



## POR STINGER

EXHIBIT H UTILITY REPORT

29421 E WOODARD RD  
TROUTDALE, OR 97060-8317  
E911 ADDRESS: 29421 E WOODARD RD  
TROUTDALE, OR 97060-8317



**R&W**  
ENGINEERING, INC.  
9615 S.W. Allen Blvd., Suite 107  
Beaverton, Oregon 97005  
Phone: (503) 726-3325  
Fax: (503) 726-3326  
E-mail: rwharris@rweng.com  
Project No.: 1382.025.001  
Contact: VANESSA FUGATE

### COORDINATES

LATITUDE: 45.525419° N  
LONGITUDE: -122.359431° W

### SITE ACCESS INFORMATION

ACCESS TO THE PROPERTY IS PROVIDED VIA AN EXISTING GRAVEL DRIVEWAY. LAST 200' TO TOWER AREA IS DIRT. A TRUCK/DRILL RIG CAN ACCESS WITH ADVANCE COORDINATION WITH OWNER.

### DRIVING DIRECTIONS

FROM NE 122ND AVE, HEAD NORTH ON NE 122ND TOWARD NE MARINE DR; TURN RIGHT ON MARINE DR - GO 9.6 MILE; TURN LEFT ONTO SE WOODARD RD. GO 0.8 MI. TURN RIGHT ONTO DRIVEWAY AT 29421 EAST WOODARD RD, DRIVE PAST HOUSE TO RIGHT SIDE IN WOODS PAST GATE.

### SITE NOTES

- SARZAR DATED 08/26/16 RECEIVED 11/15/16.
- ZDS DATED 02/17/17 RECEIVED 02/27/17.
- LEASE EXHIBIT DATED 01/18/17 RECEIVED 02/27/17.

#### EASEMENTS:

#### POWER:

- PGE WILL REQUIRE AN EASEMENT IF ONE IS NOT IN PLACE BY VIRTUE OF LEASE OR NON-EXCLUSIVE EASEMENT. SITE AGG TO PROVIDE PGE WITH THE LEASE EXHIBIT OR NON-EXCLUSIVE EASEMENT FOR REVIEW.

#### TELCO:

- TELCO WILL REQUIRE AN EASEMENT IF ONE IS NOT ALREADY IN PLACE BY VIRTUE OF LEASE OR NON-EXCLUSIVE EASEMENT.

### PROJECT CONTACTS

**APPLICANT**  
VERIZON WIRELESS  
5430 NE 122ND AVE  
PORTLAND, OR 97230

**PROJECT CONSULTANT**  
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VANESSA FUGATE  
PH: 503.726.3325  
VFUGATE@RWENG.COM

**REAL ESTATE CONSULTANT**  
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1100 MELODY LN, STE 139  
ROSEVILLE, CA 95678  
KONRAD HYLE  
PH: 503.522.0634  
KONRAD@BLK-ROCK.COM

**CONSTRUCTION MANAGER**  
VERIZON WIRELESS  
JASON FALLAU  
CELL: 541.981.3542  
JASON.FALLAU@VERIZONWIRELESS.COM

**LAND OWNER**  
CLIFF HEGSTAD  
PH: 503.481.8927  
CLIFF1931@AOL.COM

**STRUCTURE OWNER**  
N/A

**POWER PROVIDER**  
PORTLAND GENERAL ELECTRIC (PGE) - W/O #M2221580  
3700 SE 17TH AVE  
PORTLAND, OR 97202  
CONTACT: SYDNEY COX  
PH: 503.963.6871  
SYDNEY.COM@PGN.COM

**FIBER/TELCO PROVIDER**  
GENERIC FIBER  
FRONTIER TERRITORY

### DRAWING INDEX

SHEET	DESCRIPTION
T-1.0	TITLE SHEET
A-1.0	OVERALL SITE PLAN
A-2.0	PHOTOS
A-3.0	PHOTOS
A-4.0	PHOTOS
A-5.0	504-PGE VAULT SPEC
A-6.0	PGE PADMOUNT SPEC
A-7.0	644-3-PGE VAULT SPEC
A-8.0	PGE DESIGN
PG. 10	POWER EMAIL

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R&W PROJECT NO.: 1382.025.001

#### WALK DATES

NO	DATE	BY	DESCRIPTION
1	12/07/16	VAF	LOCKDOWN
2	03/24/17	VAF	POWER DESIGN

#### SUBMITTAL

NO	DATE	BY	DESCRIPTION
1	04/04/17	VAF	GENERIC FIBER

#### SITE NAME

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#### SITE ADDRESS

29421 E WOODARD RD  
TROUTDALE, OR 97060-8317

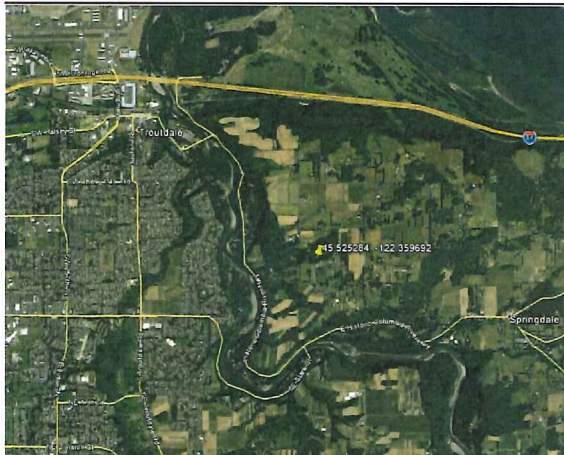
#### SHEET TITLE

TITLE  
SHEET

#### SHEET NO.

T-1.0

### PROJECT VICINITY MAP



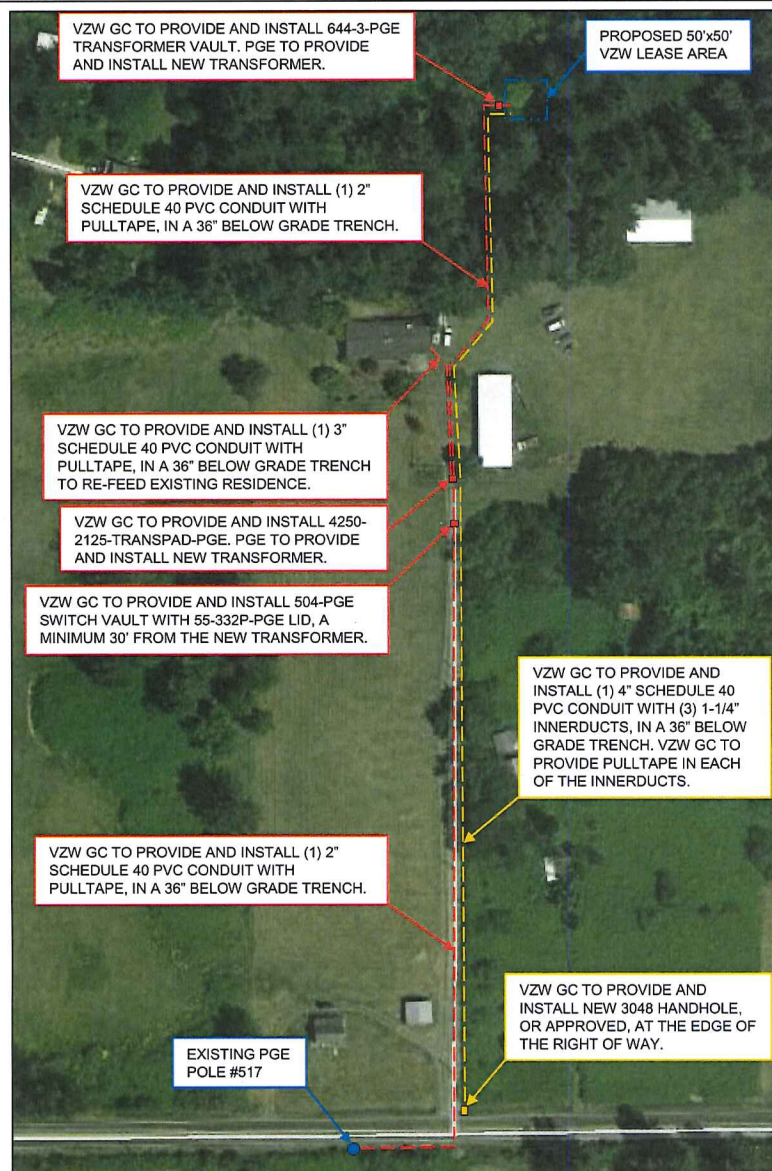
### SITE AREA MAP



EXHIBIT

A.16





## CONSTRUCTION NOTES

### GENERAL REQUIREMENTS

- THIS UCR IS NOT A CONSTRUCTION, OR BID DOCUMENT.
- VZW GC TO REQUEST LOCATES BE PERFORMED PRIOR TO ANY EXCAVATION.
- A RIGHT OF WAY PERMIT WILL BE REQUIRED FOR ALL WORK DONE IN THE RIGHT OF WAY. PGE WILL OBTAIN THE PERMIT, VZW WILL NEED TO USE A PGE APPROVED CONTRACTOR FOR WORK DONE IN THE RIGHT OF WAY.
- MAINTAIN PROPER CLEARANCES FROM ALL EXISTING AND NEW PIPING, DRAINAGE AND CONDUITS ON THE PROPERTY.
- ALL SWEEPS TO HAVE A MINIMUM 36" RADIUS. FIBERGLASS SWEEPS MAY BE REQUIRED. VERIFY WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- PGE MAY REQUIRE THAT VZW GC INSTALL BOLLARDS AROUND TRANSFORMERS. VERIFY WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- PGE WILL REQUIRE 24 HOUR ACCESS TO THEIR FACILITIES.
- PGE WILL REQUIRE A MINIMUM 60 DAYS NOTICE PRIOR TO CONSTRUCTION.

### POWER

THERE IS AN EXISTING OVERHEAD POWER LINE THAT CURRENTLY FEEDS THE PROPERTY. PGE WILL BE CONVERTING THE EXISTING OVERHEAD SERVICE TO UNDERGROUND WHICH WILL CAUSE AN OUTAGE. VZW GC TO COORDINATE OUTAGE WITH PGE REPRESENTATIVE AND OWNER REPRESENTATIVE.

- VZW GC TO SWEEP (1) 2" SCHEDULE 40 PVC CONDUIT WITH PULLTAPE, UP AT THE BASE OF EXISTING PGE POLE #517. COORDINATE EXACT SWEEP LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO PLACE CONDUIT IN A 36" BELOW GRADE TRENCH AND EXTEND EAST APPROXIMATELY 90' BEFORE MAKING 90° TURN NORTH. COORDINATE EXACT ROUTING WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO BORE CONDUIT 36" BELOW GRADE UNDER E WOODARD RD APPROXIMATELY 30' TO THE BEGINNING OF THE EXISTING DRIVEWAY.
- AT THE BEGINNING OF THE DRIVEWAY, VZW GC TO EXTEND CONDUIT IN A 36" BELOW GRADE TRENCH TO THE LOCATION OF THE NEW SWITCH VAULT.
- VZW GC TO PROVIDE AND INSTALL 504-PGE SWITCH VAULT WITH 55-332P-PGE LID, PER PGE SPECIFICATIONS. COORDINATE EXACT LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO STUB (1) 2" SCHEDULE 40 PVC CONDUIT WITH PULLTAPE, INTO THE NEW SWITCH VAULT. COORDINATE EXACT STUB LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO PLACE CONDUIT IN A 36" BELOW GRADE TRENCH AND EXTEND TO THE LOCATION OF THE NEW TRANSFORMER.
- VZW GC TO PROVIDE AND INSTALL 4250-2125-TRANSPAD-PGE, PER PGE SPECIFICATIONS, A MINIMUM 30' FROM NEW SWITCH VAULT. PGE TO PROVIDE AND INSTALL NEW TRANSFORMER. COORDINATE EXACT LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO SWEEP UP (1) 3" SCHEDULE 40 PVC CONDUIT WITH PULLTAPE, INTO THE NEW TRANSFORMER. COORDINATE EXACT SWEEP LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO PLACE CONDUIT IN A 36" BELOW GRADE AND EXTEND TO THE LOCATION OF THE EXISTING METER IN ORDER TO RE-FEED THE EXISTING RESIDENCE. NOTE: LOCATION OF THE METER MUST BE APPROVED BY PGE SERVICE INSPECTOR.
- VZW GC TO ALSO SWEEP UP (1) 2" SCHEDULE 40 PVC CONDUIT WITH PULLTAPE, INTO THE NEW TRANSFORMER. COORDINATE EXACT SWEEP LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO PLACE THE 2" CONDUIT IN A 36" BELOW GRADE TRENCH AND EXTEND TO THE LOCATION OF A NEW TRANSFORMER OUTSIDE THE VZW LEASE AREA. COORDINATE EXACT ROUTING WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO PROVIDE AND INSTALL NEW 644-3-PGE VAULT, PER PGE SPECIFICATIONS, JUST OUTSIDE THE FENCED LEASE AREA. PGE TO PROVIDE AND INSTALL NEW TRANSFORMER. COORDINATE EXACT LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO STUB (1) 3" SCHEDULE 40 PVC CONDUIT WITH PULLTAPE, INTO THE NEW TRANSFORMER VAULT. COORDINATE EXACT STUB LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO PLACE CONDUIT IN A 36" BELOW GRADE TRENCH AND EXTEND TO NEW H-FRAME WITH METERBASE. COORDINATE EXACT ROUTING WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO PROVIDE AND INSTALL NEW H-FRAME WITH 200A, 120/240V, 1-PHASE METERBASE WITH 200A MAIN DISCONNECT, PER PGE SPECIFICATIONS, INSIDE THE FENCED LEASE AREA. COORDINATE EXACT LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- PGE WILL REQUIRE ALL INSPECTIONS BE COMPLETED PRIOR TO ENERGIZING THE SERVICE.

### GENERIC FIBER

- VZW GC TO PROVIDE AND INSTALL NEW 3048 HANDHOLE, OR APPROVED, AT THE EDGE OF THE RIGHT OF WAY ON E WOODARD RD. COORDINATE EXACT LOCATION WITH THE VZW FCM PRIOR TO INSTALLATION.
- VZW GC TO STUB (1) 4" SCHEDULE 40 PVC CONDUIT WITH (3) 1-1/4" INNERDUCTS, EACH WITH PULLTAPE, INTO THE NEW HANDHOLE.
- VZW GC TO PLACE CONDUITS IN A 36" BELOW GRADE TRENCH AND EXTEND TO THE NEW FIBER DEMARC INSIDE THE VZW LEASE AREA. COORDINATE EXACT ROUTING WITH VZW FCM PRIOR TO INSTALLATION.
- VZW GC TO PROVIDE AND INSTALL DUDLIK ENCLOSURE, OR APPROVED, ON THE NEWLY INSTALLED H-FRAME. COORDINATE EXACT LOCATION AND SPECIFICATIONS WITH VZW FCM PRIOR TO PURCHASE AND INSTALLATION.
- VZW GC TO PROVIDE AND INSTALL -48V DC POWER, 19" RACK AND #6 COPPER GROUND IN THE ENCLOSURE FOR FUTURE FIBER.



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Project No.: 1382.025.001  
Contact: VANESSA FUGATE

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A-8.0	PGE DESIGN
PG. 10	POWER EMAIL

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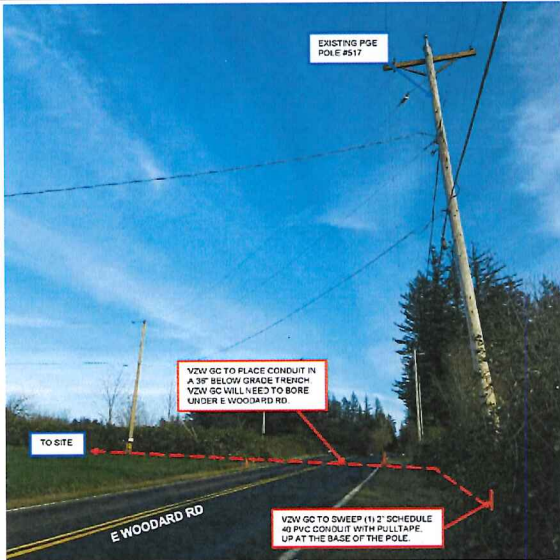
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**SITE ADDRESS**  
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TROUTDALE, OR 97060-8317

**SHEET TITLE**  
OVERALL  
SITE PLAN

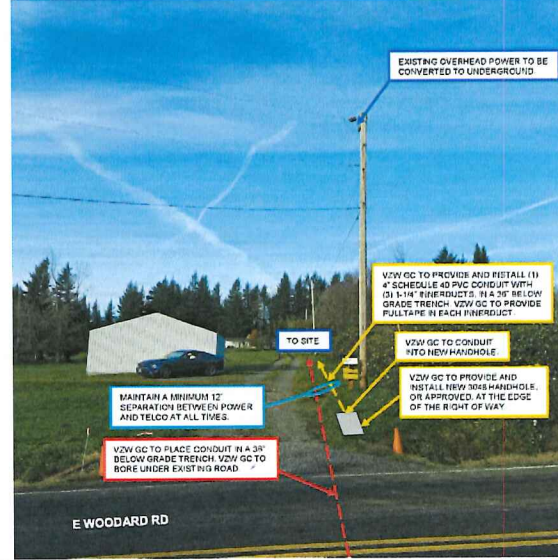
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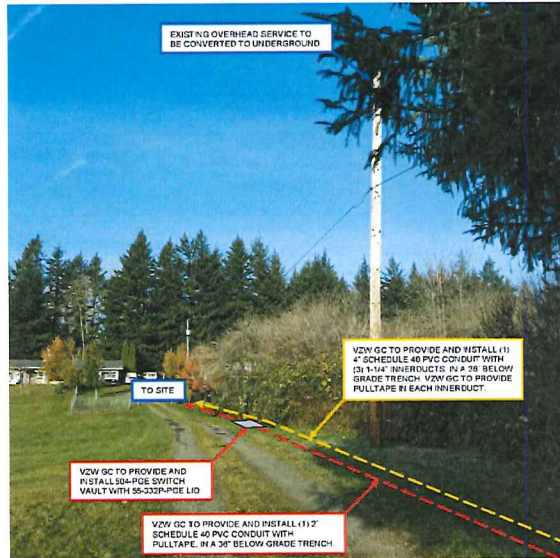
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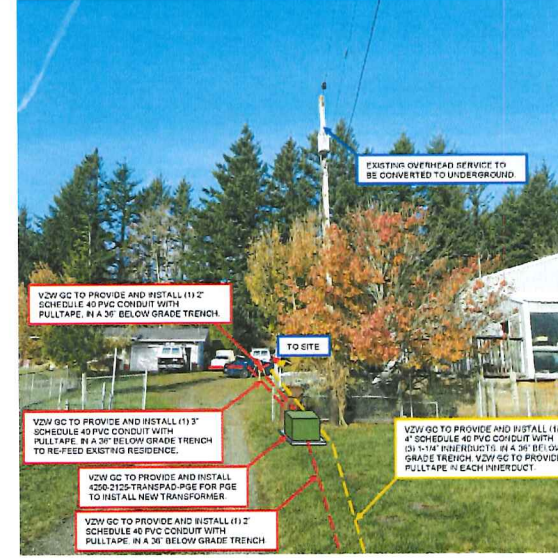
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SCALE: NTS



3 POWER/FIBER PHOTO 2

SCALE: NTS  
SCALE: NTS



4 POWER/FIBER PHOTO 3

SCALE: NTS  
SCALE: NTS



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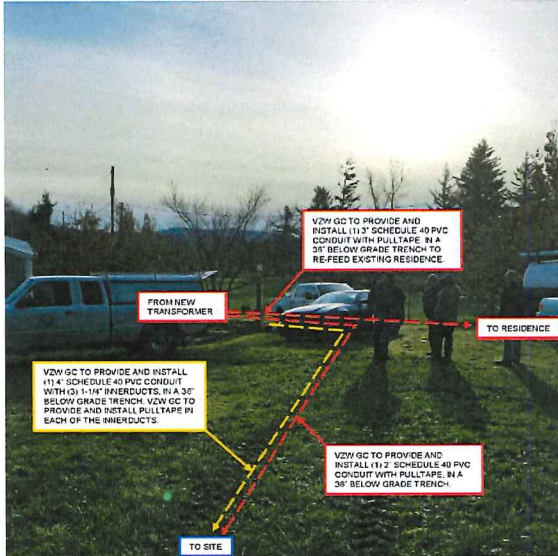
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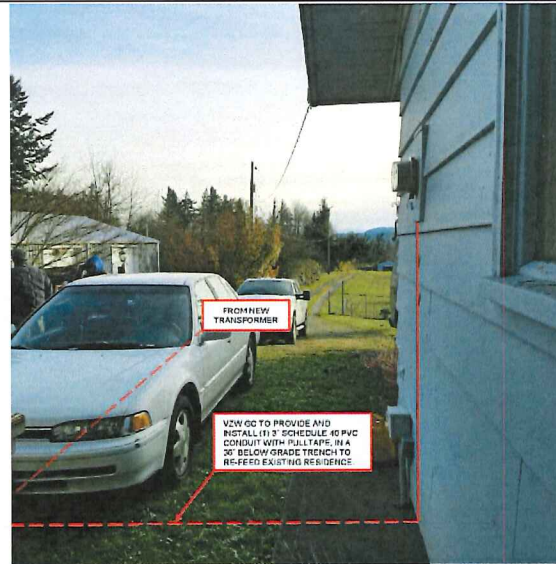
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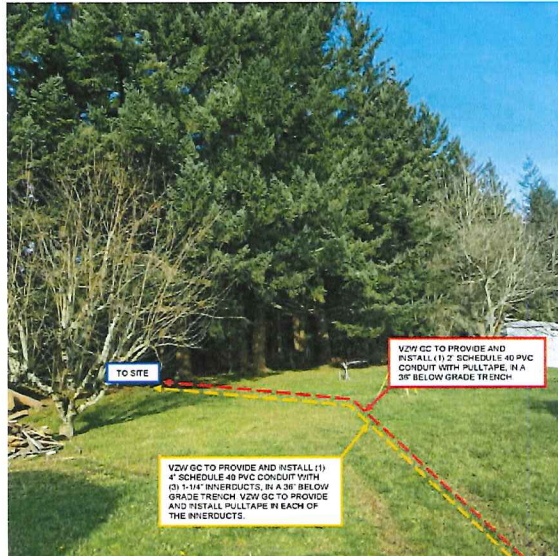
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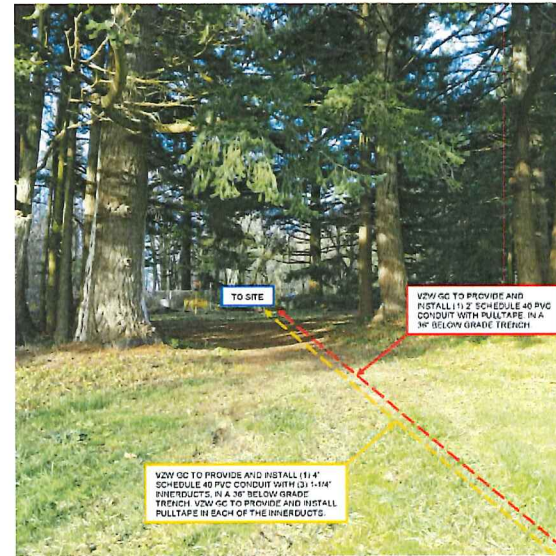
6 POWER PHOTO 2

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SCALE: NTS



7 POWER/FIBER PHOTO 5

SCALE: NTS  
SCALE: NTS



8 POWER/FIBER PHOTO 6

SCALE: NTS  
SCALE: NTS



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PG. 10	

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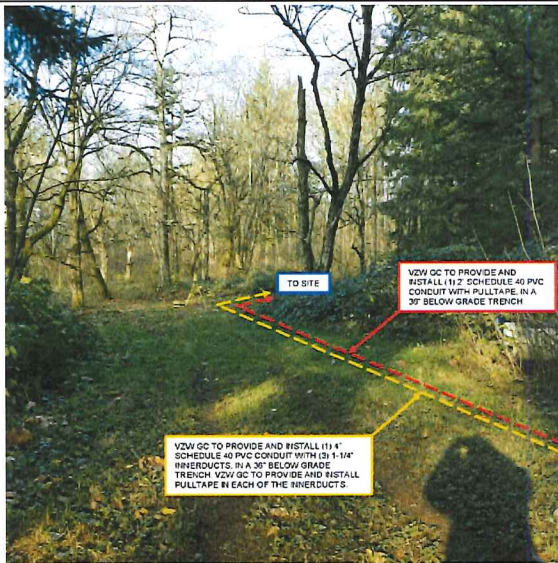
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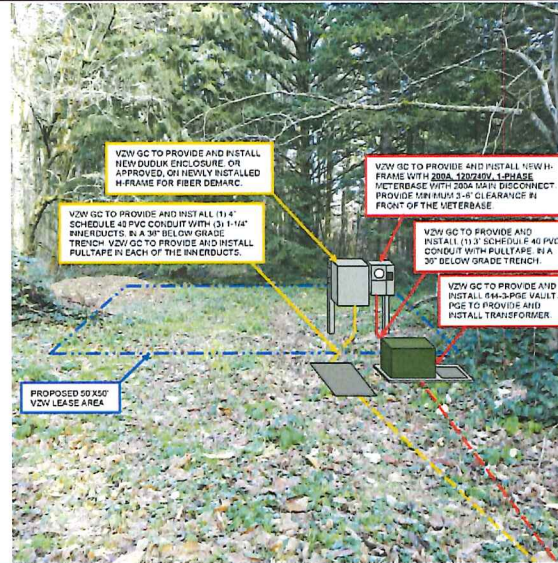
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9 POWER/FIBER PHOTO 7

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SCALE: NTS



10 POWER/FIBER PHOTO 8

SCALE: NTS  
SCALE: NTS



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## SHEET TITLE

PHOTOS

## SHEET NO.

A-4.0





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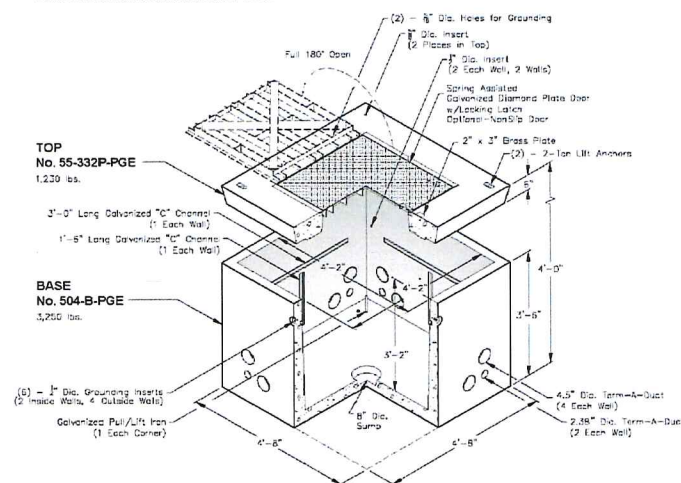
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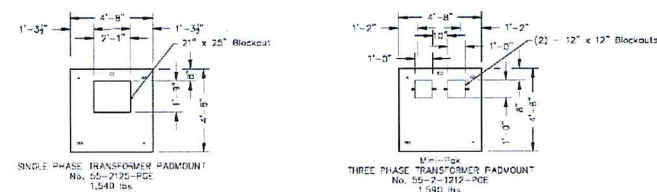
A-5.0

## 504-PGE

Single Phase Switch Vault  
Single Phase Padmount Transformer Vault - 25 & 50 kVA  
Three Phase Mini-Pak Transformer Vault



### OPTIONAL TOPS



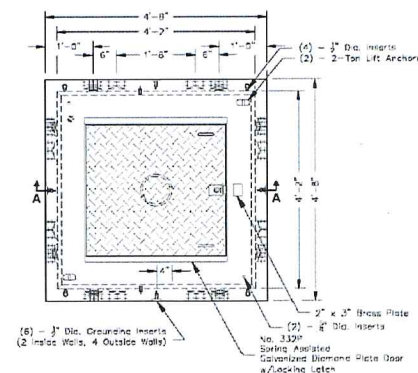
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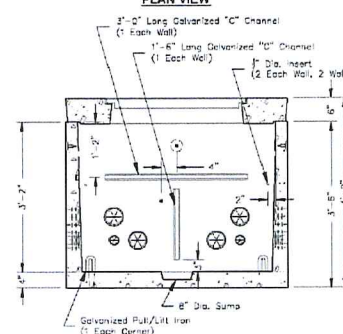
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35.0

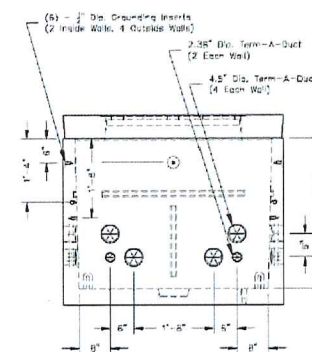
## 504-PGE



### PLAN VIEW



### SECTION AA



### END VIEW

Scale: 1/2" = 1'-0"

PGE L28100 1-5-12

 PO Box 323, Wilsonville, Oregon 97070-0323 Tel: (503) 682-2844 Fax: (503) 682-2657	<b>504-PGE</b>	<b>504-PGE</b> <b>56 x 56 x 48</b>
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	Issue Date: Revised 8-15-12	
	oldcastleprecast.com/wilsonville	

35.1

SCALE: NTS

SCALE: NTS





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VERIZON WIRELESS SERVICES IS  
STRICTLY PROHIBITED.

R&W PROJECT NO.: 1382.025.001

### WALK DATES

NO.	DATE	BY:	DESCRIPTION
1	12/07/16	VAF	LOCKDOWN
2	03/24/17	VAF	POWER DESIGN

### SUBMITTAL

NO.	DATE	BY:	DESCRIPTION
1	04/04/17	VAF	GENERIC FIBER

### SITE NAME

POR STINGER

### SITE ADDRESS

29421 E WOODARD RD  
TROUTDALE, OR 97060-8317

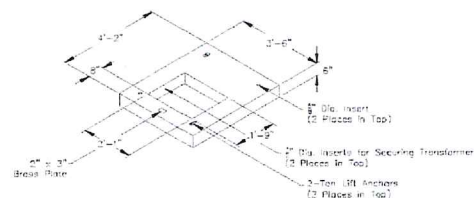
### SHEET TITLE

PHOTOS

### SHEET NO.

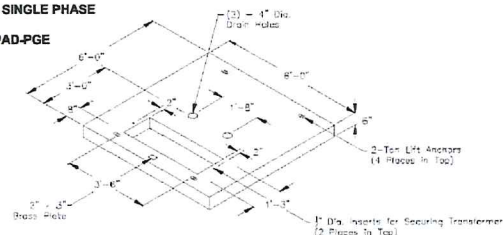
A-6.0

## PADMOUNTS-PGE



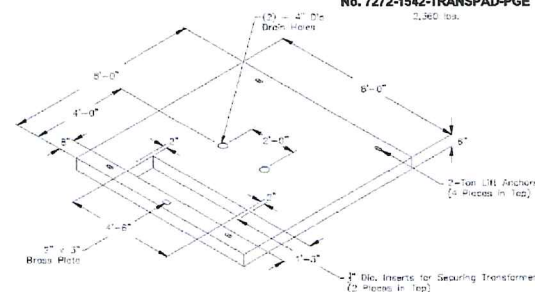
**TRANSFORMER PADMOUNT - SINGLE PHASE**  
**25 - 75 kVA**  
**No. 4250-2125-TRANSPAD-PGE**

610 lbs.



**TRANSFORMER PADMOUNT - THREE PHASE**  
**75 - 300 kVA**  
**No. 7272-1542-TRANSPAD-PGE**

2,960 lbs.



**TRANSFORMER PADMOUNT - THREE PHASE**  
**500 - 1500 kVA**  
**No. 9698-1554-TRANSPAD-PGE**

3,250 lbs.

Scale: 1/4" = 1'-0"

PGE L28105 4-14-08



PO Box 323, Wilsonville, Oregon 97070-0323  
Tel: (503) 682-2844 Fax: (503) 682-2657

### PADMNTS.-PGE

File Name: 020UEPADSPGE

Issue Date: 2011

[oldcastleprecast.com/wilsonville](http://oldcastleprecast.com/wilsonville)

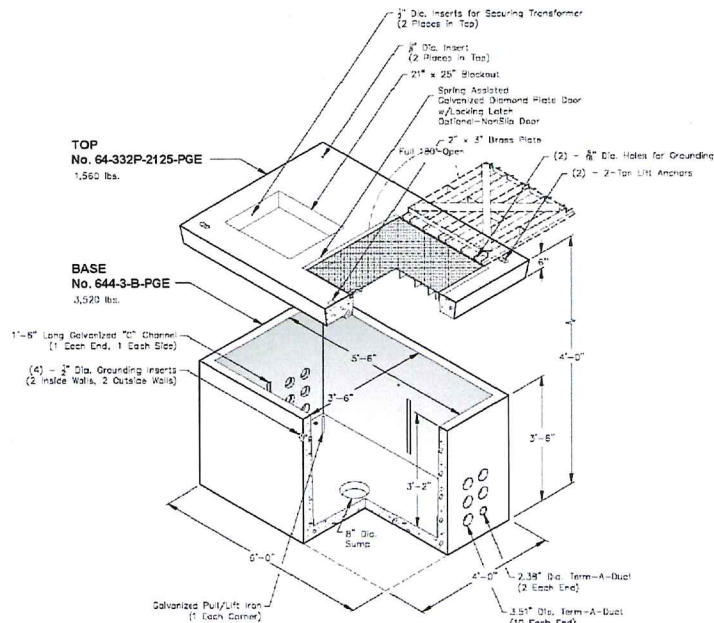
### PADMOUNTS-PGE

46.0



# 644-3-PGE

Single Phase Padmount Transformer Vault w/Access - All Sizes  
(Subdivision Design - Low Profile)



Scale: 3/8" = 1'-0"

PGE L28100 1-5-12



PO Box 323, Wilsonville, Oregon 97070-0323  
Tel: (503) 682-2844 Fax: (503) 682-2657

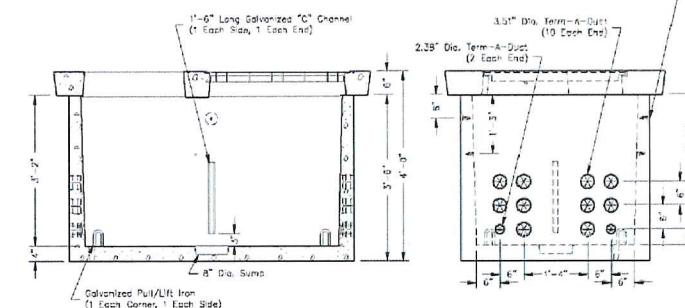
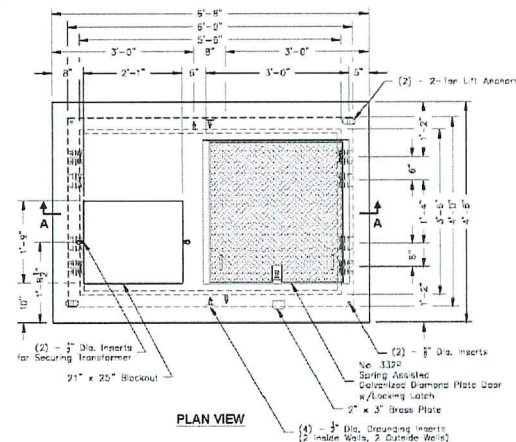
644-3-PGE

File Name: 020UEE644PGE31  
Issue Date: Revised 8-15-12  
oldcastleprecast.com/wilsonville

644-3-PGE  
48 x 72 x 48

37.0

# 644-3-PGE



Scale: 1/2" = 1'-0"

PGE L28100 1-5-12



PO Box 323, Wilsonville, Oregon 97070-0323  
Tel: (503) 682-2844 Fax: (503) 682-2657

644-3-PGE

File Name: 020UEE644PGE32  
Issue Date: Revised 8-15-12  
oldcastleprecast.com/wilsonville

644-3-PGE  
48 x 72 x 48

37.1



5515 SW Allen Blvd., Suite 107  
Beaverton, Oregon 97005  
Phone: (503) 726-3328  
Fax: (503) 726-3328  
E-mail: hmartin@rweg.com  
Project No.: 1382.025.001  
Contact: VANESSA FUGATE

## DRAWING INDEX

SHEET	DESCRIPTION
T-1.0	TITLE SHEET
A-1.0	OVERALL SITE PLAN
A-2.0	PHOTOS
A-3.0	PHOTOS
A-4.0	PHOTOS
A-5.0	504-PGE VAULT SPEC
A-6.0	PGE PADMOUNT SPEC
A-7.0	644-3-PGE VAULT SPEC
A-8.0	PGE DESIGN
PG. 10	POWER EMAIL

THE INFORMATION CONTAINED  
IN THIS SET OF DOCUMENTS IS  
PROPRIETARY BY NATURE. ANY  
USE OR DISCLOSURE OTHER  
THAN THAT WHICH RELATES TO  
VERIZON WIRELESS SERVICES IS  
STRICTLY PROHIBITED.

R&W PROJECT NO.: 1382.025.001

## WALK DATES

NO.	DATE	BY:	DESCRIPTION
1	12/07/16	VAF	LOCKDOWN
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## SUBMITTAL

NO.	DATE	BY:	DESCRIPTION
1	04/04/17	VAF	GENERIC FIBER

## SITE NAME

POR STINGER

## SITE ADDRESS

28421 E WOODARD RD  
TROUTDALE, OR 97060-8317

## SHEET TITLE

PHOTOS

## SHEET NO.

A-7.0





**Vanessa Fugate**

---

**From:** Sydney Cox <Sydney.Cox@pgn.com>  
**Sent:** Friday, March 24, 2017 1:22 PM  
**To:** Vanessa Fugate  
**Cc:** Jason Fallau; Heidi Speer; Sydney Cox  
**Subject:** RE: POR Stinger Generic Fiber UCR - FOR REVIEW  
**Attachments:** M2221580.pdf; 504 Vault.pdf; 644-3-PGE Vault.pdf

Good afternoon Vanessa. Please see the attached PGE Preliminary Electrical Design for the overhead to underground conversion and the new service to the cell site. The existing customer meter will need to be replaced with a meter that will accept an underground feed. Once I have received the okay to proceed, I will finalize the design and make the necessary changes to the exact locations of conduits into the micro-pad and vaults. Please let me know if you have any questions.

Thank you,

Sydney Cox  
Service & Design Project Manager  
Portland General Electric  
1705 NE. Burnside St.  
Gresham, OR. 97030  
 503.669-5226 |  [sydney.cox@pgn.com](mailto:sydney.cox@pgn.com)

---

**From:** Vanessa Fugate [mailto:vfugate@rweng.com]  
**Sent:** Tuesday, March 21, 2017 6:35 PM  
**To:** Sydney Cox  
**Cc:** Jason Fallau; Heidi Speer  
**Subject:** RE: POR Stinger Generic Fiber UCR - FOR REVIEW

\*\*\*Please take care when opening links, attachments or responding to this email as it originated outside of PGE.\*\*\*

Good Evening Sydney,

Per your request, attached is the revised UCR. Please review and let me know if any further changes are required.

Jason, please review and let me know if anything needs changed for Verizon.

Thanks!

*Vanessa Fugate*  
**R&W Engineering, Inc.**  
9615 SW Allen Blvd, Suite 107  
Beaverton, OR 97005

(503) 726-3325 (direct)  
(503) 747-8016 (mobile)  
(503) 292-6000 (mainline)



(503) 726-3326 (fax)

Visit our NEW website: [www.rweng.com](http://www.rweng.com)

Please consider the environment before printing this email

---

**From:** Sydney Cox [<mailto:Sydney.Cox@pgn.com>]  
**Sent:** Thursday, March 16, 2017 8:46 AM  
**To:** Vanessa Fugate <[vfugate@rweng.com](mailto:vfugate@rweng.com)>  
**Cc:** Sydney Cox <[Sydney.Cox@pgn.com](mailto:Sydney.Cox@pgn.com)>  
**Subject:** RE: POR Stinger Generic Fiber UCR - FOR REVIEW

Good morning Vanessa. Attached is the specs for the 504 Vault. This will now be a switching vault instead of a transformer vault. The lid that will need to be purchased is 55-332P-PGE. The location of this switch vault needs to be a minimum of 30 feet away from all transformers for safety purposes. You can either call for a 4x4 gravel pad base for a mini pad transformer to feed the existing house or choose to install a 4250-2125-Transpad-PGE that will accommodate a larger pad mount transformer if one is ever needed. The transformer needs to be a minimum of 8-feet away from a combustible structure and within 15-feet of a drivable surface. Please let me know if you have any questions.

Thank you,

Sydney Cox  
Service & Design Project Manager  
Portland General Electric  
1705 NE. Burnside St.  
Gresham, OR. 97030  
 503.669-5226 |  [sydney.cox@pgn.com](mailto:sydney.cox@pgn.com)

---

**From:** Vanessa Fugate [<mailto:vfugate@rweng.com>]  
**Sent:** Monday, March 06, 2017 2:20 PM  
**To:** Sydney Cox; Jason Fallau  
**Cc:** Shawn VanGiesen; Roy Lorete; Greg Robertson  
**Subject:** POR Stinger Generic Fiber UCR - FOR REVIEW

\*\*\*Please take care when opening links, attachments or responding to this email as it originated outside of PGE.\*\*\*

Good Afternoon,

Attached is the UCR for VZW POR Stinger. Please review and let me know if any changes are required.

