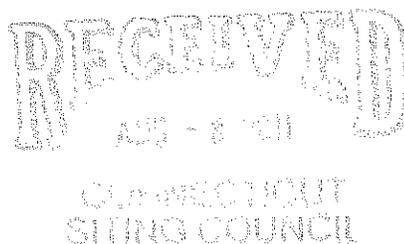


280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

August 5, 2011

Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051



Re: **Docket No. 410 – Application of Celco Partnership d/b/a Verizon Wireless for a Certificate of Environmental Compatibility and Public Need for the Construction, Maintenance and Operation of a Wireless Telecommunications Facility at 234 Melba Street, Milford, Connecticut Development & Management (D&M) Plan**

Dear Ms. Roberts:

Enclosed please find the original and twenty (20) copies of the following information:

1. Final site plans for the approved telecommunications facility at 234 Melba Street in Milford, Connecticut incorporating the Council's conditions of approval;
2. A Geotechnical Evaluation Report prepared by Design Earth Technology; and
3. The proposed Tower and Foundation Design Calculations prepared by Engineered Endeavors.

Also enclosed are four (4) full size sets of the final site plans. Together, this information constitutes the final D&M Plan for Celco's approved Bayview facility.

We respectfully request that this information be reviewed and this matter be placed on the next available Siting Council agenda for approval.



Law Offices

BOSTON

PROVIDENCE

HARTFORD

NEW LONDON

STAMFORD

WHITE PLAINS

NEW YORK CITY

ALBANY

SARASOTA

www.rc.com

11212580-v1

ROBINSON & COLE^{LLP}

Linda Roberts
August 5, 2011
Page 2

Please feel free to contact me if you have any questions or require additional information. Thank you.

Sincerely,



Kenneth C. Baldwin

Enclosures

Copy to:

Sandy M. Carter
James L. Richetelli, Jr., Milford Mayor



Cellco Partnership

NOT FOR CONSTRUCTION

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

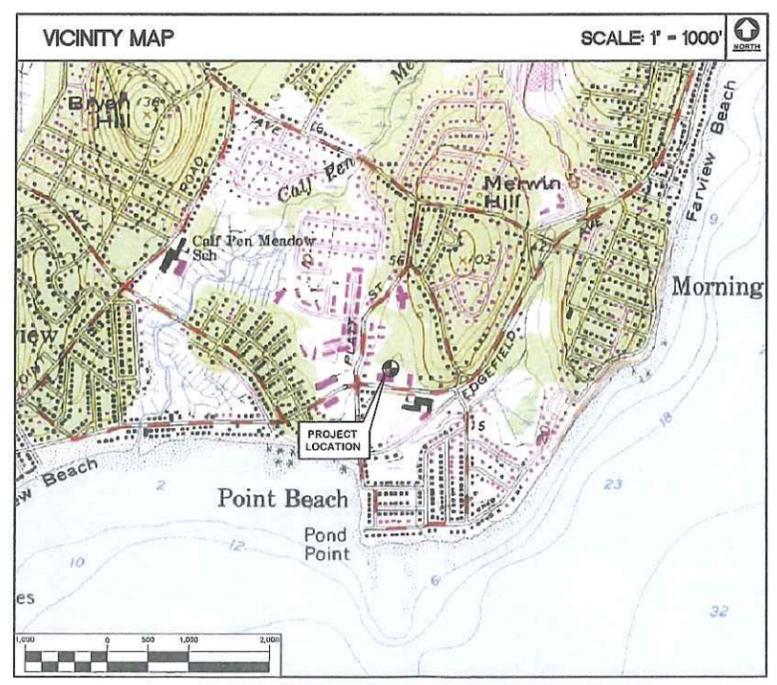
DEVELOPMENT AND MANAGEMENT PLAN WIRELESS COMMUNICATIONS FACILITY BAYVIEW

234 MELBA STREET
MILFORD, CT 06461

SITE DIRECTIONS	
FROM: 99 EAST RIVER DRIVE EAST HARTFORD, CONNECTICUT	TO: 234 MELBA STREET MILFORD, CONNECTICUT
1. Start out going EAST on E RIVER DR toward PITKIN ST.	1.3 mi
2. Merge onto US-5 S/CT-15 S toward I-95 S/NEW HAVEN.	1.1 mi
3. Merge onto I-91 S via EXIT 86 toward NEW HAVEN/N.Y. CITY.	36.6 mi
4. Merge onto I-95 S/GOVERNOR JOHN DAVIS LODGE TURNPIKE via the exit on the LEFT.	7.4 mi
5. Take the WOODMONT RD exit, EXIT 40.	0.2 mi
6. Turn LEFT onto WOODMONT RD.	0.0 mi
7. Turn RIGHT onto OLD GATE LN.	1.1 mi
8. Turn SLIGHT RIGHT onto NEW HAVEN AVENUE/CT-162.	0.7 mi
9. Turn LEFT onto BUCKINGHAM AVENUE.	1.5 mi
10. Turn LEFT onto MELBA STREET.	0.2 mi
11. 234 MELBA ST is on the RIGHT.	

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

SITE INFORMATION
1. THE CONSTRUCTION OF A 1290± SQ. FT. FENCED WIRELESS COMMUNICATIONS COMPOUND WITHIN A 1405± SQ. FT. LEASE AREA.
2. THREE (3) DIRECTIONAL PANEL ANTENNAS ARE PROPOSED TO BE MOUNTED AT A CENTERLINE ELEVATION OF 130'± AGL. THREE (3) DIRECTIONAL PANEL ANTENNAS ARE PROPOSED TO BE MOUNTED AT A CENTERLINE ELEVATION OF 120'± AGL AND THREE DIRECTIONAL PANEL ANTENNAS ARE PROPOSED TO BE MOUNTED AT A CENTERLINE ELEVATION OF 110'± AGL. FOR A TOTAL OF NINE (9) ANTENNAS WITHIN A PROPOSED RF TRANSPARENT FLAGPOLE (FLAGLESS) TOWER.
3. ACCESS TO SITE WILL BE VIA A PROPOSED 20' WIDE BY 360'± LONG ACCESS EASEMENT OFF OF MELBA STREET.
4. POWER AND TELCO UTILITIES SHALL BE ROUTED UNDERGROUND FROM EXISTING RESPECTIVE DEMARCS TO THE EQUIPMENT WITHIN THE PROPOSED COMPOUND. FINAL UTILITY INSTALLATION TO BE PER UTILITY COMPANY REQUIREMENTS.
5. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMENDMENTS, INCLUDING THE TIA/EIA-222 REVISION "F" STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES, NFPA 101 WITH 2005 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
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:	BAYVIEW
SITE ADDRESS:	234 MELBA STREET MILFORD, CT 06461
PROPERTY OWNER:	MELBA REALTY LLC M.A. C/O LOMBARD GROUP P.O. BOX 7014 PROSPECT, CT 06714
LESSEE/TENANT:	CELCO PARTNERSHIP d.b.a. VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
CONTACT PERSON:	SANDY CARTER CELCO PARTNERSHIP (860) 803-8219
ENGINEER:	CEN TEK ENGINEERING 63-2 NORTH BRANFORD ROAD BRANFORD, CT 06405 (203) 488-0580
TOWER COORDINATES:	LATITUDE 41°-12'-35.821" LONGITUDE 73°-01'-09.873" GROUND ELEVATION: 30.3'± A.M.S.L.
COORDINATES AND GROUND ELEVATION BASED ON FAA 2C SURVEY CERTIFICATION PREPARED BY MARTINEZ COUCH AND ASSOCIATES DATED JANUARY 5, 2010, LAST REVISED 04/28/10.	

SHEET INDEX		
SHT. NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	2
C-1	ABUTTERS MAP	2
C-1A	SITE / SURVEY PLAN	2
C-1B	UTILITY ROUTING PLAN	2
C-2	PARTIAL SITE PLAN AND ELEVATION	2
C-3	SITE DETAILS AND SHELTER ELEVATIONS	2
C-4	SHELTER FOUNDATION PLAN, DETAILS AND NOTES	2

DESIGNED BY:	CFC			
DRAWN BY:	DMD			
CHK'D BY:	CFC			
REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	08/04/11	DMD	CFC	FINAL DEVELOPMENT & MANAGEMENT (08/04) PLAN
1	07/19/11	DMD	CFC	DEVELOPMENT & MANAGEMENT (08/04) PLAN
0	06/15/11	DMD	CFC	DEVELOPMENT & MANAGEMENT (08/04) PLAN - CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

Cellco Partnership
d.b.a. **verizon** wireless

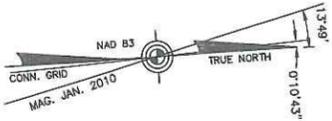
CEN TEK ENGINEERING
Continued on Scale
203 488 0580
63-2 North Branford Road
Branford, CT 06405
www.CenTekEng.com

Cellco Partnership d/b/a Verizon Wireless
WIRELESS COMMUNICATIONS FACILITY
BAYVIEW
234 MELBA STREET
MILFORD, CT 06461

DATE: 06/08/11
SCALE: AS NOTED
JOB NO. 09092

TITLE SHEET

T-1
Sheet No. 1 of 7



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.

VERTICAL DATUM IS BASED ON NGVD 29.

COORDINATES REFER TO NAD 83.

PARCEL OWNER OF RECORD: MELBA REALTY LLC
M.A. C/O LOMBARD GROUP
P.O. BOX 7014
PROSPECT, CT 06714

REFERENCE IS MADE TO THE FOLLOWING MAPS

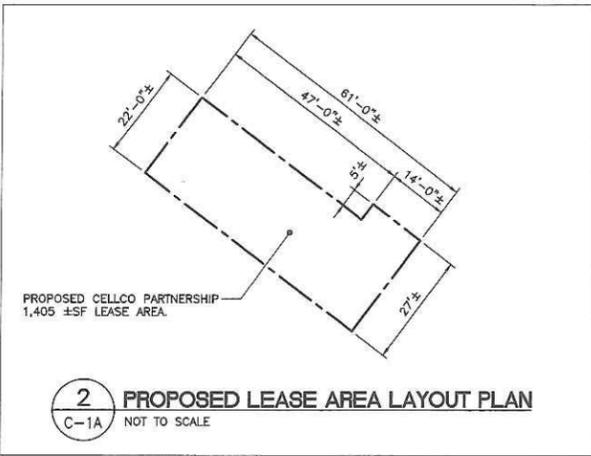
1) PROPERTY SURVEY, 232-234 MELBA STREET - PARCEL 38A, 252-254-256 MELBA STREET - PARCEL 2, MILFORD, CONNECTICUT, SCALE 1"=30', DATED 7-14-06, CERTIFIED A-2, BY ASW CONSULTING GROUP, LLC.

PARCEL AREA = 2.703± ACRES.

PARCEL IS IN THE BUSINESS DISTRICT ZONING DISTRICT.

PARCEL ID: MAP 39 BLOCK 542 LOT 38A MILFORD, CT ASSESSOR'S MAP.

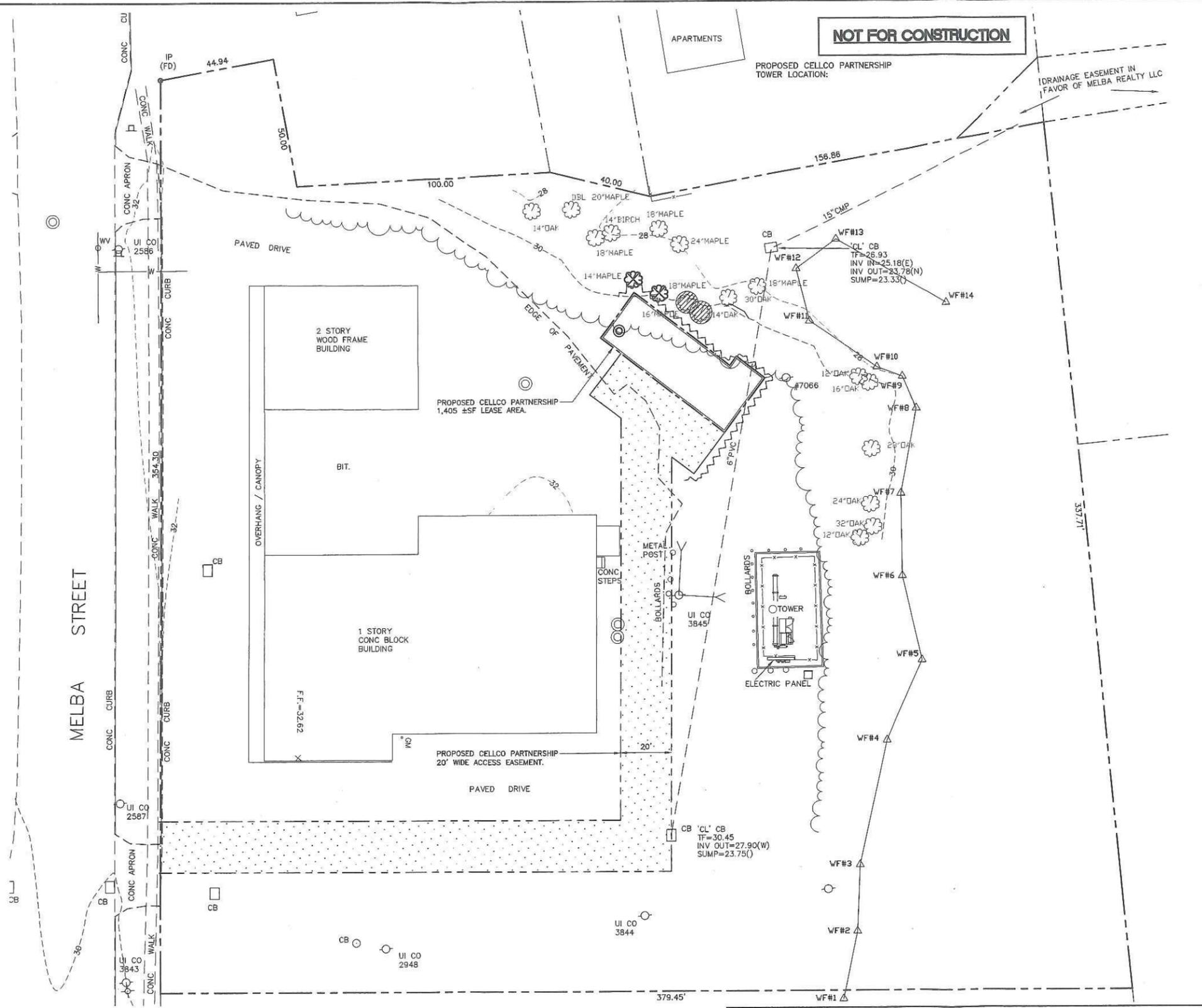
PARCEL IS IN ZONE X ON THE FLOOD INSURANCE RATE MAP, MILFORD, CT, NEW HAVEN COUNTY, PANEL 3 OF 6, COMMUNITY PANEL NUMBER 090083 0003 D, EFFECTIVE DATE JULY 2, 1987, BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY.



