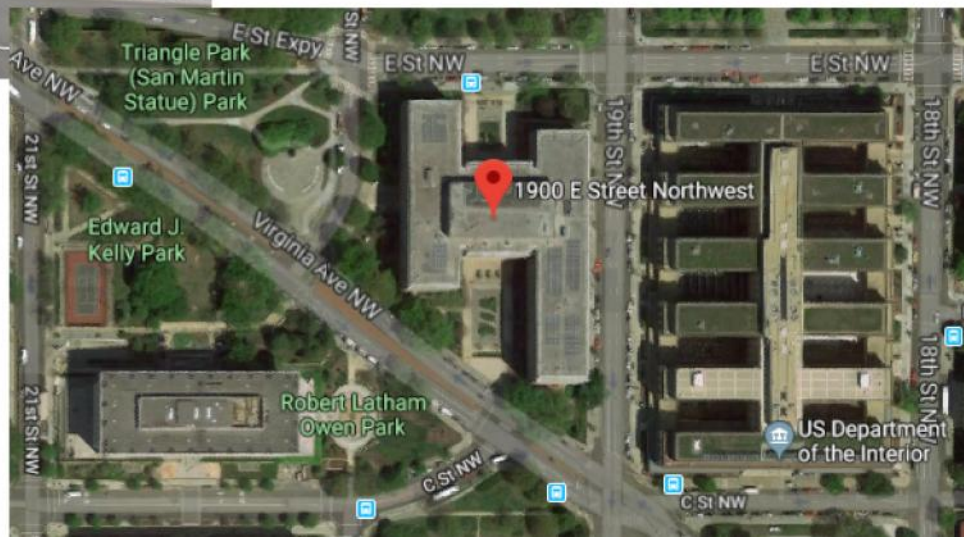
Verizon Wireless Communications Facility at Office of Personnel Management (OPM)

NCPC Preliminary and Final Site Plan Review

Submitted by the General Services Administration
December 7, 2018

GSA Site Name: OPM/Theodore Roosevelt Building
Verizon Site Name: Ellipse Relo

Office of Personnel Management/OPM



Project Overview:

This is a new proposed location for Verizon, due to the transfer of the existing site at DOI/SIB to the Federal Reserve Board.

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Contact Information

AGENCY PROJECT MANAGER

Gary L. Porter (GSA Sponsor)
Historic Perseveration Specialist
US General Services Administration

301 7th Street Southwest, Washington DC 20407
(202) 205-7766
Gary.Porter@gsa.gov

Project Report

Project Description:

Cellco Partnership, d/b/a Verizon Wireless is licensed by the Federal Communications Commission (FCC) to provide wireless service, including licenses to deploy its network in the Greater Washington, D.C. metropolitan area. Verizon Wireless proposes install a new communications facility on the roof of OPM, in order to continue to meet coverage and capacity objectives for the immediate area as part of this network.

This is especially crucial on time frame due to the termination by GSA of the existing site located at DOI SIB. The absence of this site, and its associated coverage and capacity will have a devastating effect on the area, as it is very heavily trafficked by travelers on Constitution Avenue, visitors to the Mall, and covers a great deal of surrounding federal offices and key thoroughfares. It will also have an impact on 911 calls, public safety and first responders.

Proposed Installation:

The proposed facility consists of (3) main antenna sectors, resulting in (10) of the (12) total antennas. The first sector will be sled mounted to the northwest corner of the rooftop and consist of four (4) antennas. The second sector will be sled mounted on the west facing side of the rooftop and consists of three (3) antennas. The third sector will consist of three (3) antennas sled mounted on the south side of the east wing of the rooftop. The remaining (2) antennas are small self-contained radio/antenna combos, and will be mounted on very small low profile sleds on the corners of the south end of the east wing.

The equipment that supports this facility is proposed to be located on a steel beam platform that will be located right next to the existing T-Mobile platform, and is not visible from any street level vantage point..

Visibility:

The addition of Verizon Wireless antennas at this facility will be no more visible than the current carrier installations. The visual impact of the new installation will be minimal to the aesthetics of the building and the surrounding area.

Capacity Issues:

Solid voice communications are an important necessity related to every day public safety, and are especially critical in the event of emergencies or unplanned events. Voice communication requires robust data capacity to ensure reliability. Additionally, with the proliferation of Smartphones, apps, photography and video streaming demand a persistent connection to the network, as the phones connect to the “Cloud” and do not release from it, even when not in use. This creates an unprecedented demand on the capacity of the network, particularly at large scale events where users are congregated in one place, and utilizing these streaming features non-stop. The addition of this site will help to maintain an adequate level of network coverage and capacity.

Project Report

Safety Considerations:

It is Verizon Wireless' goal to continue to provide reliable service to the public. From a safety perspective, there is an immediate need to improve capacity throughout DC and particularly in the core of the Capital and National Mall areas. Verizon Wireless is a major supplier of mobile communications to all of the US Government Agencies and is the priority network provider for DC Government, which includes the majority of first responders. Capitol Police, Park Police and many other crucial public safety agencies utilize the Verizon network, as well. Improvements to capacity are not only crucial for the improved safety for the many large scale events held throughout the year but are highly critical in the event of an emergency or other "unplanned event". The addition of a site at this facility will help to ensure that the network can continue to provide enough coverage and capacity for both the public and emergency service agencies to utilize.

Alternatives Considered:

Both OPM and DOI Main were vetted as possible locations. DOI was found to have no space for additional carriers and did not meet the coverage objective. Because the OPM building is already utilized as a telecommunication facility by at least two other carriers, it was felt that the impact of adding another carrier would be minimal.

Project Budget:

No government funds are being utilized for the installation of the proposed antennas.

Project Schedule:

The installation of this site is extremely urgent, and we are requesting an expedited review, due to the termination of Verizon Wireless' existing site at DOI SIB.

Construction commence: Mid-September 2018

Construction completion: Mid-October, 2018

Historic Preservation:

GSA, in coordination with Verizon Wireless, is initiating this review required under Section 106 of the National Historic Preservation Act of 1996, and Verizon Wireless will assist GSA as required.

Building Codes and Operational Maintenance:

