

Florence



# Building Permit Application

Howard County Maryland  
Department of Inspections, Licenses and Permits  
3430 Court House Drive  
Permits: 410-313-2455  
www.howardcountymd.gov

Date Received: \_\_\_\_\_

Permit No.: **B16001799**

# Health

Building Address: 1960 Old Annapolis Road  
 City: Woodbine State: MD Zip Code: 21797  
 Suite/Apt. # \_\_\_\_\_ SDP/WP/BA #: \_\_\_\_\_  
 Census Tract: \_\_\_\_\_ Subdivision: \_\_\_\_\_  
 Section: \_\_\_\_\_ Area: \_\_\_\_\_ Lot: \_\_\_\_\_  
 Tax Map: 0013 Parcel: 0015 Grid: \_\_\_\_\_  
 Zoning: RC-DEO Map Coordinates: \_\_\_\_\_ Lot Size: 128.34AC

Property Owner's Name: G Lawrence Moore Family LLC  
 Address: 1960 Old Annapolis Road  
 City: Woodbine State: MD Zip Code: 21797  
 Phone: 410 489 5343 Fax: \_\_\_\_\_  
 Email: \_\_\_\_\_

Applicant's Name & Mailing Address, (If other than stated herein)  
 Applicant's Name: Venzon Wireless  
 Address: 7600 Montpelier Rd  
 City: Laurel State: MD Zip Code: \_\_\_\_\_  
 Phone: 443 546 0014 Fax: \_\_\_\_\_  
 Email: hrubinstein@sceeng.com

Contractor Company: SCE  
 Contact Person: Heather Rubinstein **TBD**  
 Address: 9305 Gernig Lane  
 City: Columbia State: MD Zip Code: 21046  
 License No.: TBD  
 Phone: 443 546 0014 Fax: \_\_\_\_\_  
 Email: hrubinstein@sceeng.com

Engineer/Architect Company: Entrex Communications Services Inc  
 Responsible Design Prof.: Marc Marzullo  
 Address: 6600 Rockledge Drive, Suite 550  
 City: Bethesda State: MD Zip Code: 20817  
 Phone: (202) 408 0960 Fax: \_\_\_\_\_  
 Email: mmarzullo@entrex.com

Existing Use: \_\_\_\_\_  
 Proposed Use: Installation (1) Antenna-Wireless Telecom Facility  
 Estimated Construction Cost: \$ 70,000  
 Description of Work: Proposed installation of wireless telecomm facility on existing 140' Monopole at 130' Radiation Center; (2) Antennas & Equipment pad & Generator box  
 Occupant or Tenant: Venzon Wireless and cary  
 Was tenant space previously occupied?  Yes  No  
 Contact Name: Heather Rubinstein of SCE  
 Address: 9305 Gernig Lane Suite P  
 City: Columbia State: MD Zip Code: 21046  
 Phone: 443 546 0014 Fax: \_\_\_\_\_  
 Email: hrubinstein@sceeng.com

Commercial Building Characteristics	Residential Building Characteristics	
Height:	<input type="checkbox"/> SF Dwelling <input type="checkbox"/> SF Townhouse	
No. of stories:	<b>Depth</b>	<b>Width</b>
Gross area, sq. ft./floor:	1 <sup>st</sup> floor:	
	2 <sup>nd</sup> floor:	
Area of construction (sq. ft.):	Basement:	
	<input type="checkbox"/> Finished Basement	
Use group:	<input type="checkbox"/> Unfinished Basement	
	<input type="checkbox"/> Craw Space	
<b>Construction type:</b>	<input type="checkbox"/> Slab on Grade	
<input type="checkbox"/> Reinforced Concrete	No. of Bedrooms:	
<input type="checkbox"/> Structural Steel	<b>Multi-family Dwelling</b>	
<input type="checkbox"/> Masonry	No. of efficiency units:	
<input type="checkbox"/> Wood Frame	No. of 1 BR units:	
<input type="checkbox"/> State Certified Modular	No. of 2 BR units:	
	No. of 3 BR units:	
	Other Structure:	
	Dimensions:	
<b>Roadside Tree Project Permit</b>	Footings:	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Roof:	
<b>Roadside Tree Project Permit #</b>	<input type="checkbox"/> State Certified Modular	
	<input type="checkbox"/> Manufactured Home	

Utilities	
<b>Water Supply</b>	
<input type="checkbox"/> Public	<b>RECEIVED</b>
<input checked="" type="checkbox"/> Private	
<b>Sewage Disposal</b>	
<input type="checkbox"/> Public	APR 27 2016
<input checked="" type="checkbox"/> Private	
Electric: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>LICENSES &amp; PERMITS DIVISION</b>
Gas: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>Heating System</b>	
<input type="checkbox"/> Electric <input type="checkbox"/> Oil	
<input type="checkbox"/> Natural Gas <input type="checkbox"/> Propane Gas	
<input type="checkbox"/> Other:	
<b>Sprinkler System:</b>	
<input type="checkbox"/> Yes <input type="checkbox"/> No	
Grading Permit Number:	
Building Shell Permit Number:	

THE UNDERSIGNED HEREBY CERTIFIES AND AGREES AS FOLLOWS: (1) THAT HE/SHE IS AUTHORIZED TO MAKE THIS APPLICATION; (2) THAT THE INFORMATION IS CORRECT; (3) THAT HE/SHE WILL COMPLY WITH ALL REGULATIONS OF HOWARD COUNTY WHICH ARE APPLICABLE THERETO; (4) THAT HE/SHE WILL PERFORM NO WORK ON THE ABOVE REFERENCED PROPERTY NOT SPECIFICALLY DESCRIBED IN THIS APPLICATION; (5) THAT HE/SHE GRANTS COUNTY OFFICIALS THE RIGHT TO ENTER ONTO THIS PROPERTY FOR THE PURPOSE OF INSPECTING THE WORK PERMITTED AND POSTING NOTICES.

Applicant's Signature: [Signature] for SCE aka Venzon Wireless  
 Print Name: Heather Rubinstein for SCE aka Venzon Wireless  
 Email Address: hrubinstein@sceeng.com  
 Title/Company: SCE Zoning Manager  
 Date: April 27, 2016

Checks Payable to: DIRECTOR OF FINANCE OF HOWARD COUNTY  
 \*\*PLEASE WRITE NEATLY & LEGIBLY\*\*  
 FOR OFFICE USE ONLY

AGENCY	DATE	SIGNATURE OF APPROVAL
<input checked="" type="checkbox"/> State Highways		
<input checked="" type="checkbox"/> Building Officials		
<input checked="" type="checkbox"/> PSZA ( Zoning )		
<input checked="" type="checkbox"/> PSZA ( Engineering )		
<input checked="" type="checkbox"/> Health	<u>5/5/16</u>	<u>H. Oswald</u>

Is Sediment Control approval required for issuance?  Yes  No  
 CONTINGENCY CONSTRUCTION START

DPZ SETBACK INFORMATION

Front: \_\_\_\_\_  
 Rear: \_\_\_\_\_  
 Side: \_\_\_\_\_  
 Side St.: \_\_\_\_\_  
 All minimum setbacks met?  Yes  No  
 Is Entrance Permit Required?  Yes  No  
 Historic District?  Yes  No  
 Lot Coverage for New Town Zone: \_\_\_\_\_  
 SDP/Red-line approval date: \_\_\_\_\_

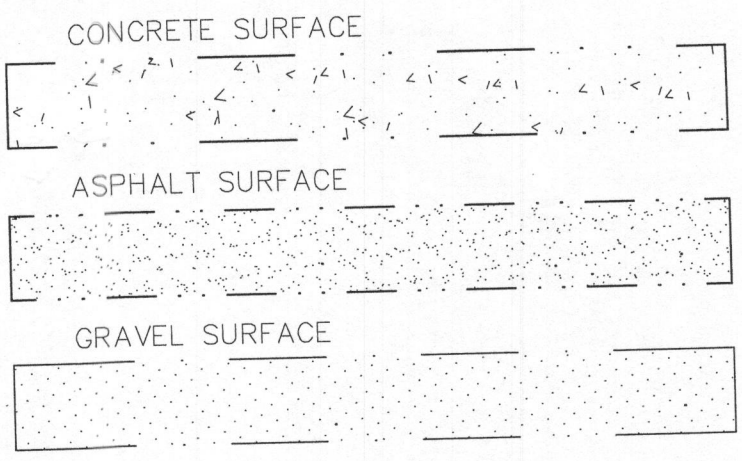
Filing Fee	\$ <u>200.00</u>
Permit Fee	\$
Tech Fee	\$
Excise Tax	\$
PSFS	\$
Guaranty Fund	\$
Add'l per Fee	\$
Total Fees	\$
Sub- Total Paid	\$
Balance Due	\$
Check	#

Distribution of Copies: White: Building Officials Green: PSZA,Zoning Yellow: PSZA,Engineering Pink: Health Gold: SHA

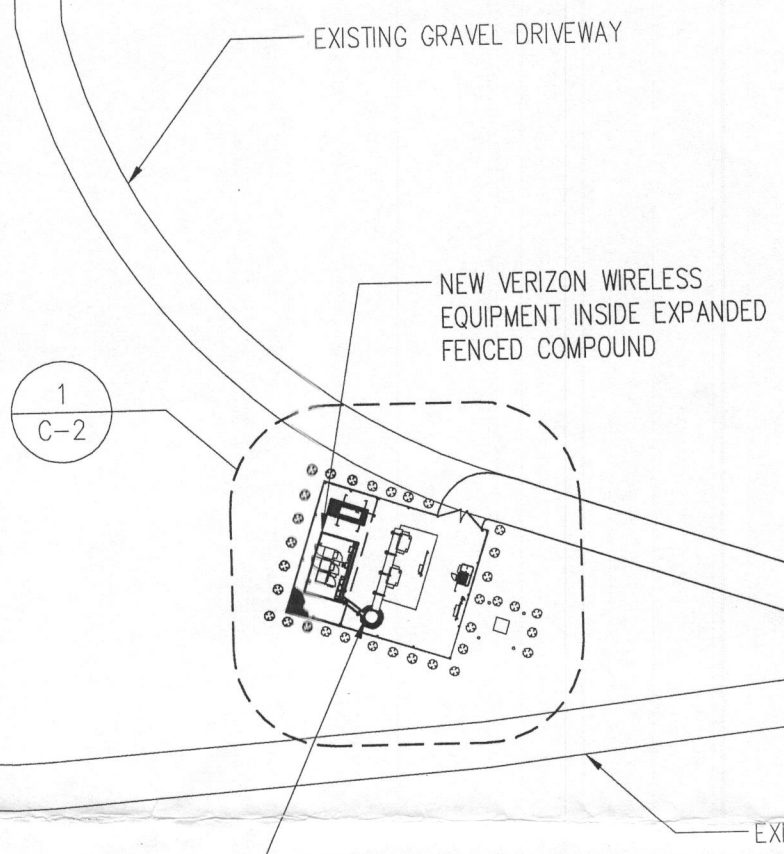
Enter in as commercial no., Per T Hobson

- SIGN
- ☼ LIGHT POLE
- Ⓢ SANITARY MANHOLE
- ⊙ INDIVIDUAL TREE — DECIDUOUS

EXISTING OPEN FIELD



OWNER: G. LAURENCE MOORE FA  
 MAP/PARCEL: 0013/0015  
 DISTRICT: 04 ACCOUNT: 32337  
 128.3 ACRES



VERIZON WIRELESS 24/7  
 INGRESS/EGRESS OVER  
 EXISTING GRAVEL DRIVEWAY

1  
 C-2

EXISTING MONOPOLE IN  
 A FENCED COMPOUND

EXISTING WOODED AREA

**RECEIVED**  
 MAY 08 2006  
 HOWARD COUNTY HEALTH DEPT.  
 BUREAU OF ENVIRONMENTAL HEALTH



HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
3430 Courthouse Drive ■ Ellicott City, Maryland 21043 ■ 410-313-2350

Marsha S. McLaughlin, Director

[www.howardcountymd.gov](http://www.howardcountymd.gov)  
FAX 410-313-3467  
TDD 410-313-2323

July 9, 2014

G. Lawrence Moore Family LLLP  
1960 Old Annapolis Road  
Woodbine, Maryland 21797

RE: WP-14-114, Larriland Farm  
Telecommunications Facility

Dear Owner:

The Director of the Department of Planning and Zoning considered your request for a waiver from the Howard County Subdivision and Land Development Regulations.

As of the date of this letter, the Planning Director **approved** your request to waive **Section 16.155(a)(1)(i)** of the Subdivision and Land Development Regulations, which states that a site development plan is required for expanded nonresidential development, including utility development, and **Section 16.1201(n)** of the Subdivision and Land Development Regulations which states that the net tract area (NTA) should be used in calculating the forest conservation obligation.

Approval is subject to the following conditions:

1. Compliance with the Board of Appeals Case No. 09-043C Decision and Order approved on February 12, 2010 for the original communication facility and the waiver petition exhibit submitted June 18, 2014 for the expansion of the communication facility. The waiver petition plan exhibit shall serve as the substitute for a site development plan for the expansion of the Conditional Use site. The waiver shall apply only to the expanded uses and structures as described in the waiver petition exhibit and not to any other activities, uses, structures or additions. No disturbance shall be permitted beyond the disturbance as shown on the waiver exhibit.
2. In accordance with the Department of Planning and Zoning, Resource Conservation Division comments dated April 22, 2014 – The applicant must amend the Deed of Easement to release 525 square feet from the Agricultural Land Preservation Program. Be advised, since the area released does not exceed the release amount originally approved the proposal does not need further review from the Agricultural Board or County Council.
3. As a condition to use the Limit of Disturbance, instead of the Net Tract Area, for the forest conservation calculation, the Department of Planning and Zoning requires that a fee-in-lieu in the amount of \$827.64 be paid to the Department of Planning and Zoning before construction is initiated on-site. Please be advised this fee is only applicable for the additional limit of disturbance proposed under this petition request. If the applicant decides to further develop the site they will be required to comply with the forest conservation requirements for the entire site.
4. The required landscaping must be in accordance with the waiver petition exhibit and the Howard County Landscape Manual. Since a grading permit application will not be required for these improvements the applicant will not be required to post surety to ensure the completion of your landscaping obligation for this project; however, this Department will still perform an inspection to verify installation of the required plan materials. The inspection fee required for this project is

\$100.00 and must be paid to the Department of Planning and Zoning with the submission of applicable permit.

5. Compliance with all applicable County and State Regulations and obtain all necessary permits from the Department of Inspections, Licenses and Permits prior to initiating development on-site. Submission of a detailed plan similar to the approved waiver petition plan exhibit for any grading and building permits required by the Department of Inspections, Licenses and Permits. Reference and summarize this waiver petition decision on all relevant plans and permit application submissions.

*Advisory Comment from the DPZ, Development Engineering Division – Any future expansion that requires this compound to exceed 5,000 square feet of total disturbance for all construction shall require that stormwater management be provided for the entire compound under current stormwater management regulations.*

Our decision was made based on the following:

*Extraordinary Hardship or Practical Difficulty*

No site development plan exists for this site. The development of the initial telecommunications facility was granted by a previous waiver petition, WP-10-173. Due to the insignificant proposal, compliance with submitting a standard site development plan would provide an extraordinary hardship on the applicant.

*Not Detrimental to the Public Interest*

It has been determined by the Department of Planning and Zoning, Division of Public Service and Zoning Administration, that the minor modification to the existing facility will not require further approval from the Hearing Examiner in accordance with Section 131.0.1.2.c of the Zoning Regulations, which states "The Department of Planning and Zoning may approve minor modifications to the configuration of buildings or other improvements as long as they do not move closer to abutting residential properties."