2 PROPOSED LEASE AREA LAYOUT PLAN
C-1A NOT TO SCALE

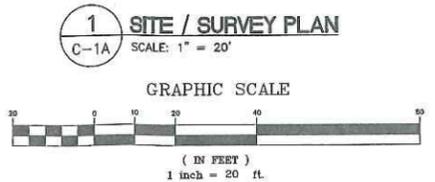
TO MY KNOWLEDGE AND BELIEF THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON
THIS MAP IS NOT VALID WITHOUT A LIVE SIGNATURE AND SEAL

A. RAFAEL MARTINEZ LLS #18833 DATE



TREE REMOVAL SUMMARY

TREES PROPOSED TO BE REMOVED IN LOCATION OF PROPOSED CELCO PARTNERSHIP 20' WIDE ACCESS EASEMENT	= 0
TREES PROPOSED TO BE REMOVED WITHIN AND ADJACENT TO PROPOSED LEASE AREA	= 2
TOTAL TREES PROPOSED TO BE REMOVED	= 2



Legend

—	PROPERTY LINE	○	ANGLE POINT IN PROPERTY LINE
- - -	EASEMENT LINE (PROPOSED)	●	IRON PIN / IRON PIPE FOUND
- · - · -	LEASE LINE (PROPOSED)	⊙	CONCRETE MONUMENT / CHD FOUND
— · — · —	CONTOUR LINE	⊕	EXIST'G UTILITY POLE
— · — · — · — · —	SPOT ELEVATIONS	WF#	WETLAND FLAG
~ ~ ~	SILTATION FENCE	☆	DECIDUOUS TREE
⊙	MAN HOLE	★	EVERGREEN TREE
— ○ —	PROPOSED FENCE	⊗	DECIDUOUS TREE TO BE REMOVED
— [] —	GRADING LINE	⊗	EVERGREEN TREE TO BE REMOVED
— [] —	SPOT GRADE ELEVATION	⊗	DECIDUOUS TREE TO BE PROTECTED

NOT FOR CONSTRUCTION

DESIGNED BY: CFC
DRAWN BY: DMD
CHK'D BY: CFC

REV.	DATE	DESCRIPTION
2	06/08/11	CFC FINAL DEVELOPMENT & MANAGEMENT (DAM) PLAN
1	07/15/11	DMD DEVELOPMENT & MANAGEMENT (DAM) PLAN
0	06/15/11	DMD DEVELOPMENT & MANAGEMENT (DAM) PLAN - CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

Cellco Partnership
d.b.a. Verizon Wireless

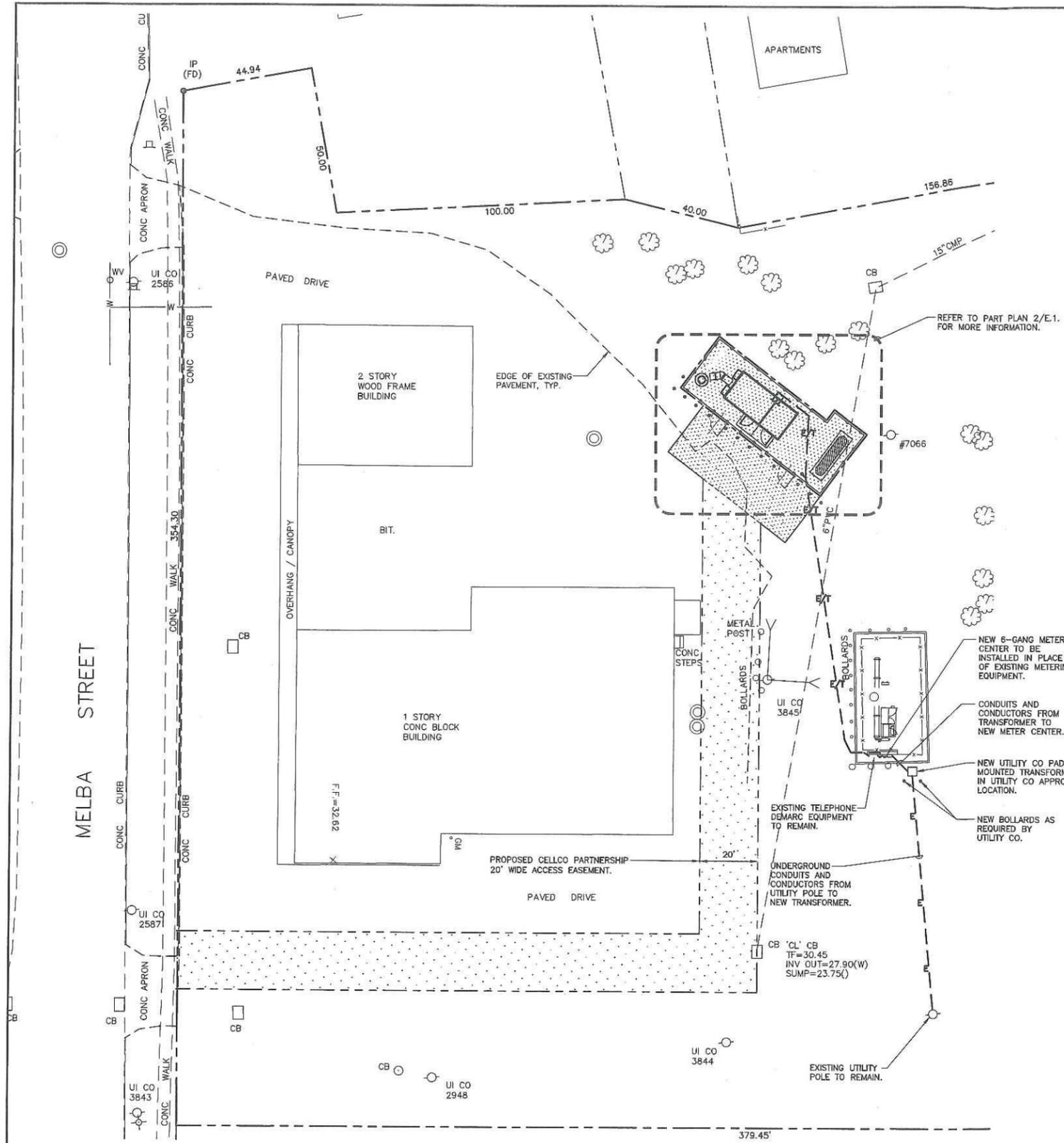
CENTEK engineering
Communication Solutions
(203) 488-0880
(203) 488-8887 Fax
1000 Main Road
Branford, CT 06405
www.CentekEng.com

Cellco Partnership d/b/a Verizon Wireless
WIRELESS COMMUNICATIONS FACILITY
BAYVIEW
234 MELBA STREET
MILFORD, CT 06461

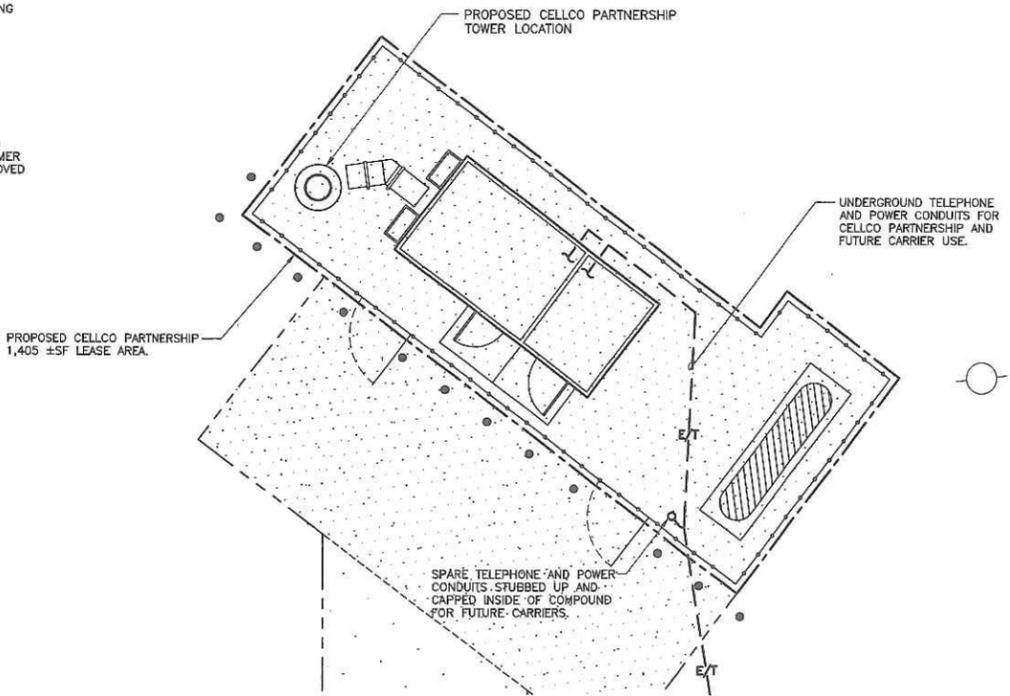
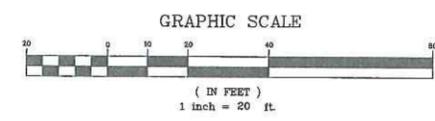
DATE: 06/08/11
SCALE: AS NOTED
JOB NO. 09092

SITE / SURVEY PLAN

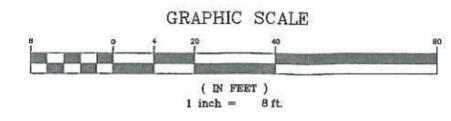
C-1A
Sheet No. 3 of 7



1 UTILITY ROUTING PLAN
C-1B SCALE: 1" = 20'-0"



2 PARTIAL UTILITY ROUTING PLAN
C-1B SCALE: 1/8" = 1'-0"



SYMBOLS LEGEND

---	PROPERTY LINE
- - - -	DIRT DRIVE (EXISTING)
- - - -	ACCESS DRIVE
- - - -	CL&P DISTRIBUTION EASEMENT AREA
- - - -	EASEMENT LINE
E	ELECTRICAL CONDUIT RUN (UNDERGROUND)
T	TELCO CONDUIT RUN (UNDERGROUND)
O/H	UTILITY LINES (OVERHEAD)
●	POWER UTILITY PULL BOX/SILO
■	TELCO UTILITY PULL BOX
◇	UTILITY POLE (EXISTING)
◇	UTILITY POLE
⊙	DECIDUOUS TREE (TO REMAIN)

ELECTRICAL UTILITY PULL BOX & TRANSFORMER PAD & HANDHOLE REFERENCE SPECIFICATIONS:
REFER TO UI CONSTRUCTION STANDARDS FOR INSTALLATION SPECIFICATION FOR DIRECT-BURIED IN CONDUIT - INSTALLATION OF CONCRETE PAD FOR SINGLE-PHASE-MOUNTED TRANSFORMERS.

- UTILITY LOCATION NOTES:**
- 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 AREAS ALREADY APPROVED FOR SUCH USE.
 - COORDINATE WITH OWNER AND UTILITY COMPANY FOR APPROVED LOCATIONS FOR ALL UTILITY AND SERVICE RELATED EQUIPMENT.

DESIGNED BY:	CFC			
DRAWN BY:	DMD			
CHK'D BY:	CFC			
REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	06/24/11	DMD	CFC	FINAL DEVELOPMENT & MANAGEMENT (D&M) PLAN
1	07/19/11	DMD	CFC	DEVELOPMENT & MANAGEMENT (D&M) PLAN
0	06/15/11	DMD	CFC	DEVELOPMENT & MANAGEMENT (D&M) PLAN - CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

Cellco Partnership
d.b.a. Verizon Wireless

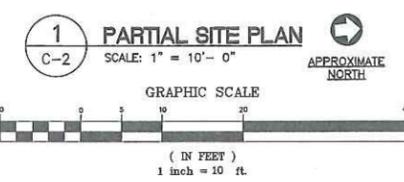
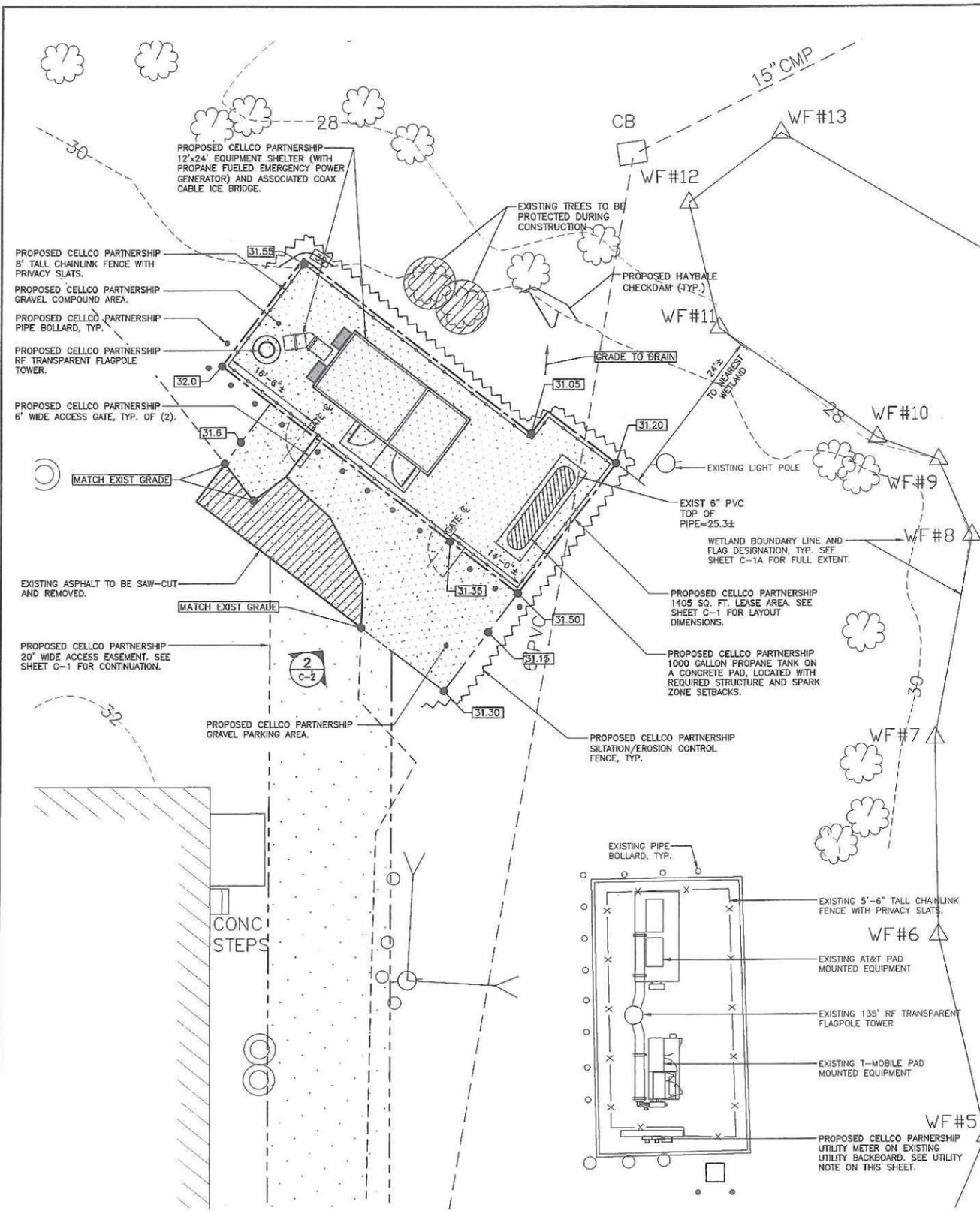
CENTEK engineering
Centered on Solutions™
0203 486 0800
0203 486 8087 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

Cellco Partnership d/b/a Verizon Wireless
WIRELESS COMMUNICATIONS FACILITY
BAYVIEW
234 MELBA STREET
MILFORD, CT 06461

