BATAVIA CITY COUNCIL
CONFERENCE MEETING

City Hall - Council Board Room
One Batavia City Centre
Monday, July 9, 2018 at 7:00 PM

AGENDA

I. Call to Order

II. To Submit a Community Development Block Grant (CDBG) Planning Application CDBG

III. To Amend the 2018-2019 Police Department Budget to Reflect the Receipt of a STOP-DWI Grant Amendment in the amount of $1,668.07 to address the Crimes of Driving While Intoxicated and/or Driving While Ability Impaired by Drugs

IV. Inter-Municipal Agreement – Antenna Installation on VA Water Tank

V. Adjournment

City of Batavia

Memorandum

To: Honorable City Council

From: Matt Worth, Interim City Manager

Date: July3, 2018

Subject: Consolidated Funding Grant Application – Recreation Sub Committee

The deadline for submission of Consolidated Funding Applications (CFA) for the next round of CDBG planning grants is July 27th, 2018 The City has had discussions with the Creek Park Recreation Sub-Committee as to a planning document that would qualify for funding.

The Batavia Development Corporation formed this Sub-Committee with Council representation from Councilpersons Viele and Tabelski, and the planning document would review the feasibility of the construction of an additional sheet of ice, as well as possible indoor recreation facilities. This program has a 10% match requirement which has been committed by private monies the sub-committee has procured.

This document, if funded, would be a critical resource in the scheduled City/County/Town Planning and Recreation plan scheduled for fiscal year 2019 The City has budgeted funds available to commit to the cost of the application preparation by the City's grant consultant.

Supporting Documentation
Draft Resolution

Office of the City Manager
One Batavia City Centre
Batavia, New York 14020

Phone: 585-345-6330
Fax: 585-343-8182
www.batavianewyork.com

#-2018

A RESOLUTION TO SUBMIT A COMMUNITY DEVELOPMENT BLOCK GRANT PLANNING APPLICATION

Motion of Councilperson

WHEREAS, the City of Batavia would like to submit an application a feasibility study of the possible addition of a second ice rink at the Falleti Ice Arena and

WHEREAS, the New York State Community Development Block Grant (CDBG) program provides funding for planning projects in support of economic development, job creation and reinvestment in communities;

NOW THEREOFRE, BE IT RESOLVED, that the Interim City Manager of the City of Batavia, New York, is hereby authorized as the official representative of the City of Batavia to execute and submit a Community Development Block Grant application to the administrative agency for the Fiscal Year 2018 program, all understandings and assurances contained therein, and is hereby directed and authorized to act in connection with the submission of the application and to provide such additional information as may be required.

Seconded by Councilperson
and on roll call

City of Batavia

Memorandum

To: Matt Worth, Interim-City Manager

From: Shawn Heubusch, Chief of Police SL

Date: June 28, 2018

Subject: Additional funding for STOP-DWI

Attach: Grant Award Documents

Cc: Lisa Neary, Deputy Director of Finance

On June 14, 2018 the City Police Department was awarded additional funding in the amount of $1,668.07 for STOP-DWI enforcement efforts. This funding is to be utilized during specific Crackdown periods as directed by the Governor's Traffic Safety Committee (GTSC). I am requesting the attached budget adjustment via resolution by Council.

The City of Batavia will benefit greatly from this STOP- DWI funding by enhancing the Police Department's ability to conduct more specialized enforcement details to target alcohol or drug impaired drivers.

Feel free to call with any questions you may have. Thank you.

Police Department
10 Main Street
Batavia, New York 14020

Phone: 585-345-6350
Fax: 585-344-1878
Records: 585-345-6303
Detective Bureau: 585-345-6370
www.batavianewyork.com

#-2018

A RESOLUTION TO AMEND THE 2018-2019 POLICE DEPARTMENT BUDGET TO REFLECT THE RECEIPT OF A STOP-DWI GRANT AMENDMENT IN THE AMOUNT OF $1,668.07 TO ADDRESS THE CRIMES OF DRIVING WHILE INTOXICATED AND/OR DRIVING WHILE ABILITY IMPAIRED BY DRUGS

Motion of Councilperson

WHEREAS, the City of Batavia Police Department has received additional grant funding in the amount of $1,668.07 from THE GENESEE COUNTY STOP-DWI PROGRAM TO COMBAT IMPAIRED DRIVING BY FUNDING SPECIALIZED PATROL FUNCTIONS DURING SPECIFIC CRACKDOWN PERIODS; and

WHEREAS, to properly account for the expenditure of this money, a budget amendment needs to be made; and

NOW THEREFORE, BE IT RESOLVED, by the Council of the City of Batavia that the City Manager be and hereby is authorized to make the following budget amendment to the 2018-2019 budget to cover various initiatives to combat alcohol and drug related traffic offenses:

Effective July 9, 2018, amend the 2018-19 budget:

Increase expenditure accounts

001.3120.0101.1171	$ 1,668.07

Increase revenue accounts

1.1.3389.1171	$ 1,668.07

Seconded by Councilperson
and on roll call

Shawn Heubusch

From: Matt Landers <Matt.Landers@co.genesee.ny.us>
Sent: Thursday, June 14, 2018 9:27 AM
To: Gregory Walker; Joseph Graff; lp01@leroypolice.org; lp11@leroypolice.org; Shawn Heubusch; Todd Crossett; William Sheron
Cc: Vicky Muckle
Subject: FW: Additional Crackdown
Attachments: Crackdown additional allocation ltr - Genesee2.pdf

Based on the letter attached LeRoy Police, Batavia Police and the Sheriff's Office are entitled to additional crackdown monies. There are two more crackdown periods left in the grant cycle, 4th of July and Labor Day. Below is what each agency is allocated based on the original allocation formula. I know some may not be able to spend the money, so I can reallocate it as needed. Hopefully, this might be enough to entice a larger presence during one of the crackdowns like a larger check point.

City of Batavia Police = $1,668.07
Village of LeRoy Police = $482.07
Genesee County Sheriff's Office = $2,349.86

Let me know if you have any questions.

Thanks,
Matt

L. Matthew Landers, CPA
Assistant County Manager
STOP DWI Coordinator
Genesee County Manager's Office
Old County Courthouse
7 Main Street
Batavia, NY 14020
Phone: (585) 344-2550 x2204
Email: Matt.Landers@co.genesee.ny.us

From: Pamela Aini [mailto:stopdwifoundation@gmail.com]
Sent: Friday, May 18, 2018 3:47 PM
To: Matt Landers
Subject: Additional Crackdown

Hi - attached is an official letter granting additional crackdown funds to be expended during the last three crackdowns.

Let me know if you have any questions.
PAM

--

Pamela Aini
Grant Administrator & Project Director
NYS STOP-DWI Foundation, Inc.

New York State

STOP-DWI Foundation, Inc.

STOP DWI New York | Community Focused. Saving Lives.

May 18, 2018

Matt Landers
Genesee County STOP-DWI
7 Main Street
Batavia, NY 14020

Re: Allocation of Additional Crackdown Funds

Dear Matt:

As you are aware Genesee County was allocated $10,000.00 in crackdown funds for the grant cycle of October 1, 2017 through September 30, 2018 and in February an additional $1,300 was awarded.

Please accept this letter as official notification that effective today the NYS STOP-DWI Foundation has again increased the Genesee County allotted crackdown money by an additional $4,500.00. This additional allocation is subject to use under the same criteria as the original funds granted.

Should you have any questions or require any additional information, please feel free to contact me or Grant Administrator, Pam Aini.

Sincerely,

Reginald Crowley

Reginald Crowley, Chairperson
NYS STOP-DWI Foundation, Inc.

City of Batavia

Memorandum

To: Honorable City Council

From: Matt Worth, Interim City Manager

Date: July 3, 2018

Subject: Antenna Installation on VA water tank

The Town of Batavia has approached the City in regards to installing an antenna on the City's elevated water storage tank near the VA hospital. The antenna would be magnetically mounted with a cable attached down one of the legs of the structure on brackets that currently exist.

The antenna installation is to be utilized for the purpose of a wireless water meter reading system that the Town is utilizing. The installation and maintenance of this magnetically mounted antenna will not impact the operation of the tank, and the meter reading capabilities will allow for master meter readings to be obtained in this same manner for City use.

As this installation is for the use by an adjoining municipality, and the City will receive some benefit from its utilization, it is recommended that the antenna be allowed to be attached to the City water tank without cost.

Supporting Documentation
Draft Inter-Municipal Agreement
Exhibit "A" Equipment Details

Office of the City Manager
One Batavia City Centre
Batavia, New York 14020

Phone: 585-345-6330
Fax: 585-343-8182
www.batavianewyork.com

INTER-MUNICIPAL AGREEMENT

THIS AGREEMENT, made the _____ day of _____, 2018, by and between the **TOWN OF BATAVIA**, a municipal corporation of the State of New York, with offices located at Town Hall, 3833 West Main St., Rd., Batavia, New York, (hereinafter "Town"), and the **CITY OF BATAVIA**, a municipal corporation of the State of New York, with offices located at City Hall, One Batavia City Centre, Batavia, New York, (hereinafter "City"), also jointly referred to hereinafter as "Municipalities".