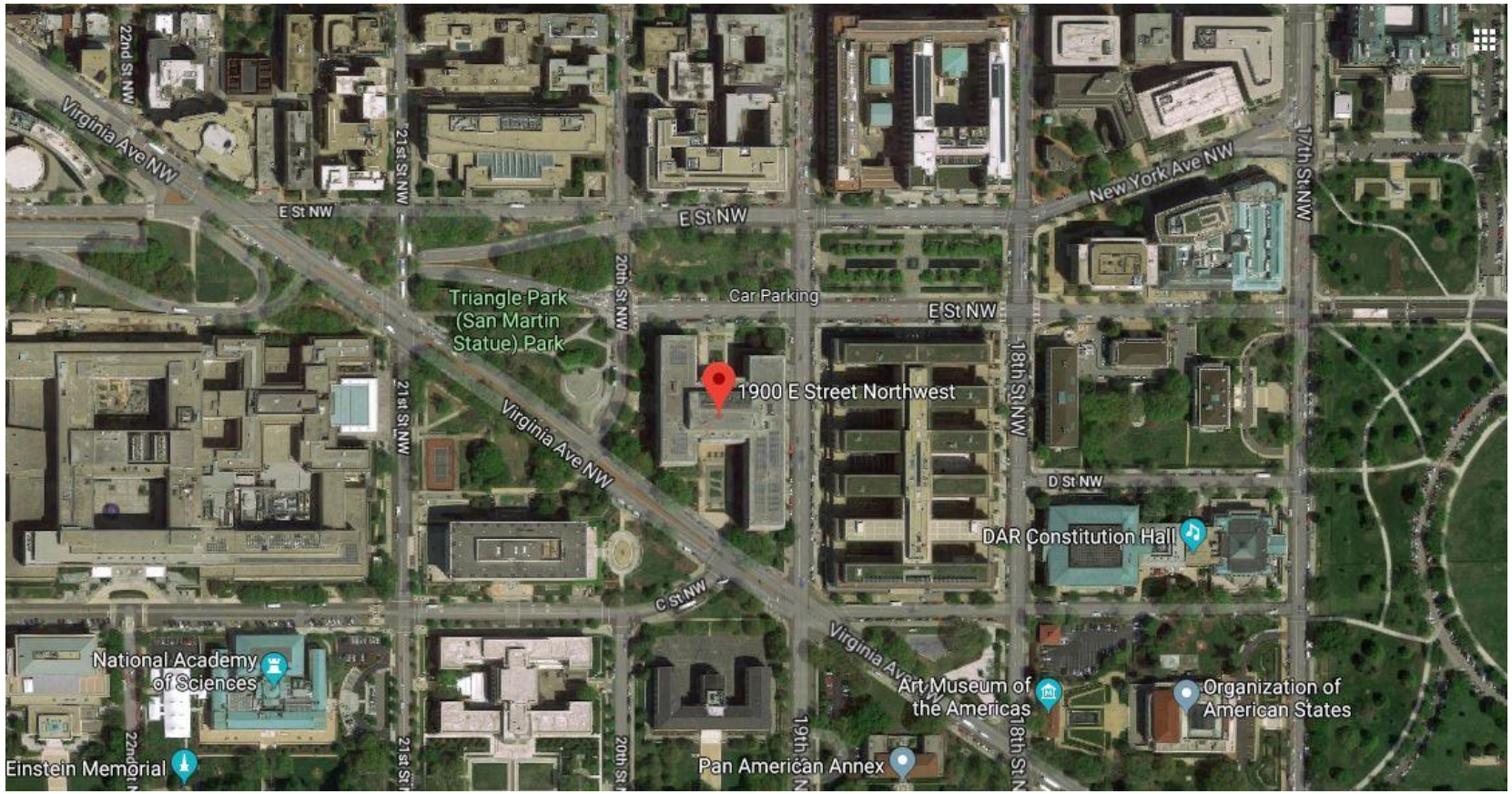
Installation of the proposed antennas will be completed in compliance with the International Building Code 2015. Verizon Wireless will conduct regular periodic inspections of the site to ensure its continued, safe operation. The roof is a secured area and is not accessible by the general public.

Conclusion:

Verizon Wireless has worked very closely with GSA to design this telecommunications facility. The resulting changes will pose minimal impact on the subject building and the surrounding area.

EXHIBITS

Vicinity Map



Aerial Map


Car Parking
E St NW
20th St NW
Lloyd's Snack Bar
1900 E Street Northwest
17th St NW
Virginia Ave NW
Virginia Ave NW

Neighborhood Description

Surrounding landmarks include:

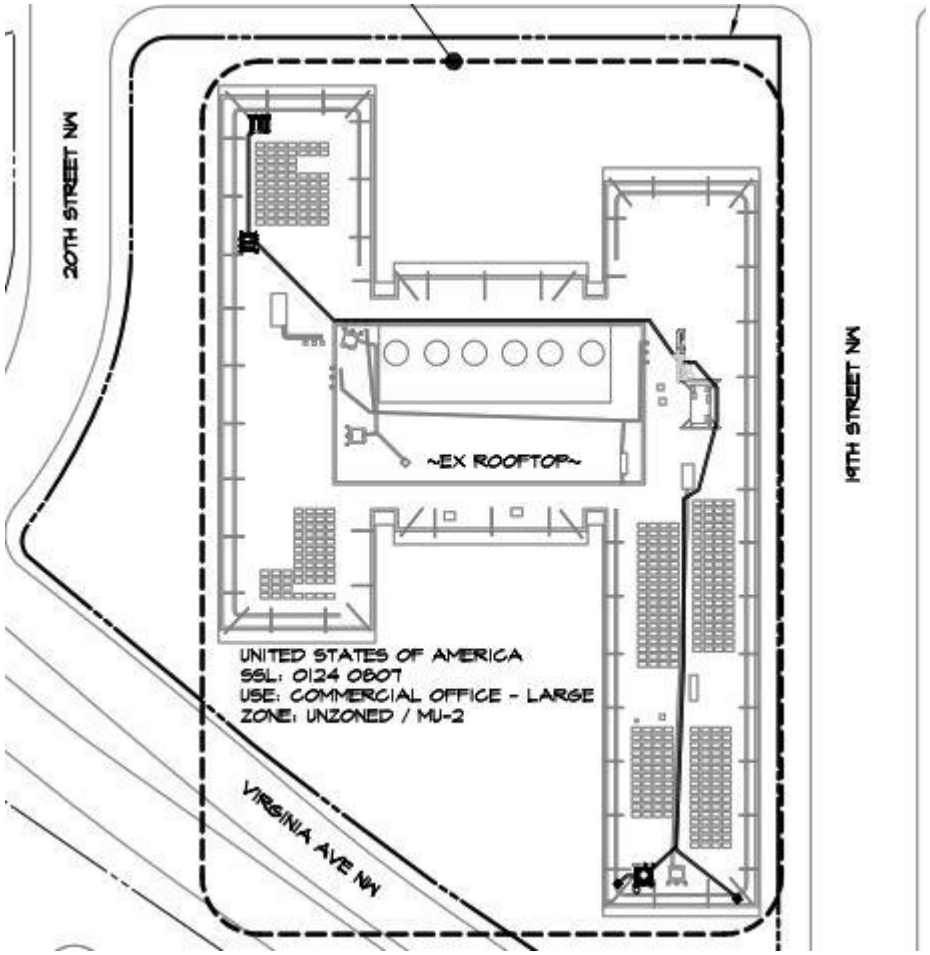
To the North of the building: US Department of State Washington Passport Agency, GSA (General Service Administration).

To the East of the building: US Department of Interior Museum.

