Revised 1.21.19 - JR

App No: 2018110611

Applicant Name	Smartlink			Antenna Compliance	Yes
Application Type	Minor Modificatio	Updated	11/29/2018	Compliance Desc	
Carrier	AT&T Wireless	6409?	No	Antenna Location	Yes
Solution Type	Macro	Ann. Plan?	No	Antenna Loc. Desc.	
Existing	Existing	Equipment Gvt Us	No	Env. Assessment	
		Gvt. Use Desc.	N/A	Cat. Excluded?	
				Routine Env. Evaluation	checked

Application Description

Remove (12) RRH's & (2) antenna's, Adding (9) RRH's & (4) antenna's

Site Id	84	Zoning	CR-5.0
Structure Type	Building	Latitude	38.984525
Address	4600 East-West Hwy, Bethesda	Longitude	-77.0929
County Site Name	Crescent Bldg.	Ground Elevation	351
Carrier Site Name	Crescent	City	Bethesda
Site Owner	Bethesda Crescent 4600 CO Limited Prtnrship	Lease Status	Leased
Structure Owner	Bethesda Crescent 4600 CO Limited Prtnrship	PROW	No
Structure Height	138		

Justification

Existing cell site, minor modification

NearbySites (New Apps Only):

Screeningconsiderations(New Apps Only):

Friday, November 30, 2018

9:34:51 AM

App No: 2018110611

Antenna Model JAHH-45A-R3B,

Frequency

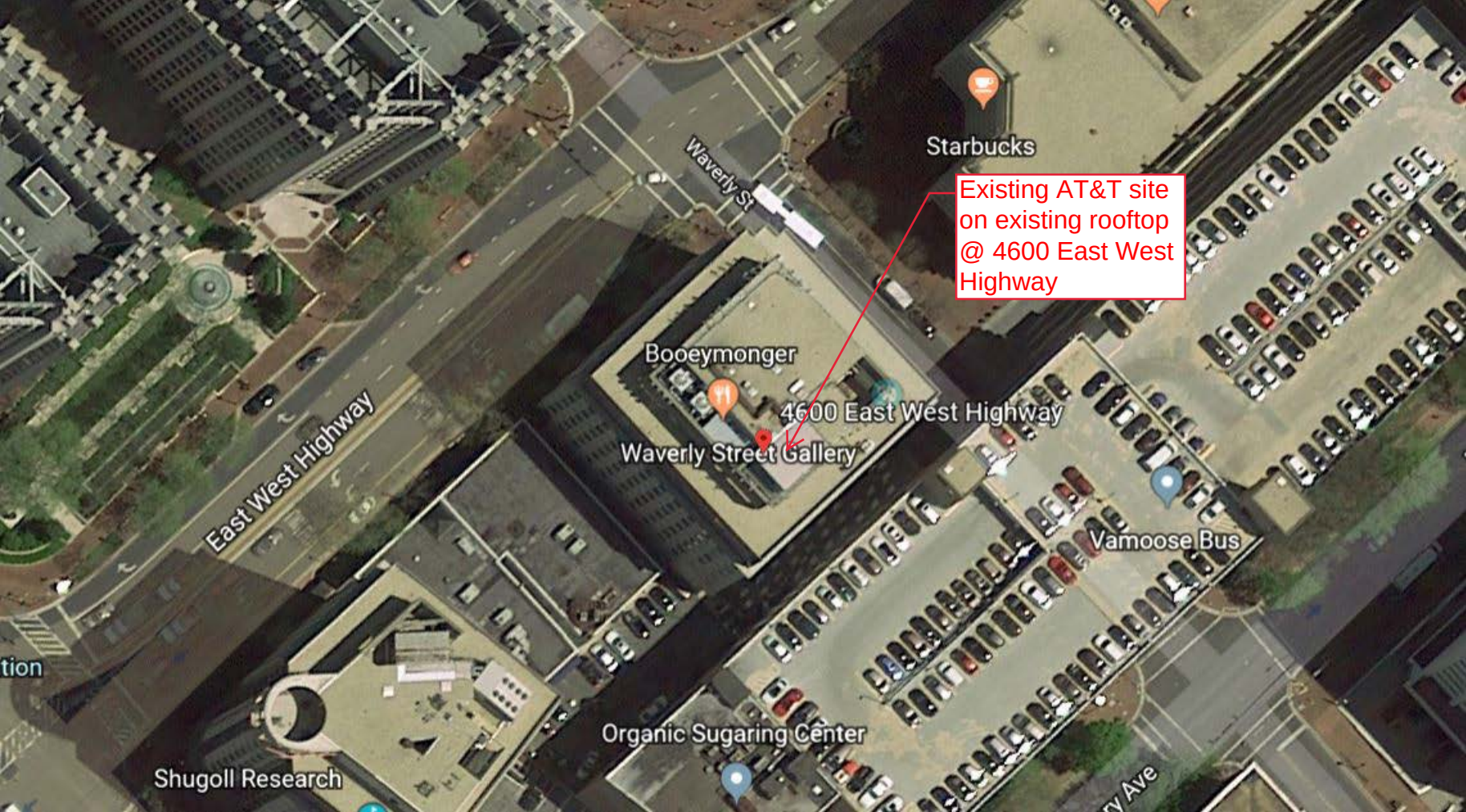
RAD Center 138 Max ERP 500 Antenna Dimensions Quantity 4,

55.1 in x 18.0 in x 7 in,

700: 704-716, 734-746
FN: 758-768, 788-798
850: 824-835, 845-846.75, 890-891.5, 869-880
1900/PCS: 1865-1885, 1945-1965
AWS: 1710-1720, 1765-1770, 2110-2120, 2165-2170
WCS: 2305-2315, 2350-2360

Friday, November 30, 2018

9:34:51 AM


Existing AT&T site on existing rooftop @ 4600 East West Highway
Starbucks
Waverly St
Booeymonger
4600 East West Highway
Waverly Street Gallery
East West Highway
Vamoose Bus
Organic Sugaring Center
Shugoll Research

JAHH-45A-R3B

8-port sector antenna, 2x 698–798, 2x 824-894 and 4x 1695–2360 MHz, 45° HPBW, low bands each have a RET and the high bands share a RET. Two internal SBTs.

- Internal SBT on low and high band allow remote RET control from the radio over the RF jumper cable
- One RET for 700MHz, one RET for 850MHz, and one RET for both high bands to ensure same tilt level for 4x Rx or 4x MIMO
- Internal filter on low band and interleaved dipole technology providing for attractive, low wind load mechanical package
- Separate RS-485 RET input/output for low and high band
- Narrow beamwidth capacity antenna for higher level of densification and enhanced data throughput

Electrical Specifications

Frequency Band, MHz	**698–798**	**824–894**	**1695–1880**	**1850–1990**	**1920–2200**	**2300–2360**
Gain, dBi	14.8	15.6	18.1	18.7	19.1	19.6
Beamwidth, Horizontal, degrees	49	42	44	43	42	39
Beamwidth, Vertical, degrees	18.6	16.6	7.7	7.2	6.7	6.0
Beam Tilt, degrees	2–18	2–18	1–9	1–9	1–9	1–9
USLS (First Lobe), dB	17	19	18	19	19	20
Front-to-Back Ratio at 180°, dB	33	32	36	37	36	37
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	25	25	25	25	25	25
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port, maximum, watts	200	200	300	300	300	250
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

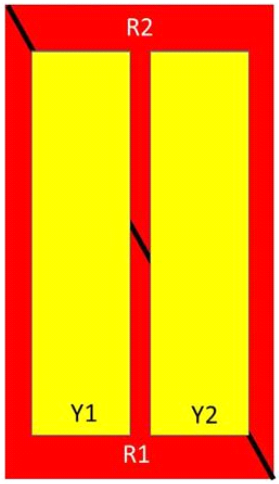
Electrical Specifications, BASTA*

Frequency Band, MHz	**698–798**	**824–894**	**1695–1880**	**1850–1990**	**1920–2200**	**2300–2360**
Gain by all Beam Tilts, average, dBi	14.5	15.4	17.7	18.4	18.8	19.4
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.4	±0.5	±0.4	±0.5	±0.3
Gain by Beam Tilt, average, dBi	2 ° | 14.6 10 ° | 14.5 18 ° | 14.3	2 ° | 15.6 10 ° | 15.4 18 ° | 15.1	1 ° | 17.7 5 ° | 17.8 9 ° | 17.5	1 ° | 18.5 5 ° | 18.5 9 ° | 18.2	1 ° | 18.8 5 ° | 18.9 9 ° | 18.6	1 ° | 19.5 5 ° | 19.5 9 ° | 19.2
Beamwidth, Horizontal Tolerance, degrees	±1.5	±2.7	±2.4	±1.5	±2.4	±1.3
Beamwidth, Vertical Tolerance, degrees	±1.2	±0.8	±0.3	±0.3	±0.4	±0.2
USLS, beampeak to 20° above beampeak, dB	17	22	14	14	15	15
Front-to-Back Total Power at 180° ± 30°, dB	24	23	29	31	32	32
CPR at Boresight, dB	22	24	17	21	20	19
CPR at Sector, dB	17	17	11	13	15	17

JAHH-45A-R3B

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

Array Layout



(Sizes of colored boxes are not true depictions of array sizes)

Array	Freq (MHz)	Conns	RET (SRET)	AISG RET UID
R1	698-798	1-2	1	ANxxxxxxxxxxxxxxxx1
R2	824-894	3-4	2	ANxxxxxxxxxxxxxxxx2
Y1	1695-2360	5-6	3	ANxxxxxxxxxxxxxxxx3
Y2	1695-2360	7-8		

Port Configuration

General Specifications

Operating Frequency Band	1695 – 2360 MHz | 698 – 798 MHz | 824 – 894 MHz
Antenna Type	Sector
Band	Multiband
Performance Note	Outdoor usage
Total Input Power, maximum	800 W @ 50 °C

Mechanical Specifications

RF Connector Quantity, total	8
RF Connector Quantity, low band	4
RF Connector Quantity, high band	4
RF Connector Interface	4.3-10 Female
Color	Light gray
Grounding Type	RF connector body grounded to reflector and mounting bracket
Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Location	Bottom
Wind Loading, frontal	795.0 N @ 150 km/h 178.7 lbf @ 150 km/h
Wind Loading, lateral	173.0 N @ 150 km/h 38.9 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Length	1399.0 mm | 55.1 in
Width	457.0 mm | 18.0 in
Depth	178.0 mm | 7.0 in
Net Weight, without mounting kit	33.5 kg | 73.9 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Internal Bias Tee	Port 1 | Port 5
Internal RET	High band (1) | Low band (2)
Power Consumption, idle state, maximum	1 W
Power Consumption, normal conditions, maximum	8 W
Protocol	3GPP/AISG 2.0 (Single RET)
RET Interface	8-pin DIN Female | 8-pin DIN Male

JAHH-45A-R3B

RET Interface, quantity	2 female | 2 male

Packed Dimensions

Length	1542.0 mm | 60.7 in
Width	608.0 mm | 23.9 in
Depth	346.0 mm | 13.6 in
Shipping Weight	46.5 kg | 102.5 lb

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

BSAMNT-3 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

Field Notice
BTS Hardware Product/Solution

Product Name: **Nokia_AirScale Dual RRH 4T4R B12/B14 320W (AHLBA)**

Product/Solution description: **AirScale 4T4R B12/B14 Remote Radio Unit**

HQ NP&E RAN Contact:	Shahid Waheed (sw905t); Shane Smith (c34017); Effendi Jubilee (ej9883); Ming Ho(mh8532)
HQ CTO RAN Contact:	Dan Edwards (de4055)
HQ SCM Contact:	Jeff Brashears (jb245y); Ricky Ayo JR. (ra5144)
HQ FNP Contact:	Hull, Brian (bh2374), McAleer Heather (hm5610)
HQ C&E Contact:	Thomas Land (tl5529)
HQ NP&E Asset Opt. Contact:	Rob Seawright (rs6833)

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FITZGERALD, MARY	LIDDIL, JAKE	PORTZER, BRUCE T	WAHEED, SHAHID	

Notice:

- **AirScale AirScale Dual RRH 4T4R B12/B14 320W (AHLBA) has achieved GA under FL18 Dr 4.2 to allow the installation and integration.**

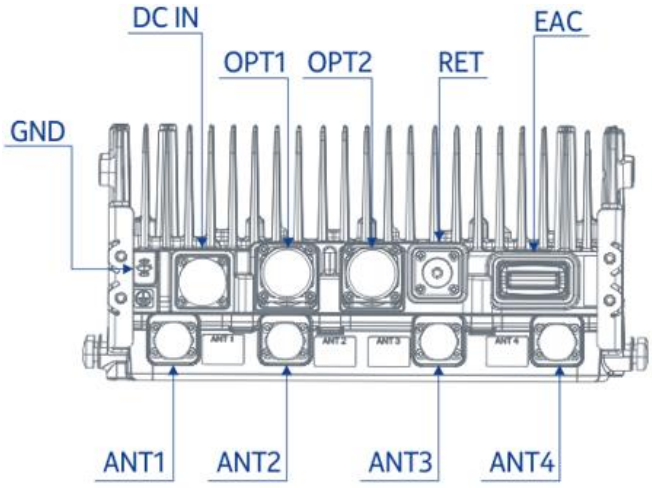
  Please refer to the restriction mode under FL18Dr.4.2 in the "Application Dependencies"

- **Market shall prepare the 2nd Fronthaul Fiber for future 5G NR.**

<table>
<tr><th>Item Master Number</th><th>Description</th><th>Status</th></tr>
<tr><td>CEQ.19797</td><td>AirScale Dual RRH 4T4R B12/B14 320W (AHLBA) with Ancillary kits, 3 units of SFP7- 2 for RRH sides and 1 for BBU side

Components:
<table>
<tr><th>Nokia Part #</th><th>ATT Item #</th><th>Qty</th><th>Description</th></tr>
<tr><td>474384A</td><td>TBD</td><td>2</td><td>KIT: PLUG WEATHERIZED-R2CT Short Plug</td></tr>
<tr><td>408978567</td><td>CEQ.16546</td><td>1</td><td>KIT, WEATHERPROOF TAPE</td></tr>
<tr><td>471649A</td><td>CEQ.32098</td><td>2</td><td>FPKA Flexi Pole Kit</td></tr>
<tr><td>472949A</td><td>NEQ.20022</td><td>3</td><td>FOSP Optical SFP P 1310nm 9.8Gb 10km SM</td></tr>
<tr><td>474240A</td><td>CEQ.19798</td><td>1</td><td>AirScale Dual RRH 4T4R B12/B14 320W (AHLBA)</td></tr>
<tr><td>474283A</td><td>TBD</td><td>1</td><td>DC power connector (6 AWG)</td></tr>
</table></td><td>Active</td></tr>
<tr><td>CEQ.19798</td><td>AirScale Dual RRH 4T4R B12/B14 320W (AHLBA) – RADIO ONLY as Spare</td><td>Active</td></tr>
</table>

Key Technical Characteristic



	AirScale Dual RRH 4T4R B12/B14 320W (AHLBA)
Dimension HxWxD (with Solar Shield)	NTE: 28.7" x 15.4" x 9.5"
Weight (Core Only)	NTE: 101.4 lbs
Frequency Band	Band 12: DL 729 - 745 MHz, UL 699 - 715 MHz Band 14: DL 758 - 768 MHz, UL 788 - 798 MHz
Instantaneous Bandwidth	B12: 16 MHz B14: 10 MHz
Technology	LTE, 5GNR
Rx Diversity	2-Way or 4-way
TX MIMO	2TX or 4TX
RF Power Range	4x40W per band (4x80W Total)
RF Ports	4 ports of 4.3-10 (F)
Operating Temperature	-40°C to 55°C, IP65
Power Supply	DC-48 V / -36V to -60V
Power Consumption	525W (ETSI 24h Avg – 4x20W per band, 40W per TX port)
AISG RF port	AISG on all ports, BiasT support on ANT1 & ANT3
RET Port (RS485)	30 W max, 14.5 V

- AirScale Dual RRH 4T4R B12/B14 320W (AHLBA) can be supported by the following baseband products:
  - Nokia AirScale BBU-FSM4 (LTE)

- AirScale Dual RRH 4T4R B12/B14 320W (AHLBA) equipped with 4 RF ports of 4.3-10 Female Connectors

- AirScale Dual RRH 4T4R B12/B14 320W (AHLBA) has an integrated Bias Tee on RF ports TxRx1 and TxRx3.

- Unused RF port connectors must have min of 2**-watt load terminator** installed, which are not provided with the Radio CEQs. If needed, they must be ordered separately.

Application Dependencies:

- Per Policy Letter - RRH Placement, ATT-002-290-744; the ATT deployment preference is still to place RRH on top by the antenna location.
- CPRI Daisy Chaining is not supported
- 1 CPRI for LTE and the other CPRI for 5G NR
- FL18_ENB_0000_001344_000000 is known as FL18-DR1 with Defensive Fix.
- Under FL18-DR1 with Defensive Fix, AirScale Dual RRH 4T4R B12/B14 320W (AHLBA) can support:
  - B12 in 2T2R mode **only**
  - B14 in 2T2R or 4T4R.

  Restriction: No B12 4T4R under FL18-DR4.2

  Under FL18-GA3 (Sept 2018); AirScale Dual RRH 4T4R B12/B14 320W (AHLBA) will support 4T4R mode on B12.

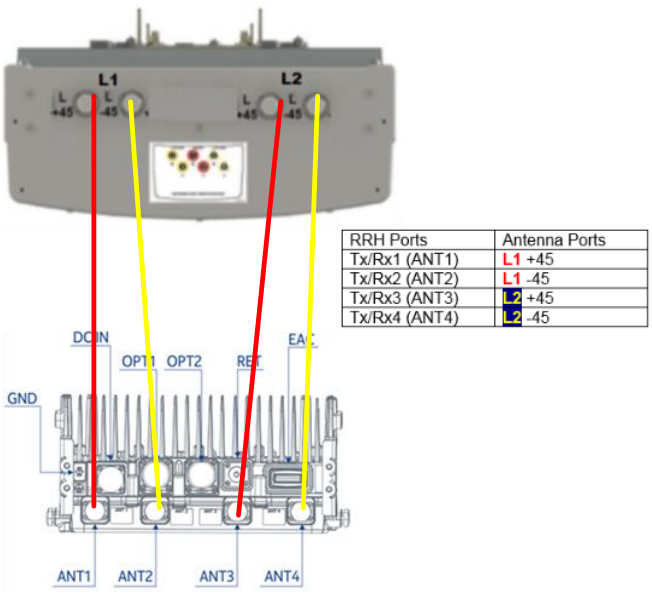
Antenna Configuration for
AirScale Dual RRH 4T4R B12/B14 320W (AHLBA)

- Below is the mapping to configure 2T or 4T4R configuration with 4 antenna LO ports

RRH Ports	Antenna Ports
Tx/Rx1 (ANT1)	**L1** +45
Tx/Rx2 (ANT2)	**L1** -45
Tx/Rx3 (ANT3)	**L2** +45
Tx/Rx4 (ANT4)	**L2** -45

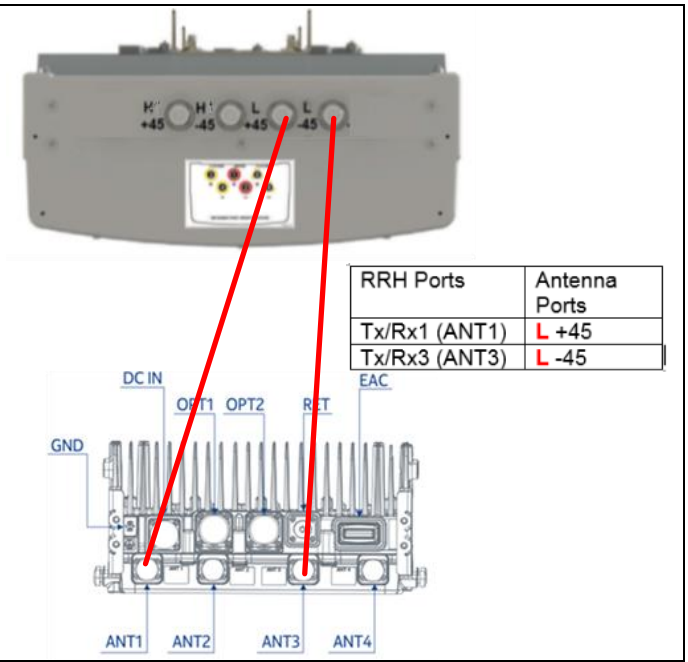
- As **exception**, 2-port antenna configuration (2T2R) might be used and it requires the red lines (Tx/Rx1 and Tx/Rx3) to be connected to the antenna ports.
- Market shall wire the jumpers accordingly to the table above per the field notice: 4T4R Antenna_Radio Port Connections

Antenna Bottom View



- Below is the mapping to configure 2T2R configuration with 2 antenna LO ports

RRH Ports	Antenna Ports
Tx/Rx1 (ANT1)	**L** +45
Tx/Rx3 (ANT3)	**L** -45



IM Analysis for Multicarrier Capable Radios

Per Intermodulation Distortion Analysis guideline (ATT-002-290-319), markets must run the Intermodulation (IM) Analysis during their planning phase to anticipate future multicarrier deployment using a single radio.

Markets must avoid 3rd order IM when operating multiple carriers in single radio by considering other alternatives such as swapping to other spectrum bands, adding additional radio or so on.

In addition to the guideline, market could use the tools below for IM analysis.

- Commscope IM tool (easy to use)
  Band_and_Block_North_America.zip

- Quintel IM tool
  Full Band PIM Simulator (010915) v9_1 no UKL.zip
  Full Band PIM Simulator (010915) v9_1 no UKL64.zip (for 64-bit computer)

Identification and Treatment of Assets Removed from Service

The goal of the Mobility Network Asset Acceleration program is to manage, minimize financial impact when the business dictates a high probability a network element(s) will be retired prior to the end of its useful life. In-Service RAN equipment associated with pre-identified company directed decommission initiatives, not defined by the enterprise for reuse or sparing will qualify for accelerated depreciation treatment when retired. Eligible items must meet one of the following criteria:

— Part of a Technology turndown (e.g. TDMA, GSM, and CDMA)
— Part of an exception process (Battery Replacement, Antenna Turndown)
— On the Excess & Obsolete list
  - Item/part numbers that are on the E&O list are preapproved for retirement

  Please note:
  - Idle/spare equipment, Destroyed/Damaged Sites, Cancelled Projects are not eligible for re-class to depreciation expense

Equipment Reuse Program

Under a condition of reusing older equipment in the inventory, a special Reuse Program might be setup and would **supersede** this policy letter on how to use the above equipment.

C&E Deployment Notice

When initially installing equipment, such as new site builds (NSB) or first carrier (1C), along with adding equipment to existing sites (2C, 3C, etc.), the following practices must be followed:

- Properly dimension equipment per ATT-002-291-223 (C&E Mobility: Cell Site DC Power and Battery Backup) including, but not limited to:
  - DC power plant (rectifiers & converters)
  - Commercial AC power feed
  - Backup batteries
  - Fixed generators

  - HVAC
- Complete a Site Power Calculation Tool (SPCT) for properly dimensioning the site (as directed in ATT-002-290-223)
  - Utilize the Rosenberger Voltage Drop Calculator or the Commscope Voltage Drop Calculator for determining the proper size DC trunk (4, 6 or 8-AWG) and jumper cables (8, 10 or 12-AWG) for RRH/RRUs
  - Max DC jumper cable size from SQUID to radio is 10-AWG; 8-AWG DC jumper may only be used with a NEMA enclosure style Raycap device, not a SQUID; unless the RRH is powered via a breaker larger than 30 amps, then follow ATT-CEM-18004 to install #8 AWG DC jumpers
  - Shielded DC cable is required
  - Max DC trunk (feeder) cable size for SQUID is #4-AWG

Maximum Permissible Exposure (MPE) limits
Market shall follow to the AT&T Radio Frequency (RF) Safety Compliance Program for complying with the Federal Communications Commission (FCC) regulations on RF safety requirements to wireless communication services and Maximum Permissible Exposure (MPE) limits for preventing harmful effects from exposure to RF energy.

Below are RF Safety and MPE guidelines:
- RF Exposure Compliance **(ATT-002-290-394)**
- RF Exposure: Responsibilities, Procedures & Guidelines **(ATT-002-290-078)**

Additional Information/Technical References

1. Policy Letter – RRH Placement, ATT-002-290-744
2. LTE RF Network Design Guidelines, ATT-002-290-329
3. LTE eDNB RF Operation Guidelines, ATT-002-290-531
4. ATT-CEM-18002-OEM Radio Breaker Size Standard v5 053018

Refer to website:

- AT&T APEX for guideline and policy letter
- NP&E Emerging Technology- Policy Letter
- NP&E Emerging Technology- Field Notice
- NP&E Emerging Technology- RF HW Equipment Engineering
- C&E Site Support

Revision

Rev	Date	Remark
5.0	Aug 7, 2018	Jumper set up for 2T and 4T
4.0	July 26, 2018	• GA under FL18-Dr4.2
3.0	July 3, 2018	• CGA under FL18-Dr4.1 with defensive fix to install and to integrate
2.1	June 19, 2018	• 2nd Fronthaul Fiber for 5G NR preparation
2.0	June 19, 2018	• CGA-Ph1: To install only on sites with an new B12 or B14 carrier-add. NO integration until GA achieved. • Remove the Site Deliverable Limitation.
1.0	June 8, 2018	Initial Release-Orderable

Field Notice
BTS Hardware Product/Solution

Product Name: **Nokia_AirScale Dual RRH 4T4R B25/B66 320W (AHFIB)**

Product/Solution description: **AirScale 4T4R B25/B66 Remote Radio Unit**

HQ NP&E RAN Contact:	Shahid Waheed (sw905t); Shane Smith (c34017); Effendi Jubilee (ej9883); Ming Ho(mh8532)
HQ CTO RAN Contact:	Dan Edwards (de4055)
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FITZGERALD, MARY	LIDDIL, JAKE	PORTZER, BRUCE T	WAHEED, SHAHID	

Notice:

- **FL18-GA3 has achieved GA. It has AirScale Dual RRH 4T4R B25/B66 320W (AHFIB) to support**
  - **2T2R, 2T4R or 4T4R mode on B2, B4, and B66A**
  - **CPRI IQ compression (LTE2492) on carrier with either 15MHz or 20MHz that AHFIB could support up to 6 carriers total, 3 carriers per band total according to *Table 2***
- **AirScale AirScale Dual RRH 4T4R B25/B66 320W (AHFIB) has achieved GA**
- **Market shall prepare the 2nd Fronthaul Fiber for future 5G NR.**

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Components:
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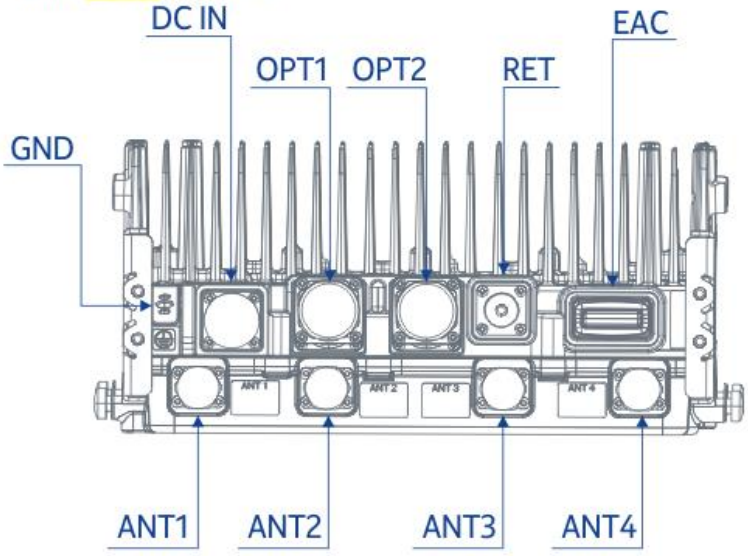
<tr><td>474283A</td><td>TBD</td><td>1</td><td>DC power connector (6 AWG)</td></tr>
</table></td><td>Active</td></tr>
<tr><td>CEQ.19790</td><td>AirScale Dual RRH 4T4R B25/B66 320W (AHFIB) – RADIO ONLY as Spare</td><td>Active</td></tr>
</table>

Key Technical Characteristic

Figure: *AHFIB interfaces*



	AirScale Dual RRH 4T4R B25/B66 320W (AHFIB)
Dimension HxWxD (with Solar Shield)	22" x 12.1" x 5.9"
Weight (Core Only)	66.1 lbs
Frequency Band	Band 25: DL 1930–1995MHz, UL 1850–1915MHz Band 66: DL 2110–2200MHz, UL 1710–1780MHz
Instantaneous Bandwidth	Band 25/ Band 66 – full band
Technology	LTE, 5GNR
Rx Diversity	2-Way or 4-way
TX MIMO	2TX or 4TX
RF Power Range	4x40W per band (4x80W Total)
RF Ports	4 ports of 4.3-10 (F)
Operating Temperature	-40°C to 55°C, IP65
Wind load (@150km/h or 93mph)	367N (83b)
Power Supply	DC-48 V / -36V to -60V
Power Consumption	525W (ETSI 24h Avg – 4x20W per band, 40W per TX port)
AISG RF port	AISG on all ports, BiasT support on ANT1 & ANT3
RET Port (RS485)	30 W max, 14.5 V

- AirScale Dual RRH 4T4R B25/B66 320W (AHFIB) can be supported by the following baseband products:
  - Nokia AirScale BBU-FSM4 (LTE)

- AirScale Dual RRH 4T4R B25/B66 320W (AHFIB) equipped with 4 RF ports of 4.3-10 Female Connectors

- AirScale Dual RRH 4T4R B25/B66 320W (AHFIB) has an integrated Bias Tee on RF ports TxRx1 and TxRx3.

- Unused RF port connectors must have min of 2**-watt load terminator** installed, which are not provided with the Radio CEQs. If needed, they must be ordered separately.

Application Dependencies:

- Per Policy Letter - RRH Placement, ATT-002-290-744; the ATT deployment preference is still to place RRH on top by the antenna location.
- CPRI Daisy Chaining is not supported
- 1 CPRI for LTE and 1 CPRI for 5G NR
- Under FL18-GA3 (Sept 2018); AirScale Dual RRH 4T4R B25/B66 320W (AHFIB) could operate up to 4T4R mode for B2, B4, and B66A.

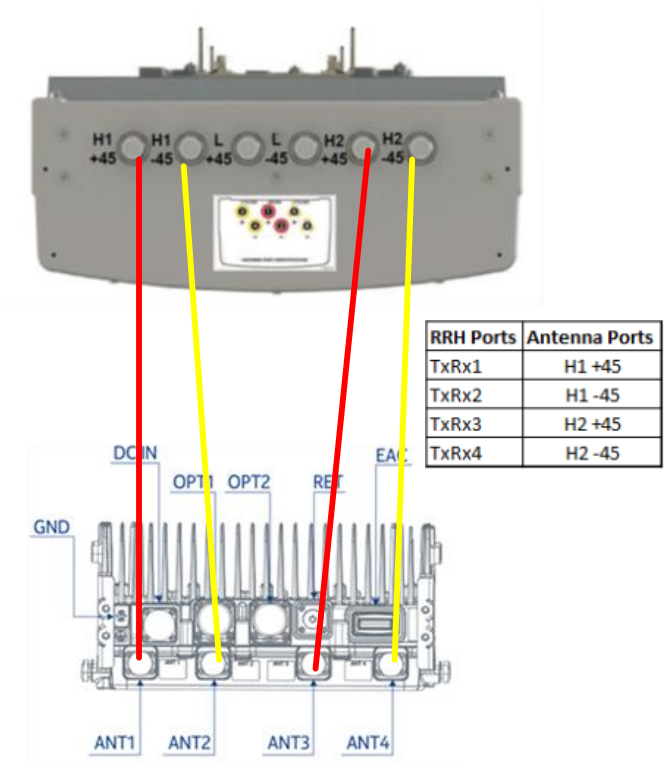
Antenna Configuration for
AirScale Dual RRH 4T4R B25/B66 320W (AHFIB)

- Below is the mapping to configure 2T or 4T4R configuration with 4 antenna LO ports

RRH Ports	Antenna Ports
Tx/Rx1 (ANT1)	**H1** +45
Tx/Rx2 (ANT2)	**H1** -45
Tx/Rx3 (ANT3)	**H2** +45
Tx/Rx4 (ANT4)	**H2** -45

- As **exception**, 2-port antenna configuration (2T2R) might be used and it requires the red lines (Tx/Rx1 and Tx/Rx3) to be connected to the antenna ports.
- Market shall wire the jumpers accordingly to the table above per the field notice: 4T4R Antenna Radio Port Connections

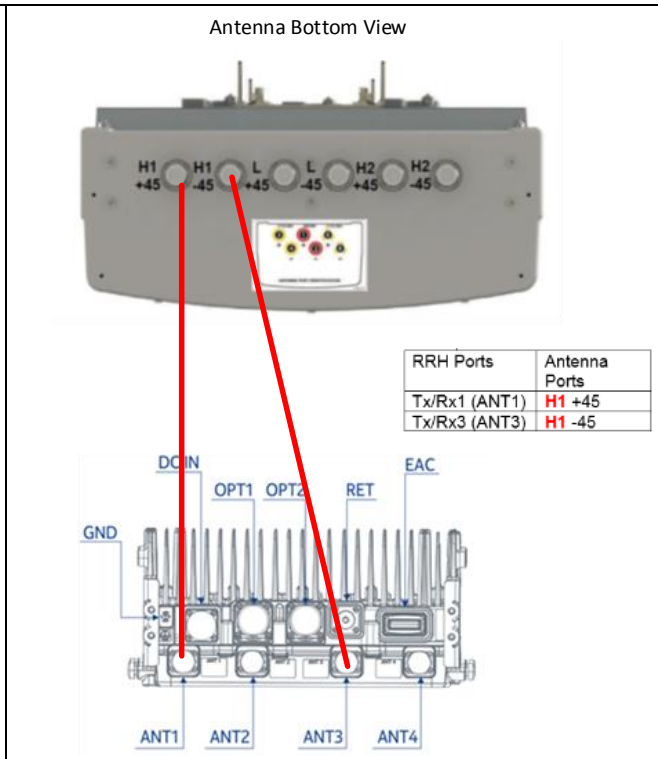
Antenna Bottom View



RRH Ports	Antenna Ports
TxRx1	H1 +45
TxRx2	H1 -45
TxRx3	H2 +45
TxRx4	H2 -45

- Below is the mapping to configure 2T2R configuration with 2 antenna LO ports

RRH Ports	Antenna Ports
Tx/Rx1 (ANT1)	**H1** +45
Tx/Rx3 (ANT3)	**H1** -45



- Under FL18-GA3; AirScale Dual RRH 4T4R B25/B66 320W (AHFIB) supports

  - Max 3 carriers on B25 band and Max 3 carriers on B66 band
  - LTE2492-IQ CPRI Compression only for 15MHz and 20 MHz LTE Carriers. With LTE2492 only 3 CPRI ports in ABIA could be used (RF-1, RF-2 and RF-3)

	IQ BW (Mbps) required w/out CPRI IQ Compression (LTE2492 NOT enabled)	
LTE BW	2Tx/2Rx	4Tx/4Rx
20 MHz	2457.6	4915.2
15 MHz	1843.2	3686.4
10 MHz	1228.8	2457.6
5 MHz	614.4	1228.8

	IQ BW (Mbps) required with CPRI IQ Compression (LTE2492 enabled)	
LTE BW	2Tx/2Rx	4Tx/4Rx
20 MHz	1105.9	2211.8
15 MHz	1105.9	2211.8
10 MHz	1228.8	2457.6
5 MHz	614.4	1228.8

Example: 20 MHz carrier, 4T4R → 55 % less data. Note that data rates are approximate,

CPRI IQ Compression not applied on 5 and 10 MHz carriers

Table 1. CPRI IQ compression (LTE2492)

- Supported BW Combo:

Configuration reference #	# sectors	Max total # of carriers per sector with BW combinations in MHz	Tot # carriers	Tx/Rx mode
1	1	3 Carriers [5, 10, 15, 20] *Note 1*	3	4T4R
2	1	2 Carriers [5,10] + 2 Carriers [5, 10, 15, 20] *Note 1*	4	4T4R
3	1	6 Carriers [5, 10, 15, 20] *Note 1*	6	2T2R
4	1	6 Carriers [5, 10] *Note 2*	6	4T4R
5	2	3 Carriers [5, 10, 15, 20]	6	2T2R
6	2	3 Carriers [5, 10]	6	4T4R
7	2	2 Carriers [5, 10] + 2 Carriers [5, 10, 15, 20]	8	2T2R
8	3	3 Carriers [5, 10, 15, 20] *Note 1*	9	4T4R
9	3	4 Carriers [5, 10, 15, 20]	12	2T2R
10	3	4 Carriers [5, 10]	12	4T4R
11	3	2 Carriers [5, 10] + 2 Carriers [5, 10, 15, 20] *Note 1*	12	4T4R
12	3	3 Carriers [5, 10] + 2 Carriers [5]	15	4T4R
13	3	6 Carriers [5, 10, 15, 20] *Note 1*	18	2T2R
14	3	6 Carriers [5, 10] *Note 2*	18	4T4R

Note1. IQ CPRI Compression needed.
Note2. Since max ABW per CPRI without IQ CPRI Compression is 40MHz; not all carriers could support 10MHz.

Table 2. Carrier BW Combo

IM Analysis for Multicarrier Capable Radios
Per Intermodulation Distortion Analysis guideline (ATT-002-290-319), markets must run the Intermodulation (IM) Analysis during their planning phase to anticipate future multicarrier deployment using a single radio.
Markets must avoid 3rd order IM when operating multiple carriers in single radio by considering other alternatives such as swapping to other spectrum bands, adding additional radio or so on.
In addition to the guideline, market could use the tools below for IM analysis.

- Commscope IM tool (easy to use)
  Band_and_Block_North_America.zip

- Quintel IM tool
  Full Band PIM Simulator (010915) v9_1 no UKL.zip
  Full Band PIM Simulator (010915) v9_1 no UKL64.zip (for 64-bit computer)

Identification and Treatment of Assets Removed from Service
The goal of the Mobility Network Asset Acceleration program is to manage, minimize financial impact when the business dictates a high probability a network element(s) will be retired prior to the end of its useful life. In-Service RAN equipment associated with pre-identified company directed decommission initiatives, not defined by the enterprise for reuse or sparing will qualify for accelerated depreciation treatment when retired. Eligible items must meet one of the following criteria:

— Part of a Technology turndown (e.g. TDMA, GSM, and CDMA)
— Part of an exception process (Battery Replacement, Antenna Turndown)
— On the Excess & Obsolete list
  - Item/part numbers that are on the E&O list are preapproved for retirement

  Please note:
  - Idle/spare equipment, Destroyed/Damaged Sites, Cancelled Projects are not eligible for re-class to depreciation expense

Equipment Reuse Program
Under a condition of reusing older equipment in the inventory, a special Reuse Program might be setup and would **supersede** this policy letter on how to use the above equipment.

C&E Deployment Notice
When initially installing equipment, such as new site builds (NSB) or first carrier (1C), along with adding equipment to existing sites (2C, 3C, etc.), the following practices must be followed:

- Properly dimension equipment per ATT-002-291-223 (C&E Mobility: Cell Site DC Power and Battery Backup) including, but not limited to:
  - DC power plant (rectifiers & converters)

  - Commercial AC power feed
  - Backup batteries
  - Fixed generators
  - HVAC
- Complete a Site Power Calculation Tool (SPCT) for properly dimensioning the site (as directed in ATT-002-290-223)
  - Utilize the Rosenberger Voltage Drop Calculator or the Commscope Voltage Drop Calculator for determining the proper size DC trunk (4, 6 or 8-AWG) and jumper cables (8, 10 or 12-AWG) for RRH/RRUs
  - Max DC jumper cable size from SQUID to radio is 10-AWG; 8-AWG DC jumper may only be used with a NEMA enclosure style Raycap device, not a SQUID; unless the RRH is powered via a breaker larger than 30 amps, then follow ATT-CEM-18004 to install #8 AWG DC jumpers
  - Shielded DC cable is required
  - Max DC trunk (feeder) cable size for SQUID is #4-AWG

Maximum Permissible Exposure (MPE) limits

Market shall follow to the AT&T Radio Frequency (RF) Safety Compliance Program for complying with the Federal Communications Commission (FCC) regulations on RF safety requirements to wireless communication services and Maximum Permissible Exposure (MPE) limits for preventing harmful effects from exposure to RF energy.

Below are RF Safety and MPE guidelines:
- RF Exposure Compliance (ATT-002-290-394)
- RF Exposure: Responsibilities, Procedures & Guidelines (ATT-002-290-078)

Additional Information/Technical References

1. Policy Letter – RRH Placement, ATT-002-290-744
2. LTE RF Network Design Guidelines, ATT-002-290-329
3. LTE eDNB RF Operation Guidelines, ATT-002-290-531
4. ATT-CEM-18002-OEM Radio Breaker Size Standard v5 053018

Refer to website:
- AT&T APEX for guideline and policy letter
- NP&E Emerging Technology- Policy Letter
- NP&E Emerging Technology- Field Notice
- NP&E Emerging Technology- RF HW Equipment Engineering
- C&E Site Support

Revision

Rev	Date	Remark
6.0	Sep 25, 2018	FL18-GA3 achieved GA, AHFIB support CPRI IQ Compression to allow 6C.
5.0	Sep 19, 2018	Operate up to 4T4R under FL18-GA3 and after
4.0	Aug 7, 2018	Jumper set up for 2T and 4T
3.0	July 26, 2018	GA under FL18-Dr4.2
2.0	June 27, 2018	FL18-GA2 and G3 support / limitation
1.0	June 8, 2018	Initial Release-Orderable

ALCATEL-LUCENT RRH4X25-WCS

The Alcatel-Lucent RRH4x25-WCS is the new addition of Remote Radio Head to the extended product line of Alcatel-Lucent's distributed Base Station solution, aimed at facilitating the RF site acquisition and civil engineering.

Supporting 2Tx/4Tx MIMO and 4 ways Rx diversity, it allows North American operators to have a compact radio solution to deploy LTE in the new Wireless Communication Services band (WCS - 2.3 GHz, 3GPP band 30), providing them with the means to achieve high capacity, high quality and high coverage with minimum site requirements.

The Alcatel-Lucent RRH4x25-WCS product has four transmit RF paths, delivering either 4x25 or 2x50 W RF output power, and four receive RF paths. It supports 4Rx diversity and offers the possibility to select, just by Software, 2Tx or 4Tx MIMO configurations with an instantaneous bandwidth of either 5MHz or 10MHz.

The Alcatel-Lucent RRH4x25-WCS is a near zero-footprint solution and operates noise free, simplifying negotiations with site property owners and minimizing environmental impacts. Installation can easily be done by a single person because the Alcatel-Lucent RRH4x25-WCS is compact and weights less than 30 kg, eliminating the need for a crane to hoist the equipment to the rooftop.

Thanks to its small sizes and weight, the Alcatel-Lucent RRH4x25-WCS can be installed close to the antenna. Operators can therefore locate the Alcatel-Lucent RRH4x25-WCS where RF engineering is deemed ideal, minimizing trade-offs between available sites and RF optimum sites. The RF feeder and installation costs are reduced or even eliminated.

FEATURES

- Operating in 2.3 GHz band (WCS, 3GPP band 30)
- LTE 2Tx or 4Tx MIMO (switchable) and 4Rx Diversity
- Output power: Up to 2x50W or 4x25W
- Convection-cooled (fan-less)
- Supports AISG 2.0 ALD devices (RET, TMA) through RS485 or RF ports

BENEFITS

- Compact to reduce additional footprint when adding LTE in WCS band
- MIMO scheme operation selection (2Tx or 4Tx) by Software only
- Improves Downlink spectral efficiency through MIMO4
- Increases LTE coverage thanks to 4RxDiv capability and best in class Rx sensitivity
- Easy installation, with a unit that can be carried and set up by one person
- Flexible mounting options: Pole/Wall/Floor

Features & performance	
Number of TX/RX paths	4 duplexed (either 4T4R or 2T4R by SW)
Frequency band	WCS band (3GPP band 30) DL: 2350 - 2360 MHz UL: 2305 - 2315 MHz
Instantaneous bandwidth - #carriers	10MHz - 1 LTE carrier (5 or 10MHz)
RF output power	2x50W or 4x25W (by SW)
Noise figure – RX Diversity scheme	2.5 dB typ. (<3 dB max) – 2 or 4 ways Rx diversity
Sizes (HxWxD) in mm (in.) **Volume** **Weight in kg (lb) (w/o mounting HW)**	800 x 305 x 220 (31.5" x 12" x 8.7") (with solar shield) 54 l 31.5 (70)
DC voltage range **DC power consumption (@ -48V)**	-40.5 to -57V at full performance, -38 to -57V at full performance (but power consumption) 500W typical @100% RF load in 2Tx operation, 550W typical in 4Tx operation
Environmental conditions **Wind load (@150km/h or 93mph)**	40°C (-40°F) /+55°C (+131°F) IP65 Frontal:<300N / Lateral :<200N
Antenna ports	2 ports 7/16 DIN female (50 ohms) VSWR < 1.5
CPRI ports	2 CPRI ports (@4.9 Gbps) SFP single mode dual fiber
AISG interfaces	1 AISG2.0 output (RS485) Integrated Bias Tee on 2 duplexed RF ports
Misc. Interfaces	6 external alarms (2 connectors) – 2 Tx monitor ports - 1 DC block
Installation conditions	Pole and wall mounting
Regulatory compliance	3GPP 36.141 / 3GPP 36.113 / GR-1089-CORE / UL 60950-1 / FCC Part 27

INFINIGY
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1033 WATERVLIET SHAKER RD, ALBANY, NY 12205

Mount Analysis Report

November 28, 2018

AT&T Site Name	Crescent
AT&T FA#	10006543
Pace Job#	MRWSH027627
PTN#	2251A0HYT4
Client	Smartlink
Carrier	AT&T
Infinigy Job Number	1106-A0001-B
Site Location	4600 East West Highway, Bethesda, MD 20814 38.9843720 N NAD83 77.0930390 W NAD83
Mount Centerline EL.	138.0 ft
Mount Classification	Pipe Mounts
Structural Usage Ratio	**13.0%**
Overall Result	**Pass**
Note	**Install pipe mounts per Infinigy Engineering's construction documents. Prior to installation of proposed cabinets, general contractor is to verify that the existing equipment room floor slab has minimum thickness of 4in.**

Upon reviewing the results of this analysis, it is our opinion that the mounts meet the specified TIA and ASCE code requirements. The mounts and connections for the proposed carrier are therefore deemed adequate to support the final loading configuration as listed in this report.

Ray Marshall
Structural Engineer II

Contents

Introduction

Infinigy Engineering has been requested to perform a mount analysis on the existing AT&T mounts. All supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The mount was analyzed using RISA-3D Version 17.0.1 analysis software.

Supporting Documentation

Mount Analysis Report	Maser Consulting P.A., dated October 3, 2017
Site Visit Photos	Infinigy Engineering PLLC, dated September 5, 2018
RF Design Sheet	AT&T RFDS#2510027, dated September 18, 2018
Construction Drawings	Infinigy Engineering, PLLC, dated November 14, 2018

Analysis Code Requirements

Wind Speed	89 mph (3-Second Gust, V_{ASD}) / 115 mph (3-Second Gust, V_{ULT})
Wind Speed w/ ice	40 mph (3-Second Gust) w/ 1/2" radial ice concurrent
TIA Revision	ANSI/TIA-222-G
Adopted IBC	2015 IBC
Structure Class	II
Exposure Category	B
Topographic Category	1
Calculated Crest Height	0 ft

Conclusion

Upon reviewing the results of this analysis, it is our opinion that the mounts meet the specified TIA code requirements. The mounts and connections are therefore deemed adequate to support the final loading configuration as listed in this report.

If you have any questions, require additional information, or actual conditions differ from those as detailed in this report please contact me via the information below:

Ray Marshall
Structural Engineering II | INFINIGY
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(O) (847) 648-4068 | (M) (773) 656-3072
rmarshall@infinigy.com | www.infinigy.com

Final Configuration Loading

Mount CL (ft)	Rad. HT (ft)	Vert. O/S (ft)	Horiz. O/S (ft)*	Qty	Appurtenance	Carrier
138.0	138.0	0.0	--	3	Kathrein 742264	AT&T
		0.0	--	2	Kathrein 80010966	
		0.0	--	4	Commscope JAHH-45A-R3B	
		0.0	--	2	CCI OPA-65R-LCUU-H4	
		0.0	--	3	Commscope SBNHH-1D65A	
		0.0	--	4	Alcatel-Lucent RRH 4x25-WCS-4R	
		0.0	--	4	Nokia Airscale RRH 4T4R B12/14	
		0.0	--	4	Nokia Airscale RRH 4T4R B25/66	
		0.0	--	6	Powerwave LGP21401	
		0.0	--	1	KMW KFTDR00110030	
		0.0	--	3	Raycap DC6-48-60-18-8F	

(1) Horizontal Offset is defined as the distance from the left most edge of the mount face horizontal when viewed facing the rooftop.
(2) Radios are to be mounted behind existing screen wall at respective locations see appended documents for vertical locations.
(3) Raycaps are to be mounted behind existing screen wall at respective locations see appended documents for vertical locations.

Structure Usages

Mount Pipe	13.0%	Pass
RATING =	**13.0%**	**Pass**

Mount Connection Reactions

Reaction Data	Design Reactions	Analysis Reactions	Result
Shear (kip)	17.9	.14	.78%
Axial (kip)	32.1	.13	.40%
Unity Check	-	-	1.3%

***(2) 3/4" A307 Hilti threaded rods per connection.**

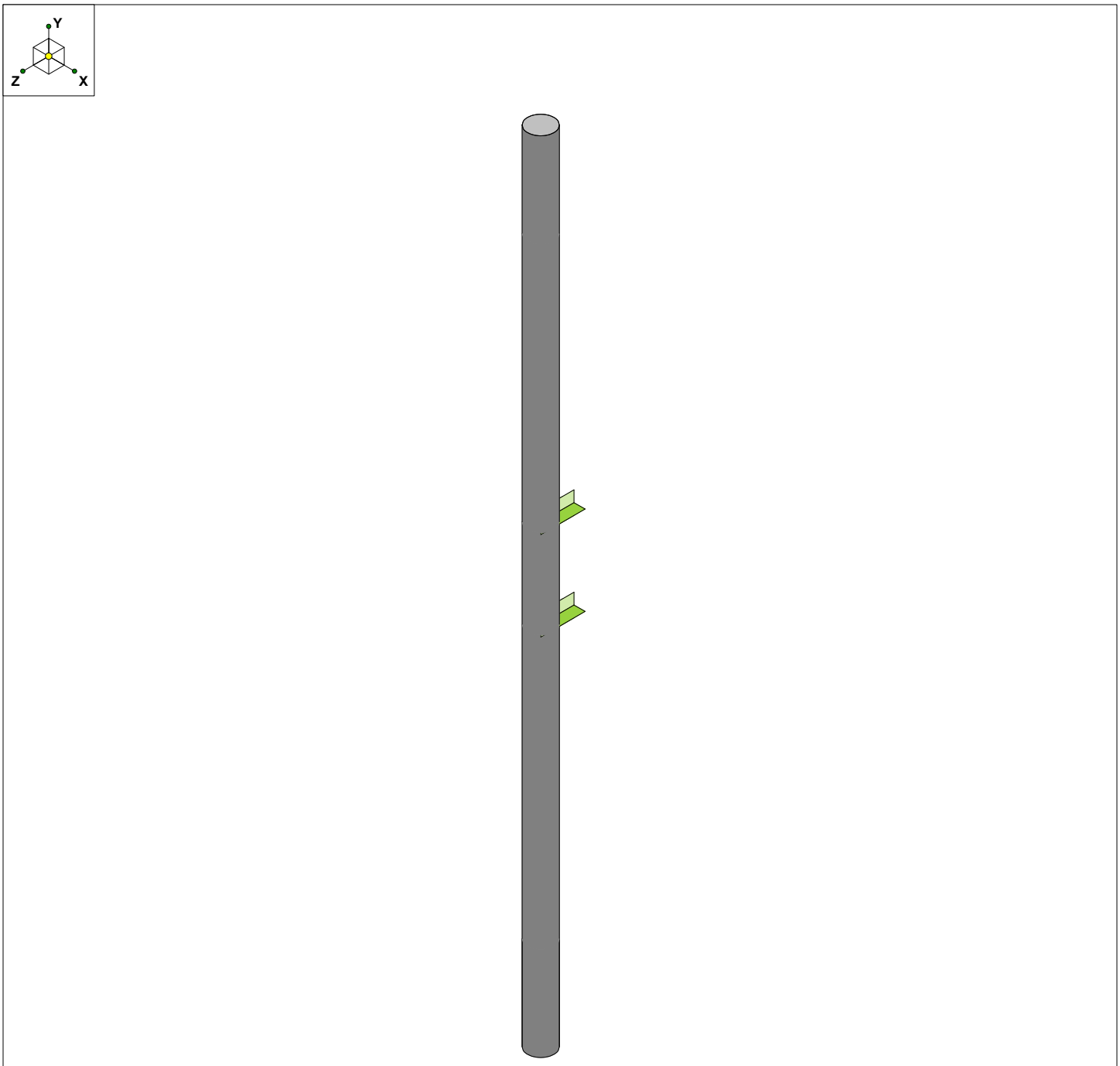
-Threaded rods reactions are acceptable when compared to manufacturer's listed capacities.

Assumptions and Limitations

Our structural calculations are completed assuming all information provided to Infinigy Engineering is accurate and applicable to this site. For the purposes of calculations, we assume an overall structure condition of "like new" and all members and connections to be free of corrosion and/or structural defects. The structure owner and/or contractor shall verify the structure's condition prior to installation of any proposed equipment. If actual conditions differ from those described in this report Infinigy Engineering should be notified immediately to complete a revised evaluation.

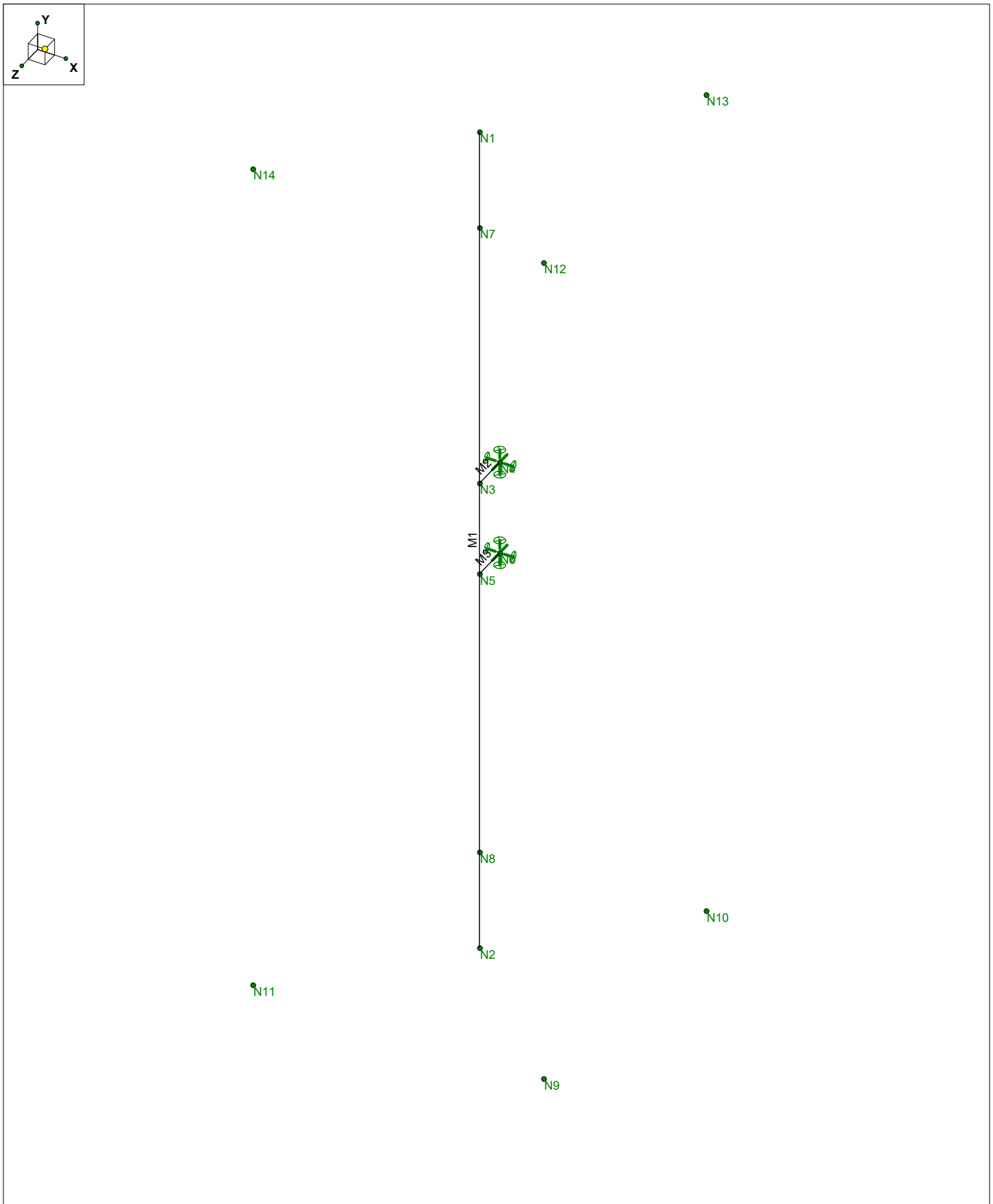
Our evaluation is completed using standard TIA, AISC, ACI, and ASCE methods and procedures. Our structural results are proprietary and should not be used by others as their own. Infinigy Engineering is not responsible for decisions made by others that are or are not based on our supplied assumptions and conclusions.

This report is an evaluation of the proposed carriers mount structure only and does not reflect adequacy of the existing tower, other mounts, or coax mounting attachments. These elements are assumed to be adequate for the purposes of this analysis and are assumed to have been installed per their manufacturer requirements.



Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Proposed Configuration
RAM		Nov 28, 2018 at 1:05 PM
1106-A0001-B		Crescent.R3D



Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Wireframe
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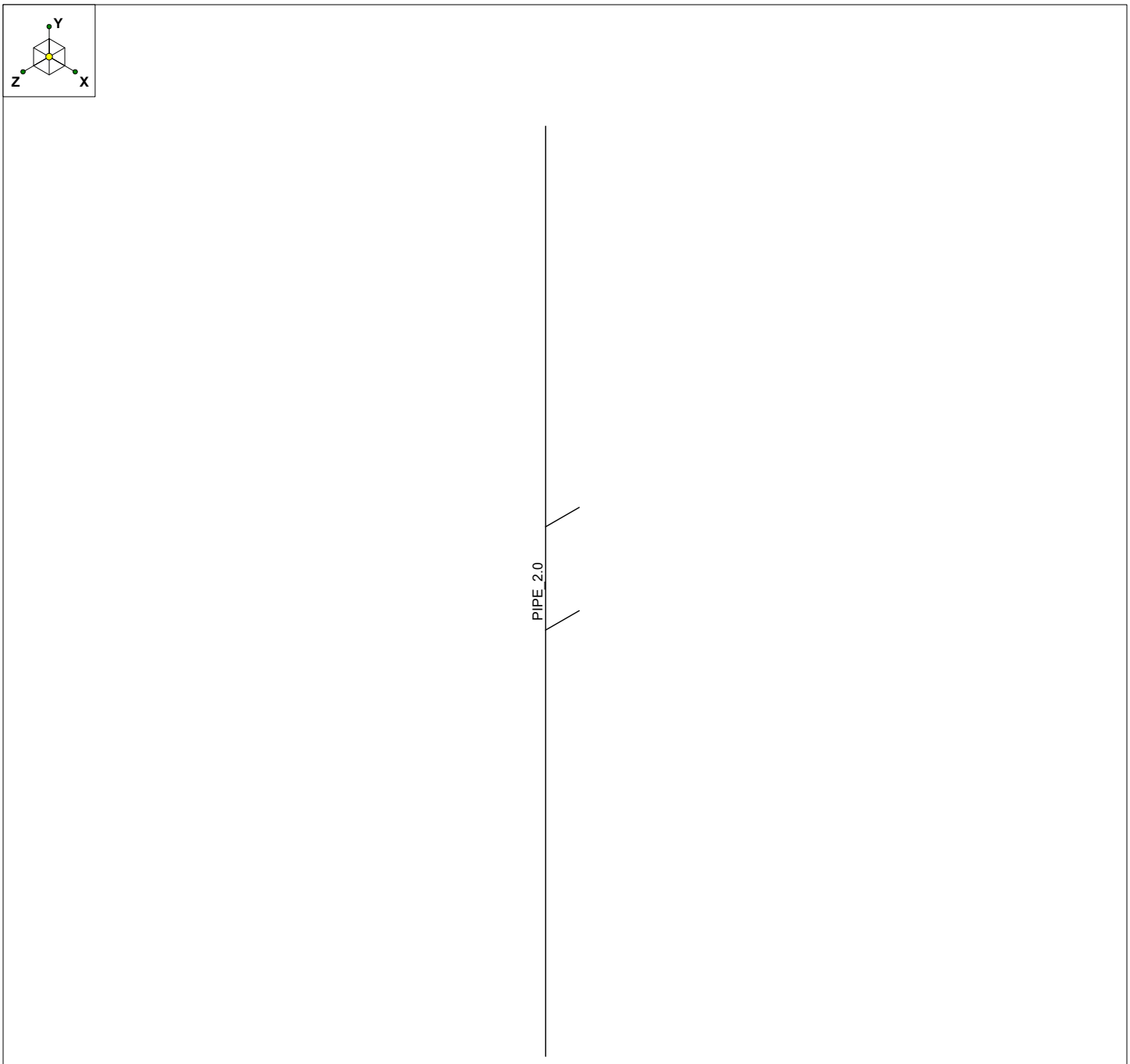

Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Members
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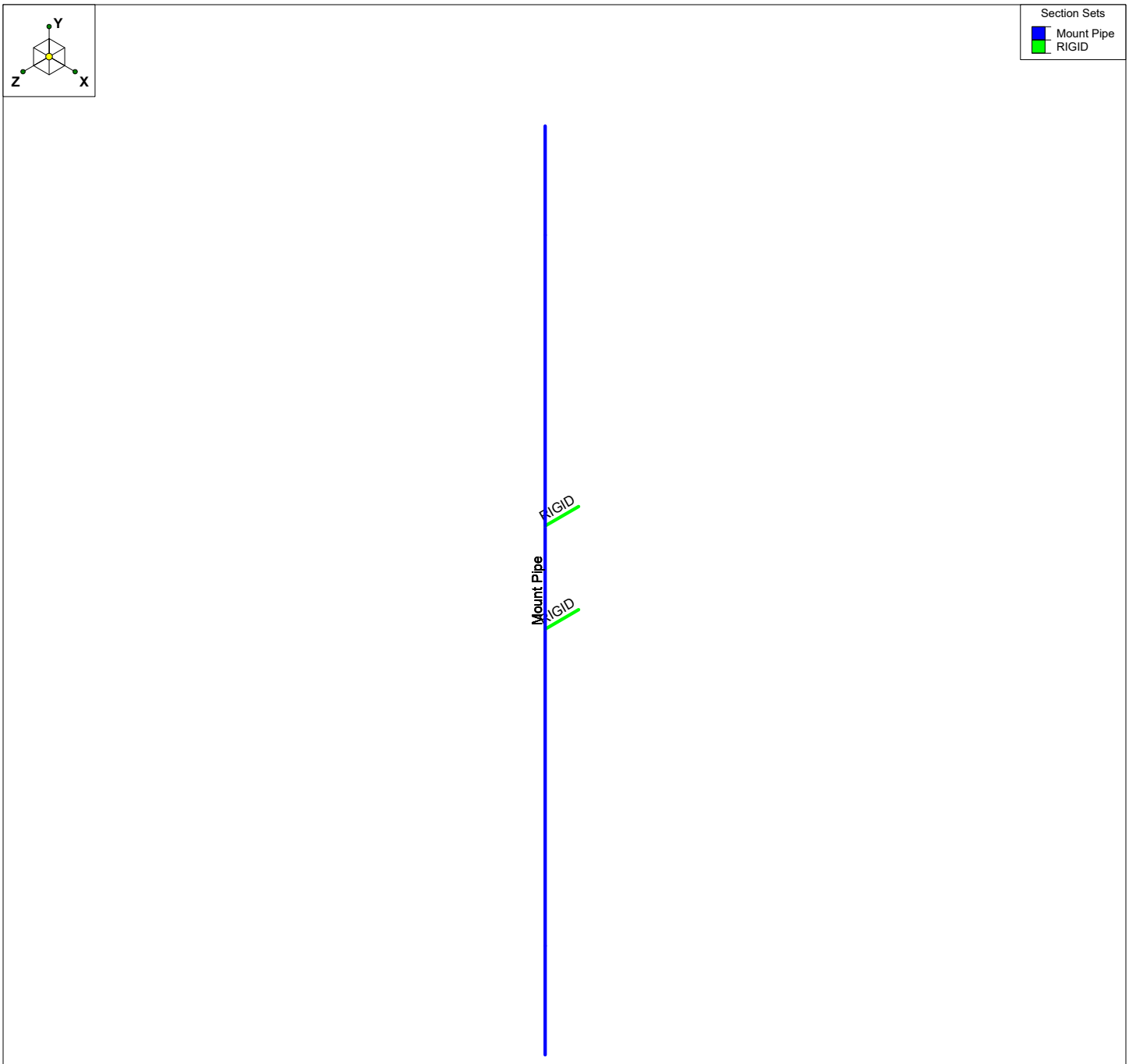

Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Section Set
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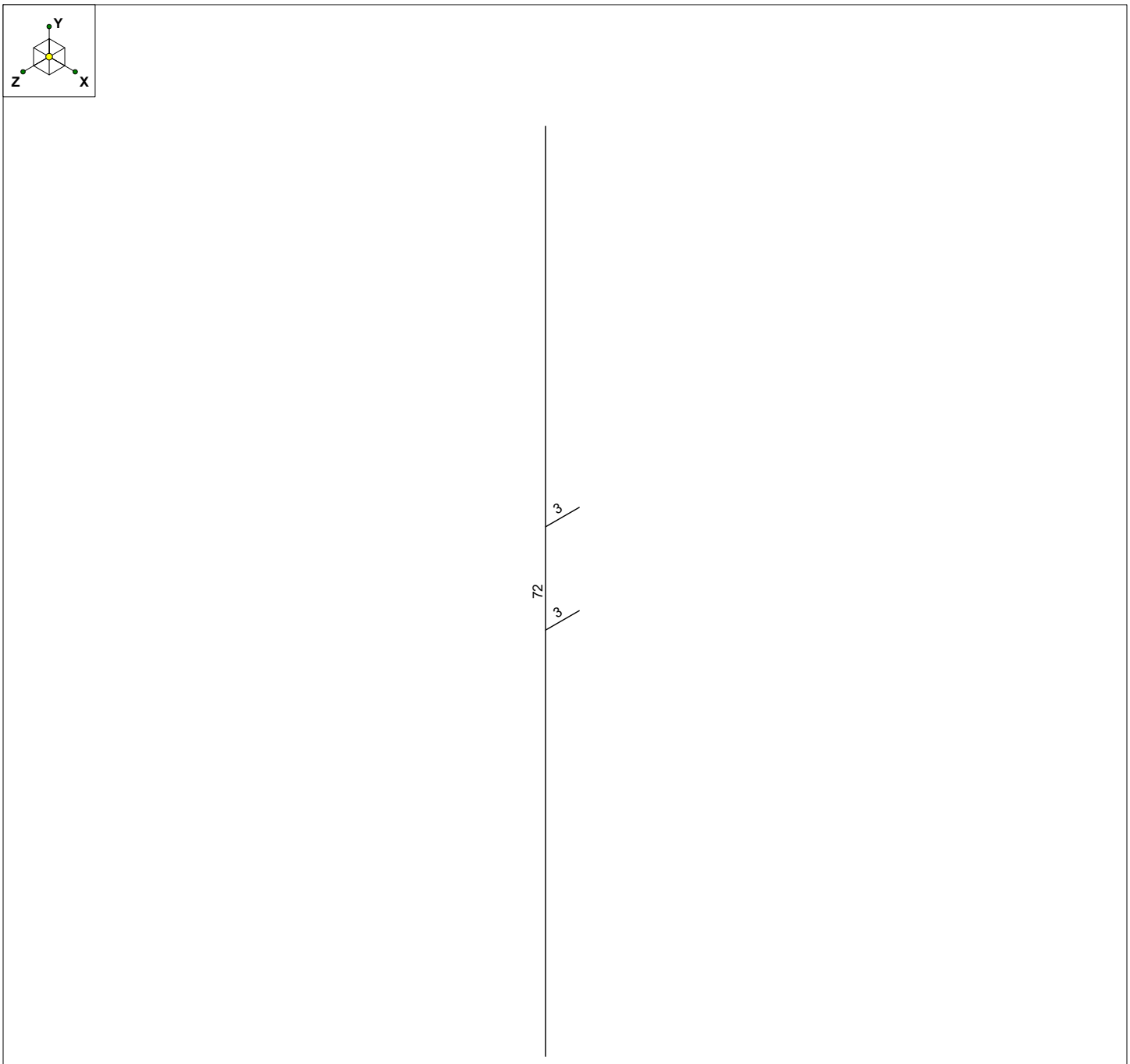

