

DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK CITY OF PORTLAND

Please Read Application And Notes, If Any, Attached

PERMIT SECTION

Permit Number: 031524

This is to certify that Littlefield Barbara C &/n/a
has permission to Construct a monopole & place building inside leased area, place antennas on monopole.
AT 52 Canco Rd 147 C001001

provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of the Statutes of the City and of the Ordinances of the City of Portland regulating the construction, maintenance and use of buildings and structures, and of the application on file in this department.

Apply to Public Works for street line and grade if nature of work requires such information.

Notification of inspection must be given and work in progress must be stopped before this building or part thereof is leased or occupied. 24 HOUR NOTICE IS REQUIRED.

A certificate of occupancy must be procured by owner before this building or part thereof is occupied.

OTHER REQUIRED APPROVALS

Fire Dept. [Signature]
Health Dept. _____
Appeal Board _____
Other _____
Department Name _____

[Signature] 4/20/03
Director - Building & Inspection Services

PENALTY FOR REMOVING THIS CARD

City of Portland, Maine - Building or Use Permit Application
 389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

PERMIT ISSUED

Permit No: 03-1524	Issue Date: JAN 21 2004	BL: 147 C001001
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Location of Construction: 52 Canco Rd	Owner Name: Littlefield Barbara C &	Owner Address: 5 Pineloch Dr	Phone: CITY OF PORTLAND
Business Name: n/a	Contractor Name: n/a	Contractor Address: n/a Portland	Phone:
Lessee/Buyer's Name n/a	Phone: n/a	Permit Type: Additions - Commercial	Zone: IM

Past Use: Commercial	Proposed Use: Commercial / Construct a monopole and place building inside leased area, also place antennas on monopole.	Permit Fee: \$588.00	Cost of Work: \$63,000.00	CEO District: 4
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FIRE DEPT: <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Denied	INSPECTION: Use Group: <i>U</i> Type: <i>2C</i>
Signature: <i>[Signature]</i>	Signature: <i>[Signature]</i>

Proposed Project Description:
 Construct a monopole & place a building inside leased area, place antennas on monopole. - 150' high

PEDESTRIAN ACTIVITIES DISTRICT (P.A.D.)
 Action: Approved Approved w/Conditions Denied
 Signature: _____ Date: _____

Permit Taken By: gg	Date Applied For: 12/18/2003	Zoning Approval	
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1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules. 2. Building permits do not include plumbing, septic or electrical work. 3. Building permits are void if work is not started within six (6) months of the date of issuance. False information may invalidate a building permit and stop all work..	Special Zone or Reviews <input type="checkbox"/> Shoreland <input type="checkbox"/> Wetland <input type="checkbox"/> Flood Zone <input type="checkbox"/> Subdivision <input checked="" type="checkbox"/> Site Plan <i>exemption</i> Approved by Planning Maj <input type="checkbox"/> Minor <input type="checkbox"/> MM <input type="checkbox"/> OK with cond... previously by the ZBA Date: <i>1/12/04</i>	Zoning Appeal <input type="checkbox"/> Variance <input type="checkbox"/> Miscellaneous <input type="checkbox"/> Conditional Use <input type="checkbox"/> Interpretation <input type="checkbox"/> Approved <input type="checkbox"/> Denied Date: <i>monopole is not a</i>	Historic Preservation <input checked="" type="checkbox"/> Not in District or Landmark <input type="checkbox"/> Does Not Require Review <input type="checkbox"/> Requires Review <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied Date: <i>[Signature]</i>
	Structure does not need to meet min structure height		

CERTIFICATION

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT	ADDRESS	DATE	PHONE
RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE		DATE	PHONE

City of Portland, Maine - Building or Use Permit

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

Permit No: 03-1524	Date Applied For: 12/18/2003	CBL: 147 C001001
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Location of Construction: 52 Canco Rd	Owner Name: Littlefield Barbara C &	Owner Address: 5 Pineloch Dr	Phone:
Business Name: n/a	Contractor Name: n/a	Contractor Address: n/a Portland	Phone:
Lessee/Buyer's Name: n/a	Phone: n/a	Permit Type: Radio/Telecommunications Tower	

Proposed Use: Commercial / Construct a monopole and place building inside leased area, also place antennas on monopole. - monopole is 150' in height	Proposed Project Description: Construct a monopole & place a building inside leased area, place antennas on monopole.
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Dept: Zoning	Status: Approved with Conditions	Reviewer: Marge Schmuckal	Approval Date: 01/12/2004
Note: site plan exemption approved - all ground cabinets are 25' from property lines			Ok to Issue: <input checked="" type="checkbox"/>
1) The I-M zone has noise performance standards that shall be met. The generator shall not violate the standards listed under section 14-252 of the land use zoning ordinance.			
2) This permit is being approved on the basis of plans submitted. Any deviations shall require a separate approval before starting that work.			

Dept: Building	Status: Approved with Conditions	Reviewer: Mike Nugent	Approval Date: 01/21/2003
Note:			Ok to Issue: <input checked="" type="checkbox"/>
1) This installation shall be subject to special inspections pursuant to Section 1705 of the code; primarily foundation, geotech and steel fabrication and erection. A final report from the design professionals indicating compliance is required prior to the closing of this permit and use of the structure.			

Dept: Fire	Status: Approved	Reviewer: Lt. MacDougal	Approval Date: 01/12/2004
Note:			Ok to Issue: <input checked="" type="checkbox"/>

Comments:
1/7/2004-gg: received additional plans. /gg
1/14/2004-mjn: need geotech info, foundation design based on geo. , and spec book, apoke with ed shaw.

All Purpose Building Permit Application

If you or the property owner owes real estate or personal property taxes or user charges on any property within the City, payment arrangements must be made before permits of any kind are accepted.

Location/Address of Construction: <u>52 Canco Road</u>		
Total Square Footage of Proposed Structure	Square Footage of Lot	
Tax Assessor's Chart, Block & Lot Chart# <u>147</u> Block# <u>C</u> Lot# <u>1</u>	Owner: <u>F. Gilbert Congdon III ET AL</u>	Telephone: <u>(207) 774-5076</u>
Lessee/Buyer's Name (If Applicable) <u>United States Cellular</u>	Applicant name, address & telephone: <u>LCC International</u> <u>482 Congress Street</u> <u>Suite 502</u> <u>Portland, Me 04103</u>	Cost Of Work: \$ <u>63,000</u> Fee: \$ <u>588.00</u>
Current use: <u>Warehouse + Business Location</u>		
If the location is currently vacant, what was prior use: _____		
Approximately how long has it been vacant: _____		
Proposed use: <u>Construct a Monopole and Place a building inside leased</u> Project description: <u>Area. Also place antennas on Monopole.</u>		
Contractor's name, address & telephone: <u>TBD</u>		
Who should we contact when the permit is ready: <u>Ed Shaw 20</u>		
Mailing address: <u>482 Congress Street</u> <u>Suite 502</u> <u>Portland, Maine 04103</u>		
We will contact you by phone when the permit is ready. You must come in and pick up the permit and review the requirements before starting any work, with a Plan Reviewer. A stop work order will be issued and a \$100.00 fee if any work starts before the permit is picked up. PHONE: <u>329-1246</u>		

IF THE REQUIRED INFORMATION IS NOT INCLUDED IN THE SUBMISSIONS THE PERMIT WILL BE AUTOMATICALLY DENIED AT THE DISCRETION OF THE BUILDING/PLANNING DEPARTMENT, WE MAY REQUIRE ADDITIONAL INFORMATION IN ORDER TO APPROVE THIS PERMIT.