*Will Not Nullify the Intent or Purpose of the Regulations*

In accordance with the Division of Land Development policy memo dated May 1, 2011 an applicant may submit a waiver petition application for consideration to waive the standard SDP process when only minor alterations or additions are proposed to any existing structures. The proposed telecommunications expansion is 525 square feet and is exempt from stormwater management. The proposed improvements meet the current setbacks and no additional parking is required for the utility expansion. Landscaping will be required along the perimeter of the compound. Therefore, in compliance with the policy memo and the site proposal the intent of the requirement a site development plan is not being nullified.

It was recommended by DPZ that the applicant apply for a waiver to use the limit of disturbance rather than the net tract area for the forest conservation obligation since the primary use of the parcel is agricultural and the total area of disturbance for the proposed commercial use is 707 square feet. As a condition the DPZ has required that a fee-in-lieu for forest conservation be paid based on the forest conservation calculations. Also, DPZ will require that any development, other than what is shown in this waiver exhibit, must conform to the full Forest Conservation Regulations at that time.

Indicate this waiver petition file number, request, section of the regulations, action, conditions of approval, and date on all related plats, and site development plans, and building permits. This requested waiver will remain valid for one year from the date of this letter or as long as the permit remains in active processing.

If you have any questions, please contact Julia Boone at (410) 313-2350 or email at [jboone@howardcountymd.gov](mailto:jboone@howardcountymd.gov).

Sincerely,



Kent Sheubrooks, Chief  
Division of Land Development

KS/jb

cc: Research  
DED  
DILP  
Zoning  
Landscape Coordinator  
DNR – Marian Honeczy  
Hillorie Morrison

Florence



# Building Permit Application

Howard County Maryland  
Department of Inspections, Licenses and Permits  
3430 Court House Drive  
Permits: 410-313-2455  
www.howardcountymd.gov

Date Received: \_\_\_\_\_

Permit No.: **B16001799**

Health

Building Address: 1960 Old Annapolis Road  
 City: Woodbine State: MD Zip Code: 21797  
 Suite/Apt. # \_\_\_\_\_ SDP/WP/BA #: \_\_\_\_\_  
 Census Tract: \_\_\_\_\_ Subdivision: \_\_\_\_\_  
 Section: \_\_\_\_\_ Area: \_\_\_\_\_ Lot: \_\_\_\_\_  
 Tax Map: 0013 Parcel: 0015 Grid: \_\_\_\_\_  
 Zoning: RC-DEO Map Coordinates: \_\_\_\_\_ Lot Size: 128.34AC

Existing Use: \_\_\_\_\_  
 Proposed Use: Installation (1) Antenna-Wireless telecom Facility  
 Estimated Construction Cost: \$ 70,000  
 Description of Work: Proposed installation of wireless telecomm facility on existing 140' Monopole at 130' Radiation Center; (2) Antennas & Equipment pad & Generator box  
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 Was tenant space previously occupied?  Yes  No  
 Contact Name: Heather Rubinstein of SCE  
 Address: 9305 Gernig Lane Suite P  
 City: Columbia State: MD Zip Code: 21046  
 Phone: 443 546 0014 Fax: \_\_\_\_\_  
 Email: hrubinstein@sceeng.com

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 Address: 1960 Old Annapolis Road  
 City: Woodbine State: MD Zip Code: 21797  
 Phone: 410 489 5343 Fax: \_\_\_\_\_  
 Email: \_\_\_\_\_

Applicant's Name & Mailing Address, (If other than stated herein)  
 Applicant's Name: Venzon Wireless  
 Address: 7600 Montpelier Rd  
 City: Laurel State: MD Zip Code: \_\_\_\_\_  
 Phone: 443 546 0014 Fax: \_\_\_\_\_  
 Email: hrubinstein@sceeng.com

Contractor Company: SCE  
 Contact Person: Heather Rubinstein **TBD**  
 Address: 9305 Gernig Lane  
 City: Columbia State: MD Zip Code: 21046  
 License No.: TBD  
 Phone: 443 546 0014 Fax: \_\_\_\_\_  
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Engineer/Architect Company: Entrex Communications Services Inc  
 Responsible Design Prof.: Marc Marzullo  
 Address: 6600 Rockledge Drive, Suite 550  
 City: Bethesda State: MD Zip Code: 20817  
 Phone: (202) 408 0960 Fax: \_\_\_\_\_  
 Email: mmarzullo@entrex.com

Commercial Building Characteristics	Residential Building Characteristics	
Height:	<input type="checkbox"/> SF Dwelling <input type="checkbox"/> SF Townhouse	
No. of stories:	<b>Depth</b>	<b>Width</b>
Gross area, sq. ft./floor:	1 <sup>st</sup> floor:	
	2 <sup>nd</sup> floor:	
Area of construction (sq. ft.):	Basement:	
	<input type="checkbox"/> Finished Basement	
Use group:	<input type="checkbox"/> Unfinished Basement	
	<input type="checkbox"/> Craw Space	
<b>Construction type:</b>	<input type="checkbox"/> Slab on Grade	
<input type="checkbox"/> Reinforced Concrete	No. of Bedrooms:	
<input type="checkbox"/> Structural Steel	<b>Multi-family Dwelling</b>	
<input type="checkbox"/> Masonry	No. of efficiency units:	
<input type="checkbox"/> Wood Frame	No. of 1 BR units:	
<input type="checkbox"/> State Certified Modular	No. of 2 BR units:	
	No. of 3 BR units:	
	Other Structure:	
	Dimensions:	
<b>Roadside Tree Project Permit</b>	Footings:	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Roof:	
<b>Roadside Tree Project Permit #</b>	<input type="checkbox"/> State Certified Modular	
	<input type="checkbox"/> Manufactured Home	

Utilities	
<b>Water Supply</b>	
<input type="checkbox"/> Public	<b>RECEIVED</b>
<input checked="" type="checkbox"/> Private	
<b>Sewage Disposal</b>	
<input type="checkbox"/> Public	APR 27 2016
<input checked="" type="checkbox"/> Private	
Electric: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<b>LICENSES &amp; PERMITS DIVISION</b>
Gas: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
<b>Heating System</b>	
<input type="checkbox"/> Electric <input type="checkbox"/> Oil	
<input type="checkbox"/> Natural Gas <input type="checkbox"/> Propane Gas	
<input type="checkbox"/> Other:	
<b>Sprinkler System:</b>	
<input type="checkbox"/> Yes <input type="checkbox"/> No	
Grading Permit Number:	
Building Shell Permit Number:	

THE UNDERSIGNED HEREBY CERTIFIES AND AGREES AS FOLLOWS: (1) THAT HE/SHE IS AUTHORIZED TO MAKE THIS APPLICATION; (2) THAT THE INFORMATION IS CORRECT; (3) THAT HE/SHE WILL COMPLY WITH ALL REGULATIONS OF HOWARD COUNTY WHICH ARE APPLICABLE THERETO; (4) THAT HE/SHE WILL PERFORM NO WORK ON THE ABOVE REFERENCED PROPERTY NOT SPECIFICALLY DESCRIBED IN THIS APPLICATION; (5) THAT HE/SHE GRANTS COUNTY OFFICIALS THE RIGHT TO ENTER ONTO THIS PROPERTY FOR THE PURPOSE OF INSPECTING THE WORK PERMITTED AND POSTING NOTICES.

Applicant's Signature: [Signature] for SCE aka Venzon Wireless Heather Rubinstein for SCE aka Venzon Wireless  
 Print Name: \_\_\_\_\_  
 Email Address: hrubinstein@sceeng.com  
 Title/Company: SCE Zoning Manager  
 Date: April 27, 2016

Checks Payable to: DIRECTOR OF FINANCE OF HOWARD COUNTY  
 \*\*PLEASE WRITE NEATLY & LEGIBLY\*\*  
 FOR OFFICE USE ONLY

AGENCY	DATE	SIGNATURE OF APPROVAL
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Is Sediment Control approval required for issuance?  Yes  No  
 CONTINGENCY CONSTRUCTION START

**DPZ SETBACK INFORMATION**

Front: \_\_\_\_\_  
 Rear: \_\_\_\_\_  
 Side: \_\_\_\_\_  
 Side St.: \_\_\_\_\_  
 All minimum setbacks met?  Yes  No  
 Is Entrance Permit Required?  Yes  No  
 Historic District?  Yes  No  
 Lot Coverage for New Town Zone: \_\_\_\_\_  
 SDP/Red-line approval date: \_\_\_\_\_

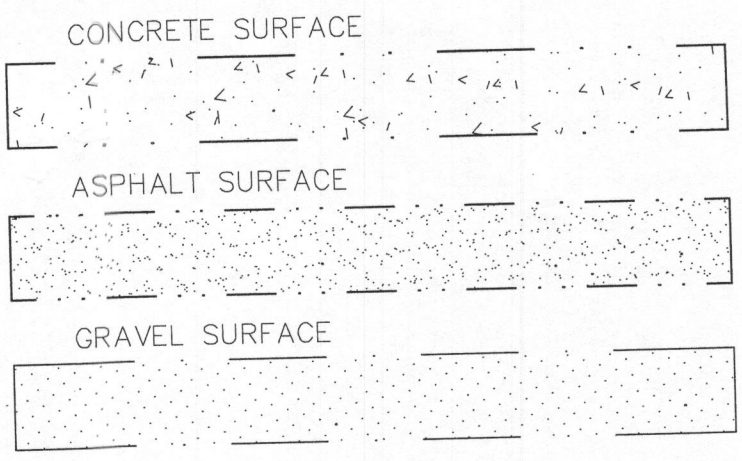
Filing Fee	\$ <u>200.00</u>
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Total Fees	\$
Sub- Total Paid	\$
Balance Due	\$
Check	#

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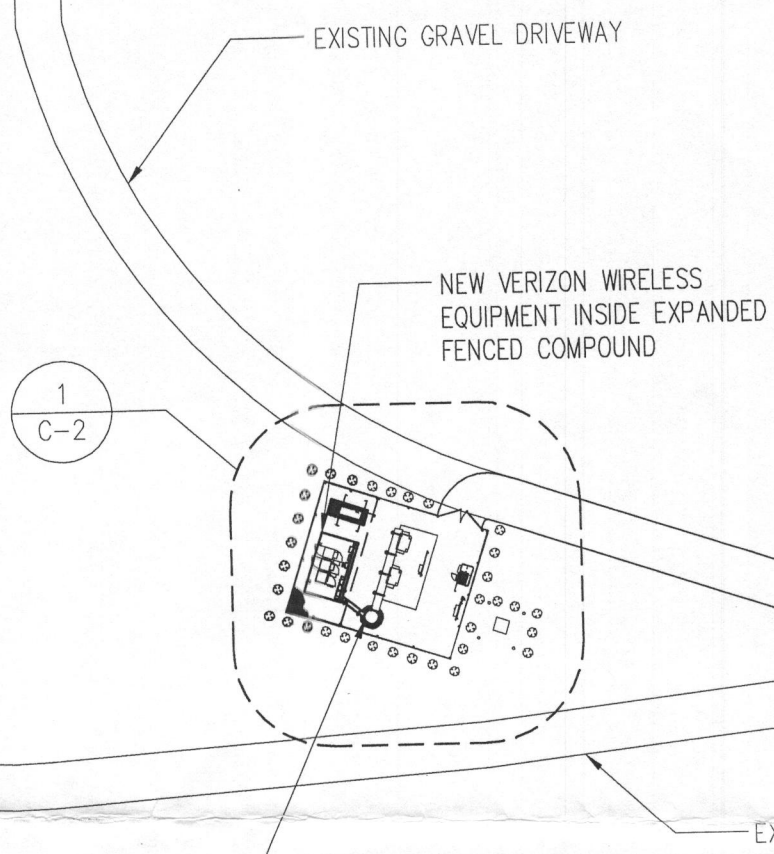
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- SIGN
- ☼ LIGHT POLE
- Ⓢ SANITARY MANHOLE
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EXISTING OPEN FIELD



OWNER: G. LAURENCE MOORE FA  
 MAP/PARCEL: 0013/0015  
 DISTRICT: 04 ACCOUNT: 32337  
 128.3 ACRES



VERIZON WIRELESS 24/7  
 INGRESS/EGRESS OVER  
 EXISTING GRAVEL DRIVEWAY

1  
 C-2

EXISTING MONOPOLE IN  
 A FENCED COMPOUND

EXISTING WOODED AREA

**RECEIVED**  
 MAY 08 2006  
 HOWARD COUNTY HEALTH DEPT.  
 BUREAU OF ENVIRONMENTAL HEALTH



HOWARD COUNTY DEPARTMENT OF PLANNING AND ZONING  
3430 Courthouse Drive ■ Ellicott City, Maryland 21043 ■ 410-313-2350

Marsha S. McLaughlin, Director

[www.howardcountymd.gov](http://www.howardcountymd.gov)  
FAX 410-313-3467  
TDD 410-313-2323

July 9, 2014

G. Lawrence Moore Family LLLP  
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Approval is subject to the following conditions:

1. Compliance with the Board of Appeals Case No. 09-043C Decision and Order approved on February 12, 2010 for the original communication facility and the waiver petition exhibit submitted June 18, 2014 for the expansion of the communication facility. The waiver petition plan exhibit shall serve as the substitute for a site development plan for the expansion of the Conditional Use site. The waiver shall apply only to the expanded uses and structures as described in the waiver petition exhibit and not to any other activities, uses, structures or additions. No disturbance shall be permitted beyond the disturbance as shown on the waiver exhibit.
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*Advisory Comment from the DPZ, Development Engineering Division – Any future expansion that requires this compound to exceed 5,000 square feet of total disturbance for all construction shall require that stormwater management be provided for the entire compound under current stormwater management regulations.*

Our decision was made based on the following:

*Extraordinary Hardship or Practical Difficulty*

No site development plan exists for this site. The development of the initial telecommunications facility was granted by a previous waiver petition, WP-10-173. Due to the insignificant proposal, compliance with submitting a standard site development plan would provide an extraordinary hardship on the applicant.

*Not Detrimental to the Public Interest*

It has been determined by the Department of Planning and Zoning, Division of Public Service and Zoning Administration, that the minor modification to the existing facility will not require further approval from the Hearing Examiner in accordance with Section 131.0.1.2.c of the Zoning Regulations, which states "The Department of Planning and Zoning may approve minor modifications to the configuration of buildings or other improvements as long as they do not move closer to abutting residential properties."

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Indicate this waiver petition file number, request, section of the regulations, action, conditions of approval, and date on all related plats, and site development plans, and building permits. This requested waiver will remain valid for one year from the date of this letter or as long as the permit remains in active processing.

If you have any questions, please contact Julia Boone at (410) 313-2350 or email at [jboone@howardcountymd.gov](mailto:jboone@howardcountymd.gov).

Sincerely,



Kent Sheubrooks, Chief  
Division of Land Development

KS/jb

cc: Research  
DED  
DILP  
Zoning  
Landscape Coordinator  
DNR – Marian Honeczy  
Hillorie Morrison

DEPARTMENT OF PLANNING AND ZONING  
DEVELOPMENT ENGINEERING DIVISION

June 24, 2014

RECEIVED

JUN 25 2014

Division of Land Development  
Department of Planning & Zoning

TO: Kent Sheubrooks, Chief  
Division of Land Development

FROM: Chad Edmondson, P.E., Chief  
Development Engineering Division

Project Engineer: Philip M. Thompson

RE: DP&Z File #: WP-14-114

Larriland Farm – T-Mobile

Based on a revised submission addressing our previous comments dated April 8, 2014, we revise our comments as follows:

After review of the submitted information requesting a waiver of the Subdivision and Land Development Regulations, Section 16.155(a)(1)(i), requiring the submission of a Site Development Plan approved by the Department of Planning and Zoning for all non-residential development, this Division has **NO OBJECTION**. Please be advised that the current exemption is for the total disturbance under WP-10-137 and WP-14-114 for 1,832 sft. Any future expansion that requires this compound to exceed 5,000 sft of total disturbance for all construction shall require that stormwater management be provided for the entire compound under current stormwater management regulations.

