0.0	47.299 9	-29379.00	3462070.00	0.008
L3	48.153 - 1 (3)	TP52.5x39.3645x0.5625	52.85	0.00	0.0	92.727 9	-56390.60	6889220.00	0.008

Pole Bending Design Data



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Job	EEI Job #17382/Southington East	Page	20 of 20
Project	90' Pine Tree Pole (Extendable To 110')	Date	09:47:07 02/06/15
Client	Centek	Designed by	Aleksandar Mrkajic

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{ux} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M_{uy} kip-ft	ϕM_{uy} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	110 - 90 (1)	TP31x25.9579x0.25	548.77	1080.05	0.508	0.00	1080.05	0.000
L2	90 - 48.153 (2)	TP41.55x31x0.375	2603.68	2824.69	0.922	0.00	2824.69	0.000
L3	48.153 - 1 (3)	TP52.5x39.3645x0.5625	7049.80	7336.10	0.961	0.00	7336.10	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_u lb	Ratio $\frac{V_u}{\phi V_u}$	Actual T_u kip-ft	ϕT_u kip-ft	Ratio $\frac{T_u}{\phi T_u}$
L1	110 - 90 (1)	TP31x25.9579x0.25	36630.20	854268.00	0.043	0.58	2162.75	0.000
L2	90 - 48.153 (2)	TP41.55x31x0.375	77035.90	1731030.00	0.045	0.58	5656.30	0.000
L3	48.153 - 1 (3)	TP52.5x39.3645x0.5625	86411.80	3444610.00	0.025	0.57	14690.17	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	Ratio $\frac{M_{uy}}{\phi M_{uy}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	110 - 90 (1)	0.006	0.508	0.000	0.043	0.000	0.516	1.000	4.8.2 ✓
L2	90 - 48.153 (2)	0.008	0.922	0.000	0.045	0.000	0.932	1.000	4.8.2 ✓
L3	48.153 - 1 (3)	0.008	0.961	0.000	0.025	0.000	0.970	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	
L1	110 - 90	Pole	TP31x25.9579x0.25	1	-10057.6 0	1708540. 00	51.6	Pass	
L2	90 - 48.153	Pole	TP41.55x31x0.375	2	-29379.0 0	3462070. 00	93.2	Pass	
L3	48.153 - 1	Pole	TP52.5x39.3645x0.5625	3	-56390.6 0	6889220. 00	97.0	Pass	
							Summa ry		
							Pole (L3) RATING	97.0 97.0	Pass Pass

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

Site Data

EEI #: 17382
 Site Name: Southington East
 Site #: N/A

Reactions		
Mu	548.5	ft-kips
Axial, Pu:	10	kips
Shear, Vu:	37	kips
Elevation:	90	feet

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

Pole Manufacturer:	Other
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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:		<-- Disregard
N/A:		<-- Disregard
Circle (in.):	35.5	

Flange Bolt Results

Bolt Tension Capacity, $\phi^*T_n, B1$: 54.54 kips
 Adjusted ϕ^*T_n (due to $V_u = V_u/Qty$), **B**: 54.44 kips
 Max Bolt directly applied T_u : 45.73 Kips
 Min. PL "tc" for B cap. w/o Pry: 1.034 in
 Min PL "treq" for actual T w/ Pry: 0.838 in
 Min PL "t1" for actual T w/o Pry: 0.948 in
 T allowable with Prying: 52.80 kips $\theta \leq 1$ case
 Prying Force, q: 0.00 kips
 Total Bolt Tension = $T_u + q$: 45.73 kips
 Prying Bolt Stress Ratio = $(T_u + q) / (B)$: 84.0%

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

Plate Data		
Diam:	38.5	in
Thick, t:	1	in
Grade (Fy):	50	ksi
Strength, Fu:	65	ksi
Single-Rod B-eff:	6.15	in

Exterior Flange Plate Results

Flexural Check
 Compression Side Plate Stress: 40.2 ksi
 Allowable Plate Stress: 45.0 ksi
 Compression Plate Stress Ratio: 89.4%
No Prying
 Tension Side Stress Ratio, $(treq/t)^2$: 70.2%

Rigid
TIA G
ϕ^*F_y
Comp. Y.L. Length: 17.30

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

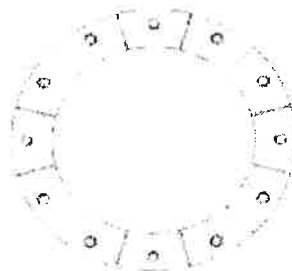
Stiffener Results

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:	31	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	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



Anchor Rod and Base Plate Design

Designed per: TIA-222-G

2/6/2015

Page 1

EI Job #:	17382
Site Name:	Southington East
Structure:	90' Tree Pole (Extendable to 110')

Client:	Verizon Wireless
Site #:	n/a
Location:	Hartford County, CA

Pole Properties at Base	
Pole Diameter =	52.5 in
Pole Thickness =	0.5625 in
Yield Strength =	65 ksi
Monopole Shape =	18-Sided

Base Plate Properties	
Base Plate Material =	A572GR50
Outside Diameter =	66 in
Inside Diameter =	42.5 in
Weight =	1661 lbf