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in this application is issued, I certify that the Code Official's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

Signature of applicant: <u>Edward A Shaw</u>	Date: <u>12/5/03</u>
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**This is NOT a permit, you may not commence ANY work until the permit is issued.
If you are in a Historic District you may be subject to additional permitting and fees with the
Planning Department on the 4th floor of City Hall**

**Built
to a
Higher
Standard**

US CELLULAR CORP

145' Sabre Model Monopole

Canco Road, ME

Sabre Job Number 04-01048

STAMPED PERMIT DRAWINGS

REPRESENTATIVE IS

Larry Vaydich

1-800-369-6690 EXT. 140



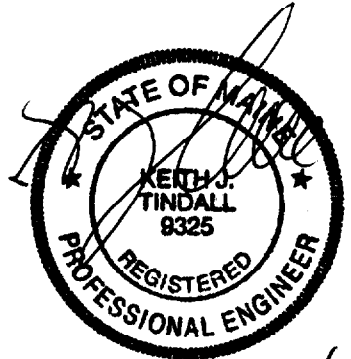
Structural Design Report
145' Monopole
located at: Canco Road, ME

prepared for: US CELLULAR
by: Sabre Communications Corporation TM

Job Number: 04-01048

January 19, 2004

Monopole Profile.....	1
Foundation Design Summary.....	2
Pole Calculation.....	C1-C6
Foundation Calculations.....	F1-F2



Prepared by JV
 Checked by KJT
 Approved by KJT

1/20/04

POLE SPECIFICATIONS	
POLE HEIGHT	144.00 FEET
TAPER	.2710 IN/FT
POLE SHAPE	18 SIDED POLYGON
ORIENTATION	FLAT-FLAT

Lev	Qty	Elev ft.	Future	APPURTENANCE / ANTENNA DESCRIPTION
1	1	142.00	F	10' LP Platform (12"-36")
9	1	144.00	F	FV65-17-XXDP
2	1	129.00		10' LP Platform (12"-36")
9	1	129.00		FV65-17-XXDP
3	1	119.00	F	10' LP Platform (12"-36")
6	1	119.00	F	DB980H90

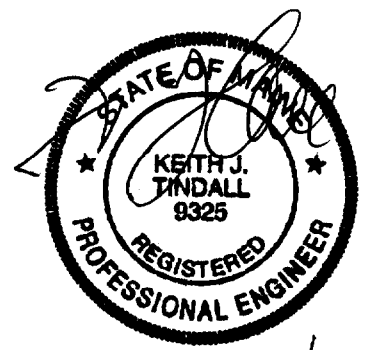
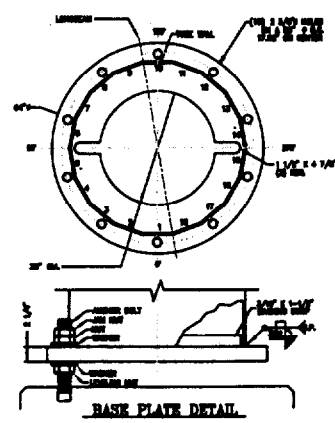
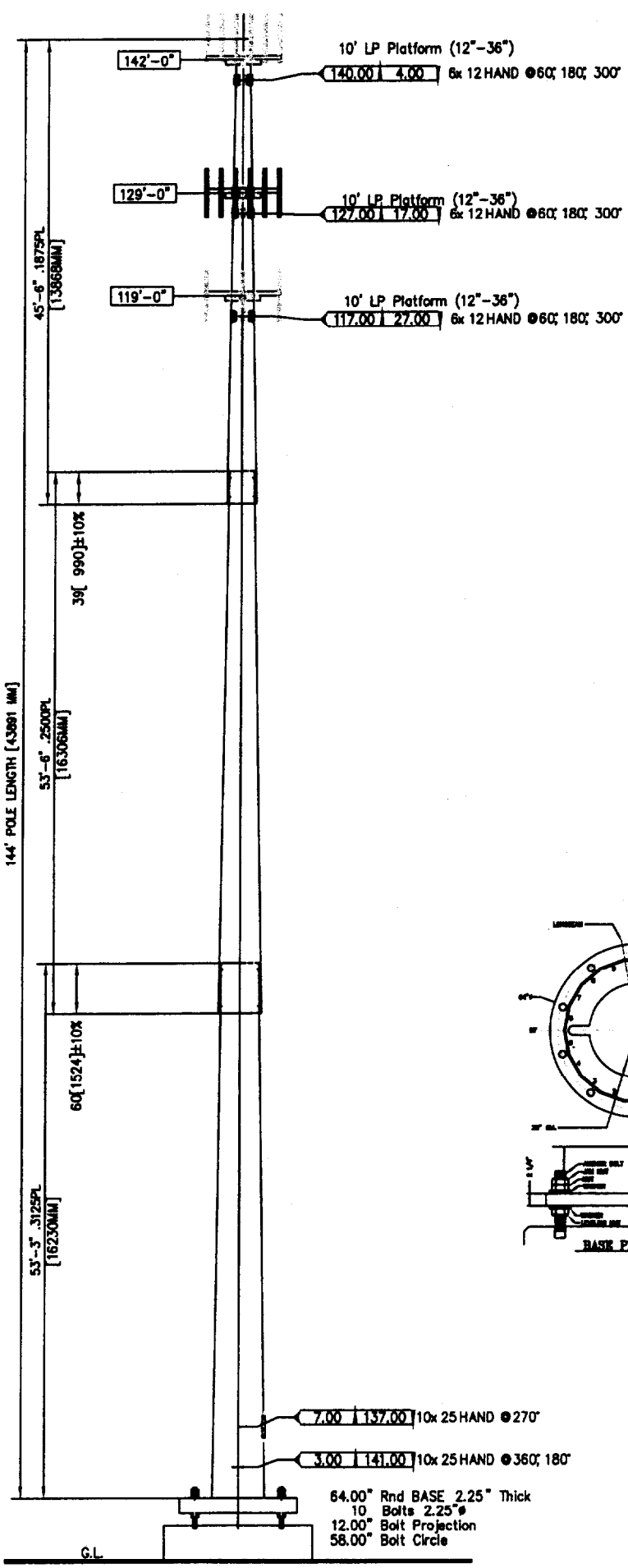
Load Case DESCRIPTION	Wind (mph)	OLF Vert	Rad. Ice	Factors Gust Cf	Wind (psf)
1) Max Wind	110.0	1.00		1.69 .85	52.3
2) Max Wind Load x.75	95.3	1.00	.50	1.69 .85	39.3
3) Everyday Operating	50.0	1.00		1.69 .85	10.8

Load Case DESCRIPTION	Res. Axial (kips)	Base Shear (kips)	React Mom (ft-k)	Disp (ft)	@Top DEFL SWAY (deg)
1) Max Wind	21.9	25.3	2369	10.4	8.63
2) Max Wind Load x.75	25.5	20.2	1926	8.6	7.14
3) Everyday Operating	21.0	5.3	492	2.2	1.80

Sec	LENGTH (ft)	Flat-Flat TOP#	BOT#	THICK (in)	WEIGHT (lbs)	STEEL SPEC	FINISH
1	45.50	13.25	25.58	.1875	1771	A572-65	Galv
2	53.50	24.32	38.82	.2500	4524	A572-65	Galv
3	53.25	36.97	51.40	.3125	7884	A572-65	Galv
BP	64.00		10	38.00	2.250	1289	A633-60 Galv
AB	84.00	2.25	2.625		1520	A615-75	Galv-18"
				Bolt#	Hole#	TOTAL	15488

- 1) FULL HEIGHT STEP BOLTS
- 2) ANTENNA FEED LINES RUN INSIDE POLE

CENTER of GRAVITY= 47.78 Ft. UP



1/20/04

US CELLULAR		Canco Road, ME	
145.00 MONOPOLE			
04-01048		SIZE	DRAWING NO.
DATE	19Jan04	A	04-01048-01
DRAWN BY	-	REFERENCE DRAWING	SCALE
CHECKED BY	JV		N.T.S.
		PAGE	1