DF&RS (Chuck Ridgely, 410-313-6047, FD1232@howardcountymd.gov)

1. No comments.

MSHA (Scott Newell, 410-545-5606, SNewill@sha.state.md.us)

1. No comments.

H:\COMMENTS\WAIVERS\2014\WP14114.1.docx



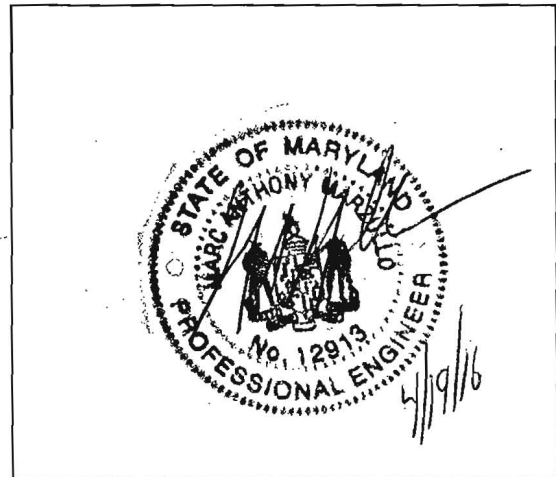
Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	10/19
Client:	Verizon Wireless			Date:	4/10/2016
Site Name:	Florence			Date:	
Site Number:				Date:	

**STRUCTURAL NARRATIVE & CALCULATIONS**

**VERIZON WIRELESS  
FLORENCE**

**1960 OLD ANNAPOLIS ROAD  
WOODBINE, MARYLAND 21797**

Engineer: R Crumrine  
Checked By: M Marzullo



Engineer's Seal & Signature

PREPARED BY:  
ENTREX COMMUNICATION SERVICES, INC.  
6600 ROCKLEDGE DRIVE, SUITE 550  
BETHESDA, MARYLAND 20817  
TEL: (202) 408-0960



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	2
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	

## TABLE OF CONTENTS

Sections	Page Number
1.0 Introduction	3
2.0 Criteria	3
3.0 Assumptions	3
4.0 Conclusion	4
5.0 Calculations	
a. Evaluate the Soil Bearing Capacity - Equipment Slab on Grade	5
b. Antenna & RRH Effective Projected Area (EPA) Calculations	7
c. Qualitative Analysis of the Low Profile Platform	12
d. Qualitative Analysis of the Low Profile Platform - Pipe Mounts	13
6.0 Attachments	
a. Site Pro 1 Platform Rating	15

0	Original Report	RMC	MM	MM	4/19/2016
No.	Reason for Revision	Engr	Checked	Approved	Date

Records of Revision Block



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	3
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	

## 1.0 Introduction

This calculation was prepared to evaluate the soil bearing capacity to support the Verizon Wireless equipment loads on the ground and to evaluate the low profile platform on the monopole located at 1960 Old Annapolis Road, Woodbine, Maryland 21797.

## 2.0 Criteria

The existing structure was analyzed and the new support frame was designed in accordance of the codes and standards listed below:

- |                |  |
|----------------|--|
| a. 2012 IBC    | 2012 International Building Code, International Code Council                           |
| b. ASCE 7-10   | Minimum Design Loads for Building and Other Structure                                  |
| c. AISC 360-10 | Specification for Structural Steel Building Allowable Stress Design 14th Edition, AISC |
| d. ACI 318-11  | Building Code Requirement for Structural Concrete                                      |

## 3.0 Assumptions

- This analysis assumes that the original building structure members were properly designed and installed in accordance with the original drawings.
- This analysis assumes that the as-built members are load-rated designed and constructed in accordance with accepted industry-wide standards.
- This analysis assumes that the as-built conditions are structurally sound and properly maintained in accordance with the referenced standard and manufacturer's requirements.
- Structural member sizes, building geometry, connection designs or steel/concrete/masonry material yield strengths, contrary to those assumed for the purpose of preparing this report could alter the findings and conclusions as stated.
- The investigation of the structure or design of the structure analysis uses STAAD Pro finite element structural analysis computer program. In this analysis a finite element mathematical model of the structure was prepared based upon the exact structure geometry. The overall finite element model was loaded with live, dead & wind loading and weight associated with the structure itself.
- For any structural components that were found to be rated up to 105% of its design capacity may be deemed acceptable. Overstressed percentages of 5% or less are considered to be within the accuracy limits of the calculations and are not consider to be critical.



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	4
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	

## 4.0 Conclusion

### Verizon Wireless Slab on Grade

The soil bearing capacity is structurally adequate to support Verizon Wireless canopy loads and equipment loads.

### Verizon Wireless Low Profile Platform on Monopole:

The Site Pro 1 Low Profile Platform and pipe mounts were found to be adequate to support the proposed Verizon Wireless antenna loads and RRH loads in accordance with the TIA-222-G Standard.



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	6
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:	Evaluate the Soil Bearing Capacity - Equipment Slab on Grade				

**Proposed Loads:**

Verizon Wireless Equipment Load Parameters

Slab on Grade Width =	10.0	ft
Slab on Grade Length =	16.0	ft
Slab on Grade Thickness =	12	in
Bearing Area =	160	sf
Concrete Pad Wt =	24000	lbs
(2) Charles Cabinet Wt =	2000	lbs
(1) Battery Cabinet Wt =	3450	lbs
Utility Wt =	400	lbs
Canopy Self Wt =	1450	lbs

Total Gravity Load = 31300 lbs

Use Total Gravity Wt = 32000 lbs

Actual Bearing Pressure = 200 psf  
Allowable Bearing Pressure = 1500 psf

**Conclusion**

The computed actual bearing pressure is less than the allowable bearing pressure. The foundation is structurally adequate to support Verizon Wireless loads.



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	7
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:	Antenna & RRH Effective Projected Area (EPA) Calculations				

## 5.0 Structural Calculations

### b. Antenna & RRH Effective Projected Area (EPA) Calculations

**Problem Statement:** The purpose of this calculations to compute the total EPA and the total weight in accordance with the TIA-222-G Standard.

Model = JMA Wireless X7C-FRO-660

Total Number of Antennas = 6  
 Number of Antennas at Front = 2  
 Number of Antennas at Side = 4  
 Front  $\Theta$  = 0 degrees  
 Side  $\Theta$  = 60 degrees  
 Height = 72.00 in  
 Width = 14.60 in  
 Depth = 8.00 in  
 Weight = 45 lbs  
 Aspect Ratio: Front = 4.93  
 Aspect Ratio: Side = 9.00  
 Ca : Front = 1.31  
 Ca: Side = 1.47  
 Ka = 0.8  
 EPA<sub>N</sub> = 9.55 sf  
 EPA<sub>T</sub> = 5.87 sf

$$EPA_A = Ka (EPA_N \cos^4 \Theta + EPA_T \sin^4 \Theta)$$

EPA<sub>A</sub> = 15.28 sf  
 LPA<sub>A</sub> = 21.72 sf

Total Weight =	270	lbs
Total EPA <sub>A</sub> =	37.00	sf

Model = JMA Wireless AXP19-60

Total Number of Antennas = 6  
 Number of Antennas at Front = 2  
 Number of Antennas at Side = 4  
 Front  $\Theta$  = 0 degrees  
 Side  $\Theta$  = 60 degrees  
 Height = 69.10 in  
 Width = 6.70 in  
 Depth = 4.10 in  
 Weight = 28 lbs  
 Aspect Ratio: Front = 10.31  
 Aspect Ratio: Side = 16.85  
 Ca : Front = 1.51  
 Ca: Side = 1.73  
 Ka = 0.8  
 EPA<sub>N</sub> = 4.86 sf  
 EPA<sub>T</sub> = 3.40 sf

$$EPA_A = Ka (EPA_N \cos^4 \Theta + EPA_T \sin^4 \Theta)$$

EPA<sub>A</sub> = 7.77 sf  
 LPA<sub>A</sub> = 12.05 sf

Total Weight =	168	lbs
Total EPA <sub>A</sub> =	19.82	sf



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	8
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:	Antenna & RRH Effective Projected Area (EPA) Calculations				

Model = 2100 MHz RRH

Total Number of RRHs = 3  
 Number of RRHs at Front = 1  
 Number of RRHs at Side = 2  
 Front  $\Theta$  = 0 degrees  
 Side  $\Theta$  = 60 degrees  
 Height = 36.60 in  
 Width = 10.63 in  
 Depth = 5.74 in  
 Weight = 55 lbs  
 Aspect Ratio: Front = 3.44  
 Aspect Ratio: Side = 6.38  
 Ca : Front = 1.24  
 Ca: Side = 1.37  
 Ka = 0.8  
 EPA<sub>N</sub> = 3.36 sf  
 EPA<sub>T</sub> = 2.00 sf

$$EPA_A = Ka (EPA_N \cos^2 \Theta + EPA_T \sin^2 \Theta)$$

EPA<sub>A</sub> = 2.68 sf  
 EPA<sub>A</sub> = 3.74 sf

Total Weight =	165	lbs
Total EPA <sub>A</sub> =	6.43	sf

Model = Future RRH

Total Number of RRHs = 3  
 Number of RRHs at Front = 1  
 Number of RRHs at Side = 2  
 Front  $\Theta$  = 0 degrees  
 Side  $\Theta$  = 60 degrees  
 Height = 36.60 in  
 Width = 10.63 in  
 Depth = 5.74 in  
 Weight = 55 lbs  
 Aspect Ratio: Front = 3.44  
 Aspect Ratio: Side = 6.38  
 Ca : Front = 1.24  
 Ca: Side = 1.37  
 Ka = 0.8  
 EPA<sub>N</sub> = 3.36 sf  
 EPA<sub>T</sub> = 2.00 sf

$$EPA_A = Ka (EPA_N \cos^2 \Theta + EPA_T \sin^2 \Theta)$$

EPA<sub>A</sub> = 2.68 sf  
 EPA<sub>A</sub> = 3.74 sf

Total Weight =	165	lbs
Total EPA <sub>A</sub> =	6.43	sf



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	9
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:	Antenna & RRH Effective Projected Area (EPA) Calculations				

Model = 700 MHz RRH

Total Number of RRHs = 3  
 Number of RRHs at Front = 1  
 Number of RRHs at Side = 2  
 Front  $\Theta$  = 0 degrees  
 Side  $\Theta$  = 60 degrees  
 Height = 20.90 in  
 Width = 11.80 in  
 Depth = 7.50 in  
 Weight = 56 lbs  
 Aspect Ratio: Front = 1.77  
 Aspect Ratio: Side = 2.79  
 Ca : Front = 1.20  
 Ca: Side = 1.21  
 Ka = 0.8  
 EPA<sub>N</sub> = 2.06 sf  
 EPA<sub>T</sub> = 1.32 sf

$$EPA_A = Ka (EPA_N \cos^4 \Theta + EPA_T \sin^4 \Theta)$$

EPA<sub>A</sub> = 1.64 sf  
 EPA<sub>A</sub> = 2.41 sf

Total Weight =	168	lbs
Total EPA <sub>A</sub> =	4.05	sf

Model = 1900 MHz RRH

Total Number of RRHs = 3  
 Number of RRHs at Front = 1  
 Number of RRHs at Side = 2  
 Front  $\Theta$  = 0 degrees  
 Side  $\Theta$  = 60 degrees  
 Height = 21.20 in  
 Width = 12.00 in  
 Depth = 7.20 in  
 Weight = 53 lbs  
 Aspect Ratio: Front = 1.77  
 Aspect Ratio: Side = 2.94  
 Ca : Front = 1.20  
 Ca: Side = 1.22  
 Ka = 0.8  
 EPA<sub>N</sub> = 2.12 sf  
 EPA<sub>T</sub> = 1.29 sf

$$EPA_A = Ka (EPA_N \cos^4 \Theta + EPA_T \sin^4 \Theta)$$

EPA<sub>A</sub> = 1.70 sf  
 EPA<sub>A</sub> = 2.40 sf

Total Weight =	159	lbs
Total EPA <sub>A</sub> =	4.10	sf



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	10
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective: Antenna & RRH Effective Projected Area (EPA) Calculations					

Model = Raycap

Total Number of Boxes = 2

Number of Boxes at Front = 3

Number of Boxes at Side = 0

Front  $\Theta$  = 0 degrees

Side  $\Theta$  = 60 degrees

Height = 28.93 in

Width = 15.80 in

Depth = 10.30 in

Weight = 27 lbs

Aspect Ratio: Front = 1.83

Aspect Ratio: Side = 2.81

Ca : Front = 1.20

Ca: Side = 1.21

Ka = 0.8

EPA<sub>N</sub> = 3.81 sf

EPA<sub>T</sub> = 2.51 sf

$$EPA_A = Ka (EPA_N \cos^2 \Theta + EPA_T \sin^2 \Theta)$$

EPA<sub>A</sub> = 9.14 sf

EPA<sub>A</sub> = 0.00 sf

Total Weight =	54	lbs
Total EPA <sub>A</sub> =	9.14	sf

Model = Site Pro Stiffener Kit HRK12

Total Number of Horiz Pipes = 3

Number of Mounts at Front = 1

Number of Mounts at Side = 2

Front  $\Theta$  = 0 degrees

Side  $\Theta$  = 60 degrees

Weight = - lbs

Front EPA = 2.55 sf

Side EPA = 2.55 sf

Total Weight =	262	lbs
Total EPA <sub>A</sub> =	5.11	sf



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	11
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:	Antenna & RRH Effective Projected Area (EPA) Calculations				

EPA Summary

Weight Summary

JMA Wireless X7C-FRO-660	=	37.0	sf
JMA Wireless AXP19-60	=	19.8	sf
2100 MHz RRH	=	6.4	sf
Future RRH	=	6.4	sf
700 MHz RRH	=	4.1	sf
1900 MHz RRH	=	4.1	sf
Raycap	=	9.1	sf
Site Pro Stiffener Kit HRK12	=	5.1	sf

JMA Wireless X7C-FRO-660	=	270	lbs
JMA Wireless AXP19-60	=	168	lbs
2100 MHz RRH	=	165	lbs
Future RRH	=	165	lbs
700 MHz RRH	=	168	lbs
1900 MHz RRH	=	159	lbs
Raycap	=	54	lbs
Site Pro Stiffener Kit HRK12	=	262	lbs

Total EPA<sub>s</sub> = 92.1 sf

Total Weight = 1411 lbs



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	12
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:	Qualitative Analysis of the Low Profile Platform			Platform	

## 5.0 Structural Calculations

### c. Qualitative Analysis of the Low Profile Platform

**Problem Statement:** The purpose of this evaluate the low profile platform to support the Verizon Wireless loads on the monopole in accordance with the TIA-222-G Standard.