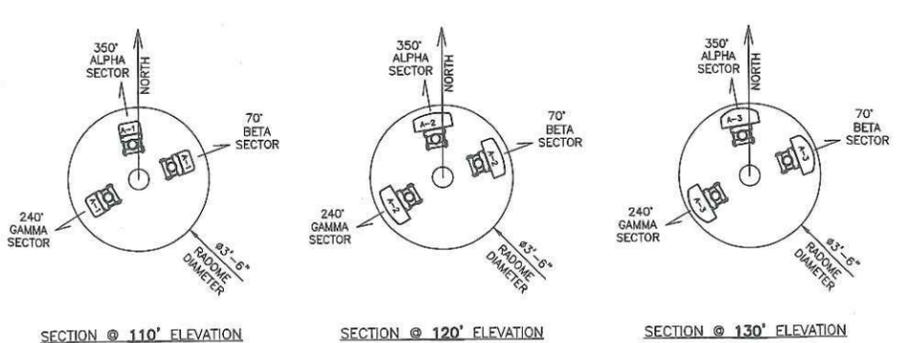
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SCALE: AS NOTED
JOB NO. 09092

UTILITY ROUTING PLAN

C-1B
Sheet No. 4 of 7

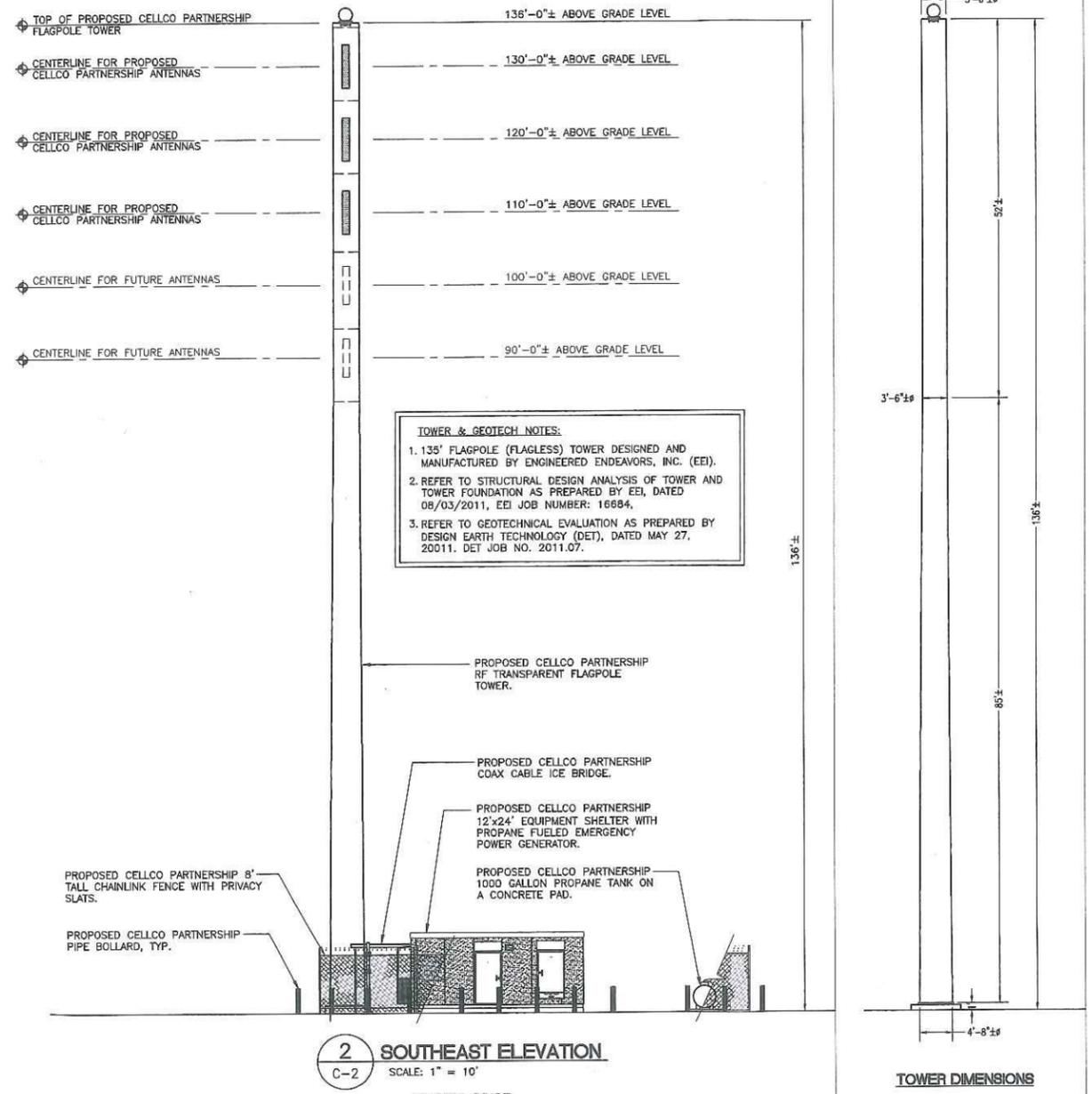


UTILITY NOTE:
EXISTING POWER UTILITY SERVICE CAPACITY SUBJECT TO REVIEW BY LOCAL UTILITY COMPANY.



ANTENNA ELEVATION:	130' A.G.L.
ANTENNA DESIGNATION:	A-3
MODEL:	BXA-185063/BCF_2 (DIMS: 48.8'Lx6.1'Wx3.2'D)
ANTENNA ELEVATION:	120' A.G.L.
ANTENNA DESIGNATION:	A-2
MODEL:	BXA-80063/6CF (DIMS: 71.1'Lx11.2'Wx5.0'D)
ANTENNA ELEVATION:	110' A.G.L.
ANTENNA DESIGNATION:	A-1
MODEL:	BXA-70063/6CF (DIMS: 71.0'Lx11.2'Wx4.5'D)

3 TYPICAL ANTENNA MOUNTING CONFIGURATIONS
C-2 NOT TO SCALE



NOT FOR CONSTRUCTION

DESIGNED BY: CFC
DRAWN BY: DMG
CHK'D BY: CFC

REV.	DATE	DESCRIPTION	DRAWN BY	CHK'D BY
2	06/04/11	DMD	CFC	CFC
1	07/19/11	DMD	CFC	CFC
0	06/15/11	DMD	CFC	CFC

FINAL DEVELOPMENT & MANAGEMENT (D&M) PLAN
DEVELOPMENT & MANAGEMENT (D&M) PLAN
DEVELOPMENT & MANAGEMENT (D&M) PLAN - CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

Celco Partnership
d.b.a. Verizon Wireless

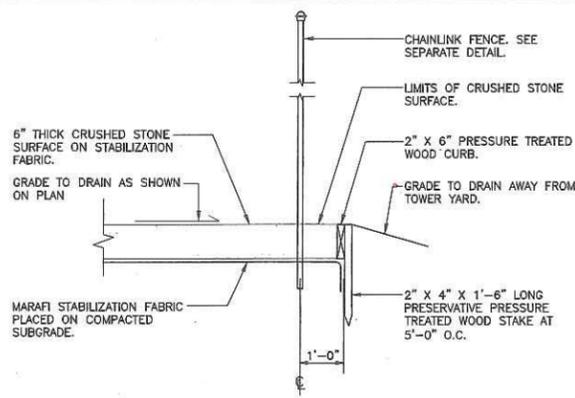
CENITEK engineering
Central Connecticut
2020 488-0990 Fax
452 North Branch Road
Branford, CT 06405
www.cenitekg.com

Celco Partnership d/b/a Verizon Wireless
WIRELESS COMMUNICATIONS FACILITY
BAYVIEW
284 MELBA STREET
MILFORD, CT 06461

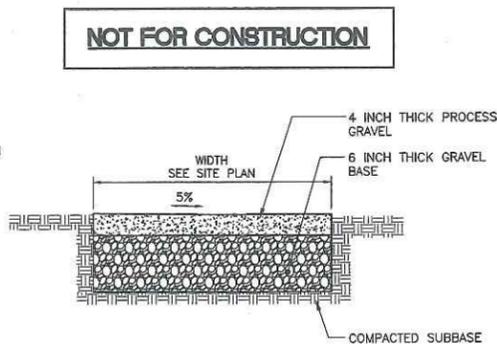
DATE: 06/08/11
SCALE: AS NOTED
JOB NO. 09092

PARTIAL SITE PLAN AND ELEVATION

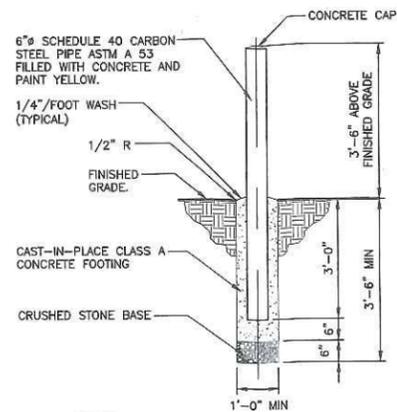
C-2
Sheet No. 5 of 7



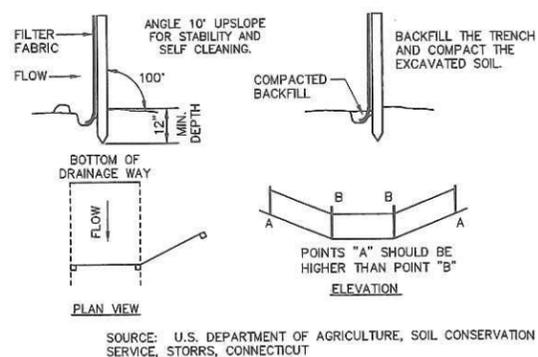
1 COMPOUND SURFACING DETAIL
C-3 NOT TO SCALE



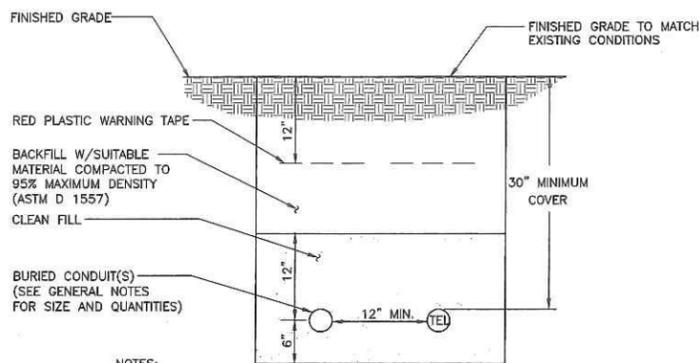
2 GRAVEL PARKING SURFACE
C-3 NOT TO SCALE



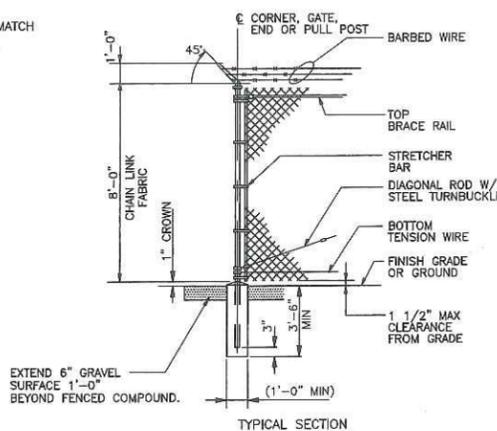
3 BOLLARD DETAIL
C-3 NOT TO SCALE



4 PLACEMENT AND CONSTRUCTION SILT FENCE
C-3 NOT TO SCALE



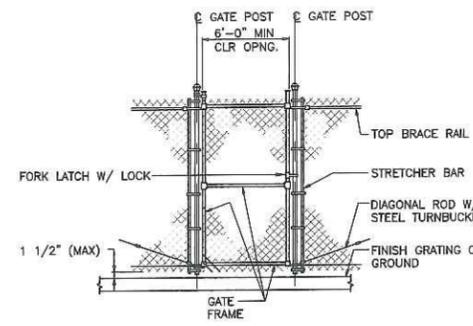
5 TYPICAL ELECTRICAL/TEL TRENCH DETAIL
C-3 NOT TO SCALE



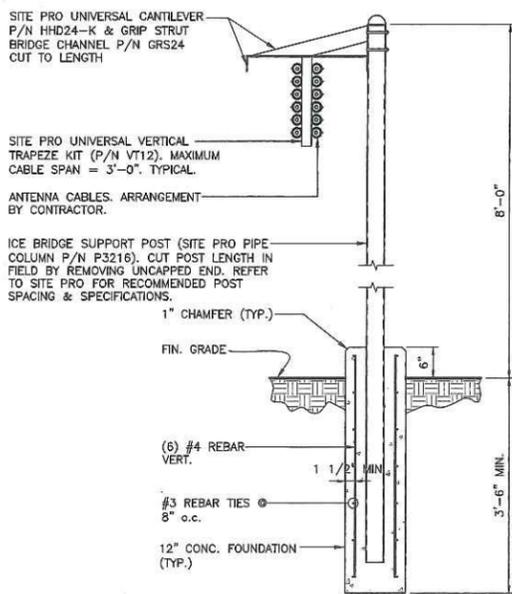
6 WOVEN WIRE FENCE DETAIL
C-3 NOT TO SCALE

WOVEN WIRE FENCE NOTES

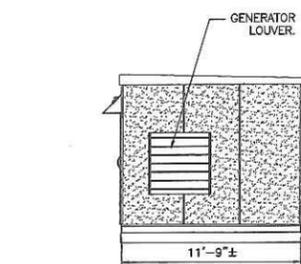
- GATE POST, CORNER, TERMINAL OR PULL POST 2 1/2" Ø SCHEDULE 40 FOR GATE WIDTHS UP THRU 6 FEET OR 12 FEET FOR DOUBLE SWING GATE PER ASTM-F1083.
- LINE POST: 2" Ø SCHEDULE 40 PIPE PER ASTM-F1083.
- GATE FRAME: 1 1/2" Ø SCHEDULE 40 PIPE PER ASTM-F1083.
- TOP RAIL & BRACE RAIL: 1 1/2" Ø SCHEDULE 40 PIPE PER ASTM-F1083.
- 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 LOOKABLE FORK LATCH AND LOCK, KEYS ALIKE FOR ALL SITES IN A GIVEN MTA.
- LOCAL ORDINANCE OF BARBED WIRE PERMIT REQUIREMENT SHALL BE COMPLIED WITH IF REQUIRED.
- HEIGHT = 8' VERTICAL + 1' BARBED WIRE VERTICAL DIMENSION.
- ALL FENCE AND GATE SECTIONS TO RECEIVE BLACK VINYL PRIVACY SLATS.



