City of Bandon

555 Hwy 101, PO Box 67
Bandon, OR 97411
(541) 347-2437
Bandon by the Sea

AGENDA REPORT

TO: Honorable Mayor and Members of the City Council

FROM: Torrey Contreras, City Manager TC

DATE: January 9, 2024

SUBJECT: **4.0 BANDON RURAL FIRE PROTECTION DISTRICT RADIO COMMUNICATIONS TOWER PROJECT PROPOSAL**

BACKGROUND:

This item is being presented to the City Council for informational and transparency purposes. Since the subject property is located beyond the City's jurisdictional boundaries, City Council land use approval is not required for this project.

In May of 2020, a Coos County tax levy was passed by the voters to provide funding to upgrade the County radio system that provides vital communications to emergency services throughout the County. The Radio Communications Tower Project involves the collaboration of the Fire District, Local Police, Emergency Medical Services (EMS), and the Coos Forest Protective Association. Coden Communications has been retained to complete the project, which includes upgrading existing radio sites, as well as constructing new sites as required to improve emergency communications. Accordingly, a new radio communications tower is being proposed for the Bandon area. The proposed tower is intended to significantly improve radio coverage for both the Fire District and the Bandon Police Department.

The Fire District is proposing the installation of a new 140-foot mono-pole style communications tower to be located behind the main fire station at 50530 HWY 101 South. The new communications tower and improved radio system is designed to correct existing gaps in coverage and will further enhance emergency services that are provided for the Bandon community (see Attachment – Radio Communications Tower Project Proposal).

FISCAL IMPACT

As the project is funded by tax revenue generated by the levy that was passed in May of 2020, there is no direct monetary cost to the City for the purchase and installation of the radio communications tower. Further, because the project is being managed and facilitated by the Fire District, no City staffing resources will be used to complete the project.

RECOMMENDATION

It is recommended that the City Council receive and file this report.

Attachment: Radio Communications Tower Project Proposal

BANDON RURAL FIRE PROTECTION DISTRICT

RADIO COMMUNICATIONS TOWER PROJECT PROPOSAL

BANDON FIRE MAIN STATION

50530 HWY 101 SOUTH

BANDON, OR 97411

BANDON RURAL FIRE DISTRICT

NICK SIEWELL, OPERATIONS CHIEF

P.O. BOX 1467 BANDON, OR 97411

EMAIL-nicksiewell@gmail.com PHONE-(541) 404-7632

To whom it may concern,

In May 2020 a county tax levy was passed by the voters to provide funding to upgrade the county radio system that provides vital communication to emergency services throughout Coos County. Representatives from local agencies to include Fire, Police, EMS and the Coos Forest Protective Association have been overseeing the project that was awarded to a company by the name of Codan Communications. The project includes upgrading existing radio sites as well as construction of new sites as necessary. After completion of the project, radio service did improve throughout the county with the exception of Bandon and the surrounding areas. With the lack of coverage in the Bandon area fire department pager reception has been less than adequate. Portable radio coverage is also a big issue for all emergency services to include the Bandon Police Department that rely on radio coverage to not only receive calls but request additional help in situations that could result in injury or death to an officer.

Bandon Rural Fire District recognizes that this issue creates a life safety issue for all public safety responders as well as the citizens that we serve and protect. We are proposing an additional site to include a 140' Monopole style tower located behind the main fire station at 50530 HWY 101 South. It is believed that this addition to the radio system will correct the discussed issues and provide something we believe could make the difference in emergency situations.

The tower is purchased through a company by the name of Valmont. The foundation work and pole construction will be completed by Ace Communications. Please see all included information for more details specific to tower and construction including completed site soil survey.

I hope that I have expressed what we here at Bandon Fire feel is a critical need to our local emergency services. I encourage you to reach out with any questions or concerns that you might have.

Thank you for your time,

Nick Siewell
Bandon Rural Fire District

Coos Forest Protective Association

63612 Fifth Road
Coos Bay, Oregon 97420

TELEPHONE
(541) 267-3161

FAX
(541) 266-8452

City of Bandon
555 Highway 101
Bandon, OR 97411

December 8, 2023

To Whom it May Concern,

Coos County has a collaborative partnership with Coos Forest Protective Association (CFPA), City of Coos Bay, City of North Bend, all County Fire Departments and Coos County Sheriff's office that has worked together to build out a new 911 First Responder radio System. This work has been ongoing since 2018.

In the spring of 2020, Coos County voters passed a levy to fund the replacement of the aging/failing 911 public safety radio system used by all Coos County First Responders (Police, Fire, Medical). The collaborative as worked since 2020 with Codan/Zetron to engineer, secure all new equipment and install the new system at all hilltops locations. This new system includes five additional CFPA hilltops that helped enhance the finished project for all citizens and first responders in Coos County.

The performance of the new system is excellent. Bandon and the surrounding area have been identified as one area where coverage for our first responders could be better. This was originally engineered by Codan/Zetron, and the Bandon site has yet to be completed.

Currently, the partnership is working at getting approvals for the proposed communication site at the Bandon Fire Department. This includes a 140' mono-tower, radio LMR and connectivity at the site to simulcast the signal across Coos County.

This letter is to inform the City of Bandon of our need to complete the Bandon radio communication site for public safety and the safety of all our first responders. CFPA is available to answer any questions or participate in any meetings to assure that the project fits with the needs of Bandon.

Respectfully submitted,

Michael E Robison
District Manager
Coos Forest Protective Association

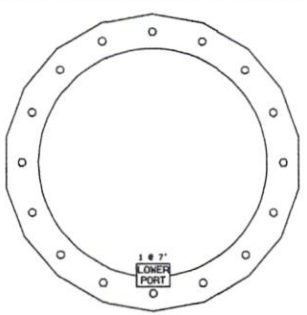

Proposed Communication Tower

valmont

STRUCTURES

Intermediate Designer: JORGE ORTIZ

COMMUNICATION POLE RECORD DRAWINGS



THE LOWER HANDHOLE ORIENTATIONS ARE SHOWN ABOVE TO AID IN THE INSTALLATION PROCESS

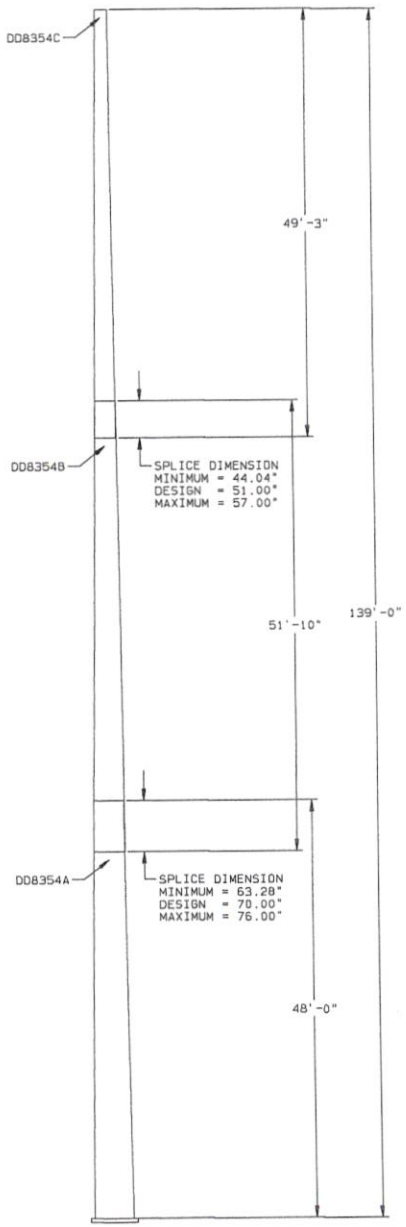
ORIENTATION INDEX

INDEX OF DRAWINGS

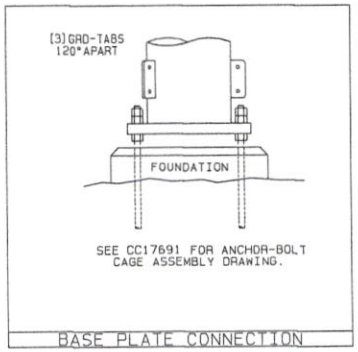
DESCRIPTION	DRAWING #	DESCRIPTION	DRAWING #
POLE ASSEMBLY	DD8354Z	ANCHOR BOLT CAGE ASSEMBLY	CC17691
SECTION ASSEMBLY	DD8354A	CAGE PLATE	BD43955
SECTION ASSEMBLY	DD8354B	LIGHTNING ROD KIT 4'-21' LONG	BD28242
SECTION ASSEMBLY	DD8354C	150FT SP1 SAFETY CLIMB KIT	AC16560

Valmont Industries, Inc.
7002 North 288th Street
P.O. Box 358
Valley, NE 68064-0358 USA
Ph: 402-359-2201
Fax: 402-359-4025

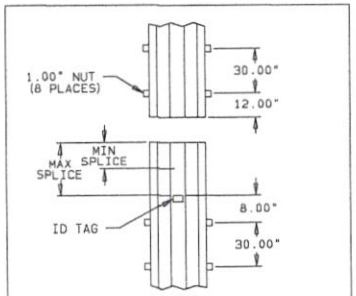
BANDON RURAL FIRE DISTRICT
VALMONT ORDER# 575746-P1
SITE: BANDON, OR
POLE HEIGHT: 139'-0"



ELEVATION VIEW
SEE FABRICATION DRAWINGS FOR ADDITIONAL DETAILS

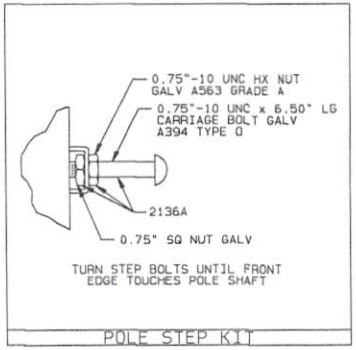


BASE PLATE CONNECTION

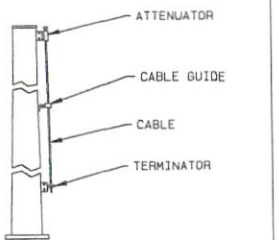


REFER TO ELEVATION VIEW FOR MINIMUM AND MAXIMUM SPLICE VALUES.

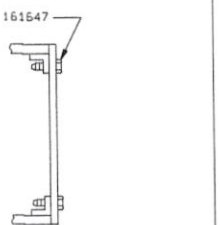
SPLICE CONNECTION



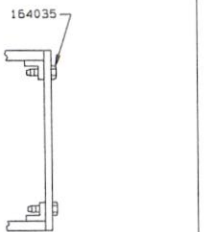
POLE STEP KIT



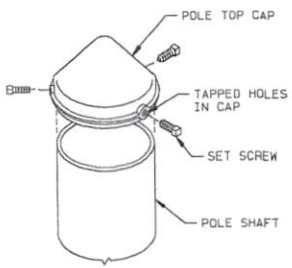
SAFETY CLIMB ASSEMBLY



9 X 24 HEAVY COVERS



HANDHOLE COVERS



FINIAL CAP CONNECTION

NOTES:

1. COMPONENT IDENTIFICATION: TAG LOCATIONS ARE INDICATED BY CALLOUTS ON DRAWING. SUBSEQUENT DIGITS WILL INDCATE SEQUENCE MANUFACTURED
2. ASSEMBLY AND ERECTION GUIDELINES: SEE VALMONT COMMUNICATION POLE INSTALLATION GUIDELINE I012.
3. SLIP JOINT JACKING FORCE:
   MINIMUM = 29,306#
   MAXIMUM = 90,000#
4. FINISH: GALVANIZED PER ASTM A-123

BILL OF MATERIAL
(SHIPPING SEQ =1 FOR ALL)

VALMONT PART NUMBER	DESCRIPTION	UNIT WEIGHT (LBS)	QTY PER STR
DD8354A	SECTION ASSEMBLY	8909	1
DD8354B	SECTION ASSEMBLY	5044	1
DD8354C	SECTION ASSEMBLY	2710	1
2129B	FINIAL CAP	6	1
AC14222	HANDHOLE COVER (9 X 24 HV)	9	1
AC14209	HANDHOLE COVER (6 X 12)	4	4

VALMONT PART NUMBER	DESCRIPTION							QTY PER STR
	HARDWARE SIZE (IN)				GENERAL	FINISH	ASTM SPEC	
	BOLT		NUT	WSHR				
	DIA	LONG						
161647	0.38	1.00			SCREW	PL		5
164035	0.25	1.50			SCREW	SS	A410	12
2136A					STEP KIT	HDGV	-	165

DUPLICATE DRAWING DISTRIBUTION

PED575746_BANDON_OB

DWG SIZE D CLASS CODE (1) 1 CLASS NO. (3) 450

DRAWN	ENGR	DATE	SCALE
JO2	CA71	09/22/23	NONE

P.A. CHK | SHOP CHK

OTHER SPECIFICATIONS

REV ID	DATE	REV BY	CHK BY	REVISION DESCRIPTION

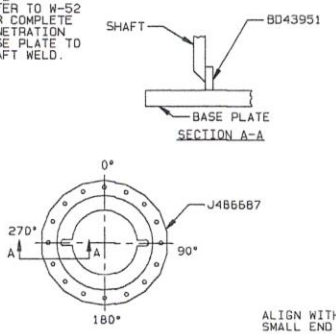
MATERIAL	THICKNESS	WEIGHT
		17,213#

valmont

ORDER NO.	CUSTOMER	DESCRIPTION	DWG NO.
575746	BANDON RURAL FIRE DISTRICT	139.0' POLE	DD8354Z

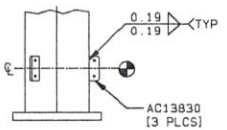
LOCATION DIMENSION		
FROM LARGE END	FROM SMALL END	DETAIL
	0'-6.00"	11
	6'-4.00"	10
	6'-7.00"	9
	7'-0.00"	8
		8
	10'-9.00"	7
	12'-6.00"	6
12'-0.00"		5
7'-0.00"		4
5'-0.00"		3
1'-2.00"		2
0'-0.00"		1

NOTE
REFER TO W-52 FOR COMPLETE PENETRATION BASE PLATE TO SHAFT WELD.



1 BASE PLATE

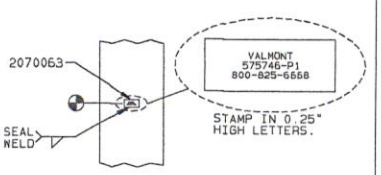
ORIENTATION
30°, 150°, 270°



IF MULTI-SIDED SHAFT CENTER PLATES ON FLATS.

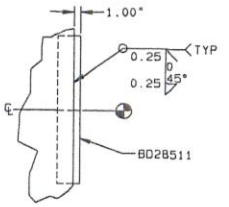
2 GROUNDING PLATES

ORIENTATION
50°



3 ID PLATE

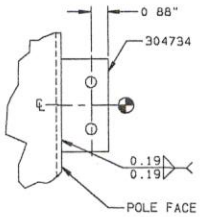
ORIENTATION
180°



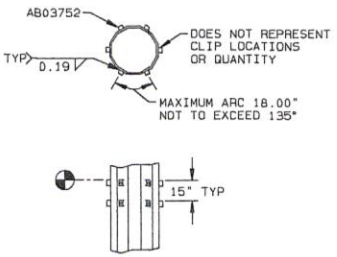
NOTE: LOCATE COVER MOUNT CLIPS OUTSIDE OF SHAFT.

4 HANDHOLE RIM 9X24

ORIENTATION
50°



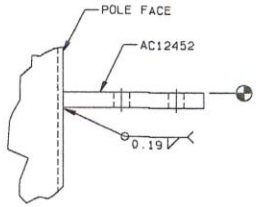
5 CABLE STOP



NOTE: REFER TO M-5 AND M-67.

