ROBINSON & COLE LLP

KENNETH C. BALDWIN

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Hartford, CT 06103-3597
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kbaldwin@rc.com
Direct (860) 275-8345

November 25, 2008

Via Hand Delivery

S. Derek Phelps
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Docket No. 361 – Application of Cellco Partnership d/b/a Verizon Wireless for a Certificate of Environmental Compatibility and Public Need for the Construction, Maintenance and Operation of a Wireless Telecommunications Facility off Norfolk Road (Route 44), Winchester, Connecticut - Development & Management (D&M) Plan**

Dear Mr. Phelps:

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

1. Final site plans for the approved telecommunications facility off Norfolk Road in Winchester, Connecticut incorporating the Council's Docket No. 361 Conditions of Approval;

2. A Geotechnical Evaluation Report prepared by JGI Eastern, Inc.; and

3. The proposed tower and foundation design calculations prepared by Engineered Endeavors Incorporated.

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

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

Enclosures
Copy to:
Sandy M. Carter
Kenneth J. Fracasso, Winchester Mayor

Cellco Partnership

d.b.a. verizon wireless

WIRELESS COMMUNICATIONS FACILITY

WINCHESTER
NORFOLK ROAD
WINCHESTER, CT

SITE DIRECTIONS

FROM: 99 EAST RIVER DRIVE, EAST HARTFORD, CONNECTICUT **TO:** SITE ACCESS ON NORFOLK RD, WINCHESTER, CONNECTICUT

1. START AT 99 E RIVER DR TOWARD E RIVER DR	<0.1 MI.
2. TURN LEFT ON E RIVER DR.	0.3 MI.
3. TURN LEFT ON CONNECTICUT BLVD (US-44).	0.2 MI.
4. TAKE RAMP ONTO I-84 W.	0.3 MI.
5. TAKE EXIT #50/MAIN ST (I-91 S).	0.2 MI.
6. CONTINUE ON MORGAN ST N (US-44 W).	0.1 MI.
7. BEAR RIGHT TO FOLLOW US-44 W.	22.9 MI.
8. ARRIVE AT PROPOSED SITE ACCESS ENTRANCE ON NORFOLK RD.	

GENERAL NOTES

1. PROPOSED ANTENNA LOCATIONS AND HEIGHTS PROVIDED BY CELLCO PARTNERSHIP.

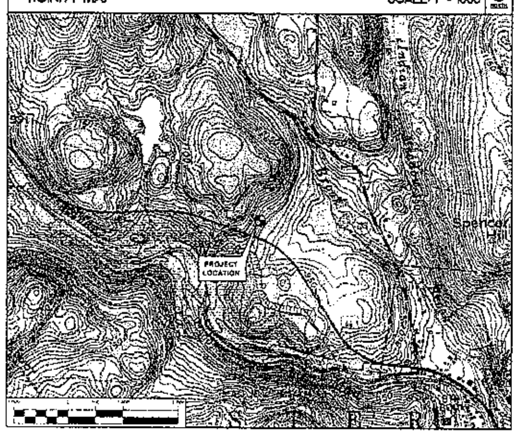
SITE INFORMATION

THE SCOPE OF WORK SHALL INCLUDE:

1. THE CONSTRUCTION OF A 50'x75' FENCED WIRELESS TELECOMMUNICATIONS COMPOUND WITHIN A 100'x100' LEASE AREA.
2. THE PROPOSED COMPOUND WILL BE LOCATED IN THE CENTRAL PORTION OF THE SUBJECT PARCEL. A PROPOSED 1,268'± LONG 12' WIDE ACCESS DRIVE WITHIN A PROPOSED 20' ACCESS/UTILITY EASEMENT WILL PROVIDE ACCESS TO THE SITE FROM THE EXISTING DOT CURB-CUT ON NORFOLK ROAD. SAID ACCESS DRIVE SHALL UTILIZE SEGMENTED PORTIONS OF EXISTING GRASS/DIRT LOGGING PATHS EQUALING A TOTAL OF APPROXIMATELY 815'.
3. A TOTAL OF UP TO FIFTEEN (15) DIRECTIONAL PANEL ANTENNAS ARE PROPOSED TO BE MOUNTED AT A RAD CENTER ELEVATION OF 150'-0"+/- AGL ON A 157' PROPOSED MONOPINE TOWER LOCATED CENTRALLY WITHIN THE PROPOSED COMPOUND.
4. POWER AND TELCO UTILITIES SHALL BE ROUTED UNDERGROUND FROM RESPECTIVE DEMARCS TO THE PROPOSED UTILITY BACKBOARD LOCATED IN FRONT OF THE PROPOSED FENCED COMPOUND. UTILITIES WILL BE ROUTED FROM UTILITY BACKBOARD TO THE PROPOSED NOMINAL 12'x30' WIRELESS EQUIPMENT SHELTER LOCATED WITHIN THE COMPOUND. FINAL UTILITY ROUTING FROM DEMARCS TO PROPOSED BACKBOARD WILL BE VERIFIED/DETERMINED BY LOCAL UTILITY COMPANIES.
5. THE PROPOSED WIRELESS FACILITY INSTALLATION WILL BE DESIGNED IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 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.
8. FOR ADDITIONAL NOTES AND DETAILS REFER TO THE ACCOMPANYING DRAWING.

VICINITY MAP

SCALE: 1" = 1000'



PROJECT SUMMARY

SITE NAME:	WINCHESTER
SITE ADDRESS:	NORFOLK ROAD WINCHESTER, CT 06098
PROPERTY OWNER:	WIN21 LLC 156 ROOSEVELT DRIVE SEYMOUR, CT 06483
LEASOR:	WIN21 LLC 156 ROOSEVELT DRIVE SEYMOUR, CT 06483
LESSEE:	CELLCO PARTNERSHIP d.b.a. VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
APPLICANT:	CELLCO PARTNERSHIP d.b.a. VERIZON WIRELESS 99 EAST RIVER DRIVE EAST HARTFORD, CT 06108
CONTACT PERSON:	SANDY CARTER CELLCO PARTNERSHIP (860) 803-8219
TOWER COORDINATES:	LATITUDE: 41°58'24.70" LONGITUDE: 73°05'45.25" COORDINATES FAA 2C SURVEY CERTIFICATION AS PREPARED BY BARRETT, BONACCI & VAN WEELE, P.C., DATED FEBRUARY 5, 2008.

LEGEND

SYMBOL	DESCRIPTION
	SECTION OR DETAIL NUMBER SHEET WHERE DETAIL/SECTION OCCURS
	ELEVATION NUMBER SHEET WHERE ELEVATION OCCURS

SHEET INDEX

SHT. NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	0
C-1.0	SITE PLAN	0
C-1.1	ABUTTERS MAP	0
C-1.2	ACCESS DRIVE PROFILE	0
C-1.3	UTILITY ROUTING PLAN	0
C-2	COMPOUND PLAN AND ELEVATION	0
C-3	SITE DETAILS AND NOTES	0
C-4	SITE DETAILS AND SHELTER ELEVATIONS	0
C-5	SHELTER FOUNDATION DETAILS AND NOTES	0

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	11/21/08	DMD	CFC	D&M PLAN
A	11/17/08	DMD	CFC	D&M PLAN – CLIENT REVIEW

STATE OF CONNECTICUT · LICENSED PROFESSIONAL ENGINEER

Cellco Partnership d.b.a. verizon wireless

NATCOMM

VERIZON WIRELESS
WIRELESS COMMUNICATIONS FACILITY
WINCHESTER
NORFOLK ROAD
WINCHESTER, CT

DATE: 11/03/08
SCALE: AS NOTED
JOB NO. 07019

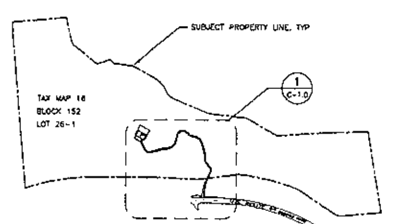
TITLE SHEET

T-1

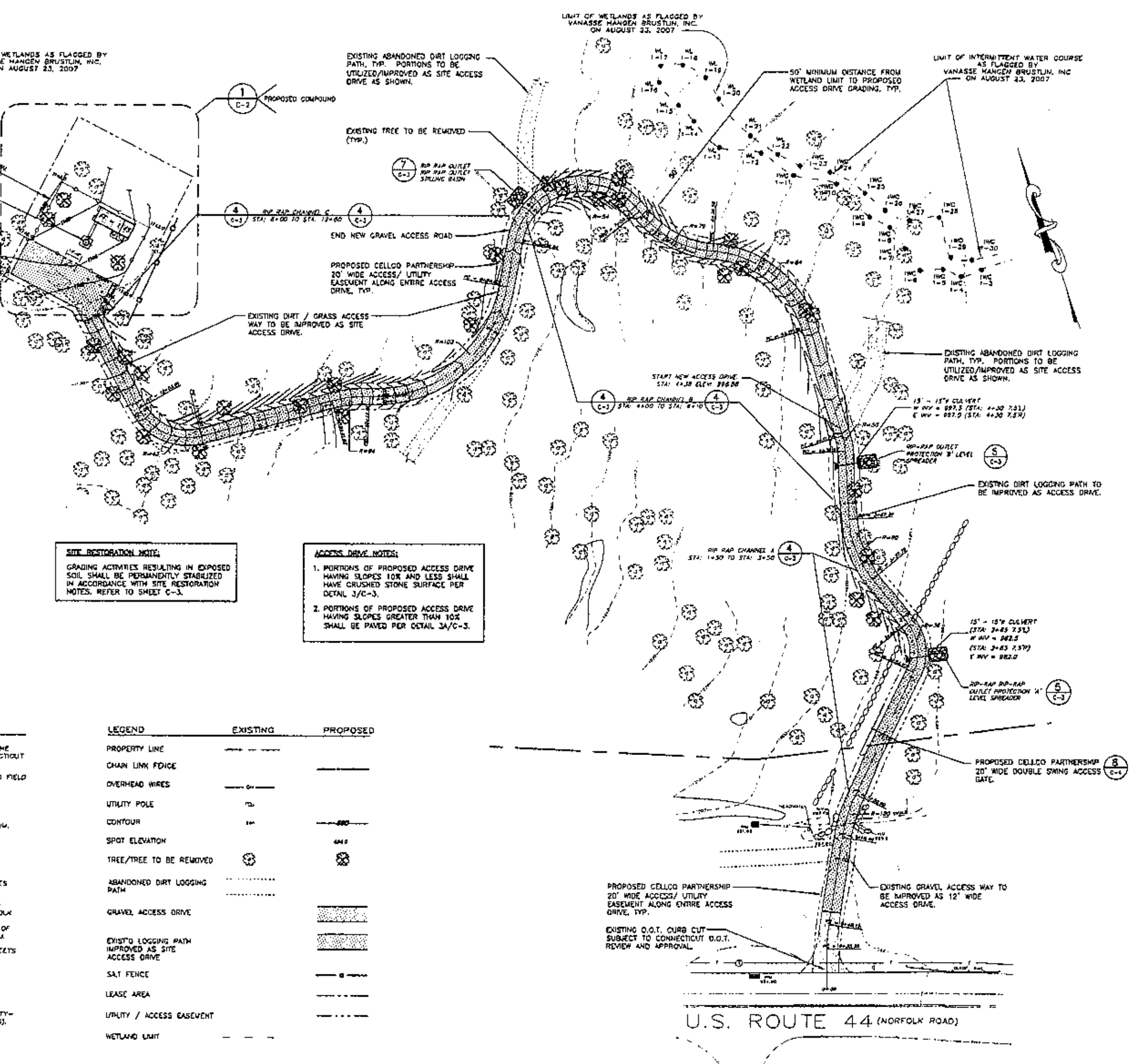
Sheet No. 1 of 9

TREE REMOVAL SUMMARY

TREES PROPOSED TO BE REMOVED ALONG ACCESS DRIVE AND ACCESS/UTILITY EASEMENT	= 27
TREES PROPOSED TO BE REMOVED WITHIN THE 100'x100' LEASE AREA	= 3
TOTAL TREES PROPOSED TO BE REMOVED	= 30



SITE KEY PLAN
SCALE: 1" = 200'
NORTH



SITE RESTORATION NOTE:

GRADING ACTIVITIES RESULTING IN EXPOSED SOIL SHALL BE PERMANENTLY STABILIZED IN ACCORDANCE WITH SITE RESTORATION NOTES. REFER TO SHEET C-3.

ACCESS DRIVE NOTES:

1. PORTIONS OF PROPOSED ACCESS DRIVE HAVING SLOPES 10% AND LESS SHALL HAVE CRUSHED STONE SURFACE PER DETAIL 3/C-3.
2. PORTIONS OF PROPOSED ACCESS DRIVE HAVING SLOPES GREATER THAN 10% SHALL BE PAVED PER DETAIL 3A/C-3.

NOTES

1. THE EXISTING SURVEY INFORMATION DEPICTED HEREON HAS BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH 20-300b-20 AND THE "STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT," AS ADOPTED BY THE CONNECTICUT ASSOCIATION OF LAND SURVEYORS, INC. ON SEPTEMBER 26, 1996.
2. THE BOUNDARY LINES DEPICTED HEREON ARE COMPILED FROM OTHER MAPS, DEEDS, AND A LIMITED FIELD SURVEY. THESE LINES ARE NOT TO BE CONSTRUED AS A BOUNDARY OPINION AND ARE SUBJECT TO CHANGE BASED ON A COMPLETE FIELD SURVEY. PROPERTY MAY BE SUBJECT TO ENCUMBRANCES, EASEMENTS, RIGHTS OF WAY AS A TITLE SEARCH MAY DISCLOSE.
3. HORIZONTAL ACCURACY CLASS: D
4. VERTICAL ACCURACY CLASS: T-2. ELEVATIONS REFER TO NATIONAL GEODETIC VERTICAL 1929 DATUM.
5. LOT AREA: ± 63.11 ACRES
6. REFERENCE IS MADE TO THE FOLLOWING MAPS:
   A) "PERIMETER SURVEY, PREPARED FOR WIN 21, LLC, ROUTE #44, WINCHESTER, CONNECTICUT." PREPARED BY DICARA LAND SURVEYING SERVICES, DATED JUNE, 2007.
   B) "TOWN OF WINCHESTER, MAP SHOWING LAND TRANSFERRED FROM THE STATE WATER RESOURCES COMMISSION TO THE STATE HIGHWAY DEPARTMENT, WINSTED-NORFOLK ROAD," SHEET 1 OF 1, DATED MAY, 1963 AND REVISED JULY, 1963.
   C) "TOWN OF WINCHESTER, MAP SHOWING LAND & RIGHTS OF ACCESS TO BE TRANSFERRED FROM STATE WATER RESOURCES COMMISSION TO THE STATE HIGHWAY DEPARTMENT, WINSTED-NORFOLK ROAD," SHEETS 1-3 OF 3, DATED JANUARY 29, 1965.
   D) "STATE OF CONNECTICUT WATER RESOURCES COMMISSION, MAP SHOWING LAND OF THE STATE OF CONNECTICUT, MAD RIVER DAM, TOWN OF WINCHESTER," SHEETS 1 & 2. PREPARED BY JOHN J. MOZZOCHI, DATED OCTOBER 12, 1961.
   E) STATE OF CONNECTICUT CONSTRUCTION PLANS ENTITLED "RELOCATION OF ROUTE U.S. #4," SHEETS 12, 14, 16, 18 & 20, DATED 1960.
7. PARCEL OWNER OF RECORD: WIN 21, LLC
   158 ROOSEVELT DRIVE
   SEYMOUR, CT 06483
8. FIELD SURVEYED SEPTEMBER, 2007.
9. ACCORDING TO FEDERAL [illegible] AGENCY FLOOD INSURANCE RATE MAP COMMUNITY-PANEL NUMBER 09013[illegible] PROPERTY IS LOCATED IN ZONE C (AREAS OF MINIMAL FLOODING).

TO MY KNOWLEDGE [illegible] SURVEY INFORMATION DEPICTED HEREON [illegible] CORRECT AS NOTED HEREON.

STATE OF CONNECTICUT — GREGORY J. BROUILLET — LICENSED LAND SURVEYOR

LEGEND

	EXISTING	PROPOSED
PROPERTY LINE		
CHAIN LINK FENCE		
OVERHEAD WIRES		
UTILITY POLE		
CONTOUR		
SPOT ELEVATION		
TREE/TREE TO BE REMOVED		
ABANDONED DIRT LOGGING PATH		
GRAVEL ACCESS DRIVE		
EXIST'G LOGGING PATH IMPROVED AS SITE ACCESS DRIVE		
SILT FENCE		
LEASE AREA		
UTILITY / ACCESS EASEMENT		
WETLAND LIMIT		

1 / C-1.0 SITE PLAN
SCALE: 1" = 40'

GRAPHIC SCALE
(IN FEET)
1 inch = 40 ft.

DESIGNED BY:	CFC			
DRAWN BY:	DMD			
CHK'D BY:	CFC			
11/21/06	DMD	CFC		D&M PLAN
11/17/06	DMD	CFC		D&M PLAN – CLIENT REVIEW
DATE	DRAWN BY	CHK'D BY	REV.	DESCRIPTION

STATE OF CONNECTICUT — No. 16694 — LICENSED PROFESSIONAL ENGINEER

Cellco Partnership
d.b.a. Verizon Wireless

NATCOMM

VERIZON WIRELESS
WIRELESS COMMUNICATIONS FACILITY
WINCHESTER
NORFOLK ROAD
WINCHESTER, CT

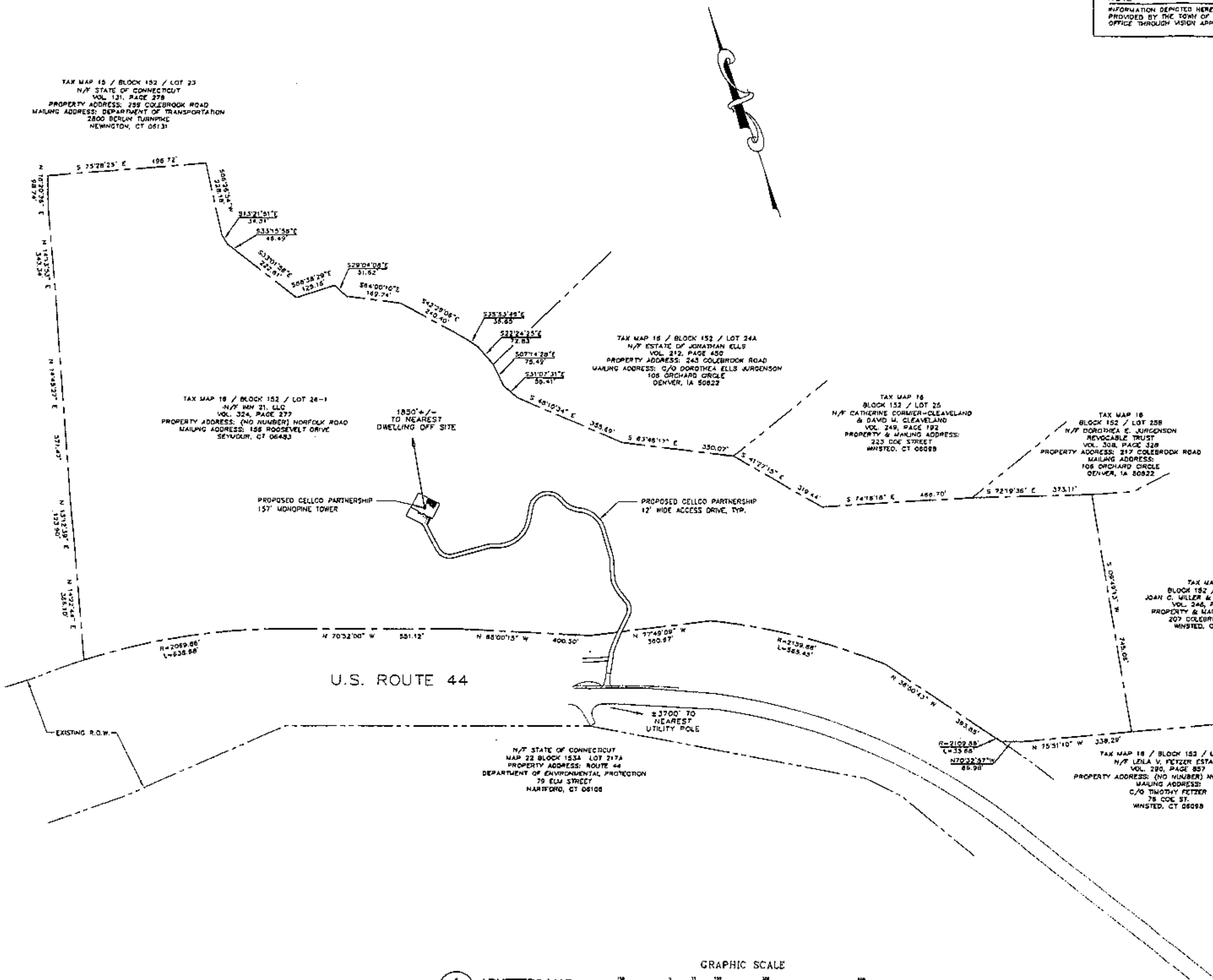
DATE: 11/03/06
SCALE: AS NOTED
JOB NO. 07019

SITE PLAN

C-1.0

Sheet No. 2 of 9

NOTE
INFORMATION DEPICTED HEREON IS BASED ON DATA PROVIDED BY THE TOWN OF WINCHESTER TAX ASSESSOR'S OFFICE THROUGH VISION APPRAISAL ON OCTOBER 1, 2007.