Compute Antenna Pipe Mount & Platform Capacity of Site Pro 1 Low Profile Platform Model: RMQP-496

Code = ANSI/TIA-222-G-2005 Standards

The low profile platform capacity is based on as follows (See attached Site Pro 1 Rating for additional details):

Max Low Profile Platform Shear Load = 4880 lbs per Platform (See Site Pro 1 Rating attachments)

Compute Verizon Antenna & RRH Wind Load Per Low Profile Platform

Code = ANSI/TIA-222-G-2005 Standards

Proposed RAD Elev = 130 ft  
 Exposure Category = C  
 Structure Class = II  
 Kz = 1.34  
 Kzt = 1.00  
 Kd = 0.95 Pole Structures  
 V = 90 mph  
 I = 1.00  
 Gh = 1.10 Pole Structures  
 qz = 26.35 psf (  $qz = 0.00256 Kz Kzt Kd V^2 I$  )  
 qz Gh = 28.98 psf

Total EPA<sub>s</sub> = 92.1 sf (See Calculation on Section 5b)

Max Low Profile Platform Wind Load = 2668 lbs per Low Profile Platform < 4880 lbs OK

**Conclusion**

Based on the calculation, the proposed Verizon Wireless antenna wind loads & RRH wind loads are less than the Site Pro 1 Low Profile Platform capacity.



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	13
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:	Qualitative Analysis of the Low Profile Platform			Pipe Mounts	

## 5.0 Structural Calculations

### d. Qualitative Analysis of the Low Profile Platform - Pipe Mounts

**Problem Statement:** The purpose of this evaluate the low profile platform mounting pipes to support the Verizon Wireless loads on the monopole in accordance with the TIA-222-G Standard.

#### Verizon Wireless Antenna and Appurtenance Summary Loading

#### Calculate Normal EPA & Weight on a Site Pro 1 Low Profile Platform

Verizon Wireless							Normal		
							Each	Total	Total
Qty	Description & Model	Height (in)	Width (in)	Depth (in)	Weight (lbs)	Ca	CaAa (sf)	CaAa (sf)	Weight (lbs)
Elevation = 130 ft									
6	JMA Wireless X7C-FRO-660	72.00	14.60	8.00	45	1.31	9.55	57.3	270
6	JMA Wireless AXP19-60	69.40	6.70	4.10	28	1.51	4.88	29.3	168
3	2100 MHz RRH	36.60	10.63	5.74	55	1.24	3.36	10.1	165
3	Future RRH	36.60	10.63	5.74	55	1.24	3.36	10.1	165
3	700 MHz RRH	20.90	11.80	7.50	56	1.20	2.06	6.2	168
3	1900 MHz RRH	21.20	12.00	7.20	53	1.20	2.12	6.4	159
2	Raycap, RCMDC-3315-PF-48 (on Platform)	28.90	15.80	10.30	27	1.20	3.81	7.6	54
1	Handrail Site Pro 1 HRK 12				262		-	5.1	262

Total Normal Gross EPA = 132.0 sf

Total Antenna wt = 1411.0 lbs

#### Calculate Tangential EPA

Verizon Wireless							Tangential		
							Each	Total	
Qty	Description & Model	Height (in)	Width (in)	Depth (in)	Weight (lbs)	Ca	CaAa (sf)	CaAa (sf)	
Elevation = 130 ft									
6	JMA Wireless X7C-FRO-660	72.00	14.60	8.00	45.00	1.20	4.80	28.8	
6	JMA Wireless AXP19-60	69.40	6.70	4.10	28.00	1.20	2.37	14.2	
3	2100 MHz RRH	36.60	10.63	5.74	55.00	1.20	1.75	5.3	
3	Future RRH	36.60	10.63	5.74	55.00	1.20	1.75	5.3	
3	700 MHz RRH	20.90	11.80	7.50	56.00	1.20	1.31	3.9	
3	1900 MHz RRH	21.20	12.00	7.20	53.00	1.20	1.27	3.8	
2	Raycap, RCMDC-3315-PF-48 (on Platform)	28.90	15.80	10.30	27.00	1.20	2.48	5.0	
1	Handrail Site Pro 1 HRK 12				262		-	5.1	

Total Tangential Gross EPA = 71.3 sf

#### Compute CaAa Per Antenna Pipe Mount

	Normal	Tangential
JMA Wireless X7C-FRO-660, EPA =	9.55 sf	4.80 sf
Future RRH, EPA =	3.36 sf	1.75 sf
	<u>12.90 sf</u>	<u>6.55 sf</u>

#### Compute Dead Load Antenna Pipe Mount

JMA Wireless X7C-FRO-660, Wt =	45 lbs
Future RRH, Wt =	55 lbs
	<u>100 lbs</u>

#### Compute CaAa Per Antenna Pipe Mount

	Normal	Tangential
JMA Wireless X7C-FRO-660, EPA =	9.55 sf	4.80 sf
Alcatel Lucent 700 MHz, EPA =	2.06 sf	1.31 sf
	<u>11.60 sf</u>	<u>6.11 sf</u>

JMA Wireless X7C-FRO-660, Wt =	45 lbs
Alcatel Lucent 700 MHz, Wt =	56 lbs
	<u>101 lbs</u>

#### Compute CaAa Per Antenna Pipe Mount

	Normal	Tangential
JMA Wireless AXP19-60, EPA =	4.88 sf	2.37 sf
Alcatel Lucent 2100 MHz, EPA =	3.36 sf	1.75 sf
	<u>8.24 sf</u>	<u>4.12 sf</u>

JMA Wireless AXP19-60, Wt =	28 lbs
Alcatel Lucent 2100 MHz, Wt =	55 lbs
	<u>83 lbs</u>



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	14
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:	Qualitative Analysis of the Low Profile Platform			Pipe Mounts	

Compute CaAa Per Antenna Pipe Mount

JMA Wireless AXP19-60, EPA =	4.88	sf	2.37	sf	JMA Wireless AXP19-60, Wt =	28	lbs
Alcatel Lucent 1900 MHz, EPA =	2.12	sf	1.27	sf	Alcatel Lucent 1900 MHz, Wt =	53	lbs
	<u>7.00</u>	sf	<u>3.64</u>	sf		<u>81</u>	lbs

Compute Antenna Pipe Mount & Platform Capacity of Site Pro 1 Low Profile Platform Model: RMQP-496

Code = ANSI/TIA-222-G-2005 Standards

The low profile platform capacity is based on as follows (See attached Site Pro 1 Rating for additional details):

Max Normal Pipe Shear Load = 444 lbs (each Pipe)  
 Max Tangential Pipe Shear Load = 200 lbs (each Pipe)

Compute Verizon Antenna & RRH Wind Load Per Pipe Mount

Code = ANSI/TIA-222-G-2005 Standards

Proposed RAD Elev = 130 ft  
 Exposure Category = C  
 Structure Class = II  
 Kz = 1.34  
 Kzt = 1.00  
 Kd = 0.95 Pole Structures  
 V = 90 mph  
 I = 1.00  
 Gh = 1.10 Pole Structures  
 qz = 26.35 psf ( qz = 0.00256 Kz Kzt Kd V<sup>2</sup> I )

qz Gh = 28.98 psf

Max Verizon Wireless Normal Pipe EPA = 12.9 sf  
 Max Verizon Wireless Tangential Pipe EPA = 6.6 sf

Max Normal Pipe Wind Load = 374 lbs (each) ( 28.98 psf x 12.9 sf )  
 Max Tangential Pipe Wind Load = 190 lbs (each) ( 28.98 psf x 6.6 sf )

Normal Pipe	Capacity	>	Computed	Pipe Mount is
Wind Load	444	>	374	adequate

Tangential Pipe	Capacity	>	Computed	Pipe Mount is
Wind Load	200	>	190	adequate

Conclusion

Based on the calculation, the proposed Verizon Wireless antenna wind loads & RRH wind loads are less than the Site Pro 1 Low Profile Platform pipe mount capacity.



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	15
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:					

## 6.0 Attachments

### a. Site Pro 1 Platform Rating



A valmont COMPANY

April 14, 2010

RE: ANSI/TIA-222-G Mount Capacity  
Valmont / Site Pro 1 Mount: 12'-6" & 14'-6" Low Profile Co-Location Platform with 9 or 12 antennas

Part No.	RMQP-3xx	RMQP-4xx
	RMQLP-3xx	RMQLP-4xx
	RMVP-3xx	RMVP-4xx

The Low Profile Co-Location Platform referenced above has been analyzed in accordance with ANSI/TIA-222-G-2005 standard using the following design criteria.

**Mount Design Criteria**

Structure Height	200'	
Basic Wind Speed	90 mph (3-sec)	
Structure Class	II	
Exposure Category	C	
Topographic Category	I	
Design Ice Thickness	1.0"	
Wind Direction Factor	0.95	Tubular Pole Structures, Lattice Structures with other than triangular, square or rectangular cross-sections, strength design of appurtenances
Gust Effect Factor	0.85	Guyed Masts & Self Supporting Lattice Structures 450' tall or less 1.10 Tubular Pole Structures

**Modeling & Applied Appurtenance Loading**

The mount was analyzed for four (4) and three (3) antenna loads evenly spaced across each face of the mount, centered on the centerline of the mount (i.e. no vertical eccentricity). Based on the Design Criteria above, the mount capacity is 4,880 lbs (153 Sq-ft). The maximum normal force per antenna pipe is 444 lbs (13.9 Sq-ft) with a maximum tangential force of 200 lbs (6.3 Sq-ft). The weight of each antenna was considered to be a maximum of 100 lbs. Self-weight of the mount was also considered.

The mount will also support a nominal load of 250 lbs at two (2) locations simultaneously (500 lbs total) to provide access for climbers. This condition assumes no wind.



Valmont Site Pro 1  
2400 Walter Glaub Drive Plymouth, Indiana 46563-4005 USA  
574-936-4221 Fax 574-936-8925 www.sitepro1.com

GUST FACTOR BASED ON:	3	1. latticed tower, overall height = antenna height 2. latticed tower, overall height = 200 ft 3. monopole tower 4. Guyed Tower 5. Structure supported on other structures
Radial Ice Thickness:	1	inch
Structure Class:	2	See Worksheet "Structure Class" for Description
Exposure Category	C	See Worksheet "Exposure Category" for Description
Topography Category	1	See Worksheet "Topography Category" for Description
Height of Crest Above Surrounding Area, H	1	(ft) If 0 ft, use 1.0
Height Above Ground Level at the		
Base of the Structure, z	0	(ft)
Wind Direction, $K_d$	0.95	See Worksheet "Wind Direction" for Description
$(EPA)_N$ (ft <sup>2</sup> )	0	
$(EPA)_T$ (ft <sup>2</sup> )	0	See Worksheet "Wind Force on Appurtenances" for Description
$\theta$	0	
$K_a$	1.00	
$A_f$	0	Projected area of flat structural components in one face of the section
$A_r$	0	Projected area of round structural components in one face of the section including the projected area of ice on flat and round structural components in one face for loading combinations that include ice.
$A_g$	25	Gross area of one face as if the face were solid, sqft.
$\epsilon$	0.000	solidity ratio = $(A_f + A_r)/A_g$

Effective Projected Area (EPA) <sub>A</sub> for Maximum Allowable Mount Load on Low Profile Co-Location Platform (RMQP / RMQLP / RMVP) with 9 / 12 Antenna Pipes (sq-ft)											
WIND LOAD: 4.8800 kips											
HEIGHT (ft)	BASIC WIND SPEED (mph)										
	70	75	80	85	90	95	100	105	110	115	120
40	356.7315	310.7528	273.1225	241.9355	215.8005	193.6825	174.7984	158.5473			
60	327.5440	285.3272	250.7758	222.1405	198.1439	177.8355	160.4965				
80	308.2952	268.5593	236.0385	209.0860	186.4995	167.3846					
100	294.1471	256.2348	225.2064	199.4908	177.9408	159.7031					
120	283.0707	246.5860	216.7260	191.9787	171.2403	153.6893					
140	274.0317	238.7121	209.8055	185.8485	165.7723						
160	266.4354	232.0949	203.9896	180.6967	161.1770						
180	259.9100	226.4105	198.9936	176.2711	157.2295						
200	254.2084	221.4437	194.6283	172.4043	153.7804						
220	249.1584	217.0447	190.7619	168.9794							

<b>GUST FACTOR BASED ON:</b>	3	1. latticed tower, overall height = antenna height
		2. latticed tower, overall height = 200 ft
		3. monopole tower
		4. Guyed Tower
		5. Structure supported on other structures
<b>Radial Ice Thickness:</b>	1	inch
<b>Structure Class:</b>	2	See Worksheet "Structure Class" for Description
<b>Exposure Category</b>	C	See Worksheet "Exposure Category" for Description
<b>Topography Category</b>	1	See Worksheet "Topography Category" for Description
<b>Height of Crest Above Surrounding Area, H</b>	1	(ft) If 0 ft, use 1.0
<b>Height Above Ground Level at the</b>		
<b>Base of the Structure, z</b>	0	(ft)
<b>Wind Direction, <math>K_d</math></b>	0.95	See Worksheet "Wind Direction" for Description
<b><math>(EPA)_N</math> (ft<sup>2</sup>)</b>	0	
<b><math>(EPA)_T</math> (ft<sup>2</sup>)</b>	0	
<b><math>\theta</math></b>	0	See Worksheet "Wind Force on Appurtenances" for Description
<b><math>K_a</math></b>	1.00	
<b><math>A_f</math></b>	0	Projected area of flat structural components in one face of the section
<b><math>A_r</math></b>	0	Projected area of round structural components in one face of the section including the projected area of ice on flat and round structural components in one face for loading combinations that include ice.
<b><math>A_g</math></b>	25	Gross area of one face as if the face were solid, sqft.
<b><math>\epsilon</math></b>	0.000	solidity ratio = $(A_f + A_r)/A_g$

**Effective Projected Area  $(EPA)_A$  for Maximum Allowable Normal Load  
on Low Profile Co-Location Platform (RMQP / RMQLP / RMVP) per Antenna Pipe (sq-ft)**

**WIND LOAD: 0.4440 kips**

HEIGHT (ft)	BASIC WIND SPEED (mph)										
	70	75	80	85	90	95	100	105	110	115	120
40	32.4567	28.2734	24.8497	22.0122	19.6343	17.6219	15.9038	14.4252			
60	29.8011	25.9601	22.8165	20.2111	18.0278	16.1801	14.6026				
80	28.0498	24.4345	21.4756	19.0234	16.9684	15.2293					
100	26.7626	23.3132	20.4901	18.1504	16.1897	14.5304					
120	25.7548	22.4353	19.7185	17.4669	15.5801	13.9832					
140	24.9324	21.7189	19.0889	16.9092	15.0826						
160	24.2413	21.1168	18.5597	16.4404	14.6645						
180	23.6476	20.5996	18.1052	16.0378	14.3053						
200	23.1288	20.1478	17.7080	15.6860	13.9915						
220	22.6693	19.7475	17.3562	15.3744							

<b>GUST FACTOR BASED ON:</b>	<b>3</b>	1. latticed tower, overall height = antenna height 2. latticed tower, overall height = 200 ft 3. monopole tower 4. Guyed Tower 5. Structure supported on other structures
Radial Ice Thickness:	1	inch
Structure Class:	2	See Worksheet "Structure Class" for Description
Exposure Category	C	See Worksheet "Exposure Category" for Description
Topography Category	1	See Worksheet "Topography Category" for Description
Height of Crest Above Surrounding Area, H	1	(ft) If 0 ft, use 1.0
Height Above Ground Level at the Base of the Structure, z	0	(ft)
Wind Direction, $K_d$	0.95	See Worksheet "Wind Direction" for Description
$(EPA)_N$ (ft <sup>2</sup> )	0	
$(EPA)_T$ (ft <sup>2</sup> )	0	See Worksheet "Wind Force on Appurtenances" for Description
$\theta$	0	
$K_a$	1.00	
$A_f$	0	Projected area of flat structural components in one face of the section
$A_r$	0	Projected area of round structural components in one face of the section including the projected area of ice on flat and round structural components in one face for loading combinations that include ice.
$A_g$	25	Gross area of one face as if the face were solid, sqft.
$\varepsilon$	0.000	solidity ratio = $(A_f + A_r)/A_g$