6 WORKING BAND

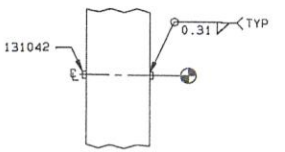
ORIENTATION
50°



LOCATION ±2' VERTICALLY TO AVOID INTERFERENCE

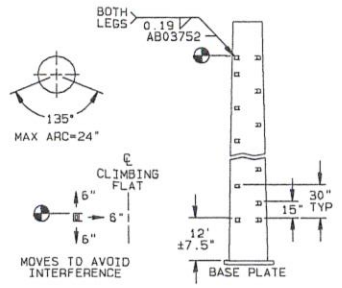
7 CABLE GUIDE

ORIENTATION
90°, 270°



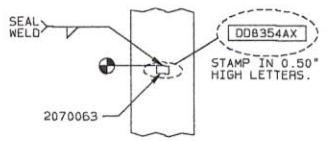
8 JACKING NUT

ORIENTATION
50°



9 STEP LUG

ORIENTATION
50°



THE LAST CHARACTER, "X", IS A SEQUENTIAL NUMERAL ASSIGNED BY MANUFACTURING.

10 IDENT TAG

2.63" DIA HOLE BURNED AT (DEG): 70, 110, 250

0.06" X 45° CHAMFER ON BOTH SIDES OF UPPER HALF OF HOLES AND TOP OF FLATS AT (DEG): 70, 90, 110, 250

11 HANGING HOLES

BILL OF MATERIAL
(SHIP SEQ=0)

VALMONT PART NO	DESCRIPTION	QTY PER ASSY
BD43950	SHAFT	1
J486687	BASE PLATE	1
BD43951	BACK-UP RING	2
AC13830	GROUND PLATE	3
BD28511	HANDHOLE RIM	1
304734	CABLE STOP	1
AB03752	STEP LUG	40
AC12452	CABLE GUIDE	1
131042	1.00" NUT	4
2070063	IDENT TAG	2

NOTES:

1. LOCATE SEAM WELD AT 40°. ALL MEASUREMENTS ARE CLOCKWISE WHEN VIEWED FROM THE SMALL END.
2. ALL CROSS SECTION VIEWS AND ORIENTATION REFERENCES ARE FROM SMALL END OF THE TUBE.
3. ALIGN WITH FLATS AT SMALL END UNLESS OTHERWISE NOTED

LOCATION SYMBOL KEY	SHAFT INFO (MEASURED ACROSS FLATS)						
LOCATION REFERENCE	SHAPE	LENGTH	BASE OD	TOP OD	TAPER	THK	ASTM
	18-SIDED	48'-0.00"	54.00"	40.55"	0.280	0.313"	A572

DUPLICATE DRAWING DISTRIBUTION

TMF SEC ASSY 54"BD 41"TD 48'-0"LG

DWG SIZE D CLASS CODE (1) 1 CLASS NO. (3) 400

REV ID	DATE	REV BY	CHK BY	REVISION DESCRIPTION

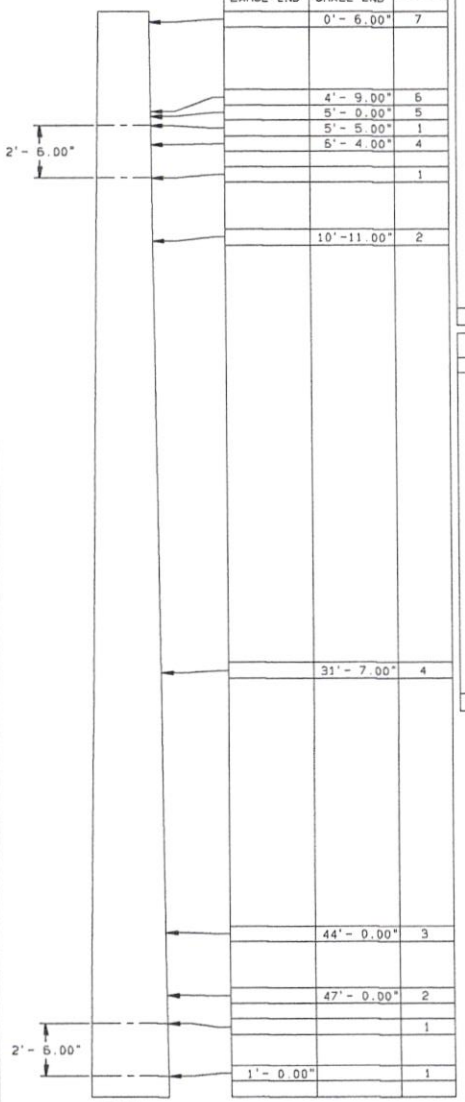
DRAWN	ENGR	DATE	SCALE
JO2	CA71	09/22/23	NONE
P.A. CHK		SHOP CHK	

OTHER SPECIFICATIONS
F-1, M-1, W-24

MATERIAL	THICKNESS	WEIGHT
S-22		8,909#

ORDER NO.	CUSTOMER	DESCRIPTION	DWG NO.
575746	BANDON RURAL FIRE DISTRICT	SECTION ASSEMBLY	DD8354A

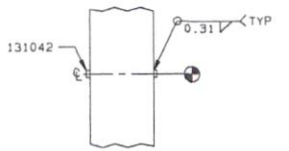
valmont



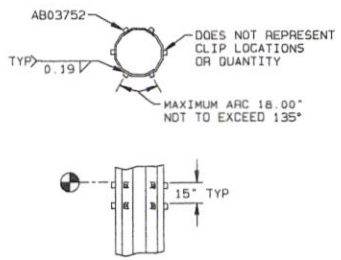
LOCATION DIMENSION		
FROM LARGE END	FROM SMALL END	DETAIL
	0'- 6.00"	7
	4'- 9.00"	6
	5'- 0.00"	5
	5'- 5.00"	1
	5'- 4.00"	4
		1
	10'-11.00"	2
	31'- 7.00"	4
	44'- 0.00"	3
	47'- 0.00"	2
		1
	1'- 0.00"	1

ORIENTATION

90°, 270°



1 JACKING NUT

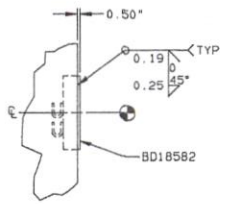


NOTE: REFER TO M-5 AND M-67.

2 WORKING BAND

ORIENTATION

180°

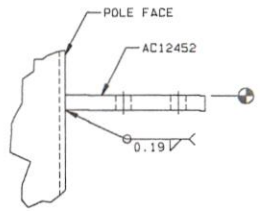


NOTE: LOCATE HOOKS TOWARD LARGE END.

3 HANDHOLE RIM 6X12

ORIENTATION

50°

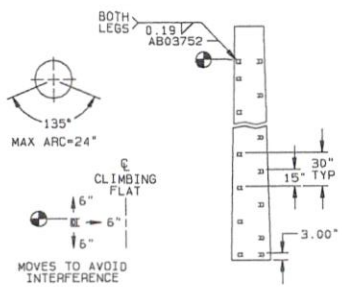


LOCATION ±2' VERTICALLY TO AVOID INTERFERENCE

4 CABLE GUIDE

ORIENTATION

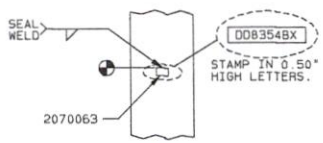
50°



5 STEP LUG

ORIENTATION

50°



THE LAST CHARACTER, "X", IS A SEQUENTIAL NUMERAL ASSIGNED BY MANUFACTURING.

6 IDENT TAG

2.63" DIA HOLE BURNED AT (DEG): 70, 110, 250

0.06" X 45° CHAMFER ON BOTH SIDES OF UPPER HALF OF HOLES AND TOP OF FLATS AT (DEG): 70, 90, 110, 250

7 HANGING HOLES

NOTES:

1. LOCATE SEAM WELD AT 40°. ALL MEASUREMENTS ARE CLOCKWISE WHEN VIEWED FROM THE SMALL END.
2. ALL CROSS SECTION VIEWS AND ORIENTATION REFERENCES ARE FROM SMALL END OF THE TUBE.
3. ALIGN WITH FLATS AT SMALL END UNLESS OTHERWISE NOTED

BILL OF MATERIAL
(SHIP SEQ=0)

VALMONT PART NO	DESCRIPTION	QTY PER ASSY
BD43952	SHAFT	1
131042	1.00" NUT	8
AB03752	STEP LUG	64
BD18582	HANDHOLE RIM	1
AC12452	CABLE GUIDE	2
2070063	IDENT TAG	2

LOCATION SYMBOL KEY	SHAFT INFO (MEASURED ACROSS FLATS)						
LOCATION REFERENCE	SHAPE	LENGTH	BASE OD	TOP OD	TAPER	THK	ASTM
	18-SIDED	51'-10.00"	42.69"	28.17"	0.280	0.250"	A572

DUPLICATE DRAWING DISTRIBUTION

TMF SEC ASSY 43"BD 28"TD 51'-10"LG

DWG SIZE D CLASS CODE (1) 1 CLASS NO. (3) 400

DRAWN	ENGR	DATE	SCALE
JO2	CA7L	09/22/23	NONE

P.A. CHK | SHOP CHK

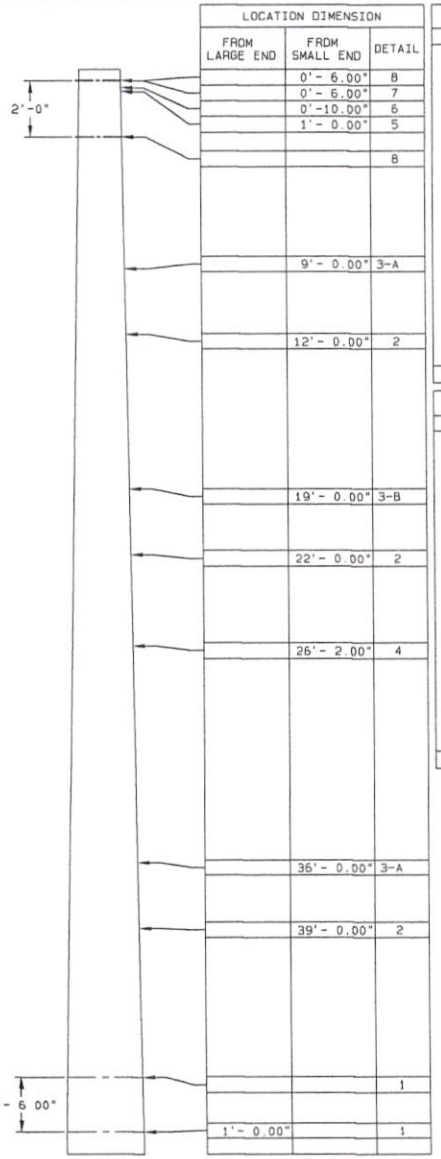
OTHER SPECIFICATIONS
F-1 M-1,M-24

REV ID	DATE	REV BY	CHK BY	REVISION DESCRIPTION

MATERIAL	THICKNESS	WEIGHT
S-22		5,044#

valmont

ORDER NO.	CUSTOMER	DESCRIPTION	DWG NO.
575746	BANDON RURAL FIRE DISTRICT	SECTION ASSEMBLY	DD8354B

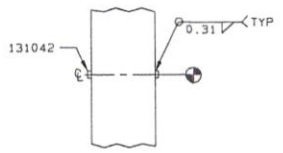


LOCATION DIMENSION		
FROM LARGE END	FROM SMALL END	DETAIL
	0'- 6.00"	8
	0'- 6.00"	7
	0'-10.00"	6
	1'- 0.00"	5
		8
	9'- 0.00"	3-A
	12'- 0.00"	2
	19'- 0.00"	3-B
	22'- 0.00"	2
	26'- 2.00"	4
	36'- 0.00"	3-A
	39'- 0.00"	2
		1
	1'- 0.00"	1

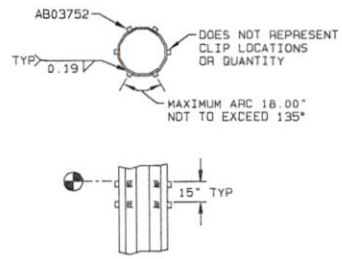
NOTES:

1. LOCATE SEAM WELD AT 40°. ALL MEASUREMENTS ARE CLOCKWISE WHEN VIEWED FROM THE SMALL END.
2. ALL CROSS SECTION VIEWS AND ORIENTATION REFERENCES ARE FROM SMALL END OF THE TUBE.
3. ALIGN WITH FLATS AT LARGE END UNLESS OTHERWISE NOTED

ORIENTATION: 90°, 270°



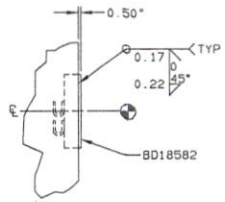
1 JACKING NUT



NOTE: REFER TO M-5 AND M-67.

2 WORKING BAND

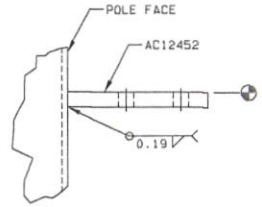
ORIENTATION: A 40° B 70°



NOTE: LOCATE HOOKS TOWARD LARGE END.

3 HANDHOLE RIM 6X12

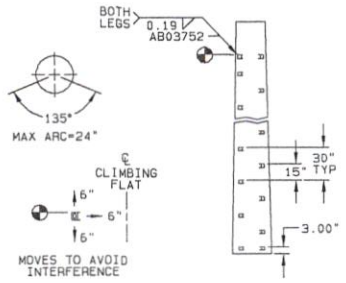
ORIENTATION: 50°



LOCATION ±2' VERTICALLY TO AVOID INTERFERENCE

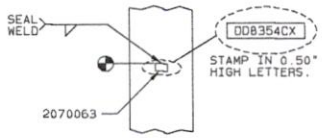
4 CABLE GUIDE

ORIENTATION: 50°



5 STEP LUG

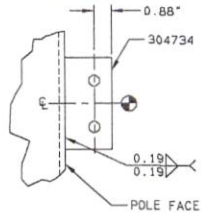
ORIENTATION: 50°



THE LAST CHARACTER, "X", IS A SEQUENTIAL NUMERAL ASSIGNED BY MANUFACTURING.