TAX MAP 15 / BLOCK 152 / LOT 23
N/F STATE OF CONNECTICUT
VOL. 131, PAGE 278
PROPERTY ADDRESS: 259 COLEBROOK ROAD
MAILING ADDRESS: DEPARTMENT OF TRANSPORTATION
2800 BERLIN TURNPIKE
NEWINGTON, CT 06131
TAX MAP 16 / BLOCK 152 / LOT 24A
N/F ESTATE OF JONATHAN ELLS
VOL. 212, PAGE 450
PROPERTY ADDRESS: 245 COLEBROOK ROAD
MAILING ADDRESS: C/O DOROTHEA ELLS JURGENSON
105 ORCHARD CIRCLE
DENVER, IA 50622
TAX MAP 16 / BLOCK 152 / LOT 26-1
N/F WH 21, LLC
VOL. 324, PAGE 277
PROPERTY ADDRESS: (NO NUMBER) NORFOLK ROAD
MAILING ADDRESS: 156 ROOSEVELT DRIVE
SEYMOUR, CT 06483
1850'+/- TO NEAREST DWELLING OFF SITE
PROPOSED CELLCO PARTNERSHIP 157' MONOPINE TOWER
PROPOSED CELLCO PARTNERSHIP 12' WIDE ACCESS DRIVE, TYP.
TAX MAP 16
BLOCK 152 / LOT 25
N/F CATHERINE CORMIER-CLEAVELAND
& DAVID M. CLEAVELAND
VOL. 249, PAGE 192
PROPERTY & MAILING ADDRESS:
223 COE STREET
WINSTED, CT 06098
TAX MAP 16
BLOCK 152 / LOT 25B
N/F DOROTHEA E. JURGENSON
REVOCABLE TRUST
VOL. 308, PAGE 328
PROPERTY ADDRESS: 217 COLEBROOK ROAD
MAILING ADDRESS:
105 ORCHARD CIRCLE
DENVER, IA 50622
TAX MAP 16
BLOCK 152 / LOT 26A
JOAN C. MILLER & THOMAS F. REIF
VOL. 246, PAGE 352
PROPERTY & MAILING ADDRESS:
207 COLEBROOK ROAD
WINSTED, CT 06098
U.S. ROUTE 44
EXISTING R.O.W.
±3700' TO NEAREST UTILITY POLE
N/F STATE OF CONNECTICUT
MAP 22 BLOCK 153A LOT 217A
PROPERTY ADDRESS: ROUTE 44
DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106
TAX MAP 16 / BLOCK 152 / LOT 27
N/F LEILA V. FETZER ESTATE
VOL. 290, PAGE 857
PROPERTY ADDRESS: (NO NUMBER) NORFOLK ROAD
MAILING ADDRESS:
C/O TIMOTHY FETZER
75 COE ST.
WINSTED, CT 06098
S 75°28'23" E 196.72'
S06°26'54" W 228.18'
S13°21'51"E 34.31'
S33°15'56"E 46.49'
S33°01'58"E 222.61'
S68°38'29"E 125.16'
S29°04'08"E 51.62'
S64°00'10"E 149.74'
S42°29'06"E 240.40'
S35°53'49"E 36.85'
S22°24'25"E 72.83'
S07°14'28"E 75.49'
S31°07'31"E 50.41'
S 48°10'34" E 355.69'
S 63°46'17" E 350.07'
S 41°27'15" E 319.44'
S 74°18'18" E 466.70'
S 72°19'36" E 373.11'
S 09°40'13" W 745.05'
N 75°31'10" W 338.29'
N70°32'57"W 65.98'
R=2109.88' L=33.66'
393.85'
N 36°00'43" W
R=2139.88' L=565.43'
N 77°49'09" W 360.67'
N 65°00'15" W 400.30'
N 70°32'00" W 551.12'
R=2059.88' L=635.88'
N 14°52'44" E 126.10'
N 13°12'30" E 133.90'
571.47'
N 14°45'27" E
N 14°13'53" E 343.34'
N 12°20'36" E 98.74'

1 ABUTTERS MAP
C-1.1
SCALE: 1" = 150'

GRAPHIC SCALE
(IN FEET)
1 inch = 150 ft.

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
A	11/17/08	DMD	CFC	D&M PLAN – CLIENT REVIEW
0	11/21/08	DMD	CFC	D&M PLAN

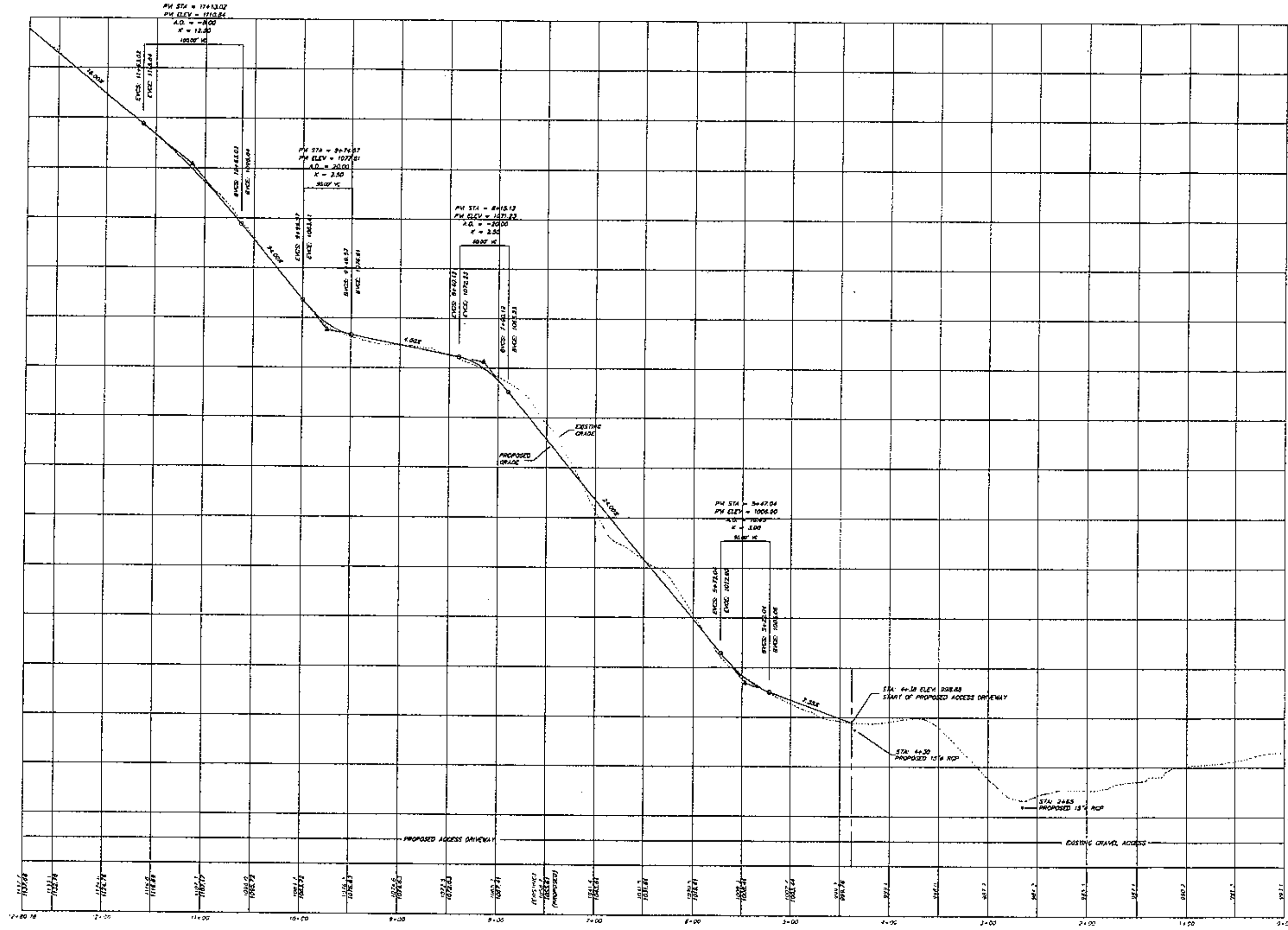
Cellco Partnership
d.b.a. Verizon wireless

VERIZON WIRELESS
WIRELESS COMMUNICATIONS FACILITY
WINCHESTER
NORFOLK ROAD
WINCHESTER, CT

DATE:	11/03/08
SCALE:	AS NOTED
JOB NO.	07019

ABUTTERS MAP

C-1.1
Sheet No. 3 of 2



LEGEND

PT	-	POINT OF TANGENCY	BVCS	-	BEGINNING OF VERTICAL CURVE (STATION)
PC	-	POINT OF CURVATURE	BVCE	-	BEGINNING OF VERTICAL CURVE (ELEVATION)
R	-	RADIUS	EVCS	-	END OF VERTICAL CURVE (STATION)
STA	-	POINT OF VERTICAL INTERSECTION	EVCE	-	END OF VERTICAL CURVE (ELEVATION)
ELEV	-	ELEVATION	AD	-	ALGEBRAIC DIFFERENCE (GRADE)

1 / C-1.2 ACCESS DRIVE PROFILE
NOT TO SCALE

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	11/21/06	DMD	CFC	D&M PLAN
A	11/17/06	DMD	CFC	D&M PLAN - CLIENT REVIEW

Cellco Partnership
d.b.a. Verizon wireless

NATCOMM

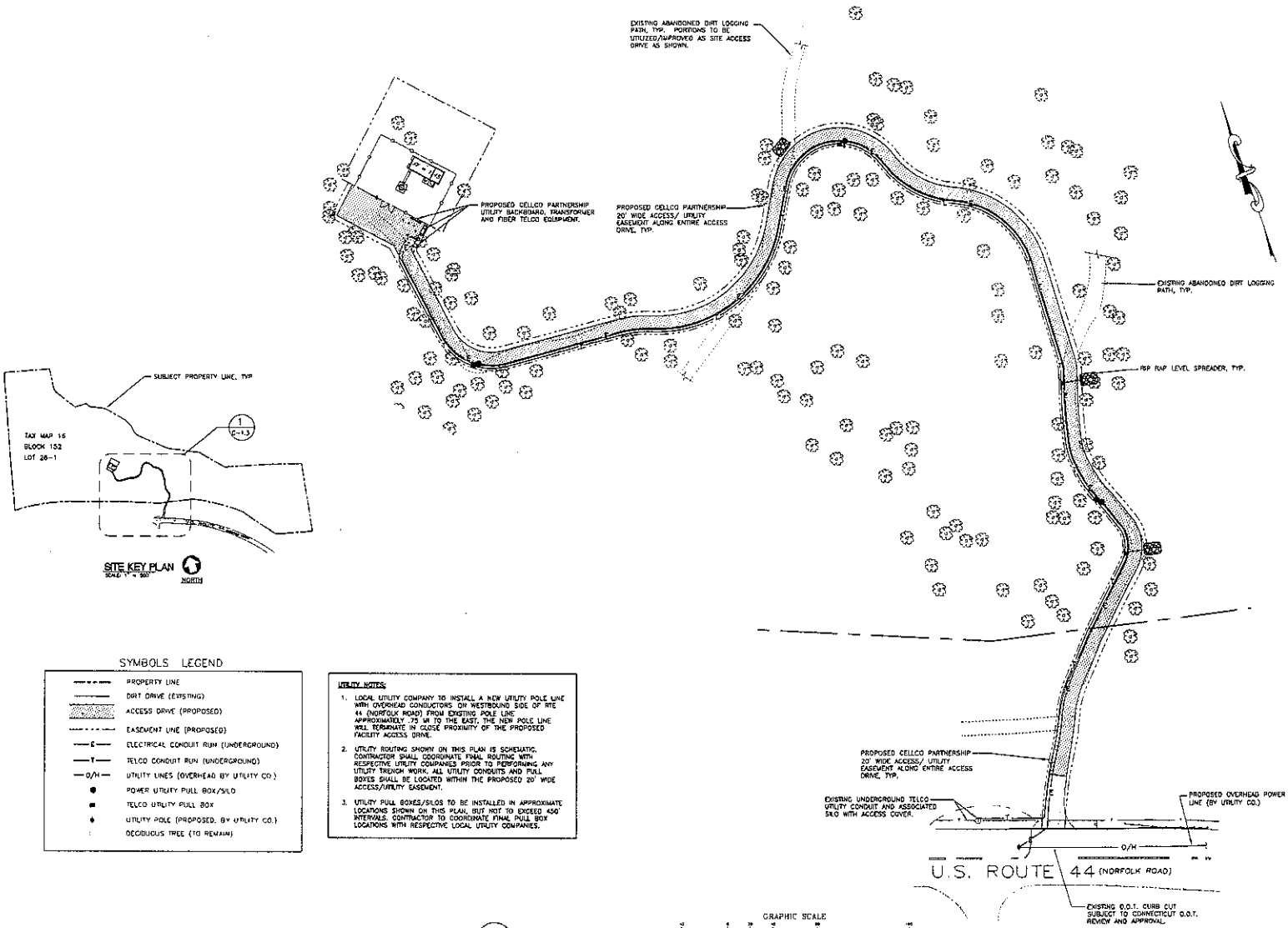
VERIZON WIRELESS
WIRELESS COMMUNICATIONS FACILITY
WINCHESTER
NORFOLK ROAD
WINCHESTER, CT

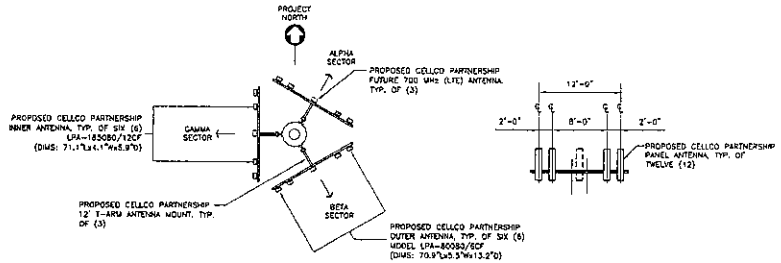
DATE:	11/03/06
SCALE:	AS NOTED
JOB NO.	07019

ACCESS DRIVE PROFILE

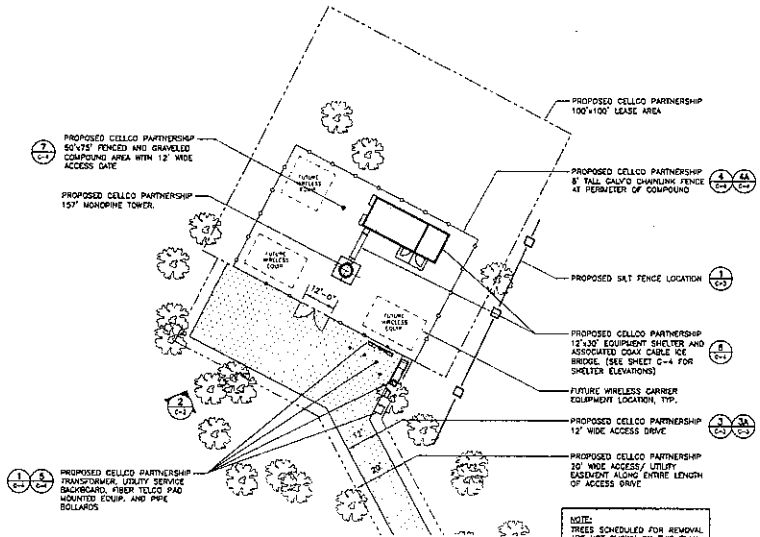
C-1.2

Sheet No. 6 of 9


EXISTING ABANDONED DIRT LOGGING PATH, TYP. PORTIONS TO BE UTILIZED/IMPROVED AS SITE ACCESS DRIVE AS SHOWN.
PROPOSED CELLCO PARTNERSHIP UTILITY BACKBOARD, TRANSFORMER AND FIBER TELCO EQUIPMENT.
PROPOSED CELLCO PARTNERSHIP 20' WIDE ACCESS/ UTILITY EASEMENT ALONG ENTIRE ACCESS DRIVE, TYP.
EXISTING ABANDONED DIRT LOGGING PATH, TYP.
RIP RAP LEVEL SPREADER, TYP.
PROPOSED CELLCO PARTNERSHIP 20' WIDE ACCESS/ UTILITY EASEMENT ALONG ENTIRE ACCESS DRIVE, TYP.
EXISTING UNDERGROUND TELCO UTILITY CONDUIT AND ASSOCIATED 5X10 WITH ACCESS COVER.
PROPOSED OVERHEAD POWER UTILITY LINE (BY UTILITY CO.)
O/H
U.S. ROUTE 44 (NORFOLK ROAD)
EXISTING D.O.T. CURB CUT SUBJECT TO CONNECTICUT D.O.T. REVIEW AND APPROVAL.
SUBJECT PROPERTY LINE, TYP.
TAX MAP 15
BLOCK 152
LOT 26-1
1
C-1.3
SITE KEY PLAN
SCALE: 1" = 300'
NORTH
SYMBOLS LEGEND
PROPERTY LINE
DIRT DRIVE (EXISTING)
ACCESS DRIVE (PROPOSED)
EASEMENT LINE (PROPOSED)
E
ELECTRICAL CONDUIT RUN (UNDERGROUND)
T
TELCO CONDUIT RUN (UNDERGROUND)
O/H
UTILITY LINES (OVERHEAD BY UTILITY CO.)
POWER UTILITY PULL BOX/S1LO
TELCO UTILITY PULL BOX
UTILITY POLE (PROPOSED, BY UTILITY CO.)
DECIDUOUS TREE (TO REMAIN)
UTILITY NOTES:
1. LOCAL UTILITY COMPANY TO INSTALL A NEW UTILITY POLE LINE WITH OVERHEAD CONDUCTORS ON WESTBOUND SIDE OF RTE 44 (NORFOLK ROAD) FROM EXISTING POLE LINE APPROXIMATELY 75 +/- TO THE EAST. THE NEW POLE LINE WILL TERMINATE IN CLOSE PROXIMITY OF THE PROPOSED FACILITY ACCESS DRIVE.
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 20' WIDE ACCESS/UTILITY EASEMENT.
3. UTILITY PULL BOXES/SILOS TO BE 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.
1
C-1.3
UTILITY ROUTING PLAN
SCALE: 1" = 40'
GRAPHIC SCALE
(IN FEET)
1 inch = 40 ft.
STATE OF CONNECTICUT
CHRISTOPHER E. FISHER
15394
REGISTERED PROFESSIONAL ENGINEER
Cellco Partnership d.b.a. Verizon Wireless
DRAWN BY: DMD
CHK'D BY: CFC
11/03/08 DMD CFC ISSUE PLAN CLIENT REVIEW
DATE DRAWN BY CHK'D BY DESCRIPTION NO.
NATIONAL GRID
VERIZON WIRELESS
WIRELESS COMMUNICATIONS FACILITY
WINCHESTER
NORFOLK ROAD
WINCHESTER, CT
DATE: 11/03/08
SCALE: AS NOTED
JOB NO.: 07019
UTILITY ROUTING PLAN
C-1.3
Sheet No. 1 of 2



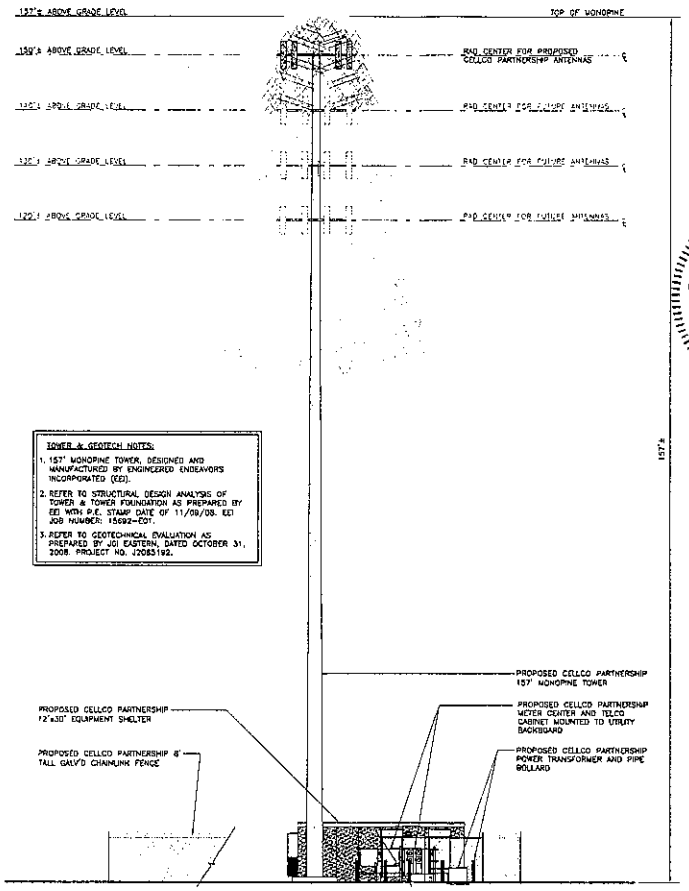
3 / C-1 ANTENNA MOUNTING CONFIGURATION
NOT TO SCALE



NOTE:
TREES SCHEDULED FOR REMOVAL ARE NOT SHOWN ON THIS PLAN FOR CLARITY. REFER TO SHEET C-1.0 FOR TREE REMOVAL LOCATIONS.

1 / C-2 COMPOUND PLAN
SCALE: 1" = 20'
APPROXIMATE NORTH

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.



TOWER & GEOTECH NOTES:
1. 157' MONOPINE TOWER, DESIGNED AND MANUFACTURED BY ENGINEERED ENDEAVORS INCORPORATED (EE).
2. REFER TO STRUCTURAL DESIGN ANALYSIS OF TOWER & TOWER FOUNDATION AS PREPARED BY EE WITH P.E. STAMP DATE OF 11/06/08. EE JOB NUMBER: 15692-E01.
3. REFER TO GEOTECHNICAL EVALUATION AS PREPARED BY JGI EASTERN, DATED OCTOBER 31, 2008. PROJECT NO. J20051192.

2 / C-2 COMPOUND AND TOWER ELEVATION
SCALE: 1" = 10'

GRAPHIC SCALE
(IN FEET)
1 inch = 10 ft.

DESIGNED BY:	CFC		
DRAWN BY:	DWD		
CHK'D BY:	CFC		
11/03/08	DWD	CFC	CLIENT REVIEW
DATE	DRAWN BY	CHK'D BY	DESCRIPTION

STATE OF CONNECTICUT
SCOTT F. CENTRELLA
No. 18694
REGISTERED PROFESSIONAL ENGINEER

Cellco Partnership d.b.a. verizonwireless

COMMSCOPE

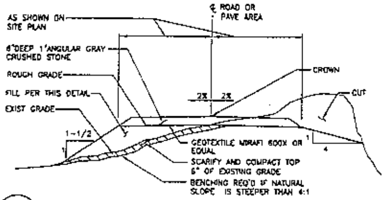
VERIZON WIRELESS
WIRELESS COMMUNICATIONS FACILITY
WINCHESTER
NORFOLK ROAD
WINCHESTER, CT

DATE: 11/03/08
SCALE: AS NOTED
JOB NO. 07019

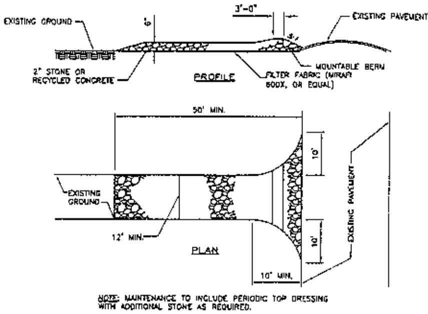
COMPOUND PLAN AND ELEVATION

C-2

Sheet No. 6 of 8

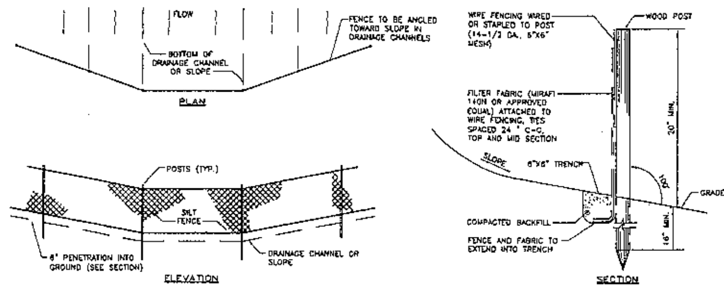


3 (C-3) TYP. CRUSHED STONE ACCESS DRIVE DETAIL
NOT TO SCALE



NOTE: MAINTENANCE TO INCLUDE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS REQUIRED.