Gabro
Communications
Corporation

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No.: 04-01048

Page: 2

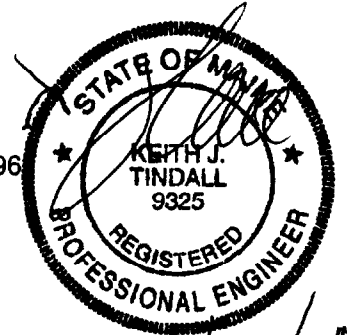
Date: 1/19/04

By: JV

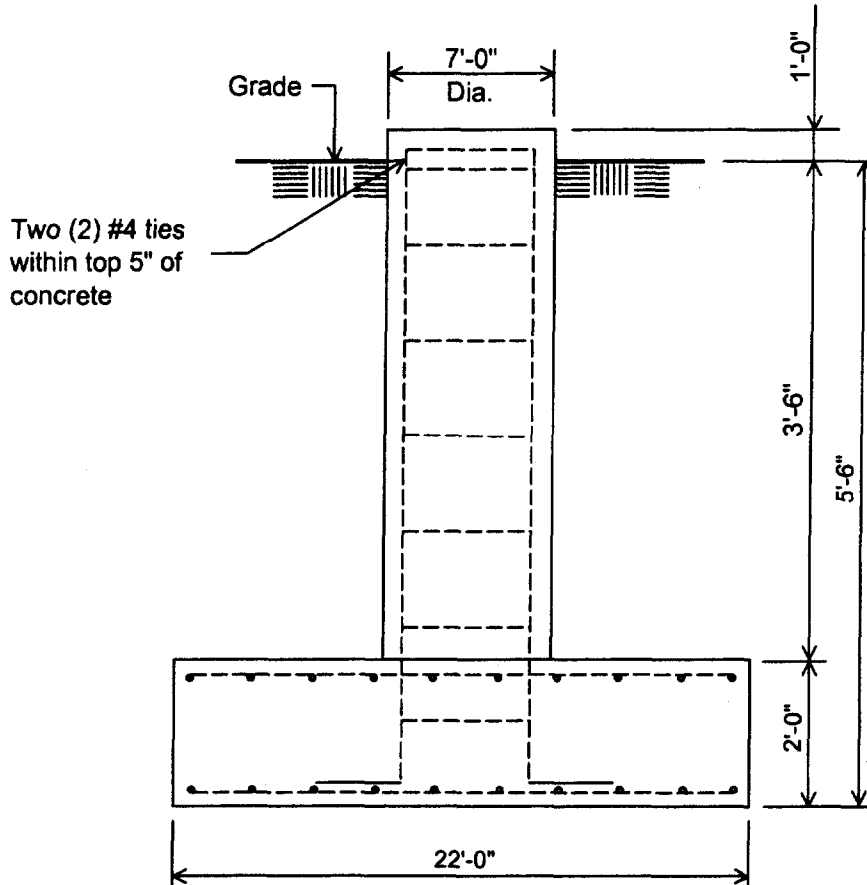
Customer: US CELLULAR

Site: Canco Road, ME

145' Monopole at
110 mph Wind + 0.5 in. Ice per ANSI/TIA/EIA-222-F-1996
Antenna Loading per Page 1



1/20/04



Notes:

- 1). Concrete shall have a minimum 28-day compressive strength of 4000 PSI, in accordance with ACI 318-02
- 2). Rebar to conform to ASTM specification A615 Grade 60.
- 3). All rebar to have a minimum of 3" concrete cover.
- 4). All exposed concrete corners to be chamfered 3/4".
- 5). The foundation design is based on the geotechnical report by S.W. Cole Engineering, Inc., project # 03-0351.2, dated 12/19/03.
- 6). See the geotechnical report for compaction requirements, if specified.

ELEVATION VIEW

(42.27 Cu. Yds. each)
(1 REQUIRED)

Rebar Schedule per Pad and Pier	
Pier	(36) #8 vertical rebar w/hooks at bottom w/#4 ties, two within top 5" of top of pier then 12" C/C
Pad	(33) #8 horizontal rebar evenly spaced each way top and bottom (132 Total)

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SABRE COMMUNICATIONS CORP
 2101 Murray Street
 Sioux City, IA 51101

JOB: 04-01048
US CELLULAR
 Canco Road, ME

19-Jan-04 13:37
 Ph 712.258.6690
 Fx 712.258.8250

TOP DIAMETER 13.25 in. [13.45 in. Point-Point]
 BOTTOM DIAMETER 51.40 in. [52.19 in. Point-Point]
 POLE HEIGHT 144.00 ft. 18 SIDED FLAT ORIENTATION
 BASE HEIGHT 1.00 ft. ABOVE GROUND
 E-MODULUS 29000 ksi [12000 ksi SHEAR MODULUS]

APPURTENANCES

ATTACH POINTS:	NO.	X,ft	Qty	Description	Status
	1	142.00	1	10' LP Platform (12"-36")	Future Appurt
	2	129.00	1	10' LP Platform (12"-36")	Initial Appurt
	3	119.00	1	10' LP Platform (12"-36")	Future Appurt

POLE SECTION	Bottom X,ft.	Thick in.	Connect Type	LAP in.	Taper in/ft	Length ft.	Weight lbs	Steel Spec	Pole Finish
1	45.50	.18750	SLIP-JNT	39.	.2710	45.50	1771	A572-65	GALVANIZE
2	95.75	.25000	SLIP-JNT	60.	.2710	53.50	4524	A572-65	GALVANIZE
3	144.00	.31250	C-WELD		.2710	53.25	7884	A572-65	GALVANIZE

SECTION PROPERTIES

X,ft	UP,ft	D,in	T,in	Area in^2	Iz in^4	IxIy in^4	SxSy in^3	w/t	d/t	Fy ksi	
144.00	.00	13.25	.1875	50.67	336	168	25.0	27.24	70.7	65.00	TOP
142.00	2.00	13.79	.1875	8.10	378	189	27.0	11.21	73.6	65.00	-P1
137.00	7.00	15.15	.1875	8.90	504	252	32.8	12.48	80.8	65.00	
132.00	12.00	16.50	.1875	9.71	652	326	38.9	13.76	88.0	65.00	
129.00	15.00	17.31	.1875	10.19	754	377	42.9	14.52	92.3	65.00	-P2
124.00	20.00	18.67	.1875	11.00	948	474	50.0	15.79	99.6	65.00	
119.00	25.00	20.02	.1875	11.81	1174	587	57.7	17.07	106.8	65.00	-P3
114.00	30.00	21.38	.1875	12.61	1432	716	66.0	18.34	114.0	65.00	
109.00	35.00	22.73	.1875	13.42	1724	862	74.7	19.62	121.3	65.00	
104.00	40.00	24.09	.1875	14.22	2052	1026	83.9	20.89	128.5	65.00	
101.75	42.25	24.70	.1875	14.59	2214	1107	88.3	21.46	131.7	65.00	Slip-B1
98.50	45.50	25.21	.2500	19.80	3116	1558	121.7	16.01	100.8	65.00	Slip-T2
93.50	50.50	26.56	.2500	20.88	3650	1825	135.3	16.97	106.2	65.00	
88.50	55.50	27.92	.2500	21.95	4244	2122	149.7	17.93	111.7	65.00	
83.50	60.50	29.27	.2500	23.03	4898	2449	164.8	18.88	117.1	65.00	
78.50	65.50	30.63	.2500	24.10	5616	2808	180.6	19.84	122.5	65.00	
73.50	70.50	31.98	.2500	25.18	6402	3201	197.1	20.79	127.9	65.00	
68.50	75.50	33.34	.2500	26.25	7260	3630	214.5	21.75	133.3	65.00	
63.50	80.50	34.69	.2500	27.33	8188	4094	232.4	22.70	138.8	65.00	
58.50	85.50	36.05	.2500	28.40	9192	4596	251.1	23.66	144.2	65.00	
53.50	90.50	37.40	.2500	29.48	10276	5138	270.6	24.62	149.6	65.00	
53.25	90.75	37.47	.2500	29.53	10334	5167	271.6	24.66	149.9	65.00	Slip-B2
48.25	95.75	38.32	.3125	37.70	13760	6880	353.6	19.86	122.6	65.00	Slip-T3
43.25	100.75	39.68	.3125	39.04	15284	7642	379.3	20.63	127.0	65.00	
38.25	105.75	41.03	.3125	40.39	16916	8458	406.0	21.39	131.3	65.00	
33.25	110.75	42.39	.3125	41.73	18662	9331	433.6	22.15	135.6	65.00	
28.25	115.75	43.74	.3125	43.08	20526	10263	462.1	22.92	140.0	65.00	
23.25	120.75	45.10	.3125	44.42	22506	11253	491.5	23.68	144.3	65.00	
18.25	125.75	46.45	.3125	45.76	24612	12306	521.8	24.45	148.7	65.00	
13.25	130.75	47.81	.3125	47.11	26842	13421	552.9	25.21	153.0	65.00	
8.25	135.75	49.16	.3125	48.45	29206	14603	585.0	25.98	157.3	65.00	
3.25	140.75	50.52	.3125	49.80	31706	15853	618.1	26.74	161.7	65.00	
.00	144.00	51.40	.3125	50.67	33404	16702	640.0	27.24	164.5	65.00	BASE

SABRE COMMUNICATIONS CORP	JOB: 04-01048	19-Jan-04 13:37
2101 Murray Street	US CELLULAR	Ph 712.258.6690
Sioux City, IA 51101	Canco Road, ME	Fx 712.258.8250

CASE - 1: Max Wind **TIA/EIA-222F**

VERTICAL OLF	1.00	WIND SPEED	110.0 mph 177.0 kph
ICE COVER	.00 in	GUST FACTOR	1.69
STRESS REDUCTION	.60	EXPOSURE COEFF.	.2857
STRESS AMPLIFY	1.33	Cf	.650
BASE ABOVE Grd	1.00 ft	REFERENCE HEIGHT	33.0 ft
		PRESSURE @Ref.Ht	52.3 psf 2505.Pa

