

**Engineering Exhibit
Certifications and
Declarations**

Statement of Charles F. Ellis, PE
Ellis Engineering

Answers to Special Operating Conditions or Restrictions for WWOZ

Special operating condition 1:

BEFORE PROGRAM TESTS ARE AUTHORIZED, permittee shall submit the results of a complete proof-of-performance to establish the horizontal plane radiation patterns for both the horizontally and vertically polarized radiation components. This proof-of-performance may be accomplished using the complete full size antenna, or individual bays therefrom, mounted on a supporting structure of identical dimensions and configuration as the proposed structure, including all braces, ladders, conduits, coaxial lines, and other appurtenances; or using a carefully manufactured scale model of the entire antenna, or individual bays therefrom, mounted on an equally scaled model of the proposed supporting structure, including all appurtenances. Engineering exhibits should include a description of the antenna testing facilities and equipment employed, including appropriate photographs or sketches and a description of the testing procedures, including scale factor, measurements frequency, and equipment calibration.

Answer:

See Attachment "WWOZ PATTERN CERTIFICATION".

Special operating condition 2:

BEFORE PROGRAM TESTS ARE AUTHORIZED, permittee shall submit an affidavit from a licensed surveyor to establish that the directional antenna has been oriented at the proper azimuth.

Answer:

See Attachment "WWOZ Surveyor's Declaration Letter".

Special operating condition 3:

BEFORE PROGRAM TESTS ARE AUTHORIZED, permittee/licensee shall submit an affidavit that the installation of the directional antenna system was overseen by a qualified engineer. This affidavit shall include a certification by the engineer that the

antenna was installed pursuant to the manufacturer's instructions and list the qualifications of the certifying engineer.

See Attachment "Declaration of James A. Guillory"

Special operating condition 4:

The relative field strength of neither the measured horizontally nor vertically polarized radiation component shall exceed at any azimuth the value indicated on the composite radiation pattern authorized by this construction permit.

A relative field strength of 1.0 on the composite radiation pattern herein authorized corresponds to the following effective radiated power:

100 kilowatts.

Principal minima and their associated field strength limits:

270 degrees True: 4.9 kilowatts

320 degrees True: 8.8 kilowatts

Answer:

The relative field strength of neither the measured horizontally nor vertically polarized radiation component exceeds at any azimuth the value indicated on the composite radiation pattern authorized by the construction permit.

Special operating condition 5:

BEFORE PROGRAM TESTS ARE AUTHORIZED, the permittee must submit an exhibit demonstrating that the measured directional antenna pattern complies with the appropriate community coverage provisions of 47C.F.R. Sections 73.315 or 73.515.(See 47 C.F.R. Section 73.316(c)(2)(ix)(B))

Answer:

See Figure 1 within this document.

Special operating condition 6:

Permittee has specified use of the antenna listed below to demonstrate compliance with the FCC radiofrequency electromagnetic field exposure guidelines. If any other type or size of antenna is to be used with the facilities authorized herein, THE AUTOMATIC PROGRAM TEST PROVISIONS OF 47 C.F.R. SECTION 73.1620 WILL NOT

APPLY. In this case, a FORMALREQUEST FOR PROGRAM TEST AUTHORITY must be filed in conjunction with FCC Form 302-FM, application for license, BEFORE program tests will be authorized. The request must include a revised RF field showing to demonstrate continued compliance with the FCC guidelines.EPA Type 1, eight sections, 0.5 wavelength spacing.

The antenna specified in the modified construction permit BMPED-20120706ABN is the antenna installed.

Special operating condition 7:

Further modification of WNKV, (facility ID No. 89686), Norco, LA will not be construed as a per se modification of WWOZ's authorization.(See Educational Information Corporation, 6 FCC Rcd. 2207 (1991)).

Answer:

The licensee understands the further modification of WNKV, (facility ID No. 89686) , Norco, LA will not be construed as a per se modification of WWOZ's authorization.

Special operating condition 8:

The permittee/licensee in coordination with other users of the site must reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radio frequency electromagnetic fields in excess of FCC guidelines.

Answer:

The licensee in coordination with other users of the sites will reduce power or cease operation as necessary to protect persons having access to the site, tower or antenna from radiofrequency electromagnetic fields in excess of FCC guidelines.

Special operating condition 9:

If the antenna is mounted on an existing tower that is not base-insulated or detuned at the AM frequency, the permittee shall submit a certification to this effect. If the antenna is mounted on an existing tower that is base-insulated or detuned at the frequency of AM station WGSO, New Orleans, LA (Facility ID 52433), the applicant shall notify the AM station. If necessary, the AM station may determine operating power by

a method described in Section 73.51(a)(1) or (d). Permittee shall be responsible for readjustment and continued maintenance of any detuning apparatus necessary to prevent adverse effects upon the radiation pattern of the AM station. Both before and after the installation of the antenna and transmission line, AM antenna impedance measurements shall be made and sufficient field strength measurements, taken at minimum of 8 locations along each of 6 equally spaced radials, shall be made to establish that the AM radiation pattern is essentially omnidirectional. The results of the field strength measurements and the impedance measurements shall be submitted to the Commission in an application on FCC Form 302 notifying of the AM station's return to the direct method of power determination.(See Section 73.45(c), FCC Rules)

Answer:

The antenna is mounted on an existing tower that is not base-insulated or detuned at the AM frequency of WGSO. The tower is being shortened by the owner. The placement of the WWOZ antenna is not affected.



Charles F. Ellis, PE

April 7, 2013

WWOZ Pattern Certification



SYSTEMS WITH RELIABILITY, LLP
BROADCAST ANTENNAS AND TRANSMISSION LINE

PATTERN CERTIFICATION
DIRECTIONAL FM ANTENNA
WWOZ
January 7, 2013

Call Sign	:	WWOZ
Location	:	New Orleans, LA
Frequency	:	90.7 MHz
Channel	:	214C1
Antenna Model	:	FM10/8-HWS-DA
Maximum Antenna Gain	:	
Horizontal	:	5.127 / 7.099 dB
Vertical	:	5.127 / 7.099 dB

ANTENNA DESCRIPTION

A custom designed FM10/8-HWS-DA antenna was fabricated to conform to the prescribed directional azimuth pattern. Each antenna bay consists of a circularly polarized, cross-V dipole radiating element, with 3 horizontal parasitics each. The bays are spaced one half (1/2) wavelength apart, mounted to a 4" (inch) support pole. The support pole is mounted to a large, tapered monopole atop a building. The antenna array points 110 degrees true north.

DESCRIPTION OF TEST PROCEDURE

The test antenna consisted of a single third-scale bay and parasitic system. The antenna was mounted to a third-scale pipe, which was mounted to a third-scale, tapered monopole, by use of third-scale brackets identical to those shipped with the final, full-scale antenna. For testing, the entire third-scale model was then mounted atop a 20' (foot) high platform, and all feed cables were properly grounded. Horizontal and vertical readings were taken. The desired directional pattern was obtained by adjusting the distance between the poles and the antenna, and implementing the use of horizontal parasitic elements.

DESCRIPTION OF TEST PARAMETERS AND EQUIPMENT

Horizontal and vertical pattern readings were taken by mounting a source antenna - a vertical/horizontal dipole, Cavity Back Resonator (CBR) antenna bay - approximately 100' (feet) from the third-scale antenna model. The source antenna's height was adjusted to achieve a uniform field at the third-scale test antenna location. The CBR antenna was operated in transmit mode, at frequency 272.1 MHz. The third-scale test antenna was then rotated clockwise in order to achieve 360° (degree) pattern readings. A gain reference was taken using a dipole tuned to 272.1 MHz. Nowhere did the received signal, or resultant documentation, exceed a maximum to minimum ratio of 15dB (decibels).

TEST RESULTS

The attached calculations verify that the **RMS** value of this antenna is **95.0%** of the **RMS** value of the pattern authorized in the related construction permit **BMPED-20120706ABN**. The vertical component **RMS** value is **0.713**. The horizontal component **RMS** value is **0.692**. The circular polarized component **RMS** value is **0.739**.

Azimuth and elevation plots and associated tabulations of this antenna are included with this package.

Measured vertical polarized directivity: 1.968 / 2.940 dB

Measured horizontal polarized directivity: 2.091 / 3.204 dB

Measured circular polarized pattern directivity: 1.833 / 2.631 dB

Gain in each polarization was calculated using the following relation:

$$\text{GAIN} = \text{Azimuth Directivity} \times \text{Power Ratio Between Polarizations} \times \text{Elevation Directivity}$$

Using this relationship along with ratio measured at our testing facilities:

$$\text{V-Pol. Gain} = (1.968)(.515)(5.057) = 5.127 / 7.099 \text{ dB}$$

$$\text{H-Pol. Gain} = (2.091)(.485)(5.057) = 5.127 / 7.099 \text{ dB}$$

INSTALLATION AND MOUNTING

The antenna is to be mounted in accordance with the supplied drawings. The antenna center of radiation is to be **133.1 meters (436.70 ft.)** above ground level. The antenna aperture is **37.96 feet**. No other antennas are to be mounted within **10 feet** of the antenna. No other obstructions other than those specified by original drawings supplied are to be mounted at the same level as the antenna. The antenna is to be oriented **110 degrees** true North.

The parasitic system is custom designed to shape and direct the antenna pattern as required. The systems orientation and the mounting details are described in the following drawings:

DRAWING NO.	TITLE
1765D00	ELEVATION
1765D00A	ANTENNA ORENTATION WITH PARASITICS
1765D01	BAY 1 PARASITIC PLACEMENT AND ASSEMBLY
1765D02	BAY 2 PARASITIC PLACEMENT AND ASSEMBLY
1765D03	BAY 3 PARASITIC PLACEMENT AND ASSEMBLY
1765D04	BAY 4 PARASITIC PLACEMENT AND ASSEMBLY
1765D05	BAY 5 PARASITIC PLACEMENT AND ASSEMBLY
1765D06	BAY 6 PARASITIC PLACEMENT AND ASSEMBLY
1765D07	BAY 7 PARASITIC PLACEMENT AND ASSEMBLY
1765D08	BAY 8 PARASITIC PLACEMENT AND ASSEMBLY
1765D09	INPUT TEE ASSEMBLY
1765D10	MOUNTING PIPE INSTALLATION
2105A10	TEST RANGE SCHEMATIC

The array shall be mounted according to **DWG. 1765D00**. The antenna elements shall be aligned at the same heading as in **DWG. 1765D00A**. This will ensure that the antenna is oriented properly at 110 degrees true north. Each bay's parasitic assembly is shown in **DWG. 1765D01 THRU 1765D08**. **DWG. 1765D09** shows the input tee mounting details. **DWG. 1765D10** shows the mounting pipe detail. The test range schematic **DWG. 2105A10** shows the mounting configuration of the antenna setup on our range.

619 Industrial Park Road, Ebensburg, PA 15931 Tel. 800 762 7743 / 814 472 5436 ♦ Fax 814 472 5552

DOCUMENT EXHIBITS

The following exhibits are included as part of this Certificate of Compliance:

Exhibit 1	Circular Polarized Azimuth Pattern Field Strength Tabulations (Composite)
Exhibit 2	Measured Horizontal Polarized Azimuth Pattern Measured Field Strength Tabulations (Horizontal)
Exhibit 3	Measured Vertical Polarized Azimuth Pattern Measured Field Strength Tabulations (Vertical)
Exhibit 4	Elevation Pattern Elevation Tabulations
Exhibit 5	Antenna Data Sheet
Exhibit 6	RMS Calculations
Exhibit 7	Drawings

TEST EQUIPMENT

Network Analyzer	:	Hewlett Packard Model # 8753C Serial Number: 08753 – 69138
Computer	:	Pentium 3, 450 MHz, SAMS Range Program
Printer	:	Hewlett-Packard Laser Jet 6L
Positioner	:	Orbit Positioner

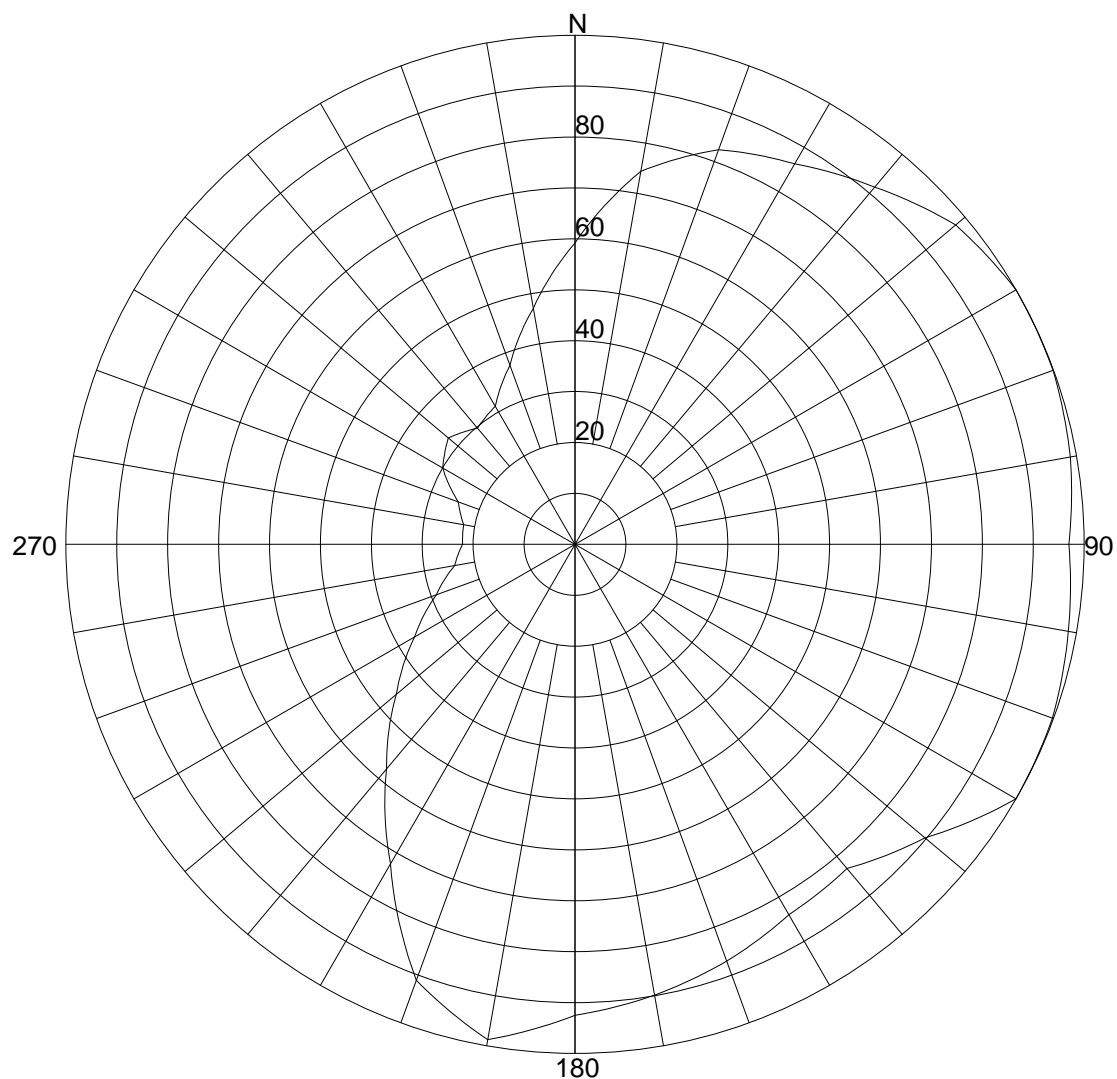
All equipment is calibrated to ANSI/NCSL Z540-1-1994 specs

Prepared by:



Mark A. Gergely
Electrical Engineer
Systems With Reliability LLP

Exhibit 1: Circular Polarized Azimuth Pattern (Composite)



Azimuth Pattern

Systems With Reliability

Scale: Linear

Unit: Relative Field

CLIENT: WWOZ

Date: 1/2/2013

ANTENNA TYPE: FM10/8-HWS-DA

FREQUENCY: 90.7 MHz

PATTERN POL.: Circular

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 1.83282 / 2.63dB

PATTERN RMS: 0.739

Relative Field Tabulation(Azimuth)