2 (C-3) ANTI-TRACKING APRON
NOT TO SCALE



NOTE: PERIODIC MAINTENANCE IS REQUIRED AS NEEDED TO REMOVE ACCUMULATED MATERIALS AND REPAIR FENCE.

1 (C-3) SILTATION FENCE DETAIL
NOT TO SCALE

SOIL EROSION AND SEDIMENT CONTROL NOTES

(A) ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES, SUCH AS STABILIZED CONSTRUCTION ENTRANCE / ANTITRAKING PAD AND SILT FENCE, 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.

(B) ALL ENTRANCES TO THE PROJECT SITE ARE TO BE PROTECTED BY STONE TRACKING PADS. THE STONE TRACKING PAD IS TO BE MAINTAINED AT ALL TIMES DURING THE CONSTRUCTION PERIOD.

(C) LAND DISTURBANCE WILL BE KEPT TO A MINIMUM AND RESTABILIZATIONS WILL BE SCHEDULED AS SOON AS PRACTICAL.

(D) ALL SOIL EROSION AND SEDIMENT CONTROL WORK SHALL BE DONE IN STRICT ACCORDANCE WITH THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL.

(E) ANY ADDITIONAL EROSION/SEDIMENTATION CONTROL DEEMED NECESSARY BY THE AUTHORITY HAVING JURISDICTION 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 AUTHORITY HAVING JURISDICTION.

(F) 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.

(G) 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.

(H) PIPE AND SWALES DISCHARGE AREAS (TEMPORARY & PERMANENT) WILL BE PROTECTED WITH RIPRAP, ENERGY DISSIPATERS AND/OR STILLING BASINS AS INDICATED.

(J) PIPE INLETS WILL BE PROTECTED WITH SILTATION FENCES THROUGHOUT CONSTRUCTION AND UNTIL ALL DISTURBED AREAS ARE THOROUGHLY STABILIZED.

(I) ALL FILL AREAS SHALL BE COMPACTED SUFFICIENTLY FOR THEIR INTENDED PURPOSE AND AS REQUIRED TO REDUCE SLIPPING, EROSION OR EXCESS SATURATION.

(N) 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 SODDING OR SEEDING.

AFTER CONSTRUCTION IS COMPLETE AND GROUND IS STABILE, CLEAN SILTS IN THE RIPRAP ENERGY DISSIPATERS / STILLING BASIN, REMOVE OTHER EROSION AND SEDIMENT DEVICES.

SOIL EROSION AND SEDIMENT CONTROL MAINTENANCE SCHEDULE

AREA	REQUIRED MAINTENANCE	FREQUENCY
LEASE AREA	INSPECT AND CLEAR OF VEGETAION	BI-ANNUALLY; AND AFTER EACH MAJOR RAINFALL EVENT
ACCESS DRIVEWAY	INSPECT AND CLEAR OF VEGETAION	BI-ANNUALLY; AND AFTER EACH MAJOR RAINFALL EVENT
RIP-RAP LINED SWALES	INSPECT AND CLEAR OF ALL OVERGROWN VEGETATION OR DEBRIS, INSPECT INTEGRITY OF STRUCTURE, REPAIR/REPLACE AS NEC.	BI-ANNUALLY; AND AFTER EACH MAJOR RAINFALL EVENT
RIP-RAP OUTLETS	INSPECT AND CLEAR OF ALL OVERGROWN VEGETATION OR DEBRIS, INSPECT INTEGRITY OF STRUCTURE, REPAIR/REPLACE AS NEC. REMOVE SEDIMENT AS NECESSARY.	BI-ANNUALLY; AND AFTER EACH MAJOR RAINFALL EVENT

SITE RESTORATION NOTES

GRADING ACTIVITIES ASSOCIATED WITH CONSTRUCTION OF THE ACCESS DRIVE AND COMPOUND THAT DO NOT RECEIVE RIP RAP TREATMENT SHALL BE STABILIZED AS FOLLOWS:

1. GRADED AREAS SHALL RECEIVE 6 INCHES OF CLEAN LOAM TOPSOIL SUITABLE FOR ESTABLISHMENT OF A SEEDING BED.
2. SUCH AREAS SHALL BE SEEDED WITH A NEW ENGLAND LOGGING ROAD SEED MIX (NEW ENGLAND WETLAND PLANTS, INC. (413) 548-8000, OR APPROVED EQUIVALENT) MODIFIED TO INCLUDE ADDITIONAL SPECIES AS NOTED BELOW.
3. GOOD SEED/SOIL CONTACT SHALL BE ESTABLISHED BY EITHER LIGHT RAKING OR LIGHT COMPACTION WITH A HAND ROLLER OR BY FOOT.
4. A LIGHT MULCH OF 2 TO 3 INCHES OF CLEAN STRAW SHALL BE APPLIED TO SEEDED AREAS ON SLOPES LESS THAN 3:1. A BIODEGRADABLE EROSION CONTROL BLANKET SHALL BE APPLIED TO SEEDED AREAS ON SLOPES GREATER THAN 3:1.

USE OF THIS SPECIAL SEED MIX WILL PROMOTE ESTABLISHMENT OF HABITAT FOR COMMON ROADSIDE SKIPPER (AMBLYSCIRTES VIALIS) A RARE BUTTERFLY KNOWN TO INHABIT THIS AREA OF WINCHESTER.

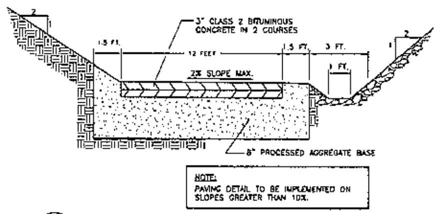
NEW ENGLAND LOGGING ROAD SEED MIX

APPLICATION RATE: 20 LBS/ACRES (2200 SQ.FT/LB)

SPECIES: SWITCHGRASS (PANICUM VIRGATUM), CREEPING RED FESCUE (FESTUCA RUBRA), LITTLE BLUESTEM (SCIZACHYRIUM SCOPARIUM), BIG BLUESTEM (ANDROPOGON GERARDII), VIRGINIA WILD RYE (ELYMUS VIRGINICUS), INDIAN GRASS (SORGHASTRUM NUTANS), PARTRIDGE PEA (CHAMAECRISTA FASCICULATA), SOFT RUSH (JUNCUS EFFUSUS), UPLAND BENTGRASS (AGROSTIS PERENNANS), PATH RUSH (JUNCUS TENUIS), DEER TONGUE (PANICUM VIRGATUM).

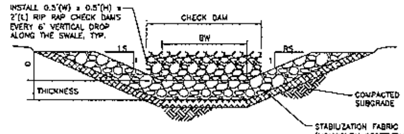
ADDITION OF SPECIAL SPECIES FOR AMBLYSCIRTES VIALIS:

ADULT FOOD SOURCES BLUE VERVAIN (VERBENA HASTATA) SELFHEAL (PRUNELLA VULGARIS) LARVAL HOST PLANTS	ROUGH BENTGRASS/TICKLEGRASS (AGROSTIS SCABRA) UPLAND BENTGRASS (AGROSTIS PERENNANS) CREEPING BENTGRASS (AGROSTIS STOLONIFERA) REDTOP (AGROSTIS ALBA) KENTUCKY BLUEGRASS (POA PRATENSIS) BERMUDA GRASS (CYNODON DACTYLON) COMMON OAT (AVENA SATIVA) WILD OAT (AVENA FATUA)



NOTE: PAVING DETAIL TO BE IMPLEMENTED ON SLOPES GREATER THAN 10%.

3A (C-3) TYP. BITUMINOUS CONCRETE DRIVEWAY DETAIL
NOT TO SCALE

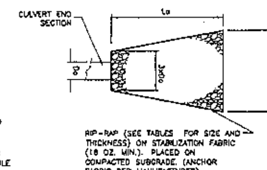


CHANNEL	D (FT)	LS (FT)	RS (FT)	BW (FT)	THICKNESS (FT)	SLOPE (MAX)
A	1	1	1	1	1.0	18%
B	1	1	1	1	1.0	24%
C	1	1	1	1	1.0	24%

4 (C-3) DRAINAGE SWALE
NOT TO SCALE

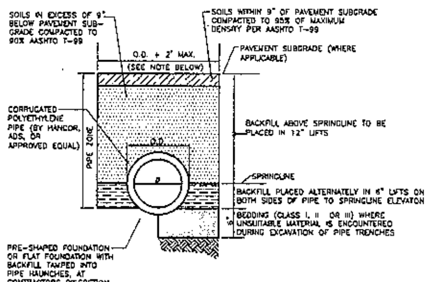
CONNDOT MODIFIED RIPRAP SIZES

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
LESS THAN 1"	0-10



APRON	La (FT)	W (FT)	THICKNESS (FT)
A	10	15	1.0
B	10	15	1.0

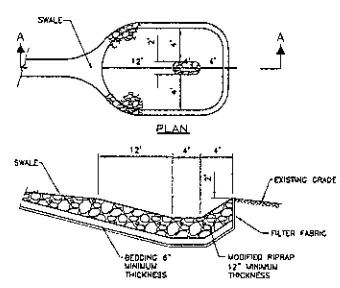
5 (C-3) LEVEL SPREADER
NOT TO SCALE



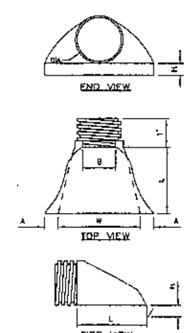
NOTES:

1. CLASS I, II, III OR IV COMPACTED BACKFILL MATERIAL REQUIRED IN ALL PIPE ZONES, PER USCS (UNIFIED SOIL CLASSIFICATION SYSTEM).
2. IF DEPTH OF TRENCH EXCEEDS 5', THE CONTRACTOR MUST PROVIDE SHEETING AND BRACING OR A SHEETING BOX IN ACCORDANCE WITH OSHA REGULATIONS. AS AN ALTERNATE, IF PERMITTED BY THE ENGINEER, THE TRENCH WALLS MAY BE CUT BACK TO A 1:1 SLOPE OR THE NATURAL ANGLE OF REPOSE FOR THE SOIL, WHICHEVER IS GREATER.
3. WHERE PIPE IS INSTALLED WITH LESS THAN 2' OF COVER, ALL BACKFILL MATERIAL THROUGHOUT THE PIPE ZONE IS TO BE CLASS I MATERIAL.

6 (C-3) PIPE TRENCH DETAIL
NOT TO SCALE



7 (C-3) STILLING BASIN
NOT TO SCALE



PIPE DIA.	A	B	H	L	W
15"	6.5"	10"	6.5"	25"	29"
24"	7.5"	18"	6.5"	36"	45"

8 (C-3) CULVERT END SECTION
NOT TO SCALE

DESIGNED BY:	CFC			
DRAWN BY:	DMD			
CHK'D BY:	CFC			
11/21/08	DMD	CFC	DRM PLAN	
11/17/08	DMD	CFC	DRM PLAN - CLIENT REVIEW	
REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION

Cellco Partnership
d.b.a. Verizon wireless

NATCOMM

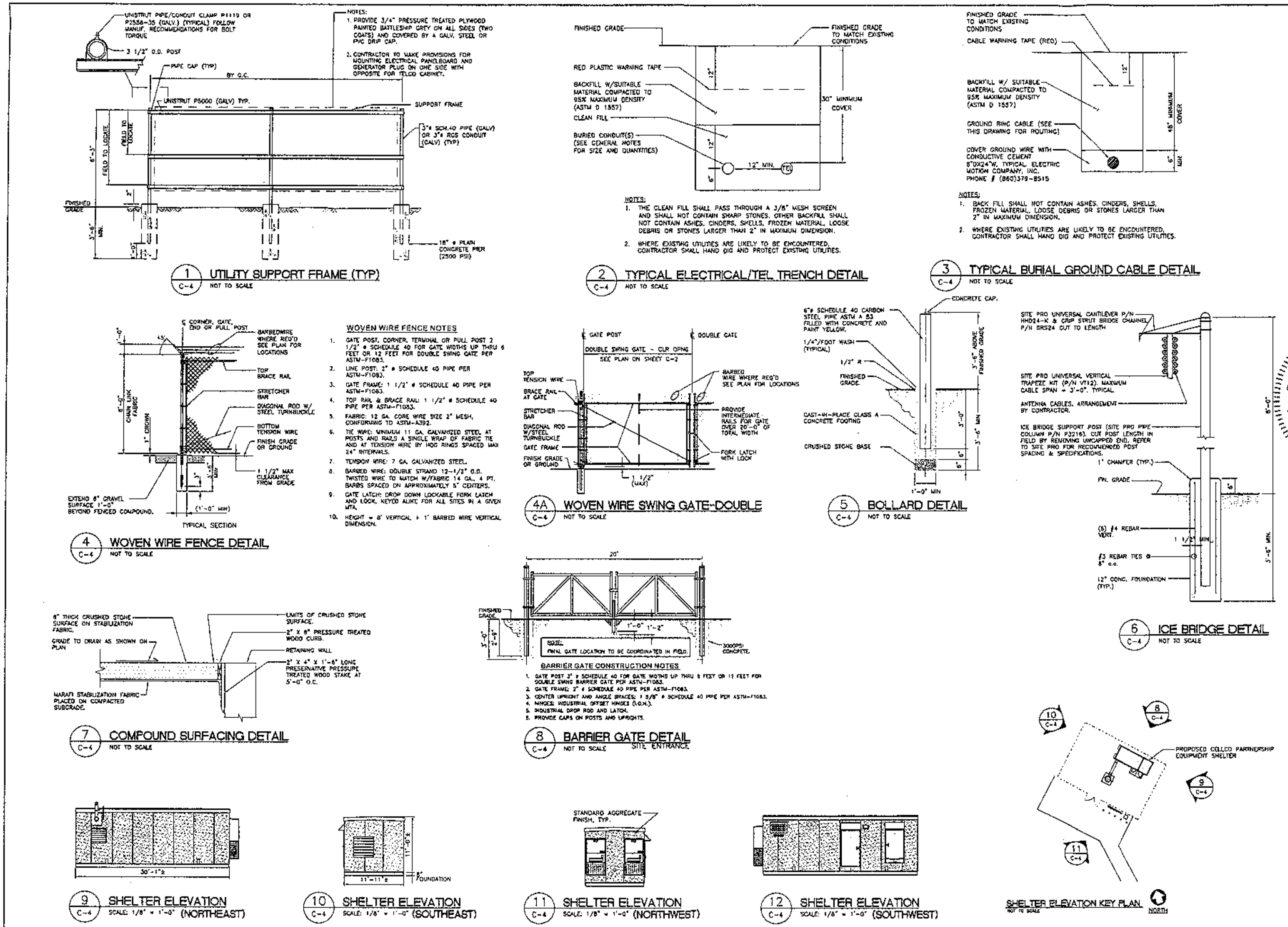
VERIZON WIRELESS
WIRELESS COMMUNICATIONS FACILITY
WINCHESTER
NORFOLK ROAD
WINCHESTER, CT

DATE:	11/03/08
SCALE:	AS NOTED
JOB NO.	07019

SITE DETAILS AND NOTES

C-3

Sheet No. 7 of 7


UNISTRUT PIPE/CONDUIT CLAMP P1119 OR P2558-35 (GALV.) (TYPICAL) FOLLOW MANUF. RECOMMENDATIONS FOR BOLT TORQUE
3 1/2" O.D. POST
PIPE CAP (TYP)
BY G.C.
UNISTRUT P5000 (GALV) TYP.
SUPPORT FRAME
3"ø SCH.40 PIPE (GALV) OR 3"ø RGS CONDUIT (GALV) (TYP)
18" ø PLAIN CONCRETE PIER (2500 PSI)
FIELD TO LOCATE
FINISHED GRADE
NOTES:
1. PROVIDE 3/4" PRESSURE TREATED PLYWOOD PAINTED BATTLESHIP GREY ON ALL SIDES (TWO COATS) AND COVERED BY A GALV. STEEL OR PVC DRIP CAP.
2. CONTRACTOR TO MAKE PROVISIONS FOR MOUNTING ELECTRICAL PANELBOARD AND GENERATOR PLUG ON ONE SIDE WITH OPPOSITE FOR TELCO CABINET.
1 UTILITY SUPPORT FRAME (TYP) C-4 NOT TO SCALE
FINISHED GRADE
FINISHED GRADE TO MATCH EXISTING CONDITIONS
RED PLASTIC WARNING TAPE
BACKFILL W/SUITABLE MATERIAL COMPACTED TO 95% MAXIMUM DENSITY (ASTM D 1557)
CLEAN FILL
BURIED CONDUIT(S) (SEE GENERAL NOTES FOR SIZE AND QUANTITIES)
30" MINIMUM COVER
12" MIN.
TEL
NOTES:
1. 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.
2. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.
2 TYPICAL ELECTRICAL/TEL TRENCH DETAIL C-4 NOT TO SCALE
FINISHED GRADE TO MATCH EXISTING CONDITIONS
CABLE WARNING TAPE (RED)
BACKFILL W/ SUITABLE MATERIAL COMPACTED TO 95% MAXIMUM DENSITY (ASTM D 1557)
GROUND RING CABLE (SEE THIS DRAWING FOR ROUTING)
COVER GROUND WIRE WITH CONDUCTIVE CEMENT 8"0X24"W, TYPICAL. ELECTRIC MOTION COMPANY, INC. PHONE # (860)379-8515
48" MINIMUM COVER
NOTES:
1. BACK FILL SHALL NOT CONTAIN ASHES, CINDERS, SHELLS, FROZEN MATERIAL, LOOSE DEBRIS OR STONES LARGER THAN 2" IN MAXIMUM DIMENSION.
2. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.
3 TYPICAL BURIAL GROUND CABLE DETAIL C-4 NOT TO SCALE
CORNER, GATE, END OR PULL POST
BARBEDWIRE WHERE REQ'D SEE PLAN FOR LOCATIONS
TOP BRACE RAIL
STRETCHER BAR
DIAGONAL ROD W/ STEEL TURNBUCKLE
BOTTOM TENSION WIRE
FINISH GRADE OR GROUND
1 1/2" MAX CLEARANCE FROM GRADE
CHAIN LINK FABRIC
1" CROWN
EXTEND 6" GRAVEL SURFACE 1'-0" BEYOND FENCED COMPOUND.
TYPICAL SECTION
4 WOVEN WIRE FENCE DETAIL C-4 NOT TO SCALE
WOVEN WIRE FENCE NOTES
1. 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.
2. LINE POST: 2" ø SCHEDULE 40 PIPE PER ASTM-F1083.
3. GATE FRAME: 1 1/2" ø SCHEDULE 40 PIPE PER ASTM-F1083.
4. TOP RAIL & BRACE RAIL: 1 1/2" ø SCHEDULE 40 PIPE PER ASTM-F1083.
5. FABRIC: 12 GA. CORE WIRE SIZE 2" MESH, CONFORMING TO ASTM-A392.
6. 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.
7. TENSION WIRE: 7 GA. GALVANIZED STEEL.
8. 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.
9. GATE LATCH: DROP DOWN LOCKABLE FORK LATCH AND LOCK, KEYED ALIKE FOR ALL SITES IN A GIVEN MTA.
10. HEIGHT = 8' VERTICAL + 1' BARBED WIRE VERTICAL DIMENSION.
GATE POST
DOUBLE GATE
DOUBLE SWING GATE - CLR OPNG SEE PLAN ON SHEET C-2
TOP TENSION WIRE
BRACE RAIL AT GATE
STRETCHER BAR
DIAGONAL ROD W/STEEL TURNBUCKLE
GATE FRAME
FINISH GRADE OR GROUND
BARBED WIRE WHERE REQ'D SEE PLAN FOR LOCATIONS
PROVIDE INTERMEDIATE RAILS FOR GATE OVER 20'-0" OF TOTAL WIDTH
FORK LATCH WITH LOCK
4A WOVEN WIRE SWING GATE-DOUBLE C-4 NOT TO SCALE
6"ø SCHEDULE 40 CARBON STEEL PIPE ASTM A 53 FILLED WITH CONCRETE AND PAINT YELLOW.
CONCRETE CAP.
1/4"/FOOT WASH (TYPICAL)
1/2" R
FINISHED GRADE
CAST-IN-PLACE CLASS A CONCRETE FOOTING
CRUSHED STONE BASE
3'-6" ABOVE FINISHED GRADE
3'-6" MIN
1'-0" MIN
5 BOLLARD DETAIL C-4 NOT TO SCALE
SITE PRO UNIVERSAL CANTILEVER P/N HHD24-K & GRIP STRUT BRIDGE CHANNEL P/N GR524 CUT TO LENGTH
SITE PRO UNIVERSAL VERTICAL TRAPEZE KIT (P/N VT12). MAXIMUM CABLE SPAN = 3'-0". TYPICAL
ANTENNA CABLES. ARRANGEMENT BY CONTRACTOR.
ICE BRIDGE SUPPORT POST (SITE PRO PIPE COLUMN P/N P3216). CUT POST LENGTH IN FIELD BY REMOVING UNCAPPED END. REFER TO SITE PRO FOR RECOMMENDED POST SPACING & SPECIFICATIONS.
1" CHAMFER (TYP.)
FIN. GRADE
(6) #4 REBAR VERT.
#3 REBAR TIES @ 8" o.c.
12" CONC. FOUNDATION (TYP.)
6 ICE BRIDGE DETAIL C-4 NOT TO SCALE
6" THICK CRUSHED STONE SURFACE ON STABILIZATION FABRIC.
GRADE TO DRAIN AS SHOWN ON PLAN
MARAFI STABILIZATION FABRIC PLACED ON COMPACTED SUBGRADE.
LIMITS OF CRUSHED STONE SURFACE.
2" X 8" PRESSURE TREATED WOOD CURB.
RETAINING WALL
2" X 4" X 1'-6" LONG PRESERVATIVE PRESSURE TREATED WOOD STAKE AT 5'-0" O.C.
7 COMPOUND SURFACING DETAIL C-4 NOT TO SCALE
20'
FINISHED GRADE
NOTE:
FINAL GATE LOCATION TO BE COORDINATED IN FIELD.
3000PSI CONCRETE.
BARRIER GATE CONSTRUCTION NOTES
1. GATE POST 3" ø SCHEDULE 40 FOR GATE WIDTHS UP THRU 6 FEET OR 12 FEET FOR DOUBLE SWING BARRIER GATE PER ASTM-F1083.
2. GATE FRAME: 2" ø SCHEDULE 40 PIPE PER ASTM-F1083.
3. CENTER UPRIGHT AND ANGLE BRACES: 1 5/8" ø SCHEDULE 40 PIPE PER ASTM-F1083.
4. HINGES: INDUSTRIAL OFFSET HINGES (L.O.H.).
5. INDUSTRIAL DROP ROD AND LATCH.
6. PROVIDE CAPS ON POSTS AND UPRIGHTS.
8 BARRIER GATE DETAIL C-4 NOT TO SCALE SITE ENTRANCE
PROPOSED CELLCO PARTNERSHIP EQUIPMENT SHELTER
30'-1"±
11'-11"±
FOUNDATION
STANDARD AGGREGATE FINISH, TYP.
9 SHELTER ELEVATION C-4 SCALE: 1/8" = 1'-0" (NORTHEAST)
10 SHELTER ELEVATION C-4 SCALE: 1/8" = 1'-0" (SOUTHEAST)
11 SHELTER ELEVATION C-4 SCALE: 1/8" = 1'-0" (NORTHWEST)
12 SHELTER ELEVATION C-4 SCALE: 1/8" = 1'-0" (SOUTHWEST)
SHELTER ELEVATION KEY PLAN NOT TO SCALE
NORTH