WITNESSETH

WHEREAS, the City owns a water tower ("Water Tower") situated on a parcel of land identified as tax map parcel no. 71.13-3-1.111 (the "Land") and leases certain areas on the Water Tower to owners of antenna equipment, and

WHEREAS, there is room on the Water Tower for the placement of additional antennas, and

WHEREAS, the Town is in the process of acquiring and installing a new water meter reading radio antenna system, and desires to utilize available space on the Water Tower to install antennas which are a part of the system as more particularly described in "Exhibit A," attached hereto (the "Equipment"), and

WHEREAS, this system will benefit the City as their Master Meters will be read by the system and available to the City at any reading frequency they desire.

NOW, THEREFORE, in consideration of the mutual covenants and agreements contained herein, it is agreed as follows:

1. The City agrees to permit the Town to place on the Water Tower the Equipment described in Exhibit A, and any replacements thereto, at such locations as agreed between the City and the Town.

2. The Town shall be solely responsible for all costs related to the design, furnishing and installation of the Equipment.

3. The Equipment shall be installed in a manner so as not to interfere with the operation and maintenance of the Water Tower or the proper functioning of any other antennas installed on the Water Tower.

4. In consideration for the use of the Water Tower by the Town, and upon the completion of the installation of the Equipment, the Town agrees to utilize the Equipment to read all master meters owned by the City at the Town's sole expense and deliver the data to the City at least quarterly. There shall be no rent charged to the Town for the use of the Water Tower.

5. The City further agrees to grant unto the Town and its employees, agents and/or assigns the right to enter upon the Land and Water Tower to access the Equipment installed on the Water Tower for purposes of maintenance and repair.

6. The Town agrees to indemnify and hold harmless the City, and its officers, employees and agents, of and from any liability arising out of the operation, maintenance and repair of the Equipment by the Town.

7. The Town agrees to provide the City any such proofs of insurance as the City may reasonably require.

8. The term of this Agreement shall be five (5) years, commencing on the XX day of XXXX, 2018, and ending on the 30th day of June, 2058. This agreement may be renewed by written agreement of the parties. Either party may terminate this agreement by providing ninety (90) days written notice to the other party.

9. Upon termination of the agreement the Town shall remove the Equipment installed on the Water Tower within ninety (90) days from termination. In the event that the Town fails to remove the Equipment timely, the Equipment may be removed by the City.

IN WITNESS WHEREOF the parties have last signed this Agreement the day and year first written above.

TOWN OF BATAVIA (SEAL)

_____

By: Gregory H. Post, Supervisor

CITY OF BATAVIA (SEAL)

_____

By: Eugene Jankowski Jr.,
Batavia City Council President

EXHIBIT "A"

PlusComm llc

Andrew Rasdorf
4910 Poplar Drive
Alexandria, Virginia 22310
(703) 963-5334

April 4, 2018

Chris Mensinga
Core&Main – Meter Product Specialist
14 Arch St
Watervliet, NY 12189

Scope of Work – Batavia NY – Batavia VA Hospital Tank

Dear Mr. Mensinga,

This scope of work is for the Advanced Metering Infrastructure Antenna Equipment Supply and Installation located on the water tank at the following coordinates in Batavia, NY. (43.012108, -78.195824).

PlusComm is an active member of NATE (the National Association of Tower Erectors) and will provide to Core&Main the following certifications for the onsite crew upon request:

- Competent Climber/Rescue
- Fisrt Aid, CPR, AED Training
- OSHA 10
- OSHA 30
- RF Awareness

PlusComm will perform the following services for Core&Main:

MATERIALS

- PlusComm will supply, transport, and install all equipment for this installation on the VA Hospital Tank in Batavia NY.
    - Antenna: Db589-Y
    - Magnetic Mount – Model MB36-2
    - Hard Line Cable: 240' of AVA6-50
    - Remaining Materials including connectors, jumpers, grounding kits, polyphasers, GPS cable and mounts, hoisting grips, hose clamps, snap-ins, trapboxes, I-Beam clamps, all grounding equipment, M400 mounting material, etc.

LABOR

- The M400 will be mounted in one of the two shelters located at the bottom of the tank. The wall mount that is provided with the M400 will be anchored to the shelter wall.
- The magnetic mount will be installed on the top most point of the tank. It will be tethered to the overflow pipe at the top.
- The transmit antenna will be mounted on the magnetic mount.
- The antenna will be secured in a level position at correct rad center and verified by range finder, tape drop, digital level, and pictures.
- The transmission hard line will follow the existing cable path running out of the shelter, up the tank leg, across the hand rail, and follow the overflow pipe to the top of the tank. It is expected that the hardline will ride an existing cable by snapping into the existing stackable Snap-ins. The hardline will then be secured every 3' up