Azimuth Heading	Normalized Field(dB)	Azimuth Heading	Normalized Field(dB)
0	.5920 (-4.55)	180	.9250 (-0.68)
5	.6680 (-3.5)	185	.9565 (-0.39)
10	.7440 (-2.57)	190	.9880 (-0.1)
15	.7845 (-2.11)	195	.9495 (-0.45)
20	.8250 (-1.67)	200	.9110 (-0.81)
25	.8440 (-1.47)	205	.8180 (-1.74)
30	.8630 (-1.28)	210	.7250 (-2.79)
35	.8895 (-1.02)	215	.6505 (-3.74)
40	.9160 (-0.76)	220	.5760 (-4.79)
45	.9460 (-0.48)	225	.5170 (-5.73)
50	.9760 (-0.21)	230	.4580 (-6.78)
55	.9880 (-0.1)	235	.4110 (-7.72)
60	1.0000 (0)	240	.3640 (-8.78)
65	.9995 (0)	245	.3270 (-9.71)
70	.9990 (-0.01)	250	.2900 (-10.75)
75	.9935 (-0.06)	255	.2650 (-11.54)
80	.9880 (-0.1)	260	.2400 (-12.4)
85	.9790 (-0.18)	265	.2305 (-12.75)
90	.9700 (-0.26)	270	.2210 (-13.11)
95	.9770 (-0.2)	275	.2215 (-13.09)
100	.9840 (-0.14)	280	.2220 (-13.07)
105	.9910 (-0.08)	285	.2330 (-12.65)
110	.9980 (-0.02)	290	.2440 (-12.25)
115	.9990 (-0.01)	295	.2720 (-11.31)
120	1.0000 (0)	300	.3000 (-10.46)
125	.9485 (-0.46)	305	.3125 (-10.1)
130	.8970 (-0.94)	310	.3250 (-9.76)
135	.8640 (-1.27)	315	.3115 (-10.13)
140	.8310 (-1.61)	320	.2980 (-10.52)
145	.8355 (-1.56)	325	.3055 (-10.3)
150	.8400 (-1.51)	330	.3130 (-10.09)
155	.8555 (-1.36)	335	.3435 (-9.28)
160	.8710 (-1.2)	340	.3740 (-8.54)
165	.8850 (-1.06)	345	.4225 (-7.48)
170	.8990 (-0.92)	350	.4710 (-6.54)
175	.9120 (-0.8)	355	.5315 (-5.49)

Systems With Reliability

CLIENT: WWOZ

Date: 1/2/2013

ANTENNA TYPE: FM10/8-HWS-DA

FREQUENCY: 90.7 MHz

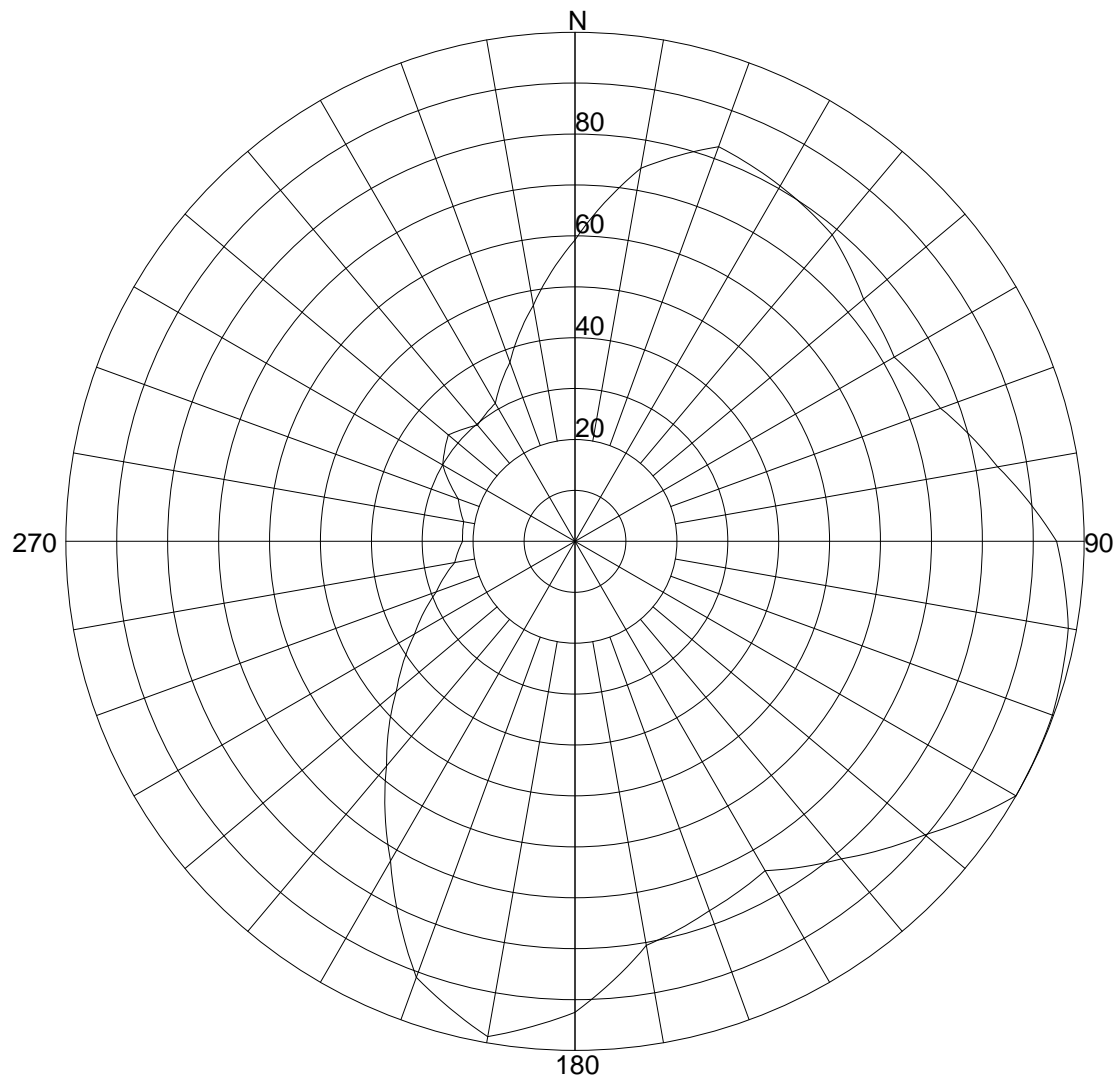
PATTERN POL.: Circular

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 1.83282 / 2.63dB

PATTERN RMS: 0.739

Exhibit 2: Measured Horizontally Polarized Azimuth Pattern



Azimuth Pattern

Systems With Reliability

Scale: Linear

Unit: Relative Field

CLIENT: WWOZ

Date: 1/2/2013

ANTENNA TYPE: FM10/8-HWS-DA

FREQUENCY: 90.7 MHz

PATTERN POL.: Horizontal

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 2.09102 / 3.2dB

PATTERN RMS: 0.692

Relative Field Tabulation(Azimuth)

Azimuth Heading	Normalized Field(dB)	Azimuth Heading	Normalized Field(dB)
0	.5920 (-4.55)	180	.9250 (-0.68)
5	.6680 (-3.5)	185	.9565 (-0.39)
10	.7440 (-2.57)	190	.9880 (-0.1)
15	.7845 (-2.11)	195	.9495 (-0.45)
20	.8250 (-1.67)	200	.9110 (-0.81)
25	.8155 (-1.77)	205	.8180 (-1.74)
30	.8060 (-1.87)	210	.7250 (-2.79)
35	.7960 (-1.98)	215	.6505 (-3.74)
40	.7860 (-2.09)	220	.5760 (-4.79)
45	.7630 (-2.35)	225	.5170 (-5.73)
50	.7400 (-2.62)	230	.4580 (-6.78)
55	.7320 (-2.71)	235	.4110 (-7.72)
60	.7240 (-2.81)	240	.3640 (-8.78)
65	.7440 (-2.57)	245	.3270 (-9.71)
70	.7640 (-2.34)	250	.2900 (-10.75)
75	.8035 (-1.9)	255	.2650 (-11.54)
80	.8430 (-1.48)	260	.2400 (-12.4)
85	.8945 (-0.97)	265	.2305 (-12.75)
90	.9460 (-0.48)	270	.2210 (-13.11)
95	.9650 (-0.31)	275	.2215 (-13.09)
100	.9840 (-0.14)	280	.2220 (-13.07)
105	.9910 (-0.08)	285	.2330 (-12.65)
110	.9980 (-0.02)	290	.2440 (-12.25)
115	.9990 (-0.01)	295	.2720 (-11.31)
120	1.0000 (0)	300	.3000 (-10.46)
125	.9485 (-0.46)	305	.3125 (-10.1)
130	.8970 (-0.94)	310	.3250 (-9.76)
135	.8555 (-1.36)	315	.3115 (-10.13)
140	.8140 (-1.79)	320	.2980 (-10.52)
145	.7805 (-2.15)	325	.3055 (-10.3)
150	.7470 (-2.53)	330	.3130 (-10.09)
155	.7595 (-2.39)	335	.3435 (-9.28)
160	.7720 (-2.25)	340	.3740 (-8.54)
165	.7890 (-2.06)	345	.4225 (-7.48)
170	.8060 (-1.87)	350	.4710 (-6.54)
175	.8655 (-1.25)	355	.5315 (-5.49)

Systems With Reliability

CLIENT: WWOZ

Date: 1/2/2013

ANTENNA TYPE: FM10/8-HWS-DA

FREQUENCY: 90.7 MHz

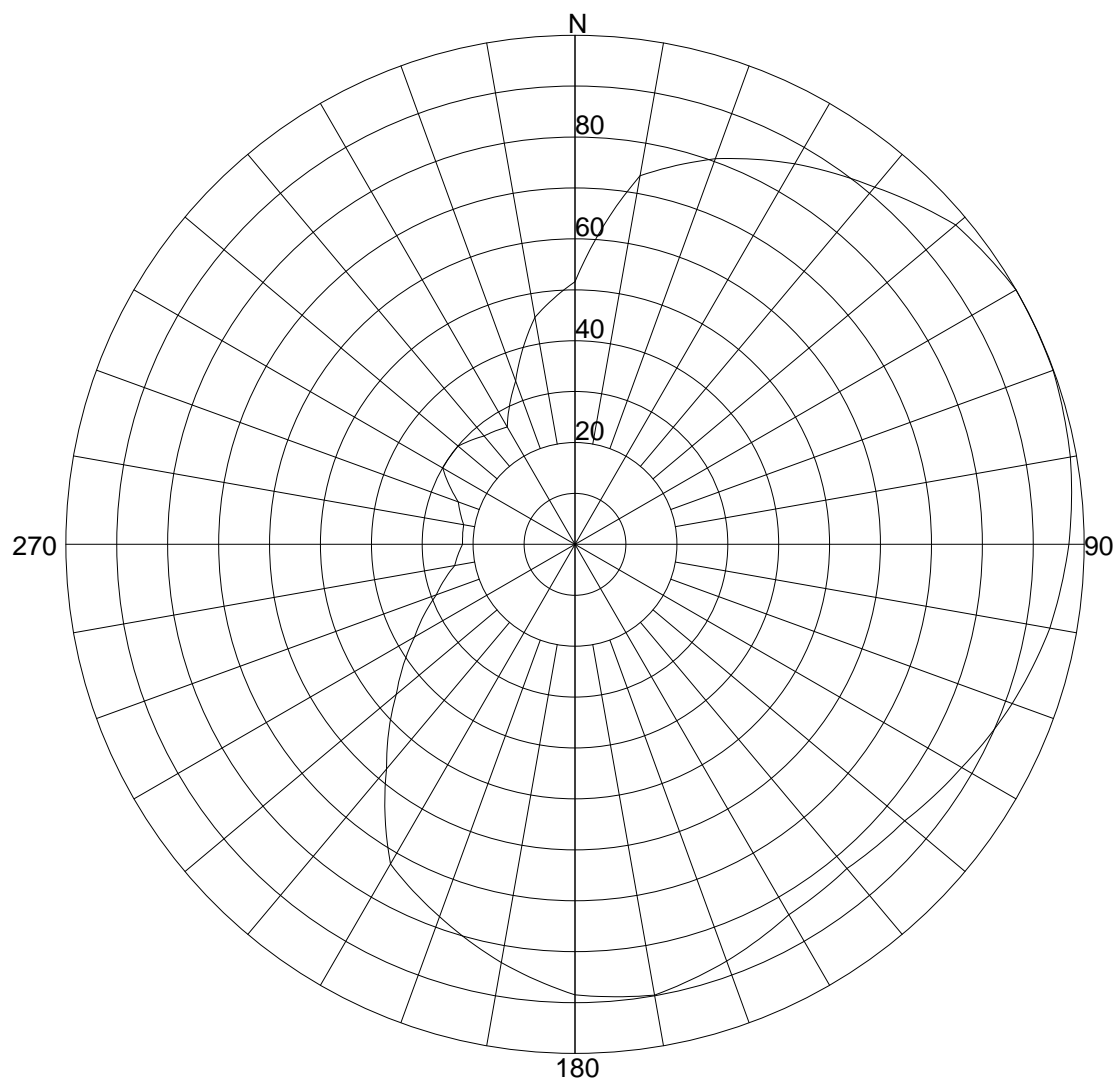
PATTERN POL.: Horizontal

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 2.09102 / 3.2dB

PATTERN RMS: 0.692

Exhibit 3: Measured Vertically Polarized Azimuth Pattern



Azimuth Pattern

Systems With Reliability

Scale: Linear

Unit: Relative Field

CLIENT: WWOZ

Date: 1/2/2013

ANTENNA TYPE: FM10/8-HWS-DA

FREQUENCY: 90.7 MHz

PATTERN POL.: Vertical

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 1.96803 / 2.94dB

PATTERN RMS: 0.713

Relative Field Tabulation(Azimuth)

Azimuth Heading	Normalized Field(dB)	Azimuth Heading	Normalized Field(dB)
0	.5160 (-5.75)	180	.8850 (-1.06)
5	.6255 (-4.08)	185	.8595 (-1.32)
10	.7350 (-2.67)	190	.8340 (-1.58)
15	.7705 (-2.26)	195	.8060 (-1.87)
20	.8060 (-1.87)	200	.7780 (-2.18)
25	.8345 (-1.57)	205	.7515 (-2.48)
30	.8630 (-1.28)	210	.7250 (-2.79)
35	.8895 (-1.02)	215	.6505 (-3.74)
40	.9160 (-0.76)	220	.5760 (-4.79)
45	.9460 (-0.48)	225	.5170 (-5.73)
50	.9760 (-0.21)	230	.4580 (-6.78)
55	.9880 (-0.1)	235	.4110 (-7.72)
60	1.0000 (0)	240	.3640 (-8.78)
65	.9995 (0)	245	.3270 (-9.71)
70	.9990 (-0.01)	250	.2900 (-10.75)
75	.9935 (-0.06)	255	.2650 (-11.54)
80	.9880 (-0.1)	260	.2400 (-12.4)
85	.9790 (-0.18)	265	.2305 (-12.75)
90	.9700 (-0.26)	270	.2210 (-13.11)
95	.9585 (-0.37)	275	.2215 (-13.09)
100	.9470 (-0.47)	280	.2220 (-13.07)
105	.9305 (-0.63)	285	.2330 (-12.65)
110	.9140 (-0.78)	290	.2440 (-12.25)
115	.8955 (-0.96)	295	.2720 (-11.31)
120	.8770 (-1.14)	300	.3000 (-10.46)
125	.8610 (-1.3)	305	.3000 (-10.46)
130	.8450 (-1.46)	310	.3000 (-10.46)
135	.8380 (-1.54)	315	.2890 (-10.78)
140	.8310 (-1.61)	320	.2780 (-11.12)
145	.8355 (-1.56)	325	.2720 (-11.31)
150	.8400 (-1.51)	330	.2660 (-11.5)
155	.8555 (-1.36)	335	.3035 (-10.36)
160	.8710 (-1.2)	340	.3410 (-9.34)
165	.8850 (-1.06)	345	.3970 (-8.02)
170	.8990 (-0.92)	350	.4530 (-6.88)
175	.8920 (-0.99)	355	.4845 (-6.29)