APPURTENANCE LOADS

#	Qty	Description	Center Line Elev-Ft	WEIGHT each Lbs	AREA each Ft^2	Tx-CABLE			WIND Psf	FORCES		MOM. Lg-X Ft-K
						Type	Qty	#/Ft		Tra-Y Kips	Ax-Z Kips	
- 1	1	10' LP Platform (12"-36")	142.0	938	45.5				79.6	3.62	-.9	-.9
	9	FV65-17-XXDP	144.0	18		1	5/8"	9	1.04			-1.5
- 2	1	10' LP Platform (12"-36")	129.0	938	45.5				77.5	3.53	-.9	-.9
	9	FV65-17-XXDP	129.0	18		1	5/8"	9	1.04			-1.4
- 3	1	10' LP Platform (12"-36")	119.0	938	36.3				75.7	2.75	-.9	-.7
	6	DB980H90	119.0	8		1	5/8"	6	1.04			-.8

RESULTS

X, ft	WIND psf	--- FORCES, kips ---				--- MOMENTS, ft-kips ---			STRESS ALLOW		
		ShearX	ShearY	Axiaz	BendX	BendY	TorqZ	ksi	ksi	CSR	
144.00	51.9	.0	.1	.0	.0	.0	.0	.00	49.80	.000	
142.00	51.7	.0	4.2	-2.0	-1.0	.0	.0	1.14	51.87	.022	
137.00	51.2	.0	4.6	-2.1	-22.2	.0	.0	8.29	51.87	.160	
132.00	50.7	.0	4.9	-2.3	-45.1	.0	.0	13.95	51.87	.269	
129.00	50.3	.0	9.0	-4.2	-60.5	.0	.0	17.16	51.87	.331	
124.00	49.8	.0	9.4	-4.5	-105.4	.0	.0	25.36	51.87	.489	
119.00	49.2	.0	12.7	-6.1	-153.0	.0	.0	31.89	51.87	.615	
114.00	48.6	.0	13.1	-6.4	-216.6	.0	.0	39.35	51.87	.759	
109.00	48.0	.0	13.6	-6.7	-282.3	.0	.0	45.21	51.87	.872	
104.00	47.4	.0	13.9	-7.0	-350.2	.0	.0	49.85	51.87	.961	
101.75	47.1	.0	14.1	-7.3	-381.4	.0	.0	51.59	51.87	.995	
98.50	46.6	.0	14.6	-7.9	-427.4	.0	.0	41.91	51.87	.808	
93.50	46.0	.0	15.1	-8.4	-500.3	.0	.0	44.10	51.87	.850	
88.50	45.3	.0	15.6	-8.9	-575.5	.0	.0	45.85	51.87	.884	
83.50	44.5	.0	16.1	-9.4	-653.4	.0	.0	47.28	51.87	.912	
78.50	43.7	.0	16.6	-9.9	-733.8	.0	.0	48.45	51.87	.934	
73.50	42.9	.0	17.2	-10.4	-816.9	.0	.0	49.40	51.87	.952	
68.50	42.1	.0	17.7	-11.0	-902.5	.0	.0	50.16	51.87	.967	
63.50	41.2	.0	18.3	-11.6	-991.7	.0	.0	50.85	51.87	.980	
58.50	40.3	.0	18.8	-12.1	-1082.5	.0	.0	51.38	51.87	.991	
53.50	39.3	.0	19.1	-12.5	-1176.7	.0	.0	51.83	51.87	.999	
53.25	39.2	.0	19.5	-13.1	-1181.7	.0	.0	51.87	51.87	1.000	
48.25	38.2	.0	20.0	-14.3	-1279.2	.0	.0	43.14	51.87	.832	
43.25	37.0	.0	20.6	-15.2	-1379.2	.0	.0	43.36	51.87	.836	
38.25	35.8	.0	21.2	-16.0	-1482.5	.0	.0	43.56	51.87	.840	
33.25	34.4	.0	21.8	-16.8	-1588.3	.0	.0	43.70	51.87	.843	
28.25	34.0	.0	22.4	-17.6	-1697.5	.0	.0	43.83	51.87	.845	
23.25	34.0	.0	22.9	-18.4	-1809.2	.0	.0	43.93	51.87	.847	
18.25	34.0	.0	23.5	-19.3	-1924.2	.0	.0	44.01	51.87	.848	
13.25	34.0	.0	24.2	-20.2	-2041.7	.0	.0	44.07	51.51	.856	
8.25	34.0	.0	24.8	-21.1	-2162.5	.0	.0	44.13	50.86	.868	
3.25	34.0	.0	25.3	-21.9	-2286.7	.0	.0	44.17	50.22	.880	
.00	34.0	.0	25.3	-21.9	2369.2	.0	.0	44.19	49.80	.887	

DISPLACEMENTS

Zft.	--- DEFLECTION ft. ---				--- ROTATION, degrees ---			
	X	Y	Z	XY-Result	X	Y	Z	XY-Result
142.00	.00	10.08	-.52	10.08< 7.10%>	-8.63	.00	.00	8.63
129.00	.00	8.16	-.38	8.16< 6.33%>	-8.27	.00	.00	8.27
119.00	.00	6.77	-.28	6.77< 5.69%>	-7.64	.00	.00	7.64
.00	.00	.00	.00	.00< .00%>	.00	.00	.00	.00

SABRE COMMUNICATIONS CORP	JOB: 04-01048	19-Jan-04 13:37
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Sioux City, IA 51101	Canco Road, ME	Fx 712.258.8250

CASE - 2: Max Wind Load x.75

TIA/EIA-222F

VERTICAL OLF	1.00	WIND SPEED	95.3 mph 153.3 kph
ICE COVER	.50 in	GUST FACTOR	1.69
STRESS REDUCTION	.60	EXPOSURE COEFF.	.2857
STRESS AMPLIFY	1.33	Cf	.650
BASE ABOVE Grd	1.00 ft	REFERENCE HEIGHT	33.0 ft
		PRESSURE @Ref.Ht	39.3 psf 1879.Pa

APPURTENANCE LOADS

#	Qty	Description	Center Line Elev-Ft	WEIGHT each Lbs	AREA each Ft^2	Tx-CABLE		WIND Psf	FORCES		MOM. Lg-X Ft-K
						Type	Qty #/Ft		Tra-Y Kips	Ax-Z Kips	
- 1	1	10' LP Platform (12"-36")	142.0	1032	50.1			59.7	2.99	-1.0	-.7
	9	FV65-17-XXDP	144.0	38		1 5/8"	9 1.04	59.9		-1.7	
- 2	1	10' LP Platform (12"-36")	129.0	1032	50.1			58.1	2.91	-1.0	-.7
	9	FV65-17-XXDP	129.0	38		1 5/8"	9 1.04	58.1		-1.6	
- 3	1	10' LP Platform (12"-36")	119.0	1032	40.4			56.8	2.29	-1.0	-.6
	6	DB980H90	119.0	27		1 5/8"	6 1.04	56.8		-.9	