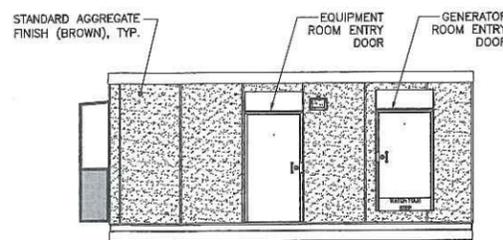
6A WOVEN WIRE SWING GATE-SINGLE
C-3 NOT TO SCALE



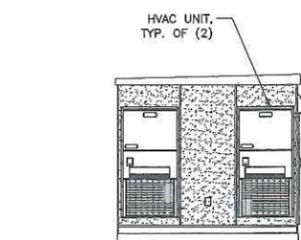
7 ICE BRIDGE DETAIL
C-3 NOT TO SCALE



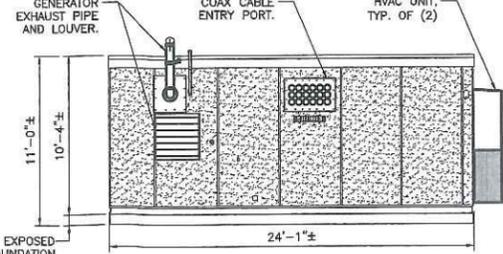
8 NORTH SHELTER ELEVATION
C-3 SCALE: 3/16" = 1'-0"



9 EAST SHELTER ELEVATION
C-3 SCALE: 3/16" = 1'-0"



10 SOUTH SHELTER ELEVATION
C-3 SCALE: 3/16" = 1'-0"



11 WEST SHELTER ELEVATION
C-3 SCALE: 3/16" = 1'-0"

EROSION CONTROL

GENERAL CONSTRUCTION SEQUENCE

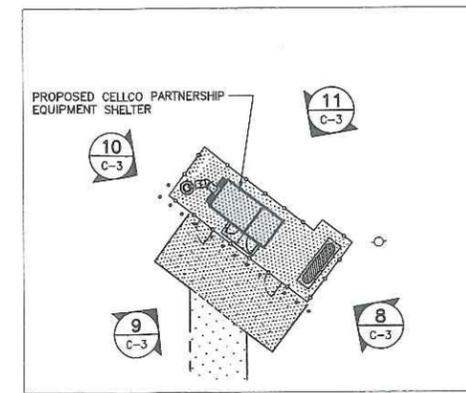
- THIS IS A GENERAL CONSTRUCTION SEQUENCE OUTLINE SOME ITEMS OF WHICH MAY NOT APPLY TO PARTICULAR SITES.
- CUT AND STUMP AREAS OF PROPOSED CONSTRUCTION.
 - INSTALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES AS REQUIRED.
 - REMOVE AND STOCKPILE TOPSOIL. STOCKPILE SHALL BE SEEDED TO PREVENT EROSION.
 - 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.

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 16 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.



SHELTER ELEVATION KEY PLAN
NOT TO SCALE APPROXIMATE NORTH

DESIGNED BY: CFC
DRAWN BY: DMD
CHK'D BY: CFC

NO.	DATE	BY	DESCRIPTION
1	06/04/11	DMD	FINAL DEVELOPMENT & MANAGEMENT (D&M) PLAN
2	07/19/11	DMD	DEVELOPMENT & MANAGEMENT (D&M) PLAN
0	05/15/11	DMD	DEVELOPMENT & MANAGEMENT (D&M) PLAN - CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

Cellco Partnership
d.b.a. Verizon Wireless

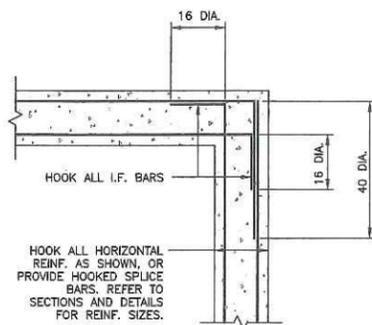
CEN TEK engineering
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(203) 488-6580
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Bristol, CT 06033
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Cellco Partnership d/b/a Verizon Wireless
WIRELESS COMMUNICATIONS FACILITY
BAYVIEW
234 MELBA STREET
MILFORD, CT 06461

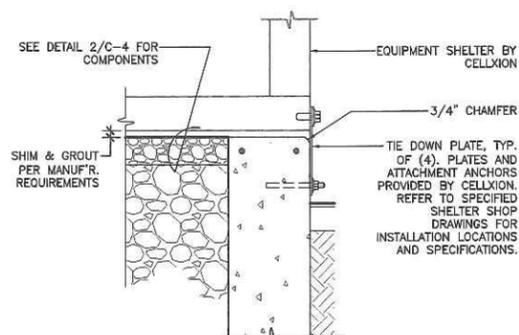
DATE: 06/08/11
SCALE: AS NOTED
JOB NO. 09092

SITE DETAILS AND SHELTER ELEVATIONS

C-3
Sheet No. 6 of 7

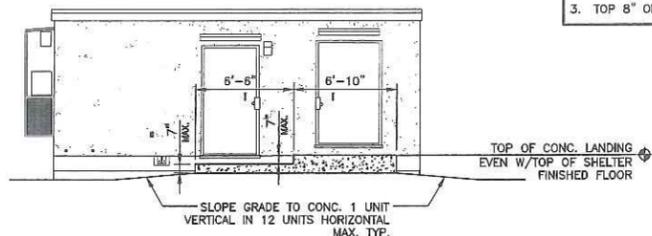


3 PLAN DETAIL
C-4 NOT TO SCALE

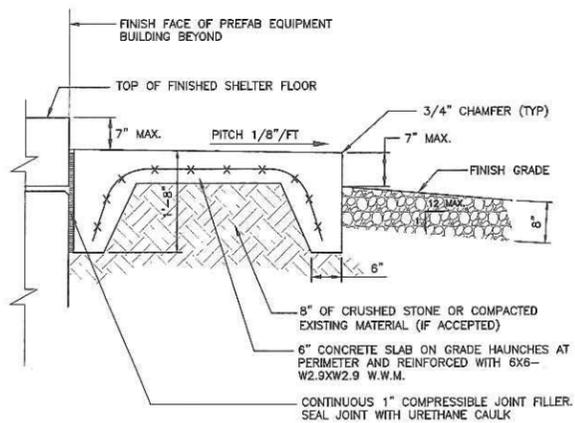


4 BUILDING TIE DOWN
C-4 SCALE: 1"=1'-0"

- NOTES:**
1. 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.
 2. SLAB/ TOP OF WALL TOLERANCE IS 1/4"±
 3. TOP 8" OF FOUNDATION SIDES MUST BE FORMED FLAT TO ACCEPT TIE-DOWN PLATES.

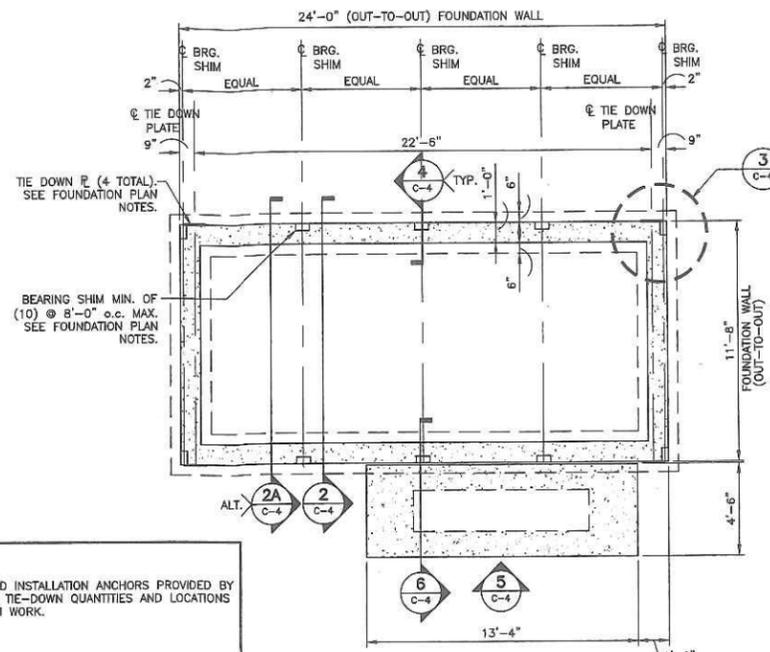


5 ENTRY STOOP DETAIL - ELEVATION
C-4 SCALE: 3/16"=1'-0"

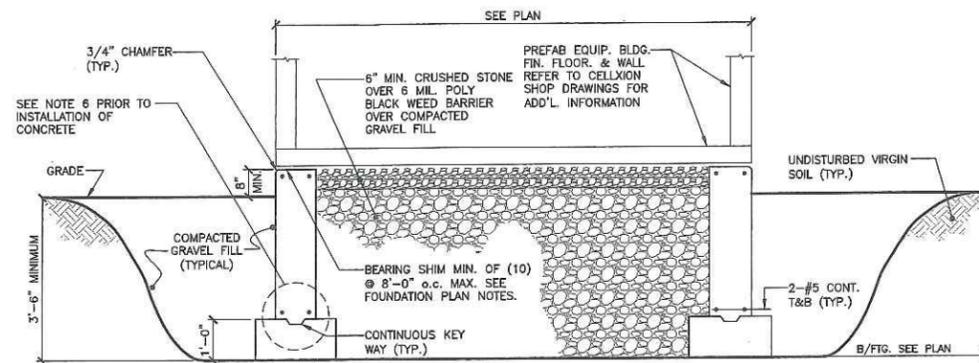


6 ENTRY STOOP DETAIL - SECTION
C-4 SCALE: 3/16"=1'-0"

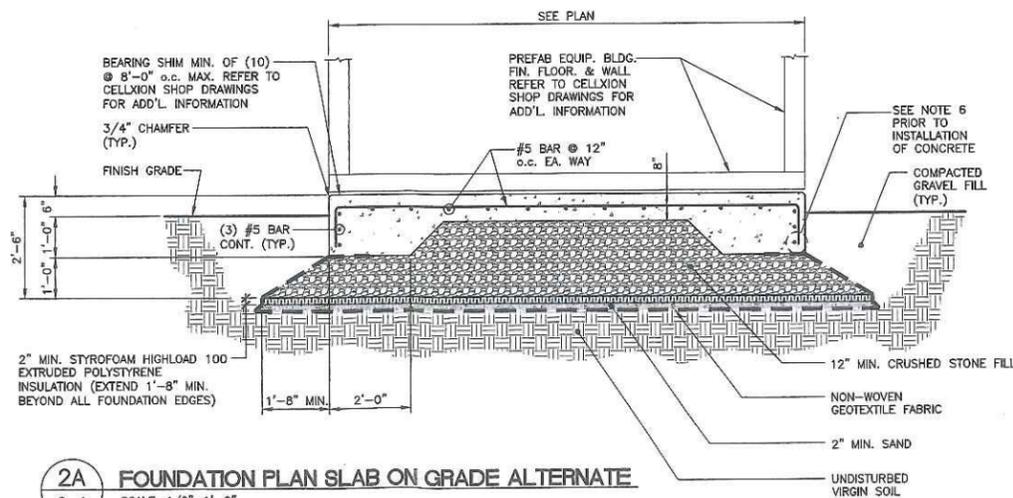
EQUIPMENT SHELTER BY CELLXION. VERIFY ALL SHELTER DIMENSIONS, EQUIPMENT DIMENSIONS, EQUIPMENT LOCATIONS AND UTILITY OPENINGS WITH BUILDING SHOP DRAWINGS PRIOR TO COMMENCEMENT OF WORK.



1 FOUNDATION PLAN
C-4 SCALE: 1/4"=1'-0" APPROXIMATE NORTH



2 TYPICAL SECTION
C-4 SCALE: 1/2"=1'-0"



2A FOUNDATION PLAN SLAB ON GRADE ALTERNATE
C-4 SCALE: 1/2"=1'-0"

FOUNDATION NOTES:

1. 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.
2. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST THE PRE MANUFACTURED EQUIPMENT BUILDING SHOP DRAWINGS.
3. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
4. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

SITE NOTES:

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. 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.
3. ALL RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED OFF SITE AND BE LEGALLY DISPOSED, AT NO ADDITIONAL COST.
4. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE EQUIPMENT AND TOWER AREAS.
5. 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.
6. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
7. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
8. 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.
9. 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.
10. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST THE PRE MANUFACTURED EQUIPMENT BUILDING SHOP DRAWINGS.
11. 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:

1. COMPACTED GRAVEL FILL SHALL BE FURNISHED AND PLACED AS A FOUNDATION FOR STRUCTURES, WHERE SHOWN ON THE CONTRACT DRAWINGS OR DIRECTED BY THE ENGINEER.
2. 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.
3. 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.
4. 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 COMPACTATION EQUIPMENT. COMPACTATION 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 COMPACTON IS ACHIEVED FOR THE PREVIOUS LAYER. IF NECESSARY TO OBTAIN THE REQUIRED COMPACTON, 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:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318.
2. 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.
3. 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.
4. 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:	
#6 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.
5. ALL EXPOSED EDGES OF CONCRETE TO RECEIVE A 3/4" CHAMFER IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
6. CONCRETE EQUIPMENT PAD TO RECEIVE A BRUSHED FINISH.
7. 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.

DESIGNED BY:	CFC
DRAWN BY:	DMD
CHK'D BY:	CFC
DATE:	06/08/11
SCALE:	AS NOTED
JOB NO.:	09092
SHELTER FOUND. PLAN, DETAILS AND NOTES	
C-4	
Sheet No. 1 of 1	

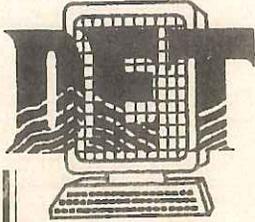
PROFESSIONAL ENGINEER SEAL	DATE	REV.	DESCRIPTION
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	07/19/11	1	DEVELOPMENT & MANAGEMENT (D&M) PLAN
	05/13/11	0	DEVELOPMENT & MANAGEMENT (D&M) PLAN - CLIENT REVIEW

Cellco Partnership
d/b/a Verizon Wireless

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DESIGN EARTH TECHNOLOGY

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GENERAL CIVIL ENGINEERING ■ GEOTECHNICAL ENGINEERING ■ HYDROGEOLOGY ■ HYDROLOGY AND HYDRAULICS ■ TESTING—SOILS & MATERIALS ■ CONSTRUCTION ENGINEERING

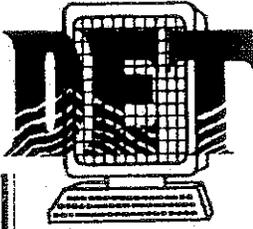
GEOTECHNICAL AND GEOPHYSICAL TESTING REPORT

PROPOSED VERIZON WIRELESS
COMMUNICATIONS FACILITY
234 MELBA STREET
MILFORD, CONNECTICUT

PREPARED FOR:

CEN TEK ENGINEERING, Inc.

MAY 2011



DESIGN EARTH TECHNOLOGY

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

May 27, 2011

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

Re: Proposed Verizon Wireless Communications Facility
Bayview – 234 Melba Street
Milford, Connecticut
DET Job No. 2011.07

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 May 10, 2011 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 Melba Street in Milford, Connecticut. The project location is shown on the attached "Location Plan, Figure No. 1". The project is located at a substantially developed site that has an existing operating grocery store. This grocery store occupies a somewhat large one story masonry structure with connecting bituminous parking lot. A smaller two story wood frame structure also exists on-site just west of the grocery store building. The occupancy of the two story wood building is unknown. Just north of the grocery store building is a wireless communications facility with a chain-link fenced compound area and flag pole type tower. This site is very flat with only about 2 to 4 feet of relief. There are also wetlands soils located along the northern portion of the site which is in the non-developed portion of the property.

PROJECT DESCRIPTION

The proposed project for this report consists of the construction of a +/-136' high flag pole type wireless communications tower with the installation of new communications equipment.

SUBSURFACE EXPLORATION

Associated Borings Company, Inc. performed the subsurface exploration work on May 23, 2011. 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 three (3) 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 boring was advanced to a depth of 21 feet below existing grade while the probes were advanced 10 feet below existing grade.

The auger boring was drilled using a 3.25" inside diameter (I.D.) standard hollow-stem auger (HSA) techniques. Standard Penetration Tests (SPT) were performed in the test boring with spilt spoon samples recovered. Spilt spoon samples were taken continuously from a depth of 1' below the ground surface to 19.6' below ground surface. The SPT consists of driving a 1 3/8" I.D. 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 No. 1 for a view of some of the subsurface drilling equipment used.

RESISTIVITY TESTING

In place soil resistivity testing was conducted by DET personnel on May 23, 2011 within the vicinity of the proposed tower facility. One test section was established in an approximate north-south direction; two (two) test sections were established in an approximate northeast-southwest direction. One test section could not be performed due to site limitations. 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 photograph No. 2 of a typical resistivity test.