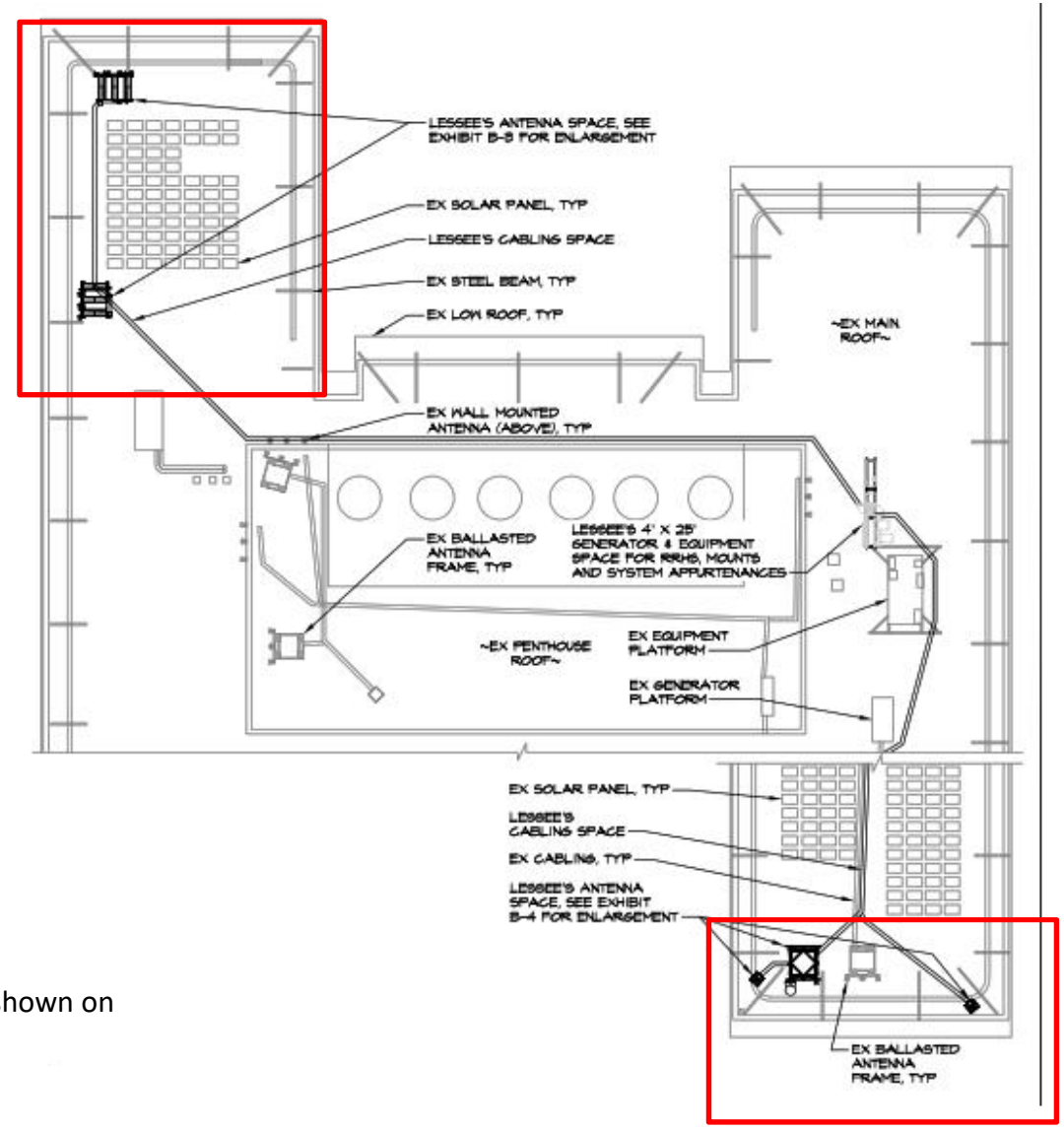
To the South of the building: South Interior Building, Constitution Gardens.

To the West of the building: US Department of State.

Overview Map

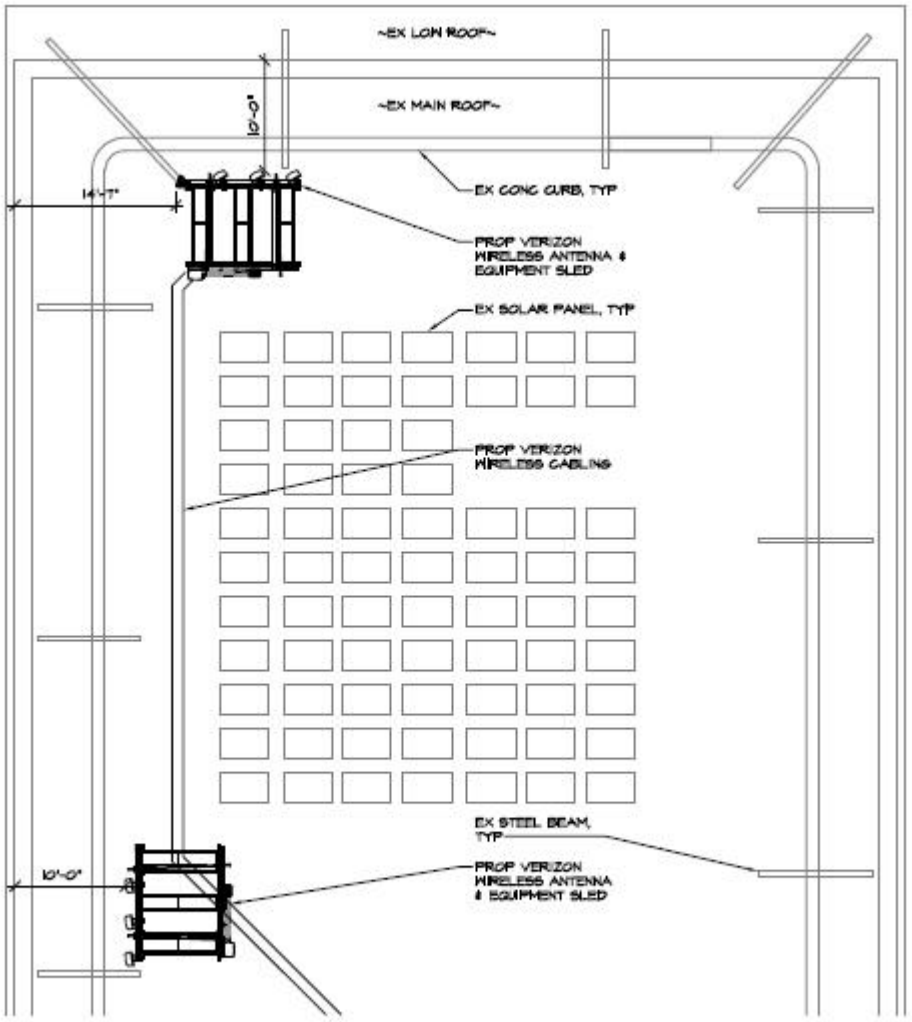


Roof Layout



☐ Details view shown on later slides

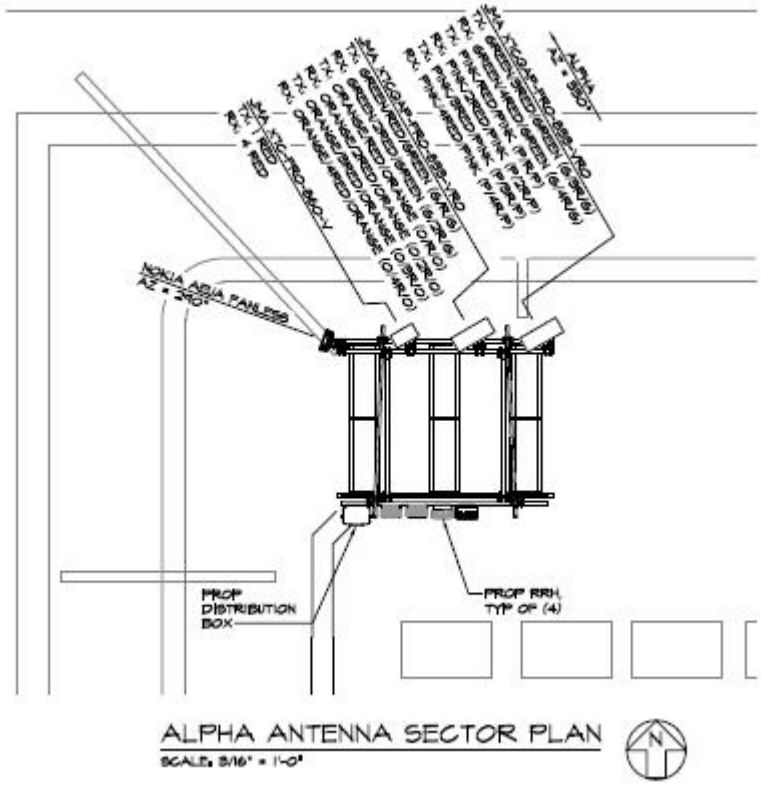
Proposed Northwest and West Sectors



ENLARGED ROOF LAYOUT (NORTH)