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	11/21/06	DHD	CFC	D&M PLAN
A	11/17/06	DHD	CFC	D&M PLAN - CLIENT REVIEW

Cellco Partnership d.b.a. Verizon Wireless

NATCOMM

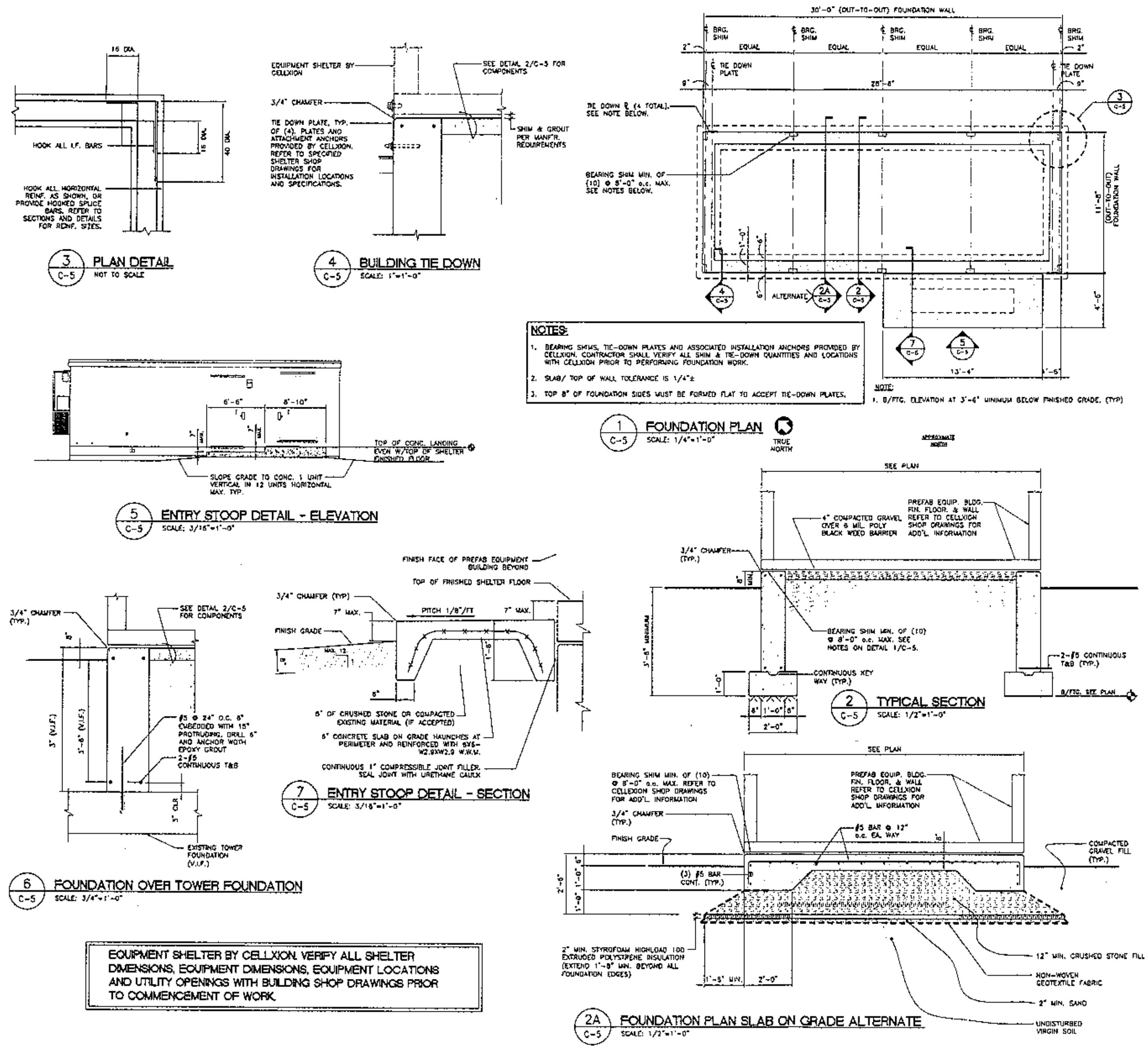
VERIZON WIRELESS
WIRELESS COMMUNICATIONS FACILITY
WINCHESTER
NORFOLK ROAD
WINCHESTER, CT

DATE: 11/03/06
SCALE: AS NOTED
JOB NO. 07018

SITE DETAILS AND SHELTER ELEVATIONS

C-4

Sheet No. 5 of 8



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 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:

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	

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
	11/17/08	DMD	CFC	DRAW PLAN - CLIENT REVIEW
	11/21/08	DMD	CFC	DRAW PLAN

Cellco Partnership d.b.a. Verizon wireless

NATCOMM

VERIZON WIRELESS
WIRELESS COMMUNICATIONS FACILITY
WINCHESTER
NORFOLK ROAD
WINCHESTER, CT

DATE: 11/03/08
SCALE: AS NOTED
JOB NO. 07019

SHELTER FOUNDATION DETAILS & NOTES

C-5

Sheet No. 9 of 9

EASTERN, Inc.
A Terracon COMPANY
201 Hammer Mill Road
Rocky Hill, CT 06067
Phone (860) 721-1900
Fax (860) 721-1939
www.terracon.com

October 31, 2008

Mr. Carlo F. Centore, P.E.
Natcomm, LLC
63-2 North Branford Road
Branford, CT 06405

Advance Copy by Email

Re: Geotechnical Evaluation
Proposed Communications Tower – Winchester PCS
Norfolk Road (Route 44)
Winchester, Connecticut
Terracon Project No. J2085192

Dear Mr. Centore:

JGI Eastern, Inc., A Terracon Company (Terracon) has completed the geotechnical engineering evaluation for the proposed communications tower at the above-referenced location. Our services, which were conducted in general accordance with our proposal dated September 25, 2008, are subject to the limitations contained in this letter report. An environmental assessment was not part of the assignment.

SITE AND PROJECT DESCRIPTION

The site is located north of Norfolk Road (Route 44), south of Colebrook Road (Route 183), and just to the east of an unnamed pond in the Town of Winchester, Connecticut. The site is undeveloped and moderately to heavily wooded. The 100-foot by 100-foot lease area slopes up to the northwest from approximately Elevation (El) 1,138 to 1,150 feet. However, the proposed access road slopes steeply up from Route 44 to the lease area from approximately El 990 to 1,140. Large boulders and possible bedrock outcrops are visible at ground surface within the lease area.

The project consists of constructing a 150-foot high steel monopole communications tower with associated equipment cabinets within a 50-foot by 75-foot fenced compound. The approximately 1,300-foot long access drive will be gravel surfaced. The proposed tower lease area, existing conditions, and test boring and probe locations are shown on Figure 1, Exploration Location Diagram.

SUBSURFACE EXPLORATIONS AND CONDITIONS

JGI monitored the advancement of two test borings (JB-1A and JB-1B) by New England Boring Contractors Inc. of Glastonbury, Connecticut on October 27, 2008. Because of access issues, the all terrain vehicle (ATV) mounted drill rig could not reach the tower lease area. The test borings were therefore drilled on the access road, as close as possible to the proposed tower location. JB-1A was advanced with 4-inch diameter solid stem augers (SSA) to refusal on bedrock at a depth of 9.5 feet below existing grade. Soil samples were obtained semi-continuously to a depth of 6.5 feet with a standard 2-inch outside-diameter split-barrel sampler. Standard Penetration Tests (SPTs) were performed at sampling intervals, in general accordance with ASTM D1586. The drill rig was then offset by about 15 feet to the north to advance JB-1B for rock coring. JB-1B was advanced with 4-inch diameter SSA without sampling to refusal on bedrock at a depth of 11 feet below existing grade. Flush wall casing (FWC) was set and the bedrock was cored from 11 to 17.5 feet with an NQ2-size core barrel prior to termination of the boring.

Five probes (JP-1 through JP-5) were advanced using a hand auger or spade to evaluate the subsurface conditions around the proposed tower foundation. The probes encountered generally similar conditions to JB-1; however, bedrock was encountered closer to ground surface. The probes were terminated at refusal on boulders or bedrock at depths ranging from 0.7 to 2 feet below existing grade.

The exploration logs are attached. The ground surface elevations on the exploration logs were obtained by interpolating from contours on Natcomm Drawing C-1 Site Plan, dated July 30, 2007.

The subsurface profile in the probes within the lease area consists of forest mat over subsoil, underlain by bedrock. Boulders overlie the bedrock in places. There may also be a relatively thin glacial till layer, as encountered in JB-1A and JB-1B. The forest mat, which is about 2 to 3 inches thick, consists primarily of dark brown, medium to fine sand, some silt, trace organics. Subsoil, encountered below the forest mat, generally extends to the bedrock surface, which is likely less than a foot below ground surface in some locations. The subsoil consists of generally loose, dark brown, fine sand and silt, with roots. The glacial till encountered in JB-1A and JB-1B consists of dense to very dense, brown, coarse to fine sand, little silt and gravel, occasional cobbles and boulders.

Based on an assessment of the rock core from JB-1B and our review of the Bedrock Geologic Map of Connecticut (1983), the bedrock consists of hard, gray, medium grained, slightly weathered gneiss. The Rock Quality Designation (RQD) values from 11 to 14 feet and from 14 to 17.5 feet were 89 and 77 percent, respectively, indicating a good in situ bedrock quality. We would expect similar bedrock at the tower location.

At the time of drilling, groundwater was observed in JB-1A at a depth of 3 feet below existing grade. Groundwater was not observed in the shallower probes within the lease area. Groundwater levels will vary depending upon season, precipitation and other conditions that may be different from those at the time of exploration. Perched water may exist seasonally above the relatively impermeable bedrock surface.

In situ soil resistivity testing was completed on October 29, 2008. Resistivity testing was performed in accordance with ASTM G57 by the Wenner Four Probe Method using a 16gl Earth Resistivity Meter. One resistivity line was completed with electrodes spaced at 5, 10, 20, 30, and 40 feet. Because of space limitations, one resistivity line was completed with electrodes spaced at 5, 10, and 20 feet. At the time of resistivity testing, the soil at the surface was moist. The location and orientation of resistivity lines are shown on Figure 1. The resistivity test results are summarized below:

	Resistivity (ohm-cm)	
Electrode Spacing (ft)	**Line 1**	**Line 2**
5	676,950	659,700
10	842,600	792,800
20	1,087,700	1,022,600
30	959,400	Not measured
40	1,041,750	Not measured

FOUNDATION TYPE AND DESIGN RECOMMENDATIONS

Tower

The tower may be supported on either a monolithic mat or a pier and pad foundation bearing on the bedrock, or on structural fill or minus ¾-inch crushed stone placed on the bedrock. The tower foundation may be designed on the basis of a net allowable bearing pressure of 8 kips per square foot (ksf). The net allowable bearing pressure may be increased by one third for transient loadings, such as wind and seismic. Bearing pressure is unlikely to govern the design, with overturning determining the size of the foundation. Settlement of the tower foundation should be negligible if founded directly on the bedrock or on a few inches of structural fill or minus ¾-inch crushed stone placed on the bedrock.

An ultimate friction factor of 0.5 may be used for calculation of the sliding resistance between the bearing materials and concrete surfaces. A factor of safety of at least 1.5 should be applied to the sliding resistance.

If the concrete of the mat or pad is not placed directly against the cut face of the bedrock, an ultimate passive earth pressure coefficient, K_p, of 3.0 and a total unit weight (γ) of 125 pounds per cubic foot (pcf) should be used for the calculation of passive resistance provided by compacted backfill adjacent to the tower foundation. The passive pressure calculated with these

parameters should be reduced by at least a factor of safety of 3, to reflect the amount of movement required to mobilize the passive resistance.

If the concrete of the mat or pad is placed directly against the cut face of the bedrock, passive resistance may be estimated using an ultimate passive pressure coefficient, K_p, of 6.0 and a total unit weight (γ) of 165 pcf. The passive pressure calculated with these parameters should be reduced by at least a factor of safety of 1.5.

Control of backfill compaction above a pier and pad foundation will be required to provide uplift resistance. Care should be exercised during excavation for the tower foundation to minimize disturbance to the soil and/or bedrock surrounding the excavation; disturbance to the adjacent soil and/or bedrock will influence resistance to lateral loads.

Rock anchors may also be installed to provide uplift and sliding resistance. Either cement grouted or resin rock anchors could be used. For cement grout rock anchors, an ultimate bond stress between competent bedrock and anchor grout equal to 200 pounds per square inch is recommended. A factor of safety of at least 2 should be applied to the ultimate bond stress. For resin rock anchor design, a rock unit weight of 165 pounds per cubic foot is recommended to estimate the weight of bedrock engaged within a theoretical zone of influence. The zone of influence is a cone defined by lines drawn at a 40-degree angle from the midpoint of anchor bond length to the rock surface. The factor of safety based on dead weight resistance may be taken as 1.0. We recommend that the upper 5 feet of rock be ignored when calculating the required bond length. For anchor design purposes, the bedrock surface should be taken at a depth of 6 feet below existing grade. The minimum bond length should be 15 feet. The design, installation, and proof testing of rock anchors should be completed in accordance with the manufacturer's recommendations.

As an alternative, the monopole tower may be supported by a drilled shaft/rock socket foundation embedded into the bedrock. Rock strength parameters associated with the design of a drilled shaft/rock socket are summarized on Table 1. We anticipate that the length of the shaft/socket will be governed by the lateral capacity required to resist live loading, such as the combination of wind and ice. An allowable deflection at the top of the shaft/socket of up to 0.5 inch is considered acceptable for calculating lateral capacity.

The minimum shaft diameter should match the diameter of the monopole base. The compression capacity of the shaft/socket will be based on allowable bond and end bearing in the bedrock. The uplift capacity of the shaft/socket will be based on allowable bond in the bedrock. The shaft/socket should be designed to resist tension loads; reinforcing steel should be installed throughout the entire length of the shaft.

Equipment Cabinets

The equipment cabinet pads may be supported on concrete pier foundations or strip footings bearing on bedrock or slabs-on-grade deriving support from the bedrock. An allowable bearing pressure of 4 ksf may be used for foundation design of piers and strip footings. Settlements of piers and strip footings founded on or within the bedrock will be negligible. Strip footings should have a minimum width of 12 inches. Piers should have a minimum side dimension/diameter of 12 inches.

Slabs-on-grade should be underlain by a minimum 12-inch thick layer of compacted structural fill or minus ¾-inch crushed stone placed on bedrock. A modulus of subgrade reaction (k_s) of 250 pounds per cubic inch may be used for design of slabs constructed in this way. Consideration should be given to using dense insulation boards (Dow Styrofoam Highload, or similar) under and adjacent to lightly loaded slabs-on-grade, to provide the equivalent of 3.5 feet of earth cover, thus reducing frost penetration.

Air entraining admixtures should be used for concrete exposed to freezing. To reduce the likelihood of frost heave, the underside of foundation elements should be at least 3.5 feet below adjacent finished grade, unless founded directly on sound, competent bedrock or adequately protected by insulation boards.

Permanent Slopes

From the site topography and planned contours, only minor grading will be required to develop the site. Design of permanent soil slopes, if required, should be based on a grade no steeper than 2H:1V.

Forest mat and organic subsoil, i.e. subsoil with visible roots, should be removed prior to placing fill for any slopes. Soil placed to create fill slopes should be compacted to at least 92 percent of the maximum dry density, as determined by ASTM D1557, Method C. Organic subsoil should only be re-used in fill slopes within 12 inches of the surface of the slope.

We recommend that any permanent slope surfaces be vegetated or covered with riprap stone underlain by a geotextile separation fabric (Mirafi 140N, or equivalent) to reduce erosion. Temporary sedimentation and erosion control methods should be implemented during construction and left in place until the slope surfaces have become stabilized.

Seismic Design Criteria

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 2003 International Building Code. The Seismic Design Category determination is based on:

- Building Importance (grouping based on use of building)
- Mapping factors (expected maximum considered ground motions)
- Site classification (soil type)

From our explorations, we consider that the site subsurface conditions match the General Soil Description of "rock". The Site Class is therefore B. We expect that the communications tower will be classified as Category III Seismic Use Group, i.e. "designated for emergency preparedness, communication, and operation centers and other facilities required for emergency response". Based on the above, and a review of USGS National Seismic Hazard Mapping, we consider the facility to be in Seismic Design Category B. This determination should be confirmed by the structural engineer. The site is not susceptible to liquefaction in the event of an earthquake.

EARTHWORK AND CONSTRUCTION RECOMMENDATIONS

Site Grading

The lease area slopes down to the southeast. We understand that this slope will essentially be maintained when the fenced compound is developed. Only minor site grading will therefore be required. However, prior to placement of fill, the forest mat and organic subsoil should be removed.

Bedrock Excavation

Although bedrock excavation can generally be carried out either by explosive or non-explosive methods, because of the type and quality of the bedrock, we consider that controlled blasting will be more economical and efficient at this site than non-explosive methods, such as using a hydraulic ram. Controlled blasting methods should be specified to excavate rock safely. Controlled blasting methods should control overbreak at the excavation perimeter, and should limit the peak particle velocity at adjacent structures to a maximum 2.0 inches per second. Blasting mats should be used on all pre-split and production rounds.

Prior to blasting, the blasting contractor should submit proposed blast methods for typical pre-split and production rounds, and lift sizes to the project engineer for review. Specifications should require the blaster to be licensed with the State of Connecticut and to provide proof of experience with similar types of projects and constraints.

Compacted Structural Fill

Imported structural fill, if required, should conform to the gradation requirements for Bank or Crushed Gravel (M.02.06, Grading B) as defined by the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction (Form 816) 2004. Crushed stone, where used, should have a maximum particle size of ¾ inch.

Structural fill, or crushed stone if used, should be placed in loose lifts not exceeding 12 inches in thickness. Structural fill should be compacted to at least 95 percent of the maximum dry density, as determined by ASTM D1557, Method C.

Excavated inorganic subsoil, and glacial till if encountered, may be re-used as common fill for minor site grading, fill slopes, and backfill adjacent to and over the tower foundation, provided they can be adequately compacted. These soils will be sensitive to moisture and lose strength quickly when wet because of their silt content. Consequently, the recommendation for re-use of these soils is only applicable during periods when the climate and moisture are favorable for re-using silty soil as compacted fill.

Mat and Equipment Foundation Subgrades

The foundation bearing subgrades should be prepared by the contractor as outlined in this report and observed by a geotechnical engineer, prior to foundation construction. Fill or concrete should not be placed on frozen subgrades. Frozen material should not be used as fill.

Forest mat and subsoil should be removed within the foundation bearing zone of the tower mat/pad. The foundation bearing zone is defined as the volume beneath 1H:1V lines extending downward and outward from the lower edges of the footing. The forest mat and subsoil should be removed within the foundation bearing zone of the slabs-on-grade.

Upon completion of foundation excavations, the bedrock subgrade should be observed for open joints, loose rock, and uneven surfaces. Bedrock subgrade steeper than 4H:1V should be benched to provide a relatively level bearing surface. Minor irregularities in the rock surface may be filled with lean concrete to provide a level working surface. Small amounts of minus ¾-inch crushed stone could also be used to provide a working surface. The joints in competent bedrock should be tight; care should be taken not to displace the joints in the bedrock during excavation.

Excavation for the tower foundation will likely require removing large diameter boulders in addition to the bedrock. Where boulders are greater than 2 cubic yards, specifications typically allow their removal to be classified as bedrock excavation. Boulder removal may require blasting, mechanical methods, such as a backhoe-mounted ram, or the use of expansive agents. We recommend that the contractor familiarize him/herself with site conditions in this regard prior to construction.

Drilled Shaft/Rock Socket

The shaft/socket should be aligned vertically. The drilling method or combination of methods selected by the contractor should be submitted for review by the geotechnical engineer. Concrete placed for the shaft/socket should have a minimum 28-day unconfined compressive strength of 4,000 pounds per square inch (psi). Concrete should be placed through a tremie pipe.

Temporary Excavation and Dewatering

Excavations greater than 4 feet deep will be required for construction of the tower foundation. Temporary construction slopes in the subsoil and bedrock should be designed in compliance with recent governing regulations. Construction slopes should be cut to a stable incline or braced, depending upon the excavation depth and encountered subsurface conditions.

Construction slopes should be reviewed for signs of mass movement. If movement/potential stability problems are observed, work should cease; the geotechnical engineer should be immediately contacted. The responsibility for excavation safety and stability of temporary construction slopes should lie solely with the contractor.

Although groundwater was encountered at a depth of 3 feet in JB-1A, groundwater was not encountered in the shallower probes in the vicinity of the tower. Given the topography of the lease area and the shallow depth to bedrock, we do not anticipate significant construction dewatering. The contractor should prevent groundwater, if encountered, and surface water runoff from collecting in excavations. Sound bedrock will not be affected by water in the short term. Subgrade soils and weathered bedrock, if encountered, that become unstable because of water and/or reworking by construction activity should be replaced with compacted granular structural fill or minus ¾-inch crushed stone, as necessary.

LIMITATIONS

The analyses and recommendations submitted in this report are based upon the data obtained from two test borings and five probes. The nature and extent of variations from the conditions observed within the explorations may not become evident until construction. If variations then appear evident, JGI should re-evaluate the recommendations in this report.

We request the opportunity to review final design drawings and specifications to evaluate the appropriate implementation of our recommendations. In the event that changes in the nature, design, or location of the proposed tower are planned, the conclusions and recommendations contained in this report shall not be considered valid unless we review the changes, and conclusions of the report are modified or verified by us in writing.

A geotechnical engineer should be retained to provide testing and monitoring services during the earthwork phases of the project. This is to observe compliance with our design concepts, specifications, and recommendations and to allow design changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

This report has been prepared for the exclusive use of Natcomm, LLC in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made. This report has been prepared for preliminary design purposes and may be

limited in its scope to complete an accurate bid. Contractors wishing a copy of the report may secure it with the understanding that its scope is limited to evaluation only.

We thank you for this opportunity to offer our services and look forward to working with you on this and other projects. If you have questions or require additional information, please contact us.