LABORATORY TESTING

The laboratory testing program consisted of two (2) Gradation Analysis. 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 miscellaneous granular fill material underlain by gray/olive green, medium to dense, wet, glacial till. This natural undisturbed till layer generally consists of possible boulders, possible cobbles, gravel, sand, silt, clay in varying proportions underlain by bedrock. The somewhat shallow layer of natural glacial till soil starts at about 8' below existing ground surface and ends at about 19.5 feet below ground surface.

The bedrock surface at the site is estimate to be about 19.5 feet below existing grade indicated from drill rig auger refusal. According to the "Bedrock Geological Map of Connecticut", by John Rodgers, the bedrock at the site is "not classified" as it is not shown on the ground surface. Most likely this bedrock is Oronoque Schist; gray to silver, medium to fine grained schist and granfels as this is the near-by rock classification. Schist is metamorphic type rock. Rock cores were not taken at the site and a geologist was not retained to determinate the specific rock type.

Groundwater was observed in boring B1 at 6'. 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 soils below about eight feet of miscellaneous fill from existing grade are suitable for support for the flag pole tower foundation on spread footing. The miscellaneous fill material in general, has erratic density, composition, settlement potential, presence of voids and material subject to decomposition. The natural, dense sands, gravels, boulders, cobbles, and silt (glacial till) will become disturbed during the foundation excavation under normal excavation procedures, groundwater 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 (> 8' below existing ground surface to natural undisturbed till), 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 a non-woven geo-textile fabric with a minimum weight of 10 oz./s.y. as a separation layer. This fabric is to be installed on all soil subgrades.
- Install an 12" thick layer (min.) of ½" size crushed 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 stone is used to minimize the softening of the subgrade soils and aid in dewatering the excavation. The ½" size crushed stone shall meet the CTDOT gradation and hardness requirements. See Figure No. 3 for additional details.

Provided that the foundations are prepared as recommended above, a maximum net allowable soil bearing of 3 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 ½" 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 State Building Code, which incorporates the Seismic design Category approach from the International Building Code. The seismic design Category determination is based on a few category factors. One such category is the "Site Classification (soil type)". From our test borings, we consider that the site subsurface conditions match the General Description of "Very Dense Soil and Soft Rock". The site classification is therefore "C".

For transfer of ground shear into the natural soil, the friction factor between the concrete and natural deposit can be 0.45.

The proposed foundation is to bear on dense soil. This dense soil will not liquefy during a seismic event and needs not be addressed in the foundation design.

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 is to be used in the design to obtain "allowable" passive pressure from ultimate passive pressure.

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 miscellaneous granular fill and till, hence excavation is not expected to be difficult.

Dewatering/Groundwater

Normal groundwater levels are expected to be above the proposed bottom of proposed foundation excavation. Therefore, dewatering is expected and will require for pumping of groundwater, surface runoff and precipitation that enters the excavation. It is anticipated that dewatering will be performed by localized sump techniques.

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.

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 holes 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.
May 27, 2011
Page 7

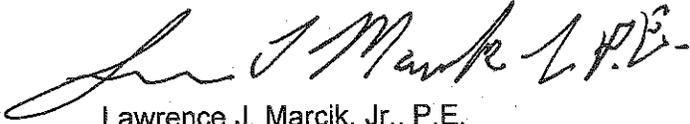
Use of This Report

This report has been prepared for specific application and use of the proposed Verizon Wireless Communications Tower to be located off of Malba Street in Milford, 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.

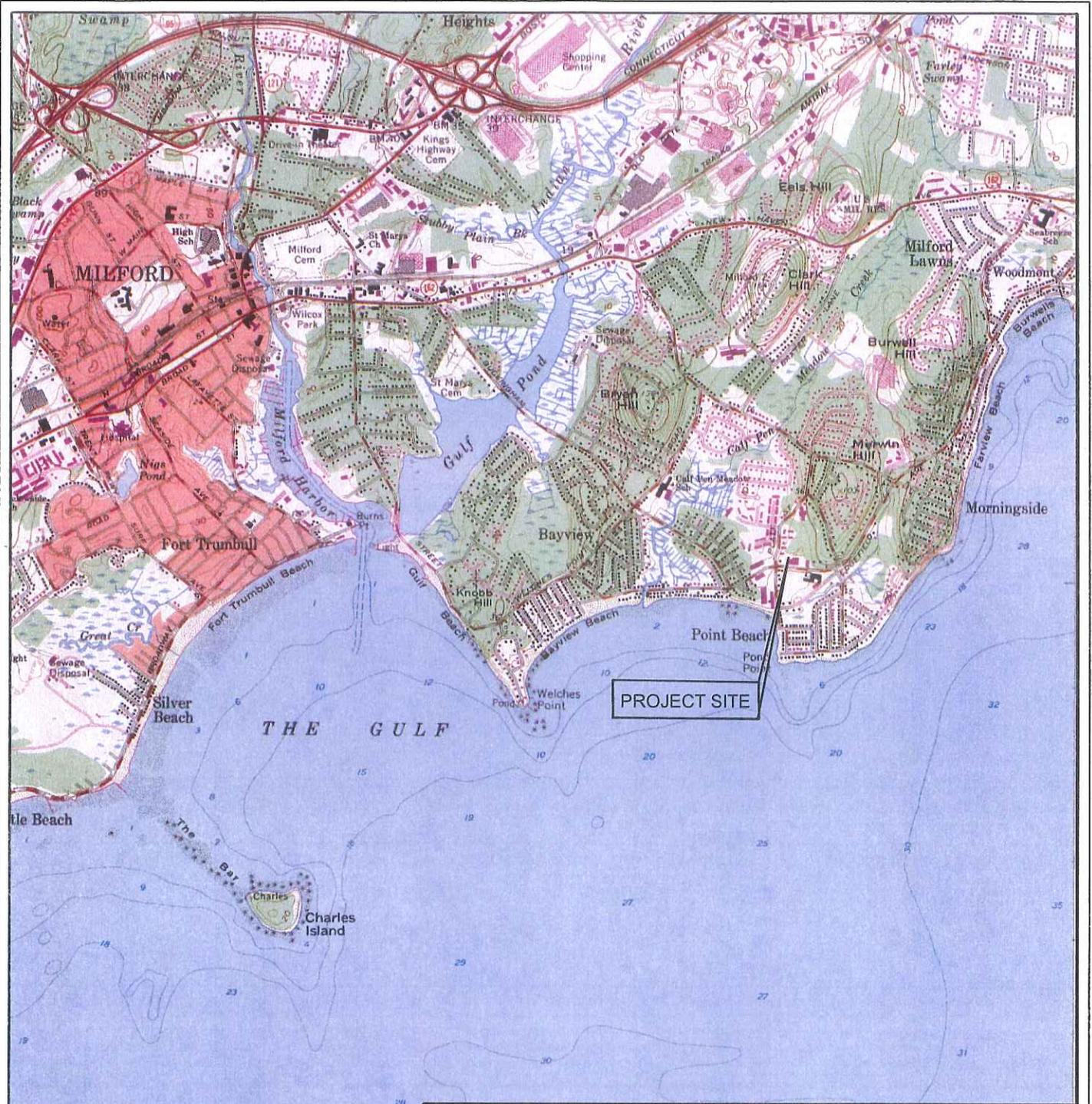
Sincerely,

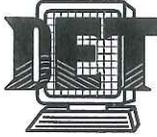
DESIGN EARTH TECHNOLOGY

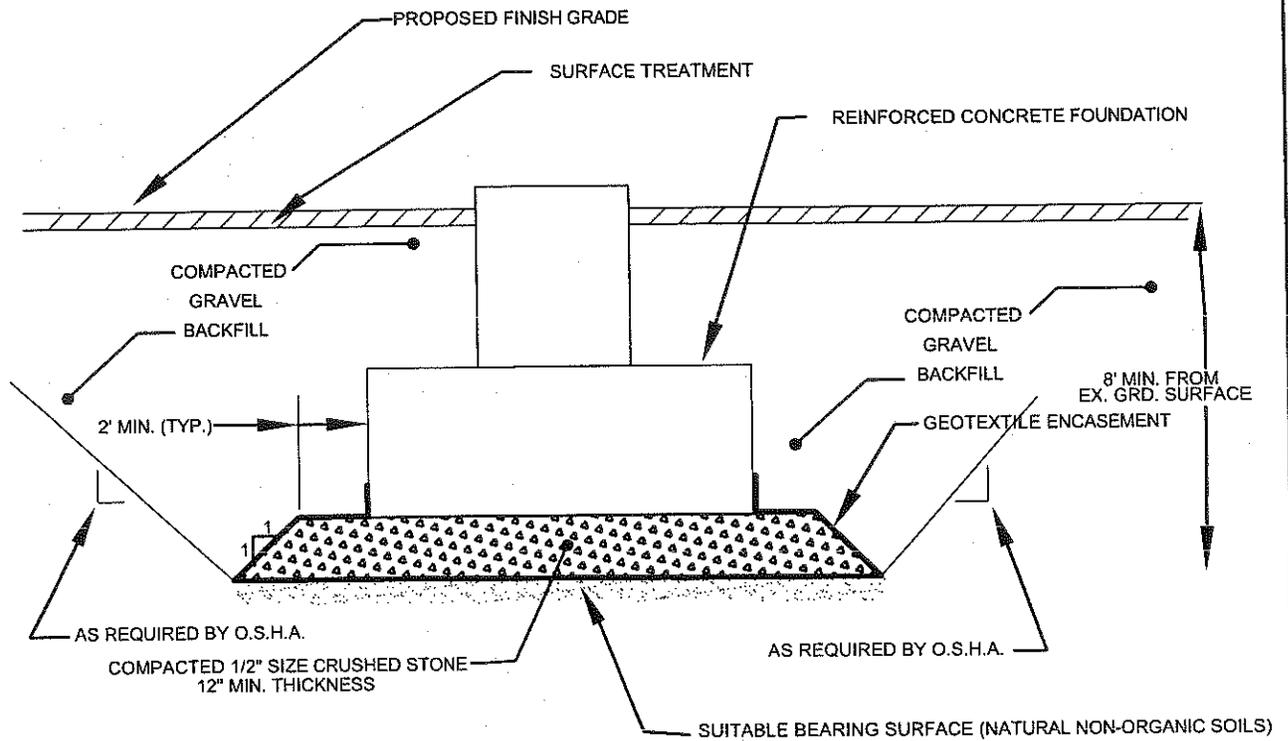
A handwritten signature in black ink, appearing to read "Lawrence J. Marcik, Jr., P.E.", written in a cursive style.

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

FIGURES



JOB TITLE: GEOTECHNICAL REPORT FOR A PROPOSED VERIZON WIRELESS COMMUNICATION FACILITY AT 234 MELBA STREET MILFORD, CONNECTICUT		DATE: MAY 23, 2011
PREPARED FOR: CEN TEK ENGINEERING, INC.		SCALE: NTS
SOURCE: U.S.G.S. QUADRANGLE MILFORD	 DESIGN EARTH TECHNOLOGY P.O. Box 187 • Guilford, CT 06437 Phone/Fax: (203) 458-9806 Email: doedit@aol.com	PROJECT No.: 2011-07
		DRAWN: LJM
FIGURE TITLE: LOCATION PLAN		FIGURE No.: 1
		CAD FILE: Location Plan



SECTION

FOUNDATION BEARING SURFACE PREPARATION

NOT TO SCALE

JOB TITLE: GEOTECHNICAL REPORT FOR A
 PROPOSED VERIZON WIRELESS COMMUNICATION FACILITY
 AT
 234 MELBA STREET
 MILFORD, CONNECTICUT

PREPARED FOR:
CEN TEK ENGINEERING, INC.

DATE:
 MAY 23, 2011

SCALE:
 NTS

PROJECT No.:
 2011-07

DRAWN:
 LJM

FIGURE No.:

3

CAO FILE: Figures



**DESIGN EARTH
 TECHNOLOGY**

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

FIGURE TITLE: FOUNDATION DETAILS

TABLES

TABLE 1

**PROPOSED VERIZON WIRELESS TOWER
BAYVIEW
234 Melba, Street
Milford, CT**

IN-SITU SOIL RESISTIVITY RESULTS¹

Section No.

ELECTRODE SPACING (ft)	1	2	3	4
5	18,585	20,299	33,800	C.N.P.
10	22,080	20,318	34,719	C.N.P.
20	17,158	19,610	47,683	C.N.P.
30	17,982	20,797	29,587	C.N.P.
40	20,912	22,061	31,483	C.N.P.

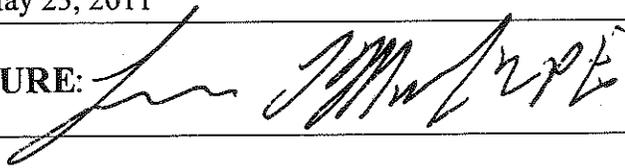
- NOTES:
1. Resistivity values indicated are in OHMCM
 2. ¹Test completed using Wenner Four Probe Method with a Det 2/2 Auto Earth Tester as manufactured by Avo, Inc.
 3. C.N.P. = Could not perform test due to site limitations

APPENDICES

APPENDIX A

APPENDIX B

**RESISTIVITY
DATA**

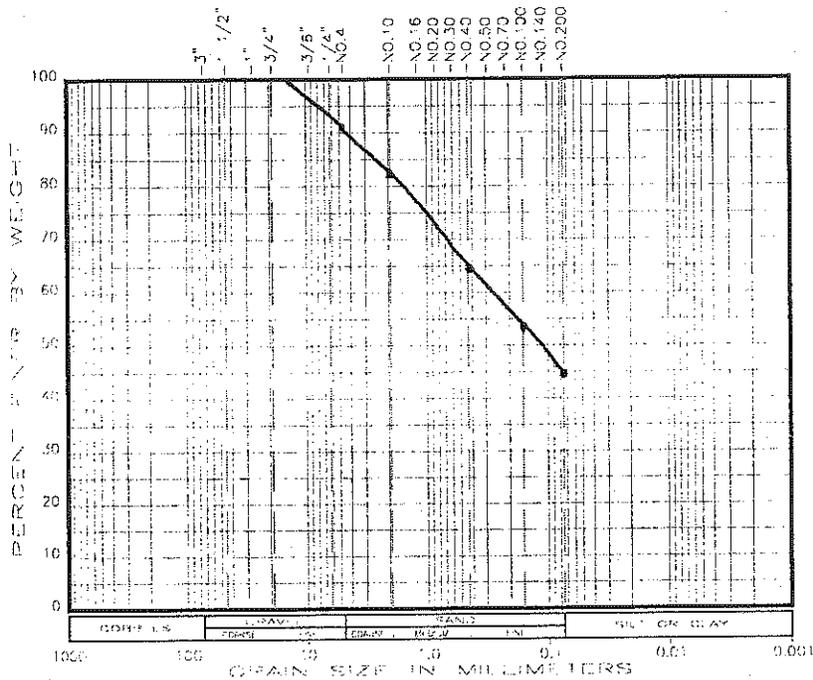
SITE: BAYVIEW- 234 Melba St., Milford, Connecticut
DATE: May 23, 2011
SIGNATURE: 