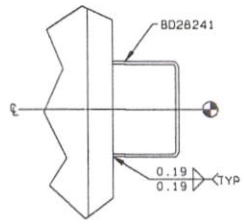
6 IDENT TAG

ORIENTATION: 50°



7 CABLE STOP

ORIENTATION: 270°



8 BRACKET

BILL OF MATERIAL (SHIP SEQ=0)

VALMONT PART NO	DESCRIPTION	QTY PER ASSY
BD43953	SHAFT	1
131042	1.00" NUT	4
AB03752	STEP LUG	61
BD18582	HANDHOLE RIM	3
AC12452	CABLE GUIDE	1
2070063	IDENT TAG	2
304734	CABLE STOP	1
BD28241	BRACKET	2

LOCATION SYMBOL KEY	SHAFT INFO (MEASURED ACROSS FLATS)						
LOCATION REFERENCE	SHAPE	LENGTH	BASE OD	TOP OD	TAPER	THK	ASTM
	18-SIDED	49'-3.00"	29.80"	16.00"	0.280	0.219"	A572

DUPLICATE DRAWING DISTRIBUTION

IMF SEC ASSY 30"BD 16"ID 49'-3"LG

DWG SIZE D CLASS CODE (1) 1 CLASS NO. (3) 400

DRAWN	ENGR	DATE	SCALE
JO2	CR7	09/22/23	NONE

P.A. CHK | SHOP CHK

OTHER SPECIFICATIONS: F-1, M-1, W-24

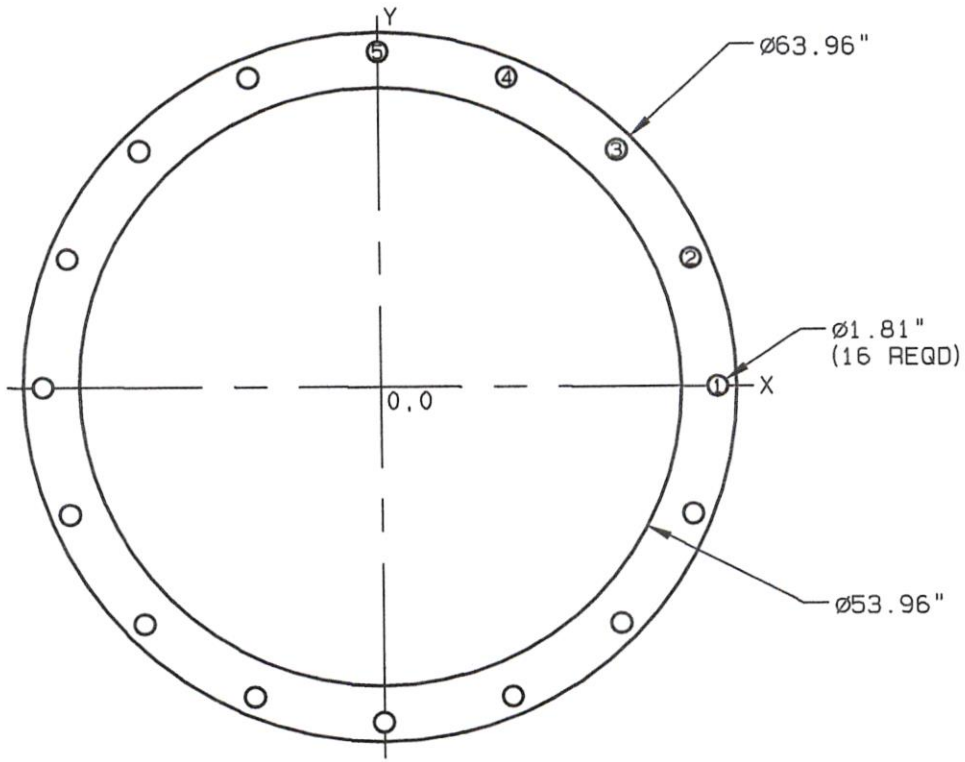
REV ID	DATE	REV BY	CHK BY	REVISION DESCRIPTION

MATERIAL	THICKNESS	WEIGHT
S-22		2,710#

ORDER NO.	CUSTOMER	DESCRIPTION	DWG NO.
575746	BANDON RURAL FIRE DISTRICT	SECTION ASSEMBLY	DD8354C

valmont

HOLE COORDINATES (INCHES)		
HOLE NO.	X-COORD	Y-COORD
1	30.23	0.00
2	27.93	11.57
3	21.37	21.37
4	11.57	27.93
5	0.00	30.23



NOTES:
1. BOLT CIRCLE DIAMETER = 60.46" (EQUALLY SPACED).

DUPLICATE DRAWING DISTRIBUTION

BCP9854003023

DWG SIZE B CLASS CODE (1) 4 CLASS NO. (3) 900

REV ID	DATE	REV BY	CHK BY	REVISION DESCRIPTION

DRAWN	ENGR	DATE	SCALE
J02	CR71	09/22/23	CNC

P.A. CHK | SHOP CHK

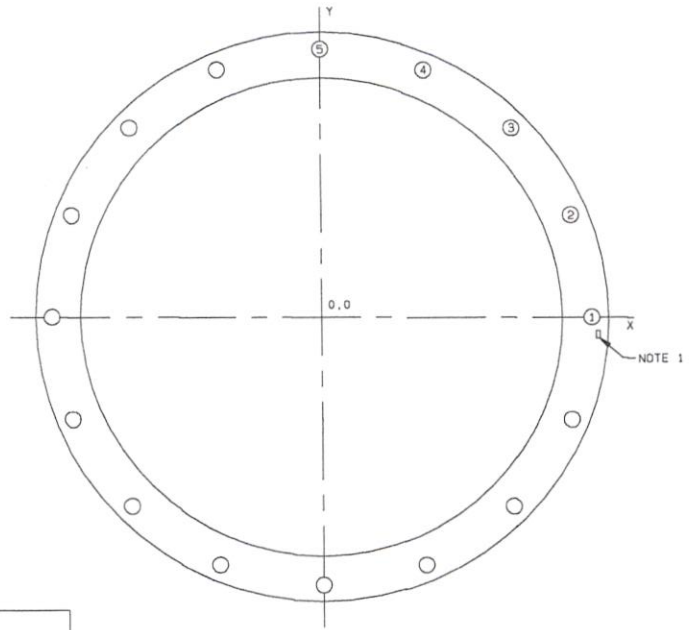
OTHER SPECIFICATIONS: M-1

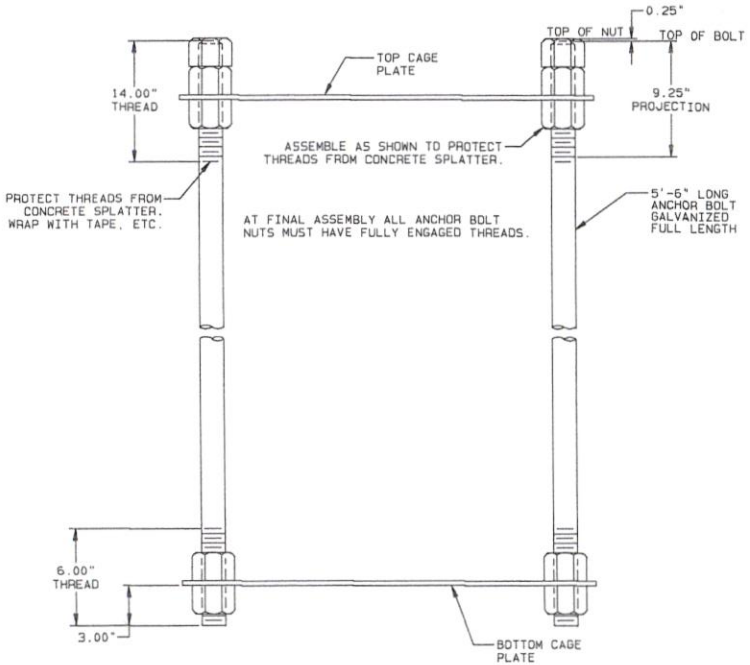
MATERIAL	THICKNESS	WEIGHT
S-70	0.500"	125#

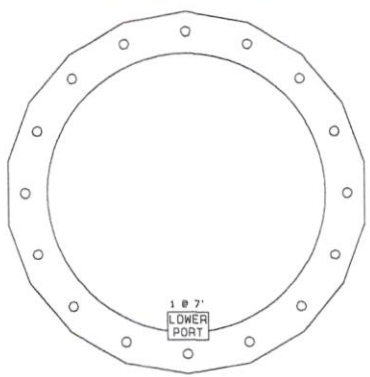
valmont

ORDER NO.	CUSTOMER	DESCRIPTION	DWG NO.
575746	BANDON RURAL FIRE DISTRICT	CAGE PLATE	BD43955

HOLE COORDINATES (INCHES)		
HOLE NUMBER	X-COORD	Y-COORD
1	30.23	0.00
2	27.93	11.57
3	21.37	21.37
4	11.57	27.93
5	0.00	30.23
HOLE & SLOT SIZES (INCHES)		
TEMPLATE = Ø1.81		
BOLT CIRCLE (INCHES)		
60.46		







THE LOWER HANDHOLE ORIENTATIONS ARE SHOWN ABOVE TO AID IN THE INSTALLATION PROCESS

ORIENTATION INDEX

NOTES

1. STAMP OR ENGRAVE THE DRAWING NUMBER ON 1620194 IN 0.50" CHARACTERS. SEAL WELD.
2. OUTSIDE DIAMETER OF ALL CAGE PLATES = 63.96".
3. INSIDE DIAMETER OF ALL CAGE PLATES = 53.96"
4. CAGE PLATES - 0.500" THK; A36 MATERIAL.
5. ANCHOR BOLTS - 14J BAR; A615, GRADE 75 MATERIAL.
6. SHIPPED LOOSE, ASSEMBLE IN THE FIELD.

INSTALLATION GUIDELINES

1. UPON ARRIVAL AT THE JOB SITE, THE TEMPLATES AND ANCHOR BOLTS SHOULD BE CHECKED FOR BENDING AND ANY DAMAGE THAT MIGHT DISTURB THE BOLT PATTERN. THE ANCHOR BOLT THREADS SHOULD BE CHECKED FOR DAMAGE AND WITH A NUT TO ENSURE THAT THEY CAN BE TURNED UP AND DOWN THE FULL LENGTH OF THE ANCHOR BOLT THREADS.
2. THE BOLT CIRCLE AND ANCHOR BOLT DIMENSIONS MUST BE CHECKED TO VERIFY THEY MATCH THE FOUNDATION DESIGN AND THE ANCHOR BOLT CAGE ASSEMBLY DRAWING PRIOR TO INSTALLATION.
3. THE ORIENTATION OF THE ANCHOR BOLTS, IN RELATION TO THE DESIRED ANTENNA AND BASE PORT AZIMUTHS, MUST BE CHECKED CAREFULLY USING DATA FROM THE VALMONT DRAWINGS AND THE OWNER'S PLANS.
4. CARE MUST BE TAKEN TO PLACE THE ANCHOR BOLTS VERTICALLY AND TO NOT DISTURB THEIR POSITION WHILE POURING CONCRETE.
5. IF WASHERS ARE INCLUDED IN THE BILL OF MATERIAL, USE ONE ABOVE AND ONE BELOW THE BASE PLATE ON EACH ANCHOR BOLT.

BILL OF MATERIAL (SHIP SEQ=1)

VALMONT PART NO	DESCRIPTION	QTY PER ASSY
BD43955	CAGE PLATE	2
AC14395	1.75" BOLT	16
131735	1.75" NUT A563	80
141330	1.75" WASHER F436	32
1620194	IDENT TAG	1

139.0' POLE, SITE: BANDON, OR

DUPLICATE DRAWING DISTRIBUTION | ICACCADYDNAC14395E

DWG SIZE D | CLASS CODE (1) 4 | CLASS NO. (3) 800

DRAWN	ENGR	DATE	SCALE
JO2	CR71	09/22/23	NONE

P.A. CHK | SHOP CHK

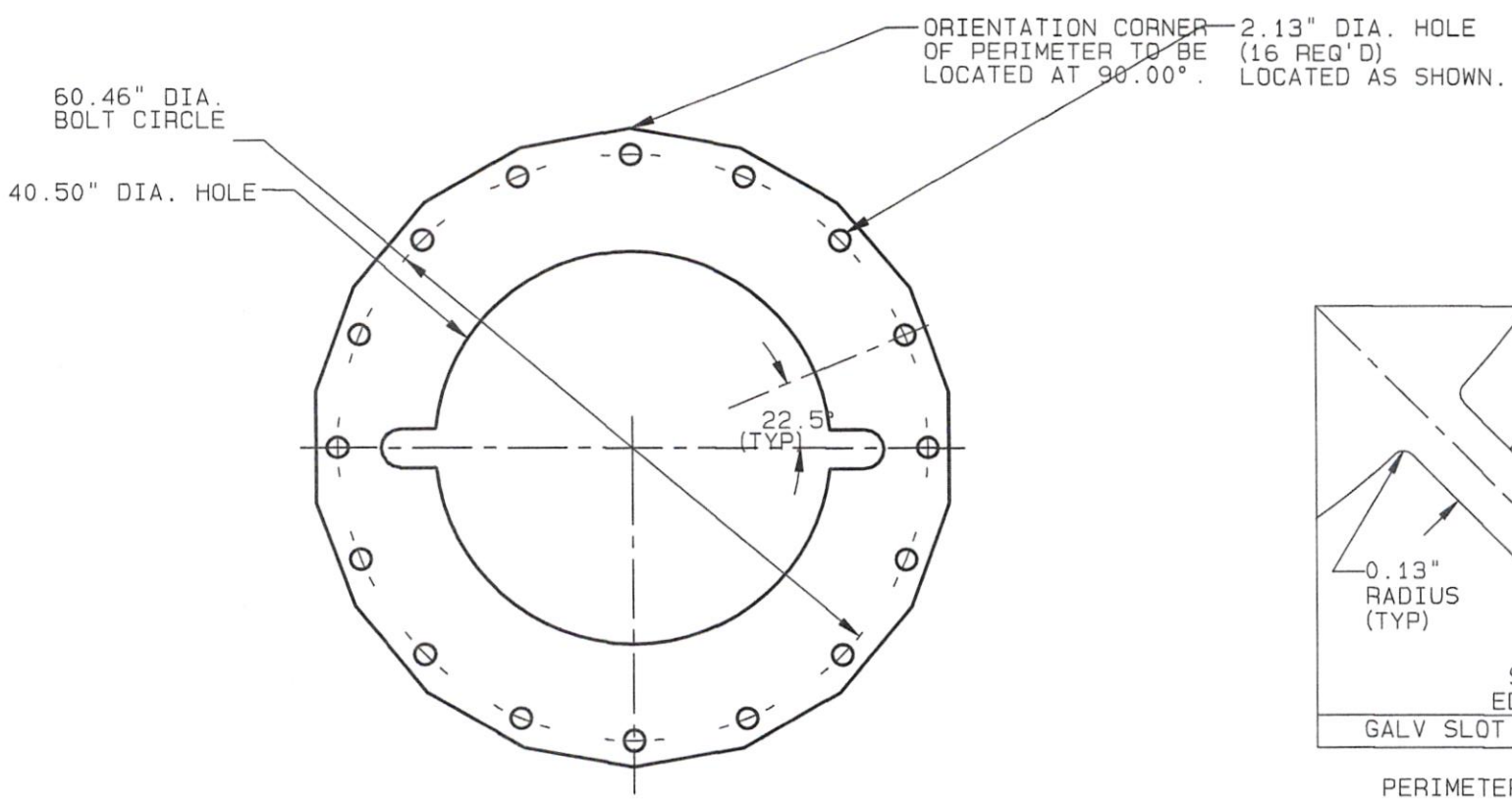
OTHER SPECIFICATIONS: M-1

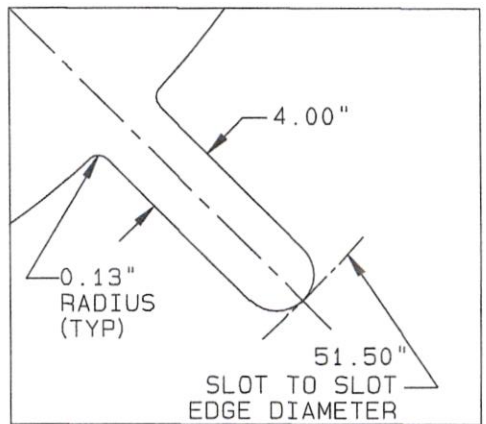
REV ID	DATE	REV BY	CHK BY	REVISION DESCRIPTION

MATERIAL	THICKNESS	WEIGHT
		1,335#

ORDER NO.	CUSTOMER	DESCRIPTION	DWG NO.
575746	BANDON RURAL FIRE DISTRICT	ANCHOR BOLT CAGE ASSEMBLY	CC17691

valmont





GALV SLOT DETAIL (2 PLCS)

PERIMETER DIMENSIONS:

DIST. ACROSS FLATS	= 64.83"
CORNER RADIUS	= 0.00"
NUMBER OF SIDES	= 18
FLAT LENGTH	= 11.43"

REV.	DATE	REVISION DESCRIPTION

MATERIAL THICKNESS: 2.000"

SPECIFICATIONS
MATERIAL S56
FINISH N/A
WELD N/A
TOLERANCE M30

DUPLICATE DRAWING DISTRIBUTION
☐ 04 ☐ 37 ☐ 38 ☐ 40

DATE	DRAWN	CHECKED	SCALE
09/22/23	J02		CNC

PROD.CODE (2) 04 (28) S.CODE (1) (27) ELS (7) (02) STD.IND. (1) (15) UOM (2) PC (16) SHIP FLAG (1) (29) CLASS CODE (1) (35) CLASS NO (3) (36)