Sincerely,

JGI Eastern, Inc.,
A Terracon Company

Robert W. Olah, P.E.
Geotechnical Engineer

Richard W.M. McLaren, P.E.
Senior Associate/Senior Engineer

/ekc/J2085192

Attachments: Table 1 – Drilled Shaft/Rock Socket Foundation Design Criteria
Figure 1 – Exploration Location Diagram
Test Boring Logs, JB-1A and JB-1B
Probe Logs, JP-1 through JP-5

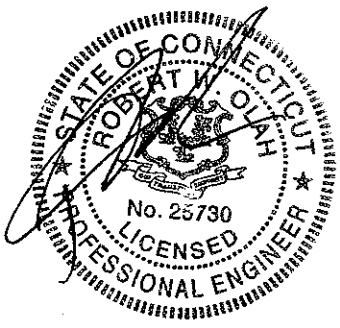


TABLE 1

Winchester PCS Communications Tower
Norfolk Road (Route 44)
Winchester, Connecticut
JGI Project No. J2085192

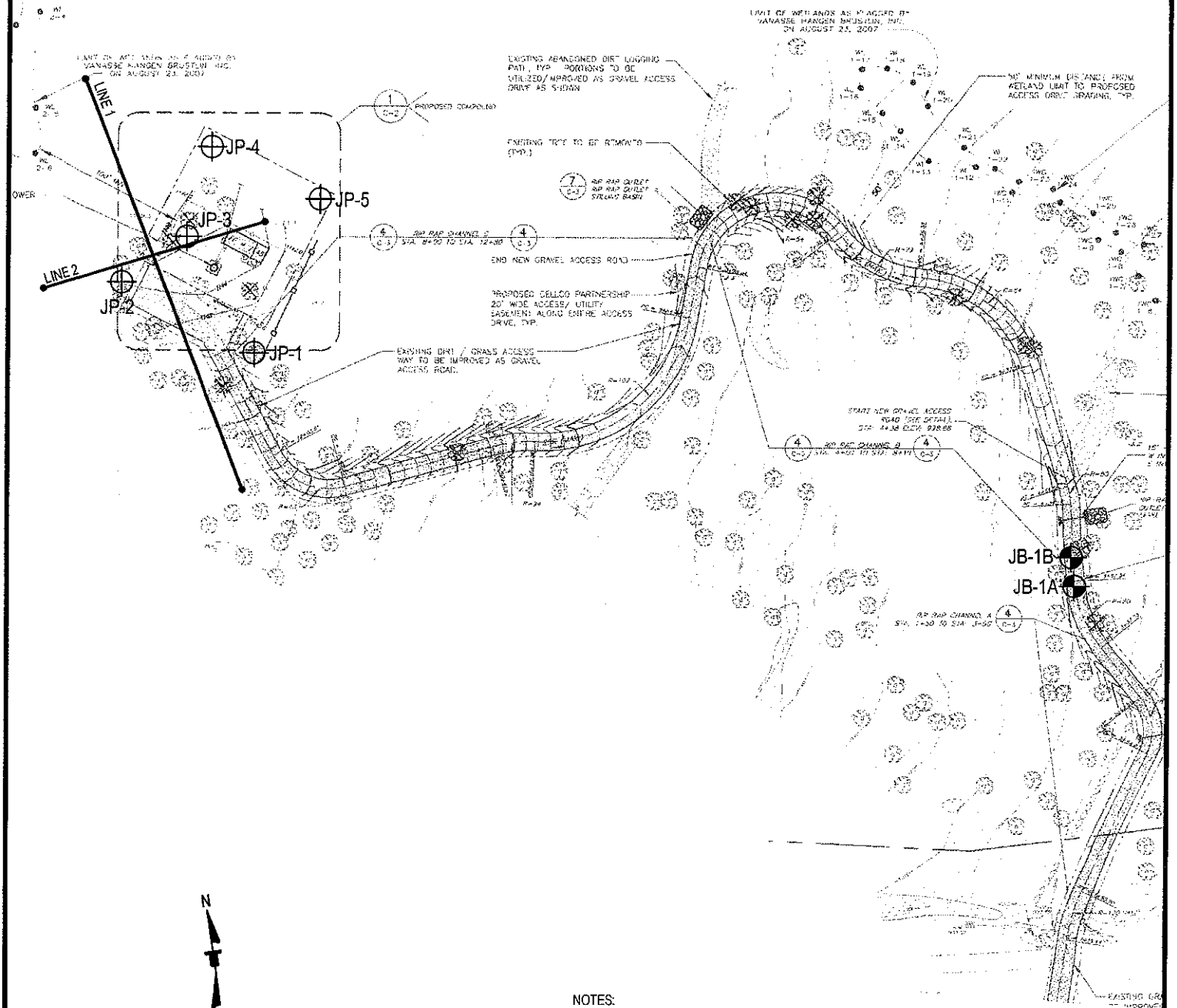
Drilled Shaft/Rock Socket Foundation Design Criteria

Design Parameter	Design Value
Net Allowable Bearing Pressure (ksf) Sound Bedrock (>6 feet)	15
Ultimate Bond (psi) Sound Bedrock (>6 feet)	200
Coefficient of Lateral Subgrade Reaction (kcf) Subsoil (0 – 2 feet) Glacial Till or Weathered Bedrock (2 – 6 feet) Sound Bedrock (>6 feet)	 20 (Z/D) 50 (Z/D) 80 (Z/D)
Angle of Internal Friction (degrees)	45
Estimated In situ Unit Weight of Bedrock (pcf)	165
Approximate Groundwater Depth on 10/31/08 (feet)	Not encountered

Notes:

Ultimate bond should be applied uniformly to shaft length within the bedrock. The contribution to shaft vertical capacity from soil or weathered bedrock above the sound bedrock should be ignored.

Z = depth below the ground surface (feet)	D = diameter of shaft (feet)
ksf = kips per square foot	psi = kips per square inch
kcf = kips per cubic foot	pcf = pounds per cubic foot
> greater than	



LEGEND

- JB-1A TEST BORING LOCATION (TYP)
- JP-1 PROBE LOCATION (TYP)
- LINE 1 RESISTIVITY TEST LOCATION (TYP)

NOTES:

1. THIS DIAGRAM WAS BASED ON NATCOMM CONSULTING ENGINEERS INC. OF BRANFORD, CONNECTICUT, PROJECT NUMBER: 07019, DRAWING NUMBER C-1, TITLED "SITE PLAN", DATED: 7/30/07.

2. THE TEST BORINGS WERE ADVANCED ON OCTOBER 27, 2008 UNDER THE DIRECTION OF TERRACON WITH EQUIPMENT OWNED AND OPERATED BY NEW ENGLAND BORING CONTRACTORS, INC. OF GLASTONBURY, CONNECTICUT.

3. THE PROBES WERE ADVANCED ON OCTOBER 31, 2008 BY A TERRACON FIELD ENGINEER USING A HAND AUGER AND A SPADE.

4. RESISTIVITY TESTING WAS PERFORMED ON OCTOBER 29, 2008 BY A JGI ENGINEER.

5. THE APPROXIMATE LOCATIONS OF THE EXPLORATIONS AND RESISTIVITY TESTS WERE TAPED FROM SITE FEATURES. THE LOCATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

6. USE OF THIS DIAGRAM IS LIMITED TO THE ILLUSTRATION OF THE APPROXIMATE LOCATIONS OF THE EXPLORATIONS, AND OTHER PERTINENT SITE FEATURES. ANY OTHER USE OF THIS DIAGRAM WITHOUT PERMISSION FROM TERRACON IS PROHIBITED.

Project Mngr:	RWO
Drawn By:	BJS
Checked By:	RWO
Approved By:	RWM
Project No.	J2085192
Scale:	1" = 100'
File No.	J2085192
Date:	OCTOBER 2008

Terracon
Consulting Engineers and Scientists
201 Hammer Mill Road Rocky Hill, Connecticut 06067
PH. (860)721-1900 FAX (860)721-1939

EXPLORATION LOCATION DIAGRAM

NATCOMM, LLC - WINCHESTER PCS
NORFOLK ROAD (ROUTE 44)
WINCHESTER, CONNECTICUT

FIG. No. 1

LOG OF BORING NO. JB-1A

CLIENT: **Natcomm, LLC**

SITE: **Norfolk Road, Winchester, CT**

PROJECT: **Winchester PCS**

Approx. Surface Elev.: 999 ft (approx.)

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: SPT - Blows per 6"	TESTS: WATER CONTENT, %	TESTS: DRY DENSITY, pcf	TESTS: UNCONFINED STRENGTH, psf	TESTS: OTHER TESTS
	0.2 FOREST MAT — 999										
	SS-1: Loose, brown SILT, some fine Sand, trace Gravel, with Roots, Cobbles, Boulders. — 997			1	SS	12	4-4 3-19				
	2 (SUBSOIL)										
	SS-2: Dense to very dense, brown, medium to fine SAND, little Gravel and Silt, occasional Cobbles and Boulders.	▽		2	SS	9	14-19 23-28				
	SS-3: Very dense, brown, coarse to fine SAND, little Gravel and Silt, occasional Cobbles and Boulders.	5		3	SS	12	26-37 50				
	9.5 (GLACIAL TILL) — 989.5										
	AUGER REFUSAL AT 9.5ft ON BEDROCK	10									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

140h SPT 4" Dia. SSA with Winch and Cable

WATER LEVEL OBSERVATIONS, ft		
WL	▽ 3.0	▼
WL	▼	▼
WL	30 Minutes after drilling.	

Terracon

BORING STARTED	10-27-08		
BORING COMPLETED	10-27-08		
RIG	Mobile B-48	FOREMAN	JL
LOGGED	DY	JOB #	J2085192

LOG OF BORING NO. JB-1B

CLIENT: **Natcomm, LLC**

SITE: **Norfolk Road, Winchester, CT**

PROJECT: **Winchester PCS**

Approx. Surface Elev.: 999 ft (approx.)

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: SPT - Blows per 6"	TESTS: WATER CONTENT, %	TESTS: DRY DENSITY, pcf	TESTS: UNCONFINED STRENGTH, psf	TESTS: OTHER TESTS
											CORE RATE (min/ft)
	See JB-1A.	5									
	11 988	10									
	C-1: Hard, gray, medium grained, slightly weathered, gray, GNEISS. RQD = 89%			1	C	35					4.5 5.5 9.5
	C-2: Similar to C-1. RQD = 77%	15		2	C	40.5					10.3 12.5 9 4.5 for 6"
	17.5 (BEDROCK) 981.5										
	BORING TERMINATED AT 17.5 ft										

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

140h SPT 4" Dia. SSA with Winch and Cable
C=CORE

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▼
WL	▼	▼
WL		

Terracon

BORING STARTED	10-27-08		
BORING COMPLETED	10-27-08		
RIG	Mobile B-48	FOREMAN	JL
LOGGED	DY	JOB #	J2085192

JGI BORING LOG J2085192 NATCOMM, INC. WINCHESTER, CT JB-1A AND JB-1B.GPJ TERRACON 20080217.GDT 11/19/08

LOG OF PROBE NO. JP-1

CLIENT **Natcomm, LLC**

SITE **Norfolk Road**
Winchester, CT

PROJECT **Winchester PCS**

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - Blows per 6"	TESTS WATER CONTENT, %	TESTS DRY DENSITY, pcf	TESTS UNCONFINED STRENGTH, psf	TESTS OTHER TESTS
	Approx. Surface Elev.: 1138 ft										
	FOREST MAT 0.3 — 1137.5										
	Dark brown, fine SAND and Silt, with Roots.										
	2 (SUBSOIL) — 1136										
	AUGER REFUSAL AT 2ft ON PROBABLE BEDROCK										

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

2" ID Hand Auger

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▼
WL	▼	▼
WL	Not Encountered	

Terracon

PROBE STARTED	10-31-08		
PROBE COMPLETED	10-31-08		
RIG	N/A	FOREMAN	N/A
LOGGED	DY	JOB #	J2085192

LOG OF PROBE NO. JP-2

CLIENT **Natcomm, LLC**

SITE **Norfolk Road, Winchester, CT**

PROJECT **Winchester PCS**

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: SPT - Blows per 6"	TESTS: WATER CONTENT, %	TESTS: DRY DENSITY, pcf	TESTS: UNCONFINED STRENGTH, psf	TESTS: OTHER TESTS
	Approx. Surface Elev.: 1144 ft										
	FOREST MAT 0.3 — 1143.5										
	Dark brown, fine SAND and Silt, trace Gravel, with Roots.										
	1 (SUBSOIL) — 1143										
	PROBE TERMINATED AT 1.0 ft ON PROBABLE BEDROCK										

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

Spade

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▼
WL	▼	▼
WL	Not Encountered	

Terracon

PROBE STARTED	10-31-08		
PROBE COMPLETED	10-31-08		
RIG	N/A	FOREMAN	N/A
LOGGED	DY	JOB #	J2085192

JGI BORING LOG J2085192 NATCOMM, INC. WINCHESTER, CT C-1 AND C-5.GPJ TERRACON 20080217.GDT 11/19/08

LOG OF PROBE NO. JP-3

CLIENT **Natcomm, LLC**

SITE **Norfolk Road**
Winchester, CT

PROJECT **Winchester PCS**

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - Blows per 6"	TESTS WATER CONTENT, %	TESTS DRY DENSITY, pcf	TESTS UNCONFINED STRENGTH, psf	TESTS OTHER TESTS
	Approx. Surface Elev.: 1146 ft										
	FOREST MAT 0.3 1145.5										
	Dark brown, fine SAND and Silt, with Roots. 0.8 (SUBSOIL) 1145										
	PROBE TERMINATED AT 0.8 ft ON PROBABLE BOULDER										

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

Spade

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▼
WL	▼	▼
WL	Not Encountered	

Terracon

PROBE STARTED	10-31-08		
PROBE COMPLETED	10-31-08		
RIG	N/A	FOREMAN	N/A
LOGGED	DY	JOB #	J2085192

LOG OF PROBE NO. JP-4

CLIENT **Natcomm, LLC**

SITE **Norfolk Road, Winchester, CT**

PROJECT **Winchester PCS**

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: RECOVERY, in.	SAMPLES: SPT - Blows per 6"	TESTS: WATER CONTENT, %	TESTS: DRY DENSITY, pcf	TESTS: UNCONFINED STRENGTH, psf	TESTS: OTHER TESTS
	Approx. Surface Elev.: 1149 ft										
	FOREST MAT 0.3 — 1148.5										
	Dark brown, fine SAND and Silt, with Roots. 0.9 — (SUBSOIL) — 1148										
	PROBE TERMINATED AT 0.9 ft ON PROBABLE BEDROCK										

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

Spade

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▼
WL	▼	▼
WL	Not Encountered	

Terracon

PROBE STARTED	10-31-08		
PROBE COMPLETED	10-31-08		
RIG	N/A	FOREMAN	N/A
LOGGED	DY	JOB #	J2085192

LOG OF PROBE NO. JP-5

CLIENT **Natcomm, LLC**

SITE **Norfolk Road, Winchester, CT**

PROJECT **Winchester PCS**

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - Blows per 6"	TESTS WATER CONTENT, %	TESTS DRY DENSITY, pcf	TESTS UNCONFINED STRENGTH, psf	TESTS OTHER TESTS
	Approx. Surface Elev.: 1140 ft										
	FOREST MAT 0.3 1139.5										
	Dark brown, fine SAND and Silt, frequent Cobbles, with Roots.										
	1.6 (SUBSOIL) 1138.5										
	PROBE TERMINATED AT 1.6 ft ON PROBABLE BEDROCK										

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

Spade

WATER LEVEL OBSERVATIONS, ft		
WL	▽	▼
WL	▼	▼
WL	Not Encountered	

Terracon

PROBE STARTED	10-31-08		
PROBE COMPLETED	10-31-08		
RIG	N/A	FOREMAN	N/A
LOGGED	DY	JOB #	J2085192

JGI BORING LOG J2085192 NATCOMM, INC. WINCHESTER, CT C-1 AND C-5.GPJ TERRACON 20080217.GDT 11/19/08

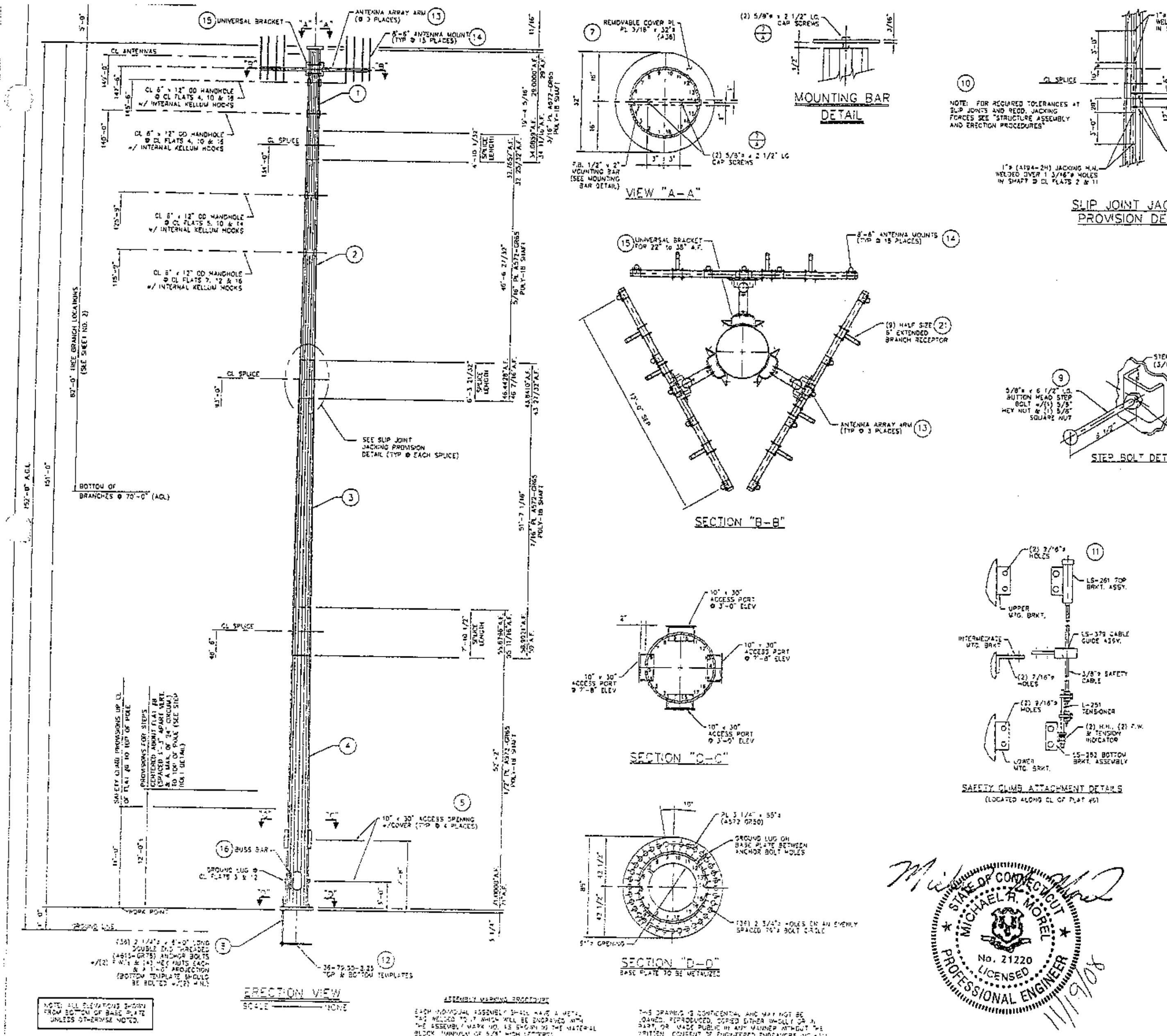
EMERSON
Network Power

ENGINEERED
ENDEAVORS
INCORPORATED
The Experienced Point of View

Natcomm, Inc.
Structure & Foundation
Design Calculations
157' 4C Engineering Services
Site: Norfolk Rd.
EEI Job # 15692-E01

ENGINEERED ENDEAVORS INCORPORATED

7610 Jenther Drive ■ Mentor, Ohio 44060
Telephone: (440) 918-1101 ■ Telefax: (440) 918-1108



MATERIAL REQ'D. PER ASSEMBLY

GALV. WT.	QTY.	ITEM	MK. NO.	DESCRIPTION
--	1	1	---	SHAFT ASSY. (TOP) 19.51' LG.
--	1	2	---	SHAFT ASSY. (UP. MID.) 46.90' LG.
--	1	3	---	SHAFT ASSY. (LOW MID.) 52.13' LG.
--	1	4	---	SHAFT ASSY. (BOTTOM) 52.77' LG.
31.39	4	5	K11497	10" x 30" ACCESS PORT COVER PL
		6		HARDWARE AS FOLLOWS:
7.25	12	5/A	K11097	6" x 12" HANDHOLE COVER PL
42.63	1	7	GS14948	REMOVABLE COVER PLATE
	2	7/A		5/8"ø x 2 1/2" LG. CAP SCREW
101.45	35	8	2.25-AB600E-4	2 1/4"ø x 6'-0" LG. (A615-GR75) ANCHOR BOLTS w/ (2) F.W.'s & (4) HEX NUTS (A194-GR2H), EACH
1.08	--	9	S10006	5/8"ø x 6 1/2" LG. BUTTON HEAD STEP BOLT w/ (1) HEX & (1) SQUARE NUT EACH
	1	10		STRUCTURE ASSEMBLY AND ERECTION PROCEDURES
	1	11	DBI-150	150'-0" SAFETY CLIMB KIT
	1	11/A	L2010	SAFETY CLIMB HARNESS
141.41	2	12	36-79.00-2.25	SETTING TEMPLATE
331.74	3	13	K10463	ANTENNA ARRAY ARM (12'-0" SEPARATION)
43.58	15	14	K12060	8'-8" LOW PROFILE ANTENNA MOUNTS
343.14	1	15	K10462	UNIVERSAL BRACKET (22" - 38")
7.50	1	16	K10062	BUSS BAR KIT
	38	17	PA-CPB-FSC-0122	FULL-SIZE CURVED PINE BRANCH (PA-CPB-FSC-SA-0271)
	17	18	PA-CPB-HSC-0121	HALF SIZE BRANCH (PA-CPB-HSC-SA-0270)
	32	19	PA-CPB-BSH-0133	PINE BUSHEL (PA-CPB-BSC-SA-0272)
--	4	20	--	BOLT ON BRANCH RECEPTOR w/ 45° ANGLE
--	9	21	--	BOLT ON BRANCH RECEPTOR FOR ARRAY w/ 45° ANGLE
0.54	192	22	BHX-G5ST-HDG-.5x6	ø1/2" x 6" TAP BOLT (GR5) w/(2) HEX NUT, (1) FLAT WASHER & (1) LOCK WASHER
	32	23	SN-SSP-HDH-250-15	1/4"-14-7/16" SELF DRILL SCREW
	1	24		PINE TREE POLE ASSEMBLY INSTRUCTIONS
--	20	25	--	42" BRANCH EXTENDER
16.45	24	26	WA13473	24" BRANCH EXTENDER
--	8	27	--	48" BRANCH EXTENDER w/BUSHELS
--	4	28	--	BOLT ON BRANCH RECEPTOR (18" EXT.) w/ 25° ANGLE
				PAINTED FINISH

TOTAL GALV. STR. & ACCES. WT. __#__
TOTAL ANCHOR BOLT & TEMPLATE WT. 3962.93#

GENERAL NOTES

1) MONOPOLE IS DESIGNED IN ACCORDANCE WITH TIA-222-G AND ASCE 7 FOR 90 MPH 3-SECOND GUST WIND SPEED.
   * STRUCTURE CLASSIFICATION - II
   * EXPOSURE CATEGORY - C
   * TOPOGRAPHIC CATEGORY - 1
2) ALL WELDS SHALL BE IN ACCORDANCE WITH AWS D.1.1. (LATEST EDITION). LONGITUDINAL SEAM WELDS WITHIN SLIP-JOINT AREA IN FEMALE SECTION SHALL BE 100% PENETRATION.
3) MONOPOLE SHALL BE HOT DIP GALVANIZED PER ASTM A123 AND THEN PAINTED (COLOR TBD). TOUCH-UP PAINT NOT SUPPLIED.
4) CONTRACTOR SHALL THOROUGHLY REVIEW EEI'S ASSEMBLY & ERECTION PROCEDURE PRIOR TO INITIATING THE ERECTION OF THE MONOPOLE.
5) THE ORIENTATION OF THE MONOPOLE SHALL BE VERIFIED PRIOR TO ERECTION OF THE POLE.
6) SECTIONS OF THE MONOPOLE SHALL BE JACKED TOGETHER WITH A MINIMUM JACKING FORCE OF 10,000 lbf APPLIED TO EACH SIDE. FOR A MAXIMUM RECOMMENDED JACKING FORCE, SPLICE LENGTH TOLERANCE, AND AIR GAP BETWEEN SECTIONS REFER TO EEI ASSEMBLY & ERECTION PROCEDURE.
7) FOR PROPER SHAFT ALIGNMENT A 2" HORIZONTAL WELD BEAD AND A MARK ARE POSITIONED ON EACH SHAFT AT EACH SPLICE. THE 2" HORIZONTAL WELD BEADS ARE ON THE MATCHING CORNERS. THE MARK NUMBER IS ON THE ADJACENT FLAT. THE CORNERS WITH WELD BEADS SHALL BE ALIGNED FROM TOP TO BOTTOM OF THE POLE. MARK NUMBERS SHALL BE MATCHED FOR EACH SIDE & THE DISTANCE BETWEEN TWO WELD BEADS SHOULD BE 18" (±4").
8) FIELD ASSEMBLY NUTS (1"ø) FOR JACKING SECTIONS TOGETHER ARE LOCATED ON OPPOSING SECTION FLATS ABOVE AND BELOW SPLICES.
9) GAP BETWEEN 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 UNDERNEATH THE BASE PLATE TO ENSURE THAT MOISTURE DOES NOT COLLECT INSIDE THE MONOPOLE.
10) ALL BOLTED CONNECTIONS WITH A325 HIGH-STRENGTH BOLTS SHALL BE ASSEMBLED IN ACCORDANCE WITH SPECIFICATIONS FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS. BOLTS SHALL BE BROUGHT TO SNUG-TIGHT CONDITIONS AS RECOMMENDED BY THE FLANGE SPECIFICATIONS IN FLANGE-TYPE JOINTS AND SHOULD BE SHIMMED IF NECESSARY. THE SHIMS WILL BE SUPPLIED BY EEI.
11) ANCHOR BOLTS SHALL BE TIGHTENED AFTER THE STRUCTURE IS PLUMB. BOTH TOP & BOTTOM NUT SHALL BE TIGHTEN TO 600 ft-lbs MOMENT. FOR DETAIL ANCHOR BOLT INSTALLATION REFER TO EEI ASSEMBLY AND ERECTION PROCEDURE.
12) POLE TAPER = 0.3325in/ft.