Member Length (in) Displayed
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Member Lengths
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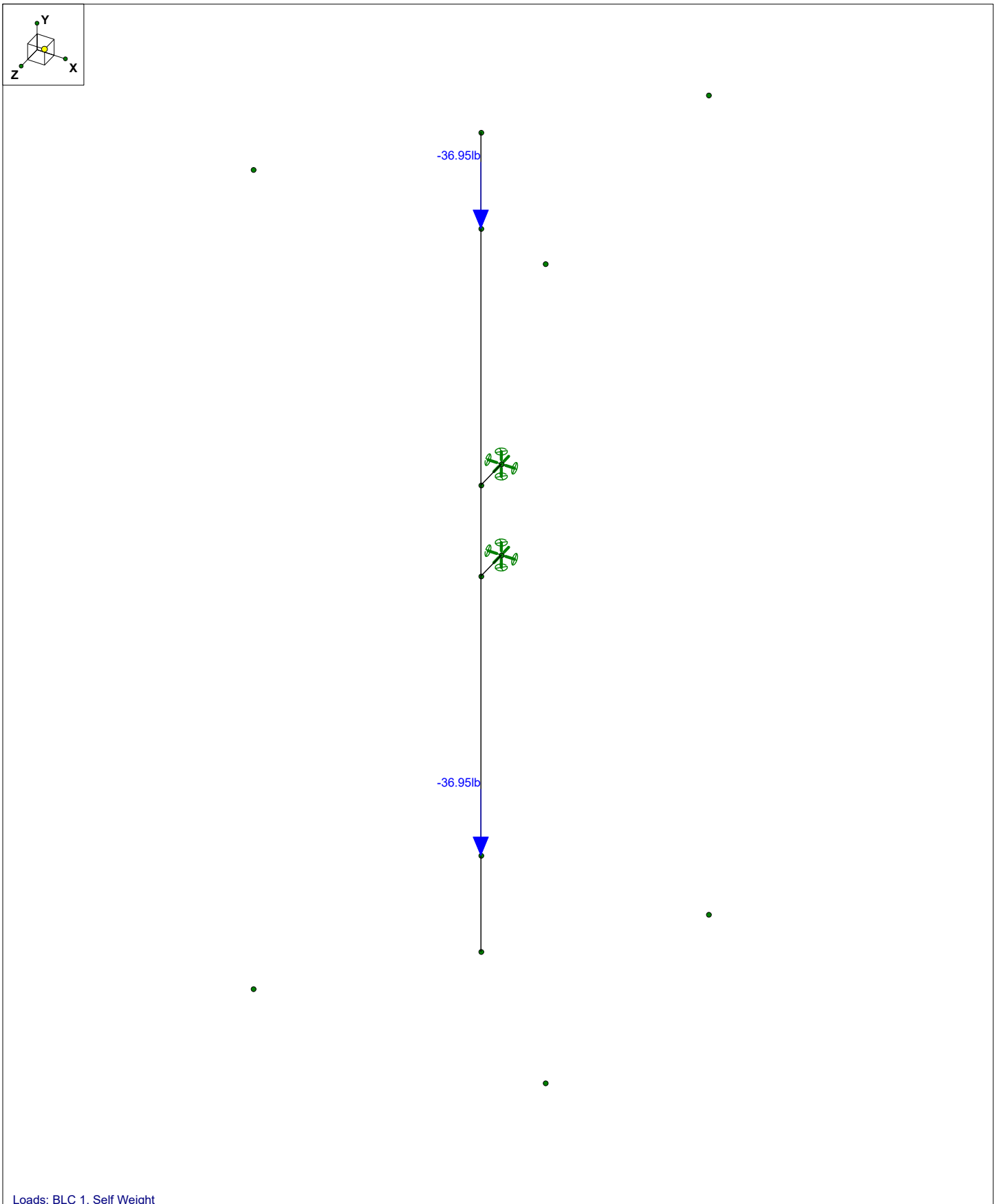
1106-A0001-B		Crescent.R3D



Loads: BLC 1, Self Weight
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Dead Load
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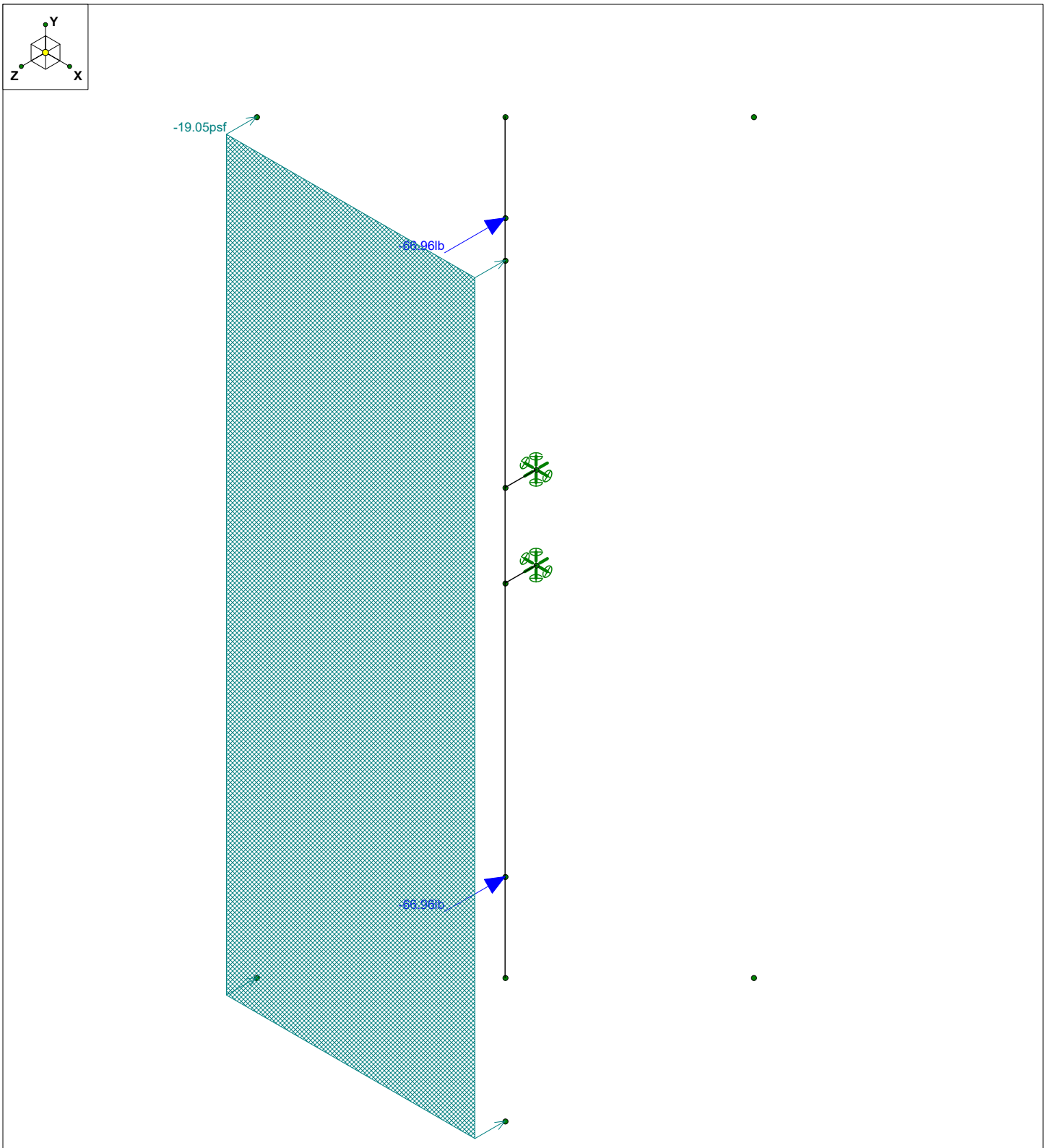

Loads: BLC 2, Wind Load AZI 000
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Wind Load 0
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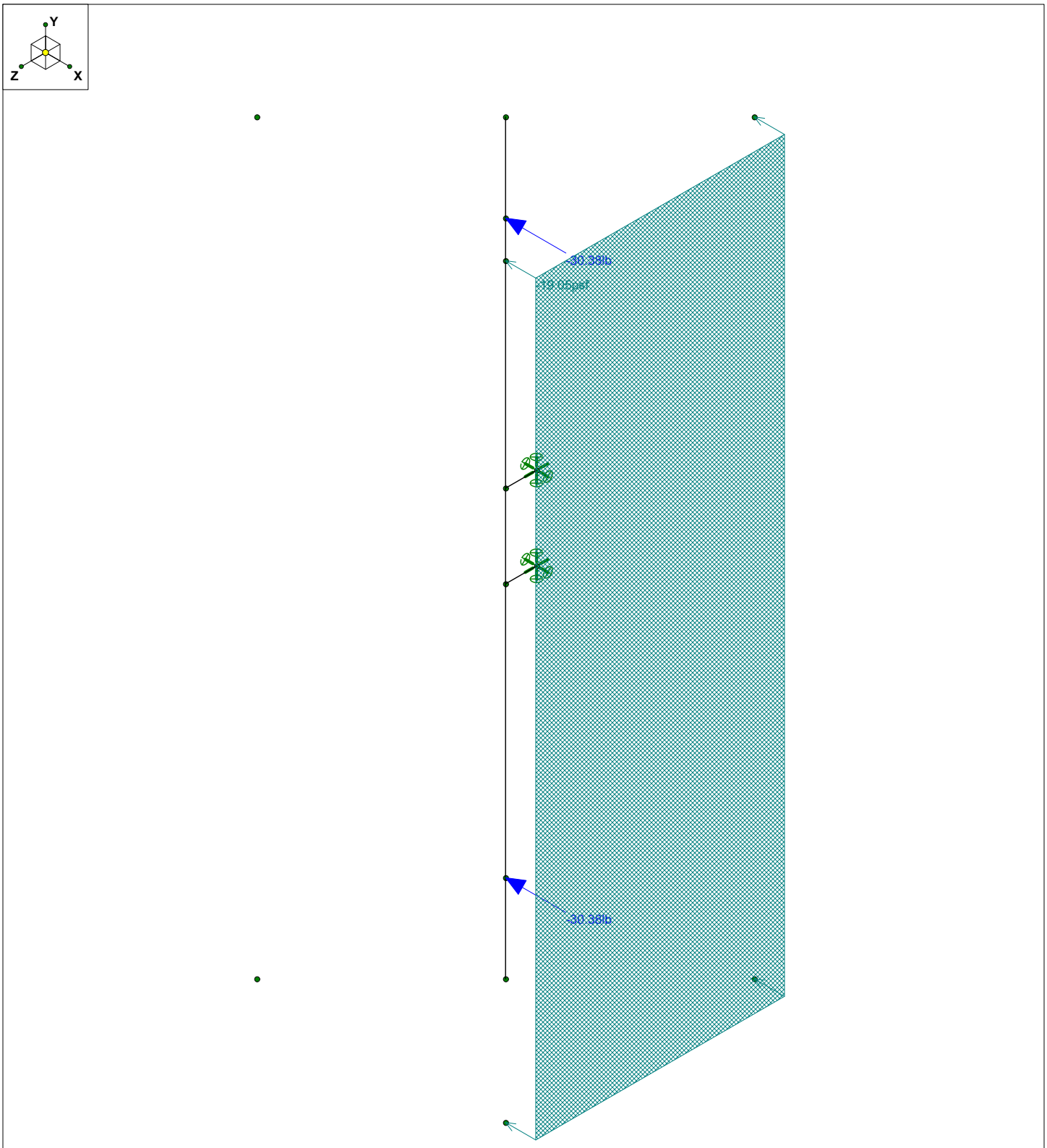

Loads: BLC 3, Wind Load AZI 090
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Wind Load 90
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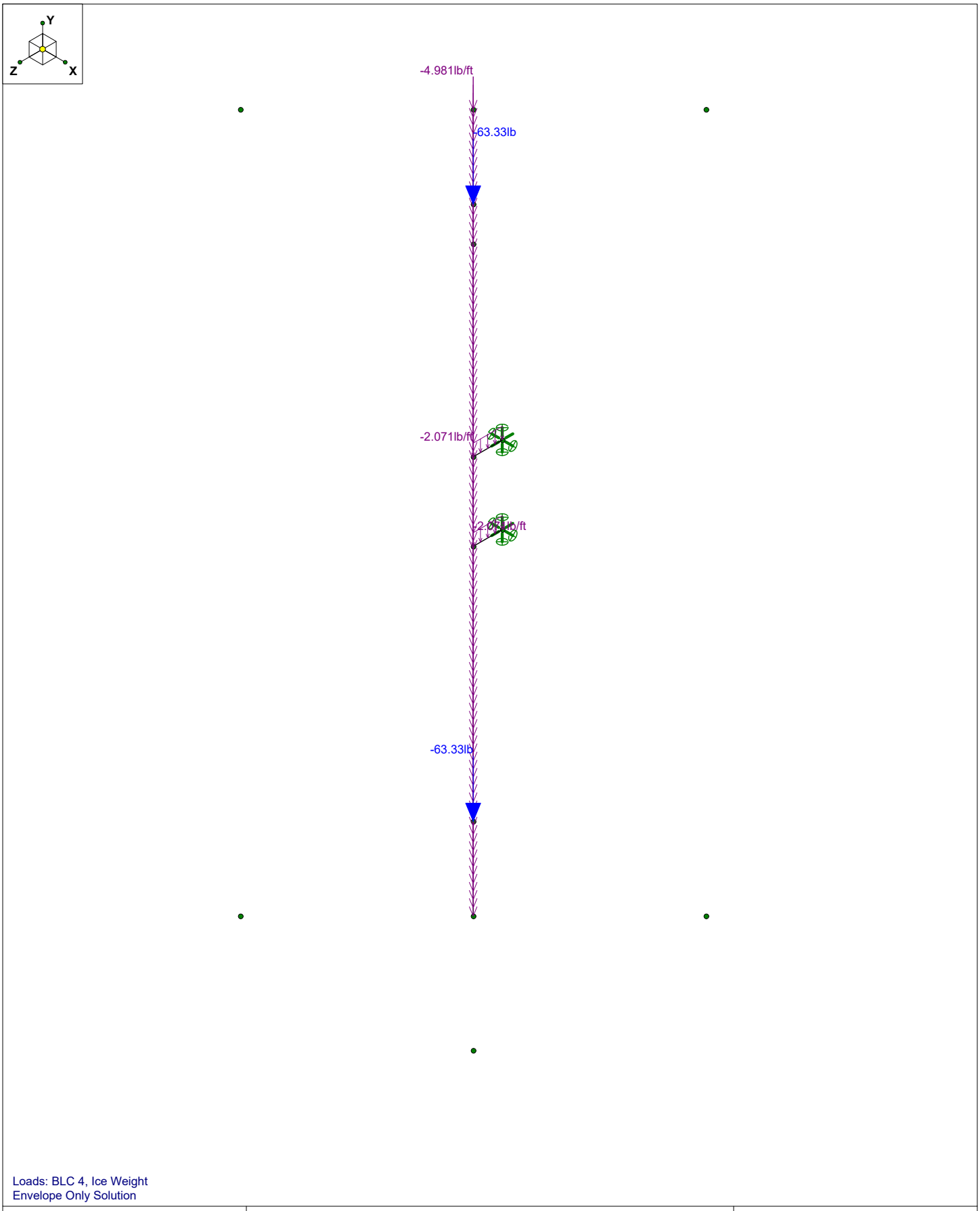

Loads: BLC 4, Ice Weight
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Ice Load
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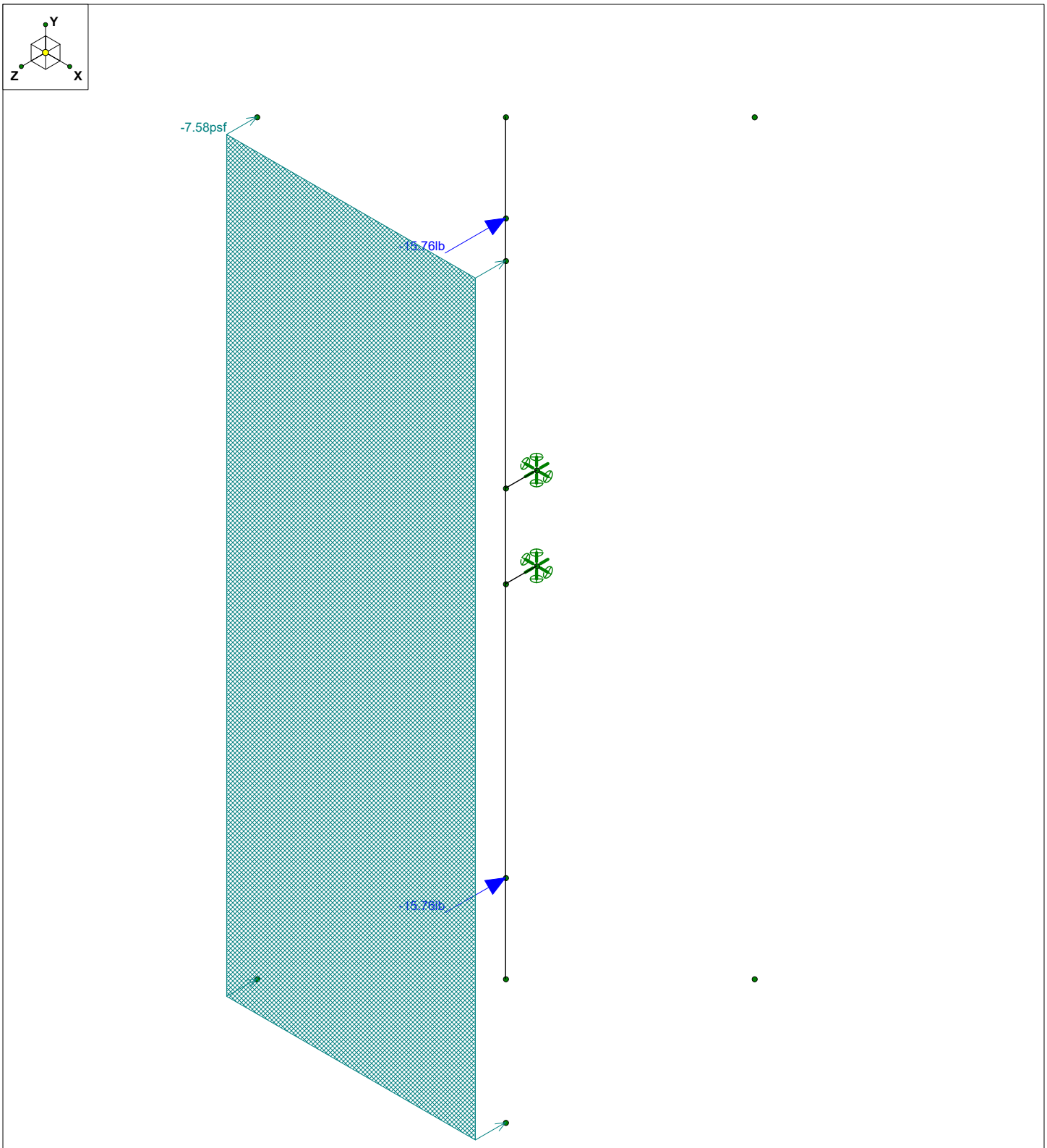

Loads: BLC 5, Wind + Ice Load AZI 000
Envelope Only Solution

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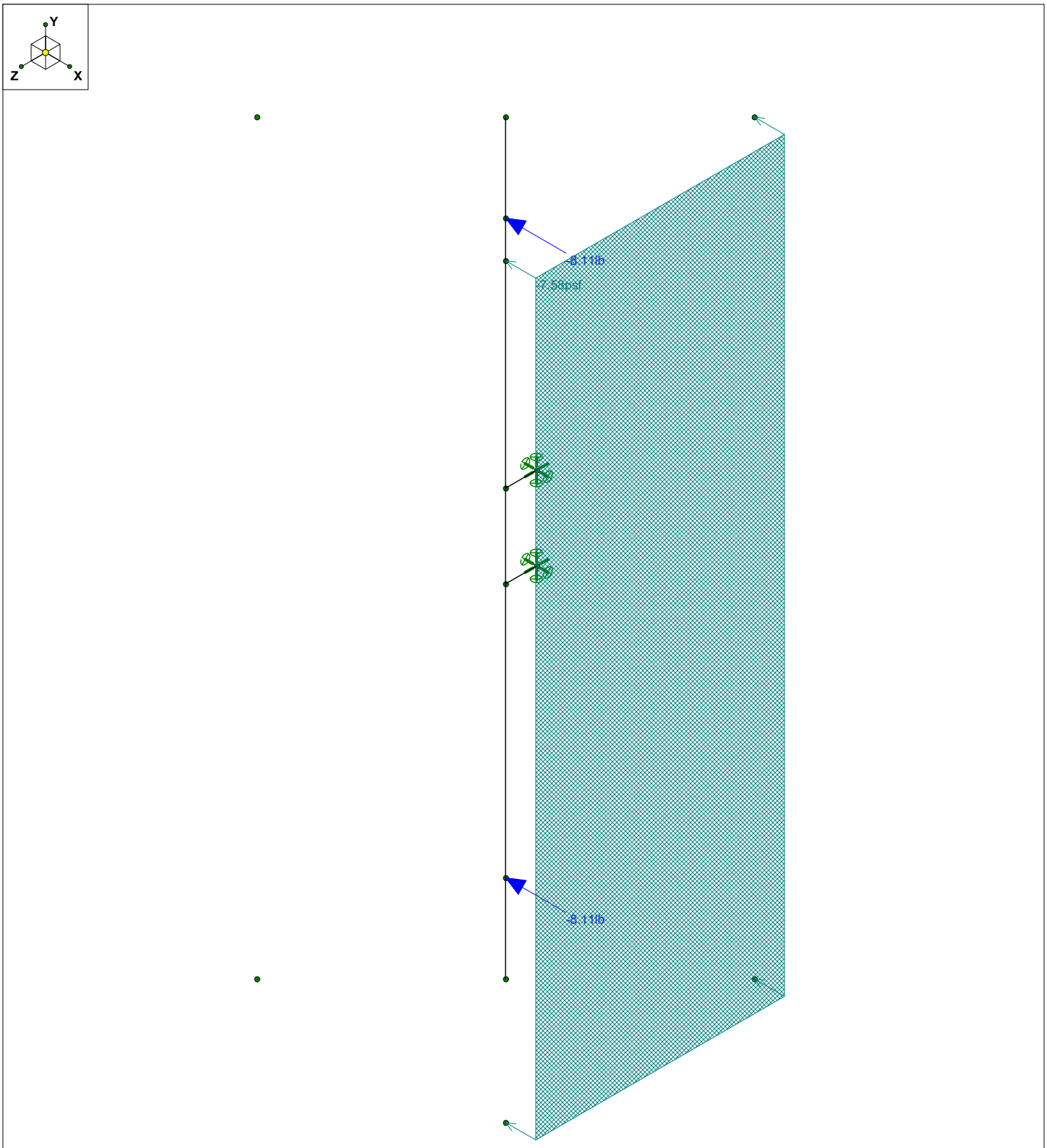
1106-A0001-B		Crescent.R3D



Loads: BLC 6, Wind + Ice Load AZI 090
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Wind + Ice Load 90
RAM		Nov 28, 2018 at 1:04 PM
1106-A0001-B		Crescent.R3D

Site Name:	Crescent
Client:	Smartlink
Carrier:	AT&T
Engineer:	RAM
Date:	11/28/2018

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

INFINIGY WIND LOAD CALCULATOR 3.0.2

Site Information Inputs:

Adopted Building Code:	2015 IBC
Structure Load Standard:	TIA-222-G
Antenna Load Standard:	TIA-222-G
Structure Risk Category:	II
Structure Type:	Rooftop
Number of Sectors:	4
Structure Shape 1:	Round

Rooftop Inputs:

Rooftop Wind Speed-Up?:	No

Wind Loading Inputs:

Design Wind Velocity:	89	mph (nominal 3-second gust)
Wind Centerline 1 (z_1):	138.0	ft
Side Face Angle (θ):	60	degrees
Exposure Category:	B	
Topographic Category:	1	

Wind with No Ice		
q_z (psf)	Gh	F_{ST} (psf)
18.68	0.85	**19.05**

Wind with Ice		
q_z (psf)	Gh	F_{ST} (psf)
3.77	0.85	**7.58**

Ice Loading Inputs:

Is Ice Loading Needed?:	Yes	
Ice Wind Velocity:	40	mph (nominal 3-second gust)
Base Ice Thickness:	0.50	in

Input Appurtenance Information and Load Placements:

Appurtenance Name	Elevation (ft)	Total Quantity	Ka	Front Shape	Side Shape	q_z (psf)	EPA (ft^2)	Fz (lbs)	Fx (lbs)	Fz(60) (lbs)	Fx(30) (lbs)
Kathrein 742264	138.0	3	1.00	Flat	Flat	18.68	4.86	77.19	46.50	54.17	69.52
Kathrein 80010966	138.0	2	1.00	Flat	Flat	18.68	17.36	275.62	119.05	158.19	236.48
Commscope JAHH-45A-R3B	138.0	4	1.00	Flat	Flat	18.68	8.44	133.92	60.76	79.05	115.63
CCI OPA-65R-LCUU-H4	138.0	2	1.00	Flat	Flat	18.68	5.98	94.92	53.75	64.04	84.62
Commscope SBNHH-1D65A	138.0	3	1.00	Flat	Flat	18.68	5.96	94.56	62.13	70.24	86.46
Alcatel-Lucent RRH 4x25-WCS-4R	138.0	4	1.00	Flat	Flat	18.68	3.34	52.97	60.88	58.90	54.94
Nokia RRH 4T4R B12/14	138.0	4	1.00	Flat	Flat	18.68	2.20	34.92	20.86	24.37	31.41
Nokia RRH 4T4R B25/66	138.0	4	1.00	Flat	Flat	18.68	2.20	34.92	20.86	24.37	31.41
KMW KFTDR00110030	138.0	1	1.00	Flat	Flat	18.68	0.92	14.60	4.18	6.78	11.99
Powerwave LGP21401	138.0	6	1.00	Flat	Flat	18.68	0.55	8.77	7.07	7.50	8.35
Raycap DC6	138.0	3	1.00	Round	Round	18.68	1.21	19.23	19.23	19.23	19.23

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
2	M2	N3	N4			RIGID	None	None	RIGID	Typical
3	M3	N5	N6			RIGID	None	None	RIGID	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	General				
2	RIGID		2	6	0
3	Total General		2	6	0
4					
5	Hot Rolled Steel				
6	A53 Gr.B	PIPE_2.0	1	72	0
7	Total HR Steel		1	72	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Self Weight	DL		-1			2			
2	Wind Load AZI 000	WLZ					2		1	
3	Wind Load AZI 090	WLX					2		1	
4	Ice Weight	OL1					2	3		
5	Wind + Ice Load AZI 000	OL2					2		1	
6	Wind + Ice Load AZI 090	OL3					2		1	
7	Service Live 1	LL								
8	BLC 2 Transient Area Loads	None						1		
9	BLC 3 Transient Area Loads	None						3		
10	BLC 5 Transient Area Loads	None						1		
11	BLC 6 Transient Area Loads	None						3		

Load Combinations

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fac...	BLC	Factor	BLC Factor .....
1	1.4D	Yes	Y		DL	1.4					
2	1.2D + 1.6W AZI 000	Yes	Y		DL	1.2	WLZ	1.6			
3	1.2D + 1.6W AZI 030	Yes	Y		DL	1.2	WLZ	1.386	WLX	.8	
4	1.2D + 1.6W AZI 060	Yes	Y		DL	1.2	WLZ	.8	WLX	1.386	
5	1.2D + 1.6W AZI 090	Yes	Y		DL	1.2			WLX	1.6	
6	1.2D + 1.6W AZI 120	Yes	Y		DL	1.2	WLZ	-.8	WLX	1.386	
7	1.2D + 1.6W AZI 150	Yes	Y		DL	1.2	WLZ	-1.3...	WLX	.8	
8	1.2D + 1.6W AZI 180	Yes	Y		DL	1.2	WLZ	-1.6			
9	1.2D + 1.6W AZI 210	Yes	Y		DL	1.2	WLZ	-1.3...	WLX	-.8	
10	1.2D + 1.6W AZI 240	Yes	Y		DL	1.2	WLZ	-.8	WLX	-1.386	
11	1.2D + 1.6W AZI 270	Yes	Y		DL	1.2			WLX	-1.6	
12	1.2D + 1.6W AZI 300	Yes	Y		DL	1.2	WLZ	.8	WLX	-1.386	
13	1.2D + 1.6W AZI 330	Yes	Y		DL	1.2	WLZ	1.386	WLX	-.8	
14	0.9D + 1.6W AZI 000	Yes	Y		DL	.9	WLZ	1.6			
15	0.9D + 1.6W AZI 030	Yes	Y		DL	.9	WLZ	1.386	WLX	.8	
16	0.9D + 1.6W AZI 060	Yes	Y		DL	.9	WLZ	.8	WLX	1.386	
17	0.9D + 1.6W AZI 090	Yes	Y		DL	.9			WLX	1.6	
18	0.9D + 1.6W AZI 120	Yes	Y		DL	.9	WLZ	-.8	WLX	1.386	
19	0.9D + 1.6W AZI 150	Yes	Y		DL	.9	WLZ	-1.3...	WLX	.8	
20	0.9D + 1.6W AZI 180	Yes	Y		DL	.9	WLZ	-1.6			
21	0.9D + 1.6W AZI 210	Yes	Y		DL	.9	WLZ	-1.3...	WLX	-.8	

Load Combinations (Continued)

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fac...	BLC	Factor	BLC	Factor
22	0.9D + 1.6W AZI 240	Yes	Y		DL	.9	WLZ	-.8	WLX	-1.386		
23	0.9D + 1.6W AZI 270	Yes	Y		DL	.9			WLX	-1.6		
24	0.9D + 1.6W AZI 300	Yes	Y		DL	.9	WLZ	.8	WLX	-1.386		
25	0.9D + 1.6W AZI 330	Yes	Y		DL	.9	WLZ	1.386	WLX	-.8		
26	1.2D + 1.0Di	Yes	Y		DL	1.2	OL1	1				
27	1.2D + 1.0Di + 1.0Wi AZI 0...	Yes	Y		DL	1.2	OL1	1	OL2	1		
28	1.2D + 1.0Di + 1.0Wi AZI 0...	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	.5
29	1.2D + 1.0Di + 1.0Wi AZI 0...	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	.866
30	1.2D + 1.0Di + 1.0Wi AZI 0...	Yes	Y		DL	1.2	OL1	1			OL3	1
31	1.2D + 1.0Di + 1.0Wi AZI 1...	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	.866
32	1.2D + 1.0Di + 1.0Wi AZI 1...	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	.5
33	1.2D + 1.0Di + 1.0Wi AZI 1...	Yes	Y		DL	1.2	OL1	1	OL2	-1		
34	1.2D + 1.0Di + 1.0Wi AZI 2...	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	-.5
35	1.2D + 1.0Di + 1.0Wi AZI 2...	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	-.866
36	1.2D + 1.0Di + 1.0Wi AZI 2...	Yes	Y		DL	1.2	OL1	1			OL3	-1
37	1.2D + 1.0Di + 1.0Wi AZI 3...	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	-.866
38	1.2D + 1.0Di + 1.0Wi AZI 3...	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	-.5
39	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	.114		
40	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	.098	WLX	.057
41	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	.057	WLX	.098
42	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5			WLX	.114
43	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.057	WLX	.098
44	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.098	WLX	.057
45	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.114		
46	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.098	WLX	-.057
47	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.057	WLX	-.098
48	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5			WLX	-.114
49	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	.057	WLX	-.098
50	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	.098	WLX	-.057

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N6	max	83.119	17	136.388	33	125.736	2	230.916	20	20.78	17	0	50
2		min	-83.119	23	42.886	14	-125.736	20	-255.89	2	-20.78	23	0	1
3	N4	max	50.379	5	134.864	27	124.731	14	210.742	14	12.595	5	0	50
4		min	-50.379	11	42.366	20	-124.731	8	-235.489	8	-12.595	11	0	1
5	Totals:	max	133.411	17	271.251	38	250.467	14						
6		min	-133.411	11	85.253	14	-250.467	8						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*P...	phi*M...	phi*M...	Cb	Eqn
1	M1	PIPE_2.0	.130	39	8	.013	39		20	20866.733	32130	1871....	1871....	1	H1-1b

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mount Pipe	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N4	Reaction	Reaction	Reaction	Reaction	Reaction	
2	N6	Reaction	Reaction	Reaction	Reaction	Reaction	

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	M1						Yes	** NA **			None
2	M2						Yes	** NA **			None
3	M3						Yes	** NA **			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torq...	Kyy	Kzz	Cb	Function
1	M1	Mount Pipe	72			Lbyy						Lateral

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^...
No Data to Print ...			

Member Point Loads (BLC 1 : Self Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	Y	-36.95	8.45
2	M1	Y	-36.95	63.55

Member Point Loads (BLC 2 : Wind Load AZI 000)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	Z	-66.96	8.45
2	M1	Z	-66.96	63.55

Member Point Loads (BLC 3 : Wind Load AZI 090)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	X	-30.38	8.45
2	M1	X	-30.38	63.55

Member Point Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	Y	-63.33	8.45
2	M1	Y	-63.33	63.55

Member Point Loads (BLC 5 : Wind + Ice Load AZI 000)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	Z	-15.76	8.45
2	M1	Z	-15.76	63.55

Member Point Loads (BLC 6 : Wind + Ice Load AZI 090)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	X	-8.11	8.45
2	M1	X	-8.11	63.55

Member Distributed Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[...	End Location[i...
1	M1	Y	-4.981	-4.981	0	%100
2	M2	Y	-2.071	-2.071	0	%100
3	M3	Y	-2.071	-2.071	0	%100

Member Distributed Loads (BLC 8 : BLC 2 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[...	End Location[i...
1	M1	Z	-3.77	-3.77	0	72

Member Distributed Loads (BLC 9 : BLC 3 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[...	End Location[i...
1	M1	X	-3.77	-3.77	0	72
2	M2	X	0	0	0	3
3	M3	X	0	0	0	3

Member Distributed Loads (BLC 10 : BLC 5 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[...	End Location[i...
1	M1	Z	-1.5	-1.5	0	72

Member Distributed Loads (BLC 11 : BLC 6 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[...	End Location[i...
1	M1	X	-1.5	-1.5	0	72
2	M2	X	0	0	0	3
3	M3	X	0	0	0	3

Member Area Loads (BLC 2 : Wind Load AZI 000)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N14	N12	N9	N11	Z	Open Structure	-19.05

Member Area Loads (BLC 3 : Wind Load AZI 090)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N12	N13	N10	N9	X	Open Structure	-19.05

Member Area Loads (BLC 5 : Wind + Ice Load AZI 000)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N14	N12	N9	N11	Z	Open Structure	-7.58

Member Area Loads (BLC 6 : Wind + Ice Load AZI 090)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N12	N13	N10	N9	X	Open Structure	-7.58

Date:	11/28/2018
Client:	Smartlink
Site:	Crescent
Engineer:	RAM
Job #:	1106-A0001-B

Slab Check (4" Thickness)		
Slab Thickness	4	in
Slab Width	72	in
Slab Length	72	in
Reinforcement	0.31	in^2/ft
Decking	0	in^2/ft
DL (conc. wt.)	300	lb/ft
LL (Enclosure)	228.75	lb/ft
W_u	726.00	lb/ft
M_u	3.27	kip-ft
$M_u/\phi bd^2$	37.81	psi
ρ	0.0018	ACI 10.5
A_{req}	0.52	in^2
A_s	1.86	in^2/ft
$A_s > A_{req}$	OK	

Shear Check		
Slab Thickness	4	in
Slab Width	72	in
Slab Length	72	in
f'c	4000	psi
ϕV_c	27322.08	lb
V_u (From Wind)	7560.784	lb
$V_u/\phi V_c$	27.6728	%
No consideration of shear reinforcement needed		

SHEET INDEX

DRIVING DIRECTIONS

FROM 7150 STANDARD DRIVE HANOVER MD:

HEAD SOUTH–WEST ON STANDARD DR TOWARDS PARKWAY DR, TURN LEFT TOWARDS STANDARD DR, TURN RIGHT ONTO STANDARD DR, TURN LEFT ONTO PARKWAY DR, TURN RIGHT ONTO PARK CIR DR, TURN LEFT ONTO COCA COLA DR, TURN RIGHT TO MERGE ONTO MD–100 W TOWARDS ELLICOTT CITY, MERGE ONTO MD–100 W, TAKE EXIT 5A–B TOWARDS WASHINGTON, MERGE ONTO I–95 S, USE THE RIGHT 2 LANES TO TAKE EXIT 27 W TO MERGE ONTO I–495 W TOWARDS SILVER SPRING, TAKE EXIT 33 FOR MD–185/CONNECTICUT AVE TOWARDS KENSINGTON/CHEVY CHASE, USE THE LEFT 2 LANES TO TURN LEFT ONTO MD–185 S/CONNECTICUT AVE, TURN RIGHT ONTO MD–410 W/STATE HWY 410 W, CONTINUE STRAIGHT ONTO MD–410 W AND FINALLY THE DESTINATION WILL BE ON THE LEFT.

PROJECT

DELTA SECTOR ADD W/ 2 RETRO FITS FOR DUAL AIRSCALES

SITE NAME

CRESCENT

USID

55113

FA SITE NUMBER

10006543

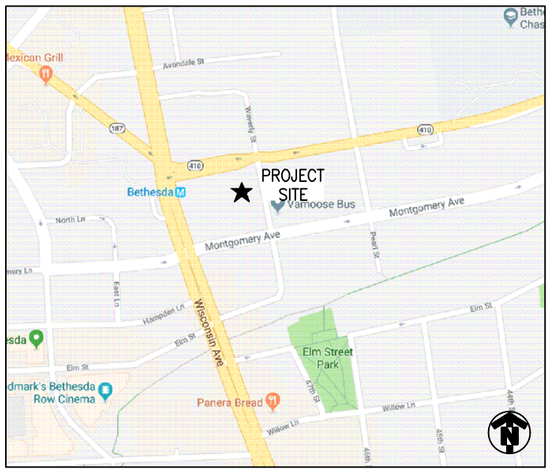
SITE ADDRESS

4600 EAST WEST HIGHWAY
BETHESDA, MD 20814

AT&T ROOFTOP PIM NOTICE

- REPLACE ANY HOSE CLAMPS, HANGERS AND SNAP–INS SUPPORTING RF COAX JUMPERS, CPRI, RET OR DC CABLES LOCATED WITHIN LEASE SPACE BEHIND ANTENNA (15 FT MINIMUM) WITH INTERIM SOLUTION QTY= 2 UV RATED 1/4" WIDE NYLON CABLE TIES THAT MEET 120 LBS TENSILE STRENGTH SPECIFICATION.
  EXAMPLES: MINIMUM: 120 LBS TENSILE STRENGTH, THOMAS AND BETTS CABLE TIES, PANDUIT CABLE TIES
- REPLACE ANY HOSE CLAMPS, HANGERS AND SNAP–INS SUPPORTING RF COAX JUMPERS, CPRI, RET OR DC CABLES LOCATED WITHIN 30 FT MINIMUM LEASE SPACE IN FRONT (180 DEGREE) OF ANTENNA WITH QTY= 2 UV RATED 1/4" WIDE NYLON CABLE TIES
- REMOVE ANY UNNECESSARY HARDWARE THAT'S NOT CURRENTLY SUPPORTING ANYTHING. TIGHTEN ALL REMAINING CLAMPS, BRACKETS, ANTENNA SUPPORTS ETC. TO MANUFACTURER TORQUE SPEC.
- ENSURE THERE IS NO RUSTING METAL ON MOUNTING PIPE WHERE CABLE HANGER AND ADAPTER ARE TO BE ATTACHED. USE A WIRE BRUSH OR WIRE WHEEL & DRILL TO REMOVE ANY RUSTING METAL. CLEAN THE MOUNTING SURFACE (INCLUDING REMOVAL OF MINOR CORROSION) WITH A SCOTCHBRITE PAD. PAINT ANY EXPOSED METAL WHERE THERE WAS RUST OR GALVANIZING HAS BEEN DAMAGED WITH COLD–GALVANIZING PAINT (COLD–GALV). USE NO–OX BETWEEN PIPE MOUNTING HARDWARE (CLAMPS OR STAINLESS–STEEL BANDING) AND MOUNTING PIPE. IF COLD–GALV PAINT WAS APPLIED, ENSURE THE PAINT HAS DRIED BEFORE APPLYING NO–OX. DO NOT USE HOSE CLAMPS TO SECURE CABLE HANGERS OR HANGER ADAPTERS IN HIGH RISK PIM ZONES.
- ALL CABLES TIES SHOULD BE FLUSH CUT TO PREVENT INJURY FROM EXPOSED SHARP EDGES.
- DO NOT ATTACH BRASS TAGS TO RF CABLES FOR CABLE IDENTIFICATION LABELING. USE COLOR CODED TAPE AS SPECIFIED BY LOCAL RF CABLE COLOR CODE STANDARD.

LOCATION MAP



GENERAL NOTES

- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED.
- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- FACILITY HAS NO PLUMBING OR REFRIGERANTS.
- THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS.
- ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. EQUIPMENT, ANTENNAS/RRH AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.
- THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON STORMWATER DRAINAGE.
- NO SANITARY SEWER, POTABLE WATER, OR TRASH DISPOSAL SERVICE IS REQUIRED
- NO COMMERCIAL SIGNAGE IS PROPOSED

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT ADOPTED EDITIONS OF THE FOLLOWING CODES WITH ANY LOCAL AMENDMENTS BY THE LOCAL GOVERNING AUTHORITIES:

- INTERNATIONAL BUILDING CODE
- NATIONAL ELECTRICAL CODE
- NATIONAL FIRE PROTECTION ASSOCIATION 101
- NATIONAL FIRE PROTECTION ASSOCIATION 1
- LOCAL BUILDING CODES
- CITY/COUNTY ORDINANCES
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATIONS (AISC)
- UNDERWRITERS LABORATORIES APPROVED ELECTRICAL PRODUCTS.
- ANSI EIA/TIA 222 REV. G
- TIA 607
- INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81
- IEEE C2 (LATEST EDITION)
- TELCORDIA GR–1275
- ANSI T1.311

PROJECT SITE INFORMATION

SITE NAME:	CRESCENT	
USID:	55113	
FA SITE #:	10006543	
SITE ADDRESS:	4600 EAST WEST HIGHWAY BETHESDA, MD 20814	
JURISDICTION:	MONTGOMERY COUNTY	
SITE COORDINATES: LATITUDE:	N 38° 59' 03.7"	(NAD 83)
LONGITUDE:	W 77° 05' 34.9"	(NAD 83)
APPLICANT:	AT&T MOBILITY 7150 STANDARD DRIVE HANOVER, MD 21076	

STRUCTURAL ANALYSIS INFORMATION

ROOF LOADING ANALYSIS

*BASED ON THE STRUCTURAL ANALYSIS COMPLETED BY **INFINIGY** DATED **11/28/2018**. THE EXISTING **PENTHOUSE SLAB** IS CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION.*

ANTENNA MOUNTS

*BASED ON THE MOUNT ANALYSIS COMPLETED BY **INFINIGY** DATED **11/28/2018**. THE EXISTING ANTENNA MOUNTS ARE CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION*

PROJECT TEAM INFORMATION

CLIENT REPRESENTATIVE:	SMARTLINK, LLC 1362 MELLON ROAD HANOVER, MD 21076
CLIENT REP. CONTACT:	STEVE BRIANAS STEVE.BRIANAS@SMARTLINKLLC.COM
SITE ACQUISITION:	SMARTLINK, LLC 1362 MELLON ROAD HANOVER, MD 21076
SITE ACQUISITION CONTACT:	STEVE BRIANAS STEVE.BRIANAS@SMARTLINKLLC.COM
ENGINEER:	INFINIGY SOLUTIONS 1033 WATERVLIET SHAKER ROAD ALBANY, NY 12205
ENGINEER CONTACT:	MATT LIVERETTE MLIVERETTE@INFINIGY.COM 301–928–8789
RF ENGINEER:	AT&T 7150 STANDARD DRIVE HANOVER, MD 21076
RF CONTACT:	STEVE HATHWAY AT&T RAN ENGINEER 443–770–4443 SH733Y@ATT.COM

811 Know what's below. Call before you dig.

TO OBTAIN LOCATION OF PARTICIPANTS UNDERGROUND FACILITIES BEFORE YOU DIG IN MARYLAND (WEST OF CHESAPEAKE BAY), CALL MISS UTILITY OF MARYLAND
TOLL FREE: 1-800-257-7777 OR www.missutility.net
MARYLAND STATUTE REQUIRES MIN OF 2 WORKING DAYS NOTICE BEFORE YOU EXCAVATE

INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

STATE OF MARYLAND · JOHN S. STEVENS · 36339 · PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 36339 EXP. 12/12/2020

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Drawn: HAM
Designed: MRL
Checked: AJD

Project Number: 499-002

Project Title:

CRESCENT
SITE ID: 55113
FA # 10006543
4600 EAST WEST HIGHWAY
BETHESDA, MD 20814

Prepared For:

smartlink
1362 MELLON RD
HANOVER, MD 21076
TEL (410) 582-8043
FAX (443) 221-2962

Drawing Title: **TITLE PAGE**

Drawing Number: **T1**

GENERAL NOTES

PART 1 – GENERAL REQUIREMENTS

1.1 THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
C. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC").
D. AND NFPA 101 (LIFE SAFETY CODE).
E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM).
F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE).

1.2 DEFINITIONS:
A: WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B: COMPANY: AT&T CORPORATION
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D: CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E: THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.

1.3 POINT OF CONTACT: COMMUNICATION BETWEEN THE COMPANY AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE COMPANY SITE DEVELOPMENT SPECIALIST OR OTHER PROJECT COORDINATOR APPOINTED TO MANAGE THE PROJECT FOR THE COMPANY.

1.4 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.5 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES, AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.

1.6 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.7 NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE AT&T WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – EXECUTION

2.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE, POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

2.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

2.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

2.4 COMPANY FURNISHED MATERIAL AND EQUIPMENT: ALL HANDLING, STORAGE AND INSTALLATION OF COMPANY FURNISHED MATERIAL AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
A. CONTRACTOR SHALL PROCURE ALL OTHER REQUIRED WORK RELATED MATERIALS NOT PROVIDED BY AT&T TO SUCCESSFULLY CONSTRUCT A WIRELESS FACILITY.

2.5 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

2.6 EXISTING CONDITIONS: NOTIFY THE COMPANY REPRESENTATIVE OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

PART 3 – RECEIPT OF MATERIAL & EQUIPMENT

3.1 RECEIPT OF MATERIAL AND EQUIPMENT: CONTRACTOR IS RESPONSIBLE FOR AT&T PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
A. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
B. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
C. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
D. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO AT&T OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
E. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
F. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

PART 4 – GENERAL REQUIREMENTS FOR CONSTRUCTION

4.1 CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

4.2 EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

4.3 CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
A. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
B. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

4.4 CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION.

4.5 CONDUCT TESTING AS REQUIRED HEREIN.

PART 5 – TESTS AND INSPECTIONS

5.1 TESTS AND INSPECTIONS:
A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
B. CONTRACTOR SHALL COORDINATE TEST AND INSPECTION SCHEDULES WITH COMPANY'S REPRESENTATIVE WHO MUST BE ON SITE TO WITNESS SUCH TESTS AND INSPECTIONS.
C. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
D. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
E. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
F. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
G. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

PART 6 – TRENCHING AND BACKFILLING

6.1 TRENCHING AND BACKFILLING: THE CONTRACTOR SHALL PERFORM ALL EXCAVATION OF EVERY DESCRIPTION AND OF WHATEVER SUBSTANCES ENCOUNTERED, TO THE DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS OTHERWISE SPECIFIED.

A. PROTECTION OF EXISTING UTILITIES: THE CONTRACTOR SHALL CHECK WITH THE LOCAL UTILITIES AND THE RESPECTIVE UTILITY LOCATOR COMPANIES PRIOR TO STARTING EXCAVATION OPERATIONS IN EACH RESPECTIVE AREA TO ASCERTAIN THE LOCATIONS OF KNOWN UTILITY LINES. THE LOCATIONS, NUMBER AND TYPES OF EXISTING UTILITY LINES DETAILED ON THE CONSTRUCTION DRAWINGS ARE APPROXIMATE AND DO NOT REPRESENT EXACT INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL LINES DAMAGED DURING EXCAVATION AND ALL ASSOCIATED OPERATIONS. ALL UTILITY LINES UNCOVERED DURING THE EXCAVATION OPERATIONS, SHALL BE PROTECTED FROM DAMAGE DURING EXCAVATION AND ASSOCIATED OPERATIONS. ALL REPAIRS SHALL BE APPROVED BY THE UTILITY COMPANY.

B. HAND DIGGING: UNLESS APPROVED IN WRITING OTHERWISE, ALL DIGGING WITHIN AN EXISTING CELL SITE COMPOUND IS TO BE DONE BY HAND.

C. DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING AND TO PREVENT SLIDES OR CAVE-INS. ALL EXCAVATED MATERIALS NOT REQUIRED OR SUITABLE FOR BACKFILL SHALL BE REMOVED AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE.

D. GRADING SHALL BE DONE AS MAY BE NECESSARY TO PREVENT SURFACE WATER FROM FLOWING INTO TRENCHES OR OTHER EXCAVATIONS, AND ANY WATER ACCUMULATING THEREIN SHALL BE REMOVED BY PUMPING OR BY OTHER APPROVED METHOD.

E. SHEETING AND SHORING SHALL BE DONE AS NECESSARY FOR THE PROTECTION OF THE WORK AND FOR THE SAFETY OF PERSONNEL. UNLESS OTHERWISE INDICATED, EXCAVATION SHALL BE BY OPEN CUT, EXCEPT THAT SHORT SECTIONS OF A TRENCH MAY BE TUNNELED IF, THE CONDUIT CAN BE SAFELY AND PROPERLY INSTALLED AND BACKFILL CAN BE PROPERLY TAMPED IN SUCH TUNNEL SECTIONS. EARTH EXCAVATION SHALL COMPRISE ALL MATERIALS AND SHALL INCLUDE CLAY, SILT, SAND, MUCK, GRAVEL, HARDPAN, LOOSE SHALE, AND LOOSE STONE.

F. TRENCHES SHALL BE OF NECESSARY WIDTH FOR THE PROPER LAYING OF THE CONDUIT OR CABLE, AND THE BANKS SHALL BE AS NEARLY VERTICAL AS PRACTICABLE. THE BOTTOM OF THE TRENCHES SHALL BE ACCURATELY GRADED TO PROVIDE UNIFORM BEARING AND SUPPORT FOR EACH SECTION OF THE CONDUIT OR CABLE ON UNDISTURBED SOIL AT EVERY POINT ALONG ITS ENTIRE LENGTH. EXCEPT WHERE ROCK IS ENCOUNTERED, CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED. WHERE ROCK EXCAVATIONS ARE NECESSARY, THE ROCK SHALL BE EXCAVATED TO A MINIMUM OVER DEPTH OF 6 INCHES BELOW THE TRENCH DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR SPECIFIED. OVER DEPTHS IN THE ROCK EXCAVATION AND UNAUTHORIZED OVER DEPTHS SHALL BE THOROUGHLY BACK FILLED AND TAMPED TO THE APPROPRIATE GRADE. WHENEVER WET OR OTHERWISE UNSTABLE SOIL THAT IS INCAPABLE OF PROPERLY SUPPORTING THE CONDUIT OR CABLE IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, SUCH SOLID SHALL BE REMOVED TO A MINIMUM OVER DEPTH OF 6 INCHES AND THE TRENCH BACKFILLED TO THE PROPER GRADE WITH EARTH OF OTHER SUITABLE MATERIAL, AS HEREINAFTER SPECIFIED.

G. BACKFILLING OF TRENCHES. TRENCHES SHALL NOT BE BACKFILLED UNTIL ALL SPECIFIED TESTS HAVE BEEN PERFORMED AND ACCEPTED. WHERE COMPACTED BACKFILL IS NOT INDICATED THE TRENCHES SHALL BE CAREFULLY BACKFILLED WITH SELECT MATERIAL SUCH AS EXCAVATED SOILS THAT ARE FREE OF ROOTS, SOD, RUBBISH OR STONES, DEPOSITED IN 6 INCH LAYERS AND THOROUGHLY AND CAREFULLY RAMMED UNTIL THE CONDUIT OR CABLE HAS A COVER OF NOT LESS THAN 1 FOOT. THE REMAINDER OF THE BACKFILL MATERIAL SHALL BE GRANULAR IN NATURE AND SHALL NOT CONTAIN ROOTS, SOD, RUBBING, OR STONES OF 2-1/2 INCH MAXIMUM DIMENSION. BACKFILL SHALL BE CAREFULLY PLACED IN THE TRENCH AND IN 1 FOOT LAYERS AND EACH LAYER TAMPED. SETTLING THE BACKFILL WITH WATER WILL BE PERMITTED. THE SURFACE SHALL BE GRADED TO A REASONABLE UNIFORMITY AND THE MOUNDING OVER THE TRENCHES LEFT IN A UNIFORM AND NEAT CONDITION.

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER
	NON-FUSIBLE DISCONNECT SWITCH
F	FUSIBLE DISCONNECT SWITCH
	SURFACE MOUNTED PANEL BOARD
T	TRANSFORMER
M	KILOWATT HOUR METER
JB	JUNCTION BOX
PB	PULL BOX TO NEC/TELCO STANDARDS
	UNDERGROUND UTILITIES
	EXOTHERMIC WELD CONNECTION
	MECHANICAL CONNECTION
OR	GROUND ROD
OR	GROUND ROD WITH INSPECTION SLEEVE
	GROUND BAR
	120AC DUPLEX RECEPTACLE
G	GROUND CONDUCTOR
	DC POWER AND FIBER OPTIC TRUNK CABLES
	DC POWER CABLES
# / #	REPRESENTS DETAIL NUMBER REF. DRAWING NUMBER

ABBREVIATIONS

CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
MIGB	MASTER ISOLATED GROUND BAR
SST	SELF SUPPORTING TOWER
GPS	GLOBAL POSITIONING SYSTEM
TYP.	TYPICAL
DWG	DRAWING
BCW	BARE COPPER WIRE
BFG	BELOW FINISH GRADE
PVC	POLYVINYL CHLORIDE
CAB	CABINET
C	CONDUIT
SS	STAINLESS STEEL
G	GROUND
AWG	AMERICAN WIRE GAUGE
RGS	RIGID GALVANIZED STEEL
AHJ	AUTHORITY HAVING JURISDICTION
TTLNA	TOWER TOP LOW NOISE AMPLIFIER
UNO	UNLESS NOTED OTHERWISE
EMT	ELECTRICAL METALLIC TUBING
AGL	ABOVE GROUND LEVEL

at&t

INFINIGY

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JOHN S. STEVENS
36339
PROFESSIONAL ENGINEER

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Designed: MRL
Checked: AJD

Project Number: 499-002

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BETHESDA, MD 20814

Prepared For:

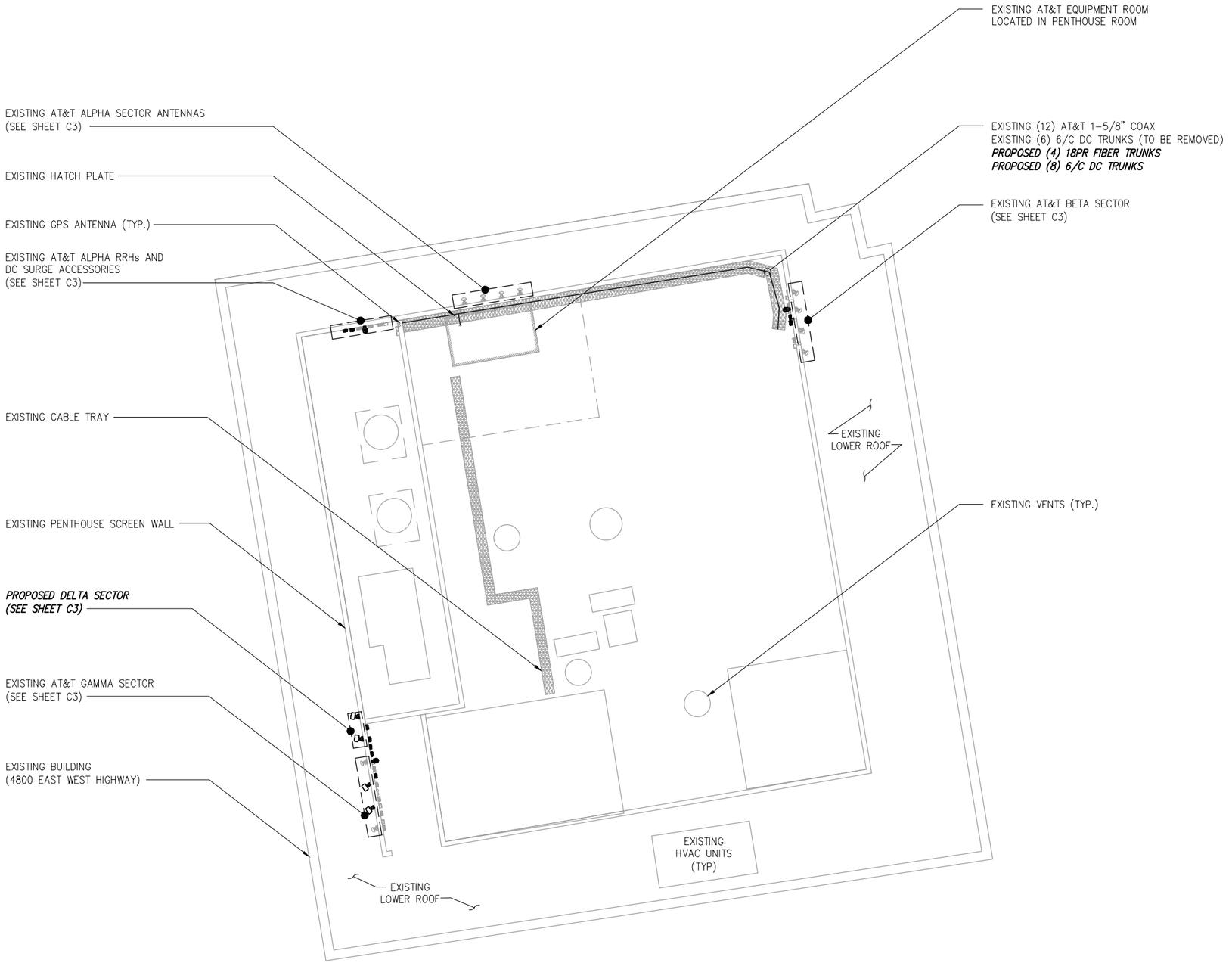
smartlink
1362 MELLON RD
HANOVER, MD 21076
TEL (410) 582-8043
FAX (443) 221-2962

Drawing Title

GENERAL NOTES

Drawing Number

N1



NORTH

1 / C1 ROOF PLAN
SCALE: AS NOTED

GRAPHIC SCALE:

20' 10' 0 10' 20'

SCALE (11x17): 1" = 20'-0"
SCALE (22x34): 1" = 10'-0"

at&t

INFINIGY

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Drawing Number

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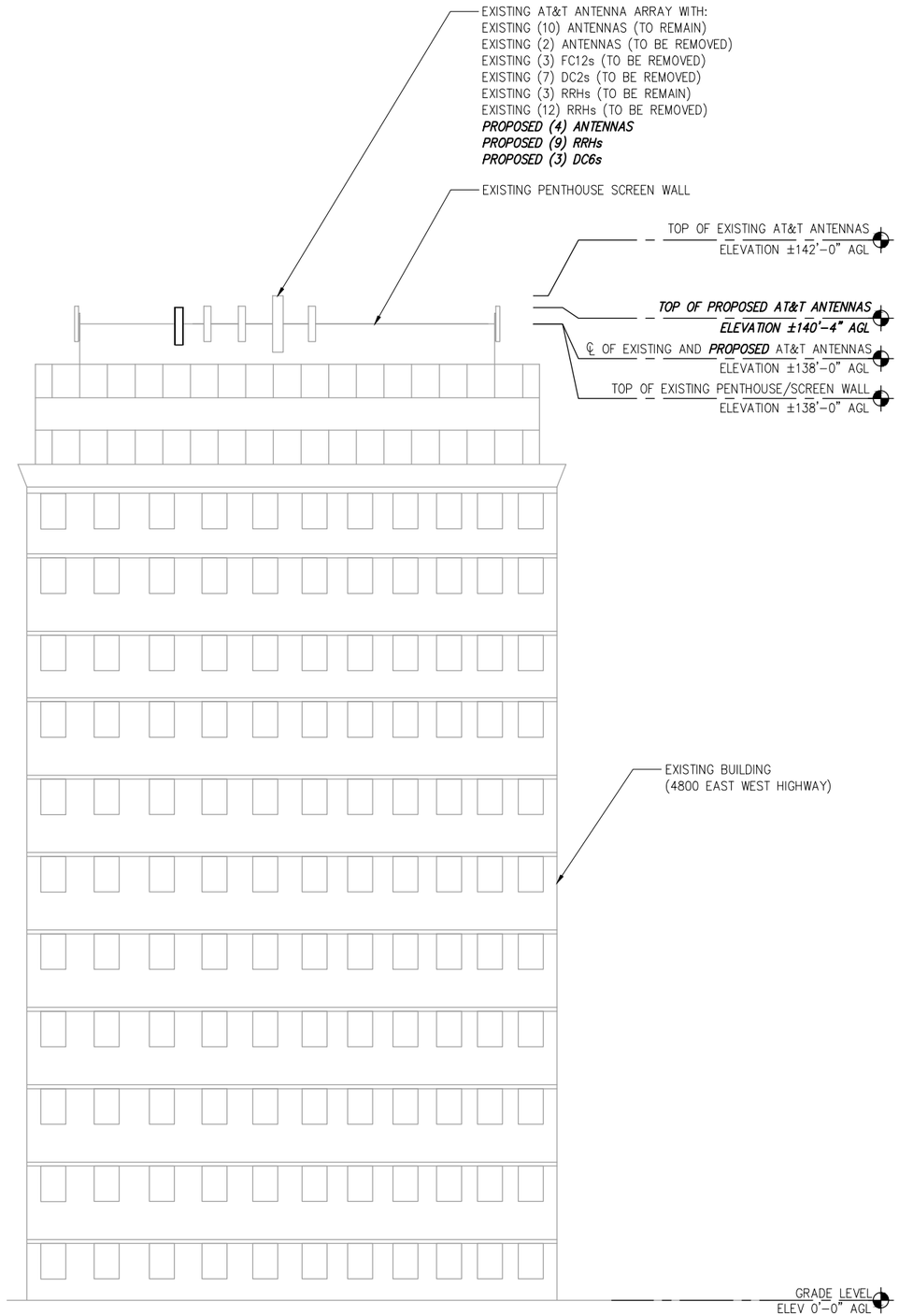

1 C2 ELEVATION VIEW
SCALE: NOT TO SCALE

ANTENNA AND RRH SCHEDULE

SECTOR	ANTENNA POSITION	ANTENNA MAKE	ANTENNA MODEL	RAD CTR. FT. AGL	AZIMUTH	RRH/TMA QTY/MAKE/MODEL	FILTER/DIPLEXER QTY/MAKE/MODEL	E-TILT	M-TILT	FREQUENCY (MHz)
A	#1	KATHREIN	742264	138'-0"	350°	(2) POWERWAVE LGP21401	(2) POWERWAVE LGP13519	10° (UMTS 850)	0°	824-835, 845-846.75, 890-891.5, 869-880
	#2	KATHREIN	80010966	138'-0"	0°	**(1) AIRSCALE B12/14** **(1) AIRSCALE B25/66**	–	10° (LTE 700) 6° (LTE 700) 8° (LTE 1900) 2° (LTE AWS)	2°	704-722, 734-746, 758-768, 788-798, 1865-1885, 1945-1965, 1710-1720, 1765-1770, 2110-2120, 2165-2170
	#3	CCI	OPA-65R-LCUU-H4	138'-0"	0°	(1) RRH 4x25-WCS-4R	–	2° (LTE WCS)	0°	2305-2315, 2350-2360
	#4	COMMSCOPE	SBNHH-1D65A	138'-0"	0°	(1) TMAT1921B68-21-43	–	–	–	704-722, 734-746, 1710-1720, 1765-1770, 2110-2120, 2165-2170
B	#5	KATHREIN	742264	138'-0"	120°	(2) POWERWAVE LGP21401	(2) POWERWAVE LGP13519	10° (UMTS 850)	0°	824-835, 845-846.75, 890-891.5, 869-880
	#6	KATHREIN	80010966	138'-0"	120°	**(1) AIRSCALE B12/14** **(1) AIRSCALE B25/66**	–	10° (LTE 700) 6° (LTE 700) 6° (LTE 1900) 5° (LTE AWS)	2°	704-722, 734-746, 758-768, 788-798, 1865-1885, 1945-1965, 1710-1720, 1765-1770, 2110-2120, 2165-2170
	#7	CCI	OPA-65R-LCUU-H4	138'-0"	120°	(1) RRH 4x25-WCS-4R	(1) KFTDR00110030	5° (LTE WCS)	2°	2305-2315, 2350-2360
	#8	COMMSCOPE	SBNHH-1D65A	138'-0"	120°	(1) TMAT1921B68-21-43	–	–	–	704-722, 734-746, 1710-1720, 1765-1770, 2110-2120, 2165-2170
C	#9	KATHREIN	742264	138'-0"	240°	(2) POWERWAVE LGP21401	(2) POWERWAVE LGP13519	10° (UMTS 850)	0°	824-835, 845-846.75, 890-891.5, 869-880
	#10	**COMMSCOPE**	**JAHH-45A-R3B**	138'-0"	235°	**(1) AIRSCALE B12/14** **(1) AIRSCALE B25/66**	–	8° (LTE 700) 3° (LTE 1900) 1° (LTE AWS)	0°	704-722, 734-746, 758-768, 788-798, 1865-1885, 1945-1965, 1710-1720, 1765-1770, 2110-2120, 2165-2170
	#11	**COMMSCOPE**	**JAHH-45A-R3B**	138'-0"	235°	(1) RRH 4x25-WCS-4R	–	8° (LTE 700) 1° (LTE WCS)	0°	2305-2315, 2350-2360
	#12	COMMSCOPE	SBNHH-1D65A	138'-0"	235°	–	–	–	–	704-722, 734-746, 1710-1720, 1765-1770, 2110-2120, 2165-2170
D	#14	**COMMSCOPE**	**JAHH-45A-R3B**	**138'-0"**	**280°**	**(1) AIRSCALE B12/14** **(1) AIRSCALE B25/66**	–	8° (LTE 700) 3° (LTE 1900) 1° (LTE AWS)	0°	704-722, 734-746, 758-768, 788-798, 1865-1885, 1945-1965, 1710-1720, 1765-1770, 2110-2120, 2165-2170
	#15	**COMMSCOPE**	**JAHH-45A-R3B**	**138'-0"**	**280°**	**(1) RRH4x25-WCS-4R**	–	8° (LTE 700) 1° (LTE WCS)	0°	704-722, 734-746, 758-768, 788-798, 2305-2315, 2350-2360

KEY:
EXISTING
PROPOSED

CABLE SCHEDULE

SYSTEM	TYPE	QTY	LENGTH
UMTS	7/8"ø COAX	12	150'±
LTE	**PWRT-606-S**	**6**	**150'±**
LTE	**18 PAIR FIBER**	**3**	**150'±**

SURGE PROTECTION DEVICE SCHEDULE

TYPE	LOCATION	QTY
DC6	**SECTOR LEVEL**	**3**

RF DESIGN NOTE:
THIS ANTENNA AND CABLE SCHEDULE HAS BEEN CREATED USING THE FOLLOWING AT&T RFDS
DATED: **09/18/2018** REVISION: **V2018_0.2** ALL ANTENNA DESIGN, ZONING, STRUCTURAL ANALYSIS PERMITS AND COMPLIANCE SUBMISSIONS ARE COORDINATED WITH THE AFOREMENTIONED DOCUMENT.