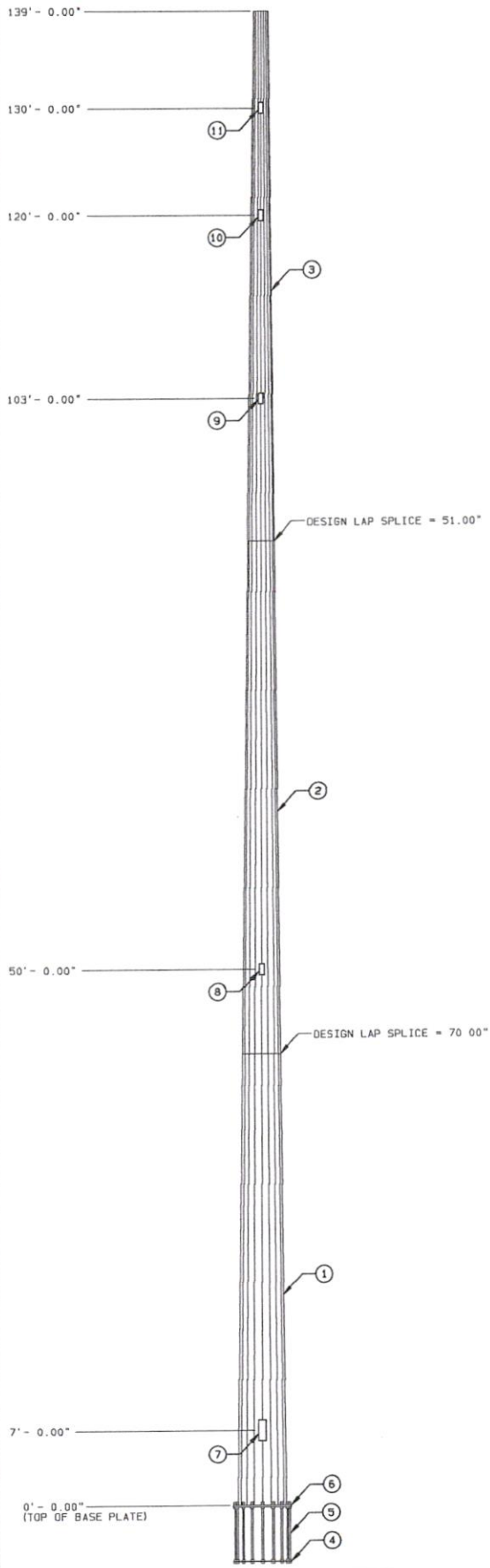
BPLR405OC000605 16H2132 00056M1 80648D

DESCRIPTION (40) FIELD 37

DWG.SIZE (1) B (66) PURC.L.T. (5) (87) CONTROL (1) (102) MATL.COST (5.4) (07) PL.CODE (1) (41) WEIGHT (7) 1127 (104)

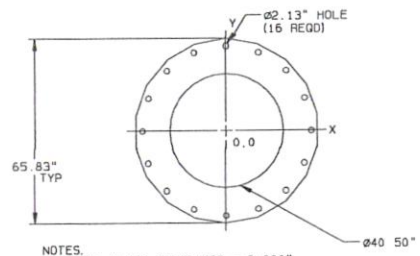
valmont

PART NO. J486687



ITEM ID	NO. REQD	FEATURES	UNIT WEIGHT (LBS)	WEIGHT (LBS)
1	1	SECTION A VALMONT S-22 0.313" THK (A572 GR65)	7,583	7,583
2	1	SECTION B VALMONT S-22 0.250" THK (A572 GR65)	4,904	4,904
3	1	SECTION C VALMONT S-22 0.219" THK (A572 GR65)	2,623	2,623
4	1	BOTTOM CAGE PLATE	124	124
5	16	1.75" ANCHOR BOLT, LENGTH=5.50' A615 GR75	63	1,005
6	1	BASE PLATE VALMONT S-56 2.000" THK (A572 GR50)	1,129	1,129
	1	TOP CAGE PLATE (REMOVE BEFORE SETTING POLE)	162	162
	1	SAFETY CLIMBING CABLE (LENGTH = 129.00')	99	99
	3	GROUNDING LUG	2	6
		GALVANIZING	398	398
	165	STEP AND CLIP (VALMONT STANDARD)	1	165
7	1	HAND HOLE HVY (9" x 24") @ 180°	52	52
8	1	HAND HOLE STD (6" x 12") @ 180°	11	11
9	1	HAND HOLE STD (6" x 12") @ 40°	11	11
10	1	HAND HOLE STD (6" x 12") @ 70°	11	11
11	1	HAND HOLE STD (6" x 12") @ 40°	11	11
	1	POLE CAP	15	15

HOLE COORDS (INCHES)	
X-COORD	Y-COORD
30.23	0.00
27.93	11.57
21.37	21.37
11.57	27.93
0.00	30.23



NOTES.
1. BASE PLATE THICKNESS = 2.000"
2. BASE PLATE ALLOWABLE STRESS (KSI) = 68
3. ANGLES ARE MEASURED CLOCKWISE FROM 0 DEGREES
4. BOLT CIRCLE DIAMETER = 60.46"
5. CAGE TEMPLATE DIAMETER = 63.96"

BASE PLATE / ANCHORAGE CHARACTERISTICS

NOTES:

1. *FACTORED BASE REACTIONS*
   MOMENT = 32,894 IN-KIPS
   SHEAR = 27,569 #
   VERTICAL = 30,434 #
2. GALVANIZED PER ASTM A-123.
3. DESIGN CRITERIA: TIA-222-H
4. THIS STRUCTURE HAS BEEN DESIGNED FOR THE FOLLOWING LOADING:
   EXPOSURE CATEGORY = C
   TOPOGRAPHY CATEGORY = 1
   RISK CATEGORY = IV
   SITE ELEVATION = 79 FT
   EARTHQUAKE SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS SS = 2.03
   EARTHQUAKE SPECTRAL RESPONSE ACCELERATION AT ONE SECOND S1 = 0.97
   EARTHQUAKE SITE CLASS = D
   WIND LOAD CASES ARE BASED ON 3 SECOND GUST AND 3000 YEAR MRI
   A. CASE 1: WIND = 130 MPH WIND SPEED
   B. CASE 2: WIND = 30 MPH ICE AND WIND SPEED
      DESIGN ICE THICKNESS = 0.25 IN
   C. CASE 3: WIND = 60 MPH WIND SPEED
   D. CASE 4: SEISMIC
   E. CASE 5: SEISMIC
   F. EQUIPMENT

DESCRIPTION	ABP MTG HT (FT)	ABP CENTROID HT. (FT)	WITHOUT ICE EPA (FT**2)	WITHOUT ICE WT (LBS)	WITH ICE EPA (FT**2)	WITH ICE WT (LBS)
1-CAMERA	139.00	139.00	1.00	10	2.00	20
1-FAA LIGHTING	139.00	139.00	5.00	50	10.00	100
1-F3P-14W WITH HRK14	132.50	134.00	34.60	2620	44.14	3480
10-PIPE MOUNTS (W/PM)	132.50	134.00	12.83	293	16.71	389
1-F3P-14W WITH HRK14	111.50	113.00	34.65	2620	44.15	3480
10-PIPE MOUNTS (W/PM)	111.50	113.00	12.83	293	16.65	387
1-17' LIGHTNING ROD LIGHTNING	139.00	147.50	5.85	200	7.30	236
2-ICE SHIELD FOR 6' ANTENNA MO	129.00	129.00	21.00	1200	23.15	1634
2-6' HIGH PERFORMANCE MICROWAV	124.00	124.00	76.54	744	78.48	961
2-876-70 COMPROD COMMUNICATION	132.50	134.00	17.18	193	22.59	221
2-876-70 COMPROD COMMUNICATION	111.50	113.00	12.84	193	16.86	220
1-4' HIGH PERFORMANCE MICROWAV	106.00	106.00	18.45	282	19.17	337

5. FEEDLINES ARE PLACED INTERIOR TO THE POLE SHAFT (UNLESS NOTED OTHERWISE)
6. TOTAL POLE HEIGHT IS 140 FT AGL
7. ELEVATIONS ARE MEASURED FROM TOP OF BASE PLATE (APPROX. 1 FT AGL)
8. 18 SIDED SHAFT
9. 130 MPH ULTIMATE WIND SPEED USED PER OSSC 2019
10. DESIGN CONTROLLED BY MICROWAVE ROTATION
11. VALMONT STANDARD HANDHOLE SIZES USED
12. ALTHOUGH RARE, VIBRATIONS SEVERE ENOUGH TO CAUSE DAMAGE CAN OCCASIONALLY OCCUR IN STRUCTURES OF ALL TYPES. BECAUSE THEY ARE INFLUENCED BY MANY INTERACTING VARIABLES, VIBRATIONS ARE GENERALLY UNPREDICTABLE. THE USER'S MAINTENANCE PROGRAM SHOULD INCLUDE OBSERVATION FOR EXCESSIVE VIBRATION AND EXAMINATION FOR ANY STRUCTURAL DAMAGE OR BOLT LOOSENING. THE VALMONT WARRANTY SPECIFICALLY EXCLUDES FATIGUE FAILURE OR SIMILAR PHENOMENA RESULTING FROM INDUCED VIBRATION, HARMONIC OSCILLATION OR RESONANCE ASSOCIATED WITH MOVEMENT OF AIR CURRENTS AROUND THE PRODUCT.

REGISTERED PROFESSIONAL ENGINEER
89133PE
OREGON
SEPT 12, 2017
NATHAN ANDREW ROSS

Nathan A Ross
Date: 2023.09.24 15:52:04 -07'00'

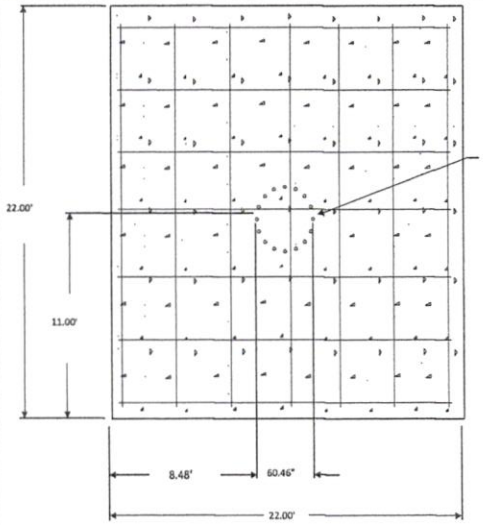
EXPIRES: 12/31/2024

SECTION INFORMATION					
ITEM ID	LENGTH	BASE OD	TOP OD	THK	MATL
1	48'- 0.00"	54.00"	40.55"	0.313"	A572 65 KSI
2	51'-10.00"	42.69"	28.17"	0.250"	A572 65 KSI
3	49'- 3.00"	29.80"	16.00"	0.219"	A572 65 KSI

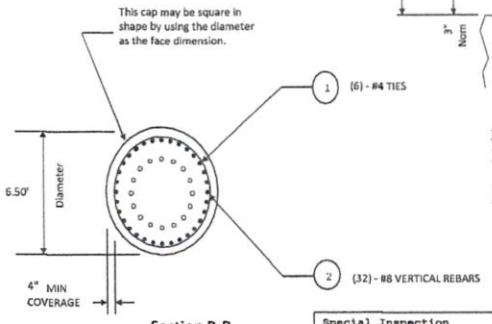
ORDER	PROJECT	FILE ID	SCALE	DATE	ENGR
575746		575746-P1	NONE	09/22/23	CR71

DESCRIPTION
BANDON RURAL FIRE DISTRICT 139.0' POLE, SITE: BANDON, OR

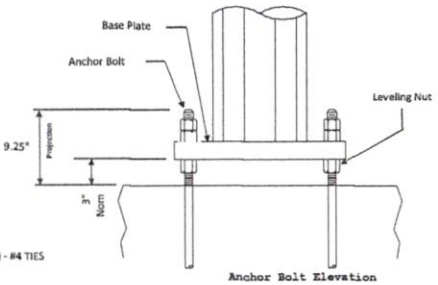
valmont



Section A-A
No Scale



Section B-B
No Scale



Anchor Bolt Elevation
(No Scale)

Note:
Extreme care should be taken to ensure that all leveling nuts are level with respect to each other prior to erection of the structure. Anchor bolts shall extend through the top nut completely, fully engaging all nut threads. Distance from top of concrete and bottom of leveling nut shall not exceed the diameter of the anchor bolt.

General Notes: Slab Foundation

1. Prior to excavation, check the area for underground facilities.
2. All reinforcing shall be deformed bars conforming to ASTM A615 Grade 60 (60,000 psi min. yield) and shall be provided by the foundation contractor.
3. All concrete shall have a minimum compressive strength of 4500 psi @ 28 days. The requirement for the concrete shall be as given in the ACI "Building Code Requirements for Reinforced Concrete", ACI 318, the latest edition.
4. Trowel top of pedestal smooth with slight crown for proper drainage.
5. Concrete shall be placed against undisturbed soil to the depth indicated on the foundation drawing. The portion above grade shall be formed. If an area is excavated beyond the limits shown, this volume shall be filled with concrete or formed. After the forms are removed, the excess excavation shall be replaced and compacted.
6. The ground water was encountered at 8' below grade during boring.
7. Foundation design based on Ultimate vert. bearing pressure of 5000 psf.
8. Concrete is assumed to weigh 150 pcf.
9. Estimated concrete volume = **49.12 cubic yards total.**
10. Design Based on the following loads from installation drawing for order No: 575746.

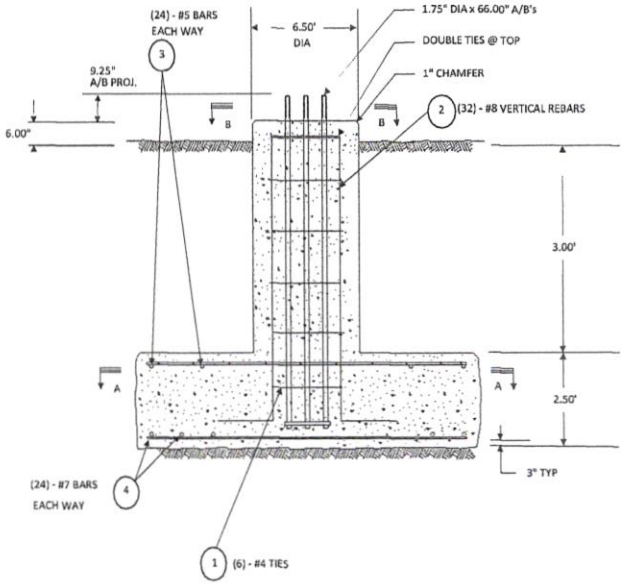
Factored Moment = 2741 FT-KIPS **Overturning Safety Factor = 1.28**
Factored Download = 30.4 KIPS **Max. Toe Bearing Pressure = 4.04 ksf**
Factored Shear = 27.6 KIPS

11. Backfill should be compacted to a density of 110 pcf.
12. Anchor bolts to be ASTM A615 Gr8.
13. Reference: geotechnical report, Pinnacle Engineering Project # 3C574.03 dated 11 July 2023
14. Foundation designed to not exceed 100% of monopole's capacity.
15. Foundation should bear on a structural fill prepared per geotechnical report.

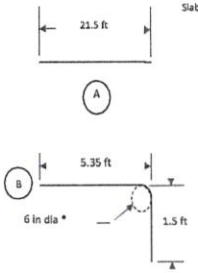
Special Inspection
1. Inspection of reinforcing steel and placement (periodic).
2. Inspection of anchor bolts cast in concrete (periodic).
3. Verifying use of required mix design (periodic).
4. At the time fresh concrete is sampled to fabricate specimens for strength tests; perform slump and air content tests and determine temperature of concrete (continuous).
5. Inspection of concrete placement for proper application techniques (continuous).
6. Inspect formwork for shape, location, and dimensions of the concrete member being formed (periodic).
7. Verify materials below shallow foundation are adequate to achieve the design bearing capacity (periodic).
8. Verify excavations are extended to proper depth and have reached proper material (periodic).
9. Perform classification and testing of compacted fill materials (periodic).
10. Verify use of proper materials, densities, and lift thicknesses during placement and compaction of compacted fill (continuous).