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)	19.41	11.53	4.48	3.13	2.73
AREA 1 CALCULATED (OHM-CM)	18,585	22,080	17,158	17,982	20,912
AREA 2 MEASURED R (OHM)	21.20	10.61	5.12	3.62	2.88
AREA 2 CALCULATED (OHM-CM)	20,299	20,318	19,610	20,797	22,061
AREA 3 MEASURED R (OHM)	35.3	18.13	12.45	5.15	4.11
AREA 3 CALCULATED (OHM-CM)	33,800	34,719	47,683	29,587	31,483
AREA 4 MEASURED R (OHM)	C.N.P.	C.N.P.	C.N.P.	C.N.P.	C.N.P.
AREA 4 CALCULATED (OHM-CM)	-	-	-	-	-

C.N.P. = Could Not Perform Test Due to Site Conditions

APPENDIX C

REPORT OF GRADATION ANALYSIS



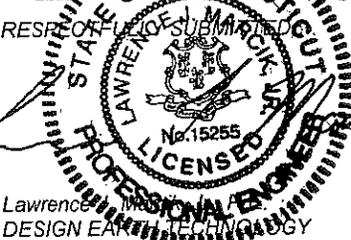
BORING NO. 1	SAMPLE NO. 5
ORIGIN OF MATERIAL: From Split Spoon Sampler	
VISUAL CLASSIFICATION: Medium to Fine Sand, Trace Coarse Sand, Trace Fine Gravel and Silt/Clay	
PROPOSED USE: Foundation Soil	
ASTM METHOD USED: D422	
DEVIATION FROM ASTM METHOD: Washed Through the No. 100 and No. 200 Sieves	
DESCRIPTION OF SAMPLING PROCEDURE USED: Split Spoon Sampler	
DESCRIPTION OF ANY MEASUREMENT UNCERTAINTY: NONE	
REMARKS: 1. Depth of sample 8 to 10 feet	

SIEVE SIZE	% PASSING
3/4"	100
No. 4	91
No. 10	83
No. 40	65
No. 100	54
No. 200	45



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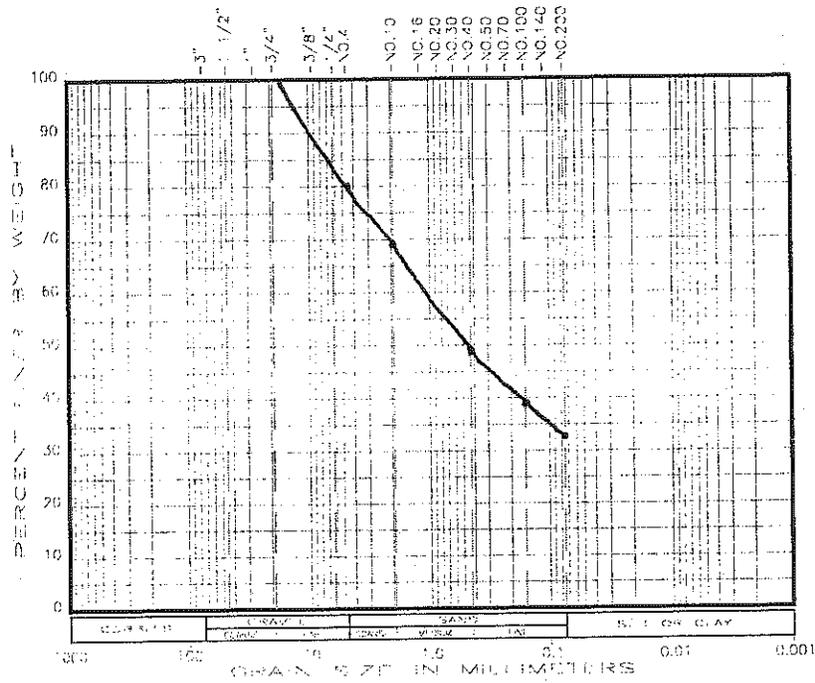
Lawrence J. M.
 DESIGN EARTH TECHNOLOGY

Date:	May 23, 2011	Project No.:	2011-07
Test By:	LJM, Jr.	Checked By:	LJM, Jr.
Project:	Proposed Wireless Communications Facility		
	Bayview- 234 Melba St.,		
	Milford, 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



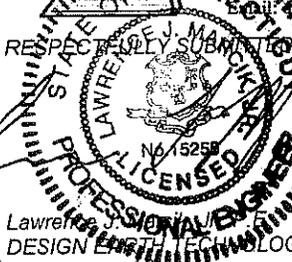
BORING NO. 1	SAMPLE NO. 7
ORIGIN OF MATERIAL: From Split Spoon Sampler	
VISUAL CLASSIFICATION: Coarse to Fine Sand, Some Silt/Clay, Little Fine Gravel	
PROPOSED USE: Foundation Soil	
ASTM METHOD USED: D422	
DEVIATION FROM ASTM METHOD: Washed Through the No. 100 and No. 200 Sieves	
DESCRIPTION OF SAMPLING PROCEDURE USED: Split Spoon Sampler	
DESCRIPTION OF ANY MEASUREMENT UNCERTAINTY: NONE	
REMARKS: 1. Depth of sample 12 to 14 feet	

SIEVE SIZE	% PASSING
3/4"	100
No. 4	80
No. 10	69
No. 40	49
No. 100	39
No. 200	33



DESIGN EARTH TECHNOLOGY

P.O. Box 1873, Guilford, CT 06437
 Phone: Fax: (203) 458-9806
 Email: cedirt@aol.com



Date:	May 23, 2011	Project No.:	2011-07
Test By:	LJM, Jr.	Checked By:	LJM, Jr.
Project:	Proposed Wireless Communications Facility		
	Bayview- 234 Melba Street.		
	Milford, 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.

PHOTOGRAPHS

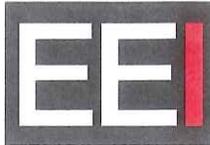
PHOTOGRAPHS



PHOTO NO. 1 - DRILLING EQUIPMENT USED IN THE SUBSURFACE INVESTIGATION



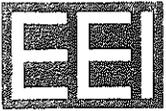
PHOTO NO. 2 - TYPICAL SOIL RESISTIVITY TESTING



**ENGINEERED
ENDEAVORS**

**Verizon Wireless
Structure & Foundation
Design Calculations
135' 5C Disguised Monopole
Site: Bayview
EEI Job #: 16684-E01**

ENGINEERED ENDEAVORS



ENGINEERED ENDEAVORS

The Experienced Point of View

Customer: VERIZON WIRELESS

Description: 135' AMS POLE - 42"Ø AMS

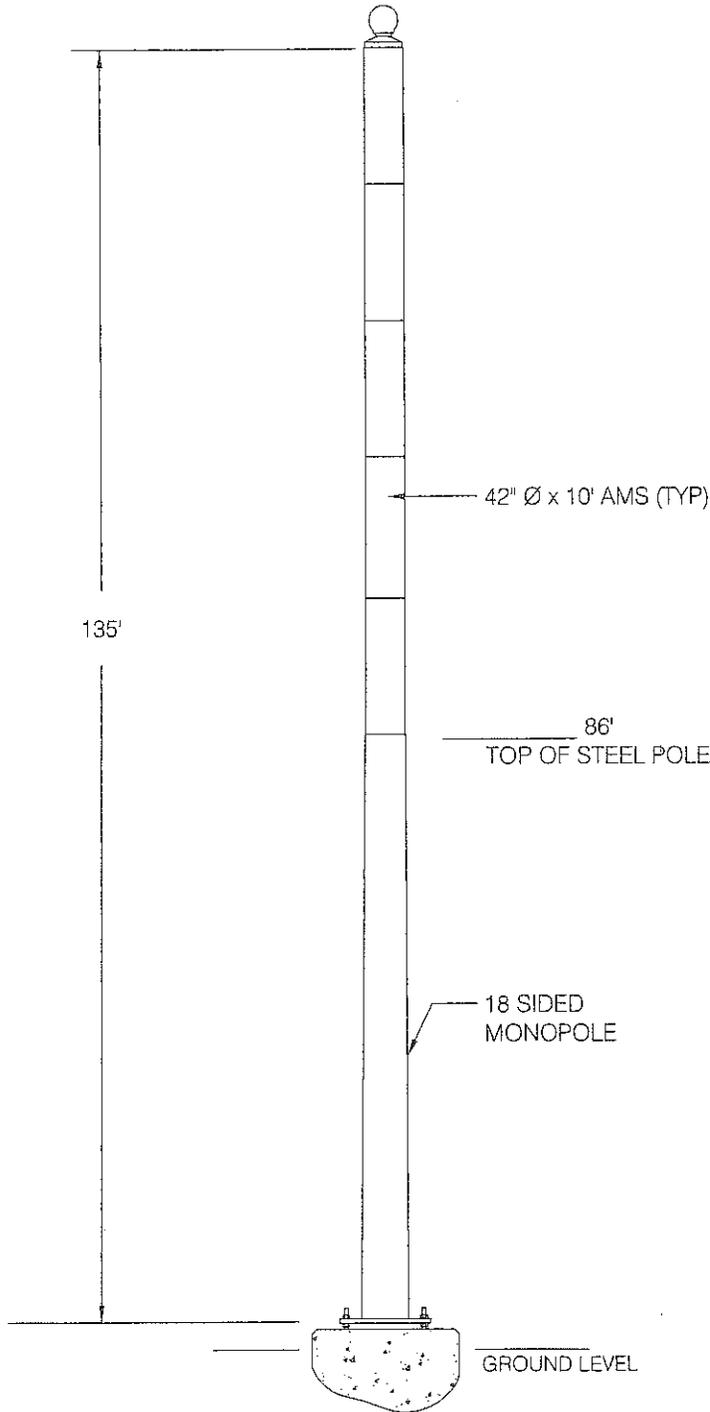
EEI Job Number: 16684

SITE INFORMATION

Location: MILFORD, CT
Site Name: BAYVIEW
Site Number: N/A

DESIGN INFORMATION

Designed By: MRM
Design Date: 8/3/2011
Status: REVISION 1



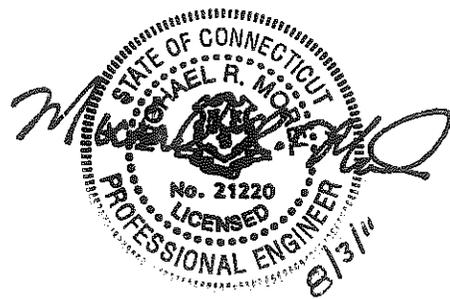
ANTENNA LOADING

(5) 42" Ø x 10' ANTENNA MOUNTING SYSTEM (AMS) AT 130', 120', 110', 100', AND 90'

DESIGN CRITERIA

DESIGNED IN ACCORDANCE WITH THE TIA 222-G AND ASCE 7 FOR 115 MPH 3-SECOND GUST WIND SPEED

- STRUCTURE CLASSIFICATION - II
- EXPOSURE - C
- TOPOGRAPHIC CATEGORY - 1



ENGINEERED ENDEAVORS

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

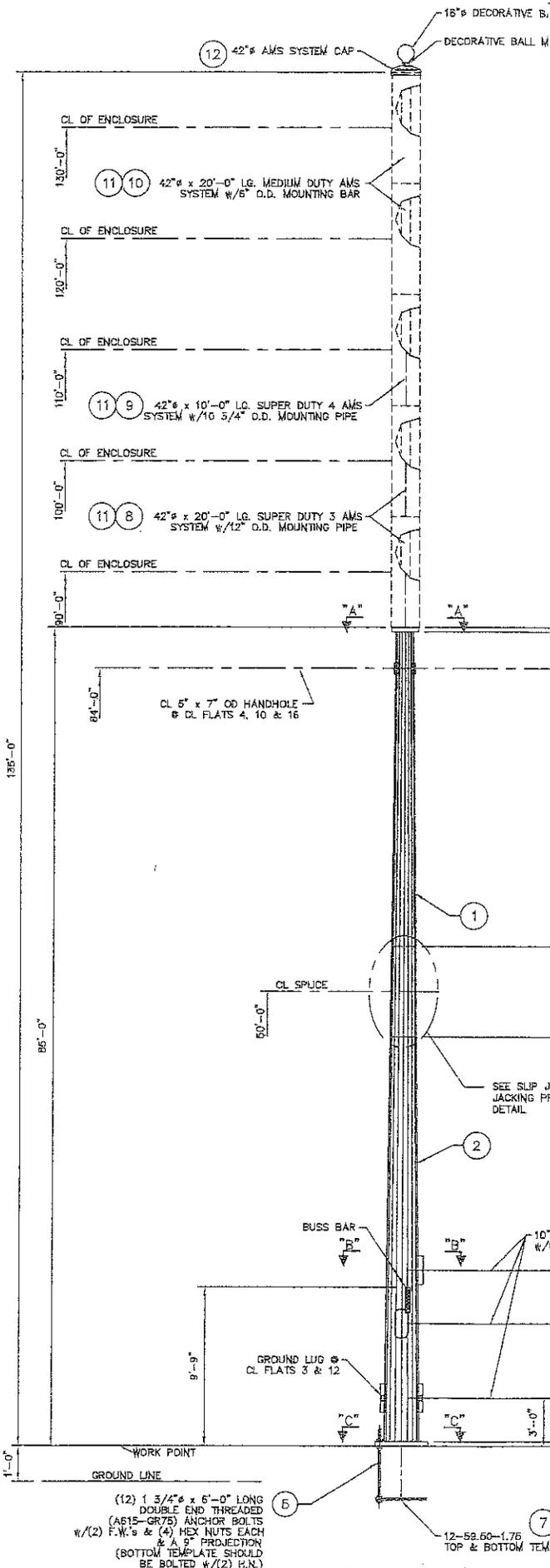
MATERIAL REQ'D. PER ASSEMBLY

GALV. WT.	QTY.	ITEM	MK. NO.	DESCRIPTION
---	1	(1)	---	SHAFT ASSY. (TOP) 37.83' LG.
---	1	(2)	---	SHAFT ASSY. (BOTTOM) 52.83' LG.
31.41	5	(3)	K11497	10" x 30" ACCESS PORT COVER PL
		(4)		HARDWARE AS FOLLOWS:
2.69	3	(4)	K11153	5" x 7" HANDHOLE COVER PLATE
59.56	12	(5)	1.75-AB60DC-4	1 3/4" x 6"-0" LG. (A615-GR75) ANCHOR BOLTS W/ (2) F.W.'s & (4) HEX NUTS (A194-GR2H), EACH
	1	(6)		STRUCTURE ASSEMBLY AND ERECTION PROCEDURES
115.75	2	(7)	12-59.50-1.75	SETTING TEMPLATE
----	1	(8)	K-----	42" x 20'-0" LG SUPER DUTY 3 AMS SYSTEM II
----	1	(9)	K-----	42" x 10'-0" LONG SUPER DUTY 4 AMS SYSTEM 2.5
----	1	(10)	K-----	42" x 20'-0" LONG HEAVY DUTY AMS SYSTEM 2.5
----	5	(11)	K-----	42" x 10'-0" LG STD APPLICATION PANEL ENCLOSURE KIT FOR AMS SYSTEM II
----	1	(12)	K-----	42" AMS SYSTEM II CAP
----	1	(13)	K-----	AMS MOUNTED DECORATIVE BALL MOUNT FOR 16" TO 42" AMS's
10.04	1	(14)	K11475	18" DECORATIVE BALL KIT
				PAINTED FINISH TBD