Effective Projected Area $(EPA)_A$ for Maximum Allowable Tangential Load on Low Profile Co-Location Platform (RMQP / RMQLP / RMVP) per Antenna Pipe (sq-ft)											
WIND LOAD: 0.2000 kips											
HEIGHT (ft)	BASIC WIND SPEED (mph)										
	70	75	80	85	90	95	100	105	110	115	120
40	14.6201	12.7358	11.1935	9.9154	8.8443	7.9378	7.1639	6.4978			
60	13.4239	11.6937	10.2777	9.1041	8.1207	7.2883	6.5777				
80	12.6350	11.0065	9.6737	8.5691	7.6434	6.8600					
100	12.0552	10.5014	9.2298	8.1759	7.2927	6.5452					
120	11.6013	10.1060	8.8822	7.8680	7.0180	6.2987					
140	11.2308	9.7833	8.5986	7.6167	6.7939						
160	10.9195	9.5121	8.3602	7.4056	6.6056						
180	10.6520	9.2791	8.1555	7.2242	6.4438						
200	10.4184	9.0756	7.9766	7.0657	6.3025						
220	10.2114	8.8953	7.8181	6.9254							

<b>GUST FACTOR BASED ON:</b>	3	1. latticed tower, overall height = antenna height 2. latticed tower, overall height = 200 ft 3. monopole tower 4. Guyed Tower 5. Structure supported on other structures
Radial Ice Thickness:	1	inch
Structure Class:	2	See Worksheet "Structure Class" for Description
Exposure Category	C	See Worksheet "Exposure Category" for Description
Topography Category	1	See Worksheet "Topography Category" for Description
Height of Crest Above Surrounding Area, H	1	(ft) If 0 ft, use 1.0
Height Above Ground Level at the		
Base of the Structure, z	0	(ft)
Wind Direction, $K_d$	0.95	See Worksheet "Wind Direction" for Description
$(EPA)_N$ (ft <sup>2</sup> )	0	
$(EPA)_T$ (ft <sup>2</sup> )	0	See Worksheet "Wind Force on Appurtenances" for Description
$\theta$	0	
$K_a$	1.00	
$A_f$	0	Projected area of flat structural components in one face of the section
$A_r$	0	Projected area of round structural components in one face of the section including the projected area of ice on flat and round structural components in one face for loading combinations that include ice.
$A_g$	25	Gross area of one face as if the face were solid, sqft.
$\epsilon$	0.000	solidity ratio = $(A_f + A_r)/A_g$

**Effective Projected Area (EPA)<sub>A</sub> for Maximum Allowable Tangential Load on Low Profile Co-Location Platform (RMQP / RMQLP / RMVP) per Antenna Pipe (sq-ft)**

**WIND LOAD: 0.2000 kips**

HEIGHT (ft)	BASIC WIND SPEED (mph)										
	70	75	80	85	90	95	100	105	110	115	120
40	14.6201	12.7358	11.1935	9.9154	8.8443	7.9378	7.1639	6.4978			
60	13.4239	11.6937	10.2777	9.1041	8.1207	7.2883	6.5777				
80	12.6350	11.0065	9.6737	8.5691	7.6434	6.8600					
100	12.0552	10.5014	9.2298	8.1759	7.2927	6.5452					
120	11.6013	10.1060	8.8622	7.8680	7.0180	6.2987					
140	11.2308	9.7833	8.5986	7.6167	6.7939						
160	10.9195	9.5121	8.3602	7.4056	6.6056						
180	10.6520	9.2791	8.1555	7.2242	6.4438						
200	10.4184	9.0756	7.9766	7.0657	6.3025						
220	10.2114	8.8953	7.8181	6.9254							

# GAS ENGINE-GENERATOR SET 40-GC6NLT1

40 kWe / 60 Hz / Standby  
208 - 600V



## SYSTEM RATINGS

### Standby

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1.0	1.0	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
Natural Gas Ratings: Amps	167	167	139	120	60	48
Natural Gas Ratings: kW/kVA	40/40	40/40	40/50	40/50	40/50	40/50
LP Gas Ratings: Amps	167	167	139	120	60	48
LP Gas Ratings: kW/kVA	40/40	40/40	40/50	40/50	40/50	40/50
skVA@30%						
Voltage Dip	128	116	125	125	167	92
Generator Model*	362CSL1604	361CSL1612	284PSL1742	284PSL1742	284PSL1742	361PSL1632
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD ZIG-ZAG	4 LEAD	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

\* The Generator Model Number identified in the table is for standard C Series Configuration. Consult the factory for alternate configuration.

\*\* UL 2200 Offered

## CERTIFICATIONS AND STANDARDS

// **Engine-generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004**

// **Power Rating**  
- Accepts Rated Load in One Step Per NFPA 110

// **UL 2200 / CSA - Optional**

- UL 2200 Listed
- CSA Certified

// **Performance Assurance Certification (PAC)**

- Engine-Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

## APPLICATION DATA

## // Engine

Manufacturer	GM
Model	4.3L
Type	4-Cycle
Arrangement	6-V
Displacement: L (in <sup>3</sup> )	4.3 (262)
Bore: cm (in)	10.2 (4)
Stroke: cm (in)	8.8 (3.5)
Compression Ratio	9.4:1
Rated RPM	1,800
Engine Governor	Bosch
Maximum Power (NG): kWm (bhp)	49.6 (66.5)
Maximum Power (LP): kWm (bhp)	53.2 (71.4)
Speed Regulation	C/F
Air Cleaner	Dry

## // Liquid Capacity (Lubrication)

Total Oil System: L (gal)	4.2 (1.1)
Engine Jacket Water Capacity: L (gal)	7.2 (1.9)
System Coolant Capacity: L (gal)	21.6 (5.7)

## // Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

## // Fuel Inlet

Fuel Supply Connection Size	3/4" NPT
Fuel Supply Pressure: mm H <sub>2</sub> O (in. H <sub>2</sub> O)	178-279 (7-11)

// Fuel Consumption (NG-1000 BTU/ft<sup>3</sup> / LP-2500 BTU/ft<sup>3</sup>)

	NG	LPG
At 100% of Power Rating: m <sup>3</sup> /hr (ft <sup>3</sup> /hr)	13.9 (489)	6.1 (216)
At 75% of Power Rating: m <sup>3</sup> /hr (ft <sup>3</sup> /hr)	10.4 (368)	4.6 (163)
At 50% of Power Rating: m <sup>3</sup> /hr (ft <sup>3</sup> /hr)	7.3 (256)	3.2 (113)

## // Cooling - Radiator System

Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Restriction of Cooling Air, Intake, and Discharge Side of Rad.: kPa (in. H <sub>2</sub> O)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	117.3 (31)
Heat Rejection to Coolant: kW (BTUM)	39 (2,220)
Heat Radiated to Ambient: kW (BTUM)	16.5 (938)

## // Air Requirements

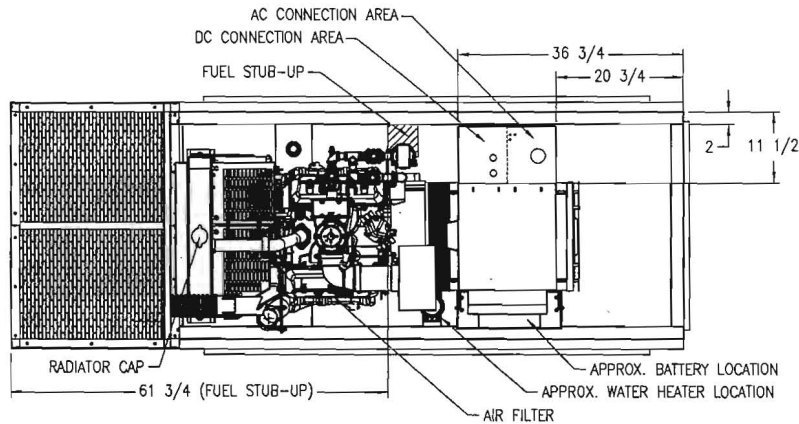
Aspirating: *m <sup>3</sup> /min (SCFM)	3.9 (136.5)
Air Flow Required for Rad.	
Cooled Unit: *m <sup>3</sup> /min (SCFM)	211.4 (7,464)
Remote Cooled Applications; Air Flow Required for Dissipation of Radiated Gen-set Heat For a Max of 25 °F Rise: *m <sup>3</sup> /min (SCFM)	59.9 (2,114)

\* Air density = 1.184 kg/m<sup>3</sup> (0.0739 lbm/ft<sup>3</sup>)

## // Exhaust System

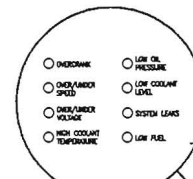
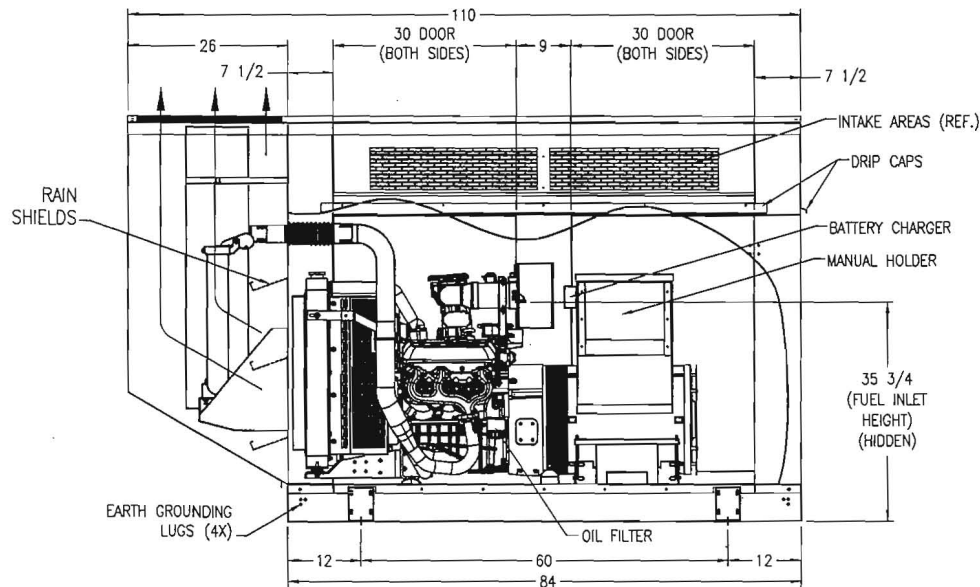
Gas Temp. (Stack): °C (°F)	704.4 (1,300)
Gas Volume at Stack Temp: m <sup>3</sup> /min (CFM)	12.5 (440.8)
Maximum Allowable Back Pressure: kPa (in. H <sub>2</sub> O)	10 (40)

DWG. #: VER30\_GC6NLT1(4.3)CQE-MI-5

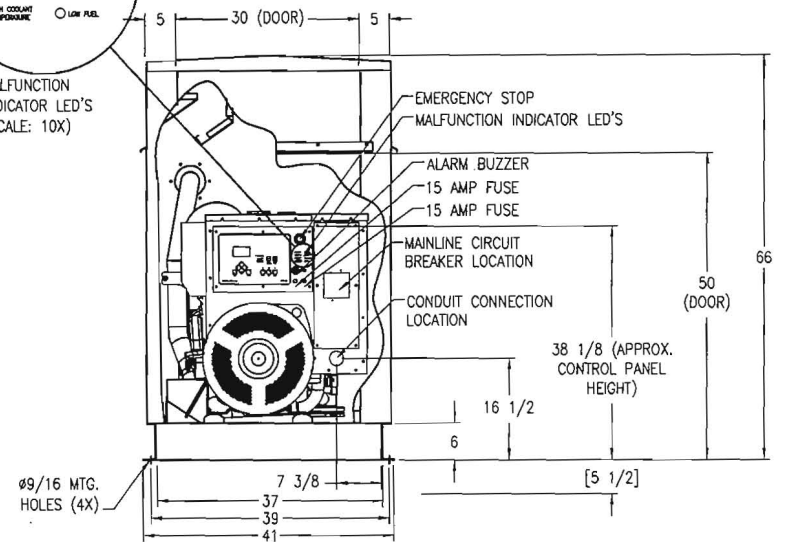


**NOTES:**

- 1) APPROX. WEIGHT: (WET) 1900#
- 2) REFERENCE BASE DRAWING: 105-5425
- 3) REFERENCE ENCLOSURE DRAWING: CQE-729-ALUM
- 4) SOUND LEVEL: 65 DBA @ 23 FT. (TO BE DETERMINED)
- 5) GEN-SET IS OFF-SET 1 3/4" TO LEFT SIDE OF BASE/ENCL.
- 6) ENCLOSURE & EXHAUST SYSTEMS ARE NOT SHOWN ON TOP VIEW
- 7) FUEL CONNECTIONS 3/4" NPT
- 8) PAINT FINISH: ANSI 61 GRAY



MALFUNCTION INDICATOR LED'S (SCALE: 10X)



REVISION	DATE	REVISION DESCRIPTION	INITIALS
A	04-11-13	INITIAL RELEASE TO SALES AND ENGINEERING	JDA



THIS DRAWING IS PROPERTY OF ON SITE ENERGY CORPORATION AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF ON SITE ENERGY CORPORATION. ALL RIGHTS RESERVED.

**GEN-SET INFORMATION**

ENGINE: GM 4.3L  
 GENERATOR: 361  
 RADIATOR: W/ ENG.  
 RADIATOR AMBIENT: 50C  
 DUCT FLANGE: 105-1401  
 CONTROL PANEL: DGC-2020  
 BASE: 105-5425

ENCLOSURE: CQE-729-ALUM  
 BREAKER: AS SPECIFIED  
 TANK: NA  
 MUFFLER: 3 CRITICAL  
 TRAILER: NA  
 ISOLATORS: PAOS

**DIMENSIONAL LAYOUT**

DRAWN TO SCALE  
 ALL DIMENSIONS ARE IN INCHES  
 DATE: 04-11-13  
 MODEL: VER30\_GC6NLT1  
 DRAWN BY: JDA  
 DWG. #: VER30\_GC6NLT1(4.3)CQE-MI-5



# Howard County


*Agricultural Land Preservation Program*

---

**MEMORANDUM**

**Subject:** WP-14-114, Moore property

**To:** Kent Sheubrooks, Chief, Division of Land Development

**From:** Joy Levy, ALPP Administrator 

**Date:** April 22, 2014

The referenced plan has been reviewed for compliance with the requirements of the Howard County Agricultural Land Preservation Program (ALPP). The following comments are forwarded for your review:

1. The original request for the public interest use release from the Moore easement was for 3,000 square feet. This is what was approved by the Ag Board and the County Council.
2. By the time the release was actually completed, the release amount had been reduced to 875 square feet.
3. The current proposed area for the compound expansion is 525 square feet, and is adjacent to the area previously released.
4. Since the additional area plus the released area does not exceed the release amount originally approved, the proposal does not need further review by the Ag Board or the Council.
5. The only ALPP requirement will be an amendment to the deed of easement to release the 525 square feet.
6. Approval of the waiver petition should be contingent on the execution of the amended deed of easement. I will contact the property owners once the amended deed of easement has been drafted.