Thank you,  
*Vanessa Fugate*  
**R&W Engineering, Inc.**  
9615 SW Allen Blvd, Suite 107  
Beaverton, OR 97005

(503) 726-3325 (direct)  
(503) 747-8016 (mobile)  
(503) 292-6000 (mainline)

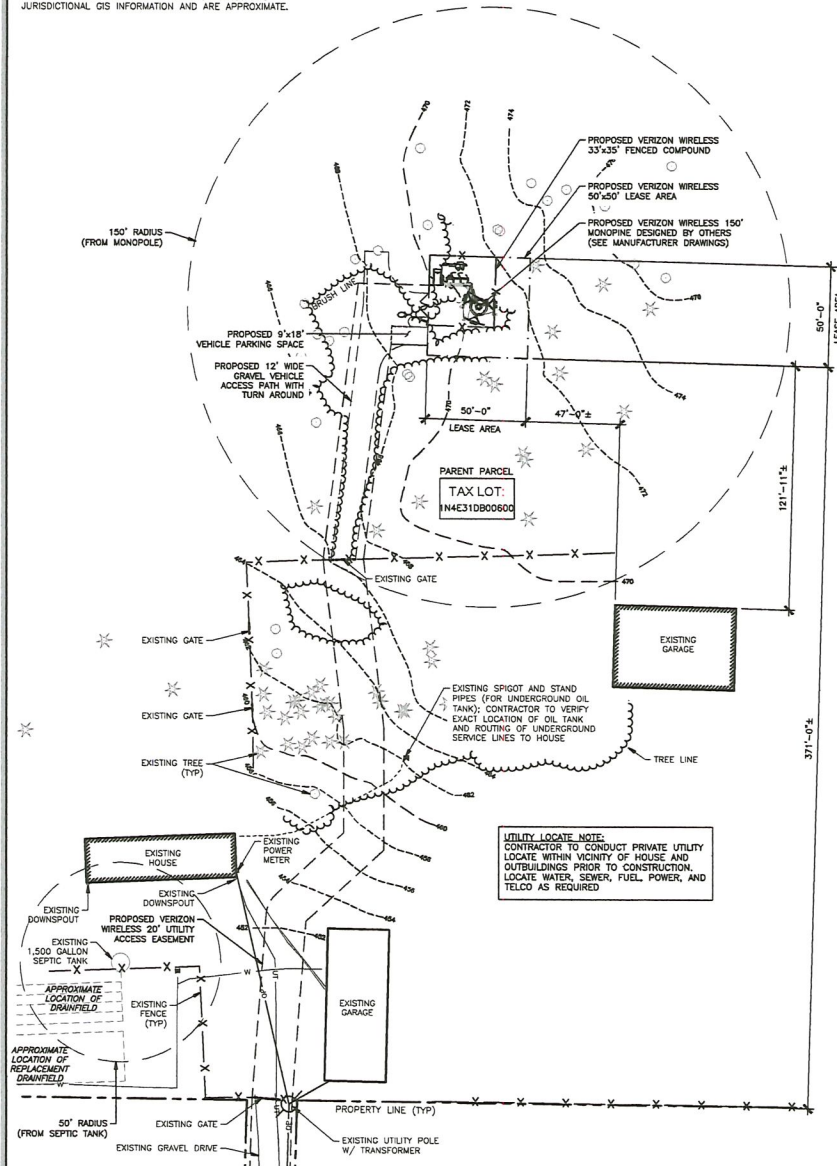
(503) 726-3326 (fax)

Visit our NEW website: [www.rweng.com](http://www.rweng.com)

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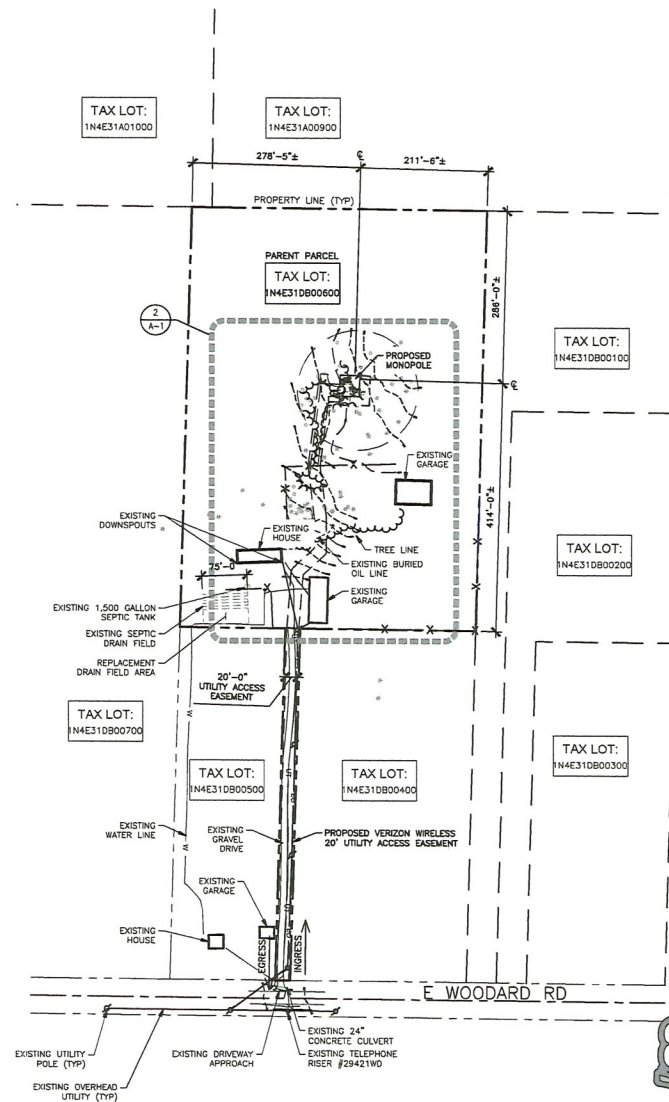


NOTE:  
THIS IS NOT A SURVEY. ALL INFORMATION AND TRUE NORTH  
HAVE BEEN OBTAINED FROM EXISTING DRAWINGS AND  
JURISDICTIONAL GIS INFORMATION AND ARE APPROXIMATE.



24"x36" SCALE: 1" = 30'-0"  
11"x17" SCALE: 1" = 60'-0"

ENLARGED SITE PLAN 2



24"x36" SCALE: 1" = 100'-0"  
11"x17" SCALE: 1" = 200'-0"

Know what's below.  
Call before you dig.

SITE PLAN 1

DO NOT SCALE DRAWINGS. CONTRACTOR MUST VERIFY ALL  
DIMENSIONS AND ADHERE TO ALL SPECIFICATIONS. NO VARIATIONS OR MODIFICATIONS TO WORK  
SHOWN SHALL BE IMPLEMENTED WITHOUT PRIOR WRITTEN  
APPROVAL. ALL PREVIOUS ISSUES OF THIS DRAWING ARE  
SUPERSEDED BY THE LATEST REVISION. ALL DIMENSIONS AND  
SPECIFICATIONS REMAIN THE PROPERTY OF MORRISON  
HERSHFIELD CORPORATION. WITHOUT MORRISON HERSHFIELD  
OR THE ARCHITECT WILL BE PROVIDING CONSTRUCTION  
REVIEW OF THIS PROJECT.



EXP 12/31/19

ZONING		
5	11/15/19	ADD MONOPINE & LANDSCAPE
4	05/24/19	ADD L-810 LIGHTING
3	02/27/19	ISSUED FOR REVIEW
2	05/29/18	ISSUED FOR REVIEW
1	10/12/17	ISSUED FOR REVIEW
0	02/17/17	ISSUED FOR PERMIT
A	12/19/16	ISSUED FOR REVIEW

No. Date Revision  
Client:



Implementation Team:



A&E Team:  
**MORRISON HERSHFIELD**  
600 STEWART ST, SUITE 200  
SEATTLE, WA 98101  
Tel: 206.268.7370  
www.morrisonhershfield.com

Project Info:  
**POR STINGER**  
23421 E WOODARD RD  
TROUTDALE, OR 97060

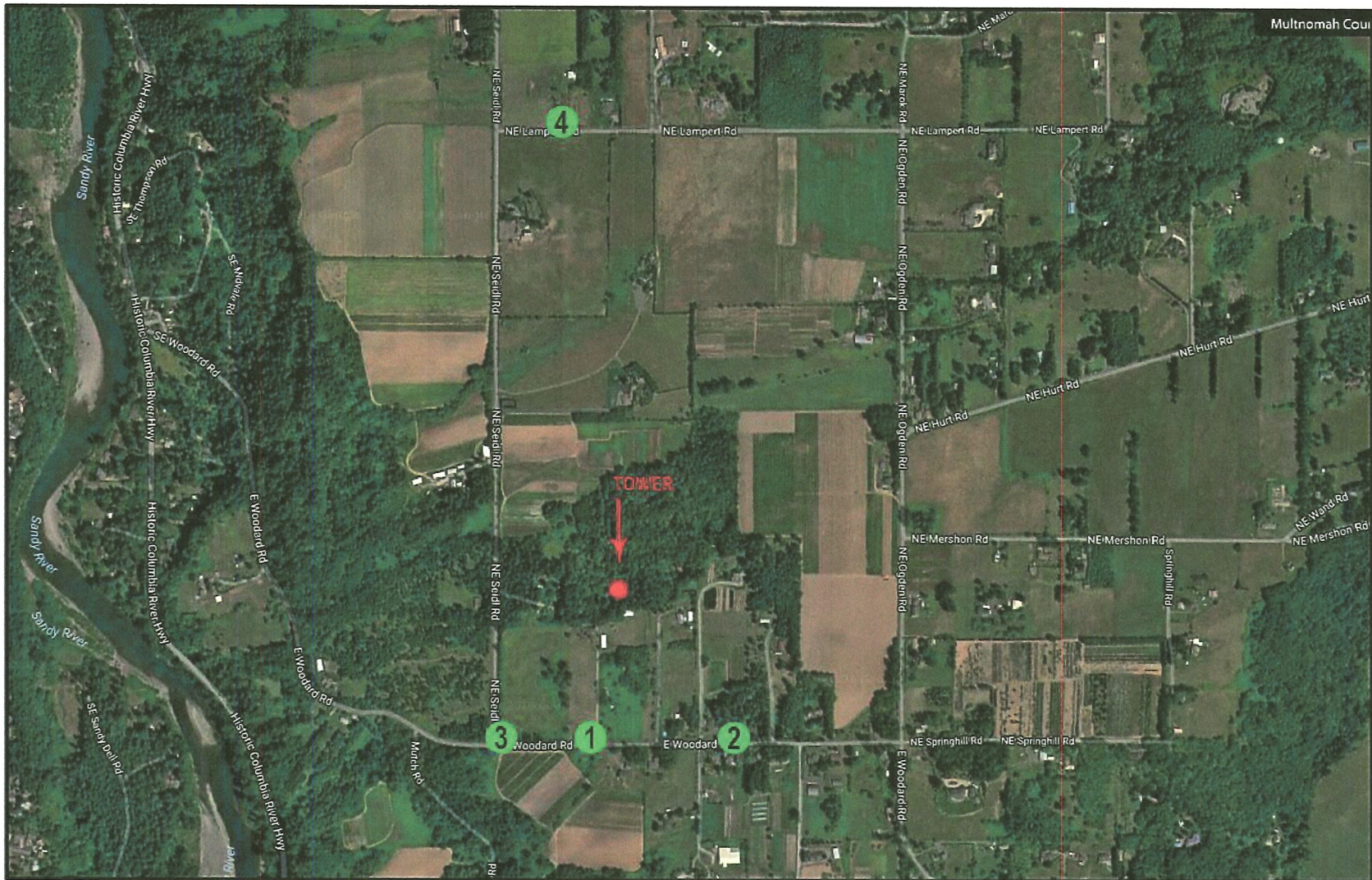
Drawing Title:  
**SITE PLAN**

Project Number: 190001800	Start Date: 12/13/16
Drafter: JA	Designer: RB
Project Manager: LC	Professional of Record: LC
Revision No:	Sheet No:

5 A-1

EXHIBIT  
A.18





TIM BRADLEY IMAGING

PHOTO SIM LOCATIONS

**mh**  
MORRISON HERSHFIELD

**verizon**✓

**POR STINGER**  
29421 E. WOODARD RD., TROUTDALE, OR

EXHIBIT  
A.19





CURRENT

VIEW #1 LOOKING NORTH  
AT 29421 E. WOODARD RD.



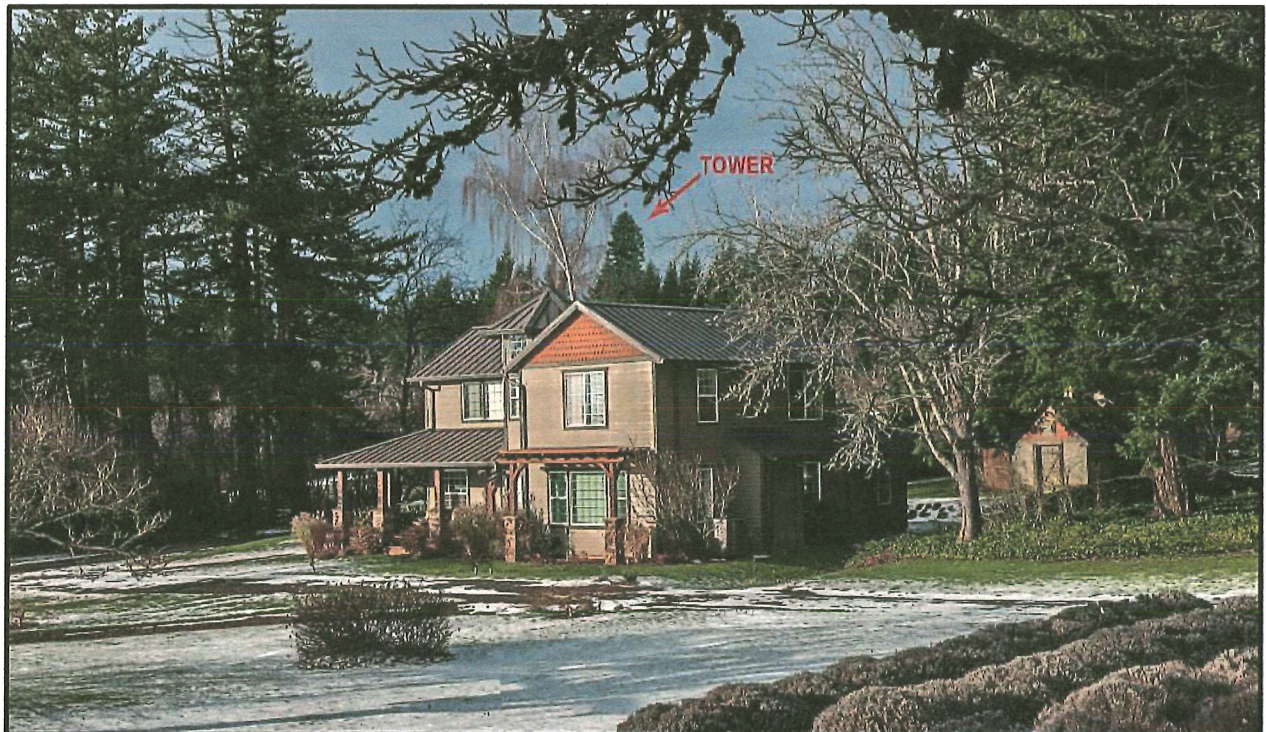
PROPOSED





CURRENT

VIEW #2 LOOKING NORTHWEST  
AT 29853 E. WOODARD RD.



PROPOSED





CURRENT

VIEW #3 LOOKING NORTHEAST  
AT E. WOODARD RD. AND NE SEIDL RD.



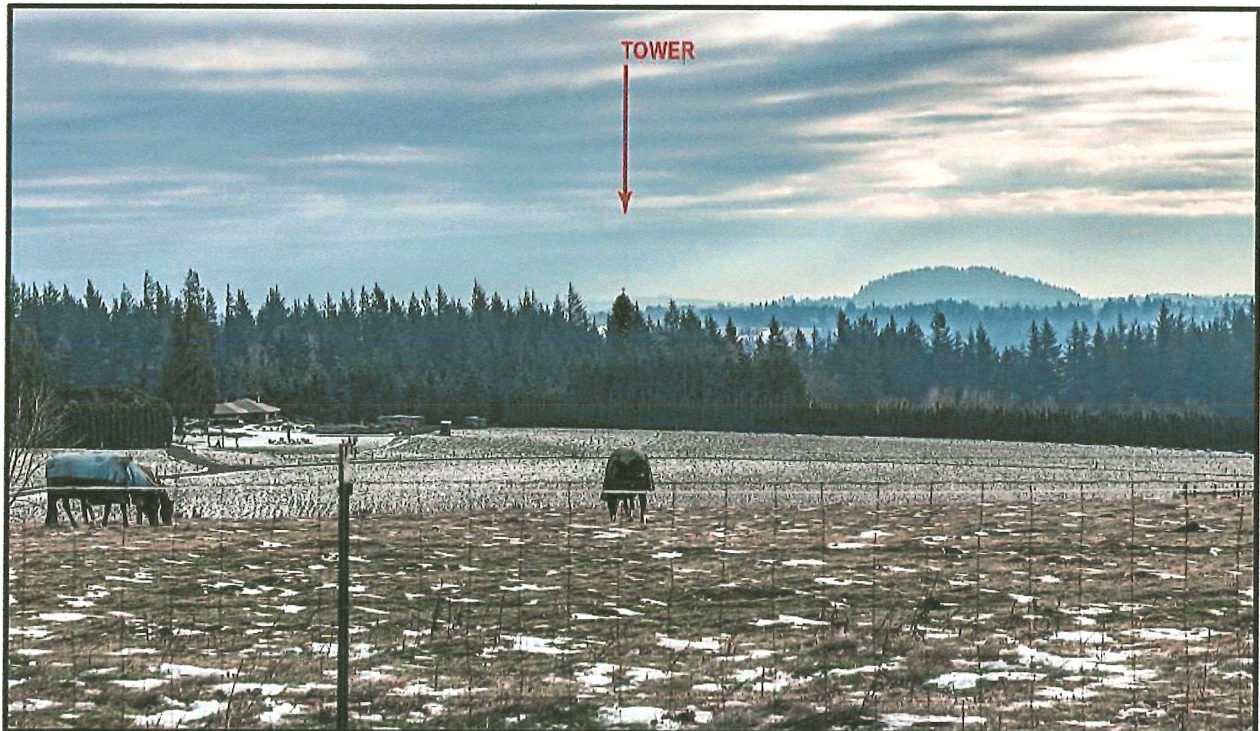
PROPOSED





CURRENT

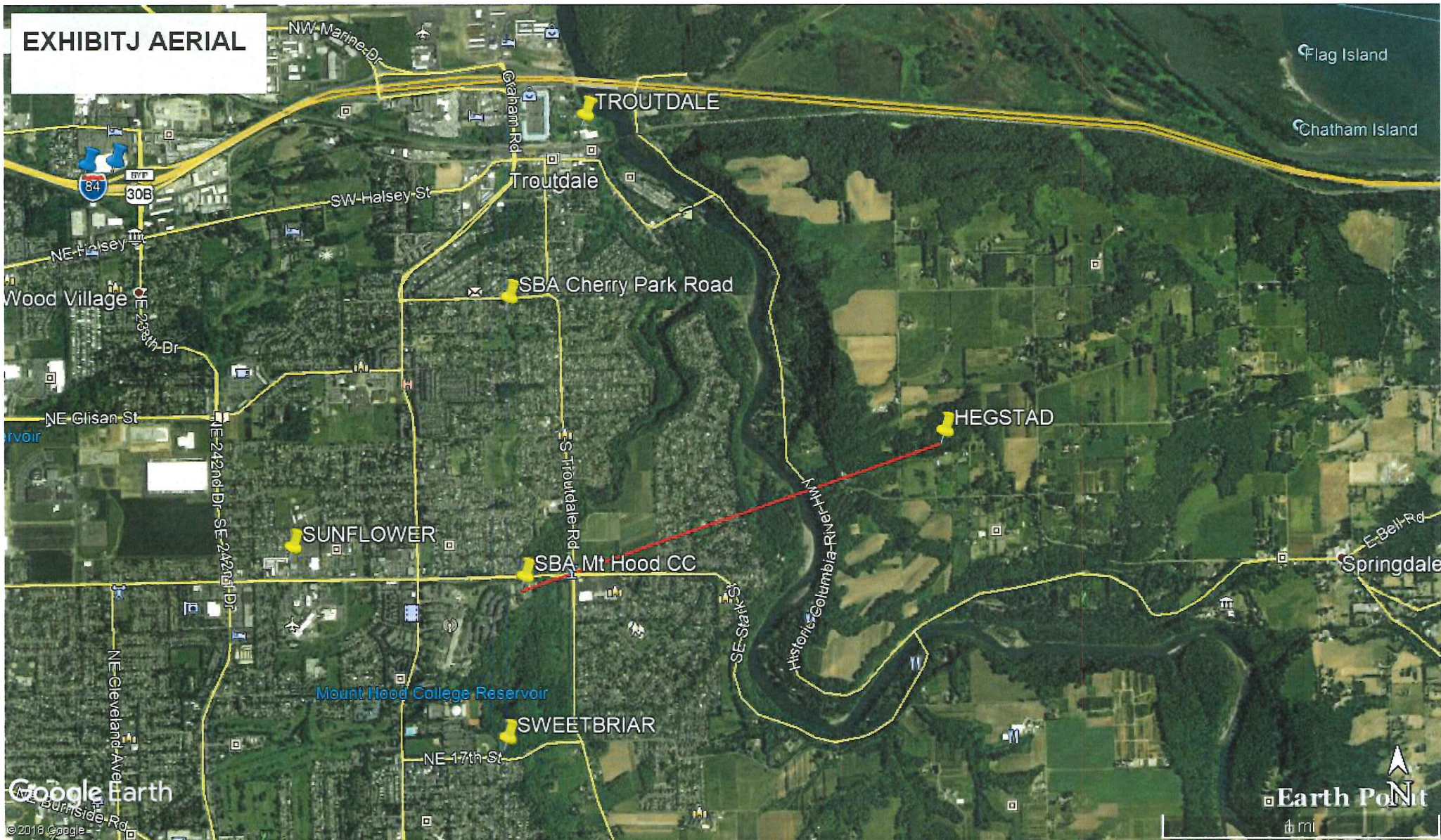
VIEW #4 LOOKING SOUTH  
ON NE LAMPERT ROAD



PROPOSED



EXHIBITJ AERIAL





THOMAS M. ECKELS, PE  
STEPHEN S. LOCKWOOD, PE  
DAVID J. PINION, PE  
ERIK C. SWANSON, PE

THOMAS S. GORTON, PE  
MICHAEL H. MEHIGAN, PE

JAMES B. HATFIELD, PE  
BENJAMIN F. DAWSON III, PE  
CONSULTANTS

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SEATTLE, WASHINGTON 98103

TELEPHONE (206) 783-9151  
FACSIMILE (206) 789-9834  
E-MAIL pinion @ hatdaw.com

MAURY L. HATFIELD, PE  
(1942 – 2009)  
PAUL W. LEONARD, PE  
(1925 – 2011)

April 6, 2018

To Whom It May Concern  
Land Use Planning Division  
Multnomah County Oregon  
1600 SE 190th Avenue  
Portland, Oregon 97233

Re: RF Engineering Review of proposed Verizon Wireless communications facility "POR STINGER".

#### PROJECT DESCRIPTION AND RF USAGE AND FACILITY JUSTIFICATION

In accordance with Multnomah County Code (MCC), sections 35.6182 (B)(4)(a-c), I have reviewed construction drawings, dated October 12, 2017, the Exhibit E "Search Ring Map," the Exhibit F "RF Usage and Facility Justification with Propagation Maps" presentation, dated February 20, 2018, by Verizon RF Specialist Jeff Culley, and a narrative and other material provided by Mr. Konrad Hyle of Black Rock LLC.

The construction drawings indicate that the proposed Verizon Wireless (VAW) LLC (d/b/a Verizon Wireless) personal Wireless Communications Facility (WCF) "POR STINGER" will support Verizon panel and microwave antennas atop a new 150 foot monopole support tower on the proposed project site at 29421 E Woodward Rd, Troutdale, Oregon 97060. According to the drawings the project tower will accommodate two levels of additional antennas for future co-location.

#### (a). The reasons why the WCF must be located at the proposed site (service demands, topography, dropped coverage, etc.)

Verizon is in the business of providing personal wireless communications services in Multnomah County and other areas of the United States. In order to more effectively provide such services, Verizon must construct wireless facilities and choose appropriate antenna support structures. These support structures must provide a minimum antenna height to meet coverage and service objectives. Intervening obstructions such as hills, trees and nearby buildings must be avoided.

In his narrative Mr. Hyle states that the extent of the coverage objective areas for the proposed POR STINGER WCF are generally north to SW Cherry Park Road, east to SE Lucas Road, south to SE Sweetbriar Road, and west to 257th Avenue. The primary service objective for the proposed WCF is to close a significant gap in existing network coverage to persons inside buildings and inside vehicles, and to enhance voice and data wireless services to the residents of Troutdale, persons traveling on the Historic Columbia River Highway, and nearby portions of Multnomah County as depicted on page 4 of Exhibit F.



All of the Verizon service coverage maps in Exhibit F show Reference Signal Received Power (RSRP) levels in four intervals: white areas have low capacity for data services and unreliable signal coverage less than -95 dBm, blue areas correspond to poor received signal levels between -95 and -85 dBm which provide marginal in-vehicle coverage but are inadequate for serving indoor users, green areas correspond to stronger received signal levels between -85 and -75 dBm which may be adequate for users inside vehicles but provide unreliable coverage and data capacity inside buildings, and the red areas have the strongest received signal levels of greater than -75 dBm which are capable of providing reliable service inside buildings and vehicles.

Page 4 of Exhibit F shows the location of the proposed project site with respect to the existing Verizon WCFs located to the northwest and to the southwest of the proposed site, labeled as TROUTDALE and SWEETBRIAR respectively on the maps. This page also shows the present Verizon network coverage area provided by the combined signals from the existing Verizon WCFs closest to the project site. The two existing WCFs TROUTDALE and SWEETBRIAR are not adequate to fill the coverage and service gaps. The proposed WCF will offload data burdens from TROUTDALE and SWEETBRIAR, and it will provide more service capacity for users. The proposed WCF will be advantageously located to provide service capacity relief to these two existing Verizon WCFs since it will be approximately equidistant from both.

It is clear from the existing coverage map on page 4 that there is a lack of adequate existing service coverage and data capacity by the Verizon network to vehicular and indoor users in the coverage objective areas described by Mr. Hyle. The coverage gap is graphically portrayed as the white and blue colored areas shown on page 4. In order to remain competitive, Verizon must improve services in those coverage gap areas where consumers are increasingly using their phones and data services, and where existing service is inadequate. The extensive white and blue areas indicate very unreliable signal coverage and an especially low capacity for data services.

The coverage map on page 5 of Exhibit F shows the future projected "post-construction" Verizon service coverage after the proposed WCF is activated with antennas atop the proposed 150-foot monopole. This exhibit shows significant improvements in service coverage of the areas surrounding the proposed project site, the areas between the existing TROUTDALE and SWEETBRIAR WCFs, and in the low-lying areas along the Columbia River including the Historic Columbia River Highway. A comparison of the coverage maps on pages 4 and 5 shows the dramatic increase in reliable service coverage and data capacity within the coverage objective areas with the Verizon antennas at the proposed 150-foot elevation.

The proposed POR STINGER WCF is both a service coverage and a service capacity site. Mr. Culley describes the service capacity issues on pages 2 and 3, and graphically on page 9 of Exhibit F. The proposed WCF will offload data burdens from the existing Verizon WCFs TROUTDALE and SWEETBRIAR, and it will provide more service capacity for users. Users in neighborhoods surrounding those WCFs may already be experiencing sluggish data speeds or interruptions of data-based services.

The Exhibit E "Search Ring Map" shows two areas highlighted in yellow where a proposed Verizon WCF could fulfill the coverage objective areas. When contemplating how to provide coverage to the identified service area, Verizon representatives considered every feasible existing WCF option available within the search ring area. The representatives determined that there are no existing towers within, or anywhere near, the search areas. As a result, Verizon was not able to consider co-locating the proposed WCF on an existing tower structure.

According to Mr. Hyle the western search area in the Troutdale "Sunrise City Park" was not suitable for use because of its likely adverse impacts on neighboring residences, and the fact that the park was built on a landfill "... and may have environmental impacts for tower construction." The proposed project site in the eastern search area along NE Seidl Road just north of E. Woodard Road was chosen after due diligence and negotiations, and after a lease agreement was executed between the parties.

The two existing towers nearest to the search ring areas are shown and discussed on Exhibit F – the SBA tower at the Mount Hood Community College (MHCC) on page 7, and the SBA tower at the Cherry Park Presbyterian Church on page 8. As demonstrated in Exhibit F neither of these collocation sites would fulfill the coverage objectives and close the existing coverage gap.

Furthermore the two existing alternative sites are not acceptable for collocation because they are too close to the existing Verizon WCFs. A new Verizon WCF with antennas on the SBA tower at the MHCC would unnecessarily duplicate the wireless services provided by SWEETBRIAR, and would cause interference to the Verizon network. Likewise, a new Verizon WCF with antennas at the Cherry Park site would unnecessarily duplicate the wireless services provided by TROUTDALE, and would also cause interference to the Verizon network.

The coverage maps in Exhibit 5 show that the proposed project site is ideally suited to meet coverage objectives because of favorable topography which places it well above the residential areas to the west of the site, and well above the nearby low-lying coverage objectives along the Columbia River which includes the Historic Columbia River Highway.

**b). The reason why the WCF must be constructed at the proposed height;**

Verizon operates in the 700MHz, cellular, PCS and AWS base-station frequency ranges for receive and transmit functions. In order to provide effective wireless service at these frequencies, the RF signal path to the primary coverage area must be primarily line-of-sight from the Verizon antennas. Intervening obstructions such as hills, trees and nearby buildings must be avoided. Therefore the antennas must be high enough to overcome intervening obstructions.

The proposed location at 29421 E Woodward Rd was chosen because it will overcome topographic obstacles to best provide wireless communication services to new and existing Verizon customers in areas where these services are currently lacking. Page 5 of Exhibit F shows the vastly improved network coverage resulting from a new Verizon WCF with a 150-foot monopole at the proposed project site.



Page 6 of Exhibit F shows that coverage from a reduced tower height of 120 feet would not adequately meet coverage objectives, especially for the in-building coverage shown in red, and the in-vehicle coverage shown in green, because of intervening obstructions including the tall trees surrounding the proposed project site. Those obstructions would attenuate the Verizon signals, and prevent the WCF from providing line-of-sight coverage, especially to the west and southwest of the site.

There are no available existing tall structures in or near the search areas that would allow Verizon to meet the coverage and service objectives. A new 150-foot tall support structure which will support all of the antennas at a minimum height above grade is required to meet the objectives.

**c). Verification of good faith efforts made to locate or design the proposed WCF to qualify for an expedited review process. To this end, if an existing structure approved for co-location is within the area recommended by the engineer's report, the reason for not co-locating shall be provided;**

The Verizon Real Estate Group, with the help of outside consultant Mr. Hyle of Black Rock, has evaluated the search areas for co-location opportunities, but ultimately found none suitable. The findings of this good faith effort, as described in Mr. Hyle's narrative, resulted in the proposal for a new WCF at the proposed project site.

According to Mr. Hyle the real estate search was supplemented by a driving tour of the search ring and coverage area. During that tour "... the Applicant quickly discovered that co-locating the required facility on an existing or approved tower, building or other suitable structure within the identified search ring was simply not available. The majority of the buildings in the search area are 2 stories maximum height or 25-30' height. There are a few short power utility poles (about 30' height) in the vicinity on Woodard Road, however these are too short to provide the service required. A tall tower height of 150' is minimum required to provide the coverage. There are no tall structures in or near the search area available to meet the coverage objective."

The author has searched the FCC Antenna Structure Registration (ASR) database, and the "Antenna Search" website at AntennaSearch.com in order to confirm that there are no existing towers suitable for collocation within or anywhere near the search areas.

## **CONCLUSION**

I have reviewed the narratives and coverage exhibits provided by Verizon personnel and representatives. The information provided is internally consistent, and reasonable from an RF engineering perspective. The supplied material, taken as a whole, appears to present an accurate and complete depiction of the existing and proposed Verizon network service coverage and service capacity in the areas near the proposed WCF. Verizon has provided sufficient evidence justifying the need for the proposed WCF at the proposed location and height. In my opinion the narrative and exhibits provide a plausible justification for the requested placement and height of the proposed

Verizon WCF. The proposed project site is well situated to provide capacity relief for the existing WCFs, and to improve Verizon network service to the coverage objective areas while avoiding conflicts with, and duplication of, existing Verizon wireless services.

Furthermore I concur with the conclusion that none of the identified alternative support towers, including the SBA towers at the Mount Hood Community College and at the Cherry Park Presbyterian Church, are feasible co-location alternatives. There does not appear to be any existing towers or structures within the planned service coverage area which are suitable for co-location.

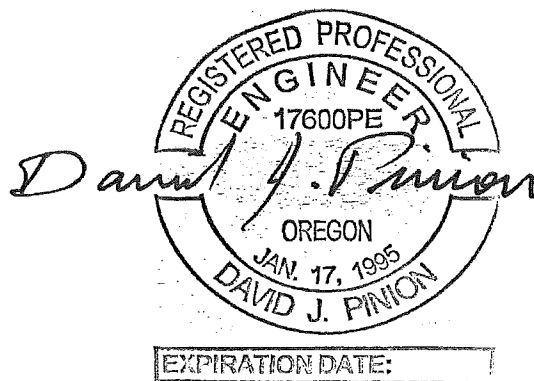
The proposed Verizon "POR STINGER" WCF will help to fill a significant gap in existing Verizon network service coverage, it will provide service capacity relief to the existing Verizon WCFs TROUTDALE and SWEETBRIAR, and it will improve the user's experience in terms of voice, video and data services, as well as critical 911 services necessary for public safety.

#### QUALIFICATIONS

I am a Senior Member of the IEEE. As a partner in the firm of Hatfield & Dawson Consulting Engineers I am registered as a Professional Engineer in the States of Oregon, Washington, California and Hawaii. I am an experienced radio engineer and RF Specialist with over 35 years of professional engineering experience whose qualifications are a matter of record with the Federal Communications Commission, and I hold an FCC General Radiotelephone Operator License PG-12-21740.

All representations contained herein are true to the best of my knowledge.

April 6, 2018



David J. Pinion, P.E.

PE Expiration Date 12/31/2018

Hatfield & Dawson Consulting Engineers



THOMAS M. ECKELS, PE  
STEPHEN S. LOCKWOOD, PE  
DAVID J. PINION, PE  
ERIK C. SWANSON, PE

THOMAS S. GORTON, PE  
MICHAEL H. MEHIGAN, PE

JAMES B. HATFIELD, PE  
BENJAMIN F. DAWSON III, PE  
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TELEPHONE (206) 783-9151  
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E-MAIL pinion @ hatdaw.com

MAURY L. HATFIELD, PE  
(1942 – 2009)  
PAUL W. LEONARD, PE  
(1925 – 2011)

NON-IONIZING ELECTROMAGNETIC EXPOSURE  
ANALYSIS  
AND  
ENGINEERING CERTIFICATION

PREPARED FOR

**Verizon Wireless**

“POR STINGER”

PROPOSED WIRELESS FACILITY

29421 E WOODWARD RD

TROUTDALE

MULTNOMAH COUNTY, OREGON

MARCH 2018

## INTRODUCTION

Hatfield & Dawson Consulting Engineers has been retained to evaluate the proposed Verizon Wireless personal wireless telecommunications facility "POR STINGER" for compliance with current Federal Communications Commission (FCC) and local guidelines regarding public exposure to radio frequency (RF) electromagnetic fields (EMFs).

## BACKGROUND

Construction drawings and other information provided by Verizon representatives indicate that the Verizon Wireless facility will have panel antennas installed atop a new 150-foot monopole tower at 29421 E Woodward Rd, Troutdale, in Multnomah County, Oregon 97060.

The drawings show that all of the Verizon panel antennas will be mounted and centered approximately 145 feet above grade. Microwave dish antennas and two levels of future colocated antennas are shown centered at, and above, the 110 foot level. Therefore all of the Verizon and future colocated antennas will be mounted well above head height for persons at the project site or on adjacent properties. The tower compound will be surrounded by a 6-foot tall chain link fence topped with barbed wire. Therefore it is unlikely that anyone other than authorized and RF cognizant workers could approach near enough to any of the Verizon or colocated antennas to cause that person's RF exposure to exceed FCC limits.

Personal wireless panel and microwave antennas are highly directional; these antennas project the majority of the transmitted RF energy horizontally and well above all nearby accessible areas. It is expected that RF exposure conditions at the project site and on adjacent properties, due to the contributions from all of the Verizon wireless operations, in combination with any future colocated wireless facilities, will be well below FCC and local public exposure limits.

***The operation of the Verizon facility, in combination with the future colocated wireless facilities, will NOT create significant RF exposure conditions at any occupancy, habitable area or publicly accessible area.***



## **EMISSION CHARACTERISTICS**

The Verizon facility may operate within the 700 MHz LTE band, the 850 MHz cellular band, the 1.9 GHz Personal Communications Service (PCS) bands, the 2.1 GHz Advanced Wireless Service (AWS) frequency bands, and the point-to-point microwave frequency bands.

## **RF EXPOSURE CONDITIONS DUE TO VERIZON FACILITY**

It is expected that RF exposure conditions at the project site, within nearby buildings, and on all adjacent properties, due to the contributions from all of the Verizon and colocated antennas, will be a fraction of the 100% FCC Public MPE (Maximum Permissible Exposure) limit. ***Installation of the new Verizon facility will not cause any occupancy or public area to exceed the FCC limits for human exposure to radio frequency electromagnetic fields.***

***Therefore Verizon wireless operations at the project site will not have a significant environmental impact as defined by the FCC Public MPE limits. Furthermore, the Verizon facility will not cause any existing wireless facilities to exceed non-ionizing electromagnetic radiation (NIE) exposure standards.***

## **FCC COMPLIANCE**

The FCC has determined through calculations and technical analysis that personal wireless and microwave facilities, such as those operated by Verizon, are highly unlikely to cause human RF exposures in excess of FCC guideline limits. In particular, personal wireless facilities with non-building-mounted antennas greater than 10 meters (about 33 feet) above ground level are considered to have such a low impact on overall exposure conditions that they are "categorically excluded" (i.e., exempt) from the requirement for routine environmental assessment regarding RF exposure hazards.

Thus according to FCC rules, the Verizon facility, and future collocated wireless facilities, with all antennas centered above the 33 foot level, will be exempt from further RF safety environmental assessment because they are presumed to be in compliance with the FCC RF exposure rules and guidelines. The Verizon facility is expected to be compliant with FCC rules regarding public RF exposure provided that direct access to the Verizon antennas is positively restricted.

#### **COMPLIANCE WITH FCC REGULATIONS FOR RF EMISSIONS AND RF INTERFERENCE**

It is expected that the RF interaction between all of the wireless operations at the project site will be low enough to preclude the likelihood of localized interference caused by the Verizon Wireless facility to the reception of any other communications signals. All of the wireless antennas will be sufficiently high enough, and far enough removed from all occupancies, that they are unlikely to cause interference with nearby consumer receivers or other consumer electronic devices.

Transmission equipment for the Verizon wireless facility is certified by the FCC under the equipment authorization procedures set forth in the FCC rules. This assures that the wireless facility will transmit within the desired base-station frequency bands at authorized power levels.

The Verizon Wireless facility will operate in accordance with all FCC rules regarding power, signal bandwidth, interference mitigation, and good RF engineering practices. ***The Verizon facility will comply with all FCC standards for radio frequency emissions.***

Predicted RF exposure conditions at the project site and on adjacent properties, within any nearby buildings, and on all adjacent properties, due to the contributions from all of the Verizon wireless operations, in combination with future collocated wireless facilities, will be well below the 100% FCC Public MPE limit. In fact the Verizon facility will likely contribute less than 1% of the FCC MPE limit to the ground level exposure environment at the project site, or on any adjacent property. This conclusion is based on information supplied by Verizon representatives, and estimates of future RF exposure conditions due to the Verizon facility in specific areas with the corresponding safe exposure guidelines set forth in the FCC rules and guidelines.



The FCC exposure limits are based on recommendations by federal and private entities with the appropriate expertise in human safety issues. Under the Commission's rules and guidelines, licensees are required to ensure compliance with the limits for maximum permissible exposure (MPE) established by the FCC. These limits have been developed based on guidelines provided by the Institute of Electrical and Electronics Engineers, Inc. (IEEE) and the National Council on Radiation Protection and Measurements (NCRP). Both the NCRP and IEEE guidelines were developed by scientists and engineers with a great deal of experience and knowledge in the area of RF biological effects and related issues.

To ensure full compliance with FCC rules and guidelines regarding human exposure to radio frequency electromagnetic fields, the Verizon transmitters should be turned off whenever maintenance personnel are required to work in the immediate vicinity of the Verizon antenna apertures. This safety procedure should apply to all future wireless transmission facilities at the project site. All instances of antenna-related work require deactivation of the subject antennas.

#### **CONCLUSIONS BASED ON LOCAL AND FCC REGULATIONS**

The Verizon facility "POR STINGER" will be in compliance with current local and FCC rules and standards regarding radio frequency emissions including radio frequency interference, and public exposure to radio frequency electromagnetic fields. The proposed facility will be in compliance with NIER emissions standards as set forth by the FCC, particularly with respect to any habitable areas near the project site, provided that direct access to the Verizon antennas is positively restricted to authorized and RF cognizant workers accessing the project tower.