EEI WILL NOT HONOR ANY BACKCHARGES WHICH HAVE NOT RECEIVED PRIOR WRITTEN AUTHORIZATION phone (440) 918-1101

STATE OF CONNECTICUT
MICHAEL R. MOREL
No. 21220
LICENSED
PROFESSIONAL ENGINEER
11/19/08

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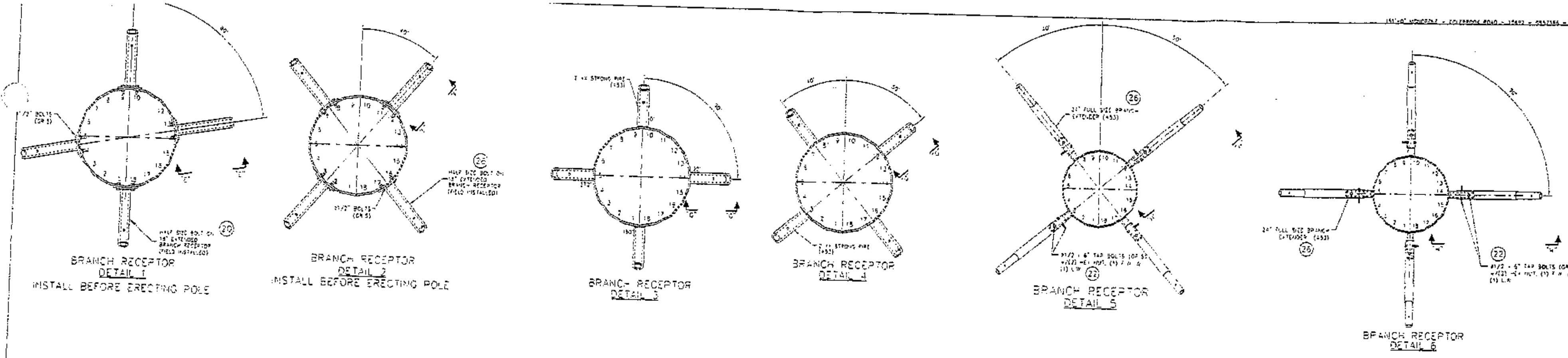
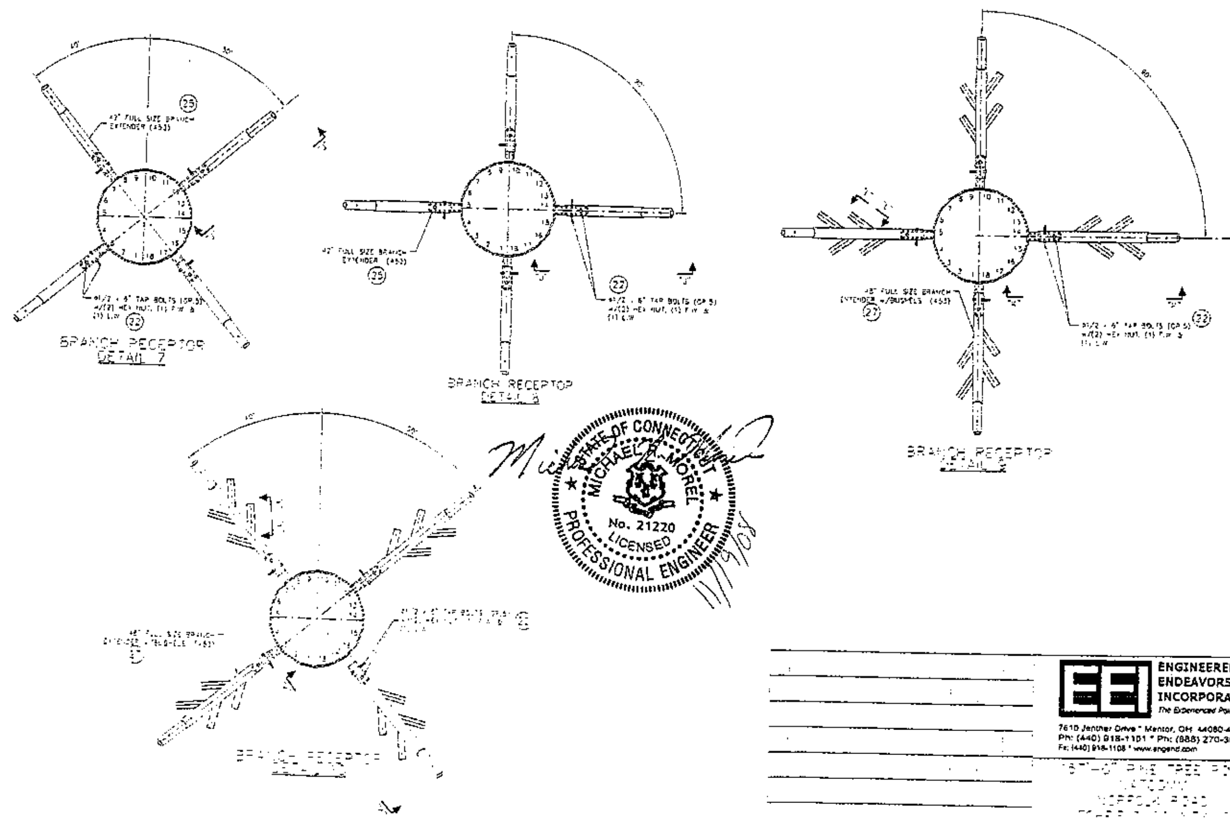
157'-0" PINE TREE POLE
NATCOMM
NORFOLK ROAD
LITCHFIELD COUNTY, CT

0	COMPLETED APPROVAL DWG		
SCALE: NONE	PROJECT NO. 15692	SHEET 1 OF 2	DRAWING NO. GS57385





BRANCH RECEPTOR LAYOUT

BRANCH ELEV	DIST FROM TOP	BRANCH ANGLE	BRANCH ORIENTATION	QUANTITY AT THIS ELEVATION	BRANCH PART#	DETAIL #
150'-3"	0'-9"	45°	0, 90, 180, 280	4	PA-CPB-HSC-0131	DETAIL 1
149'-3"	1'-9"	28°	40, 140, 220, 320	4	PA-CPB-HSC-0131	DETAIL 2
147'-6"	3'-6"	45°	ON ARRAY	9	PA-CPB-HSC-0131	SECTION B-B
141'-6"	9'-6"	30°	0, 90, 180, 270	4	PA-CPB-FSC-0132	DETAIL 3
139'-3"	11'-9"	25°	50, 140, 230, 320	4	PA-CPB-FSC-0132	DETAIL 4
135'-9"	15'-3"	24°	0, 90, 180, 270	4	PA-CPB-FSC-0132	DETAIL 3
132'-3"	18'-9"	22°	50, 140, 230, 320	4	PA-CPB-FSC-0132	DETAIL 4
128'-9"	22'-3"	20°	0, 90, 180, 270	4	PA-CPB-FSC-0132	DETAIL 3
125'-3"	25'-9"	18°	50, 140, 230, 320	4	PA-CPB-FSC-0132	DETAIL 4
121'-9"	29'-3"	15°	0, 90, 180, 270	4	PA-CPB-FSC-0132	DETAIL 3
118'-9"	32'-3"	12°	50, 140, 230, 320	4	PA-CPB-FSC-0132	DETAIL 4
115'-3"	35'-9"	9°	0, 90, 180, 270	4	PA-CPB-FSC-0132	DETAIL 3
111'-9"	39'-3"	24°	50, 140, 230, 320	4	PA-CPB-FSC-0132	DETAIL 5
108'-3"	42'-9"	22°	0, 90, 180, 270	4	PA-CPB-FSC-0132	DETAIL 5
104'-9"	46'-3"	20°	50, 140, 230, 320	4	PA-CPB-FSC-0132	DETAIL 5
101'-3"	49'-9"	18°	0, 90, 180, 270	4	PA-CPB-FSC-0132	DETAIL 5
[illegible]	53'-3"	[illegible]	50, 140, 230, 320	4	PA-CPB-FSC-0132	DETAIL 5
94'-3"	56'-9"	12°	0, 90, 180, 270	4	PA-CPB-FSC-0132	DETAIL 5
90'-9"	60'-3"	[illegible]	50, 140, 230, 320	4	PA-CPB-FSC-0132	DETAIL 6
87'-3"	63'-9"	22°	0, 90, 180, 270	4	PA-CPB-FSC-0132	DETAIL 7
83'-9"	67'-3"	20°	50, 140, 230, 320	4	PA-CPB-FSC-0132	DETAIL 8
80'-3"	[illegible]	18°	0, 90, 180, 270	4	PA-CPB-FSC-0132	DETAIL 7
[illegible]	[illegible]	[illegible]	50, 140, 230, 320	4	PA-CPB-FSC-0132	DETAIL 8
[illegible]	[illegible]	[illegible]	0, 90, 180, 270	4	PA-CPB-FSC-0132	DETAIL 7
[illegible]	[illegible]	--	0, 90, 180, 270	[illegible]	[illegible]	DETAIL 8
[illegible]	[illegible]	[illegible]	50, 140, 230, 320	[illegible]	[illegible]	DETAIL 9
[illegible]	[illegible]	--	50, 140, 230, 320	[illegible]	[illegible]	DETAIL 10

[illegible] = HALF SIZE BRANCH
[illegible] = FULL SIZE BRANCH
[illegible] = BUSHELS

STATE OF CONNECTICUT
MICHAEL R. MOREL
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LICENSED
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11/19/08

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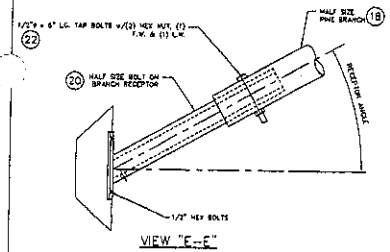
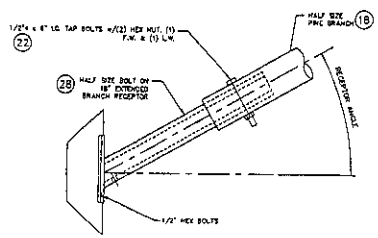
[illegible] PINE TREE POLE
NORFOLK ROAD

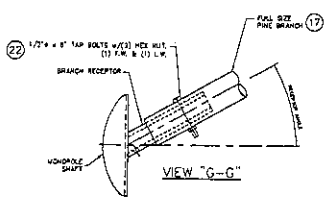
... ANY BACKCHARGES WHICH HAVE NOT RECEIVED PRIOR WRITTEN AUTHORIZATION phone (440) 918-1101



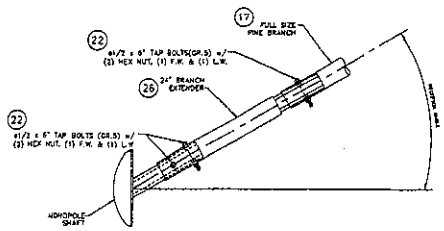
VIEW "E-E"
INSTALL BRANCH RECEPTOR
BEFORE ERECTING POLE



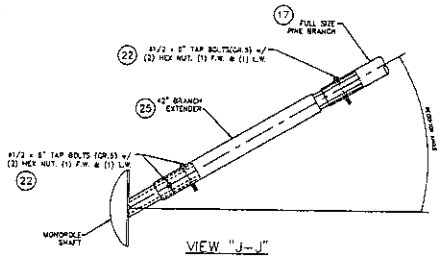
VIEW "F-F"
INSTALL BRANCH RECEPTOR
BEFORE ERECTING POLE



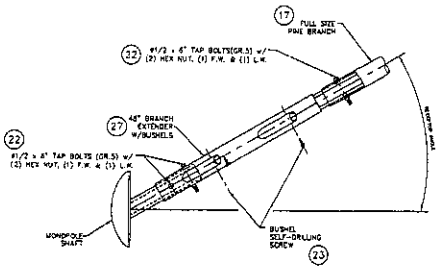
VIEW "G-G"



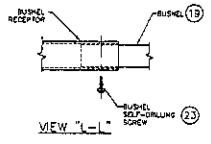
VIEW "H-H"



VIEW "J-J"



VIEW "K-K"



VIEW "L-L"

NOTE:
1). REVIEW THE ASSEMBLY INSTRUCTIONS PRIOR TO OFFLOADING AND INSTALLATION OF PINE TREE POLE.

2. INSTALL PINE LIMBS TO CURVE UPWARD.

STATE OF CONNECTICUT
MICHAEL A. MOREL
No. 21220
LICENSED
PROFESSIONAL ENGINEER
11/19/08

REV	DESCRIPTION	DATE	BY	APP
0	COMPLETED APPROVAL DWG	11/19/08	JAM	

ENGINEERED ENDEAVORS INCORPORATED
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Fx: (440) 918-1108 * www.engend.com

157'-0" PINE TREE POLE
NATCOMM
NORFOLK ROAD
LITCHFIELD COUNTY, CT

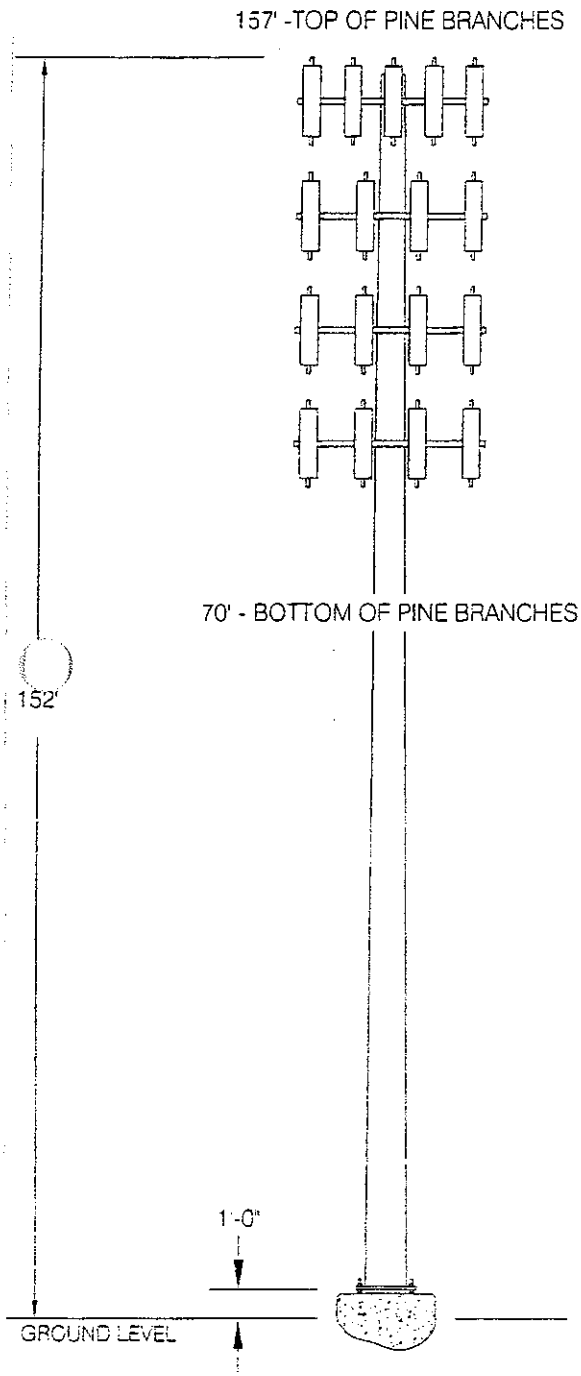
SCALE: NONE	PROJECT NO. 15692
SHEET 3 OF 3	DRAWING NO. GS57386

SITE INFORMATION

Location: LITCHFIELD COUNTY, CT
Site Name: NORFOLK ROAD
Site Number: N/A

DESIGN INFORMATION

Designed By: R. BELKIN
Design Date: 11/19/2008
Status: RELEASE



ANTENNA LOADING

(6) LPA-185080/12CF , (6) LPA-80080/6CF, AND (3) LTE (72"x8"x12") PANEL ANTENNAS MOUNTED ON (3) 12' T-ARMS AT 150'℄ (CURRENT)

(6) LPA-185080/12CF AND (6) LPA-80080/6CF PANEL ANTENNAS MOUNTED ON (3) 12' T-ARMS AT 140' ℄ (FUTURE)

(6) LPA-185080/12CF AND (6) LPA-80080/6CF PANEL ANTENNAS MOUNTED ON (3) 12' T-ARMS AT 130' ℄ (FUTURE)

(6) LPA-185080/12CF AND (6) LPA-80080/6CF PANEL ANTENNAS MOUNTED ON (3) 12' T-ARMS AT 120' ℄ (FUTURE)

NOTES

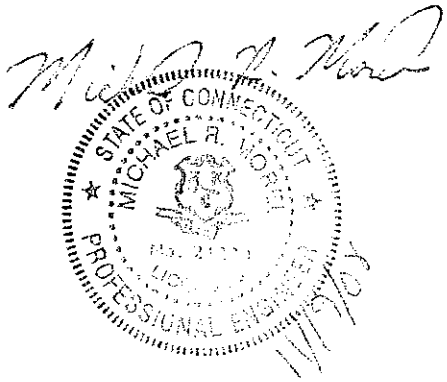
SYNTHETIC PINE BRANCHES NOT SHOWN FOR CLARITY

POLE TRUNK WILL BE FULLY PAINTED

DESIGN CRITERIA

DESIGNED IN ACCORDANCE WITH THE TIA 222-G AND ASCE 7 FOR 100 MPH 3-SECOND GUST WIND SPEED

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



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Phone: (440) 918-1101 • Phone: (888) 270-3855
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COMMUNICATIONS STRUCTURE WIND LOADING DETERMINATION
Per the ANSI/TIA 222-G-2005

ENGINEERED ENDEAVORS INCORPORATED
The Experienced Point of View

7610 Jenther Drive
Mentor, Ohio 44060
Tel (440) 918-1101 * Fax (440) 918-1108

EMERSON. Network Power

CUSTOMER: NATCOMM
SITE LOCATION: LITCHFIELD COUNTY, CT
SITE NAME: NORFOLK ROAD
SITE NUMBER: N/A

CURRENT DATE: 11/19/08
STRUCTURE: 157' PINE TREE POLE
JOB NUMBER: 15692
STATUS: RELEASE

Load Combinations

6 $1.0D + 1.0W_s$ — SERVICE DEAD LOAD FACTOR = 1.0; SERVICE WIND LOAD FACTOR = 1.0

1 $1.2D + 1.6W_s$ — WIND DEAD LOAD FACTOR = 1.2; WIND w/o ICE FACTOR = 1.6

3 $1.2D + 1.0D_i + 1.0W_i$ — WIND DEAD LOAD w/ICE FACTOR = 1.2; WIND w/ ICE FACTOR = 1.0; DEAD LOAD FACTOR FOR ICE = 1.0

MAXIMUM DEFLECTION (in) = 90.6
MAXIMUM ROTATION @ TOP (°) = 4.00

WEIGHT OF ICE (pcf) = 56
TEMPERATURE FACTOR = N/A to non-guy structures

General Information

STRUCTURE HEIGHT (ft) = 151.00
NUMBER OF MONOPOLE SIDES = 18
DESIGN WIND SPEED (mph) = 100
WIND SPEED w/ ICE (mph) = 40
RADIAL ICE (in) = 1.00
OPERATIONAL WIND SPEED (mph) = 60

DIRECTIONALITY DESIGN, Kd = 0.95
DIRECTIONALITY SERVICE, Kd = 0.85

DESIGN GUST RESPONSE FACTOR, Gh = 1.10
SERVICE GUST RESPONSE FACTOR, Gh = 1.10
FORCE COEFFICIENT w/o ICE, Cf = 0.65
FORCE COEFFICIENT w/ ICE, Cf = 1.20
ACROSS POINTS FACTOR = 1.015