RESULTS

X,ft	WIND psf	--- FORCES,kips ---				---MOMENTS,ft-kips---			STRESS ALLOW		
		ShearX	ShearY	Axiaz	BendX	BendY	TorqZ	ksi	ksi	CSR	
144.00	39.0	.0	.1	.0	.0	.0	.0	.00	49.80	.000	
142.00	38.8	.0	3.5	-2.5	-.8	.0	.0	1.02	51.87	.020	
137.00	38.4	.0	3.8	-2.7	-18.5	.0	.0	7.03	51.87	.136	
132.00	38.0	.0	4.1	-2.9	-37.6	.0	.0	11.75	51.87	.227	
129.00	37.8	.0	7.5	-5.3	-50.5	.0	.0	14.50	51.87	.280	
124.00	37.3	.0	7.8	-5.6	-88.0	.0	.0	21.34	51.87	.411	
119.00	36.9	.0	10.6	-7.6	-127.6	.0	.0	26.80	51.87	.517	
114.00	36.5	.0	10.9	-7.9	-180.6	.0	.0	33.02	51.87	.637	
109.00	36.0	.0	11.3	-8.3	-235.3	.0	.0	37.88	51.87	.730	
104.00	35.5	.0	11.5	-8.6	-291.6	.0	.0	41.71	51.87	.804	
101.75	35.3	.0	11.7	-9.0	-317.5	.0	.0	43.14	51.87	.832	
98.50	35.0	.0	12.0	-9.6	-355.6	.0	.0	35.02	51.87	.675	
93.50	34.5	.0	12.4	-10.2	-415.8	.0	.0	36.81	51.87	.710	
88.50	33.9	.0	12.8	-10.7	-477.8	.0	.0	38.22	51.87	.737	
83.50	33.4	.0	13.2	-11.3	-541.9	.0	.0	39.36	51.87	.759	
78.50	32.8	.0	13.6	-11.9	-608.0	.0	.0	40.29	51.87	.777	
73.50	32.2	.0	14.0	-12.5	-676.1	.0	.0	41.03	51.87	.791	
68.50	31.6	.0	14.4	-13.1	-746.2	.0	.0	41.62	51.87	.802	
63.50	30.9	.0	14.9	-13.8	-818.4	.0	.0	42.12	51.87	.812	
58.50	30.2	.0	15.3	-14.4	-892.5	.0	.0	42.52	51.87	.820	
53.50	29.5	.0	15.5	-14.8	-969.2	.0	.0	42.84	51.87	.826	
53.25	29.4	.0	15.8	-15.5	-973.3	.0	.0	42.88	51.87	.827	
48.25	28.6	.0	16.2	-16.8	-1052.5	.0	.0	35.63	51.87	.687	
43.25	27.8	.0	16.7	-17.8	-1133.3	.0	.0	35.77	51.87	.690	
38.25	26.8	.0	17.1	-18.7	-1216.7	.0	.0	35.88	51.87	.692	
33.25	25.8	.0	17.5	-19.6	-1301.7	.0	.0	35.96	51.87	.693	
28.25	25.5	.0	18.0	-20.5	-1390.0	.0	.0	36.03	51.87	.695	
23.25	25.5	.0	18.4	-21.5	-1479.2	.0	.0	36.06	51.87	.695	
18.25	25.5	.0	18.9	-22.5	-1571.7	.0	.0	36.10	51.87	.696	
13.25	25.5	.0	19.3	-23.5	-1665.8	.0	.0	36.11	51.51	.701	
8.25	25.5	.0	19.8	-24.6	-1762.5	.0	.0	36.12	50.86	.710	
3.25	25.5	.0	20.2	-25.5	-1860.8	.0	.0	36.10	50.22	.719	
.00	25.5	.0	20.2	-25.5	1926.7	.0	.0	36.08	49.80	.725	

DISPLACEMENTS

Zft.	-----DEFLECTION ft.-----				-----ROTATION, degrees-----			
	X	Y	Z	XY-Result	X	Y	Z	XY-Result
142.00	.00	8.31	-.36	8.31< 5.85%>	-7.14	.00	.00	7.14
129.00	.00	6.72	-.26	6.72< 5.21%>	-6.84	.00	.00	6.84
119.00	.00	5.57	-.19	5.57< 4.68%>	-6.31	.00	.00	6.31
.00	.00	.00	.00	.00< .00%>	.00	.00	.00	.00

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CASE - 3: Everyday Operating

TIA/EIA-222F

VERTICAL OLF	1.00	WIND SPEED	50.0 mph 80.5 kph
ICE COVER	.00 in	GUST FACTOR	1.69
STRESS REDUCTION	.60	EXPOSURE COEFF.	.2857
STRESS AMPLIFY	1.33	Cf	.650
BASE ABOVE Grd	1.00 ft	REFERENCE HEIGHT	33.0 ft
		PRESSURE @Ref.Ht	10.8 psf 518.Pa

APPURTENANCE LOADS

#	Qty	Description	Center Line Elev-Ft	WEIGHT each Lbs	AREA each Ft^2	Tx-CABLE		WIND Psf	FORCES		MOM. Lg-X Ft-K
						Type	Qty #/Ft		Tra-Y Kips	Ax-Z Kips	
- 1	1	10' LP Platform (12"-36")	142.0	938	45.5			16.4	.75	-.9	-.2
	9	FV65-17-XXDP	144.0	18		1 5/8"	9 1.04	16.5		-1.5	
- 2	1	10' LP Platform (12"-36")	129.0	938	45.5			16.0	.73	-.9	-.2
	9	FV65-17-XXDP	129.0	18		1 5/8"	9 1.04	16.0		-1.4	
- 3	1	10' LP Platform (12"-36")	119.0	938	36.3			15.6	.57	-.9	-.1
	6	DB980H90	119.0	8		1 5/8"	6 1.04	15.6		-.8	

RESULTS

X,ft	WIND psf	--- FORCES, kips ---				--- MOMENTS, ft-kips ---			STRESS ALLOW		CSR
		ShearX	ShearY	Axiaz	BendX	BendY	TorqZ	ksi	ksi		
144.00	10.7	.0	.0	.0	.0	.0	.0	.00	49.80	.000	
142.00	10.7	.0	.9	-2.5	-.2	.0	.0	.45	51.87	.009	
137.00	10.6	.0	1.0	-2.7	-4.6	.0	.0	1.98	51.87	.038	
132.00	10.5	.0	1.0	-2.8	-9.4	.0	.0	3.16	51.87	.061	
129.00	10.4	.0	1.9	-5.2	-12.6	.0	.0	4.01	51.87	.077	
124.00	10.3	.0	2.0	-5.4	-22.0	.0	.0	5.71	51.87	.110	
119.00	10.2	.0	2.7	-7.4	-32.0	.0	.0	7.17	51.87	.138	
114.00	10.0	.0	2.7	-7.6	-45.2	.0	.0	8.71	51.87	.168	
109.00	9.9	.0	2.8	-7.8	-58.9	.0	.0	9.91	51.87	.191	
104.00	9.8	.0	2.9	-8.0	-73.1	.0	.0	10.86	51.87	.209	
101.75	9.7	.0	2.9	-8.3	-79.6	.0	.0	11.23	51.87	.216	
98.50	9.6	.0	3.0	-8.7	-89.2	.0	.0	9.10	51.87	.175	
93.50	9.5	.0	3.1	-9.2	-104.3	.0	.0	9.55	51.87	.184	
88.50	9.3	.0	3.2	-9.6	-120.0	.0	.0	9.91	51.87	.191	
83.50	9.2	.0	3.3	-10.0	-136.2	.0	.0	10.20	51.87	.197	
78.50	9.0	.0	3.5	-10.4	-152.9	.0	.0	10.44	51.87	.201	
73.50	8.9	.0	3.6	-10.8	-170.2	.0	.0	10.63	51.87	.205	
68.50	8.7	.0	3.7	-11.3	-188.1	.0	.0	10.79	51.87	.208	
63.50	8.5	.0	3.8	-11.7	-206.4	.0	.0	10.93	51.87	.211	
58.50	8.3	.0	3.9	-12.2	-225.4	.0	.0	11.04	51.87	.213	
53.50	8.1	.0	4.0	-12.5	-245.0	.0	.0	11.13	51.87	.215	
53.25	8.1	.0	4.0	-13.1	-246.0	.0	.0	11.15	51.87	.215	
48.25	7.9	.0	4.2	-14.1	-266.3	.0	.0	9.28	51.87	.179	
43.25	7.6	.0	4.3	-15.0	-287.1	.0	.0	9.33	51.87	.180	
38.25	7.4	.0	4.4	-15.6	-308.5	.0	.0	9.37	51.87	.181	
33.25	7.1	.0	4.5	-16.4	-330.5	.0	.0	9.40	51.87	.181	
28.25	7.0	.0	4.6	-17.1	-353.2	.0	.0	9.43	51.87	.182	
23.25	7.0	.0	4.8	-17.9	-376.3	.0	.0	9.45	51.87	.182	
18.25	7.0	.0	4.9	-18.6	-400.2	.0	.0	9.47	51.87	.183	
13.25	7.0	.0	5.0	-19.5	-424.6	.0	.0	9.49	51.51	.184	
8.25	7.0	.0	5.2	-20.3	-449.8	.0	.0	9.51	50.86	.187	
3.25	7.0	.0	5.3	-21.0	-475.5	.0	.0	9.51	50.22	.189	
.00	7.0	.0	5.3	-21.0	492.6	.0	.0	9.51	49.80	.191	

DISPLACEMENTS

Zft.	--- DEFLECTION ft. ---				--- ROTATION, degrees ---				MicroW Allow
	X	Y	Z	XY-Result	X	Y	Z	XY-Result	
142.00	.00	2.10	-.02	2.10< 1.48%>	-1.80	.00	.00	1.80	
129.00	.00	1.70	-.02	1.70< 1.32%>	-1.72	.00	.00	1.72	
119.00	.00	1.41	-.01	1.41< 1.19%>	-1.59	.00	.00	1.59	
.00	.00	.00	.00	.00< .00%>	.00	.00	.00	.00	