Reinforcement Steel Schedule

	Type	Rebar Size	Rebar Spacing	Weight (lbs)	Qty
Cap Ties	1	C	#4	Equal	79	6
Cap Vertical Rebar	2	B	#8	-----	571	32
Slab Top Steel	3	A	#5	11.19 ln	1076	48
Slab Bottom Steel	4	A	#7	11.18 ln	2109	48
Total Steel Weight for Complete Foundation Installation =					3836	



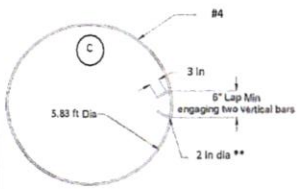
ELEVATION
No Scale



Grade 60 Rebar

Size	Wt/ft	6db (in)	d* (in)	d** (in)
#3	0.38	2.25	2.25	1.50
#4	0.67	3.00	3.00	2.00
#5	1.04	3.75	3.75	2.50
#6	1.50	4.50	4.50	4.50
#7	2.04	5.25	5.25	4.25
#8	2.67	6.00	6.00	6.00
#9	3.40	6.77	9.50	-
#10	4.30	7.62	10.75	-
#11	5.31	8.46	12.00	-

* Refers to ACI standard hook detail chart
** Refers to ACI stirrup hook detail chart



Note: adjacent circular ties shall not engage the same longitudinal bar with end hook anchorages (stagger hook location).

Rebar Lap Splice

Rebar Size	Rebar Grade	Specified Concrete Strength	Overlap (inches) Vert & Ties	Bottom Horiz	Top Horiz
#3	60	4500 psi	13	15	21
#4	60	4500 psi	18	20	29
#5	60	4500 psi	22	26	36
#6	60	4500 psi	26	33	46
#7	60	4500 psi	38	45	62
#8	60	4500 psi	43	59	82
#9	60	4500 psi	49	74	104
#10	60	4500 psi	58	95	132
#11	60	4500 psi	71	116	163

Splicing is an alternative to specified material listed in rebar schedule.
Lap Splice may be used on ties when Seismic Hook not required.

Seal Box

REGISTERED PROFESSIONAL ENGINEER
89133PE
OREGON
SEPT 12, 2017
NATHAN ANDREW ROSS

Nathan A Ross
Date: 2023.09.24 15:55:54 -07'00'

EXPIRES: 12/31/2024

Rev	Description	Date	By/Ck

valmont STRUCTURES
28800 Ida Street
Valley, NE 68064
(402) 359-2201

By: CR	Slab Foundation Layout
Check: CR	Customer: Bandon Rural Fire District
Date: 09-22-23	Site: Bandon, OR
Project #575746	SIZE - B Drawing No. OR575746FS Sheet 1 of 1

PINNACLE
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GEOTECHNICAL STUDY AND REPORT

BANDON RURAL FIRE PROTECTION DISTRICT - RADIO TOWER - 50530 HIGHWAY 101, BANDON, OR 97411

EXPIRES: 06/30/2025

Pinnacle Engineering, Inc

Matt Keller, P.E., CSI
Registered Geotechnical Engineer
President

Project#: 30574.03
11 July 2023

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GEOTECHNICAL STUDY AND REPORT
BANDON RURAL FIRE PROTECTION DISTRICT - RADIO TOWER
50530 HIGHWAY 101, BANDON OR 97411

A. EXECUTIVE SUMMARY

It is our opinion, supported by field investigations, laboratory tests and geotechnical analysis, that the existing and proposed site work, soils and geological conditions at the project site are suitable for the proposed building, provided the recommendations of our report are incorporated during design and construction.

Special attention will be required during site preparation, construction of the building foundations and drainage features and other associated improvements. Subsequent sections of this report provide geotechnical recommendations for design and construction of the planned project.

- Local deposits of unsuitable soils may be encountered and will require excavation and disposal.
- If imported fill will be required, we should be contacted when a fill source has been selected to determine swell and consolidation properties and to consider workability if the fill soil is to be placed during periods of high precipitation.
- **Construction Materials Engineering and Testing (CoMET) services of site cuts and fills, compaction testing and observation of construction of slopes and internal slope drainage features is recommended.**
- **Review of site and foundation design by the geotechnical engineer is recommended prior to beginning construction.**

The following sections of this report provide geotechnical recommendations for design and construction of the planned project.

B. INTRODUCTION

B.1. Purpose and Scope

Ace Communication Services, Inc. plans to construct a single pole radio tower at the existing Bandon Rural Fire Protection District Main Station in Bandon Oregon.

Soil samples were retrieved during site exploration for laboratory testing and other studies necessary to develop recommendations for design and construction of the foundations for the proposed structure, to evaluate potential complications that may occur during construction, to assess probable long-term performance of the structure and for use in monitoring soil compaction.

B.2. Prior Geotechnical Report

No prior geotechnical reports were discovered or provided. PEI is not aware that a prior geotechnical study report has been prepared for the above referenced site. PEI has completed several geotechnical reports near the project site.

B.3. Site and Project Description

The proposed site is located in Section 36, Township 28 S, Range 15W W.M, to the southeast of Bandon, Oregon. It is bounded to the south by a developed residential lot, to the west by a developed commercial lot, to the north by undeveloped 16th Street, and to the east by Highway 101. A vicinity map depicting the site is attached as Figure 1.

The project will result in the construction of a single pole communication tower. A pile foundation is not anticipated for the construction of the tower. Associated construction will include access and utilities.

C. TOPOGRAPHIC MAPPING

Development of topographic mapping was beyond the scope of this study. A site map generated by Coos County GIS is attached as Figure 2.

D. GEOLOGIC SITE CHARACTERIZATION

Geologic and geotechnical terms used in this report are defined in Figure 3. Surface geologic mapping of the site is presented as Figure 4.

D.1. Regional Geology

The project site is located approximately 50 miles east of the Cascadia Subduction Zone. The Cascadia Subduction Zone reflects subduction of the Juan de Fuca plate beneath the western edge of the North American continental shelf. [1]

D.2. Project Area Geology

The site is located within the Oregon Coast Range Geological province. The surface geology has been mapped as undissected to slightly dissected terrace sediments of Pleistocene marine terrace deposits.[2]

Qmtw	**Whiskey Run terrace sediments (Pleistocene):** *Gravel and sand interpreted as nearshore, beach, dune, and stream facies deposited on ancient marine platforms. In gravel facies, the transition from onshore to beach processes is often marked by a reversal of imbrication, with clasts in beach and marine environments indicating landward flow and clasts in fluvial and fan environments indicating seaward flow. Sand facies are typically pale yellowish orange, well sorted, and medium grained, containing subrounded grains of quartz, feldspar, and lithics.*

Open-File Report O-14-01, Geologic map of the southern Oregon coast between Port Orford and Bandon, Curry and Coos Counties, Oregon, 2014, Thomas J. Wiley, Jason D. McClaughry, Lina Ma, Katherine A. Mickelson, Clark A. Niewendorp, Laura L. Stimely, Heather H. Herinckx, and Jonathan Rivas

D.3. Seismicity and Seismotectonic Considerations

Local faults generally trend from northeast to southwest. Inactive fault locations relative to the project site are depicted on Figure 4.

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1 Geology of the Pacific Northwest, 1999, Orr, Elizabeth L, and William N., Kendall/Hunt Publishing Company.

2 Geologic Map of the Southern Oregon Coast Between Port Orford and Bandon, Curry and Coos Counties, Oregon, 2014, Thomas J. Wiley, Jason D. McClaughry, Lina Ma, Katherine A. Mickelson, Clark A. Niewendorp, Laura L. Stimely, Heather H. Herinckx, and Jonathan Rivas, Oregon department of Geology and Mineral Industries, Open-File Report O-14-01.

D.3.a. Area and Site Seismicity

Extensive seismotectonic studies conducted since 1990 have concluded that western Oregon is subject to a much greater likelihood of both random and plate-subduction seismic events of far greater magnitude and far more frequently than was formerly believed.

- Regionally, the Cascadia Subduction Zone is considered as a feasible source of Magnitude 8.5, or greater, earthquakes.
- Intraplate earthquakes, focused at a relatively great depth within the Juan de Fuca plate subducted beneath western Oregon and Washington, are capable of producing magnitude 7.0 earthquakes. Deep focus intraplate earthquakes are theoretically possible, but considered rare in Oregon.
- Relatively shallow crustal earthquakes are more likely, with an upper bound considered to be on the order of Magnitude 6.0.
- The design spectral response acceleration expected in the project area is as follows;

S_S = 2.026 g	S_{MS} = 2.026 g	S_{DS} = 1.351 g
S_1 = 0.966 g	S_{M1} = 1.642 g	S_{D1} = 1.095 g

Evidence of historic seismic activity is apparent near the project area. The southeasterly trending recently active Coquille Fault has been identified and passes within 1 mile of the site.

D.3.b. Site Stability

Beneath the root zone and a thin layer of topsoil, the site is generally underlain by a stiff medium brown sandy SILT. The sandy SILT transitions to a stiff medium brown low plasticity CLAY with sand at a depth of two feet. Underlying the low plasticity CLAY is an orange-gray mottled poorly graded fine-grained SAND at a depth of seven feet.

The soils underlying the project site are likely to be very stable during seismic events having a reasonable probability of occurrence. Despite the particle size distribution of the materials at the site Liquefaction is not likely, due to the water table elevation. There is no likelihood of *tsunami* or *seiche*. Seismically induced landslides are not possible.

D.3.c. Site Classification

Depth to weathered formational rock is inferred to be greater than 30 feet BGS. The average soil properties in the upper 100 feet underlying the site are consistent with Site Class D, as defined by the current International Building Code and Oregon Structural Specialty Code (IBC/OSSC).

D.3.d. Seismic Refraction Survey

A seismic refraction survey was not included in our agreed scope of services.

E. FIELD STUDIES

E.1. Surface Reconnaissance

Contemporaneous with the geotechnical site characterization, a surface reconnaissance was conducted. The surface reconnaissance concluded that there were no observable site defects that would compromise viability of the site for the planned use.

E.2. Surface Hydrology

The shallow natural sandy soils are relatively free draining and allow for percolation.

Post development, the surface water runoff will be conveyed via gutters, ditches and storm drains, Gross Creek then, ultimately, the Coquille River.

E.3. Field Observations

Field observations included soil description, classification, qualitative density measurement, measurements of thicknesses of the various soil horizons and depth to or presence of groundwater.

E.4. Site Exploration and Field Testing

Field investigations conducted on June 23rd, 2023 included geologic reconnaissance of the site and immediate surrounding area, and observation, sampling and testing in conformance to ASTM D-2488 of the underlying soils encountered in one test pit.

The test pit was excavated with a Takeuchi TB250-2 excavator with 24" bucket at the location depicted on Figure 2. The test pit was observed, logged and samples retrieved by a certified technician. The summary logs of the test pit are contained in Appendix A.

Samples were retrieved at visible soil horizon changes. Most of the samples were obtained using a Modified California Barrel advanced by hand driving, which produces a measure of soil density while recovering moderately disturbed samples for strength and performance testing. Bulk samples were retrieved at the depths and locations indicated on the test pit logs.

The test pit was left unfilled for a brief time to allow groundwater levels, if present, to stabilize. Groundwater was encountered during the field investigation.

Please note that shear strengths and estimated bearing capacities, if noted on the field logs are field estimates of ultimate values, recorded for correlation of laboratory results and are only provided for comparative purposes. They should not be used for design. We should be contacted before utilization of values other than those recommended in Section G to confirm applicability and that the designer's interpretation is consistent with our understanding of design properties.

E.5. Geotechnical Characterization

Soil descriptions and layer interfaces are interpreted from observations on site. While the layers are shown as having distinct boundaries in field logs, in reality, the change is gradual.

Surface soils consists of fine-grained residual silt and clay with sand to a depth of seven feet. The surface soils are characterized as being dense, medium brown in color, and low to non-plastic. Underlying the surface soils is fine grained sand to depths in excess of ten feet. The subsurface soils are characterized as being poorly graded, orange-gray mottled in color, and loose. The foundation soils are moderately permeable.

The site soils can be excavated with light to moderate effort by moderate energy excavation equipment. Bedrock is not likely to be encountered during foundation excavation.

The site soils are compactible after removal of the vegetative component and may be used as site fills if construction occurs during dry weather. The vegetative component is suitable for use as landscaping material or for sculpting wetlands mitigation areas.

Pertinent geotechnical factors that may influence design and construction include;

- Control of both ground and surface water is required during construction and during the life of the project to assure long term site stability.
- Stability of excavations during construction of all components and trenches will require careful monitoring by the contractor.
- Site soils are not expansive.

E.6. Groundwater

Groundwater (the phreatic surface) was encountered at 9 feet below the surface during the field investigation. It is likely that the phreatic surface will fluctuate both seasonally and during the typical five-year hydrologic cycle. Considering annual precipitation records during the past several years, the absence of measurable changes in the ground water surface should not be regarded as evidence that higher groundwater conditions will not occur in the future. Experience indicates that the phreatic surface will vary seasonally by approximately five feet and will vary by approximately ten feet between hydrologic extremes, an average ten-year period. We project that the average high groundwater elevation will be greater than 8 feet below the surface. Seepage, occasionally in considerable amounts, should be expected at the transitional zone between the residual soils and the underlying transitional bedrock.

E.7. Soil Permeability

Permeability tests were not performed for this study. Qualitatively, flow velocities within the proposed structural fill soil can be expected to range between 10-4 and 10-5 cm/sec and as high as 10-2 cm/sec at the bedrock interface where fine grained soils transition to weathered formational material. Where sandy layers exist, their permeability will be on the order of 10-3 cm/sec.

F. LABORATORY TESTING

All of the samples recovered during the site exploration were visually reexamined at our Roseburg laboratory to verify the field descriptions. To assist in soil classification and assessing long term stability of the site soils, physical characteristics, including bearing capacity, natural moisture/density relationship and plasticity indices. Samples were then classified in conformance with the Unified Soil Classification System (USCS) per ASTM D-2487.

F.1. Soil Classification

The USCS identifies soil type by single letter prefix and subgroup by single letter suffix as follows;

Table F 1
USCS Classification

Soil Type	Prefix	Subgroup	Suffix
Gravel	G	Well Graded	W
Sand	S	Poorly Graded	P
Silt	M	Silty	M
Clay	C	Clayey	C
Organic	O	w_L < 50 per cent	L
Peat	Pt	w_H > 50 per cent	H

F.2. Electro-Chemical Parameters

Electro-Chemical analysis was neither requested nor conducted during this investigative effort.

F.3. Strength Parameters

For strength calculations, we recommend the following values for angles of internal friction and residual cohesion at 4% strain;

Table F 2
Strength Parameters

Normal Load	Soil Type	Phi	Cohesion
500 #/ft²	Surface silt/clay with sand	26 degrees	120 #/ft²
	Poorly graded sand	28 degrees	0 #/ft²
	Imported ABC FILL @ 90% density per D 1557	33 degrees	0#/ft²
3,000 #/ft²	Surface silt/clay with sand	30 degrees	240 #/ft²
	Poorly graded sand	33 degrees	0 #/ft²
	Imported ABC FILL @ 90% density per D 1557	37 degrees	0 #/ft²

Note that the above values are based on historic, typically minimum values determined in other tests of similar soils. For imported fill, we should be contacted to verify values after an actual fill source has been selected

F.4. Performance Parameters

In addition to the strength parameters described above, swell and consolidation characteristics of the natural soil were carefully considered, both in terms of primary and secondary (long term) volume change.