2 C2 RF SCHEDULE
NOT TO SCALE

at&t

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PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 36339 EXP. 12/12/2020

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Drawn: HAM
Designed: MRL
Checked: AJD

Project Number:
499-002

Project Title:
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SITE ID: 55113
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Drawing Title
ELEVATION AND RF SCHEDULE

Drawing Number
C2

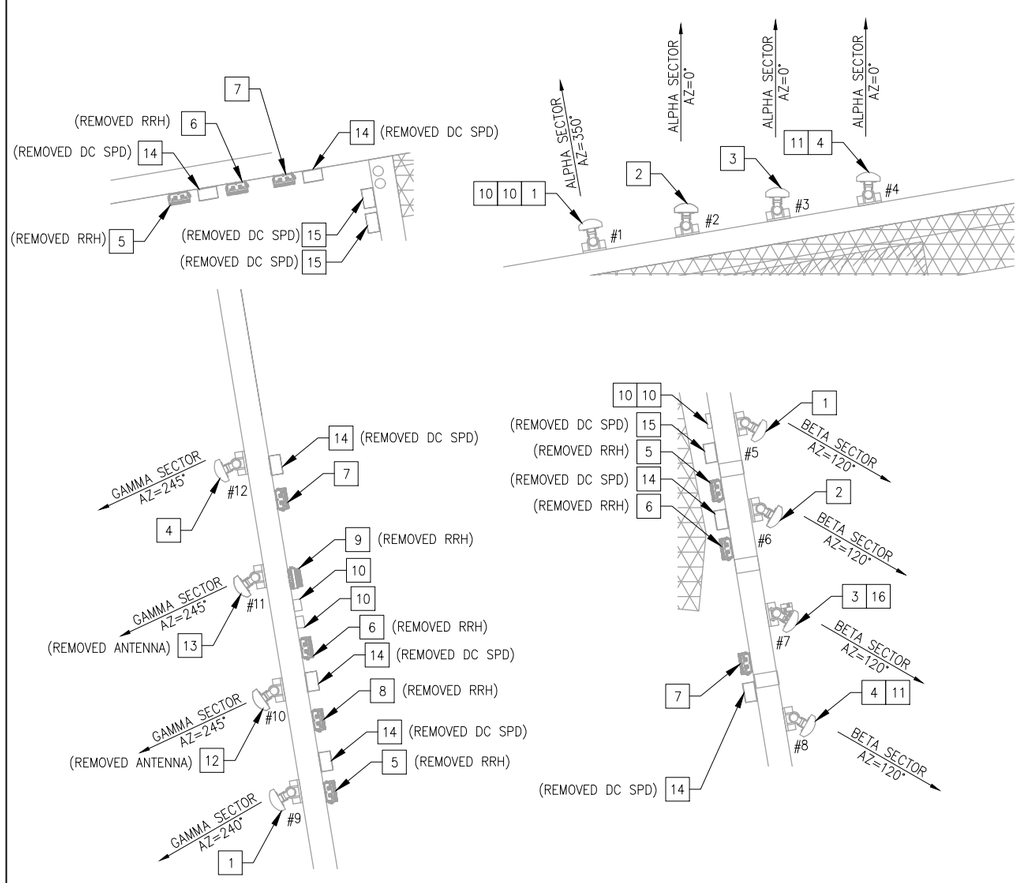
AT&T ROOFTOP PIM NOTICE

- REPLACE ANY HOSE CLAMPS, HANGERS AND SNAP-INS SUPPORTING RF COAX JUMPERS, CPRI, RET OR DC CABLES LOCATED WITHIN LEASE SPACE BEHIND ANTENNA (15 FT MINIMUM) WITH INTERIM SOLUTION QTY= 2 UV RATED 1/4" WIDE NYLON CABLE TIES THAT MEET 120 LBS TENSILE STRENGTH SPECIFICATION.
  EXAMPLES: MINIMUM: 120 LBS TENSILE STRENGTH, THOMAS AND BETTS CABLE TIES, PANDUIT CABLE TIES
- REPLACE ANY HOSE CLAMPS, HANGERS AND SNAP-INS SUPPORTING RF COAX JUMPERS, CPRI, RET OR DC CABLES LOCATED WITHIN 30 FT MINIMUM LEASE SPACE IN FRONT (180 DEGREE) OF ANTENNA WITH QTY= 2 UV RATED 1/4" WIDE NYLON CABLE TIES
- REMOVE ANY UNNECESSARY HARDWARE THAT'S NOT CURRENTLY SUPPORTING ANYTHING. TIGHTEN ALL REMAINING CLAMPS, BRACKETS, ANTENNA SUPPORTS ETC. TO MANUFACTURER TORQUE SPEC.
- ENSURE THERE IS NO RUSTING METAL ON MOUNTING PIPE WHERE CABLE HANGER AND ADAPTER ARE TO BE ATTACHED. USE A WIRE BRUSH OR WIRE WHEEL & DRILL TO REMOVE ANY RUSTING METAL. CLEAN THE MOUNTING SURFACE (INCLUDING REMOVAL OF MINOR CORROSION) WITH A SCOTCHBRITE PAD. PAINT ANY EXPOSED METAL WHERE THERE WAS RUST OR GALVANIZING HAS BEEN DAMAGED WITH COLD-GALVANIZING PAINT (COLD-GALV). USE NO-OX BETWEEN PIPE MOUNTING HARDWARE (CLAMPS OR STAINLESS-STEEL BANDING) AND MOUNTING PIPE. IF COLD-GALV PAINT WAS APPLIED, ENSURE THE PAINT HAS DRIED BEFORE APPLYING NO-OX. DO NOT USE HOSE CLAMPS TO SECURE CABLE HANGERS OR HANGER ADAPTERS IN HIGH RISK PIM ZONES.
- ALL CABLES TIES SHOULD BE FLUSH CUT TO PREVENT INJURY FROM EXPOSED SHARP EDGES.
- DO NOT ATTACH BRASS TAGS TO RF CABLES FOR CABLE IDENTIFICATION LABELING. USE COLOR CODED TAPE AS SPECIFIED BY LOCAL RF CABLE COLOR CODE STANDARD.

ORIENTATION PLAN KEY

KEY	DESCRIPTION	TYPE	QTY	STATUS
1	742264	ANTENNA	3	REMAIN
2	80010966	ANTENNA	2	REMAIN
3	OPA-65R-LCUU-H4	ANTENNA	2	REMAIN
4	SBNHH-1D65A	ANTENNA	3	REMAIN
5	RRH 4T4R B14 160W	RRH	3	REMOVED
6	B25 RRH4x30-4R	RRH	3	REMOVED
7	RRH4-25-WCS-4R	RRH	3	REMAIN
8	RRH2x40W-07L	RRH	3	REMOVED
9	B66A-RRH4x45	RRH	3	REMOVED
10	LGP21401	TMA	6	REMAIN
11	TMAT1921B68-21-43	TMA	2	REMAIN
12	80010966	ANTENNA	1	REMOVED
13	OPA-65R-LCUU-H4	ANTENNA	1	REMOVED
14	DC2	DC/FIBER MGMT	7	REMOVED
15	FC12	SLACK BOX	3	REMOVED
16	KFTDR00110030	FILTER	1	REMAIN
17	**JAHH-45A-R3B**	**ANTENNA**	**4**	**PROPOSED**
18	**AIRSCALE B12/14**	**RRH**	**4**	**PROPOSED**
19	**AIRSCALE B25/66**	**RRH**	**4**	**PROPOSED**
20	**RRH4x25-WCS-4R**	**RRH**	**1**	**PROPOSED**
21	**DC6**	**DC/FIBER MGMT**	**3**	**PROPOSED**

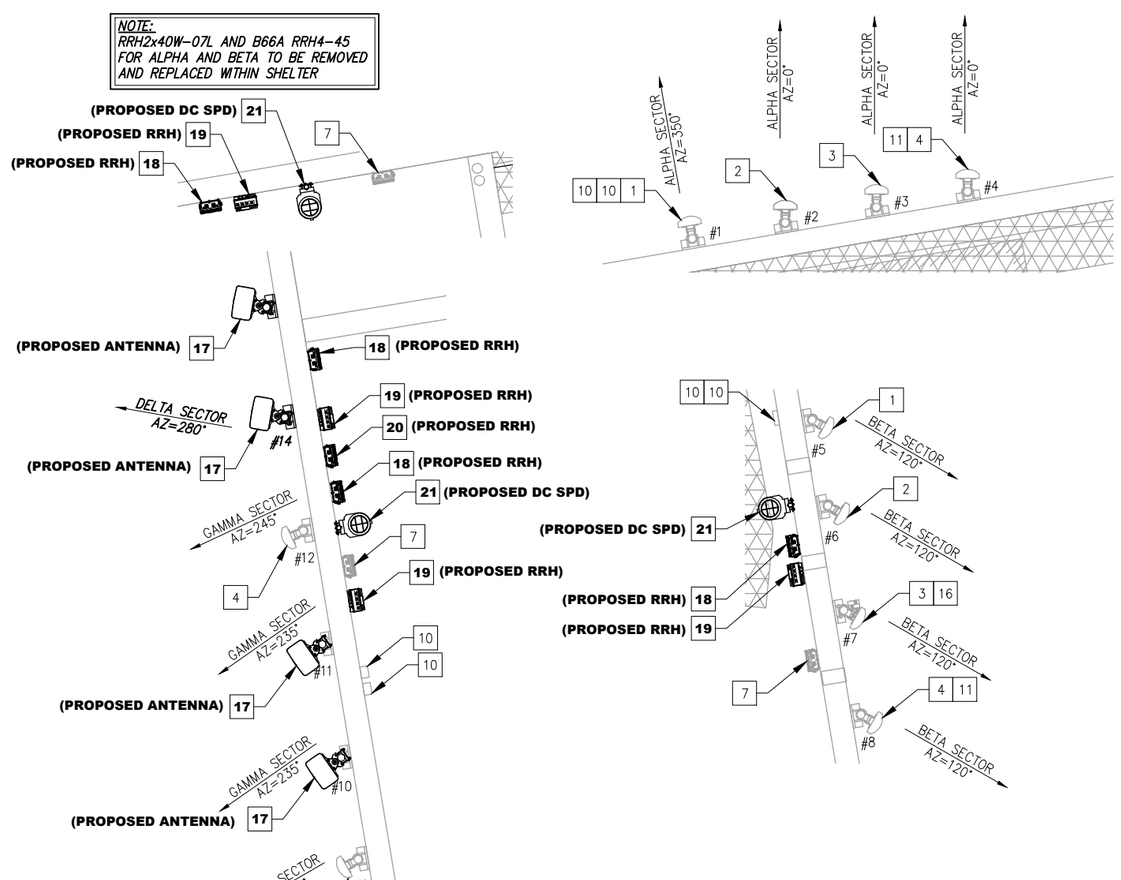
NOTE:
1. *LAYOUT SHOWN BASED ON AVAILABLE INFORMATION FROM AUDIT PHOTOS. GC TO FIELD ADJUST LAYOUT AS NECESSARY FOR MINIMUM REQUIRED CLEARANCES OF EQUIPMENT.*
2. *NO EXISTING OR PROPOSED UNISTRUT TO EXCEED A SPAN OF 4' BETWEEN SUPPORTS. REMOVE AND REPLACE EXISTING UNISTRUT AS NECESSARY FOR MAX. 4' SPAN WHEN UTILIZED FOR MOUNTING RRHs AND SLACK BOXES.*
3. *SEE SHEETS C5 AND C6 FOR PROPOSED EQUIPMENT MOUNTING DETAILS.*
4. *ALL EQUIPMENT NOT SPECIFIED BELOW AS TO BE REMOVED WILL BE RETAINED.*



NORTH

1 / C3 ANTENNA ORIENTATION PLAN (EXISTING)
NOT TO SCALE

NOTE:
RRH2x40W-07L AND B66A RRH4-45 FOR ALPHA AND BETA TO BE REMOVED AND REPLACED WITHIN SHELTER



NORTH

2 / C3 ANTENNA ORIENTATION PLAN (PROPOSED)
NOT TO SCALE

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Designed: MRL
Checked: AJD

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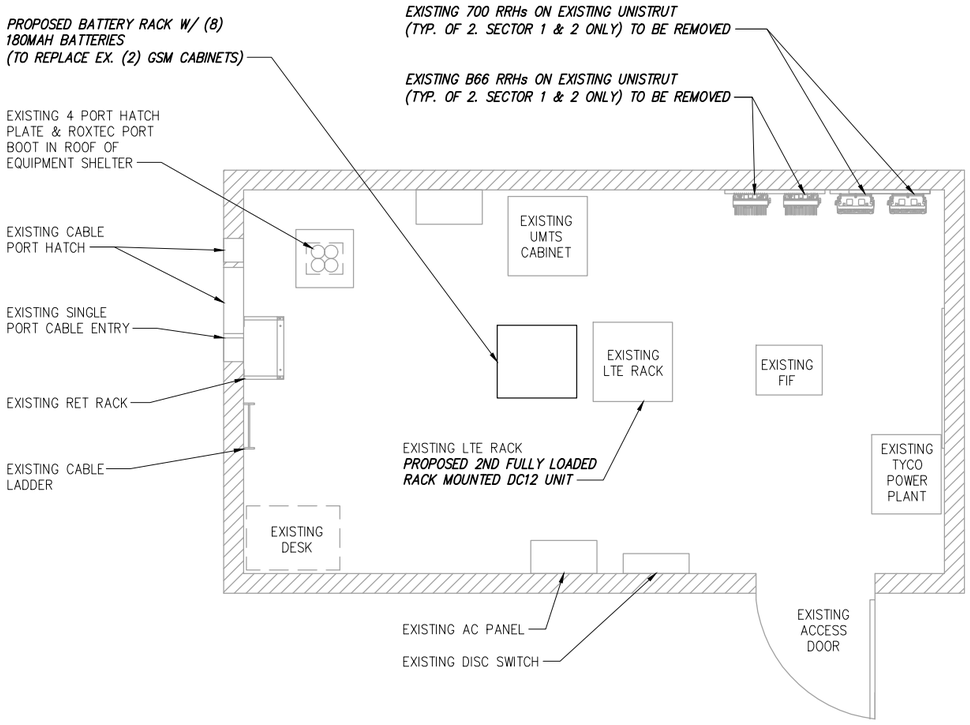
Drawing Title
ANTENNA ORIENTATION PLAN

Drawing Number
C3

NOTE:
REMOVING EXISTING FIBER & DC CABLES AND UTILIZE SPARE PORTS IN AVAILABLE ENTRY PANELS.



1 / C4 EQUIPMENT LAYOUT
SCALE: NOT TO SCALE

FA # 10006543	SITE: Crescent
EXISTING CABLES AND DC SURGE EQUIPMENT:	EQUIPMENT SCOPING:
12 X 7/8" FEEDERS, 6 X 8-6 DC TRUNKS, 3 X FC12, 9 X DC2'S	ADD A 2ND FULLY LOADED RACK MOUNTED DC12 UNIT TO THE EXISTING LTE RACK
CABLES AND DC SURGE EQPT SOW:	REMOVE GSM CABINET ADD RACK WITH 8 X +24 180MHA STRINGS TOTAL WEIGHT OF 2728LBS
REMOVE ALL FC12'S, REMOVE ALL DC2'S, REMOVE ALL DC TRUNKS, AND ADD 8 NEW PWRT-606-S DC TRUNKS, ADD 4 NEW 18 PAIR FIBER TRUNKS, ADD 4 NEW DC6'S	

PROJECT: DELTA SECTOR ADD WITH 2 RETRO FITS FOR DUAL AIRSCALES

ANTENNA AND RRH SCOPING:		
ALPHA POS. #2	ALPHA POS. #4	
SWAP OUT BAND 14 AND B25 RRH FOR NEW B12/14 AND B25/66 RRH'S	REMOVE TMA, 07L AND B66 RRH'S	
BETA POS. #2	BETA POS. #4	
SWAP OUT BAND 14 AND B25 RRH FOR NEW B12/14 AND B25/66 RRH'S	REMOVE TMA, 07L AND B66 RRH'S	
GAMMA POS. #2	GAMMA POS. #3	GAMMA POS. #4
SWAP OUT ANTENNA AND SWAP OUT BAND 14 AND B25 RRH FOR NEW B12/14 AND B25/66 RRH'S AND NEW JAHH-45A-R3B	SWAP OUT AND ANTENNA FOR NEW JAHH-45A-R3B	REMOVE TMA, 07L AND B66 RRH'S
DELTA POS. #1	DELTA POS. #2	
ADD NEW JAHH-45A-R3B WITH B12/14 AND B25/66 RRHS	ADD NEW JAHH-45A-R3B WITH WCS RRH	

2 / C4 SCOPE OF WORK

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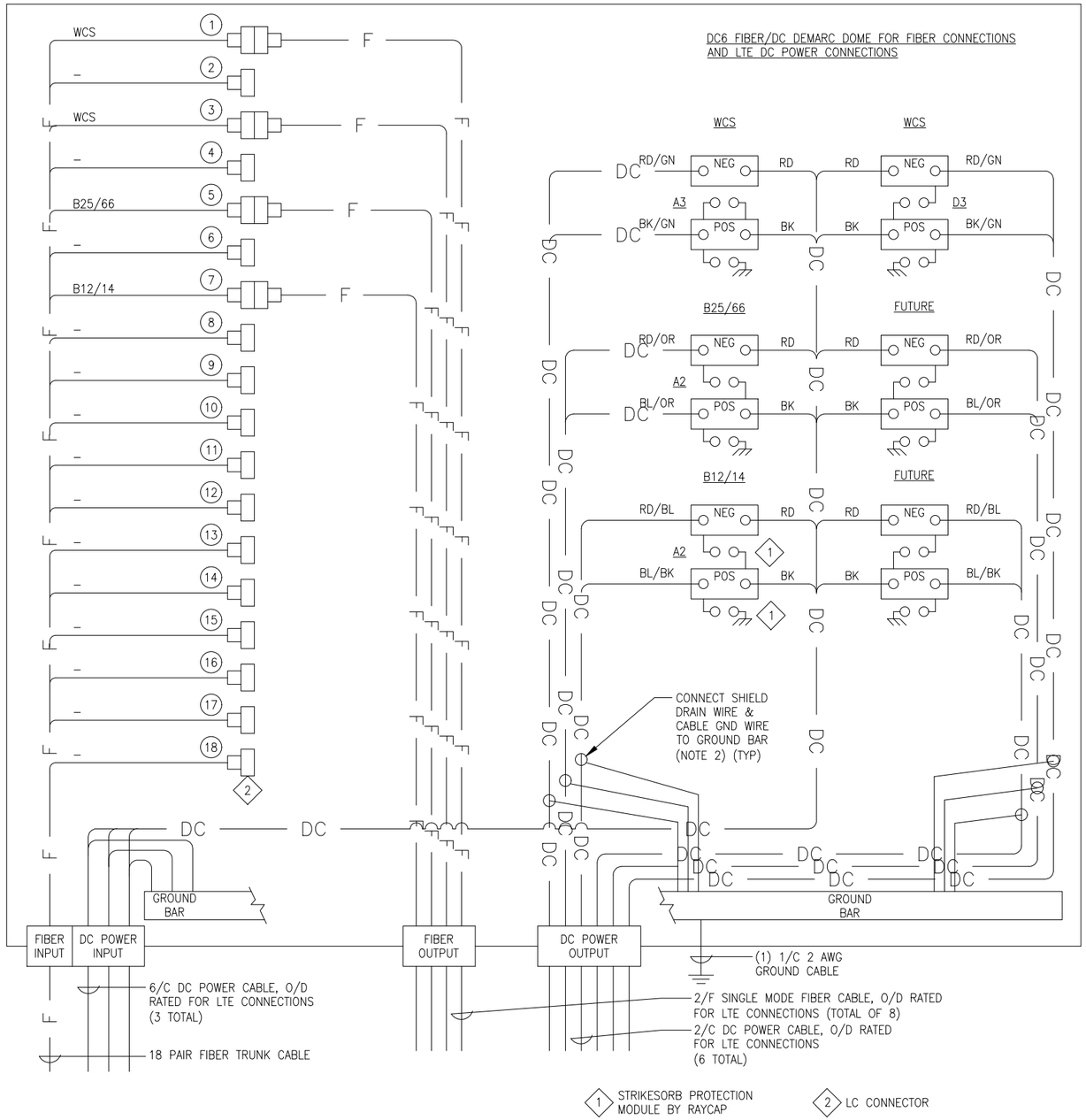
Drawing Title
EQUIPMENT LAYOUT AND SCOPE

Drawing Number
C4



NOTES:
1. SEE RF CHART FOR CONDUCTOR SIZES.
2. WHEN SHIELDED CABLE IS USED CONNECT CABLE SHIELD DRAIN WIRE AND GROUND WIRE TO GROUND BAR.

1 / C5 RAYCAP DC6 FIBER/DC DEMARC DOME DETAIL (ALPHA SECTOR)
SCALE: NTS

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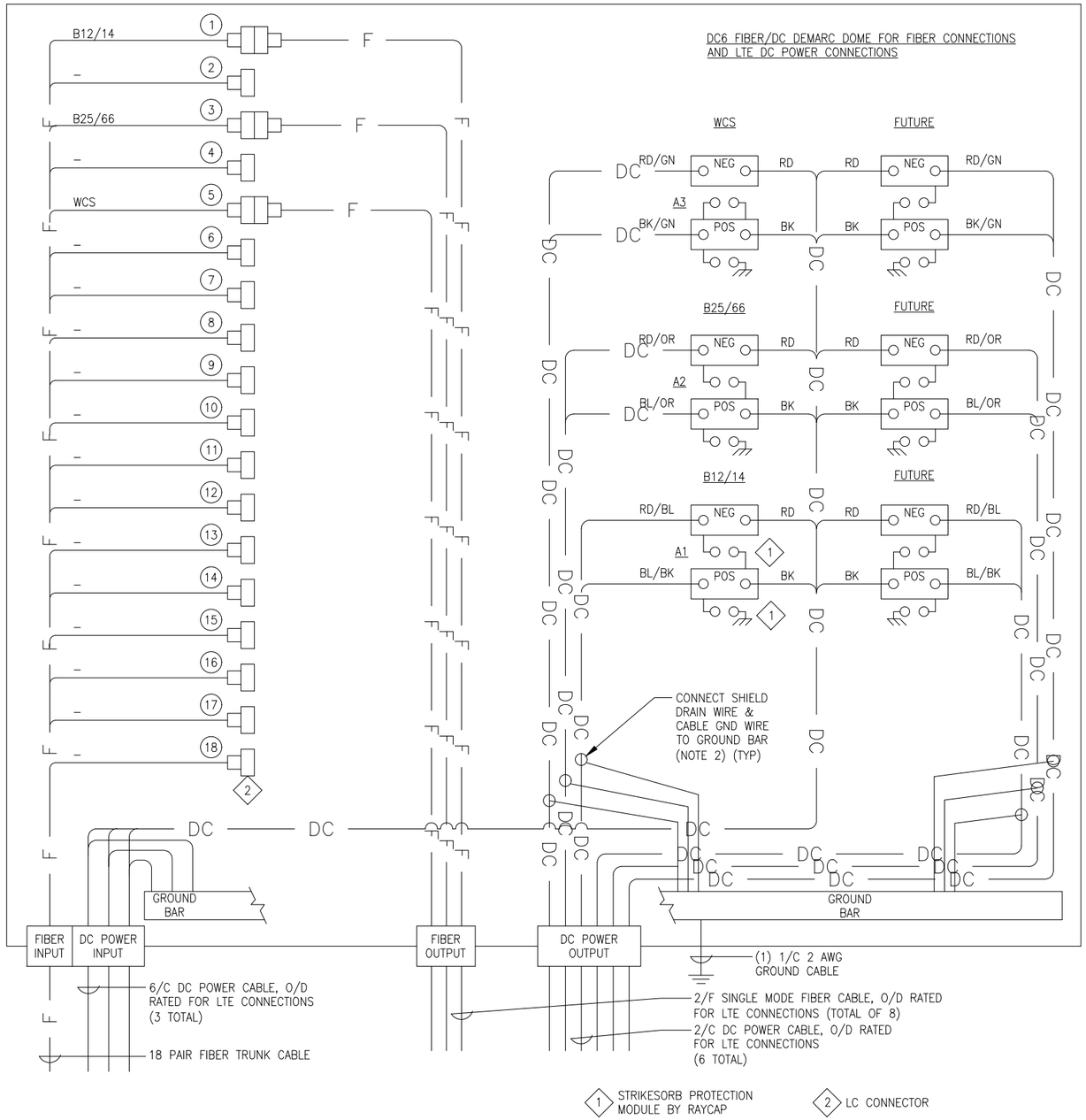
Drawing Title
DC6 WIRING DIAGRAM ALPHA

Drawing Number
C5



NOTES:
1. SEE RF CHART FOR CONDUCTOR SIZES.
2. WHEN SHIELDED CABLE IS USED CONNECT CABLE SHIELD DRAIN WIRE AND GROUND WIRE TO GROUND BAR.

1 / C6 RAYCAP DC6 FIBER/DC DEMARC DOME DETAIL (BETA SECTOR)
SCALE: NTS

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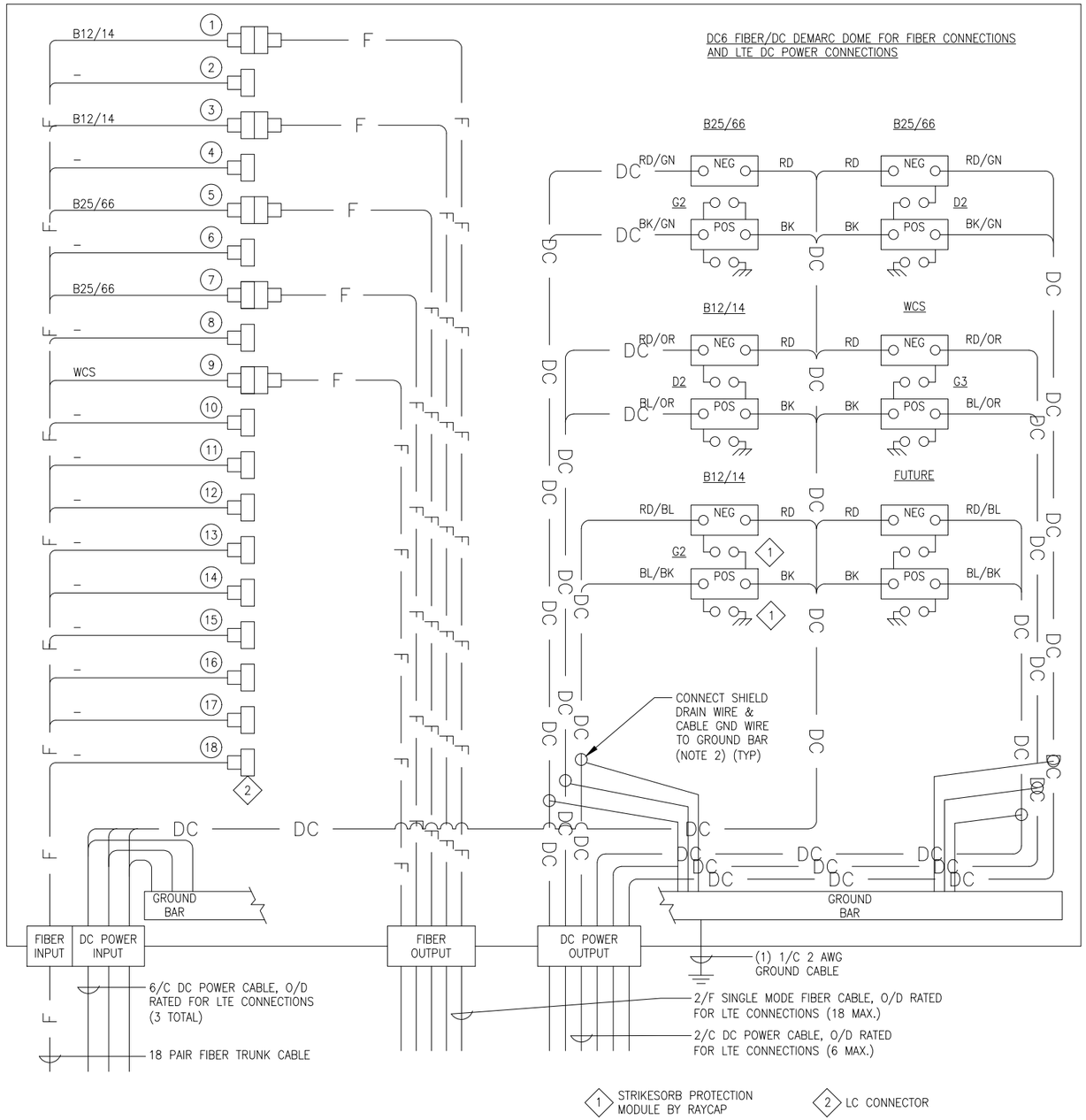
Drawing Title
DC6 WIRING DIAGRAM BETA

Drawing Number
C6



NOTES:
1. SEE RF CHART FOR CONDUCTOR SIZES.
2. WHEN SHIELDED CABLE IS USED CONNECT CABLE SHIELD DRAIN WIRE AND GROUND WIRE TO GROUND BAR.

1 / C7 RAYCAP DC6 FIBER/DC DEMARC DOME DETAIL (GAMMA SECTOR)
SCALE: NTS

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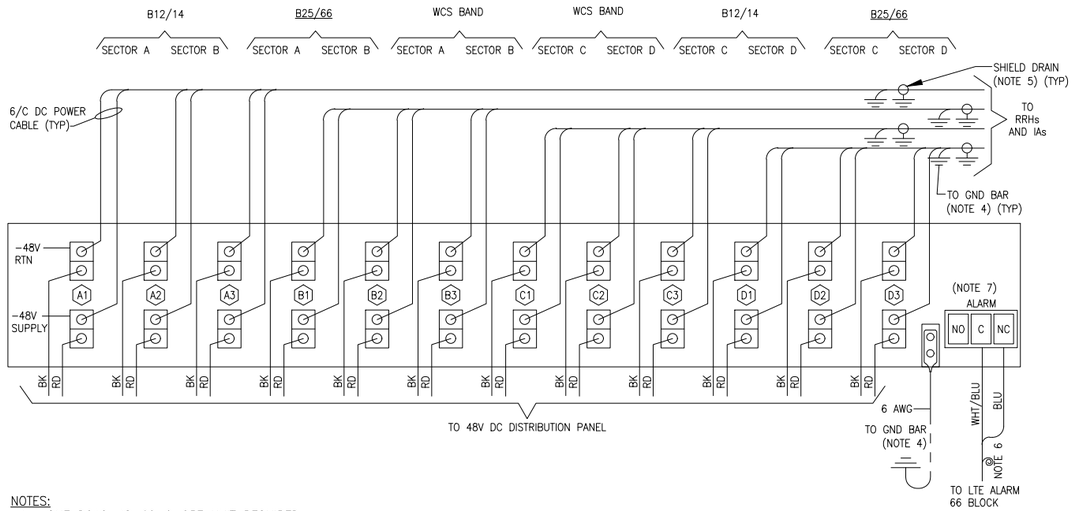
Drawing Title
DC6 WIRING DIAGRAM GAMMA

Drawing Number
C7



NOTES:

1. ONE DC12-48-60-0-25E UNIT REQUIRED.
2. SEE RF CHART FOR DC POWER CABLE CONDUCTOR SIZES.
3. CABLE TERMINALS FOR POWER CONNECTION SHALL BE COMPRESSION TYPE, 1-HOLE FOR 1/4"-20 STUDS.
4. CABLE TERMINAL FOR GROUND CONNECTION SHALL BE COMPRESSION TYPE, 2-HOLE 1"-CENTERS FOR 1/4"-20 STUDS.
5. CONNECTIONS TO RACK GROUND BAR SHALL BE MADE WITH 2-HOLE COMPRESSION TERMINALS.
6. WHEN SHIELDED CABLE IS USED, CONNECT CABLE SHIELD DRAIN WIRE TO RACK GROUND BAR. THIS CONNECTION SHALL BE INDEPENDENT OF THE CABLE GROUND WIRE CONNECTION.
7. TURN BACK AND STORE UNUSED CONDUCTORS.
8. INSTALL RAYCAP PROVIDED LOOP-BACK CONNECTOR ON THE LAST ACTIVE (POWERED) MODULE WHEN FEWER THAN 6 RRH's OR RRU's ARE DEPLOYED.

1 / C8

CONNECTION DIAGRAM OUTDOOR
SURGE SUPPRESSION SYSTEM
(RAYCAP DC12-48-60-0-25E)

SCALE: NTS

at&t

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Drawing Title

GROUNDING DETAILS

Drawing Number

C8

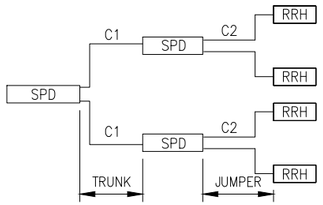


FIGURE 1 – TRUNK CABLE TO DC SURGE PROTECTION DEVICE (DC6/FC12/DC2)

MAXIMUM CABLE LENGTHS FOR FIGURE 1

NOKIA AIRSCALE DUAL RRH TRUNK/JUMPER LENGTH (FT)			
CABLE	4 AWG	6 AWG	8 AWG
C1	245	150	–
C2	–	–	12

NOKIA B5 RRH & ALU RRHs TRUNK/JUMPER LENGTH (FT)			
CABLE	4 AWG	6 AWG	8 AWG
C1	530	340	–
C2	–	–	12

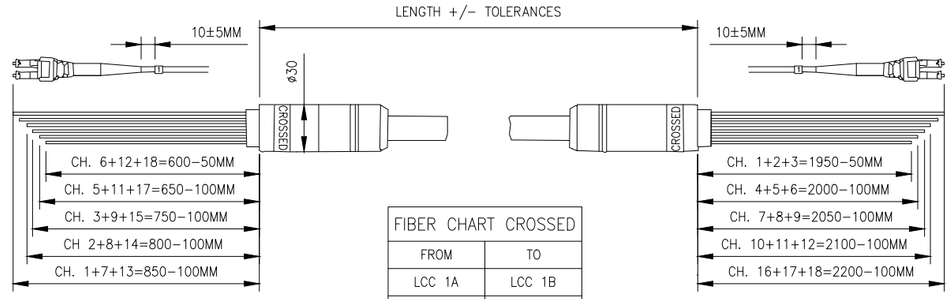
NOTES:

1. BASED ON POWER PLANT SUPPLY VOLTAGE OF –48VDC AND VOLTAGE AT RRHs OF –42VDC AND MAX. TEMPERATURE OF 60° CELSIUS.
2. CABLE LENGTHS BASED ON COMMSCOPE CABLES.

1 / C9 DC CABLE LENGTH CHART
NOT TO SCALE

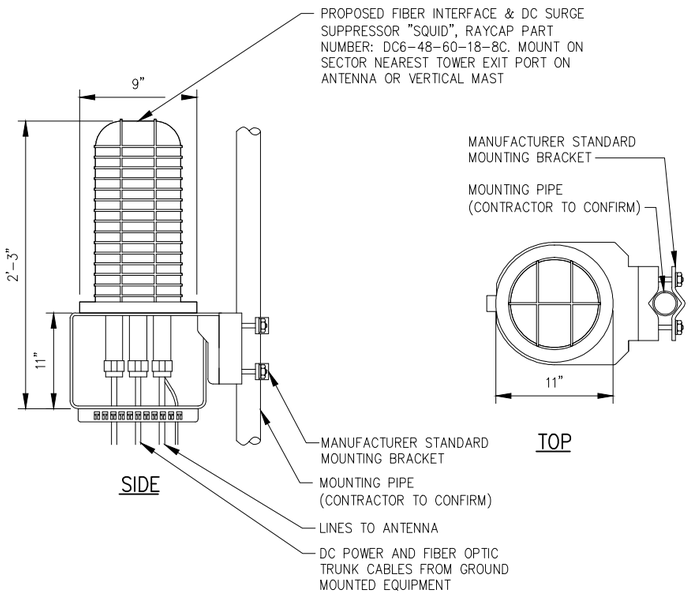
FIBER TRUNK CHANNEL	TECHNOLOGY	FREQUENCY BAND	SECTOR
1.1	LTE	700 B/C	ALPHA
1.2			BETA
1.3			GAMMA
1.4	LTE	B25 1900	ALPHA
1.5			BETA
1.6			GAMMA
1.7	LTE	700 FNET	ALPHA
1.8			BETA
1.9			GAMMA
2.1	LTE	AWS	ALPHA
2.2			BETA
2.3			GAMMA
2.4	LTE	WCS	ALPHA
2.5			BETA
2.6			GAMMA

2 / C9 FIBER TRUNK ASSIGNMENTS
NOT TO SCALE

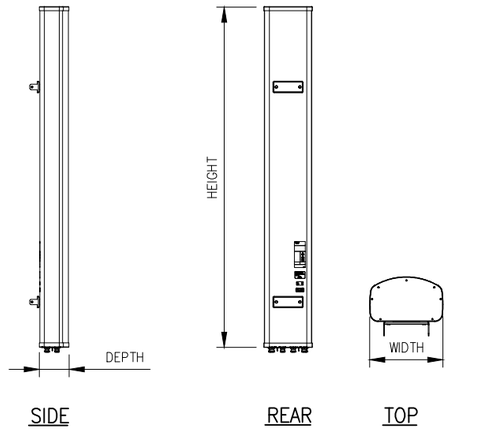


FIBER CHART CROSSED	
FROM	TO
LCC 1A	LCC 1B
LCC 1B	LCC 1A
LCC 2A	LCC 2B
LCC 2B	LCC 2A
LCC 3A	LCC 3B
LCC 3B	LCC 3A
...	...
...	...
LCC 18B	LCC 18A

3 / C9 FIBER CONNECTION DETAIL
NOT TO SCALE



4 / C9 DC6 DETAIL
NOT TO SCALE



COMMSCOPE MODEL NO.:	JAHH–45A–R3B
DIMENSIONS, HxWxD:	55.1"x18.0"x7.0"
WEIGHT:	73.9LBS

5 / C9 ANTENNA DETAIL
NOT TO SCALE

at&t

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STATE OF MARYLAND JOHN S. STEVENS 36339 PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 36339 EXP. 12/12/2020

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Drawn: HAM
Designed: MRL
Checked: AJD

Project Number: 499-002

Project Title:
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SITE ID: 55113
FA # 10006543
4600 EAST WEST HIGHWAY
BETHESDA, MD 20814

Prepared For:
smartlink
1362 MELLON RD
HANOVER, MD 21076
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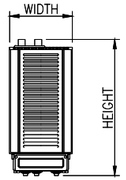
FAX (443) 221-2962

Drawing Title
FIBER/DC DETAILS

Drawing Number
C9

REMOTE RADIO HEAD (RRH)



SIZE AND WEIGHT TABLE

RRH MODEL	HEIGHT x WIDTH x DEPTH	WEIGHT
ALU RRH 2x40-07AT	24.8"x11.5"x5.7"	52.91 LBS
ALU B25 RRH 4x30-4R	21.2"x11.97"x7.18"	52.9 LBS
ALU RRH 4x25-WCS-4R	31.5"x12.0"x8.7"	31.5 LBS
ALU B66A RRH4x45-4R	25.8"x11.8"x7.2"	52.9 LBS
FLEXI RRH 4T4R B14 160W FRBI	23.0"x13.0"x6.6"	53.0 LBS
NOKIA 4T4R B12/14 320W AHLBA	26.7"x12.8"x7.4"	99.2 LBS
NOKIA 4T4R B25/66 320W AHFIB	26.7"x12.8"x6.3"	88.18 LBS
NOKIA 4T4R B5 160W AHCA	13.2"x11.6"x6.4"	36.81 LBS

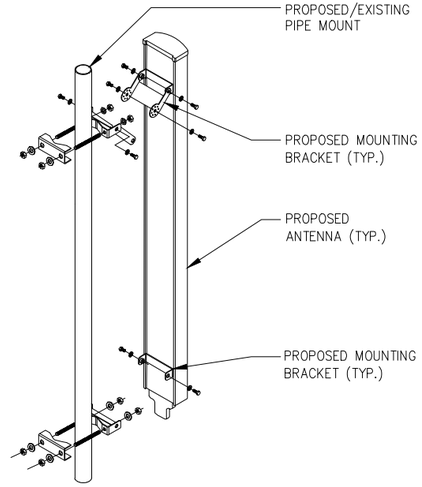
CLEARANCE TABLE

	CLEARANCE REQ'D
FRONT	36" FOR INSTALLATION ACCESS
REAR	2" (0" WITH SUPPLIED MOUNTING BRACKETS)
RIGHT	4" FOR AIR FLOW
LEFT	4" FOR AIR FLOW
TOP	12" FOR AIR FLOW
BOTTOM	12" FOR CONDUIT ROUTING

NOTES:

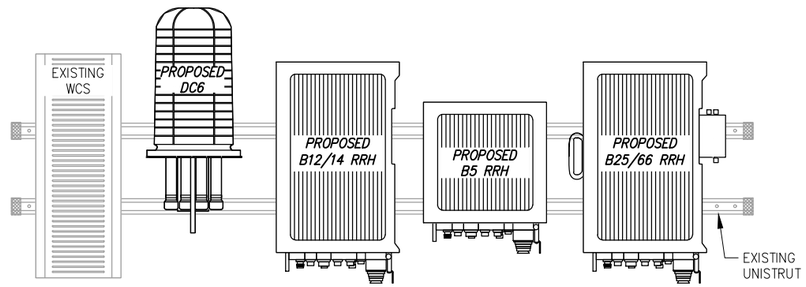
1. ALCATEL-LUCENT/NOKIA VIA AT&T SUPPLIES RRH AND RRH MOUNTING BRACKET. SUBCONTRACTOR SHALL SUPPLY UNISTRUT AND INSTALL RRHs AND ALL MOUNTING HARDWARE INCLUDING ALU/NOKIA RRH WALL MOUNTING BRACKET IF NECESSARY. ALU/NOKIA MAKES CABLE TERMINATIONS.
2. DIMENSIONS AND WEIGHTS ARE FOR RRH WITHOUT MOUNTING BRACKET

1 / C10 RRH DETAIL
SCALE: NTS



NOTE: CONTRACTOR IS TO USE MANUFACTURERS MANUAL BRACKETS AND HARDWARE. NO U-BOLTS OR BEAM CLAMPS ALLOWED

2 / C10 MOUNTING DETAIL
SCALE: NTS



NOTES:

1. FC12 LOCATED AT ALPHA SECTOR ONLY.
2. ALCATEL-LUCENT (ALU)/NOKIA VIA AT&T SUPPLIES THE RRH. SUBCONTRACTOR SHALL SUPPLY ALL OTHER MATERIALS AND INSTALL ALL MOUNTING HARDWARE. ALU/NOKIA INSTALLS RRH AND MAKES CABLE TERMINATIONS OR AS SCOPED BY MARKET.
3. CHANNEL AND MOUNTING HARDWARE SHALL HAVE HOT-DIPPED GALVANIZED FINISH.
4. MOUNT RRH TO UNISTRUT WITH 3/8"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER BRACKET. SUBCONTRACTOR SHALL SUPPLY.
5. MOUNT FIBER AND POWER DISTRIBUTION BOX WITH FOUR (4) 1/4"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS.
6. NO PAINTING OF THE RRH OR SOLAR SHIELD IS ALLOWED.

3 / C10 RRH MOUNTING DETAIL
SCALE: NTS

at&t

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STATE OF MARYLAND
JOHN S. STEVENS
36339
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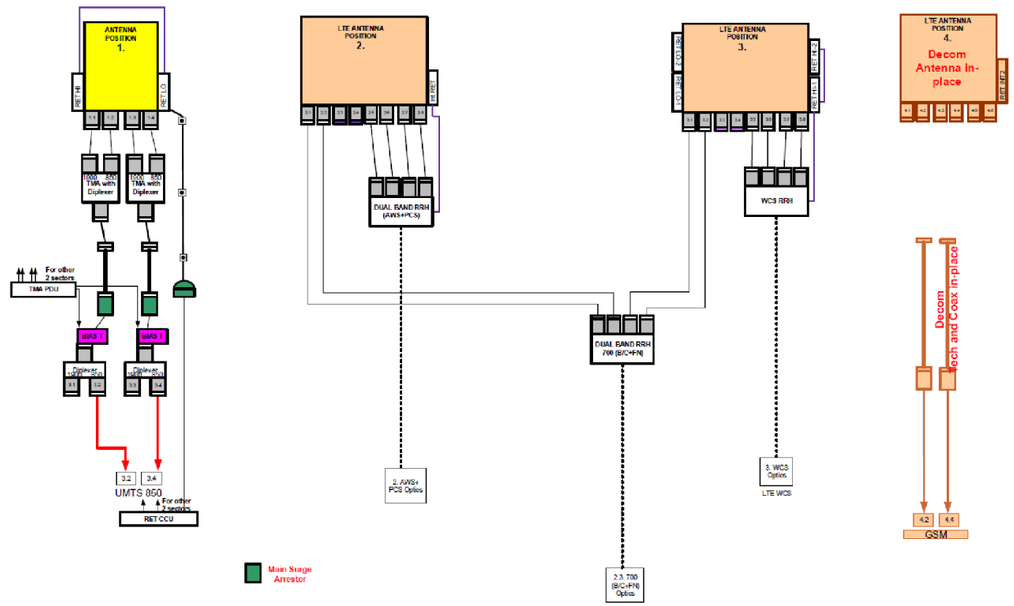
Drawing Title

EQUIPMENT DETAILS

Drawing Number

C10

FN7_P1QU_P2OFN7LPA1A3_P3OFN7LW_P4H_AF2_DF2_TMA1_ERET3_NoDC_A



ALPHA SECTOR

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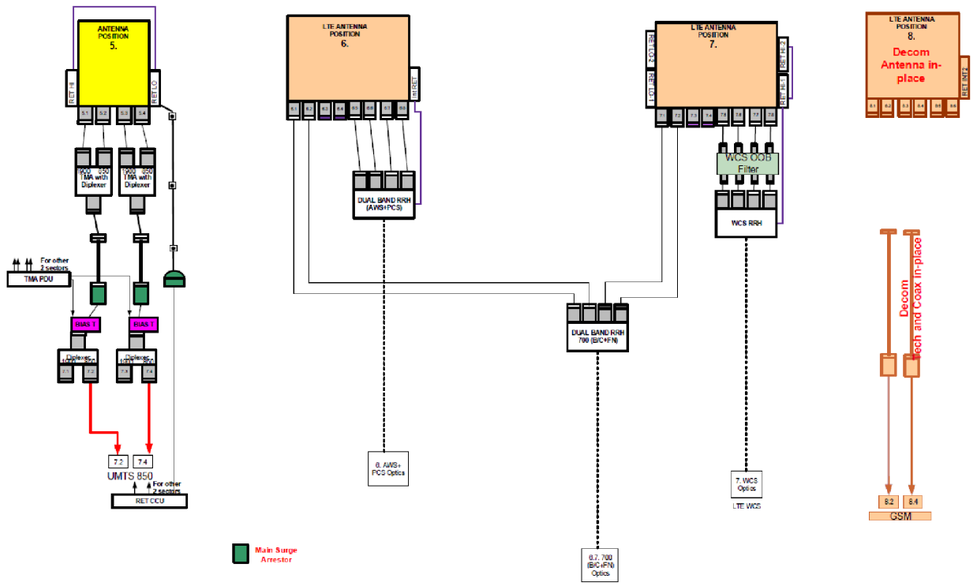

BETA SECTOR

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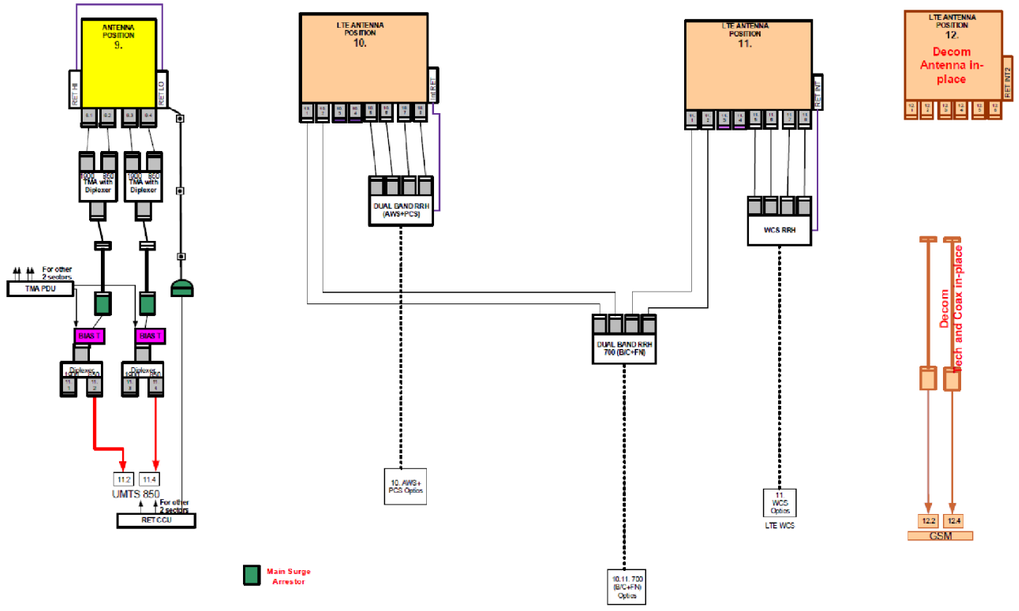

GAMMA SECTOR

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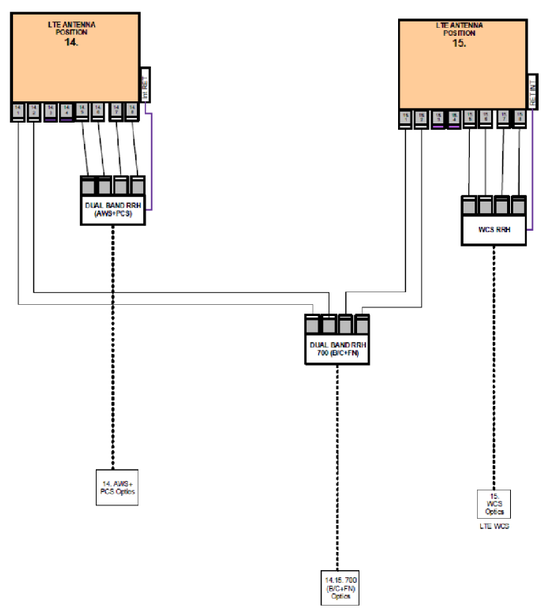

DELTA SECTOR

1 / C11 PLUMBING DIAGRAM (FINAL CONFIGURATION)
NOT TO SCALE

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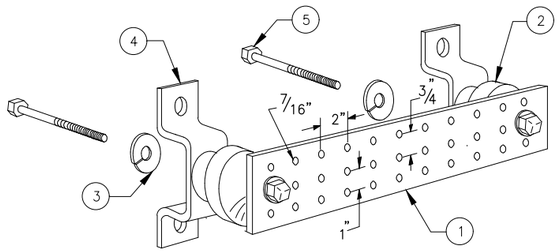
Drawing Title

RF PLUMBING DIAGRAM

Drawing Number

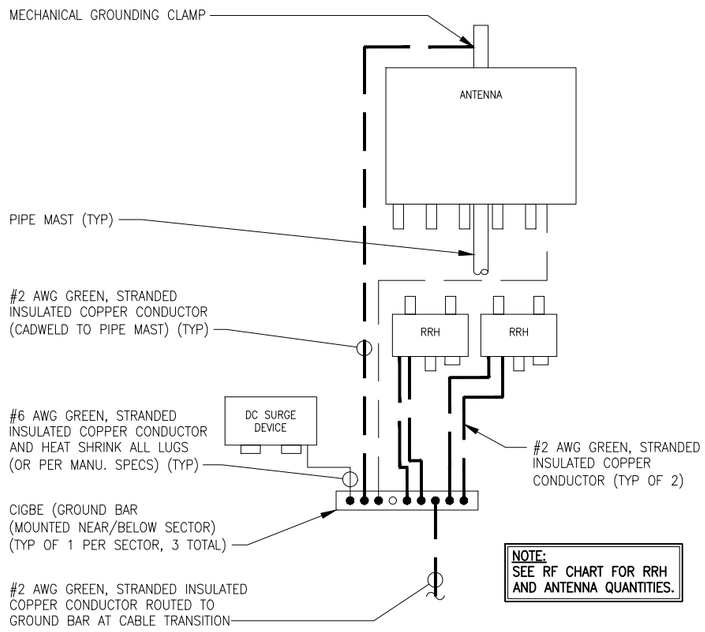
C11



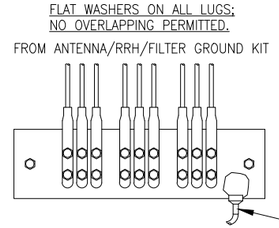
LEGEND

1 – SOLID TINNED COPPER GROUND BAR, 1/4"x 4"x 20" MIN., NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
2 – INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061–4
3 – 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015–8
4 – WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A–6056
5 – 5/8–11 X 1" H.H.C.S. BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012–1
6 – GROUND BAR SHALL BE SIZED TO ACCOMODATE ALL GROUNDING CONNECTIONS REQUIRED PLUS PROVIDE 50% SPARE CAPACITY
7 – GROUND BARS SHALL NEITHER BE FIELD FABRICATED NOR NEW HOLES DRILLED
8 – GROUND LUGS SHALL MATCH THE HOLE SPACING ON THE BAR
9 – HARDWARE DIAMETER SHALL BE MINIMUM 3/8"

1 / C12 GROUND BAR
SCALE: NTS



2 / C12 CONNECTION OF SECTOR EQUIPMENT TO GROUNDING BAR DETAIL
SCALE: NTS



3 / C12 INSTALLATION OF GROUND WIRE TO GROUND BAR DETAIL
SCALE: NTS

at&t

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Drawing Title
GROUNDING DETAILS

Drawing Number
C12

GENERAL NOTES:

1. THESE DOCUMENTS WERE DESIGNED IN ACCORDANCE WITH THE LATEST VERSION OF APPLICABLE LOCAL/STATE/COUNTY/CITY BUILDING CODES, AS WELL AS ANSI/TIA-222 STANDARD, AWWA-D100 STANDARD, NDS, NEC, MSJC, AND/OR THE LATEST VERSION OF THE INTERNATIONAL BUILDING CODE, UNLESS NOTED OTHERWISE IN THE CORRESPONDING STRUCTURAL REPORT.
2. ALL CONSTRUCTION METHODS SHOULD FOLLOW STANDARDS OF GOOD CONSTRUCTION PRACTICE.
3. ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN SIMILAR CONSTRUCTION.
4. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. IF OBSTRUCTIONS ARE FOUND, CONTRACTOR SHALL NOTIFY ENGINEER OF RECORD PRIOR TO CONTINUING WORK.
5. ANY CHANGES OR ADDITIONS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS, AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL CHANGES OR ADDITIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND/OR CONSTRUCTION.
6. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE DURING CONSTRUCTION. TIA-1019-A-2011 IS AN APPROPRIATE REFERENCE FOR THOSE DESIGNS MEETING TIA STANDARDS. THE ENGINEER OF RECORD MAY PROVIDE FORMAL RIGGING PLANS AT THE REQUEST AND EXPENSE OF THE CONTRACTOR.
7. INSTALLATION SHALL NOT INTERFERE NOR DENY ADEQUATE ACCESS TO OR FROM ANY EXISTING OR PROPOSED OPERATIONAL AND SAFETY EQUIPMENT.
8. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO ANY FABRICATION. CONTACT INFINIGY ENGINEERING IF ANY DISCREPANCIES EXIST.

STEEL CONSTRUCTION NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE AISC MANUAL OF STEEL CONSTRUCTION 14TH EDITION, FOR THE DESIGN AND FABRICATION OF STEEL COMPONENTS.
2. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES, AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS' RECOMMENDATIONS.
3. ALL FIELD DRILLED HOLES TO BE USED FOR FIELD BOLTING INSTALLATION SHALL BE STANDARD HOLES, AS DEFINED BY AISC, UNLESS NOTED OTHERWISE.
4. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
5. ALL STEEL MEMBERS AND CONNECTIONS SHALL MEET THE FOLLOWING GRADES:
   - ANGLES, CHANNELS, PLATES AND BARS TO BE A36. Fy=36 KSI, U.N.O.
   - W SHAPES TO BE A992. Fy=50 KSI, U.N.O.
   - RECTANGULAR HSS TO BE A500, GRADE B. FY=46 KSI, U.N.O.
   - ROUND HSS TO BE A500, GRADE B. FY=42 KSI, U.N.O.
   - STEEL PIPE TO BE A53, GRADE B. Fy=35 KSI, U.N.O.
   - BOLTS TO BE A325-X. Fu=120 KSI, U.N.O.
   - U-BOLTS AND LAG SCREWS TO BE A307 GR A. Fu=60 KSI, U.N.O.
6. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES, U.N.O.
7. ALL WELDING SHALL CONFORM TO AISC AND AWS D1.1 LATEST EDITION.
8. ALL HILTI ANCHORS TO BE CARBON STEEL, U.N.O.
   - MECHANICAL ANCHORS: KWIK BOLT-TZ, U.N.O.
   - CMU BLOCK ANCHORS: ADHESIVE – HY120, U.N.O.
   - CONCRETE ANCHORS: ADHESIVE – HY150, U.N.O.
   - CONCRETE REBAR: ADHESIVE – RE500, U.N.O.
9. ALL STUDS TO BE NELSON CAPACITOR DISCHARGE 1/4"-20 LOW CARBON STEEL COPPER-FLASH AT 55 KSI ULT/50 KSI YIELD, U.N.O.
10. BOLTS SHALL BE TIGHTENED TO A "SNUG TIGHT" CONDITION AS DEFINED BY AISC.
11. MINIMUM EDGE DISTANCES SHALL CONFORM TO AISC TABLE J3.4.

CONCRETE CONSTRUCTION NOTES:

1. CONCRETE TO BE 4000 PSI @ 28 DAYS. REINFORCING BAR TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. CONCRETE INSTALLATION TO CONFORM TO ACI-318 BUILDING REQUIREMENTS FOR REINFORCED CONCRETE. ALL CONCRETE TO BE PLACED AGAINST UNDISTURBED EARTH FREE OF WATER AND ALL FOREIGN OBJECTS AND MATERIALS. A MINIMUM OF THREE INCHES OF CONCRETE SHALL COVER ALL REINFORCEMENT. WELDING OF REBAR IS NOT PERMITTED.
2. EXISTING CONCRETE SURFACES THAT ARE TO BE IN CONTACT WITH NEW PROPOSED CONCRETE SHOULD BE WIRE BRUSHED CLEAN AND TREATED WITH APPROPRIATE MECHANICAL SCRATCH COAT AND REPAIR MATERIALS OR APPROPRIATE CHEMICAL METHODS SUCH AS THE APPLICATION OF A BONDING AGENT, EX. SAKRETE OR EQUIVALENT, TO ENSURE A QUALITY BOND BETWEEN EXISTING AND PROPOSED CONCRETE SURFACES.

FIBER REINFORCED POLYMER (FRP) NOTES:

1. FRP PLATES, SHAPES, BOLTS AND NUTS (STUD/NUT ASSEMBLIES) SHALL CONFORM TO ASTM D638, 695, 790. PLATES AND SHAPES TO BE FY = 5.35 KSI LW (SAFETY FACTOR OF 8), .945 KSI CW (SAFETY FACTOR OF 8) MIN.
2. IF FIELD FABRICATION IS REQUIRED, ALL CUT EDGES AND DRILLED HOLES TO BE SEALED USING VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
3. ALL FASTENERS TO BE 1/2" DIA FRP THREADED ROD WITH FIBER REINFORCED THERMOPLASTIC NUT, SPACED AT 12 INCHES ON CENTER MAXIMUM, U.N.O., FOR PANELS AND AS DESIGNED FOR STRUCTURAL MEMBERS.
4. THE COLOR AND SURFACE PATTERN OF EXPOSED FRP PANELS SHALL MATCH THE EXTERIOR OF THE EXISTING BUILDING, U.N.O.
5. STUD/NUT ASSEMBLIES SHOULD BE LUBRICATED FOR INSTALLATION
6. ENSURE BEARING SURFACES OF THE NUTS ARE PARALLEL TO THE SURFACES BEING FASTENED.
7. TORQUE BOLTS ACCORDING TO THE FOLLOWING TABLE:

INSTALLATION TORQUE TABLE		
SIZE	**ULTIMATE TORQUE STRENGTH**	**RECOMMENDED MAXIMUM INSTALLATION TORQUE**
3/8-16 UNC	8 FT-LBS	4 FT-LBS
1/2-13 UNC	18 FT-LBS	8 FT-LBS
5/8-11 UNC	35 FT-LBS	16 FT-LBS
3/4-10 UNC	50 FT-LBS	24 FT-LBS
1-8 UNC	110 FT-LBS	50 FT-LBS

8. WHEN TIGHTENING FRP STUD/NUT ASSEMBLIES, WRENCHES MUST MAKE FULL CONTACT WITH ALL NUT EDGES. A STANDARD SIX POINT SOCKET IS RECOMMENDED.
9. STUD/NUT ASSEMBLIES SHOULD BE BONDED BY APPLYING BONDING AGENT TO ENTIRE NUT AND EXPOSED STUD.
10. ALL FRP MATERIALS TO BE PROVIDED BY FIBERGRATE COMPOSITE STRUCTURES, DALLAS TX, OR APPROVED EQUAL.
11. ALL FRP SHAPES TO BE DYNAFORM PULTRUDED STRUCTURAL SHAPES.
12. ALL FRP PLATES TO BE FIBERPLATE MOLDED FRP PLATE.
13. ALL FRP PANELS TO BE FIBERPLATE CLADDING PANEL.
14. EACH FRP PANEL TO BE IDENTIFIED WITH LARR#25536 AND FIBERGRATE COMPOSITE STRUCTURAL LABEL.
15. FRP MATERIAL TO BE CLASSIFIED AS CC1 OR BETTER, AND HAVE MAXIMUM FLAME SPREAD OF 50.
16. ALL DESIGN AND CONSTRUCTION TO BE COMPLETED IN ACCORDANCE WITH LOS ANGELES RESEARCH REPORT RR25536, DATED FEBRUARY 1, 2016.
17. SPECIAL INSPECTIONS MUST BE PROVIDED FOR ALL FRP INSTALLMENTS. SEE SPECIAL INSPECTION SECTION, THIS SHEET.

RATIO OF EDGE DISTANCE TO FRP FASTENER DIAMETER		
	RANGE	**RECOMMENDED**
EDGE DISTANCE – CL* BOLT TO END	2.0-4.0	3.0
EDGE DISTANCE – CL* BOLT TO SIDE	1.5-3.5	2.5
BOLT PITCH – CL* TO CL*	4.0-5.0	5.0

WOOD CONSTRUCTION NOTES:

1. ALL EXISTING WOOD SHAPES ARE ASSUMED TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN.
2. ALL PROPOSED WOOD SHAPES ARE TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN. U.N.O.
3. ALL EXISTING AND PROPOSED GLUED LAMINATED TIMBERS ARE TO BE 24F-1.8C DOUGLAS FIR BALANCED WITH A REFERENCE DESIGN BENDING VALUE OF 2400 PSI MIN. U.N.O.

MASONRY CONSTRUCTION NOTES:

1. ALL BRICK TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
   - FOR INTERIOR/ABOVE GRADE APPLICATIONS TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 100 PSI SHALL BE USED. FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 133 PSI.
   - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.
2. ALL CMU TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
   - FOR INTERIOR/ABOVE GRADE APPLICATIONS, TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 64 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 158 PSI FOR FULLY GROUTED BLOCKS.
   - FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 84 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 163 PSI FOR FULLY GROUTED BLOCKS.
   - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.

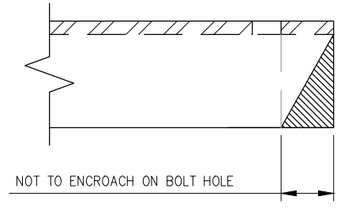
TOWER PLUMB & TENSION NOTES:

1. PLUMB AND TENSION TOWER UPON COMPLETION OF STRUCTURAL MODIFICATIONS DETAILED IN THESE DRAWINGS.
2. RETENSIONING OF EXISTING GUY WIRES SHALL BE PERFORMED AT A TIME WHEN THE WIND VELOCITY IS LESS THAN 10 MPH AT GROUND LEVEL AND WITH NO ICE ON THE STRUCTURE AND GUY WIRES.
3. PLUMB THE TOWER WHILE RETENSIONING THE EXISTING GUY WIRES. THE HORIZONTAL DISTANCE BETWEEN THE VERTICAL CENTERLINES AT ANY TWO ELEVATIONS SHALL NOT EXCEED 0.25% OF THE VERTICAL DISTANCE BETWEEN TWO ELEVATIONS FOR LATTICED STRUCTURES.
4. THE TWIST BETWEEN ANY TWO ELEVATIONS THROUGHOUT THE HEIGHT OF A LATTICE STRUCTURE SHALL NOT EXCEED 0.5 DEGREES IN 10 FEET. THE MAXIMUM TWIST OVER THE LATTICE STRUCTURE HEIGHT SHALL NOT EXCEED 5 DEGREES.

SPECIAL INSPECTIONS NOTES:

1. A QUALIFIED INDEPENDENT TESTING LABORATORY, EMPLOYED BY THE OWNER AND APPROVED BY THE JURISDICTION, SHALL PERFORM INSPECTION AND TESTING IN ACCORDANCE WITH THE THE GOVERNING BUILDING CODE, APPLICABLE SECTION(S) AS REQUIRED BY PROJECT SPECIFICATIONS FOR THE FOLLOWING CONSTRUCTION WORK:
   a. STRUCTURAL WELDING (CONTINUOUS INSPECTION OF FIELD WELDS ONLY).
   b. HIGH STRENGTH BOLTS (PERIODIC INSPECTION OF A325 AND/OR A490 BOLTS) TO BE TIGHTENED PER "TURN-OF-THE-NUT" METHOD.
   c. MECHANICAL AND EPOXIED ANCHORAGES.
   d. FIBER REINFORCED POLYMER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE FRP MATERIAL SPECIFIED ON THE APPROVED DESIGN DOCUMENTS IS BEING INSTALLED.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT ALL CUT EDGES AND DRILLED HOLES ARE PROPERLY SEALED USING A VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE STRUCTURE IS BUILT IN ACCORDANCE WITH THE APPROVED DESIGN DOCUMENTS.
2. THE INSPECTION AGENCY SHALL SUBMIT INSPECTION AND TEST REPORTS TO THE BUILDING DEPARTMENT, THE ENGINEER OF RECORD, AND THE OWNER UNLESS THE FABRICATOR IS APPROVED BY THE BUILDING OFFICIAL TO PERFORM WORK WITHOUT THE SPECIAL INSPECTIONS.

MAXIMUM ALLOWABLE ANGLE CLIP



at&t
INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

STATE OF MARYLAND
JOHN S. STEVENS
36339
PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 36339 EXP. 12/12/2020

No.	Submittal / Revision	App'd	Date
2	JURISDICTION COMMENTS	RMS	01/14/19
1	JURISDICTION COMMENTS	RMS	01/04/19
0	ISSUED FOR CONSTRUCTION	RMS	11/28/18
B	CLIENT COMMENTS	RMS	11/12/18
A	ISSUED FOR CLIENT REVIEW	HAM	11/08/18

Drawn: HAM
Designed: MRL
Checked: AJD

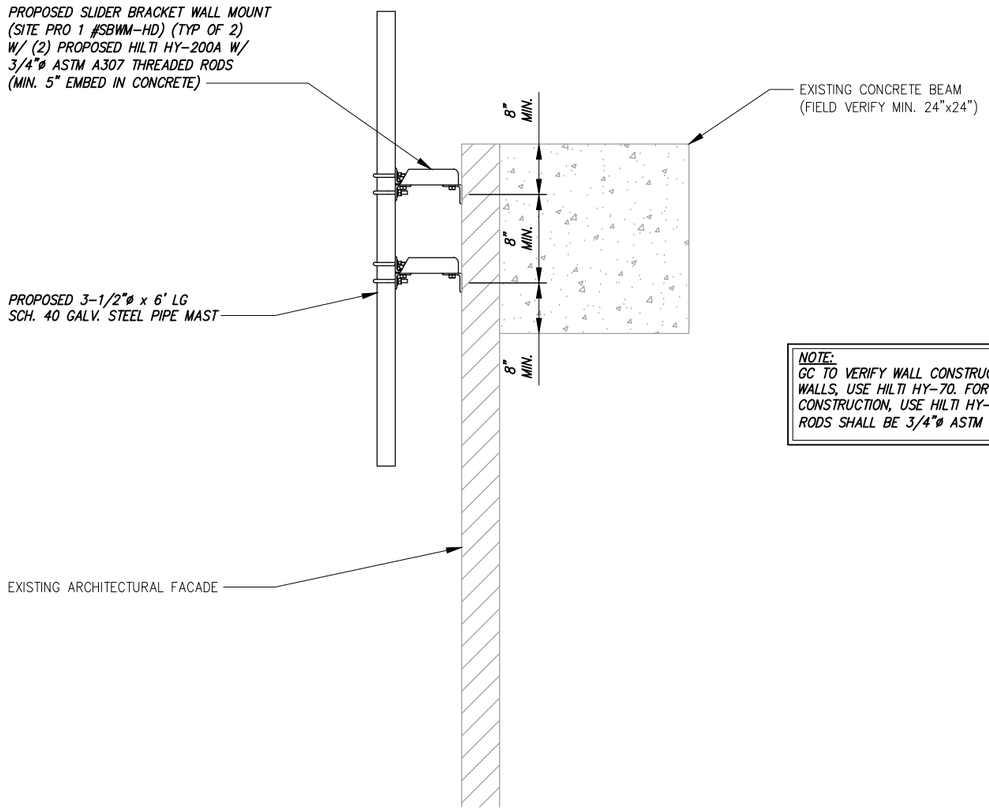
Project Number: 499-002

Project Title:
CRESCENT
SITE ID: 55113
FA # 10006543
4600 EAST WEST HIGHWAY
BETHESDA, MD 20814

Prepared For:
smartlink
1362 MELLON RD
HANOVER, MD 21076
TEL (410) 582-8043
FAX (443) 221-2962

Drawing Title
STRUCTURAL NOTES

Drawing Number
S1



NOTE:
GC TO VERIFY WALL CONSTRUCTION. FOR HOLLOW WALLS, USE HILTI HY-70. FOR SOLID WALL CONSTRUCTION, USE HILTI HY-200A. THREADED RODS SHALL BE 3/4"ø ASTM A307.