TOTAL GALV. STR. & ACCES. WT. #
 TOTAL ANCHOR BOLT & TEMPLATE WT. 946.22 #

GENERAL NOTES

- IS DESIGNED IN ACCORDANCE WITH THE TIA 222-G AND ASCE 7 FOR 115 MPH 3-SECOND GUST WIND SPEED.
- CLASSIFICATION - II
- C
- HIC CATEGORY - 1
- SHALL BE IN ACCORDANCE WITH AMS D.1.1. (LATEST EDITION). LONGITUDINAL SEAM WELDS SLIP-JOINT AREA IN FEMALE SECTION SHALL BE 100% PENETRATION.
- SHALL BE HOT DIP GALVANIZED PER ASTM A123 AND THEN PAINTED TBD. TOUCH-UP PAINT NOT SUPPLIED.
- DR SHALL THOROUGHLY REVIEW EET'S ASSEMBLY & ERECTION PROCEDURE PRIOR TO INITIATING THE ERECTION OF THE MONOPOLE.
- ALIGNMENT OF THE MONOPOLE SHALL BE VERIFIED PRIOR TO ERECTION OF THE POLE.
- IF THE MONOPOLE SHALL BE JACKED TOGETHER WITH A MINIMUM JACKING FORCE OF 10,000 LBS TO EACH SIDE. FOR A MAXIMUM RECOMMENDED JACKING FORCE, SPLICE LENGTH TOLERANCE, AND DISTANCE BETWEEN SECTIONS REFER TO EET ASSEMBLY & ERECTION PROCEDURE.
- FOR SHAFT ALIGNMENT A 2" HORIZONTAL WELD BEAD AND A MARK ARE POSITIONED ON EACH SHAFT. FOR SPLICE, THE 2" HORIZONTAL WELD BEADS ARE ON THE MATCHING CORNERS. THE MARK NUMBER IS ADJACENT FLAT. THE CORNERS WITH WELD BEADS SHALL BE ALIGNED FROM TOP TO BOTTOM OF THE SHAFT. THE MARK NUMBERS SHALL BE MATCHED FOR EACH SIDE & THE DISTANCE BETWEEN TWO WELD BEADS SHOULD BE $(\pm 4")$.
- WEDGEBOLT NUTS (1" x 1") FOR JACKING SECTIONS TOGETHER ARE LOCATED ON OPPOSING SECTION FLATS AND BELOW SPLICES.
- TOP OF THE FOUNDATION AND BOTTOM OF THE BASE PLATE MAY BE FILLED WITH A NON-SHRINK GROUT WITH A MINIMUM COMPRESSIVE STRENGTH OF $f' = 2000$ PSI. WATER DRAINAGE MUST BE PROVIDED TO THE BASE PLATE TO ENSURE THAT MOISTURE DOES NOT COLLECT INSIDE THE MONOPOLE.
- FLANGE CONNECTIONS WITH A325 HIGH-STRENGTH BOLTS SHALL BE ASSEMBLED IN ACCORDANCE WITH THE SPECIFICATIONS FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS. BOLTS SHALL BE BROUGHT TO TIGHT CONDITIONS AS RECOMMENDED BY THE FLANGE SPECIFICATIONS IN FLANGE-TYPE JOINTS AND BE SHIMMED IF NECESSARY. THE SHIMS WILL BE SUPPLIED BY EET.
- BOLTS SHALL BE TIGHTENED AFTER THE STRUCTURE IS PLUMB. BOTH TOP & BOTTOM NUT SHALL BE TIGHTENED TO 350 FT-LBS MOMENT. FOR DETAIL ANCHOR BOLT INSTALLATION REFER TO EET ASSEMBLY & ERECTION PROCEDURE.
- $\alpha = 0.1549 \text{ in/ft}$



ERECTION VIEW
 SCALE NONE

NOTE: ALL ELEVATIONS SHOWN FROM BOTTOM OF BASE PLATE UNLESS OTHERWISE NOTED.



ENGINEERED ENDEAVORS

The Experienced Point of View

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 Pht: (440) 564-5484 * Pht: (888) 270-3855
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135'-0" AMS POLE-42" Ø
 VERIZON WIRELESS
 BAYVIEW
 MILFORD, CT

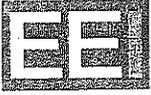
SCALE	NONE	PROJECT NO.	16684
SK.	1 of 1	DRAWING NO.	GS57781

APPROVAL DWG 6/23/2011 RPH

EET WILL NOT HONOR ANY BACKCHARGES WHICH HAVE NOT RECEIVED PRIOR WRITTEN AUTHORIZATION phone (440) 564-5484

COMMUNICATIONS STRUCTURE WIND LOADING DEVELOPMENT

Per the ANSI/TIA 222-G-2005



**ENGINEERED
ENDEAVORS**
The Experienced Point of View

CUSTOMER: VERIZON WIRELESS
SITE LOCATION: MILFORD, CT
SITE NAME: BAYVIEW
SITE NUMBER:

CURRENT DATE: 08/03/11
STRUCTURE: 135' AMS POLE
JOB NUMBER: 16684
STATUS: REVISION 1

Load Combinations

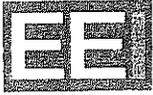
<p>6 1.0D + 1.0W₀</p> <p>1 1.2D + 1.6W₀</p> <p>3 1.2D + 1.0D₁ + 1.0W₁</p>	<p>SERVICE DEAD LOAD FACTOR = 1.0</p> <p>SERVICE WIND LOAD FACTOR = 1.0</p> <p>WIND DEAD LOAD FACTOR = 1.2</p> <p>WIND w/o ICE FACTOR = 1.6</p> <p>WIND DEAD LOAD w/ICE FACTOR = 1.2</p> <p>WIND w/ ICE FACTOR = 1.0</p> <p>DEAD LOAD FACTOR FOR ICE = 1.0</p>	<p>MAXIMUM DEFLECTION (in) = 30.6</p> <p>MAXIMUM ROTATION @ TOP (°) = 4.00</p> <p>WEIGHT OF ICE (pcf) = 56</p> <p>TEMPERATURE FACTOR = N/A to non-guy structures</p>
---	--	--

General Information

<p>STRUCTURE HEIGHT (ft) = 85.00</p> <p>NUMBER OF MONOPOLE SIDES = 18</p> <p>DESIGN WIND SPEED (mph) = 115</p> <p>WIND SPEED w/ ICE (mph) = 50</p> <p>RADIAL ICE (in) = 0.75</p> <p>OPERATIONAL WIND SPEED (mph) = 60</p> <p>DIRECTIONALITY DESIGN, K_d = 0.95</p> <p>DIRECTIONALITY SERVICE, K_d = 0.85</p> <p>DESIGN GUST RESPONSE FACTOR, G_h = 1.10</p> <p>SERVICE GUST RESPONSE FACTOR, G_h = 1.10</p> <p>FORCE COEFFICIENT w/o ICE, C_f = 0.65</p> <p>FORCE COEFFICIENT w/ ICE, C_f = 1.20</p> <p>ACROSS POINTS FACTOR = 1.015</p>	<p>STRUCTURE CLASSIFICATION II (Importance Factor)</p> <p>DESIGN SERVICE (Section 2.8.3)</p> <p>Wind Load w/o Ice 1.00 1.00</p> <p>Wind Load w/ Ice 1.00</p> <p>Ice Thickness 1.00</p> <p>Earthquake 1.00</p> <p>EXPOSURE CATEGORY - C</p> <p>Z_g = 900</p> <p>a = 9.5</p> <p>Ke = 1.0</p> <p>K_{zmin} = 0.85</p> <p>TOPOGRAPHIC CATEGORY- 1</p> <p>K_t = N/A</p> <p>f = N/A</p>
--	--

COMMUNICATIONS STRUCTURE WIND LOADING DEVELOPMENT

Per the ANSI/TIA 222-G-2005



**ENGINEERED
ENDEAVORS**
The Experienced Point of View

CUSTOMER: VERIZON WIRELESS
SITE LOCATION: MILFORD, CT
SITE NAME: BAYVIEW
SITE NUMBER:

CURRENT DATE: 08/03/11
STRUCTURE: 135' AMS POLE
JOB NUMBER: 16684
STATUS: REVISION 1

Antenna Loading

	DESCRIPTION	QTY	HEIGHT (ft)	Kz	CASE 1		CASE 2		CASE 3	
					EPA (ft ²)	WEIGHT (lbs)	EPA (ft ²)	WEIGHT (lbs)	EPA _i (ft ²)	WEIGHT _i (lbs)
1	42" x 10' AMS	1	130	1.337	35.66	950.00	35.66	950.00		
2	42" x 10' AMS	1	120	1.315	35.66	1350.00	35.66	1350.00		
3	42" x 10' AMS	1	110	1.291	35.66	1900.00	35.66	1900.00		
4	42" x 10' AMS	1	100	1.266	35.66	2200.00	35.66	2200.00		
5	42" x 10' AMS	1	90	1.238	35.66	2800.00	35.66	2800.00		
6										
7										
8										
9										
10										
11										
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COMMUNICATIONS STRUCTURE WIND LOADING DEVELOPMENT

Per the ANSI/TIA 222-G-2005



**ENGINEERED
ENDEAVORS**

The Experienced Point of View

CUSTOMER: VERIZON WIRELESS
SITE LOCATION: MILFORD, CT
SITE NAME: BAYVIEW
SITE NUMBER:

CURRENT DATE: 08/03/11
STRUCTURE: 135' AMS POLE
JOB NUMBER: 16684
STATUS: REVISION 1

Loading Case 1 - Serviceability

The loading developed in Case 1 shall be used for the evaluation of serviceability for the twist and sway limits. The design of a monopole must also take into account the factored loading cases.

WIND VELOCITY (mph) = 60

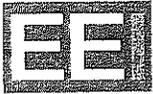
Load Combination

1.0D + 1.0W_o

Antenna Loads						Monopole Pressures			
	HEIGHT (ft)	APPURTENANCE FORCES		APPURTENANCE FACTORED FORCES		HEIGHT (ft)	EXPOSURE COEFFICIENT Kz	WIND PRESSURE ON POLE	
		GRAVITY (kips)	WIND (kips)	GRAVITY (kips)	WIND (kips)				(psf)
1	130	0.950	0.411	0.950	0.411	1	3.04	0.850	4.83
2	120	1.350	0.404	1.350	0.404	2	9.11	0.850	4.83
3	110	1.900	0.397	1.900	0.397	3	15.18	0.851	4.84
4	100	2.200	0.389	2.200	0.389	4	21.25	0.913	5.20
5	90	2.800	0.380	2.800	0.380	5	27.32	0.963	5.48
6						6	33.39	1.005	5.71
7						7	39.46	1.041	5.92
8						8	45.54	1.072	6.10
9						9	51.61	1.101	6.26
10						10	57.68	1.127	6.41
11						11	63.75	1.151	6.55
12						12	69.82	1.173	6.67
13						13	75.89	1.194	6.79
14						14	81.96	1.214	6.90
15						15	85.00	1.223	6.96
16									
17									
18									
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30									

COMMUNICATIONS STRUCTURE WIND LOADING DEVELOPMENT

Per the ANSI/TIA 222-G-2005



**ENGINEERED
ENDEAVORS**

The Experienced Point of View

CUSTOMER: VERIZON WIRELESS
SITE LOCATION: MILFORD, CT
SITE NAME: BAYVIEW
SITE NUMBER:

CURRENT DATE: 08/03/11
STRUCTURE: 135' AMS POLE
JOB NUMBER: 16684
STATUS: REVISION 1

Loading Case 2 - Design

WIND VELOCITY (mph) = 115.00

Load Combination

1.2D + 1.6Wo

Antenna Loads						Monopole Pressures			
	HEIGHT (ft)	APPURTENANCE FORCES		APPURTENANCE FACTORED FORCES		HEIGHT (ft)	EXPOSURE COEFFICIENT Kz	WIND PRESSURE ON POLE	
		GRAVITY (kips)	WIND (kips)	GRAVITY (kips)	WIND (kips)			HEIGHT (ft)	COEFFICIENT Kz
1	130	0.950	1.687	1.140	2.700	1	3.04	0.850	31.76
2	120	1.350	1.659	1.620	2.655	2	9.11	0.850	31.76
3	110	1.900	1.629	2.280	2.607	3	15.18	0.851	31.80
4	100	2.200	1.597	2.840	2.555	4	21.25	0.913	34.13
5	90	2.800	1.562	3.360	2.499	5	27.32	0.963	35.98
6						6	33.39	1.005	37.54
7						7	39.46	1.041	38.88
8						8	45.54	1.072	40.07
9						9	51.61	1.101	41.14
10						10	57.68	1.127	42.11
11						11	63.75	1.151	43.01
12						12	69.82	1.173	43.84
13						13	75.89	1.194	44.62
14						14	81.96	1.214	45.35
15						15	85.00	1.223	45.70
16									
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30									

Engineered Endeavors Inc.

7810 Jenther Drive
Mentor, Ohio 44060
Tel (440) 918-1101 Fax (440) 918-1108

Communications Structure Nonlinear Analysis and Design Program

8/3/2011 11:46:12 AM
Revision 2.3 01/16/09
Engineer MR MOREL

Customer VERIZON WIRELESS
Job Name 16684
Structure 135' AMS POLE
Location MILFORD, CT
Site BAYVIEW
Site Number 0
Data File LASTPOLE.TXT

OD BOT	OD TOP	NUM SIDES	THICK INCH	TAPER IN/FT	LENGTH FT	JOINT INCH	JOINT TYPE	YIELD KSI	WEIGHT LBS	JOINT HEIGHT
46.95	41.50	18	.2500	.143	38.21	77.00	SLIP	65.00	4481.	50.00
53.00	45.41	18	.3125	.143	53.21	.00	BASEPL	65.00	8673.	.00
TOTAL TUBE WEIGHT						13155.	POUNDS			
POLE SHAFT LENGTH						85.00	FEET			

AISC constants are used for stress reductions.
Tube sections hsvc 18 sides
Internal bend radius = 4. X T
Tube diameters are measured flat to flat.
AISC Tube Shape Coefficient of 1.000 is applied.
Slip joint length factor is 1.500 times the inner tube diameter.
An additional length of 6.00 inches is added to the joint.

RESISTANCE TABLE

ELEV Ft	DIAM In.	THICK In.	EFF FY Ksi	PhiPn Kips	PhiMn Ft-Kips	PhiVn Kips	PhiTn Ft-Kips	DEFLECT IN	TILT DEG
85.00	41.50	.2500	62.07	1709.	1546.	905.	3092.		
79.50	42.28	.2500	61.49	1726.	1591.	914.	3181.		
74.00	43.07	.2500	60.91	1741.	1635.	922.	3270.		
68.00	43.93	.2500	60.28	1758.	1684.	930.	3367.		
62.00	44.78	.2500	59.65	1773.	1732.	939.	3464.		
56.00	45.64	.2500	59.01	1788.	1780.	947.	3561.		
50.00	45.87	.3125	65.00	2471.	2466.	1308.	4933.		
50.00	46.49	.2500	58.38	1802.	1829.	954.	3657.		
46.00	46.44	.3125	65.00	2502.	2529.	1325.	5057.		
42.00	47.01	.3125	64.95	2531.	2590.	1340.	5179.		
36.00	47.86	.3125	64.44	2557.	2665.	1354.	5330.		
30.00	48.72	.3125	63.94	2583.	2740.	1367.	5481.		
24.00	49.58	.3125	63.43	2608.	2816.	1380.	5632.		
18.00	50.43	.3125	62.92	2632.	2892.	1393.	5783.		
12.00	51.29	.3125	62.42	2655.	2968.	1406.	5935.		
6.00	52.14	.3125	61.91	2678.	3043.	1418.	6087.		
.00	53.00	.3125	61.41	2700.	3119.	1429.	6239.		

LOAD CASE 1

Loading Case 1 - Serviceability

DEAD LOAD FACTOR 1.00 RADIAL ICE .00 IN.