Base Reactions	
$M_u =$	7050 ft-kip
$V_u =$	86.3 kip
$P_u =$	56.5 kip

Effective Base Plate Bend Line	
Desantis' Bend Line =	40.00 in
% Reduction =	60 %
Reduced Bend Line =	18.50 in
Brinker's Bend Line =	9.59 in
Effective Bend Line =	9.59 in

Anchor Rod Properties	
Anchor Material =	A615GR75
Anchor Diameter =	2.25 in
Anchor Length =	6 ft
No. of Anchors =	24
Weight =	2143 lbs

Base Plate Thickness	
Section Modulus: Plastic	
$\Phi_b =$	0.9
Minimum Thickness =	2.87 in
Actual Thickness =	3 in
$M_{ub} =$	890 in-k
$\Phi M_n =$	971 in-kip
Capacity Usage =	91.6%

Bolt Circle Diameter & Spacing	
Minimum Bolt Circle $\emptyset =$	59.81 in
Actual Bolt Circle $\emptyset =$	60 in
Spacing =	7.85 in

Setting Template Properties	
Outside Diameter =	66 in
Inside Diameter =	54 in
Thickness =	0.375 in
Template Hole $\emptyset =$	2.375 in
Template Weight =	109.0 lbs
<i>*Bottom Template Must Be Bolted*</i>	

Anchor Rod Inter. Eq. 1 (4.9.9)	
$P_{ub} =$	237 kip
$V_{ub} =$	3.60 kip
$\eta =$	0.5
$\Phi_t =$	0.80
$\Phi_t R_{nt} =$	260 kip
Inter. Eq. 1 =	0.94

Anchor Rod Inter. Eq. 2 (4.9.9)	
$L_{ar} =$	2.25 in
$V_{ub} =$	3.60 kip
$P_{ub} =$	237 kip
$M_{ub} =$	5.26 kip-in
$\Phi_v R_{nv} =$	134 kip
$\Phi_t R_{nt} =$	260 kip
$\Phi_t R_{nm} =$	95 kip-in
Inter. Eq. 2 =	0.94

Monopole Drilled Pier

Checks capacity of a single drilled shaft foundation for a monopole

EEl #: 17382

Site Name: Southington East

Site #: n/a



TIA Revision:	G
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Base Reactions	
Moment (k-ft):	7050
Axial (k):	56.5
Shear (k):	86.3

Foundation Dimensions	
Calsson Diameter (ft):	7
Extension Above Grade (ft):	1
Depth Below Existing Grade (ft):	31
Volume (yd ³):	46

Rebar Properties	
Rebar Size:	11
Rebar Quantity:	38
Tie Size:	5
Tie Quantity:	39

Material Properties	
Rebar Tensile (ksi):	60
Concrete Strength (psi):	3000
Clear cover (In):	5.5
Rebar Weight (lbs):	7265

Soil Properties	
Neglect Top Layer:	Y
Groundwater Depth Below Grade (ft):	999
# of Layers:	3

Analysis Checks				
	Capacity	Demand	Check	Rating
Rebar Area (In ²):	59.28	18.47	OK	N/A
Pier Moment Capacity (k-ft):	8491.08	7551.95	OK	88.9%
Pier-Soil Interaction (FOS):	2.27	1.33	OK	58.6%

Assume 0.33% Minimum Steel



Input the data in the "shaded" columns. If soil layer is submerged, enter the buoyant unit weight

Layer:	From (ft)	To (ft)	Layer Thickness (ft)	Unit Weight of Soil (pcf)	Cohesion (psf)	Internal Friction Angle (deg)
1	0	3.5	3.5	120	0	0
2	3.5	23	19.5	120	0	30
3	23	31	8	57.6	0	30

Calculation Notes:

1- Sand Resistance = 3 * Kp * Overburden --> (Per equations used in PLS-Calsson Software)

2- Cohesion Resistance = 8 * C -----> (Per equations used in PLS-Calsson Software, Full 8CD approach)

Pier Overturning Stability Check

EEI Project No. 17382-G CODE

Base Moment, kip-ft	7050	Pier Diameter, ft	7
Shear Force, kips	86.3	Groundwater, ft	23
Vertical Force, kips	56.5	Pier Embedment, ft	31
		Disregard, ft	3.5

Date 2/11/2015

Soil Properties Information

Soil Layer	Depth, ft	γ	ϕ	C, psf	Kp
sand	3.5	120	30	0	3.00
sand	23	120	30	0	
sand	31	57.6	30	0	



Zero Line, ft 22.5 Force Imbalance 0.825%

Resisting Moment, k-ft 13,584.72 Overturning Moment, k-ft 9,078.06

Safety Factor 1.50











Pier Overturning Stability Check

EEl Project No. 17382-F CODE

Base Moment, kip-ft	5222	Pier Diameter, ft	7
Shear Force, kips	64	Groundwater, ft	23
Vertical Force, kips	42	Pier Embedment, ft	31
		Disregard, ft	3.5

Date 2/11/2015

Soil Properties Information

Soil Layer	Depth, ft	γ	ϕ	C, psf	Kp
sand	3.5	120	30	0	3.00
sand	23	120	30	0	
sand	31	57.6	30	0	
					
					

Zero Line, ft 22.3 Force Imbalance 0.794%

Resisting Moment, k-ft 13,552.69 Overturning Moment, k-ft 6,713.20

Safety Factor 2.02