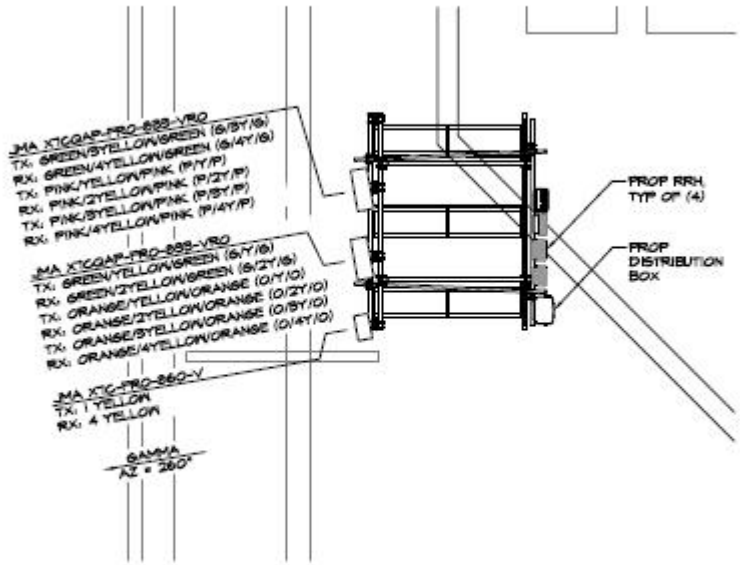
SCALE: 1" = 10'-0"

Proposed Alpha and Gamma Sector Details



ALPHA ANTENNA SECTOR PLAN

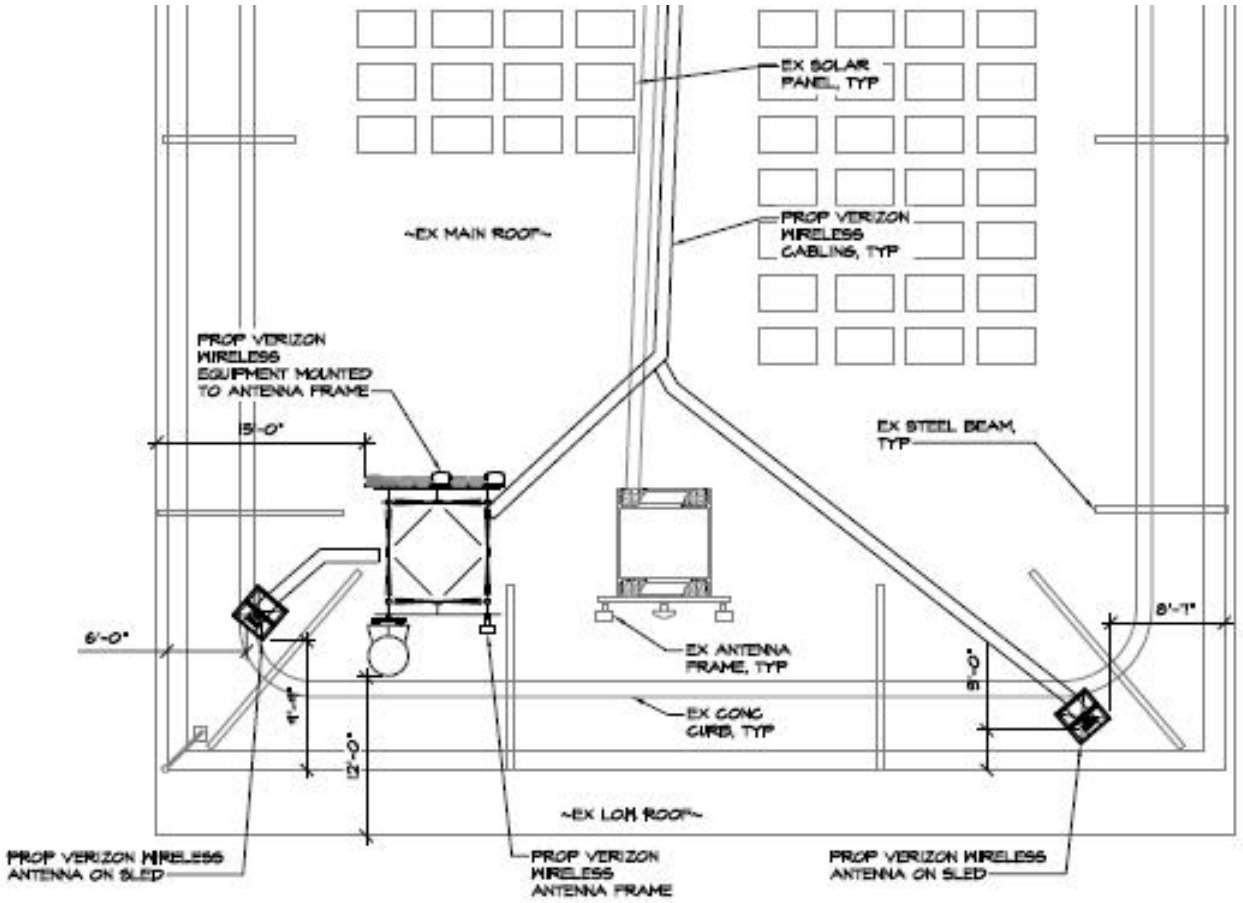
SCALE: 3/16" = 1'-0"



GAMMA ANTENNA SECTOR PLAN

SCALE: 3/16" = 1'-0"