Please contact Joy Levy at 410-313-5407 if you have any questions.

cc: Ag Read File  
Land Development (2)  
Moore File HO-86-03-E  
Lisa O'Brien, Office of Law

DEPARTMENT OF PLANNING AND ZONING  
DEVELOPMENT ENGINEERING DIVISION

June 24, 2014

RECEIVED

JUN 25 2014

Division of Land Development  
Department of Planning & Zoning

TO: Kent Sheubrooks, Chief  
Division of Land Development

FROM: Chad Edmondson, P.E., Chief  
Development Engineering Division

Project Engineer: Philip M. Thompson

RE: DP&Z File #: WP-14-114

Larriland Farm – T-Mobile

Based on a revised submission addressing our previous comments dated April 8, 2014, we revise our comments as follows:

After review of the submitted information requesting a waiver of the Subdivision and Land Development Regulations, Section 16.155(a)(1)(i), requiring the submission of a Site Development Plan approved by the Department of Planning and Zoning for all non-residential development, this Division has **NO OBJECTION**. Please be advised that the current exemption is for the total disturbance under WP-10-137 and WP-14-114 for 1,832 sft. Any future expansion that requires this compound to exceed 5,000 sft of total disturbance for all construction shall require that stormwater management be provided for the entire compound under current stormwater management regulations.

DF&RS (Chuck Ridgely, 410-313-6047, FD1232@howardcountymd.gov)

1. No comments.

MSHA (Scott Newell, 410-545-5606, SNewill@sha.state.md.us)

1. No comments.

H:\COMMENTS\WAIVERS\2014\WP14114.1.docx



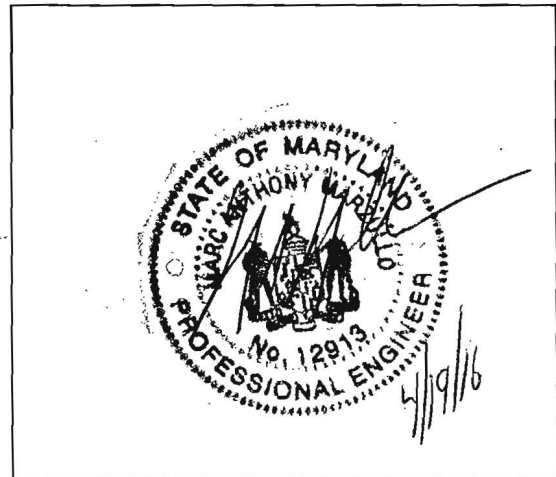
Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	10/19
Client:	Verizon Wireless			Date:	4/10/2016
Site Name:	Florence			Date:	
Site Number:				Date:	

**STRUCTURAL NARRATIVE & CALCULATIONS**

**VERIZON WIRELESS  
FLORENCE**

**1960 OLD ANNAPOLIS ROAD  
WOODBINE, MARYLAND 21797**

Engineer: R Crumrine  
Checked By: M Marzullo



Engineer's Seal & Signature

PREPARED BY:  
ENTREX COMMUNICATION SERVICES, INC.  
6600 ROCKLEDGE DRIVE, SUITE 550  
BETHESDA, MARYLAND 20817  
TEL: (202) 408-0960



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	2
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	

## TABLE OF CONTENTS

Sections	Page Number
1.0 Introduction	3
2.0 Criteria	3
3.0 Assumptions	3
4.0 Conclusion	4
5.0 Calculations	
a. Evaluate the Soil Bearing Capacity - Equipment Slab on Grade	5
b. Antenna & RRH Effective Projected Area (EPA) Calculations	7
c. Qualitative Analysis of the Low Profile Platform	12
d. Qualitative Analysis of the Low Profile Platform - Pipe Mounts	13
6.0 Attachments	
a. Site Pro 1 Platform Rating	15

0	Original Report	RMC	MM	MM	4/19/2016
No.	Reason for Revision	Engr	Checked	Approved	Date

Records of Revision Block



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	3
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	

## 1.0 Introduction

This calculation was prepared to evaluate the soil bearing capacity to support the Verizon Wireless equipment loads on the ground and to evaluate the low profile platform on the monopole located at 1960 Old Annapolis Road, Woodbine, Maryland 21797.

## 2.0 Criteria

The existing structure was analyzed and the new support frame was designed in accordance of the codes and standards listed below:

- |                |  |
|----------------|--|
| a. 2012 IBC    | 2012 International Building Code, International Code Council                           |
| b. ASCE 7-10   | Minimum Design Loads for Building and Other Structure                                  |
| c. AISC 360-10 | Specification for Structural Steel Building Allowable Stress Design 14th Edition, AISC |
| d. ACI 318-11  | Building Code Requirement for Structural Concrete                                      |

## 3.0 Assumptions

- This analysis assumes that the original building structure members were properly designed and installed in accordance with the original drawings.
- This analysis assumes that the as-built members are load-rated designed and constructed in accordance with accepted industry-wide standards.
- This analysis assumes that the as-built conditions are structurally sound and properly maintained in accordance with the referenced standard and manufacturer's requirements.
- Structural member sizes, building geometry, connection designs or steel/concrete/masonry material yield strengths, contrary to those assumed for the purpose of preparing this report could alter the findings and conclusions as stated.
- The investigation of the structure or design of the structure analysis uses STAAD Pro finite element structural analysis computer program. In this analysis a finite element mathematical model of the structure was prepared based upon the exact structure geometry. The overall finite element model was loaded with live, dead & wind loading and weight associated with the structure itself.
- For any structural components that were found to be rated up to 105% of its design capacity may be deemed acceptable. Overstressed percentages of 5% or less are considered to be within the accuracy limits of the calculations and are not consider to be critical.



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	4
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	

## 4.0 Conclusion

### Verizon Wireless Slab on Grade

The soil bearing capacity is structurally adequate to support Verizon Wireless canopy loads and equipment loads.

### Verizon Wireless Low Profile Platform on Monopole:

The Site Pro 1 Low Profile Platform and pipe mounts were found to be adequate to support the proposed Verizon Wireless antenna loads and RRH loads in accordance with the TIA-222-G Standard.



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	6
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:	Evaluate the Soil Bearing Capacity - Equipment Slab on Grade				

**Proposed Loads:**

Verizon Wireless Equipment Load Parameters

Slab on Grade Width =	10.0	ft
Slab on Grade Length =	16.0	ft
Slab on Grade Thickness =	12	in
Bearing Area =	160	sf
Concrete Pad Wt =	24000	lbs
(2) Charles Cabinet Wt =	2000	lbs
(1) Battery Cabinet Wt =	3450	lbs
Utility Wt =	400	lbs
Canopy Self Wt =	1450	lbs

Total Gravity Load = 31300 lbs

Use Total Gravity Wt = 32000 lbs

Actual Bearing Pressure = 200 psf  
Allowable Bearing Pressure = 1500 psf

**Conclusion**

The computed actual bearing pressure is less than the allowable bearing pressure. The foundation is structurally adequate to support Verizon Wireless loads.



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	7
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:	Antenna & RRH Effective Projected Area (EPA) Calculations				

## 5.0 Structural Calculations

### b. Antenna & RRH Effective Projected Area (EPA) Calculations

**Problem Statement:** The purpose of this calculations to compute the total EPA and the total weight in accordance with the TIA-222-G Standard.

Model = JMA Wireless X7C-FRO-660

Total Number of Antennas = 6  
 Number of Antennas at Front = 2  
 Number of Antennas at Side = 4  
 Front  $\Theta$  = 0 degrees  
 Side  $\Theta$  = 60 degrees  
 Height = 72.00 in  
 Width = 14.60 in  
 Depth = 8.00 in  
 Weight = 45 lbs  
 Aspect Ratio: Front = 4.93  
 Aspect Ratio: Side = 9.00  
 Ca : Front = 1.31  
 Ca: Side = 1.47  
 Ka = 0.8  
 EPA<sub>N</sub> = 9.55 sf  
 EPA<sub>T</sub> = 5.87 sf

$$EPA_A = Ka (EPA_N \cos^4 \Theta + EPA_T \sin^4 \Theta)$$

EPA<sub>A</sub> = 15.28 sf  
 LPA<sub>A</sub> = 21.72 sf

Total Weight =	270	lbs
Total EPA <sub>A</sub> =	37.00	sf

Model = JMA Wireless AXP19-60

Total Number of Antennas = 6  
 Number of Antennas at Front = 2  
 Number of Antennas at Side = 4  
 Front  $\Theta$  = 0 degrees  
 Side  $\Theta$  = 60 degrees  
 Height = 69.10 in  
 Width = 6.70 in  
 Depth = 4.10 in  
 Weight = 28 lbs  
 Aspect Ratio: Front = 10.31  
 Aspect Ratio: Side = 16.85  
 Ca : Front = 1.51  
 Ca: Side = 1.73  
 Ka = 0.8  
 EPA<sub>N</sub> = 4.86 sf  
 EPA<sub>T</sub> = 3.40 sf

$$EPA_A = Ka (EPA_N \cos^4 \Theta + EPA_T \sin^4 \Theta)$$

EPA<sub>A</sub> = 7.77 sf  
 LPA<sub>A</sub> = 12.05 sf

Total Weight =	168	lbs
Total EPA <sub>A</sub> =	19.82	sf



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	8
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:	Antenna & RRH Effective Projected Area (EPA) Calculations				

Model = 2100 MHz RRH

Total Number of RRHs = 3  
 Number of RRHs at Front = 1  
 Number of RRHs at Side = 2  
 Front  $\Theta$  = 0 degrees  
 Side  $\Theta$  = 60 degrees  
 Height = 36.60 in  
 Width = 10.63 in  
 Depth = 5.74 in  
 Weight = 55 lbs  
 Aspect Ratio: Front = 3.44  
 Aspect Ratio: Side = 6.38  
 Ca : Front = 1.24  
 Ca: Side = 1.37  
 Ka = 0.8  
 EPA<sub>N</sub> = 3.36 sf  
 EPA<sub>T</sub> = 2.00 sf

$$EPA_A = Ka (EPA_N \cos^2 \Theta + EPA_T \sin^2 \Theta)$$

EPA<sub>A</sub> = 2.68 sf  
 EPA<sub>A</sub> = 3.74 sf

Total Weight =	165	lbs
Total EPA <sub>A</sub> =	6.43	sf

Model = Future RRH

Total Number of RRHs = 3  
 Number of RRHs at Front = 1  
 Number of RRHs at Side = 2  
 Front  $\Theta$  = 0 degrees  
 Side  $\Theta$  = 60 degrees  
 Height = 36.60 in  
 Width = 10.63 in  
 Depth = 5.74 in  
 Weight = 55 lbs  
 Aspect Ratio: Front = 3.44  
 Aspect Ratio: Side = 6.38  
 Ca : Front = 1.24  
 Ca: Side = 1.37  
 Ka = 0.8  
 EPA<sub>N</sub> = 3.36 sf  
 EPA<sub>T</sub> = 2.00 sf

$$EPA_A = Ka (EPA_N \cos^2 \Theta + EPA_T \sin^2 \Theta)$$

EPA<sub>A</sub> = 2.68 sf  
 EPA<sub>A</sub> = 3.74 sf

Total Weight =	165	lbs
Total EPA <sub>A</sub> =	6.43	sf



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	9
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:	Antenna & RRH Effective Projected Area (EPA) Calculations				

Model = 700 MHz RRH

Total Number of RRHs = 3  
 Number of RRHs at Front = 1  
 Number of RRHs at Side = 2  
 Front  $\Theta$  = 0 degrees  
 Side  $\Theta$  = 60 degrees  
 Height = 20.90 in  
 Width = 11.80 in  
 Depth = 7.50 in  
 Weight = 56 lbs  
 Aspect Ratio: Front = 1.77  
 Aspect Ratio: Side = 2.79  
 Ca : Front = 1.20  
 Ca: Side = 1.21  
 Ka = 0.8  
 EPA<sub>N</sub> = 2.06 sf  
 EPA<sub>T</sub> = 1.32 sf

$$EPA_A = Ka (EPA_N \cos^4 \Theta + EPA_T \sin^4 \Theta)$$

EPA<sub>A</sub> = 1.64 sf  
 EPA<sub>A</sub> = 2.41 sf

Total Weight =	168	lbs
Total EPA <sub>A</sub> =	4.05	sf

Model = 1900 MHz RRH

Total Number of RRHs = 3  
 Number of RRHs at Front = 1  
 Number of RRHs at Side = 2  
 Front  $\Theta$  = 0 degrees  
 Side  $\Theta$  = 60 degrees  
 Height = 21.20 in  
 Width = 12.00 in  
 Depth = 7.20 in  
 Weight = 53 lbs  
 Aspect Ratio: Front = 1.77  
 Aspect Ratio: Side = 2.94  
 Ca : Front = 1.20  
 Ca: Side = 1.22  
 Ka = 0.8  
 EPA<sub>N</sub> = 2.12 sf  
 EPA<sub>T</sub> = 1.29 sf

$$EPA_A = Ka (EPA_N \cos^4 \Theta + EPA_T \sin^4 \Theta)$$

EPA<sub>A</sub> = 1.70 sf  
 EPA<sub>A</sub> = 2.40 sf

Total Weight =	159	lbs
Total EPA <sub>A</sub> =	4.10	sf



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	10
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective: Antenna & RRH Effective Projected Area (EPA) Calculations					

Model = Raycap

Total Number of Boxes = 2

Number of Boxes at Front = 3

Number of Boxes at Side = 0

Front  $\Theta$  = 0 degrees

Side  $\Theta$  = 60 degrees

Height = 28.93 in

Width = 15.80 in

Depth = 10.30 in

Weight = 27 lbs

Aspect Ratio: Front = 1.83

Aspect Ratio: Side = 2.81

Ca : Front = 1.20

Ca: Side = 1.21

Ka = 0.8

EPA<sub>N</sub> = 3.81 sf

EPA<sub>T</sub> = 2.51 sf

$$EPA_A = Ka (EPA_N \cos^2 \Theta + EPA_T \sin^2 \Theta)$$

EPA<sub>A</sub> = 9.14 sf

EPA<sub>A</sub> = 0.00 sf

Total Weight =	54	lbs
Total EPA <sub>A</sub> =	9.14	sf

Model = Site Pro Stiffener Kit HRK12

Total Number of Horiz Pipes = 3

Number of Mounts at Front = 1

Number of Mounts at Side = 2

Front  $\Theta$  = 0 degrees

Side  $\Theta$  = 60 degrees

Weight = - lbs

Front EPA = 2.55 sf

Side EPA = 2.55 sf

Total Weight =	262	lbs
Total EPA <sub>A</sub> =	5.11	sf



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	11
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:	Antenna & RRH Effective Projected Area (EPA) Calculations				

EPA Summary

Weight Summary

JMA Wireless X7C-FRO-660	=	37.0	sf
JMA Wireless AXP19-60	=	19.8	sf
2100 MHz RRH	=	6.4	sf
Future RRH	=	6.4	sf
700 MHz RRH	=	4.1	sf
1900 MHz RRH	=	4.1	sf
Raycap	=	9.1	sf
Site Pro Stiffener Kit HRK12	=	5.1	sf

JMA Wireless X7C-FRO-660	=	270	lbs
JMA Wireless AXP19-60	=	168	lbs
2100 MHz RRH	=	165	lbs
Future RRH	=	165	lbs
700 MHz RRH	=	168	lbs
1900 MHz RRH	=	159	lbs
Raycap	=	54	lbs
Site Pro Stiffener Kit HRK12	=	262	lbs

Total EPA<sub>s</sub> = 92.1 sf

Total Weight = 1411 lbs



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	12
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:	Qualitative Analysis of the Low Profile Platform			Platform	

## 5.0 Structural Calculations

### c. Qualitative Analysis of the Low Profile Platform

**Problem Statement:** The purpose of this evaluate the low profile platform to support the Verizon Wireless loads on the monopole in accordance with the TIA-222-G Standard.