***The Verizon facility will comply with all FCC RF emissions safety standards.***



## Structural Design Report

150' Monopine

Site: POR Stinger, OR

Prepared for: VERIZON WIRELESS

by: Sabre Towers & Poles™

Job Number: 446974

Revision C

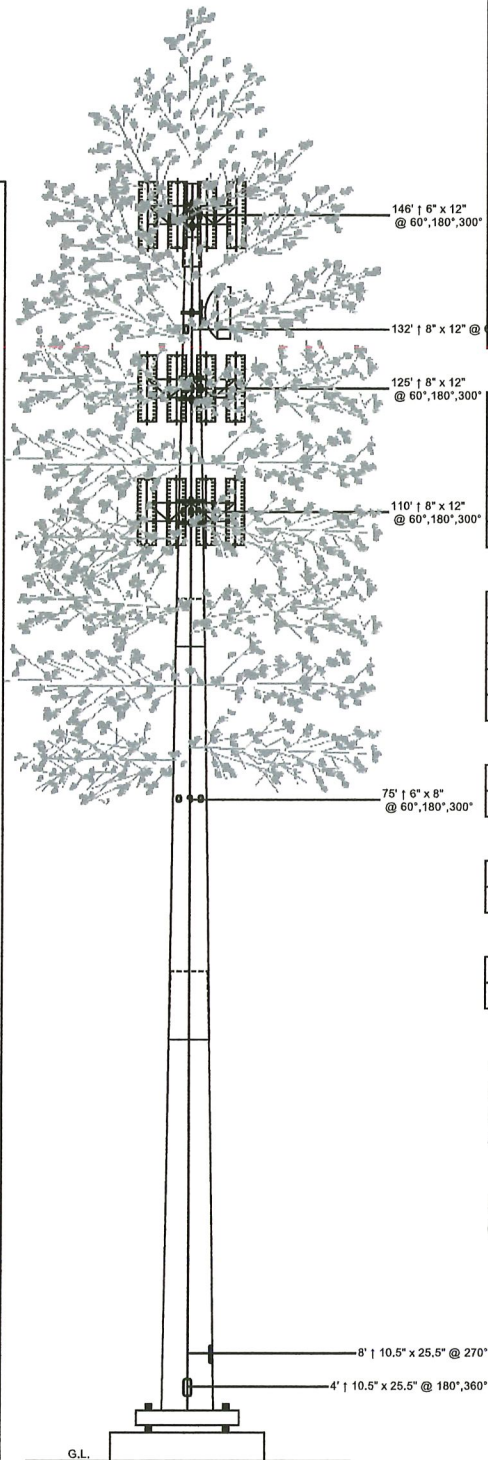
November 15, 2019

Monopole Profile.....	1
Foundation Design Summary.....	2
Pole Calculations.....	3-14
Foundation Calculations.....	15-22





Length (ft)	53'-3"	49'-3"	10'-0"
Number Of Sides	18		
Thickness (in)	9/16"	3/8"	1/4"
Lap Splice (ft)	8' - 3"	5' - 9"	A
Top Diameter (in)	55.48"	38.95"	20.5"
Bottom Diameter (in)	76.25"	59.82"	24.4"
Taper (in/ft)		0.3901	
Grade		A572-65	
Weight (lbs)	25086	16865	719
Overall Steel Height (ft)		149	



### Designed Appurtenance Loading

Elev	Description	Tx-Line
150	(1) Beacon + 6' Extension	
146	3V-Boom - 10ft Face - 3ft Standoff	
146	(12) 8' x 2' x 6in	
146	(9) RRUS 12	(3) DC/Fiber Trunks
146	(3) RCMDC-3315-PF-48	
134	(1) Dish Mount (Monopole Only) - Pipe Mount (up to 6' Dish)	
134	(1) 6' H.P. Dish	(1) EW63
125	3V-Boom - 10ft Face - 3ft Standoff	
125	(12) 8' x 2' x 6in	(12) 1 5/8"
125	(12) RRH (18.86" x 20.38" x 5.83")	(3) DC/Fiber Trunks
125	(3) RCMDC-3315-PF-48	
110	3V-Boom - 10ft Face - 3ft Standoff	
110	(12) 8' x 2' x 6in	(12) 1 5/8"
110	(12) RRH (18.86" x 20.38" x 5.83")	(3) DC/Fiber Trunks
110	(3) RCMDC-3315-PF-48	
75	(3) Side Light	

### Design Criteria - ANSI/TIA-222-G

Nominal Wind Speed (No Ice)	120 mph
Wind Speed (Ice)	120 mph
Design Ice Thickness	0.50 in
Structure Class	II
Exposure Category	C
Topographic Category	1

### Load Case Reactions

Description	Axial (kips)	Shear (kips)	Moment (ft-k)	Deflection (ft)	Sway (deg)
3s Gusted Wind	77.89	127.97	14082.85	9.92	7.43
3s Gusted Wind 0.9 Dead	58.56	127.83	13996.12	9.84	7.37
3s Gusted Wind&Ice	101.75	112.98	12111.04	8.46	6.31
Service Loads	64.93	17.89	1969.76	1.4	1.04

### Base Plate Dimensions

Shape	Diameter	Thickness	Bolt Circle	Bolt Qty	Bolt Diameter
Round	89.75"	2.75"	84"	34	2.25"

### Anchor Bolt Dimensions

Length	Diameter	Hole Diameter	Weight	Type	Finish
84"	2.25"	2.625"	4117.4	A615-75	Galv

### Material List

Display	Value
A	3' - 6"

### Notes

- 1) Antenna Feed Lines Run Inside Pole
- 2) All dimensions are above ground level, unless otherwise specified.
- 3) Weights shown are estimates. Final weights may vary.
- 4) This tower design and, if applicable, the foundation design(s) shown on the following page(s) also meet or exceed the requirements of the 2019 Oregon Structural Specialty Code.
- 5) Tower Rating: 99.6%
- 6) This structure has been designed to support pine tree branches starting at the 80' elevation to an overall height of 155'.

**Sabre Industries™**  
Towers and Poles

**Sabre Communications Corporation**  
7101 Southbridge Drive  
P.O. Box 658  
Sioux City, IA 51102-0658  
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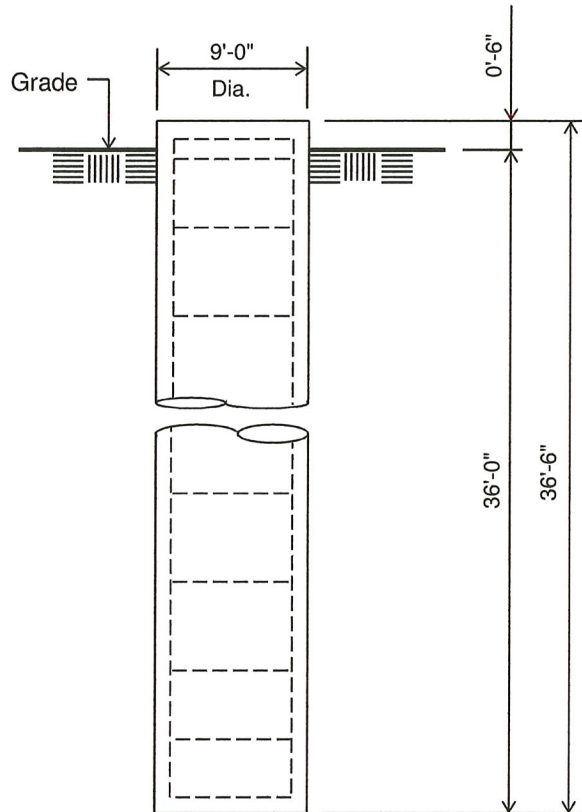
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Job:	446974C
Customer:	VERIZON WIRELESS
Site Name:	POR Stinger, OR
Description:	150' Monopole
Date:	11/15/2019 By: REB

**Customer: VERIZON WIRELESS**

**Site: POR Stinger, OR**

150' Monopole



**ELEVATION VIEW**

(86. Cu. Yds.)

(1 REQUIRED; NOT TO SCALE)

**Notes:**

- 1) Concrete shall have a minimum 28-day compressive strength of 4,500 psi, in accordance with ACI 318-11.
- 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 Adapt Engineering project no. OR17-20807-GEO, dated: 5/4/17.
- 6) See the geotechnical report for drilled pier installation requirements, if specified.
- 7) The foundation is based on the following factored loads:  
Moment = 14,082.85 k-ft  
Axial = 77.89 k  
Shear = 127.97 k

Rebar Schedule for Pier	
Pier	(62) #11 vertical rebar w/ #5 ties, (2) within top 5" of pier, then 6" C/C

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446974C

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(USA 222-G) - Monopole Spatial Analysis (c)2015 Guymast Inc.

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Sabre Towers and Poles

on: 15 nov 2019 at: 13:14:58

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150' Monopine / POR Stinger, OR

\* All pole diameters shown on the following pages are across corners.  
See profile drawing for widths across flats.

## POLE GEOMETRY

=====

ELEV ft	SECTION NAME	No. SIDE	OUTSIDE DIAM in	THICK -NESS in	RESISTANCES ♦*Pn kip	♦*Mn ft-kip	SPLICE TYPE	...OVERLAP... LENGTH ft	RATIO	w/t
149.0	.....		20.82	0.250	1193.8	495.1				
	A	18	23.38	0.250	1342.8	627.2				12.7
142.5	.....		23.38	0.250	1342.8	627.2				
	A/B	18	24.28	0.375	2081.0	999.5	SLIP	3.50	1.76	
139.0	.....		24.28	0.375	2081.0	999.5				
	B	18	40.30	0.375	3433.3	2771.8				9.5
98.5	.....		40.30	0.375	3433.3	2771.8				
	B/C	18	41.84	0.562	5390.9	4480.6	SLIP	5.75	1.67	
92.7	.....		41.84	0.562	5390.9	4480.6				
	C	18	57.46	0.562	7431.0	8544.9				11.2
53.2	.....		57.46	0.562	7431.0	8544.9				
	C/D	18	59.62	0.562	7645.6	9128.7	SLIP	8.25	1.69	
45.0	.....		59.62	0.562	7645.6	9128.7				
	D	18	77.43	0.562	9165.1	14274.3				16.6
0.0	.....									

## POLE ASSEMBLY

=====

SECTION NAME	BASE ELEV ft	..... NUMBER	BOLTS TYPE	AT BASE DIAM in	OF SECTION STRENGTH ksi	..... THREADS IN SHEAR PLANE	CALC BASE ELEV ft
A	139.000	0	A325	0.00	92.0	0	139.000
B	92.750	0	A325	0.00	92.0	0	92.750
C	45.000	0	A325	0.00	92.0	0	45.000
D	0.000	0	A325	0.00	92.0	0	0.000

## POLE SECTIONS

=====

SECTION NAME	No.of SIDES	LENGTH ft	OUTSIDE BOT * in	DIAMETER TOP * in	BEND RAD in	MAT- ERIAL ID	FLANGE.ID BOT	FLANGE.ID TOP	FLANGE.WELD ..GROUP.ID.. BOT	FLANGE.WELD TOP
A	18	10.00	24.78	20.82	0.000	1	0	0	0	0
B	18	49.75	42.59	22.88	0.000	2	0	0	0	0
C	18	53.50	60.74	39.55	0.000	3	0	0	0	0
D	18	53.25	77.43	56.33	0.000	4	0	0	0	0

446974C

\* - Diameter of circumscribed circle

# MATERIAL TYPES

=====

TYPE OF SHAPE	TYPE NO	NO OF ELEM.	ORIENT  & deg	HEIGHT  in	WIDTH  in	.THICKNESS. WEB FLANGE		IRREGULARITY .PROJECTION. % OF ORIENT AREA	deg
PL	1	1	0.0	24.78	0.25	0.250	0.250	0.00	0.0
PL	2	1	0.0	42.59	0.38	0.375	0.375	0.00	0.0
PL	3	1	0.0	60.74	0.56	0.562	0.562	0.00	0.0
PL	4	1	0.0	77.43	0.56	0.562	0.562	0.00	0.0

& - With respect to vertical

# MATERIAL PROPERTIES

=====

MATERIAL TYPE NO.	ELASTIC MODULUS ksi	UNIT WEIGHT pcf	.. STRENGTH .. Fu ksi Fy ksi		THERMAL COEFFICIENT /deg
1	29000.0	490.0	80.0	65.0	0.00001170
2	29000.0	490.0	80.0	65.0	0.00001170
3	29000.0	490.0	80.0	65.0	0.00001170
4	29000.0	490.0	80.0	65.0	0.00001170

\* Only 3 condition(s) shown in full

\* RRUS/TMAS were assumed to be behind antennas

\* Some concentrated wind loads may have been derived from full-scale wind tunnel testing

=====

# LOADING CONDITION A

=====

120 mph Nominal wind with no ice. Wind Azimuth: 0°

# LOADS ON POLE

=====

LOAD TYPE	ELEV ft	APPLY...LOAD... RADIUS ft	..AT AZI	LOAD AZI	.....FORCES..... HORIZ DOWN kip kip		.....MOMENTS..... VERTICAL TORSNAL ft-kip ft-kip	
C	151.500	0.00	0.0	0.0	2.1314	0.3000	0.0000	0.0000
C	149.000	0.00	0.0	0.0	0.4863	0.1536	0.0000	0.0000
C	146.500	0.00	0.0	0.0	2.1165	0.3000	0.0000	0.0000
C	145.000	0.00	0.0	0.0	0.0000	0.0522	0.0000	0.0000
C	145.000	0.00	0.0	0.0	13.5526	4.0645	0.0000	0.0000
C	141.500	0.00	0.0	0.0	4.2024	0.6000	0.0000	0.0000
C	136.500	0.00	0.0	0.0	4.1709	0.6000	0.0000	0.0000
C	133.000	0.00	0.0	0.0	0.0000	0.0814	0.0000	0.0000
C	131.500	0.00	0.0	0.0	4.1385	0.6000	0.0000	0.0000
C	126.500	0.00	0.0	0.0	4.1051	0.6000	0.0000	0.0000
C	124.000	0.00	0.0	0.0	0.0000	1.9017	0.0000	0.0000
C	124.000	0.00	0.0	0.0	13.1123	4.1581	0.0000	0.0000
C	121.500	0.00	0.0	0.0	4.0707	0.6000	0.0000	0.0000
C	116.500	0.00	0.0	0.0	4.0351	0.6000	0.0000	0.0000
C	111.500	0.00	0.0	0.0	3.9983	0.6000	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0000	1.6716	0.0000	0.0000
C	109.000	0.00	0.0	0.0	12.7641	4.1581	0.0000	0.0000
C	106.500	0.00	0.0	0.0	3.9603	0.6000	0.0000	0.0000
C	101.500	0.00	0.0	0.0	3.9208	0.6000	0.0000	0.0000
C	96.500	0.00	0.0	0.0	4.3111	0.6000	0.0000	0.0000
C	91.500	0.00	0.0	0.0	4.2636	0.6000	0.0000	0.0000
C	86.500	0.00	0.0	0.0	4.2140	0.6000	0.0000	0.0000
C	81.500	0.00	0.0	0.0	4.1621	0.6000	0.0000	0.0000
C	74.000	0.00	0.0	0.0	0.2127	0.1159	0.0000	0.0000



446974C								
D	149.000	0.00	180.0	0.0	0.1013	0.0698	0.0000	0.0000
D	142.500	0.00	180.0	0.0	0.1013	0.0698	0.0000	0.0000
D	142.500	0.00	180.0	0.0	0.1095	0.1876	0.0000	0.0000
D	139.000	0.00	180.0	0.0	0.1095	0.1876	0.0000	0.0000
D	139.000	0.00	180.0	0.0	0.1209	0.1275	0.0000	0.0000
D	125.500	0.00	180.0	0.0	0.1209	0.1275	0.0000	0.0000
D	125.500	0.00	180.0	0.0	0.1417	0.1528	0.0000	0.0000
D	112.000	0.00	180.0	0.0	0.1417	0.1528	0.0000	0.0000
D	112.000	0.00	180.0	0.0	0.1611	0.1781	0.0000	0.0000
D	98.500	0.00	180.0	0.0	0.1611	0.1781	0.0000	0.0000
D	98.500	0.00	180.0	0.0	0.1739	0.4850	0.0000	0.0000
D	92.750	0.00	180.0	0.0	0.1739	0.4850	0.0000	0.0000
D	92.750	0.00	180.0	0.0	0.1824	0.3154	0.0000	0.0000
D	79.583	0.00	180.0	0.0	0.1824	0.3154	0.0000	0.0000
D	79.583	0.00	180.0	0.0	0.1969	0.3525	0.0000	0.0000
D	66.417	0.00	180.0	0.0	0.1969	0.3525	0.0000	0.0000
D	66.417	0.00	180.0	0.0	0.2088	0.3895	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.2088	0.3895	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.2160	0.8323	0.0000	0.0000
D	45.000	0.00	180.0	0.0	0.2160	0.8323	0.0000	0.0000
D	45.000	0.00	180.0	0.0	0.2158	0.4402	0.0000	0.0000
D	33.750	0.00	180.0	0.0	0.2158	0.4402	0.0000	0.0000
D	33.750	0.00	180.0	0.0	0.2160	0.4719	0.0000	0.0000
D	22.500	0.00	180.0	0.0	0.2160	0.4719	0.0000	0.0000
D	22.500	0.00	180.0	0.0	0.2080	0.5036	0.0000	0.0000
D	11.250	0.00	180.0	0.0	0.2080	0.5036	0.0000	0.0000
D	11.250	0.00	180.0	0.0	0.2134	0.5353	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.2134	0.5353	0.0000	0.0000

# ANTENNA LOADING

=====

.....ANTENNA.....				ATTACHMENT		.....ANTENNA FORCES.....		
TYPE	ELEV ft	AZI	RAD ft	AZI	AXIAL kip	SHEAR kip	GRAVITY kip	TORSION ft-kip
HP	133.0	0.0	1.8	0.0	2.96	0.00	0.34	0.00

# LOADING CONDITION M

120 mph Nominal wind with no ice. Wind Azimuth: 0°

# LOADS ON POLE

=====

LOAD TYPE	ELEV ft	APPLY..LOAD..AT RADIUS ft	AZI	LOAD AZI	.....FORCES.....		.....MOMENTS.....	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	151.500	0.00	0.0	0.0	2.1314	0.2250	0.0000	0.0000
C	149.000	0.00	0.0	0.0	0.4863	0.1152	0.0000	0.0000
C	146.500	0.00	0.0	0.0	2.1165	0.2250	0.0000	0.0000
C	145.000	0.00	0.0	0.0	0.0000	0.0391	0.0000	0.0000
C	145.000	0.00	0.0	0.0	13.5526	3.0484	0.0000	0.0000
C	141.500	0.00	0.0	0.0	4.2024	0.4500	0.0000	0.0000
C	136.500	0.00	0.0	0.0	4.1709	0.4500	0.0000	0.0000
C	133.000	0.00	0.0	0.0	0.0000	0.0610	0.0000	0.0000
C	131.500	0.00	0.0	0.0	4.1385	0.4500	0.0000	0.0000
C	126.500	0.00	0.0	0.0	4.1051	0.4500	0.0000	0.0000
C	124.000	0.00	0.0	0.0	0.0000	1.4262	0.0000	0.0000
C	124.000	0.00	0.0	0.0	13.1123	3.1186	0.0000	0.0000
C	121.500	0.00	0.0	0.0	4.0707	0.4500	0.0000	0.0000
C	116.500	0.00	0.0	0.0	4.0351	0.4500	0.0000	0.0000
C	111.500	0.00	0.0	0.0	3.9983	0.4500	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0000	1.2537	0.0000	0.0000
C	109.000	0.00	0.0	0.0	12.7641	3.1186	0.0000	0.0000
C	106.500	0.00	0.0	0.0	3.9603	0.4500	0.0000	0.0000
C	101.500	0.00	0.0	0.0	3.9208	0.4500	0.0000	0.0000
C	96.500	0.00	0.0	0.0	4.3111	0.4500	0.0000	0.0000
C	91.500	0.00	0.0	0.0	4.2636	0.4500	0.0000	0.0000
C	86.500	0.00	0.0	0.0	4.2140	0.4500	0.0000	0.0000
C	81.500	0.00	0.0	0.0	4.1621	0.4500	0.0000	0.0000
C	74.000	0.00	0.0	0.0	0.2127	0.0869	0.0000	0.0000
D	149.000	0.00	180.0	0.0	0.1013	0.0523	0.0000	0.0000
D	142.500	0.00	180.0	0.0	0.1013	0.0523	0.0000	0.0000

446974C

D	142.500	0.00	180.0	0.0	0.1095	0.1407	0.0000	0.0000
D	139.000	0.00	180.0	0.0	0.1095	0.1407	0.0000	0.0000
D	139.000	0.00	180.0	0.0	0.1209	0.0956	0.0000	0.0000
D	125.500	0.00	180.0	0.0	0.1209	0.0956	0.0000	0.0000
D	125.500	0.00	180.0	0.0	0.1417	0.1146	0.0000	0.0000
D	112.000	0.00	180.0	0.0	0.1417	0.1146	0.0000	0.0000
D	112.000	0.00	180.0	0.0	0.1611	0.1336	0.0000	0.0000
D	98.500	0.00	180.0	0.0	0.1611	0.1336	0.0000	0.0000
D	98.500	0.00	180.0	0.0	0.1739	0.3637	0.0000	0.0000
D	92.750	0.00	180.0	0.0	0.1739	0.3637	0.0000	0.0000
D	92.750	0.00	180.0	0.0	0.1824	0.2366	0.0000	0.0000
D	79.583	0.00	180.0	0.0	0.1824	0.2366	0.0000	0.0000
D	79.583	0.00	180.0	0.0	0.1969	0.2643	0.0000	0.0000
D	66.417	0.00	180.0	0.0	0.1969	0.2643	0.0000	0.0000
D	66.417	0.00	180.0	0.0	0.2088	0.2921	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.2088	0.2921	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.2160	0.6242	0.0000	0.0000
D	45.000	0.00	180.0	0.0	0.2160	0.6242	0.0000	0.0000
D	45.000	0.00	180.0	0.0	0.2158	0.3301	0.0000	0.0000
D	33.750	0.00	180.0	0.0	0.2158	0.3301	0.0000	0.0000
D	33.750	0.00	180.0	0.0	0.2160	0.3539	0.0000	0.0000
D	22.500	0.00	180.0	0.0	0.2160	0.3539	0.0000	0.0000
D	22.500	0.00	180.0	0.0	0.2080	0.3777	0.0000	0.0000
D	11.250	0.00	180.0	0.0	0.2080	0.3777	0.0000	0.0000
D	11.250	0.00	180.0	0.0	0.2134	0.4015	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.2134	0.4015	0.0000	0.0000

#### ANTENNA LOADING

=====

.....ANTENNA.....	ELEV	AZI	ATTACHMENT	.....ANTENNA FORCES.....
TYPE	ft		RAD AZI	AXIAL SHEAR GRAVITY TORSION
			ft	kip kip kip ft-kip
HP	133.0	0.0	1.8 0.0	2.96 0.00 0.25 0.00

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#### LOADING CONDITION Y

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120 mph wind with 0.5 ice. wind Azimuth: 0°

#### LOADS ON POLE

=====

LOAD	ELEV	APPLY..LOAD..AT	LOAD	.....FORCES.....	.....MOMENTS.....
TYPE	ft	RADIUS	AZI	HORIZ DOWN VERTICAL TORSNAL	ft-kip ft-kip
		ft		kip kip	
C	151.500	0.00	0.0	0.0 1.5805 0.7662	0.0000 0.0000
C	149.000	0.00	0.0	0.0 0.5830 0.2467	0.0000 0.0000
C	146.500	0.00	0.0	0.0 1.5686 0.7646	0.0000 0.0000
C	145.000	0.00	0.0	0.0 0.0000 0.0522	0.0000 0.0000
C	145.000	0.00	0.0	0.0 11.1442 6.3359	0.0000 0.0000
C	141.500	0.00	0.0	0.0 3.3561 1.0630	0.0000 0.0000
C	136.500	0.00	0.0	0.0 3.3284 1.0614	0.0000 0.0000
C	133.000	0.00	0.0	0.0 0.0000 0.0814	0.0000 0.0000
C	131.500	0.00	0.0	0.0 3.2999 1.0597	0.0000 0.0000
C	126.500	0.00	0.0	0.0 3.2706 1.0579	0.0000 0.0000
C	124.000	0.00	0.0	0.0 0.0000 1.9017	0.0000 0.0000
C	124.000	0.00	0.0	0.0 10.7777 6.5453	0.0000 0.0000
C	121.500	0.00	0.0	0.0 3.2404 1.0561	0.0000 0.0000
C	116.500	0.00	0.0	0.0 3.2092 1.0542	0.0000 0.0000
C	111.500	0.00	0.0	0.0 3.1770 1.0522	0.0000 0.0000
C	109.000	0.00	0.0	0.0 0.0000 1.6716	0.0000 0.0000
C	109.000	0.00	0.0	0.0 10.4595 6.5150	0.0000 0.0000
C	106.500	0.00	0.0	0.0 3.1437 1.0501	0.0000 0.0000
C	101.500	0.00	0.0	0.0 3.1092 1.0480	0.0000 0.0000
C	96.500	0.00	0.0	0.0 3.3430 1.0458	0.0000 0.0000
C	91.500	0.00	0.0	0.0 3.3028 1.0434	0.0000 0.0000
C	86.500	0.00	0.0	0.0 3.2609 1.0410	0.0000 0.0000
C	81.500	0.00	0.0	0.0 3.2171 1.0384	0.0000 0.0000
C	74.000	0.00	0.0	0.0 0.2584 0.1159	0.0000 0.0000
D	149.000	0.00	180.0	0.0 0.1291 0.1028	0.0000 0.0000
D	142.500	0.00	180.0	0.0 0.1291 0.1028	0.0000 0.0000
D	142.500	0.00	180.0	0.0 0.1385 0.2232	0.0000 0.0000
D	139.000	0.00	180.0	0.0 0.1385 0.2232	0.0000 0.0000

446974C

D	139.000	0.00	180.0	0.0	0.1515	0.1669	0.0000	0.0000
D	125.500	0.00	180.0	0.0	0.1515	0.1669	0.0000	0.0000
D	125.500	0.00	180.0	0.0	0.1750	0.1992	0.0000	0.0000
D	112.000	0.00	180.0	0.0	0.1750	0.1992	0.0000	0.0000
D	112.000	0.00	180.0	0.0	0.1970	0.2313	0.0000	0.0000
D	98.500	0.00	180.0	0.0	0.1970	0.2313	0.0000	0.0000
D	98.500	0.00	180.0	0.0	0.2114	0.5429	0.0000	0.0000
D	92.750	0.00	180.0	0.0	0.2114	0.5429	0.0000	0.0000
D	92.750	0.00	180.0	0.0	0.2209	0.3768	0.0000	0.0000
D	79.583	0.00	180.0	0.0	0.2209	0.3768	0.0000	0.0000
D	79.583	0.00	180.0	0.0	0.2371	0.4197	0.0000	0.0000
D	66.417	0.00	180.0	0.0	0.2371	0.4197	0.0000	0.0000
D	66.417	0.00	180.0	0.0	0.2503	0.4621	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.2503	0.4621	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.2580	0.9089	0.0000	0.0000
D	45.000	0.00	180.0	0.0	0.2580	0.9089	0.0000	0.0000
D	45.000	0.00	180.0	0.0	0.2573	0.5185	0.0000	0.0000
D	33.750	0.00	180.0	0.0	0.2573	0.5185	0.0000	0.0000
D	33.750	0.00	180.0	0.0	0.2567	0.5530	0.0000	0.0000
D	22.500	0.00	180.0	0.0	0.2567	0.5530	0.0000	0.0000
D	22.500	0.00	180.0	0.0	0.2464	0.5860	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.2518	0.6145	0.0000	0.0000

ANTENNA LOADING  
=====

.....ANTENNA.....	ATTACHMENT		.....ANTENNA FORCES.....					
TYPE	ELEV	AZI	RAD	AZI	AXIAL	SHEAR	GRAVITY	TORSION
	ft		ft		kip	kip	kip	ft-kip
HP	133.0	0.0	1.8	0.0	1.97	0.00	0.84	0.00

=====

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Sabre Towers and Poles on: 15 nov 2019 at: 13:14:58

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150' Monopine / POR Stinger, OR

MAXIMUM POLE DEFORMATIONS CALCULATED(w.r.t. wind direction)

MAST ELEV ft	.....DEFLECTIONS (ft).....			.....ROTATIONS (deg).....		
	HORIZONTAL ALONG	ACROSS	DOWN	TILT ALONG	ACROSS	TWIST
149.0	9.92A	0.180	0.91A	7.43A	0.140	-0.01J
142.5	9.09A	0.170	0.81A	7.39A	0.140	-0.01J
139.0	8.65A	0.160	0.75A	7.34A	0.140	-0.01J
125.5	6.99A	0.130	0.54A	6.87A	0.140	-0.01J
112.0	5.48A	0.100	0.37A	6.11A	0.120	-0.01J
98.5	4.16A	0.070	0.24A	5.13A	0.090	0.00J
92.7	3.67A	0.060	0.20A	4.83A	0.090	0.00J
79.6	2.65A	0.040	0.12A	4.06A	0.070	0.00J
66.4	1.81A	0.030	0.07A	3.30A	0.060	0.00J
53.2	1.14A	0.020	0.03A	2.57A	0.040	0.00J
45.0	0.80A	0.010	0.02A	2.14A	0.040	0.00J
33.7	0.44A	0.010	0.01A	1.54A	0.030	0.00J



22.5	0.19A	0.00o	0.00A	446974C 0.99A	0.02o	0.00J
11.2	0.05A	0.00o	0.00Y	0.48A	0.01o	0.00J
0.0	0.00A	0.00A	0.00A	0.00A	0.00A	0.00A

# MAXIMUM ANTENNA AND REFLECTOR ROTATIONS

ELEV ft	ANT AZI deg	ANT TYPE	ROLL	BEAM DEFLECTIONS (deg) YAW	PITCH	TOTAL
133.0	0.0	HP	6.999 D	0.387 K	7.129 A	7.129 A

# MAXIMUM POLE FORCES CALCULATED(w.r.t. to wind direction)

MAST ELEV ft	TOTAL AXIAL kip	SHEAR.w.r.t.WIND.DIR ALONG kip	WIND.DIR ACROSS kip	MOMENT.w.r.t.WIND.DIR ALONG ft-kip	WIND.DIR ACROSS ft-kip	TORSION ft-kip
149.0	1.02 AJ	2.63 N	0.01 X	-5.37 J	0.03 N	0.00 X
142.5	8.84 AJ	18.95 N	0.01 X	-67.85 K	-0.05 O	0.14 W
	8.84 Z	19.07 B	0.09 B	-68.02 I	-0.17 AA	0.15 W
139.0	10.68 Z	23.65 B	0.09 B	-146.97 B	0.28 R	0.32 W
	10.71 AB	23.68 E	0.23 U	-147.03 A	-0.29 B	-0.33 C
125.5	17.06 AB	40.67 A	-1.64 W	-581.55 A	12.87 W	-3.98 J
	17.06 Z	40.72 A	-1.67 W	-581.56 A	12.87 W	-3.98 J
112.0	30.29 Z	63.84 A	-1.67 W	-1374.86 A	35.54 W	-3.86 J
	30.32 AB	63.80 A	1.63 O	-1374.83 A	35.52 W	-3.86 J
98.5	44.77 AB	90.61 A	1.63 O	-2504.50 A	-57.63 O	-3.85 J
	44.76 AB	90.64 A	1.61 O	-2504.58 A	-57.67 O	-3.85 J
92.7	48.92 AB	95.94 A	1.61 O	-3056.17 A	-67.06 O	-3.85 J
	48.91 Z	96.00 A	-1.72 K	-3055.97 A	-67.21 O	-3.85 J
79.6	56.99 Z	111.03 A	-1.72 K	-4452.19 A	-88.87 O	-3.89 J
	56.98 AB	111.04 A	1.71 O	-4452.13 A	-88.86 O	-3.89 J
66.4	62.61 AB	113.84 A	1.71 O	-5961.56 A	-111.63 O	-3.93 J
	62.62 AB	113.85 A	1.71 O	-5961.57 A	-111.67 O	-3.93 J
53.2	68.70 AB	116.59 A	1.71 O	-7505.74 A	-134.46 O	-3.97 J
	68.70 AB	116.60 A	-1.73 K	-7505.73 A	-134.47 O	-3.97 J
45.0	76.19 AB	118.38 A	-1.73 K	-8491.00 A	-148.51 O	-3.99 J
	76.19 AB	118.40 A	-1.70 K	-8490.96 A	-148.56 O	-3.99 J
33.7	82.02 AB	120.82 A	-1.70 K	-9856.14 A	-167.69 O	-4.01 J
	82.02 AB	120.81 A	-1.70 K	-9856.11 A	-167.69 O	-4.01 J
22.5	88.24 AB	123.24 A	-1.70 K	-11243.93 A	-186.76 O	-4.02 J
	88.24 AB	123.25 A	-1.71 K	-11243.91 A	-186.76 O	-4.02 J
11.2	94.92 AB	125.59 A	-1.71 K	-12653.24 A	-205.67 O	-4.03 J

	94.92 AB	125.57 A	-1.71 K	446974C -12653.24 A	-205.68 O	-4.03 J
	101.75 AB	127.97 A	-1.71 K	-14082.85 A	-224.55 O	-4.03 J
-----						
base reaction	101.75 AB	-127.97 A	1.71 K	14082.85 A	224.55 O	4.03 J
-----						

COMPLIANCE WITH 4.8.2 & 4.5.4  
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ELEV ft	AXIAL	BENDING	SHEAR + TORSIONAL	TOTAL	SATISFIED	D/t(w/t)	MAX ALLOWED
149.00	0.00AJ	0.01J	0.00N	0.01J	YES	12.70A	45.2
	0.01AJ	0.11K	0.03N	0.11K	YES	14.48A	45.2
142.50	0.00Z	0.07I	0.02B	0.08I	YES	9.07A	45.2
	0.01Z	0.14B	0.02B	0.14B	YES	9.71A	45.2
139.00	0.01AB	0.15A	0.02E	0.15A	YES	9.48A	45.2
	0.01AB	0.39A	0.03A	0.39A	YES	11.95A	45.2
125.50	0.01Z	0.39A	0.03A	0.39A	YES	11.95A	45.2
	0.01Z	0.65A	0.04A	0.66A	YES	14.43A	45.2
112.00	0.01AB	0.65A	0.04A	0.66A	YES	14.43A	45.2
	0.01AB	0.90A	0.05A	0.91A	YES	16.90A	45.2
98.50	0.01AB	0.60A	0.03A	0.61A	YES	10.68A	45.2
	0.01AB	0.66A	0.03A	0.67A	YES	11.38A	45.2
92.75	0.01Z	0.68A	0.04A	0.69A	YES	11.15A	45.2
	0.01Z	0.78A	0.04A	0.79A	YES	12.76A	45.2
79.58	0.01AB	0.78A	0.04A	0.79A	YES	12.76A	45.2
	0.01AB	0.85A	0.03A	0.85A	YES	14.37A	45.2
66.42	0.01AB	0.85A	0.03A	0.85A	YES	14.37A	45.2
	0.01AB	0.88A	0.03A	0.89A	YES	15.98A	45.2
53.25	0.01AB	0.88A	0.03A	0.89A	YES	15.98A	45.2
	0.01AB	0.90A	0.03A	0.91A	YES	16.99A	45.2
45.00	0.01AB	0.93A	0.03A	0.94A	YES	16.64A	45.2
	0.01AB	0.95A	0.03A	0.96A	YES	18.01A	45.2
33.75	0.01AB	0.95A	0.03A	0.96A	YES	18.01A	45.2
	0.01AB	0.97A	0.03A	0.98A	YES	19.39A	45.2
22.50	0.01AB	0.97A	0.03A	0.98A	YES	19.39A	45.2
	0.01AB	0.98A	0.03B	0.99A	YES	20.76A	45.2
11.25	0.01AB	0.98A	0.03B	0.99A	YES	20.76A	45.2
	0.01AB	0.99A	0.03B	1.00A	YES	22.14A	45.2
0.00							

MAXIMUM LOADS ONTO FOUNDATION(w.r.t. wind direction)  
=====

DOWN	SHEAR.w.r.t.WIND.DIR	MOMENT.w.r.t.WIND.DIR	TORSION
kip	ALONG kip	ACROSS ft-kip	ft-kip

446974C

101.75      127.97      -1.71      -14082.85      -224.55      -4.03  
 AB            A            K            A            O            J

=====

(USA 222-G) - Monopole Spatial Analysis                      (c)2015            Guymast Inc.

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150' Monopine / POR Stinger, OR

\*\*\*\*\*  
 \*\*\*\*\* Service Load Condition \*\*\*\*\*  
 \*\*\*\*\*

- \* Only 1 condition(s) shown in full
- \* RRUs/TMAS were assumed to be behind antennas
- \* Some concentrated wind loads may have been derived from full-scale wind tunnel testing

LOADING CONDITION A                      =====

60 mph wind with no ice. Wind Azimuth: 0♦

LOADS ON POLE

=====

LOAD TYPE	ELEV ft	APPLY.. RADIUS ft	LOAD..AT AZI	LOAD AZI	.....FORCES.....		.....MOMENTS.....	
					HORIZ kip	DOWN kip	VERTICAL ft-kip	TORSNAL ft-kip
C	151.500	0.00	0.0	0.0	0.2980	0.2500	0.0000	0.0000
C	149.000	0.00	0.0	0.0	0.0717	0.1280	0.0000	0.0000
C	146.500	0.00	0.0	0.0	0.2959	0.2500	0.0000	0.0000
C	145.000	0.00	0.0	0.0	0.0000	0.0435	0.0000	0.0000
C	145.000	0.00	0.0	0.0	1.8947	3.3871	0.0000	0.0000
C	141.500	0.00	0.0	0.0	0.5875	0.5000	0.0000	0.0000
C	136.500	0.00	0.0	0.0	0.5831	0.5000	0.0000	0.0000
C	133.000	0.00	0.0	0.0	0.0000	0.0678	0.0000	0.0000
C	131.500	0.00	0.0	0.0	0.5786	0.5000	0.0000	0.0000
C	126.500	0.00	0.0	0.0	0.5739	0.5000	0.0000	0.0000
C	124.000	0.00	0.0	0.0	0.0000	1.5847	0.0000	0.0000
C	124.000	0.00	0.0	0.0	1.8331	3.4651	0.0000	0.0000
C	121.500	0.00	0.0	0.0	0.5691	0.5000	0.0000	0.0000
C	116.500	0.00	0.0	0.0	0.5641	0.5000	0.0000	0.0000
C	111.500	0.00	0.0	0.0	0.5590	0.5000	0.0000	0.0000
C	109.000	0.00	0.0	0.0	0.0000	1.3930	0.0000	0.0000
C	109.000	0.00	0.0	0.0	1.7845	3.4651	0.0000	0.0000
C	106.500	0.00	0.0	0.0	0.5537	0.5000	0.0000	0.0000
C	101.500	0.00	0.0	0.0	0.5481	0.5000	0.0000	0.0000
C	96.500	0.00	0.0	0.0	0.6027	0.5000	0.0000	0.0000
C	91.500	0.00	0.0	0.0	0.5961	0.5000	0.0000	0.0000
C	86.500	0.00	0.0	0.0	0.5891	0.5000	0.0000	0.0000
C	81.500	0.00	0.0	0.0	0.5819	0.5000	0.0000	0.0000
C	74.000	0.00	0.0	0.0	0.0297	0.0966	0.0000	0.0000
D	149.000	0.00	180.0	0.0	0.0142	0.0581	0.0000	0.0000
D	142.500	0.00	180.0	0.0	0.0142	0.0581	0.0000	0.0000
D	142.500	0.00	180.0	0.0	0.0153	0.1563	0.0000	0.0000
D	139.000	0.00	180.0	0.0	0.0153	0.1563	0.0000	0.0000
D	139.000	0.00	180.0	0.0	0.0169	0.1062	0.0000	0.0000
D	125.500	0.00	180.0	0.0	0.0169	0.1062	0.0000	0.0000
D	125.500	0.00	180.0	0.0	0.0198	0.1273	0.0000	0.0000
D	112.000	0.00	180.0	0.0	0.0198	0.1273	0.0000	0.0000
D	112.000	0.00	180.0	0.0	0.0225	0.1484	0.0000	0.0000



446974C

D	98.500	0.00	180.0	0.0	0.0225	0.1484	0.0000	0.0000
D	98.500	0.00	180.0	0.0	0.0243	0.4041	0.0000	0.0000
D	92.750	0.00	180.0	0.0	0.0243	0.4041	0.0000	0.0000
D	92.750	0.00	180.0	0.0	0.0255	0.2629	0.0000	0.0000
D	79.583	0.00	180.0	0.0	0.0255	0.2629	0.0000	0.0000
D	79.583	0.00	180.0	0.0	0.0275	0.2937	0.0000	0.0000
D	66.417	0.00	180.0	0.0	0.0275	0.2937	0.0000	0.0000
D	66.417	0.00	180.0	0.0	0.0292	0.3246	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0292	0.3246	0.0000	0.0000
D	53.250	0.00	180.0	0.0	0.0302	0.6936	0.0000	0.0000
D	45.000	0.00	180.0	0.0	0.0302	0.6936	0.0000	0.0000
D	45.000	0.00	180.0	0.0	0.0302	0.3668	0.0000	0.0000
D	33.750	0.00	180.0	0.0	0.0302	0.3668	0.0000	0.0000
D	33.750	0.00	180.0	0.0	0.0302	0.3932	0.0000	0.0000
D	22.500	0.00	180.0	0.0	0.0302	0.3932	0.0000	0.0000
D	22.500	0.00	180.0	0.0	0.0291	0.4197	0.0000	0.0000
D	11.250	0.00	180.0	0.0	0.0291	0.4197	0.0000	0.0000
D	11.250	0.00	180.0	0.0	0.0298	0.4461	0.0000	0.0000
D	0.000	0.00	180.0	0.0	0.0298	0.4461	0.0000	0.0000

ANTENNA LOADING  
=====

.....ANTENNA.....				ATTACHMENT		.....ANTENNA FORCES.....			
TYPE	ELEV ft	AZI	RAD ft	AZI	AXIAL kip	SHEAR kip	GRAVITY kip	TORSION ft-kip	
HP	133.0	0.0	1.8	0.0	0.41	0.00	0.28	0.00	

=====

MAXIMUM POLE DEFORMATIONS CALCULATED(w.r.t. wind direction)

=====

MAST ELEV ft	.....DEFLECTIONS (ft).....			.....ROTATIONS (deg).....		
	..... HORIZONTAL ALONG	..... ACROSS	..... DOWN	..... TILT ALONG	..... ACROSS	..... TWIST
149.0	1.40A	-0.02K	0.02A	1.04A	-0.02K	0.00J
142.5	1.29A	-0.02K	0.02A	1.04A	-0.02K	0.00J
139.0	1.22A	-0.02K	0.02A	1.03A	-0.02K	0.00J
125.5	0.99A	-0.02K	0.01A	0.97A	-0.02K	0.00J
112.0	0.77A	-0.01K	0.01A	0.86A	-0.01K	0.00J
98.5	0.59A	-0.01K	0.01A	0.72A	-0.01K	0.00J
92.7	0.52A	-0.01K	0.01A	0.68A	-0.01K	0.00J
79.6	0.37A	-0.01K	0.00A	0.57A	-0.01K	0.00J
66.4	0.25A	0.00K	0.00A	0.46A	-0.01K	0.00J
53.2	0.16A	0.00K	0.00A	0.36A	-0.01K	0.00J
45.0	0.11A	0.00K	0.00A	0.30A	0.00K	0.00J
33.7	0.06A	0.00K	0.00A	0.22A	0.00K	0.00J
22.5	0.03A	0.00K	0.00A	0.14A	0.00K	0.00J
11.2	0.01A	0.00K	0.00A	0.07A	0.00K	0.00J
0.0	0.00A	0.00A	0.00A	0.00A	0.00A	0.00A