Systems With Reliability

CLIENT: WWOZ

Date: 1/2/2013

ANTENNA TYPE: FM10/8-HWS-DA

FREQUENCY: 90.7 MHz

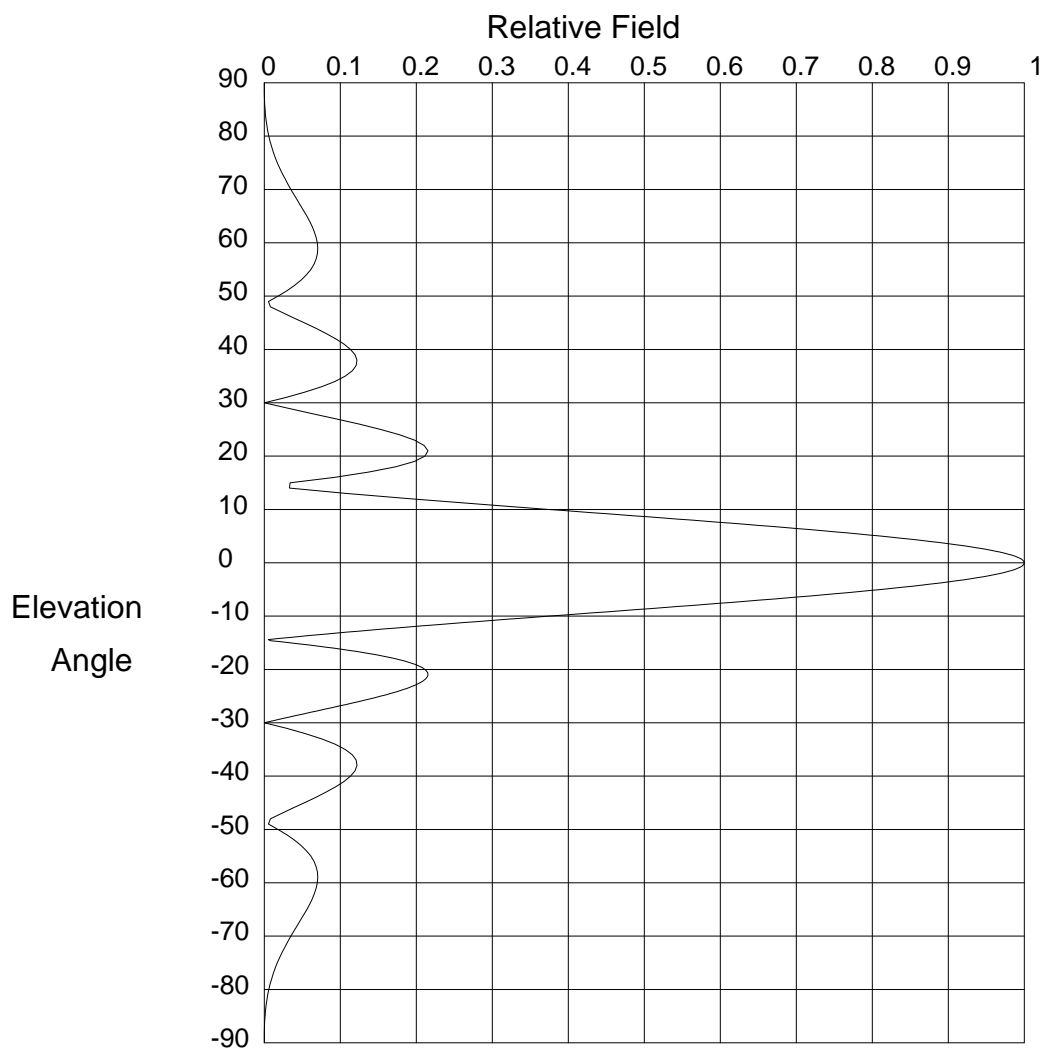
PATTERN POL.: Vertical

CIRCULARITY(+/-dB):

AZ. DIRECTIVITY: 1.96803 / 2.94dB

PATTERN RMS: 0.713

Exhibit 4: Elevation Pattern



Elevation Pattern

Scale: Linear

Units: Field, Relative

Systems With Reliability

CLIENT: WWOZ

Date: 1/7/2013

ANTENNA TYPE: FM10/8 HWS-DA

FREQUENCY: 90.7 MHz

PATTERN POL.: Circular

DIRECTIVITY(Peak): 5.057/7.039 dBd

Beam Tilt (Deg.) : 0

DIRECTIVITY(Horiz): 5.057/7.039 dBd

Null Fill(s)(%) : 0, 0, 0

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)
90.0	.00 (-50)	52.0	.04 (-28.009)	14.0	.033 (-29.568)
89.0	.00 (-91.156)	51.0	.03 (-30.555)	13.0	.109 (-19.231)
88.0	.00 (-78.01)	50.0	.018 (-34.799)	12.0	.193 (-14.301)
87.0	.00 (-69.988)	49.0	.006 (-45.179)	11.0	.282 (-10.997)
86.0	.001 (-64.113)	48.0	.008 (-41.712)	10.0	.375 (-8.525)
85.0	.001 (-59.443)	47.0	.023 (-32.876)	9.8	.394 (-8.099)
84.0	.002 (-55.552)	46.0	.038 (-28.48)	9.6	.412 (-7.693)
83.0	.002 (-52.211)	45.0	.053 (-25.559)	9.4	.431 (-7.304)
82.0	.003 (-49.281)	44.0	.067 (-23.417)	9.2	.45 (-6.932)
81.0	.005 (-46.672)	43.0	.081 (-21.783)	9.0	.469 (-6.576)
80.0	.006 (-44.321)	42.0	.094 (-20.525)	8.8	.488 (-6.235)
79.0	.008 (-42.185)	41.0	.105 (-19.573)	8.6	.507 (-5.907)
78.0	.01 (-40.231)	40.0	.114 (-18.888)	8.4	.525 (-5.593)
77.0	.012 (-38.433)	39.0	.119 (-18.455)	8.2	.544 (-5.291)
76.0	.014 (-36.773)	38.0	.122 (-18.271)	8.0	.562 (-5.001)
75.0	.017 (-35.236)	37.0	.121 (-18.35)	7.8	.581 (-4.723)
74.0	.02 (-33.811)	36.0	.116 (-18.722)	7.6	.599 (-4.455)
73.0	.024 (-32.488)	35.0	.107 (-19.446)	7.4	.617 (-4.198)
72.0	.027 (-31.26)	34.0	.093 (-20.626)	7.2	.635 (-3.951)
71.0	.031 (-30.122)	33.0	.075 (-22.464)	7.0	.652 (-3.714)
70.0	.035 (-29.07)	32.0	.054 (-25.421)	6.8	.669 (-3.486)
69.0	.039 (-28.1)	31.0	.028 (-30.971)	6.6	.686 (-3.268)
68.0	.044 (-27.211)	30.0	.00 (-50)	6.4	.703 (-3.058)
67.0	.048 (-26.403)	29.0	.03 (-30.316)	6.2	.72 (-2.857)
66.0	.052 (-25.674)	28.0	.062 (-24.117)	6.0	.736 (-2.663)
65.0	.056 (-25.026)	27.0	.094 (-20.521)	5.8	.752 (-2.478)
64.0	.06 (-24.462)	26.0	.125 (-18.059)	5.6	.767 (-2.301)
63.0	.063 (-23.983)	25.0	.153 (-16.279)	5.4	.782 (-2.131)
62.0	.066 (-23.595)	24.0	.178 (-14.985)	5.2	.797 (-1.969)
61.0	.068 (-23.304)	23.0	.198 (-14.085)	5.0	.811 (-1.814)
60.0	.07 (-23.116)	22.0	.21 (-13.537)	4.8	.825 (-1.667)
59.0	.07 (-23.043)	21.0	.215 (-13.334)	4.6	.839 (-1.526)
58.0	.07 (-23.098)	20.0	.211 (-13.496)	4.4	.852 (-1.392)
57.0	.068 (-23.299)	19.0	.198 (-14.088)	4.2	.865 (-1.265)
56.0	.066 (-23.672)	18.0	.173 (-15.239)	4.0	.877 (-1.144)
55.0	.061 (-24.254)	17.0	.138 (-17.233)	3.8	.888 (-1.03)
54.0	.056 (-25.099)	16.0	.091 (-20.815)	3.6	.899 (-0.922)
53.0	.048 (-26.298)	15.0	.034 (-29.399)	3.4	.91 (-0.821)

Systems With Reliability

Page 1 of 3

CLIENT: WWOZ

Date: 1/7/2013

ANTENNA TYPE: FM10/8 HWS-DA

FREQUENCY: 90.7 MHz

PATTERN POL.: Circular

DIRECTIVITY(Peak): 5.057/7.039 dBd

Beam Tilt (Deg.) : 0

DIRECTIVITY(Horiz): 5.057/7.039 dBd

Null Fill(s)(%) : 0, 0, 0

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)
3.2	.92 (-0.725)	-4.4	.852 (-1.392)	-12.0	.193 (-14.301)
3.0	.929 (-0.636)	-4.6	.839 (-1.526)	-12.2	.176 (-15.113)
2.8	.938 (-0.553)	-4.8	.825 (-1.667)	-12.4	.159 (-15.996)
2.6	.947 (-0.476)	-5.0	.811 (-1.814)	-12.6	.142 (-16.964)
2.4	.954 (-0.405)	-5.2	.797 (-1.969)	-12.8	.125 (-18.034)
2.2	.962 (-0.34)	-5.4	.782 (-2.131)	-13.0	.109 (-19.231)
2.0	.968 (-0.281)	-5.6	.767 (-2.301)	-13.2	.093 (-20.593)
1.8	.974 (-0.227)	-5.8	.752 (-2.478)	-13.4	.078 (-22.173)
1.6	.98 (-0.179)	-6.0	.736 (-2.663)	-13.6	.063 (-24.062)
1.4	.984 (-0.137)	-6.2	.72 (-2.857)	-13.8	.048 (-26.417)
1.2	.988 (-0.101)	-6.4	.703 (-3.058)	-14.0	.033 (-29.568)
1.0	.992 (-0.07)	-6.6	.686 (-3.268)	-14.2	.019 (-34.397)
.8	.995 (-0.045)	-6.8	.669 (-3.486)	-14.4	.005 (-45.594)
.6	.997 (-0.025)	-7.0	.652 (-3.714)	-14.6	.008 (-41.743)
.4	.999 (-0.011)	-7.2	.635 (-3.951)	-14.8	.021 (-33.461)
.2	1.00 (-0.003)	-7.4	.617 (-4.198)	-15.0	.034 (-29.399)
.0	1.00 (0)	-7.6	.599 (-4.455)	-15.2	.046 (-26.718)
-.2	1.00 (-0.003)	-7.8	.581 (-4.723)	-15.4	.058 (-24.732)
-.4	.999 (-0.011)	-8.0	.562 (-5.001)	-15.6	.069 (-23.169)
-.6	.997 (-0.025)	-8.2	.544 (-5.291)	-15.8	.08 (-21.89)
-.8	.995 (-0.045)	-8.4	.525 (-5.593)	-16.0	.091 (-20.815)
-1.0	.992 (-0.07)	-8.6	.507 (-5.907)	-16.2	.101 (-19.896)
-1.2	.988 (-0.101)	-8.8	.488 (-6.235)	-16.4	.111 (-19.098)
-1.4	.984 (-0.137)	-9.0	.469 (-6.576)	-16.6	.12 (-18.399)
-1.6	.98 (-0.179)	-9.2	.45 (-6.932)	-16.8	.129 (-17.781)
-1.8	.974 (-0.227)	-9.4	.431 (-7.304)	-17.0	.138 (-17.233)
-2.0	.968 (-0.281)	-9.6	.412 (-7.693)	-17.2	.146 (-16.743)
-2.2	.962 (-0.34)	-9.8	.394 (-8.099)	-17.4	.153 (-16.304)
-2.4	.954 (-0.405)	-10.0	.375 (-8.525)	-17.6	.16 (-15.91)
-2.6	.947 (-0.476)	-10.2	.356 (-8.971)	-17.8	.167 (-15.557)
-2.8	.938 (-0.553)	-10.4	.337 (-9.439)	-18.0	.173 (-15.239)
-3.0	.929 (-0.636)	-10.6	.319 (-9.931)	-18.2	.179 (-14.954)
-3.2	.92 (-0.725)	-10.8	.30 (-10.45)	-18.4	.184 (-14.698)
-3.4	.91 (-0.821)	-11.0	.282 (-10.997)	-18.6	.189 (-14.47)
-3.6	.899 (-0.922)	-11.2	.264 (-11.577)	-18.8	.193 (-14.267)
-3.8	.888 (-1.03)	-11.4	.246 (-12.192)	-19.0	.198 (-14.088)
-4.0	.877 (-1.144)	-11.6	.228 (-12.848)	-19.2	.201 (-13.93)
-4.2	.865 (-1.265)	-11.8	.21 (-13.548)	-19.4	.204 (-13.794)

Systems With Reliability

Page 2 of 3

CLIENT: WWOZ

Date: 1/7/2013

ANTENNA TYPE: FM10/8 HWS-DA

FREQUENCY: 90.7 MHz

PATTERN POL.: Circular

DIRECTIVITY(Peak): 5.057/7.039 dBd

Beam Tilt (Deg.) : 0

DIRECTIVITY(Horiz): 5.057/7.039 dBd

Null Fill(s)(%) : 0, 0, 0

Relative Field Tabulation

Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)	Elev. Angle	Rel. Fld(dB)
-19.6	.207 (-13.676)	-27.2	.088 (-21.127)	-54.0	.056 (-25.099)
-19.8	.209 (-13.577)	-27.4	.081 (-21.781)	-55.0	.061 (-24.254)
-20.0	.211 (-13.496)	-27.6	.075 (-22.491)	-56.0	.066 (-23.672)
-20.2	.213 (-13.432)	-27.8	.069 (-23.266)	-57.0	.068 (-23.299)
-20.4	.214 (-13.384)	-28.0	.062 (-24.117)	-58.0	.07 (-23.098)
-20.6	.215 (-13.352)	-28.2	.056 (-25.06)	-59.0	.07 (-23.043)
-20.8	.215 (-13.336)	-28.4	.049 (-26.115)	-60.0	.07 (-23.116)
-21.0	.215 (-13.334)	-28.6	.043 (-27.31)	-61.0	.068 (-23.304)
-21.2	.215 (-13.346)	-28.8	.037 (-28.689)	-62.0	.066 (-23.595)
-21.4	.214 (-13.373)	-29.0	.03 (-30.316)	-63.0	.063 (-23.983)
-21.6	.213 (-13.414)	-29.2	.024 (-32.303)	-64.0	.06 (-24.462)
-21.8	.212 (-13.469)	-29.4	.018 (-34.853)	-65.0	.056 (-25.026)
-22.0	.21 (-13.537)	-29.6	.012 (-38.431)	-66.0	.052 (-25.674)
-22.2	.208 (-13.62)	-29.8	.006 (-44.511)	-67.0	.048 (-26.403)
-22.4	.206 (-13.715)	-30.0	.00 (-50)	-68.0	.044 (-27.211)
-22.6	.204 (-13.825)	-31.0	.028 (-30.971)	-69.0	.039 (-28.1)
-22.8	.201 (-13.948)	-32.0	.054 (-25.421)	-70.0	.035 (-29.07)
-23.0	.198 (-14.085)	-33.0	.075 (-22.464)	-71.0	.031 (-30.122)
-23.2	.194 (-14.236)	-34.0	.093 (-20.626)	-72.0	.027 (-31.26)
-23.4	.191 (-14.401)	-35.0	.107 (-19.446)	-73.0	.024 (-32.488)
-23.6	.187 (-14.581)	-36.0	.116 (-18.722)	-74.0	.02 (-33.811)
-23.8	.182 (-14.775)	-37.0	.121 (-18.35)	-75.0	.017 (-35.236)
-24.0	.178 (-14.985)	-38.0	.122 (-18.271)	-76.0	.014 (-36.773)
-24.2	.174 (-15.21)	-39.0	.119 (-18.455)	-77.0	.012 (-38.433)
-24.4	.169 (-15.451)	-40.0	.114 (-18.888)	-78.0	.01 (-40.231)
-24.6	.164 (-15.709)	-41.0	.105 (-19.573)	-79.0	.008 (-42.185)
-24.8	.159 (-15.985)	-42.0	.094 (-20.525)	-80.0	.006 (-44.321)
-25.0	.153 (-16.279)	-43.0	.081 (-21.783)	-81.0	.005 (-46.672)
-25.2	.148 (-16.591)	-44.0	.067 (-23.417)	-82.0	.003 (-49.281)
-25.4	.142 (-16.925)	-45.0	.053 (-25.559)	-83.0	.002 (-52.211)
-25.6	.137 (-17.279)	-46.0	.038 (-28.48)	-84.0	.002 (-55.552)
-25.8	.131 (-17.657)	-47.0	.023 (-32.876)	-85.0	.001 (-59.443)
-26.0	.125 (-18.059)	-48.0	.008 (-41.712)	-86.0	.001 (-64.113)
-26.2	.119 (-18.488)	-49.0	.006 (-45.179)	-87.0	.00 (-69.988)
-26.4	.113 (-18.946)	-50.0	.018 (-34.799)	-88.0	.00 (-78.01)
-26.6	.107 (-19.435)	-51.0	.03 (-30.555)	-89.0	.00 (-91.156)
-26.8	.10 (-19.959)	-52.0	.04 (-28.009)	-90.0	.00 (-50)
-27.0	.094 (-20.521)	-53.0	.048 (-26.298)	90.0	.00 (-50)

Systems With Reliability

Page 3 of 3

CLIENT: WWOZ

Date: 1/7/2013

ANTENNA TYPE: FM10/8 HWS-DA

FREQUENCY: 90.7 MHz

PATTERN POL.: Circular

DIRECTIVITY(Peak): 5.057/7.039 dBd

Beam Tilt (Deg.) : 0

DIRECTIVITY(Horiz): 5.057/7.039 dBd

Null Fill(s)(%) : 0, 0, 0

Exhibit 5: Antenna Data Sheet



SYSTEMS WITH RELIABILITY, LLP

BROADCAST ANTENNAS AND TRANSMISSION LINE

SYSTEM DATA SHEET

Customer	WWOZ
Contact	Tony Guillory
Location	New Orleans, LA
Antenna Model	FM10/8-HWS-DA
Channel / Frequency	214C1 / 90.7 MHz

ELECTRICAL SPECIFICATIONS

Antenna Specifications:

	H-POL	dB		V. Pol.	dB
License ERP (KW)	100.000	20.000 dB		100.000	20.000 dB
FCC Limit Pattern Directivity	1.654	2.185 dB		1.654	2.185 dB
Elevation Directivity	5.057	7.039 dB		5.057	7.039 dB
Azimuth Directivity	2.091	3.204 dB		1.968	2.940 dB
Composite Pattern	1.833	2.631 dB		1.833	2.631 dB
Polarization Ratio	0.485	-3.144 dB		0.515	-2.881 dB
RMS Comp./RMS Limit	95.0 %				
Antenna Efficiency %	100	0		100	0
Power Ratio (Pol. Ratio X Efficiency)	0.4848	0		0.5152	0
Antenna Gain	5.127	7.099 dB		5.127	7.099 dB

Antenna Input Power (KW)	19.505 kW	12.901 (dBK)
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Feed Line Specifications:

Line Type- RFS	3" Air 50 Ω HCA300-50J
Attenuation Per 100 ft (dB)	0.137 dB
Total Line Length (ft)	220.00 ft.
Total Line Attenuation (dB)	0.3014 dB
Line Efficiency	93.30 %
Power Input to the Line (KW)	20.907 kW 13.203 (dBK)

MECHANICAL SPECIFICATIONS

No. Of Bays	8	
Antenna Aperture	37.96 ft.	11.57 meter
Center of Radiation AGL	436.70 ft.	133.10 meter
Antenna Weight with Pole	1350.00 lbs.	613.64 kg
Windload (50/33)	2242.00 lbs.	Windload CaAc 65.0 ft^2

Prepared by:

David K. Edmiston Jr.