SABRE COMMUNICATIONS CORP
 2101 Murray Street
 Sioux City, IA 51101

JOB: 04-01048
US CELLULAR
Canco Road, ME

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 Fx 712.258.8250

LOAD CASE SUMMARIES

LOAD CASE DESCRIPTION	FORCES, kips			MOMENTS, ft-kips		
	X	Y	Z	X	Y	Z
1 Max Wind	.00	25.34	-21.88	2369.2	.0	.0
2 Max Wind Load x.75	.00	20.18	-25.45	1926.7	.0	.0
3 Everyday Operating	.00	5.26	-20.98	492.6	.0	.0

STRESS ENVELOPE

BOT-UP X,ft.	TOP DOWN		+-----COMBINED-----+	STRESS ksi	STRESS RATIO	LOAD CASE Qty	APPURTENANCE
144.00	.00	TOP		.00	.000	1	
142.00	2.00	- 1	-P1	1.14	.022	1	(1) 10' LP Platform (12"-36")
137.00	7.00			8.29	.160	1	
132.00	12.00			13.95	.269	1	
129.00	15.00	- 2	-P2	17.16	.331	1	(1) 10' LP Platform (12"-36")
124.00	20.00			25.36	.489	1	
119.00	25.00	- 3	-P3	31.89	.615	1	(1) 10' LP Platform (12"-36")
114.00	30.00			39.35	.759	1	
109.00	35.00			45.21	.872	1	
104.00	40.00			49.85	.961	1	
101.75	42.25	Slip-B1		51.59	.995	1	
98.50	45.50	Slip-T2		41.91	.808	1	
93.50	50.50			44.10	.850	1	
88.50	55.50			45.85	.884	1	
83.50	60.50			47.28	.912	1	
78.50	65.50			48.45	.934	1	
73.50	70.50			49.40	.952	1	
68.50	75.50			50.16	.967	1	
63.50	80.50			50.85	.980	1	
58.50	85.50			51.38	.991	1	
53.50	90.50			51.83	.999	1	
53.25	90.75	Slip-B2		51.87	1.000	1	
48.25	95.75	Slip-T3		43.14	.832	1	
43.25	100.75			43.36	.836	1	
38.25	105.75			43.56	.840	1	
33.25	110.75			43.70	.843	1	
28.25	115.75			43.83	.845	1	
23.25	120.75			43.93	.847	1	
18.25	125.75			44.01	.848	1	
13.25	130.75			44.07	.856	1	
8.25	135.75			44.13	.868	1	
3.25	140.75			44.17	.880	1	
.00	144.00	BASE		44.19	.887	1	

SABRE COMMUNICATIONS CORP
2101 Murray Street
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SHAPE: 18 SIDED POLYGON with FLAT-FLAT ORIENTATION
BOLTS EVENLY SPACED 17.92 in. ON CENTER

POLE DATA

DIAMETER =	51.40 in.	BASE	AXIAL FORCE=	-21.9 kips	Vert
PLATE =	.3125 in.	ACTIONS	SHEAR X =	.0 kips	Long
TAPER =	.2710 in/ft		SHEAR Y =	25.3 kips	Tran
POLE Fy =	65.00 ksi		X-AXIS MOM =	1675.0 ft-kips	Tran
			Y-AXIS MOM =	1675.0 ft-kips	Long
			Z-AXIS MOM =	.0 ft-kips	Vert

DESIGN CASE = 1 Max Wind

Design: ANY Orientation Reactions at 45.00 deg to X-AXIS

BOLT LOADS

AXIAL - COMPRESSION	=	188.66 kips	
AXIAL - TENSION	=	184.28 kips	
SHEAR	=	2.53 kips	
AXIAL STRESS	=	58.05 ksi	
SHEAR STRESS	=	.83 ksi	
YIELD STRENGTH Fy	=	75.00 ksi	CSR
ALLOW STRENGTH Fa [.60 x 1.33]	=	59.85 ksi	.970 EIA-F
TENSION AREA REQUIRED	=	3.15 in ²	
TENSION AREA FURNISHED	=	3.25 in ²	
ROOT AREA FURNISHED	=	3.07 in ²	

ANCHOR BOLT DESIGN USED

10 Bolts on a	58.00 in. Bolt Circle	SHIP
2.250 in. Diameter	67.13 in. Embedded	(lbs)
12.00 in. Exposed	84.00 in. Total Length	1520

CONCRETE BOND - Fc= 4000 psi

ANCHOR BOLTS are STRAIGHT w\ UPLIFT NUT

BASE PLATE

[Bend Model: 1/4 Circ]
YIELD STRENGTH = 60.0 ksi
BEND LINE WIDTH = 32.6 in.
PLATE MOMENT = 1138.9 in-kips
THICKNESS REQD = 2.091 in.
BENDING STRESS = 41.4 ksi
ALLOWABLE = 47.9 ksi
[Fy x .60 x 1.33]

BASE PLATE USED

2.25 in. THICK	
64.00 in. ROUND	SHIP
38.00 in. CENTER HOLE	(lbs)
.00 in.	1289

LOAD CASE SUMMARY

	FORCES-(kips)			MOMENTS-(ft-k)			ABolt-Str		Plate-Str		Design Code
	LC Axial	ShearX	ShearY	X-axis	Y-axis	TorQ	Actual	Allow	Actual	Allow	
1	21.9	.0	25.3	2369	0	.0	-58.1	59.9	41.4	47.9	EIA-F
2	25.5	.0	20.2	1926	0	.0	-47.5	59.9	33.8	47.9	EIA-F
3	21.0	.0	5.3	492	0	.0	-12.6	59.9	9.0	47.9	EIA-F

MAT FOUNDATION DESIGN BY SABRE COMMUNICATIONS CORP.
 145' Monopole US CELLULAR Canco Road, ME (04-01048) 1-19-04 JV

Overall Loads:			
Moment (ft-kips)	2369.17		
Axial (kips)	21.88		
Shear (kips)	25.34		
Allowable Bearing Pressure (ksf)	8	Maximum Soil Bearing Pressure (ksf)	1.60
Water Table Below Grade (ft)	999		
Width of Mat (ft)	22		
Thickness of Mat (ft)	2		
Depth to Bottom of Slab (ft)	5.5		
Quantity of Bars in Bolt Circle	10		
Bolt Circle Diameter (in)	58		
Top of Concrete to Top of Bottom Threads (in)	60		
Diameter of Pier (ft)	7	Minimum Pier Diameter (ft)	6.33
Ht. of Pier Above Ground (ft)	1	Equivalent Square b (ft)	6.20
Ht. of Pier Below Ground (ft)	3.5		
Quantity of Bars in Mat	33		
Bar Diameter in Mat (in)	1		
Area of Bars in Mat (in ²)	25.92		
Spacing of Bars in Mat (in)	8.03	Recommended Spacing (in)	6 to 12
Quantity of Bars Pier	36		
Bar Diameter in Pier (in)	1		
Tie Bar Diameter in Pier (in)	0.5		
Spacing of Ties (in)	12		
Area of Bars in Pier (in ²)	28.27	Minimum Pier A _s (in ²)	27.71
Spacing of Bars in Pier (in)	6.63	Recommended Spacing (in)	6 to 12
f _c (ksi)	4		
f _y (ksi)	60		
Unit Wt. of Soil (kcf)	0.1		
Unit Wt. of Concrete (kcf)	0.15		
Load Factor	1.3		
Volume of Concrete (yd ³)	42.27		
Two-Way Shear Action:			
Average d (in)	20		
φV _c (kips)	1239.8	V _u (kips)	33.3
φV _c = φ(2 + 4/β _c)f _c ^{1/2} b _o d	1859.8		
φV _c = φ(α _s d/b _o + 2)f _c ^{1/2} b _o d	1378.9		
φV _c = φ4f _c ^{1/2} b _o d	1239.8		
Shear perimeter, b _o (in)	326.73		
β _c	1		
One-Way Shear:			
q _{ult} (ksf)	1.95		
φV _c (kips)	500.9	V _u (kips)	267.1
Stability:			
Allowable Resisting M (ft-k)	2559.2	Total Applied M (ft-k)	2533.9

MAT FOUNDATION DESIGN BY SABRE COMMUNICATIONS CORP. (CONTINUED)

145' Monopole US CELLULAR Canco Road, ME (04-01048) 1-19-04 JV

Pier Design:

ϕV_n (kips)	536.6	V_u (kips)	32.9
$\phi V_c = \phi 2(1 + N_u / (2000 A_g)) f'_c{}^{1/2} b_w d$	536.6		
V_s (kips)	0.0	*** V_s max = $4 f'_c{}^{1/2} b_w d$ (kips)	1428.0
Maximum Spacing (in)	5.61	(Only if Shear Ties are Required)	