1 / S2 MOUNT DETAIL
SCALE: NOT TO SCALE

at&t

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Albany, NY 12205
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smartlink
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Drawing Title
MOUNT DETAIL

Drawing Number
S2

App No: 2018110611

Revised 1.4.19 - JR

Applicant Name	Smartlink			Antenna Compliance	Yes
Application Type	Minor Modificatio	Updated	11/29/2018	Compliance Desc	
Carrier	AT&T Wireless	6409?	No	Antenna Location	Yes
Solution Type	Macro	Ann. Plan?	No	Antenna Loc. Desc.	
Existing	Existing	Equipment Gvt Us	No	Env. Assessment	
		Gvt. Use Desc.	N/A	Cat. Excluded?	
				Routine Env. Evaluation	checked

Application Description

Remove (12) RRH's & (2) antenna's, Adding (9) RRH's & (4) antenna's

Site Id	84	Zoning	CR-5.0
Structure Type	Building	Latitude	38.984525
Address	4600 East-West Hwy, Bethesda	Longitude	-77.0929
County Site Name	Crescent Bldg.	Ground Elevation	351
Carrier Site Name	Crescent	City	Bethesda
Site Owner	Bethesda Crescent 4600 CO Limited Prtnrship	Lease Status	Leased
Structure Owner	Bethesda Crescent 4600 CO Limited Prtnrship	PROW	No
Structure Height	138		

Justification

Existing cell site, minor modification

NearbySites (New Apps Only):

Screeningconsiderations(New Apps Only):

Friday, November 30, 2018

9:34:51 AM

App No: 2018110611

Antenna Model JAHH-45A-R3B

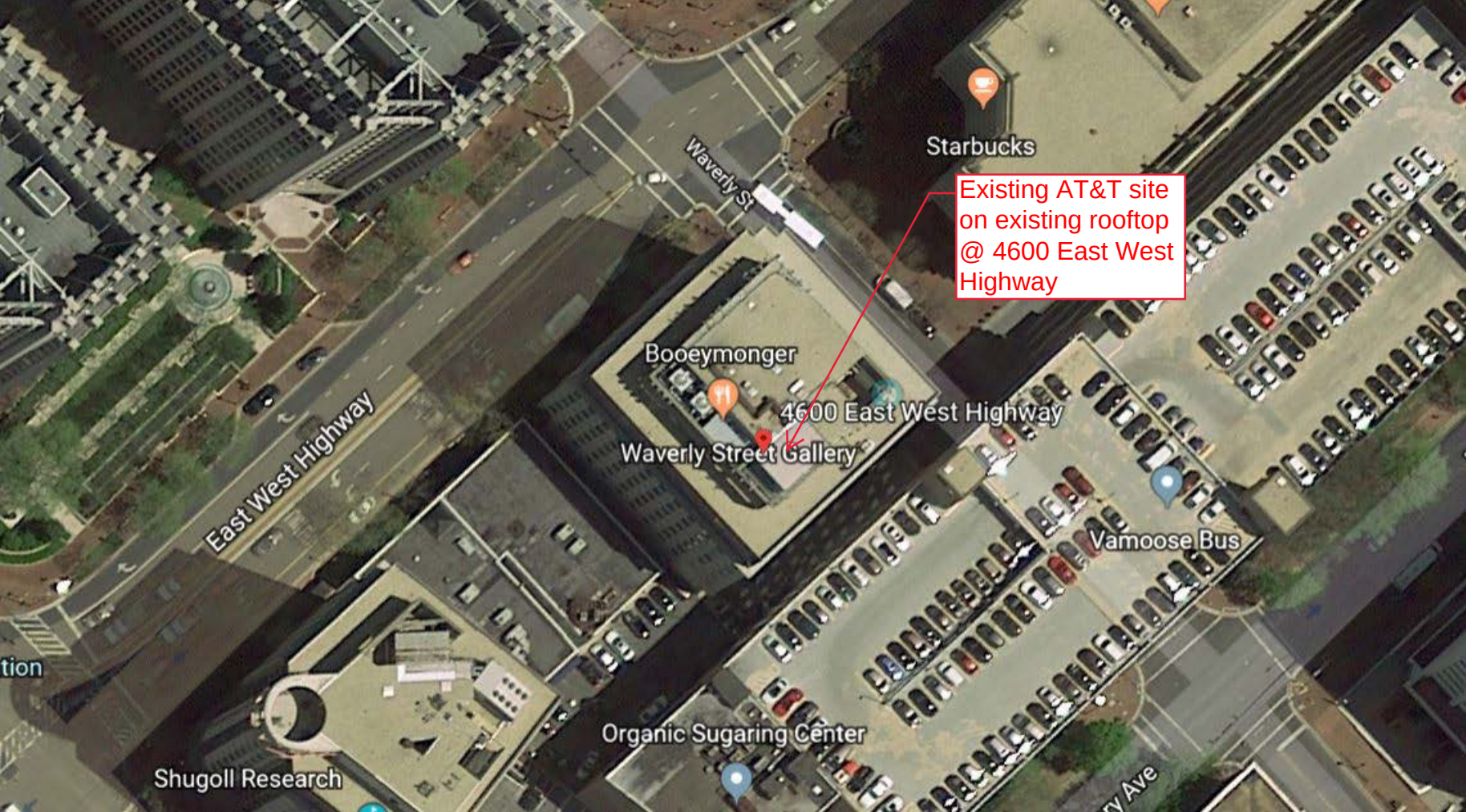
Frequency

RAD Center 138 Max ERP 500 Antenna Dimensions 55.1 in x 18.0 in x 7 in Quantity 4

PCS 1900 (TX 1870, 1950) (RX 1885, 1965) AWS 2100 (TX 1710, 2110) (RX 1770, 2170)WCS (TX 2305, 2350) (RX 2315, 2360) 700 (TX 704, 734) (RX 716, 746) FirstNet (TX 798, 768) (RX 788, 758)

Friday, November 30, 2018

9:34:51 AM


Existing AT&T site on existing rooftop @ 4600 East West Highway
Starbucks
Waverly St
Booeymonger
4600 East West Highway
Waverly Street Gallery
East West Highway
Vamoose Bus
Organic Sugaring Center
Shugoll Research

JAHH-45A-R3B

8-port sector antenna, 2x 698–798, 2x 824-894 and 4x 1695–2360 MHz, 45° HPBW, low bands each have a RET and the high bands share a RET. Two internal SBTs.

- Internal SBT on low and high band allow remote RET control from the radio over the RF jumper cable
- One RET for 700MHz, one RET for 850MHz, and one RET for both high bands to ensure same tilt level for 4x Rx or 4x MIMO
- Internal filter on low band and interleaved dipole technology providing for attractive, low wind load mechanical package
- Separate RS-485 RET input/output for low and high band
- Narrow beamwidth capacity antenna for higher level of densification and enhanced data throughput

Electrical Specifications

Frequency Band, MHz	**698–798**	**824–894**	**1695–1880**	**1850–1990**	**1920–2200**	**2300–2360**
Gain, dBi	14.8	15.6	18.1	18.7	19.1	19.6
Beamwidth, Horizontal, degrees	49	42	44	43	42	39
Beamwidth, Vertical, degrees	18.6	16.6	7.7	7.2	6.7	6.0
Beam Tilt, degrees	2–18	2–18	1–9	1–9	1–9	1–9
USLS (First Lobe), dB	17	19	18	19	19	20
Front-to-Back Ratio at 180°, dB	33	32	36	37	36	37
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	25	25	25	25	25	25
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port, maximum, watts	200	200	300	300	300	250
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

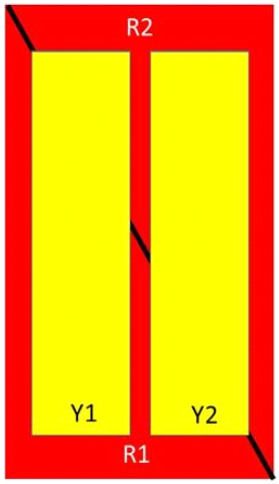
Electrical Specifications, BASTA*

Frequency Band, MHz	**698–798**	**824–894**	**1695–1880**	**1850–1990**	**1920–2200**	**2300–2360**
Gain by all Beam Tilts, average, dBi	14.5	15.4	17.7	18.4	18.8	19.4
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.4	±0.5	±0.4	±0.5	±0.3
Gain by Beam Tilt, average, dBi	2 ° | 14.6 10 ° | 14.5 18 ° | 14.3	2 ° | 15.6 10 ° | 15.4 18 ° | 15.1	1 ° | 17.7 5 ° | 17.8 9 ° | 17.5	1 ° | 18.5 5 ° | 18.5 9 ° | 18.2	1 ° | 18.8 5 ° | 18.9 9 ° | 18.6	1 ° | 19.5 5 ° | 19.5 9 ° | 19.2
Beamwidth, Horizontal Tolerance, degrees	±1.5	±2.7	±2.4	±1.5	±2.4	±1.3
Beamwidth, Vertical Tolerance, degrees	±1.2	±0.8	±0.3	±0.3	±0.4	±0.2
USLS, beampeak to 20° above beampeak, dB	17	22	14	14	15	15
Front-to-Back Total Power at 180° ± 30°, dB	24	23	29	31	32	32
CPR at Boresight, dB	22	24	17	21	20	19
CPR at Sector, dB	17	17	11	13	15	17

JAHH-45A-R3B

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

Array Layout



(Sizes of colored boxes are not true depictions of array sizes)

Array	Freq (MHz)	Conns	RET (SRET)	AISG RET UID
R1	698-798	1-2	1	ANxxxxxxxxxxxxxxxx1
R2	824-894	3-4	2	ANxxxxxxxxxxxxxxxx2
Y1	1695-2360	5-6	3	ANxxxxxxxxxxxxxxxx3
Y2	1695-2360	7-8		

Port Configuration

General Specifications

Operating Frequency Band	1695 – 2360 MHz | 698 – 798 MHz | 824 – 894 MHz
Antenna Type	Sector
Band	Multiband
Performance Note	Outdoor usage
Total Input Power, maximum	800 W @ 50 °C

Mechanical Specifications

RF Connector Quantity, total	8
RF Connector Quantity, low band	4
RF Connector Quantity, high band	4
RF Connector Interface	4.3-10 Female
Color	Light gray
Grounding Type	RF connector body grounded to reflector and mounting bracket
Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Location	Bottom
Wind Loading, frontal	795.0 N @ 150 km/h 178.7 lbf @ 150 km/h
Wind Loading, lateral	173.0 N @ 150 km/h 38.9 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Length	1399.0 mm | 55.1 in
Width	457.0 mm | 18.0 in
Depth	178.0 mm | 7.0 in
Net Weight, without mounting kit	33.5 kg | 73.9 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Internal Bias Tee	Port 1 | Port 5
Internal RET	High band (1) | Low band (2)
Power Consumption, idle state, maximum	1 W
Power Consumption, normal conditions, maximum	8 W
Protocol	3GPP/AISG 2.0 (Single RET)
RET Interface	8-pin DIN Female | 8-pin DIN Male

JAHH-45A-R3B

RET Interface, quantity	2 female | 2 male

Packed Dimensions

Length	1542.0 mm | 60.7 in
Width	608.0 mm | 23.9 in
Depth	346.0 mm | 13.6 in
Shipping Weight	46.5 kg | 102.5 lb

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

BSAMNT-3 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

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FROM ZERO TO INFINIGY
the solutions are endless

1033 WATERVLIET SHAKER RD, ALBANY, NY 12205

Mount Analysis Report

November 28, 2018

AT&T Site Name	Crescent
AT&T FA#	10006543
Pace Job#	MRWSH027627
PTN#	2251A0HYT4
Client	Smartlink
Carrier	AT&T
Infinigy Job Number	1106-A0001-B
Site Location	4600 East West Highway, Bethesda, MD 20814 38.9843720 N NAD83 77.0930390 W NAD83
Mount Centerline EL.	138.0 ft
Mount Classification	Pipe Mounts
Structural Usage Ratio	**13.0%**
Overall Result	**Pass**
Note	**Install pipe mounts per Infinigy Engineering's construction documents. Prior to installation of proposed cabinets, general contractor is to verify that the existing equipment room floor slab has minimum thickness of 4in.**

Upon reviewing the results of this analysis, it is our opinion that the mounts meet the specified TIA and ASCE code requirements. The mounts and connections for the proposed carrier are therefore deemed adequate to support the final loading configuration as listed in this report.

Ray Marshall
Structural Engineer II

Contents

Introduction

Infinigy Engineering has been requested to perform a mount analysis on the existing AT&T mounts. All supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The mount was analyzed using RISA-3D Version 17.0.1 analysis software.

Supporting Documentation

Mount Analysis Report	Maser Consulting P.A., dated October 3, 2017
Site Visit Photos	Infinigy Engineering PLLC, dated September 5, 2018
RF Design Sheet	AT&T RFDS#2510027, dated September 18, 2018
Construction Drawings	Infinigy Engineering, PLLC, dated November 14, 2018

Analysis Code Requirements

Wind Speed	89 mph (3-Second Gust, V_{ASD}) / 115 mph (3-Second Gust, V_{ULT})
Wind Speed w/ ice	40 mph (3-Second Gust) w/ 1/2" radial ice concurrent
TIA Revision	ANSI/TIA-222-G
Adopted IBC	2015 IBC
Structure Class	II
Exposure Category	B
Topographic Category	1
Calculated Crest Height	0 ft

Conclusion

Upon reviewing the results of this analysis, it is our opinion that the mounts meet the specified TIA code requirements. The mounts and connections are therefore deemed adequate to support the final loading configuration as listed in this report.

If you have any questions, require additional information, or actual conditions differ from those as detailed in this report please contact me via the information below:

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Structural Engineering II | INFINIGY
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(O) (847) 648-4068 | (M) (773) 656-3072
rmarshall@infinigy.com | www.infinigy.com

Final Configuration Loading

Mount CL (ft)	Rad. HT (ft)	Vert. O/S (ft)	Horiz. O/S (ft)*	Qty	Appurtenance	Carrier
138.0	138.0	0.0	--	3	Kathrein 742264	AT&T
		0.0	--	2	Kathrein 80010966	
		0.0	--	4	Commscope JAHH-45A-R3B	
		0.0	--	2	CCI OPA-65R-LCUU-H4	
		0.0	--	3	Commscope SBNHH-1D65A	
		0.0	--	4	Alcatel-Lucent RRH 4x25-WCS-4R	
		0.0	--	4	Nokia Airscale RRH 4T4R B12/14	
		0.0	--	4	Nokia Airscale RRH 4T4R B25/66	
		0.0	--	6	Powerwave LGP21401	
		0.0	--	1	KMW KFTDR00110030	
		0.0	--	3	Raycap DC6-48-60-18-8F	

(1) Horizontal Offset is defined as the distance from the left most edge of the mount face horizontal when viewed facing the rooftop.
(2) Radios are to be mounted behind existing screen wall at respective locations see appended documents for vertical locations.
(3) Raycaps are to be mounted behind existing screen wall at respective locations see appended documents for vertical locations.

Structure Usages

Mount Pipe	13.0%	Pass
RATING =	**13.0%**	**Pass**

Mount Connection Reactions

Reaction Data	Design Reactions	Analysis Reactions	Result
Shear (kip)	17.9	.14	.78%
Axial (kip)	32.1	.13	.40%
Unity Check	-	-	1.3%

***(2) 3/4" A307 Hilti threaded rods per connection.**

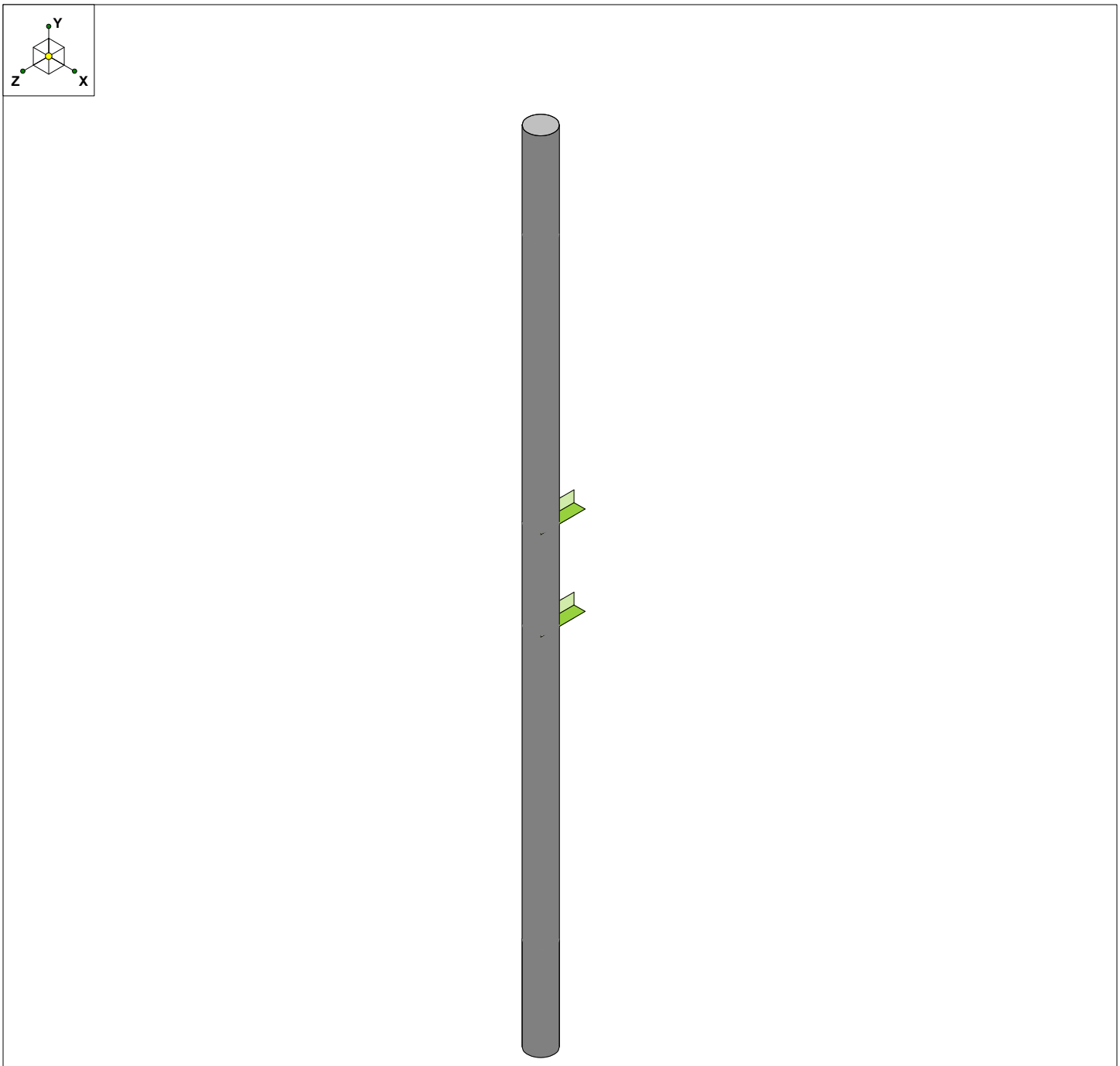
-Threaded rods reactions are acceptable when compared to manufacturer's listed capacities.

Assumptions and Limitations

Our structural calculations are completed assuming all information provided to Infinigy Engineering is accurate and applicable to this site. For the purposes of calculations, we assume an overall structure condition of "like new" and all members and connections to be free of corrosion and/or structural defects. The structure owner and/or contractor shall verify the structure's condition prior to installation of any proposed equipment. If actual conditions differ from those described in this report Infinigy Engineering should be notified immediately to complete a revised evaluation.

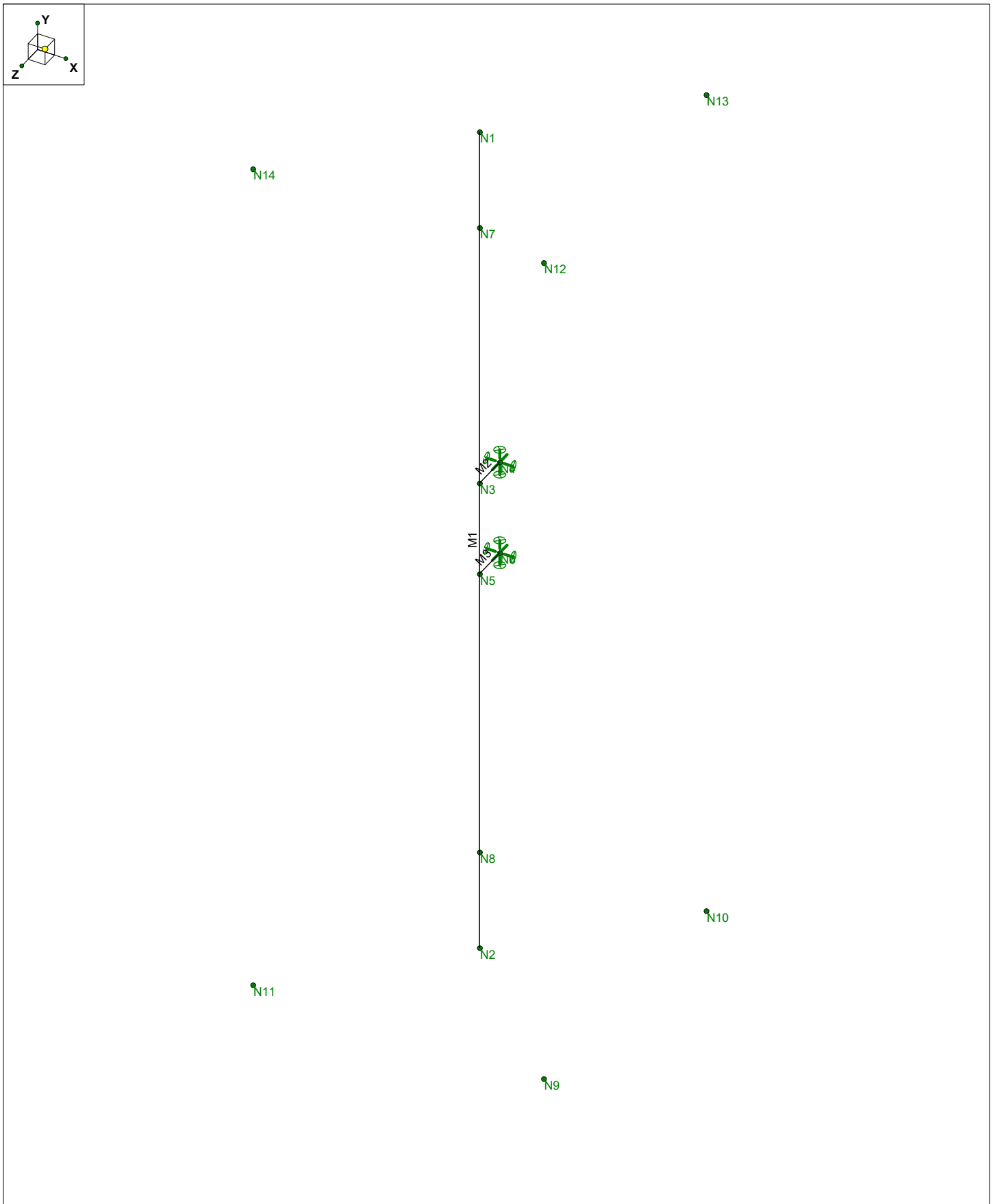
Our evaluation is completed using standard TIA, AISC, ACI, and ASCE methods and procedures. Our structural results are proprietary and should not be used by others as their own. Infinigy Engineering is not responsible for decisions made by others that are or are not based on our supplied assumptions and conclusions.

This report is an evaluation of the proposed carriers mount structure only and does not reflect adequacy of the existing tower, other mounts, or coax mounting attachments. These elements are assumed to be adequate for the purposes of this analysis and are assumed to have been installed per their manufacturer requirements.



Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Proposed Configuration
RAM		Nov 28, 2018 at 1:05 PM
1106-A0001-B		Crescent.R3D



Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Wireframe
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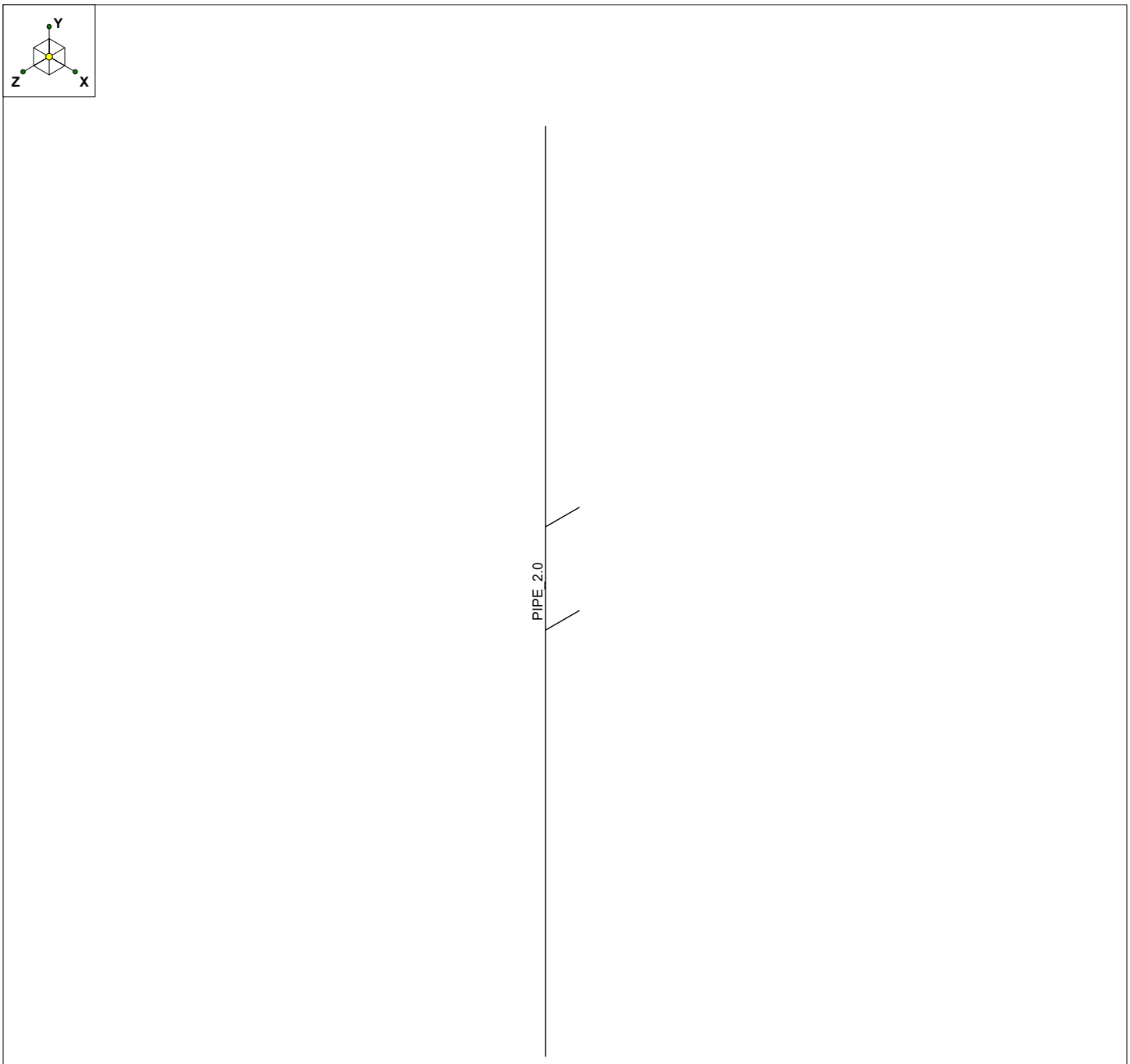

Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Members
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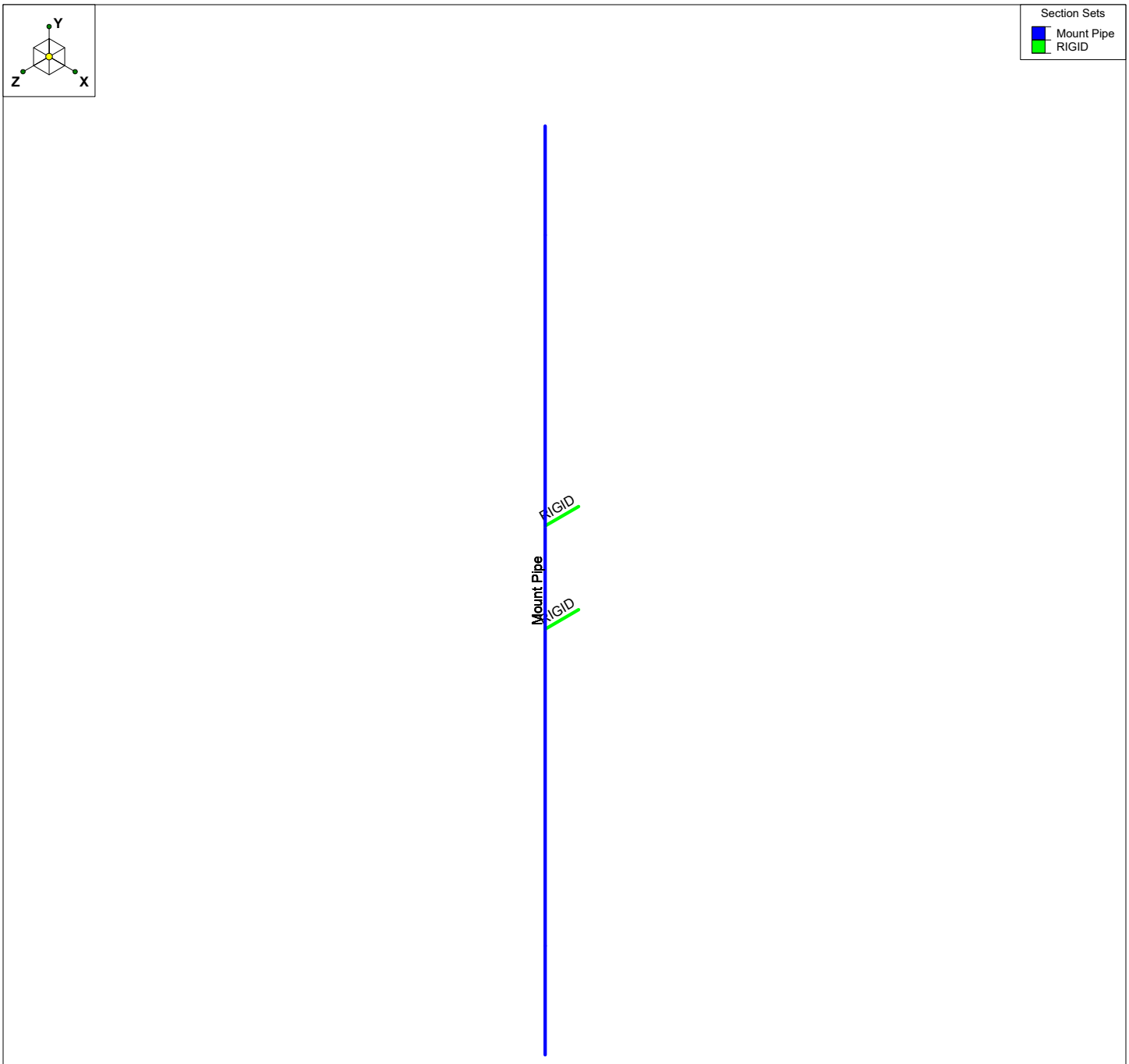

Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Section Set
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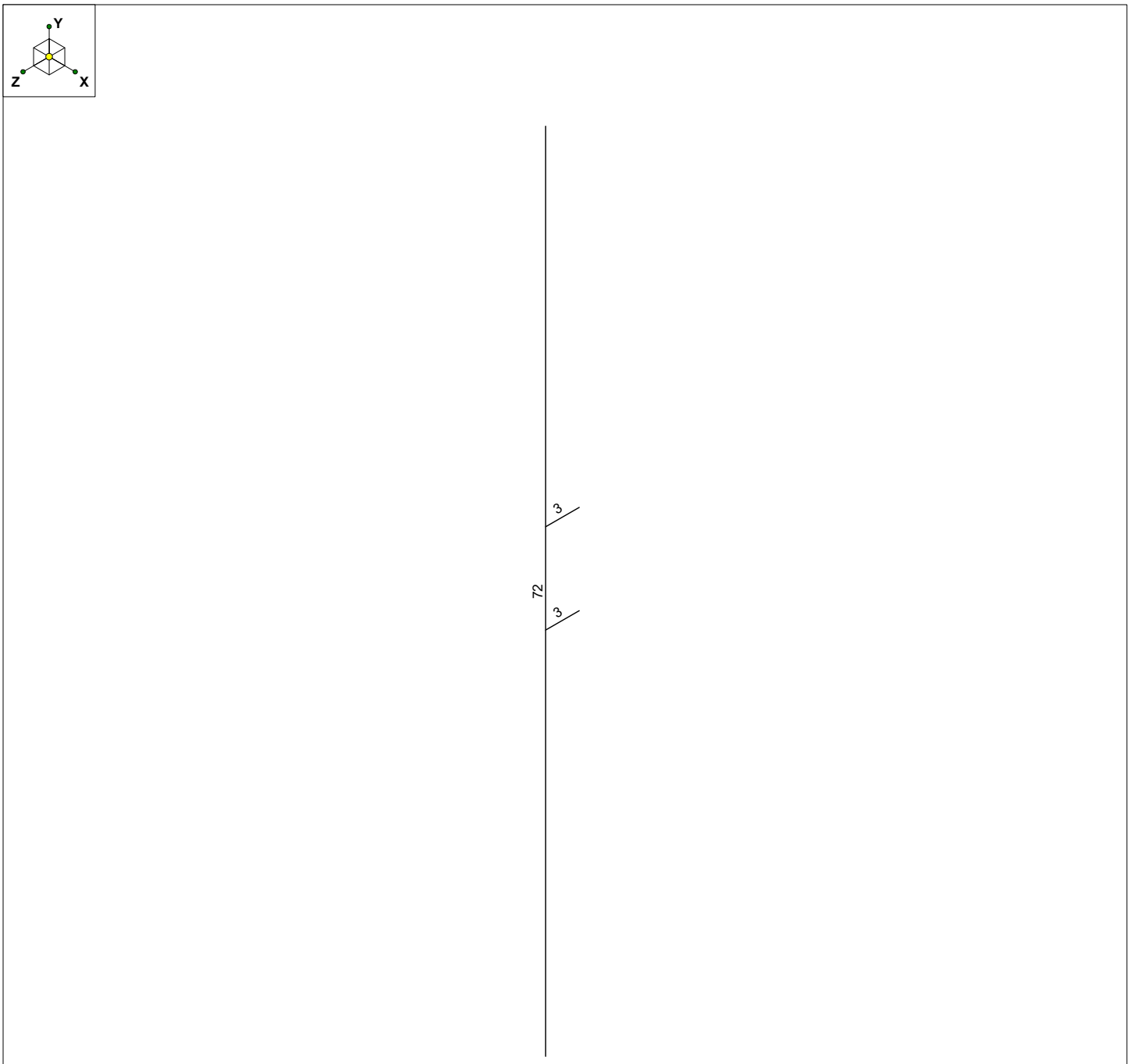

Member Length (in) Displayed
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Member Lengths
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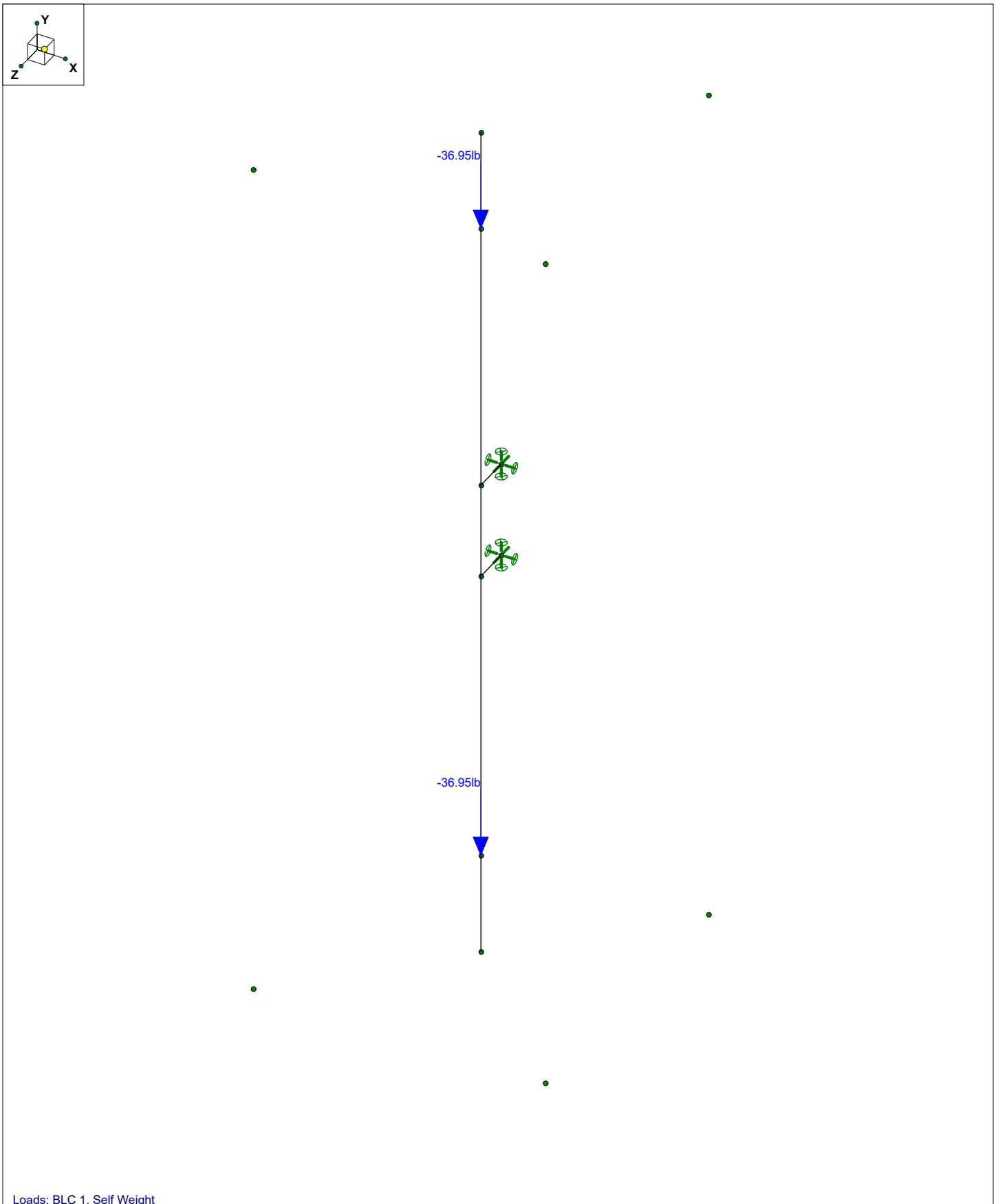
1106-A0001-B		Crescent.R3D



Loads: BLC 1, Self Weight
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Dead Load
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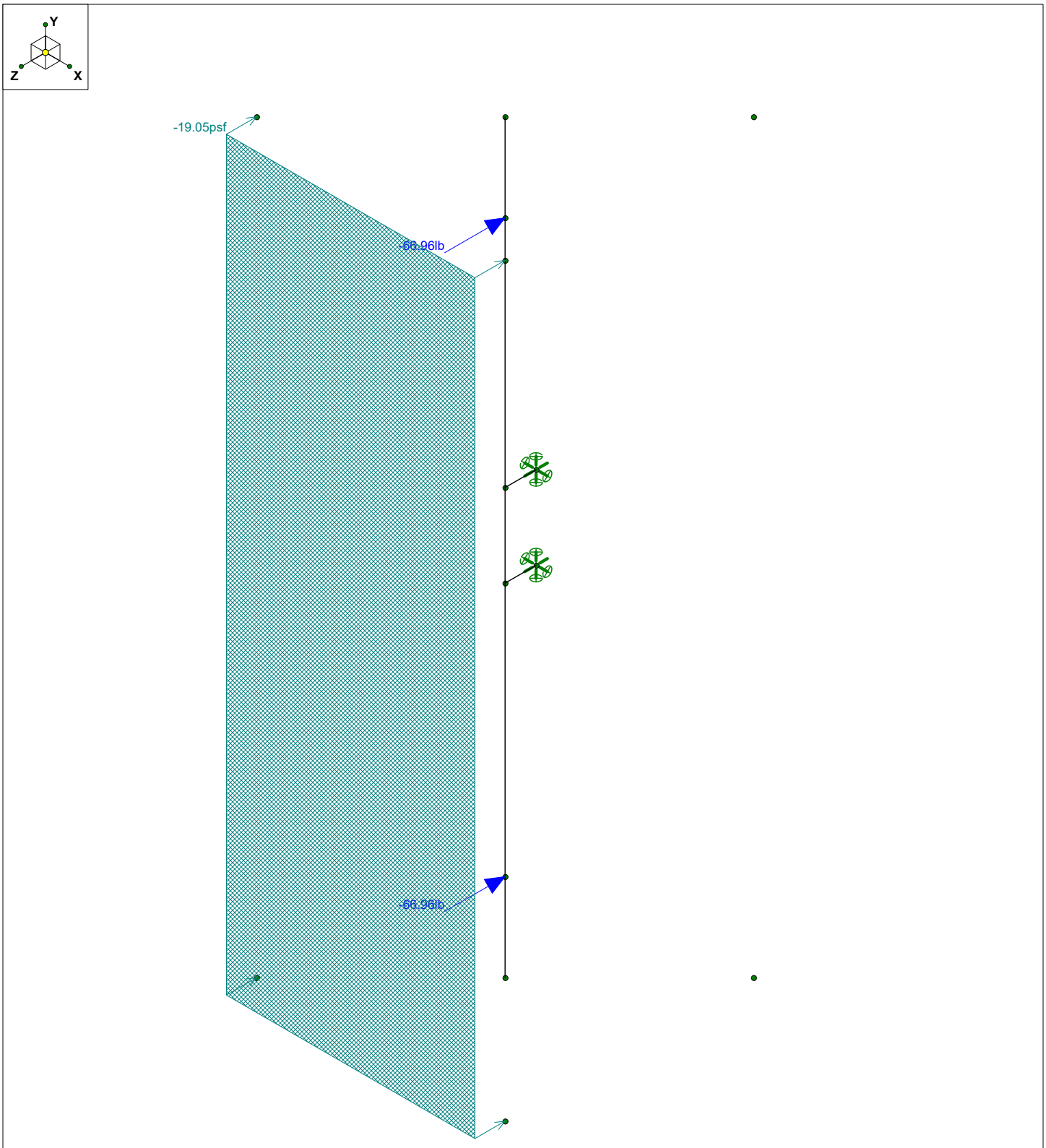

Loads: BLC 2, Wind Load AZI 000
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Wind Load 0
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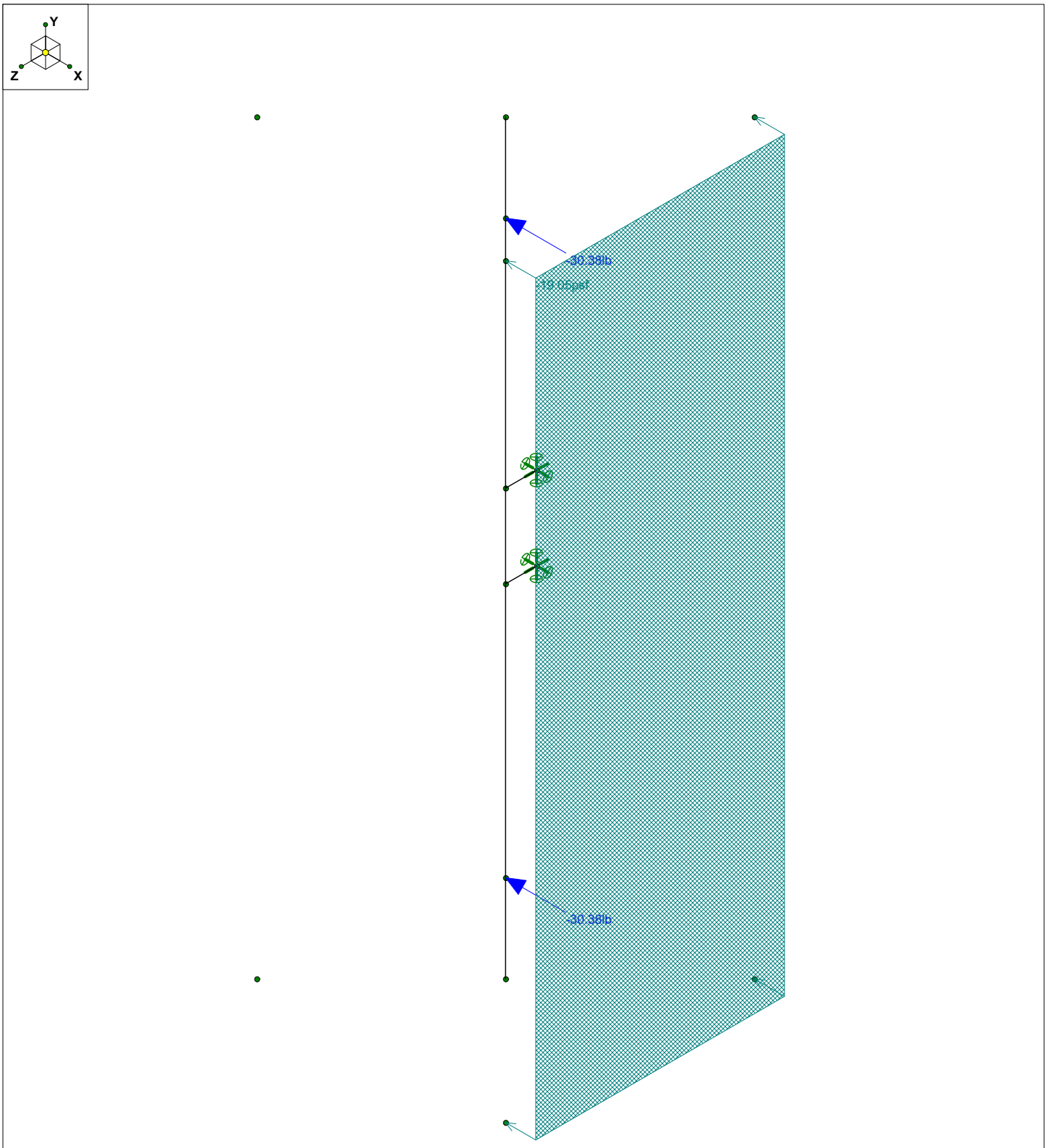

Loads: BLC 3, Wind Load AZI 090
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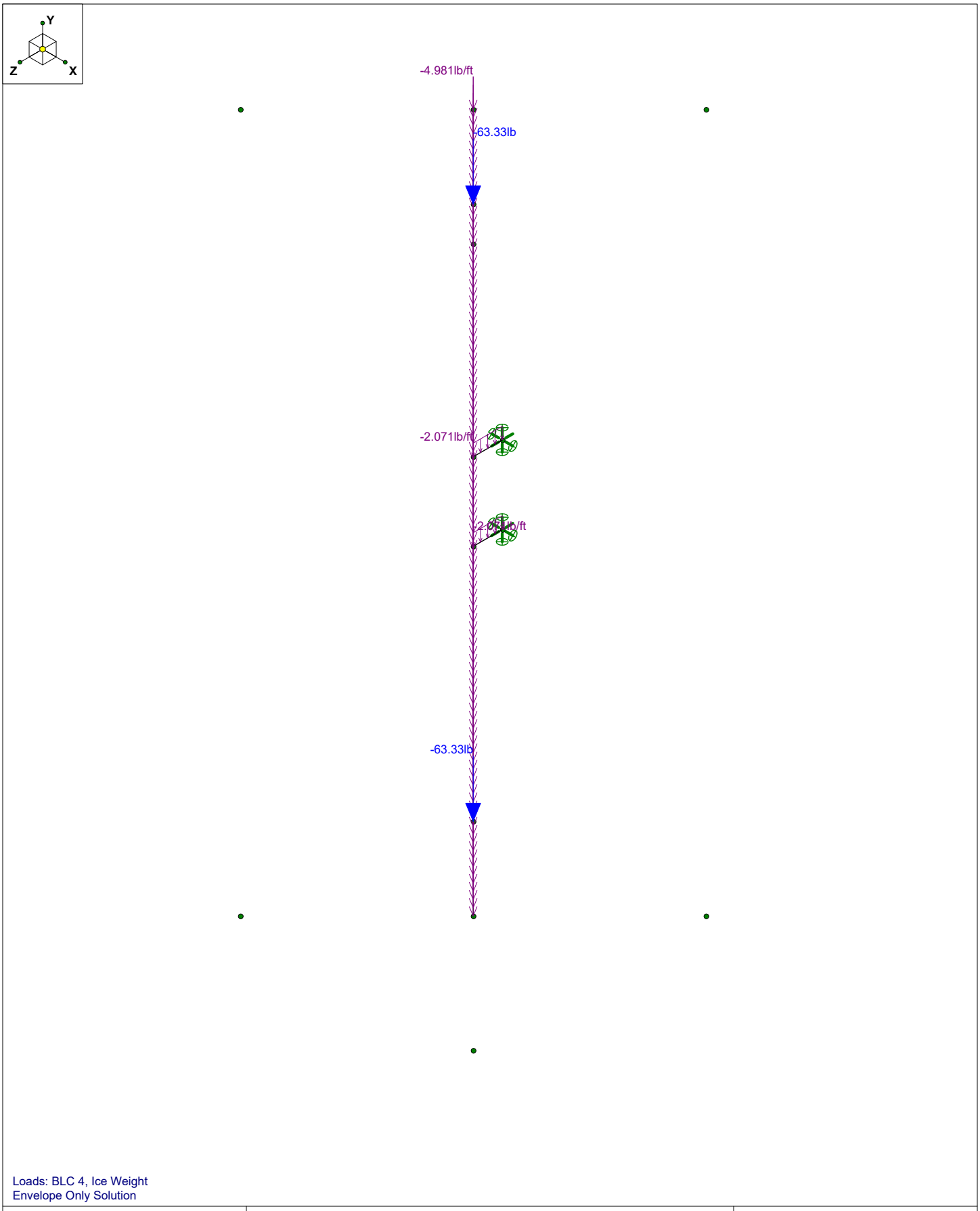

Loads: BLC 4, Ice Weight
Envelope Only Solution

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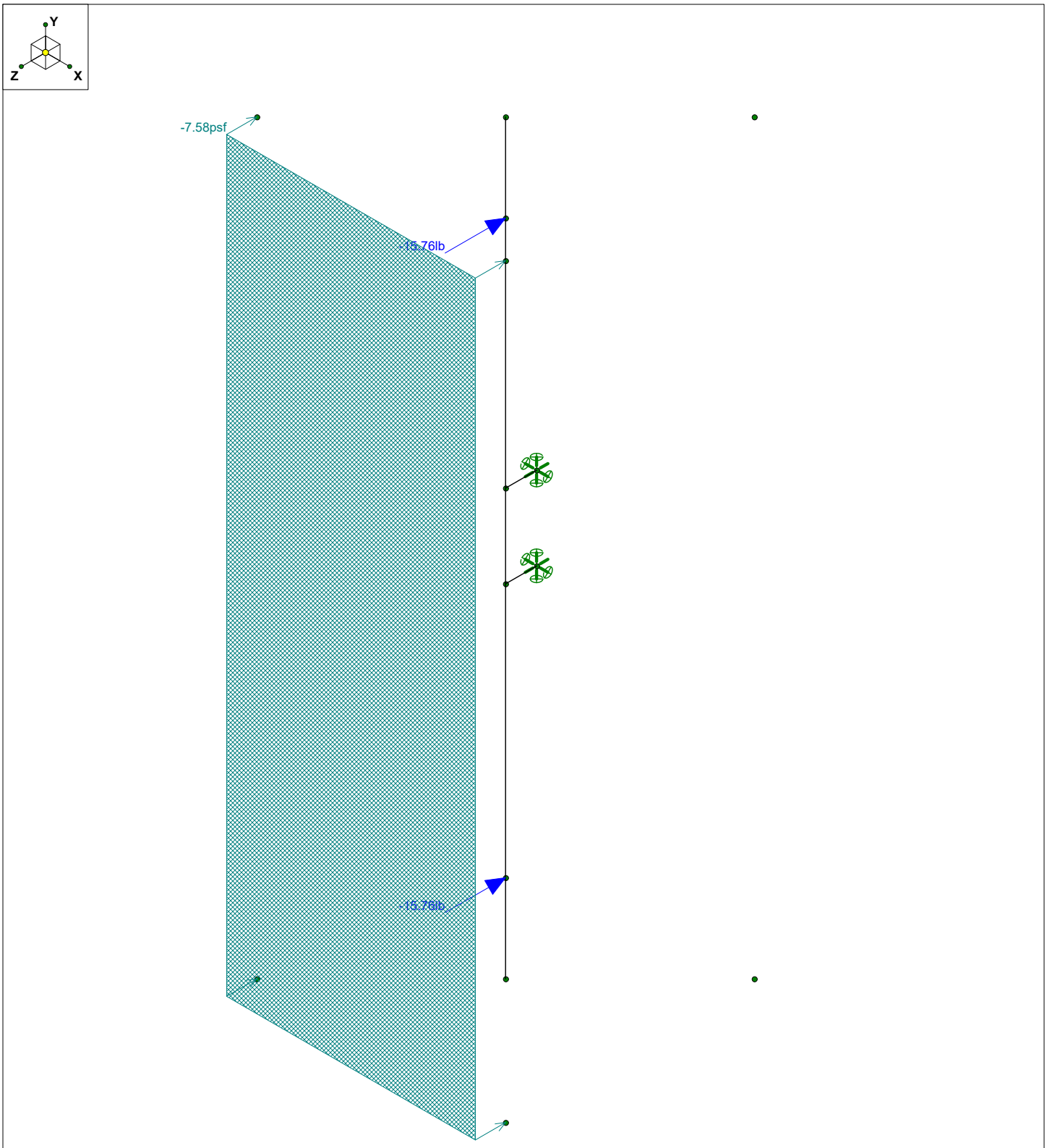
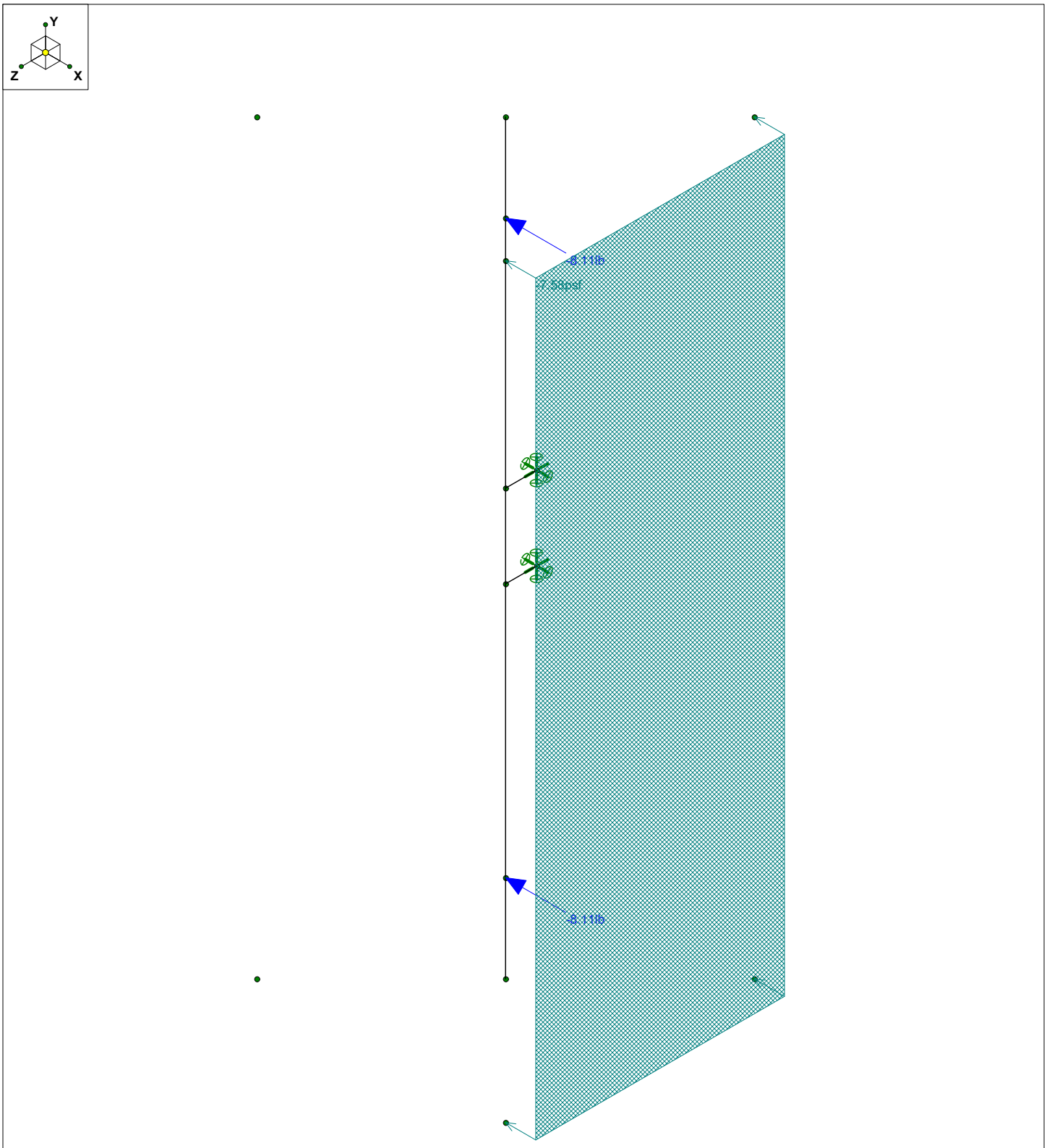


Loads: BLC 5, Wind + Ice Load AZI 000
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Wind + Ice Load 0
RAM		Nov 28, 2018 at 1:04 PM
1106-A0001-B		Crescent.R3D



Loads: BLC 6, Wind + Ice Load AZI 090
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Wind + Ice Load 90
RAM		Nov 28, 2018 at 1:04 PM
1106-A0001-B		Crescent.R3D

Site Name:	Crescent
Client:	Smartlink
Carrier:	AT&T
Engineer:	RAM
Date:	11/28/2018

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

INFINIGY WIND LOAD CALCULATOR 3.0.2

Site Information Inputs:

Adopted Building Code:	2015 IBC
Structure Load Standard:	TIA-222-G
Antenna Load Standard:	TIA-222-G
Structure Risk Category:	II
Structure Type:	Rooftop
Number of Sectors:	4
Structure Shape 1:	Round

Rooftop Inputs:

Rooftop Wind Speed-Up?:	No

Wind Loading Inputs:

Design Wind Velocity:	89	mph (nominal 3-second gust)
Wind Centerline 1 (z_1):	138.0	ft
Side Face Angle (θ):	60	degrees
Exposure Category:	B	
Topographic Category:	1	

Wind with No Ice		
q_z (psf)	Gh	F_{ST} (psf)
18.68	0.85	**19.05**

Wind with Ice		
q_z (psf)	Gh	F_{ST} (psf)
3.77	0.85	**7.58**

Ice Loading Inputs:

Is Ice Loading Needed?:	Yes	
Ice Wind Velocity:	40	mph (nominal 3-second gust)
Base Ice Thickness:	0.50	in

Input Appurtenance Information and Load Placements:

Appurtenance Name	Elevation (ft)	Total Quantity	Ka	Front Shape	Side Shape	q_z (psf)	EPA (ft^2)	Fz (lbs)	Fx (lbs)	Fz(60) (lbs)	Fx(30) (lbs)
Kathrein 742264	138.0	3	1.00	Flat	Flat	18.68	4.86	77.19	46.50	54.17	69.52
Kathrein 80010966	138.0	2	1.00	Flat	Flat	18.68	17.36	275.62	119.05	158.19	236.48
Commscope JAHH-45A-R3B	138.0	4	1.00	Flat	Flat	18.68	8.44	133.92	60.76	79.05	115.63
CCI OPA-65R-LCUU-H4	138.0	2	1.00	Flat	Flat	18.68	5.98	94.92	53.75	64.04	84.62
Commscope SBNHH-1D65A	138.0	3	1.00	Flat	Flat	18.68	5.96	94.56	62.13	70.24	86.46
Alcatel-Lucent RRH 4x25-WCS-4R	138.0	4	1.00	Flat	Flat	18.68	3.34	52.97	60.88	58.90	54.94
Nokia RRH 4T4R B12/14	138.0	4	1.00	Flat	Flat	18.68	2.20	34.92	20.86	24.37	31.41
Nokia RRH 4T4R B25/66	138.0	4	1.00	Flat	Flat	18.68	2.20	34.92	20.86	24.37	31.41
KMW KFTDR00110030	138.0	1	1.00	Flat	Flat	18.68	0.92	14.60	4.18	6.78	11.99
Powerwave LGP21401	138.0	6	1.00	Flat	Flat	18.68	0.55	8.77	7.07	7.50	8.35
Raycap DC6	138.0	3	1.00	Round	Round	18.68	1.21	19.23	19.23	19.23	19.23

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
2	M2	N3	N4			RIGID	None	None	RIGID	Typical
3	M3	N5	N6			RIGID	None	None	RIGID	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	General				
2	RIGID		2	6	0
3	Total General		2	6	0
4					
5	Hot Rolled Steel				
6	A53 Gr.B	PIPE_2.0	1	72	0
7	Total HR Steel		1	72	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Self Weight	DL		-1			2			
2	Wind Load AZI 000	WLZ					2		1	
3	Wind Load AZI 090	WLX					2		1	
4	Ice Weight	OL1					2	3		
5	Wind + Ice Load AZI 000	OL2					2		1	
6	Wind + Ice Load AZI 090	OL3					2		1	
7	Service Live 1	LL								
8	BLC 2 Transient Area Loads	None						1		
9	BLC 3 Transient Area Loads	None						3		
10	BLC 5 Transient Area Loads	None						1		
11	BLC 6 Transient Area Loads	None						3		

Load Combinations

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fac...	BLC	Factor	BLC Factor .....
1	1.4D	Yes	Y		DL	1.4					
2	1.2D + 1.6W AZI 000	Yes	Y		DL	1.2	WLZ	1.6			
3	1.2D + 1.6W AZI 030	Yes	Y		DL	1.2	WLZ	1.386	WLX	.8	
4	1.2D + 1.6W AZI 060	Yes	Y		DL	1.2	WLZ	.8	WLX	1.386	
5	1.2D + 1.6W AZI 090	Yes	Y		DL	1.2			WLX	1.6	
6	1.2D + 1.6W AZI 120	Yes	Y		DL	1.2	WLZ	-.8	WLX	1.386	
7	1.2D + 1.6W AZI 150	Yes	Y		DL	1.2	WLZ	-1.3...	WLX	.8	
8	1.2D + 1.6W AZI 180	Yes	Y		DL	1.2	WLZ	-1.6			
9	1.2D + 1.6W AZI 210	Yes	Y		DL	1.2	WLZ	-1.3...	WLX	-.8	
10	1.2D + 1.6W AZI 240	Yes	Y		DL	1.2	WLZ	-.8	WLX	-1.386	
11	1.2D + 1.6W AZI 270	Yes	Y		DL	1.2			WLX	-1.6	
12	1.2D + 1.6W AZI 300	Yes	Y		DL	1.2	WLZ	.8	WLX	-1.386	
13	1.2D + 1.6W AZI 330	Yes	Y		DL	1.2	WLZ	1.386	WLX	-.8	
14	0.9D + 1.6W AZI 000	Yes	Y		DL	.9	WLZ	1.6			
15	0.9D + 1.6W AZI 030	Yes	Y		DL	.9	WLZ	1.386	WLX	.8	
16	0.9D + 1.6W AZI 060	Yes	Y		DL	.9	WLZ	.8	WLX	1.386	
17	0.9D + 1.6W AZI 090	Yes	Y		DL	.9			WLX	1.6	
18	0.9D + 1.6W AZI 120	Yes	Y		DL	.9	WLZ	-.8	WLX	1.386	
19	0.9D + 1.6W AZI 150	Yes	Y		DL	.9	WLZ	-1.3...	WLX	.8	
20	0.9D + 1.6W AZI 180	Yes	Y		DL	.9	WLZ	-1.6			
21	0.9D + 1.6W AZI 210	Yes	Y		DL	.9	WLZ	-1.3...	WLX	-.8	

Load Combinations (Continued)

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fac...	BLC	Factor	BLC	Factor
22	0.9D + 1.6W AZI 240	Yes	Y		DL	.9	WLZ	-.8	WLX	-1.386		
23	0.9D + 1.6W AZI 270	Yes	Y		DL	.9			WLX	-1.6		
24	0.9D + 1.6W AZI 300	Yes	Y		DL	.9	WLZ	.8	WLX	-1.386		
25	0.9D + 1.6W AZI 330	Yes	Y		DL	.9	WLZ	1.386	WLX	-.8		
26	1.2D + 1.0Di	Yes	Y		DL	1.2	OL1	1				
27	1.2D + 1.0Di + 1.0Wi AZI 0...	Yes	Y		DL	1.2	OL1	1	OL2	1		
28	1.2D + 1.0Di + 1.0Wi AZI 0...	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	.5
29	1.2D + 1.0Di + 1.0Wi AZI 0...	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	.866
30	1.2D + 1.0Di + 1.0Wi AZI 0...	Yes	Y		DL	1.2	OL1	1			OL3	1
31	1.2D + 1.0Di + 1.0Wi AZI 1...	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	.866
32	1.2D + 1.0Di + 1.0Wi AZI 1...	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	.5
33	1.2D + 1.0Di + 1.0Wi AZI 1...	Yes	Y		DL	1.2	OL1	1	OL2	-1		
34	1.2D + 1.0Di + 1.0Wi AZI 2...	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	-.5
35	1.2D + 1.0Di + 1.0Wi AZI 2...	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	-.866
36	1.2D + 1.0Di + 1.0Wi AZI 2...	Yes	Y		DL	1.2	OL1	1			OL3	-1
37	1.2D + 1.0Di + 1.0Wi AZI 3...	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	-.866
38	1.2D + 1.0Di + 1.0Wi AZI 3...	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	-.5
39	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	.114		
40	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	.098	WLX	.057
41	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	.057	WLX	.098
42	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5			WLX	.114
43	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.057	WLX	.098
44	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.098	WLX	.057
45	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.114		
46	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.098	WLX	-.057
47	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.057	WLX	-.098
48	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5			WLX	-.114
49	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	.057	WLX	-.098
50	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	.098	WLX	-.057

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N6	max	83.119	17	136.388	33	125.736	2	230.916	20	20.78	17	0	50
2		min	-83.119	23	42.886	14	-125.736	20	-255.89	2	-20.78	23	0	1
3	N4	max	50.379	5	134.864	27	124.731	14	210.742	14	12.595	5	0	50
4		min	-50.379	11	42.366	20	-124.731	8	-235.489	8	-12.595	11	0	1
5	Totals:	max	133.411	17	271.251	38	250.467	14						
6		min	-133.411	11	85.253	14	-250.467	8						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*P...	phi*M...	phi*M...	Cb	Eqn
1	M1	PIPE_2.0	.130	39	8	.013	39		20	20866.733	32130	1871....	1871....	1	H1-1b

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mount Pipe	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N4	Reaction	Reaction	Reaction	Reaction	Reaction	
2	N6	Reaction	Reaction	Reaction	Reaction	Reaction	

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	M1						Yes	** NA **			None
2	M2						Yes	** NA **			None
3	M3						Yes	** NA **			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torq...	Kyy	Kzz	Cb	Function
1	M1	Mount Pipe	72			Lbyy						Lateral

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^...
No Data to Print ...			