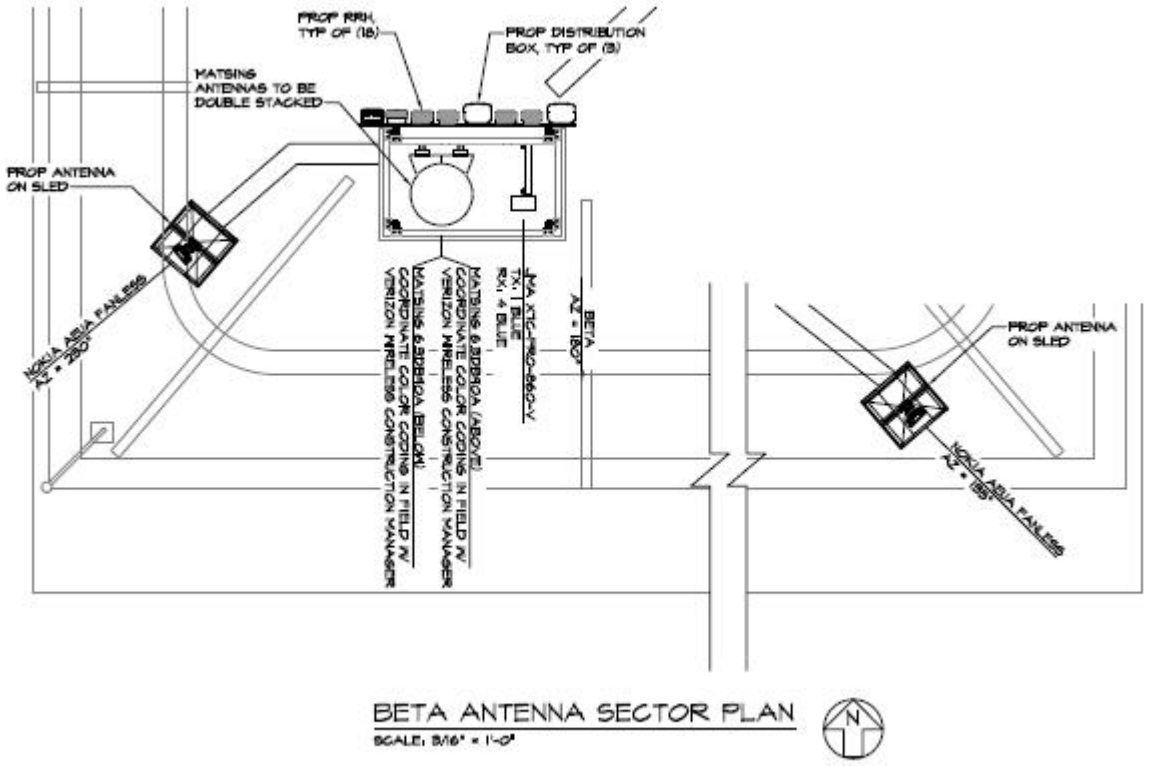
Proposed South Sector



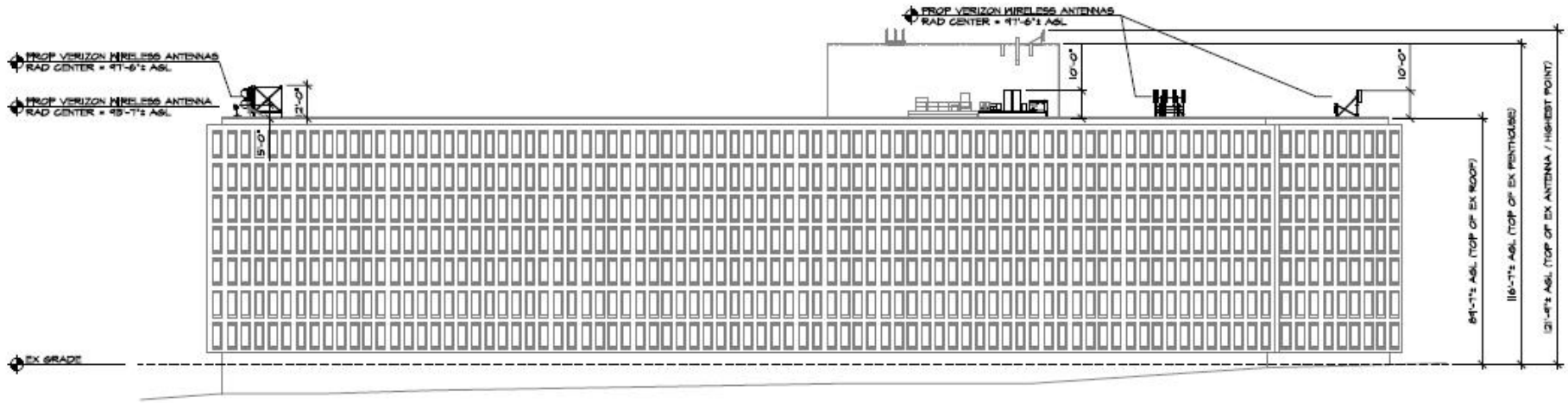
ENLARGED ROOF LAYOUT (SOUTH)

SCALE: 1" = 10'-0"

Proposed Beta Sector Details



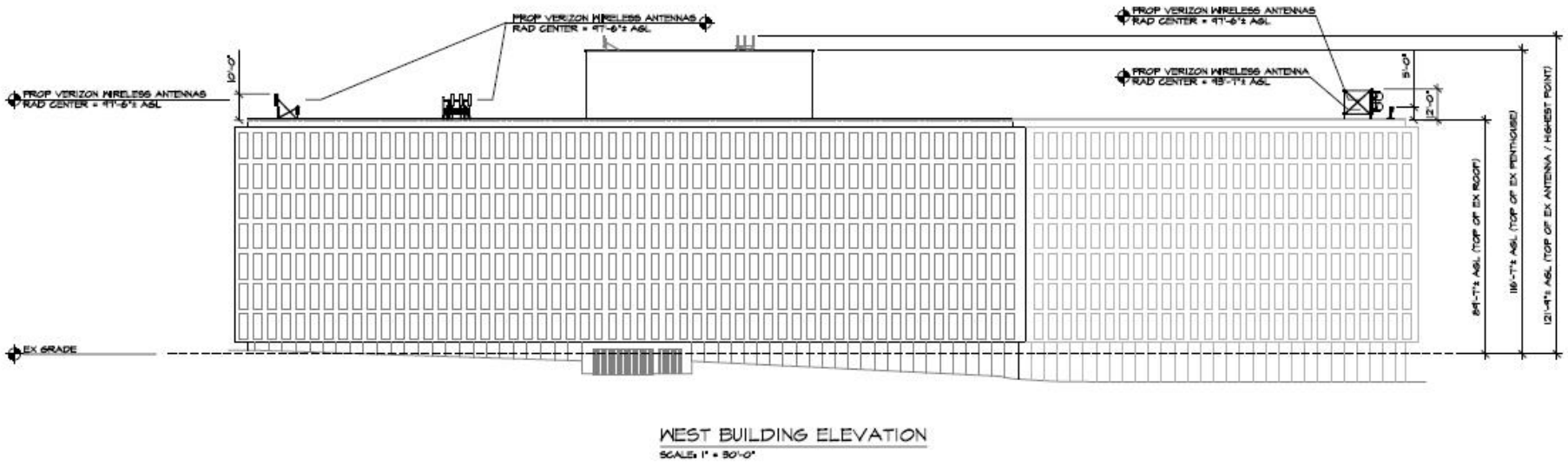
East Building Elevation



EAST BUILDING ELEVATION

SCALE: 1" = 30'-0"

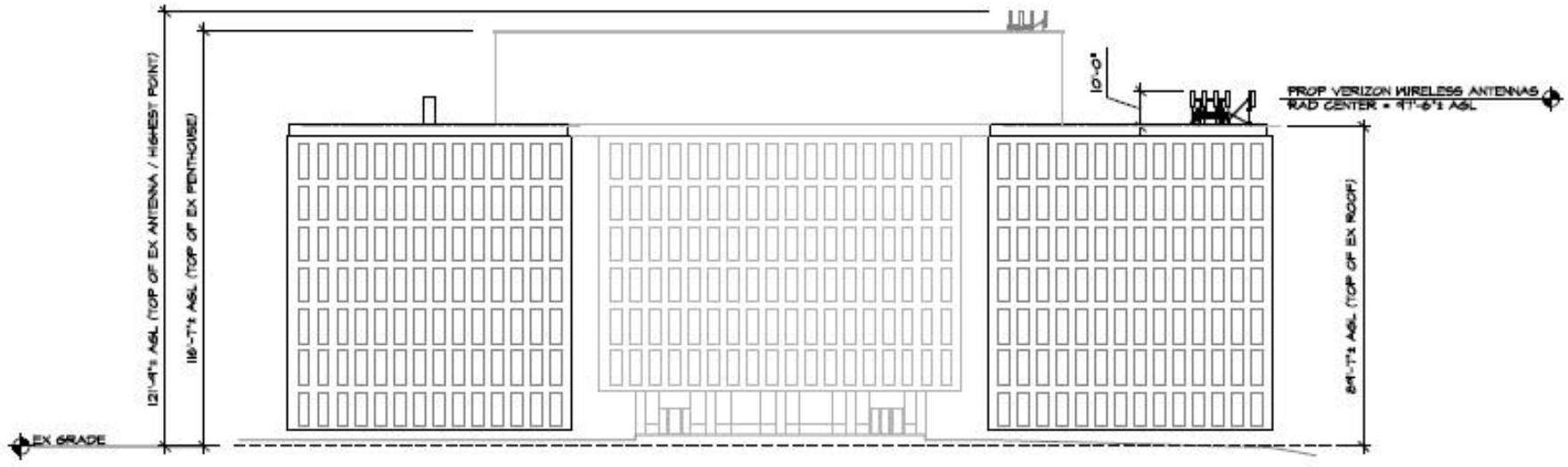
West Building Elevation



WEST BUILDING ELEVATION

SCALE: 1" = 30'-0"