MAXIMUM ANTENNA AND REFLECTOR ROTATIONS

=====

ELEV ft	ANT AZI deg	ANT TYPE	.... BEAM DEFLECTIONS (deg) .....			
			ROLL	YAW	PITCH	TOTAL
133.0	0.0	HP	-0.986 J	0.008 C	1.002 A	1.002 A

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MAXIMUM POLE FORCES CALCULATED(w.r.t. to wind direction)

MAST ELEV ft	TOTAL AXIAL kip	SHEAR.w.r.t. ALONG kip	WIND.DIR ACROSS kip	MOMENT.w.r.t. ALONG ft-kip	WIND.DIR ACROSS ft-kip	TORSION ft-kip
149.0	0.38 C	0.37 F	0.00 H	-0.75 I	0.00 H	0.00 H
142.5	4.44 C	2.65 F	0.00 H	-9.61 A	-0.01 H	0.00 K
	4.44 H	2.67 F	-0.01 F	-9.65 L	0.03 E	0.00 K
139.0	5.49 H	3.31 F	-0.01 F	-20.79 F	-0.03 H	0.01 K
	5.49 H	3.31 C	-0.01 B	-20.81 E	0.05 K	0.01 K
125.5	8.77 H	5.68 A	-0.21 K	-81.69 G	-1.53 I	-0.56 J
	8.77 H	5.68 A	-0.21 K	-81.69 G	-1.53 I	-0.56 J
112.0	16.54 H	8.91 A	-0.21 K	-193.11 A	4.14 K	-0.56 J
	16.54 H	8.91 A	-0.21 K	-193.11 A	4.14 K	-0.56 J
98.5	24.90 H	12.66 A	-0.21 K	-351.61 A	7.10 K	-0.56 J
	24.90 H	12.67 A	0.22 C	-351.58 A	7.10 K	-0.56 J
92.7	27.72 H	13.42 A	0.22 C	-428.94 A	8.32 K	-0.56 J
	27.72 H	13.43 A	-0.22 K	-428.91 A	8.33 K	-0.56 J
79.6	32.68 H	15.53 A	-0.22 K	-624.52 A	11.26 K	-0.56 J
	32.68 H	15.52 A	-0.22 K	-624.53 A	11.26 K	-0.56 J
66.4	36.65 H	15.91 A	-0.22 K	-835.51 A	14.23 K	-0.57 J
	36.65 H	15.91 A	-0.22 K	-835.52 A	14.22 K	-0.57 J
53.2	40.92 H	16.30 A	-0.22 K	-1051.21 A	17.20 K	-0.57 J
	40.92 H	16.30 A	-0.22 K	-1051.23 A	17.19 K	-0.57 J
45.0	46.64 H	16.55 A	-0.22 K	-1188.80 A	19.04 K	-0.57 J
	46.64 H	16.56 A	-0.22 K	-1188.81 A	19.04 K	-0.57 J
33.7	50.77 H	16.90 A	-0.22 K	-1379.41 A	21.56 K	-0.57 J
	50.77 H	16.89 A	-0.22 K	-1379.42 A	21.56 K	-0.57 J
22.5	55.19 H	17.23 A	-0.22 K	-1573.17 A	24.06 K	-0.57 J
	55.19 H	17.23 A	-0.22 K	-1573.17 A	24.06 K	-0.57 J
11.2	59.91 H	17.56 A	-0.22 K	-1769.98 A	26.56 K	-0.57 J
	59.91 H	17.55 A	-0.22 K	-1769.99 A	26.56 K	-0.57 J
	64.93 H	17.89 A	-0.22 K	-1969.76 A	29.05 K	-0.57 J
base reaction	64.93 H	-17.89 A	0.22 K	1969.76 A	-29.05 K	0.57 J

COMPLIANCE WITH 4.8.2 & 4.5.4

ELEV ft	AXIAL	BENDING	SHEAR + TORSIONAL	TOTAL SATISFIED	D/t(w/t)	MAX ALLOWED
149.00						

	0.00C	0.00I	0.00F	0.00I	446974C YES	12.70A	45.2
142.50	0.00C	0.02A	0.00F	0.02A	YES	14.48A	45.2
	0.00H	0.01L	0.00F	0.01L	YES	9.07A	45.2
139.00	0.00H	0.02F	0.00F	0.02F	YES	9.71A	45.2
	0.00H	0.02E	0.00C	0.02E	YES	9.48A	45.2
125.50	0.00H	0.05G	0.00A	0.06G	YES	11.95A	45.2
	0.00H	0.05G	0.00A	0.06G	YES	11.95A	45.2
112.00	0.01H	0.09A	0.01A	0.10A	YES	14.43A	45.2
	0.01H	0.09A	0.01A	0.10A	YES	14.43A	45.2
98.50	0.01H	0.13A	0.01A	0.13A	YES	16.90A	45.2
	0.00H	0.08A	0.00A	0.09A	YES	10.68A	45.2
92.75	0.01H	0.09A	0.00A	0.10A	YES	11.38A	45.2
	0.01H	0.10A	0.00A	0.10A	YES	11.15A	45.2
79.58	0.01H	0.11A	0.01A	0.12A	YES	12.76A	45.2
	0.01H	0.11A	0.01A	0.12A	YES	12.76A	45.2
66.42	0.01H	0.12A	0.00A	0.12A	YES	14.37A	45.2
	0.01H	0.12A	0.00A	0.12A	YES	14.37A	45.2
53.25	0.01H	0.12A	0.00A	0.13A	YES	15.98A	45.2
	0.01H	0.12A	0.00A	0.13A	YES	15.98A	45.2
45.00	0.01H	0.13A	0.00A	0.13A	YES	16.99A	45.2
	0.01H	0.13A	0.00A	0.14A	YES	16.64A	45.2
33.75	0.01H	0.13A	0.00A	0.14A	YES	18.01A	45.2
	0.01H	0.13A	0.00A	0.14A	YES	18.01A	45.2
22.50	0.01H	0.14A	0.00A	0.14A	YES	19.39A	45.2
	0.01H	0.14A	0.00A	0.14A	YES	19.39A	45.2
11.25	0.01H	0.14A	0.00A	0.14A	YES	20.76A	45.2
	0.01H	0.14A	0.00A	0.14A	YES	20.76A	45.2
0.00	0.01H	0.14A	0.00J	0.15A	YES	22.14A	45.2

MAXIMUM LOADS ONTO FOUNDATION(w.r.t. wind direction)

DOWN	SHEAR.w.r.t.WIND.DIR	MOMENT.w.r.t.WIND.DIR	TORSION
kip	ALONG kip	ALONG ft-kip	ft-kip
	ACROSS kip	ACROSS ft-kip	
64.93	17.89	-0.22	-1969.76
H	A	K	A
			29.05
			K
			-0.57
			J



## Round Base Plate and Anchor Rods, per ANSI/TIA 222-G

### Pole Data

Diameter: 76.250 in (flat to flat)  
Thickness: 0.5625 in  
Yield (Fy): 65 ksi  
# of Sides: 18 "0" IF Round  
Strength (Fu): 80 ksi

### Reactions

Moment, Mu: 14082.85 ft-kips  
Axial, Pu: 77.89 kips  
Shear, Vu: 127.97 kips

### Anchor Rod Data

Quantity: 34  
Diameter: 2.25 in  
Rod Material: A615  
Strength (Fu): 100 ksi  
Yield (Fy): 75 ksi  
BC Diam. (in): 84 BC Override:

### Anchor Rod Results

Maximum Rod (Pu+ Vu/η): 246.5 Kips  
Allowable  $\Phi^*R_{nt}$ : 260.0 Kips (per 4.9.9)  
Anchor Rod Interaction Ratio: **94.8% Pass**

### Plate Data

Diameter (in): 89.75 Dia. Override:  
Thickness: 2.75 in  
Yield (Fy): 50 ksi  
Eff Width/Rod: 7.12 in  
Drain Hole: 2.625 in. diameter  
Drain Location: 36 in. center of pole to center of drain hole  
Center Hole: 64 in. diameter

### Base Plate Results

Base Plate (Mu/Z): 43.1 ksi  
Allowable  $\Phi^*F_y$ : 45.0 ksi (per AISC)  
Base Plate Interaction Ratio: **95.9% Pass**

446974C

=====

LPILE for Windows(Beta), Version 2018-10.009

Analysis of Individual Piles and Drilled Shafts  
Subjected to Lateral Loading Using the p-y Method  
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Files Used for Analysis

-----

Path to file locations:  
\\Program Files (x86)\\Ensoft\\Lpile2018\\files\\

Name of input data file:  
446974B.lp10

Name of output report file:  
446974B.lp10

Name of plot output file:  
446974B.lp10

Name of runtime message file:  
446974B.lp10

-----

Date and Time of Analysis

-----

Date: November 15, 2019

Time: 8:36:19

-----

Problem Title

-----

Site : POR Stinger, OR

Tower : 150' Monopole

Prepared for : VERIZON WIRELESS

Job Number : 446974 Revision B

Engineer : REB

-----

Program Options and Settings

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446974C

Computational Options:

- Use unfactored loads in computations (conventional analysis)

Engineering Units Used for Data Input and Computations:

- US Customary System Units (pounds, feet, inches)

Analysis Control Options:

- Maximum number of iterations allowed = 999
- Deflection tolerance for convergence = 1.0000E-05 in
- Maximum allowable deflection = 100.0000 in
- Number of pile increments = 100

Loading Type and Number of Cycles of Loading:

- Static loading specified
- Use of p-y modification factors for p-y curves not selected
- Analysis uses layering correction (Method of Georgiadis)
- No distributed lateral loads are entered
- Loading by lateral soil movements acting on pile not selected
- Input of shear resistance at the pile tip not selected
- Input of moment resistance at the pile tip not selected
- Computation of pile-head foundation stiffness matrix not selected
- Push-over analysis of pile not selected
- Buckling analysis of pile not selected

Output Options:

- Output files use decimal points to denote decimal symbols.
- Report only summary tables of pile-head deflection, maximum bending moment, and maximum shear force in output report file.
- No p-y curves to be computed and reported for user-specified depths
- Print using wide report formats

-----  
Pile Structural Properties and Geometry  
-----

Number of pile sections defined = 1  
Total length of pile = 36.500 ft  
Depth of ground surface below top of pile = 0.5000 ft

Pile diameters used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over the length of the pile. A summary of values of pile diameter vs. depth follows.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
1	0.000	108.0000
2	36.500	108.0000

Input Structural Properties for Pile Sections:  
-----

Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile  
Length of section = 36.500000 ft  
Shaft Diameter = 108.000000 in  
Shear capacity of section = 0.0000 lbs

-----  
Ground Slope and Pile Batter Angles  
-----

Ground Slope Angle = 0.000 degrees  
= 0.000 radians  
Pile Batter Angle = 0.000 degrees  
= 0.000 radians  
-----



446974C  
Soil and Rock Layering Information

---

The soil profile is modelled using 5 layers

Layer 1 is soft clay, p-y criteria by Matlock, 1970

Distance from top of pile to top of layer	=	0.500000	ft
Distance from top of pile to bottom of layer	=	2.500000	ft
Effective unit weight at top of layer	=	110.000000	pcf
Effective unit weight at bottom of layer	=	110.000000	pcf
Undrained cohesion at top of layer	=	14.400000	psf
Undrained cohesion at bottom of layer	=	14.400000	psf
Epsilon-50 at top of layer	=	0.100000	
Epsilon-50 at bottom of layer	=	0.100000	

Layer 2 is stiff clay without free water

Distance from top of pile to top of layer	=	2.500000	ft
Distance from top of pile to bottom of layer	=	5.500000	ft
Effective unit weight at top of layer	=	110.000000	pcf
Effective unit weight at bottom of layer	=	110.000000	pcf
Undrained cohesion at top of layer	=	500.000000	psf
Undrained cohesion at bottom of layer	=	500.000000	psf
Epsilon-50 at top of layer	=	0.020000	
Epsilon-50 at bottom of layer	=	0.020000	

Layer 3 is sand, p-y criteria by Reese et al., 1974

Distance from top of pile to top of layer	=	5.500000	ft
Distance from top of pile to bottom of layer	=	15.500000	ft
Effective unit weight at top of layer	=	110.000000	pcf
Effective unit weight at bottom of layer	=	110.000000	pcf
Friction angle at top of layer	=	29.000000	deg.
Friction angle at bottom of layer	=	29.000000	deg.
Subgrade k at top of layer	=	25.000000	pci
Subgrade k at bottom of layer	=	25.000000	pci

Layer 4 is stiff clay without free water

Distance from top of pile to top of layer	=	15.500000	ft
Distance from top of pile to bottom of layer	=	20.500000	ft
Effective unit weight at top of layer	=	110.000000	pcf
Effective unit weight at bottom of layer	=	110.000000	pcf
Undrained cohesion at top of layer	=	1429.	psf
Undrained cohesion at bottom of layer	=	1429.	psf
Epsilon-50 at top of layer	=	0.007000	
Epsilon-50 at bottom of layer	=	0.007000	

Layer 5 is stiff clay without free water

Distance from top of pile to top of layer	=	20.500000	ft
Distance from top of pile to bottom of layer	=	36.500000	ft
Effective unit weight at top of layer	=	110.000000	pcf
Effective unit weight at bottom of layer	=	110.000000	pcf
Undrained cohesion at top of layer	=	5160.	psf
Undrained cohesion at bottom of layer	=	5160.	psf
Epsilon-50 at top of layer	=	0.004000	
Epsilon-50 at bottom of layer	=	0.004000	

(Depth of the lowest soil layer extends 0.000 ft below the pile tip)

---

Summary of Input Soil Properties

---

Layer	Soil Type	Layer	Effective	Undrained	Angle of	E50	
Layer	Name	Depth	Unit Wt.	Cohesion	Friction	or	kpy
Num.	(p-y Curve Type)	ft	pcf	psf	deg.	krm	pci
-----	-----	-----	-----	-----	-----	-----	-----

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1	Soft	0.5000	110.0000	14.4000	--	0.10000	--
	Clay	2.5000	110.0000	14.4000	--	0.10000	--
2	stiff clay	2.5000	110.0000	500.0000	--	0.02000	--
	w/o Free Water	5.5000	110.0000	500.0000	--	0.02000	--
3	Sand	5.5000	110.0000	--	29.0000	--	25.0000
	(Reese, et al.)	15.5000	110.0000	--	29.0000	--	25.0000
4	stiff clay	15.5000	110.0000	1429.	--	0.00700	--
	w/o Free Water	20.5000	110.0000	1429.	--	0.00700	--
5	stiff clay	20.5000	110.0000	5160.	--	0.00400	--
	w/o Free Water	36.5000	110.0000	5160.	--	0.00400	--

-----  
Static Loading Type  
-----

Static loading criteria were used when computing p-y curves for all analyses.

-----  
Pile-head Loading and Pile-head Fixity Conditions  
-----

Number of loads specified = 2

Load No.	Load Type	Condition 1	Condition 2	Axial Thrust Force, lbs	Compute Top y vs. Pile Length
1	1	V = 170627. lbs	M = 225325600. in-lbs	103853.	No
2	1	V = 17840. lbs	M = 23568960. in-lbs	64830.	No

V = shear force applied normal to pile axis  
M = bending moment applied to pile head  
y = lateral deflection normal to pile axis  
S = pile slope relative to original pile batter angle  
R = rotational stiffness applied to pile head  
Values of top y vs. pile lengths can be computed only for load types with specified shear loading (Load Types 1, 2, and 3).  
Thrust force is assumed to be acting axially for all pile batter angles.

-----  
Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness  
-----

Axial thrust force values were determined from pile-head loading conditions

Number of Pile Sections Analyzed = 1

Pile Section No. 1:  
-----

Dimensions and Properties of Drilled Shaft (Bored Pile):  
-----

Length of Section	=	36.500000 ft
Shaft Diameter	=	108.000000 in
Concrete Cover Thickness (to edge of long. rebar)	=	3.625000 in
Number of Reinforcing Bars	=	62 bars
Yield Stress of Reinforcing Bars	=	60000. psi
Modulus of Elasticity of Reinforcing Bars	=	29000000. psi
Gross Area of Shaft	=	9161. sq. in.
Total Area of Reinforcing Steel	=	96.809905 sq. in.
Area Ratio of Steel Reinforcement	=	1.06 percent
Edge-to-Edge Bar Spacing	=	3.621488 in
Maximum Concrete Aggregate Size	=	0.750000 in
Ratio of Bar Spacing to Aggregate Size	=	4.83

offset of Center of Rebar Cage from Center of Pile <sup>446974C</sup> = 0.0000 in

Axial Structural Capacities:

Nom. Axial Structural Capacity =  $0.85 F_c A_c + F_y A_s$  = 40478.678 kips  
Tensile Load for Cracking of Concrete = -4314.393 kips  
Nominal Axial Tensile Capacity = -5808.594 kips

Reinforcing Bar Dimensions and Positions Used in Computations:

Bar Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y inches
1	1.410000	1.561450	49.670000	0.00000
2	1.410000	1.561450	49.415159	5.025031
3	1.410000	1.561450	48.653252	9.998497
4	1.410000	1.561450	47.392097	14.869366
5	1.410000	1.561450	45.644635	19.587655
6	1.410000	1.561450	43.428796	24.104948
7	1.410000	1.561450	40.767320	28.374892
8	1.410000	1.561450	37.687516	32.353671
9	1.410000	1.561450	34.220987	36.000458
10	1.410000	1.561450	30.403304	39.277831
11	1.410000	1.561450	26.273642	42.152160
12	1.410000	1.561450	21.874378	44.593951
13	1.410000	1.561450	17.250652	46.578148
14	1.410000	1.561450	12.449911	48.084390
15	1.410000	1.561450	7.521418	49.097222
16	1.410000	1.561450	2.515744	49.606249
17	1.410000	1.561450	-2.515744	49.606249
18	1.410000	1.561450	-7.521418	49.097222
19	1.410000	1.561450	-12.449911	48.084390
20	1.410000	1.561450	-17.250652	46.578148
21	1.410000	1.561450	-21.874378	44.593951
22	1.410000	1.561450	-26.273642	42.152160
23	1.410000	1.561450	-30.403304	39.277831
24	1.410000	1.561450	-34.220987	36.000458
25	1.410000	1.561450	-37.687516	32.353671
26	1.410000	1.561450	-40.767320	28.374892
27	1.410000	1.561450	-43.428796	24.104948
28	1.410000	1.561450	-45.644635	19.587655
29	1.410000	1.561450	-47.392097	14.869366
30	1.410000	1.561450	-48.653252	9.998497
31	1.410000	1.561450	-49.415159	5.025031
32	1.410000	1.561450	-49.670000	0.00000
33	1.410000	1.561450	-49.415159	-5.025031
34	1.410000	1.561450	-48.653252	-9.998497
35	1.410000	1.561450	-47.392097	-14.869366
36	1.410000	1.561450	-45.644635	-19.587655
37	1.410000	1.561450	-43.428796	-24.104948
38	1.410000	1.561450	-40.767320	-28.374892
39	1.410000	1.561450	-37.687516	-32.353671
40	1.410000	1.561450	-34.220987	-36.000458
41	1.410000	1.561450	-30.403304	-39.277831
42	1.410000	1.561450	-26.273642	-42.152160
43	1.410000	1.561450	-21.874378	-44.593951
44	1.410000	1.561450	-17.250652	-46.578148
45	1.410000	1.561450	-12.449911	-48.084390
46	1.410000	1.561450	-7.521418	-49.097222
47	1.410000	1.561450	-2.515744	-49.606249
48	1.410000	1.561450	2.515744	-49.606249
49	1.410000	1.561450	7.521418	-49.097222
50	1.410000	1.561450	12.449911	-48.084390
51	1.410000	1.561450	17.250652	-46.578148
52	1.410000	1.561450	21.874378	-44.593951
53	1.410000	1.561450	26.273642	-42.152160
54	1.410000	1.561450	30.403304	-39.277831
55	1.410000	1.561450	34.220987	-36.000458
56	1.410000	1.561450	37.687516	-32.353671
57	1.410000	1.561450	40.767320	-28.374892
58	1.410000	1.561450	43.428796	-24.104948
59	1.410000	1.561450	45.644635	-19.587655
60	1.410000	1.561450	47.392097	-14.869366
61	1.410000	1.561450	48.653252	-9.998497
62	1.410000	1.561450	49.415159	-5.025031

NOTE: The positions of the above rebars were computed by LPile



446974C

Minimum spacing between any two bars not equal to zero = 3.621 inches  
between bars 41 and 42.

Ratio of bar spacing to maximum aggregate size = 4.83

Concrete Properties:

Compressive Strength of Concrete	=	4500. psi
Modulus of Elasticity of Concrete	=	3823676. psi
Modulus of Rupture of Concrete	=	-503.115295 psi
Compression Strain at Peak Stress	=	0.002001
Tensile Strain at Fracture of Concrete	=	-0.0001152
Maximum Coarse Aggregate Size	=	0.750000 in

Number of Axial Thrust Force Values Determined from Pile-head Loadings = 2

Number	Axial Thrust Force kips
1	64.830
2	103.853

Summary of Results for Nominal (Unfactored) Moment Capacity for Section 1

Moment values interpolated at maximum compressive strain = 0.003  
or maximum developed moment if pile fails at smaller strains.

Load No.	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain
1	64.830	261712.114	0.00300000
2	103.853	263167.368	0.00300000

Note that the values of moment capacity in the table above are not  
factored by a strength reduction factor (phi-factor).

In ACI 318, the value of the strength reduction factor depends on whether  
the transverse reinforcing steel bars are tied hoops (0.65) or spirals (0.70).

The above values should be multiplied by the appropriate strength reduction  
factor to compute ultimate moment capacity according to ACI 318, Section  
9.3.2.2 or the value required by the design standard being followed.

The following table presents factored moment capacities and corresponding  
bending stiffnesses computed for common resistance factor values used for  
reinforced concrete sections.

Axial Load No.	Resist. Factor for Moment	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. Stiff. at Ult Mom kip-in <sup>2</sup>
1	0.65	261712.	42.139500	170113.	6.7830E+09
2	0.65	263167.	67.504667	171059.	6.8242E+09
1	0.70	261712.	45.381000	183198.	6.7607E+09
2	0.70	263167.	72.697333	184217.	6.8001E+09
1	0.75	261712.	48.622500	196284.	6.5378E+09
2	0.75	263167.	77.890000	197376.	6.5800E+09

Layering Correction Equivalent Depths of Soil & Rock Layers

Layer No.	Top of Layer Below Pile Head ft	Equivalent Top Depth Below Grnd Surf ft	Same Layer Type As Layer Above	Layer is Rock or is Below Rock Layer	F0 Integral for Layer lbs	F1 Integral for Layer lbs
1	0.5000	0.00	N.A.	No	0.00	2083.

2	2.5000	0.1532	No	No	446974C	2083.	46584.
3	5.5000	3.5289	No	No		48667.	746157.
4	15.5000	15.3773	No	No		794824.	346430.
5	20.5000	7.4756	Yes	No		1141254.	N.A.

Notes: The F0 integral of Layer n+1 equals the sum of the F0 and F1 integrals for Layer n. Layering correction equivalent depths are computed only for soil types with both shallow-depth and deep-depth expressions for peak lateral load transfer. These soil types are soft and stiff clays, non-liquefied sands, and cemented c-phi soil.

# Summary of Pile-head Responses for Conventional Analyses

## Definitions of Pile-head Loading Conditions:

Load Type 1: Load 1 = Shear, V, lbs, and Load 2 = Moment, M, in-lbs  
Load Type 2: Load 1 = Shear, V, lbs, and Load 2 = Slope, S, radians  
Load Type 3: Load 1 = Shear, V, lbs, and Load 2 = Rot. Stiffness, R, in-lbs/rad.  
Load Type 4: Load 1 = Top Deflection, y, inches, and Load 2 = Moment, M, in-lbs  
Load Type 5: Load 1 = Top Deflection, y, inches, and Load 2 = Slope, S, radians

Load Case No.	Load Type 1	Pile-head Load 1	Load Type 2	Pile-head Load 2	Axial Loading lbs	Pile-head Deflection inches	Pile-head Rotation radians	Max Shear in Pile lbs	Max Moment in Pile in-lbs
1	V, lb	170627.	M, in-lb	2.25E+08	103853.	20.6455	-0.07317	-1382170.	2.40E+08
2	V, lb	17840.	M, in-lb	2.36E+07	64830.	0.06435	-3.16E-04	-191498.	2.52E+07

Maximum pile-head deflection = 20.6455032029 inches  
Maximum pile-head rotation = -0.0731697072 radians = -4.192315 deg.

The analysis ended normally.

**1807.3.2.1 (2009 IBC, 2012 IBC, & 2015 IBC)**

Moment (ft·k)	14,082.85	
Shear (k)	127.97	
Caisson diameter (ft)	9	
Caisson height above ground (ft)	0.5	
Caisson height below ground (ft)	36	
Lateral soil pressure (lb/ft <sup>2</sup> )	340.00	
Ground to application of force, h (ft)	110.55	
Applied lateral force, P (lb)	127,970	
Lateral soil bearing pressure, S <sub>1</sub> (lb/ft)	4,080.00	
Diameter, b (ft)	9	
A	8.15	$= (2.34P)/(S_1 b)$
Minimum depth of embedment, d (ft)	35.69	$= 0.5A [ 1 + ( 1 + ( 4.36h / A ) )^{1/2} ]$



February 21 2018

Multnomah County  
Land Use Planning Division  
1600 SE 190<sup>th</sup> Avenue, Suite 116  
Portland OR 97233

RE: Future Facility Collocations:  
(Proposed Site: POR STINGER / Address: 29421 E. Woodard Road. Troutdale OR 97060. APN: R322458)

To whom it may concern:

Verizon Wireless proposes to install a new wireless communication facility on property at 29421 E. Woodard Road. Troutdale OR 97060.

To comply with the requirements of MCC Section 35.6182. (B) (6):

The Applicant, Verizon Wireless agrees to cooperate to allow other carriers/users to collocate on the proposed tower provided all safety, structural, and technological requirements are met. This obligation shall apply to any future owners or operators of the tower.

Sincerely,

A handwritten signature in black ink, appearing to read "Malissa Johnson", with a long horizontal line extending to the right.

Malissa Johnson  
Real Estate Specialist  
5430 NE 122<sup>nd</sup> Ave. Portland OR 97230



## LAND LEASE AGREEMENT

This Land Lease Agreement (the "Agreement") made this 19 day of May, 2017, between Clifton E. Hegstad and Doreen F. Hegstad, Trustees of the Clifton E. Hegstad Trust dated August 5, 2016, and Doreen F. Hegstad and Clifton E. Hegstad, Trustees of the Doreen F. Hegstad Trust dated August 5, 2016, as tenants in common, with its principal offices located at 29421 E. Woodard Road, Troutdale, Oregon 97060-8317, hereinafter designated LESSOR and Verizon Wireless (VAW) LLC d/b/a Verizon Wireless with its principal offices at One Verizon Way, Mail Stop 4AW100, Basking Ridge, New Jersey 07920 (telephone number [REDACTED]), hereinafter designated LESSEE. LESSOR and LESSEE are at times collectively referred to hereinafter as the "Parties" or individually as the "Party."

WITNESSETH

In consideration of the mutual covenants contained herein and intending to be legally bound hereby, the Parties hereto agree as follows:

1. GRANT: In accordance with this Agreement, LESSOR hereby grants to LESSEE the right to install, maintain and operate communications equipment ("Use") upon the Premises (as hereinafter defined), which are a part of that real property owned, leased or controlled by LESSOR at 29421 E. Woodard Road, Troutdale, County of Multnomah, State of Oregon (the "Property"). The Property is legally described on Exhibit "A" attached hereto and made a part hereof. The Premises are a portion of the Property and are approximately 2,500 square feet, and are shown in detail on Exhibit "B" attached hereto and made a part hereof. LESSEE may survey the Premises. Upon completion, the survey shall replace Exhibit "B" in its entirety.

2. INITIAL TERM. This Agreement shall be effective as of the date of execution by both Parties ("Effective Date"). The initial term of the Agreement shall be for 5 years beginning on the first day of the month following the Commencement Date (as hereinafter defined). The "Commencement Date" shall be the first day of the month after LESSEE begins installation of LESSEE's communications equipment.

3. EXTENSIONS. This Agreement shall automatically be extended for 4 additional 5 year terms unless Lessee terminates it at the end of the then current term by giving LESSOR written notice of the intent to terminate at least 3 months prior to the end of the then current term. The initial term and all extensions shall be collectively referred to herein as the "Term".

4. RENTAL; EXTENSION RENTALS.

(a). Rental payments shall begin on the Commencement Date and be due at a total [REDACTED] to be paid in equal monthly installments on the first day of the month, in advance, to LESSOR at 29421 E. Woodard Road, Troutdale, Oregon 97060-8317 or to such other person, firm, or place as LESSOR may, from time to time, designate in writing at least 30 days in advance of any rental payment date by notice given in accordance with Paragraph 20 below. LESSOR and LESSEE acknowledge and agree that the initial rental payment shall not be delivered by LESSEE until 60 days after the Commencement Date. Upon agreement of the Parties, LESSEE may pay rent by electronic funds transfer and in such event, LESSOR agrees to provide to LESSEE bank routing information for such purpose upon request of LESSEE.

(b). For any party to whom rental payments are to be made, LESSOR or any successor in interest of LESSOR hereby agrees to provide to LESSEE (i) a completed, current version of Internal

Revenue Service Form W-9, or equivalent; (ii) complete and fully executed state and local withholding forms if required; and (iii) other documentation to verify LESSOR's or such other party's right to receive rental as is reasonably requested by LESSEE. Rental shall accrue in accordance with this Agreement, but LESSEE shall have no obligation to deliver rental payments until the requested documentation has been received by LESSEE. Upon receipt of the requested documentation, LESSEE shall deliver the accrued rental payments as directed by LESSOR.

(c). The annual rental for the first (1st) five (5) year extension term shall be increased to the annual rental for the second (2nd) five (5) year extension term shall be increased to the annual rental for the third (3rd) five (5) year extension term shall be increased to the annual rental for the fourth (4th) five (5) year extension term shall be increased to

5. ACCESS. LESSEE shall have the non-exclusive right of ingress and egress from a public right-of-way, 7 days a week, 24 hours a day, over the Property to and from the Premises for the purpose of installation, operation and maintenance of LESSEE's communications equipment over or along a twenty (20') foot wide right-of-way ("Easement"), which shall be depicted on Exhibit "B". LESSEE may use the Easement for the installation, operation and maintenance of wires, cables, conduits and pipes for all necessary electrical, telephone, fiber and other similar support services. In the event it is necessary, LESSOR agrees to grant LESSEE or the provider the right to install such services on, through, over and/or under the Property, provided the location of such services shall be reasonably approved by LESSOR. Notwithstanding anything to the contrary, the Premises shall include such additional space sufficient for LESSEE's radio frequency signage and/or barricades as are necessary to ensure LESSEE's compliance with Laws (as defined in Paragraph 27).

6. CONDITION OF PROPERTY. LESSOR shall deliver the Premises to LESSEE in a condition ready for LESSEE's Use and clean and free of debris. LESSOR represents and warrants to LESSEE that as of the Effective Date, the Premises (a) in compliance with all Laws; and (b) in compliance with all EH&S Laws (as defined in Paragraph 24).

7. IMPROVEMENTS. The communications equipment including, without limitation, the tower structure, antennas, conduits, fencing and other screening, and other improvements shall be at LESSEE's expense and installation shall be at the discretion and option of LESSEE. LESSEE shall have the right to replace, repair, add or otherwise modify its communications equipment, tower structure, antennas, conduits, fencing and other screening, or other improvements or any portion thereof and the frequencies over which the communications equipment operates, whether or not any of the communications equipment, antennas, conduits or other improvements are listed on any exhibit.

8. GOVERNMENT APPROVALS. LESSEE's Use is contingent upon LESSEE obtaining all of the certificates, permits and other approvals (collectively the "Government Approvals") that may be required by any Federal, State or Local authorities (collectively, the "Government Entities") as well as a satisfactory soil boring test, environmental studies, or any other due diligence Lessee chooses that will permit LESSEE's Use. LESSOR shall cooperate with LESSEE in its effort to obtain such approvals and shall take no action which would adversely affect the status of the Property with respect to LESSEE's Use.

9. TERMINATION. LESSEE may, unless otherwise stated, immediately terminate this Agreement upon written notice to LESSOR in the event that (i) any applications for such Government Approvals should be finally rejected; (ii) any Government Approval issued to LESSEE is canceled, expires,

lapses or is otherwise withdrawn or terminated by any Government Entity; (iii) LESSEE determines that such Government Approvals may not be obtained in a timely manner; (iv) LESSEE determines any structural analysis is unsatisfactory; (v) LESSEE, in its sole discretion, determines the Use of the Premises is obsolete or unnecessary; (vi) with 3 months prior notice to LESSOR, upon the annual anniversary of the Commencement Date; or (vii) at any time before the Commencement Date for any reason or no reason in LESSEE's sole discretion.

10. INDEMNIFICATION. Subject to Paragraph 11, each Party shall indemnify and hold the other harmless against any claim of liability or loss from personal injury or property damage resulting from or arising out of the negligence or willful misconduct of the indemnifying Party, its employees, contractors or agents, except to the extent such claims or damages may be due to or caused by the negligence or willful misconduct of the other Party, or its employees, contractors or agents. The indemnified Party will provide the indemnifying Party with prompt, written notice of any claim covered by this indemnification; provided that any failure of the indemnified Party to provide any such notice, or to provide it promptly, shall not relieve the indemnifying Party from its indemnification obligation in respect of such claim, except to the extent the indemnifying Party can establish actual prejudice and direct damages as a result thereof. The indemnified Party will cooperate appropriately with the indemnifying Party in connection with the indemnifying Party's defense of such claim. The indemnifying Party shall defend any indemnified Party, at the indemnified Party's request, against any claim with counsel reasonably satisfactory to the indemnified Party. The indemnifying Party shall not settle or compromise any such claim or consent to the entry of any judgment without the prior written consent of each indemnified Party and without an unconditional release of all claims by each claimant or plaintiff in favor of each indemnified Party.

11. INSURANCE.

a. Notwithstanding the indemnity in Paragraph 10, the Parties hereby waive and release any and all rights of action for negligence against the other which may hereafter arise on account of damage to the Premises or to the Property, resulting from any fire, or other casualty of the kind covered by standard fire insurance policies with extended coverage, regardless of whether or not, or in what amounts, such insurance is now or hereafter carried by the Parties, or either of them. These waivers and releases shall apply between the Parties and they shall also apply to any claims under or through either Party as a result of any asserted right of subrogation. All such policies of insurance obtained by either Party concerning the Premises or the Property shall waive the insurer's right of subrogation against the other Party.

b. LESSEE will maintain at its own cost;

i. Commercial General Liability insurance with limits not less than \$1,000,000 for injury to or death of one or more persons in any one occurrence and \$500,000 for damage or destruction to property in any one occurrence.

ii. Commercial Auto Liability insurance on all owned, non-owned and hired automobiles with a minimum combined limit of not less than one million (\$1,000,000) per occurrence.

iii. Workers Compensation insurance providing the statutory benefits and not less than one million (\$1,000,000) of Employers Liability coverage.

LESSEE will include the LESSOR as an additional insured on the Commercial General Liability and Auto Liability policies.

c. LESSOR hereby acknowledges that all portions of the Property within three hundred feet (300') of the Premises (hereinafter referred to as the "Insurance Buffer") are currently being used solely for agricultural, forestry or non-commercial purposes. In the event that the current use of the Insurance Buffer changes during the Term, LESSOR agrees that at such time and in the future, and at its own cost and expense, each will maintain commercial general liability insurance with limits not less than \$1,000,000 for injury to or death of one or more persons in any one occurrence and \$500,000 for damage or destruction to property in any one occurrence.

12. LIMITATION OF LIABILITY. Except for indemnification pursuant to Paragraphs 10 and 24, a violation of Paragraph 29, or a violation of law, neither Party shall be liable to the other, or any of their respective agents, representatives, or employees for any lost revenue, lost profits, loss of technology, rights or services, incidental, punitive, indirect, special or consequential damages, loss of data, or interruption or loss of use of service, even if advised of the possibility of such damages, whether under theory of contract, tort (including negligence), strict liability or otherwise.

13. INTERFERENCE.

(a). LESSEE agrees that LESSEE will not cause interference that is measurable in accordance with industry standards to LESSOR's equipment. LESSOR agrees that LESSOR and other occupants of the Property will not cause interference that is measurable in accordance with industry standards to the then existing equipment of LESSEE.

(b). Without limiting any other rights or remedies, if interference occurs and continues for a period in excess of 48 hours following notice to the interfering party via telephone to LESSEE's Network Operations Center (████████████████████) or to LESSOR at (██████████), the interfering party shall or shall require any other user to reduce power or cease operations of the interfering equipment until the interference is cured.

(c). The Parties acknowledge that there will not be an adequate remedy at law for noncompliance with the provisions of this Paragraph and therefore the Parties shall have the right to equitable remedies such as, without limitation, injunctive relief and specific performance.

14. REMOVAL AT END OF TERM. Upon expiration or within 90 days of earlier termination, LESSEE shall remove LESSEE's Communications Equipment (except footings) and restore the Premises to its original condition, reasonable wear and tear and casualty damage excepted. LESSOR agrees and acknowledges that the communications equipment shall remain the personal property of LESSEE and LESSEE shall have the right to remove the same at any time during the Term, whether or not said items are considered fixtures and attachments to real property under applicable laws. If such time for removal causes LESSEE to remain on the Premises after termination of the Agreement, LESSEE shall pay rent at the then existing monthly rate or on the existing monthly pro-rata basis if based upon a longer payment term, until the removal of the communications equipment is completed.

15. HOLDOVER. If upon expiration of the Term the Parties are negotiating a new lease or a lease extension, then this Agreement shall continue during such negotiations on a month to month basis at the rental in effect as of the date of the expiration of the Term. In the event that the Parties are not in the process of negotiating a new lease or lease extension and LESSEE holds over after the expiration



or earlier termination of the Term, then Lessee shall pay rent at the then existing monthly rate or on the existing monthly pro-rata basis if based upon a longer payment term, until the removal of the communications equipment is completed.

16. RIGHT OF FIRST REFUSAL. If at any time after the Effective Date, LESSOR receives an offer or letter of intent from any person or entity that is in the business of owning, managing or operating communications facilities or is in the business of acquiring landlord interests in agreements relating to communications facilities, to purchase fee title, an easement, a lease, a license, or any other interest in the Premises or any portion thereof or to acquire any interest in this Agreement, or an option for any of the foregoing, LESSOR shall provide written notice to LESSEE of said offer ("LESSOR's Notice"). LESSOR's Notice shall include the prospective buyer's name, the purchase price being offered, any other consideration being offered, the other terms and conditions of the offer, a description of the portion of and interest in the Premises and/or this Agreement which will be conveyed in the proposed transaction, and a copy of any letters of intent or form agreements presented to LESSOR by the third party offeror. LESSEE shall have the right of first refusal to meet any bona fide offer of sale or transfer on the terms and conditions of such offer or by effectuating a transaction with substantially equivalent financial terms. If LESSEE fails to provide written notice to LESSOR that LESSEE intends to meet such bona fide offer within thirty (30) days after receipt of LESSOR's Notice, LESSOR may proceed with the proposed transaction in accordance with the terms and conditions of such third party offer, in which event this Agreement shall continue in full force and effect and the right of first refusal described in this Paragraph shall survive any such conveyance to a third party. If LESSEE provides LESSOR with notice of LESSEE's intention to meet the third party offer within thirty (30) days after receipt of LESSOR's Notice, then if LESSOR's Notice describes a transaction involving greater space than the Premises, LESSEE may elect to proceed with a transaction covering only the Premises and the purchase price shall be pro-rated on a square footage basis. Further, LESSOR acknowledges and agrees that if LESSEE exercises this right of first refusal, LESSEE may require a reasonable period of time to conduct due diligence and effectuate the closing of a transaction on substantially equivalent financial terms of the third party offer. LESSEE may elect to amend this Agreement to effectuate the proposed financial terms of the third party offer rather than acquiring fee simple title or an easement interest in the Premises. For purposes of this Paragraph, any transfer, bequest or devise of LESSOR's interest in the Property as a result of the death of LESSOR, whether by will or intestate succession, or any conveyance to LESSOR's family members by direct conveyance or by conveyance to a trust for the benefit of family members shall not be considered a sale for which LESSEE has any right of first refusal.

17. RIGHTS UPON SALE. Should LESSOR, at any time during the Term, decide (i) to sell or otherwise transfer all or any part of the Property, or (ii) to grant to a third party by easement or other legal instrument an interest in and to any portion of the Premises, such sale, transfer, or grant of an easement or interest therein shall be under and subject to this Agreement and any such purchaser or transferee shall recognize LESSEE's rights hereunder. In the event that LESSOR completes any such sale, transfer, or grant described in this Paragraph without executing an assignment of the Agreement whereby the third party agrees in writing to assume all obligations of LESSOR under this Agreement, then LESSOR shall not be released from its obligations to LESSEE under this Agreement, and LESSEE shall have the right to look to LESSOR and the third party for the full performance of the Agreement.

18. LESSOR's TITLE. LESSOR covenants that LESSEE, on paying the rent and performing the covenants herein, shall peaceably and quietly have, hold and enjoy the Premises. LESSOR represents and warrants to LESSEE as of the Effective Date and covenants during the Term that LESSOR has full

authority to enter into and execute this Agreement and that there are no liens, judgments, covenants, easement, restrictions or other impediments of title that will adversely affect LESSEE's Use.