Member Point Loads (BLC 1 : Self Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	Y	-36.95	8.45
2	M1	Y	-36.95	63.55

Member Point Loads (BLC 2 : Wind Load AZI 000)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	Z	-66.96	8.45
2	M1	Z	-66.96	63.55

Member Point Loads (BLC 3 : Wind Load AZI 090)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	X	-30.38	8.45
2	M1	X	-30.38	63.55

Member Point Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	Y	-63.33	8.45
2	M1	Y	-63.33	63.55

Member Point Loads (BLC 5 : Wind + Ice Load AZI 000)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	Z	-15.76	8.45
2	M1	Z	-15.76	63.55

Member Point Loads (BLC 6 : Wind + Ice Load AZI 090)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	X	-8.11	8.45
2	M1	X	-8.11	63.55

Member Distributed Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[...	End Location[i...
1	M1	Y	-4.981	-4.981	0	%100
2	M2	Y	-2.071	-2.071	0	%100
3	M3	Y	-2.071	-2.071	0	%100

Member Distributed Loads (BLC 8 : BLC 2 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[...	End Location[i...
1	M1	Z	-3.77	-3.77	0	72

Member Distributed Loads (BLC 9 : BLC 3 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[...	End Location[i...
1	M1	X	-3.77	-3.77	0	72
2	M2	X	0	0	0	3
3	M3	X	0	0	0	3

Member Distributed Loads (BLC 10 : BLC 5 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[...	End Location[i...
1	M1	Z	-1.5	-1.5	0	72

Member Distributed Loads (BLC 11 : BLC 6 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[...	End Location[i...
1	M1	X	-1.5	-1.5	0	72
2	M2	X	0	0	0	3
3	M3	X	0	0	0	3

Member Area Loads (BLC 2 : Wind Load AZI 000)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N14	N12	N9	N11	Z	Open Structure	-19.05

Member Area Loads (BLC 3 : Wind Load AZI 090)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N12	N13	N10	N9	X	Open Structure	-19.05

Member Area Loads (BLC 5 : Wind + Ice Load AZI 000)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N14	N12	N9	N11	Z	Open Structure	-7.58

Member Area Loads (BLC 6 : Wind + Ice Load AZI 090)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N12	N13	N10	N9	X	Open Structure	-7.58

Date:	11/28/2018
Client:	Smartlink
Site:	Crescent
Engineer:	RAM
Job #:	1106-A0001-B

Slab Check (4" Thickness)		
Slab Thickness	4	in
Slab Width	72	in
Slab Length	72	in
Reinforcement	0.31	in^2/ft
Decking	0	in^2/ft
DL (conc. wt.)	300	lb/ft
LL (Enclosure)	228.75	lb/ft
W_u	726.00	lb/ft
M_u	3.27	kip-ft
$M_u/\phi bd^2$	37.81	psi
ρ	0.0018	ACI 10.5
A_{req}	0.52	in^2
A_s	1.86	in^2/ft
$A_s > A_{req}$	OK	

Shear Check		
Slab Thickness	4	in
Slab Width	72	in
Slab Length	72	in
f'c	4000	psi
ϕV_c	27322.08	lb
V_u (From Wind)	7560.784	lb
$V_u/\phi V_c$	27.6728	%
No consideration of shear reinforcement needed		

SHEET INDEX

DRIVING DIRECTIONS

FROM 7150 STANDARD DRIVE HANOVER MD:

HEAD SOUTH–WEST ON STANDARD DR TOWARDS PARKWAY DR, TURN LEFT TOWARDS STANDARD DR, TURN RIGHT ONTO STANDARD DR, TURN LEFT ONTO PARKWAY DR, TURN RIGHT ONTO PARK CIR DR, TURN LEFT ONTO COCA COLA DR, TURN RIGHT TO MERGE ONTO MD–100 W TOWARDS ELLICOTT CITY, MERGE ONTO MD–100 W, TAKE EXIT 5A–B TOWARDS WASHINGTON, MERGE ONTO I–95 S, USE THE RIGHT 2 LANES TO TAKE EXIT 27 W TO MERGE ONTO I–495 W TOWARDS SILVER SPRING, TAKE EXIT 33 FOR MD–185/CONNECTICUT AVE TOWARDS KENSINGTON/CHEVY CHASE, USE THE LEFT 2 LANES TO TURN LEFT ONTO MD–185 S/CONNECTICUT AVE, TURN RIGHT ONTO MD–410 W/STATE HWY 410 W, CONTINUE STRAIGHT ONTO MD–410 W AND FINALLY THE DESTINATION WILL BE ON THE LEFT.

at&t

PROJECT

DELTA SECTOR ADD W/ 2 RETRO FITS FOR DUAL AIRSCALES

SITE NAME

CRESCENT

USID

55113

FA SITE NUMBER

10006543

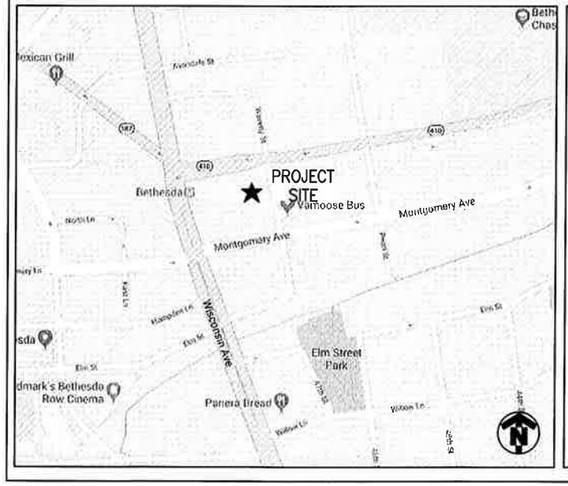
SITE ADDRESS

4600 EAST WEST HIGHWAY
BETHESDA, MD 20814

AT&T ROOFTOP PIM NOTICE

- REPLACE ANY HOSE CLAMPS, HANGERS AND SNAP–INS SUPPORTING RF COAX JUMPERS, CPRI, RET OR DC CABLES LOCATED WITHIN LEASE SPACE BEHIND ANTENNA (15 FT MINIMUM) WITH INTERIM SOLUTION QTY= 2 UV RATED 1/4" WIDE NYLON CABLE TIES THAT MEET 120 LBS TENSILE STRENGTH SPECIFICATION.
  EXAMPLES: MINIMUM: 120 LBS TENSILE STRENGTH, THOMAS AND BETTS CABLE TIES, PANDUIT CABLE TIES
- REPLACE ANY HOSE CLAMPS, HANGERS AND SNAP–INS SUPPORTING RF COAX JUMPERS, CPRI, RET OR DC CABLES LOCATED WITHIN 30 FT MINIMUM LEASE SPACE IN FRONT (180 DEGREE) OF ANTENNA WITH QTY= 2 UV RATED 1/4" WIDE NYLON CABLE TIES
- REMOVE ANY UNNECESSARY HARDWARE THAT'S NOT CURRENTLY SUPPORTING ANYTHING. TIGHTEN ALL REMAINING CLAMPS, BRACKETS, ANTENNA SUPPORTS ETC. TO MANUFACTURER TORQUE SPEC.
- ENSURE THERE IS NO RUSTING METAL ON MOUNTING PIPE WHERE CABLE HANGER AND ADAPTER ARE TO BE ATTACHED. USE A WIRE BRUSH OR WIRE WHEEL & DRILL TO REMOVE ANY RUSTING METAL. CLEAN THE MOUNTING SURFACE (INCLUDING REMOVAL OF MINOR CORROSION) WITH A SCOTCHBRITE PAD. PAINT ANY EXPOSED METAL WHERE THERE WAS RUST OR GALVANIZING HAS BEEN DAMAGED WITH COLD–GALVANIZING PAINT (COLD–GALV). USE NO–OX BETWEEN PIPE MOUNTING HARDWARE (CLAMPS OR STAINLESS–STEEL BANDING) AND MOUNTING PIPE. IF COLD–GALV PAINT WAS APPLIED, ENSURE THE PAINT HAS DRIED BEFORE APPLYING NO–OX. DO NOT USE HOSE CLAMPS TO SECURE CABLE HANGERS OR HANGER ADAPTERS IN HIGH RISK PIM ZONES.
- ALL CABLES TIES SHOULD BE FLUSH CUT TO PREVENT INJURY FROM EXPOSED SHARP EDGES.
- DO NOT ATTACH BRASS TAGS TO RF CABLES FOR CABLE IDENTIFICATION LABELING. USE COLOR CODED TAPE AS SPECIFIED BY LOCAL RF CABLE COLOR CODE STANDARD.

LOCATION MAP



GENERAL NOTES

- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED.
- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- FACILITY HAS NO PLUMBING OR REFRIGERANTS.
- THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS.
- ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. EQUIPMENT, ANTENNAS/RRH AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.
- THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON STORMWATER DRAINAGE.
- NO SANITARY SEWER, POTABLE WATER, OR TRASH DISPOSAL SERVICE IS REQUIRED
- NO COMMERCIAL SIGNAGE IS PROPOSED

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT ADOPTED EDITIONS OF THE FOLLOWING CODES WITH ANY LOCAL AMENDMENTS BY THE LOCAL GOVERNING AUTHORITIES:

- INTERNATIONAL BUILDING CODE
- NATIONAL ELECTRICAL CODE
- NATIONAL FIRE PROTECTION ASSOCIATION 101
- NATIONAL FIRE PROTECTION ASSOCIATION 1
- LOCAL BUILDING CODES
- CITY/COUNTY ORDINANCES
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATIONS (AISC)
- UNDERWRITERS LABORATORIES APPROVED ELECTRICAL PRODUCTS.
- ANSI EIA/TIA 222 REV. G
- TIA 607
- INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81
- IEEE C2 (LATEST EDITION)
- TELCORDIA GR–1275
- ANSI T1.311

PROJECT SITE INFORMATION

SITE NAME:	CRESCENT	
USID:	55113	
FA SITE #:	10006543	
SITE ADDRESS:	4600 EAST WEST HIGHWAY BETHESDA, MD 20814	
JURISDICTION:	MONTGOMERY COUNTY	
SITE COORDINATES: LATITUDE:	N 38° 59' 03.7"	(NAD 83)
LONGITUDE:	W 77° 05' 34.9"	(NAD 83)
APPLICANT:	AT&T MOBILITY 7150 STANDARD DRIVE HANOVER, MD 21076	

STRUCTURAL ANALYSIS INFORMATION

ROOF LOADING ANALYSIS

*BASED ON THE STRUCTURAL ANALYSIS COMPLETED BY **INFINIGY** DATED **11/28/2018**. THE EXISTING **PENTHOUSE SLAB** IS CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION.*

ANTENNA MOUNTS

*BASED ON THE MOUNT ANALYSIS COMPLETED BY **INFINIGY** DATED **11/28/2018**. THE EXISTING ANTENNA MOUNTS ARE CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION*

PROJECT TEAM INFORMATION

CLIENT REPRESENTATIVE:	SMARTLINK, LLC 1362 MELLON ROAD HANOVER, MD 21076
CLIENT REP. CONTACT:	STEVE BRIANAS STEVE.BRIANAS@SMARTLINKLLC.COM
SITE ACQUISITION:	SMARTLINK, LLC 1362 MELLON ROAD HANOVER, MD 21076
SITE ACQUISITION CONTACT:	STEVE BRIANAS STEVE.BRIANAS@SMARTLINKLLC.COM
ENGINEER:	INFINIGY SOLUTIONS 1033 WATERVLIET SHAKER ROAD ALBANY, NY 12205
ENGINEER CONTACT:	MATT LIVERETTE MLIVERETTE@INFINIGY.COM 301–928–8789
RF ENGINEER:	AT&T 7150 STANDARD DRIVE HANOVER, MD 21076
RF CONTACT:	STEVE HATHWAY AT&T RAN ENGINEER 443–770–4443 SH733Y@ATT.COM

811 Know what's below. Call before you dig.

TO OBTAIN LOCATION OF PARTICIPANTS UNDERGROUND FACILITIES BEFORE YOU DIG IN MARYLAND (WEST OF CHESAPEAKE BAY), CALL MISS UTILITY OF MARYLAND
TOLL FREE: 1-800-257-7777 OR
www.missutility.net
MARYLAND STATUTE REQUIRES MIN OF 2 WORKING DAYS NOTICE BEFORE YOU EXCAVATE

at&t

INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

STATE OF MARYLAND
JOHN S. STEVENS
36339
PROFESSIONAL ENGINEER
JAN 04 2019

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 36339 EXP. 12/12/2020

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Designed: MRL
Checked: AJD

Project Number: 499-002

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Prepared For:

smartlink
1362 MELLON RD
HANOVER, MD 21076
TEL (410) 582-8043
FAX (443) 221-2962

Drawing Title
TITLE PAGE

Drawing Number
T1

GENERAL NOTES

PART 1 – GENERAL REQUIREMENTS

1.1 THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
- A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
- B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
- C. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC").
- D. AND NFPA 101 (LIFE SAFETY CODE).
- E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM).
- F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE).

1.2 DEFINITIONS:
A: WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B: COMPANY: AT&T CORPORATION
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D: CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E: THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.

1.3 POINT OF CONTACT: COMMUNICATION BETWEEN THE COMPANY AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE COMPANY SITE DEVELOPMENT SPECIALIST OR OTHER PROJECT COORDINATOR APPOINTED TO MANAGE THE PROJECT FOR THE COMPANY.

1.4 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.5 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES, AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.

1.6 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.7 NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE AT&T WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – EXECUTION

2.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE, POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

2.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

2.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

2.4 COMPANY FURNISHED MATERIAL AND EQUIPMENT: ALL HANDLING, STORAGE AND INSTALLATION OF COMPANY FURNISHED MATERIAL AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
A. CONTRACTOR SHALL PROCURE ALL OTHER REQUIRED WORK RELATED MATERIALS NOT PROVIDED BY AT&T TO SUCCESSFULLY CONSTRUCT A WIRELESS FACILITY.

2.5 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

2.6 EXISTING CONDITIONS: NOTIFY THE COMPANY REPRESENTATIVE OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

PART 3 – RECEIPT OF MATERIAL & EQUIPMENT

3.1 RECEIPT OF MATERIAL AND EQUIPMENT: CONTRACTOR IS RESPONSIBLE FOR AT&T PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
- A. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
- B. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
- C. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
- D. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO AT&T OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
- E. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
- F. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

PART 4 – GENERAL REQUIREMENTS FOR CONSTRUCTION

4.1 CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

4.2 EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

4.3 CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
A. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
B. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

4.4 CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION.

4.5 CONDUCT TESTING AS REQUIRED HEREIN.

PART 5 – TESTS AND INSPECTIONS

5.1 TESTS AND INSPECTIONS:
- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
- B. CONTRACTOR SHALL COORDINATE TEST AND INSPECTION SCHEDULES WITH COMPANY'S REPRESENTATIVE WHO MUST BE ON SITE TO WITNESS SUCH TESTS AND INSPECTIONS.
- C. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
- D. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
- E. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
- F. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
- G. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

PART 6 – TRENCHING AND BACKFILLING

6.1 TRENCHING AND BACKFILLING: THE CONTRACTOR SHALL PERFORM ALL EXCAVATION OF EVERY DESCRIPTION AND OF WHATEVER SUBSTANCES ENCOUNTERED, TO THE DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS OTHERWISE SPECIFIED.

A. PROTECTION OF EXISTING UTILITIES: THE CONTRACTOR SHALL CHECK WITH THE LOCAL UTILITIES AND THE RESPECTIVE UTILITY LOCATOR COMPANIES PRIOR TO STARTING EXCAVATION OPERATIONS IN EACH RESPECTIVE AREA TO ASCERTAIN THE LOCATIONS OF KNOWN UTILITY LINES. THE LOCATIONS, NUMBER AND TYPES OF EXISTING UTILITY LINES DETAILED ON THE CONSTRUCTION DRAWINGS ARE APPROXIMATE AND DO NOT REPRESENT EXACT INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL LINES DAMAGED DURING EXCAVATION AND ALL ASSOCIATED OPERATIONS. ALL UTILITY LINES UNCOVERED DURING THE EXCAVATION OPERATIONS, SHALL BE PROTECTED FROM DAMAGE DURING EXCAVATION AND ASSOCIATED OPERATIONS. ALL REPAIRS SHALL BE APPROVED BY THE UTILITY COMPANY.

B. HAND DIGGING: UNLESS APPROVED IN WRITING OTHERWISE, ALL DIGGING WITHIN AN EXISTING CELL SITE COMPOUND IS TO BE DONE BY HAND.

C. DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING AND TO PREVENT SLIDES OR CAVE-INS. ALL EXCAVATED MATERIALS NOT REQUIRED OR SUITABLE FOR BACKFILL SHALL BE REMOVED AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE.

D. GRADING SHALL BE DONE AS MAY BE NECESSARY TO PREVENT SURFACE WATER FROM FLOWING INTO TRENCHES OR OTHER EXCAVATIONS, AND ANY WATER ACCUMULATING THEREIN SHALL BE REMOVED BY PUMPING OR BY OTHER APPROVED METHOD.

E. SHEETING AND SHORING SHALL BE DONE AS NECESSARY FOR THE PROTECTION OF THE WORK AND FOR THE SAFETY OF PERSONNEL. UNLESS OTHERWISE INDICATED, EXCAVATION SHALL BE BY OPEN CUT, EXCEPT THAT SHORT SECTIONS OF A TRENCH MAY BE TUNNELED IF, THE CONDUIT CAN BE SAFELY AND PROPERLY INSTALLED AND BACKFILL CAN BE PROPERLY TAMPED IN SUCH TUNNEL SECTIONS. EARTH EXCAVATION SHALL COMPRISE ALL MATERIALS AND SHALL INCLUDE CLAY, SILT, SAND, MUCK, GRAVEL, HARDPAN, LOOSE SHALE, AND LOOSE STONE.

F. TRENCHES SHALL BE OF NECESSARY WIDTH FOR THE PROPER LAYING OF THE CONDUIT OR CABLE, AND THE BANKS SHALL BE AS NEARLY VERTICAL AS PRACTICABLE. THE BOTTOM OF THE TRENCHES SHALL BE ACCURATELY GRADED TO PROVIDE UNIFORM BEARING AND SUPPORT FOR EACH SECTION OF THE CONDUIT OR CABLE ON UNDISTURBED SOIL AT EVERY POINT ALONG ITS ENTIRE LENGTH. EXCEPT WHERE ROCK IS ENCOUNTERED, CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED. WHERE ROCK EXCAVATIONS ARE NECESSARY, THE ROCK SHALL BE EXCAVATED TO A MINIMUM OVER DEPTH OF 6 INCHES BELOW THE TRENCH DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR SPECIFIED. OVER DEPTHS IN THE ROCK EXCAVATION AND UNAUTHORIZED OVER DEPTHS SHALL BE THOROUGHLY BACK FILLED AND TAMPED TO THE APPROPRIATE GRADE. WHENEVER WET OR OTHERWISE UNSTABLE SOIL THAT IS INCAPABLE OF PROPERLY SUPPORTING THE CONDUIT OR CABLE IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, SUCH SOLID SHALL BE REMOVED TO A MINIMUM OVER DEPTH OF 6 INCHES AND THE TRENCH BACKFILLED TO THE PROPER GRADE WITH EARTH OF OTHER SUITABLE MATERIAL, AS HEREINAFTER SPECIFIED.

G. BACKFILLING OF TRENCHES. TRENCHES SHALL NOT BE BACKFILLED UNTIL ALL SPECIFIED TESTS HAVE BEEN PERFORMED AND ACCEPTED. WHERE COMPACTED BACKFILL IS NOT INDICATED THE TRENCHES SHALL BE CAREFULLY BACKFILLED WITH SELECT MATERIAL SUCH AS EXCAVATED SOILS THAT ARE FREE OF ROOTS, SOD, RUBBISH OR STONES, DEPOSITED IN 6 INCH LAYERS AND THOROUGHLY AND CAREFULLY RAMMED UNTIL THE CONDUIT OR CABLE HAS A COVER OF NOT LESS THAN 1 FOOT. THE REMAINDER OF THE BACKFILL MATERIAL SHALL BE GRANULAR IN NATURE AND SHALL NOT CONTAIN ROOTS, SOD, RUBBING, OR STONES OF 2-1/2 INCH MAXIMUM DIMENSION. BACKFILL SHALL BE CAREFULLY PLACED IN THE TRENCH AND IN 1 FOOT LAYERS AND EACH LAYER TAMPED. SETTLING THE BACKFILL WITH WATER WILL BE PERMITTED. THE SURFACE SHALL BE GRADED TO A REASONABLE UNIFORMITY AND THE MOUNDING OVER THE TRENCHES LEFT IN A UNIFORM AND NEAT CONDITION.

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER
F	NON-FUSIBLE DISCONNECT SWITCH
F	FUSIBLE DISCONNECT SWITCH
	SURFACE MOUNTED PANEL BOARD
T	TRANSFORMER
M	KILOWATT HOUR METER
JB	JUNCTION BOX
PB	PULL BOX TO NEC/TELCO STANDARDS
	UNDERGROUND UTILITIES
	EXOTHERMIC WELD CONNECTION
	MECHANICAL CONNECTION
OR ⊗	GROUND ROD
OR ⊠	GROUND ROD WITH INSPECTION SLEEVE
	GROUND BAR
	120AC DUPLEX RECEPTACLE
G	GROUND CONDUCTOR
	DC POWER AND FIBER OPTIC TRUNK CABLES
	DC POWER CABLES
# / #	REPRESENTS DETAIL NUMBER / REF. DRAWING NUMBER

ABBREVIATIONS

CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
MIGB	MASTER ISOLATED GROUND BAR
SST	SELF SUPPORTING TOWER
GPS	GLOBAL POSITIONING SYSTEM
TYP.	TYPICAL
DWG	DRAWING
BCW	BARE COPPER WIRE
BFG	BELOW FINISH GRADE
PVC	POLYVINYL CHLORIDE
CAB	CABINET
C	CONDUIT
SS	STAINLESS STEEL
G	GROUND
AWG	AMERICAN WIRE GAUGE
RGS	RIGID GALVANIZED STEEL
AHJ	AUTHORITY HAVING JURISDICTION
TTLNA	TOWER TOP LOW NOISE AMPLIFIER
UNO	UNLESS NOTED OTHERWISE
EMT	ELECTRICAL METALLIC TUBING
AGL	ABOVE GROUND LEVEL

at&t

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STATE OF MARYLAND
JOHN S. STEVENS
36339
PROFESSIONAL ENGINEER
JAN 04 2019

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 36339 EXP. 12/12/2020

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Checked: AJD

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smartlink
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Drawing Title
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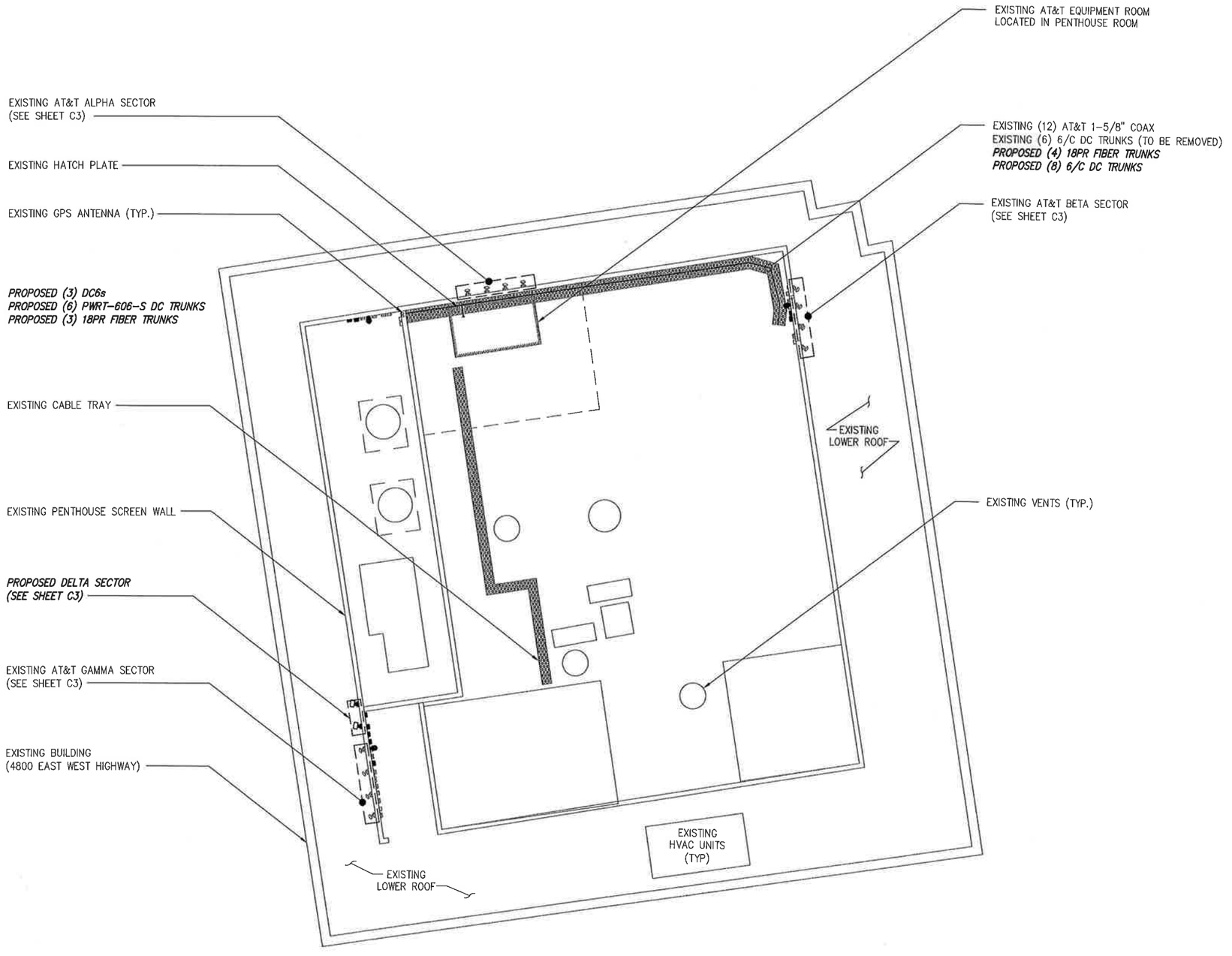

NORTH

1 C1 ROOF PLAN
SCALE: AS NOTED

GRAPHIC SCALE:
20' 10' 0 10' 20'
SCALE (11x17): 1" = 20'-0"
SCALE (22x34): 1" = 10'-0"

at&t

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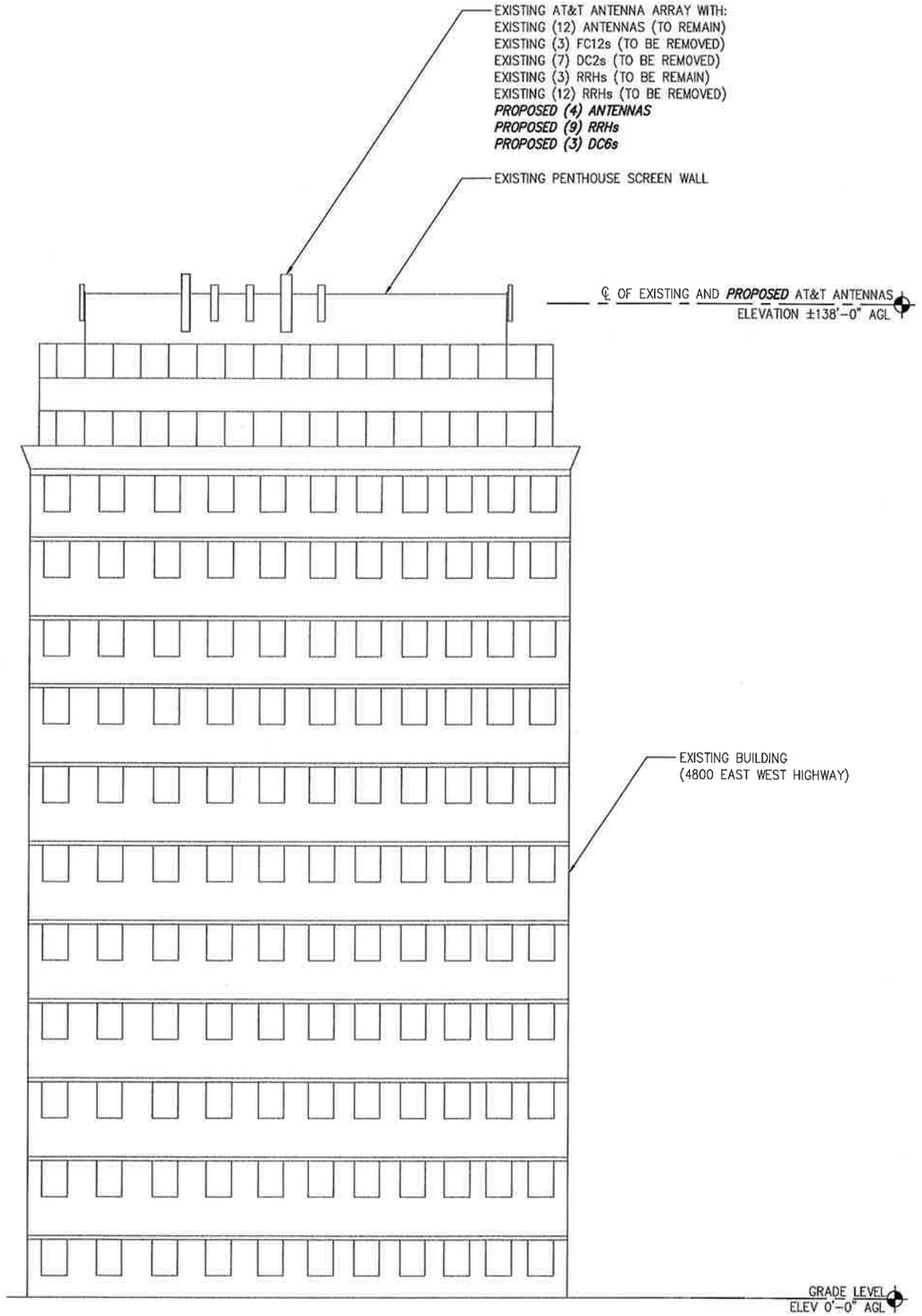
Drawing Title
ROOF PLAN

Drawing Number
C1



1 C2 ELEVATION VIEW
SCALE: NOT TO SCALE

ANTENNA AND RRH SCHEDULE

SECTOR	ANTENNA POSITION	ANTENNA MAKE	ANTENNA MODEL	RAD CTR. FT. AGL	AZIMUTH	RRH/TMA QTY/MAKE/MODEL	FILTER/DIPLEXER QTY/MAKE/MODEL	E-TILT	M-TILT
A	#1	KATHREIN	742264	138'-0"	350°	(2) POWERWAVE LGP21401	(2) POWERWAVE LGP13519	10° (UMTS 850)	0°
	#2	KATHREIN	80010966	138'-0"	0°	**(1) AIRSCALE B12/14** **(1) AIRSCALE B25/66**	–	10° (LTE 700) 6° (LTE 700) 8° (LTE 1900) 2° (LTE AWS)	2°
	#3	CCI – OCTO	OPA-65R-LCUU-H4	138'-0"	0°	RRH 4x25-WCS-4R	–	2° (LTE WCS)	0°
	#4	COMMSCOPE	SBNHH-1D65A	138'-0"	0°	–	–	–	–
B	#5	KATHREIN	742264	138'-0"	120°	(2) POWERWAVE LGP21401	(2) POWERWAVE LGP13519	10° (UMTS 850)	0°
	#6	KATHREIN	80010966	138'-0"	120°	**(1) AIRSCALE B12/14** **(1) AIRSCALE B25/66**	–	10° (LTE 700) 6° (LTE 700) 6° (LTE 1900) 5° (LTE AWS)	2°
	#7	CCI – OCTO	OPA-65R-LCUU-H4	138'-0"	120°	RRH 4x25-WCS-4R	(1) KFTDR00110030	5° (LTE WCS)	2°
	#8	COMMSCOPE	SBNHH-1D65A	138'-0"	120°	–	–	–	–
C	#9	KATHREIN	742264	138'-0"	240°	(2) POWERWAVE LGP21401	(2) POWERWAVE LGP13519	10° (UMTS 850)	0°
	#10	**COMMSCOPE**	**JAHH-45A-R3B**	138'-0"	235°	**(1) AIRSCALE B12/14** **(1) AIRSCALE B25/66**	–	8° (LTE 700) 3° (LTE 1900) 1° (LTE AWS)	0°
	#11	**COMMSCOPE**	**JAHH-45A-R3B**	138'-0"	235°	RRH 4x25-WCS-4R	–	8° (LTE 700) 1° (LTE WCS)	0°
	#12	COMMSCOPE	SBNHH-1D65A	138'-0"	235°	–	–	–	–
D	#14	**COMMSCOPE**	**JAHH-45A-R3B**	**138'-0"**	**280°**	**(1) AIRSCALE B12/14** **(1) AIRSCALE B25/66**	–	8° (LTE 700) 3° (LTE 1900) 1° (LTE AWS)	0°
	#15	**COMMSCOPE**	**JAHH-45A-R3B**	**138'-0"**	**280°**	**(1) RRH4x25-WCS-4R**	–	8° (LTE 700) 1° (LTE WCS)	0°

KEY:
EXISTING
PROPOSED

CABLE SCHEDULE

SYSTEM	TYPE	QTY	LENGTH
UMTS	7/8"ø COAX	12	150'±
LTE	**PWRT-606-S**	**6**	**150'±**
LTE	**18 PAIR FIBER**	**3**	**150'±**

SURGE PROTECTION DEVICE SCHEDULE

TYPE	LOCATION	QTY
DC6	**SECTOR LEVEL**	**3**

RF DESIGN NOTE:
THIS ANTENNA AND CABLE SCHEDULE HAS BEEN CREATED USING THE FOLLOWING AT&T RFDS DATED: **09/18/2018** REVISION: **V2018_0.2** ALL ANTENNA DESIGN, ZONING, STRUCTURAL ANALYSIS PERMITS AND COMPLIANCE SUBMISSIONS ARE COORDINATED WITH THE AFOREMENTIONED DOCUMENT.

2 C2 RF SCHEDULE
NOT TO SCALE

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Albany, NY 12205
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Fax # (518) 690-0793

STATE OF MARYLAND
JOSEPH S. STEVENS
PROFESSIONAL ENGINEER
JAN 04 2019
26339
I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 26339, EXP. 12/12/2020

No.	Submittal / Revision	Appd.	Date
1	JURISDICTION COMMENTS	RMS	01/04/19
0	ISSUED FOR CONSTRUCTION	RMS	11/28/18
B	CLIENT COMMENTS	RMS	11/12/18
A	ISSUED FOR CLIENT REVIEW	HAM	11/08/18

Drawn: HAM
Designed: MRL
Checked: AJD

Project Number:
499-002

Project Title:
CRESCENT
SITE ID: 55113
FA # 10006543
4600 EAST WEST HIGHWAY
BETHESDA, MD 20814

Prepared For:

smartlink
1362 MELLON RD
HANOVER, MD 21076
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Drawing Title
ELEVATION AND RF SCHEDULE

Drawing Number
C2

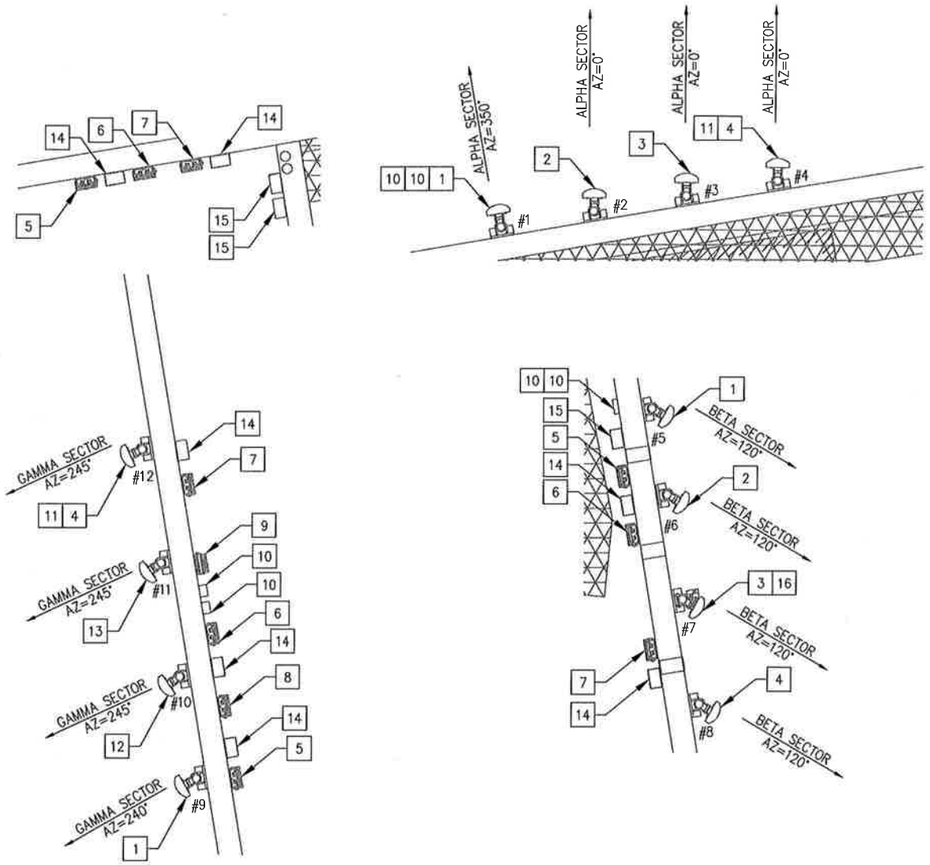
AT&T ROOFTOP PIM NOTICE

- REPLACE ANY HOSE CLAMPS, HANGERS AND SNAP-INS SUPPORTING RF COAX JUMPERS, CPRI, RET OR DC CABLES LOCATED WITHIN LEASE SPACE BEHIND ANTENNA (15 FT MINIMUM) WITH INTERIM SOLUTION QTY= 2 UV RATED 1/4" WIDE NYLON CABLE TIES THAT MEET 120 LBS TENSILE STRENGTH SPECIFICATION.
  EXAMPLES: MINIMUM: 120 LBS TENSILE STRENGTH, THOMAS AND BETTS CABLE TIES, PANDUIT CABLE TIES
- REPLACE ANY HOSE CLAMPS, HANGERS AND SNAP-INS SUPPORTING RF COAX JUMPERS, CPRI, RET OR DC CABLES LOCATED WITHIN 30 FT MINIMUM LEASE SPACE IN FRONT (180 DEGREE) OF ANTENNA WITH QTY= 2 UV RATED 1/4" WIDE NYLON CABLE TIES
- REMOVE ANY UNNECESSARY HARDWARE THAT'S NOT CURRENTLY SUPPORTING ANYTHING. TIGHTEN ALL REMAINING CLAMPS, BRACKETS, ANTENNA SUPPORTS ETC. TO MANUFACTURER TORQUE SPEC.
- ENSURE THERE IS NO RUSTING METAL ON MOUNTING PIPE WHERE CABLE HANGER AND ADAPTER ARE TO BE ATTACHED. USE A WIRE BRUSH OR WIRE WHEEL & DRILL TO REMOVE ANY RUSTING METAL. CLEAN THE MOUNTING SURFACE (INCLUDING REMOVAL OF MINOR CORROSION) WITH A SCOTCHBRITE PAD. PAINT ANY EXPOSED METAL WHERE THERE WAS RUST OR GALVANIZING HAS BEEN DAMAGED WITH COLD-GALVANIZING PAINT (COLD-GALV). USE NO-OX BETWEEN PIPE MOUNTING HARDWARE (CLAMPS OR STAINLESS-STEEL BANDING) AND MOUNTING PIPE. IF COLD-GALV PAINT WAS APPLIED, ENSURE THE PAINT HAS DRIED BEFORE APPLYING NO-OX. DO NOT USE HOSE CLAMPS TO SECURE CABLE HANGERS OR HANGER ADAPTERS IN HIGH RISK PIM ZONES.
- ALL CABLES TIES SHOULD BE FLUSH CUT TO PREVENT INJURY FROM EXPOSED SHARP EDGES.
- DO NOT ATTACH BRASS TAGS TO RF CABLES FOR CABLE IDENTIFICATION LABELING. USE COLOR CODED TAPE AS SPECIFIED BY LOCAL RF CABLE COLOR CODE STANDARD.

ORIENTATION PLAN KEY

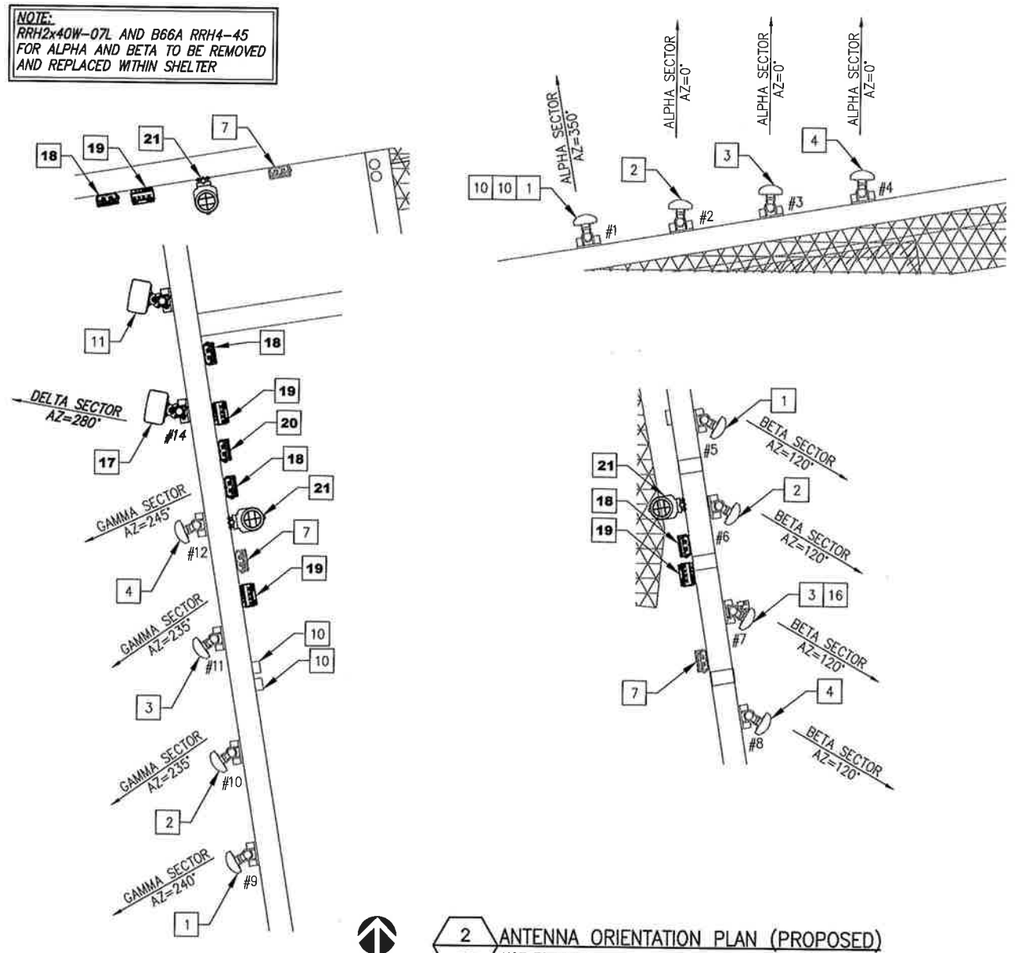
KEY	DESCRIPTION	TYPE	QTY	STATUS
1	742264	ANTENNA	3	REMAIN
2	80010966	ANTENNA	2	REMAIN
3	OPA-65R-LCUU-H4	ANTENNA	2	REMAIN
4	SBNHH-1D65A	ANTENNA	3	REMAIN
5	RRH 4T4R B14 160W	RRH	3	REMOVED
6	B25 RRH4x30-4R	RRH	3	REMOVED
7	RRH4-25-WCS-4R	RRH	3	REMAIN
8	RRH2x40W-07L	RRH	3	REMOVED
9	B66A-RRH4x45	RRH	3	REMOVED
10	LGP21401	TMA	6	REMAIN
11	TMAT1921B68-21-43	TMA	2	REMAIN
12	80010966	ANTENNA	1	REMOVED
13	OPA-65R-LCUU-H4	ANTENNA	1	REMOVED
14	DC2	DC/FIBER MGMT	7	REMOVED
15	FC12	SLACK BOX	3	REMOVED
16	KFTDR00110030	FILTER	1	REMAIN
17	**JAHH-45A-R3B**	**ANTENNA**	**4**	**PROPOSED**
18	**AIRSCALE B12/14**	**RRH**	**4**	**PROPOSED**
19	**AIRSCALE B25/66**	**RRH**	**4**	**PROPOSED**
20	**RRH4x25-WCS-4R**	**RRH**	**1**	**PROPOSED**
21	**DC6**	**DC/FIBER MGMT**	**3**	**PROPOSED**

NOTE:
1. LAYOUT SHOWN BASED ON AVAILABLE INFORMATION FROM AUDIT PHOTOS. GC TO FIELD ADJUST LAYOUT AS NECESSARY FOR MINIMUM REQUIRED CLEARANCES OF EQUIPMENT.
2. NO EXISTING OR PROPOSED UNISTRUT TO EXCEED A SPAN OF 4' BETWEEN SUPPORTS. REMOVE AND REPLACE EXISTING UNISTRUT AS NECESSARY FOR MAX. 4' SPAN WHEN UTILIZED FOR MOUNTING RRHs AND SLACK BOXES.
3. SEE SHEETS C5 AND C6 FOR PROPOSED EQUIPMENT MOUNTING DETAILS.



1 C3 ANTENNA ORIENTATION PLAN (EXISTING)
NOT TO SCALE

NOTE:
RRH2x40W-07L AND B66A RRH4-45 FOR ALPHA AND BETA TO BE REMOVED AND REPLACED WITHIN SHELTER



2 C3 ANTENNA ORIENTATION PLAN (PROPOSED)
NOT TO SCALE

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STATE OF MARYLAND
JOHN S. STEVENS
No. 36339
PROFESSIONAL ENGINEER
JAN 04 2019

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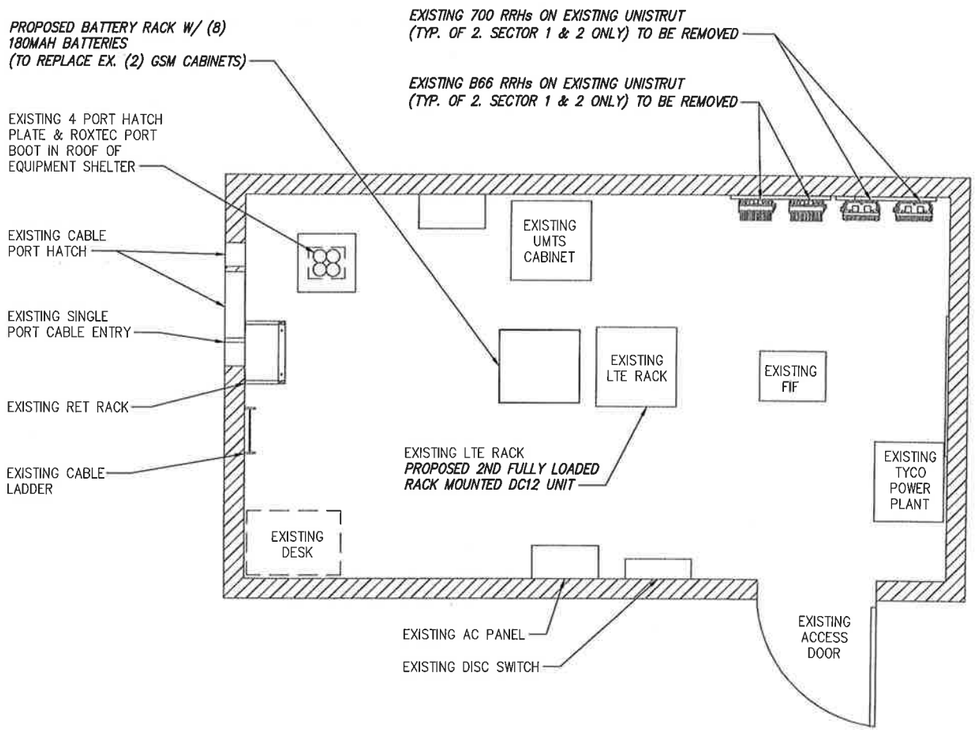
Drawing Title
ANTENNA ORIENTATION PLAN

Drawing Number
C3

NOTE:
REMOVING EXISTING FIBER & DC CABLES AND UTILIZE SPARE PORTS IN AVAILABLE ENTRY PANELS.



1 C4 EQUIPMENT LAYOUT
SCALE: NOT TO SCALE

FA # 10006543	SITE: Crescent
EXISTING CABLES AND DC SURGE EQUIPMENT:	EQUIPMENT SCOPING:
12 X 7/8" FEEDERS, 6 X 8-6 DC TRUNKS, 3 X FC12, 9 X DC2'S	ADD A 2ND FULLY LOADED RACK MOUNTED DC12 UNIT TO THE EXISTING LTE RACK
CABLES AND DC SURGE EQPT SOW:	REMOVE GSM CABINET ADD RACK WITH 8 X +24 180MHA STRINGS TOTAL WEIGHT OF 2728LBS
REMOVE ALL FC12'S, REMOVE ALL DC2'S, REMOVE ALL DC TRUNKS, AND ADD 8 NEW PWRT-606-S DC TRUNKS, ADD 4 NEW 18 PAIR FIBER TRUNKS, ADD 4 NEW DC6'S	

PROJECT: DELTA SECTOR ADD WITH 2 RETRO FITS FOR DUAL AIRSCALES

ANTENNA AND RRH SCOPING:		
ALPHA POS. #2	ALPHA POS. #4	
SWAP OUT BAND 14 AND B25 RRH FOR NEW B12/14 AND B25/66 RRH'S	REMOVE TMA, 07L AND B66 RRH'S	
BETA POS. #2	BETA POS. #4	
SWAP OUT BAND 14 AND B25 RRH FOR NEW B12/14 AND B25/66 RRH'S	REMOVE TMA, 07L AND B66 RRH'S	
GAMMA POS. #2	GAMMA POS. #3	GAMMA POS. #4
SWAP OUT ANTENNA AND SWAP OUT BAND 14 AND B25 RRH FOR NEW B12/14 AND B25/66 RRH'S AND NEW JAHH-45A-R3B	SWAP OUT AND ANTENNA FOR NEW JAHH-45A-R3B	REMOVE TMA, 07L AND B66 RRH'S
DELTA POS. #1	DELTA POS. #2	
ADD NEW JAHH-45A-R3B WITH B12/14 AND B25/66 RRHS	ADD NEW JAHH-45A-R3B WITH WCS RRH	

2 C4 SCOPE OF WORK

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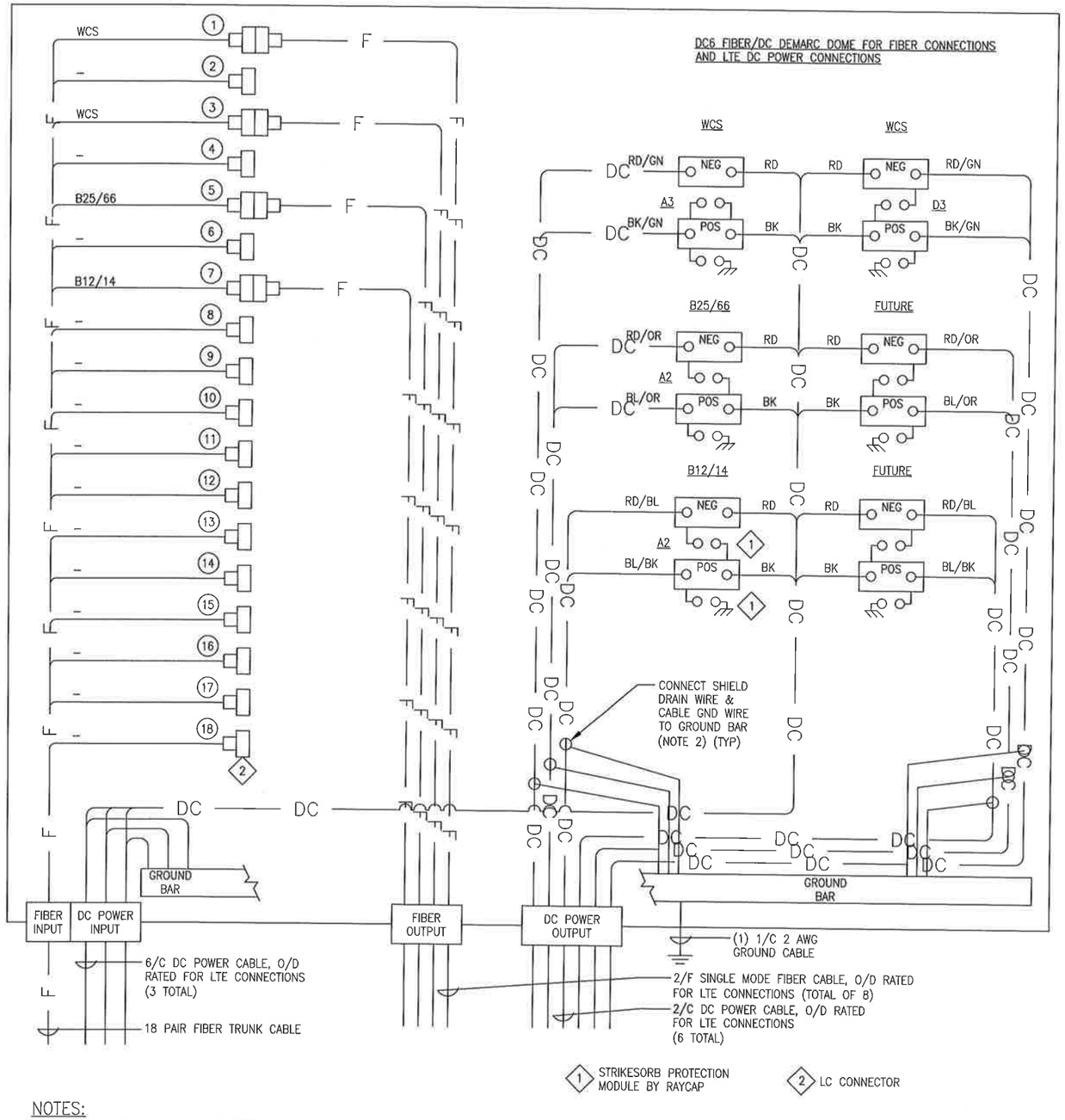
Drawing Title
EQUIPMENT LAYOUT AND SCOPE

Drawing Number
C4



NOTES:

1. SEE RF CHART FOR CONDUCTOR SIZES.
2. WHEN SHIELDED CABLE IS USED CONNECT CABLE SHIELD DRAIN WIRE AND GROUND WIRE TO GROUND BAR.

1/C5 RAYCAP DC6 FIBER/DC DEMARC DOME DETAIL (ALPHA SECTOR)

SCALE: NTS

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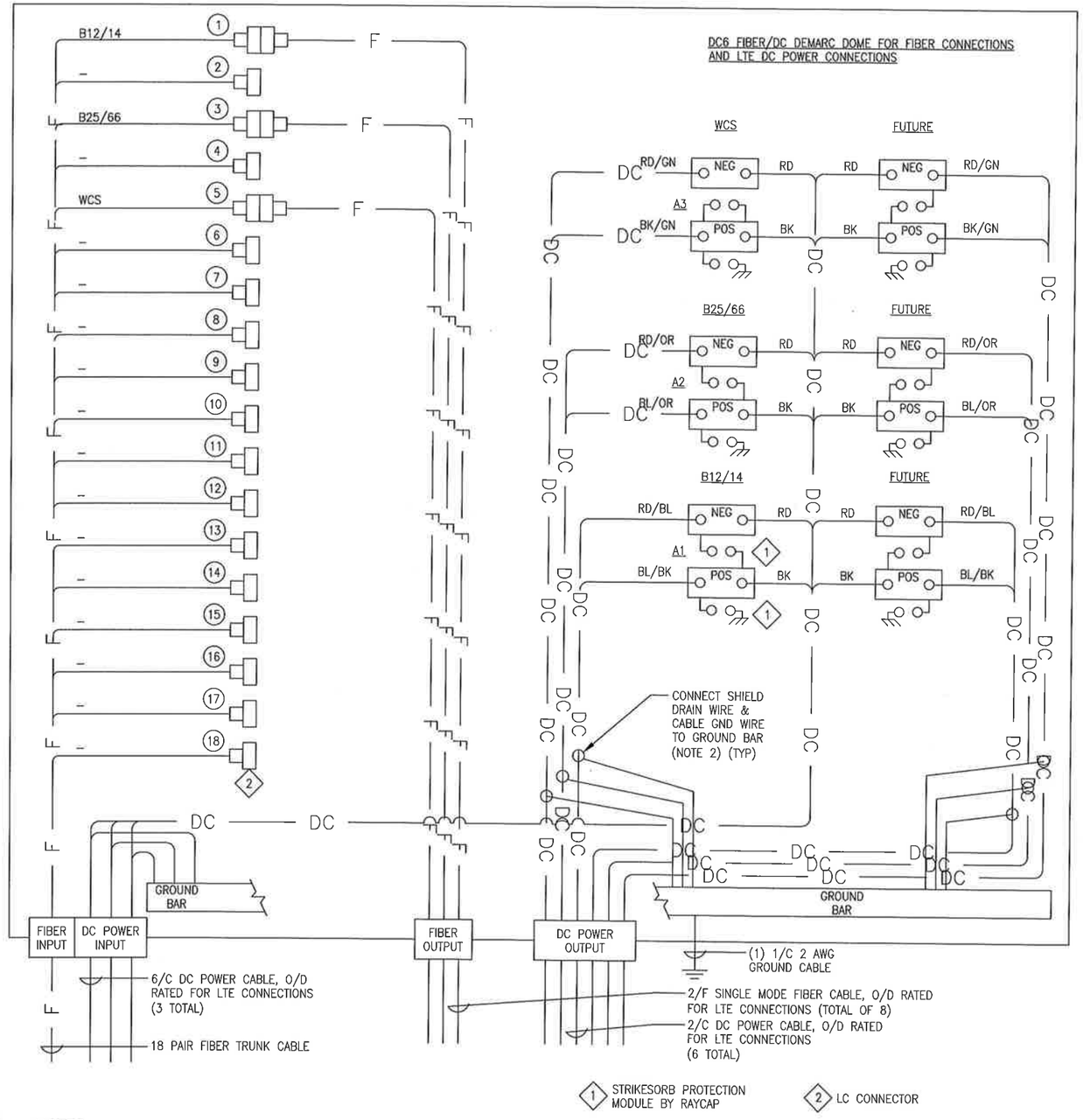
Drawing Title
DC6 WIRING DIAGRAM ALPHA

Drawing Number
C5



NOTES:
1. SEE RF CHART FOR CONDUCTOR SIZES.
2. WHEN SHIELDED CABLE IS USED CONNECT CABLE SHIELD DRAIN WIRE AND GROUND WIRE TO GROUND BAR.

1/C6 RAYCAP DC6 FIBER/DC DEMARC DOME DETAIL (BETA SECTOR)
SCALE: NTS

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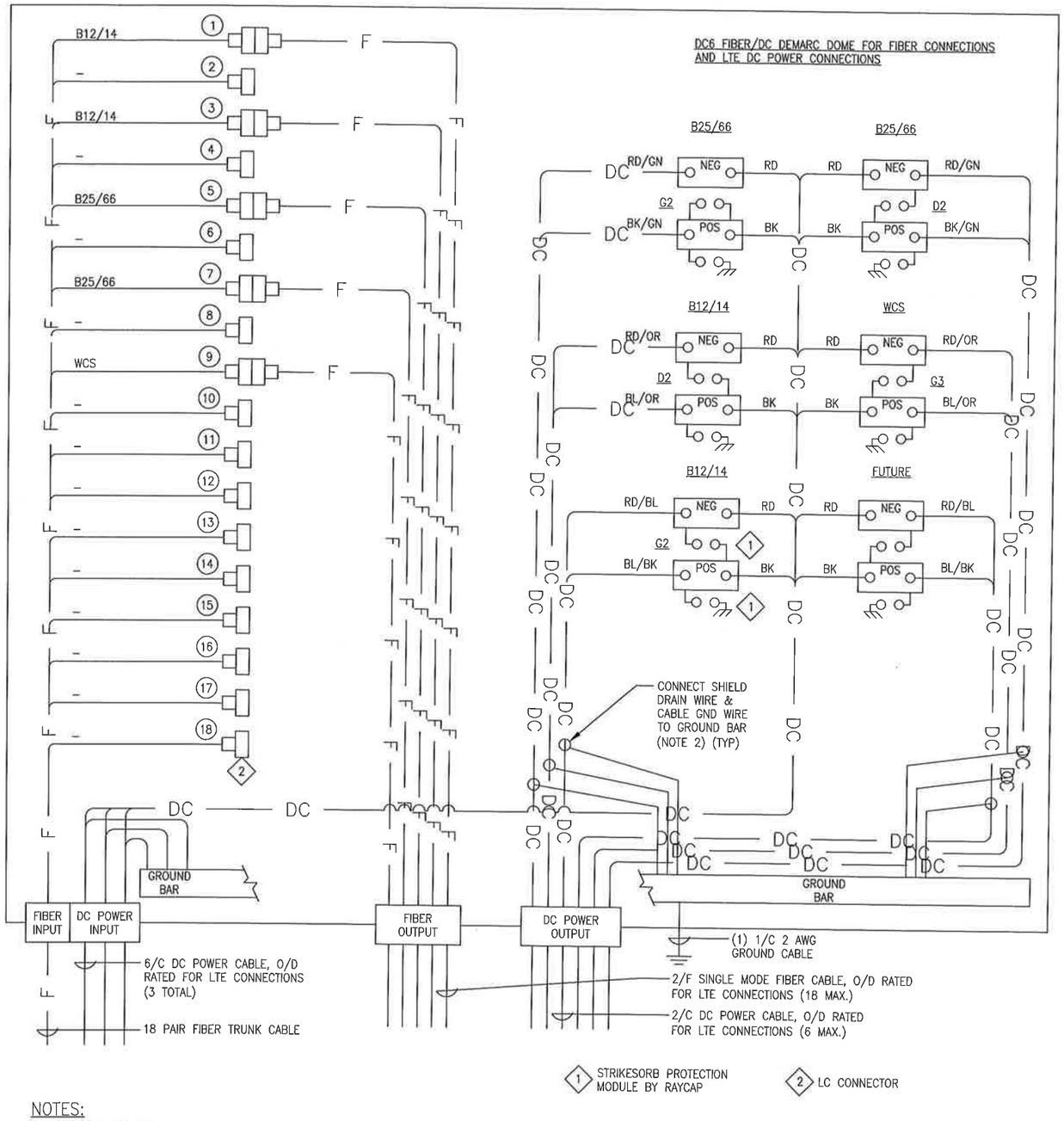
Drawing Title
DC6 WIRING DIAGRAM BETA

Drawing Number
C6



NOTES:
1. SEE RF CHART FOR CONDUCTOR SIZES.
2. WHEN SHIELDED CABLE IS USED CONNECT CABLE SHIELD DRAIN WIRE AND GROUND WIRE TO GROUND BAR.

1 / C7 RAYCAP DC6 FIBER/DC DEMARC DOME DETAIL (GAMMA SECTOR)
SCALE: NTS

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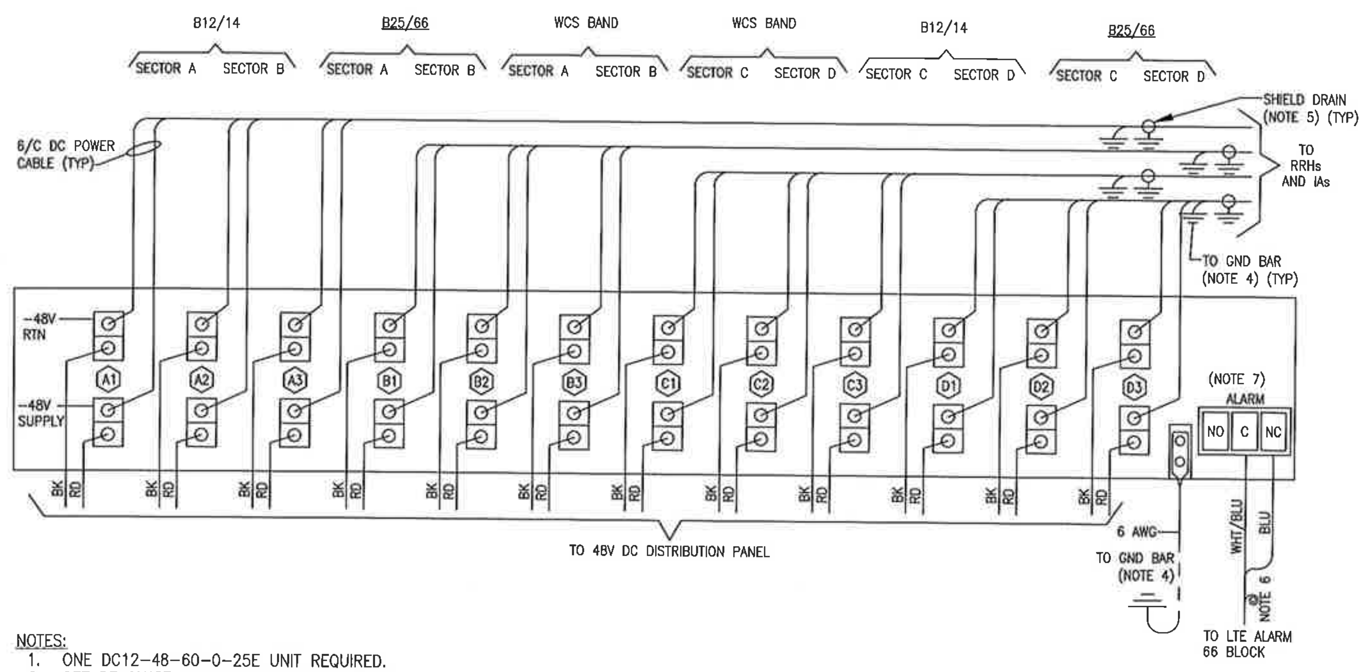
Drawing Title
DC6 WIRING DIAGRAM GAMMA

Drawing Number
C7



NOTES:

1. ONE DC12-48-60-0-25E UNIT REQUIRED.
2. SEE RF CHART FOR DC POWER CABLE CONDUCTOR SIZES.
3. CABLE TERMINALS FOR POWER CONNECTION SHALL BE COMPRESSION TYPE, 1-HOLE FOR 1/4"-20 STUDS.
4. CABLE TERMINAL FOR GROUND CONNECTION SHALL BE COMPRESSION TYPE, 2-HOLE 1"-CENTERS FOR 1/4"-20 STUDS.
5. CONNECTIONS TO RACK GROUND BAR SHALL BE MADE WITH 2-HOLE COMPRESSION TERMINALS.
6. WHEN SHIELDED CABLE IS USED, CONNECT CABLE SHIELD DRAIN WIRE TO RACK GROUND BAR. THIS CONNECTION SHALL BE INDEPENDENT OF THE CABLE GROUND WIRE CONNECTION.
7. TURN BACK AND STORE UNUSED CONDUCTORS.
8. INSTALL RAYCAP PROVIDED LOOP-BACK CONNECTOR ON THE LAST ACTIVE (POWERED) MODULE WHEN FEWER THAN 6 RRH's OR RRU's ARE DEPLOYED.

1 / C8

CONNECTION DIAGRAM OUTDOOR SURGE SUPPRESSION SYSTEM (RAYCAP DC12-48-60-0-25E)

SCALE: NTS

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STATE OF MARYLAND JOHN S. STEVENS PROFESSIONAL ENGINEER 36339

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Drawing Title

GROUNDING DETAILS

Drawing Number

C8

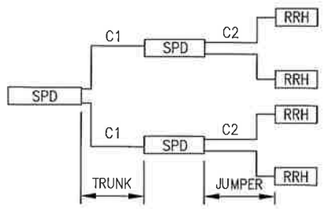


FIGURE 1 – TRUNK CABLE TO DC SURGE PROTECTION DEVICE (DC6/FC12/DC2)

MAXIMUM CABLE LENGTHS FOR FIGURE 1

NOKIA AIRSCALE DUAL RRH TRUNK/JUMPER LENGTH (FT)			
CABLE	4 AWG	6 AWG	8 AWG
C1	245	150	–
C2	–	–	12

NOKIA B5 RRH & ALU RRHs TRUNK/JUMPER LENGTH (FT)			
CABLE	4 AWG	6 AWG	8 AWG
C1	530	340	–
C2	–	–	12

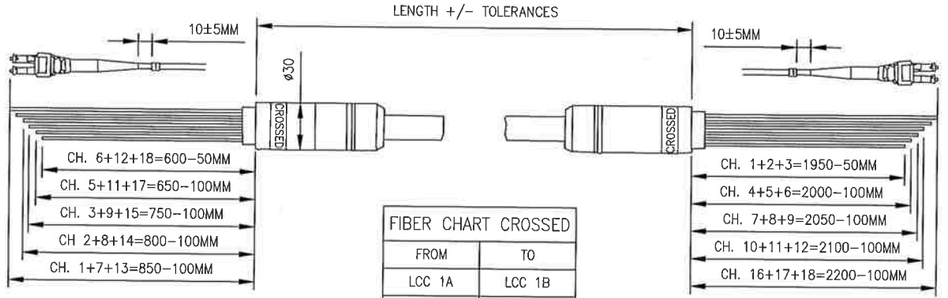
NOTES:

1. BASED ON POWER PLANT SUPPLY VOLTAGE OF –48VDC AND VOLTAGE AT RRHs OF –42VDC AND MAX. TEMPERATURE OF 60° CELSIUS.
2. CABLE LENGTHS BASED ON COMMSCOPE CABLES.