WIND VELOCITY 60. MPH BOTTOM 4.8 PSF TOP 7. PSF

MAX BASE ROTATION 0.0 DEG

LOAD CASE 1 Loading Case 1 - Serviceability

ELEV Ft	DIAM In.	THICK In.	EFF FY Ksi	RATIO	Pu Kips	Mu Ft-Kips	Vu Kips	Tu Ft-Kips	Displ Inches	Tilt Deg
85.00	41.50	.2500	62.07	.038	9.51	50.	2.10	.0	3.07	.31
79.50	42.28	.2500	61.49	.044	9.51	62.	2.10	.0	2.72	.30
74.00	43.07	.2500	60.91	.051	10.13	74.	2.23	.0	2.39	.28
68.00	43.93	.2500	60.28	.059	10.79	88.	2.37	.0	2.04	.27
62.00	44.78	.2500	59.65	.066	11.49	104.	2.52	.0	1.71	.25
56.00	45.64	.2500	59.01	.074	12.21	120.	2.67	.0	1.41	.23
50.00	46.49	.2500	58.38	.082	12.94	136.	2.81	.0	1.14	.21
50.00	45.87	.3125	65.00	.061	14.60	136.	2.94	.0	1.14	.21
46.00	46.44	.3125	65.00	.064	14.60	148.	2.94	.0	.97	.19
42.00	47.01	.3125	64.95	.068	15.22	160.	3.03	.0	.82	.18
36.00	47.86	.3125	64.44	.074	16.00	179.	3.15	.0	.61	.16
30.00	48.72	.3125	63.94	.079	16.96	199.	3.28	.0	.43	.13
24.00	49.58	.3125	63.43	.085	17.93	219.	3.42	.0	.28	.11
18.00	50.43	.3125	62.92	.090	18.93	241.	3.54	.0	.16	.08
12.00	51.29	.3125	62.42	.096	19.93	263.	3.66	.0	.07	.06
6.00	52.14	.3125	61.91	.102	20.96	285.	3.78	.0	.02	.03
.00	53.00	.3125	61.41	.107	22.53	309.	3.96	.0	.00	.00
Max Deflection Percentage .3%				Max Tilt .31 Degrees						

REACTION COMPONENTS (KIPS AND FT-KIPS)

TRANSVERSE SHEAR	VERTICAL FORCE	WIND SHEAR	MOMENT ABOUT TRANSVERSE	MOMENT ABOUT VERTICAL	MOMENT ABOUT WIND AXIS
.000	-22.529	3.950	308.609	.000	.000

LOAD CASE 2

Loading Case 2 - Design

DEAD LOAD FACTOR 1.00 RADIAL ICE .00 IN.

WIND VELOCITY 115. MPH BOTTOM 31.8 PSF TOP 45.7 PSF

MAX BASE ROTATION 0.0 DEG

LOAD CASE 2 Loading Case 2 - Design

ELEV Ft	DIAM In.	THICK In.	EFF FY Ksi	RATIO	Pu Kips	Mu Ft-Kips	Vu Kips	Tu Ft-Kips	Displ Inches	Tilt Deg
85.00	41.50	.2500	62.07	.220	10.87	330.	13.85	.0	20.21	2.05
79.50	42.28	.2500	61.49	.262	10.87	406.	13.85	.0	17.90	1.97
74.00	43.07	.2500	60.91	.305	11.48	487.	14.73	.0	15.69	1.87
68.00	43.93	.2500	60.28	.352	12.14	581.	15.66	.0	13.41	1.76
68.00	43.93	.2500	60.28	.353	13.34	581.	16.63	.0	13.41	1.76
62.00	44.78	.2500	59.65	.401	13.34	681.	16.63	.0	11.27	1.64
56.00	45.64	.2500	59.01	.450	14.05	787.	17.60	.0	9.30	1.50
50.00	46.49	.2500	58.38	.500	14.78	898.	18.55	.0	7.51	1.35
50.00	45.87	.3125	65.00	.371	16.44	898.	19.36	.0	7.51	1.35
46.00	46.44	.3125	65.00	.392	16.44	975.	19.36	.0	6.41	1.26
42.00	47.01	.3125	64.95	.414	17.06	1055.	19.97	.0	5.40	1.17
36.00	47.86	.3125	64.44	.450	17.84	1180.	20.72	.0	4.02	1.02
30.00	48.72	.3125	63.94	.485	18.80	1309.	21.61	.0	2.82	.87
24.00	49.58	.3125	63.43	.521	19.78	1444.	22.46	.0	1.83	.71
18.00	50.43	.3125	62.92	.556	20.77	1584.	23.29	.0	1.04	.54
12.00	51.29	.3125	62.42	.591	21.77	1728.	24.06	.0	.47	.37
6.00	52.14	.3125	61.91	.626	22.80	1877.	24.82	.0	.12	.19
.00	53.00	.3125	61.41	.660	24.37	2030.	25.99	.0	.00	.00

Max Deflection Percentage 2.0%

Max Tilt 2.05 Degrees

REACTION COMPONENTS (KIPS AND FT-KIPS)

TRANSVERSE SHEAR	VERTICAL FORCE	WIND SHEAR	MOMENT ABOUT TRANSVERSE	MOMENT ABOUT VERTICAL	MOMENT ABOUT WIND AXIS
.000	-24.369	25.952	2030.361	.000	.000

Design Summary Table

Elevation	Stress Ratio	Axial	Bending	Loading	
85.	.22	10.87	330.4	2	Loading Case 2 - Design
79.5	.26	10.87	406.5	2	Loading Case 2 - Design
74.	.3	11.48	487.4	2	Loading Case 2 - Design
68.	.35	12.14	581.4	2	Loading Case 2 - Design
62.	.4	13.34	681.1	2	Loading Case 2 - Design
56.	.45	14.05	786.6	2	Loading Case 2 - Design
50.	.5	14.78	897.9	2	Loading Case 2 - Design
46.	.39	16.44	975.3	2	Loading Case 2 - Design
42.	.41	17.06	1055.2	2	Loading Case 2 - Design
36.	.45	17.84	1179.5	2	Loading Case 2 - Design
30.	.49	18.8	1309.1	2	Loading Case 2 - Design
24.	.52	19.78	1443.9	2	Loading Case 2 - Design
18.	.56	20.77	1583.7	2	Loading Case 2 - Design
12.	.59	21.77	1728.	2	Loading Case 2 - Design
6.	.63	22.8	1876.9	2	Loading Case 2 - Design
0.	.66	24.37	2030.4	2	Loading Case 2 - Design

BASE PLATE AT ELEVATION	.00	FEET
TUBE DIAMETER	53.00	INCHES
DESIGN MOMENT	2030.36	KIP FT
DESIGN MOMENT IS .00 DEGREES FROM THE WIND DIRECTION		
APPLIED AXIAL FORCE	24.4	KIPS
APPLIED SHEAR	25.99	KIPS

BOLT DATA

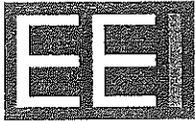
BOLT TYPE	A615 - G75	
BOLTS ARE EVENLY SPACED		
DIAMETER	1.750	INCHES
EFFECTIVE AREA	1.900	SQ IN
DESIGN STRESS	100.000	KSI
TOTAL LENGTH	6.0	FEET
BOTTOM TEMPLATE MUST BE BOLTED ON		
End plates are required.		
MINIMUM EMBEDMENT	5.0	FEET
NUMBER OF BOLTS	12	
BOLT CIRCLE DIAMETER	59.50	INCHES
APPLIED AXIAL STRESS	72.908	KSI
MAX BOLT FORCE	138.526	KIPS
MAX BOLT SHEAR	2.166	KIPS
BOLT PHI	.800	
TENSION RESISTANCE	152.000	KIPS
SHEAR RESISTANCE	76.960	KIPS
RATIO	.939	

PLATE DATA

DIAMETER OF PLATE	64.50	INCHES
BEND WIDTH REDUCTION	.850	
EDGE CLEARANCE MAY BE BELOW SUGGESTED MINIMUM		
MATERIAL	A572MOD50	
PLATE YIELD	50.0	KSI
PROVIDED THICKNESS	1.750	INCHES
REQUIRED THICKNESS	1.460	INCHES
BOLT HOLE DIAMETER	2.125	INCHES
CENTER HOLE SIZE	43.00	INCHES
NET WEIGHT	877.9	POUNDS
RAW STOCK WEIGHT	2124.7	POUNDS
SURFACE AREA	24.62	SQ FT
MAX APPLIED STRESS	31.30	KSI
APPLIED MOMENT	18.76	KIP-FT
RESIST MOMENT	26.97	KIP-FT
RATIO	.70	
PLATE PHI	.90	

CONCRETE STRENGTH	3000.	PSI
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Base Plate - use 64.50 inch ROUND x 1.750 inch A572MOD50 with (12) 1.750 diameter x 6. foot caged A615 - G75 bolts on a 59.5 inch bolt circle. End plates are required.



ENGINEERED
ENDEAVORS
INCORPORATED

The Experienced Point of View

DESIGN CALCULATIONS
FOR A
DRILLED PIER FOUNDATION

VERIZON WIRELESS
135' AMS POLE

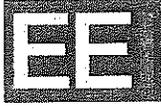
BAYVIEW Site
MILFORD, CT

EI Project Number 16684, REVISION 1

August 3, 2011

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

FOUNDATION DESIGN CALCULATIONS FOR A DRILLED PIER FOUNDATION



**ENGINEERED
ENDEAVORS**

The Experienced Point of View

CUSTOMER: VERIZON WIRELESS

DATE: 08/03/11

LOCATION: MILFORD, CT

STRUCTURE: 135' AMS POLE

SITE NAME: BAYVIEW

JOB NUMBER: 16684

SITE NUMBER:

STATUS: REVISION 1

FACTORED FOUNDATION DESIGN LOADS

	OVERTURNING MOMENT	SHEAR FORCE	AXIAL FORCE
SERVICEABILITY LOADS			
STRENGTH LOADS	2030.4 ft-kips	26.0 kips	24.3 kips
$f_s = 0.75$	2707.2 ft-kips	34.7 kips	32.4 kips

PIER PROPERTIES

ANCHOR BOLT CIRCLE 59.5 in

ACTUAL DIAMETER 84.0 in

ANCHOR BOLT DESCRIPTION (12) 2.25 in BOLTS AT 6 ft - 0 in LONG

PIER AREA 5541.8 in²

MINIMUM DIAMETER 79.5 in

MOMENT OF INERTIA 2443920.3 in⁴

SOIL INFORMATION

SOIL DESCRIPTION	DEPTH ft	DEPTH in	ϕ degrees	γ pcf/pci	COHESION psf/psi	E_{50} in/in
FILL	1.0	12	25	100		
	6.0	72		0.058		
FILL	6.0	72	30	60		
	8.0	96		0.035		
SAND	8.0	96	32	60		
	14.0	168		0.035		
SAND	14.0	168	36	60		
	19.5	234		0.035		
BEDROCK	19.5	234	40	130		
	25.0	300		0.075		
	25.0	300				

GROUNDWATER WAS NOT ENCOUNTERED
DISREGARD UPPER 36in OF SOIL

ACTUAL EMBEDMENT
TOTAL LENGTH
CONCRETE VOLUME

$L_a = 24.0$ ft
 $L = 25.0$ ft
 $V = 35.6$ yds³

CONCRETE REINFORCEMENT

	BAR SIZE	BAR WEIGHT	QUANTITY	LENGTH	WEIGHT
VERTICAL BARS	# 8	2.670 lbs/ft	36	24.5 ft	2354.9 lbs
HORIZONTAL TIES	# 5	1.043 lbs/ft	27	21.67 ft	610.2 lbs
TOTAL					2965.1 lbs

PIER STRUCTURAL DESIGN

BENDING MOMENT

2534.8 ft-kips

PIER DIAMETER	84 in		
CONCRETE	3 ksi		
REINFORCEMENT	60 ksi		
REBAR # 8	QUANTITY 36	ACTUAL BAR AREA	0.79 in ²
DESIGN REBAR	QUANTITY 12	THEORETICAL BAR AREA	2.37 in ²
MINIMUM REINFORCEMENT RATIO:	0.0050	REBAR SPACING	6.37 in
ACTUAL REINFORCEMENT RATIO:	0.0051		
CONCRETE COVER	3 in	HORIZONTAL TIES	27
REBAR LAYOUT RADIUS	36.5000 in		

VERTICAL REBAR LAYOUT

REBAR NUMBER	ANGLE <i>degrees</i>	COORDINATE <i>in</i>	EDGE DIST. <i>in</i>	REBAR NUMBER	ANGLE <i>degrees</i>	COORDINATE <i>in</i>	EDGE DIST. <i>in</i>
1	0	36.50	5.50	7	180	-36.50	78.50
2	30	31.61	10.39	8	210	-31.61	73.61
3	60	18.25	23.75	9	240	-18.25	60.25
4	90	0.00	42.00	10	270	0.00	42.00
5	120	-18.25	60.25	11	300	18.25	23.75
6	150	-31.61	73.61	12	330	31.61	10.39

LOCATION OF NEUTRAL AXIS
COMPRESSION ZONE

c = 12.990 in
a = 11.042 in

COMPRESSION ZONE

REBAR NUMBER	e <i>in/in</i>	FORCE <i>kips</i>
1	0.0017	112.85
2	0.0006	35.23
12	0.0006	35.23
CONCRETE		1097.10

COMPRESSION FORCE: 1280.40 kips

TENSION ZONE

REBAR NUMBER	e <i>in/in</i>	FORCE <i>kips</i>
2		
3	0.0025	142.20
4	0.0067	142.20
5	0.0109	142.20
6	0.0140	142.20
7	0.0151	142.20
8	0.0140	142.20
9	0.0109	142.20
10	0.0067	142.20
11	0.0025	142.20
12		

TENSION FORCE: 1279.80 kips

MAXIMUM MOMENT CAPACITY

MOMENT DUE TO COMPRESSION

REBAR NUMBER	FORCE <i>kips</i>	ARM <i>in</i>	MOMENT <i>ft-kips</i>
1	112.85	36.50	343.24
2	35.23	31.61	92.79
12	35.23	31.61	92.79
CONCRETE		1097.10	3166.87

COMPRESSION MOMENT: 3695.69 ft-kips

MOMENT DUE TO TENSION

REBAR NUMBER	FORCE <i>kips</i>	ARM <i>in</i>	MOMENT <i>ft-kips</i>
2			
3	142.20	18.25	-216.26
4	142.20	0.00	0.00
5	142.20	-18.25	216.26
6	142.20	-31.61	374.58
7	142.20	-36.50	432.53
8	142.20	-31.61	374.58
9	142.20	-18.25	216.26
10	142.20	0.00	0.00
11	142.20	18.25	-216.26
12			

TENSION MOMENT: 1181.68 ft-kips

DESIGN MOMENT ($\bar{f} \times M_n$):

4389.63 ft-kips

Pier Overturning Stability Check

EEI Project No. 16884

Base Moment, kip-ft	2030.4	Pier Diameter, ft	7.0
Shear Force, kips	26.0	Groundwater, ft	6.0
Vertical Force, kips	24.3	Pier Embedment, ft	24.0
		Disregard, ft	0.0

Date 7/14/11

Soil Properties Information

Soil Layer	Depth, ft	γ	ϕ	C, psf	Kp
fill	6.0	100.0	25.0	0.0	2.46
fill	8	60.0	30.0		3.00
sand	14	60.0	32		3.25
sand	19.5	60.0	35		3.85
bedrock	25.0	100.0	40.0		4.60

Zero Line, ft 18.4 Force Imbalance 1.385%

Resisting Moment, k-ft 5,412.42 Overturning Moment, k-ft 2,534.80

Safety Factor 2.14