*** Ref. To Spacing Requirements ACI 11.5.4.3

Flexure in Slab:

ϕM_n (ft-kips)	2231.6	M_u (ft-kips)	2169.1
a (in)	1.73		
Steel Ratio	0.00491		
β_1	0.85		
Maximum Steel Ratio (.75 ρ_b)	0.0214		
Minimum Steel Ratio	0.0018		
Rebar Development in Pad (in)	129.00	Required Development in Pad (in)	46.04

Condition	1 is OK, 0 Fails
Maximum Soil Bearing Pressure	1
Pier Area of Steel	1
Pier Shear	1
Interaction Diagram Visual Check	1
Two-Way Shear Action	1
One-Way Shear Action	1
Stability (Safety Factor = 1.5)	1
Flexure	1
Steel Ratio	1
Length of Development in Pad	1



LCC International, Inc.
 482 Congress Street
 Portland, ME 04101
 (207) 771-9992 (Office)
 (207) 771-9993 (Fax)

October 29, 2003

Gilbert Congdon
 141 Prospect Street
 Portland, ME 04103

Re: Site # 853334.2

Dear Gilbert Congdon,

LCC has been contracted by US Cellular to design, develop and deploy their new PCS network in York, Cumberland and Sagadahoc Counties. As part of LCC's scope of work, we negotiate leases on behalf of our client, to secure space to construct repeater sites. When we reach a point in lease negotiations where both parties (land owner and US Cellular) are in agreement on lease terms and language, we initiate the building permit process to determine if and when the lease will commence.

At this time we are in good faith negotiations with you and feel we will consummate our deal on your property in a relatively short period. We would like to request your permission to apply for all regulatory approvals required (including, but not limited to; zoning permit, building permit, FAA and FCC filings) to build our repeater site on your property. By granting your approval, you are not contractually binding yourself to any lease contract that has not been fully executed to date. Please signify your consent to grant LCC permission to file for necessary permits for constructing a repeater site on your property by signing below.

Thank You,

A handwritten signature in black ink, appearing to read 'Tom Powell', written over a horizontal line.

Thomas W. Powell
 Program Manager
 LCCI, Inc.

A handwritten signature in black ink, appearing to read 'Gilbert Congdon', written over a horizontal line.

Gilbert Congdon
 Property Owner
 52 Canco Road
 Portland, ME 04103

President "Congdon"



S.W. COLE
ENGINEERING, INC.

• Geotechnical Engineering • Field & Lab Testing • Scientific & Environmental Consulting

03-0351.2

December 19, 2003

Oest Associates, Inc.
Attention: Michael Deletetsky
343 Gorham Road
South Portland, Maine 04106-2317

853334.2

Subject: Geotechnical Engineering Services
Proposed Communications Tower
52 Canco Road
Portland, Maine

Dear Mr. Deletetsky:

In accordance with our Agreement dated November 24, 2003, we have made a subsurface investigation at the site of the proposed communications tower at 52 Canco Road in Portland, Maine. The purpose of the investigation was to obtain subsurface information in order to provide recommendations relative to foundation design and earthwork associated with the proposed construction. The contents of this report are subject to the limitations set forth in Attachment A.

PROPOSED CONSTRUCTION

We understand that the project includes construction of a 150 foot, monopole communications tower. The proposed site is currently moderately wooded with small deciduous trees. Standing water was observed in low lying areas near the abandoned railroad tracks and bedrock outcrops were evident in all directions.

EXPLORATION AND TESTING

One test boring was made at the site on December 13, 2003, by Great Works Test Boring, Inc. of Rollinsford, New Hampshire. The exploration location was selected and established in the field by Oest Associates, Inc. The approximate location of the exploration is shown on the "Exploration Location Plan" attached as Sheet 1. A test boring log is attached as Sheet 2. A key to the notes and symbols used on the log is attached as Sheet 3.

AUGUSTA, ME OFFICE

555 Eastern Avenue, Augusta, ME 04301-5000 ■ Tel (207) 626-0700 ■ Fax (207) 626-0700 ■ E-Mail infoaugusta@swcole.com ■ www.swcole.com

Other offices in Bangor, Caribou and Gray, Maine & Somersworth, New Hampshire

Laboratory testing was performed on a representative sample of the rock core recovered from the test boring. Unit weight and unconfined compressive strength results are noted on the log.

SUBSURFACE CONDITIONS

Test Boring B-1 was made in the center of the proposed communication tower. Test Boring B-1 encountered 6 inches of dark brown forest duff overlying 0.8 feet of loose gravelly silty sand. Weathered rock was encountered from 1.5 to 2.5 feet. Boring B-1 encountered a refusal surface at 2.5 feet and was advanced using a roller cone to 3.0 feet. A bedrock sample was obtained from a depth interval of 3 to 8 feet using a rock core barrel. The bedrock sample obtained was classified as gray Mica Schist with calcite bands with a rock quality designation (RQD) of 18 percent.

Groundwater was not observed in the exploration at the time of drilling work. Long term groundwater information is not available.

EVALUATION AND RECOMMENDATIONS

The site of the proposed communications tower is underlain by shallow highly weathered bedrock of very poor quality.

Based on the subsurface findings, we recommend that the foundation be founded on bedrock at a depth of at least 5 feet below existing grade. We recommend that foundation design consider the following:

- Design Frost Depth for Portland, Maine 4.5 feet
- Allowable bearing pressure 8ksf (fractured bedrock)
- Base friction factor 0.60 (mass concrete to fractured bedrock)

Excavations to footing grade should be clean of all organic, overburden soils and loose weathered rock. The rock surface should be cleaned with compressed air and cracks greater than ¼ inch should be filled with non-shrink slurry grout. Foundations bearing on properly prepared rock may be cast directly on the rock surface. We recommend that foundation backfill soils consist of clean granular material meeting the gradation for Select Fill as follows:

SELECT FILL	
Sieve Size	Percent Finer by Weight
4 inch	100
3 inch	90 to 100
1/4 inch	25 to 90
# 40	0 to 30
# 200	0 to 5

Fill should be placed in horizontal lifts and be compacted to at least 92 percent of its maximum dry density in accordance with ASTM D-1557.

Rock anchors (if needed) could be used in conjunction with the foundation to provide additional resistance to imposed shear and overturning loads. Based on geologic conditions encountered at the explorations, we recommend the use of prestressed double corrosion protection grouted rock anchors. We offer the following parameters for design consideration:

- RQD = 18% (see rock core log)
- Dry unit weight = 142 pcf
- Ultimate shear strength = 900 psf
- Rock cone pull-out angle = 60 degrees
- Ultimate rock/grout bond strength = 160 psi

Rock anchors installed in groups should be designed with consideration of pullout resistance from overlapping failure surfaces. We recommend a center-to-center spacing of at least 1.2 times the unbounded length for rock anchors installed in groups. If anchors are installed in groups spaced closer than 1.2 times the unbounded length, we request that S. W. COLE ENGINEERING, INC. be permitted to review the design.

The borehole for each rock anchor should be cleaned of drilling fines and tightness tested to determine the need for pregrouting. Rock anchors should be installed according to the manufacture's recommendations. Additionally, each anchor should be tested to verify the load carrying capacity of the anchor and to preload the steel tendon. After testing, we recommend locking off each anchor at the allowable design load.

It is recommended that S. W. COLE ENGINEERING, INC. be retained to provide supplemental engineering and testing services during the excavation and foundation phases of the work. An S. W. COLE ENGINEERING, INC. representative should be on-site to observe rock anchor installation and testing, subgrade conditions prior to concrete placement, as well as, sampling and testing of concrete, soil, and grout. S. W. COLE ENGINEERING, INC. can coordinate the testing of rock anchors, if needed.

These and other testing elements are to observe compliance with the design concepts, specifications, and design recommendations and to allow design changes in the event that subsurface conditions are found to differ from those anticipated prior to the start of construction.

CLOSURE

We request that S.W. COLE ENGINEERING, INC. be provided the opportunity to review the final design and specifications to determine that our earthwork and foundation recommendations have been properly interpreted and implemented. We would be pleased to provide a scope of services for field and laboratory materials testing services.

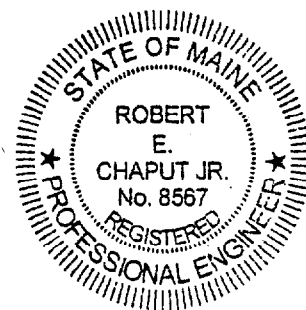
It has been a pleasure to be of assistance to you with this phase of your project. If you have any questions or if we may be of further assistance, please do not hesitate to contact us.

Very truly yours,

S.W. COLE ENGINEERING, INC.