1 / C9 DC CABLE LENGTH CHART
NOT TO SCALE

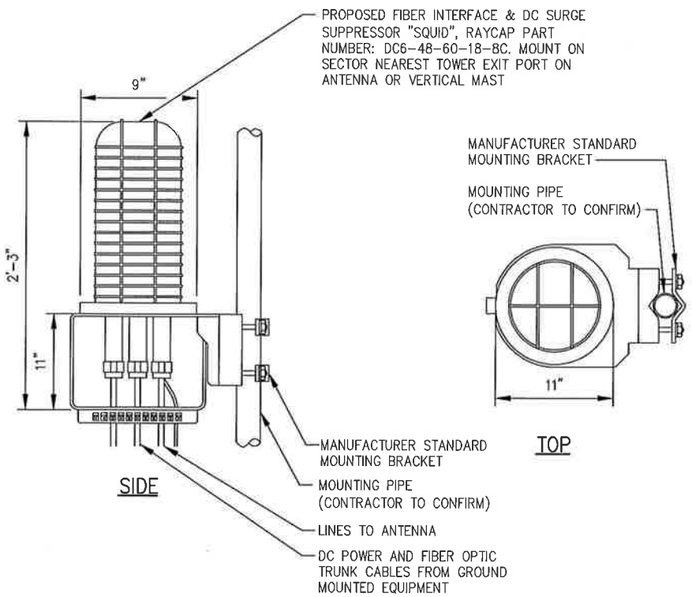
FIBER TRUNK CHANNEL	TECHNOLOGY	FREQUENCY BAND	SECTOR
1.1	LTE	700 B/C	ALPHA
1.2			BETA
1.3			GAMMA
1.4	LTE	B25 1900	ALPHA
1.5			BETA
1.6			GAMMA
1.7	LTE	700 FNET	ALPHA
1.8			BETA
1.9			GAMMA
2.1	LTE	AWS	ALPHA
2.2			BETA
2.3			GAMMA
2.4	LTE	WCS	ALPHA
2.5			BETA
2.6			GAMMA

2 / C9 FIBER TRUNK ASSIGNMENTS
NOT TO SCALE

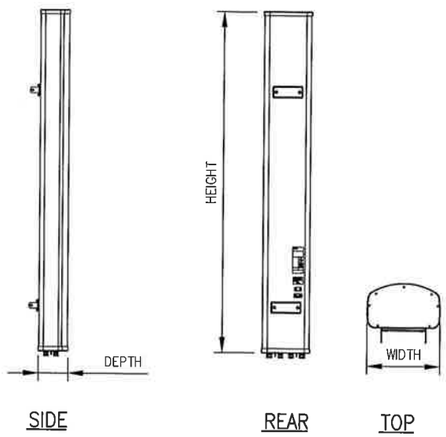


FIBER CHART CROSSED	
FROM	TO
LCC 1A	LCC 1B
LCC 1B	LCC 1A
LCC 2A	LCC 2B
LCC 2B	LCC 2A
LCC 3A	LCC 3B
LCC 3B	LCC 3A
...	...
...	...
LCC 18B	LCC 18A

3 / C9 FIBER CONNECTION DETAIL
NOT TO SCALE



4 / C9 DC6 DETAIL
NOT TO SCALE



COMMSCOPE MODEL NO.:	JAHH–45A–R3B
DIMENSIONS, HxWxD:	55.1"x18.0"x7.0"
WEIGHT:	73.9LBS

5 / C9 ANTENNA DETAIL
NOT TO SCALE

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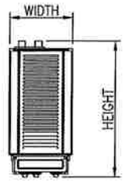
Drawing Title
FIBER/DC DETAILS

Drawing Number
C9

REMOTE RADIO HEAD (RRH)



SIZE AND WEIGHT TABLE

RRH MODEL	HEIGHT x WIDTH x DEPTH	WEIGHT
ALU RRH 2x40-07AT	24.8"x11.5"x5.7"	52.91 LBS
ALU B25 RRH 4x30-4R	21.2"x11.97"x7.18"	52.9 LBS
ALU RRH 4x25-WCS-4R	31.5"x12.0"x8.7"	31.5 LBS
ALU B66A RRH4x45-4R	25.8"x11.8"x7.2"	52.9 LBS
FLEXI RRH 4T4R B14 160W FRBI	23.0"x13.0"x6.6"	53.0 LBS
NOKIA 4T4R B12/14 320W AHLBA	26.7"x12.8"x7.4"	99.2 LBS
NOKIA 4T4R B25/66 320W AHFIB	26.7"x12.8"x6.3"	88.18 LBS
NOKIA 4T4R B5 160W AHCA	13.2"x11.6"x6.4"	36.81 LBS

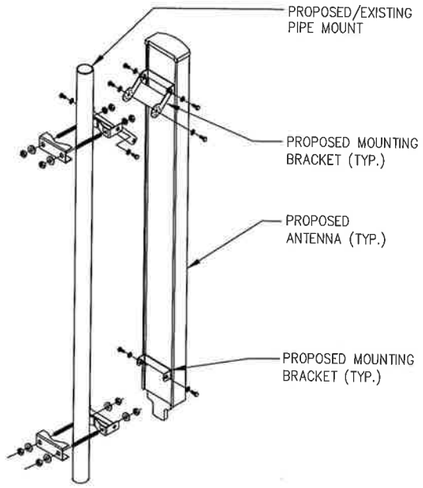
CLEARANCE TABLE

	CLEARANCE REQ'D
FRONT	36" FOR INSTALLATION ACCESS
REAR	2" (0" WITH SUPPLIED MOUNTING BRACKETS)
RIGHT	4" FOR AIR FLOW
LEFT	4" FOR AIR FLOW
TOP	12" FOR AIR FLOW
BOTTOM	12" FOR CONDUIT ROUTING

NOTES:

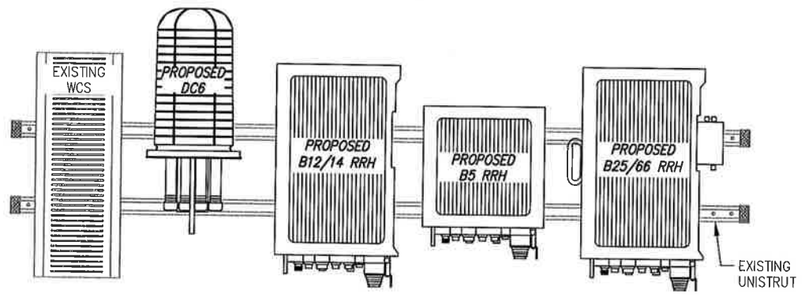
1. ALCATEL-LUCENT/NOKIA VIA AT&T SUPPLIES RRH AND RRH MOUNTING BRACKET. SUBCONTRACTOR SHALL SUPPLY UNISTRUT AND INSTALL RRHs AND ALL MOUNTING HARDWARE INCLUDING ALU/NOKIA RRH WALL MOUNTING BRACKET IF NECESSARY. ALU/NOKIA MAKES CABLE TERMINATIONS.
2. DIMENSIONS AND WEIGHTS ARE FOR RRH WITHOUT MOUNTING BRACKET

1 / C10 RRH DETAIL
SCALE: NTS



NOTE: CONTRACTOR IS TO USE MANUFACTURERS MANUAL BRACKETS AND HARDWARE. NO U-BOLTS OR BEAM CLAMPS ALLOWED

2 / C10 MOUNTING DETAIL
SCALE: NTS



NOTES:

1. FC12 LOCATED AT ALPHA SECTOR ONLY.
2. ALCATEL-LUCENT (ALU)/NOKIA VIA AT&T SUPPLIES THE RRH. SUBCONTRACTOR SHALL SUPPLY ALL OTHER MATERIALS AND INSTALL ALL MOUNTING HARDWARE. ALU/NOKIA INSTALLS RRH AND MAKES CABLE TERMINATIONS OR AS SCOPED BY MARKET.
3. CHANNEL AND MOUNTING HARDWARE SHALL HAVE HOT-DIPPED GALVANIZED FINISH.
4. MOUNT RRH TO UNISTRUT WITH 3/8"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER BRACKET. SUBCONTRACTOR SHALL SUPPLY.
5. MOUNT FIBER AND POWER DISTRIBUTION BOX WITH FOUR (4) 1/4"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS.
6. NO PAINTING OF THE RRH OR SOLAR SHIELD IS ALLOWED.

3 / C10 RRH MOUNTING DETAIL
SCALE: NTS

at&t

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STATE OF MARYLAND
JOHN S. STEVENS
36339
PROFESSIONAL ENGINEER
JAN 04 2019

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 36339 EXP. 12/12/2020

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Drawn: HAM
Designed: MRL
Checked: AJD

Project Number:
499-002

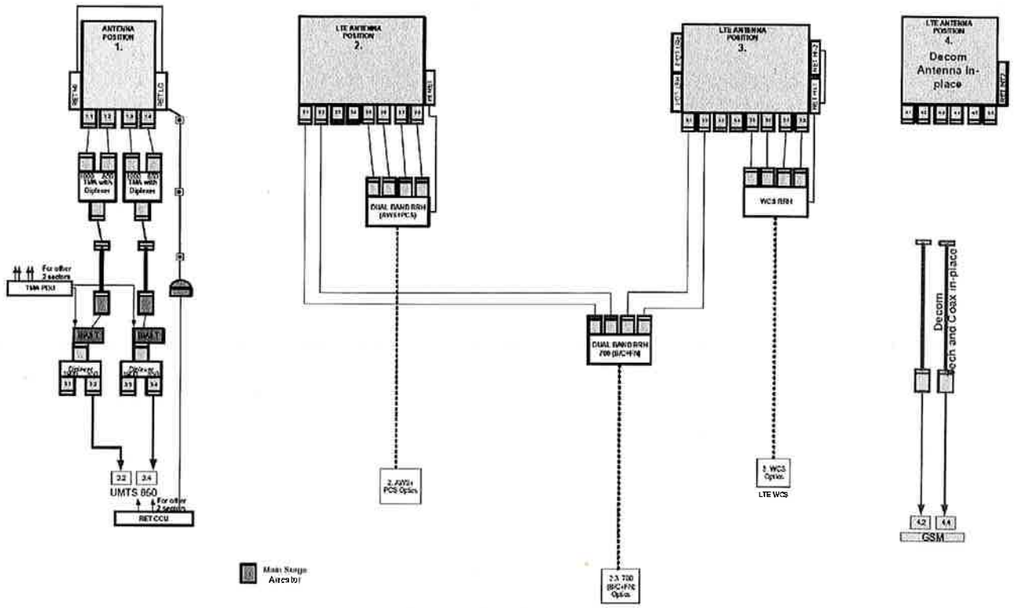
Project Title:
CRESCENT
SITE ID: 55113
FA # 10006543
4600 EAST WEST HIGHWAY
BETHESDA, MD 20814

Prepared For:
smartlink
1362 MELLON RD
HANOVER, MD 21076
TEL (410) 582-8043
FAX (443) 221-2962

Drawing Title
EQUIPMENT DETAILS

Drawing Number
C10

FN7_P1QU_P2OFN7LPA1A3_P3OFN7LW_P4H_AF2_DF2_TMA1_ERET3_NoDC_A



ALPHA SECTOR

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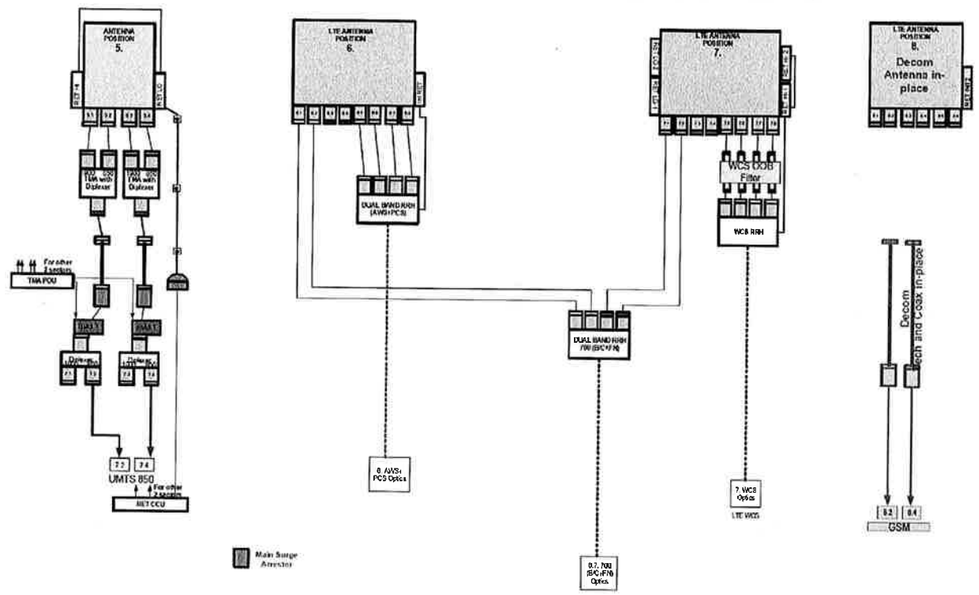

BETA SECTOR

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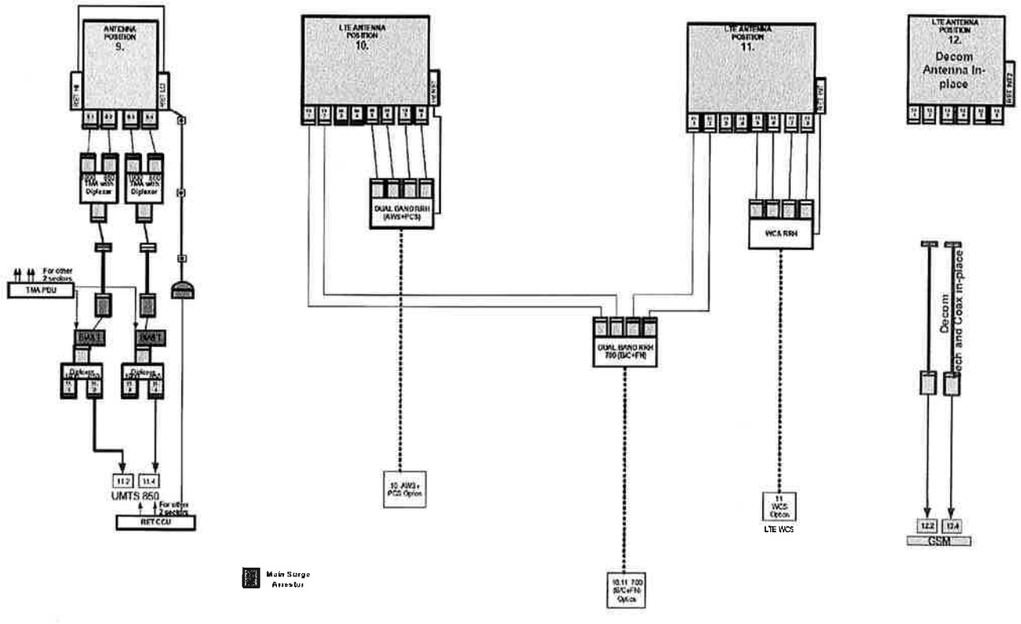

GAMMA SECTOR

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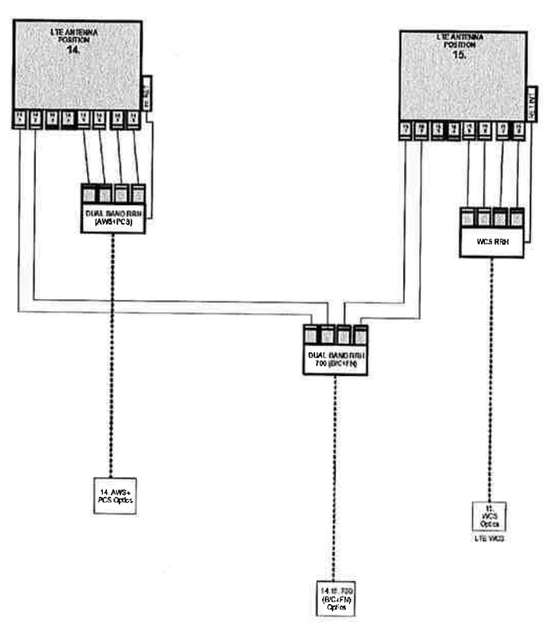

DELTA SECTOR

1 / C11 PLUMBING DIAGRAM (FINAL CONFIGURATION)
NOT TO SCALE

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Checked: AJD

Project Number: 499-002

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SITE ID: 55113
FA # 10006543
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BETHESDA, MD 20814

Prepared For:

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1362 MELLON RD
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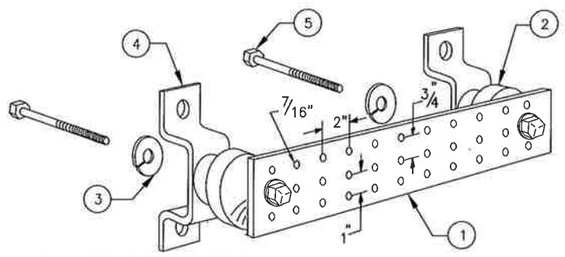
Drawing Title
RF PLUMBING DIAGRAM

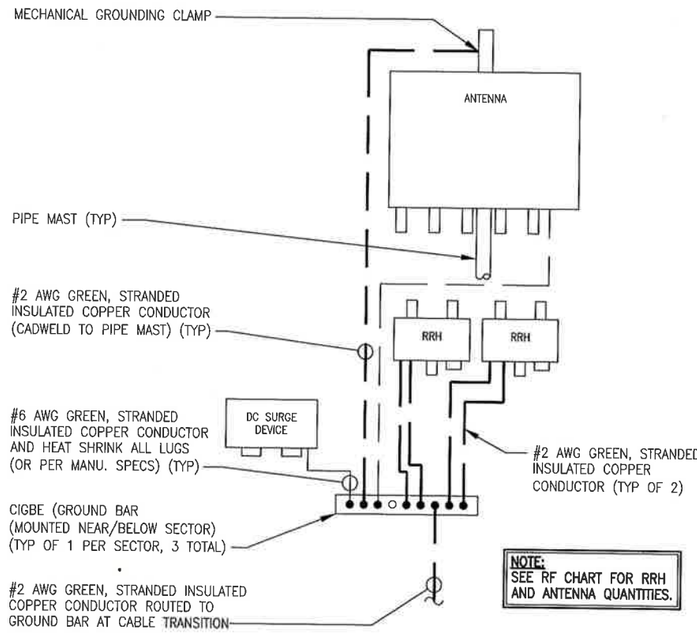
Drawing Number
C11



LEGEND

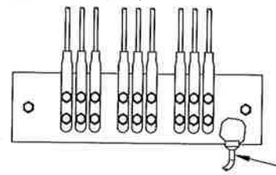
1 – SOLID TINNED COPPER GROUND BAR, 1/4"x 4"x 20" MIN., NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
2 – INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061–4
3 – 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015–8
4 – WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A–6056
5 – 5/8–11 X 1" H.H.C.S. BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012–1
6 – GROUND BAR SHALL BE SIZED TO ACCOMODATE ALL GROUNDING CONNECTIONS REQUIRED PLUS PROVIDE 50% SPARE CAPACITY
7 – GROUND BARS SHALL NEITHER BE FIELD FABRICATED NOR NEW HOLES DRILLED
8 – GROUND LUGS SHALL MATCH THE HOLE SPACING ON THE BAR
9 – HARDWARE DIAMETER SHALL BE MINIMUM 3/8"

1 / C12 GROUND BAR
SCALE: NTS



2 / C12 CONNECTION OF SECTOR EQUIPMENT TO GROUNDING BAR DETAIL
SCALE: NTS

FLAT WASHERS ON ALL LUGS; NO OVERLAPPING PERMITTED.



3 / C12 INSTALLATION OF GROUND WIRE TO GROUND BAR DETAIL
SCALE: NTS

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Drawing Title
GROUNDING DETAILS

Drawing Number
C12

GENERAL NOTES:

1. THESE DOCUMENTS WERE DESIGNED IN ACCORDANCE WITH THE LATEST VERSION OF APPLICABLE LOCAL/STATE/COUNTY/CITY BUILDING CODES, AS WELL AS ANSI/TIA-222 STANDARD, AWWA-D100 STANDARD, NDS, NEC, MSJC, AND/OR THE LATEST VERSION OF THE INTERNATIONAL BUILDING CODE, UNLESS NOTED OTHERWISE IN THE CORRESPONDING STRUCTURAL REPORT.
2. ALL CONSTRUCTION METHODS SHOULD FOLLOW STANDARDS OF GOOD CONSTRUCTION PRACTICE.
3. ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN SIMILAR CONSTRUCTION.
4. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. IF OBSTRUCTIONS ARE FOUND, CONTRACTOR SHALL NOTIFY ENGINEER OF RECORD PRIOR TO CONTINUING WORK.
5. ANY CHANGES OR ADDITIONS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS, AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL CHANGES OR ADDITIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND/OR CONSTRUCTION.
6. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE DURING CONSTRUCTION. TIA-1019-A-2011 IS AN APPROPRIATE REFERENCE FOR THOSE DESIGNS MEETING TIA STANDARDS. THE ENGINEER OF RECORD MAY PROVIDE FORMAL RIGGING PLANS AT THE REQUEST AND EXPENSE OF THE CONTRACTOR.
7. INSTALLATION SHALL NOT INTERFERE NOR DENY ADEQUATE ACCESS TO OR FROM ANY EXISTING OR PROPOSED OPERATIONAL AND SAFETY EQUIPMENT.
8. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO ANY FABRICATION. CONTACT INFINIGY ENGINEERING IF ANY DISCREPANCIES EXIST.

STEEL CONSTRUCTION NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE AISC MANUAL OF STEEL CONSTRUCTION 14TH EDITION, FOR THE DESIGN AND FABRICATION OF STEEL COMPONENTS.
2. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES, AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS' RECOMMENDATIONS.
3. ALL FIELD DRILLED HOLES TO BE USED FOR FIELD BOLTING INSTALLATION SHALL BE STANDARD HOLES, AS DEFINED BY AISC, UNLESS NOTED OTHERWISE.
4. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
5. ALL STEEL MEMBERS AND CONNECTIONS SHALL MEET THE FOLLOWING GRADES:
   - ANGLES, CHANNELS, PLATES AND BARS TO BE A36. Fy=36 KSI, U.N.O.
   - W SHAPES TO BE A992. Fy=50 KSI, U.N.O.
   - RECTANGULAR HSS TO BE A500, GRADE B. FY=46 KSI, U.N.O.
   - ROUND HSS TO BE A500, GRADE B. FY=42 KSI, U.N.O.
   - STEEL PIPE TO BE A53, GRADE B. Fy=35 KSI, U.N.O.
   - BOLTS TO BE A325-X. Fu=120 KSI, U.N.O.
   - U-BOLTS AND LAG SCREWS TO BE A307 GR A. Fu=60 KSI, U.N.O.
6. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES, U.N.O.
7. ALL WELDING SHALL CONFORM TO AISC AND AWS D1.1 LATEST EDITION.
8. ALL HILTI ANCHORS TO BE CARBON STEEL, U.N.O.
   - MECHANICAL ANCHORS: KWIK BOLT-TZ, U.N.O.
   - CMU BLOCK ANCHORS: ADHESIVE - HY120, U.N.O.
   - CONCRETE ANCHORS: ADHESIVE - HY150, U.N.O.
   - CONCRETE REBAR: ADHESIVE - RE500, U.N.O.
9. ALL STUDS TO BE NELSON CAPACITOR DISCHARGE 1/4"-20 LOW CARBON STEEL COPPER-FLASH AT 55 KSI ULT/50 KSI YIELD, U.N.O.
10. BOLTS SHALL BE TIGHTENED TO A "SNUG TIGHT" CONDITION AS DEFINED BY AISC.
11. MINIMUM EDGE DISTANCES SHALL CONFORM TO AISC TABLE J3.4.

CONCRETE CONSTRUCTION NOTES:

1. CONCRETE TO BE 4000 PSI @ 28 DAYS. REINFORCING BAR TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. CONCRETE INSTALLATION TO CONFORM TO ACI-318 BUILDING REQUIREMENTS FOR REINFORCED CONCRETE. ALL CONCRETE TO BE PLACED AGAINST UNDISTURBED EARTH FREE OF WATER AND ALL FOREIGN OBJECTS AND MATERIALS. A MINIMUM OF THREE INCHES OF CONCRETE SHALL COVER ALL REINFORCEMENT. WELDING OF REBAR IS NOT PERMITTED.
2. EXISTING CONCRETE SURFACES THAT ARE TO BE IN CONTACT WITH NEW PROPOSED CONCRETE SHOULD BE WIRE BRUSHED CLEAN AND TREATED WITH APPROPRIATE MECHANICAL SCRATCH COAT AND REPAIR MATERIALS OR APPROPRIATE CHEMICAL METHODS SUCH AS THE APPLICATION OF A BONDING AGENT, EX. SAKRETE OR EQUIVALENT, TO ENSURE A QUALITY BOND BETWEEN EXISTING AND PROPOSED CONCRETE SURFACES.

FIBER REINFORCED POLYMER (FRP) NOTES:

1. FRP PLATES, SHAPES, BOLTS AND NUTS (STUD/NUT ASSEMBLIES) SHALL CONFORM TO ASTM D638, 695, 790. PLATES AND SHAPES TO BE FY = 5.35 KSI LW (SAFETY FACTOR OF 8), .945 KSI CW (SAFETY FACTOR OF 8) MIN.
2. IF FIELD FABRICATION IS REQUIRED, ALL CUT EDGES AND DRILLED HOLES TO BE SEALED USING VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
3. ALL FASTENERS TO BE 1/2" DIA FRP THREADED ROD WITH FIBER REINFORCED THERMOPLASTIC NUT, SPACED AT 12 INCHES ON CENTER MAXIMUM, U.N.O., FOR PANELS AND AS DESIGNED FOR STRUCTURAL MEMBERS.
4. THE COLOR AND SURFACE PATTERN OF EXPOSED FRP PANELS SHALL MATCH THE EXTERIOR OF THE EXISTING BUILDING, U.N.O.
5. STUD/NUT ASSEMBLIES SHOULD BE LUBRICATED FOR INSTALLATION
6. ENSURE BEARING SURFACES OF THE NUTS ARE PARALLEL TO THE SURFACES BEING FASTENED.
7. TORQUE BOLTS ACCORDING TO THE FOLLOWING TABLE:

INSTALLATION TORQUE TABLE

SIZE	ULTIMATE TORQUE STRENGTH	RECOMMENDED MAXIMUM INSTALLATION TORQUE
3/8-16 UNC	8 FT-LBS	4 FT-LBS
1/2-13 UNC	18 FT-LBS	8 FT-LBS
5/8-11 UNC	35 FT-LBS	16 FT-LBS
3/4-10 UNC	50 FT-LBS	24 FT-LBS
1-8 UNC	110 FT-LBS	50 FT-LBS

8. WHEN TIGHTENING FRP STUD/NUT ASSEMBLIES, WRENCHES MUST MAKE FULL CONTACT WITH ALL NUT EDGES. A STANDARD SIX POINT SOCKET IS RECOMMENDED.
9. STUD/NUT ASSEMBLIES SHOULD BE BONDED BY APPLYING BONDING AGENT TO ENTIRE NUT AND EXPOSED STUD.
10. ALL FRP MATERIALS TO BE PROVIDED BY FIBERGRATE COMPOSITE STRUCTURES, DALLAS TX, OR APPROVED EQUAL.
11. ALL FRP SHAPES TO BE DYNAFORM PULTRUDED STRUCTURAL SHAPES.
12. ALL FRP PLATES TO BE FIBERPLATE MOLDED FRP PLATE.
13. ALL FRP PANELS TO BE FIBERPLATE CLADDING PANEL.
14. EACH FRP PANEL TO BE IDENTIFIED WITH LARR#25536 AND FIBERGRATE COMPOSITE STRUCTURAL LABEL.
15. FRP MATERIAL TO BE CLASSIFIED AS CC1 OR BETTER, AND HAVE MAXIMUM FLAME SPREAD OF 50.
16. ALL DESIGN AND CONSTRUCTION TO BE COMPLETED IN ACCORDANCE WITH LOS ANGELES RESEARCH REPORT RR25536, DATED FEBRUARY 1, 2016.
17. SPECIAL INSPECTIONS MUST BE PROVIDED FOR ALL FRP INSTALLMENTS. SEE SPECIAL INSPECTION SECTION, THIS SHEET.

RATIO OF EDGE DISTANCE TO FRP FASTENER DIAMETER

	RANGE	RECOMMENDED
EDGE DISTANCE - CL* BOLT TO END	2.0-4.0	3.0
EDGE DISTANCE - CL* BOLT TO SIDE	1.5-3.5	2.5
BOLT PITCH - CL* TO CL*	4.0-5.0	5.0

WOOD CONSTRUCTION NOTES:

1. ALL EXISTING WOOD SHAPES ARE ASSUMED TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN.
2. ALL PROPOSED WOOD SHAPES ARE TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN. U.N.O.
3. ALL EXISTING AND PROPOSED GLUED LAMINATED TIMBERS ARE TO BE 24F-1.8C DOUGLAS FIR BALANCED WITH A REFERENCE DESIGN BENDING VALUE OF 2400 PSI MIN. U.N.O.

MASONRY CONSTRUCTION NOTES:

1. ALL BRICK TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
   - FOR INTERIOR/ABOVE GRADE APPLICATIONS TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 100 PSI SHALL BE USED. FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 133 PSI.
   - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.
2. ALL CMU TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
   - FOR INTERIOR/ABOVE GRADE APPLICATIONS, TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 64 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 158 PSI FOR FULLY GROUTED BLOCKS.
   - FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 84 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 163 PSI FOR FULLY GROUTED BLOCKS.
   - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.

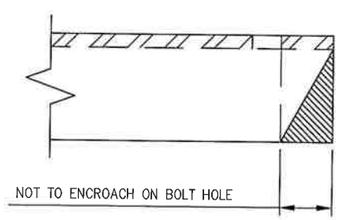
TOWER PLUMB & TENSION NOTES:

1. PLUMB AND TENSION TOWER UPON COMPLETION OF STRUCTURAL MODIFICATIONS DETAILED IN THESE DRAWINGS.
2. RETENSIONING OF EXISTING GUY WIRES SHALL BE PERFORMED AT A TIME WHEN THE WIND VELOCITY IS LESS THAN 10 MPH AT GROUND LEVEL AND WITH NO ICE ON THE STRUCTURE AND GUY WIRES.
3. PLUMB THE TOWER WHILE RETENSIONING THE EXISTING GUY WIRES. THE HORIZONTAL DISTANCE BETWEEN THE VERTICAL CENTERLINES AT ANY TWO ELEVATIONS SHALL NOT EXCEED 0.25% OF THE VERTICAL DISTANCE BETWEEN TWO ELEVATIONS FOR LATTICED STRUCTURES.
4. THE TWIST BETWEEN ANY TWO ELEVATIONS THROUGHOUT THE HEIGHT OF A LATTICE STRUCTURE SHALL NOT EXCEED 0.5 DEGREES IN 10 FEET. THE MAXIMUM TWIST OVER THE LATTICE STRUCTURE HEIGHT SHALL NOT EXCEED 5 DEGREES.

SPECIAL INSPECTIONS NOTES:

1. A QUALIFIED INDEPENDENT TESTING LABORATORY, EMPLOYED BY THE OWNER AND APPROVED BY THE JURISDICTION, SHALL PERFORM INSPECTION AND TESTING IN ACCORDANCE WITH THE THE GOVERNING BUILDING CODE, APPLICABLE SECTION(S) AS REQUIRED BY PROJECT SPECIFICATIONS FOR THE FOLLOWING CONSTRUCTION WORK:
   a. STRUCTURAL WELDING (CONTINUOUS INSPECTION OF FIELD WELDS ONLY).
   b. HIGH STRENGTH BOLTS (PERIODIC INSPECTION OF A325 AND/OR A490 BOLTS) TO BE TIGHTENED PER "TURN-OF-THE-NUT" METHOD.
   c. MECHANICAL AND EPOXIED ANCHORAGES.
   d. FIBER REINFORCED POLYMER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE FRP MATERIAL SPECIFIED ON THE APPROVED DESIGN DOCUMENTS IS BEING INSTALLED.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT ALL CUT EDGES AND DRILLED HOLES ARE PROPERLY SEALED USING A VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE STRUCTURE IS BUILT IN ACCORDANCE WITH THE APPROVED DESIGN DOCUMENTS.
2. THE INSPECTION AGENCY SHALL SUBMIT INSPECTION AND TEST REPORTS TO THE BUILDING DEPARTMENT, THE ENGINEER OF RECORD, AND THE OWNER UNLESS THE FABRICATOR IS APPROVED BY THE BUILDING OFFICIAL TO PERFORM WORK WITHOUT THE SPECIAL INSPECTIONS.

MAXIMUM ALLOWABLE ANGLE CLIP



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LICENSE NO. 36339 EXP. 12/12/2020

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No.	Submittal / Revision	App'd	Date
1	JURISDICTION COMMENTS	RMS	01/04/19
0	ISSUED FOR CONSTRUCTION	RMS	11/28/18
B	CLIENT COMMENTS	RMS	11/12/18
A	ISSUED FOR CLIENT REVIEW	HAM	11/08/18

Drawn: HAM
Designed: MRL
Checked: AJD

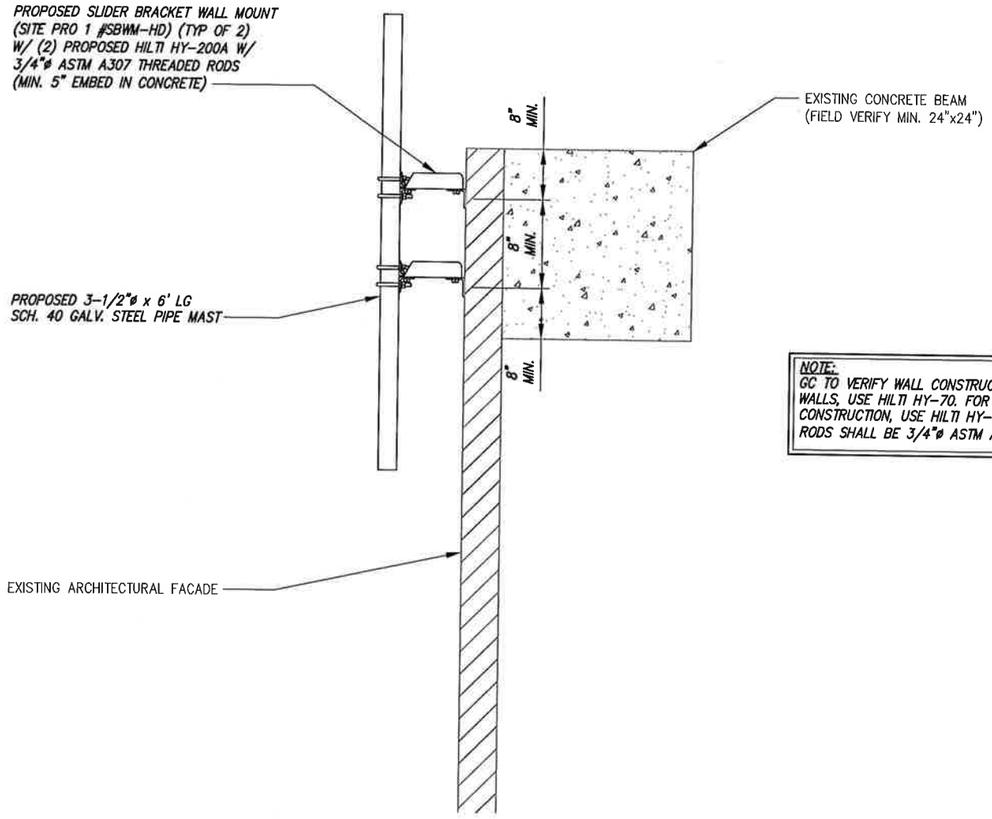
Project Number: 499-002

Project Title:
CRESCENT
SITE ID: 55113
FA # 10006543
4600 EAST WEST HIGHWAY
BETHESDA, MD 20814

Prepared For:
smartlink
1362 MELLON RD
HANOVER, MD 21076
TEL (410) 582-8043
FAX (443) 221-2962

Drawing Title
STRUCTURAL NOTES

Drawing Number
S1



NOTE:
GC TO VERIFY WALL CONSTRUCTION. FOR HOLLOW WALLS, USE HILTI HY-70. FOR SOLID WALL CONSTRUCTION, USE HILTI HY-200A. THREADED RODS SHALL BE 3/4"ø ASTM A307.

1 / S2 MOUNT DETAIL
SCALE: NOT TO SCALE

at&t

INFINIGY

1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

STATE OF MARYLAND
JOHN S. STEVENS
JAN 04 2019
PROFESSIONAL ENGINEER

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 36339 EXP. 12/12/2020

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TEL (410) 582-8043
FAX (443) 221-2962

Drawing Title
MOUNT DETAIL

Drawing Number
S2

App No: 2018110611

Applicant Name	Smartlink			Antenna Compliance	Yes
Application Type	Minor Modificatio	Updated	11/29/2018	Compliance Desc	
Carrier	AT&T Wireless	6409?	No	Antenna Location	Yes
Solution Type	Macro	Ann. Plan?	No	Antenna Loc. Desc.	
Existing	Existing	Equipment Gvt Us	No	Env. Assessment	
		Gvt. Use Desc.	N/A	Cat. Excluded?	
				Routine Env. Evaluation	checked

Application Description

Remove - (12) RRHs, adding (7) new RRHs, adding 4th sector, adding (2) new antenna, removing (6) DC trunks, (3) FC 12's, removing (9) DC 2's, adding (4) new dc 6's, adding (1) 18 pair fiber trunks, adding DC trunks. Adding a new battery cabinet

Site Id	84	Zoning	CBD-2
Structure Type	Building	Latitude	38.984525
Address	4600 East-West Hwy, Bethesda	Longitude	-77.0929
County Site Name	Crescent Bldg.	Ground Elevation	351
Carrier Site Name	Crescent	City	Bethesda
Site Owner	4600 Assoc. Limited Prtnrship	Lease Status	Leased
Structure Owner	Invisible Towers	PROW	No
Structure Height	138		

Justification

Existing cell site, minor modification

NearbySites (New Apps Only):

Screeningconsiderations(New Apps Only):

Friday, November 30, 2018

9:34:51 AM

App No: 2018110611

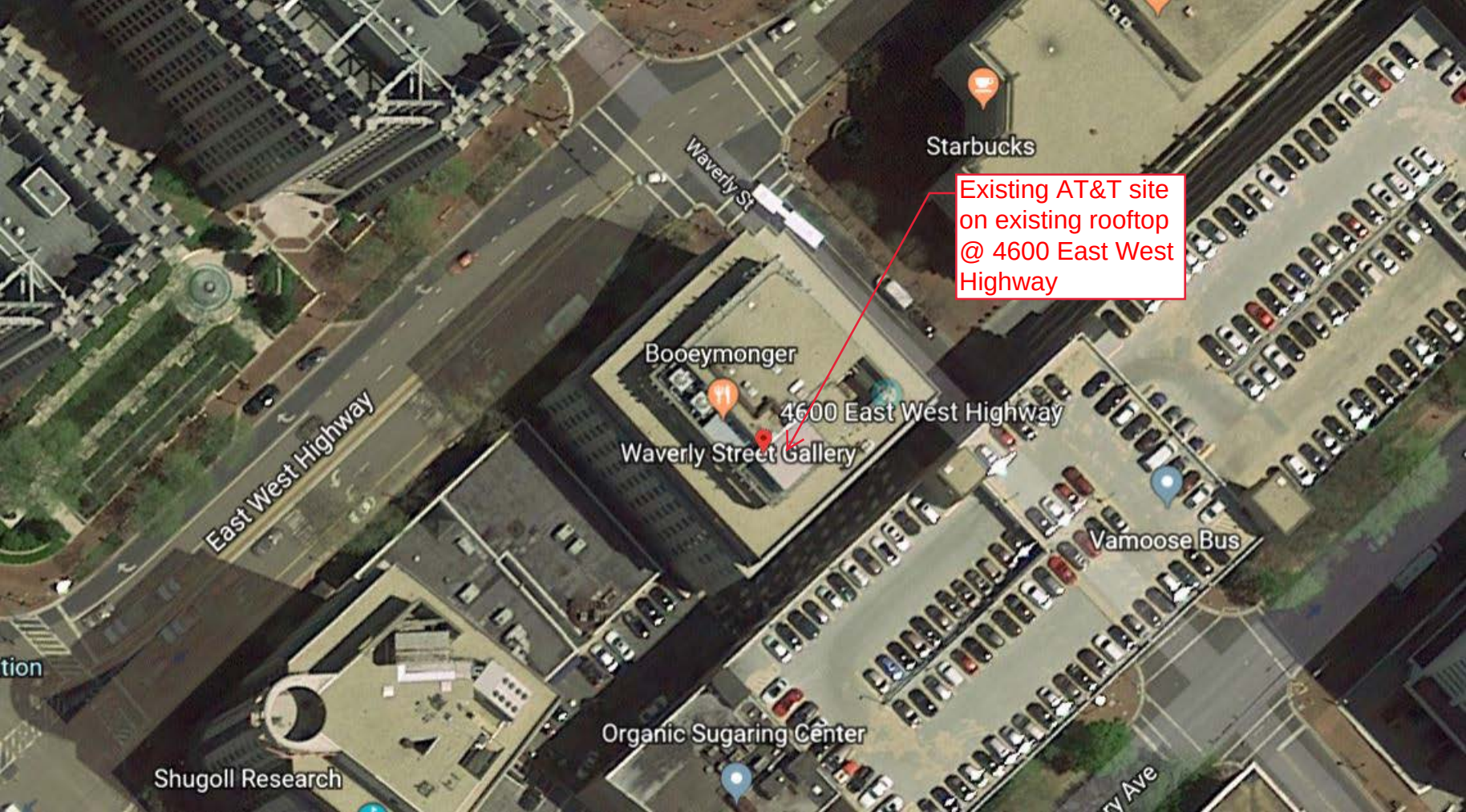
Antenna Model: JAHH-45A-R3B

Frequency: 1695-2360 MHz, 698-798 MHz, 824-897 MHz

RAD Center: 138 | Max ERP: 500 | Antenna Dimensions: 55.1 in x 18.0 in x 7 in | Quantity: 4

Friday, November 30, 2018

9:34:51 AM


Existing AT&T site on existing rooftop @ 4600 East West Highway
Starbucks
Waverly St
Booeymonger
4600 East West Highway
Waverly Street Gallery
East West Highway
Vamoose Bus
Organic Sugaring Center
Shugoll Research

JAHH-45A-R3B

8-port sector antenna, 2x 698–798, 2x 824-894 and 4x 1695–2360 MHz, 45° HPBW, low bands each have a RET and the high bands share a RET. Two internal SBTs.

- Internal SBT on low and high band allow remote RET control from the radio over the RF jumper cable
- One RET for 700MHz, one RET for 850MHz, and one RET for both high bands to ensure same tilt level for 4x Rx or 4x MIMO
- Internal filter on low band and interleaved dipole technology providing for attractive, low wind load mechanical package
- Separate RS-485 RET input/output for low and high band
- Narrow beamwidth capacity antenna for higher level of densification and enhanced data throughput

Electrical Specifications

Frequency Band, MHz	**698–798**	**824–894**	**1695–1880**	**1850–1990**	**1920–2200**	**2300–2360**
Gain, dBi	14.8	15.6	18.1	18.7	19.1	19.6
Beamwidth, Horizontal, degrees	49	42	44	43	42	39
Beamwidth, Vertical, degrees	18.6	16.6	7.7	7.2	6.7	6.0
Beam Tilt, degrees	2–18	2–18	1–9	1–9	1–9	1–9
USLS (First Lobe), dB	17	19	18	19	19	20
Front-to-Back Ratio at 180°, dB	33	32	36	37	36	37
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	25	25	25	25	25	25
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port, maximum, watts	200	200	300	300	300	250
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

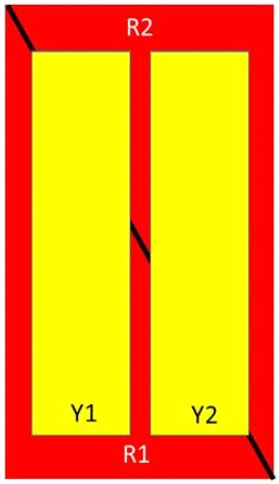
Electrical Specifications, BASTA*

Frequency Band, MHz	**698–798**	**824–894**	**1695–1880**	**1850–1990**	**1920–2200**	**2300–2360**
Gain by all Beam Tilts, average, dBi	14.5	15.4	17.7	18.4	18.8	19.4
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.4	±0.5	±0.4	±0.5	±0.3
Gain by Beam Tilt, average, dBi	2 ° | 14.6 10 ° | 14.5 18 ° | 14.3	2 ° | 15.6 10 ° | 15.4 18 ° | 15.1	1 ° | 17.7 5 ° | 17.8 9 ° | 17.5	1 ° | 18.5 5 ° | 18.5 9 ° | 18.2	1 ° | 18.8 5 ° | 18.9 9 ° | 18.6	1 ° | 19.5 5 ° | 19.5 9 ° | 19.2
Beamwidth, Horizontal Tolerance, degrees	±1.5	±2.7	±2.4	±1.5	±2.4	±1.3
Beamwidth, Vertical Tolerance, degrees	±1.2	±0.8	±0.3	±0.3	±0.4	±0.2
USLS, beampeak to 20° above beampeak, dB	17	22	14	14	15	15
Front-to-Back Total Power at 180° ± 30°, dB	24	23	29	31	32	32
CPR at Boresight, dB	22	24	17	21	20	19
CPR at Sector, dB	17	17	11	13	15	17

JAHH-45A-R3B

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

Array Layout



(Sizes of colored boxes are not true depictions of array sizes)

Array	Freq (MHz)	Conns	RET (SRET)	AISG RET UID
R1	698-798	1-2	1	ANxxxxxxxxxxxxxxxx1
R2	824-894	3-4	2	ANxxxxxxxxxxxxxxxx2
Y1	1695-2360	5-6	3	ANxxxxxxxxxxxxxxxx3
Y2	1695-2360	7-8		

Port Configuration

General Specifications

Operating Frequency Band	1695 – 2360 MHz | 698 – 798 MHz | 824 – 894 MHz
Antenna Type	Sector
Band	Multiband
Performance Note	Outdoor usage
Total Input Power, maximum	800 W @ 50 °C

Mechanical Specifications

RF Connector Quantity, total	8
RF Connector Quantity, low band	4
RF Connector Quantity, high band	4
RF Connector Interface	4.3-10 Female
Color	Light gray
Grounding Type	RF connector body grounded to reflector and mounting bracket
Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Location	Bottom
Wind Loading, frontal	795.0 N @ 150 km/h 178.7 lbf @ 150 km/h
Wind Loading, lateral	173.0 N @ 150 km/h 38.9 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Length	1399.0 mm | 55.1 in
Width	457.0 mm | 18.0 in
Depth	178.0 mm | 7.0 in
Net Weight, without mounting kit	33.5 kg | 73.9 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Internal Bias Tee	Port 1 | Port 5
Internal RET	High band (1) | Low band (2)
Power Consumption, idle state, maximum	1 W
Power Consumption, normal conditions, maximum	8 W
Protocol	3GPP/AISG 2.0 (Single RET)
RET Interface	8-pin DIN Female | 8-pin DIN Male

JAHH-45A-R3B

RET Interface, quantity	2 female | 2 male

Packed Dimensions

Length	1542.0 mm | 60.7 in
Width	608.0 mm | 23.9 in
Depth	346.0 mm | 13.6 in
Shipping Weight	46.5 kg | 102.5 lb

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

BSAMNT-3 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

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the solutions are endless

1033 WATERVLIET SHAKER RD, ALBANY, NY 12205

Mount Analysis Report

November 28, 2018

AT&T Site Name	Crescent
AT&T FA#	10006543
Pace Job#	MRWSH027627
PTN#	2251A0HYT4
Client	Smartlink
Carrier	AT&T
Infinigy Job Number	1106-A0001-B
Site Location	4600 East West Highway, Bethesda, MD 20814 38.9843720 N NAD83 77.0930390 W NAD83
Mount Centerline EL.	138.0 ft
Mount Classification	Pipe Mounts
Structural Usage Ratio	**13.0%**
Overall Result	**Pass**
Note	**Install pipe mounts per Infinigy Engineering's construction documents. Prior to installation of proposed cabinets, general contractor is to verify that the existing equipment room floor slab has minimum thickness of 4in.**

Upon reviewing the results of this analysis, it is our opinion that the mounts meet the specified TIA and ASCE code requirements. The mounts and connections for the proposed carrier are therefore deemed adequate to support the final loading configuration as listed in this report.

Ray Marshall
Structural Engineer II

Contents

Introduction

Infinigy Engineering has been requested to perform a mount analysis on the existing AT&T mounts. All supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The mount was analyzed using RISA-3D Version 17.0.1 analysis software.

Supporting Documentation

Mount Analysis Report	Maser Consulting P.A., dated October 3, 2017
Site Visit Photos	Infinigy Engineering PLLC, dated September 5, 2018
RF Design Sheet	AT&T RFDS#2510027, dated September 18, 2018
Construction Drawings	Infinigy Engineering, PLLC, dated November 14, 2018

Analysis Code Requirements

Wind Speed	89 mph (3-Second Gust, V_{ASD}) / 115 mph (3-Second Gust, V_{ULT})
Wind Speed w/ ice	40 mph (3-Second Gust) w/ 1/2" radial ice concurrent
TIA Revision	ANSI/TIA-222-G
Adopted IBC	2015 IBC
Structure Class	II
Exposure Category	B
Topographic Category	1
Calculated Crest Height	0 ft

Conclusion

Upon reviewing the results of this analysis, it is our opinion that the mounts meet the specified TIA code requirements. The mounts and connections are therefore deemed adequate to support the final loading configuration as listed in this report.

If you have any questions, require additional information, or actual conditions differ from those as detailed in this report please contact me via the information below:

Ray Marshall
Structural Engineering II | INFINIGY
2500 West Higgins Road, Suite 500, Hoffman Estates, IL 60169
(O) (847) 648-4068 | (M) (773) 656-3072
rmarshall@infinigy.com | www.infinigy.com

Final Configuration Loading

Mount CL (ft)	Rad. HT (ft)	Vert. O/S (ft)	Horiz. O/S (ft)*	Qty	Appurtenance	Carrier
138.0	138.0	0.0	--	3	Kathrein 742264	AT&T
		0.0	--	2	Kathrein 80010966	
		0.0	--	4	Commscope JAHH-45A-R3B	
		0.0	--	2	CCI OPA-65R-LCUU-H4	
		0.0	--	3	Commscope SBNHH-1D65A	
		0.0	--	4	Alcatel-Lucent RRH 4x25-WCS-4R	
		0.0	--	4	Nokia Airscale RRH 4T4R B12/14	
		0.0	--	4	Nokia Airscale RRH 4T4R B25/66	
		0.0	--	6	Powerwave LGP21401	
		0.0	--	1	KMW KFTDR00110030	
		0.0	--	3	Raycap DC6-48-60-18-8F	

(1) Horizontal Offset is defined as the distance from the left most edge of the mount face horizontal when viewed facing the rooftop.
(2) Radios are to be mounted behind existing screen wall at respective locations see appended documents for vertical locations.
(3) Raycaps are to be mounted behind existing screen wall at respective locations see appended documents for vertical locations.

Structure Usages

Mount Pipe	13.0%	Pass
RATING =	**13.0%**	**Pass**

Mount Connection Reactions

Reaction Data	Design Reactions	Analysis Reactions	Result
Shear (kip)	17.9	.14	.78%
Axial (kip)	32.1	.13	.40%
Unity Check	-	-	1.3%

***(2) 3/4" A307 Hilti threaded rods per connection.**

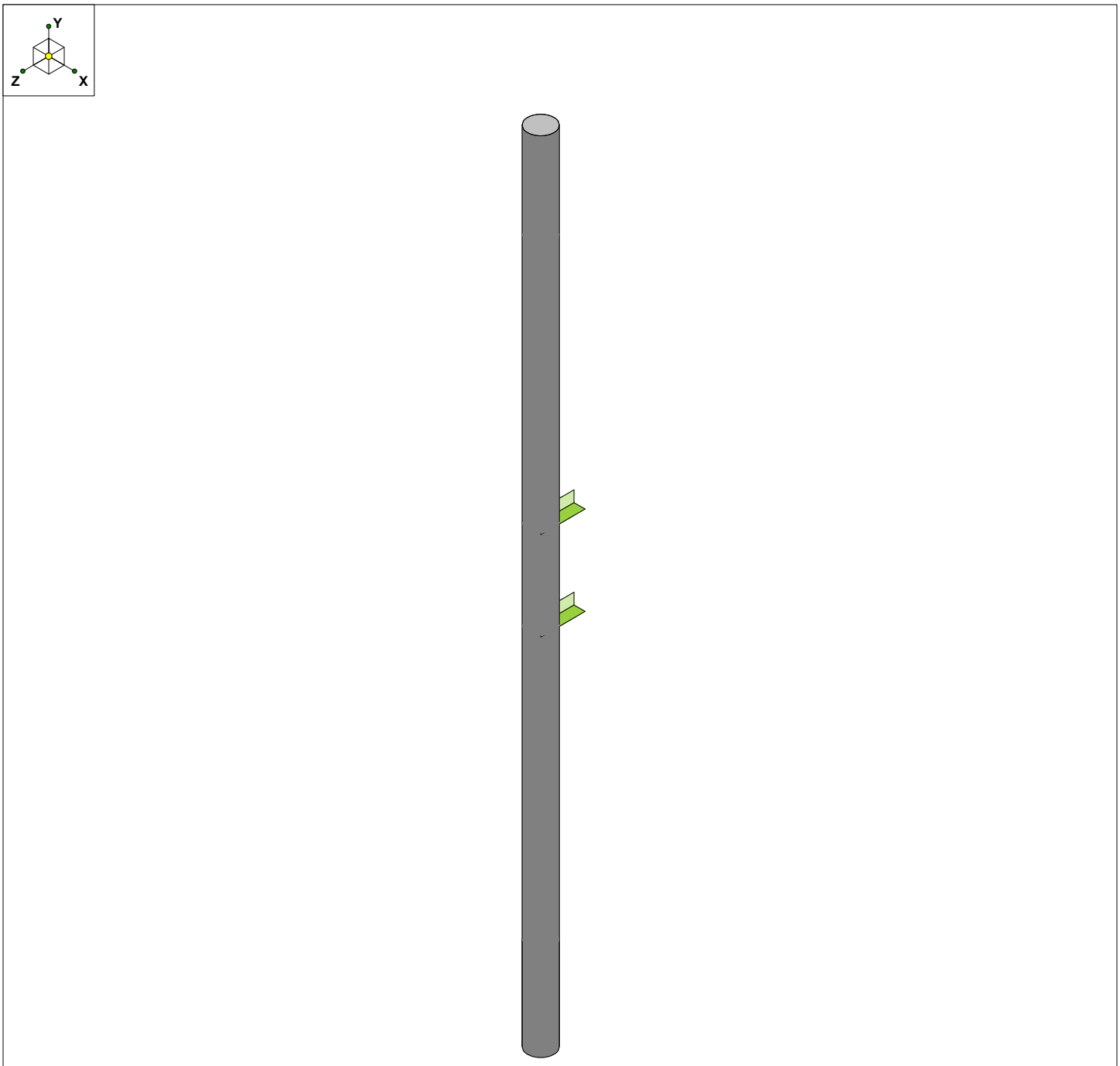
-Threaded rods reactions are acceptable when compared to manufacturer's listed capacities.

Assumptions and Limitations

Our structural calculations are completed assuming all information provided to Infinigy Engineering is accurate and applicable to this site. For the purposes of calculations, we assume an overall structure condition of "like new" and all members and connections to be free of corrosion and/or structural defects. The structure owner and/or contractor shall verify the structure's condition prior to installation of any proposed equipment. If actual conditions differ from those described in this report Infinigy Engineering should be notified immediately to complete a revised evaluation.

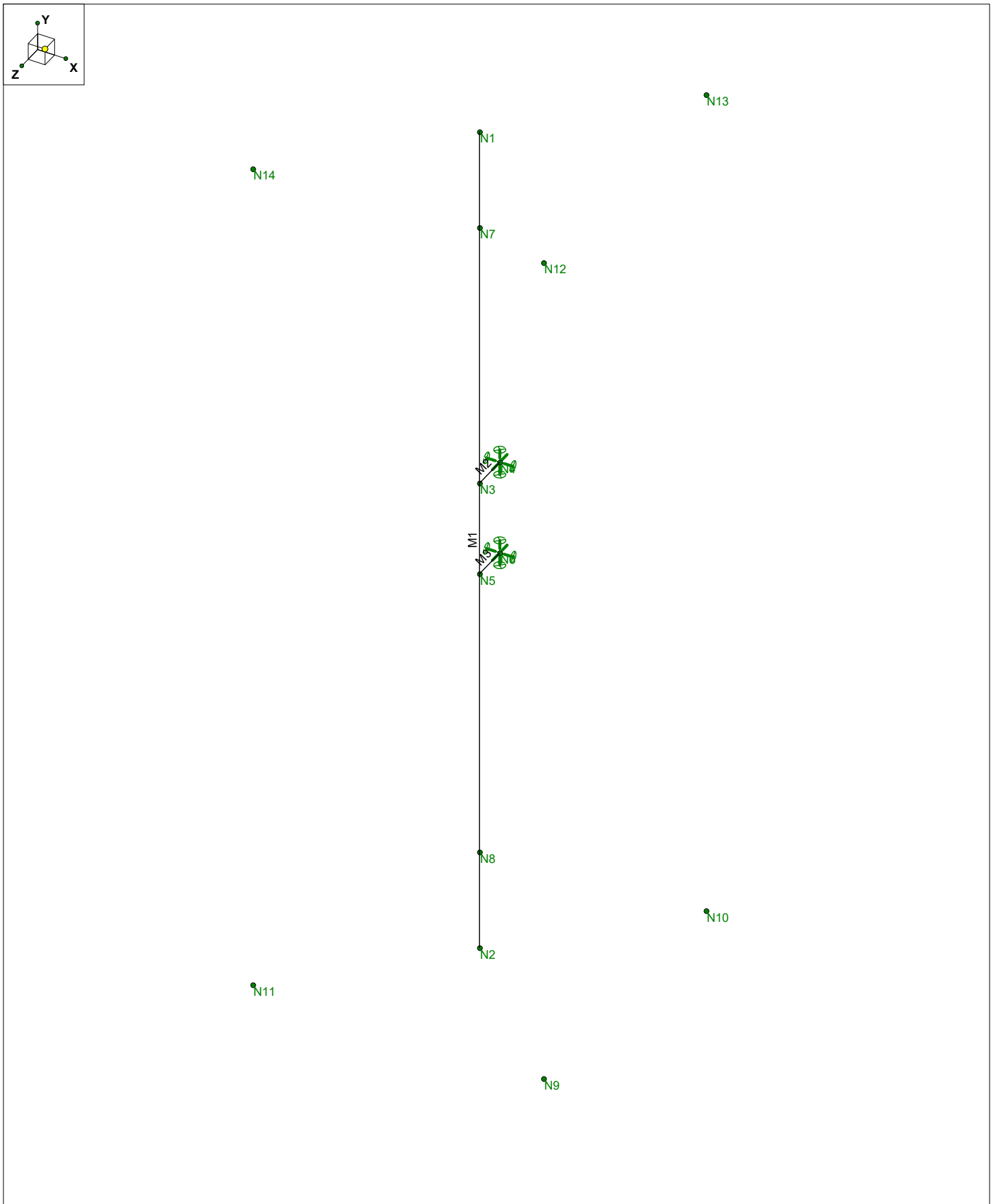
Our evaluation is completed using standard TIA, AISC, ACI, and ASCE methods and procedures. Our structural results are proprietary and should not be used by others as their own. Infinigy Engineering is not responsible for decisions made by others that are or are not based on our supplied assumptions and conclusions.

This report is an evaluation of the proposed carriers mount structure only and does not reflect adequacy of the existing tower, other mounts, or coax mounting attachments. These elements are assumed to be adequate for the purposes of this analysis and are assumed to have been installed per their manufacturer requirements.



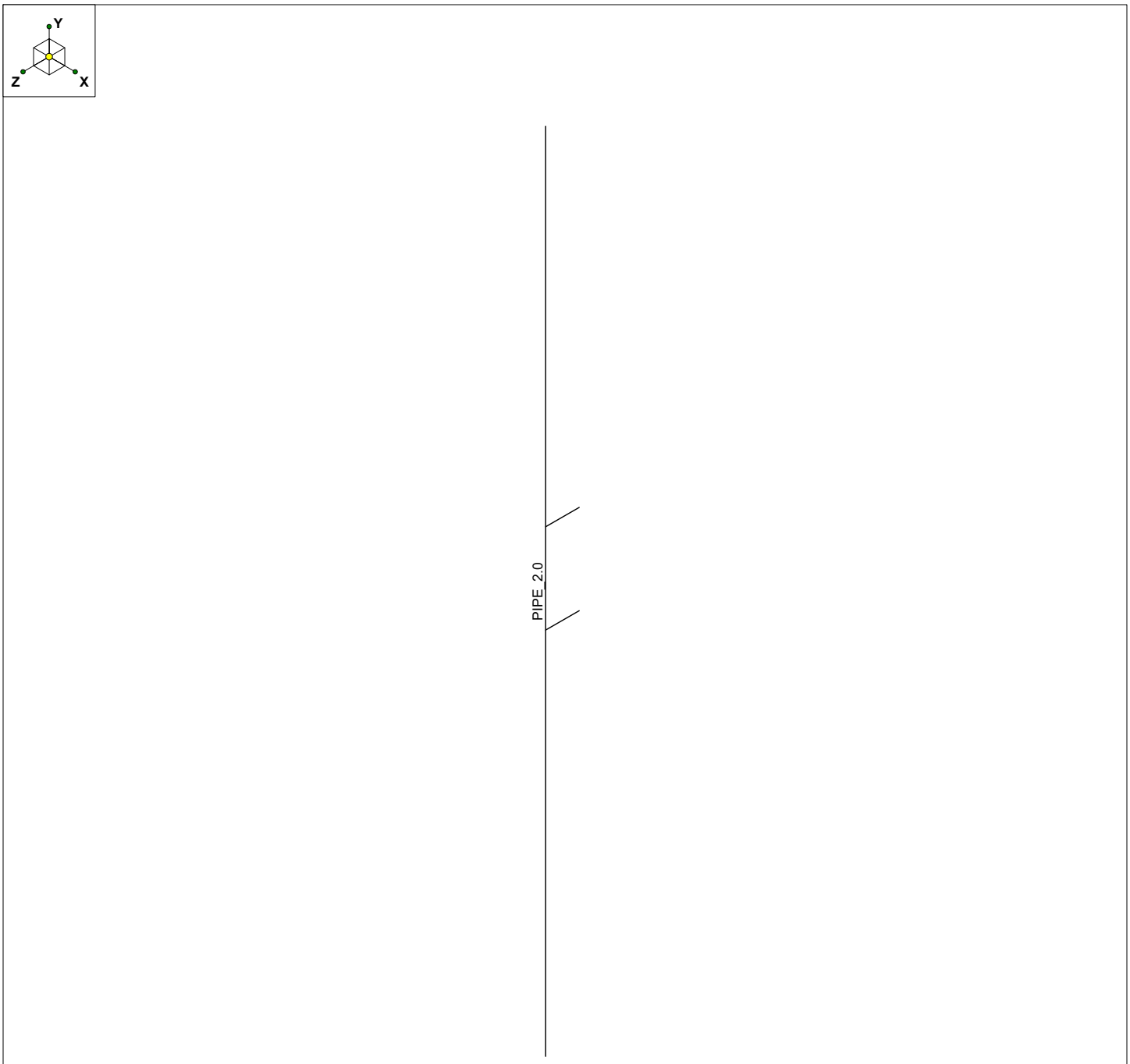
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Proposed Configuration
RAM		Nov 28, 2018 at 1:05 PM
1106-A0001-B		Crescent.R3D



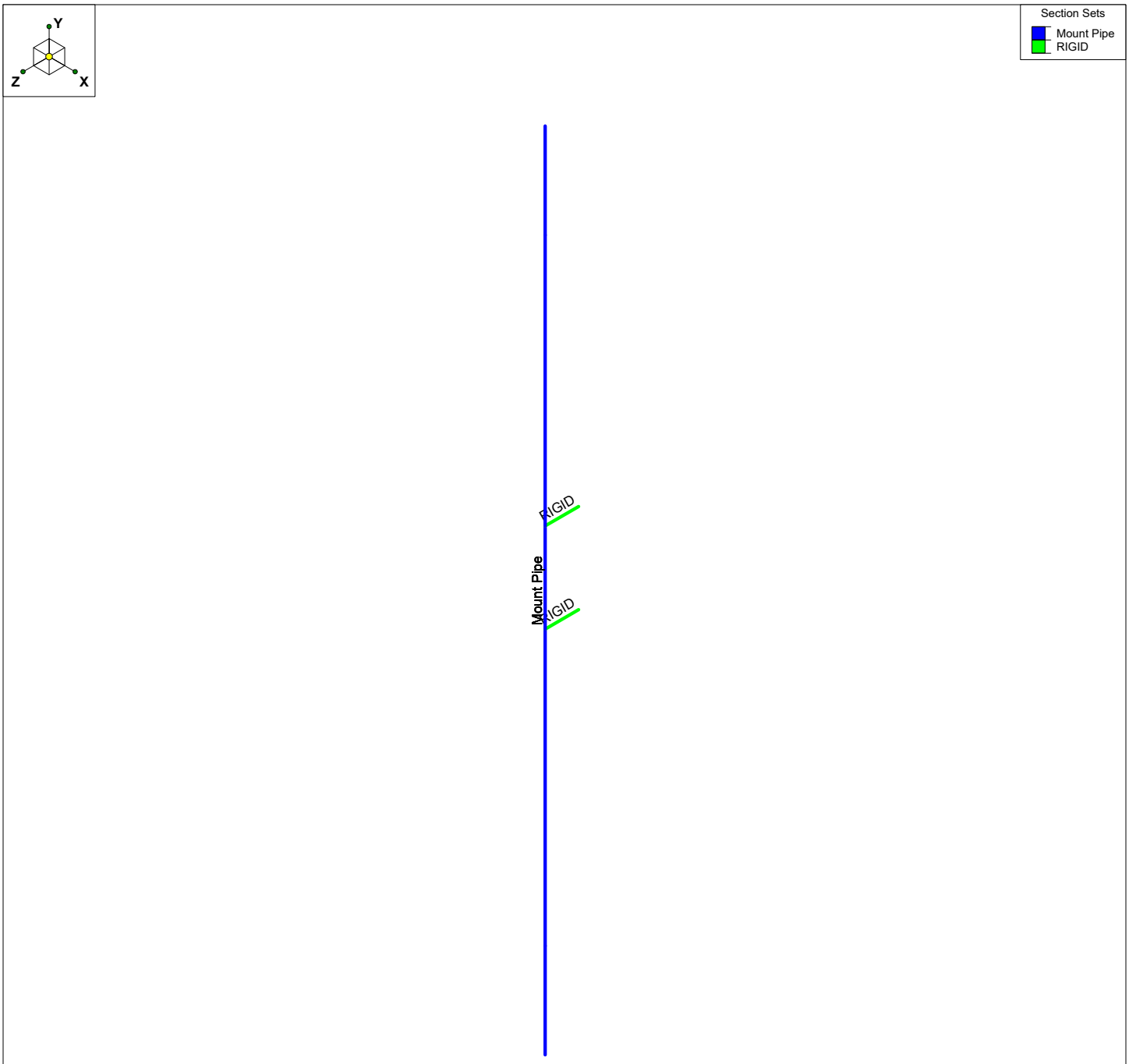
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Wireframe
RAM		Nov 28, 2018 at 1:01 PM
1106-A0001-B		Crescent.R3D



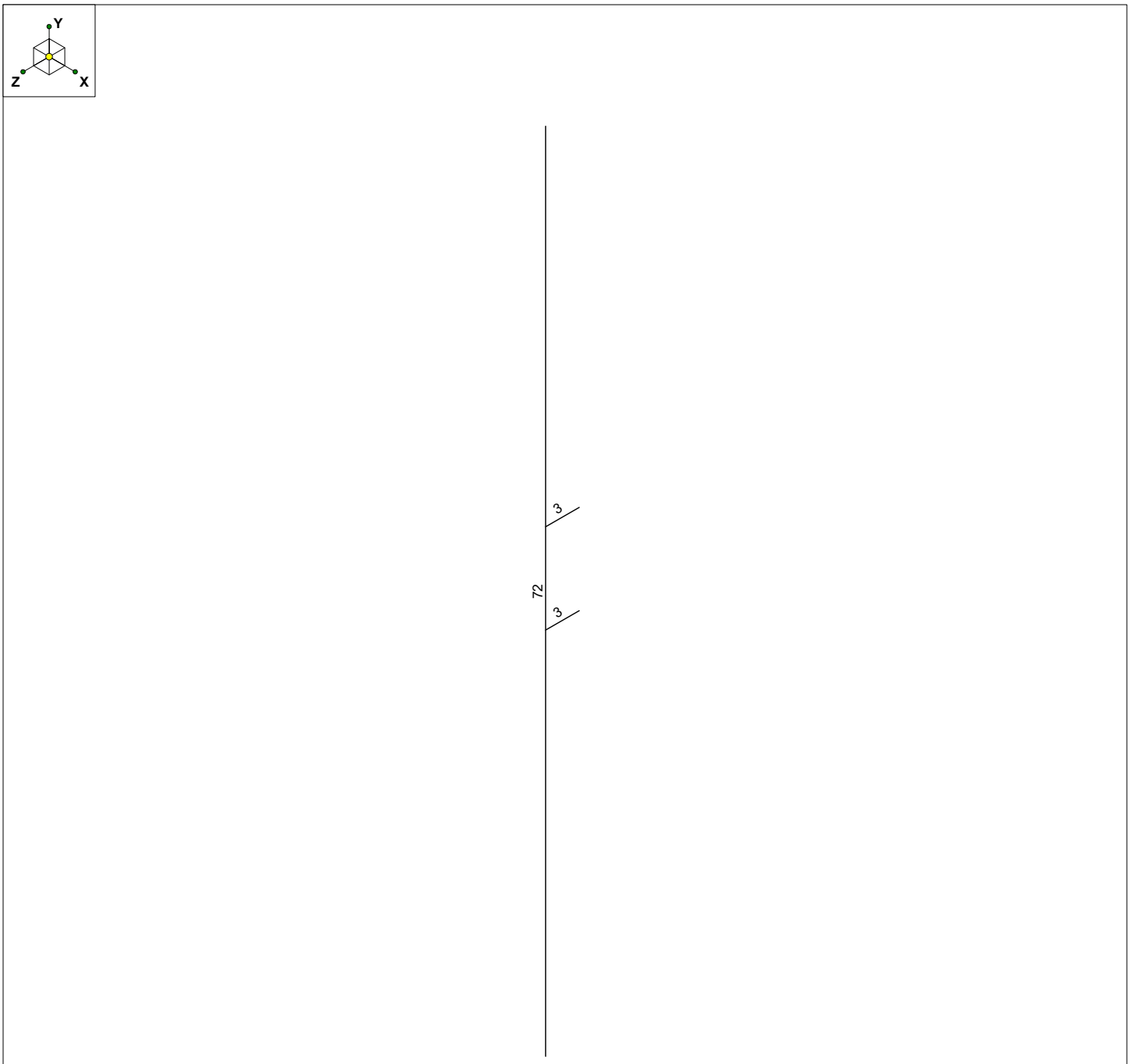
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Members
RAM		Nov 28, 2018 at 1:07 PM
1106-A0001-B		Crescent.R3D