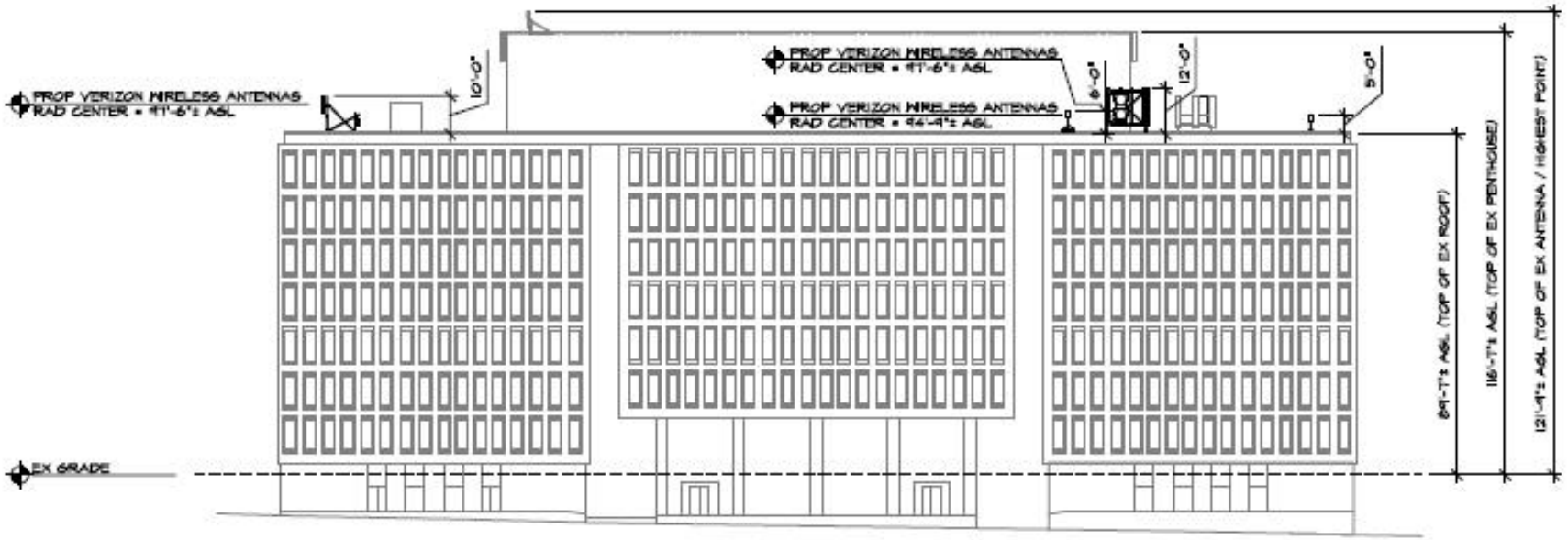
North Building Elevation



NORTH BUILDING ELEVATION

SCALE: 1" = 50'-0"

South Building Elevation



SOUTH BUILDING ELEVATION

SCALE: 1" = 30'-0"

Proposed Antennas – JMA X7C-FRO-860-V

Product Specifications

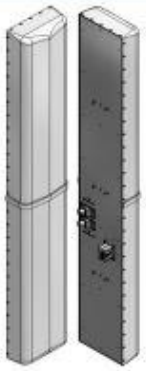
X7C-FRO-860-V

Antenna Systems Group

JMA WIRELESS

X-pol, 698-896 MHz, 96", fast roll-off 60° azimuth
Variable E-tilt, RET

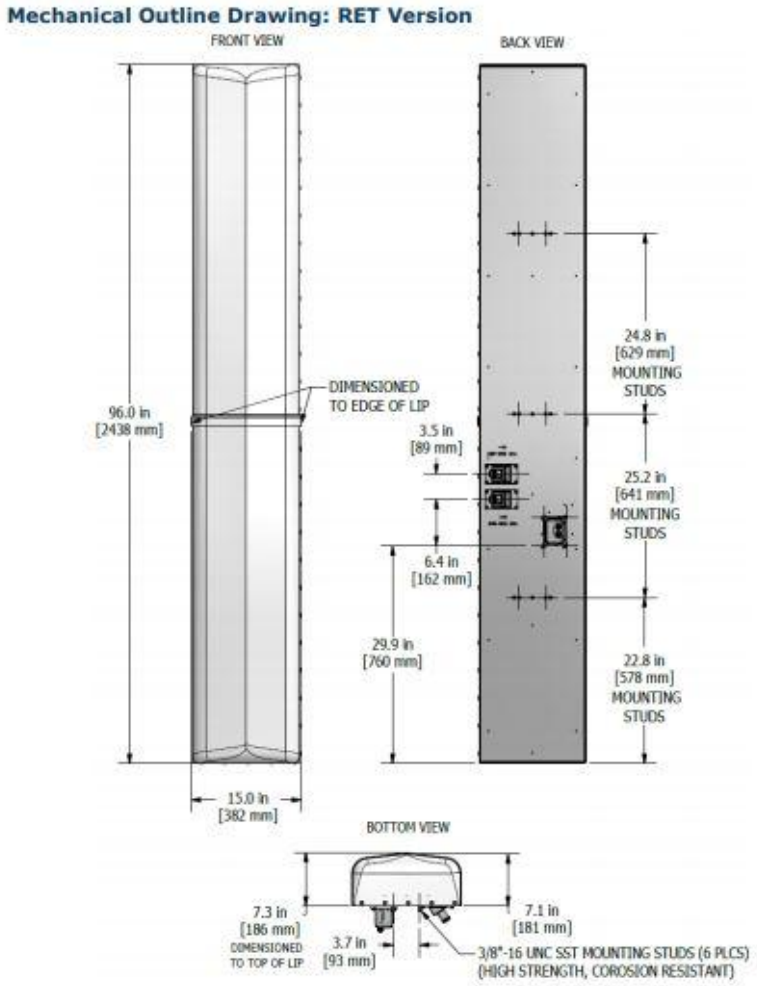
- Macro cell antenna
- Fast roll-off (FRO)
- Suitable for LTE/CDMA/UMTS/GSM
- AISG 2.0 RET control



ELECTRICAL SPECIFICATIONS		
Frequency band, MHz	**698-824**	**824-896**
Horizontal beamwidth, 3 dB points	60	57
Gain, dBi	17.2	17.9
Vertical beamwidth, 3 dB points	9.6	8.2
Front-to-back at 180°, dB	> 30	
Upper sidelobe suppression, typical, dB	18	
Polarization	+/-45°	
Electrical downtilt	0°-6° or 4°-10°	
VSWR / return loss, dB, maximum	1.5:1/-14.0	
VSWR / return loss, dB, maximum (with integrated diplexer)	1.6:1/-12.7	
Isolation between ports, dB, minimum	> 26	
Intermodulation (2 x 20 w), IM3, dBc	-150	
Impedance, ohms	50	
Maximum power per connector, CW (w)	500	

QTY: 3

Proposed Antennas – JMA X7C-FRO-860-V



Proposed Antennas – X7CQAP-FRO-833-V

X7CQAP-FRO-833-V

+/- 45° polarization, (1) 698-896 MHz & (2)1710-2180 MHz antennas, 96" Length, Fast Roll Off (FRO) 33° horizontal pattern, variable E-Tilt