The granular materials are loose and will deform (consolidate) upon application of induced loads. The primary consolidation will be nearly immediate. Secondary consolidation will have occurred prior to completion of construction. Accordingly, there is little risk of long-term settlement if a pile foundation is used.

Recommended bearing pressures are presented in Section G of this report.

G. ENGINEERING STUDIES AND RECOMMENDATIONS

G.1. General

The engineering studies and recommendations summarized in this section provide design parameters for foundations for the proposed structure and for associated construction.

For the purposes of this analysis, column loads were assumed to be on the order of 10 kips. The dead load component was estimated to be 50% of total load.

All density criteria presented herein refer to ASTM D 1557 (Modified Proctor) at optimum to 2% above optimum moisture, unless specifically noted otherwise.

Pertinent geotechnical factors that may influence design and construction include;

- Control of both ground and surface water will be required during construction to facilitate constructability and during the life of the project to assure satisfactory long-term performance.
- Stability of excavations during construction of all structures and trenches will require careful monitoring by the contractor.

G.2. Site Preparation and Grading

G.2.a. Clearing, Grubbing, and Stripping

All areas proposed for roadways, structures, driveways, parking, walkways or structural fill should be cleared and grubbed of all trees, stumps, brush and other debris and/or deleterious materials. The site should then be stripped and cleared of all vegetation, sod and organic topsoil. The depth for stripping is likely to vary between 6 and 8 inches.

PEI should be contacted to verify suitable subgrade.

G.2.b. Removal of Unsuitable Soil

Where areas of unsuitable soil, wood waste, building debris or other deleterious materials are encountered during excavation, they should be removed and replaced with compacted structural fill with the over-excavation lined with Type 2 drainage geotextile as recommended or specified by The Engineer.

G.2.c. Density Testing and Subgrade Re-compaction

After stripping, the exposed subgrade should be tested per Oregon Department of Transportation Test Method 158 (ODOT TM 158) and observed by the geotechnical engineer's representative. Such testing should not be attempted in wet weather and should be discontinued if the subgrade pumps, deflects under load or otherwise deforms. In areas that cannot be accessed with a loaded haul vehicle, the subgrade should be tested using a static cone penetrometer with results submitted to the geotechnical engineer for review.

Where soils are disturbed or if they pump when tested, they should be excavated, moisture conditioned and re-compacted or be replaced with imported structural fill. Effective recompaction of the fine-grained soil will require moisture conditioning and will require less effort if compacted with a pneumatic or static sheepsfoot roller. Moisture conditioning and recompaction beneath pavement or slabs should extend to a depth of between 10 and 12 inches. The recompaction should achieve 90% of maximum density, as determined by ASTM D 1557.

In locations where the subgrade consists of soils that are firm and generally unyielding, moisture conditioning and re-compaction is not indicated. We should be contacted to perform *in situ* strength tests of subgrade soils and to advise regarding moisture conditioning and compaction.

G.3. Structural Fill Placement and Compaction

Structural fill is defined as any fill placed and compacted to specified densities and located under roadways, structures, driveways, sidewalks and other load-bearing areas, and specifically includes all site fills more than 4 feet thick.

G.3.a. Structural Fill Materials

Structural fill should consist of a free-draining granular material with a maximum particle size of 8 inches or 2/3 of the un-compacted lift thickness, whichever is lesser. The material should be well graded with less than 5 percent non-plastic fines. During dry weather, any organic-free, non-expansive, compactable granular material meeting the maximum size criteria is typically acceptable for this use. Locally available crushed rock and jaw run crushed shale have performed adequately for most applications of structural fill.

G.3.b. Structural Fill Placement

Structural fill should be placed in horizontal lifts not exceeding 8 inches loose thickness, or thinner if necessary to obtain specified density. Each lift should be compacted to 90% of the maximum density. The lift thickness may be increased if specified density is consistently being exceeded and approved by the Engineer.

In order to accomplish effective compaction for the full fill footprint, we recommend that fills be over built by five feet, then the face cut back to achieve the design fill face.

Structural fill placed beneath footings or other structural elements should be centered on the footing. Thickness of the structural fill will vary depending on the

depth of suitable bearing conditions. The width of structural fill should be equal to the width of footing plus twice the depth of the structural fill beneath the footing.

G.3.c. Compaction

To facilitate the earthwork and compaction process, the earthwork contractor should place and compact fill materials at 1% to 2% above their optimum moisture content. If fill source soils are too wet to compact, they may be dried by continuous windrowing and aeration to achieve optimum moisture. If soils become dry, moisture should be added to maintain the moisture content at or near optimum during compaction operations.

If soil having swell potential is used for fills beneath structures, it should be moisture conditioned to 2% to 4% over optimum and compacted to 88% of maximum density. Swell properties should be determined by laboratory testing prior to use as structural fill.

G.3.c.1. Fill Observation and Testing Methods

Field density testing by nuclear methods is appropriate for compaction of 2½ - inch to ¾ - inch minus crushed base rock, fine grained soils, decomposed granite, and other materials 2½ inches or smaller in size. Due to the effect of particle size on test methods, other methods of compaction testing may be favored. Testing of only the upper lifts is not adequate to verify compaction.

G.3.c.2. Alternate Testing Methods

Density testing of the subgrade or existing base surface should be in conformance with Oregon Department of Transportation (ODOT) Test Method 158 (TM 158).

G.3.d. Non-Structural Fill

Stripped material should not be used as fill beneath permanent structures, roadway embankments, or as retaining wall backfill. If used as landscape fill, it should be placed and compacted to 88% density at 2% above optimum moisture and thoroughly processed to create a homogeneous fill. It should be limited to non-structural berms less than ten feet in height and having slopes no steeper than 3 ½ H to1 V. Surface shrinkage cracks and long-term creep of even relatively flat slopes is probable on the surface of SILT fills.

G.4. Slopes

Temporary cut and low, permanent fill slopes may be required for construction of the site fill and structure building pad.

G.4.a. Cut Slopes

Permanent cut slopes will likely not be required for construction activities at the site. Temporary cut slopes may be required for construction of retaining structures and other portions of the project. For brief periods, these may be excavated at

steeper angles than listed below. The silty soil may stand vertical to a depth of 4 feet for brief periods, except where saturated. In deeper trenches, side walls are likely to slough. We recommend cut slope angles no steeper than;

Table G 1 Cut Slopes		
Soil Classification	**Type of Cut**	**Inclination**
CLAY and SILT Soils	Temporary Cuts	1½ H to 1V
CLAY and SILT Soils	Permanent Cuts	2½ H to 1V
SAND Soils	Temporary Cuts	1 H to 1V
SAND Soils	Permanent Cuts	1½ H to 1V

G.4.b. Fill Slopes

Fill slopes are not anticipated to be required for this project.

G.5. Pavement Analysis and Design

G.5.a. Asphaltic Concrete Pavements

Site specific paving design was beyond the scope of this investigation; however, it should generally consist of compacted bituminous surface mix placed over a layer of 1 ½" minus aggregate base and compacted sub-base. Geotextile should be used as a separation medium to isolate localized sub grade failures for design purposes, CBR's can be expected to vary between 1 for soaked subgrade in fill areas to in excess of 20 in areas of competent weathered rock. If assistance is desired with site specific pavement design, please contact us. The undercompacted undocumented fill at the site will settle considerably under long term load. This should be considered during pavement design.

Material quality and placement of the surface assembly should conform to the 2021 edition of the ODOT Standard Specifications for Construction.

G.5.b. Concrete Pavement

Design of concrete pavement was not included in our scope of services. If it is desired, it should be designed using conventional principals for design of reinforced concrete paving with a modulus of subgrade reaction of 100 #/in^3.

G.5.c. Non-Structural Slabs on Grade

Exterior concrete slabs on grade will be subjected to moisture induced movement which is likely to result in cracking and vertical offsets at joints and connections with other structures. More uniform support can be achieved by placing a minimum of 8 inches of crushed rock, crushed shale or decomposed granite fill beneath these areas. Slabs and walkways reinforced with #3 or #4 deformed reinforcing steel both ways will also withstand moisture induced movement better than unreinforced flatwork. The reinforcing must extend across all joints (or use dowels) to decrease differential vertical movement. Jointing patterns designed to provide

predetermined crack locations will also generally improve the appearance of the finished flatwork. Concrete work should conform to ACI 306 and 318.

G.6. Site Drainage and Erosion Control

G.6.a. Structures

Final grading should accomplish rapid positive drainage away from the structure for a horizontal distance of at least 10 feet at a minimum grade of 10%. This water should be channeled to surface drains or swales for proper disposal. The landscaping around the structure should be graded such that drainage discharges clear of the foundation influence area. Downspouts should be connected to a sealed system which discharges to a location clear of the foundation influence area.

G.6.b. Surface Areas

Surface and subsurface water flows should be intercepted by swales and/or catch basins and conveyed through tight lines to acceptable discharge locations. We recommend that hard surfaces be provided, sloped and shaped to channel water away from the structure.

G.6.c. Erosion Control

Site soils are moderately susceptible to erosion if unprotected. The site grades are such that erosion and sediment transport during construction are not expected to be significant. The site cuts and fills, building pad, etc. should be graded such that surface water is collected and disposed without causing erosion or siltation. Sediment laden water should not be allowed to flow directly into streams or off-site drainage systems.

Typical project landscaping should be adequate for long-term erosion control. ***In no case should concentrated surface water runoff be allowed to flow from swales and over the top edge and/or down the face of any slopes.***

G.7. Tower Foundations

G.7.a. General

A spread footing is recommended for the structure. Deep foundations are not necessary nor practical for this application.

G.7.b. Natural Soil

G.7.b.1. Subgrade Preparation

After excavation, the subgrade should be moisture conditioned and compacted to 90% of maximum dry density at 2% above optimum moisture.

G.7.b.2. Structural Fill

The building footprint should be excavated of all material not meeting required density criteria. The excavation should then be filled with structural fill material conforming to Section G.3 of this report.

G.7.b.3. Fill Placement

Fill should be placed in lifts not exceeding 8 inches thick, measured loose, and compacted to 90% of maximum dry density. Fills not beneath structures or paving may be compacted to 88% density.

G.7.b.4. Unsuitable Soil

Additional areas of unsuitable soil discovered during density testing should be over excavated and filled with structural fill material compacted as described above. If these occur locally beneath significant fills, they should be removed, if feasible, or stabilized by drainage if removal is not feasible. Please contact us for additional recommendations, if this condition is encountered.

G.7.b.5. Footing Embedment

Footings should be embedded a minimum of 12 inches below natural or finish grade to provide lateral support and frost protection. Footing excavations should be backfilled with structural fill.

G.7.b.6. Allowable Bearing Pressure

Building footings placed as recommended above may be designed for the following bearing pressures;

Table G 3
Allowable Bearing Pressure

Classification	Allowable Bearing Pressure
Existing site soils	1,000 #/ft^2
Properly prepared Natural site soils	1,500 #/ft^2
Compacted structural fill (Required depth of fill ≥ B/2)	2,500 #/ft^2

G.7.b.6.a. Increases

Allowable bearing pressures may be increased as follows;

Table G 4 – Bearing Pressure Increases		
Condition	**Basis**	**Load Factor Increase**
Square spread footings	Shape	20%
Live loads	Load Duration Factor	15%
Short term loads	Load Duration Factor	33%

G.7.b.7. Minimum Width

The minimum recommended width for continuous footings is 1'- 6" and the minimum recommended dimension for spread footings is 2'-0".

G.7.c. Footing Drains

We recommend that exterior footing drains be provided for below grade components, located at an elevation low enough to intercept groundwater and limit it from rising above the surface of crawlspaces and the bearing area of interior slabs on grade. Footing drains should discharge clear of the foundation influence area.

G.7.d. Settlement

Building settlement will vary with thickness and swell/consolidation potential of fill, type and thickness of underlying soils and methodology of foundation construction. In addition to settlement, vertical movement due to swelling of the foundation soil is possible for lightly or differentially loaded structural components placed on over-compacted non-natural imported soil having swell potential.

Relying on the loads estimated herein and assuming that the dead load portion will be approximately 1/2 of the total, we project total vertical movement to be less than 1 inch. Differential movement between structural and non-structural components could be as much as ½ inch. These values assume the recommendations contained herein are followed.

G.8. Lateral Earth Pressures and Drainage

G.8.a. Lateral Load Resistance

Lateral loads exerted upon these structures can be resisted by passive pressure acting on buried portions of the foundation and other buried structures and by friction between the bottom of concrete elements of the foundations and slabs and the underlying soil.

Lateral load resistance should be calculated using the values presented in Section F.3 for the recommended depth of embedment as;

P_a or $P_p = ½ k_{(a \text{ or } p)} \gamma H^2$ where;

P_a is active earth pressure

P_p is passive earth pressure

$k_a = \tan^2 (45°-\varphi/2)$

$k_p = 1/ k_a$

γ = soil unit weight

The first one foot below the ground surface should be ignored when computing passive resistance.

- A coefficient of friction of 0.45 is recommended for elements poured neat against structural rock fill or bedrock.
- A coefficient of friction of 0.30 is recommended for elements poured against natural soils.
- The above values should be reduced to 0.2 for areas where bearing is over a non-soil vapor barrier or low permeability membrane.

G.8.b. Lateral Earth Pressures

It is possible that both unrestrained and restrained retaining walls may be constructed for the project. Lateral earth pressures will be imposed on below-ground and backfilled structures or walls, including daylight basements and foundations which do not have uniform heights of fill on both sides. The following recommendations are provided for design and construction of retaining walls:

- Walls which are free to rotate at the top when backfilled should be designed for an equivalent fluid pressure of 45 #/ft^3. This value should be increased to 52 #/ft^3 for a 2 H to 1 V back slope.
- Walls that are fixed at the top should be designed for an equivalent fluid pressure of 60 #/ft^3. This should be increased to 67 #/ft^3 for a 2 H to 1 V back slope.
- A wet soil unit weight of 135 #/ft^3 should be used for design.
- Backfill should consist of non-expansive, free draining, material. The backfill should be placed in lifts at near the optimum moisture content and compacted to between 88 and 90 % of the maximum density. Care should be employed to avoid over compacting the backfill. Loosely placed backfill and over-compacted backfill will exert greater pressures on the wall than the pressures considered above.
- To prevent damage, backfill and compaction against walls or embedded structures should be accomplished with hand-operated equipment within a lateral distance of 1/2 to 1/3 the unsupported height of wall. Beyond this zone, normal compaction equipment may be used.
- While proper compaction of wall backfill is critical to long-term performance, care should be taken to avoid over compaction of the backfill materials, which

can result in lateral loads greater than the design pressures recommended above.

- For design of retaining walls supporting or bracing structures, a peak horizontal acceleration coefficient of 0.4g is recommended for seismic loads.
- To prevent development of hydrostatic pressures exceeding the lateral earth pressures, a perimeter drainage system is recommended for underground structures, including basements.
- Hydrostatic pressures behind retaining walls should be relieved by installation of free draining backfill behind the walls, with weep holes spaced as necessary (typically 10 feet on center) to achieve effective drainage. The free draining backfill should be protected from plugging by encapsulating with drainage geotextile as recommended above.
- Allowable bearing capacities should be as recommended for Building Structures.

G.9. Trenching and Piping

Additional underground piping will be constructed. Excavation can be accomplished by normal means throughout the site. Depending on when construction occurs, dewatering of the trench may be necessary to facilitate construction.

- Pipe should be cradled in coarse aggregate compacted to 90% density, having a minimum thickness equal to 1/4 pipe diameter below bottom of pipe and extending upward to the pipe spring line.
- The trench backfill should consist of clean excavated material, compacted to 90% density.
- Beneath paved areas, full depth granular backfill is recommended as a minimum, and use of lean cement slurry should be considered.
- The top 12" of trench backfill should be compacted to a density of 92%. Loads on pipe will vary with depth and width of trench.
- For pipe design, an effective pressure of 130 #/ft^3 per foot of depth is recommended.
- Underground pipes located beneath paved areas and having shallow cover should be designed to withstand vehicular loads.