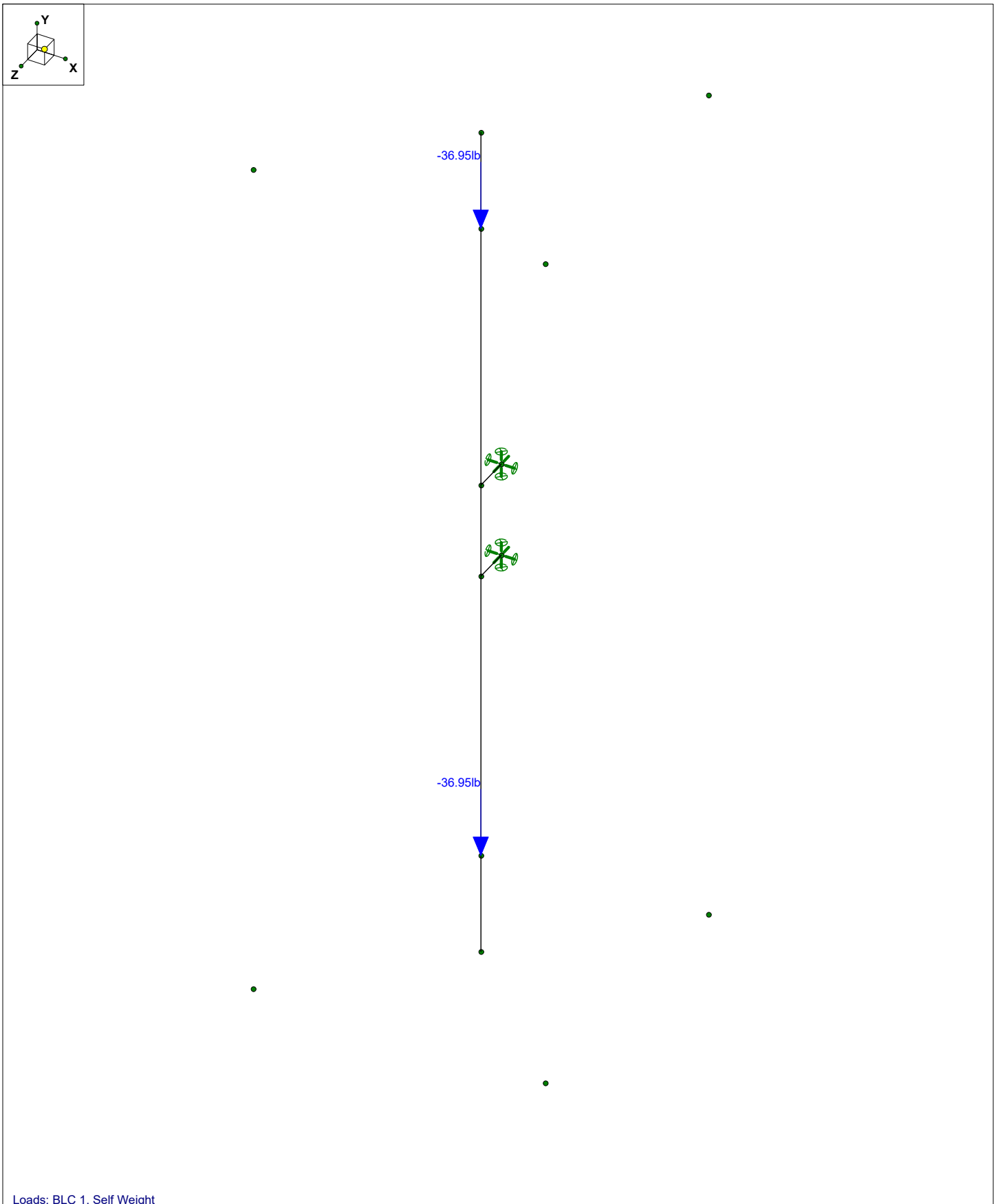
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Section Set
RAM		Nov 28, 2018 at 1:08 PM
1106-A0001-B		Crescent.R3D



Member Length (in) Displayed
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Member Lengths
RAM		Nov 28, 2018 at 1:07 PM
1106-A0001-B		Crescent.R3D



Loads: BLC 1, Self Weight
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Dead Load
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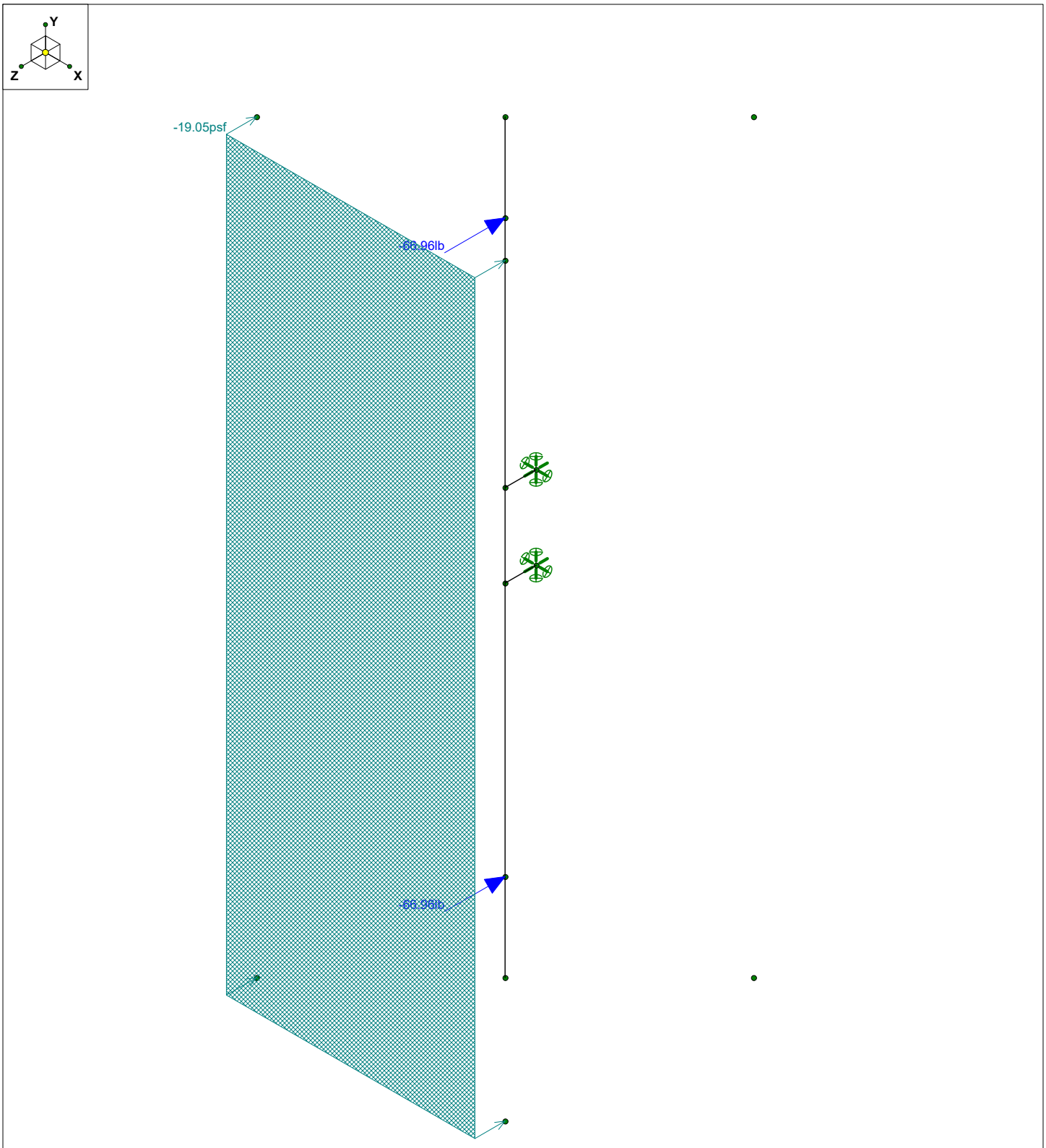
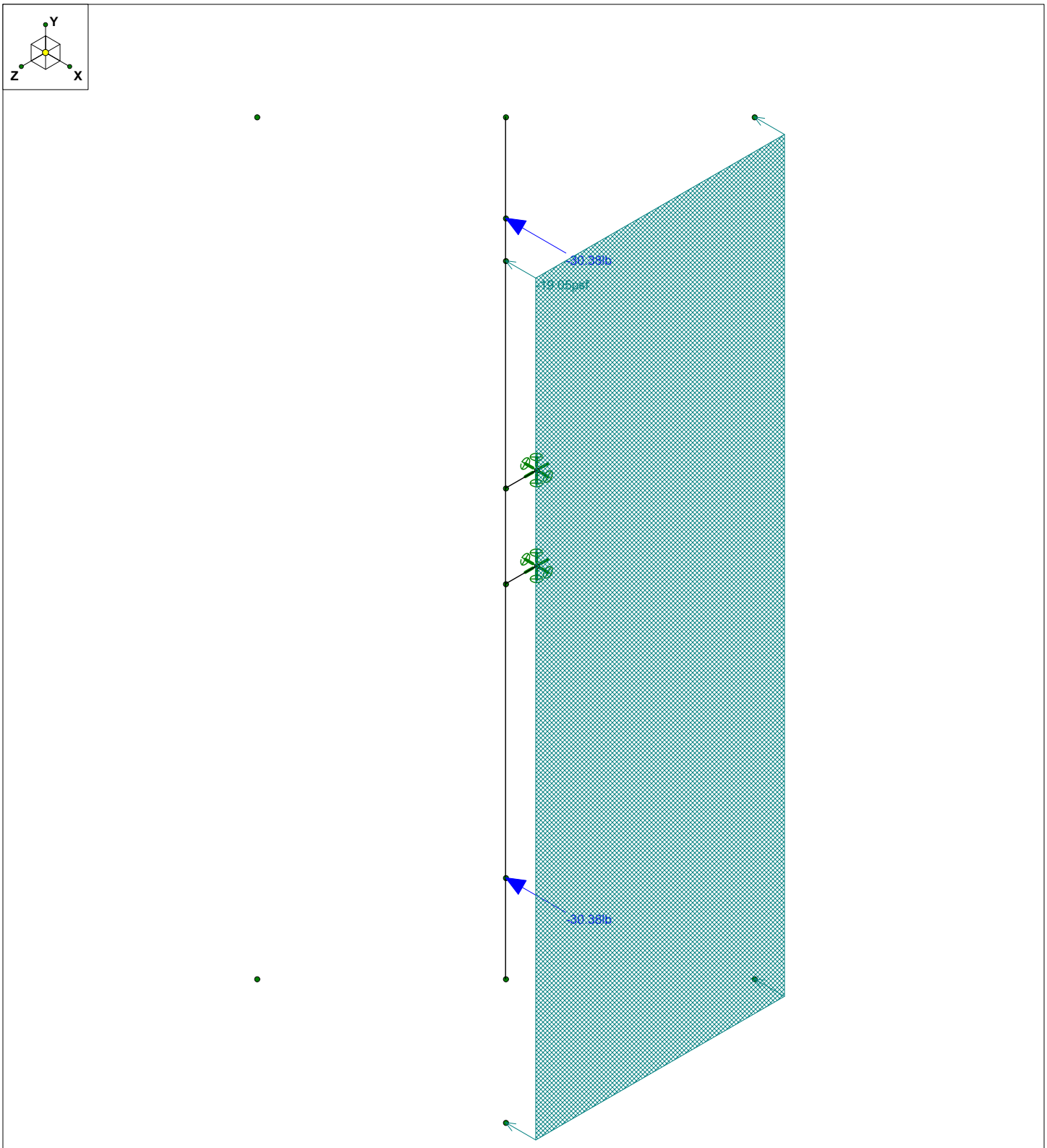
1106-A0001-B		Crescent.R3D



Loads: BLC 2, Wind Load AZI 000
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Wind Load 0
RAM		Nov 28, 2018 at 1:03 PM
1106-A0001-B		Crescent.R3D



Loads: BLC 3, Wind Load AZI 090
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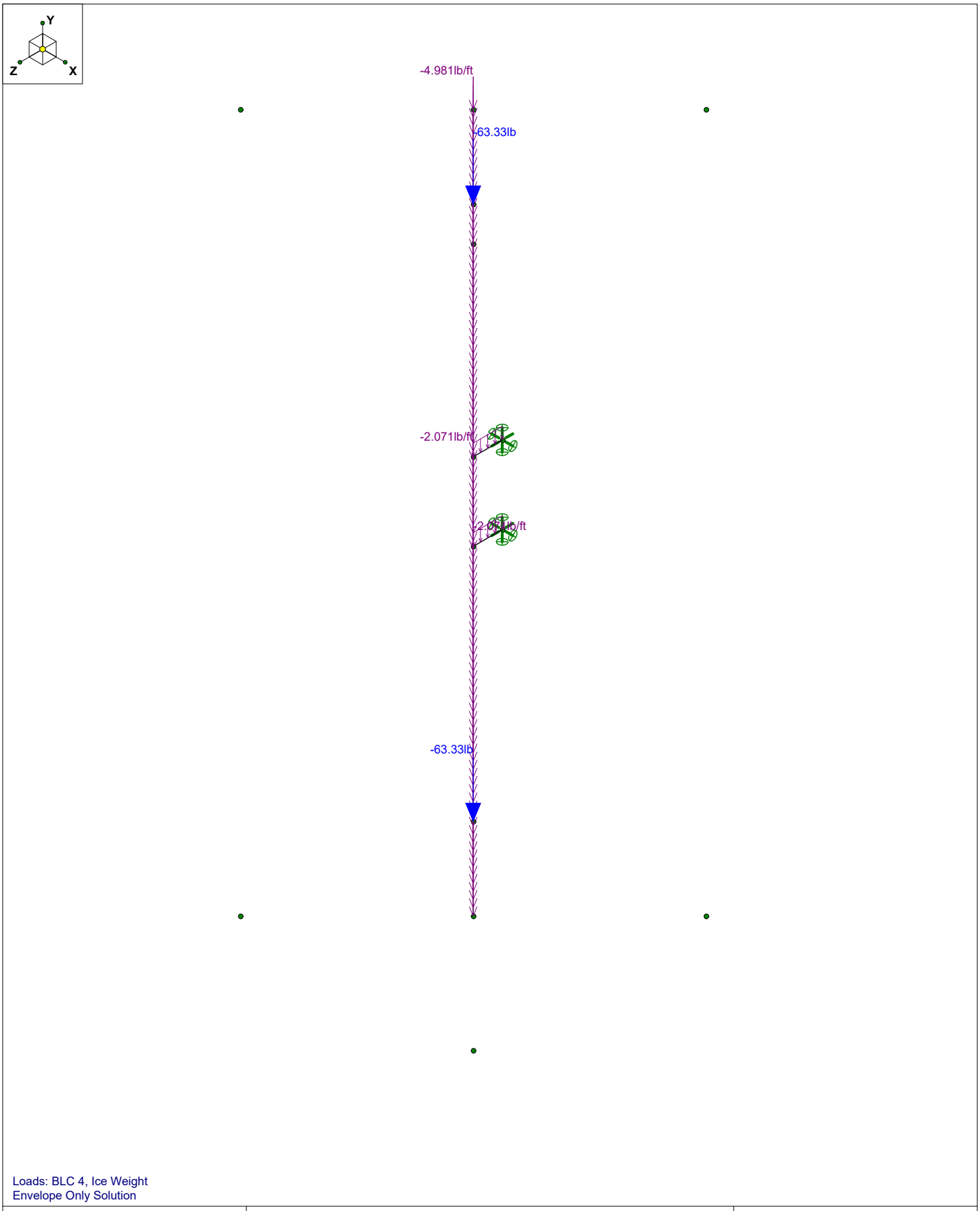
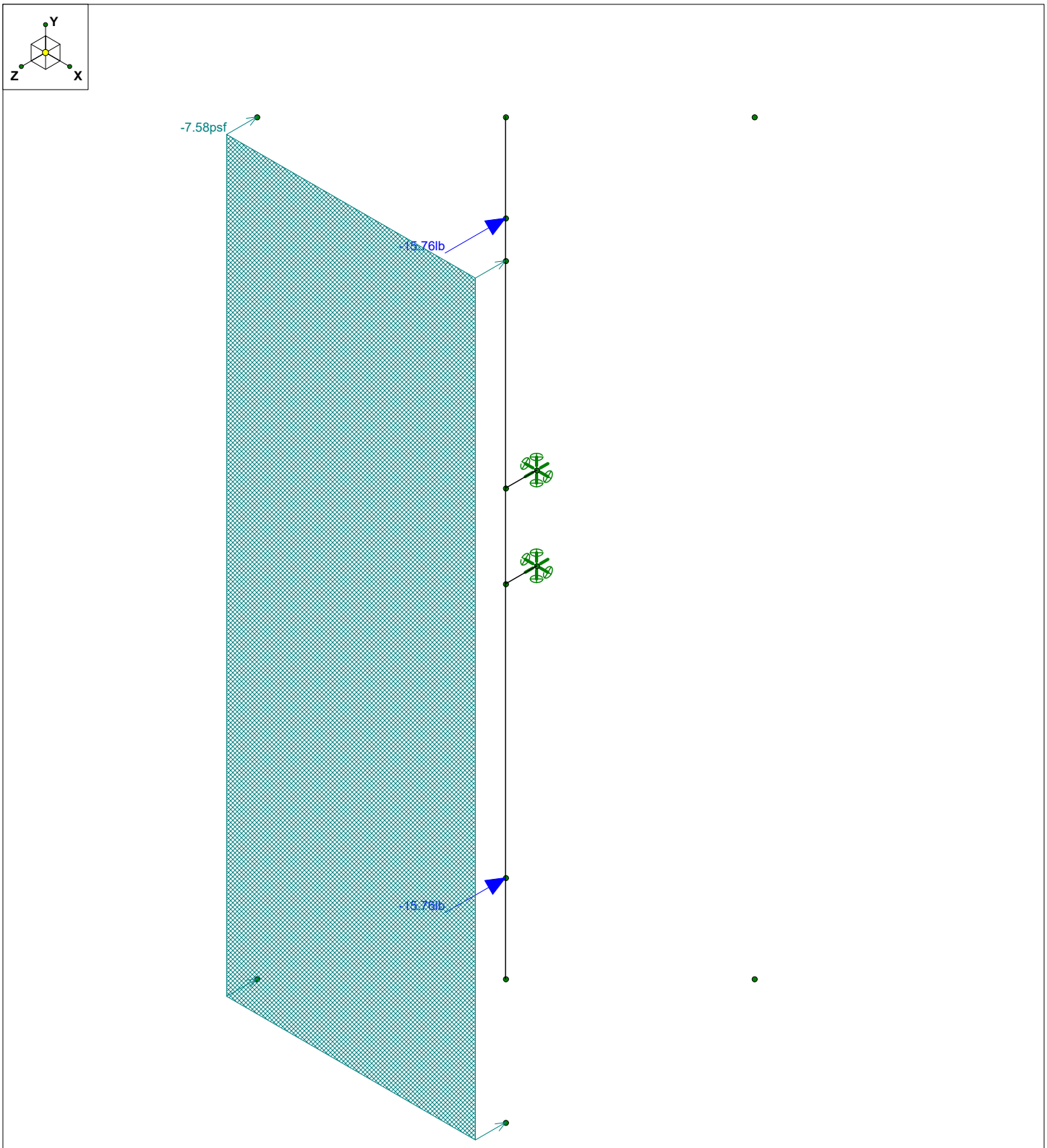
Infinigy Engineering PLLC	Crescent	Wind Load 90
RAM		Nov 28, 2018 at 1:03 PM
1106-A0001-B		Crescent.R3D



Loads: BLC 4, Ice Weight
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Ice Load
RAM		Nov 28, 2018 at 1:03 PM
1106-A0001-B		Crescent.R3D



Loads: BLC 5, Wind + Ice Load AZI 000
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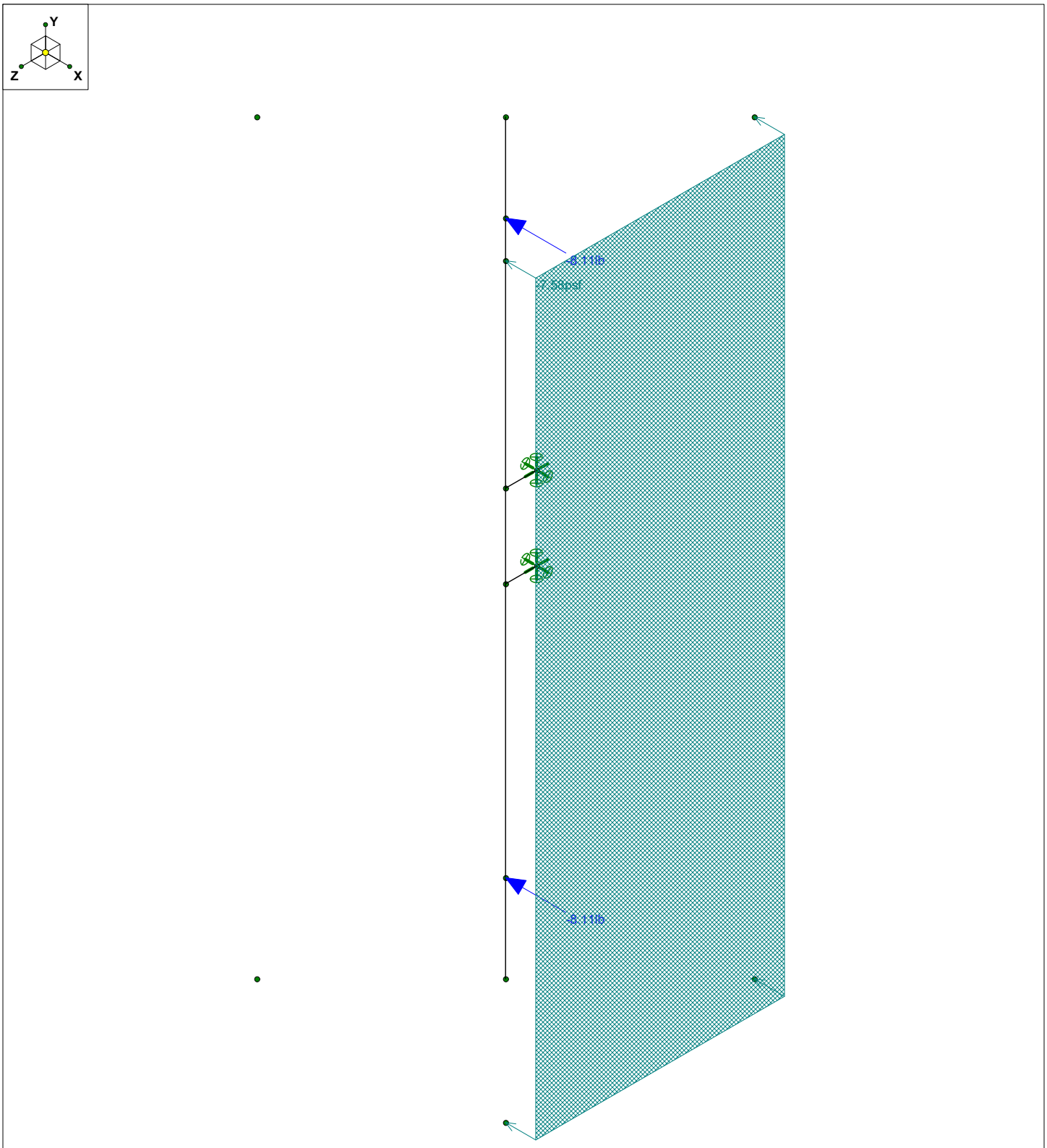
Infinigy Engineering PLLC	Crescent	Wind + Ice Load 0
RAM		Nov 28, 2018 at 1:04 PM
1106-A0001-B		Crescent.R3D



Loads: BLC 6, Wind + Ice Load AZI 090
Envelope Only Solution

Infinigy Engineering PLLC	Crescent	Wind + Ice Load 90
RAM		Nov 28, 2018 at 1:04 PM
1106-A0001-B		Crescent.R3D

Site Name:	Crescent
Client:	Smartlink
Carrier:	AT&T
Engineer:	RAM
Date:	11/28/2018

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the solutions are endless

INFINIGY WIND LOAD CALCULATOR 3.0.2

Site Information Inputs:

Adopted Building Code:	2015 IBC
Structure Load Standard:	TIA-222-G
Antenna Load Standard:	TIA-222-G
Structure Risk Category:	II
Structure Type:	Rooftop
Number of Sectors:	4
Structure Shape 1:	Round

Rooftop Inputs:

Rooftop Wind Speed-Up?:	No

Wind Loading Inputs:

Design Wind Velocity:	89	mph (nominal 3-second gust)
Wind Centerline 1 (z_1):	138.0	ft
Side Face Angle (θ):	60	degrees
Exposure Category:	B	
Topographic Category:	1	

Wind with No Ice		
q_z (psf)	Gh	F_{ST} (psf)
18.68	0.85	**19.05**

Wind with Ice		
q_z (psf)	Gh	F_{ST} (psf)
3.77	0.85	**7.58**

Ice Loading Inputs:

Is Ice Loading Needed?:	Yes	
Ice Wind Velocity:	40	mph (nominal 3-second gust)
Base Ice Thickness:	0.50	in

Input Appurtenance Information and Load Placements:

Appurtenance Name	Elevation (ft)	Total Quantity	Ka	Front Shape	Side Shape	q_z (psf)	EPA (ft^2)	Fz (lbs)	Fx (lbs)	Fz(60) (lbs)	Fx(30) (lbs)
Kathrein 742264	138.0	3	1.00	Flat	Flat	18.68	4.86	77.19	46.50	54.17	69.52
Kathrein 80010966	138.0	2	1.00	Flat	Flat	18.68	17.36	275.62	119.05	158.19	236.48
Commscope JAHH-45A-R3B	138.0	4	1.00	Flat	Flat	18.68	8.44	133.92	60.76	79.05	115.63
CCI OPA-65R-LCUU-H4	138.0	2	1.00	Flat	Flat	18.68	5.98	94.92	53.75	64.04	84.62
Commscope SBNHH-1D65A	138.0	3	1.00	Flat	Flat	18.68	5.96	94.56	62.13	70.24	86.46
Alcatel-Lucent RRH 4x25-WCS-4R	138.0	4	1.00	Flat	Flat	18.68	3.34	52.97	60.88	58.90	54.94
Nokia RRH 4T4R B12/14	138.0	4	1.00	Flat	Flat	18.68	2.20	34.92	20.86	24.37	31.41
Nokia RRH 4T4R B25/66	138.0	4	1.00	Flat	Flat	18.68	2.20	34.92	20.86	24.37	31.41
KMW KFTDR00110030	138.0	1	1.00	Flat	Flat	18.68	0.92	14.60	4.18	6.78	11.99
Powerwave LGP21401	138.0	6	1.00	Flat	Flat	18.68	0.55	8.77	7.07	7.50	8.35
Raycap DC6	138.0	3	1.00	Round	Round	18.68	1.21	19.23	19.23	19.23	19.23

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N2			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
2	M2	N3	N4			RIGID	None	None	RIGID	Typical
3	M3	N5	N6			RIGID	None	None	RIGID	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	General				
2	RIGID		2	6	0
3	Total General		2	6	0
4					
5	Hot Rolled Steel				
6	A53 Gr.B	PIPE_2.0	1	72	0
7	Total HR Steel		1	72	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Self Weight	DL		-1			2			
2	Wind Load AZI 000	WLZ					2		1	
3	Wind Load AZI 090	WLX					2		1	
4	Ice Weight	OL1					2	3		
5	Wind + Ice Load AZI 000	OL2					2		1	
6	Wind + Ice Load AZI 090	OL3					2		1	
7	Service Live 1	LL								
8	BLC 2 Transient Area Loads	None						1		
9	BLC 3 Transient Area Loads	None						3		
10	BLC 5 Transient Area Loads	None						1		
11	BLC 6 Transient Area Loads	None						3		

Load Combinations

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fac...	BLC	Factor	BLC Factor .....
1	1.4D	Yes	Y		DL	1.4					
2	1.2D + 1.6W AZI 000	Yes	Y		DL	1.2	WLZ	1.6			
3	1.2D + 1.6W AZI 030	Yes	Y		DL	1.2	WLZ	1.386	WLX	.8	
4	1.2D + 1.6W AZI 060	Yes	Y		DL	1.2	WLZ	.8	WLX	1.386	
5	1.2D + 1.6W AZI 090	Yes	Y		DL	1.2			WLX	1.6	
6	1.2D + 1.6W AZI 120	Yes	Y		DL	1.2	WLZ	-.8	WLX	1.386	
7	1.2D + 1.6W AZI 150	Yes	Y		DL	1.2	WLZ	-1.3...	WLX	.8	
8	1.2D + 1.6W AZI 180	Yes	Y		DL	1.2	WLZ	-1.6			
9	1.2D + 1.6W AZI 210	Yes	Y		DL	1.2	WLZ	-1.3...	WLX	-.8	
10	1.2D + 1.6W AZI 240	Yes	Y		DL	1.2	WLZ	-.8	WLX	-1.386	
11	1.2D + 1.6W AZI 270	Yes	Y		DL	1.2			WLX	-1.6	
12	1.2D + 1.6W AZI 300	Yes	Y		DL	1.2	WLZ	.8	WLX	-1.386	
13	1.2D + 1.6W AZI 330	Yes	Y		DL	1.2	WLZ	1.386	WLX	-.8	
14	0.9D + 1.6W AZI 000	Yes	Y		DL	.9	WLZ	1.6			
15	0.9D + 1.6W AZI 030	Yes	Y		DL	.9	WLZ	1.386	WLX	.8	
16	0.9D + 1.6W AZI 060	Yes	Y		DL	.9	WLZ	.8	WLX	1.386	
17	0.9D + 1.6W AZI 090	Yes	Y		DL	.9			WLX	1.6	
18	0.9D + 1.6W AZI 120	Yes	Y		DL	.9	WLZ	-.8	WLX	1.386	
19	0.9D + 1.6W AZI 150	Yes	Y		DL	.9	WLZ	-1.3...	WLX	.8	
20	0.9D + 1.6W AZI 180	Yes	Y		DL	.9	WLZ	-1.6			
21	0.9D + 1.6W AZI 210	Yes	Y		DL	.9	WLZ	-1.3...	WLX	-.8	

Load Combinations (Continued)

	Description	Solve	PDelta	SRSS	BLC	Factor	BLC	Fac...	BLC	Factor	BLC	Factor
22	0.9D + 1.6W AZI 240	Yes	Y		DL	.9	WLZ	-.8	WLX	-1.386		
23	0.9D + 1.6W AZI 270	Yes	Y		DL	.9			WLX	-1.6		
24	0.9D + 1.6W AZI 300	Yes	Y		DL	.9	WLZ	.8	WLX	-1.386		
25	0.9D + 1.6W AZI 330	Yes	Y		DL	.9	WLZ	1.386	WLX	-.8		
26	1.2D + 1.0Di	Yes	Y		DL	1.2	OL1	1				
27	1.2D + 1.0Di + 1.0Wi AZI 0...	Yes	Y		DL	1.2	OL1	1	OL2	1		
28	1.2D + 1.0Di + 1.0Wi AZI 0...	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	.5
29	1.2D + 1.0Di + 1.0Wi AZI 0...	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	.866
30	1.2D + 1.0Di + 1.0Wi AZI 0...	Yes	Y		DL	1.2	OL1	1			OL3	1
31	1.2D + 1.0Di + 1.0Wi AZI 1...	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	.866
32	1.2D + 1.0Di + 1.0Wi AZI 1...	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	.5
33	1.2D + 1.0Di + 1.0Wi AZI 1...	Yes	Y		DL	1.2	OL1	1	OL2	-1		
34	1.2D + 1.0Di + 1.0Wi AZI 2...	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	-.5
35	1.2D + 1.0Di + 1.0Wi AZI 2...	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	-.866
36	1.2D + 1.0Di + 1.0Wi AZI 2...	Yes	Y		DL	1.2	OL1	1			OL3	-1
37	1.2D + 1.0Di + 1.0Wi AZI 3...	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	-.866
38	1.2D + 1.0Di + 1.0Wi AZI 3...	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	-.5
39	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	.114		
40	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	.098	WLX	.057
41	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	.057	WLX	.098
42	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5			WLX	.114
43	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.057	WLX	.098
44	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.098	WLX	.057
45	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.114		
46	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.098	WLX	-.057
47	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	-.057	WLX	-.098
48	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5			WLX	-.114
49	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	.057	WLX	-.098
50	1.2D + 1.5L + 1.0WL (30 m...	Yes	Y		DL	1.2	LL	1.5	WLZ	.098	WLX	-.057

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N6	max	83.119	17	136.388	33	125.736	2	230.916	20	20.78	17	0	50
2		min	-83.119	23	42.886	14	-125.736	20	-255.89	2	-20.78	23	0	1
3	N4	max	50.379	5	134.864	27	124.731	14	210.742	14	12.595	5	0	50
4		min	-50.379	11	42.366	20	-124.731	8	-235.489	8	-12.595	11	0	1
5	Totals:	max	133.411	17	271.251	38	250.467	14						
6		min	-133.411	11	85.253	14	-250.467	8						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*P...	phi*M...	phi*M...	Cb	Eqn
1	M1	PIPE_2.0	.130	39	8	.013	39		20	20866.733	32130	1871....	1871....	1	H1-1b

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mount Pipe	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N4	Reaction	Reaction	Reaction	Reaction	Reaction	
2	N6	Reaction	Reaction	Reaction	Reaction	Reaction	

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	M1						Yes	** NA **			None
2	M2						Yes	** NA **			None
3	M3						Yes	** NA **			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torq...	Kyy	Kzz	Cb	Function
1	M1	Mount Pipe	72			Lbyy						Lateral

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^...
No Data to Print ...			

Member Point Loads (BLC 1 : Self Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	Y	-36.95	8.45
2	M1	Y	-36.95	63.55

Member Point Loads (BLC 2 : Wind Load AZI 000)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	Z	-66.96	8.45
2	M1	Z	-66.96	63.55

Member Point Loads (BLC 3 : Wind Load AZI 090)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	X	-30.38	8.45
2	M1	X	-30.38	63.55

Member Point Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	Y	-63.33	8.45
2	M1	Y	-63.33	63.55

Member Point Loads (BLC 5 : Wind + Ice Load AZI 000)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	Z	-15.76	8.45
2	M1	Z	-15.76	63.55

Member Point Loads (BLC 6 : Wind + Ice Load AZI 090)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	M1	X	-8.11	8.45
2	M1	X	-8.11	63.55

Member Distributed Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[...	End Location[i...
1	M1	Y	-4.981	-4.981	0	%100
2	M2	Y	-2.071	-2.071	0	%100
3	M3	Y	-2.071	-2.071	0	%100

Member Distributed Loads (BLC 8 : BLC 2 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[...	End Location[i...
1	M1	Z	-3.77	-3.77	0	72

Member Distributed Loads (BLC 9 : BLC 3 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[...	End Location[i...
1	M1	X	-3.77	-3.77	0	72
2	M2	X	0	0	0	3
3	M3	X	0	0	0	3

Member Distributed Loads (BLC 10 : BLC 5 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[...	End Location[i...
1	M1	Z	-1.5	-1.5	0	72

Member Distributed Loads (BLC 11 : BLC 6 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[...	End Location[i...
1	M1	X	-1.5	-1.5	0	72
2	M2	X	0	0	0	3
3	M3	X	0	0	0	3

Member Area Loads (BLC 2 : Wind Load AZI 000)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N14	N12	N9	N11	Z	Open Structure	-19.05

Member Area Loads (BLC 3 : Wind Load AZI 090)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N12	N13	N10	N9	X	Open Structure	-19.05

Member Area Loads (BLC 5 : Wind + Ice Load AZI 000)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N14	N12	N9	N11	Z	Open Structure	-7.58

Member Area Loads (BLC 6 : Wind + Ice Load AZI 090)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N12	N13	N10	N9	X	Open Structure	-7.58

Date:	11/28/2018
Client:	Smartlink
Site:	Crescent
Engineer:	RAM
Job #:	1106-A0001-B

Slab Check (4" Thickness)		
Slab Thickness	4	in
Slab Width	72	in
Slab Length	72	in
Reinforcement	0.31	in^2/ft
Decking	0	in^2/ft
DL (conc. wt.)	300	lb/ft
LL (Enclosure)	228.75	lb/ft
W_u	726.00	lb/ft
M_u	3.27	kip-ft
$M_u/\phi bd^2$	37.81	psi
ρ	0.0018	ACI 10.5
A_{req}	0.52	in^2
A_s	1.86	in^2/ft
$A_s > A_{req}$	OK	

Shear Check		
Slab Thickness	4	in
Slab Width	72	in
Slab Length	72	in
f'c	4000	psi
ϕV_c	27322.08	lb
V_u (From Wind)	7560.784	lb
$V_u/\phi V_c$	27.6728	%
No consideration of shear reinforcement needed		

SHEET INDEX

DRIVING DIRECTIONS

FROM 7150 STANDARD DRIVE HANOVER MD:

HEAD SOUTH–WEST ON STANDARD DR TOWARDS PARKWAY DR, TURN LEFT TOWARDS STANDARD DR, TURN RIGHT ONTO STANDARD DR, TURN LEFT ONTO PARKWAY DR, TURN RIGHT ONTO PARK CIR DR, TURN LEFT ONTO COCA COLA DR, TURN RIGHT TO MERGE ONTO MD–100 W TOWARDS ELLICOTT CITY, MERGE ONTO MD–100 W, TAKE EXIT 5A–B TOWARDS WASHINGTON, MERGE ONTO I–95 S, USE THE RIGHT 2 LANES TO TAKE EXIT 27 W TO MERGE ONTO I–495 W TOWARDS SILVER SPRING, TAKE EXIT 33 FOR MD–185/CONNECTICUT AVE TOWARDS KENSINGTON/CHEVY CHASE, USE THE LEFT 2 LANES TO TURN LEFT ONTO MD–185 S/CONNECTICUT AVE, TURN RIGHT ONTO MD–410 W/STATE HWY 410 W, CONTINUE STRAIGHT ONTO MD–410 W AND FINALLY THE DESTINATION WILL BE ON THE LEFT.

at&t

PROJECT

DELTA SECTOR ADD W/ 2 RETRO FITS FOR DUAL AIRSCALES

SITE NAME

CRESCENT

USID

55113

FA SITE NUMBER

10006543

SITE ADDRESS

4600 EAST WEST HIGHWAY
BETHESDA, MD 20814

AT&T ROOFTOP PIM NOTICE

- REPLACE ANY HOSE CLAMPS, HANGERS AND SNAP–INS SUPPORTING RF COAX JUMPERS, CPRI, RET OR DC CABLES LOCATED WITHIN LEASE SPACE BEHIND ANTENNA (15 FT MINIMUM) WITH INTERIM SOLUTION QTY= 2 UV RATED 1/4" WIDE NYLON CABLE TIES THAT MEET 120 LBS TENSILE STRENGTH SPECIFICATION.
  EXAMPLES: MINIMUM: 120 LBS TENSILE STRENGTH, THOMAS AND BETTS CABLE TIES, PANDUIT CABLE TIES
- REPLACE ANY HOSE CLAMPS, HANGERS AND SNAP–INS SUPPORTING RF COAX JUMPERS, CPRI, RET OR DC CABLES LOCATED WITHIN 30 FT MINIMUM LEASE SPACE IN FRONT (180 DEGREE) OF ANTENNA WITH QTY= 2 UV RATED 1/4" WIDE NYLON CABLE TIES
- REMOVE ANY UNNECESSARY HARDWARE THAT'S NOT CURRENTLY SUPPORTING ANYTHING. TIGHTEN ALL REMAINING CLAMPS, BRACKETS, ANTENNA SUPPORTS ETC. TO MANUFACTURER TORQUE SPEC.
- ENSURE THERE IS NO RUSTING METAL ON MOUNTING PIPE WHERE CABLE HANGER AND ADAPTER ARE TO BE ATTACHED. USE A WIRE BRUSH OR WIRE WHEEL & DRILL TO REMOVE ANY RUSTING METAL. CLEAN THE MOUNTING SURFACE (INCLUDING REMOVAL OF MINOR CORROSION) WITH A SCOTCHBRITE PAD. PAINT ANY EXPOSED METAL WHERE THERE WAS RUST OR GALVANIZING HAS BEEN DAMAGED WITH COLD–GALVANIZING PAINT (COLD–GALV). USE NO–OX BETWEEN PIPE MOUNTING HARDWARE (CLAMPS OR STAINLESS–STEEL BANDING) AND MOUNTING PIPE. IF COLD–GALV PAINT WAS APPLIED, ENSURE THE PAINT HAS DRIED BEFORE APPLYING NO–OX. DO NOT USE HOSE CLAMPS TO SECURE CABLE HANGERS OR HANGER ADAPTERS IN HIGH RISK PIM ZONES.
- ALL CABLES TIES SHOULD BE FLUSH CUT TO PREVENT INJURY FROM EXPOSED SHARP EDGES.
- DO NOT ATTACH BRASS TAGS TO RF CABLES FOR CABLE IDENTIFICATION LABELING. USE COLOR CODED TAPE AS SPECIFIED BY LOCAL RF CABLE COLOR CODE STANDARD.

PROJECT SITE INFORMATION

SITE NAME:	CRESCENT	
USID:	55113	
FA SITE #:	10006543	
SITE ADDRESS:	4600 EAST WEST HIGHWAY BETHESDA, MD 20814	
JURISDICTION:	MONTGOMERY COUNTY	
SITE COORDINATES: LATITUDE:	N 38° 59' 03.7"	(NAD 83)
LONGITUDE:	W 77° 05' 34.9"	(NAD 83)
APPLICANT:	AT&T MOBILITY 7150 STANDARD DRIVE HANOVER, MD 21076	

STRUCTURAL ANALYSIS INFORMATION

ROOF LOADING ANALYSIS

*BASED ON THE STRUCTURAL ANALYSIS COMPLETED BY **INFINIGY** DATED **11/28/2018**. THE EXISTING **PENTHOUSE SLAB** IS CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION.*

ANTENNA MOUNTS

*BASED ON THE MOUNT ANALYSIS COMPLETED BY **INFINIGY** DATED **11/28/2018**. THE EXISTING ANTENNA MOUNTS ARE CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION*

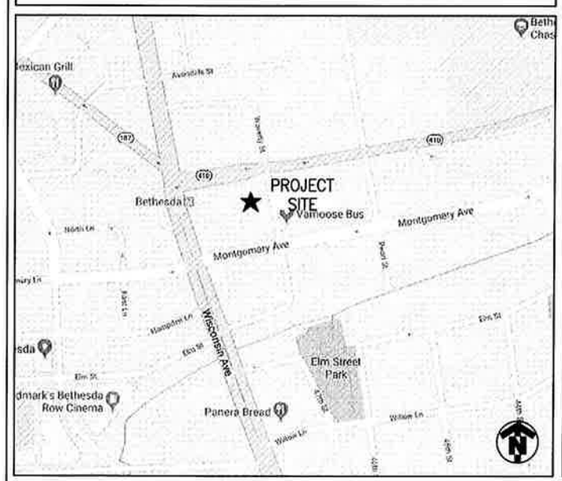
PROJECT TEAM INFORMATION

CLIENT REPRESENTATIVE:	SMARTLINK, LLC 1362 MELLON ROAD HANOVER, MD 21076
CLIENT REP. CONTACT:	STEVE BRIANAS STEVE.BRIANAS@SMARTLINKLLC.COM
SITE ACQUISITION:	SMARTLINK, LLC 1362 MELLON ROAD HANOVER, MD 21076
SITE ACQUISITION CONTACT:	STEVE BRIANAS STEVE.BRIANAS@SMARTLINKLLC.COM
ENGINEER:	INFINIGY SOLUTIONS 1033 WATERVLIET SHAKER ROAD ALBANY, NY 12205
ENGINEER CONTACT:	MATT LIVERETTE MLIVERETTE@INFINIGY.COM 301–928–8789
RF ENGINEER:	AT&T 7150 STANDARD DRIVE HANOVER, MD 21076
RF CONTACT:	STEVE HATHWAY AT&T RAN ENGINEER 443–770–4443 SH733Y@ATT.COM

811 Know what's below. Call before you dig.

TO OBTAIN LOCATION OF PARTICIPANTS UNDERGROUND FACILITIES BEFORE YOU DIG IN MARYLAND (WEST OF CHESAPEAKE BAY), CALL MISS UTILITY OF MARYLAND
TOLL FREE: 1-800-257-7777 OR www.missutility.net
MARYLAND STATUTE REQUIRES MIN OF 2 WORKING DAYS NOTICE BEFORE YOU EXCAVATE

LOCATION MAP



GENERAL NOTES

- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED.
- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- FACILITY HAS NO PLUMBING OR REFRIGERANTS.
- THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS.
- ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. EQUIPMENT, ANTENNAS/RRH AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.
- THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON STORMWATER DRAINAGE.
- NO SANITARY SEWER, POTABLE WATER, OR TRASH DISPOSAL SERVICE IS REQUIRED
- NO COMMERCIAL SIGNAGE IS PROPOSED

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT ADOPTED EDITIONS OF THE FOLLOWING CODES WITH ANY LOCAL AMENDMENTS BY THE LOCAL GOVERNING AUTHORITIES:

- INTERNATIONAL BUILDING CODE
- NATIONAL ELECTRICAL CODE
- NATIONAL FIRE PROTECTION ASSOCIATION 101
- NATIONAL FIRE PROTECTION ASSOCIATION 1
- LOCAL BUILDING CODES
- CITY/COUNTY ORDINANCES
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATIONS (AISC)
- UNDERWRITERS LABORATORIES APPROVED ELECTRICAL PRODUCTS.
- ANSI EIA/TIA 222 REV. G
- TIA 607
- INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81
- IEEE C2 (LATEST EDITION)
- TELCORDIA GR–1275
- ANSI T1.311

at&t

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Office # (518) 690-0790
Fax # (518) 690-0793

STATE OF MARYLAND
BRIAN S. STEVENS
PROFESSIONAL ENGINEER
36339
Nov 29 2018
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 36339 EXP. 12/12/2020

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DOCUMENT IS A VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS.

No	Submittal / Revision	App'd	Date
0	ISSUED FOR CONSTRUCTION	RMS	11/28/18
B	CLIENT COMMENTS	RMS	11/12/18
A	ISSUED FOR CLIENT REVIEW	HAM	11/08/18

Drawn: HAM
Designed: MRL
Checked: AJD

Project Number: 499-002

Project Title:
CRESCENT
SITE ID: 55113
FA # 10006543
4600 EAST WEST HIGHWAY
BETHESDA, MD 20814

Prepared For:
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Drawing Title
TITLE PAGE

Drawing Number
T1

GENERAL NOTES

PART 1 – GENERAL REQUIREMENTS

1.1 THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
- A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
- B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
- C. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC").
- D. AND NFPA 101 (LIFE SAFETY CODE).
- E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM).
- F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE).

1.2 DEFINITIONS:
A: WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B: COMPANY: AT&T CORPORATION
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D: CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E: THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.

1.3 POINT OF CONTACT: COMMUNICATION BETWEEN THE COMPANY AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE COMPANY SITE DEVELOPMENT SPECIALIST OR OTHER PROJECT COORDINATOR APPOINTED TO MANAGE THE PROJECT FOR THE COMPANY.

1.4 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.5 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES, AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.

1.6 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.7 NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE AT&T WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – EXECUTION

2.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE, POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

2.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

2.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

2.4 COMPANY FURNISHED MATERIAL AND EQUIPMENT: ALL HANDLING, STORAGE AND INSTALLATION OF COMPANY FURNISHED MATERIAL AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
A. CONTRACTOR SHALL PROCURE ALL OTHER REQUIRED WORK RELATED MATERIALS NOT PROVIDED BY AT&T TO SUCCESSFULLY CONSTRUCT A WIRELESS FACILITY.

2.5 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

2.6 EXISTING CONDITIONS: NOTIFY THE COMPANY REPRESENTATIVE OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

PART 3 – RECEIPT OF MATERIAL & EQUIPMENT

3.1 RECEIPT OF MATERIAL AND EQUIPMENT: CONTRACTOR IS RESPONSIBLE FOR AT&T PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
- A. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
- B. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
- C. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
- D. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO AT&T OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
- E. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
- F. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

PART 4 – GENERAL REQUIREMENTS FOR CONSTRUCTION

4.1 CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

4.2 EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

4.3 CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
A. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
B. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

4.4 CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION.

4.5 CONDUCT TESTING AS REQUIRED HEREIN.

PART 5 – TESTS AND INSPECTIONS

5.1 TESTS AND INSPECTIONS:
- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
- B. CONTRACTOR SHALL COORDINATE TEST AND INSPECTION SCHEDULES WITH COMPANY'S REPRESENTATIVE WHO MUST BE ON SITE TO WITNESS SUCH TESTS AND INSPECTIONS.
- C. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
- D. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
- E. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
- F. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
- G. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

PART 6 – TRENCHING AND BACKFILLING

6.1 TRENCHING AND BACKFILLING: THE CONTRACTOR SHALL PERFORM ALL EXCAVATION OF EVERY DESCRIPTION AND OF WHATEVER SUBSTANCES ENCOUNTERED, TO THE DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS OTHERWISE SPECIFIED.

A. PROTECTION OF EXISTING UTILITIES: THE CONTRACTOR SHALL CHECK WITH THE LOCAL UTILITIES AND THE RESPECTIVE UTILITY LOCATOR COMPANIES PRIOR TO STARTING EXCAVATION OPERATIONS IN EACH RESPECTIVE AREA TO ASCERTAIN THE LOCATIONS OF KNOWN UTILITY LINES. THE LOCATIONS, NUMBER AND TYPES OF EXISTING UTILITY LINES DETAILED ON THE CONSTRUCTION DRAWINGS ARE APPROXIMATE AND DO NOT REPRESENT EXACT INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL LINES DAMAGED DURING EXCAVATION AND ALL ASSOCIATED OPERATIONS. ALL UTILITY LINES UNCOVERED DURING THE EXCAVATION OPERATIONS, SHALL BE PROTECTED FROM DAMAGE DURING EXCAVATION AND ASSOCIATED OPERATIONS. ALL REPAIRS SHALL BE APPROVED BY THE UTILITY COMPANY.

B. HAND DIGGING: UNLESS APPROVED IN WRITING OTHERWISE, ALL DIGGING WITHIN AN EXISTING CELL SITE COMPOUND IS TO BE DONE BY HAND.

C. DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING AND TO PREVENT SLIDES OR CAVE-INS. ALL EXCAVATED MATERIALS NOT REQUIRED OR SUITABLE FOR BACKFILL SHALL BE REMOVED AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE.

D. GRADING SHALL BE DONE AS MAY BE NECESSARY TO PREVENT SURFACE WATER FROM FLOWING INTO TRENCHES OR OTHER EXCAVATIONS, AND ANY WATER ACCUMULATING THEREIN SHALL BE REMOVED BY PUMPING OR BY OTHER APPROVED METHOD.

E. SHEETING AND SHORING SHALL BE DONE AS NECESSARY FOR THE PROTECTION OF THE WORK AND FOR THE SAFETY OF PERSONNEL. UNLESS OTHERWISE INDICATED, EXCAVATION SHALL BE BY OPEN CUT, EXCEPT THAT SHORT SECTIONS OF A TRENCH MAY BE TUNNELED IF, THE CONDUIT CAN BE SAFELY AND PROPERLY INSTALLED AND BACKFILL CAN BE PROPERLY TAMPED IN SUCH TUNNEL SECTIONS. EARTH EXCAVATION SHALL COMPRISE ALL MATERIALS AND SHALL INCLUDE CLAY, SILT, SAND, MUCK, GRAVEL, HARDPAN, LOOSE SHALE, AND LOOSE STONE.

F. TRENCHES SHALL BE OF NECESSARY WIDTH FOR THE PROPER LAYING OF THE CONDUIT OR CABLE, AND THE BANKS SHALL BE AS NEARLY VERTICAL AS PRACTICABLE. THE BOTTOM OF THE TRENCHES SHALL BE ACCURATELY GRADED TO PROVIDE UNIFORM BEARING AND SUPPORT FOR EACH SECTION OF THE CONDUIT OR CABLE ON UNDISTURBED SOIL AT EVERY POINT ALONG ITS ENTIRE LENGTH. EXCEPT WHERE ROCK IS ENCOUNTERED, CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED. WHERE ROCK EXCAVATIONS ARE NECESSARY, THE ROCK SHALL BE EXCAVATED TO A MINIMUM OVER DEPTH OF 6 INCHES BELOW THE TRENCH DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR SPECIFIED. OVER DEPTHS IN THE ROCK EXCAVATION AND UNAUTHORIZED OVER DEPTHS SHALL BE THOROUGHLY BACK FILLED AND TAMPED TO THE APPROPRIATE GRADE. WHENEVER WET OR OTHERWISE UNSTABLE SOIL THAT IS INCAPABLE OF PROPERLY SUPPORTING THE CONDUIT OR CABLE IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, SUCH SOLID SHALL BE REMOVED TO A MINIMUM OVER DEPTH OF 6 INCHES AND THE TRENCH BACKFILLED TO THE PROPER GRADE WITH EARTH OF OTHER SUITABLE MATERIAL, AS HEREINAFTER SPECIFIED.

G. BACKFILLING OF TRENCHES. TRENCHES SHALL NOT BE BACKFILLED UNTIL ALL SPECIFIED TESTS HAVE BEEN PERFORMED AND ACCEPTED. WHERE COMPACTED BACKFILL IS NOT INDICATED THE TRENCHES SHALL BE CAREFULLY BACKFILLED WITH SELECT MATERIAL SUCH AS EXCAVATED SOILS THAT ARE FREE OF ROOTS, SOD, RUBBISH OR STONES, DEPOSITED IN 6 INCH LAYERS AND THOROUGHLY AND CAREFULLY RAMMED UNTIL THE CONDUIT OR CABLE HAS A COVER OF NOT LESS THAN 1 FOOT. THE REMAINDER OF THE BACKFILL MATERIAL SHALL BE GRANULAR IN NATURE AND SHALL NOT CONTAIN ROOTS, SOD, RUBBING, OR STONES OF 2-1/2 INCH MAXIMUM DIMENSION. BACKFILL SHALL BE CAREFULLY PLACED IN THE TRENCH AND IN 1 FOOT LAYERS AND EACH LAYER TAMPED. SETTLING THE BACKFILL WITH WATER WILL BE PERMITTED. THE SURFACE SHALL BE GRADED TO A REASONABLE UNIFORMITY AND THE MOUNDING OVER THE TRENCHES LEFT IN A UNIFORM AND NEAT CONDITION.

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER
	NON-FUSIBLE DISCONNECT SWITCH
F	FUSIBLE DISCONNECT SWITCH
	SURFACE MOUNTED PANEL BOARD
T	TRANSFORMER
M	KILOWATT HOUR METER
JB	JUNCTION BOX
PB	PULL BOX TO NEC/TELCO STANDARDS
	UNDERGROUND UTILITIES
	EXOTHERMIC WELD CONNECTION
	MECHANICAL CONNECTION
OR	GROUND ROD
OR	GROUND ROD WITH INSPECTION SLEEVE
	GROUND BAR
	120AC DUPLEX RECEPTACLE
G	GROUND CONDUCTOR
	DC POWER AND FIBER OPTIC TRUNK CABLES
	DC POWER CABLES
# / #	REPRESENTS DETAIL NUMBER / REF. DRAWING NUMBER

ABBREVIATIONS

CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
MIGB	MASTER ISOLATED GROUND BAR
SST	SELF SUPPORTING TOWER
GPS	GLOBAL POSITIONING SYSTEM
TYP.	TYPICAL
DWG	DRAWING
BCW	BARE COPPER WIRE
BFG	BELOW FINISH GRADE
PVC	POLYVINYL CHLORIDE
CAB	CABINET
C	CONDUIT
SS	STAINLESS STEEL
G	GROUND
AWG	AMERICAN WIRE GAUGE
RGS	RIGID GALVANIZED STEEL
AHJ	AUTHORITY HAVING JURISDICTION
TTLNA	TOWER TOP LOW NOISE AMPLIFIER
UNO	UNLESS NOTED OTHERWISE
EMT	ELECTRICAL METALLIC TUBING
AGL	ABOVE GROUND LEVEL

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STATE OF MARYLAND
JOHN S. STEVENS
36339
PROFESSIONAL ENGINEER
NOV 29 2018

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 36339 EXP. 12/12/2020

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0	ISSUED FOR CONSTRUCTION	RMS	11/28/18
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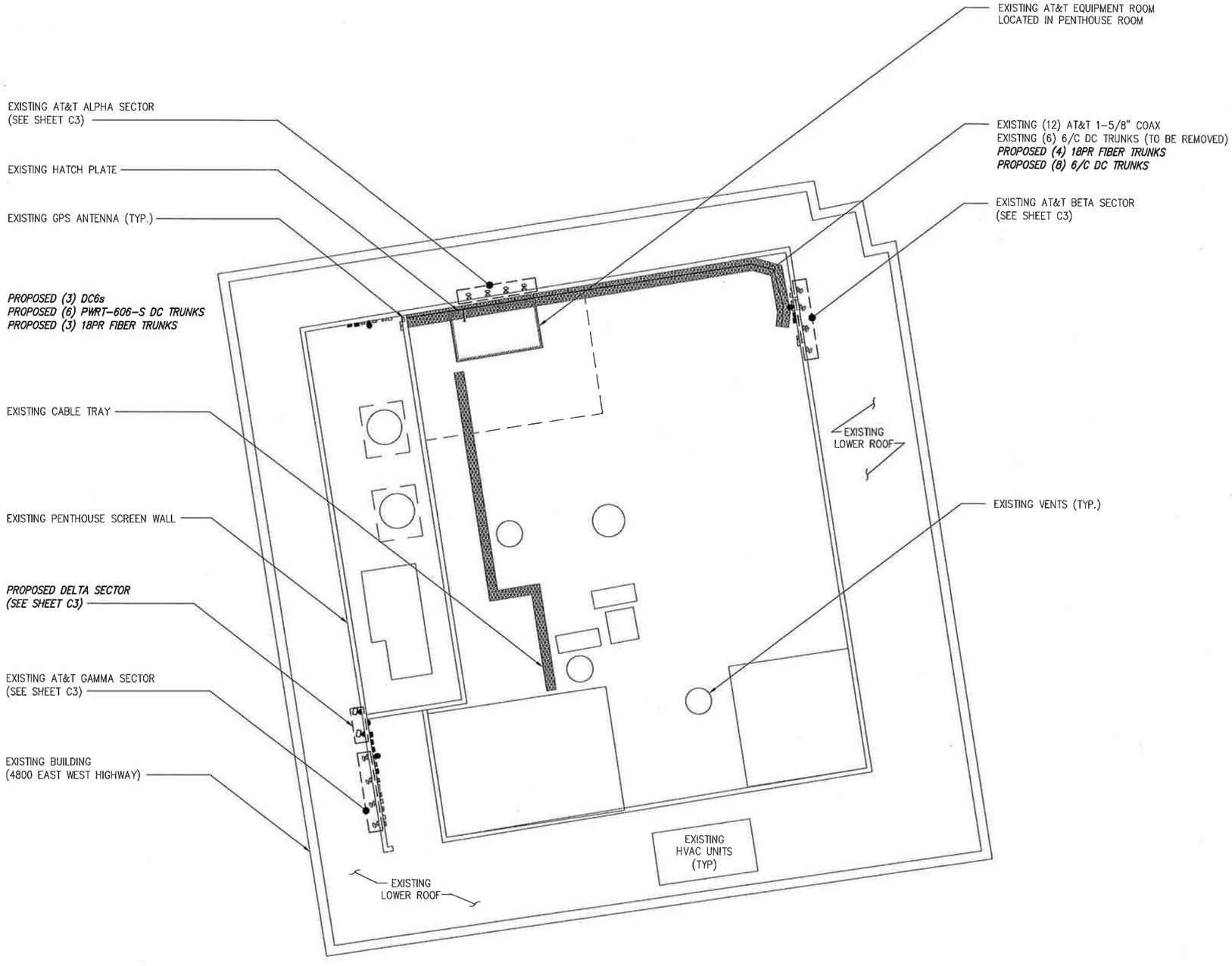
GENERAL NOTES

Drawing Number
N1



NORTH

1 / C1 ROOF PLAN
SCALE: AS NOTED

GRAPHIC SCALE:
20' 10' 0 10' 20'
SCALE (11x17): 1" = 20'-0"
SCALE (22x34): 1" = 10'-0"

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ROOF PLAN

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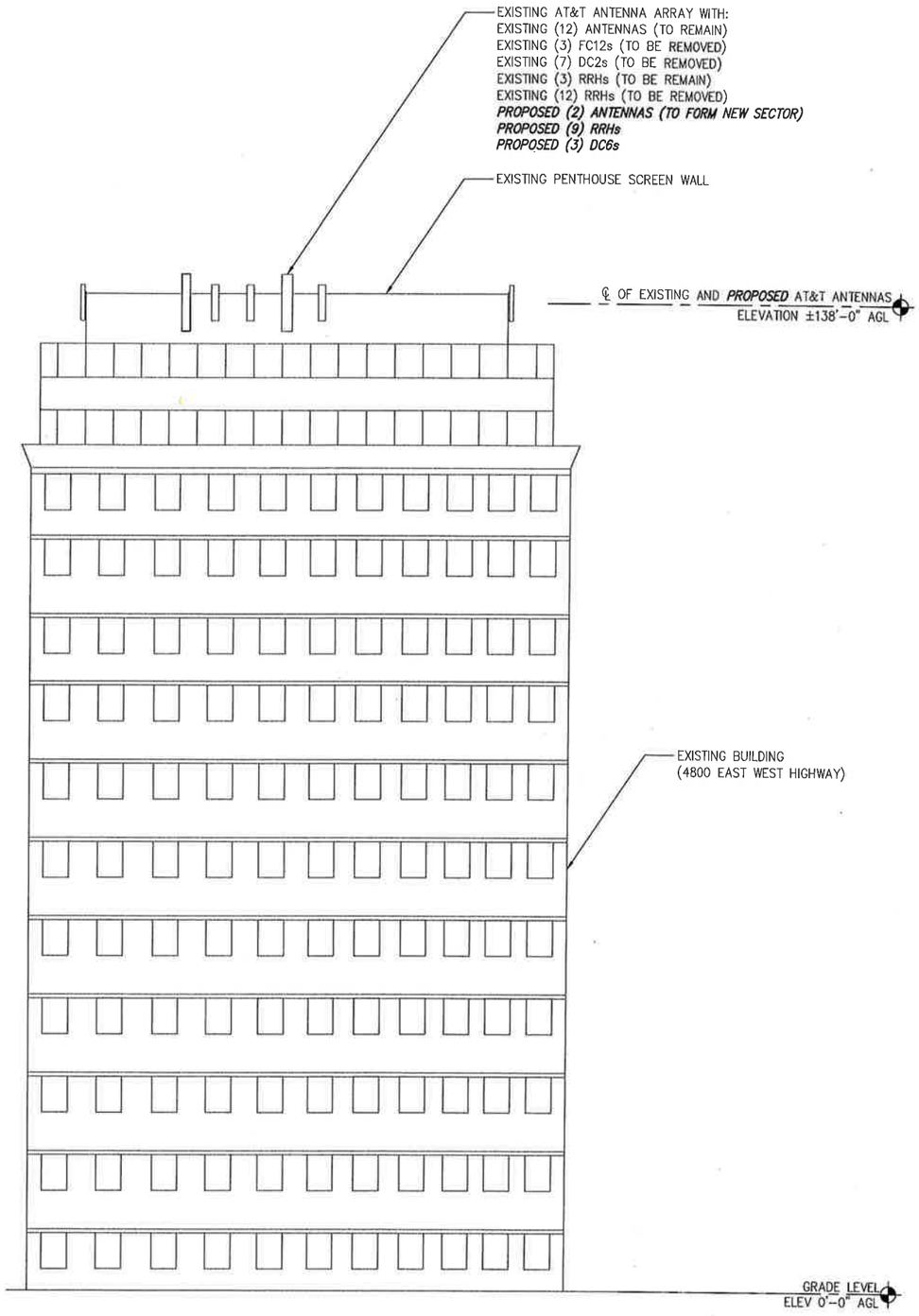

1 C2 ELEVATION VIEW
SCALE: NOT TO SCALE

ANTENNA AND RRH SCHEDULE

SECTOR	ANTENNA POSITION	ANTENNA MAKE	ANTENNA MODEL	RAD CTR. FT. AGL	AZIMUTH	RRH/TMA QTY/MAKE/MODEL	FILTER/DIPLEXER QTY/MAKE/MODEL	E-TILT	M-TILT
A	#1	KATHREIN	742264	138'-0"	350°	(2) POWERWAVE LGP21401	(2) POWERWAVE LGP13519	10° (UMTS 850)	0°
	#2	KATHREIN	80010966	138'-0"	0°	**(1) AIRSCALE B12/14** **(1) AIRSCALE B25/66**	–	10° (LTE 700) 6° (LTE 700) 8° (LTE 1900) 2° (LTE AWS)	2°
	#3	CCI - OCTO	OPA-65R-LCUU-H4	138'-0"	0°	RRH 4x25-WCS-4R	–	2° (LTE WCS)	0°
	#4	COMMSCOPE	SBNHH-1D65A	138'-0"	0°	–	–	–	–
B	#5	KATHREIN	742264	138'-0"	120°	(2) POWERWAVE LGP21401	(2) POWERWAVE LGP13519	10° (UMTS 850)	0°
	#6	KATHREIN	80010966	138'-0"	120°	**(1) AIRSCALE B12/14** **(1) AIRSCALE B25/66**	–	10° (LTE 700) 6° (LTE 700) 6° (LTE 1900) 5° (LTE AWS)	2°
	#7	CCI - OCTO	OPA-65R-LCUU-H4	138'-0"	120°	RRH 4x25-WCS-4R	(1) KFTDR00110030	5° (LTE WCS)	2°
	#8	COMMSCOPE	SBNHH-1D65A	138'-0"	120°	–	–	–	–
C	#9	KATHREIN	742264	138'-0"	240°	(2) POWERWAVE LGP21401	(2) POWERWAVE LGP13519	10° (UMTS 850)	0°
	#10	COMMSCOPE	JAHH-45A-R3B	138'-0"	235°	**(1) AIRSCALE B12/14** **(1) AIRSCALE B25/66**	–	8° (LTE 700) 3° (LTE 1900) 1° (LTE AWS)	0°
	#11	COMMSCOPE	JAHH-45A-R3B	138'-0"	235°	RRH 4x25-WCS-4R	–	8° (LTE 700) 1° (LTE WCS)	0°
	#12	COMMSCOPE	SBNHH-1D65A	138'-0"	235°	–	–	–	–
D	#14	**COMMSCOPE**	**JAHH-45A-R3B**	**138'-0"**	**280°**	**(1) AIRSCALE B12/14** **(1) AIRSCALE B25/66**	–	8° (LTE 700) 3° (LTE 1900) 1° (LTE AWS)	0°
	#15	**COMMSCOPE**	**JAHH-45A-R3B**	**138'-0"**	**280°**	**(1) RRH4x25-WCS-4R**	–	8° (LTE 700) 1° (LTE WCS)	0°

KEY:
EXISTING
PROPOSED

CABLE SCHEDULE

SYSTEM	TYPE	QTY	LENGTH
UMTS	7/8"ø COAX	12	150'±
LTE	**PWRT-606-S**	**6**	**150'±**
LTE	**18 PAIR FIBER**	**3**	**150'±**

SURGE PROTECTION DEVICE SCHEDULE

TYPE	LOCATION	QTY
DC6	**SECTOR LEVEL**	**3**

RF DESIGN NOTE:
THIS ANTENNA AND CABLE SCHEDULE HAS BEEN CREATED USING THE FOLLOWING AT&T RFDS DATED: **09/18/2018** REVISION: **V2018_0.2** ALL ANTENNA DESIGN, ZONING, STRUCTURAL ANALYSIS PERMITS AND COMPLIANCE SUBMISSIONS ARE COORDINATED WITH THE AFOREMENTIONED DOCUMENT.