19. ASSIGNMENT. Without any approval or consent of the other Party, this Agreement may be sold, assigned or transferred by either Party to (i) any entity in which the Party directly or indirectly holds an equity or similar interest; (ii) any entity which directly or indirectly holds an equity or similar interest in the Party; or (iii) any entity directly or indirectly under common control with the Party. LESSEE may assign this Agreement to any entity which acquires all or substantially all of LESSEE's assets in the market defined by the FCC in which the Property is located by reason of a merger, acquisition or other business reorganization without approval or consent of LESSOR. As to other parties, this Agreement may not be sold, assigned or transferred without the written consent of the other Party, which such consent will not be unreasonably withheld, delayed or conditioned. No change of stock ownership, partnership interest or control of LESSEE or transfer upon partnership or corporate dissolution of either Party shall constitute an assignment hereunder. LESSEE may sublet the Premises in LESSEE's sole discretion. Notwithstanding the foregoing, any subtenant or co-locator that may desire to sublet space upon LESSEE's communications facilities shall be required to lease separate access and ground space directly from LESSOR for placement of any ancillary equipment at the Property in order that LESSOR may have the opportunity to achieve a separate agreement with that entity related to any associated use of LESSOR's Property.

20. NOTICES. Except for notices permitted via telephone in accordance with Paragraph 13, all notices hereunder must be in writing and shall be deemed validly given if sent by certified mail, return receipt requested or by commercial courier, provided the courier's regular business is delivery service and provided further that it guarantees delivery to the addressee by the end of the next business day following the courier's receipt from the sender, addressed as follows (or any other address that the Party to be notified may have designated to the sender by like notice):

LESSOR: Clifton E. Hegstad  
29421 E. Woodard Road  
Troutdale, Oregon 97060-8317

LESSEE: Verizon Wireless (VAW) LLC  
d/b/a Verizon Wireless  
180 Washington Valley Road  
Bedminster, New Jersey 07921  
Attention: Network Real Estate

Notice shall be effective upon actual receipt or refusal as shown on the receipt obtained pursuant to the foregoing.

21. SUBORDINATION AND NON-DISTURBANCE. Within 15 days of the Effective Date, LESSOR shall obtain a Non-Disturbance Agreement, as defined below, from its existing mortgagee(s), ground lessors and master lessors, if any, of the Property. At LESSOR's option, this Agreement shall be subordinate to any future master lease, ground lease, mortgage, deed of trust or other security interest (a "Mortgage") by LESSOR which from time to time may encumber all or part of the Property; provided, however, as a condition precedent to LESSEE being required to subordinate its interest in this Agreement to any future Mortgage covering the Property, LESSOR shall obtain for LESSEE's benefit a non-disturbance and attornment agreement for LESSEE's benefit in the form reasonably satisfactory to

LESSEE, and containing the terms described below (the "Non-Disturbance Agreement"), and shall recognize LESSEE's rights under this Agreement. The Non-Disturbance Agreement shall include the encumbering party's ("Lender's") agreement that, if Lender or its successor-in-interest or any purchaser of Lender's or its successor's interest (a "Purchaser") acquires an ownership interest in the Property, Lender or such successor-in-interest or Purchaser will honor all of the terms of the Agreement. Such Non-Disturbance Agreement must be binding on all of Lender's participants in the subject loan (if any) and on all successors and assigns of Lender and/or its participants and on all Purchasers. In return for such Non-Disturbance Agreement, LESSEE will execute an agreement for Lender's benefit in which LESSEE (1) confirms that the Agreement is subordinate to the Mortgage or other real property interest in favor of Lender, (2) agrees to attorn to Lender if Lender becomes the owner of the Property and (3) agrees to accept a cure by Lender of any of LESSOR's defaults, provided such cure is completed within the deadline applicable to LESSOR. In the event LESSOR defaults in the payment and/or other performance of any mortgage or other real property interest encumbering the Property, LESSEE, may, at its sole option and without obligation, cure or correct LESSOR's default and upon doing so, LESSEE shall be subrogated to any and all rights, titles, liens and equities of the holders of such mortgage or other real property interest and LESSEE shall be entitled to deduct and setoff against all rents that may otherwise become due under this Agreement the sums paid by LESSEE to cure or correct such defaults.

22. DEFAULT. It is a "Default" if (i) either Party fails to comply with this Agreement and does not remedy the failure within 30 days after written notice by the other Party or, if the failure cannot reasonably be remedied in such time, if the failing Party does not commence a remedy within the allotted 30 days and diligently pursue the cure to completion within 90 days after the initial written notice, or (ii) LESSOR fails to comply with this Agreement and the failure interferes with LESSEE's Use and LESSOR does not remedy the failure within 5 days after written notice from LESSEE or, if the failure cannot reasonably be remedied in such time, if LESSOR does not commence a remedy within the allotted 5 days and diligently pursue the cure to completion within 15 days after the initial written notice. The cure periods set forth in this Paragraph 22 do not extend the period of time in which either Party has to cure interference pursuant to Paragraph 13 of this Agreement.

23. REMEDIES. In the event of a Default, without limiting the non-defaulting Party in the exercise of any right or remedy which the non-defaulting Party may have by reason of such default, the non-defaulting Party may terminate this Agreement and/or pursue any remedy now or hereafter available to the non-defaulting Party under the Laws or judicial decisions of the state in which the Property is located. Further, upon a Default, the non-defaulting Party may at its option (but without obligation to do so), perform the defaulting Party's duty or obligation. The costs and expenses of any such performance by the non-defaulting Party shall be due and payable by the defaulting Party upon invoice therefor. If LESSEE undertakes any such performance on LESSOR's behalf and LESSOR does not pay LESSEE the full undisputed amount within 30 days of its receipt of an invoice setting forth the amount due, LESSEE may offset the full undisputed amount due against all fees due and owing to LESSOR under this Agreement until the full undisputed amount is fully reimbursed to LESSEE.

24. ENVIRONMENTAL. LESSEE shall conduct its business in compliance with all applicable laws governing the protection of the environment or employee health and safety ("EH&S Laws"). LESSEE shall indemnify and hold harmless the LESSOR from claims to the extent resulting from LESSEE's violation of any applicable EH&S Laws or to the extent that LESSEE causes a release of any regulated substance to the environment. LESSOR shall indemnify and hold harmless LESSEE from all claims resulting from the violation of any applicable EH&S Laws or a release of any regulated substance to the environment except to the extent resulting from the activities of LESSEE. The Parties recognize that

LESSEE is only leasing a small portion of LESSOR's property and that LESSEE shall not be responsible for any environmental condition or issue except to the extent resulting from LESSEE's specific activities and responsibilities. In the event that LESSEE encounters any hazardous substances that do not result from its activities, LESSEE may relocate its facilities to avoid such hazardous substances to a mutually agreeable location or, if LESSEE desires to remove at its own cost all or some the hazardous substances or materials (such as soil) containing those hazardous substances, LESSOR agrees to sign any necessary waste manifest associated with the removal, transportation and/or disposal of such substances.

25. CASUALTY. If a fire or other casualty damages the Property or the Premises and impairs LESSEE's Use, rent shall abate until LESSEE's Use is restored. If LESSEE's Use is not restored within 45 days, LESSEE may terminate this Agreement.

26. CONDEMNATION. If a condemnation of any portion of the Property or Premises impairs LESSEE's Use, Lessee may terminate this Agreement. LESSEE may on its own behalf make a claim in any condemnation proceeding involving the Premises for losses related to LESSEE's communications equipment, relocation costs and, specifically excluding loss of LESSEE's leasehold interest, any other damages LESSEE may incur as a result of any such condemnation.

27. APPLICABLE LAWS. During the Term, LESSOR shall maintain the Property in compliance with all applicable laws, EH&S Laws, rules, regulations, ordinances, directives, covenants, easements, consent decrees, zoning and land use regulations, and restrictions of record, permits, building codes, and the requirements of any applicable fire insurance underwriter or rating bureau, now in effect or which may hereafter come into effect (including, without limitation, the Americans with Disabilities Act and laws regulating hazardous substances) (collectively "Laws"). LESSEE shall, in respect to the condition of the Premises and at LESSEE's sole cost and expense, comply with (i) all Laws relating solely to LESSEE's specific and unique nature of use of the Premises; and (ii) all building codes requiring modifications to the Premises due to the improvements being made by LESSEE in the Premises. It shall be LESSOR's obligation to comply with all Laws relating to the Property, without regard to specific use (including, without limitation, modifications required to enable LESSEE to obtain all necessary building permits).

28. TAXES.

(a). LESSOR shall invoice and LESSEE shall pay any applicable transaction tax (including sales, use, gross receipts, or excise tax) imposed on the LESSEE and required to be collected by the LESSOR based on any service, rental space, or equipment provided by the LESSOR to the LESSEE. LESSEE shall pay all personal property taxes, fees, assessments, or other taxes and charges imposed by any Government Entity that are imposed on the LESSEE and required to be paid by the LESSEE that are directly attributable to the LESSEE's equipment or LESSEE's use and occupancy of the Premises. Payment shall be made by LESSEE within 60 days after presentation of a receipted bill and/or assessment notice which is the basis for such taxes or charges. LESSOR shall pay all ad valorem, personal property, real estate, sales and use taxes, fees, assessments or other taxes or charges that are attributable to LESSOR's Property or any portion thereof imposed by any Government Entity.

(b). LESSEE shall have the right, at its sole option and at its sole cost and expense, to appeal, challenge or seek modification of any tax assessment or billing for which LESSEE is wholly or partly responsible for payment. LESSOR shall reasonably cooperate with LESSEE at LESSEE's expense in filing, prosecuting and perfecting any appeal or challenge to taxes as set forth in the preceding sentence,



including but not limited to, executing any consent, appeal or other similar document. In the event that as a result of any appeal or challenge by LESSEE, there is a reduction, credit or repayment received by the LESSOR for any taxes previously paid by LESSEE, LESSOR agrees to promptly reimburse to LESSEE the amount of said reduction, credit or repayment. In the event that LESSEE does not have the standing rights to pursue a good faith and reasonable dispute of any taxes under this paragraph, LESSOR will pursue such dispute at LESSEE's sole cost and expense upon written request of LESSEE.

29. NON-DISCLOSURE. The Parties agree this Agreement and any information exchanged between the Parties regarding the Agreement are confidential. The Parties agree not to provide copies of this Agreement or any other confidential information to any third party without the prior written consent of the other or as required by law. If a disclosure is required by law, prior to disclosure, the Party shall notify the other Party and cooperate to take lawful steps to resist, narrow, or eliminate the need for that disclosure.

30. ELECTRICAL. If permitted by the local utility company servicing the Property, LESSEE will install a separate meter for the measurement of its electric power and will pay for its own utilities used. If installation of a separate meter is not permitted by the utility, LESSEE shall furnish and install an electrical submeter at the Premises for the measurement of electrical power used by LESSEE's installation. LESSEE shall pay for its own power consumption used sixty (60) days after receipt of an invoice from LESSOR indicating the usage amount. LESSEE shall be permitted to install, maintain and/or provide access to and use of, as necessary (during any power interruption at the Premises), a temporary power source.

31. MOST FAVORED LESSEE. LESSOR represents and warrants that the rent, benefits and terms and conditions granted to LESSEE by LESSOR hereunder are now and shall be, during the Term, no less favorable than the rent, benefits and terms and conditions for substantially the same or similar tenancies or licenses granted by LESSOR to other parties. If at any time during the Term LESSOR shall offer more favorable rent, benefits or terms and conditions for substantially the same or similar tenancies or licenses as those granted hereunder, then LESSOR shall, within 30 days after the effective date of such offering, notify LESSEE of such fact and offer LESSEE the more favorable offering. If LESSEE chooses, the parties shall then enter into an amendment that shall be effective retroactively to the effective date of the more favorable offering, and shall provide the same rent, benefits or terms and conditions to LESSEE. LESSEE shall have the right to decline to accept the offering. LESSOR's compliance with this requirement shall be subject, at LESSEE's option, to independent verification.

32. MISCELLANEOUS. This Agreement contains all agreements, promises and understandings between the LESSOR and the LESSEE regarding this transaction, and no oral agreement, promises or understandings shall be binding upon either the LESSOR or the LESSEE in any dispute, controversy or proceeding. This Agreement may not be amended or varied except in a writing signed by all Parties. This Agreement shall extend to and bind the heirs, personal representatives, successors and assigns hereto. The failure of either party to insist upon strict performance of any of the terms or conditions of this Agreement or to exercise any of its rights hereunder shall not waive such rights and such party shall have the right to enforce such rights at any time. The performance of this Agreement shall be governed, interpreted, construed and regulated by the laws of the state in which the Premises is located without reference to its choice of law rules. Except as expressly set forth in this Agreement, nothing in this Agreement shall grant, suggest or imply any authority for one Party to use the name, trademarks, service marks or trade names of the other for any purpose whatsoever. LESSOR agrees to execute a Memorandum of this Agreement, which LESSEE may record with the appropriate recording

officer. The provisions of the Agreement relating to indemnification from one Party to the other Party shall survive any termination or expiration of this Agreement.

IN WITNESS WHEREOF, the Parties hereto have set their hands and affixed their respective seals the day and year first above written.

**LESSOR:**

Clifton E. Hegstad and Doreen F. Hegstad, Trustees of the Clifton E. Hegstad  
Trust dated August 5, 2016

By: Clifton E. Hegstad  
Name: Clifton E. Hegstad  
Title: Trustee  
Date: 4/5/17

By: Doreen F. Hegstad  
Name: Doreen F. Hegstad  
Title: Trustee  
Date: 4/5/17

Doreen F. Hegstad and Clifton E. Hegstad, Trustees of the Doreen F. Hegstad  
Trust dated August 5, 2016

By: Doreen F. Hegstad  
Name: Doreen F. Hegstad  
Title: Trustee  
Date: 4/5/17

By: Clifton E. Hegstad  
Name: Clifton E. Hegstad  
Title: Trustee  
Date: 4/5/17

**LESSEE:** Verizon Wireless (VAW) LLC  
d/b/a Verizon Wireless

By: Jim R. Creel, Jr.  
Name: Director - Network Field Engineering  
Title: \_\_\_\_\_  
Date: 5/19/2017

**EXHIBIT "A"**  
**DESCRIPTION OF PROPERTY**

Tract in Section 31, Township 1 North, Range 4 East of the Willamette Meridian, in the County of Multnomah and State of Oregon, more particularly described as follows:

Beginning at the Southeast corner of the West 15 acres of the Northwest one-quarter of the Southeast one-quarter of Section 31, said township and range, said point being South 89°20'00" West 2132.13 feet and South 0°20'55" West 1316.67 feet from the East one-quarter corner of said Section 31 and running thence North 0°20'55" East along the East line of the said 15 acre tract, 1316.67 feet to the Northeast corner of said tract; thence North 89°20'00" East 490.03 feet to the Northwest corner of the property described in the deed recorded in Book 315, Page 113, Multnomah County Records of Deeds; thence South 0°15'40" West along the West line of the last mentioned property, 700 feet; thence South 89°20'00" West 291.11 feet; thence South 0°20'55" West 616.23 feet to the South line of the Northwest one-quarter of the Southeast one-quarter of said Section 31; thence South 89°12'00" West along said South line 200 feet to the point of beginning.

**EXHIBIT "B"**  
**SITE PLAN OF THE PREMISES**

The site plan illustrates the layout of the premises, including property lines, easements, and buildings. The plan is divided into several sections by property lines and easements.

**Property Lines and Dimensions:**

- Top boundary: 253'-0"±, 50'-0", 187'-0"±
- Left boundary: 276'-0"±, 50'-0", 374'-0"±
- Right boundary: 50'-0"
- Bottom boundary: 50'-0"

**Easements and Access:**

- LESSEE 20' WIDE ACCESS & UTILITY ROUTE TO PUBLIC ROAD (E WOODARD RD):** Indicated on the left side of the plan.
- EGRESS** and **INGRESS** paths are shown along the bottom boundary.
- LESSEE LEASE AREA 50'x50' (2500 SF):** A shaded rectangular area in the center-right of the plan.
- EXISTING BUILDING, TYP**: A rectangular building footprint is shown within the lease area.

**Tax Lots:**

- TAX LOT: 1N4E31A00900 (Top left)
- TAX LOT: 1N4E31D000800 (Center right)
- TAX LOT: 1N4E31D000500 (Bottom left)
- TAX LOT: 1N4E31D000400 (Bottom right)

**Other Features:**

- E WOODARD RD**: Located at the bottom of the plan.
- NOT TO SCALE**: A note indicating the plan is not to scale.
- POR STINGER**: A note indicating the location of the Por Stinger.
- 29421 E WOODARD RD** and **TROUTDALE, OR 97060**: Address and location information.





EXHIBIT P

November 3, 2017

Konrad Hyle  
Black Rock Consulting  
9895 Montegrino Court  
Elk Grove, CA 95757

Re: Acoustical Report – Verizon POR Stinger  
Site: 29421 East Woodard Road, Troutdale, OR 97060

Dear Konrad,

The following report presents a noise study for the proposed Verizon Wireless telecommunications facility at 29421 East Woodard Road in Troutdale, Oregon. This noise study extends from the proposed equipment to the nearest properties. The purpose of this report is to document the existing conditions and the impacts of the acoustical changes due to the proposed equipment. This report contains data on the existing and predicted noise environments, impact criteria and an evaluation of the predicted sound levels as they relate to the criteria.

### **Ambient Conditions**

Existing ambient sound levels of the site were measured on October 20, 2017 with a Svantek 971 Type 1 precision spectrum analyzer sound level meter. Measurements were conducted as close to the proposed location as possible and the property lines in accordance with the State of Oregon Sound Measurement Procedures Manual (NPCS-1). The average ambient noise level was 48 dBA, due primarily to rainfall and a light breeze.

### **Code Requirements**

The site is located within Multnomah County on property designated with an MUA zoning. The nearest receiving properties are zoned R-15.

The proposed new equipment includes equipment support cabinets and an emergency generator. The cabinets are expected to run intermittently 24 hours a day. The generator will operate during daytime hours for maintenance testing or during a power outage.

Multnomah County Code Chapter 35.6183(A)(3) states: Noise levels should not exceed 5 dBA above ambient levels or 55 dBA Sound Pressure Level, whichever is greater, on adjacent properties. Operation of a back-up generator in the event of power failure or the testing of a back-up generator between 8 AM and 8 PM are exempt from this standard. No testing of back-up power generators shall occur between the hours of 8 PM and 8 AM.

EXHIBIT  
A.26

### Predicted Equipment Sound Levels

#### 24-Hour Operation Equipment

The following table presents a summary of the equipment and their associated noise levels:

Table 1: Equipment Noise Levels

Equipment	dBA (each)	QTY	Combined dBA @ 5 ft
Commscope RBA84 Power/Battery Cabinet	66 dBA @ 5ft	2	69

Methods established by ARI Standard 275-2010 and ASHRAE were used in predicting equipment noise levels to the receiving properties. Application factors such as location, height, and reflective surfaces are accounted for in the calculations.

The equipment will be located at grade surrounded by a chain link fence. The nearest receiving property is approximately 200 feet east of the equipment. The following table presents the predicted sound level at the nearest receiving property:

Table 2: Predicted Noise Levels for Proposed Equipment Cabinets

Line	Application Factor	East
1	Sound Pressure Level at 5 ft (dBA), Lp1	69
2	Distance Factor (DF) Inverse-Square Law (Free Field): $DF = 20 \cdot \log(d1/d2)$	-32 (200 ft)
3	New Equipment Sound Pressure Level at Receiver, Lpr (Add lines 1 and 2)	37

As shown in Table 2, the sound pressure level from the proposed equipment will meet the 55 dBA code limit at the nearest receiving property line. Noise levels from the equipment to the other receiving properties, which are further away, will be lower and within the code limit.

#### Emergency Backup Equipment:

The proposed emergency backup equipment includes one Generac 20 kW Diesel Generator with a Level 2 enclosure and has a sound level of 65 dBA at 23 feet. Test cycle operation shall occur between 8 AM and 8 PM. Noise from the generator is exempt from the code when tested during daytime hours and when operating during a power outage.

Please contact us if you have any questions or require further information.

Sincerely,  
SSA Acoustics, LLP



Alan Burt, P.E.  
PARTNER



RENEWAL DATE: 12/31/17

This report has been prepared for the titled project or named part thereof and should not be used in whole or part and relied upon for any other project without the written authorization of SSA Acoustics, LLP. SSA Acoustics, LLP accepts no responsibility or liability for the consequences of this document if it is used for a purpose other than that for which it was commissioned. Persons wishing to use or rely upon this report for other purposes must seek written authority to do so from the owner of this report and/or SSA Acoustics, LLP and agree to indemnify SSA Acoustics, LLP for any and all resulting loss or damage. SSA Acoustics, LLP accepts no responsibility or liability for this document to any other party other than the person by whom it was commissioned. The findings and opinions expressed are relevant to the dates of the works and should not be relied upon to represent conditions at substantially later dates. Opinions included therein are based on information gathered during the study and from our experience. If additional information becomes available which may affect our comments, conclusions or recommendations SSA Acoustics, LLP reserves the right to review the information, reassess any new potential



Mail Processing Center  
Federal Aviation Administration  
Southwest Regional Office  
Obstruction Evaluation Group  
10101 Hillwood Parkway  
Fort Worth, TX 76177

Aeronautical Study No.  
2017-ANM-948-OE

EXHIBIT Q

Issued Date: 07/25/2017

Network Regulatory  
Verizon Wireless (VAW) LLC  
5055 North Point Pkwy  
NP2NE Network Engineering  
Alpharetta, GA 30022

**\*\* DETERMINATION OF NO HAZARD TO AIR NAVIGATION \*\***

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Monopole STINGER - A
Location:	TROUTDALE, OR
Latitude:	45-31-31.51N NAD 83
Longitude:	122-21-33.95W
Heights:	471 feet site elevation (SE) 150 feet above ground level (AGL) 621 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 1, Obstruction Marking and Lighting, a med-dual system - Chapters 4,8(M-Dual),&12.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

\_\_\_\_ At least 10 days prior to start of construction (7460-2, Part 1)  
  X   Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

See attachment for additional condition(s) or information.

This determination expires on 01/25/2019 unless:



- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.
- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is subject to review if an interested party files a petition that is received by the FAA on or before August 24, 2017. In the event a petition for review is filed, it must contain a full statement of the basis upon which it is made and be submitted to the Manager, Airspace Policy & Regulation, Federal Aviation Administration, 800 Independence Ave, SW, Room 423, Washington, DC 20591.

This determination becomes final on September 03, 2017 unless a petition is timely filed. In which case, this determination will not become final pending disposition of the petition. Interested parties will be notified of the grant of any review. For any questions regarding your petition, please contact Airspace Regulations & ATC Procedures Group via telephone -- 202-267-8783 - or facsimile 202-267-9328.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

This aeronautical study considered and analyzed the impact on existing and proposed arrival, departure, and en route procedures for aircraft operating under both visual flight rules and instrument flight rules; the impact on all existing and planned public-use airports, military airports and aeronautical facilities; and the cumulative impact resulting from the studied structure when combined with the impact of other existing or proposed structures. The study disclosed that the described structure would have no substantial adverse effect on air navigation.

An account of the study findings, aeronautical objections received by the FAA during the study (if any), and the basis for the FAA's decision in this matter can be found on the following page(s).



A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

If we can be of further assistance, please contact Paul Holmquist, at (425) 227-2625, or paul.holmquist@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2017-ANM-948-OE.

**Signature Control No: 326639493-338917379**

( DNH )

Mike Helvey

Manager, Obstruction Evaluation Group

Attachment(s)

Additional Information

Frequency Data

Map(s)

cc: FCC

## **Additional information for ASN 2017-ANM-948-OE**

Aeronautical Study Number 2017-ANM-948-OE

### **Abbreviations**

AGL - above ground level

AMSL - above mean sea level

RWY - runway

VFR - visual flight rules

IFR - instrument flight rules

NM - nautical mile

ASN- Aeronautical Study Number

Part 77 - Title 14 Code of Federal Regulations (CFR) Part 77, Safe, Efficient Use and Preservation of the Navigable Airspace

### **1. LOCATION OF PROPOSED CONSTRUCTION**

Proposed is a 150-foot AGL (621-foot AMSL) Monopole Antenna Tower to be located near 29421 E. Woodard Rd., Troutdale, OR, and would be approximately 11,901 feet (1.96 NM) southeast of the RWY 25 threshold at Portland-Troutdale Airport (TTD), Troutdale, OR. The TTD airport elevation is 39 feet AMSL.

### **2. OBSTRUCTION STANDARDS EXCEEDED**

The structure is identified as an obstruction under the following Part 77 standard:

Section 77.19(b) -- Conical Surface: a surface extending outward and upward from the periphery of the horizontal surface at a slope of 20:1 for a horizontal distance of 4,000 feet. This structure would exceed the TTD conical surface by 344 feet. The terrain also exceeds the TTD conical surface at this location by 194 feet.

### **3. EFFECT ON AERONAUTICAL OPERATIONS**

a. The impact on arrival, departure, and en route procedures for aircraft operating under VFR: This structure would exceed the TTD conical surface by 344 feet. The terrain also exceeds the TTD conical surface at this location by 194 feet.

There are no effects on the VFR traffic pattern.

There are no effects on any existing or proposed arrival, departure, or en route IFR/VFR minimum flight altitudes.

There are no physical or electromagnetic effects on the operation of air navigation and communications facilities.

There are no effects on any airspace and routes used by the military.

b. The impact on arrival, departure, and en route procedures for aircraft operating under IFR: None.

c. The impact on all planned public-use airports and aeronautical facilities: None.

d. The cumulative impact resulting from the proposed construction or alteration of a structure when combined with the impact of other existing or proposed structures: None.

### **4. CIRCULATION AND COMMENTS RECEIVED**

The proposal was circulated for public comment based on 13 June 2017 and public comment period closed on 20 July 2017. No comments were received by 20 July 2017.

### **5. DETERMINATION - NO HAZARD TO AIR NAVIGATION**

It is determined that the proposed construction would not have a substantial adverse effect on the safe and efficient use of navigable airspace by aircraft.

## 6. BASIS FOR DECISION

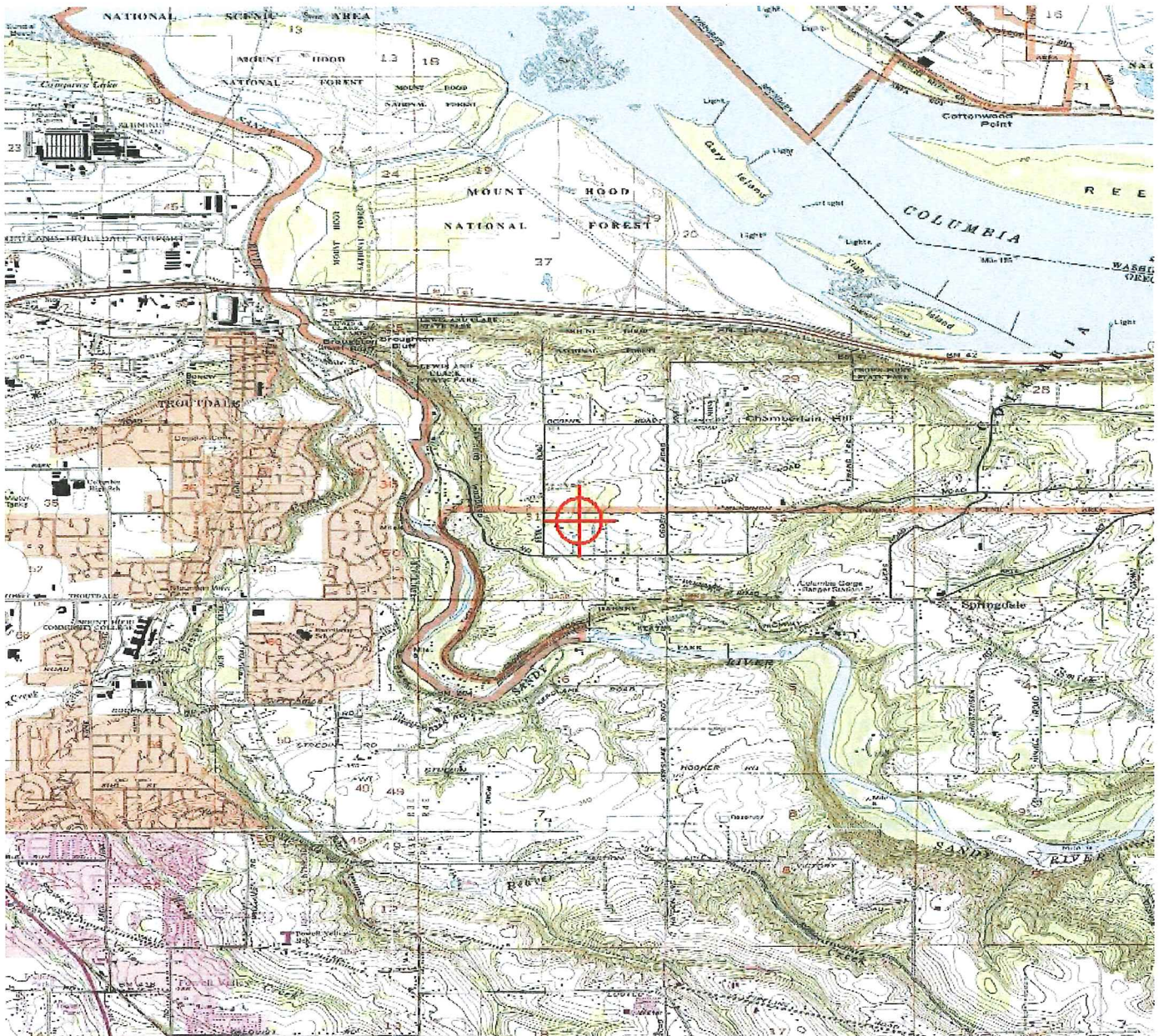
Study for possible VFR effect disclosed that the proposed structure would not affect existing or proposed en route, arrival or departure VFR operations or procedures. In this case, the proposed structure would exceed the TTD Part 77 Conical Surface by 344 feet and where the terrain also exceeds by 194 feet, however the proposed monopole would be located in an area of high terrain that is a well know obstacle for local pilots. No other VFR issues were identified and there are no IFR effects. Circularization and further aeronautical study resulted in no issues or objections to this proposed construction. The incorporation of obstruction marking and lighting is required to mitigate the protected surface penetrations and provide additional conspicuity for VFR and IFR pilots flying in this vicinity.

# Frequency Data for ASN 2017-ANM-948-OE

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
698	806	MHz	1000	W
806	824	MHz	500	W
824	849	MHz	500	W
851	866	MHz	500	W
869	894	MHz	500	W
896	901	MHz	500	W
901	902	MHz	7	W
930	931	MHz	3500	W
931	932	MHz	3500	W
932	932.5	MHz	17	dBW
935	940	MHz	1000	W
940	941	MHz	3500	W
1850	1910	MHz	1640	W
1930	1990	MHz	1640	W
2305	2310	MHz	2000	W
2345	2360	MHz	2000	W

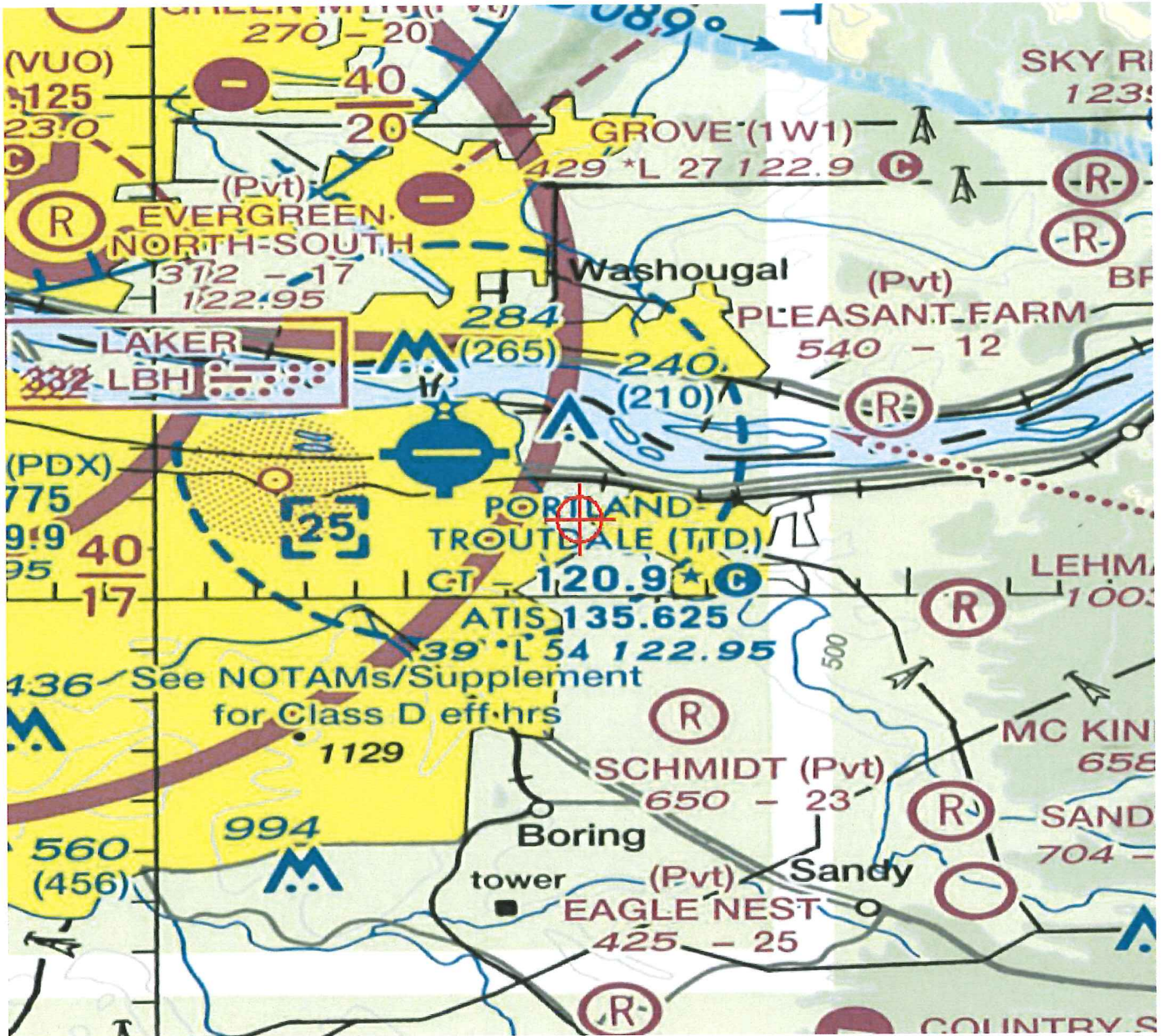


TOPO Map for ASN 2017-ANM-948-OE





## Sectional Map for ASN 2017-ANM-948-OE





Mail Processing Center  
Federal Aviation Administration  
Southwest Regional Office  
Obstruction Evaluation Group  
10101 Hillwood Parkway  
Fort Worth, TX 76177

Aeronautical Study No.  
2017-ANM-948-OE

Issued Date: 01/29/2019

Network Regulatory  
Verizon Wireless (VAW) LLC  
5055 North Point Pkwy  
NP2NE Network Engineering  
Alpharetta, GA 30022

**\*\* Extension \*\***

A Determination was issued by the Federal Aviation Administration (FAA) concerning:

Structure:	Monopole STINGER - A
Location:	TROUTDALE, OR
Latitude:	45-31-31.51N NAD 83
Longitude:	122-21-33.95W
Heights:	471 feet site elevation (SE) 150 feet above ground level (AGL) 621 feet above mean sea level (AMSL)

In response to your request for an extension of the effective period of the determination, the FAA has reviewed the aeronautical study in light of current aeronautical operations in the area of the structure and finds that no significant aeronautical changes have occurred which would alter the determination issued for this structure.

Accordingly, pursuant to the authority delegated to me, the effective period of the determination issued under the above cited aeronautical study number is hereby extended and will expire on 07/25/2020 unless otherwise extended, revised, or terminated by this office. You must adhere to all conditions identified in the original determination.

This extension issued in accordance with 49 U.S.C., Section 44718 and, if applicable, Title 14 of the Code of Federal Regulations, part 77, concerns the effect of the structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this extension will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

If we can be of further assistance, please contact our office at (206) 231-2990, or [paul.holmquist@faa.gov](mailto:paul.holmquist@faa.gov). On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2017-ANM-948-OE.

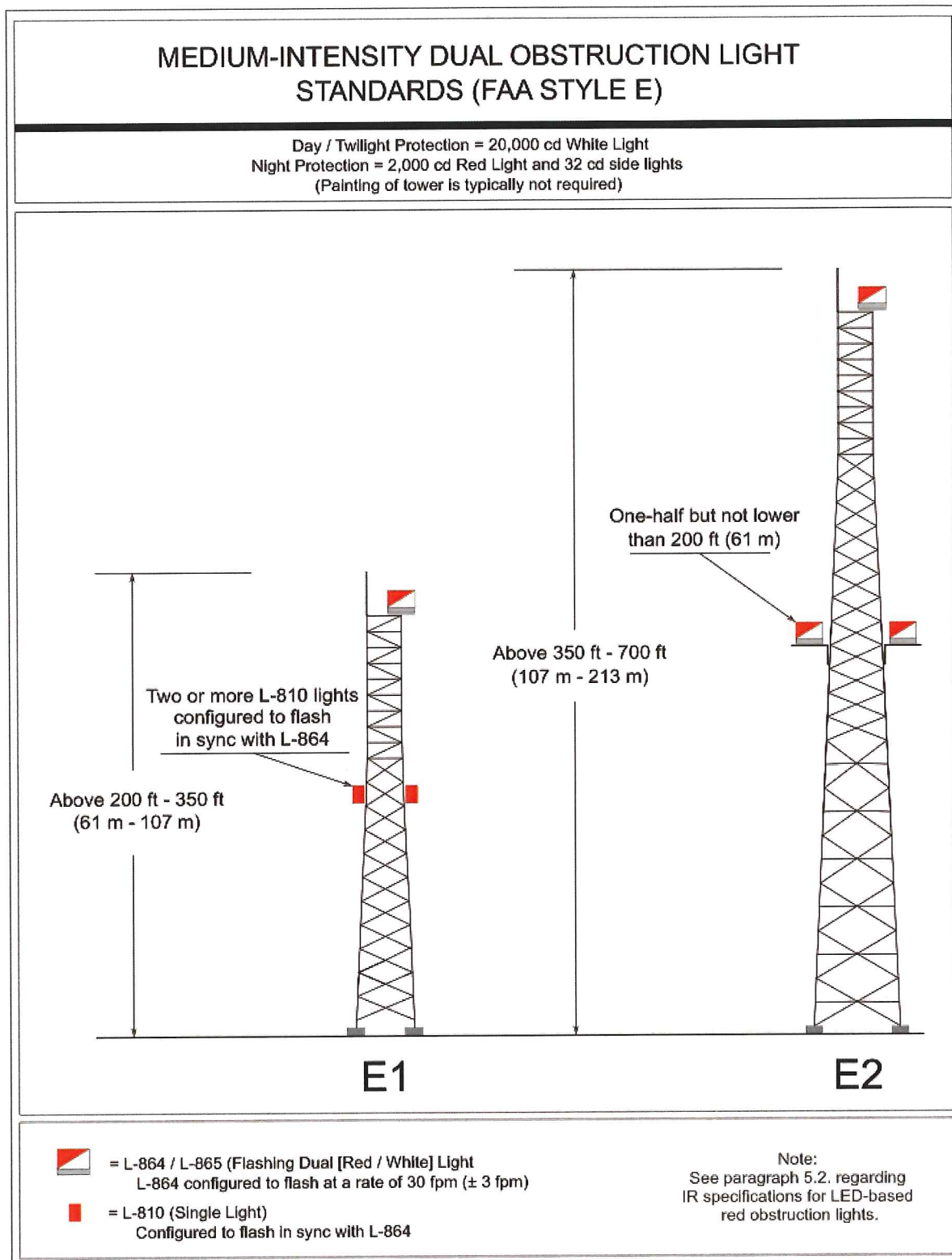
**Signature Control No: 326639493-394665010**

(EXT)

Paul Holmquist  
Specialist

cc: FCC





**Figure A-11. Medium-Intensity Dual Obstruction Lighting Standards**



Kate Brown, Governor

# Oregon



February 26, 2018

EXHIBIT R

3040 25th Street, SE  
Salem, OR 97302-1125  
Phone: (503) 378-4880  
Toll Free: (800) 874-0102  
FAX: (503) 373-1688

Konrad Hyle  
Black Rock

**Subject: Oregon Department of Aviation comments regarding the replacement of a mono pole constructed to 150-FEET in height located near Troutdale, Oregon.**

**Aviation Reference: 2018-ODA-L-106-OE**

The Oregon Department of Aviation (ODA) has conducted an aeronautical study of this proposed construction and has determined that notice to the FAA is required. The structure exceeds FAR Part 77.9 (a-d) and Obstruction Standards of OAR 738-70-0100.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. Any changes to the original application will void this determination. Any future construction or alteration to the original application will require a separate notice from ODA.

This determination will expire 18 months after its effective date, regardless of whether the proposed construction or alteration has been started, or on the date the proposed construction or alteration is abandoned, whichever is earlier.

**Mitigation Recommendation:**

- ☒ We do not object with conditions to the construction described in this proposal. This determination does not constitute ODA approval or disapproval of the physical development involved in the proposal. It is a determination with respect to the safe and efficient use of navigable airspace by aircraft and with respect to the safety of persons and property on the ground.
- ☒ Marking and lighting are required / recommended for aviation safety. We recommend it be installed and maintained in accordance with FAA Advisory Circular AC70/7460-1L
- ☐ The proposed obstruction should to be lower to a height that is no longer a hazard to the airport primary and horizontal surface FAA FAR 77
- ☐ The proposed obstruction should be relocate outside the airport primary and horizontal surface FAA FAR 77

Sincerely,

Matt Lawyer  
Program Coordinator

EXHIBIT  
A.30



Land Use Planning Division  
1600 SE 190<sup>th</sup> Ave, Ste 116  
Portland OR 97233  
Ph: 503-988-3043 Fax: 503-988-3389  
multco.us/landuse

EXHIBIT S

**FIRE SERVICE AGENCY  
REVIEW**

**TO THE APPLICANT:** Take this form to the Structural Fire Service Provider\* that serves your property along with the following:

- ☒ A site plan drawn to scale showing the subject property, its improvements, location of fire hydrants and driveway information;
- ☐ A floor plan of the proposed development; and NA
- ☐ A fire flow report from your water purveyor (if applicable) [Not applicable for Properties served by MCRFD#14 customers] NA
- ☐ After the fire official signs this form, include it with your application material. See Fire Code Application Guide for fire-related access standards and fire flow information.