David K. Edmiston Jr.
SWR, LLP

Exhibit 6: RMS Calculations



SYSTEMS WITH RELIABILITY, INC.
Broadcast Antennas and Transmission Systems

WWOZ Antenna RMS Comparison

PROPOSED ANTENNA

Azimuth Heading	Relative Field
0	0.592
10	0.745
20	0.909
30	1.000
40	1.000
50	1.000
60	1.000
70	1.000
80	1.000
90	1.000
100	1.000
110	1.000
120	1.000
130	1.000
140	1.000
150	1.000
160	1.000
170	1.000
180	1.000
190	0.997
200	0.912
210	0.725
220	0.576
230	0.458
240	0.365
250	0.290
260	0.240
270	0.221
280	0.222
290	0.245
300	0.301
310	0.325
320	0.298
330	0.313
340	0.375
350	0.471

Sum of Relative Field Squared : 21.803
Sum Divided by 36 (Readings) : 0.606
Square Root : 0.778

DESIGNED ANTENNA

Azimuth Heading	Relative Field
0	0.592
10	0.744
20	0.825
30	0.863
40	0.916
50	0.976
60	1.000
70	0.999
80	0.988
90	0.970
100	0.984
110	0.998
120	1.000
130	0.897
140	0.831
150	0.840
160	0.871
170	0.899
180	0.925
190	0.988
200	0.911
210	0.725
220	0.576
230	0.458
240	0.364
250	0.290
260	0.240
270	0.221
280	0.222
290	0.244
300	0.300
310	0.325
320	0.298
330	0.313
340	0.374
350	0.471

Sum of Relative Field Squared : 19.673
Sum Divided by 36 (Readings) : 0.546
Square Root : 0.739

Percentage of Construction Permit Antenna Filled :

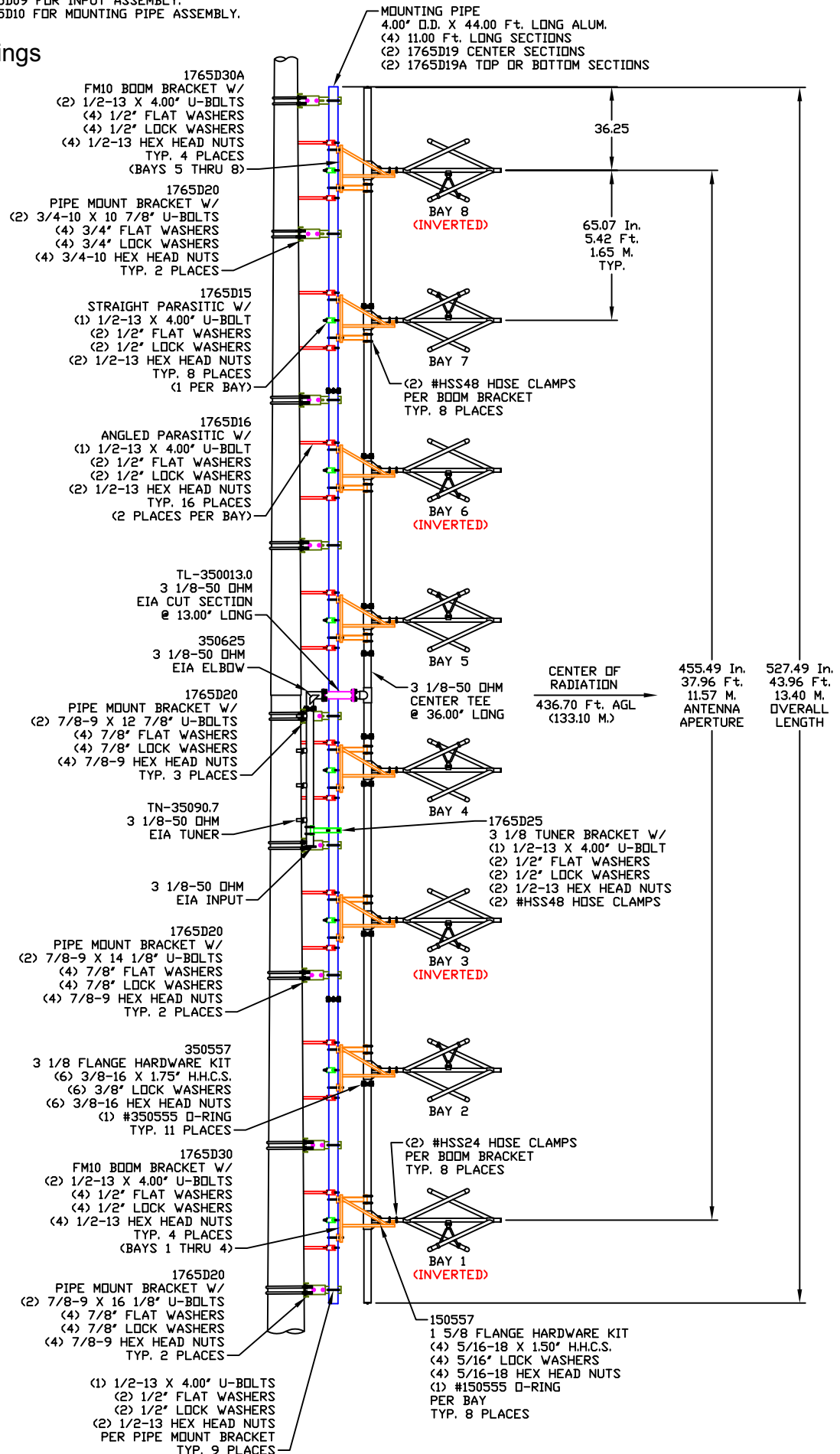
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NOTES:

1. REFERENCE DWG. 1765D00A FOR ANTENNA ORIENTATION.
2. REFERENCE DWG. 1765D01 THRU 1765D08 FOR BAY ASSEMBLIES.
3. REFERENCE DWG. 1765D09 FOR INPUT ASSEMBLY.
4. REFERENCE DWG. 1765D10 FOR MOUNTING PIPE ASSEMBLY.

DRAWING NUMBER: 1765D00

Exhibit 7: Drawings



SYSTEMS WITH RELIABILITY, LP
619 INDUSTRIAL PARK ROAD
EBENSBURG, PENNSYLVANIA 15931

TITLE: FM10/8-HWS-DA, FREQ. 90.7
WVOZ, NEW ORLEANS, LA

MATERIAL:

SIZE REV APPR. DATE
C 1
2
3

ENGINEER:

SCALE: NTS

NAME: RAC

DATE: 12/31/12

SHEET

1 OF 1

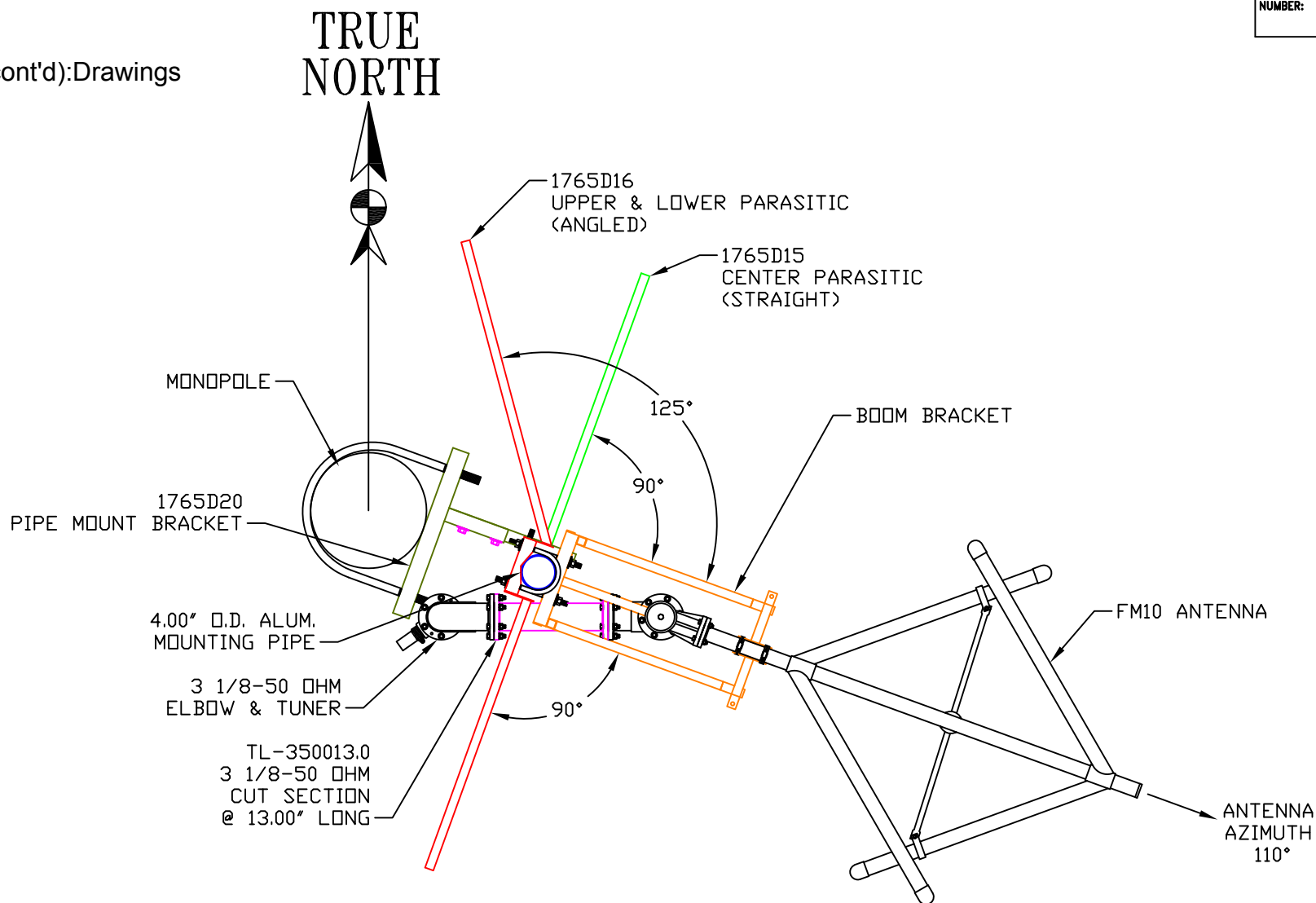
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NOTE:

Exhibit 7(cont'd):Drawings

DRAWING
NUMBER:

1765D00A



TOP VIEW

REVISION RECORD		
REV	APPROVAL	DATE



SYSTEMS WITH RELIABILITY, LP
619 INDUSTRIAL PARK ROAD
EBENSBURG, PENNSYLVANIA 15931

TITLE: FM10/8-HWS-DA, FREQ. 90.7

WWOZ, NEW ORLEANS, LA

MATERIAL: ANTENNA ORIENTATION
FROM TRUE NORTH

SIZE

A

PARTS MADE BY THIS DRAWING

SCALE: NTS

NAME: RAC

DATE: 12/31/12

SHEET 1 OF 1

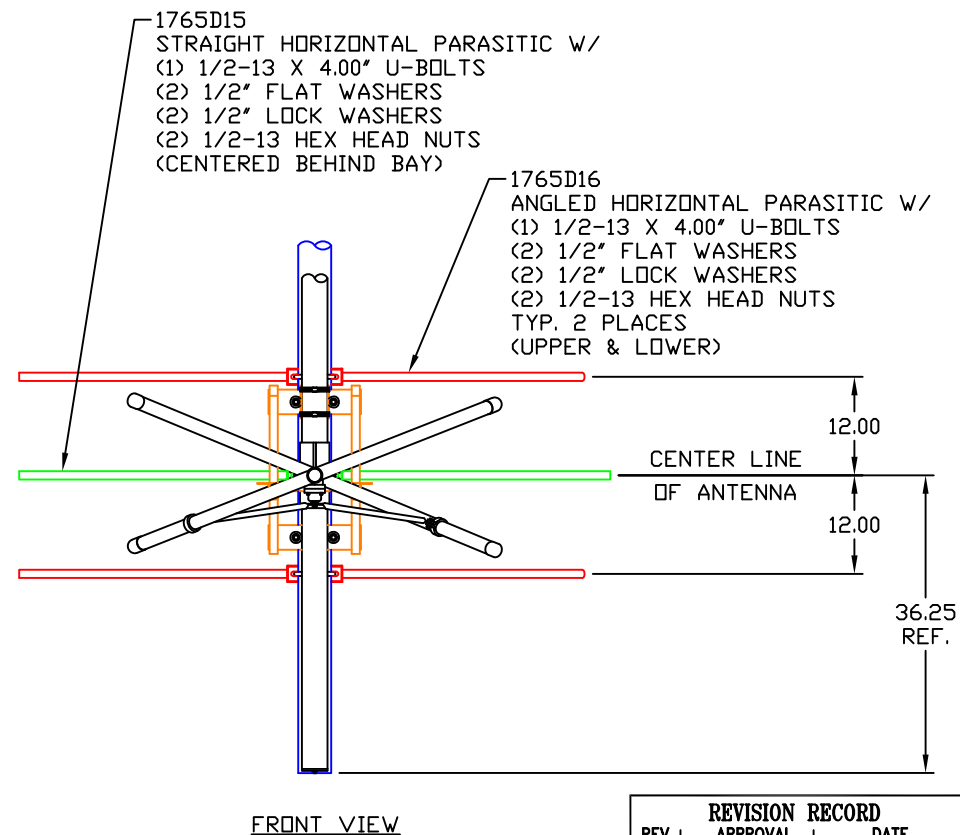
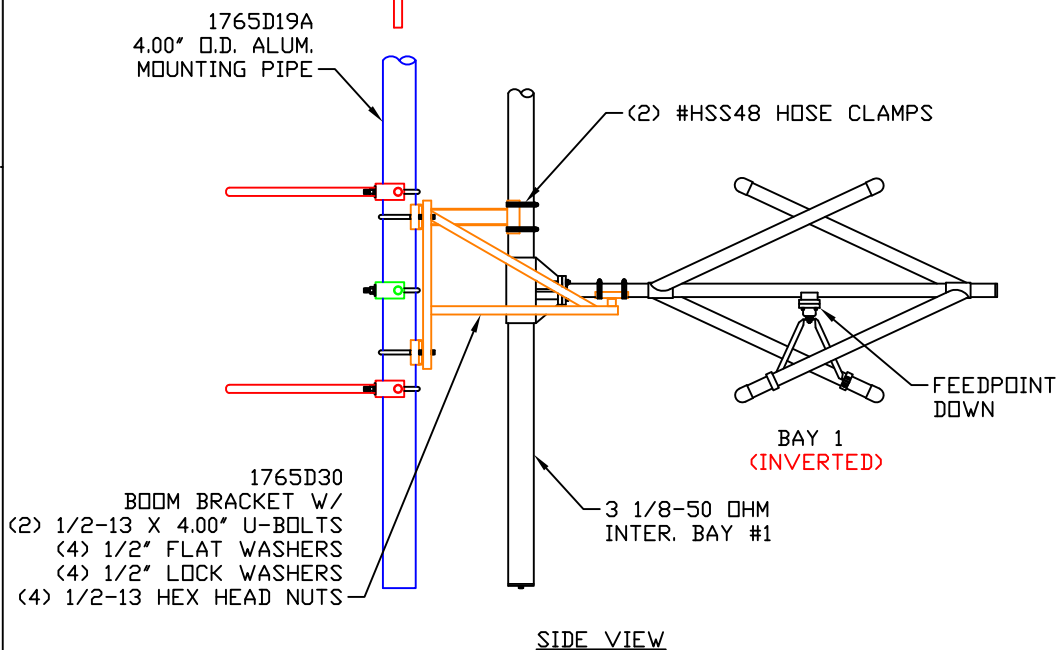
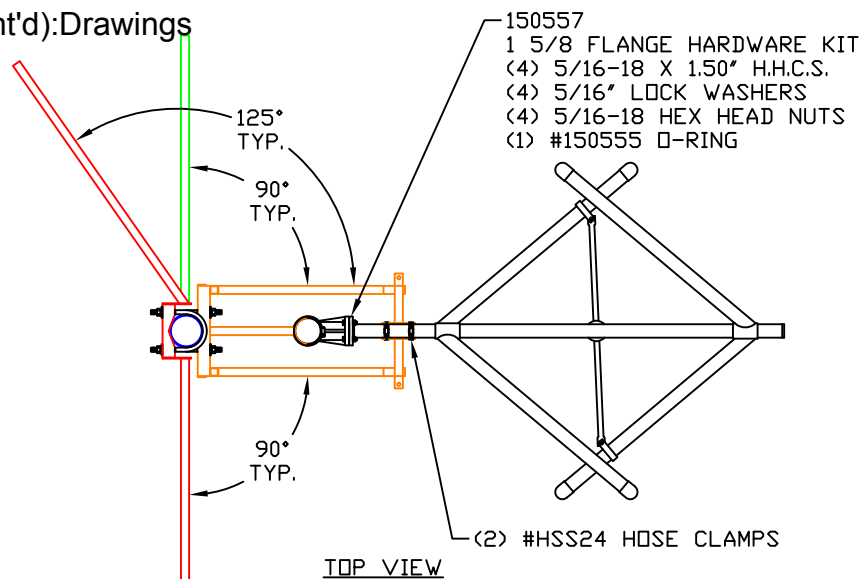
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NUMBER:

1765D00A

Exhibit 7(cont'd):Drawings

DRAWING
NUMBER:

1765D01



SYSTEMS WITH RELIABILITY, LP
619 INDUSTRIAL PARK ROAD
EBENSBURG, PENNSYLVANIA 15931

TITLE:

FM10/8-HWS-DA, FREQ. 90.7
WVOZ, NEW ORLEANS, LA

MATERIAL:

BAY 1
INSTALLATION

SIZE

A

PARTS MADE BY THIS DRAWING

SCALE: NTS

NAME: RAC

DATE: 12/31/12

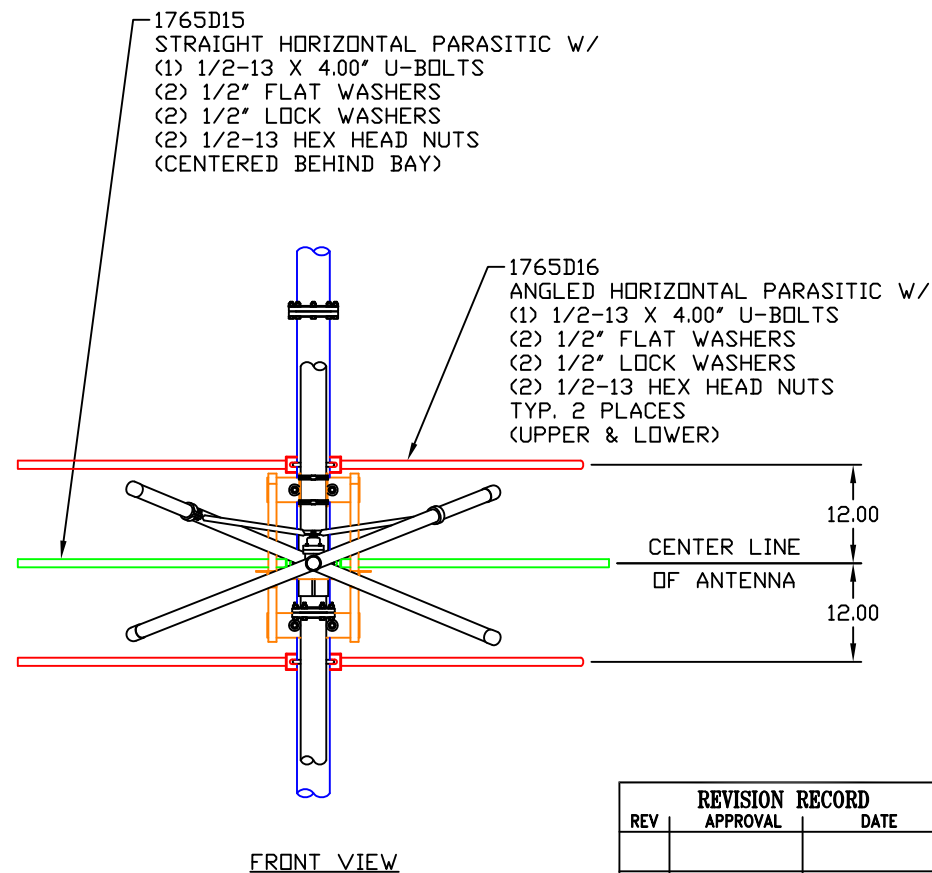
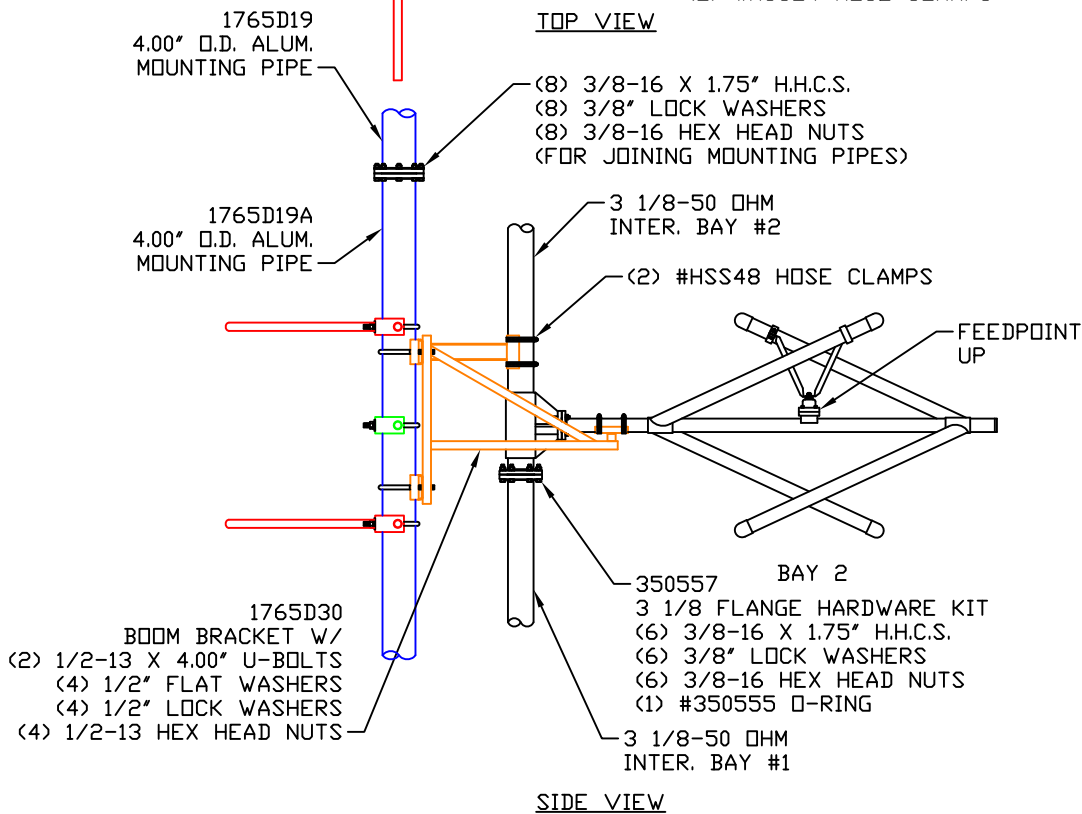
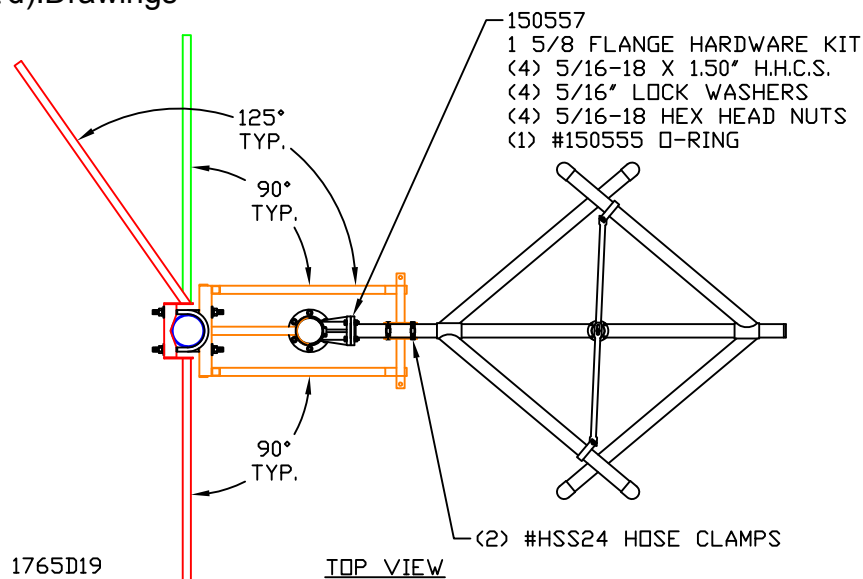
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REVISION RECORD

REV	APPROVAL	DATE

DRAWING
NUMBER:

1765D01



SYSTEMS WITH RELIABILITY, LP
619 INDUSTRIAL PARK ROAD
EBensburg, PENNSYLVANIA 15931

TITLE: FM10/8-HWS-DA, FREQ. 90.7
WWOZ, NEW ORLEANS, LA
BAY 2
INSTALLATION

MATERIAL:

SIZE

A

PARTS MADE BY THIS DRAWING

SCALE: NTS

NAME: RAC

DATE: 12/31/12

SHEET 1 OF 1

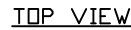
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REV	APPROVAL	DATE

DRAWING
NUMBER:

1765D02

DRAWING
NUMBER: 1765D03



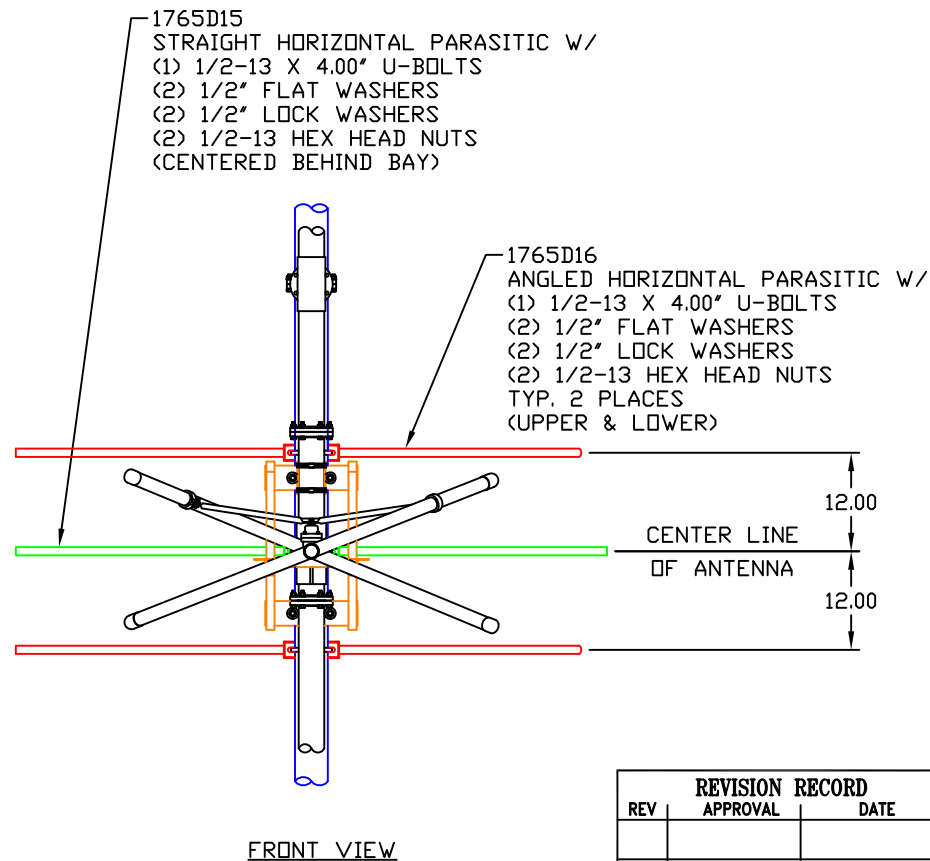
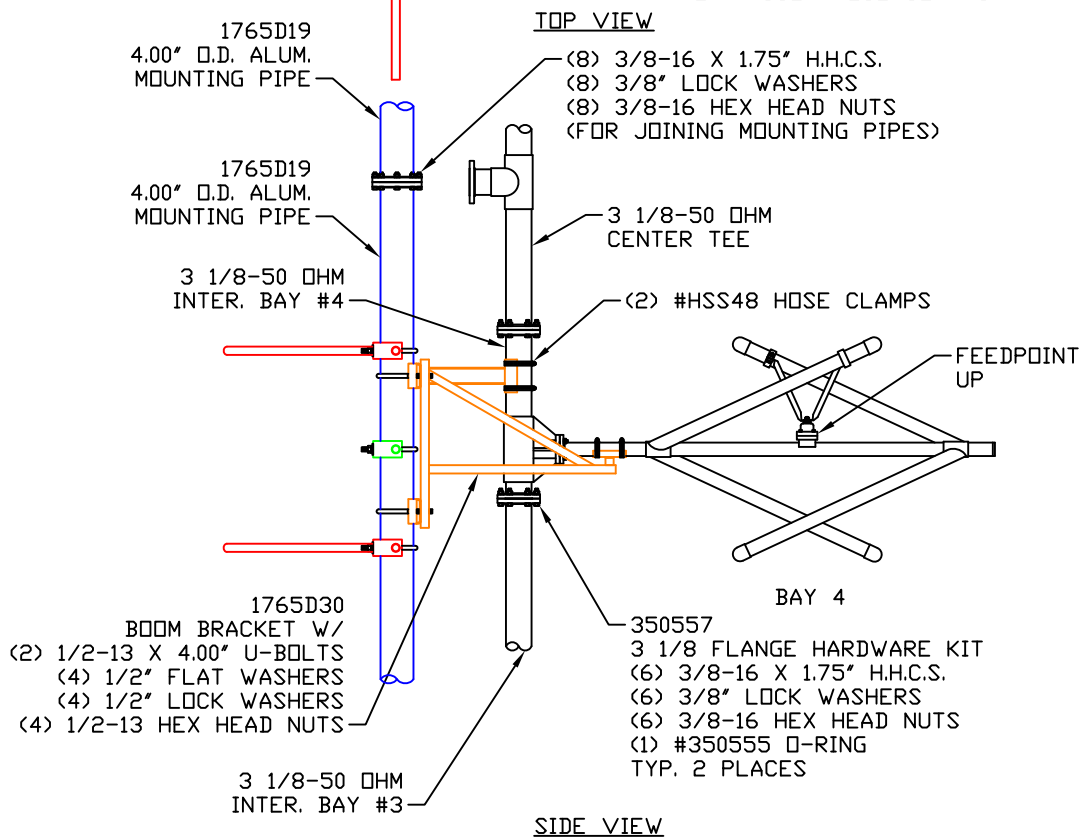
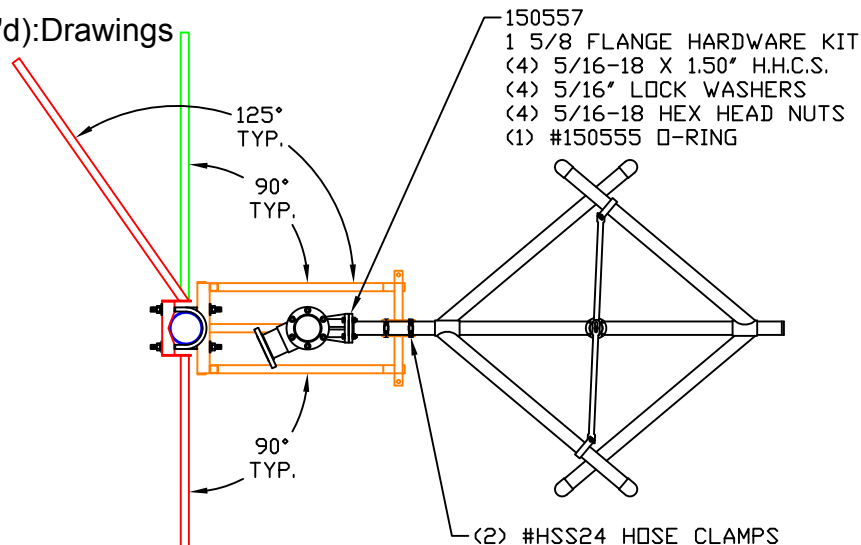
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REV	APPROVAL	DATE
DRAWING NUMBER:		1765D03