2 C2 RF SCHEDULE
NOT TO SCALE

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ELEVATION AND RF SCHEDULE

Drawing Number
C2

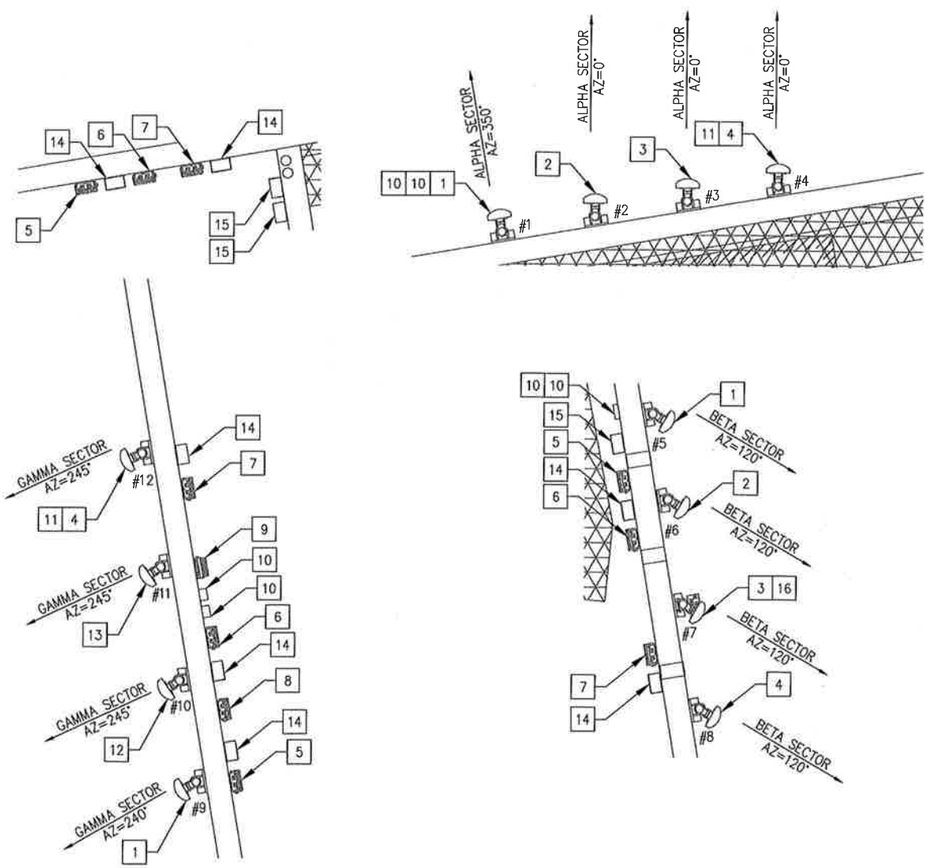
AT&T ROOFTOP PIM NOTICE

- REPLACE ANY HOSE CLAMPS, HANGERS AND SNAP-INS SUPPORTING RF COAX JUMPERS, CPRI, RET OR DC CABLES LOCATED WITHIN LEASE SPACE BEHIND ANTENNA (15 FT MINIMUM) WITH INTERIM SOLUTION QTY= 2 UV RATED 1/4" WIDE NYLON CABLE TIES THAT MEET 120 LBS TENSILE STRENGTH SPECIFICATION.
  EXAMPLES: MINIMUM: 120 LBS TENSILE STRENGTH, THOMAS AND BETTS CABLE TIES, PANDUIT CABLE TIES
- REPLACE ANY HOSE CLAMPS, HANGERS AND SNAP-INS SUPPORTING RF COAX JUMPERS, CPRI, RET OR DC CABLES LOCATED WITHIN 30 FT MINIMUM LEASE SPACE IN FRONT (180 DEGREE) OF ANTENNA WITH QTY= 2 UV RATED 1/4" WIDE NYLON CABLE TIES
- REMOVE ANY UNNECESSARY HARDWARE THAT'S NOT CURRENTLY SUPPORTING ANYTHING. TIGHTEN ALL REMAINING CLAMPS, BRACKETS, ANTENNA SUPPORTS ETC. TO MANUFACTURER TORQUE SPEC.
- ENSURE THERE IS NO RUSTING METAL ON MOUNTING PIPE WHERE CABLE HANGER AND ADAPTER ARE TO BE ATTACHED. USE A WIRE BRUSH OR WIRE WHEEL & DRILL TO REMOVE ANY RUSTING METAL. CLEAN THE MOUNTING SURFACE (INCLUDING REMOVAL OF MINOR CORROSION) WITH A SCOTCHBRITE PAD. PAINT ANY EXPOSED METAL WHERE THERE WAS RUST OR GALVANIZING HAS BEEN DAMAGED WITH COLD-GALVANIZING PAINT (COLD-GALV). USE NO-OX BETWEEN PIPE MOUNTING HARDWARE (CLAMPS OR STAINLESS-STEEL BANDING) AND MOUNTING PIPE. IF COLD-GALV PAINT WAS APPLIED, ENSURE THE PAINT HAS DRIED BEFORE APPLYING NO-OX. DO NOT USE HOSE CLAMPS TO SECURE CABLE HANGERS OR HANGER ADAPTERS IN HIGH RISK PIM ZONES.
- ALL CABLES TIES SHOULD BE FLUSH CUT TO PREVENT INJURY FROM EXPOSED SHARP EDGES.
- DO NOT ATTACH BRASS TAGS TO RF CABLES FOR CABLE IDENTIFICATION LABELING. USE COLOR CODED TAPE AS SPECIFIED BY LOCAL RF CABLE COLOR CODE STANDARD.

ORIENTATION PLAN KEY

KEY	DESCRIPTION	TYPE	QTY	STATUS
1	742264	ANTENNA	3	REMAIN
2	80010966	ANTENNA	2	REMAIN
3	OPA-65R-LCUU-H4	ANTENNA	2	REMAIN
4	SBNHH-1D65A	ANTENNA	3	REMAIN
5	RRH 4T4R B14 160W	RRH	3	REMOVED
6	B25 RRH4x30-4R	RRH	3	REMOVED
7	RRH4-25-WCS-4R	RRH	3	REMAIN
8	RRH2x40W-07L	RRH	3	REMOVED
9	B66A-RRH4x45	RRH	3	REMOVED
10	LGP21401	TMA	6	REMAIN
11	TMAT1921B68-21-43	TMA	2	REMAIN
12	80010966	ANTENNA	1	REMOVED
13	OPA-65R-LCUU-H4	ANTENNA	1	REMOVED
14	DC2	DC/FIBER MGMT	7	REMOVED
15	FC12	SLACK BOX	3	REMOVED
16	KFTDR00110030	FILTER	1	REMAIN
17	**JAHH-45A-R3B**	**ANTENNA**	**4**	**PROPOSED**
18	**AIRSCALE B12/14**	**RRH**	**4**	**PROPOSED**
19	**AIRSCALE B25/66**	**RRH**	**4**	**PROPOSED**
20	**RRH4x25-WCS-4R**	**RRH**	**1**	**PROPOSED**
21	**DC6**	**DC/FIBER MGMT**	**3**	**PROPOSED**

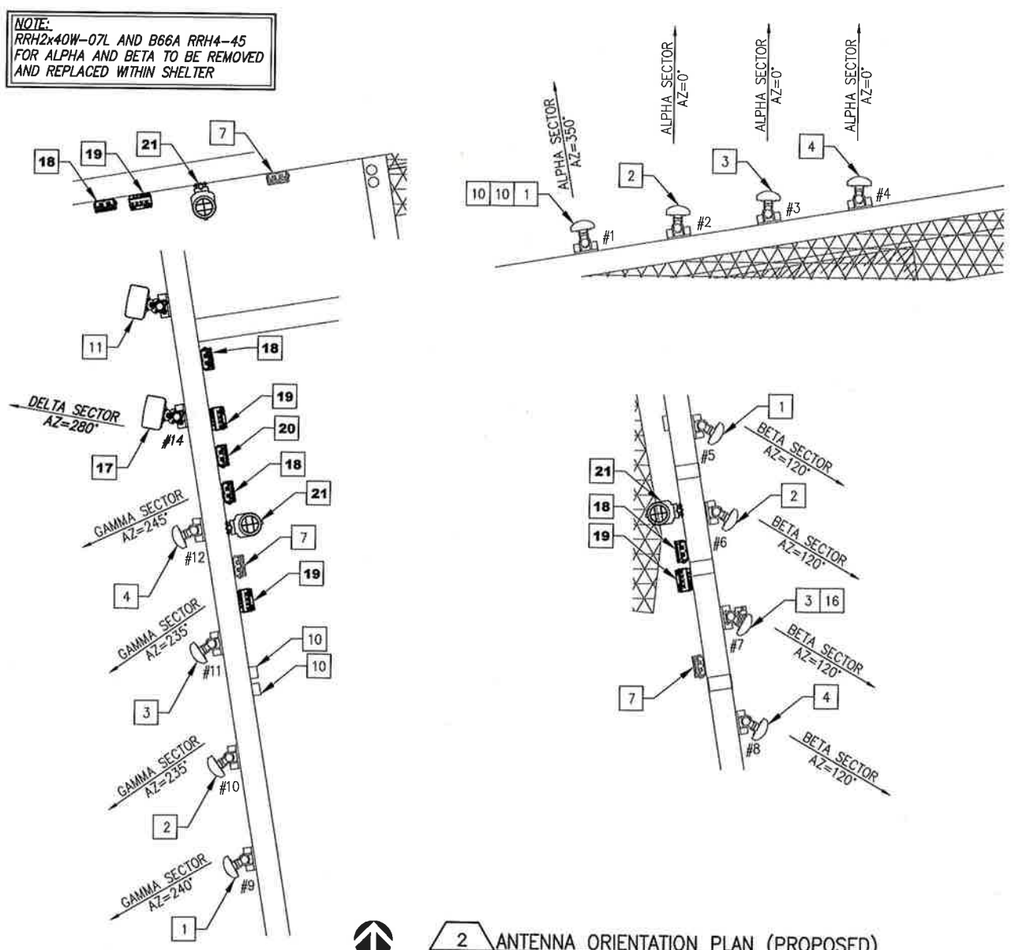
NOTE:
1. *LAYOUT SHOWN BASED ON AVAILABLE INFORMATION FROM AUDIT PHOTOS. GC TO FIELD ADJUST LAYOUT AS NECESSARY FOR MINIMUM REQUIRED CLEARANCES OF EQUIPMENT.*
2. *NO EXISTING OR PROPOSED UNISTRUT TO EXCEED A SPAN OF 4' BETWEEN SUPPORTS. REMOVE AND REPLACE EXISTING UNISTRUT AS NECESSARY FOR MAX. 4' SPAN WHEN UTILIZED FOR MOUNTING RRHs AND SLACK BOXES.*
3. *SEE SHEETS C5 AND C6 FOR PROPOSED EQUIPMENT MOUNTING DETAILS.*



NORTH

1 / C3 ANTENNA ORIENTATION PLAN (EXISTING)
NOT TO SCALE

NOTE:
RRH2x40W-07L AND B66A RRH4-45 FOR ALPHA AND BETA TO BE REMOVED AND REPLACED WITHIN SHELTER



NORTH

2 / C3 ANTENNA ORIENTATION PLAN (PROPOSED)
NOT TO SCALE

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STATE OF MARYLAND
JOHN S. STEVENS
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PROFESSIONAL ENGINEER
NOV 29 2018

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 36339 EXP. 12/12/2020

No	Submittal / Revision	Appv'd	Date
0	ISSUED FOR CONSTRUCTION	RMS	11/28/18
B	CLIENT COMMENTS	RMS	11/12/18
A	ISSUED FOR CLIENT REVIEW	HAM	11/08/18

Drawn: HAM
Designed: MRL
Checked: AJD

Project Number: 499-002

Project Title:
CRESCENT
SITE ID: 55113
FA # 10006543
4600 EAST WEST HIGHWAY
BETHESDA, MD 20814

Prepared For:

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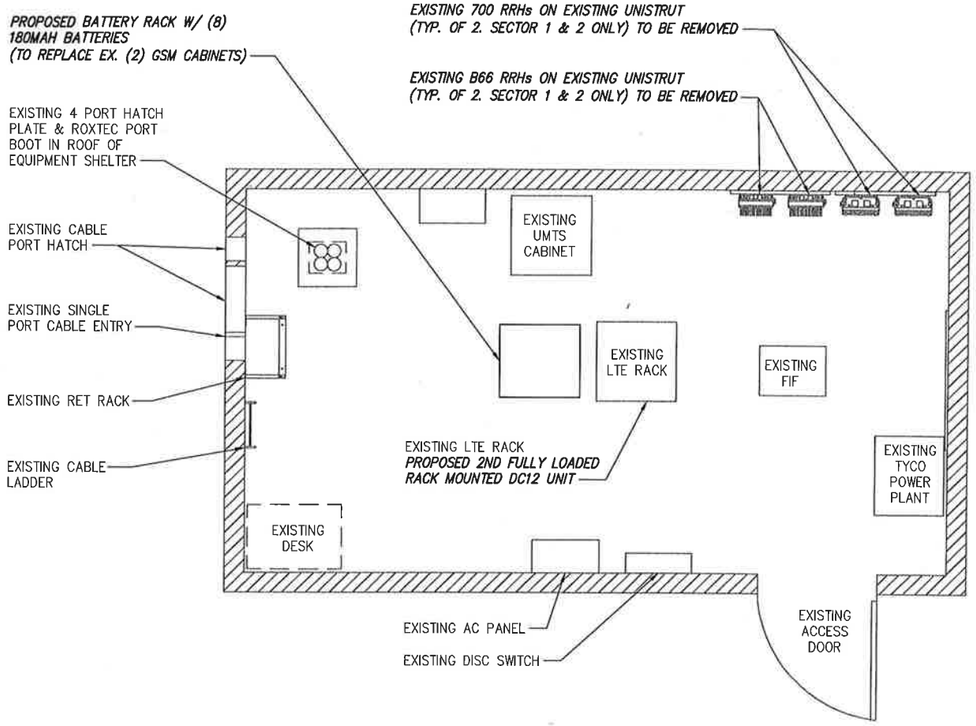
Drawing Title
ANTENNA ORIENTATION PLAN

Drawing Number
C3

NOTE:
REMOVING EXISTING FIBER & DC CABLES AND UTILIZE SPARE PORTS IN AVAILABLE ENTRY PANELS.



1 C4 EQUIPMENT LAYOUT
SCALE: NOT TO SCALE

FA # 10006543	SITE: Crescent	PROJECT: DELTA SECTOR ADD WITH 2 RETRO FITS FOR DUAL AIRSCALES
EXISTING CABLES AND DC SURGE EQUIPMENT:	EQUIPMENT SCOPING:	ANTENNA AND RRH SCOPING
12 X 7/8" FEEDERS, 6 X 8-6 DC TRUNKS, 3 X FC12, 9 X DC2'S	ADD A 2ND FULLY LOADED RACK MOUNTED DC12 UNIT TO THE EXISTING LTE RACK	ALPHA POS. #2 / ALPHA POS. #4
CABLES AND DC SURGE EQPT SOW:	REMOVE GSM CABINET ADD RACK WITH 8 X +24 180MHA STRINGS TOTAL WEIGHT OF	SWAP OUT BAND 14 AND B25 RRH FOR NEW B12/14 AND B25/66 RRH'S / REMOVE TMA, 07L AND B66 RRH'S
REMOVE ALL FC12'S, REMOVE ALL DC2'S, REMOVE ALL DC TRUNKS, AND ADD 6 NEW PWRT-606-S DC TRUNKS, ADD 3 NEW 18 PAIR FIBER TRUNKS, ADD 3 NEW DC6'S		BETA POS. #2 / BETA POS. #4
		SWAP OUT BAND 14 AND B25 RRH FOR NEW B12/14 AND B25/66 RRH'S / REMOVE TMA, 07L AND B66 RRH'S
		GAMMA POS. #2 / GAMMA POS. #4 / GAMMA POS. #3
		SWAP OUT ANTENNA AND SWAP OUT BAND 14 AND B25 RRH FOR NEW B12/14 AND B25/66 RRH'S AND NEW JAHH-45A-R3B / SWAP OUT AND ANTENNA FOR NEW JAHH-45A-R3B / REMOVE TMA, 07L AND B66 RRH'S
		DELTA POS. #1 / DELTA POS. #2
		ADD NEW JAHH-45A-R3B WITH B12/14 AND B25/66 RRHS / ADD NEW JAHH-45A-R3B WITH WCS RRH

2 C4 SCOPE OF WORK
SCALE: NOT TO SCALE

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STATE OF MARYLAND
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No	Submittal / Revision	Appd	Date
0	ISSUED FOR CONSTRUCTION	RMS	11/28/18
B	CLIENT COMMENTS	RMS	11/12/18
A	ISSUED FOR CLIENT REVIEW	HAM	11/06/18

Drawn: HAM
Designed: NRL
Checked: AJD

Project Number: 499-002

Project Title:
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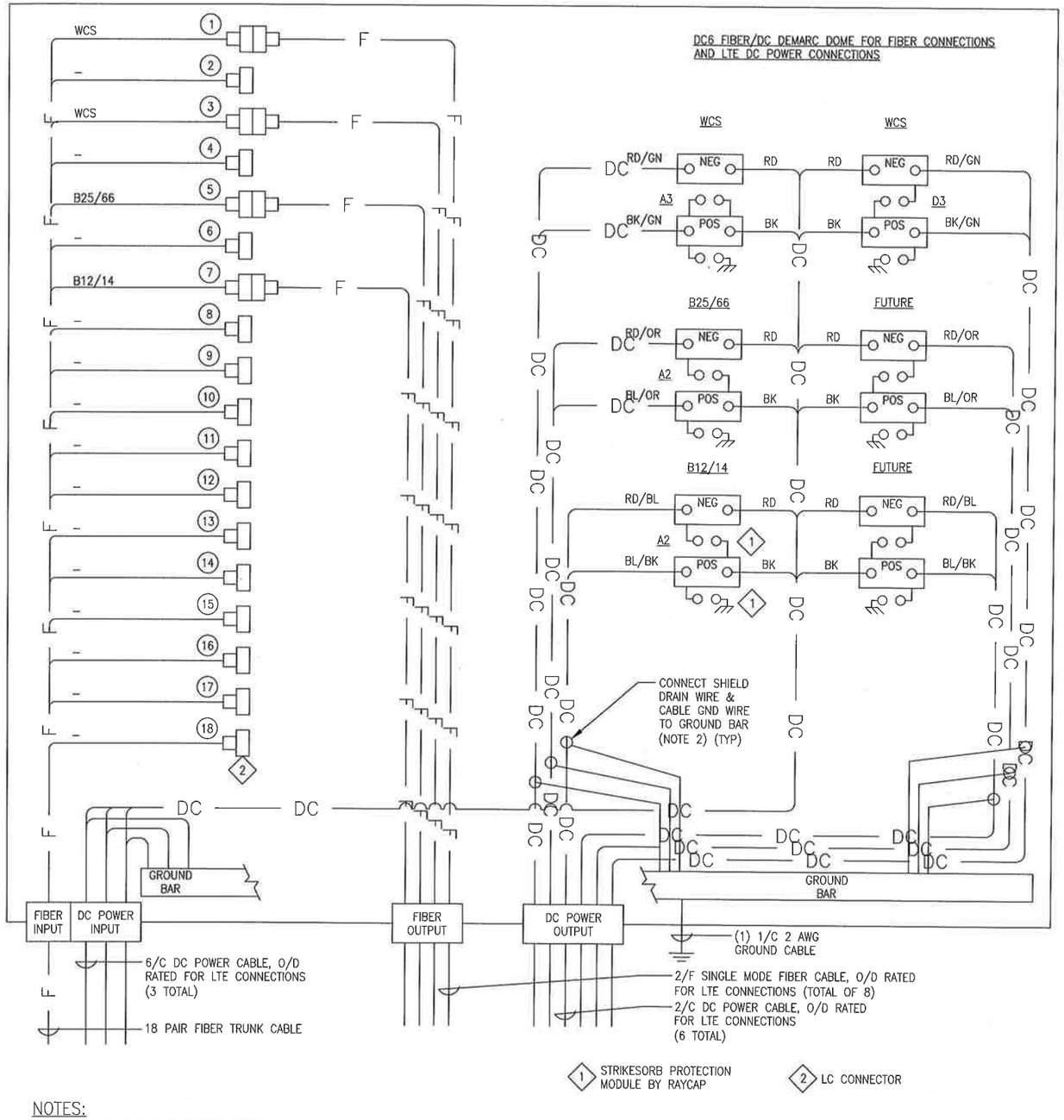
Drawing Title
EQUIPMENT LAYOUT AND SCOPE

Drawing Number
C4



NOTES:
1. SEE RF CHART FOR CONDUCTOR SIZES.
2. WHEN SHIELDED CABLE IS USED CONNECT CABLE SHIELD DRAIN WIRE AND GROUND WIRE TO GROUND BAR.

1/C5 RAYCAP DC6 FIBER/DC DEMARC DOME DETAIL (ALPHA SECTOR)
SCALE: NTS

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0	ISSUED FOR CONSTRUCTION	RMS	11/26/18
B	CLIENT COMMENTS	RMS	11/12/18
A	ISSUED FOR CLIENT REVIEW	HAM	11/08/18

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Designed: MRL
Checked: AJD

Project Number: 499-002

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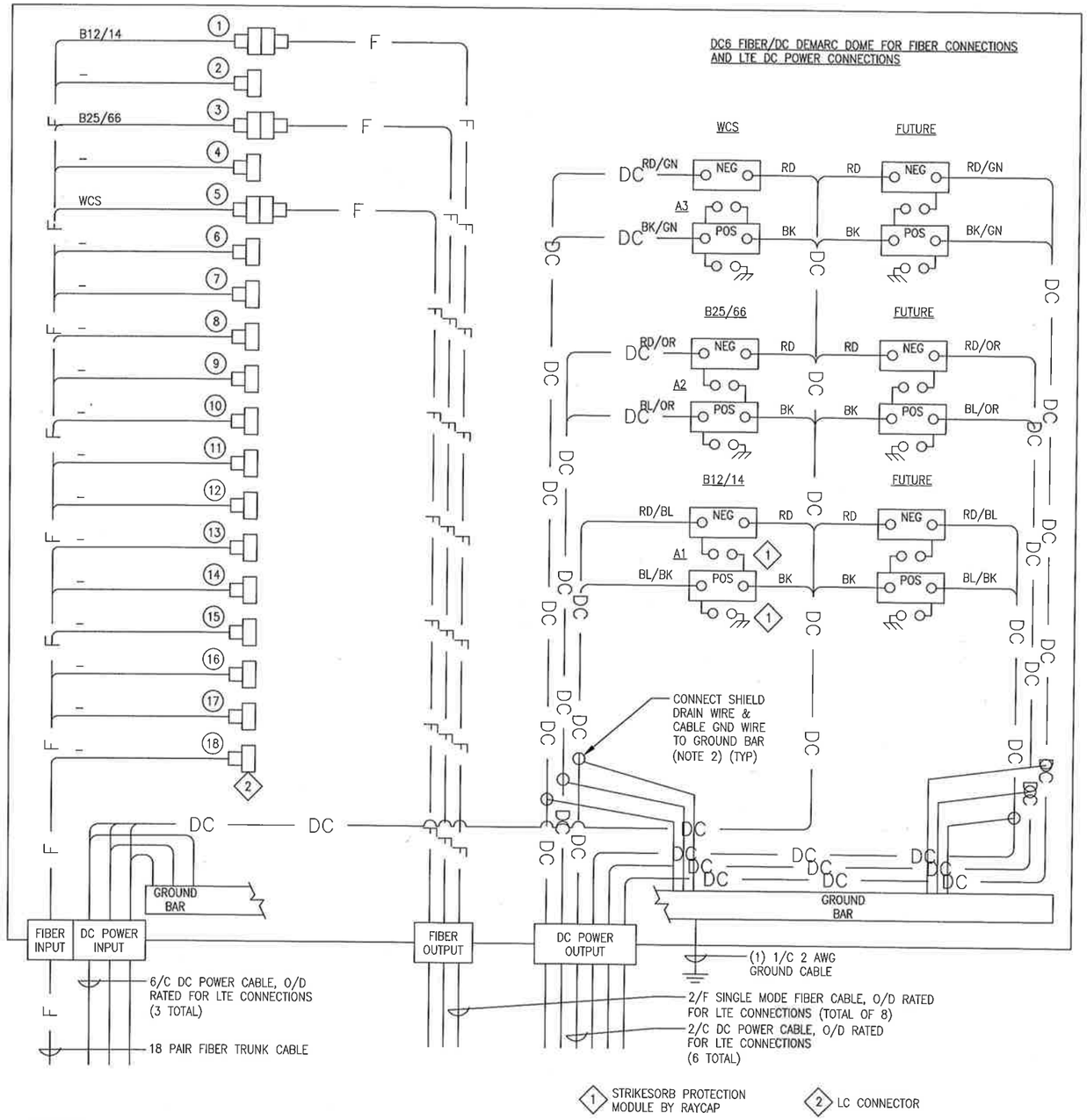
Drawing Title
DC6 WIRING DIAGRAM ALPHA

Drawing Number
C5



NOTES:

1. SEE RF CHART FOR CONDUCTOR SIZES.
2. WHEN SHIELDED CABLE IS USED CONNECT CABLE SHIELD DRAIN WIRE AND GROUND WIRE TO GROUND BAR.

1 / C6 RAYCAP DC6 FIBER/DC DEMARC DOME DETAIL (BETA SECTOR)

SCALE: NTS

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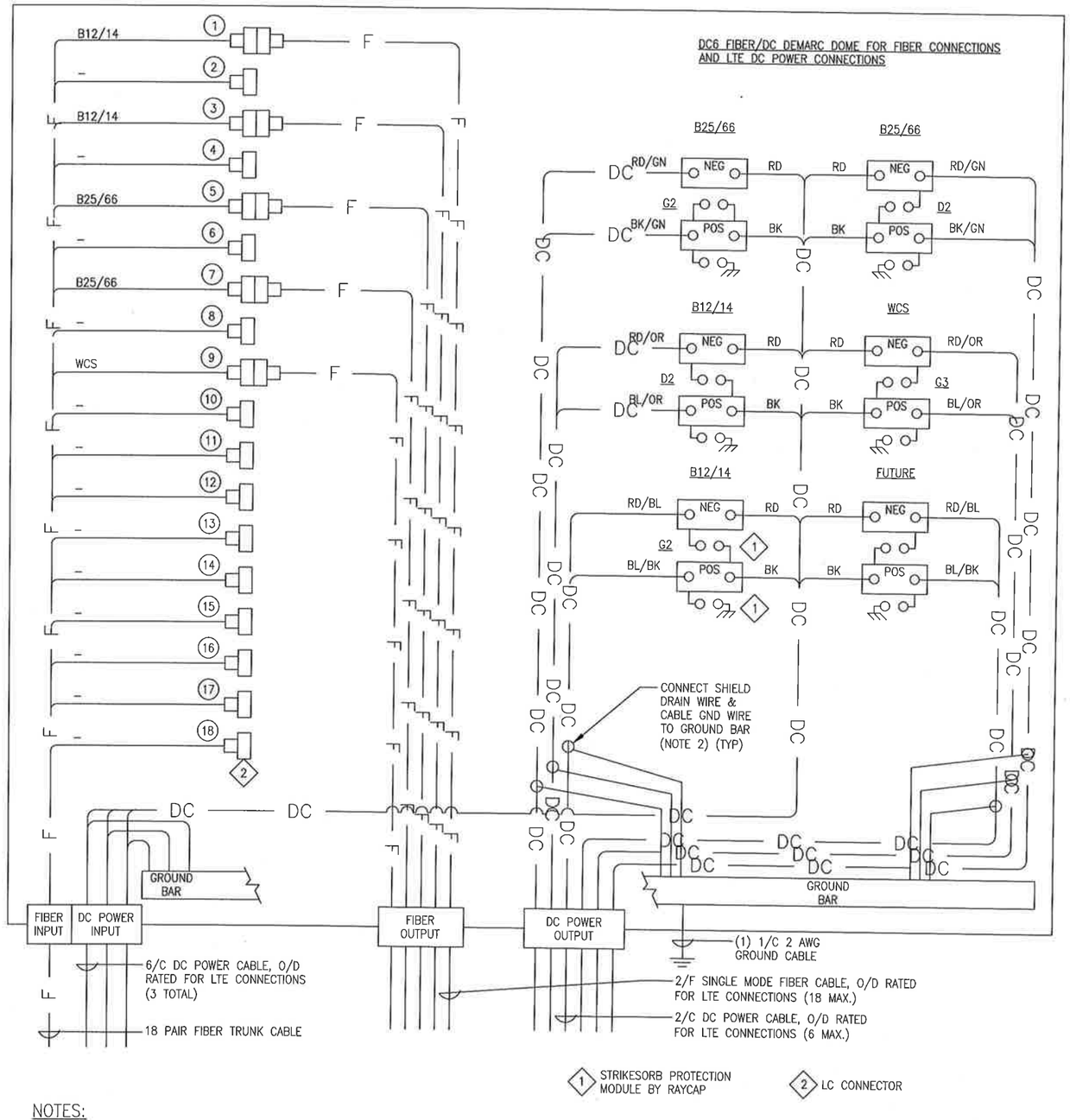
Drawing Title: **DC6 WIRING DIAGRAM BETA**

Drawing Number: **C6**



NOTES:
1. SEE RF CHART FOR CONDUCTOR SIZES.
2. WHEN SHIELDED CABLE IS USED CONNECT CABLE SHIELD DRAIN WIRE AND GROUND WIRE TO GROUND BAR.

1 / C7 RAYCAP DC6 FIBER/DC DEMARC DOME DETAIL (GAMMA SECTOR)
SCALE: NTS

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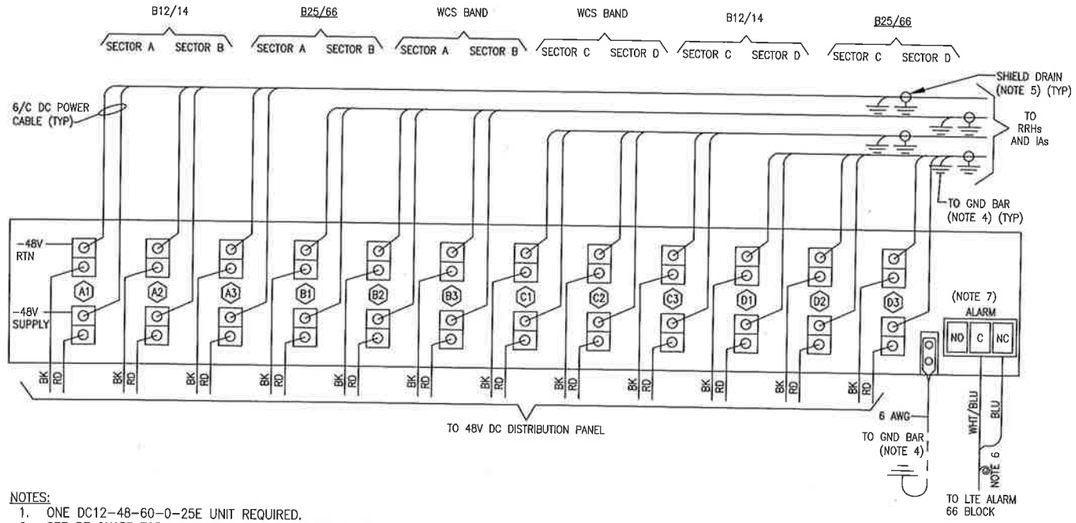
Drawing Title
DC6 WIRING DIAGRAM GAMMA

Drawing Number
C7



NOTES:

1. ONE DC12-48-60-0-25E UNIT REQUIRED.
2. SEE RF CHART FOR DC POWER CABLE CONDUCTOR SIZES.
3. CABLE TERMINALS FOR POWER CONNECTION SHALL BE COMPRESSION TYPE, 1-HOLE FOR 1/4"-20 STUDS.
4. CABLE TERMINAL FOR GROUND CONNECTION SHALL BE COMPRESSION TYPE, 2-HOLE 1"-CENTERS FOR 1/4"-20 STUDS.
5. CONNECTIONS TO RACK GROUND BAR SHALL BE MADE WITH 2-HOLE COMPRESSION TERMINALS.
6. WHEN SHIELDED CABLE IS USED, CONNECT CABLE SHIELD DRAIN WIRE TO RACK GROUND BAR. THIS CONNECTION SHALL BE INDEPENDENT OF THE CABLE GROUND WIRE CONNECTION.
7. TURN BACK AND STORE UNUSED CONDUCTORS.
8. INSTALL RAYCAP PROVIDED LOOP-BACK CONNECTOR ON THE LAST ACTIVE (POWERED) MODULE WHEN FEWER THAN 6 RRH's OR RRU's ARE DEPLOYED.

1 / C8 CONNECTION DIAGRAM OUTDOOR SURGE SUPPRESSION SYSTEM (RAYCAP DC12-48-60-0-25E)

SCALE: NTS

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Drawing Title

GROUNDING DETAILS

Drawing Number

C8

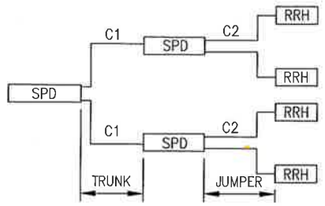


FIGURE 1 – TRUNK CABLE TO DC SURGE PROTECTION DEVICE (DC6/FC12/DC2)

MAXIMUM CABLE LENGTHS FOR FIGURE 1

NOKIA AIRSCALE DUAL RRH TRUNK/JUMPER LENGTH (FT)			
CABLE	4 AWG	6 AWG	8 AWG
C1	245	150	–
C2	–	–	12

NOKIA B5 RRH & ALU RRHs TRUNK/JUMPER LENGTH (FT)			
CABLE	4 AWG	6 AWG	8 AWG
C1	530	340	–
C2	–	–	12

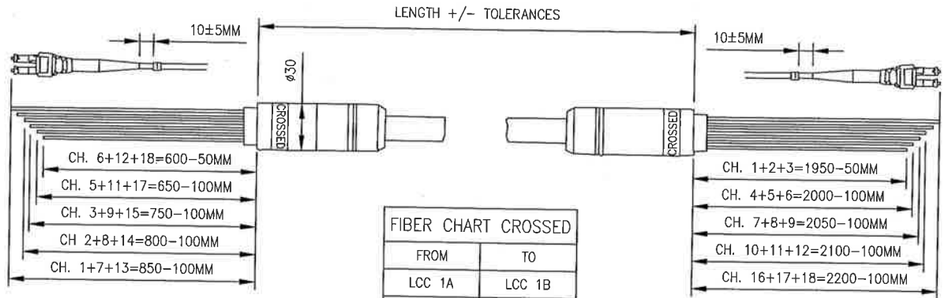
NOTES:

1. BASED ON POWER PLANT SUPPLY VOLTAGE OF –48VDC AND VOLTAGE AT RRHs OF –42VDC AND MAX. TEMPERATURE OF 60° CELSIUS.
2. CABLE LENGTHS BASED ON COMMSCOPE CABLES.

1 / C9 DC CABLE LENGTH CHART
NOT TO SCALE

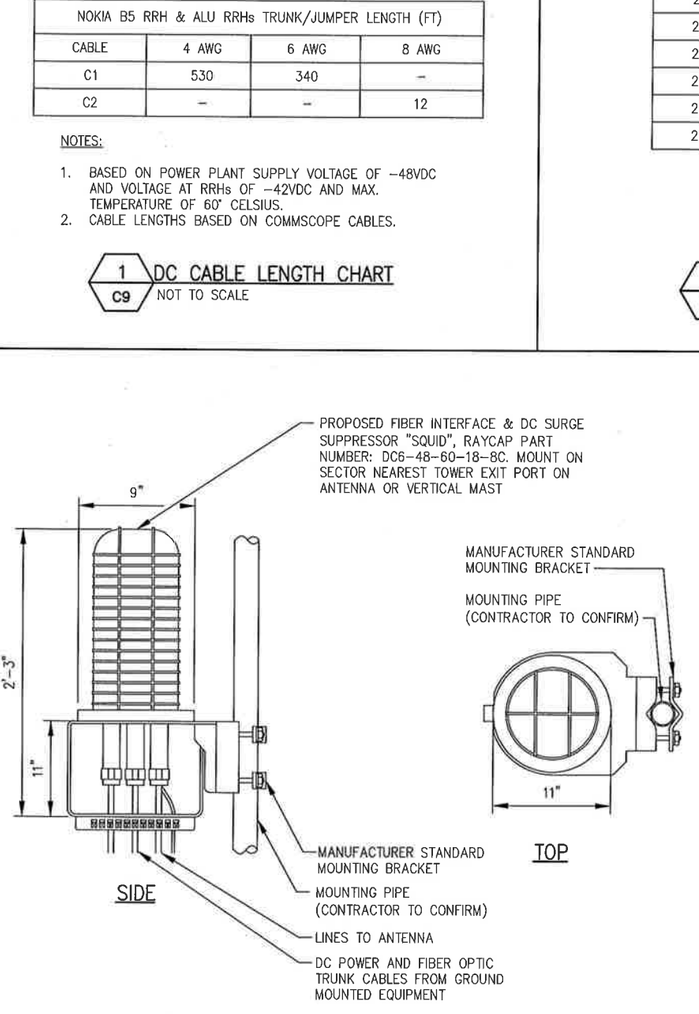
FIBER TRUNK CHANNEL	TECHNOLOGY	FREQUENCY BAND	SECTOR
1.1	LTE	700 B/C	ALPHA
1.2			BETA
1.3			GAMMA
1.4	LTE	B25 1900	ALPHA
1.5			BETA
1.6			GAMMA
1.7	LTE	700 FNET	ALPHA
1.8			BETA
1.9			GAMMA
2.1	LTE	AWS	ALPHA
2.2			BETA
2.3			GAMMA
2.4	LTE	WCS	ALPHA
2.5			BETA
2.6			GAMMA

2 / C9 FIBER TRUNK ASSIGNMENTS
NOT TO SCALE

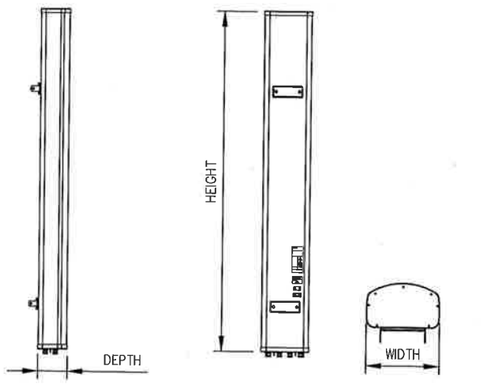


FIBER CHART CROSSED	
FROM	TO
LCC 1A	LCC 1B
LCC 1B	LCC 1A
LCC 2A	LCC 2B
LCC 2B	LCC 2A
LCC 3A	LCC 3B
LCC 3B	LCC 3A
...	...
...	...
LCC 18B	LCC 18A

3 / C9 FIBER CONNECTION DETAIL
NOT TO SCALE



4 / C9 DC6 DETAIL
NOT TO SCALE



COMMSCOPE MODEL NO.:	JAHH–45A–R3B
DIMENSIONS, HxWxD:	55.1"x18.0"x7.0"
WEIGHT:	73.9LBS

5 / C9 ANTENNA DETAIL
NOT TO SCALE

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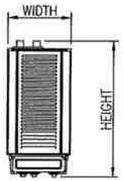
Drawing Title
FIBER/DC DETAILS

Drawing Number
C9

REMOTE RADIO HEAD (RRH)



SIZE AND WEIGHT TABLE

RRH MODEL	HEIGHT x WIDTH x DEPTH	WEIGHT
ALU RRH 2x40-07AT	24.8"x11.5"x5.7"	52.91 LBS
ALU B25 RRH 4x30-4R	21.2"x11.97"x7.18"	52.9 LBS
ALU RRH 4x25-WCS-4R	31.5"x12.0"x8.7"	31.5 LBS
ALU B66A RRH4x45-4R	25.8"x11.8"x7.2"	52.9 LBS
FLEXI RRH 4T4R B14 160W FRBI	23.0"x13.0"x6.6"	53.0 LBS
NOKIA 4T4R B12/14 320W AHLBA	26.7"x12.8"x7.4"	99.2 LBS
NOKIA 4T4R B25/66 320W AHFIB	26.7"x12.8"x6.3"	88.18 LBS
NOKIA 4T4R B5 160W AHCA	13.2"x11.6"x6.4"	36.81 LBS

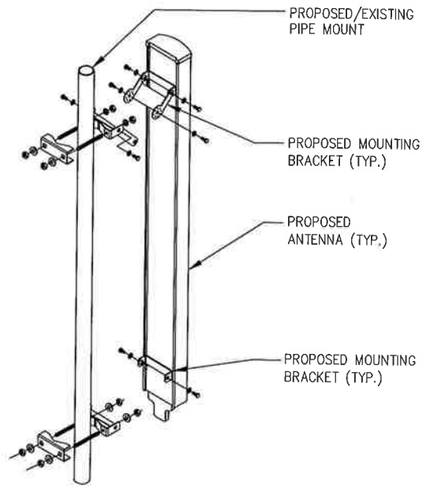
CLEARANCE TABLE

	CLEARANCE REQ'D
FRONT	36" FOR INSTALLATION ACCESS
REAR	2" (0" WITH SUPPLIED MOUNTING BRACKETS)
RIGHT	4" FOR AIR FLOW
LEFT	4" FOR AIR FLOW
TOP	12" FOR AIR FLOW
BOTTOM	12" FOR CONDUIT ROUTING

NOTES:

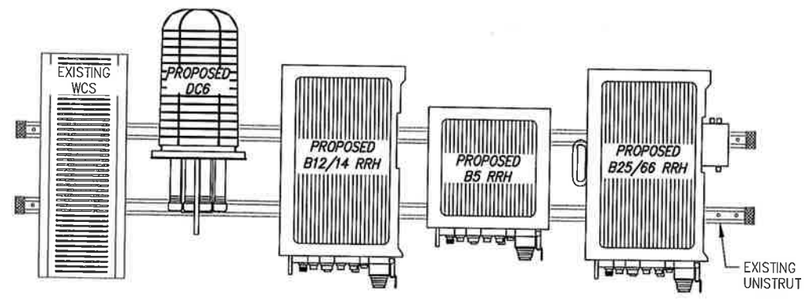
1. ALCATEL-LUCENT/NOKIA VIA AT&T SUPPLIES RRH AND RRH MOUNTING BRACKET. SUBCONTRACTOR SHALL SUPPLY UNISTRUT AND INSTALL RRHs AND ALL MOUNTING HARDWARE INCLUDING ALU/NOKIA RRH WALL MOUNTING BRACKET IF NECESSARY. ALU/NOKIA MAKES CABLE TERMINATIONS.
2. DIMENSIONS AND WEIGHTS ARE FOR RRH WITHOUT MOUNTING BRACKET

1 / C10 RRH DETAIL
SCALE: NTS



NOTE: CONTRACTOR IS TO USE MANUFACTURERS MANUAL BRACKETS AND HARDWARE. NO U-BOLTS OR BEAM CLAMPS ALLOWED

2 / C10 MOUNTING DETAIL
SCALE: NTS



NOTES:

1. FC12 LOCATED AT ALPHA SECTOR ONLY.
2. ALCATEL-LUCENT (ALU)/NOKIA VIA AT&T SUPPLIES THE RRH. SUBCONTRACTOR SHALL SUPPLY ALL OTHER MATERIALS AND INSTALL ALL MOUNTING HARDWARE. ALU/NOKIA INSTALLS RRH AND MAKES CABLE TERMINATIONS OR AS SCOPED BY MARKET.
3. CHANNEL AND MOUNTING HARDWARE SHALL HAVE HOT-DIPPED GALVANIZED FINISH.
4. MOUNT RRH TO UNISTRUT WITH 3/8"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER BRACKET. SUBCONTRACTOR SHALL SUPPLY.
5. MOUNT FIBER AND POWER DISTRIBUTION BOX WITH FOUR (4) 1/4"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS.
6. NO PAINTING OF THE RRH OR SOLAR SHIELD IS ALLOWED.

3 / C10 RRH MOUNTING DETAIL
SCALE: NTS

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STATE OF MARYLAND
JOHN S. STEVENS
No. 21638
REGISTERED PROFESSIONAL ENGINEER
NOV 29 2018

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 36339 EXP. 12/12/2020

No.	Submittal / Revision	Appd	Date
0	ISSUED FOR CONSTRUCTION	RMS	11/28/18
B	CLIENT COMMENTS	RMS	11/12/18
A	ISSUED FOR CLIENT REVIEW	HAM	11/08/18

Drawn: HAM
Designed: MRL
Checked: AJD

Project Number:
499-002

Project Title:
CRESCENT
SITE ID: 55113
FA # 10006543
4600 EAST WEST HIGHWAY
BETHESDA, MD 20814

Prepared For:
smartlink
1362 MELLON RD
HANOVER, MD 21076
TEL (410) 582-8043
FAX (443) 221-2962

Drawing Title
EQUIPMENT DETAILS

Drawing Number
C10

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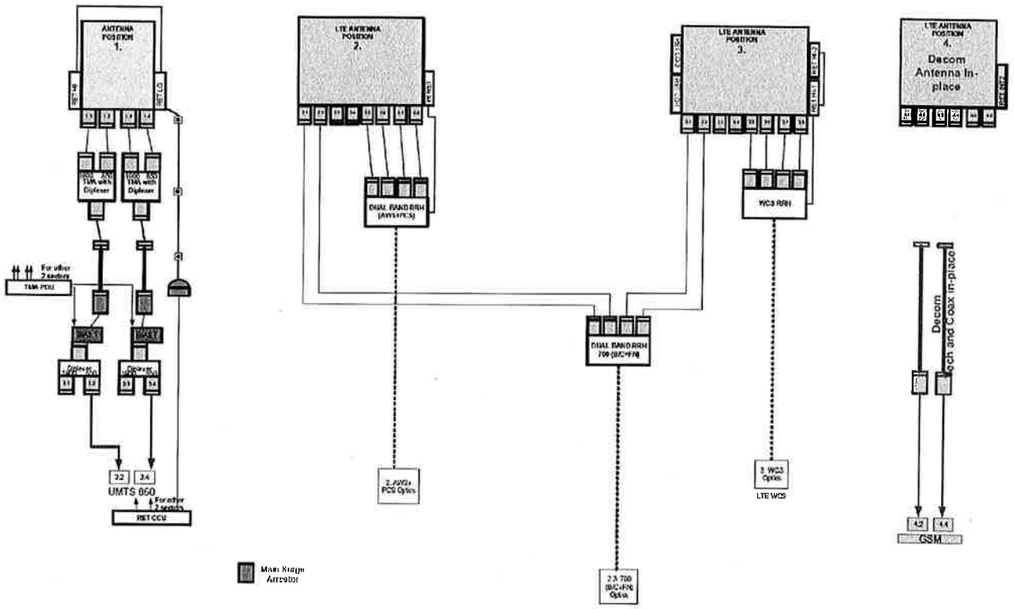

ALPHA SECTOR

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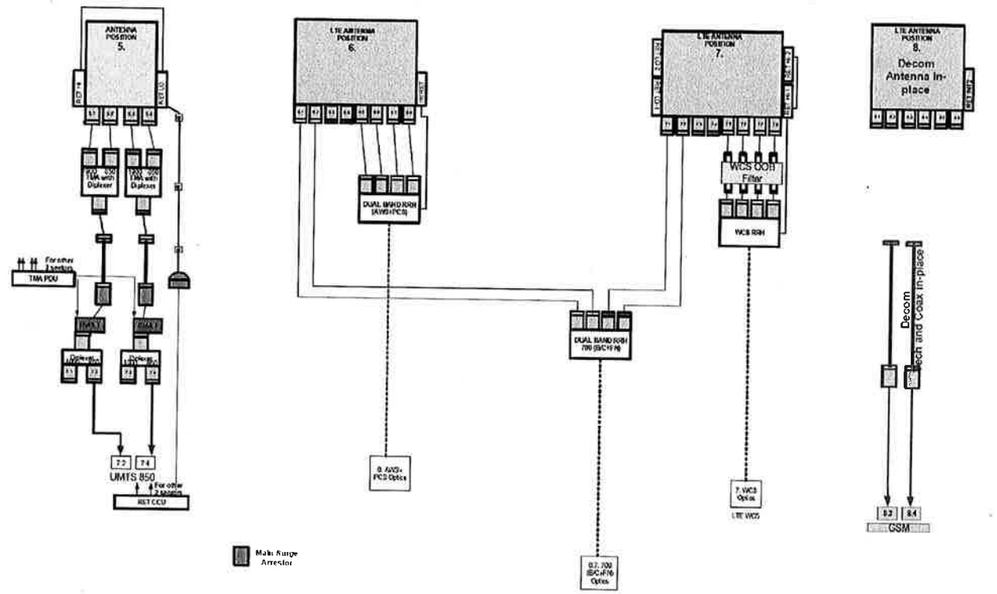

BETA SECTOR

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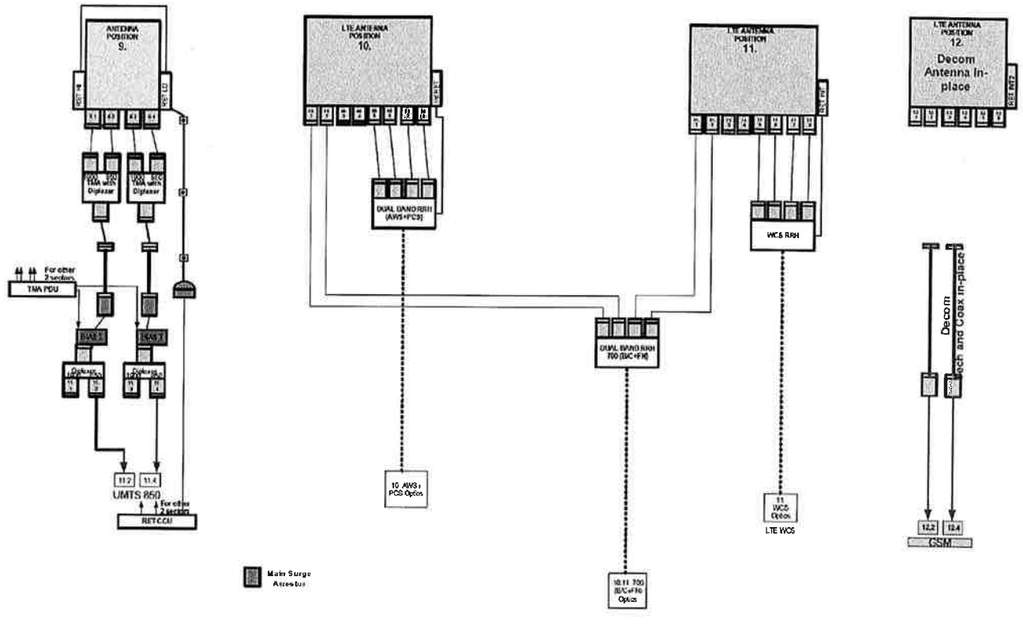

GAMMA SECTOR

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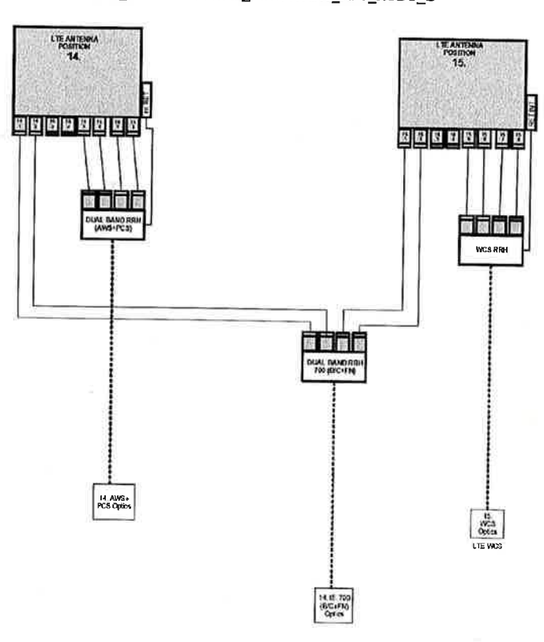

DELTA SECTOR

1 C11 PLUMBING DIAGRAM (FINAL CONFIGURATION)
NOT TO SCALE

at&t

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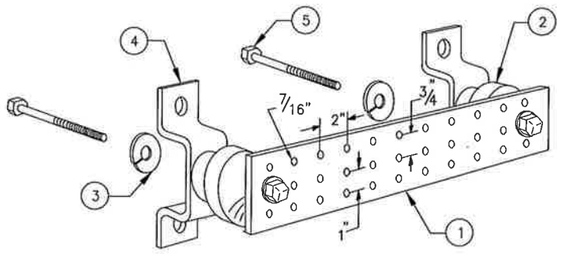
Drawing Title

RF PLUMBING DIAGRAM

Drawing Number

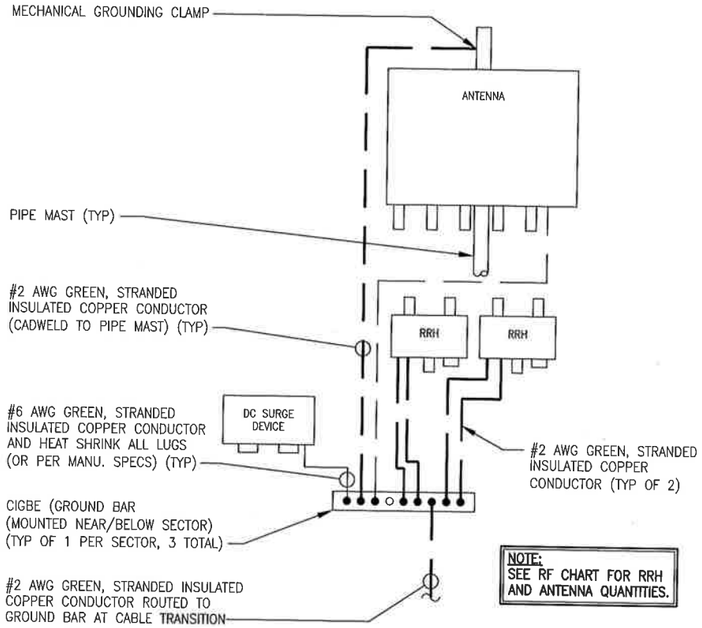
C11



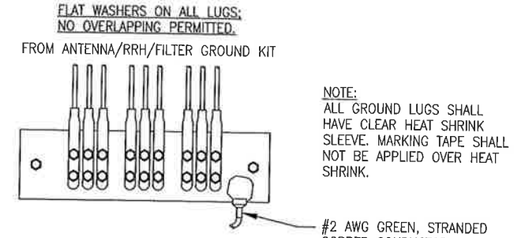
LEGEND

1 – SOLID TINNED COPPER GROUND BAR, 1/4"x 4"x 20" MIN., NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
2 – INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061–4
3 – 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015–8
4 – WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A–6056
5 – 5/8–11 X 1" H.H.C.S. BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012–1
6 – GROUND BAR SHALL BE SIZED TO ACCOMODATE ALL GROUNDING CONNECTIONS REQUIRED PLUS PROVIDE 50% SPARE CAPACITY
7 – GROUND BARS SHALL NEITHER BE FIELD FABRICATED NOR NEW HOLES DRILLED
8 – GROUND LUGS SHALL MATCH THE HOLE SPACING ON THE BAR
9 – HARDWARE DIAMETER SHALL BE MINIMUM 3/8"

1 / C12 GROUND BAR
SCALE: NTS



2 / C12 CONNECTION OF SECTOR EQUIPMENT TO GROUNDING BAR DETAIL
SCALE: NTS



3 / C12 INSTALLATION OF GROUND WIRE TO GROUND BAR DETAIL
SCALE: NTS

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Drawing Title
GROUNDING DETAILS

Drawing Number
C12

GENERAL NOTES:

1. THESE DOCUMENTS WERE DESIGNED IN ACCORDANCE WITH THE LATEST VERSION OF APPLICABLE LOCAL/STATE/COUNTY/CITY BUILDING CODES, AS WELL AS ANSI/TIA-222 STANDARD, AWWA-D100 STANDARD, NDS, NEC, MSJC, AND/OR THE LATEST VERSION OF THE INTERNATIONAL BUILDING CODE, UNLESS NOTED OTHERWISE IN THE CORRESPONDING STRUCTURAL REPORT.
2. ALL CONSTRUCTION METHODS SHOULD FOLLOW STANDARDS OF GOOD CONSTRUCTION PRACTICE.
3. ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN SIMILAR CONSTRUCTION.
4. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. IF OBSTRUCTIONS ARE FOUND, CONTRACTOR SHALL NOTIFY ENGINEER OF RECORD PRIOR TO CONTINUING WORK.
5. ANY CHANGES OR ADDITIONS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS, AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL CHANGES OR ADDITIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND/OR CONSTRUCTION.
6. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE DURING CONSTRUCTION. TIA-1019-A-2011 IS AN APPROPRIATE REFERENCE FOR THOSE DESIGNS MEETING TIA STANDARDS. THE ENGINEER OF RECORD MAY PROVIDE FORMAL RIGGING PLANS AT THE REQUEST AND EXPENSE OF THE CONTRACTOR.
7. INSTALLATION SHALL NOT INTERFERE NOR DENY ADEQUATE ACCESS TO OR FROM ANY EXISTING OR PROPOSED OPERATIONAL AND SAFETY EQUIPMENT.
8. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO ANY FABRICATION. CONTACT INFINIGY ENGINEERING IF ANY DISCREPANCIES EXIST.

STEEL CONSTRUCTION NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE AISC MANUAL OF STEEL CONSTRUCTION 14TH EDITION, FOR THE DESIGN AND FABRICATION OF STEEL COMPONENTS.
2. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES, AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS' RECOMMENDATIONS.
3. ALL FIELD DRILLED HOLES TO BE USED FOR FIELD BOLTING INSTALLATION SHALL BE STANDARD HOLES, AS DEFINED BY AISC, UNLESS NOTED OTHERWISE.
4. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
5. ALL STEEL MEMBERS AND CONNECTIONS SHALL MEET THE FOLLOWING GRADES:
   - ANGLES, CHANNELS, PLATES AND BARS TO BE A36. Fy=36 KSI, U.N.O.
   - W SHAPES TO BE A992. Fy=50 KSI, U.N.O.
   - RECTANGULAR HSS TO BE A500, GRADE B. FY=46 KSI, U.N.O.
   - ROUND HSS TO BE A500, GRADE B. FY=42 KSI, U.N.O.
   - STEEL PIPE TO BE A53, GRADE B. Fy=35 KSI, U.N.O.
   - BOLTS TO BE A325-X. Fu=120 KSI, U.N.O.
   - U-BOLTS AND LAG SCREWS TO BE A307 GR A. Fu=60 KSI, U.N.O.
6. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES, U.N.O.
7. ALL WELDING SHALL CONFORM TO AISC AND AWS D1.1 LATEST EDITION.
8. ALL HILTI ANCHORS TO BE CARBON STEEL, U.N.O.
   - MECHANICAL ANCHORS: KWIK BOLT-TZ, U.N.O.
   - CMU BLOCK ANCHORS: ADHESIVE - HY120, U.N.O.
   - CONCRETE ANCHORS: ADHESIVE - HY150, U.N.O.
   - CONCRETE REBAR: ADHESIVE - RE500, U.N.O.
9. ALL STUDS TO BE NELSON CAPACITOR DISCHARGE 1/4"-20 LOW CARBON STEEL COPPER-FLASH AT 55 KSI ULT/50 KSI YIELD, U.N.O.
10. BOLTS SHALL BE TIGHTENED TO A "SNUG TIGHT" CONDITION AS DEFINED BY AISC.
11. MINIMUM EDGE DISTANCES SHALL CONFORM TO AISC TABLE J3.4.

CONCRETE CONSTRUCTION NOTES:

1. CONCRETE TO BE 4000 PSI @ 28 DAYS. REINFORCING BAR TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. CONCRETE INSTALLATION TO CONFORM TO ACI-318 BUILDING REQUIREMENTS FOR REINFORCED CONCRETE. ALL CONCRETE TO BE PLACED AGAINST UNDISTURBED EARTH FREE OF WATER AND ALL FOREIGN OBJECTS AND MATERIALS. A MINIMUM OF THREE INCHES OF CONCRETE SHALL COVER ALL REINFORCEMENT. WELDING OF REBAR IS NOT PERMITTED.
2. EXISTING CONCRETE SURFACES THAT ARE TO BE IN CONTACT WITH NEW PROPOSED CONCRETE SHOULD BE WIRE BRUSHED CLEAN AND TREATED WITH APPROPRIATE MECHANICAL SCRATCH COAT AND REPAIR MATERIALS OR APPROPRIATE CHEMICAL METHODS SUCH AS THE APPLICATION OF A BONDING AGENT, EX. SAKRETE OR EQUIVALENT, TO ENSURE A QUALITY BOND BETWEEN EXISTING AND PROPOSED CONCRETE SURFACES.

FIBER REINFORCED POLYMER (FRP) NOTES:

1. FRP PLATES, SHAPES, BOLTS AND NUTS (STUD/NUT ASSEMBLIES) SHALL CONFORM TO ASTM D638, 695, 790. PLATES AND SHAPES TO BE FY = 5.35 KSI LW (SAFETY FACTOR OF 8), .945 KSI CW (SAFETY FACTOR OF 8) MIN.
2. IF FIELD FABRICATION IS REQUIRED, ALL CUT EDGES AND DRILLED HOLES TO BE SEALED USING VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
3. ALL FASTENERS TO BE 1/2" DIA FRP THREADED ROD WITH FIBER REINFORCED THERMOPLASTIC NUT, SPACED AT 12 INCHES ON CENTER MAXIMUM, U.N.O., FOR PANELS AND AS DESIGNED FOR STRUCTURAL MEMBERS.
4. THE COLOR AND SURFACE PATTERN OF EXPOSED FRP PANELS SHALL MATCH THE EXTERIOR OF THE EXISTING BUILDING, U.N.O.
5. STUD/NUT ASSEMBLIES SHOULD BE LUBRICATED FOR INSTALLATION
6. ENSURE BEARING SURFACES OF THE NUTS ARE PARALLEL TO THE SURFACES BEING FASTENED.
7. TORQUE BOLTS ACCORDING TO THE FOLLOWING TABLE:

INSTALLATION TORQUE TABLE		
SIZE	ULTIMATE TORQUE STRENGTH	RECOMMENDED MAXIMUM INSTALLATION TORQUE
3/8-16 UNC	8 FT-LBS	4 FT-LBS
1/2-13 UNC	18 FT-LBS	8 FT-LBS
5/8-11 UNC	35 FT-LBS	16 FT-LBS
3/4-10 UNC	50 FT-LBS	24 FT-LBS
1-8 UNC	110 FT-LBS	50 FT-LBS

8. WHEN TIGHTENING FRP STUD/NUT ASSEMBLIES, WRENCHES MUST MAKE FULL CONTACT WITH ALL NUT EDGES. A STANDARD SIX POINT SOCKET IS RECOMMENDED.
9. STUD/NUT ASSEMBLIES SHOULD BE BONDED BY APPLYING BONDING AGENT TO ENTIRE NUT AND EXPOSED STUD.
10. ALL FRP MATERIALS TO BE PROVIDED BY FIBERGRATE COMPOSITE STRUCTURES, DALLAS TX, OR APPROVED EQUAL.
11. ALL FRP SHAPES TO BE DYNAFORM PULTRUDED STRUCTURAL SHAPES.
12. ALL FRP PLATES TO BE FIBERPLATE MOLDED FRP PLATE.
13. ALL FRP PANELS TO BE FIBERPLATE CLADDING PANEL.
14. EACH FRP PANEL TO BE IDENTIFIED WITH LARR#25536 AND FIBERGRATE COMPOSITE STRUCTURAL LABEL.
15. FRP MATERIAL TO BE CLASSIFIED AS CC1 OR BETTER, AND HAVE MAXIMUM FLAME SPREAD OF 50.
16. ALL DESIGN AND CONSTRUCTION TO BE COMPLETED IN ACCORDANCE WITH LOS ANGELES RESEARCH REPORT RR25536, DATED FEBRUARY 1, 2016.
17. SPECIAL INSPECTIONS MUST BE PROVIDED FOR ALL FRP INSTALLMENTS. SEE SPECIAL INSPECTION SECTION, THIS SHEET.

RATIO OF EDGE DISTANCE TO FRP FASTENER DIAMETER		
	RANGE	RECOMMENDED
EDGE DISTANCE - CL* BOLT TO END	2.0-4.0	3.0
EDGE DISTANCE - CL* BOLT TO SIDE	1.5-3.5	2.5
BOLT PITCH - CL* TO CL*	4.0-5.0	5.0

WOOD CONSTRUCTION NOTES:

1. ALL EXISTING WOOD SHAPES ARE ASSUMED TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN.
2. ALL PROPOSED WOOD SHAPES ARE TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN. U.N.O.
3. ALL EXISTING AND PROPOSED GLUED LAMINATED TIMBERS ARE TO BE 24F-1.8C DOUGLAS FIR BALANCED WITH A REFERENCE DESIGN BENDING VALUE OF 2400 PSI MIN. U.N.O.

MASONRY CONSTRUCTION NOTES:

1. ALL BRICK TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
   - FOR INTERIOR/ABOVE GRADE APPLICATIONS TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 100 PSI SHALL BE USED. FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 133 PSI.
   - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.
2. ALL CMU TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
   - FOR INTERIOR/ABOVE GRADE APPLICATIONS, TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 64 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 158 PSI FOR FULLY GROUTED BLOCKS.
   - FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 84 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 163 PSI FOR FULLY GROUTED BLOCKS.
   - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.

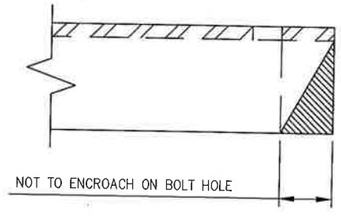
TOWER PLUMB & TENSION NOTES:

1. PLUMB AND TENSION TOWER UPON COMPLETION OF STRUCTURAL MODIFICATIONS DETAILED IN THESE DRAWINGS.
2. RETENSIONING OF EXISTING GUY WIRES SHALL BE PERFORMED AT A TIME WHEN THE WIND VELOCITY IS LESS THAN 10 MPH AT GROUND LEVEL AND WITH NO ICE ON THE STRUCTURE AND GUY WIRES.
3. PLUMB THE TOWER WHILE RETENSIONING THE EXISTING GUY WIRES. THE HORIZONTAL DISTANCE BETWEEN THE VERTICAL CENTERLINES AT ANY TWO ELEVATIONS SHALL NOT EXCEED 0.25% OF THE VERTICAL DISTANCE BETWEEN TWO ELEVATIONS FOR LATTICED STRUCTURES.
4. THE TWIST BETWEEN ANY TWO ELEVATIONS THROUGHOUT THE HEIGHT OF A LATTICE STRUCTURE SHALL NOT EXCEED 0.5 DEGREES IN 10 FEET. THE MAXIMUM TWIST OVER THE LATTICE STRUCTURE HEIGHT SHALL NOT EXCEED 5 DEGREES.

SPECIAL INSPECTIONS NOTES:

1. A QUALIFIED INDEPENDENT TESTING LABORATORY, EMPLOYED BY THE OWNER AND APPROVED BY THE JURISDICTION, SHALL PERFORM INSPECTION AND TESTING IN ACCORDANCE WITH THE THE GOVERNING BUILDING CODE, APPLICABLE SECTION(S) AS REQUIRED BY PROJECT SPECIFICATIONS FOR THE FOLLOWING CONSTRUCTION WORK:
   a. STRUCTURAL WELDING (CONTINUOUS INSPECTION OF FIELD WELDS ONLY).
   b. HIGH STRENGTH BOLTS (PERIODIC INSPECTION OF A325 AND/OR A490 BOLTS) TO BE TIGHTENED PER "TURN-OF-THE-NUT" METHOD.
   c. MECHANICAL AND EPOXIED ANCHORAGES.
   d. FIBER REINFORCED POLYMER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE FRP MATERIAL SPECIFIED ON THE APPROVED DESIGN DOCUMENTS IS BEING INSTALLED.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT ALL CUT EDGES AND DRILLED HOLES ARE PROPERLY SEALED USING A VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE STRUCTURE IS BUILT IN ACCORDANCE WITH THE APPROVED DESIGN DOCUMENTS.
2. THE INSPECTION AGENCY SHALL SUBMIT INSPECTION AND TEST REPORTS TO THE BUILDING DEPARTMENT, THE ENGINEER OF RECORD, AND THE OWNER UNLESS THE FABRICATOR IS APPROVED BY THE BUILDING OFFICIAL TO PERFORM WORK WITHOUT THE SPECIAL INSPECTIONS.

MAXIMUM ALLOWABLE ANGLE CLIP



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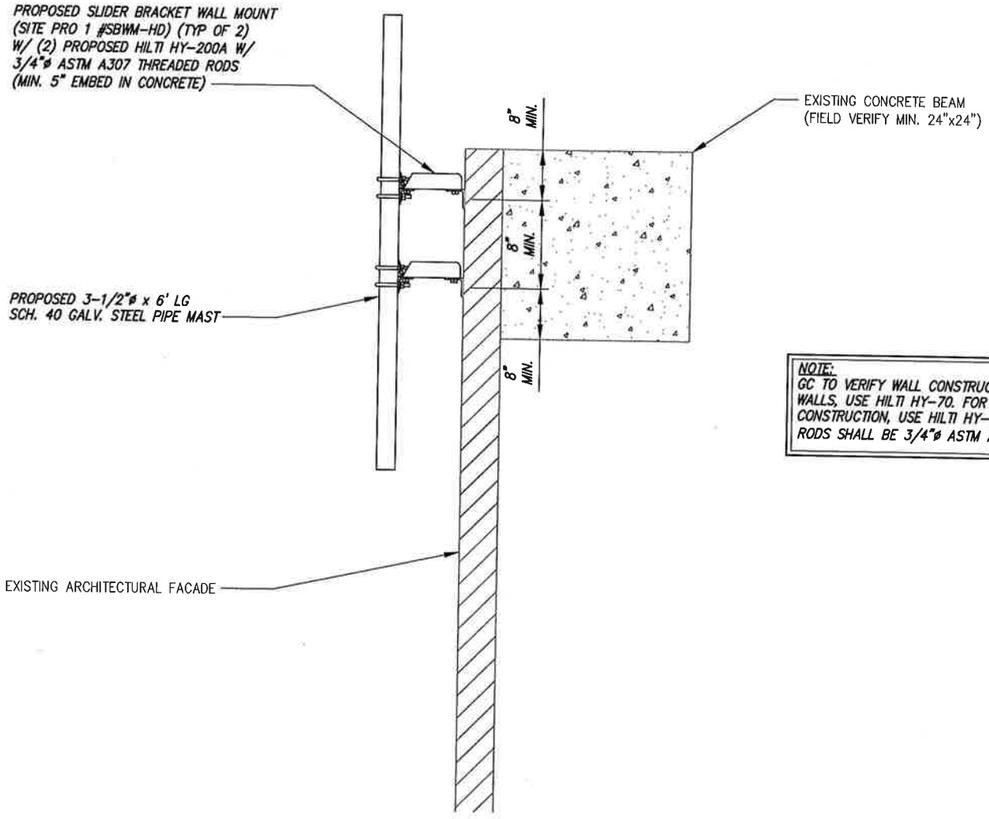
STRUCTURAL NOTES

Drawing Number
S1



NOTE:
GC TO VERIFY WALL CONSTRUCTION. FOR HOLLOW WALLS, USE HILTI HY-70. FOR SOLID WALL CONSTRUCTION, USE HILTI HY-200A. THREADED RODS SHALL BE 3/4"ø ASTM A307.

1 / S2 MOUNT DETAIL
SCALE: NOT TO SCALE

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