Compute Antenna Pipe Mount & Platform Capacity of Site Pro 1 Low Profile Platform Model: RMQP-496

Code = ANSI/TIA-222-G-2005 Standards

The low profile platform capacity is based on as follows (See attached Site Pro 1 Rating for additional details):

Max Low Profile Platform Shear Load = 4880 lbs per Platform (See Site Pro 1 Rating attachments)

Compute Verizon Antenna & RRH Wind Load Per Low Profile Platform

Code = ANSI/TIA-222-G-2005 Standards

Proposed RAD Elev = 130 ft  
 Exposure Category = C  
 Structure Class = II  
 Kz = 1.34  
 Kzt = 1.00  
 Kd = 0.95 Pole Structures  
 V = 90 mph  
 I = 1.00  
 Gh = 1.10 Pole Structures  
 qz = 26.35 psf (  $qz = 0.00256 Kz Kzt Kd V^2 I$  )  
 qz Gh = 28.98 psf

Total EPA<sub>s</sub> = 92.1 sf (See Calculation on Section 5b)

Max Low Profile Platform Wind Load = 2668 lbs per Low Profile Platform < 4880 lbs OK

**Conclusion**

Based on the calculation, the proposed Verizon Wireless antenna wind loads & RRH wind loads are less than the Site Pro 1 Low Profile Platform capacity.



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	13
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:	Qualitative Analysis of the Low Profile Platform			Pipe Mounts	

## 5.0 Structural Calculations

### d. Qualitative Analysis of the Low Profile Platform - Pipe Mounts

**Problem Statement:** The purpose of this evaluate the low profile platform mounting pipes to support the Verizon Wireless loads on the monopole in accordance with the TIA-222-G Standard.

#### Verizon Wireless Antenna and Appurtenance Summary Loading

#### Calculate Normal EPA & Weight on a Site Pro 1 Low Profile Platform

Verizon Wireless							Normal		
							Each	Total	Total
Qty	Description & Model	Height (in)	Width (in)	Depth (in)	Weight (lbs)	Ca	CaAa (sf)	CaAa (sf)	Weight (lbs)
Elevation = 130 ft									
6	JMA Wireless X7C-FRO-660	72.00	14.60	8.00	45	1.31	9.55	57.3	270
6	JMA Wireless AXP19-60	69.40	6.70	4.10	28	1.51	4.88	29.3	168
3	2100 MHz RRH	36.60	10.63	5.74	55	1.24	3.36	10.1	165
3	Future RRH	36.60	10.63	5.74	55	1.24	3.36	10.1	165
3	700 MHz RRH	20.90	11.80	7.50	56	1.20	2.06	6.2	168
3	1900 MHz RRH	21.20	12.00	7.20	53	1.20	2.12	6.4	159
2	Raycap, RCMDC-3315-PF-48 (on Platform)	28.90	15.80	10.30	27	1.20	3.81	7.6	54
1	Handrail Site Pro 1 HRK 12				262		-	5.1	262

Total Normal Gross EPA = 132.0 sf

Total Antenna wt = 1411.0 lbs

#### Calculate Tangential EPA

Verizon Wireless							Tangential		
							Each	Total	
Qty	Description & Model	Height (in)	Width (in)	Depth (in)	Weight (lbs)	Ca	CaAa (sf)	CaAa (sf)	
Elevation = 130 ft									
6	JMA Wireless X7C-FRO-660	72.00	14.60	8.00	45.00	1.20	4.80	28.8	
6	JMA Wireless AXP19-60	69.40	6.70	4.10	28.00	1.20	2.37	14.2	
3	2100 MHz RRH	36.60	10.63	5.74	55.00	1.20	1.75	5.3	
3	Future RRH	36.60	10.63	5.74	55.00	1.20	1.75	5.3	
3	700 MHz RRH	20.90	11.80	7.50	56.00	1.20	1.31	3.9	
3	1900 MHz RRH	21.20	12.00	7.20	53.00	1.20	1.27	3.8	
2	Raycap, RCMDC-3315-PF-48 (on Platform)	28.90	15.80	10.30	27.00	1.20	2.48	5.0	
1	Handrail Site Pro 1 HRK 12				262		-	5.1	

Total Tangential Gross EPA = 71.3 sf

#### Compute CaAa Per Antenna Pipe Mount

	Normal	Tangential
JMA Wireless X7C-FRO-660, EPA =	9.55 sf	4.80 sf
Future RRH, EPA =	3.36 sf	1.75 sf
	<u>12.90 sf</u>	<u>6.55 sf</u>

#### Compute Dead Load Antenna Pipe Mount

JMA Wireless X7C-FRO-660, Wt =	45 lbs
Future RRH, Wt =	55 lbs
	<u>100 lbs</u>

#### Compute CaAa Per Antenna Pipe Mount

	Normal	Tangential
JMA Wireless X7C-FRO-660, EPA =	9.55 sf	4.80 sf
Alcatel Lucent 700 MHz, EPA =	2.06 sf	1.31 sf
	<u>11.60 sf</u>	<u>6.11 sf</u>

JMA Wireless X7C-FRO-660, Wt =	45 lbs
Alcatel Lucent 700 MHz, Wt =	56 lbs
	<u>101 lbs</u>

#### Compute CaAa Per Antenna Pipe Mount

	Normal	Tangential
JMA Wireless AXP19-60, EPA =	4.88 sf	2.37 sf
Alcatel Lucent 2100 MHz, EPA =	3.36 sf	1.75 sf
	<u>8.24 sf</u>	<u>4.12 sf</u>

JMA Wireless AXP19-60, Wt =	28 lbs
Alcatel Lucent 2100 MHz, Wt =	55 lbs
	<u>83 lbs</u>



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	14
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:	Qualitative Analysis of the Low Profile Platform			Pipe Mounts	

Compute CaAa Per Antenna Pipe Mount

JMA Wireless AXP19-60, EPA =	4.88	sf	2.37	sf	JMA Wireless AXP19-60, Wt =	28	lbs
Alcatel Lucent 1900 MHz, EPA =	2.12	sf	1.27	sf	Alcatel Lucent 1900 MHz, Wt =	53	lbs
	<u>7.00</u>	sf	<u>3.64</u>	sf		<u>81</u>	lbs

Compute Antenna Pipe Mount & Platform Capacity of Site Pro 1 Low Profile Platform Model: RMQP-496

Code = ANSI/TIA-222-G-2005 Standards

The low profile platform capacity is based on as follows (See attached Site Pro 1 Rating for additional details):

Max Normal Pipe Shear Load =	444	lbs (each Pipe)
Max Tangential Pipe Shear Load =	200	lbs (each Pipe)

Compute Verizon Antenna & RRH Wind Load Per Pipe Mount

Code = ANSI/TIA-222-G-2005 Standards

Proposed RAD Elev =	130	ft
Exposure Category =	C	
Structure Class =	II	
Kz =	1.34	
Kzt =	1.00	
Kd =	0.95	Pole Structures
V =	90	mph
I =	1.00	
Gh =	1.10	Pole Structures
qz =	26.35	psf ( qz = 0.00256 Kz Kzt Kd V <sup>2</sup> I )

qz Gh = 28.98 psf

Max Verizon Wireless Normal Pipe EPA =	12.9	sf
Max Verizon Wireless Tangential Pipe EPA =	6.6	sf

Max Normal Pipe Wind Load =	374	lbs (each)	( 28.98 psf x 12.9 sf )
Max Tangential Pipe Wind Load =	190	lbs (each)	( 28.98 psf x 6.6 sf )

Normal Pipe Wind Load	Capacity	>	Computed	Pipe Mount is
	444	>	374	adequate

Tangential Pipe Wind Load	Capacity	>	Computed	Pipe Mount is
	200	>	190	adequate

Conclusion

Based on the calculation, the proposed Verizon Wireless antenna wind loads & RRH wind loads are less than the Site Pro 1 Low Profile Platform pipe mount capacity.



Entrex Project Number:	1102.159	Calculated By:	RMC	Page:	15
Client:	Verizon Wireless			Date:	4/19/2016
Site Name:	Florence			Date:	
Site Number:				Date:	
Engineering Objective:					

## 6.0 Attachments

### a. Site Pro 1 Platform Rating



A valmont COMPANY

April 14, 2010

RE: ANSI/TIA-222-G Mount Capacity  
Valmont / Site Pro 1 Mount: 12'-6" & 14'-6" Low Profile Co-Location Platform with 9 or 12 antennas

Part No.	RMQP-3xx	RMQP-4xx
	RMQLP-3xx	RMQLP-4xx
	RMVP-3xx	RMVP-4xx

The Low Profile Co-Location Platform referenced above has been analyzed in accordance with ANSI/TIA-222-G-2005 standard using the following design criteria.

**Mount Design Criteria**

Structure Height	200'	
Basic Wind Speed	90 mph (3-sec)	
Structure Class	II	
Exposure Category	C	
Topographic Category	I	
Design Ice Thickness	1.0"	
Wind Direction Factor	0.95	Tubular Pole Structures, Lattice Structures with other than triangular, square or rectangular cross-sections, strength design of appurtenances
Gust Effect Factor	0.85	Guyed Masts & Self Supporting Lattice Structures 450' tall or less 1.10 Tubular Pole Structures

**Modeling & Applied Appurtenance Loading**

The mount was analyzed for four (4) and three (3) antenna loads evenly spaced across each face of the mount, centered on the centerline of the mount (i.e. no vertical eccentricity). Based on the Design Criteria above, the mount capacity is 4,880 lbs (153 Sq-ft). The maximum normal force per antenna pipe is 444 lbs (13.9 Sq-ft) with a maximum tangential force of 200 lbs (6.3 Sq-ft). The weight of each antenna was considered to be a maximum of 100 lbs. Self-weight of the mount was also considered.

The mount will also support a nominal load of 250 lbs at two (2) locations simultaneously (500 lbs total) to provide access for climbers. This condition assumes no wind.



Valmont Site Pro 1  
2400 Walter Glaub Drive Plymouth, Indiana 46563-4005 USA  
574-936-4221 Fax 574-936-8925 www.sitepro1.com

GUST FACTOR BASED ON:	3	1. latticed tower, overall height = antenna height 2. latticed tower, overall height = 200 ft 3. monopole tower 4. Guyed Tower 5. Structure supported on other structures
Radial Ice Thickness:	1	inch
Structure Class:	2	See Worksheet "Structure Class" for Description
Exposure Category	C	See Worksheet "Exposure Category" for Description
Topography Category	1	See Worksheet "Topography Category" for Description
Height of Crest Above Surrounding Area, H	1	(ft) If 0 ft, use 1.0
Height Above Ground Level at the Base of the Structure, z	0	(ft)
Wind Direction, $K_d$	0.95	See Worksheet "Wind Direction" for Description
$(EPA)_N$ (ft <sup>2</sup> )	0	
$(EPA)_T$ (ft <sup>2</sup> )	0	See Worksheet "Wind Force on Appurtenances" for Description
$\theta$	0	
$K_a$	1.00	
$A_f$	0	Projected area of flat structural components in one face of the section
$A_r$	0	Projected area of round structural components in one face of the section including the projected area of ice on flat and round structural components in one face for loading combinations that include ice.
$A_g$	25	Gross area of one face as if the face were solid, sqft.
$\epsilon$	0.000	solidity ratio = $(A_f + A_r)/A_g$

Effective Projected Area (EPA) <sub>A</sub> for Maximum Allowable Mount Load on Low Profile Co-Location Platform (RMQP / RMQLP / RMVP) with 9 / 12 Antenna Pipes (sq-ft)											
WIND LOAD: 4.8800 kips											
HEIGHT (ft)	BASIC WIND SPEED (mph)										
	70	75	80	85	90	95	100	105	110	115	120
40	356.7315	310.7528	273.1225	241.9355	215.8005	193.6825	174.7984	158.5473			
60	327.5440	285.3272	250.7758	222.1405	198.1439	177.8355	160.4965				
80	308.2952	268.5593	236.0385	209.0860	186.4995	167.3846					
100	294.1471	256.2348	225.2064	199.4908	177.9408	159.7031					
120	283.0707	246.5860	216.7260	191.9787	171.2403	153.6893					
140	274.0317	238.7121	209.8055	185.8485	165.7723						
160	266.4354	232.0949	203.9896	180.6967	161.1770						
180	259.9100	226.4105	198.9936	176.2711	157.2295						
200	254.2084	221.4437	194.6283	172.4043	153.7804						
220	249.1584	217.0447	190.7619	168.9794							

<b>GUST FACTOR BASED ON:</b>	3	1. latticed tower, overall height = antenna height
		2. latticed tower, overall height = 200 ft
		3. monopole tower
		4. Guyed Tower
		5. Structure supported on other structures
<b>Radial Ice Thickness:</b>	1	inch
<b>Structure Class:</b>	2	See Worksheet "Structure Class" for Description
<b>Exposure Category</b>	C	See Worksheet "Exposure Category" for Description
<b>Topography Category</b>	1	See Worksheet "Topography Category" for Description
<b>Height of Crest Above Surrounding Area, H</b>	1	(ft) If 0 ft, use 1.0
<b>Height Above Ground Level at the</b>		
<b>Base of the Structure, z</b>	0	(ft)
<b>Wind Direction, <math>K_d</math></b>	0.95	See Worksheet "Wind Direction" for Description
<b><math>(EPA)_N</math> (ft<sup>2</sup>)</b>	0	
<b><math>(EPA)_T</math> (ft<sup>2</sup>)</b>	0	
<b><math>\theta</math></b>	0	See Worksheet "Wind Force on Appurtenances" for Description
<b><math>K_a</math></b>	1.00	
<b><math>A_f</math></b>	0	Projected area of flat structural components in one face of the section
<b><math>A_r</math></b>	0	Projected area of round structural components in one face of the section including the projected area of ice on flat and round structural components in one face for loading combinations that include ice.
<b><math>A_g</math></b>	25	Gross area of one face as if the face were solid, sqft.
<b><math>\epsilon</math></b>	0.000	solidity ratio = $(A_f + A_r)/A_g$

**Effective Projected Area  $(EPA)_A$  for Maximum Allowable Normal Load  
on Low Profile Co-Location Platform (RMQP / RMQLP / RMVP) per Antenna Pipe (sq-ft)**

**WIND LOAD: 0.4440 kips**

HEIGHT (ft)	BASIC WIND SPEED (mph)										
	70	75	80	85	90	95	100	105	110	115	120
40	32.4567	28.2734	24.8497	22.0122	19.6343	17.6219	15.9038	14.4252			
60	29.8011	25.9601	22.8165	20.2111	18.0278	16.1801	14.6026				
80	28.0498	24.4345	21.4756	19.0234	16.9684	15.2293					
100	26.7626	23.3132	20.4901	18.1504	16.1897	14.5304					
120	25.7548	22.4353	19.7185	17.4669	15.5801	13.9832					
140	24.9324	21.7189	19.0889	16.9092	15.0826						
160	24.2413	21.1168	18.5597	16.4404	14.6645						
180	23.6476	20.5996	18.1052	16.0378	14.3053						
200	23.1288	20.1478	17.7080	15.6860	13.9915						
220	22.6693	19.7475	17.3562	15.3744							