H. ADDITIONAL SERVICES AND LIMITATIONS OF REPORT

H.1. Additional Services

Additional services by the geotechnical engineer are recommended to help ensure that design recommendations are correctly interpreted during final project design and to help verify compliance with project specifications during construction. Additional services could include, but not be limited to:

- Review of final construction plans and specifications for compliance with geotechnical recommendations.
- Attend project team meetings to clarify issues raised during the construction process.

- Review and/or design of swale, fill and basement subdrain systems.
- Review of proposed cuts and fills, fills on slopes, surface and subdrains, swale drains, foundation support, and basement or rock fill subdrains.
- Site observation and/or CoMET services, i.e., observation of over excavated areas below keys, benches and footings and slabs, subgrade proof rolling, placement and compaction testing of structural fill, fill subdrains, swale subdrains, foundation drains, wall drains, subgrade proof rolling, pavement subgrade and aggregate base placement, site grading, surface drainage, etc.
- Special Inspection as defined by the OSSC may be required for certain of the components.
- Periodic construction field reports, as requested by the client and required by the building department.

H.2. Limitations

Where used herein, the terms "Special Inspector, Inspector and Special Inspection" are understood to be for services contemplated, prescribed and as defined by the International Building Code and the Oregon Structural Specialty Code.

The analyses, conclusions and recommendations contained in this report are based on site conditions and development plans as they existed at the time of the study, and assume that soils and groundwater conditions encountered, observed or inferred during our exploration are representative of soils and groundwater conditions throughout the site. If, during construction, subsurface conditions are found to be different or design parameters change, we should be advised at once so that we can review this report and reconsider our recommendations, as appropriate. If there is a significant lapse of time between submission of this report and the start of work at the site, if the project is changed, or if site conditions have changed, we recommend that this report be reviewed to verify continued applicability.

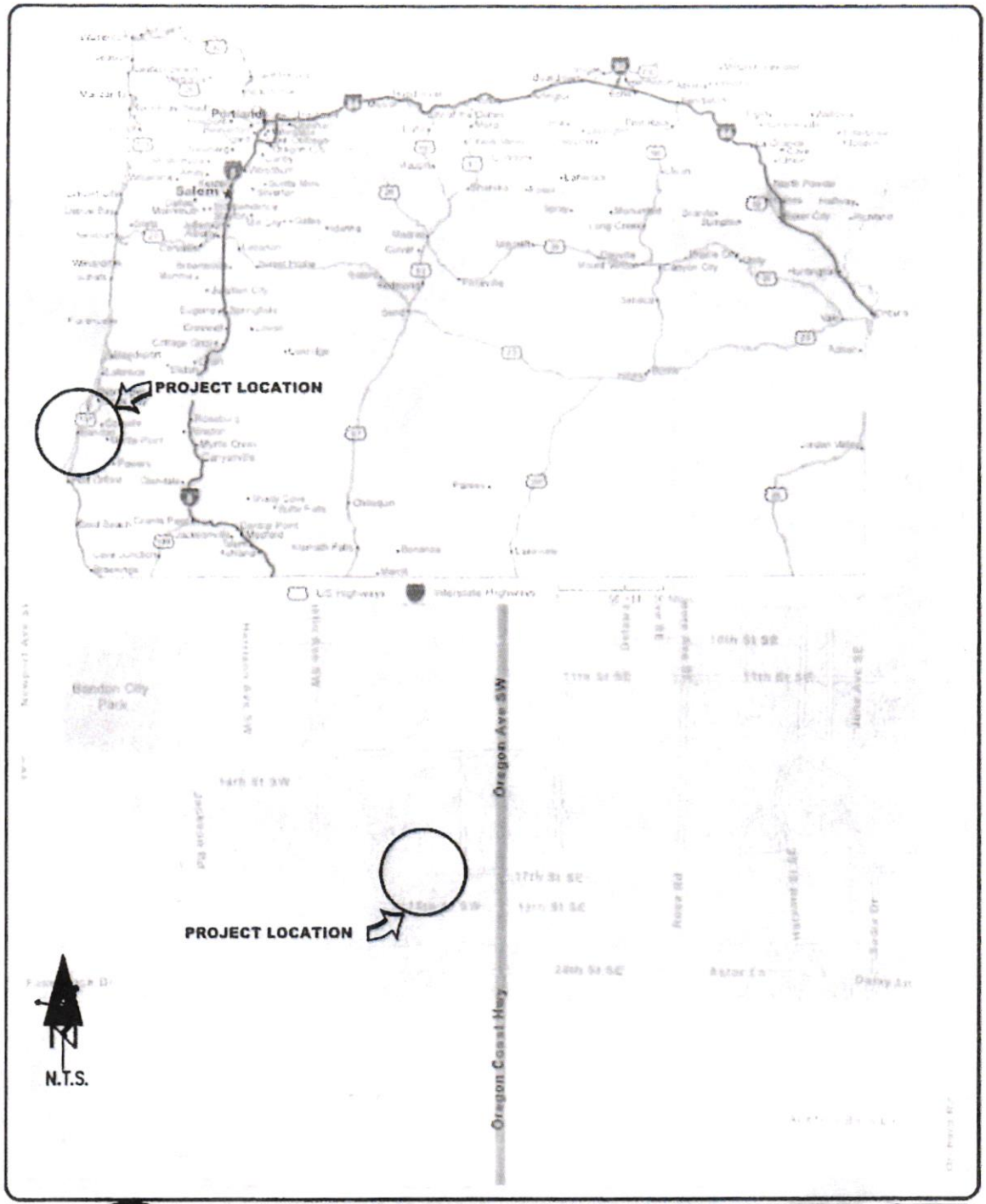
This report was prepared for the use of the owner and design team for the subject project. It is only for this site and construction project. No third party beneficiaries are intended. Potential users of the report should be so notified.

It should be made available to other contractors for information and factual data only, such as test boring or test pit logs, measured water levels, samples, sample classifications and laboratory test results. The report is interpretive in nature and shall not be used for contractual purposes, such as warranting that subsurface conditions will be consistent with, or as indicated by the formal boring or test pit logs and subsurface profiles contained or inferred herein and/or discussions of subsurface conditions. It is not to be used for extensions of this project or for other projects without our express written consent. We should be contacted to review both plans and specifications for compatibility with this report before finalization. **CoMET services, compaction testing and periodic observation during construction are recommended.**

We have performed these services in conformance with generally accepted engineering and geotechnical engineering practices in southern Oregon at the time the study was accomplished. No other warranty is either expressed or implied.

Since test pits and borings represent only the conditions at those discrete locations, unanticipated soil conditions may be and, in fact, are commonly encountered on projects of similar size. Unanticipated conditions cannot be precluded by practical field studies. Since such unexpected conditions frequently result in budget increases to attain a properly constructed project, we recommend that a reasonable contingency account be established sufficient to fund possible extra costs

FIGURES

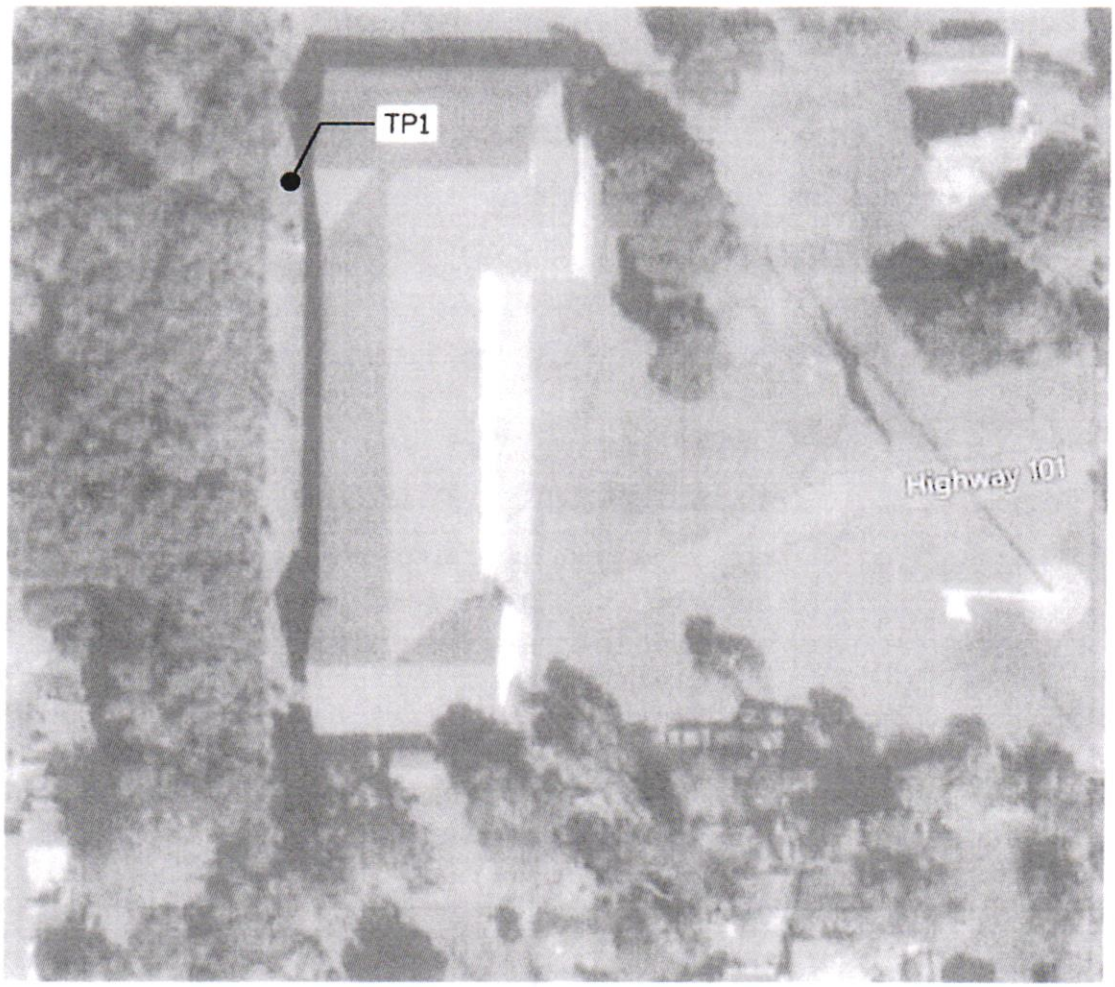


PINNACLE ENGINEERING, INC.

SUBSURFACE SOILS INVESTIGATION
VICINITY MAP
PROJECT: 30574.03 - 50530 HWY 101 - BANDON - OR
CLIENT: ACE COMMUNICATION SERVICES, INC

FIG. 1

Pinnacle Engineering, Inc. www.pinnacleengineeringinc.com Email:matt@pinnacleengineeringinc.com	4276 Old Hwy 99 South Roseburg, OR 97471	Phone (541) 440-4871	Figures Project # 30574.03



N.T.S.

PINNACLE ENGINEERING, INC.

SUBSURFACE SOILS INVESTIGATION SITE MAP

PROJECT: 30574.03 - 50530 HWY 101 - BANDON - OR

CLIENT: ACE COMMUNICATION SERVICES, INC

FIG. 2

SOIL TYPES (Ref. 1)

Boulders:	Particles of rock that will not pass a 12 inch screen.
Cobbles:	Particles of rock that will pass a 12 inch screen, but not a 3 inch sieve.
Gravel:	Particles of rock that will pass a 3 inch sieve, but a #4 sieve.
Sand:	Particles of rock that will pass a #4 sieve, but not a #200 sieve.
Silt:	Soil that will pass a #200 sieve, that is non-plastic or very slightly plastic, and exhibits little or no strength when dry.
Clay:	Soil that will pass a #200 sieve, that can be made to exhibit plasticity within a range of water contents, and that exhibits considerable strength when dry.

MOISTURE AND DENSITY

Moisture condition:	An observational term; moist, wet.
Moisture content:	The weight of water in a sample divided by the weight of dry soil in the sample, expressed as a percentage.
Dry Density:	The pounds of dry soil in a cubic foot of soil

DESCRIPTORS OF CONSISTENCY (Ref. 3)

Liquid Limit:	The water content at which a - #200 soil is on the boundary between exhibiting liquid and plastic characteristics. The consistency feels like soft butter.
Plastic Limits:	The water content at which a - #200 soil is on the boundary between exhibiting plastic and semi-solid characteristics. The consistency feels like stiff putty.
Plasticity Index:	The difference between the liquid limit and the plastic limit, i.e. the range in water contents over which the soil is in a plastic state.

MEASURES OF CONSISTENCY OF COHESIVE SOILS (CLAYS) (Ref's 2&3)

Very soft	N=0-1*	C=0-250 psf	Squeezes between fingers
Soft	N=2-4	C=250-500 psf	Easily molded by finger pressure
Medium stiff	N=5-8	C=500-1000 psf	Molded by strong finger pressure
Stiff	N=9-15	C=1000-2000 psf	Dented by strong finger pressure
Very stiff	N=16-30	C=2000-4000 psf	Dented slightly by finger pressure
Hard	N>30	C>4000 psf	Dented slightly by pencil point

*N= Blows per foot in the Standard Penetration Test. In cohesive soils, with the 3 inch diameter sampler, 140-pound weight, divide the blow count by 1.2 to get N (Ref. 4).

MEASURES OF RELATIVE DENSITY OF GRANULAR SOILS (GRAVELS, SANDS, SILTS) (Ref's 2 & 3)

Very Loose	N=0-4**	RD=0-30	Easily push a ½ inch reinforcing rod by hand
Loose	N=5-10	RD=30-50	Push a ½ inch reinforcing rod by hand
Medium Dense	N=11-30	RD=50-70	Easily drive a ½ inch reinforcing rod
Dense	N=31-50	RD=70-90	Drive a ½ inch reinforcing rod 1 foot
Very Dense	N>50	RD=90-100	Drive a ½ inch reinforcing rod a few inches

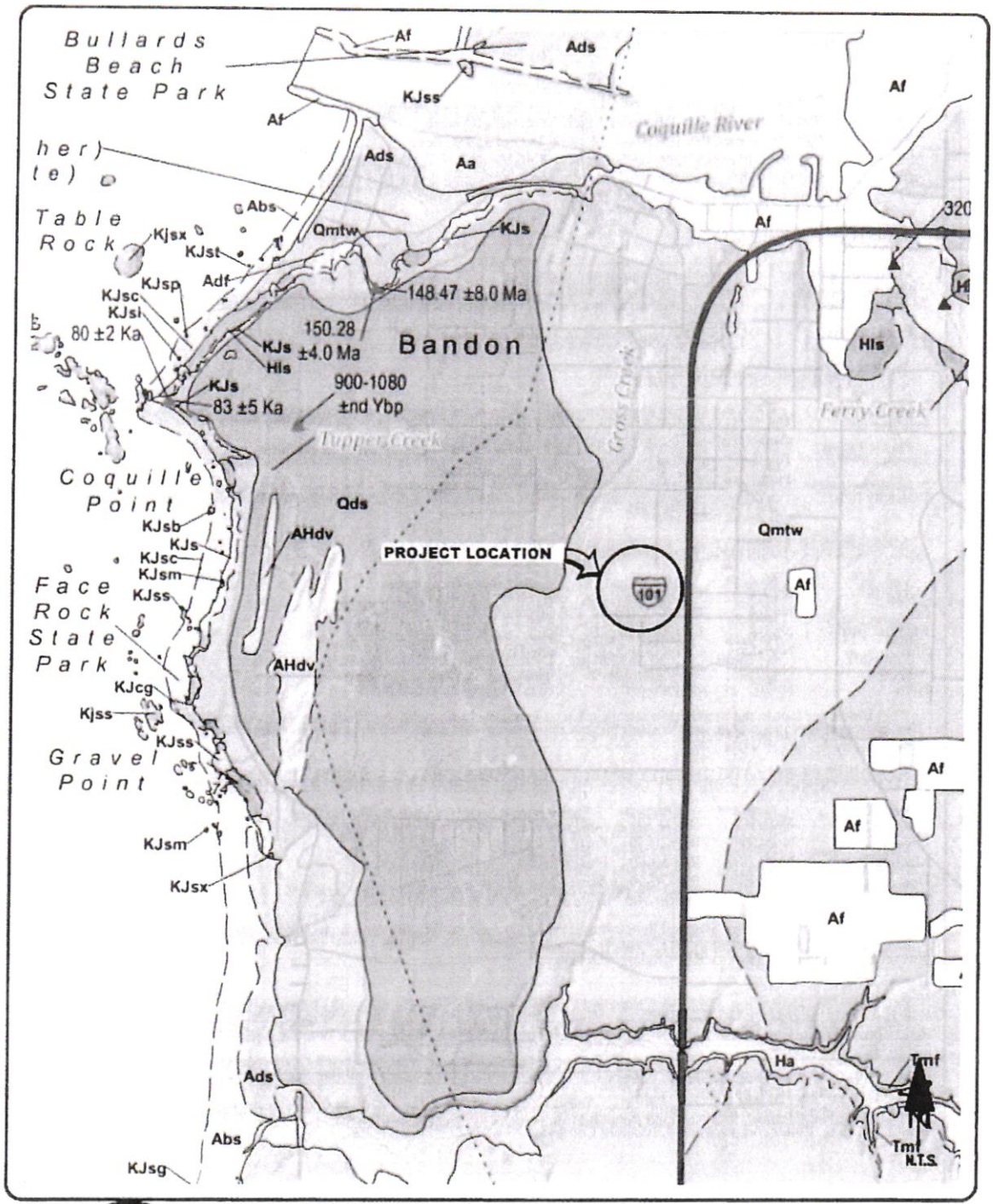
**N= Blows per foot in the Standard Penetration Test. In granular soils, with the 3 inch diameter sampler, 140 pound weight, divide the blow count by 2 to get N (Ref 4). RD = Relative Density.