STRUCTURE CLASSIFICATION	II	(Importance Factor)
	DESIGN	SERVICE (Section 2.8.3)
Wind Load w/o Ice	1.00	1.00
Wind Load w/ Ice	1.00	
Ice Thickness	1.00	
Earthquake	1.00	

EXPOSURE CATEGORY - C
Zg = 900
α = 9.5
Ke = 1.0
Kzmin = 0.85
TOPOGRAPHIC CATEGORY- 1
Kt = N/A
f = N/A

COMMUNICATIONS STRUCTURE WIND LOADING DEVELOPMENT
Per the ANSI/TIA 222-G-2005

ENGINEERED ENDEAVORS INCORPORATED
The Experienced Point of View

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CUSTOMER: NATCOMM
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SITE NUMBER: N/A
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Antenna Loading

	DESCRIPTION	QTY	HEIGHT (ft)	Kz	CASE 1 EPA (ft^2)	CASE 1 WEIGHT (lbs)	CASE 2 EPA (ft^2)	CASE 2 WEIGHT (lbs)	CASE 3 EPA_i (ft^2)	CASE 3 $WEIGHT_i$ (lbs)
1	LPA-185080/12CF	6	149	1.376	3.76	10.50	3.76	10.50	6.53	181.05
2	LPA-80080/6CF	6	149	1.376	5.64	21.00	5.64	21.00	8.91	318.16
3	(3) 12 ft UNIVERSAL T-AR	1	149	1.376	27.00	1134.00	27.00	1134.00		
4	LPA-185080/12CF	6	139	1.356	3.76	10.50	3.76	10.50	6.51	179.52
5	LPA-80080/6CF	6	139	1.356	5.64	21.00	5.64	21.00	8.89	315.69
6	(3) 12 ft UNIVERSAL T-AR	1	139	1.356	27.00	1134.00	27.00	1134.00		
7	LPA-185080/12CF	6	129	1.335	3.76	10.50	3.76	10.50	6.49	177.88
8	LPA-80080/6CF	6	129	1.335	5.64	21.00	5.64	21.00	8.87	313.06
9	(3) 12 ft UNIVERSAL T-AR	1	129	1.335	27.00	1134.00	27.00	1134.00		
10	LPA-185080/12CF	6	119	1.313	3.76	10.50	3.76	10.50	6.47	176.13
11	LPA-80080/6CF	6	119	1.313	5.64	21.00	5.64	21.00	8.84	310.25
12	(3) 12 ft UNIVERSAL T-AR	1	119	1.313	27.00	1134.00	27.00	1134.00		
13	(4) PINE BRANCH @30 D	1	156	1.390	46.80	600.00	46.80	600.00	65.00	800.00
14	(4) PINE BRANCH @30 D	1	151	1.380	46.80	600.00	46.80	600.00	65.00	800.00
15	(4) PINE BRANCH @30 D	1	146	1.371	46.80	600.00	46.80	600.00	65.00	800.00
16	(4) PINE BRANCH @30 D	1	141	1.361	46.80	600.00	46.80	600.00	65.00	800.00
17	(4) PINE BRANCH @30 D	1	136	1.350	46.80	600.00	46.80	600.00	65.00	800.00
18	(4) PINE BRANCH @30 D	1	131	1.340	46.80	600.00	46.80	600.00	65.00	800.00
19	(4) PINE BRANCH @30 D	1	126	1.329	46.80	600.00	46.80	600.00	65.00	800.00
20	(4) PINE BRANCH @30 D	1	121	1.317	46.80	600.00	46.80	600.00	65.00	800.00
21	(4) PINE BRANCH @30 D	1	116	1.306	46.80	600.00	46.80	600.00	65.00	800.00
22	(4) PINE BRANCH @30 D	1	111	1.294	46.80	600.00	46.80	600.00	65.00	800.00
23	(4) PINE BRANCH @30 D	1	96	1.255	46.80	600.00	46.80	600.00	65.00	800.00
24	(4) PINE BRANCH @30 D	1	91	1.241	46.80	600.00	46.80	600.00	65.00	800.00
25	(4) PINE BRANCH @30 D	1	86	1.226	46.80	600.00	46.80	600.00	65.00	800.00
26	(4) PINE BRANCH @30 D	1	81	1.211	46.80	600.00	46.80	600.00	65.00	800.00
27	(4) PINE BRANCH @30 D	1	76	1.195	46.80	600.00	46.80	600.00	65.00	800.00
28	(4) PINE BRANCH @30 D	1	71	1.178	46.80	600.00	46.80	600.00	65.00	800.00
29	LTE ANTENNAS	3	149	1.376	6.04	50.00	6.04	50.00	9.11	353.92
30										

COMMUNICATIONS STRUCTURE WIND LOADING DEVELOPMENT
Per the ANSI/TIA 222-G-2005

ENGINEERED ENDEAVORS INCORPORATED
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EMERSON. Network Power

CUSTOMER: NATCOMM
SITE LOCATION: LITCHFIELD COUNTY, CT
SITE NAME: NORFOLK ROAD
SITE NUMBER: N/A

CURRENT DATE: 11/19/08
STRUCTURE: 157' PINE TREE POLE
JOB NUMBER: 15692
STATUS: RELEASE

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 + 1.0Wo

Antenna Loads

	HEIGHT (ft)	APPURTENANCE FORCES GRAVITY (kips)	APPURTENANCE FORCES WIND (kips)	GRAVITY (kips)	WIND (kips)	
1	149	0.063	0.267	0.063	0.267	
2	149	0.126	0.402	0.126	0.402	
3	149	1.134	0.320	1.134	0.320	
4	139	0.063	0.263	0.063	0.263	
5	139	0.126	0.396	1.000	1.000	
6	139	1.134	0.316	1.134	0.316	
7	129	0.063	0.259	0.063	0.259	
8	129	0.126	0.390	0.126	0.390	
9	129	1.134	0.311	1.134	0.311	
10	119	0.063	0.255	0.063	0.255	0.255
11	119	0.126	0.383	0.126	0.383	0.383
12	119	1.134	0.305	1.134	0.305	0.305
13	156	0.600	0.560	0.600	0.560	0.560
14	151	0.600	0.557	0.600	0.557	0.557
15	146	0.600	0.553	0.600	0.553	0.553
16	141	0.600	0.549	0.600	0.549	0.549
17	136	0.600	0.545	0.600	0.545	0.545
18	131	0.600	0.540	0.600	0.540	0.540
19	126	0.600	0.536	0.600	0.536	0.536
20	121	0.600	0.531	0.600	0.531	0.531
21	116	0.600	0.527	0.600	0.527	0.527
22	111	0.600	0.522	0.600	0.522	0.522
23	96	0.600	0.506	0.600	0.506	0.506
24	91	0.600	0.500	0.600	0.500	0.500
25	86	0.600	0.494	0.600	0.494	0.494
26	81	0.600	0.488	0.600	0.488	0.488
27	76	0.600	0.482	0.600	0.482	0.482
28	71	0.600	0.475	0.600	0.475	0.475
29	149	0.150	0.215	0.150	0.215	0.215
30						

Monopole Pressures

	HEIGHT (ft)	EXPOSURE COEFFICIENT Kz	WIND PRESSURE ON POLE (psf)	WIND PRESSURE ON POLE (psf)	
1	5.39	0.850	4.83	4.83	
2	16.18	0.863	4.91	4.91	
3	26.96	0.960	5.46	5.46	
4	37.75	1.031	5.86	5.86	
5	48.54	1.087	6.18	6.18	
6	59.32	1.134	6.45	6.45	
7	70.11	1.174	6.68	6.68	
8	80.89	1.210	6.88	6.88	
9	91.68	1.243	7.07	7.07	
10	102.46	1.272	7.24	7.24	
11	113.25	1.299	7.39	7.39	
12	124.04	1.324	7.53	7.53	
13	134.82	1.348	7.67	7.67	
14	145.61	1.370	7.79	7.79	3p/3P
15	151.00	1.380	7.85	7.85	

Per the ANSI/TIA 222-G-2005

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SITE LOCATION: LITCHFIELD COUNTY, CT
SITE NAME: NORFOLK ROAD
SITE NUMBER: N/A

CURRENT DATE: 11/19/08
STRUCTURE: 157' PINE TREE POLE
JOB NUMBER: 15692
STATUS: RELEASE

Loading Case 2 - Design

WIND VELOCITY (mph) = 100.00

Load Combination

1.2D + 1.6Wo

Antenna Loads

	HEIGHT (ft)	APPURTENANCE FORCES GRAVITY (kips)	APPURTENANCE FORCES WIND (kips)	GRAVITY (kips)	WIND (kips)
1	149	0.063	0.830	0.076	1.328
2	149	0.126	1.247	0.151	1.995
3	149	1.134	0.994	1.361	1.591
4	139	0.063	0.818	0.076	1.308
5	139	0.126	1.229	1.000	1.000
6	139	1.134	0.980	1.361	1.568
7	129	0.063	0.805	0.076	1.288
8	129	0.126	1.210	0.151	1.935
9	129	1.134	0.965	1.361	1.543
10	119	0.063	0.791	0.076	1.266
11	119	0.126	1.189	0.151	1.903
12	119	1.134	0.948	1.361	1.517
13	156	0.600	1.740	0.720	2.784
14	151	0.600	1.728	0.720	2.765
15	146	0.600	1.716	0.720	2.746
16	141	0.600	1.703	0.720	2.725
17	136	0.600	1.691	0.720	2.705
18	131	0.600	1.677	0.720	2.684
19	126	0.600	1.664	0.720	2.662
20	121	0.600	1.649	0.720	2.639
21	116	0.600	1.635	0.720	2.616
22	111	0.600	1.620	0.720	2.592
23	96	0.600	1.571	0.720	2.514
24	91	0.600	1.553	0.720	2.485
25	86	0.600	1.535	0.720	2.456
26	81	0.600	1.516	0.720	2.425
27	76	0.600	1.496	0.720	2.393
28	71	0.600	1.474	0.720	2.359
29	149	0.150	0.667	0.180	1.067
30					

Monopole Pressures

	HEIGHT (ft)	EXPOSURE COEFFICIENT Kz	WIND PRESSURE ON POLE (psf)	WIND PRESSURE ON POLE (psf)
1	5.39	0.850	24.01	24.01
2	16.18	0.863	24.37	24.37
3	26.96	0.960	27.13	27.13
4	37.75	1.031	29.13	29.13
5	48.54	1.087	30.71	30.71
6	59.32	1.134	32.03	32.03
7	70.11	1.174	33.18	33.18
8	80.89	1.210	34.19	34.19
9	91.68	1.243	35.11	35.11
10	102.46	1.272	35.94	35.94
11	113.25	1.299	36.70	36.70
12	124.04	1.324	37.41	37.41
13	134.82	1.348	38.08	38.08
14	145.61	1.370	38.70	38.70
15	151.00	1.380	39.00	39.00

Engineered Endeavors Inc.

7810 Jenther Drive
Mentor, Ohio 44060
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Communications Structure Nonlinear Analysis and Design Program

11/19/2008 11:28:24 AM
Revision 2.0 08/15/07
Engineer R.BELKIN

Customer	NATCOMM
Job Name	15692
Structure	157' PINE TREE POLE
Location	LITCHFIELD COUNTY, CT
Site	NORFOLK ROAD
Site Number	0
Data File	C:\DES\CELLPOLE\CEL\15692-151.Cel

OD BOT	OD TOP	NUM SIDES	THICK INCH	TAPER IN/FT	LENGTH FT	JOINT INCH	JOINT TYPE	YIELD KSI	WEIGHT LBS	JOINT HEIGHT
34.70	29.00	18	.1875	.293	19.46	59.00	SLIP	65.00	1232.	134.00
46.42	32.76	18	.3125	.293	46.62	76.00	SLIP	65.00	6106.	93.00
58.95	43.82	18	.4375	.293	51.63	95.00	SLIP	65.00	12276.	48.50
71.00	55.63	18	.5000	.293	52.46	.00	BASEPL	65.00	17577.	.00
			TOTAL TUBE WEIGHT			37192.		POUNDS		
			POLE SHAFT LENGTH			151.00		FEET		

AISC constants are used for stress reductions.
Tube sections hsve 18 sides
Internal bend radius = 4. X T
Tube diameters are measured flat to flat.
AISC Tube Shape Coefficient of 1. is applied.

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
151.00	29.00	.1875	64.16	926.	585.	490.	1169.		
149.00	29.59	.1875	63.59	936.	603.	496.	1206.		
146.00	30.47	.1875	62.72	951.	631.	503.	1262.		
141.00	31.93	.1875	61.28	974.	678.	516.	1356.		
139.00	32.52	.1875	60.70	983.	697.	520.	1393.		
136.00	33.40	.1875	59.83	995.	725.	527.	1449.		
134.00	33.48	.3125	65.00	1799.	1304.	952.	2608.		
134.00	33.98	.1875	59.26	1003.	743.	531.	1487.		
131.00	34.36	.3125	65.00	1847.	1375.	978.	2749.		
129.00	34.95	.3125	65.00	1879.	1423.	995.	2845.		
126.00	35.83	.3125	65.00	1926.	1496.	1020.	2992.		
121.00	37.29	.3125	65.00	2006.	1623.	1062.	3245.		
119.00	37.88	.3125	65.00	2038.	1675.	1079.	3349.		
116.00	38.76	.3125	65.00	2085.	1754.	1104.	3508.		
111.00	40.22	.3125	65.00	2165.	1891.	1146.	3782.		
106.50	41.54	.3125	65.00	2236.	2019.	1184.	4037.		
102.00	42.86	.3125	65.00	2308.	2150.	1222.	4301.		
96.00	44.62	.3125	65.00	2403.	2332.	1272.	4665.		
93.00	44.75	.4375	65.00	3365.	3257.	1781.	6514.		
93.00	45.50	.3125	65.00	2451.	2426.	1298.	4852.		
91.00	45.33	.4375	65.00	3409.	3344.	1805.	6688.		
86.00	46.80	.4375	65.00	3521.	3567.	1864.	7134.		
81.00	48.26	.4375	65.00	3632.	3797.	1923.	7594.		
76.00	49.73	.4375	65.00	3743.	4034.	1982.	8069.		
71.00	51.19	.4375	65.00	3854.	4279.	2041.	8558.		
65.75	52.73	.4375	65.00	3971.	4543.	2102.	9087.		
60.50	54.27	.4375	65.00	4088.	4816.	2164.	9631.		
54.50	56.03	.4375	65.00	4222.	5137.	2235.	10273.		
48.50	56.79	.5000	65.00	4885.	6012.	2586.	12025.		
48.50	57.79	.4375	65.00	4355.	5468.	2306.	10936.		
45.25	57.74	.5000	65.00	4968.	6218.	2630.	12437.		
42.00	58.69	.5000	65.00	5050.	6428.	2674.	12856.		
36.00	60.45	.5000	65.00	5203.	6824.	2754.	13648.		
30.00	62.21	.5000	65.00	5355.	7232.	2835.	14464.		
24.00	63.97	.5000	65.00	5508.	7652.	2916.	15303.		
18.00	65.73	.5000	65.00	5661.	8083.	2997.	16166.		
12.00	67.48	.5000	65.00	5813.	8526.	3078.	17053.		
6.00	69.24	.5000	65.00	5966.	8982.	3158.	17963.		
.00	71.00	.5000	65.00	6118.	9449.	3239.	18897.		

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 7.9 PSF
MAX BASE ROTATION 0.0 DEG

LOAD CASE 1 Loading Case 1 - Serviceability
1.00 DEAD LOAD + 1.00 WIND - 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
151.00	29.00	.1875	64.16	.006	1.26	3.	1.19	.0	19.90	1.16
149.00	29.59	.1875	63.59	.012	2.88	5.	2.43	.0	19.41	1.16
146.00	30.47	.1875	62.72	.024	3.73	12.	3.10	.0	18.68	1.16
141.00	31.93	.1875	61.28	.046	4.55	28.	3.79	.0	17.48	1.14
139.00	32.52	.1875	60.70	.057	6.03	35.	4.78	.0	17.00	1.14
136.00	33.40	.1875	59.83	.076	6.80	50.	5.40	.0	16.29	1.12
134.00	33.48	.3125	65.00	.051	7.57	61.	5.45	.0	15.82	1.11
134.00	33.98	.1875	59.26	.088	6.80	61.	5.40	.0	15.82	1.11
131.00	34.36	.3125	65.00	.061	8.46	77.	6.12	.0	15.12	1.10
129.00	34.95	.3125	65.00	.068	10.08	89.	7.14	.0	14.67	1.09
126.00	35.83	.3125	65.00	.080	11.16	111.	7.77	.0	13.99	1.07
121.00	37.29	.3125	65.00	.098	12.19	149.	8.40	.0	12.88	1.04
119.00	37.88	.3125	65.00	.106	13.83	166.	9.42	.0	12.44	1.03
116.00	38.76	.3125	65.00	.118	14.95	194.	10.06	.0	11.80	1.01
111.00	40.22	.3125	65.00	.137	16.19	245.	10.71	.0	10.77	.97
106.50	41.54	.3125	65.00	.153	16.81	293.	10.81	.0	9.88	.93
102.00	42.86	.3125	65.00	.167	17.56	342.	10.95	.0	9.02	.88
96.00	44.62	.3125	65.00	.183	18.82	407.	11.58	.0	7.96	.82
93.00	44.75	.4375	65.00	.142	20.56	442.	11.64	.0	7.45	.79
93.00	45.50	.3125	65.00	.190	18.82	442.	11.58	.0	7.45	.79
91.00	45.33	.4375	65.00	.146	21.90	465.	12.27	.0	7.12	.77
86.00	46.80	.4375	65.00	.154	23.60	527.	12.90	.0	6.34	.73
81.00	48.26	.4375	65.00	.163	25.32	591.	13.53	.0	5.60	.68
76.00	49.73	.4375	65.00	.171	27.08	659.	14.15	.0	4.91	.64
71.00	51.19	.4375	65.00	.178	28.91	730.	14.78	.0	4.26	.60
65.75	52.73	.4375	65.00	.185	30.20	807.	14.92	.0	3.63	.55
60.50	54.27	.4375	65.00	.192	31.63	886.	15.07	.0	3.05	.50
54.50	56.03	.4375	65.00	.198	33.20	976.	15.23	.0	2.46	.44
48.50	56.79	.5000	65.00	.185	36.89	1067.	15.36	.0	1.94	.39
48.50	57.79	.4375	65.00	.203	33.20	1067.	15.23	.0	1.94	.39
45.25	57.74	.5000	65.00	.187	37.89	1117.	15.47	.0	1.68	.36
42.00	58.69	.5000	65.00	.189	39.35	1168.	15.58	.0	1.44	.33
36.00	60.45	.5000	65.00	.193	41.28	1261.	15.74	.0	1.05	.28
30.00	62.21	.5000	65.00	.196	43.27	1355.	15.89	.0	.73	.23
24.00	63.97	.5000	65.00	.198	45.32	1451.	16.05	.0	.46	.19
18.00	65.73	.5000	65.00	.200	47.42	1547.	16.18	.0	.26	.14
12.00	67.48	.5000	65.00	.201	49.58	1644.	16.31	.0	.11	.09
6.00	69.24	.5000	65.00	.203	51.80	1742.	16.44	.0	.03	.05

LOAD CASE 1 Loading Case 1 - Serviceability
1.00 DEAD LOAD + 1.00 WIND - 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
00	71.00	.5000	65.00	.203	52.92	1841.	16.52	.0	.00	.00

Max Deflection Percentage 1.1% Max Tilt 1.16 Degrees

REACTION COMPONENTS (KIPS AND FT-KIPS)

TRANSVERSE SHEAR	VERTICAL FORCE	WIND SHEAR	MOMENT ABOUT TRANSVERSE	MOMENT ABOUT VERTICAL	MOMENT ABOUT WIND AXIS
.000	-52.921	16.504	1840.700	.000	.000

LOAD CASE 2

Loading Case 2 - Design
DEAD LOAD FACTOR 1.00 RADIAL ICE .00 IN.