- FRO improves intra- and inter-cell SINR
- Separate housing and reflector construction optimizes RF performance while maximizing mechanical strength
- Good passive intermodulation (PIM) performance reduces harmful interference
- Independent tilt per array
- Suitable for LTE/CDMA/UMTS/GSM
- AISG 2.0 RET control

ELECTRICAL SPECIFICATIONS

Frequency band, MHz	698-824	824-896	1695-1880	1880-1990	1990-2180
Horizontal beamwidth, 3 dB points	35°	38°	38°	36°	30°
Gain, dBi	19.3	19.7	19.1	19.5	19.8
Vertical beamwidth, 3 dB points	9.7°	8.5°	6.1°	5.8°	5.5°
Upper side lobe suppression, typical, dB	<-16	<-16	<-16	<-16	<-16
Front-to-back at 180°, dB	> 30		> 28		
Polarization	+/-45°		2x +/-45°		
Electrical downtilt	0°-10°		0°-12°		
VSWR/return loss, dB, maximum	1.5:1/14.0		1.5:1/14.0		
Isolation between ports, dB, minimum	>28		>28		
Co-pole isolation inter-antenna	N/A		> 28		
Intermodulation (2x20 W), IM3, dBc	-153		-153		
Impedance, ohms	50		50		
Maximum power per connector, CW (W)	500		250		

QTY: 4

Proposed Antennas – MATSING 6.3DB901

ESTIMATED TECHINCAL SPECIFICATIONS PER BEAM		
Frequency	698-896 MHz	1710-2690 MHz
Gain	16.5dBi	24dBi
Return Loss	>15dB	>15dB
Polarization	Dual Slant ±45	Dual Slant ±45
Horizontal Coverage	120°	120°
Horizontal Beamwidth (10dB level)	40° ± 4°	20° ± 2°
Vertical Beamwidth (10dB level)	42°	21°
Beam Cross-over	10dB typical	10dB typical
Total Number of Beams	3	6
Manual Adjustable Tilt per 20° sector (each sector having 2 high-band beams and 1 low-band beam)	10° to 25°	0° to 15°
First Sidelobe Level	<-18dB	<-18dB
Front to Back Ratio	>28dB	>28dB
Isolation Port to Port -Polarization	>28dB	>28dB
Isolation Port to Port – Beam	>28dB	>28dB
Power Rating	400W per port	300W per port
Intermodulation	<-150dBc	<-150dBc
Impedance	50 ohm	50 ohm
Connector Quantity and Type	6 7/16 DIN female	12 7/16 DIN female

MATSING
RF Lens Technologies

MS-6.3DB90-A

Multi-Beam Dual Band Spherical Lens Antenna: 3 independent low frequency (698-896MHz-A, 790-960MHz-B) cross-polarized beams and 6 independent high-frequency (1710-2690MHz) cross-polarized beams, with 0-15° tilt for each 40° sector and 2X2 MIMO support per beam. Sector consists of 1 low-band beam and 2 high-band beams.

***Optional Packages:**

a) **MS-6.3DB90-RET**
AISG 2.0 Remote Electrical Tilt

b) **MS-6.3DB90-B**
Low Band Frequency Range (800-960MHz)

ESTIMATED MECHINCAL DATA	
Dimensions (H x W x D)	Spherical Lens diameter: 90cm/35inch Antenna dimensions: 100 x 110 x 120 cm 39 x 43 x 47 inch
Antenna Weight	60kg 132lbs
Radome Material	Fibre Glass
Mounting	2 position pipe mount Compatible pipe diameter: 6.1 – 11.4 cm 2.4 – 4.5 inch

QTY: 2

Proposed Antennas – Nokia AEUA AirScale MAA 2T2R 512A 28 GHz 8W

Optical ports	2 x QSFP+ 9.8 Gbps CPRI
Other interfaces	Two status LEDs
Operational temperature range	-40°C to 55°C
Cooling	Natural convection cooling
Ingress protection class	IP65
Installation options	Pole, Wall
Surge protection	Class II 5kA

AEUA AirScale MAA 2T2R 512AE 28 GHz 8W	
Specification	3GPP
Frequency range	26500 – 29500 MHz
Max. supported modulation	64QAM
Number of TX/RX paths	2T/2R
Instantaneous bandwidth IBW	800 MHz
Occupied bandwidth OBW	800 MHz (1-8 x 50 or 100 MHz carriers)
Total average EIRP (64 QAM) **Peak EIRP**	54 dBm 64 dBm
Antenna type / polarization	16x16 phased array / polarity (horizontal and vertical polarity)
Horizontal beamwidth	6.5° (boresight)
Vertical beamwidth	8.6° (boresight)
Horizontal steering angle (3 dB) **Horizontal steering angle (8 dB)**	±45° ±60°
Vertical steering angle (1.5 dB)	±11.25°
Dimensions	475 mm/18.70" (H) x 304 mm/14.33" (W) x 159 mm/6.25" (D)
Volume (litres)	23 l
Weight (kg)	22 kg (without mounting brackets)
Supply voltage / Connector type	AC 100 to 250 V / BTS Amphe OBTSAC
Power consumption	<380 W

QTY: 3

RF Support Letter

verizonwireless

RE: Verizon Wireless
Ellipse Relo Site
1900 E Street, NW
Washington, DC 20415

August 30, 2018

To Whom It May Concern,

Verizon Wireless operates a Personal Communication Service authorized by the Federal Communications Commission (FCC) to provide state of the art digital wireless communications in many parts of the nation, including Washington, DC. Verizon Wireless' operations and network are licensed and regulated by the FCC.

The antennas, as proposed and designed for the above noted site, are in compliance with all applicable FCC requirements. In addition, the proposed site meets all applicable ANSI/IEEE C95.1-1992 exposure levels, as adopted by the FCC requirements.

Antenna Model: MATSING 6.3 DB901	ERP = 155 Watts/MHz (Low Band)
MATSING 6.3 DB901	EIRP = 330 Watts/MHz (High Band)
CSS X7CQAP-FRO-833	ERP = 182 Watt/MHzs (Low Band)
CSS X7CQAP-FRO-833	EIRP = 100 Watts/MHz (High Band)
474214A AEUA 28Ghz RU	EIRP = 251 Watts

The means used to determine the RF levels for this installation were generated thru the "link budget" i.e. computer model calculation. This formula determines the RF level by calculating the transmit power, antenna gain and equipment specifications of the base station components.