\*If your property is not served by a structural fire service provider, your project is to be reviewed by the appropriate building official serving your property.

Address of Site 29421 E. WOODARD RD. TROUTDALE

Map & Tax Lot: IN4E310B 600 'R' number 322458

Description of Proposed Use: CELL TOWER

Total Square Footage of Building (including roof projections, eaves & attached structures): \_\_\_\_\_

Applicant Name: KONRAD HYLE / VERIZON Phone: 503.522.0634

Mailing Address: 22135 SW COLE CT.

City: TUALATIN State: OR Zip Code: 97062 Email: Konrad@bik-rock.com

**STRUCTURAL FIRE SERVICE AGENCY REVIEW**

Fire Agency completing this form: Corbett Fire Date of Review 2-23-18

- ☒ The subject property is located within our service boundaries or is under contract.
- ☐ The subject property is outside of our service boundaries and will not be providing fire protection services via contract. (Additional review is not needed.)

**\*\* Access Review by Structural Fire Service Agency Providing Service \*\***

- ☒ The proposed development is in compliance with the fire apparatus access standards of the Oregon Fire Code standards as implemented by our agency.
- ☐ The following access improvements must be completed prior to issuance of the building permit and be re-inspected by our agency before flammable materials are placed on the property.

- ☐ The proposed development is not in compliance with the adopted Fire Service Agency's access standards. The proposed building/structure is required to have a fire sprinkler system installed in compliance with Section 903.1.3 (NFPA 13D) of the Oregon Fire Code.

Fire Official: Please sign or stamp the presented site plan & floor plan and attach it to this form.

[Signature]  
Signature & Title of Fire Official

See Other Side

EXHIBIT  
A.31

**STRUCTURAL FIRE SERVICE AGENCY REVIEW, cont.**

**\*\* Fire Flow by Structural Fire Service Agency Providing Service \*\***

The structure, building or addition is exempt from the fire flow standards of the OFC B-105.2.

- ☐ The proposed non-commercial structure is less than 3,600 sq. ft. (including the horizontal projections of the roof) and there is 1,000 gallons per minute of fire-flow available at 20 psi from public water lines. No mitigation measures are necessary.
- ☐ The proposed non-commercial structure is more than 3,600 sq. ft. (including the horizontal projections of the roof) and the fire-flow & flow duration at 20 psi is available from public water lines or private well and is in compliance with minimums specified in Appendix B, Table B105.1 of the Oregon Fire Code. No mitigation measures are necessary.
- ☐ The existing fire-flow & flow duration available from public water lines or private well is not adequate to serve the proposed non-commercial structure in compliance with Appendix B of the Oregon Fire Code. The following mitigation measures are necessary\* and must be installed prior to occupancy or use of the structure.
  - ☐ A monitored fire alarm must be installed.
  - ☐ Class A or non-combustible roof materials must be installed.
  - ☐ Defensible space of 30 feet around the structure/building/addition.
  - ☐ A defensible space of 100 feet around the structure/building/addition due to slopes greater than 20 %.
  - ☐ A fire sprinkler system meeting Section 903.1.3 (NFPA 13D) of the Oregon Fire Code shall be installed.
  - ☐ Other \_\_\_\_\_

\* The above required structural features are required by the Oregon Fire Code and shall be shown clearly on all building plans.

**Commercial/Industrial Buildings & Uses.**

- ☒ The minimum fire flow and flow duration is available from public water lines or private well as specified in Appendix B, Table B105.1. No mitigation measures are required.
- ☐ The minimum fire flow & flow duration is not available from public water lines or private well as specified in Appendix B, Table B105.1. The following mitigation measures are required:  
\_\_\_\_\_  
\_\_\_\_\_

3-23-12

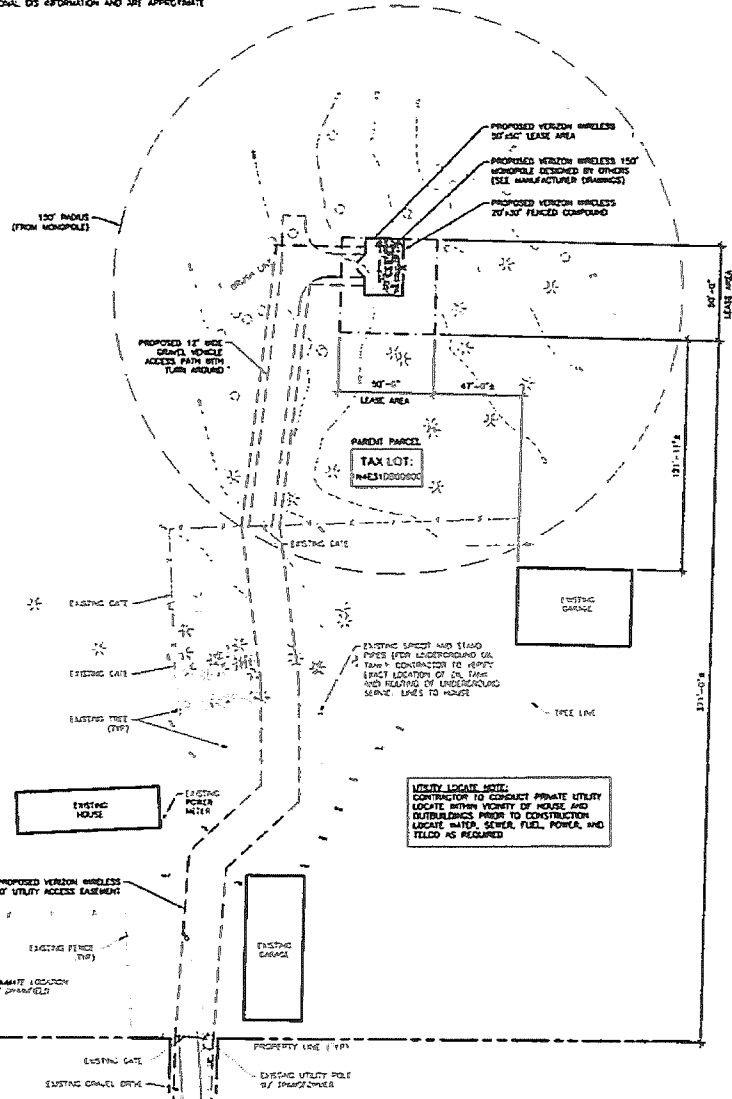
Signature & Title of Fire Official

To the Fire Official:

- ☐ Land Use Planning has determined that the proposed building will qualify as an Exempt Farm Structure and the property owner has indicated that the building will be used solely for farm purposes and they intend on using the provision under ORS 455.315 and will not be obtaining a building permit for its construction.

Mulmohah County Land Use Planning

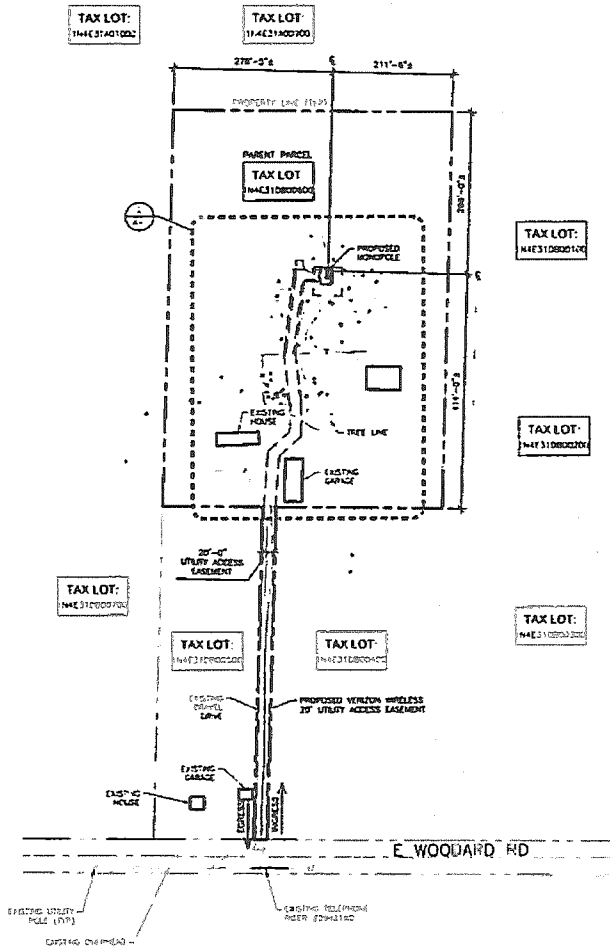




20" x 35" SCALE: 1" = 30'-0"  
11" x 17" SCALE: 1" = 60'-0"

ENLARGED SITE PLAN 2

Approved Fire 3-23-18  
Corbett FW



Know what's below.  
Call before you dig.

SITE PLAN 1

DO NOT HAVE DISCREET CONSTRUCTION MUST VERIFY ALL  
IMPROVEMENTS AND OTHER MODIFICATIONS OF ANY KINDS OF  
CONCRETE OR STRUCTURES OR MODIFICATIONS TO SOME  
STRUCTURE SHALL BE REPRODUCED EXACTLY SUCH AS THE  
ORIGINAL, AS PERVIOUS RECORDS OF THE STRUCTURE AND  
RECORDED IN THE CASE OF STRUCTURE, IMPROVEMENTS AND  
MODIFICATIONS SHALL BE REPRODUCED IN THE RECORDS OF THE  
STRUCTURE CONSTRUCTION, REPRODUCED MODIFICATIONS REPRODUCED  
AND BE REPRODUCED ALL IN EXACTING CONSTRUCTION  
RECORDS OF THIS PROJECT.

REGISTERED ARCHITECT  
ROBERT J LARA  
License # 15897  
TALLAHASSEE, FL  
Feb 17 2010 OF OREGON

ROBERT JERRY LEE  
RESIDENCE ADDRESS  
STATE OF OREGON  
285'

ZONING	



0	02/17/17	ISSUED FOR DEPART
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A	12/19/16	ISSUED FOR REVIEW
No	Date	Remarks

Client:		
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veritony



Documentation: none


**BLACK ROCK**

2017 10 10



**MORRISON HERSHFIELD**

ANDERSON ST. BUREAU  
 SEATTLE, WA 98101  
 Tel. 425-260-7100

Project Info:

POR  
STINGS

STINGER  
29421 E WOODARD RD  
TROUTDALE, OR 97060

Growing Year

SITE PLAN

SITE PLAN

Project Number: [ ] Start Date: [ ]

7160107	12/13/16
Drafters:	Designer:

JA	SV
Project Manager	Professional of Records

APR	FILE
Revision No:	Signature No:

0	A-1
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**PRE-APPLICATION CONFERENCE NOTES**

**This is not a public hearing, it is an informational meeting.**

**Case File No.: PA 2018-11705**

**MEETING TIME AND PLACE**

**April 25, 2018 at 10 am  
1600 SE 190<sup>th</sup> Avenue, Portland, OR**

- WHAT:** A Pre-Application Meeting is to be held on the date above to discuss the applicable Multnomah County Land Use Code for a Conditional Use application for the Establish a new 150-foot tall wireless communication facility (cell tower) on Multiple Use Agriculture – 20 (MUA-20) zoned land. The proposal includes new panel antennas, mw dishes, FAA lighting, and tower and ground mounted associated equipment. Ground equipment will be installed in
- LOCATION:** No Situs Address along E Woodard Road  
Township 1 North , Range 4 East, WM Section 31 DB Tax Lot 600
- WHO:** Konrad Hyle, Blackrock LLC representing Verizon Wireless
- BASE ZONE:** Multiple Use Agriculture – 20 (MUA-20)
- OVERLAYS:** No overlays
- CONTACT:** The applicable County Code provisions, Comprehensive Plan Policies and other code requirements will be discussed at the Pre-Application Meeting. For further information regarding the meeting, contact Katie Skakel, planner at Multnomah County's Land Use Planning Division at (503)-988-0213 or [Katie.skakel@multco.us](mailto:Katie.skakel@multco.us). The notes from this meeting can be obtained by attending the meeting or by contacting Multnomah County after the above date.



**The following is for informational purposes only. No approvals or conclusions have been drawn about this project. Until such time as the necessary Land Use Applications are submitted and reviewed, no decisions will be or have been made regarding the project's compliance with the land use regulations of Multnomah County.**

### **Outline of the Pre-Application Meeting's Purpose and Process**

#### **I. Meeting Purpose:**

- (A) The Pre-Application meeting is to provide information to an applicant for a land use action that will assist them in completing the application.
- (B) The objectives of the meeting are to clarify the proposal, inform the applicant of the applicable procedures and approval criteria, and to identify all known issues.
- (C) A Pre-Application meeting is a standard requirement for all applications that require a public hearing.

#### **II. Meeting Structure:**

- (A) This is not a public hearing and no decisions will be made. The meeting is meant to be informal in nature.
- (B) The Multnomah County planning staff will be responsible for conducting the meeting. Staff will begin the meeting by asking for introductions of those in attendance.
- (C) The applicant will be responsible for explaining their proposal. This explanation is especially helpful to the public who have not seen the application materials and is an opportunity to share relevant information with their neighbors.

- (D) Planning staff will be responsible for reviewing the applicable procedures and approval criteria and to identify all known issues.
- (E) Members of the public and other agency representatives will be provided the opportunity to ask questions about the proposal and will be asked to identify any relevant issues.

### III. Other Opportunities for Review:

- (A) If you are interested in the proposal and are unable to attend the Pre-Application meeting, you may review the Pre-Application case file at the offices of Multnomah County Land Use Planning, located at 1600 SE 190<sup>th</sup> Avenue, Portland, between 8:00 a.m. and 4:00 p.m., Tuesday through Friday, except holidays.
- (B) After the Pre-Application meeting, and after the application has been deemed “complete” by responding to each approval criteria, you will receive a notice announcing the date, time, and place of the Public Hearing. Failure to participate at the Pre-Application meeting will not preclude your involvement at the first scheduled hearing on the completed application.

### SUMMARY OF APPLICABLE PERMITS, CODES, POLICIES & FEES

These Multnomah County Code sections can be found at [multco.us/landuse/zoning-codes](http://multco.us/landuse/zoning-codes) under the link *Chapter 39: Multnomah County Zoning Code*.

Land Use Application	Code Section	Fees
Conditional Use (Type 3 Process)	<i>MUA-20 criteria:</i> MCC 39.7520 CU – Community Service Uses pursuant to the provisions of MCC 39.7500 through MCC 39.7810;  MCC 39.4325 Dimensional Requirements except as provided in MCC 39.3080, MCC 39.4330, MCC 39.4335, and MCC 39.5300 through MCC 39.5350  Lot of Record – MUA-20: MCC 39.3080	\$3,054
Design Review	MCC 39.8020 Application for Regulations MCC 39.6590, MCC 39.8040 (A)(1)(a) and 1(c) and MCC 35.6500 through MCC 39.6600 Off Street parking	\$1,238
	Notice Fee	\$159
<b>Development Permits</b>	<b>(Type I Process)</b>	
Grading and Erosion Control	MCC 29.350 – 29.365	\$392
	Inspection Fee	\$82
	Address Assignment (if needed)	\$219

### KEY ISSUES

1. In order for the County to be able to approve any land use application for development or building permits, the property must be in full compliance with all applicable codes (MCC 39.3080). Full Compliance means the property is a Lot of Record, any structures on site were properly reviewed or permitted and any conditions from previous land use decisions have been satisfied.
  - There are no open code compliance cases associated with this property.



2. Since there are no known land use cases associated with the property, there have been no Lot of Record findings and the application will need to include a Lot of Record Verification or Determination application for the property. A Lot of Record is a piece of property that when divided into its current configuration, met the land division and zoning rules in place at the time.
  - If there is a deed/contract that describes the subject property in recordable form prior to October 6, 1977, and the description is non-discretionary (requires no judgment or interpretation; does not refer to other deeds or documents; contains the acreage listed by Department of Assessment, Records, and Taxation then a Lot of Record Verification (\$144) could be made. If any discretion is required to make the determination, then a Lot of Record Determination would be required (\$1,088).
  - To make sure you have the correct deed, you should verify the legal description before submitting it for your application. You are strongly encouraged to provide a tax lot map for the deed/property that is color highlighted to correspond to the different segment call outs of the respective deed. For example, when the deed calls out something similar to "...thence north XX degrees a distance of XXX-feet..." Highlight that call out and the segment line on the tax lot map the same color, such as green. For the next call out and segment, highlight it red, etc. This helps you be confident you have the correct deed for the property. If a property was created through a County approved land division, partition or property line adjustment, you can simply note the case number since it is clear such a property is a Lot of Record.
3. Department of Assessment, Records, and Taxation (DART) indicates that there is a dwelling and farm building that were built approximately in 1964. Aerial photos also indicate that there is a farm building located approximately 200 feet to the north and east of the single-family dwelling. Building permit and zoning requirements were first in place over the properties in 1955; therefore, dwelling would have required building permits.
  - The single-family dwelling received a building permit in July 23, 1963. The permit number was 30848.
  - A 60 foot by 30 foot, Pole Barn received a building permit in October 22, 1974. The permit number was 741855.
  - There is no building permit associated with the second structure. (it appears as if applicant has provided information with the Pre-application which will be verified in application.
    - i. Retroactive permits would be required to establish that building. Because there is no established farm use and the property does not have farm deferral, the second structure would require an Accessory Use Determination due to its size exceeding 2,500 square feet.
      1. For all buildings receiving retroactive permits, all exterior lighting on buildings from a light source (bulbs, lamps, etc.) must be fully shielded with opaque materials and directed downwards. "Fully shielded" means no light is emitted above the horizontal plane located at the lowest point of the fixture's shielding. Shielding must be permanently attached.
4. As a Community Service Conditional Use, the proposal shall meet the provisions of MCC 39.7500 through MCC 39.7525 in addition to the Wireless Communications Facility provisions MCC

39.7700. Type 3 Conditional Use permit requires a public hearing. Staff will write a report recommending approval or denial, with suggested conditions of approval and a Hearings Officer will issue the County's Final Land Use Decision.

5. The County's Wireless Communication Facility (WCF) requirements are designed to minimize the WCF visibility and the number of distinct facilities. The County's preferences for siting WCF is co-location upon an existing tower or existing structure, use of concealment technology and finally a vegetatively, topographically or structurally screened monopole.
6. For a typical monopole to be permitted, the tower location must allow for it to blend with the surrounding existing natural and environment in such a manner so as to be visually subordinate. MCC 39.7710 defines Visually subordinate to be:

*The relative visibility of a wireless communication facility, where that facility does not noticeably contrast with the surrounding landscape. Visibly subordinate facilities may be partially visible, but not visually dominate in relation to their surroundings*

These types of tower may not be sited in locations where there is no vegetative, structural, or topographic screening available.

7. The application will need to demonstrate that the equipment for the proposed tower cannot be accommodated on an existing or approved tower or structure due to: exceeding structural capacity of the existing structure, interference preventing use of the equipment, no room at the height required or radio frequency coverage cannot be adequately met.

8. Multnomah County Code (MCC) requires that new WCF on Lands Not Zoned Exclusive Farm Use meet the requirements of MCC 39.7725 General Requirements and 39.7740 Approval Criteria for Land Not Zoned Exclusive Farm Use.

9. The proposed use will require review of off-street parking as described in MCC 35.6500 through MCC 39.6600. This requirement can be met during the Type III application process.

10. As part of this application, the applicant must provide all of the following:

- An accurate and to-scale site plan showing the location of the tower, guy anchors (if any), antennas, equipment cabinet and other uses accessory to the communication tower or antenna. The site plan shall include a description of the proposed tower including use of concealment technology if applicable;
- A visual study containing, at a minimum, a graphic simulation showing the appearance of the proposed tower, antennas, and ancillary facilities from at least five points within a five-mile radius. Such points shall include views from public places including but not limited to parks, rights-of-way, and waterways
- The distance from the nearest WCF and nearest potential co-location site.
- A report/analysis from a licensed professional engineer documenting the following:
  - (a) The reasons why the WCF must be located at the proposed site (service demands, topography, dropped coverage, etc.)
  - (b) The reason why the WCF must be constructed at the proposed height;
  - (c) Verification of good faith efforts made to locate or design the proposed WCF to qualify for an expedited review process. To this end, if an existing structure approved for co-location is within the area recommended by the engineers report, the reason for not co-locating shall be provided;

- (d) Tower height and design, including technical, engineering, economic, and other pertinent factors governing selection of the proposed design such as, but not limited to, an explanation for the failure to employ concealment technology if applicable;
  - (e) Total anticipated capacity of the structure, including number and types of antennas, which can be accommodated;
  - (f) Evidence of structural integrity of the tower structure as required by the Building Official;
  - (g) Failure characteristics of the tower; and
  - (h) Ice hazards and mitigation measures, which can be employed.
- Documentation demonstrating compliance with non-ionizing electromagnetic radiation (NIER) emissions standards set forth by the Federal Communications Commission as outlined in A Local Government Official's Guide to Transmitting Antenna RF Emission Safety: Rules, Procedures, and Practical Guidance or a subsequent FCC publication delineating required radio frequency performance standards.
  - A signed agreement, stating that the applicant will allow co-location with other users, provided all safety, structural, and technological requirements are met. This agreement shall also state that any future owners or operators will allow co-location on the tower.
  - A statement documenting a binding commitment to lease or option to lease an antenna mount upon the proposed tower by a service provider.
  - A landscape plan drawn to scale showing the proposed and existing landscaping, including type, spacing, and size.
  - Plans showing the connection to utilities/right-of-way cuts required, ownership of utilities and easements required.
  - Documents demonstrating that any necessary easements have been obtained.
  - Plans showing how vehicle access will be provided.
  - Signature of the property owner(s) on the application form or a statement from the property owner(s) granting authorization to proceed with building permit and land use processes.
  - Documentation that the ancillary facilities will not produce sound levels in excess of those standards specified below in the Approval Criteria for Lands Not Zoned Exclusive Farm Use.
  - A map of the county showing the approximate geographic limits of the "cell" to be created by the facility. This map shall include the same information for all other facilities owned or operated by the applicant within the county, or extending within the county from a distant location, and any existing detached WCF of another provider within 1,000 feet of the proposed site.
  - Documentation demonstrating that the FAA has reviewed and approved the proposal and the Oregon Aeronautics Division has reviewed the proposal.
11. The maximum height of a tower shall be 120 feet, unless: The tower and facility uses concealment technology; or it is demonstrated by an engineer that a greater height is required to provide the necessary service.
  12. The tower shall be setback from dwellings and all property lines a distance equal to the total height of the WCF measured from finished grade or according to the yard requirements of the underlying zone, whichever is greater.

13. Wireless communications storage facilities (i.e., vaults, equipment rooms, utilities, and equipment cabinets or enclosures) shall be treated to look like a building or facility typically found in the area.

## KEY ISSUES: ADDITIONAL REVIEW

14. New structures need to be supported by appropriate service. You will need to submit the following service provider forms:
  - Fire Service Agency Review – ensures that the state fire code on fire flow and access are satisfied for your replacement tower.
  - On-Site Sewage Disposal Form – ensures the proposed use will be adequate
  - Storm water Certificate will also be required if more than 500 square feet of impervious service is created to ensure that water generated from the new impervious surface can be handled on site for a 10-year/24-hour storm event. An Oregon Registered Engineer will need to review all impervious surfaces for the disposal of storm water from the roof of the buildings and paved surfaces. Please submit the completed forms with your application, narrative, site plan, supporting documents and submittal fees
15. **Transportation Impact:** A transportation impact is defined in Multnomah County Road Rules 3.000 as any new construction or alteration, which increases the number of trips generated by a site, by more than 20 percent, by more than 100 trips per day or by more than 10 trips in the peak hour. A minimum increase of 10 new trips per day is required to find a transportation impact.
16. **Storm Water:** Any alteration of the storm water discharge onto County right-of-way requires a Discharge Permit. Any alteration of storm water drainage to the existing discharge needs to be reviewed by the County. Increased run-off to incorporated Multnomah County could negatively impact the roadway system. The County currently accepts Portland Stormwater Manual methodology which can be found on their website:
  - Stormwater Management Manual:  
<https://www.portlandoregon.gov/bes/64040>
  - Appendix D: <https://www.portlandoregon.gov/bes/64050>
  - Simplified Approach submittal guide:  
<https://www.portlandoregon.gov/bes/article/474163>
  - Presumptive Approach submittal guide:  
<https://www.portlandoregon.gov/bes/article/474170>

Please contact ROW Permits at (503) 988-3582 or [row.permits@multco.us](mailto:row.permits@multco.us) for questions regarding this requirement.

## APPLICATION COMPLETENESS

Once an application is submitted, it will be assigned to a planner. The planner has 30 days, by state law, to determine whether the application is complete. . The County has 150 days from the date the application is made complete to make its final decision. If an application is incomplete, the applicant has 180 days by state law to submit the requested additional information to make the application complete. If your application is found to be incomplete, we request that you submit the additional information required



in one packet rather than trickling information in. This avoids confusion as to whether or not you intend to submit additional information, and allows us to act on your application more quickly. Once the application is made complete, it will be scheduled for hearing before a hearings officer. Notice will be mailed to all property owners within 750 feet, MC neighborhood association(s) and interested parties requesting notice of the hearing. Public hearing signage will need to be placed along the public road frontage on Woodard Road. The hearings officer will make the County's final decision

Application Checklist		REQ	Inc.
1.	<b>Completed Application Form:</b> signed by the all property owners and the applicant along with the required fee(s).	X	
2.	<b>Narrative:</b> Written narrative providing a clear and complete description of your proposal and specifically addressing each applicable code section. List the code reference you are responding to in your narrative, then your response to that criterion. Applicable criteria that you must address in your narrative have been previously listed in these notes. Reference in your narrative any supporting documents you are attaching (including required site map) to demonstrate how your proposal meets a particular code criterion.	X	
3.	<b>Scaled Site Plan:</b> The site plan shall be drawn to scale using either an engineer scale or architect scale. The site plan for an SEC permit shall include the following: <ul style="list-style-type: none"> <li><input type="checkbox"/> Boundaries, dimensions, address and size of the subject parcel;</li> <li><input type="checkbox"/> Date, north arrow, scale;</li> <li><input type="checkbox"/> Location of watercourses or drainage features on or near the property.</li> <li><input type="checkbox"/> Location, size, and label of all proposed and existing buildings, structures, distances to property lines (measured to nearest point of the building), and buildings to be removed;</li> <li><input type="checkbox"/> Location of the existing well and septic system (tank, drainfield &amp; replacement field) and storm water system (existing and/or proposed);</li> <li><input type="checkbox"/> Contour lines and topographic features such as ravines or ridges;</li> <li><input type="checkbox"/> Proposed fill, grading, site contouring or other landform changes;</li> <li><input type="checkbox"/> Location and predominant species of existing vegetation on the parcel, areas where vegetation will be removed, and location and species of vegetation to be planted, including landscaped areas;</li> <li><input type="checkbox"/> Location and width of existing and proposed driveways, and service corridors;</li> <li><input type="checkbox"/> Location of abutting public right-of-way with distances from the right-of-way line to the centerline of the adjoining road; and</li> <li><input type="checkbox"/> Location and width of existing, proposed and/or altered access points/driveway cuts to the property.</li> </ul>	X	
4.	<b>Floor plans</b> of the buildings to be permitted with dimensions and room use noted, such as kitchen, bathroom, bedroom, garage, etc.	?	
5.	<b>Building Elevations</b> (side views) of new buildings or additions, with all height dimensions, and relationship to existing and finished grade adjacent to the building	X	
6.	<b>Septic Review Certificate form</b> and site plan signed by the Sanitarian (green form).	X	
7.	<b>Fire Service Agency Review form</b> and site plan signed by appropriate personnel (TVFR)	X	
8.	<b>Sheriff Services Review form</b> – Phone 503.988.4300	?	
9.	<b>Storm Water Certificate</b> , site plan and calculations completed by a Oregon Registered Professional Engineer (Creation of 500 sq. ft. or more of impervious surfaces)	?	

#### ADDITIONAL ASSISTANCE

Please contact **Katie Skakel** at (503) 988-0213 or [katie.skakel@multco.us](mailto:katie.skakel@multco.us) with any questions. Scheduling an appointment is necessary to see your case planner. In the event your case planner is unavailable, the planner on duty can also help answer questions at 503.988.3043 (press 7). Hours for the planner on duty are Tuesday – Friday, 8:00 AM – 4:00 PM, except holidays. Please note a building permit plan review fee and erosion control inspection fee may be required at building plan signoff after the conclusion of the land use review process. These fees do not need to be paid at the time of land use application submittal.

\* \* \*

Cons. Casel





# MULTNOMAH COUNTY, OREGON

DEPARTMENT OF COMMUNITY SERVICES  
LAND USE & TRANSPORTATION PROGRAM  
RIGHT-OF-WAY PERMIT SECTION  
1620 SE 190TH AVENUE  
PORTLAND, OREGON 97233  
503-988-3582 - FAX: 503-988-3389

## APPLICATION FOR A PERMIT TO USE PUBLIC ROAD RIGHT OF WAY UNDER THE JURISDICTION OF MULTNOMAH COUNTY

### (COUNTY TO FILL OUT THIS SECTION)

Permit No. \_\_\_\_\_  
District: \_\_\_\_\_  
County Maintained: \_\_\_\_\_  
Application Fee: \_\_\_\_\_  
Deposit: \_\_\_\_\_  
Check No.: \_\_\_\_\_  
Ins. Req'd: \_\_\_\_\_

### FOR APPLICANT: (Please print)

Name: Black Rock Consulting / Konrad Hyle on behalf of Verizon Wireless  
Address: 22135 SW Cole Court  
Tualatin, OR 97062

E-mail Address: konrad@blk-rock.com  
Phone/Fax: 503-522-0634  
Contact Person: Konrad Hyle

### ROADS AND LOCATIONS COVERED BY THIS PERMIT:

Road	Specific Location	Side of Road	Distance from		Buried Cable or Pipe	
			Center Line	R/W Line	Depth	Size & Kind
E. Woodard Rd	#29421	North	20'+/-	10'+/-		

### GENERAL APPLICATION/PERMIT TERMS:

1. Upon approval of this Application by Multnomah County by the indicated signature below, this page shall become the first page of the Permit and the Applicant shall become the "Permittee."
2. Permittee must notify Multnomah County at 503-988-3582, at least one business day (24 hours) before commencing work under this permit.
3. Except as allowed under the Multnomah County Road Rules Section 18, Subsection 18.250, Permittee must complete any authorized demolition, installation, construction, placement, or similar work activities in the road right-of-way not later than 120 days after Permit Effective Date. Any extension of time beyond that period is subject to the sole discretion of Multnomah County.
4. Any Permit issued pursuant to this Application shall be applicable only to the specific public road right(s)-of-way under the Jurisdiction of Multnomah County authorized and identified herein. Applicant must obtain an additional permit or consent from Multnomah County for the use of any other public road right(s)-of-way under the County's Jurisdiction.
5. Applicant must obtain the consent from the appropriate authority for the use of any roads, highways, and streets that are not under Multnomah County's Jurisdiction.
6. This Permit shall not be effective until a construction plan; specifications or other similar documentation has been reviewed and approved by the County Engineer or designate and incorporated into the Permit.
7. This Permit includes the "Permit Provisions" attached hereto and which are incorporated by this reference.  
(Authority: ORS 374.305-ORS 374.330; MCC Chapters 27 and 29)

**APPLICANT: By the authorized signature below, Applicant (Permittee) accepts and agrees to all the requirements, terms, conditions and provisions of this Permit.**

Authorized Signature: \_\_\_\_\_

Print Name: Verizon Wireless, Konrad Hyle

Title: Agent

Date of Application: 5/30/19

**MULTNOMAH COUNTY  
DEPARTMENT OF COMMUNITY SERVICES:**

Permit Approved By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

Permit Effective Date: \_\_\_\_\_



## RIGHT-OF-WAY USE PERMIT PROVISIONS

1. (A) This Permit is issued by Multnomah County as the jurisdictional authority (hereinafter "County") over the Right-of-Way described on Page 1 of this Permit (the "Right-of-Way") to the Permittee (County and Permittee hereinafter collectively referred to as the "Parties") and controls all aspects of the Right-of-Way Use(s) set forth on Page 1, and as further provided in and subject to:

1. If applicable, **Exhibit A**, which shall consist of any plans, specifications, drawings, or other design documents (collectively referred to as the "Plans") attached hereto, or as the Parties agree in writing to amend or revise said **Exhibit A**;
2. If applicable, **Exhibit B to Right-Of-Way Use Permit for Construction ("Exhibit B")** attached hereto.
3. If applicable, **Exhibit C, the Consulting Engineer's Statement**, attached hereto.
4. To the extent applicable, **Exhibits A, B and C** are hereby incorporated as a part of this Permit.

This Permit does not authorize any activity on privately owned property. Should Permittee's activities encroach beyond the boundaries of the Right-of-Way covered under this Permit or otherwise exceed the jurisdictional authority of the County; Permittee shall obtain written consent from any owners of property abutting the Right-of-Way before beginning any work under this Permit.

(B) **Exhibit A** shall not be changed, altered, or modified without first obtaining the written consent of the County Engineer or the County Engineer's designate or as otherwise provided in **Exhibit 1**.

(C) This Permit is subject to ORS Chapter 374 and incorporates the following rules adopted by Multnomah County pursuant to Multnomah County Code Chapter 29:

1. **The Multnomah County Road Rules (MCRR)**, dated March 23, 2004 or as the MCRR shall be amended, and
2. **The Multnomah County Design and Construction Manual (DCM)**, dated June 20, 2000; or as the DCM shall be amended.

(D) For purposes of this Permit, the term "Permittee" shall refer to all parties acting under this Permit, including the property owner, the developer (if different than the owner) and any contractor responsible for or performing the work authorized under this Permit. All such parties acting through authorized representatives with the authority to bind each party shall sign this Permit. No action or work of any kind may proceed under this Permit without the binding signatures of all the parties as Permittees. The use of the term "Permittee" or "Permittees" in this Permit shall be used interchangeably and shall not be intended to limit the number of parties that are Permittees on this Permit.

2. (A) The County contact to coordinate work activities on the Right-of-Way shall be: phone: [\(503\) 988-3582](tel:5039883582), e-mail: [ROW.Permits@multco.us](mailto:ROW.Permits@multco.us).

(B) Permittee contact person shall be: (supply name, address, telephone and email contact information)

3. Prior to beginning any work or activities under this Permit, the Permittee shall confirm in writing to the County that all Permittees have obtained a commercial general liability insurance policy that provides: (i) for a combined single limit of not less than \$1,000,000 per each incident or occurrence, and with an annual aggregate limit of not less than \$2,000,000; (ii) for extended reporting period coverage for claims made within two years after the activities, work or associated work authorized under this Permit is completed; (iii) for the County, its officers, employees and agents to be named as additional named insureds for all activities, work or associated work being authorized under this Permit. This Permit is automatically revoked without further action if the insurance is permitted to lapse, is canceled, or for any other reason becomes inoperative. Insurance policy limits quoted herein are minimums set for 2014 and shall be subject to County review and adjustment annually.

4. (A) The Permittees agrees to defend, indemnify, and hold harmless the County, its officers, employees, and agents (the "Indemnitees") from:

1. All claims, demands, suits, liabilities, damages, losses, costs, or expenses including, but not limited to, attorney's fees that the Indemnitees may sustain or incur on account of any damage to or destruction of any property that the County may own or in which it may have an interest;
2. All claims, demands, suits, liabilities, damages, losses, costs or expenses including, but not limited to, attorney's fees on account of any damage to or destruction of any property belonging to any person, firm or corporation; and
3. All claims, demands, suits, liabilities, damages, losses, costs, or expenses including, but not limited to, attorney's fees on account of any damage resulting from injury to or death of any person or persons,

which arise out of or are in any way connected with the activities conducted or work performed under this Permit by the Permittees, their officers, employees, contractors, agents, or invitees.

(B) Permittees agree to defend, indemnify, and hold harmless the Indemnitees from all claims, demands, suits, liabilities, damages, losses, costs, or expenses which arise out of or are in any way connected with the use, generation, manufacture, storage, discharge, release, disposal, transportation, or possession of Hazardous Materials by the Permittee, its, employees, contractors, agents, lessees, or invitees at any time during the term of this Permit at the Permit Site. "Hazardous Materials" means: (a) any petroleum, including crude oil or any fraction thereof, natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel, or any mixture thereof, flammable substances, explosives, radioactive materials, hazardous wastes or substances, toxic wastes, wastes or substances or any other materials or pollutants which: (1) pose a hazard to the Permit Site or to persons on or about the Permit Site, or (2) cause the Permit Site to be in violation of any federal, state, or local law, ordinance, regulation, code, or rule relating to Hazardous Materials; (b) asbestos in any form which is or could become friable, urea formaldehyde foam insulation, transformers, or other equipment which contain dielectric fluid containing levels of polychlorinated biphenyls in excess of fifty (50) parts per million; (c) any chemical, material, or substance defined as or included in the definition of "hazardous substances," "hazardous wastes," "hazardous materials," "extremely hazardous waste," "restricted hazardous waste," "waste" or "toxic substances," or words of similar import under any applicable local, state, or federal law or under the regulations adopted or publications promulgated pursuant thereto including, but not limited to, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. § 9601, et seq.; the Hazardous Materials Transportation Act, as amended, 49 U.S.C. § 1801, et seq.; the Resource Conservation and Recovery Act, as amended, 42 U.S.C. § 6901, et seq.; the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1251, et seq.; and (d) any other chemical, material or substance, exposure to which is prohibited, limited, or regulated by any governmental authority or may or could pose a hazard to the health and safety of the owners and/or occupants of property adjacent to or surrounding the Permit Site.

(C) The Permittees obligations under Section 3 and Section 4 herein, shall survive the termination of this Permit.

5. Traffic control is the responsibility of the Permittee and shall be performed in accordance with the Manual of Uniform Traffic Control Devices and Oregon Supplements. The Permittee shall submit a copy of the traffic control plan for County review and approval not less than five working days prior to the date the activities or work authorized under this Permit are scheduled to begin. Work or activities shall not begin until written approval of the traffic control plan is obtained from the County Engineer or the County Engineer's designate.
6. The Permittee shall provide the name and telephone contact number for its Project inspector and a 24-hour emergency telephone number(s) for its contractor prior to beginning activities or work under this Permit.
7. ATTENTION: Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center (the "Center"). Those rules are set forth in OAR 952-001-0010 through OAR 952-001-0090. You may obtain copies of the rules by calling the Center. The telephone number for the Center is (503) 232-1987.
8. No modification shall be made to any fixture or installation as shown on Exhibit A and authorized under this Permit without prior approval from the County. Failure to comply with any term or condition of this Permit shall be cause for revocation. The County reserves the right to stop the activities or work performed under this Permit for failure to comply. All costs associated with activities or work stoppage or revocation as provided herein are the responsibility of the Permittee, and all costs shall be borne by the Permittee.

9. The Permittee shall restore the Right of Way to an equal or better condition than existed prior to the activities or work authorized under this Permit. The Permittee is responsible for quality control of all demolition or new construction made to the Right of Way. The County may perform spot inspections to monitor quality control. The Permittee shall correct all construction work that does not conform to County standards. The County may require additional work to return the Right of Way to "as good" or "better" condition.
10. The Permittee shall be in compliance with all federal, interstate, state, regional, and local laws, regulations, rules, and ordinances, pertaining to all the activities or work performed under this Permit including, but not limited to, obtaining all necessary and applicable construction and erosion control permits and approvals prior to beginning the activities or work authorized under this Permit and compliance with all applicable business licenses, OSHA rules and regulations.
11. County shall have the right, without notice, at any time including during any of Permittee's activities or work of any kind in the Right of Way, to enter and occupy the entire or any part of the Right of Way for the purpose of inspecting, maintaining, repairing, renewing, replacing or reconstructing the Right of Way, or any replacement facility thereto as County in its sole discretion shall deem necessary and appropriate.
12. County's activities described in Section 11 may require Permittee or its officers, employees, contractors, agents, vendors, lessees, sublessees or invitees (collectively "Permittee Parties") to remove any fixtures, installations or personal property including but not limited to , vehicles, machines, tools and equipment from the Right of Way. Upon entry, County shall, without liability to Permittee Parties, have the right to remove any such fixtures, installations or personal property from the Right of Way as may be necessary to accomplish the required work. County shall have no obligation to restore or repair any improvements removed or damaged in the performance of County's work. Permittee Parties agree that County shall have no obligation to restore the Right of Way or Permittee Parties' improvements and County shall have no liability to Permittee Parties for any disruption of Permittee Parties' business, for loss of Permittee Parties' real or personal property, for Permittee Parties' lost profits or for any other loss incurred by Permittee Parties as a result of such entry or as a result of Permittee Parties being required to vacate the Right of Way pursuant to the terms of this Section 12.
13. Either Subsection 13 (A) or (B) shall be applicable depending on the location. The applicable and non-applicable Subsection shall be marked where indicated.

**(A) For Certain Utility Work in Roads in Unincorporated Areas:** If this Permit has been issued in connection with work done in the public road that is authorized pursuant to the provisions of ORS 758.010(1) "...to construct, maintain and operate its water, gas, electric or communication service lines, fixtures and other facilities..." along said public road; the County reserves all the rights under ORS 758.010(2) to direct the Permittee to relocate any such fixture, line or facility in the subject public road: ☒ Applicable ☐ Not Applicable

**(B) For Other Uses and For Uses in Roads in Cities:** The County reserves the right to **revoke this Permit at any time** in the event the County determines the permitted work or activities, including any fixtures, installations or personal properties in the Right of Way; are in conflict with a County improvement project; public need requires it, or the Permittee fails to comply with the conditions of this Permit. No expenditure of money, lapse of time, or other act or thing shall operate as an estoppel against the County or be held to give the Permittee any vested or other right. Upon revocation of this Permit, the Permittee shall within 30 days of receiving notification, remove, relocate, or abandon (if consented to by the County), all fixtures, installations or personal property in the Right of Way and restore the Right of Way as directed by, and to the satisfaction of, the County: ☐ Applicable ☐ Not Applicable

14. **(A)** The Owner of the Property that directly abuts or is adjacent to the Right of Way covered under this Permit and who has signed this Permit as one of the Permittees shall bear the responsibilities imposed under ORS 374.315 to ORS 374.320 on the "applicant" and the "owner" with respect to maintenance, repair or removal, as applicable to the type of Project authorized under this Permit, or in the alternative as the County may authorize by Code or Rule with respect to said responsibilities.