Ref. 1: ASTM Designation: D 2487-93, Standard Classification of Soils for Engineering Purposes(Unified Soil Classification system).
Ref.2: Terzaghi, Karl, and Peck, Ralph B., Soil Mechanics in Engineering Practice, John Wiley & Sons, New York, 2nd Ed., 967, pp. 30, 341, 347.
Ref.3: Sowers, George F., Introductory Soil Mechanics and Foundations: Geotechnical Engineering, Macmillan Publishing Company, New York, 4th Ed., 1979, pp. 80,81, and 312.
Ref.4: Lowe, John III, and Zaccheo, Phillip F., Subsurface Explorations and Sampling Chapter 1 in Foundation Engineering Handbook, Hsai-Yang Fung, Editor , Van Nostrand Reinhold Company, New, 2nd Ed. 1991, p.39/

PINNACLE ENGINEERING, INC.

SUBSURFACE SOILS INVESTIGATION
GEOLOGIC REFERENCE
PROJECT: 30574.03 - 50530 HWY 101 - BANDON - OR
CLIENT: ACE COMMUNICATION SERVICES, INC

FIG. 3



PINNACLE ENGINEERING, INC.

SUBSURFACE SOILS INVESTIGATION
GEOLOGIC MAP
PROJECT: 30574.03 - 50530 HWY 101, BANDON, OR
CLIENT: ACE COMMUNICATION SERVICES, INC

FIG. 4

APPENDIX A
TEST BORING LOGS AND TESTS

DRILL HOLE LOG

TP#1

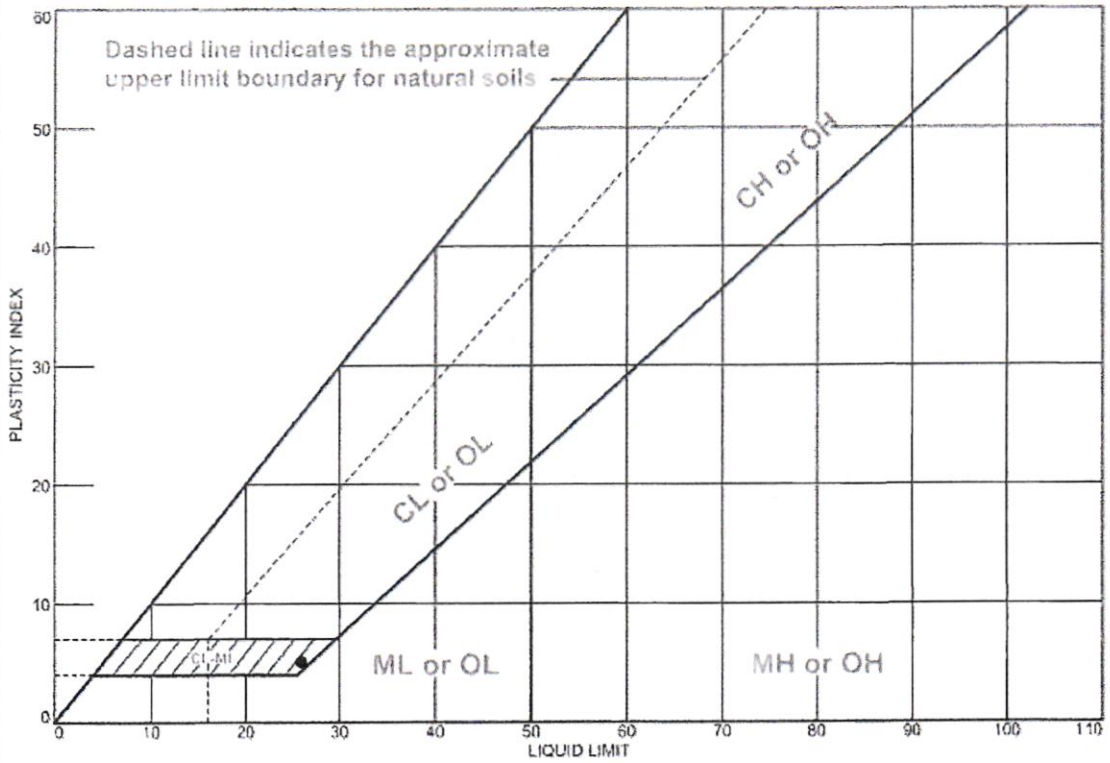
PROJECT:	BANDON RFD-RADIO TOWER	**PROJECT NO.:**	60935.22
CLIENT:	ACE COMMUNICATION	**DATE:**	6/23/23
LOCATION:	50530 HWY 101, BANDON, 97411	**ELEVATION:**	30'
DRILLER:	ACE COMMUNICATIONS	**LOGGED BY:**	TWS
DRILLING METHOD:	TAKEUCJI TB250-2 MINI EX 24" BUCKET		
DEPTH TO - WATER> INITIAL	9'	**AFTER DRILLING:**	9' **SEEPAGE:** 9'

DEPTH (feet)	Description	Recov (in)	Driven (in)	PID ppm	Sample#	Soil Type	Sampler	Symbol	TEST RESULTS
0									Plastic Limit ⊢—⊣ Liquid Limit
	GRASS AND SOD								Water Content • ◆
	ML-sandy SILT,medium brown, moist, stiff								10 20 30 40 50
1.5	QC=16								
	CL-ML-low plastic CLAY w/sand, medium brown, moist, stiff								
3									
	QC=20				36292				
	(5) TUBES								
4.5									
6									
	SP-SAND, fine grain, orange-gray mottled, moist, loose, (1) bag				36293				
7.5	qc=20								
	(3) buckets				36294				
9									
	water seepage								
	END OF TEST PIT @ 10'								
10.5									

This information pertains only to this boring and should not be interpreted as being indicative of the site.

Figure PAGE 1 of 1 **Western Testing, LLC**

LIQUID AND PLASTIC LIMITS TEST REPORT



	Material Description	Sampled	Tested	Technician	LL	PL	PI	%<#40	USCS
●	CL-ML-low plastic CLAY w/sand, medium brown, moist, dense			JBE	26	21	5		

Project No. 60935.22 **Client:** ACE COMMUNICATION

Project: BANDON RFD-RADIO TOWER

○**Source of Sample:** TP#1 **Depth:** 3 **Sample Number:** 36292

○TEST RAN PER D4318 ON 6/27/23 BY JBE

Western Testing, LLC

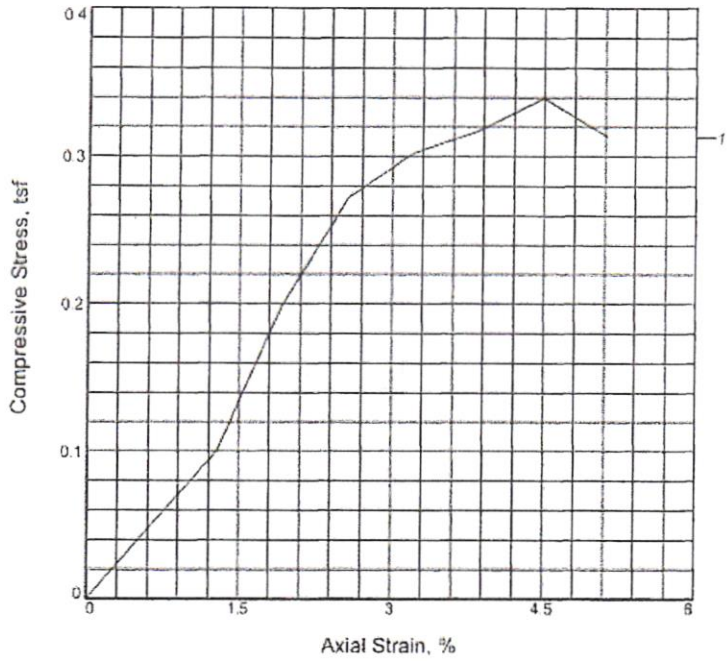
Roseburg, Oregon

Checked by:

Title: Figure

Tested By: JBE

UNCONFINED COMPRESSION TEST



Sample No.	1			
Unconfined strength, tsf	0.340			
Undrained shear strength, tsf	0.170			
Failure strain, %	4.5			
Strain rate, in./min.	N/A			
Water content, %	23.8			
Wet density, pcf	120.7			
Dry density, pcf	97.5			
Saturation, %	83.9			
Void ratio	0.7930			
Specimen diameter, in.	1.90			
Specimen height, in.	3.90			
Height/diameter ratio	2.05			

Description: CL-ML-low plastic CLAY w/sand, medium brown, moist, dense

LL = 26	PL = 21	PI = 5	Assumed GS= 2.8	Type:

Project No.: 60935.22
Date Sampled:
Remarks:
TEST RAN PER D2166 BY JBE ON 6/26/23

Figure _____

Client: ACE COMMUNICATION

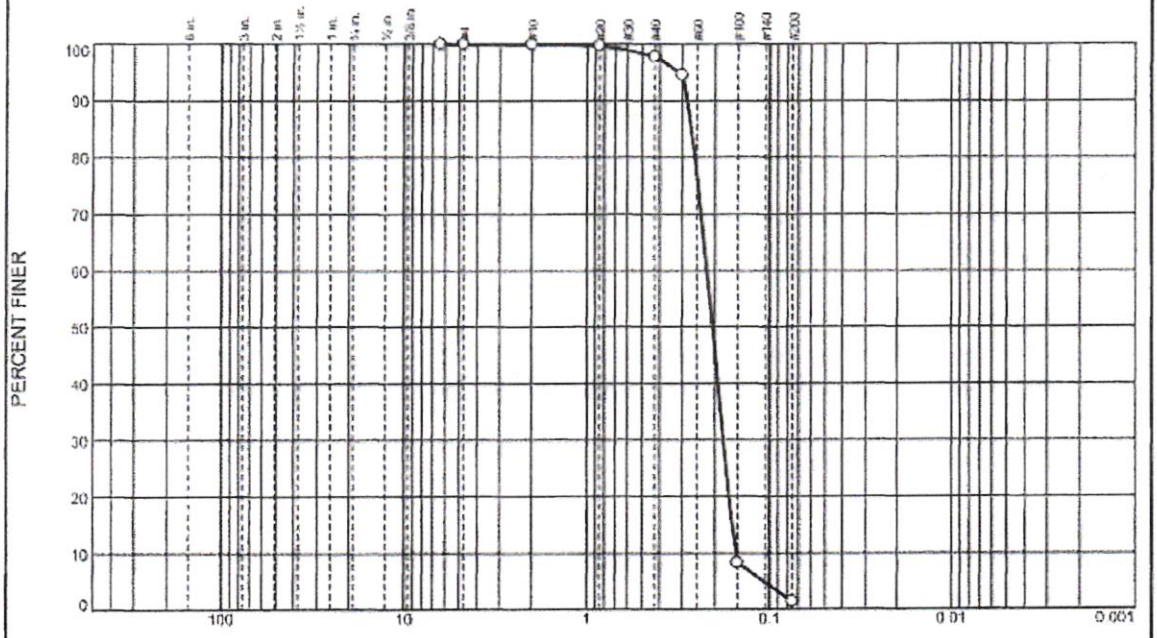
Project: BANDON RFD-RADIO TOWER

Source of Sample: TP#1 **Depth:** 3
Sample Number: 36292

UNCONFINED COMPRESSION TEST
Western Testing, LLC
Roseburg, Oregon

Tested By: JBE

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	2.2	96.3	1.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)

* (no specification provided)

Material Description

SP-SAND, fine grain, orange-gray mottled, moist, loose.

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.2821 D_{85}= 0.2677 D_{60}= 0.2204
D_{50}= 0.2060 D_{30}= 0.1797 D_{15}= 0.1600
D_{10}= 0.1527 C_u= 1.44 C_c= 0.96

Classification

USCS= SP AASHTO=

Remarks

TEST RAN PER AASHTO T11 ON 6/27/23 BY JBE

Source of Sample: TP#1 **Depth:** 8
Sample Number: 36294

Date: 6/27/23

Western Testing, LLC

Roseburg, Oregon

Client: ACE COMMUNICATION
Project: BANDON RFD-RADIO TOWER

Project No: 60935.22 **Figure**

Tested By: JBE

SOLICTED BID FORM

Bandon Rural Fire Protection District Tower Construction
Coos Forest Protective Association

CFPA Project Number 140' Monopole

We agree to execute the contract, if offered, and provide all labor and material required for construction of the above project for the following dollar amount, and in strict accordance with the attached contract documents.

ALL WORK

Bid dollar amount to accomplish ALL WORK required to fully complete the project in accordance with the Contract Documents, **INCLUDES UNIT PRICING ONLY NOT ALTERNATIVE PRICING**.

for the sum of **($ 104,800.00)**

UNIT PRICES

All unit prices are for materials installed as specified and shall be used to adjust (decrease or increase) the contract.

Unit Description (Describe in Detail	Unit Price	Quantity included in All Work – Lump Sum Base Bid
Excavation / Earth Work	$ 23,025.00	(1) Tower Foundation
Tower Construction	$ 33,975.00	(1) 140' Monopole
Concrete Work/Inspections	$ 24,975.00	(1) 30 yds Tower Found.
Excavate Trenching	$ 5,825.00	(1) Grounding & Conduit
Prevailing Wage Increase	$ 17,000.00	(1) All Labor Increase

***OPTIONAL ADDITION: Geotechnical Study & Report $21,800.00**

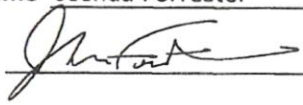
Name of Firm Ace Communication Services, Inc.

Address 290 Quarry Rd., Roseburg, OR 97470

Telephone (503) 807-1477 **E-Mail** acecommservices@yahoo.com

Building Contractor Registration Number Oregon 113441

Printed Name Joshua Forrester

Signature 

Date June 29, 2023 **Title** President

CFPA Project _____