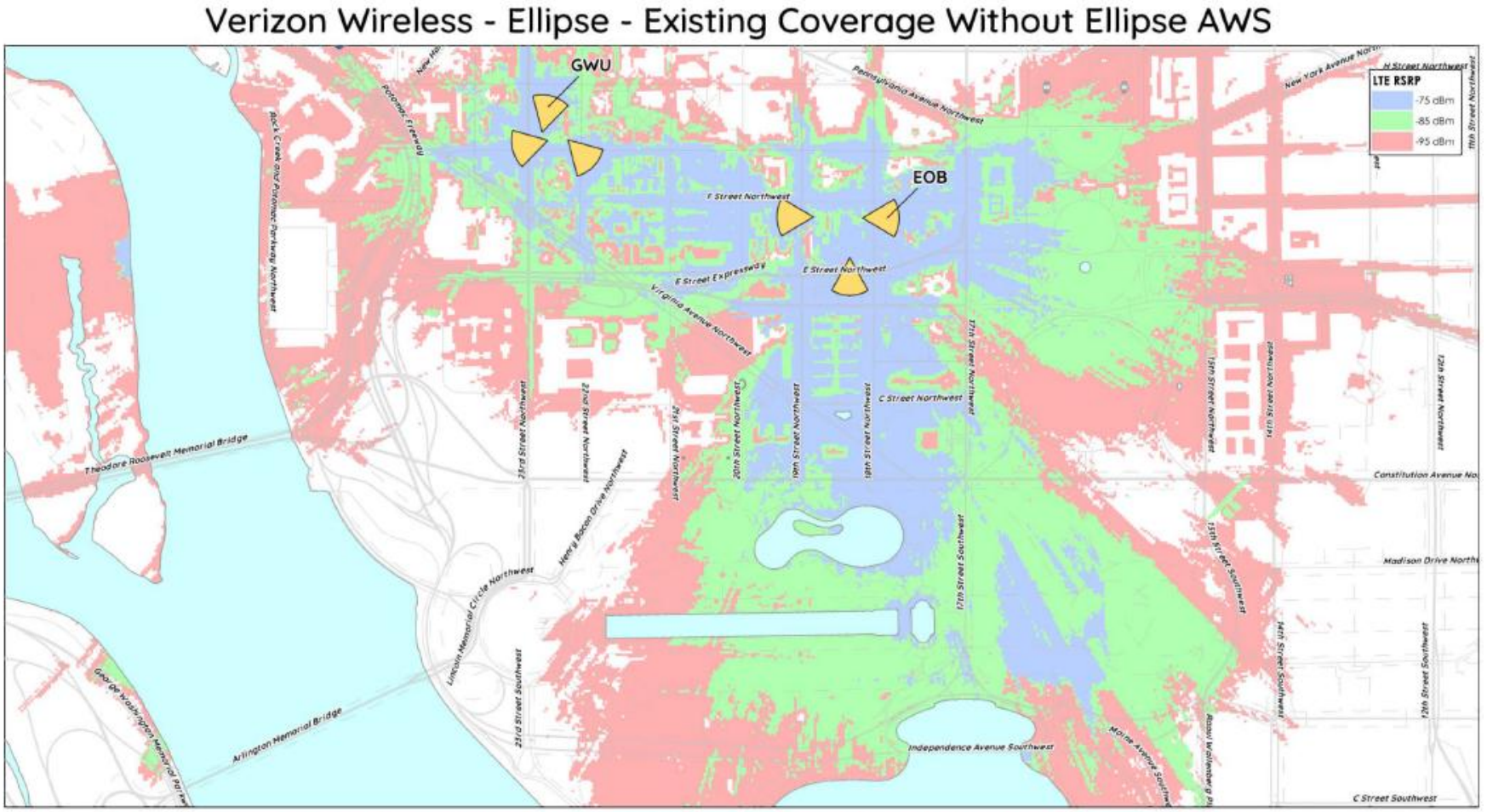
Verizon Wireless is committed to compliance with all government regulations and standards. Please contact Verizon Wireless if you have any questions regarding this matter.

Sincerely,

Roque Fial

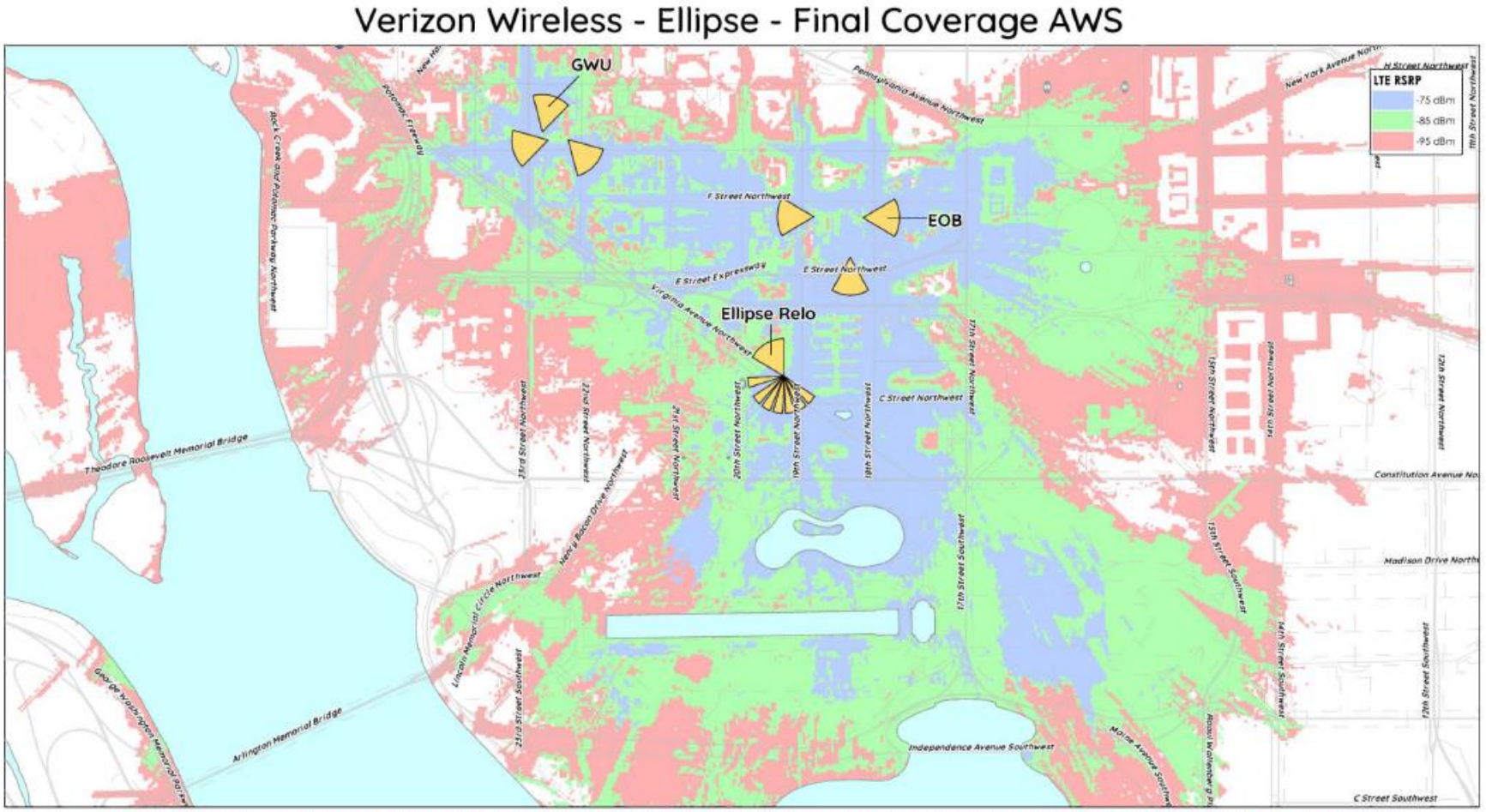
Roque Fial
RF Design Engineer / Verizon Wireless
7600 Montpelier Rd
Laurel, MD 20723
301-512-2406

RF Propagation without Existing/Proposed Site



*EOB: GSA Central Office

RF Propagation without Existing/Proposed Site



*EOB: GSA Central Office
* Ellipse Relo: OPM

verizon

PHOTO SIMULATIONS

Photo Simulation Location Legend

verizon

Northeast – Not Visible

Northeast – Existing Condition

Northeast – Proposed

North View – Existing Condition

North View – Proposed

Northwest View – Existing

Northwest View - Proposed

South View– Existing Condition

South View– Proposed

Southeast View – Existing

Southeast View – Proposed

Southeast View – Proposed*

*The stealth option was considered, but it was felt that it was more obtrusive than the un-concealed option.

West View– Existing

West View – Proposed