**(B)** As provided in the MCRR at Subsection 18.130 and consistent with ORS 374.320, the County reserves the right to revoke this Permit at any time by mutual consent; for failure of the Applicant to abide by the terms and conditions of the Permit, to protect the public safety as determined by the County Engineer or by operation of law.

**(C) Additional Indemnity.** The Permittee that is the Owner of the Property as identified in Subsection 14.A, also agrees to defend, indemnify, and hold harmless the County, its officers, employees, and agents (the "Indemnitees") from:

1. All claims, demands, suits, liabilities, damages, losses, costs, or expenses including, but not limited to, attorney's fees that the Indemnitees may sustain or incur on account of any damage to or destruction of any property that the County may own or in which it may have an interest;
2. All claims, demands, suits, liabilities, damages, losses, costs or expenses including, but not limited to, attorney's fees on account of any damage to or destruction of any property belonging to any person, firm or corporation; and
3. All claims, demands, suits, liabilities, damages, losses, costs, or expenses including, but not limited to, attorney's fees on account of any damage resulting from injury to or death of any person or persons;

which arise out of or are in any way connected with the installation, construction, alteration, placement of any object or fixture; or the planting or placement of any vegetation; or the modification of the previous existing construction in the Public Right of Way under this Permit.

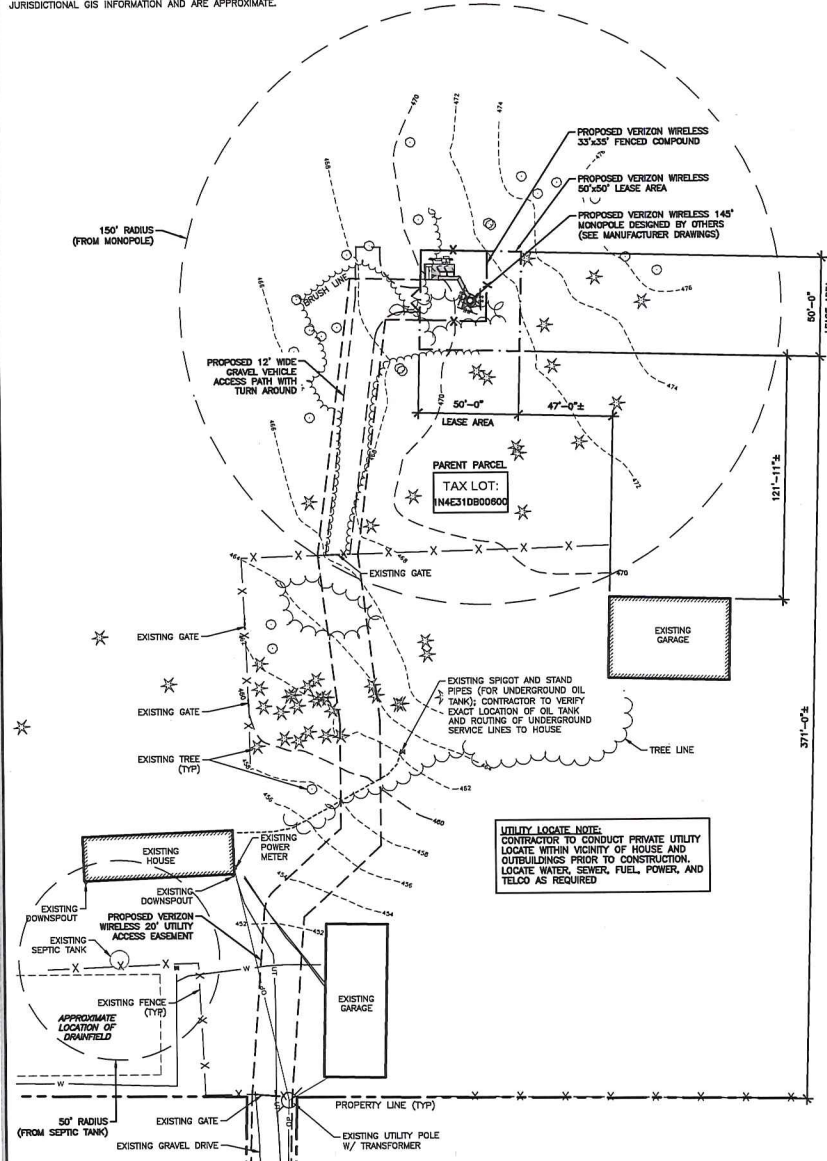
**15. (A) Miscellaneous Provisions.**

**(B) Permittee's Initials for Signature:**     *KL*    

**(Add any specific special terms or conditions unique to the Permit Site here. Permittee must initial here to indicate acceptance of the additional special terms and conditions. Add additional sheets as necessary.)**

# Exhibit A

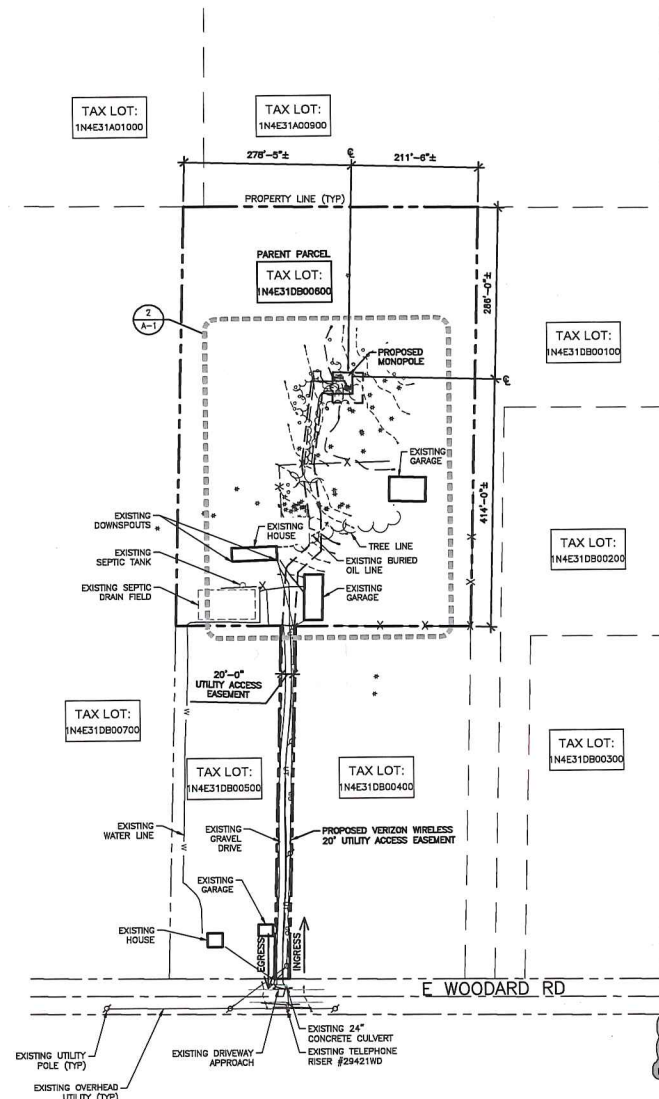
NOTE:  
THIS IS NOT A SURVEY. ALL INFORMATION AND TRUE NORTH  
HAVE BEEN OBTAINED FROM EXISTING DRAWINGS AND  
JURISDICTIONAL GIS INFORMATION AND ARE APPROXIMATE.



24"x36" SCALE: 1" = 30'-0"  
11"x17" SCALE: 1" = 60'-0"

ENLARGED SITE PLAN 2

24"x36" SCALE: 1" = 100'-0"  
11"x17" SCALE: 1" = 200'-0"



Know what's below.  
Call before you dig.

SITE PLAN 1

DO NOT SCALE DRAWINGS. CONTRACTOR MUST VERIFY ALL  
DIMENSIONS AND ADVISE CONSULTANTS OF ANY ERRORS OR  
OMISSIONS. NO VARIATIONS OR MODIFICATIONS TO WORK  
SHOWN SHALL BE IMPLEMENTED WITHOUT PRIOR WRITTEN  
APPROVAL. ALL PREVIOUS ISSUES OF THIS DRAWING ARE  
SUPERSEDED BY THE LATEST REVISION. ALL DIMENSIONS AND  
SPECIFICATIONS REMAIN THE PROPERTY OF MORRISON  
HERSHFIELD CORPORATION. OTHER MORRISON HERSHFIELD  
NOT THE ARCHITECT WILL BE PROVIDING CONSTRUCTION  
REVIEW OF THIS PROJECT.

ZONING		
No.	Date	Revision
3	01/29/19	ISSUED FOR REVIEW
2	05/29/18	ISSUED FOR REVIEW
1	10/12/17	ISSUED FOR REVIEW
0	02/17/17	ISSUED FOR PERMIT
A	12/19/16	ISSUED FOR REVIEW

Client:



Implementation Team:



A/E Team:  
**MORRISON HERSHFIELD**  
600 STEWART ST., SUITE 200  
SEATTLE, WA 98101  
Tel: 206.268.7370  
www.morrisonhershfield.com

Project Info:  
**POR STINGER**  
29421 E WOODARD RD  
TROUTDALE, OR 97060

Drawing Title:  
**SITE PLAN**

Project Number: 7160107	Start Date: 12/13/16
Drafter: JA	Designer: RB
Project Manager: LC	Professional of Record: LC
Revision No: 3	Sheet No: A-1





# MULTNOMAH COUNTY, OREGON

DEPARTMENT OF COMMUNITY SERVICES  
LAND USE & TRANSPORTATION PROGRAM  
RIGHT OF WAY PERMIT SECTION  
1620 SE 190<sup>TH</sup> AVENUE, ROOM 101D  
PORTLAND, OREGON 97233  
503-988-3582 - FAX: 503-988-3389

## UTILITY APPLICATION / PERMIT TO USE PUBLIC ROAD RIGHT OF WAY UNDER THE JURISDICTION OF MULTNOMAH COUNTY

### (COUNTY TO FILL OUT THIS SECTION)

Permit No. \_\_\_\_\_  
District: \_\_\_\_\_  
County Maintained: \_\_\_\_\_  
Application Fee: \_\_\_\_\_  
Deposit: \_\_\_\_\_  
Check No.: \_\_\_\_\_  
Ins. Req'd: \_\_\_\_\_

### FOR APPLICANT ("Applicant"): (Please print)

Name: Black Rock Consulting / Konrad Hyle on behalf of Verizon Wireless

E-mail Address: konrad@blk-rock.com

Address: 22135 SW Cole Court

Phone/Fax: 503-522-0634

Tualatin, OR 97062

Contact Person: Konrad Hyle

### ROADS AND LOCATIONS COVERED BY THIS PERMIT ("Permit Site"):

ROAD	Specific Location	Side of Road	Distance from		Buried Cable or Pipe	
			Center Line	R/W Line	Depth	Size & Kind
E. Woodard Rd	Opposite #29421	South	16'	14'	36"	2" Schd 40
						PVC

### GENERAL APPLICATION/PERMIT TERMS:

1. Upon approval of this Application by Multnomah County by the indicated signature below, this page shall become the first page of the permit ("Permit"), and the Applicant shall become the "Permittee."
2. Permittee must notify Multnomah County at 503-988-3582, at least one business day (24 hours) before commencing work under this Permit.
3. Except as allowed under the Multnomah County Road Rules Section 18, Subsection 18.250, Permittee must complete any authorized demolition, installation, construction, placement, or similar work activities in the road right of way not later than 120 days after the Permit Effective Date. Any extension of time beyond that period is subject to the sole discretion of Multnomah County.
4. Any Permit issued pursuant to this application shall be applicable only to the specific public road right(s) of way under the jurisdiction of Multnomah County authorized and identified herein. Applicant must obtain an additional permit or consent from Multnomah County for the use of any other public road right(s) of way under the County's jurisdiction.
5. Applicant must obtain the consent from the appropriate authority for the use of any roads, highways and streets that are not under Multnomah County's jurisdiction.
6. This Permit shall not be effective until a construction plan, specifications or other similar documentation has been reviewed and approved by the County Engineer or designee, and incorporated into the Permit.
7. This Permit includes the following Right of Way Use Provisions for Utility Permits, attached hereto and which are incorporated by this reference.  
(Authority: ORS 374.305-374.330; ORS Chapter 758; and MCC Chapters 27 and 29)

**APPLICANT: By the authorized signature below, Applicant (Permittee) accepts and agrees to all the requirements, terms, conditions and provisions of this Permit.**

Authorized Signature: \_\_\_\_\_

Print Name: Verizon Wireless, Konrad Hyle

Title: Agent

Date of Application: 5/30/19

**(COUNTY TO FILL OUT THIS SECTION)  
MULTNOMAH COUNTY, DEPARTMENT OF COMMUNITY  
SERVICES:**

Permit Approved By: \_\_\_\_\_

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_

Permit Effective Date: \_\_\_\_\_

## RIGHT OF WAY USE PROVISIONS FOR UTILITY PERMITS

1. (A) This Permit is issued by Multnomah County as the jurisdictional authority (hereinafter "County") over the Right of Way described on Page 1 of this Permit (the "Right of Way") to the Permittee (County and Permittee hereinafter collectively referred to as the "Parties") and controls all aspects of the Right of Way Use(s) set forth on Page 1, and as further provided in and subject to:
  1. If applicable, **Exhibit A**, which shall consist of any plans, specifications, drawings, or other design documents (collectively referred to as the "**Plans**") attached hereto, or as the Parties agree in writing to amend or revise said **Exhibit A**;
  2. If applicable, **Exhibit B, the Construction Permit ("Exhibit B")**, attached hereto.
  3. If applicable, **Exhibit C, the Consulting Engineer's Statement**, attached hereto.
  4. To the extent applicable, **Exhibits A, B and C** are hereby incorporated as a part of this Permit.

(B) This Permit does not authorize any activity on privately owned property. Should Permittee's activities encroach beyond the boundaries of the Right of Way covered under this Permit or otherwise exceed the jurisdictional authority of the County, Permittee shall obtain written consent from any owners of property abutting the Right of Way before beginning any work under this Permit. This Permit has been issued in connection with work done in a public road that is authorized pursuant to the provisions of ORS 758.010(1) "...to construct, maintain and operate its water, gas, electric or communication service lines, fixtures and other facilities..." along said public road; the County reserves all the rights under ORS 758.010(2) to direct the Permittee to relocate any such fixture, line or facility in the subject public road.

(C) **Exhibit A** shall not be changed, altered, or modified without first obtaining the written consent of the County Engineer or the County Engineer's designee.

(D) This Permit is subject to ORS Chapters 374 and 758 and incorporates the following rules adopted by Multnomah County pursuant to Multnomah County Code Chapter 29:

1. **The Multnomah County Road Rules (MCRR)**, dated March 23, 2004, or as the MCRR shall be amended, and
2. **The Multnomah County Design and Construction Manual (DCM)**, dated June 20, 2000, or as the DCM shall be amended.

(E) For purposes of this Permit, the term "Permittee" shall refer to all parties acting under this Permit, including the Applicant and any contractors and/or agents acting on behalf of the Applicant in performing the work authorized under this Permit. The use of the term "Permittee" shall not be intended to limit the number of parties that Applicant engages to perform its work under this Permit.

2. (A) The County contact person to coordinate work activities on the Right of Way shall be: Joanna Valencia, Planning and Development Manager, (503) 988-0219, joanna.valencia@multco.us.

(B) Permittee contact person shall be: (supply name, address, telephone and email contact information)

3. (A) Prior to beginning any work or activities under this Permit, the Permittee shall confirm in writing to the County that Permittee has obtained a commercial general liability insurance policy that provides: (i) for a combined single limit of not less than \$1,000,000 per each incident or occurrence, and with an annual aggregate limit of not less than \$2,000,000 ; (ii) for extended reporting period coverage for claims made within two years after the activities, work or associated work authorized under this Permit is completed; (iii) for the County, its officers, employees and agents to be named as additional named insureds for all activities, work or associated work being authorized under this Permit. This Permit is automatically revoked without further action if the insurance is permitted to lapse, is canceled, or for

any other reason becomes inoperative. Insurance policy limits quoted herein are minimums set for 2014 and shall be subject to County review and adjustment annually.

**(B)** Alternatively, if Permittee is self-insured for the risks for which insurance is required under this Permit and provided Permittee's self-insurance verification is accepted by the County's Office of Risk Management, Permittee shall not be required to procure insurance as required under Subsection 3(A). For the duration of this Permit, Permittee shall annually provide written verification of self-insurance to the County, which, is subject to acceptance by the County's Risk Management Office.

**4. (A)** Permittee agrees to defend, indemnify, and hold harmless the County, its officers, employees, and agents (the "Indemnitees") from all claims, demands, suits, liabilities, damages, losses, costs, or expenses, including but not limited to attorney's fees, that the Indemnitees may sustain or incur on account of any damage to or destruction of any property that the County or any person, party or corporation may own or in which it may have an interest, or from the injury or death of any person or persons, which arise out of or are in any way connected with the activities conducted or work performed under this Permit by the Permittee, their officers, employees, contractors, agents, or other parties accessing or working on utilities. This duty to defend, indemnify and hold harmless does not apply to parties accessing or working on utilities which obtain separate permits for such access and work.

**(B)** Permittee agrees to defend, indemnify, and hold harmless the Indemnitees from all claims, demands, suits, liabilities, damages, losses, costs, or expenses which arise out of or are in any way connected with the use, generation, manufacture, storage, discharge, release, disposal, transportation, or possession of Hazardous Materials by the Permittee, its employees, contractors, or agents at any time during the term of this Permit at the Permit Site. "Hazardous Materials" means: **(a)** any petroleum, including crude oil or any fraction thereof, natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel, or any mixture thereof, flammable substances, explosives, radioactive materials, hazardous wastes or substances, toxic wastes, wastes or substances or any other materials or pollutants which: (1) pose a hazard to the Permit Site or to persons on or about the Permit Site, or (2) cause the Permit Site to be in violation of any federal, state, or local law, ordinance, regulation, code, or rule relating to Hazardous Materials; **(b)** asbestos in any form which is or could become friable, urea formaldehyde foam insulation, transformers, or other equipment which contain dielectric fluid containing levels of polychlorinated biphenyls in excess of fifty (50) parts per million; **(c)** any chemical, material, or substance defined as or included in the definition of "hazardous substances," "hazardous wastes," "hazardous materials," "extremely hazardous waste," "restricted hazardous waste," "waste" or "toxic substances," or words of similar import under any applicable local, state, or federal law or under the regulations adopted or publications promulgated pursuant thereto including, but not limited to, the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. § 9601, et seq.; the Hazardous Materials Transportation Act, as amended, 49 U.S.C. § 1801, et seq.; the Resource Conservation and Recovery Act, as amended, 42 U.S.C. § 6901, et seq.; the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1251, et seq.; and **(d)** any other chemical, material or substance, exposure to which is prohibited, limited, or regulated by any governmental authority or may or could pose a hazard to the health and safety of the owners and/or occupants of property adjacent to or surrounding the Permit Site.

**(C)** The Permittee's obligations under Section 3 and Section 4 herein, shall survive the termination of this Permit to the fullest extent as allowed or recognized under applicable law, statutes, codes or regulations.

**(D)** Notwithstanding the foregoing language in this Section 4(A), Permittee shall not be liable for (and the foregoing indemnity obligations shall not cover) any claim, demand, suit, liabilities, damages, losses, costs, or expenses to the extent the same resulted from the negligence, willful misconduct or strict liability of Multnomah County, its officers, employees, contractors or agents.

**5.** Traffic control is the responsibility of the Permittee and shall be performed in accordance with the Manual of Uniform Traffic Control Devices and Oregon Supplements. The Permittee shall submit a copy of the traffic control plan for County review and approval not less than five working days prior to the date the activities or work authorized under this Permit are scheduled to begin. Work or activities shall not begin until written approval of the traffic control plan is obtained from the County Engineer or designee.

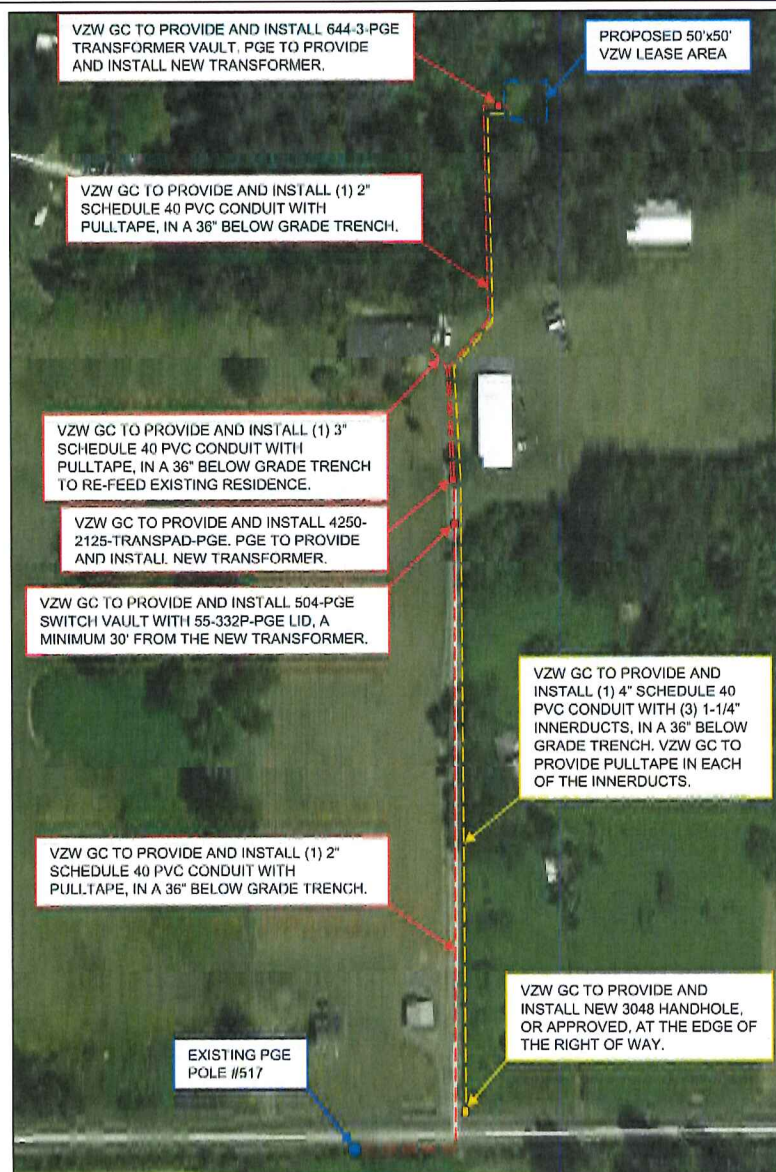
6. The Permittee shall provide the name and telephone contact number for its Project inspector or contractor, and a 24-hour emergency telephone number(s) for the Project inspector or contractor prior to beginning activities or work under this Permit.
7. Within 30 days of request by the County, Permittee shall provide the County with a list of all current or pending lessees leasing space from Permittee within the Right of Way, which shall include contact information for lessee.
8. ATTENTION: Oregon law requires you to follow rules adopted by the Oregon Utility Notification Center (the "Center"). Those rules are set forth in OAR 952-001-0010 through OAR 952-001-0090. You may obtain copies of the rules by calling the Center. The telephone number for the Center is (503) 232-1987.
9. No modification shall be made to any fixture or installation as shown on Exhibit A and authorized under this Permit without prior approval from the County. Failure to comply with any term or condition of this Permit shall be cause for revocation. The County reserves the right to stop the activities or work performed under this Permit for failure to comply. All costs associated with activities or work stoppage or revocation as provided herein are the responsibility of the Permittee, and all costs shall be borne by the Permittee.
10. The Permittee shall restore the Right of Way to an equal or better condition than existed prior to the activities or work authorized under this Permit. The Permittee is responsible for quality control of all demolition or new construction made to the Right of Way. The County may perform spot inspections to monitor quality control. The Permittee shall correct all construction work that does not conform to County standards. The County may require additional work to return the Right of Way to "as good" or "better" condition.
11. The Permittee shall be in compliance with all federal, interstate, state, regional, and local laws, regulations, rules, and ordinances, pertaining to all the activities or work performed under this Permit including, but not limited to, obtaining all necessary and applicable construction and erosion control permits and approvals prior to beginning the activities or work authorized under this Permit and compliance with all applicable business licenses, OSHA rules and regulations.
12. (A) For emergency work in the Right of Way, County shall have the right, upon such reasonable notice to Permittee as may be accomplished given the time and circumstances of the emergency event, to at any time (including during any of Permittee's activities or work of any kind in the Right of Way), enter and occupy the entire or any part of the Right of Way for the purpose of inspecting, maintaining, repairing, renewing, replacing or reconstructing the Right of Way, or any replacement facility thereto as County in its sole discretion shall deem necessary and appropriate. Notwithstanding the rights established under this Subsection 12(A), in an emergency situation County shall make reasonable efforts to coordinate with Permittee to ensure the restoration of the Right of Way and any utilities in the Right of Way is accomplished in the most effective and safe manner.  
  
(B) For non-emergency work in the Right of Way, County shall comply with the requirements of ORS 758.025 to coordinate with Permittee on any County projects, construction or other necessary work in the Right of Way that will require the relocation of Permittee's installations.
13. County's activities described in Section 12 may require Permittee, its contractors, agents or sublessees (collectively "Permittee Parties") to remove or relocate any fixtures, installations, facilities or personal property, including but not limited to: vehicles, machines, tools and equipment from their existing location in the Right of Way. Upon entry, County shall, without liability to Permittee Parties, have the right to remove any such fixtures, installations facilities or personal property from the Right of Way as may be necessary to accomplish the required work if Permittee fails to act in accordance with the County's directive under ORS 758.010(2), to remove Permittee's fixtures, installations, facilities, or personal property in a timely manner. County shall have no obligation to restore or repair any improvements removed or damaged in the performance of County's work done under these Sections 12 and 13. Permittee Parties agree that County shall have no obligation to restore the Right of Way or Permittee Parties' improvements and County shall have no liability to Permittee Parties for any disruption of Permittee Parties' business, for loss of Permittee Parties' real or personal property, for Permittee Parties' lost profits or for any other loss incurred by Permittee Parties as a result of such entry or as a result of Permittee Parties being required to vacate the Right of Way pursuant to the terms of these Sections 12 and 13.

**14. (A) Miscellaneous Provisions (if any) (County to fill this section)**

(B) Permittee's Initials for Signature:         1/14        

**(Add any specific special terms or conditions unique to the Permit Site here. Permittee must initial here to indicate acceptance of the additional special terms and conditions. Add additional sheets as necessary.)**





## CONSTRUCTION NOTES

## GENERAL REQUIREMENTS

- THIS UCR IS NOT A CONSTRUCTION, OR BID DOCUMENT.
- VZW GC TO REQUEST LOCATES BE PERFORMED PRIOR TO ANY EXCAVATION.
- A RIGHT OF WAY PERMIT WILL BE REQUIRED FOR ALL WORK DONE IN THE RIGHT OF WAY. PGE WILL OBTAIN THE PERMIT, VZW WILL NEED TO USE A PGE APPROVED CONTRACTOR FOR WORK DONE IN THE RIGHT OF WAY.
- MAINTAIN PROPER CLEARANCES FROM ALL EXISTING AND NEW PIPING, DRAINAGE AND CONDUITS ON THE PROPERTY.
- ALL SWEEPS TO HAVE A MINIMUM 36" RADIUS. FIBERGLASS SWEEPS MAY BE REQUIRED. VERIFY WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- PGE MAY REQUIRE THAT VZW GC INSTALL BOLLARDS AROUND TRANSFORMERS. VERIFY WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- PGE WILL REQUIRE 24 HOUR ACCESS TO THEIR FACILITIES.
- PGE WILL REQUIRE A MINIMUM 60 DAYS NOTICE PRIOR TO CONSTRUCTION.

## POWER

THERE IS AN EXISTING OVERHEAD POWER LINE THAT CURRENTLY FEEDS THE PROPERTY. PGE WILL BE CONVERTING THE EXISTING OVERHEAD SERVICE TO UNDERGROUND WHICH WILL CAUSE AN OUTAGE. VZW GC TO COORDINATE OUTAGE WITH PGE REPRESENTATIVE AND OWNER REPRESENTATIVE.

- VZW GC TO SWEEP (1) 2" SCHEDULE 40 PVC CONDUIT WITH PULLTAPE, UP AT THE BASE OF EXISTING PGE POLE #517. COORDINATE EXACT SWEEP LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO PLACE CONDUIT IN A 36" BELOW GRADE TRENCH AND EXTEND EAST APPROXIMATELY 90' BEFORE MAKING 90° TURN NORTH. COORDINATE EXACT ROUTING WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO BORE CONDUIT 36" BELOW GRADE UNDER E WOODARD RD APPROXIMATELY 30' TO THE BEGINNING OF THE EXISTING DRIVEWAY.
- AT THE BEGINNING OF THE DRIVEWAY, VZW GC TO EXTEND CONDUIT IN A 36" BELOW GRADE TRENCH TO THE LOCATION OF THE NEW SWITCH VAULT.
- VZW GC TO PROVIDE AND INSTALL 504-PGE SWITCH VAULT WITH 55-332P-PGE LID, PER PGE SPECIFICATIONS. COORDINATE EXACT LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO STUB (1) 2" SCHEDULE 40 PVC CONDUIT WITH PULLTAPE, INTO THE NEW SWITCH VAULT. COORDINATE EXACT STUB LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO PLACE CONDUIT IN A 36" BELOW GRADE TRENCH AND EXTEND TO THE LOCATION OF THE NEW TRANSFORMER.
- VZW GC TO PROVIDE AND INSTALL 4250-2125-TRANSPAD-PGE, PER PGE SPECIFICATIONS, A MINIMUM 30' FROM NEW SWITCH VAULT. PGE TO PROVIDE AND INSTALL NEW TRANSFORMER. COORDINATE EXACT LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO SWEEP UP (1) 3" SCHEDULE 40 PVC CONDUIT WITH PULLTAPE, INTO THE NEW TRANSFORMER. COORDINATE EXACT SWEEP LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO PLACE CONDUIT IN A 36" BELOW GRADE AND EXTEND TO THE LOCATION OF THE EXISTING METER IN ORDER TO RE-FEED THE EXISTING RESIDENCE. **NOTE: LOCATION OF THE METER MUST BE APPROVED BY PGE SERVICE INSPECTOR.**
- VZW GC TO ALSO SWEEP UP (1) 2" SCHEDULE 40 PVC CONDUIT WITH PULLTAPE, INTO THE NEW TRANSFORMER. COORDINATE EXACT SWEEP LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO PLACE THE 2" CONDUIT IN A 36" BELOW GRADE TRENCH AND EXTEND TO THE LOCATION OF A NEW TRANSFORMER OUTSIDE THE VZW LEASE AREA. COORDINATE EXACT ROUTING WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO PROVIDE AND INSTALL NEW 644-3-PGE VAULT, PER PGE SPECIFICATIONS, JUST OUTSIDE THE FENCED LEASE AREA. PGE TO PROVIDE AND INSTALL NEW TRANSFORMER. COORDINATE EXACT LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO STUB (1) 3" SCHEDULE 40 PVC CONDUIT WITH PULLTAPE, INTO THE NEW TRANSFORMER VAULT. COORDINATE EXACT STUB LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO PLACE CONDUIT IN A 36" BELOW GRADE TRENCH AND EXTEND TO NEW H-FRAME WITH METERBASE. COORDINATE EXACT ROUTING WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- VZW GC TO PROVIDE AND INSTALL NEW H-FRAME WITH 200A, 120/240V, 1-PHASE METERBASE WITH 200A MAIN DISCONNECT, PER PGE SPECIFICATIONS, INSIDE THE FENCED LEASE AREA. COORDINATE EXACT LOCATION WITH PGE REPRESENTATIVE PRIOR TO INSTALLATION.
- PGE WILL REQUIRE ALL INSPECTIONS BE COMPLETED PRIOR TO ENERGIZING THE SERVICE.

## GENERIC FIBER

- VZW GC TO PROVIDE AND INSTALL NEW 3048 HANDHOLE, OR APPROVED, AT THE EDGE OF THE RIGHT OF WAY ON E WOODARD RD. COORDINATE EXACT LOCATION WITH THE VZW FCM PRIOR TO INSTALLATION.
- VZW GC TO STUB (1) 4" SCHEDULE 40 PVC CONDUIT WITH (3) 1-1/4" INNERDUCTS, EACH WITH PULLTAPE, INTO THE NEW HANDHOLE.
- VZW GC TO PLACE CONDUITS IN A 36" BELOW GRADE TRENCH AND EXTEND TO THE NEW FIBER DEMARC INSIDE THE VZW LEASE AREA. COORDINATE EXACT ROUTING WITH VZW FCM PRIOR TO INSTALLATION.
- VZW GC TO PROVIDE AND INSTALL DUDLIK ENCLOSURE, OR APPROVED, ON THE NEWLY INSTALLED H-FRAME. COORDINATE EXACT LOCATION AND SPECIFICATIONS WITH VZW FCM PRIOR TO PURCHASE AND INSTALLATION.
- VZW GC TO PROVIDE AND INSTALL -48V DC POWER, 19" RACK AND #6 COPPER GROUND IN THE ENCLOSURE FOR FUTURE FIBER.



5515 S.W. Allen Blvd., Suite 107  
Beverton, Oregon 97005  
Phone: (503) 726-3325  
Fax: (503) 726-3325  
E-mail: rharis@rsweng.com  
Project No.: 1382.025.001  
Contact: VANESSA FUGATE

## DRAWING INDEX

SHEET	DESCRIPTION
T-1.0	TITLE SHEET
A-1.0	OVERALL SITE PLAN
A-2.0	PHOTOS
A-3.0	PHOTOS
A-4.0	PHOTOS
A-5.0	504-PGE VAULT SPEC
A-6.0	PGE PADMOUNT SPEC
A-7.0	644-3-PGE VAULT SPEC
A-8.0	PGE DESIGN
PG. 10	POWER EMAIL

THE INFORMATION CONTAINED IN THIS SET OF DOCUMENTS IS PROPRIETARY BY NATURE. ANY USE OR DISCLOSURE OTHER THAN THAT WHICH RELATES TO VERIZON WIRELESS SERVICES IS STRICTLY PROHIBITED.

R&W PROJECT NO.: 1382.025.001

## WALK DATES

NO.	DATE	BY:	DESCRIPTION
1	12/07/16	VAF	LOCKDOWN
2	03/24/17	VAF	POWER DESIGN

## SUBMITTAL

NO.	DATE	BY:	DESCRIPTION
1	04/04/17	VAF	GENERIC FIBER

## SITE NAME

POR STINGER

## SITE ADDRESS

28421 E WOODARD RD  
TROUTDALE, OR 97060-8317

## SHEET TITLE

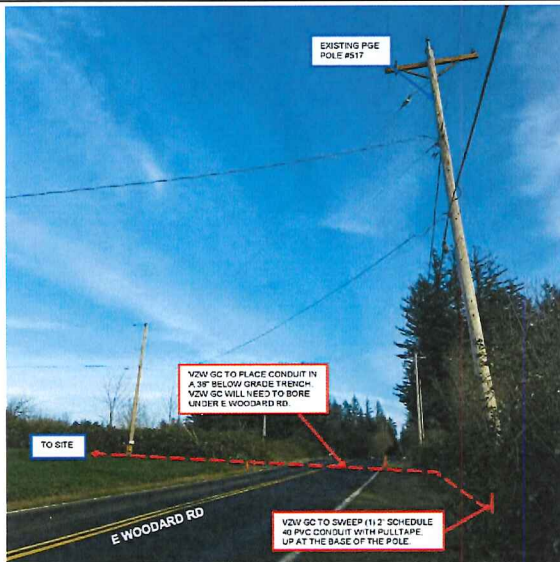
OVERALL  
SITE PLAN

## SHEET NO.

A-1.0

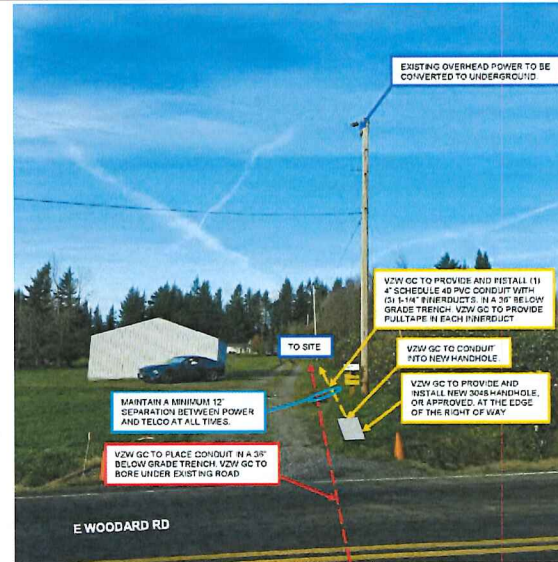


EXHIBIT A PG 2 OF 2



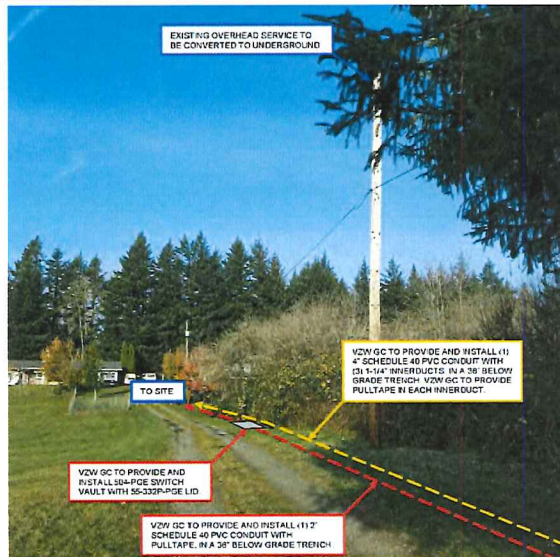
1 POWER PHOTO 1

SCALE: NTS  
SCALE: NTS



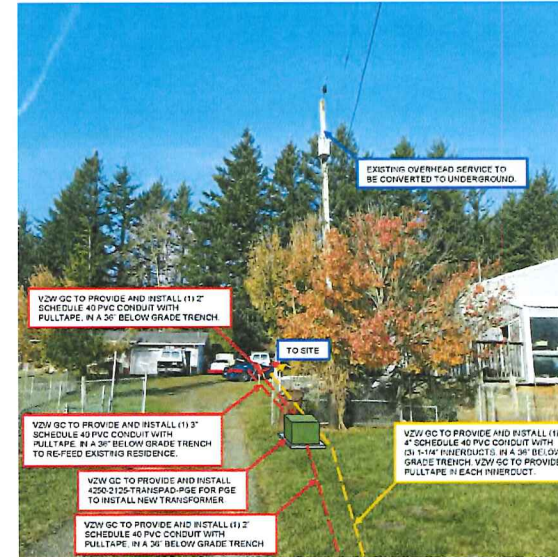
2 POWER/FIBER PHOTO 1

SCALE: NTS  
SCALE: NTS



3 POWER/FIBER PHOTO 2

SCALE: NTS  
SCALE: NTS



4 POWER/FIBER PHOTO 3

SCALE: NTS  
SCALE: NTS



**R&W**  
ENGINEERING, INC.  
AN ISO 9001:2015 CERTIFIED BUSINESS  
5515 S.W. Allen Blvd., Suite 107  
Beaverton, Oregon 97005  
Phone: (503) 726-3325  
Fax: (503) 726-3305  
E-mail: rharis@rweng.com  
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PG. 10	POWER EMAIL

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R&W PROJECT NO.: 1382.025.001

WALK DATES				
NO.	DATE	BY:	DESCRIPTION	
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2	03/24/17	VAF	POWER DESIGN	

SUBMITTAL				
NO.	DATE	BY:	DESCRIPTION	
1	04/04/17	VAF	GENERIC FIBER	

SITE NAME

POR STINGER

SITE ADDRESS

29421 E WOODARD RD  
TROUTDALE, OR 97060-8317

SHEET TITLE

PHOTOS

SHEET NO.

A-2.0

EX. W



**Land Use Planning Division**  
1600 SE 190<sup>th</sup> Ave, Ste 116  
Portland OR 97233  
Ph: 503-988-3043 Fax: 503-988-3389  
multco.us/landuse

**Grading and  
Erosion Control  
Worksheet**  
  
**Associated Active Cases:**

**PROPERTY**

Address	29421 E Woodard Rd	Site Size	
Township	1N Range 4E Section 31	Tax lot(s)	
Alt. Acct.		358,007 SF Tax Lot: 1N4E31DB00600	

Other Properties Involved: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**APPLICANT**

Name	Black Rock Consulting/Konrad Hyle on behalf of Verizon	Phone	503-522-0634
Mailing Address	22135 SW Cole Court	Fax	
City	Tualatin State OR Zipcode 97062	E-mail	konrad@blk-rock.com

**OWNER**

Name	Cliff Hegstad	Phone	503-484-8927
Mailing Address	29421 E Woodard Rd	Fax	
City	Troutdale State OR Zipcode 97060	E-mail	cliff1931@aol.com

I authorize the applicant to make this application.

SEB ATTACHED AUTHORIZATION \_\_\_\_\_

Property Owner Signature	Date
(If multiple property owners, please include additional signature sheets)	

NOTE: By signing this form, the property owner or property owner's agent is granting permission for Planning Staff to conduct site inspections on the property.

☒ If no owner signature above, a letter of authorization from the owner(s) is required.

**PROPOSED DEVELOPMENT:** Please provide a summary of your proposal. This should, at a minimum, include the size (square feet) and use of any structures you are proposing, a description of any cut/fill you will be doing, and any land clearing, including tree removal. Also, please summarize the number and species of any proposed vegetation that will be planted.

Site improvements for a new wireless facility, including extending a rock access drive and a 20'x30' rock surfaced equipment compound.

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## Instructions for applicants:

The questionnaire on the following pages asks you to provide information needed to review your proposal under the standards for a Grading and Erosion Control permit. Please answer each question fully, including the 'how' and 'why' each standard is met. The responses and supporting documents you provide will be the basis for determining whether or not your application can be approved.