<b>GUST FACTOR BASED ON:</b>	<b>3</b>	1. latticed tower, overall height = antenna height 2. latticed tower, overall height = 200 ft 3. monopole tower 4. Guyed Tower 5. Structure supported on other structures
Radial Ice Thickness:	1	inch
Structure Class:	2	See Worksheet "Structure Class" for Description
Exposure Category	C	See Worksheet "Exposure Category" for Description
Topography Category	1	See Worksheet "Topography Category" for Description
Height of Crest Above Surrounding Area, H	1	(ft) If 0 ft, use 1.0
Height Above Ground Level at the Base of the Structure, z	0	(ft)
Wind Direction, $K_d$	0.95	See Worksheet "Wind Direction" for Description
$(EPA)_N$ (ft <sup>2</sup> )	0	
$(EPA)_T$ (ft <sup>2</sup> )	0	See Worksheet "Wind Force on Appurtenances" for Description
$\theta$	0	
$K_a$	1.00	
$A_f$	0	Projected area of flat structural components in one face of the section
$A_r$	0	Projected area of round structural components in one face of the section including the projected area of ice on flat and round structural components in one face for loading combinations that include ice.
$A_g$	25	Gross area of one face as if the face were solid, sqft.
$\varepsilon$	0.000	solidity ratio = $(A_f + A_r)/A_g$

Effective Projected Area $(EPA)_A$ for Maximum Allowable Tangential Load on Low Profile Co-Location Platform (RMQP / RMQLP / RMVP) per Antenna Pipe (sq-ft)											
WIND LOAD: 0.2000 kips											
HEIGHT (ft)	BASIC WIND SPEED (mph)										
	70	75	80	85	90	95	100	105	110	115	120
40	14.6201	12.7358	11.1935	9.9154	8.8443	7.9378	7.1639	6.4978			
60	13.4239	11.6937	10.2777	9.1041	8.1207	7.2883	6.5777				
80	12.6350	11.0065	9.6737	8.5691	7.6434	6.8600					
100	12.0552	10.5014	9.2298	8.1759	7.2927	6.5452					
120	11.6013	10.1060	8.8822	7.8680	7.0180	6.2987					
140	11.2308	9.7833	8.5986	7.6167	6.7939						
160	10.9195	9.5121	8.3602	7.4056	6.6056						
180	10.6520	9.2791	8.1555	7.2242	6.4438						
200	10.4184	9.0756	7.9766	7.0657	6.3025						
220	10.2114	8.8953	7.8181	6.9254							

<b>GUST FACTOR BASED ON:</b>	3	1. latticed tower, overall height = antenna height 2. latticed tower, overall height = 200 ft 3. monopole tower 4. Guyed Tower 5. Structure supported on other structures
Radial Ice Thickness:	1	inch
Structure Class:	2	See Worksheet "Structure Class" for Description
Exposure Category	C	See Worksheet "Exposure Category" for Description
Topography Category	1	See Worksheet "Topography Category" for Description
Height of Crest Above Surrounding Area, H	1	(ft) If 0 ft, use 1.0
Height Above Ground Level at the		
Base of the Structure, z	0	(ft)
Wind Direction, $K_d$	0.95	See Worksheet "Wind Direction" for Description
$(EPA)_N$ (ft <sup>2</sup> )	0	
$(EPA)_T$ (ft <sup>2</sup> )	0	See Worksheet "Wind Force on Appurtenances" for Description
$\theta$	0	
$K_a$	1.00	
$A_f$	0	Projected area of flat structural components in one face of the section
$A_r$	0	Projected area of round structural components in one face of the section including the projected area of ice on flat and round structural components in one face for loading combinations that include ice.
$A_g$	25	Gross area of one face as if the face were solid, sqft.
$\epsilon$	0.000	solidity ratio = $(A_f + A_r)/A_g$

**Effective Projected Area  $(EPA)_A$  for Maximum Allowable Tangential Load on Low Profile Co-Location Platform (RMQP / RMQLP / RMVP) per Antenna Pipe (sq-ft)**

**WIND LOAD: 0.2000 kips**

HEIGHT (ft)	BASIC WIND SPEED (mph)										
	70	75	80	85	90	95	100	105	110	115	120
40	14.6201	12.7358	11.1935	9.9154	8.8443	7.9378	7.1639	6.4978			
60	13.4239	11.6937	10.2777	9.1041	8.1207	7.2883	6.5777				
80	12.6350	11.0065	9.6737	8.5691	7.6434	6.8600					
100	12.0552	10.5014	9.2298	8.1759	7.2927	6.5452					
120	11.6013	10.1060	8.8622	7.8680	7.0180	6.2987					
140	11.2308	9.7833	8.5986	7.6167	6.7939						
160	10.9195	9.5121	8.3602	7.4056	6.6056						
180	10.6520	9.2791	8.1555	7.2242	6.4438						
200	10.4184	9.0756	7.9766	7.0657	6.3025						
220	10.2114	8.8953	7.8181	6.9254							

# GAS ENGINE-GENERATOR SET 40-GC6NLT1

40 kWe / 60 Hz / Standby  
208 - 600V



## SYSTEM RATINGS

### Standby

Voltage (L-L)	240V**	240V**	208V**	240V**	480V**	600V**
Phase	1	1	3	3	3	3
PF	1.0	1.0	0.8	0.8	0.8	0.8
Hz	60	60	60	60	60	60
Natural Gas Ratings: Amps	167	167	139	120	60	48
Natural Gas Ratings: kW/kVA	40/40	40/40	40/50	40/50	40/50	40/50
LP Gas Ratings: Amps	167	167	139	120	60	48
LP Gas Ratings: kW/kVA	40/40	40/40	40/50	40/50	40/50	40/50
skVA@30%						
Voltage Dip	128	116	125	125	167	92
Generator Model*	362CSL1604	361CSL1612	284PSL1742	284PSL1742	284PSL1742	361PSL1632
Temp Rise	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C	130 °C/40 °C
Connection	12 LEAD ZIG-ZAG	4 LEAD	12 LEAD LOW WYE	12 LEAD HI DELTA	12 LEAD HI WYE	4 LEAD WYE

\* The Generator Model Number identified in the table is for standard C Series Configuration. Consult the factory for alternate configuration.

\*\* UL 2200 Offered

## CERTIFICATIONS AND STANDARDS

// **Engine-generator set is designed and manufactured in facilities certified to standards ISO 9001:2008 and ISO 14001:2004**

// **Power Rating**  
- Accepts Rated Load in One Step Per NFPA 110

// **UL 2200 / CSA - Optional**

- UL 2200 Listed
- CSA Certified

// **Performance Assurance Certification (PAC)**

- Engine-Generator Set Tested to ISO 8528-5 for Transient Response
- Verified product design, quality and performance integrity
- All engine systems are prototype and factory tested

## APPLICATION DATA

## // Engine

Manufacturer	GM
Model	4.3L
Type	4-Cycle
Arrangement	6-V
Displacement: L (in <sup>3</sup> )	4.3 (262)
Bore: cm (in)	10.2 (4)
Stroke: cm (in)	8.8 (3.5)
Compression Ratio	9.4:1
Rated RPM	1,800
Engine Governor	Bosch
Maximum Power (NG): kWm (bhp)	49.6 (66.5)
Maximum Power (LP): kWm (bhp)	53.2 (71.4)
Speed Regulation	C/F
Air Cleaner	Dry

## // Liquid Capacity (Lubrication)

Total Oil System: L (gal)	4.2 (1.1)
Engine Jacket Water Capacity: L (gal)	7.2 (1.9)
System Coolant Capacity: L (gal)	21.6 (5.7)

## // Electrical

Electric Volts DC	12
Cold Cranking Amps Under -17.8 °C (0 °F)	925

## // Fuel Inlet

Fuel Supply Connection Size	3/4" NPT
Fuel Supply Pressure: mm H <sub>2</sub> O (in. H <sub>2</sub> O)	178-279 (7-11)

// Fuel Consumption (NG-1000 BTU/ft<sup>3</sup> / LP-2500 BTU/ft<sup>3</sup>)

	NG	LPG
At 100% of Power Rating: m <sup>3</sup> /hr (ft <sup>3</sup> /hr)	13.9 (489)	6.1 (216)
At 75% of Power Rating: m <sup>3</sup> /hr (ft <sup>3</sup> /hr)	10.4 (368)	4.6 (163)
At 50% of Power Rating: m <sup>3</sup> /hr (ft <sup>3</sup> /hr)	7.3 (256)	3.2 (113)

## // Cooling - Radiator System

Ambient Capacity of Radiator: °C (°F)	50 (122)
Maximum Restriction of Cooling Air, Intake, and Discharge Side of Rad.: kPa (in. H <sub>2</sub> O)	0.12 (0.5)
Water Pump Capacity: L/min (gpm)	117.3 (31)
Heat Rejection to Coolant: kW (BTUM)	39 (2,220)
Heat Radiated to Ambient: kW (BTUM)	16.5 (938)

## // Air Requirements

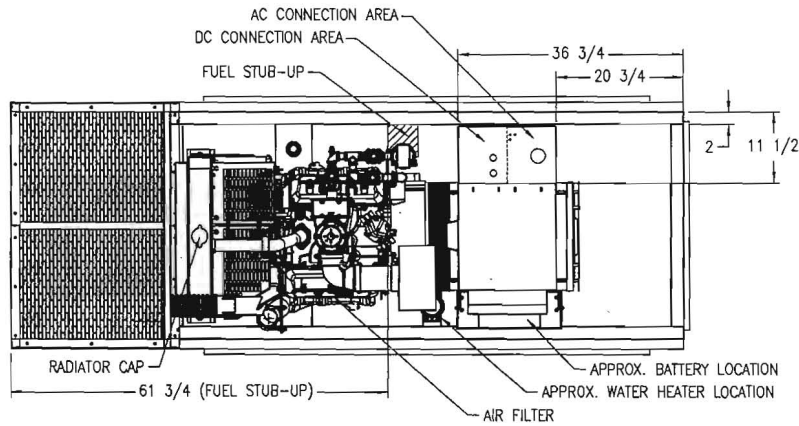
Aspirating: *m <sup>3</sup> /min (SCFM)	3.9 (136.5)
Air Flow Required for Rad.	
Cooled Unit: *m <sup>3</sup> /min (SCFM)	211.4 (7,464)
Remote Cooled Applications; Air Flow Required for Dissipation of Radiated Gen-set Heat For a Max of 25 °F Rise: *m <sup>3</sup> /min (SCFM)	59.9 (2,114)

\* Air density = 1.184 kg/m<sup>3</sup> (0.0739 lbm/ft<sup>3</sup>)

## // Exhaust System

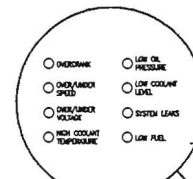
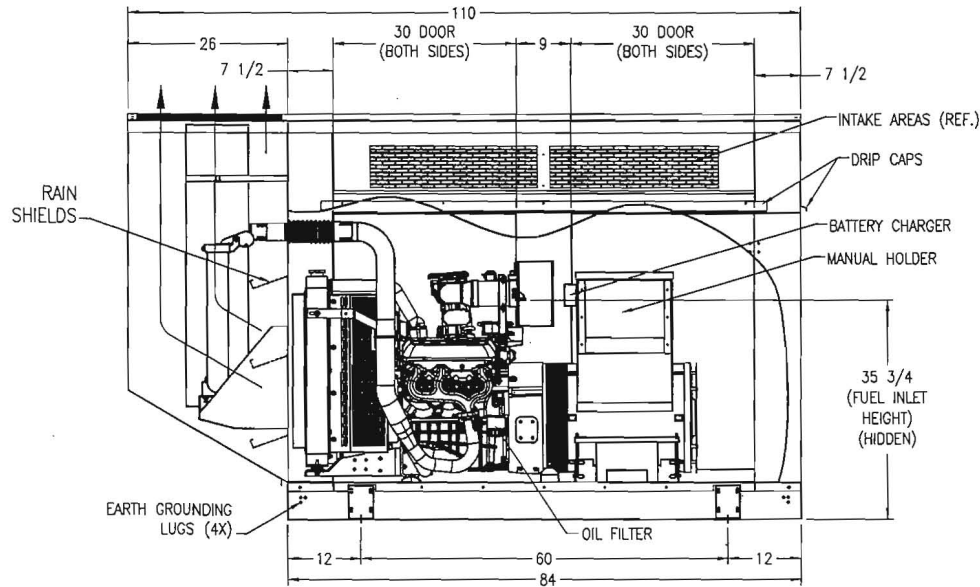
Gas Temp. (Stack): °C (°F)	704.4 (1,300)
Gas Volume at Stack Temp: m <sup>3</sup> /min (CFM)	12.5 (440.8)
Maximum Allowable Back Pressure: kPa (in. H <sub>2</sub> O)	10 (40)

DWG. #: VER30\_GC6NLT1(4.3)CQE-MI-5

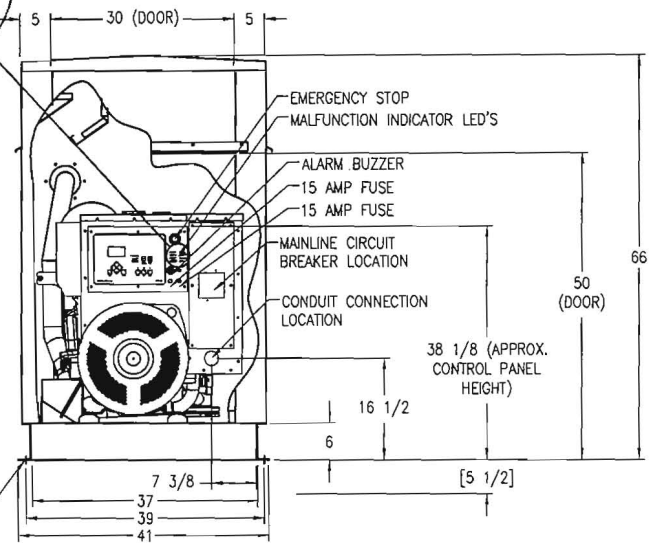


**NOTES:**

- 1) APPROX. WEIGHT: (WET) 1900#
- 2) REFERENCE BASE DRAWING: 105-5425
- 3) REFERENCE ENCLOSURE DRAWING: CQE-729-ALUM
- 4) SOUND LEVEL: 65 DBA @ 23 FT. (TO BE DETERMINED)
- 5) GEN-SET IS OFF-SET 1 3/4" TO LEFT SIDE OF BASE/ENCL.
- 6) ENCLOSURE & EXHAUST SYSTEMS ARE NOT SHOWN ON TOP VIEW
- 7) FUEL CONNECTIONS 3/4" NPT
- 8) PAINT FINISH: ANSI 61 GRAY



MALFUNCTION INDICATOR LED'S (SCALE: 10X)



REVISION	DATE	REVISION DESCRIPTION	INITIALS
A	04-11-13	INITIAL RELEASE TO SALES AND ENGINEERING	JDA



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GEN-SET INFORMATION	
ENGINE: GM 4.3L	ENCLOSURE: CQE-729-ALUM
GENERATOR: 361	BREAKER: AS SPECIFIED
RADIATOR: W/ ENG.	TANK: NA
RADIATOR AMBIENT: 50C	MUFFLER: 3 CRITICAL
DUCT FLANGE: 105-1401	TRAILER: NA
CONTROL PANEL: DGC-2020	ISOLATORS: PA05
BASE: 105-5425	

DIMENSIONAL LAYOUT	
DRAWN TO SCALE	MODEL: VER30_GC6NLT1
ALL DIMENSIONS ARE IN INCHES	
DATE: 04-11-13	DRAWN BY: JDA
DWG. #: VER30_GC6NLT1(4.3)CQE-MI-5	