12/31/12 SHEET 1 OF 1

Exhibit 7(cont'd):Drawings

DRAWING
NUMBER:

1765D04



SYSTEMS WITH RELIABILITY, LP
619 INDUSTRIAL PARK ROAD
EBensburg, PENNSYLVANIA 15931

TITLE:

FM10/8-HWS-DA, FREQ. 90.7
WWOZ, NEW ORLEANS, LA

MATERIAL:

BAY 4
INSTALLATION

SIZE

A

PARTS MADE BY THIS DRAWING

SCALE: NTS

NAME: RAC

DATE: 12/31/12

SHEET 1 OF 1

REVISION RECORD

REV	APPROVAL	DATE

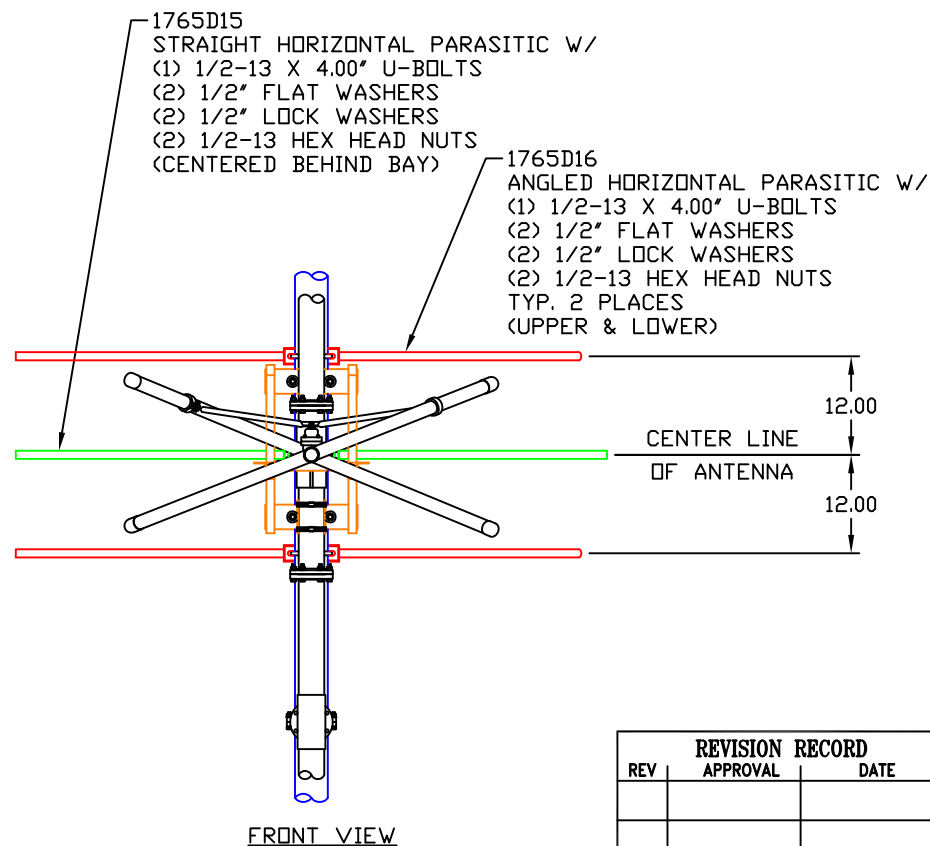
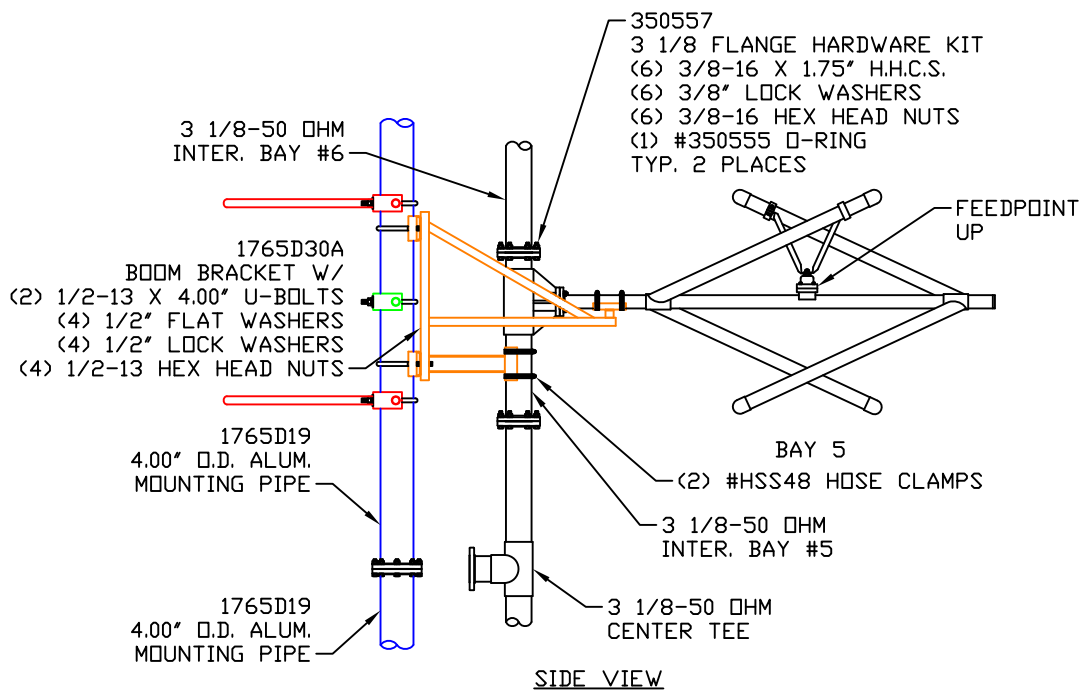
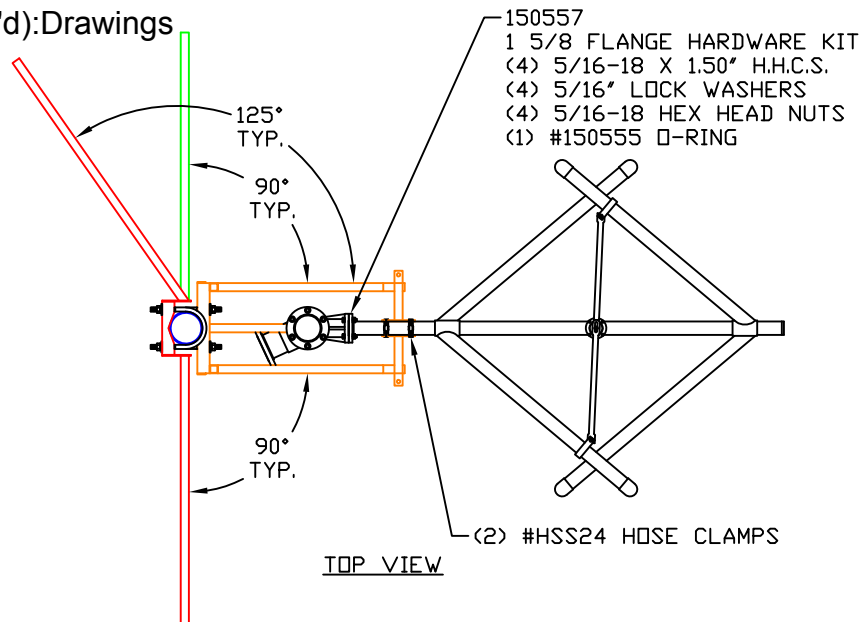
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NUMBER:

1765D04

Exhibit 7(cont'd):Drawings

DRAWING
NUMBER:

1765D05



SYSTEMS WITH RELIABILITY, LP
619 INDUSTRIAL PARK ROAD
EBensburg, PENNSYLVANIA 15931

TITLE:

FM10/8-HWS-DA, FREQ. 90.7
WVOZ, NEW ORLEANS, LA

MATERIAL:

BAY 5
INSTALLATION

SIZE

A

PARTS MADE BY THIS DRAWING

SCALE: NTS

NAME: RAC

DATE: 12/31/12

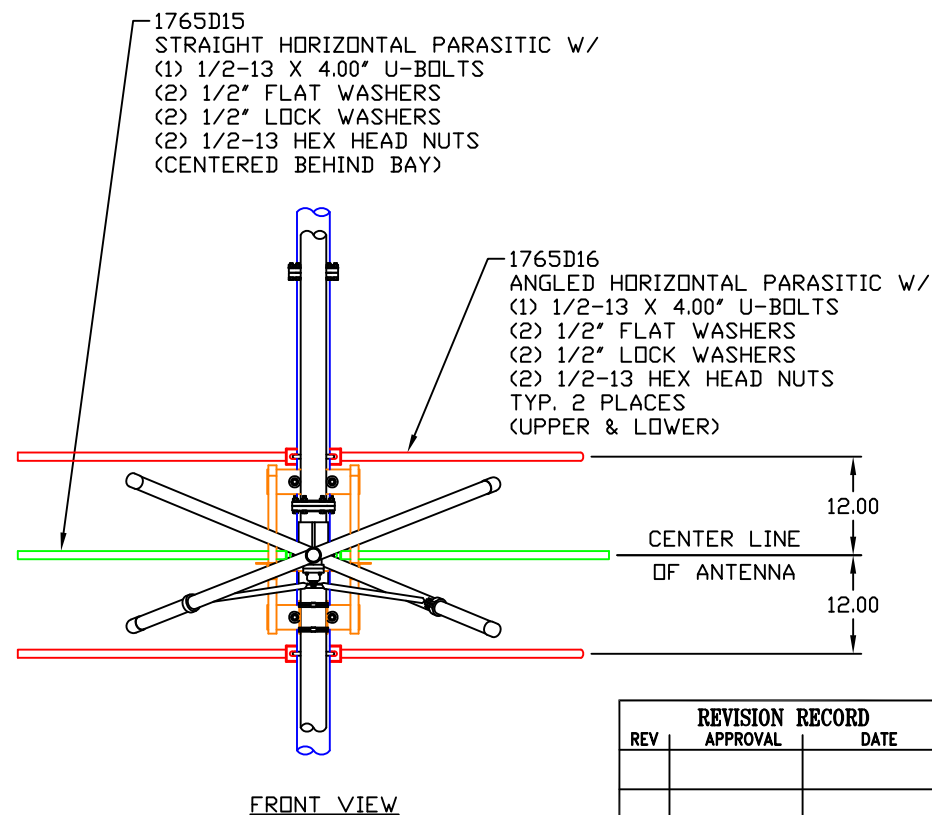
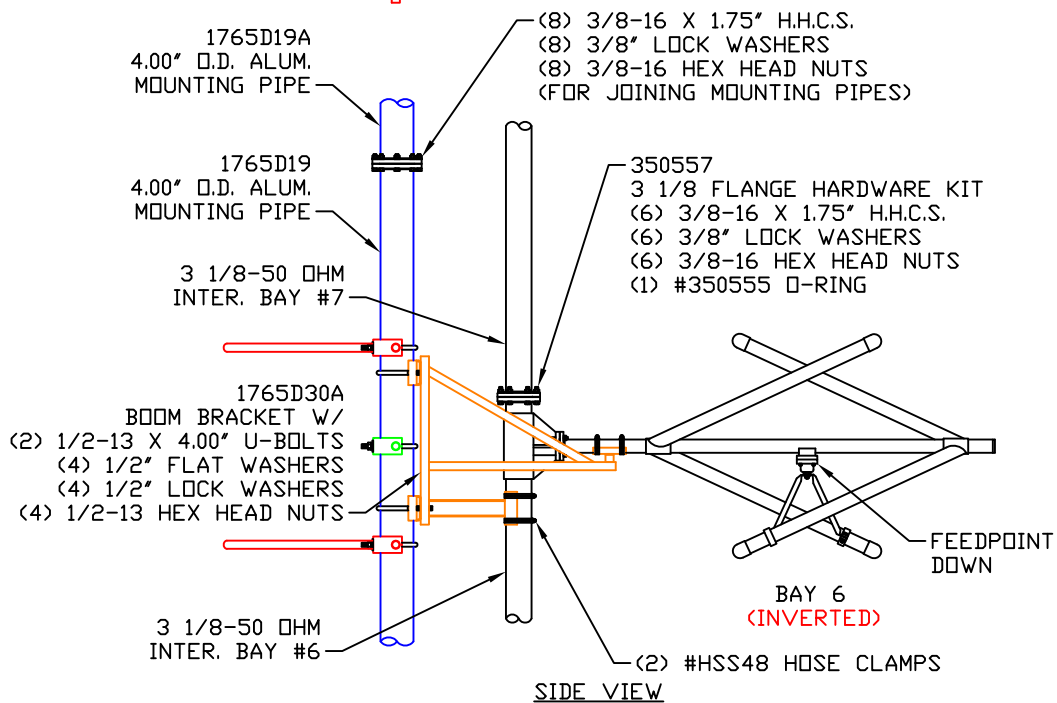
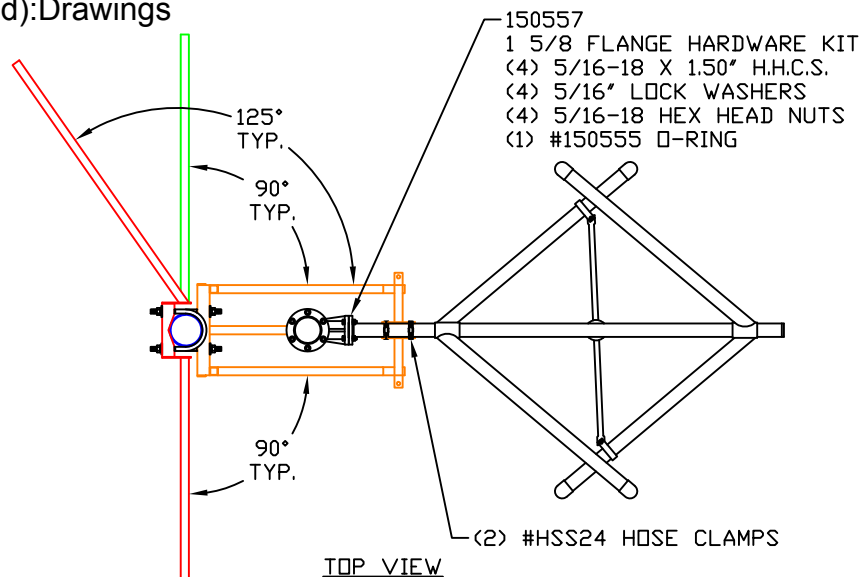
SHEET 1 OF 1

REVISION RECORD

REV	APPROVAL	DATE

DRAWING
NUMBER:

1765D05



SYSTEMS WITH RELIABILITY, LP
619 INDUSTRIAL PARK ROAD
EBENSBURG, PENNSYLVANIA 15931

TITLE: FM10/8-HWS-DA, FREQ. 90.7
WVOZ, NEW ORLEANS, LA
BAY 6
INSTALLATION

MATERIAL:

SIZE

A

PARTS MADE BY THIS DRAWING

SCALE: NTS

NAME: RAC

DATE: 12/31/12

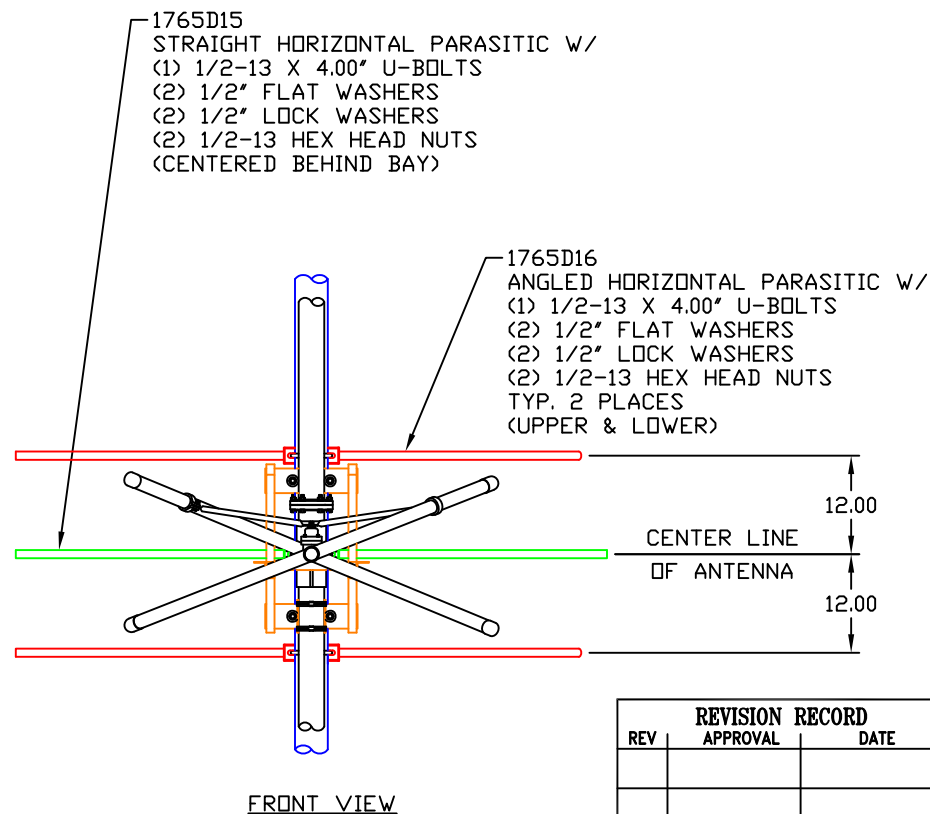
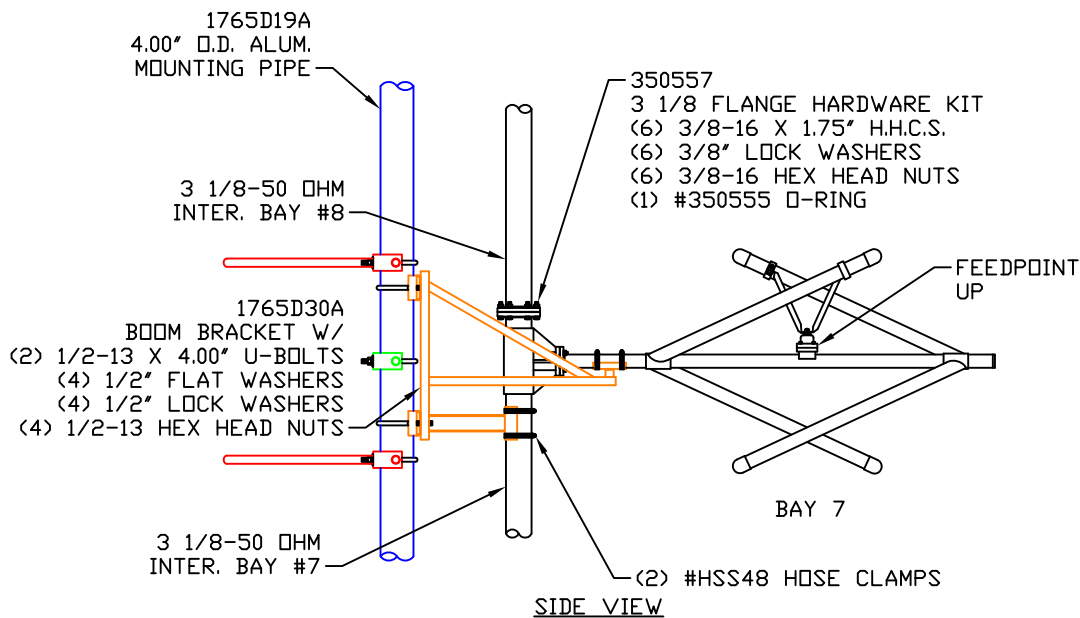
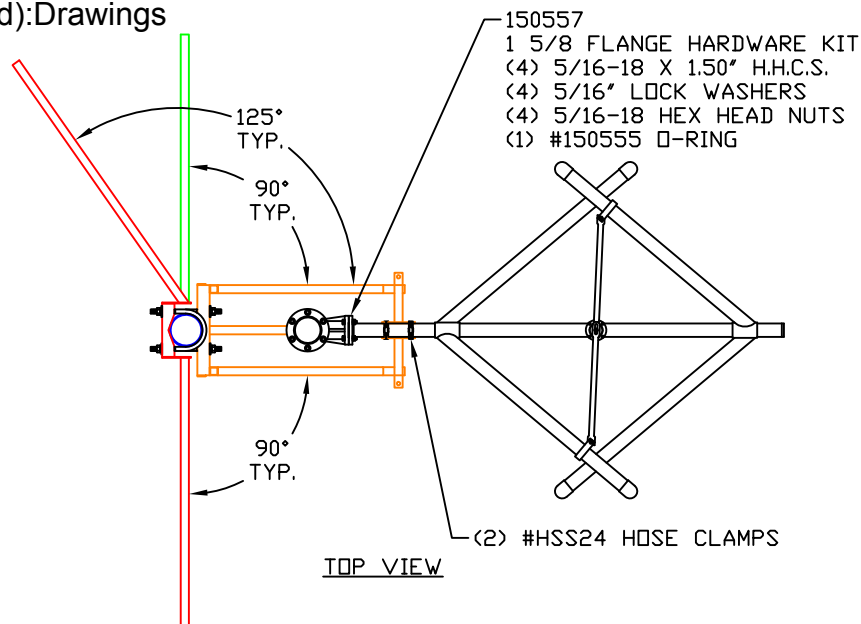
SHEET 1 OF 1

REVISION RECORD		
REV	APPROVAL	DATE
DRAWING NUMBER:		1765D06

Exhibit 7(cont'd):Drawings

DRAWING
NUMBER:

1765D07



SYSTEMS WITH RELIABILITY, LP
619 INDUSTRIAL PARK ROAD
EBENSBURG, PENNSYLVANIA 15931

TITLE: FM10/8-HWS-DA, FREQ. 90.7
WVOZ, NEW ORLEANS, LA
BAY 7
INSTALLATION

MATERIAL:

SIZE

A

PARTS MADE BY THIS DRAWING

SCALE: NTS

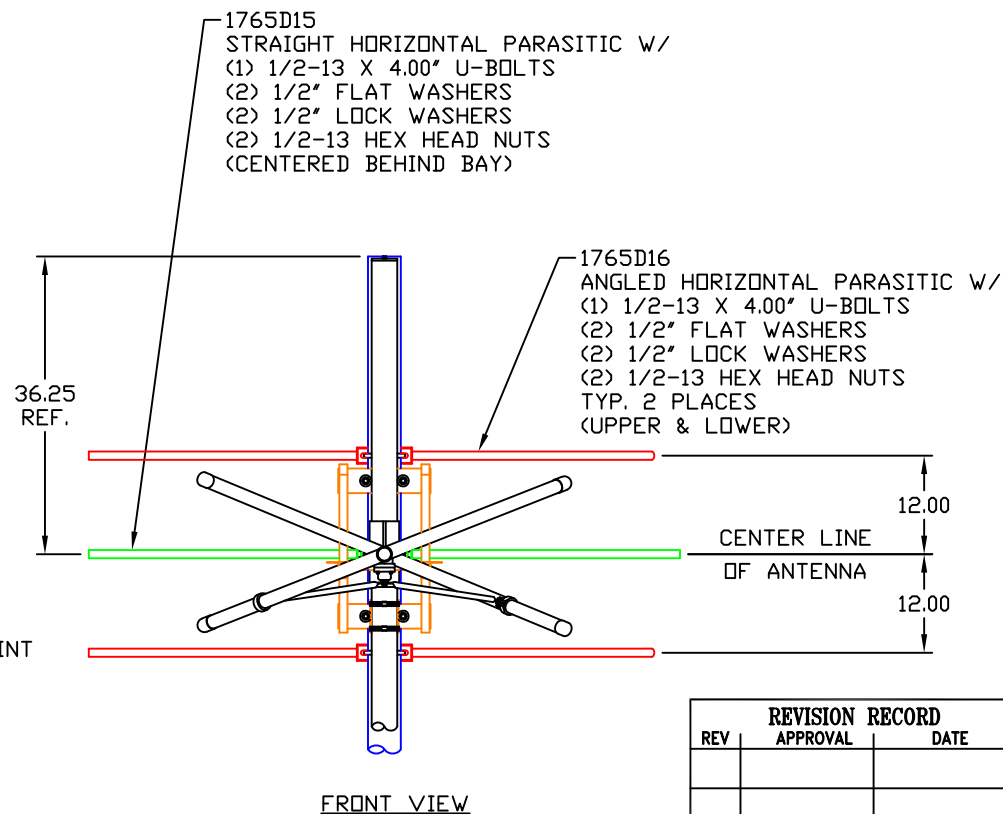
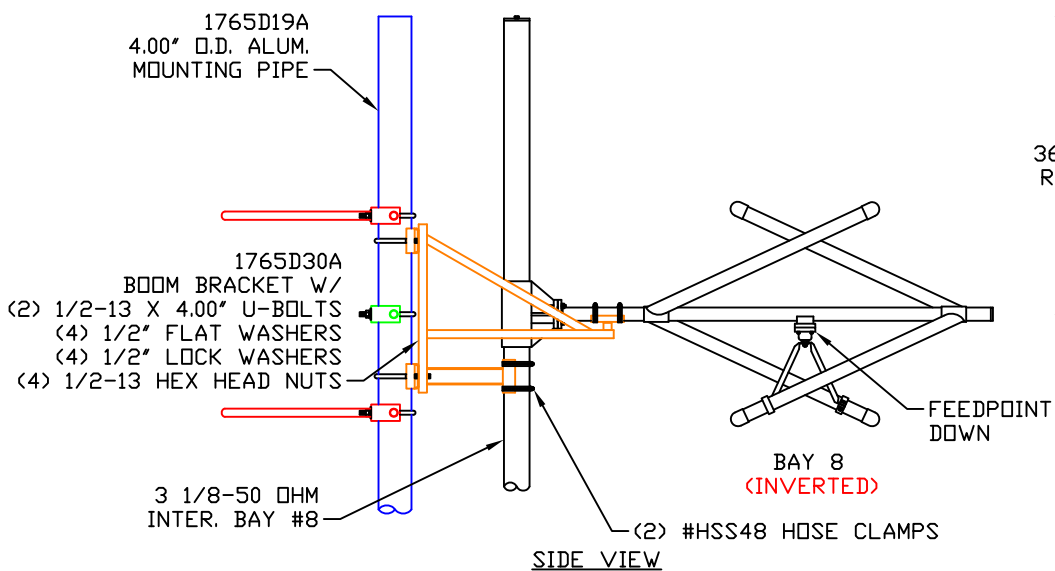
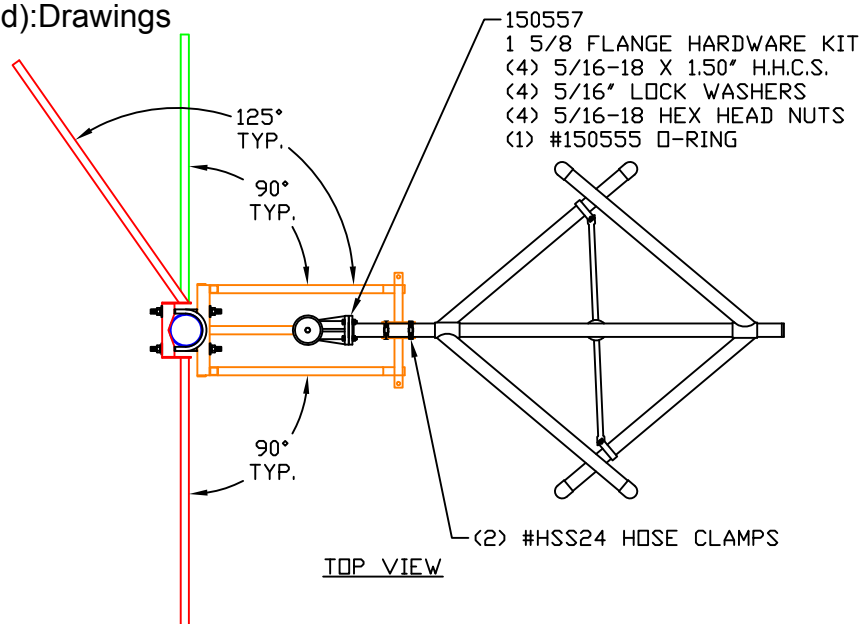
NAME: RAC

DATE: 12/31/12

SHEET 1 OF 1

REVISION RECORD		
REV	APPROVAL	DATE

DRAWING
NUMBER: 1765D07



SYSTEMS WITH RELIABILITY, LP
619 INDUSTRIAL PARK ROAD
EBENSBURG, PENNSYLVANIA 15931

TITLE: FM10/8-HWS-DA, FREQ. 90.7
WVOZ, NEW ORLEANS, LA
BAY 8
INSTALLATION

MATERIAL:

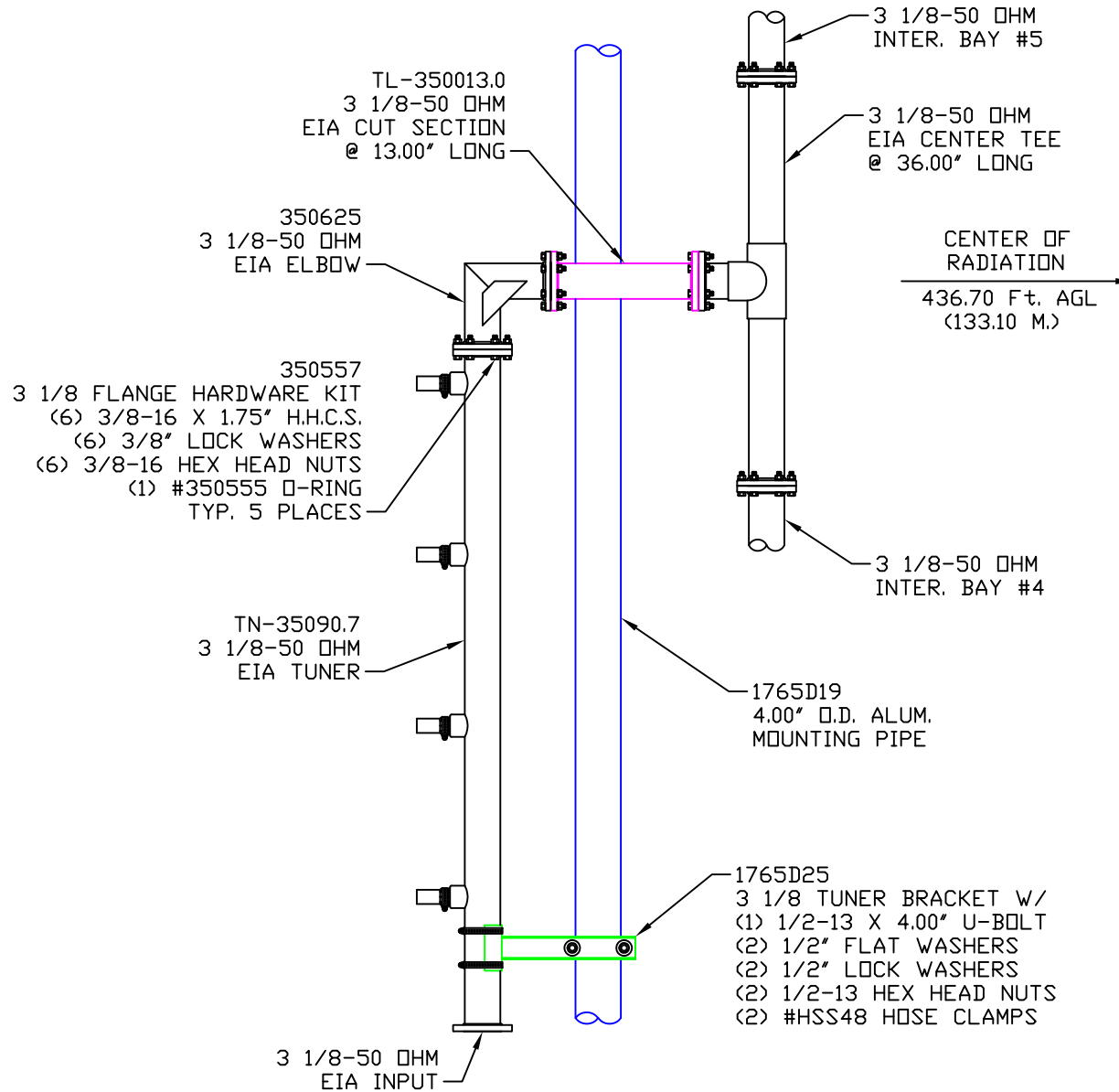
SIZE
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PARTS MADE BY THIS DRAWING
SCALE: NTS NAME: RAC DATE: 12/31/12 SHEET 1 OF 1