WIND VELOCITY 100. MPH BOTTOM 24. PSF TOP 39. PSF
MAX BASE ROTATION 0.0 DEG

LOAD CASE 2 Loading Case 2 - Design
1.20 DEAD LOAD + 1.60 WIND - 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
151.00	29.00	.1875	64.16	.025	.94	14.	5.74	.0	97.97	5.75
149.00	29.59	.1875	63.59	.045	2.22	25.	12.13	.0	95.59	5.74
146.00	30.47	.1875	62.72	.102	2.88	62.	15.37	.0	92.03	5.72
141.00	31.93	.1875	61.28	.209	3.51	138.	18.52	.0	86.12	5.66
139.00	32.52	.1875	60.70	.258	4.79	175.	23.84	.0	83.78	5.62
136.00	33.40	.1875	59.83	.347	5.41	246.	26.99	.0	80.30	5.56
134.00	33.48	.3125	65.00	.234	6.16	299.	27.35	.0	78.00	5.50
134.00	33.98	.1875	59.26	.411	5.41	300.	26.99	.0	78.00	5.50
131.00	34.36	.3125	65.00	.282	6.92	381.	30.10	.0	74.60	5.44
129.00	34.95	.3125	65.00	.315	8.36	440.	35.46	.0	72.35	5.40
126.00	35.83	.3125	65.00	.371	9.35	546.	38.56	.0	69.01	5.32
121.00	37.29	.3125	65.00	.461	10.26	738.	42.23	.0	63.56	5.17
119.00	37.88	.3125	65.00	.498	11.81	821.	46.98	.0	61.43	5.10
116.00	38.76	.3125	65.00	.556	12.92	961.	49.99	.0	58.29	4.99
111.00	40.22	.3125	65.00	.649	14.18	1210.	53.15	.0	53.20	4.78
106.50	41.54	.3125	65.00	.726	14.95	1449.	53.80	.0	48.82	4.58
102.00	42.86	.3125	65.00	.795	15.90	1690.	54.45	.0	44.62	4.36
96.00	44.62	.3125	65.00	.874	17.31	2016.	57.29	.0	39.35	4.06
93.00	44.75	.4375	65.00	.679	19.09	2188.	58.05	.0	36.87	3.90
93.00	45.50	.3125	65.00	.911	17.31	2188.	57.29	.0	36.87	3.90
91.00	45.33	.4375	65.00	.696	20.53	2304.	60.93	.0	35.26	3.82
86.00	46.80	.4375	65.00	.739	22.37	2608.	64.10	.0	31.39	3.61
81.00	48.26	.4375	65.00	.779	24.28	2928.	67.29	.0	27.73	3.39
76.00	49.73	.4375	65.00	.817	26.25	3264.	70.35	.0	24.30	3.17
71.00	51.19	.4375	65.00	.854	28.32	3616.	73.46	.0	21.10	2.95
65.75	52.73	.4375	65.00	.889	29.88	4001.	74.14	.0	17.99	2.72
60.50	54.27	.4375	65.00	.921	31.60	4390.	74.92	.0	15.14	2.48
54.50	56.03	.4375	65.00	.951	33.49	4839.	75.76	.0	12.20	2.20
48.50	56.79	.5000	65.00	.889	37.43	5293.	76.62	.0	9.60	1.93
48.50	57.79	.4375	65.00	.977	33.49	5293.	75.76	.0	9.60	1.93
45.25	57.74	.5000	65.00	.900	40.92	5542.	76.86	.0	8.34	1.79
42.00	58.69	.5000	65.00	.910	42.37	5791.	77.49	.0	7.16	1.66
36.00	60.45	.5000	65.00	.926	44.30	6256.	78.24	.0	5.23	1.41
30.00	62.21	.5000	65.00	.939	46.29	6725.	79.00	.0	3.61	1.16
24.00	63.97	.5000	65.00	.950	48.33	7199.	79.73	.0	2.30	.92
18.00	65.73	.5000	65.00	.959	50.43	7678.	80.40	.0	1.29	.69
12.00	67.48	.5000	65.00	.967	52.59	8160.	81.04	.0	.57	.45
6.00	69.24	.5000	65.00	.973	54.81	8646.	81.67	.0	.14	.22

LOAD CASE 2 Loading Case 2 - Design
1.20 DEAD LOAD + 1.60 WIND - 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
0	71.00	.5000	65.00	.977	55.93	9136.	82.09	.0	.00	.00

Max Deflection Percentage 5.4% Max Tilt 5.75 Degrees

REACTION COMPONENTS (KIPS AND FT-KIPS)

TRANSVERSE SHEAR	VERTICAL FORCE	WIND SHEAR	MOMENT ABOUT TRANSVERSE	MOMENT ABOUT VERTICAL	MOMENT ABOUT WIND AXIS
.000	-55.930	81.981	9136.369	.000	.000

Design Summary Table

Elevation	Stress Ratio	Axial	Bending	Loading	
151.	.03	.94	14.	2	Loading Case 2 - Design
149.	.04	.94	25.4	2	Loading Case 2 - Design
146.	.1	2.22	61.6	2	Loading Case 2 - Design
141.	.21	2.88	138.1	2	Loading Case 2 - Design
139.	.26	3.51	175.	2	Loading Case 2 - Design
136.	.35	4.79	246.1	2	Loading Case 2 - Design
134.	.41	5.41	299.6	2	Loading Case 2 - Design
131.	.28	6.16	380.8	2	Loading Case 2 - Design
129.	.31	6.92	440.5	2	Loading Case 2 - Design
126.	.37	8.36	546.4	2	Loading Case 2 - Design
121.	.46	9.35	738.3	2	Loading Case 2 - Design
119.	.5	10.26	822.	2	Loading Case 2 - Design
116.	.56	11.81	961.6	2	Loading Case 2 - Design
111.	.65	12.92	1210.3	2	Loading Case 2 - Design
106.5	.73	14.18	1448.7	2	Loading Case 2 - Design
102.	.79	14.95	1690.1	2	Loading Case 2 - Design
96.	.87	15.9	2015.8	2	Loading Case 2 - Design
93.	.91	17.31	2187.6	2	Loading Case 2 - Design
91.	.7	19.09	2303.8	2	Loading Case 2 - Design
86.	.74	20.53	2607.9	2	Loading Case 2 - Design
81.	.78	22.37	2928.	2	Loading Case 2 - Design
76.	.82	24.28	3264.	2	Loading Case 2 - Design
71.	.85	26.25	3615.4	2	Loading Case 2 - Design
65.75	.89	28.32	4000.7	2	Loading Case 2 - Design
60.5	.92	29.88	4389.8	2	Loading Case 2 - Design
54.5	.95	31.6	4839.	2	Loading Case 2 - Design
48.5	.98	33.49	5293.3	2	Loading Case 2 - Design
45.25	.9	37.43	5542.	2	Loading Case 2 - Design
42.	.91	40.92	5791.4	2	Loading Case 2 - Design
36.	.93	42.37	6256.2	2	Loading Case 2 - Design
30.	.94	44.3	6725.5	2	Loading Case 2 - Design
24.	.95	46.29	7199.4	2	Loading Case 2 - Design
18.	.96	48.33	7677.8	2	Loading Case 2 - Design
12.	.97	50.43	8160.2	2	Loading Case 2 - Design
6.	.97	52.59	8646.4	2	Loading Case 2 - Design
0.	.98	55.93	9136.4	2	Loading Case 2 - Design

BASE PLATE AT ELEVATION	.00	FEET
TUBE DIAMETER	71.00	INCHES
DESIGN MOMENT	9136.37	KIP FT
DESIGN MOMENT IS .00 DEGREES FROM THE WIND DIRECTION		
APPLIED AXIAL FORCE	55.9	KIPS
APPLIED SHEAR	82.09	KIPS

BOLT DATA

BOLT TYPE	A615GR75	
BOLTS ARE EVENLY SPACED		
DIAMETER	2.250	INCHES
EFFECTIVE AREA	3.250	SQ IN
BOLT YIELD	75.000	KSI
TOTAL LENGTH	6.0	FEET
BOTTOM TEMPLATE MUST BE BOLTED ON		
End plates are required.		
MINIMUM EMBEDMENT	8.0	FEET
NUMBER OF BOLTS	36	
BOLT CIRCLE DIAMETER	79.00	INCHES
APPLIED AXIAL STRESS	47.924	KSI
MAX BOLT FORCE	155.754	KIPS
MAX BOLT SHEAR	2.280	KIPS
BOLT PHI	.75	
TENSION RESISTANCE	182.813	KIPS
SHEAR RESISTANCE	89.460	KIPS
RATIO	.877	
BOLT PHI	.750	

PLATE DATA

DIAMETER OF PLATE	85.00	INCHES
BEND WIDTH REDUCTION	.600	
EDGE CLEARANCE IS BELOW SUGGESTED MINIMUM		
MATERIAL	A572 GR50	
PLATE YIELD	50.0	KSI
PROVIDED THICKNESS	3.250	INCHES
REQUIRED THICKNESS	3.244	INCHES
BOLT HOLE DIAMETER	2.625	INCHES
CENTER HOLE SIZE	61.00	INCHES
NET WEIGHT	2352.	POUNDS
RAW STOCK WEIGHT	6802.5	POUNDS
SURFACE AREA	35.52	SQ FT
MAX APPLIED STRESS	44.82	KSI
APPLIED MOMENT	89.15	KIP-FT
RESIST MOMENT	89.50	KIP-FT
RATIO	1.00	
PLATE PHI	.90	
PLATE YIELD	50.00	KSI

CONCRETE STRENGTH	3000.	PSI

Base Plate - use 85.00 inch ROUND x 3.250 inch A572 GR50
with (36) 2.250 diameter x 6. foot caged A615GR75 bolts
on a 79. inch bolt circle. End plates are required.

ENGINEERED
ENDEAVORS
INCORPORATED
The Experienced Point of View

EMERSON.
Network Power

DESIGN CALCULATIONS
FOR A
SPREAD FOOTER FOUNDATION

NATCOMM
157' PINE TREE POLE

NORFOLK ROAD
LITCHFIELD COUNTY, CT

EEI Project Number 15692
November 19, 2008

7610 Jenther Drive • Mentor, Ohio 44060-4872
Phone: (440) 918-1101 • Phone: (888) 270-3855
Fax: (440) 918-1108 • www.engend.com

FOUNDATION DESIGN CALCULATIONS
FOR
SPREAD FOOTING FOUNDATION

ENGINEERED ENDEAVORS INC.
*7610 Jentner Drive * Mentor, Ohio 44060*
*Tel:(216)918-1101 * Fax:(216)918-1108*

19-Nov-08
02:07 PM

CUSTOMER	NATCOMM
STRUCTURE	157' PINE TREE POLE
EEI PROJECT	15692
LOCATION	LITCHFIELD COUNTY, CT
SITE NAME	NORFOLK ROAD

Monopole Base Reactions			
	Base Loads	Factored Loads	Factored w/φ=0.75
	TIA-222F	TIA-222G	(soil bearing press.)
Moment, kip-ft	0.0	9136.40	12181.9
Shear, kips	0	82.1	109.5
Axial, kips	0	55.9	74.5

Select the pole design code	TIA/EIA-222G

Anchor Bolt Data			
Quantity	Length	Bolt Crc.Ø	Project., in
36.0	6.0	79.0	12.0

Soil unit wt, pcf 100.00 **Concrete unit wt, pcf** 150.00
IF FOUNDATION IS SUBMERGED, REDUCE UNIT WEIGHTS BY 62.4!

Minimum Foundation Parameters

Pedestal Min. Width, in 97.00 Pedestal Project., in 12.0
Found. Min Height, ft 5.5

Actual Foundation Size		
	Height, ft	Width, ft
Slab	3.00	34.00
Pedestal	3.00	8.50

Foundation Weight, kips	552.71
Concrete, cub.yd.	136.47
Soil Weight, kips	216.75
Total weight foundation and soil (not factored)	769.46
Total Vertical Load, kips	742.83
Total Overturning Moment, kip-ft	9629.00
Total Resisting Moment, kip-ft	12628.05

Safety Factor **1.31**

Kern of Eccentricity, ft 5.67
Actual Eccentricity, ft 12.96 uplift exists!
Allowable Gross Soil Pressure, ksf (see soil report)
Allowable Net Soil Pressure, ksf (see soil report) 8.0
Max soil pressure, ksf per TIA-222G 4.81
per TIA-222F n/a

FOOTING STRENGTH DESIGN

				NOTES
Concrete, psi	3000	Concrete cover, in	3	
Steel, ksi	60	Distan. d (slab), in	32	

TWO-WAY SHEAR IN THE SLAB

Vertical Load, kips	55.90		
Bearing Soil Pressure, ksf	0.05		
Shear in the slab, kips	**50.05**		
Design shear Vn, kips	**1597.07**	φ = 0.85	ok

ONE-WAY SHEAR IN THE SLAB

Max soil pressure, ksf	3.61		
Actual Eccentricity, ft	12.96		
Kern of Eccentricity, ft	5.67		
Pressure Distribution Zone, ft	12.11		
Effective Pressure Zone, ft	10.08		
Max Shear Force, kips	**1236.5**		
Design Shear, kips	**1215.7**	φ = 0.85	to be revised

SLAB DESIGN IN FLEXURE

Max soil pressure, ksf	3.61		
Actual Eccentricity, ft	12.96		
Kern of Eccentricity, ft	5.67		
Pressure Distribution Zone, ft	12.11		
Effective Pressure Zone, ft	12.11		
Soil Pressure at Effect. Zone Edge	0.00		
Shear Force at Critical Section, kip	742.6		
Bending Moment, k-ft	6470.4		
Coefficient of Resistance Rn=	206.5	φ = 0.90	
Min. Required Reinf. Ratio	0.00359		
Min. Reinf. Ratio per ACI 318, 200/Fy	0.00330		
Min. Reinf. Ratio per ACI 318 for wind&seism.	0.00359		
Design Reinforcement Ratio	0.00359		
Min. Steel Area, sq.in.	46.92		
Bar size	8		max bar size - #8
Bar section area, in^2	0.79		verify bar area if not #8
Bottom Bars Min. No.of Bars/One direction	60.00		
Actual No.of Bars/One direction	68		ok
Actual Steel Area, sq.in.	53.72		
Steel Ratio Actual	0.00411		ok
Revised Coef. of Resist., Rn	246.85		
Design Moment, kip-ft	7734.74		
Total bottom bars	140		incl.(4) bars on the sides
Horizontal Spacing, in shor=	6.00		
TOP Min. Steel Area, sq.in (0.18%)	23.50		expansion or temp
Min. No.of Bars/One direction	30.00		
Actual No.of Bars/One direction	35.00		ok
Top Steel Area, sq.in	27.65		
Horizontal Spacing, in shor=	11.82		
Total top bars	70		

PEDESTAL DESIGN

Pedestal Width, in		102	Ultim. Momen	9382.7
Concrete, ksi		3		
Reinforcement, ksi		60		
Actual Rebars , #8	Q-ty	66	Area, sq.in	0.79
Nominal Bars	Q-ty	12	Area, sq.in	4.35
Minimum reinforcement ratio		0.0033	Rebar space,	4.52
Actual reinforcement ratio		0.0050		
Concrete cover , in		3		
Rebar layout radius, in		47.50		

Bending about the major axis

No.	Angle, deg	Coord., in	Edge Dist., in	No.	Angle, deg	Coord., in	Edge Dist., in
1	0	47.50	3.50	7	180	-47.50	98.50
2	30	41.14	9.86	8	210	-41.14	92.14
3	60	23.75	27.25	9	240	-23.75	74.75
4	90	0.00	51.00	10	270	0.00	51.00
5	120	-23.75	74.75	11	300	23.75	27.25
6	150	-41.14	92.14	12	330	41.14	9.86

Location of neutral axis c=, in **9.65**
Compression zone, a= **8.20**

	No.	e	Force *kips*
	1	0.0019	229.82
eu= 0.003			

Tension zone		No.	e	Force *kips*
		2	0.0001	8.41
		3	0.0055	260.70
ey=	0.00207	4	0.0129	260.70
		5	0.0202	260.70
		6	0.0256	260.70
		7	0.0276	260.70
		8	0.0256	260.70
		9	0.0202	260.70
		10	0.0129	260.70
		11	0.0055	260.70
		12	0.0001	8.41
		Total tension, kips		**2363.11**

Concrete, kips	2133.29	
Total compression	**2363.11**	

Moment due to compression

Rebars	Force *kips*	Mom. Arm. *in*	Moment *k-ft*
1	229.82	47.50	909.70
2	0.00	41.14	0.00
12	0.00	41.14	0.00
Concrete	2133.29	46.90	8337.46
Total in compression			9247.16

Moment due to tension

Rebars	Force *kips*	Mom. Arm *in*	Moment *k-ft*
2	8.41	41.14	-28.82
3	260.70	23.75	-515.97
4	260.70	0.00	0.00
5	260.70	-23.75	515.97
6	260.70	-41.14	893.68
7	260.70	-47.50	1031.94
8	260.70	-41.14	893.68
9	260.70	-23.75	515.97
10	260.70	0.00	0.00
11	260.70	23.75	-515.97
12	8.41	41.14	-28.82
Total in tension			2761.67

Design moment about the major axis, kip-ft **10807.95** OK

Bending about the diagonal

No.	Angle, deg phi	Coord., in c1	Edge Dist., in di
1	0	47.50	24.62
2	30	41.14	30.99
3	60	23.75	48.37
4	90	0.00	72.12
5	120	-23.75	95.87
6	150	-41.14	113.26
7	180	-47.50	119.62
8	210	-41.14	113.26
9	240	-23.75	95.87
10	270	0.00	72.12
11	300	23.75	48.37
12	330	41.14	30.99

Location of neutral axis c=, in **33.22**

Compression zone, a= **28.23**

	No.	e	Force kips
	1	0.000775876	86.68
eu= 0.003	2		
	12		
Concrete, kips			2032.60
Total compression			**2119.28**

Tension zone	No.	e	Force kips
	2	-0.0002	-25.34
	3	0.0014	172.53
ey= 0.00207	4	0.0035	260.70
	5	0.0057	260.70
	6	0.0072	260.70
	7	0.0078	260.70
	8	0.0072	260.70
	9	0.0057	260.70
	10	0.0035	260.70
	11	0.0014	172.53
	12	-0.0002	-25.34
Total tension, kips			**2119.28**

Moment due to compression

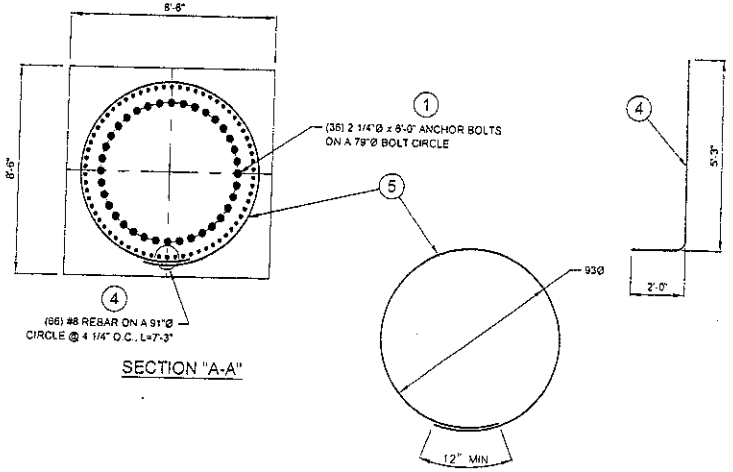
Rebars	Force kips	Mom. Arm. in	Moment k-ft
1	86.68	47.50	343.13
2	0.00	41.14	0.00
12	0.00	41.14	0.00
Concrete	2032.60	62.71	10622.67
Total in compression			**10965.80**

Moment due to tension

Rebars	Force kips	Mom. Arm in	Moment k-ft
3	172.53	23.75	-341.46
4	260.70	23.75	-515.97
5	260.70	0.00	0.00
6	260.70	-23.75	515.97
7	260.70	-47.50	1031.94
8	260.70	-41.14	893.68
9	260.70	-23.75	515.97
10	260.70	0.00	0.00
11	172.53	23.75	-341.46
Total in tension			**1758.66**

Design Moment, kip-ft **11452.01**

Pedestal Design Moment, kip-ft **10807.95** OK



SECTION "A-A"

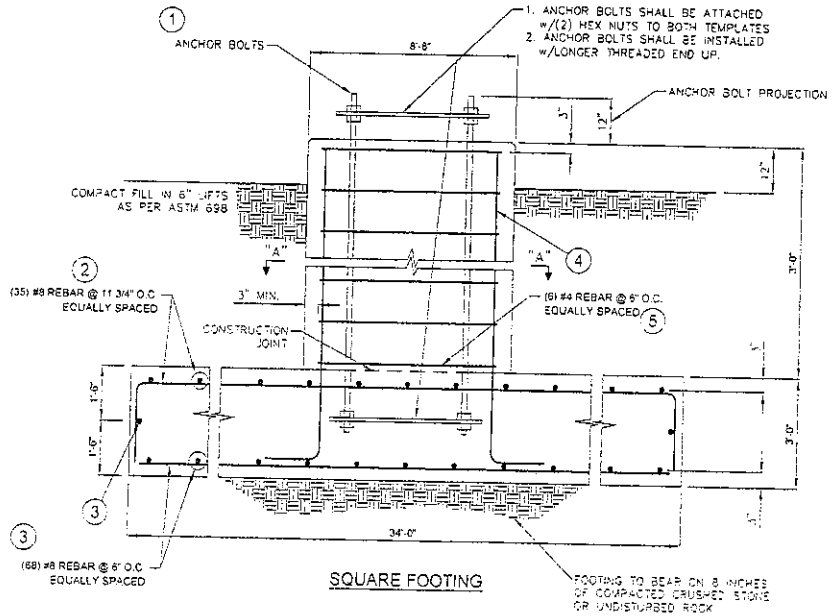
MATERIAL LIST		
ITEM	QTY.	DESCRIPTION
1	36	2 1/4"Ø x 8'-0" (A615-GR.75) ANCHOR BOLTS
2	70	#8 REBAR x 33'-6" (ASTM A615-GR.60)
3	140	#8 REBAR x 33'-6" (ASTM A615-GR.60)
4	66	#8 REBAR x 7'-3" (ASTM A615-GR.60)
5	6	#4 REBAR x 28'-3" (ASTM A615-GR.60)

VOL. CONCRETE @ 4000 psi (TYPE II CEMENT)	136.5 yd ^{3}
STEEL (ASTM A615-GR.60)	24131.2 lbs

FOUNDATION LOADING	
MOMENT	9138.4 kip-ft
SHEAR	82.1 kips
AXIAL	55.9 kips

GENERAL NOTES:

1. FOUNDATION DESIGN IS BASE ON THE FOLLOWING: EEI JOB# 15692, DRAWING# GS57386 SOIL REPORT BY JGI EASTERN, INC., REPORT NO. J2085192 - 10/31/2008
2. 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
3. SOIL REPORT SHOULD BE CONSULTED PRIOR TO CONSTRUCTION. STEEL CASING OR SLURRY 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
4. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES,AND PROCEDURES.
5. SPECIAL INSPECTION.
   5.1. SPECIAL INSPECTION IS REQUIRED IN ACCORDANCE WITH 2006 IBC CHAPTER 1704.
   5.2. SOIL.
   5.2.a. FOUNDATION EXCAVATION SHALL BE INSPECTED PRIOR TO INSTALLATION OF REINFORCEMENT.
      5.2.a. VERIFY DEPTH AND DIAMETER OF THE EXCAVATION.
   5.2.b. VERIFY ACTUAL SOIL CONDITIONS AGAINST THE GEOTECHNICAL REPORT.
   5.3. REINFORCING STEEL.
   5.3.a. VERIFY GRADE, LENGTH, DIAMETER, AND QUANTITY OF REBARS AND COMPLIANCE WITH THE DRAWINGS.
   5.3.b. VERIFY GRADE, SIZE, LENGTH, AND QUANTITY OF ANCHOR BOLTS AND BOLT PATTERN ON THE TEMPLATES.
6. REINFORCING STEEL.
   6.1. REINFORCING STEEL SHALL CONFORM TO ASTM A615-87, Fy=60 ksi.
   6.2. ALL REINFORCEMENT SHALL BE ASSEMBLED USING STEEL WIRE. WELDING IS NOT PERMITTED.
   6.3. MINIMUM SPLICE LENGTH FOR LONGITUDINAL BARS: No. 6 BARS AND SMALLER - 44 x Øbar; No. 7 BARS AND LARGER - 55 x Øbar.
   6.4. HORIZONTAL STIRRUPS SHALL BE STAGGERED ALONG THE REBAR CAGE WITH NO MORE THAN 50% OF SPLICES IN ONE PLACE.
7. CONCRETE.
   7.1. MIX DESIGN AND CONSTRUCTION PROCEDURE SHALL BE IN COMPLIANCE WITH ACI 318-05, ACI 336.3R-93, AND ALL APPLICABLE STATE AND LOCAL CODES
   7.2. MINIMUM COMPRESSIVE STRENGTH - 4000 psi AT 28 DAYS.
   7.3. TYPE II CEMENT UNLESS STATED OTHERWISE.
   7.4. SLUMP: DRILLED PIER - 7" (±1"), MAT FOUNDATION - 3" (±1").
   7.5. CONCRETE SHALL BE DEPOSITED AS NEARLY AS PRACTICAL IN ITS FINAL POSITION TO AVOID SEGREGATION DUE TO REHANDLING OR FLOWING.
   7.6. 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.
8. ANCHOR BOLT INSTALLATION. ANCHOR BOLT ORIENTATION SHALL BE VERIFIED WITH THE SITE PLANS AND MONOPOLE DRAWING FOR PROPER ACCESS PORT ORIENTATION. ANCHOR BOLT ALIGNMENT AND PROJECTION ABOVE CONCRETE PRIOR TO CONCRETE PLACEMENT



SQUARE FOOTING

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REV.	DESCRIPTION	DATE	DWN	CHK
0	COMPLETED DRAWING	11/19/2008	R.S.	

NATCOMM
157'-0" PINE TREE POLE
NORFOLK ROAD
LITCHFIELD COUNTY, CT

SCALE: N.T.S.	PROJECT NO.	15692
SHEET 1 OF 1	DRAWING NO.	15692S-157.0