Robert E. Chaput, Jr., P.E.
Senior Geotechnical Engineer



REC:kml

P:\Swc-2003\03-0351\03-0351 Report.doc

ATTACHMENT A LIMITATIONS

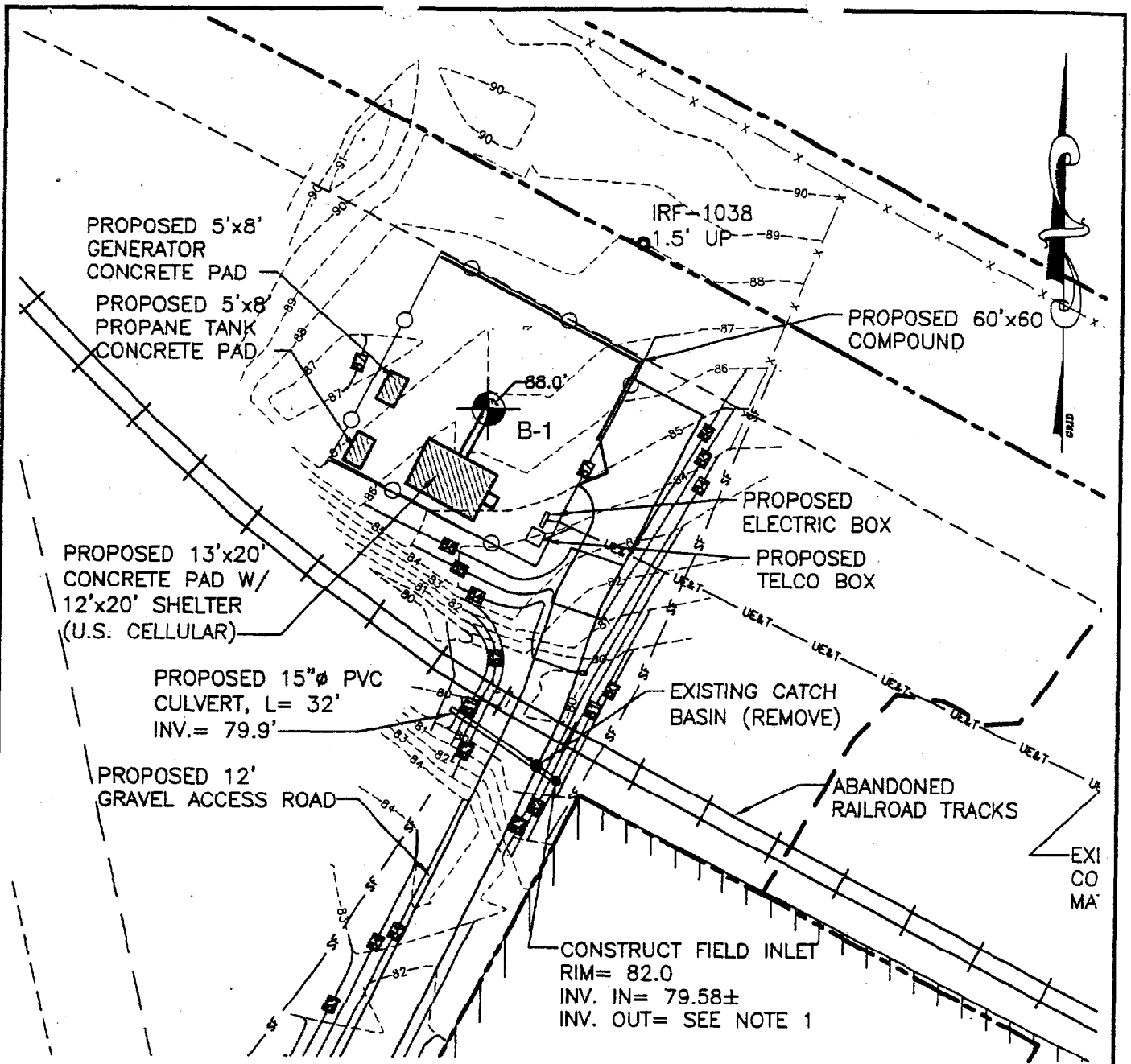
This report has been prepared for the exclusive use of Oest Associates, Inc. for specific application to the Proposed Communications Tower at 52 Canco Road in Portland, Maine. S. W. COLE ENGINEERING, INC. has endeavored to conduct the work in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S. W. COLE ENGINEERING, INC. should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless the changes are reviewed by S. W. COLE ENGINEERING, INC.



LEGEND



BORING LOCATION

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM A 1"=30' SCALE PLAN OF THE SITE ENTITLED "SITE PLAN," PREPARED BY OEST ASSOCIATES, INC., DATED 12/01/03.
2. THE LOCATION OF THE BORING WAS SELECTED IN THE FIELD BY OEST ASSOCIATES, INC.



S.W. COLE
ENGINEERING, INC.

OEST ASSOCIATES, INC.

EXPLORATION LOCATION PLAN
PROPOSED COMMUNICATIONS TOWER
52 CANCO ROAD
PORTLAND, MAINE

Job No. 03-0351.2
Date: 12/19/03

Scale 1"=40'
Sheet 1

OEST ASSOCIATES, INC. 1000 W. 10TH AVENUE, SUITE 100, DENVER, CO 80202-1000
 TEL: 303.733.1100 FAX: 303.733.1101 WWW.OESTASSOCIATES.COM
 OEST ASSOCIATES, INC. 1000 W. 10TH AVENUE, SUITE 100, DENVER, CO 80202-1000
 TEL: 303.733.1100 FAX: 303.733.1101 WWW.OESTASSOCIATES.COM



BORING LOG

BORING NO.: B-1
 SHEET: 1 OF 1
 PROJECT NO.: 03-0351.2
 DATE START: 12/13/2003
 DATE FINISH: 12/13/2003
 ELEVATION: 86.5'+
 SWC REP.: A. SIMMONS

PROJECT / CLIENT: COMMUNICATION TOWER / OEST ASSOCIATES
 LOCATION: 52 CANCO RD. PORTLAND, MAINE
 DRILLING CO.: GREAT WORKS TEST BORING, INC DRILLER: JEFF LEE

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN	300 LB	30 IN
SAMPLER:	SS	1 3/8 IN	140 LB	30 IN
CORE BARREL:				

WATER LEVEL INFORMATION
 NO FREE WATER ENCOUNTERED

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									6"	DARK BROWN FOREST DUFF
	1D	15"	14"	1.3'	1	1	25/3"		1.3'	BROWN GRAVELLY SILTY SAND - LOOSE -
									2.5'	WEATHERED ROCK
	IR	60"	39"	8.0'	RQD = 18%				8.0'	GRAY MICA SCHIST WITH CALCITE BANDS (BEDROCK) FRACTURES @ 0 TO 45 DEGREES FROM THE HORIZONTAL HIGHLY WEATHERED, SOFT, VERY POOR ROCK QUALITY $\gamma_r = 142$ PCF $q_u = 2.3$ TO 4.1 KSI
										BOTTOM OF EXPLORATION @ 8.0 FEET

SAMPLES: SOIL CLASSIFIED BY: REMARKS:

D = SPLIT SPOON
 C = 3" SHELBY TUBE
 U = 3.5" SHELBY TUBE

DRILLER - VISUALLY
 SOIL TECH. - VISUALLY
 LABORATORY TEST

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

2

BORING NO.: B-1



KEY TO THE NOTES & SYMBOLS
Test Boring and Test Pit Explorations

All stratification lines represent the approximate boundary between soil types and the transition may be gradual.

Key to Symbols Used:

- w - water content, percent (dry weight basis)
- q_u - unconfined compressive strength, kips/sq. ft. - based on laboratory unconfined compressive test
- S_v - field vane shear strength, kips/sq. ft.
- L_v - lab vane shear strength, kips/sq. ft.
- q_p - unconfined compressive strength, kips/sq. ft. based on pocket penetrometer test
- O - organic content, percent (dry weight basis)
- W_L - liquid limit - Atterberg test
- W_P - plastic limit - Atterberg test
- WOH - advance by weight of hammer
- WOM - advance by weight of man
- WOR - advance by weight of rods
- HYD - advance by force of hydraulic piston on drill
- RQD - Rock Quality Designator - an index of the quality of a rock mass. RQD is computed from recovered core samples.
- γ_T - total soil weight
- γ_B - buoyant soil weight

Description of Proportions:

- 0 to 5% TRACE
- 5 to 12% SOME
- 12 to 35% "Y"
- 35+% AND

REFUSAL: Test Boring Explorations - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

REFUSAL: Test Pit Explorations - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.