REVISION RECORD		
REV	APPROVAL	DATE
DRAWING NUMBER: 1765D08		

NOTE:
Exhibit 7(cont'd):Drawings

DRAWING
NUMBER: 1765D09



SYSTEMS WITH RELIABILITY, LP
619 INDUSTRIAL PARK ROAD
EBENSBURG, PENNSYLVANIA 15931

TITLE: FM10/8-HWS-DA, FREQ. 90.7
WWOZ, NEW ORLEANS, LA
MATERIAL: 3 1/8-50 OHM
INPUT ASSEMBLY

SIZE

A

PARTS MADE BY THIS DRAWING

SCALE: NTS

NAME: RAC

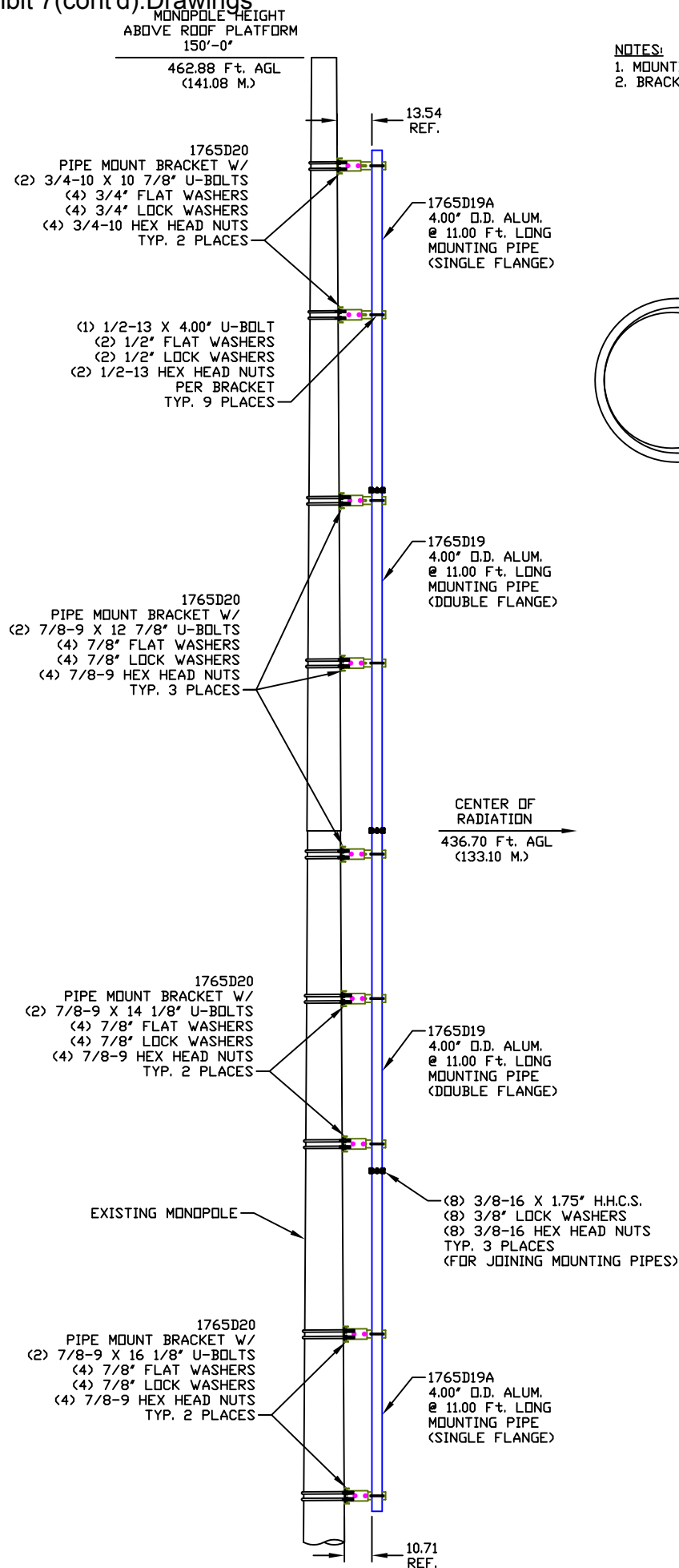
DATE: 12/31/12

SHEET 1 OF 1

REVISION RECORD

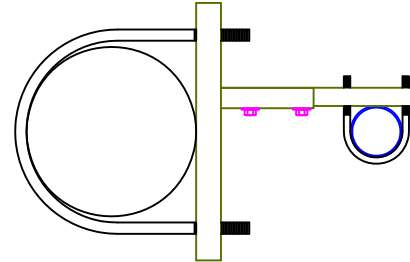
REV	APPROVAL	DATE

DRAWING
NUMBER: 1765D09



NOTES:

1. MOUNTING PIPE MUST BE LEVEL AND PLUMB.
2. BRACKET LOCATIONS TO BE FIELD DETERMINED.

TOP VIEW
NOT TO SCALE

SYSTEMS WITH RELIABILITY, LP
619 INDUSTRIAL PARK ROAD
EBENSBURG, PENNSYLVANIA 15931

TITLE: FM10/8-HWS-DA, FREQ. 90.7
WWOZ, NEW ORLEANS, LA
MATERIAL: MOUNTING PIPE
INSTALLATION

SIZE REV APPR. DATE
C 1
2
3

ENGINEER:

SCALE: NTS

NAME: RAC

DATE: 12/31/12

SHEET 1 OF 1

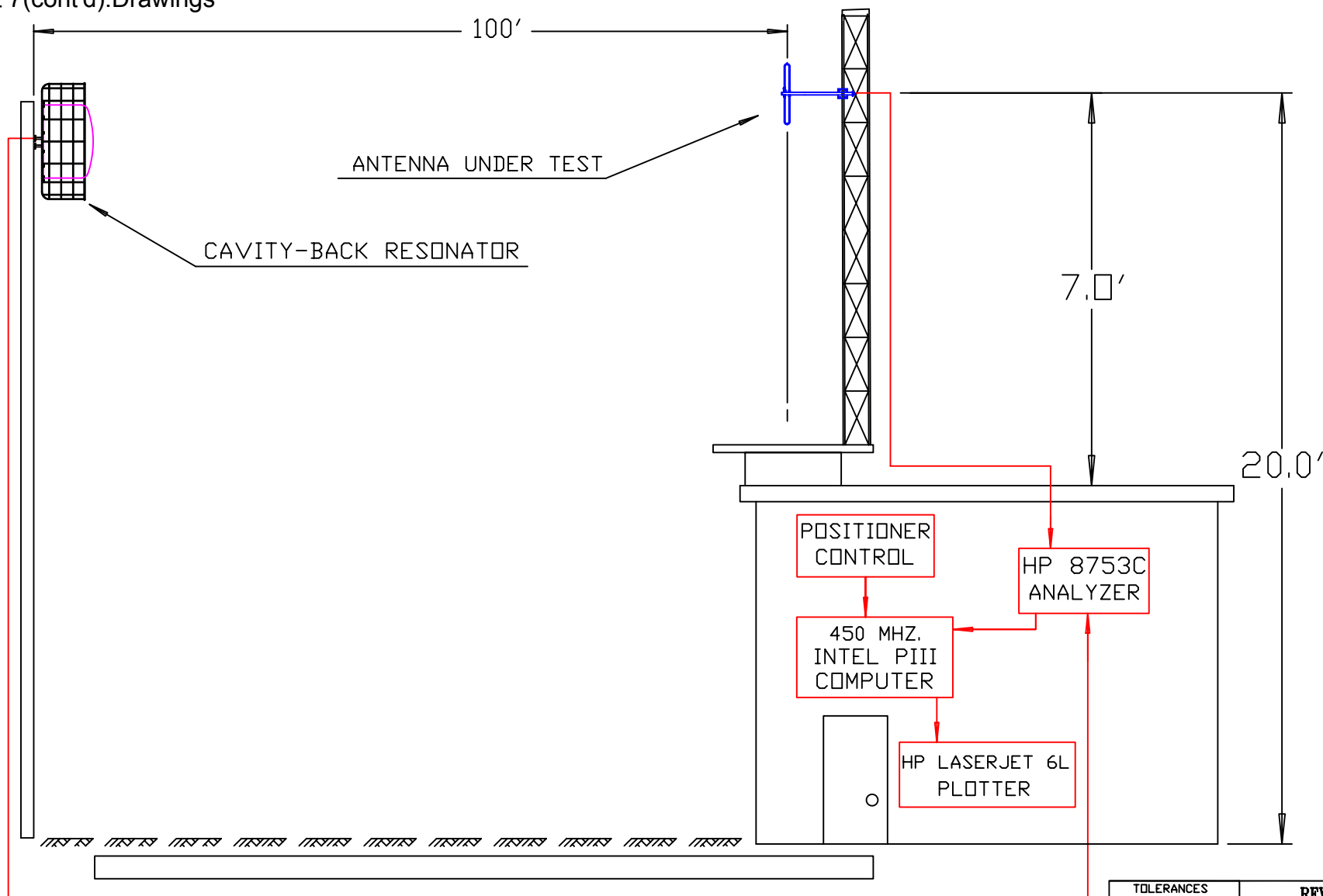
DRAWING
NUMBER: 1765D10

NOTE:

Exhibit 7(cont'd):Drawings

DRAWING
NUMBER:

2105A10



TOLERANCES	
.X	± .015
.XX	± .005
.XXX	± .002
X/X	± 1/32
DEG.	± 1/2
UNLESS OTHERWISE SPECIFIED	

REVISION RECORD		
REV	APPROVAL	DATE
2		10/7/05
1		4/30/02



SYSTEMS WITH RELIABILITY, INC
619 INDUSTRIAL PARK ROAD
EBensburg, PENNSYLVANIA 15931

TITLE:

TEST RANGE SCHEMATIC

MATERIAL:

SIZE

A

PARTS MADE BY THIS DRAWING

SCALE: NTS

NAME: JRM

DATE: 11/1/98

SHEET 1 OF 1

DRAWING
NUMBER:

2105A10

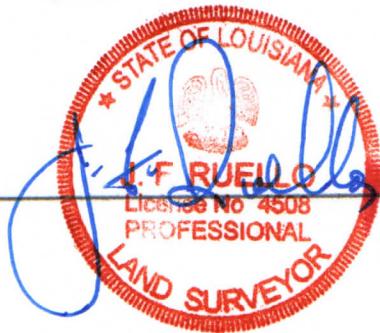
WWOZ Surveyor's Declaration Letter

Surveyor's Declaration

I, J.F. Ruello, subject to the penalties of perjury, do declare
the following:

- 1.) I am a licensed surveyor in the state(s) of Louisiana,
_____ and _____.
- 2.) I have provided professional services to WWOZ
(permit tee name), permit tee of WWOZ-FM, New Orleans (city of license),
LA (state), during the installation of the WWOZ-FM directional antenna.
- 3.) I certify that the WWOZ-FM directional antenna has been oriented at the
proper azimuth as authorized in the drawings section (Exhibit 7) of the
Proof of Performance for WWOZ-FM. Namely Drawing #1765D00A shows
the proper heading to be 110 degrees from true North.

Sign _____



Dated: 04/05/13 mm/dd/yy

619 Industrial Park Road, Ebensburg, PA 15931 Tel. 800 762 7743 / 814 472 5436 ♦ Fax 814 472 5552

1/7/2013

WWOZ PATTERN CERTIFICATION

Prepared by Landmark Surveying Inc.
1513 Kuebel Street
Harahan, LA , 70123
504-733-3303

Declaration of James A. Guillory



Engineer's Declaration

I, James A. Guillory, subject to the penalties of perjury, do declare the following:

- 1.) I am the holder of a valid General Radio Telephone Operators License, Number PG-8-8859.
- 2.) I am employed by Friends of WWOZ, Inc in an engineering capacity.
- 3.) I am familiar with the terms and conditions of the underlying WWOZ-FM Construction Permit (FCC File Number BMPED-20120706ABN) granted by the Commission
- 4.) I hereby certify that I have overseen the installation of the WWOZ-FM directional antenna and that the installation was complete to the manufacturer's instructions outlined in the Proof of Performance Drawing section (Exhibit 7) for WWOZ-FM

Sign: _____

A handwritten signature in cursive script, appearing to read "James A. Guillory", written over a horizontal line.

Date: _____

A handwritten date "4/6/2013" written in cursive script over a horizontal line.

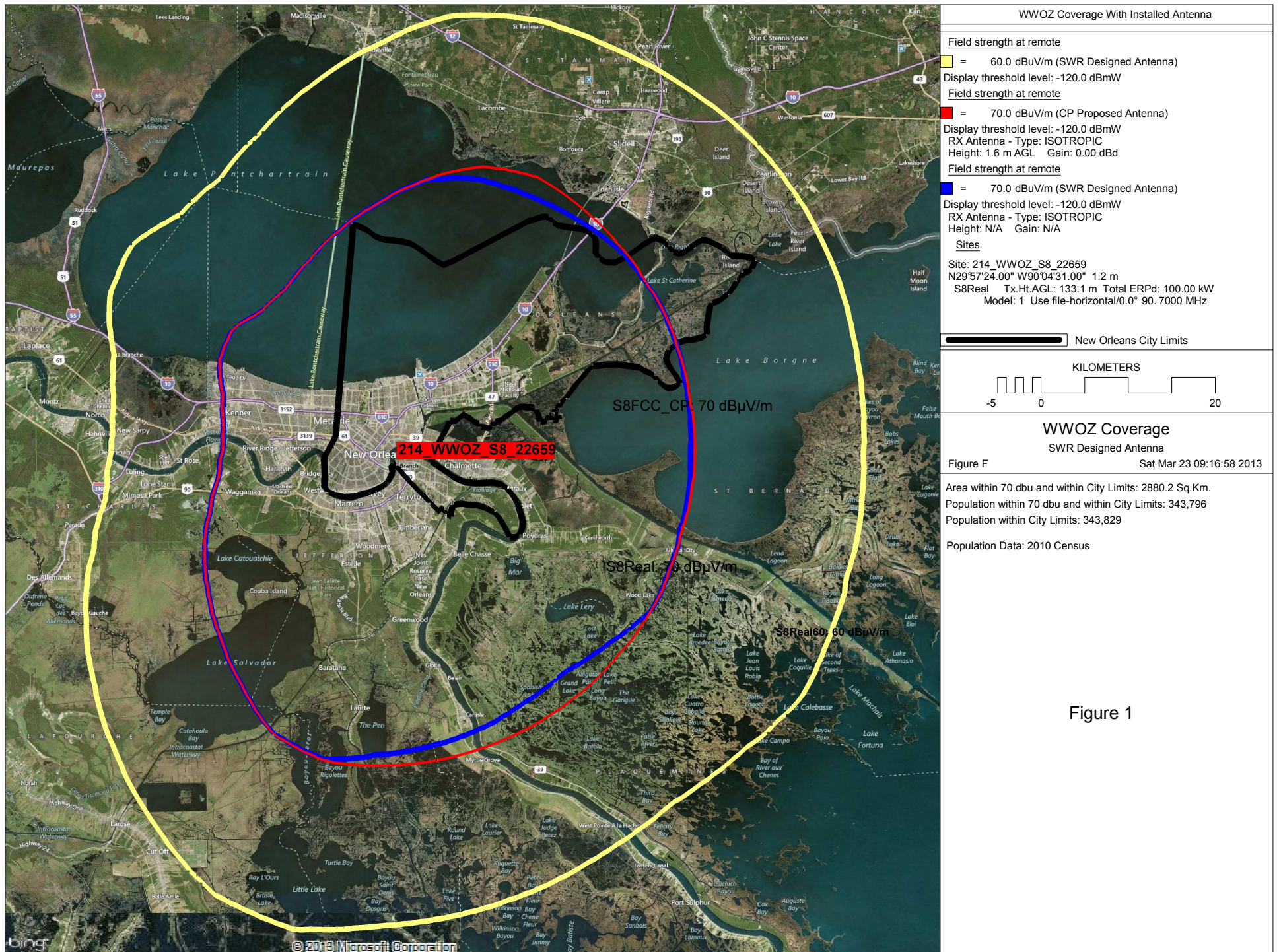


Figure 1