*Note: The planner assigned to your case will need to conduct a site visit prior to the application being deemed complete. The purpose of the visit is to verify the information in the site plan, and to verify that no violations of the zoning code exist.*

## GEC PERMIT (REQUIRED DRAWINGS).

Please submit two (2) site scaled plans containing all information referenced in the following sections of the Building Permit Checklist.

- ☐ Site Plans
- ☐ Building Plans (floor plans and building elevations)

*Helpful Hint - The most common mistake we see is not delineating on the site plan all areas that will be disturbed during construction. Disturbance occurs when tree stumps are pulled, and when land is graded, cut, or filled. Stockpiled soils count as ground disturbance. In addition to the construction of a building, disturbance is also required to construct a driveway, retaining wall, septic system, and to level the yard around a home. Omitting any of this information on your plan will delay your project review and could cause delays during construction, including the need to stop work. Again, please carefully mark and label all proposed ground disturbing activities on your plans.*

## GEC PERMIT (REQUIRED MISCELLANEOUS INFORMATION)

Please answer the following questions:

QUESTION	ANSWER
How much of the site will be disturbed (in square feet)? Please clearly delineate on your site plan.	10,000 SF +/-
How much soil will be cut (in cubic feet or cubic yards)? Show cut locations on your site plan.	180 CY. Stripping. No substantive cut/fill.
How much soil will be filled (in cubic feet or cubic yards)? Show fill locations on your site plan.	180 CY. Rock Surfacing.
How much soil will be stockpiled on the site (in cubic feet or cubic yards)? Show stockpile locations on your site plan.	20 CY-Temporary
How much soil will be imported to the property, including for soil amendment (in cubic feet or cubic yards)?	180 CY. Rock surfacing
How much soil will be taken off the property (in cubic feet or cubic yards)? Exactly where will this soil be taken? Have you obtained all necessary permits to take the soil to this location?	90 CY. Excess strippings. Location TBD.
How much new impervious surface will be established including new roofing, asphalt, concrete, etc. (in square feet)? Show the different areas on site plan.	4,800 SF. New rock surface.



What is the average ground slope through the proposed development area (in percent)? Show on your site plan the direction and elevation change.	7.5%. See contours
How steep will the steepest disturbed slopes be (in percent)?	11%
Will vegetation be planted? Please show all proposed landscaping on the site plan.	Yes

☒ **If you are establishing more than 500 square feet of new impervious surfaces, have you attached a completed Storm Water Certificate, stamped by an Oregon Registered Professional Engineer?** ☒ Yes ☐ No

☐ **Will you be discharging storm water runoff into a public right-of-way?** ☐ Yes ☒ No

☐ **If you will be discharging stormwater runoff into a public right-of-way, have you applied for a discharge permit from Multnomah County or the Oregon Department of Transportation?** ☐ Yes ☐ No

#### **GEC (REQUIRED APPROVAL STANDARDS)**

The text in bold below are the standards for approval. The questions below each standard are intended to help you answer the standards. Staff will use your responses to determine whether or not your proposal meets each specific standard. Please answer these questions as fully as you can. When responding to the questions, remember to address the 'how' and 'why' each standard is met. (Attach additional sheets if necessary.)

**Approval of development plans on sites subject to a grading and erosion control permit shall be based on a determination that the proposal adequately addresses the following standards. Conditions of approval may be imposed to assure the design meets the standards.**

#### **(A) Design standards for grading and erosion control**

##### **(1) Grading standards**

**(a) Fill materials, compaction methods and density specifications shall be indicated. Fill areas intended to support structures shall be identified on the plan. The director may require additional studies or information or work regarding fill materials and compaction.**

Is any soil being imported to the site? ☒ Yes ☐ No

Is any fill being used to support any structures? ☐ Yes ☒ No

What method is being used to compact the soil?

The soil will be compacted using a Vibratory Roller.

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**Remember to indicate on the site plan those areas that are being filled.**



**(b) Cut and fill slopes shall not be steeper than 3:1 unless a geological and/or engineering analysis certifies that steep slopes are safe and erosion control measures are specified.**

Cut and fill slopes cannot be greater than 33% (3Horizontal:1Vertical) unless a geological and/or engineering analysis certifies that the steep slopes are safe and will not endanger or disturb adjoining property. Does your project contain cut or fill slopes steeper than 33% \_\_\_\_\_ Yes ☒ No

**If you answered yes above, you will need to attach the necessary geological and/or engineering analysis and illustrate on your plan where these cuts and/or fills will occur.**

**(c) Cuts and fills shall not endanger or disturb adjoining property.**

How are adjacent properties, including the right-of-way, protected from the cut and fill that is part of your project? Does the slope or intervening topography help prevent affecting the adjacent properties?

The work area is over 250 feet from adjacent properties. Proposed cuts and fills are very minor (expected to be 1 foot or less) as needed to create a crushed rock drive and equipment compound surface.

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**(d) The proposed drainage system shall have adequate capacity to handle stormwater attributed to development on-site for a storm of ten-year frequency, and maintain the existing flood carrying capacity of all watercourses on or adjacent to the property.**

Water from your roofs, driveways, parking areas, etc., can not be carried directly to the right-of-way or stream. When water is diverted to a stream it can cause flooding and damage downstream from you. Make sure that water resulting from your development is either infiltrated into the ground, or the rate of release is controlled for the 10-year/24-hour storm event.

Is your drainage system shown on your site plan? ☒ Yes \_\_\_\_\_ No

Have you attached the drainage design details and calculations? ☒ Yes \_\_\_\_\_ No

What kind of drainage system is proposed? How is the water collected and discharged and where does it go?

Runoff from the new rock surfaced drive will sheet flow to the surrounding wooded area and be dispersed. There are no existing or proposed defined watercourses on the site or adjacent properties.

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**(e) Fills shall not encroach on natural watercourses or constructed channels unless measures are approved which will adequately handle the existing flood carrying capacity for the altered portion of the stream.**

Fill materials cannot be placed in or adjacent to a watercourse (stream, creek, river, etc.) without a Flood Development Permit to ensure the carrying capacity of the watercourse is not adversely impacted. Will you be placing fill in or near a watercourse? \_\_\_\_\_ Yes ☒ No

If yes, what measures are you using to ensure the flood carrying capacity of the stream or watercourse will not be altered?

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(2) Erosion control standards

(a) On sites within the Tualatin River Drainage Basin, erosion and stormwater control plans shall satisfy the requirements of OAR 340. Erosion and stormwater control plans shall be designed to perform as prescribed by the currently adopted edition of the "Erosion Prevention & Sediment Control Plans Technical Guidance Handbook (1994)" and the "City of Portland Stormwater Quality Facilities, A Design Manual (1995)." Ground-disturbing activities within the Tualatin Basin shall provide a 100-foot undisturbed buffer from the top of the bank of a stream, or the ordinary high water-mark (line of vegetation) of a water body, or within 100 feet of a wetland: unless a mitigation plan consistent with OAR 340 is approved for alterations within the buffer area.

Is your project site within the Tualatin River Drainage Basin? \_\_\_\_\_ Yes ☒ No

If yes, have you provided a 100-foot undisturbed buffer between the stream, water body, or wetland?  
\_\_\_\_\_ Yes \_\_\_\_\_ No

If no, what mitigation plan have you included with your project? Describe in detail below and on your site plan.

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(b) Stripping of vegetation, grading, or other soil disturbance shall be done in a manner which will minimize soil erosion, stabilize the soil as quickly as practicable, and expose the smallest practical area at any one time during construction.

How are you going to be stripping vegetation, grading and changing the topography of the site? What methods are you going to use? What specific measures will you take to ensure that soil erosion will be minimized and soil quickly stabilized? How will you ensure that the smallest area of disturbed soil will be exposed at any one time?

A narrow band of vegetation and duff layer will be stripped to expose a firm subgrade for the new rock surfaced drive and equipment compound. There will be no substantive change to the topography other than to create a 2% cross slope across the drive surface. Work will likely be done with dozer and excavator. Rock placement will likely follow directly behind stripping operation to protect subgrade soils. This will keep exposed soils to a minimum and provide quick stabilization. See notes on ESPCP Plan.

(c) Development plans shall minimize cut or fill operations and ensure conformity with topography so as to create the least erosion potential and adequately accommodate the volume and velocity of surface runoff.

How are you minimizing the cut or fill operations and ensuring conformity with the existing topography? How are you dealing with the additional volume of water generated from your project and making sure that the water flow is slowed down and does not cause erosion?

Cuts and fills are minor--expected at 1 foot or less as needed to create a 2% cross slope for the proposed rock access road and equipment compound. The road and equipment compound are outsloped so that runoff will sheet flow in the natural direction to the surrounding wooded area and be dispersed for over 250 feet before leaving the property.

**(d) Temporary vegetation and/or mulching shall be used to protect exposed critical areas during development.**

Do you have critical areas such as streams, creeks or ponds near your development? \_\_\_\_\_ Yes ☒ No  
How are you protecting those critical areas?

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**(e) Whenever feasible, natural vegetation shall be retained, protected, and supplemented.**

**1. A 100-foot undisturbed buffer of natural vegetation shall be retained from the top of the bank of a stream, or from the ordinary high watermark (line of vegetation) of a water body, or within 100 feet of a wetland.**

Is there a 100-foot undisturbed buffer of natural vegetation between your project and the stream, creek, wetland or other water body? ☒ Yes \_\_\_\_\_ No

If no, answer #2 below.

**2. The buffer required in subsection (e)1 may only be disturbed upon the approval of a mitigation plan that utilizes erosion and stormwater control features designed to perform as effectively as those prescribed in the currently adopted edition of the "Erosion Prevention & Sediment Control Plans Technical Guidance Handbook (1994)" and the "City of Portland Stormwater Quality Facilities, A Design Manual (1995)", and is consistent with attaining equivalent surface water quality standards as those established for the Tualatin River Drainage Basin in OAR 340.**

What is your mitigation plan for disturbing the vegetation within 100-feet of a stream, creek, wetland or other water body? Cite what measures and pages your mitigation plan utilizes from the currently adopted edition of the "Erosion Prevention & Sediment Control Plans Technical Guidance Handbook (1994)" and the "City of Portland Stormwater Quality Facilities, A Design Manual (1995)". Also show your measures on your site plan.

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**(f) Permanent plantings and any required structural erosion control and drainage measures shall be installed as soon as practical.**

Does your project include permanent plantings such as landscaping, grass or new native vegetation?  
☒ Yes \_\_\_\_\_ No

If so, when will they be planted? They will be planted after final grading.

Are the plantings shown on the plan? ☒ Yes \_\_\_\_\_ No

**(g) Provisions shall be made to effectively accommodate increased runoff caused by altered soil and surface conditions during and after development. The rate of surface water runoff shall be structurally retarded where necessary.**

Are you grading the site and altering the topography at all? ☒ Yes ☐ No

Were slopes increased as a result of the grading? ☐ Yes ☒ No

How do you plan to accommodate the increased runoff from the graded topography?

Regrading is very minor at about 1 foot or less for the access drive and equipment compound. The finish cross slope will be in the same direction as the natural topography. Other than the minor cut/fill shoulders of about 1 foot max, no slopes were increased. No perceptable increase in runoff at downstream property edge. See stormwater certificate.

**(h) Sediment in the runoff water shall be trapped by use of debris basins, silt traps, or other measures until the disturbed area is stabilized.**

Will sediment potentially get in runoff from a rain event? ☒ Yes ☐ No

If not, why not? What measures will you be using to ensure sediment is trapped and kept on site?

Rainfall will likely cause localized erosion in the work area. Runoff will sheet flow into the surrounding wooded area with grass and brush understory where sediment will filter out and runoff will disperse for several hundred feet on-site (vegetated buffer).  
Offsite migration of sediment off site is not anticipated.

**(i) Provisions shall be made to prevent surface water from damaging the cut face of excavations or the sloping surface of fills by installation of temporary or permanent drainage across or above such areas, or by other suitable stabilization measures such as mulching or seeding.**

How will you prevent water runoff from damaging slopes on your site or causing rilling on your exposed soil?

Cut and fill slope heights are minor at about 1 foot or less and about 5 feet wide. Upslope vegetation is mostly forested, producing little run-on to the exposed slopes. These factors combine to present a very minor potential for rilling. After final shaping, exposed soils will be hydroseeded with 2,000 lb/ac wood fiber mulch and tacifier.

**(j) All drainage provisions shall be designed to adequately carry existing and potential surface runoff to suitable drainageways such as storm drains, natural watercourses, drainage swales, or an approved drywell system.**

What type of drainage system will you have in place to handle stormwater generated from your existing or new development? Explain them in detail and show them on your site plan.

Drainage will consist of sheet flow from the new rock surface in the natural direction to the adjacent wooded area with brush and grass understory where it will disperse for about 250 feet before reaching the downstream property line. There are no existing or proposed storm drains, water courses, swales or other defined drainage features.

**(k) Where drainage swales are used to divert surface waters, they shall be vegetated or protected as required to minimize potential erosion.**

Will drainage swales be used as part of your project? ☐ Yes ☒ No

How will the swales be protected from erosion? For example, will the swale be vegetated or lined with rock?

**(l) Erosion and sediment control devices shall be required where necessary to prevent polluting discharges from occurring. Control devices and measures which may be required include, but are not limited to:**

1. **Energy absorbing devices to reduce runoff water velocity;**
2. **Sedimentation controls such as sediment or debris basins. Any trapped materials shall be removed to an approved disposal site on an approved schedule;**
3. **Dispersal of water runoff from developed areas over large undisturbed areas.**

Will you be using any erosion and sediment control devices to prevent polluting into creeks, streams, or ponds? ☒ Yes ☐ No

If so, what devices? (Make sure to show them on your site plan.)

A construction entrance and stabilization of the road subgrade with rock is proposed to minimize off-site transport of sediment to public roads, where there would be potential to enter ditches. Dispersal of runoff to the adjacent large undisturbed area is also a primary measure.

**(m) Disposed spoil material or stockpiled topsoil shall be prevented from eroding into streams or drainageways by applying mulch or other protective covering; by location at a sufficient distance from streams or drainageways; or by other sediment reduction measures.**

Will you be stockpiling soil on your site during the project? ☒ Yes ☐ No

What is the closest distance to a waterbody? >500 feet

How will you prevent the stockpiled soil from eroding to streams, creeks, water bodies, the right-of-way or an adjacent property?

Covering of stockpile in accordance with ESPCP notes.

**(n) Such non-erosion pollution associated with construction such as pesticides, fertilizers, petrochemicals, solid wastes, construction chemicals, or wastewaters shall be prevented from leaving the construction site through proper handling, disposal, continuous site monitoring and clean-up activities.**

Will any non-erosion pollution items listed above be part of your project? ☐ No ☒ Yes

If yes, how will you properly handle them? Explain in detail.

A sump is proposed for concrete washout. A nominal amount of slow release fertilizer will be incorporated in the hydroseed. Other spill prevention and response notes are included on the ESPCP plan. Construction materials for the tower and telecom equipment are pre-fabricated and pre-finished so there is no painting on-site.



**Owner Consent and Land Use Authorization for Verizon Wireless Land Use  
Application for Wireless Communication Facility**

**Project:** Verizon Wireless Telecommunication Tower Facility – site POR STINGER.

**Property Owners:** Clifford E. Hegstad & Doreen F. Hegstad - Trustees

**Applicant:** Verizon Wireless c/o Blackrock LLC, Konrad Hyle as agent.

**Property Location:** Multnomah County Account # R322458. Map and tax lot: 1N4E31DB 600

**Property @** 29421 E WOODARD RD, TROUTDALE, OR 97060-8317

Authorization to proceed with Multnomah County Oregon zoning and building permits and any other required associated permits or governmental approvals for Verizon Wireless's proposal to install a new wireless communication facility, and locate equipment and other improvements inside the existing leased area and or easement areas, on the above referenced property.

We are the owners of the parcel listed above and we are authorized to provide required permission to submit for local government approvals. Please accept this document as the letter of authorization for Verizon Wireless's representative(s), including Konrad Hyle of Blackrock LLC, to proceed with required zoning and building permit applications to gain government approval for the above referenced project, and to act as our agent only as related to filling land use application and associated permits for the Verizon Wireless Communication Facility. We also agree to record with in Multnomah County land records any declaration of covenants, conditions or restrictions required by any conditions of approval relating to said land use.

**PROPERTY OWNERS AUTHORIZATION:**

Property Owner Signature: Clifton E. Hegstad  
Clifton E. Hegstad

Date: 04 April 2017

Property Owner Signature: Doreen F. Hegstad  
Doreen F. Hegstad

Date: 04 April 2017

Printed Names / Title: Clifton E. Hegstad and Doreen F. Hegstad, Trustees of the Clifton E. Hegstad Trust dated August 5, 2016, as to an undivided 50% interest and Doreen F. Hegstad and Clifton E. Hegstad, Trustees of the Doreen F. Hegstad Trust dated August 5, 2016, as to an undivided 50% interest, as tenants in common.



Land Use Planning Division  
1600 SE 190<sup>th</sup> Ave, Ste 116  
Portland OR 97233  
Ph: 503-988-3043 Fax: 503-988-3389  
land.use.planning@multco.us  
www.multco.us/landuse

**STORM WATER CERTIFICATE  
FOR  $\geq$  500 SQUARE FEET OF NEW IMPERVIOUS SURFACES**

Please have an Oregon Licensed Professional Engineer fill out this Certificate and attach a stamped and signed site plan, stamped and signed storm water system details (if determined to be required), and stamped and signed storm water calculations used to support the conclusion. Please note that replacement of existing structures does not provide a credit to the square footage threshold.


Property Address or Legal Description: 29421 E Woodard Rd, Troutdale 97060

Description of Project: Site improvements for new wireless telecom site.

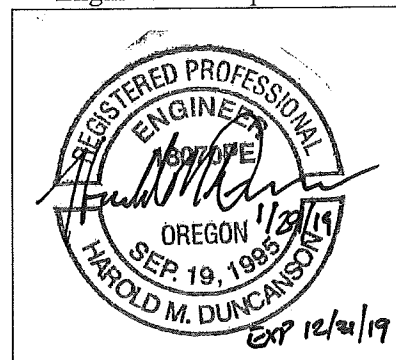
☒ **Construction of an on-site storm water drainage control system is not required.** The rate of storm water runoff attributed to the new/reviewed development (during the 10-year/24-hour storm) will be no greater than that which existed prior to the development as measured from the property line or from the point of discharge into a watercourse [MCC 39.6225(C), or MCC 39.6235]. I certify through the attached stamped and signed site plan and stamped and signed calculations dated 12/13/18 that the proposal will meet the requirements listed above.

☐ **Construction of an on-site storm water drainage control system is required.** After installation of the drainage control system, the rate of storm water runoff attributed to the development (during the 10-year/24-hour storm) will be no greater than that which existed prior to development as measured from the property line or from the point of discharge into a watercourse [MCC 39.6225(C), or MCC 39.6235]. I certify the attached stamped and signed site plan, stamped and signed storm water system design details, and stamped and signed calculations dated \_\_\_\_\_ will meet the requirements listed above.

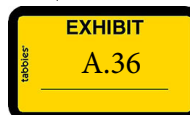
**NOTE to Engineer:** Check one box above. Multnomah County does not use the City of Portland's storm water Ordinance. As part of your review, you must consider all new and existing structures and impervious areas and determine that the generated storm water is in compliance with Oregon law for a 10 year/24 hour storm event.

Signature   
Print Name Harold Duncanson  
Business Name Duncanson Co  
Address 145 SW 155th St, #102, Seattle, WA 98166  
Phone # 206-244-4141  
Date 12/13/18

Engineer's Stamp Below:



(Rev 08/18)





**DUNCANSON**  
*Company, Inc.*

DCI 99544.1430

## MEMO REPORT

To: Multnomah County Department of Community Services

From: Harold Duncanson

Date: 12/13/18

Subject: Verizon POR Stinger—29421 E Woodard Rd  
Runoff Calculation Summary



Attached are calculation results for the predeveloped and postdeveloped conditions for this project for the 10-year, 24-hour storm. The NRCS WinTR-55 computer program was used to perform the calculations, using a Type IA rainfall distribution and a 10-year precipitation of 3.4 inches. The results show the project will have no practical increase ( $<0.01$  CFS) in peak runoff at the downstream property line.

Please call if you have any questions.

SURVEYING

LAND PLANNING

# WinTR-55 Current Data Description

## --- Identification Data ---

User: HMD Date: 12/13/2018  
 Project: POR Stinger Units: English  
 SubTitle: Areal Units: Acres  
 State: Oregon  
 County: Multnomah  
 Filename: X:\Projects\1999 Projects\99544\LDT 1400-1499\995441430 POR Stinger\Runoff\Final.w55

## --- Sub-Area Data ---

Name	Description	Reach	Area(ac)	RCN	Tc
Predev	Predeveloped Site	Outlet	8.22	75	.253
Postdev	Postdeveloped Site	Outlet	8.22	75	.253

Total area: 16.44 (ac)

## --- Storm Data ---

### Rainfall Depth by Rainfall Return Period

2-Yr (in)	5-Yr (in)	10-Yr (in)	25-Yr (in)	50-Yr (in)	100-Yr (in)	1-Yr (in)
2.4	2.9	3.4	3.9	.0	4.4	.0

Storm Data Source: User-provided custom storm data  
 Rainfall Distribution Type: Type IA  
 Dimensionless Unit Hydrograph: <standard>

HMD

POR Stinger

Multnomah County, Oregon

## Sub-Area Land Use and Curve Number Details

Sub-Area Identifier	Land Use	Hydrologic Soil Group	Sub-Area Area (ac)	Curve Number
Predev	Paved parking lots, roofs, driveways	C	.15	98
	Gravel (w/ right-of-way)	C	.23	89
	Pasture, grassland or range	(poor) C	1.85	86
	Woods	(good) C	5.99	70
	Total Area / Weighted Curve Number		8.22	75
Postdev	Paved parking lots, roofs, driveways	C	.15	98
	Gravel (w/ right-of-way)	C	.34	89
	Pasture, grassland or range	(poor) C	1.85	86
	Woods	(good) C	5.88	70
	Total Area / Weighted Curve Number		8.22	75



HMD

POR Stinger

Multnomah County, Oregon

Watershed Peak Table

Sub-Area or Reach Identifier	Peak Flow by Rainfall Return Period 10-Yr (cfs)
------------------------------------	---

SUBAREAS

Predev	1.96
--------	------

Postdev	1.96
---------	------

$\Delta = 0.00 \text{ cfs}$

REACHES

OUTLET	3.91
--------	------

**ONSITE SEPTIC**City of Portland – Bureau of Development Services  
1900 SW 4<sup>th</sup> Avenue, Portland, Oregon 97201 – 503-823-6892 – TTY 503-823-6868 – www.portlandoregon.gov/bds**SEPTIC REVIEW CERTIFICATION (Land Use/Planning)**

Land Use/Planning and Zoning approval involving new construction or addition to any building(s), any change in use, and the creation of a new parcel or property line adjustment requires approval by the Sanitarian.

**STEP 1- Complete the following:**Address of Proposed Work: 29421 E. WOODARD RD. TROUTDALEProperty Map & Tax Lot #: 1N4E31DB 600 Alternate Acct #: R 322458Description of proposed work for this Septic Planning Review CELL TOWER INSTALL  
2944310660Change in number of bedrooms? ☐ Yes ☒ No # of existing bedrooms 5 # of bedrooms at completion 5Applicant's Name KONRAD HYLEApplicant E-mail KONRAD @ BLK-ROCK.COMMailing Address 2235 SW COLE CT. Phone 503. 522-0634City TUALATIN State OR ZIP 97062Permit No. 19-11499D-SFDate 2/13/19**STEP 2- Submit** with current Septic Evaluation application, for each lot affected along with all required checklist items listed on the application. Refer to the current Septic Evaluation application for current fee for Septic Planning Review "with site visit".Septic Evaluation Application available for download at www.portlandoregon.gov/bds/ Septic Evaluation Application or Multnomah County Land Use Planning Office

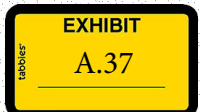
Mail or deliver completed Septic Evaluation Submittal package to:  
City of Portland, Bureau of Development Services, Trade Permits  
1900 SW 4<sup>th</sup> Ave., First Floor, Portland, OR 97201  
For questions please call 503-823-6892

**STEP 3- Review:** After submittal, allow up to 20 business days for submittal application package review**STEP 4- Site Visit:** Sanitarian will contact you with any questions and/or time of site visit**STEP 5- Sign Off:** Sanitarian Approves Septic Planning Review

Based on present knowledge of the area, and current regulations of the State of Oregon Department of Environmental Quality (DEQ), the Sanitarian hereby finds that the above proposal is:

☒ Approved – it will not impact the existing system☐ Approved – the lot is approved for an onsite septic system SER \_\_\_\_\_☐ Approval for general layout only\* - A septic permit to install the system is required prior to building permit issuance

\*Modifications may be required based on specific plans and/or soil conditions impacting the overall site design



☐ Conditions/Comments: Proposed unmanned wireless telecomm facility w/ 15' steel monopole + equipment pad pose no concern to septic. No site visit. proposed development far from septic.

Valublio REHST  
Registered Environmental Health Specialist

2/13/19  
Date

**STEP 6- Return:** to Multnomah County Land Use Office with this signed form and site plan (floor plans if applicable)Page 1 of 2

See page 2 for requirements

Sep\_Rev\_Cert - 6/23/16

No record of septic system. Per property owner/applicant tank + drainfield locations are accurate and were located via probe + staked by surveyor. Appears to be only gravity-fed location for drainfield.

150' RADIUS (FROM MONOPOLE)

PROPOSED VERIZON WIRELESS 33'x35' FENCED COMPOUND

PROPOSED VERIZON WIRELESS 50'x50' LEASE AREA

PROPOSED VERIZON WIRELESS 145' MONOPOLE DESIGNED BY OTHERS (SEE MANUFACTURER DRAWINGS)

PROPOSED 12' WIDE GRAVEL VEHICLE ACCESS PATH WITH TURN AROUND

50'-0" 47'-0"±

LEASE AREA

PARENT PARCEL TAX LOT: N4E31DB00600

EXISTING GATE

EXISTING GATE

EXISTING GATE

EXISTING TREE (TYP)

EXISTING SPIGOT AND STAND PIPES (FOR UNDERGROUND OIL TANK); CONTRACTOR TO VERIFY EXACT LOCATION OF OIL TANK AND ROUTING OF UNDERGROUND SERVICE LINES TO HOUSE

EXISTING GARAGE

TREE LINE

371'-0"±

cord of septic system.

property applicant tank

existing house

EXISTING DOWNSPOUT

PROPOSED VERIZON WIRELESS 20' UTILITY ACCESS EASEMENT

EXISTING 500 GALLON SEPTIC TANK

APPROXIMATE LOCATION OF DRAINFIELD

75'

APPROXIMATE LOCATION OF REPLACEMENT DRAINFIELD

50' RADIUS (FROM SEPTIC TANK)

EXISTING GATE

EXISTING GRAVEL DRIVE

EXISTING POWER METER

EXISTING GARAGE

PROPERTY LINE (TYP)

EXISTING UTILITY POLE W/ TRANSFORMER

UTILITY LOCATE NOTE:  
CONTRACTOR TO CONDUCT PRIVATE UTILITY LOCATE WITHIN VICINITY OF HOUSE AND OUTBUILDINGS PRIOR TO CONSTRUCTION. LOCATE WATER, SEWER, FUEL, POWER, AND TELCO AS REQUIRED

Proposed unmanned wireless telecommunications facility w/ 150' steel monopole + equipment pad pose no concern to septic. No site visit, proposed development far from septic system.

2/13/18

24"x36" SCALE: 1" = 30'-0"

ENLARGED SITE PLAN

Proposed unmanned wireless telecommunications facility w/ 150' steel monopole + equipment pad pose no concern to septic. No site visit, proposed development far from septic system.

Wickert 2/13/18

24"x36" SCALE: 1" = 100'-0"  
11"x17" SCALE: 1" = 200'-0"

Know what's below.  
Call before you dig.

SITE PLAN 1

3	A-1
---	-----

3	A-1
---	-----

# EXHIBIT Z

Catalog  
Number

Notes

Type

Hit the Tab key or mouse over the page to see all interactive elements.

## A+ Capable Luminaire

This item is an A+ capable luminaire, which has been designed and tested to provide consistent color appearance and system-level interoperability.

- All configurations of this luminaire meet the Acuity Brands' specification for chromatic consistency
- This luminaire is A+ Certified when ordered with DTL® controls marked by a shaded background. DTL DLL equipped luminaires meet the A+ specification for luminaire to photocontrol interoperability<sup>1</sup>
- This luminaire is part of an A+ Certified solution for ROAM® or XPoint™ Wireless control networks, providing out-of-the-box control compatibility with simple commissioning, when ordered with drivers and control options marked by a shaded background<sup>1</sup>

To learn more about A+, visit [www.acuitybrands.com/aplus](http://www.acuitybrands.com/aplus).

1. See ordering tree for details.
2. A+ Certified Solutions for ROAM require the order of one ROAM node per luminaire. Sold Separately: [Link to Roam](#); [Link to DTL DLL](#)

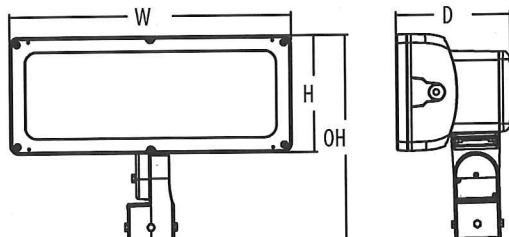


## HLF1 High Lumen LED Flood Luminaire



### Specifications

EPA:	3.6 ft <sup>2</sup> (0.34 m <sup>2</sup> )
Depth:	10" (25.4 cm)
Width:	25" (63.5 cm)
Height:	10" (25.4 cm)
Overall Height:	19" (48.3 cm)
Weight:	61 lbs (27.6 kg)



A+ Capable options indicated  
by this color background.

### Ordering Information

EXAMPLE: HLF1 LED P1 40K WFL MVOLT IS DDBXD

HLF1 LED							
Series	Performance package	Color temperature		Distribution	Voltage	Mounting	Options
HLF1 LED	P1	30K	3000 K	VNSP Very narrow spot (7°) <sup>1</sup>	MVOLT <sup>2</sup>	Shipped included	Shipped installed
	P2	40K	4000 K	MFL Medium flood (6x6)	120 <sup>3</sup>	IS Integral slipfitter (fits 2-7/8" O.D. tenon)	PER NEMA twist-lock receptacle only (controls ordered separately) <sup>4,5</sup>
	P3	50K	5000 K	WFL Wide flood (6x7)	208 <sup>3</sup>	YKC62 Yoke with 16-3 SO cord	PER5 Five-wire receptacle only (controls ordered separately) <sup>4,5</sup>
					240 <sup>3</sup>		PER7 Seven-wire receptacle only (controls ordered separately) <sup>4,5</sup>
					277 <sup>3</sup>		SF Single fuse (120, 277, 347V) <sup>3</sup>
					347 <sup>3</sup>		DF Double fuse (208, 240, 480V) <sup>3</sup>
					480 <sup>3</sup>		CFB Black faceplate
							DMG 0-10v dimming wires pulled outside fixture (for use with an external control, ordered separately)
							Shipped separately
							UBV Upper/bottom visor (universal)
							FV Full visor
							WG Wire guard
							VG Vandal guard (polycarbonate)
							DBBXD Dark bronze
							DBLXD Black
							DNAXD Natural aluminum
							DWHXD White

EXHIBIT  
A.38





## Ordering Information

### Accessories

Ordered and shipped separately.

FTS CG6 DDBXD U	Slipfitter for 2-3/8" to 2-7/8" OD tenons; mates with yoke mount (specify finish)
DSHORT SBK U	Shorting cap <sup>6</sup>
DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V) <sup>6</sup>
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V) <sup>6</sup>
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V) <sup>6</sup>

For more mounting options, visit our [Floodlighting Accessories](#) pages.

For more control options, visit [DTL](#) and [ROAM](#) online.

### NOTES

1. VN5P includes an external reflector that ships separately. For installation instructions, refer to the instruction sheet provided with the reflector. VN5P is limited to aiming from 0-90° only. VN5P is not available for use with options CFB, UVB, FV, WG or VG.
2. MVOLT driver operates on any line voltage from 120-277V.
3. Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
4. Specifies a ROAM® enabled luminaire with 0-10V dimming capability. Additional hardware and services required for ROAM® deployment; must be purchased separately. Call 1-800-442-6745 or email: [sales@roamservices.net](mailto:sales@roamservices.net).
5. For units with a photocell receptacle, the mounting must be restricted to ± 45° from horizontal aim per ANSI C136.10-2010.
6. Requires luminaire to be specified with PER, PER5 or PER7 option. Ordered and shipped as a separate line item.

## Performance Data

### Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Contact factory for performance data on any configurations not shown here.

Performance Package	System Watts	Dist. Type	Field Angle		Beam Angle		30K (3000 K, 70 CRI)			40K (4000 K, 70 CRI)			50K (5000 K, 70 CRI)		
			°H	°V	°H	°V	Max Cd	Lumens	LPW	Max Cd	Lumens	LPW	Max Cd	Lumens	LPW
P1	166W	VN5P	30	30	11	10	217,885	15,596	94	225,623	16,150	97	228,686	16,370	99
		MFL	109	114	84	103	9,070	18,706	113	9,410	19,370	117	7,296	19,633	118
		WFL	124	133	107	113	6,936	18,544	112	7,196	19,203	116	8,533	19,464	117
P2	246W	VN5P	30	30	11	10	302,828	21,677	88	313,583	22,446	91	317,840	22,751	92
		MFL	101	114	84	103	12,834	26,416	107	13,278	27,354	111	10,294	27,725	113
		WFL	124	133	107	113	9,815	26,187	106	10,154	27,117	110	12,040	27,486	112
P3	295W	VN5P	28	28	10	9	400,242	25,129	85	425,929	26,741	91	427,942	26,868	91
		MFL	101	114	84	103	12,468	30,670	104	13,278	32,638	111	10,194	32,792	111
		WFL	127	130	112	112	9,535	30,366	103	12,422	32,315	110	11,923	32,467	110

### Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.05
10°C	50°F	1.03
20°C	68°F	1.01
25°C	77°F	1
30°C	86°F	0.98
40°C	104°F	0.95

### Projected LED Lumen Maintenance

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	HLF1 LED P1			
	1	0.98	0.96	0.93
	HLF1 LED P2			
Lumen Maintenance Factor	1	0.98	0.96	0.93
	HLF1 LED P3			
1	0.93	0.9	0.83	

### Electrical Load

Power Package	System Watts	Current (A)					
		120V	208V	240V	277V	347V	480V
P1	166W	1.4	0.8	0.7	0.7	0.5	0.4
P2	246W	2.1	1.2	1.0	0.9	0.7	0.6
P3	295W	2.5	1.4	1.2	1.1	0.9	0.7

### PER Table

Control	PER (3 wire)	PER5 (5 wire)		PER7 (7 wire)	
		Wire 4/Wire5	Wire 4/Wire5	Wire 4/Wire5	Wire 6/Wire7
Photocontrol Only (On/Off)	✓	Wired to dimming leads on driver	Wired to dimming leads on driver	Wired to dimming leads on driver	Wires Capped inside fixture
ROAM	✗	Wired to dimming leads on driver	Wired to dimming leads on driver	Wired to dimming leads on driver	Wires Capped inside fixture
ROAM with Motion (ROAM on/off only)	✗	Wires Capped inside fixture	Wires Capped inside fixture	Wires Capped inside fixture	Wires Capped inside fixture
Future-proof*	✗	Wired to dimming leads on driver	Wired to dimming leads on driver	Wired to dimming leads on driver	Wires Capped inside fixture
Future-proof* with Motion	✗	Wires Capped inside fixture	Wires Capped inside fixture	Wires Capped inside fixture	Wires Capped inside fixture

✓ Recommended
✗ Will not work
⚠ Alternate

\*Future-proof means: Ability to change controls in the future.





## Mounting, Options and Accessories



IS - Integral slipfitter  
(fits 2-7/8" O.D. tenon)



YKC62  
Yoke with 16-3 50 cord



UBV  
Upper/Bottom visor (universal)



FV  
Full visor



VG  
Vandal guard



WG  
Wire guard



CFB  
Black faceplate

## Optics

Depending on the distribution chosen, luminaires are built using internal and external reflectors.



Internal reflectors  
MFL, WFL

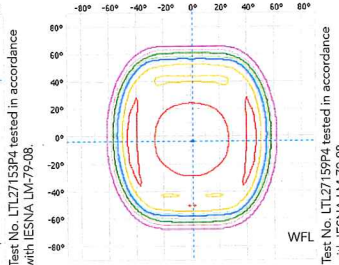
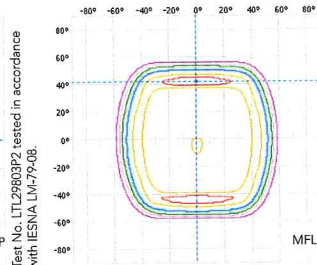
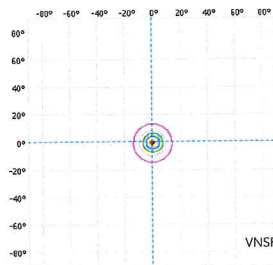
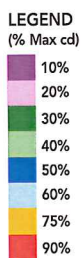


Internal and external reflectors  
VN5P

## Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's [HLF Size 1 homepage](#).

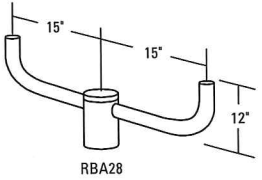
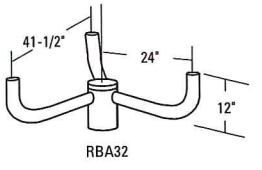
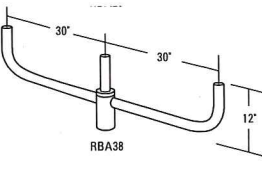
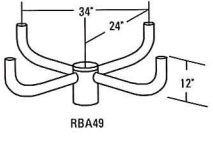
Isofootcandle plots for the HLF1 LED P3 40K. Distances are in units of mount height (20ft).



## Mounting Bracket Summary

The following is a list of approved mounting brackets for use with the HLF1. These are rated for use in up to 90mph wind zones. Mounting brackets are ordered separate from the luminaires.

### \*Aluminum Bullhorns

	Catalog Number	Weight (lbs.)	Max Luminaire Weight/Arm (lbs.)	Bracket EPA ft <sup>2</sup> (m <sup>2</sup> )	Bracket Configuration	Weight of Luminaires (lbs.)	Luminaire Tilt	Luminaire EPA ft <sup>2</sup> (m <sup>2</sup> )	Total EPA ft <sup>2</sup> (m <sup>2</sup> )
 RBA28	*RBA28	8.4	100	1.3 (0.12)	2 @ 180°	2 x 61 = 122	0°	2.4 (0.22)	6.1 (0.57)
							15°	2.5 (0.23)	6.3 (0.59)
							30°	2.8 (0.26)	6.9 (0.64)
							45°	3.5 (0.33)	8.3 (0.77)
							60°	3.6 (0.34)	8.5 (0.79)
							90°	3.6 (0.34)	8.5 (0.79)
 RBA32	*RBA32	14.3	100	1.7 (0.15)	3 @ 120°	3 x 61 = 183	0°	2.4 (0.22)	8.9 (0.83)
							15°	2.5 (0.23)	9.2 (0.85)
							30°	2.8 (0.26)	10.1 (0.94)
							45°	3.5 (0.33)	12.2 (1.13)
							60°	3.6 (0.34)	12.5 (1.16)
							90°	3.6 (0.34)	12.5 (1.16)
 RBA38	*RBA38	12.5	100	2.0 (0.18)	3 @ 180°	3 x 61 = 183	0°	2.4 (0.22)	9.2 (0.85)
							15°	2.5 (0.23)	9.5 (0.88)
							30°	2.8 (0.26)	10.4 (0.97)
							45°	3.5 (0.33)	12.5 (1.16)
							60°	3.6 (0.34)	12.8 (1.19)
							90°	3.6 (0.34)	12.8 (1.19)
 RBA49	*RBA49	17.5	100	2.2 (0.20)	4 @ 180°	4 x 61 = 244	0°	2.4 (0.22)	11.8 (1.10)
							15°	2.5 (0.23)	12.2 (1.13)
							30°	2.8 (0.26)	13.4 (1.24)
							45°	3.5 (0.33)	16.2 (1.51)
							60°	3.6 (0.34)	16.6 (1.54)
							90°	3.6 (0.34)	16.6 (1.54)

\* This can only be used with 4.0" OD tenon/pole tops

November 8, 2019

Konrad Hyle  
Verizon Wireless  
PO Box 1744  
Tualatin, OR 97062

RE: 150' Sabre Monopine for POR Stinger, OR (Sabre Job No. 446974)

Dear Mr. Hyle,

As shown in the above referenced structural design report dated: November 5, 2019, this monopine was designed for a Basic Wind Speed of 120 mph with 1/2" ice, Structure Class II, Exposure Category C and Topographic Category 1 in accordance with the Telecommunications Industry Association Standard ANSI/TIA-222-G, "Structural Standard for Antenna Supporting Structures and Antennas".

When designed according to this standard, the wind pressures and steel strength capacities include several safety factors, resulting in an overall minimum safety factor of 25%. Therefore, it is highly unlikely that the monopine will fail structurally in a wind event where the design wind speed is exceeded within the range of the built-in safety factors.

Should the wind speed increase beyond the capacity of the built-in safety factors, to the point of failure of one or more structural elements, the least likely points of failure would be in the foundation and base plate. The most likely failure point would be higher in the monopine shaft. Assuming that the wind pressure profile is similar to that used to design the monopine, the monopine will buckle at the location of the highest combined stress ratio within the monopine shaft. This is likely to result in the portion of the monopine above leaning over and remaining in a permanently deformed condition. ***Please note that this letter only applies to the above referenced monopine designed and manufactured by Sabre Towers & Poles.***

In addition, a waveguide bridge and ice shields can be provided for protection from falling ice for horizontal runs of transmission lines and microwave antennas, respectively.

Sincerely,

Robert E. Beacom, P.E., S.E.  
Engineering Supervisor