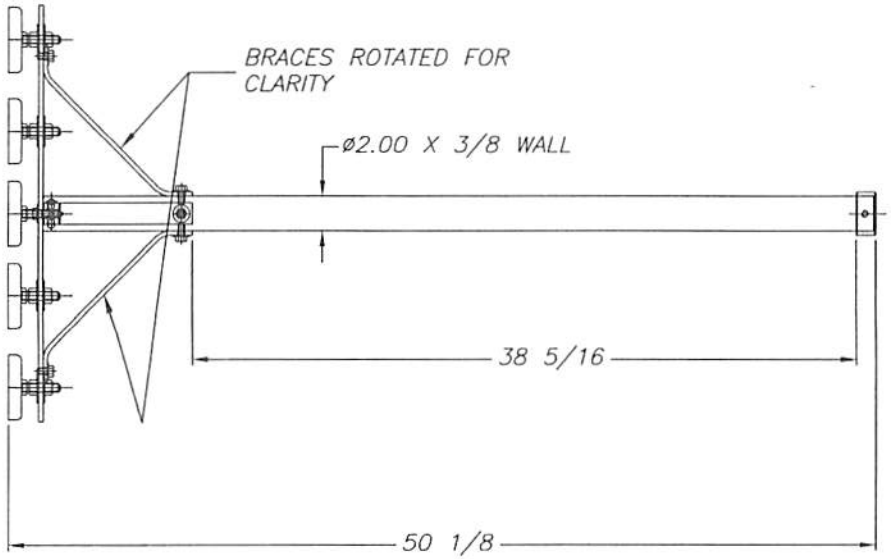
the over flow pipe using hose clamp/Snap-in configuration as well as mag mount cable secures where needed.

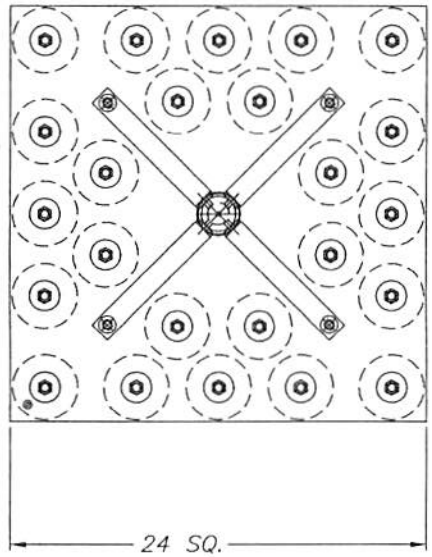
- The hard line will be grounded at the top and middle of the tank, as well as the entrance to shelter. Connectors will be installed; all exterior connections and grounds will be weather proofed.
- A boot will be used at the cable pass through point on the shelter.
- The GPS antenna will be installed in a location on the outside of the shelter. GPS cable will be installed from the M400 to the GPS antenna.
- The GPS polyphaser will be installed and grounded per specs.
- The M400 master ground bar will be grounded to a main ground point within the tower pedestal using #2 Copper wire.
- The RF PolyPhaser will be installed between hardline and bottom jumper. PolyPhaser will be grounded per specs.
- Antenna and Hardline will be tested for quality using the Anritsu Site Master S331D. Sweep Meter data and passing Sweep files will be provided to Core&Main.
- Core&Main is responsible for the supply of the M400 transmitter.
- PlusComm is not responsible the installation of any electrical.
- Site will be kept clean throughout installation process and upon completion.
- All applicable safety procedures and OSHA regulations will be followed.

Best Regards,

Andrew Rasdorf
PlusComm, LLC

REVISIONS				
ECN	REV	DESCRIPTION	DATE	APPROVED





MODEL MB

DO NOT SCALE THIS DRAWING
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN IN. & LBS.
TOLERANCES ARE:
FRACTIONS ± 1/32
DECIMALS .X ± .100, .XX ± .010, .XXX ± .005
ANGLES ± 0° 30'

SURFACE FINISH IN MICROINCHES UNLESS OTHERWISE SPECIFIED 125

MAT'L

NEXT ASSY	USED ON
APPLICATION	

ENGINEERING DEPT.

DRAWN	RLB	7-24-09
ENGINEERING		

M & C METAL & CABLE CORPORATION
9237 RAVENNA RD., UNIT C
TWINSBURG, OHIO 44087

TITLE
MAGNEMOUNT
MODEL MB

SIZE	DWG. NO.	REV.
C	MODEL MB	0

SCALE NO WEIGHT CALC. ACT SHEET 1 OF 1

BEACH & ASSOCIATES
MECHANICAL DESIGN & ENGINEERING
P.O. 185, WATERFORD, WI 53185
TELEPHONE 262-534-9001

Metal & Cable Corp., Inc.
Antenna Mount Calculations - R01

B & A Project 74035

Prepared for:
David Klein
Metal & Cable Corp.
P.O. Box 117
Twinsburg, OH 44087
July 24, 2010

Michael E. Beach, P.E.
President
Beach & Associates, LLC

74035 Antenna Mount Calculations
74035R01
7/24/2010

Overview

The scope of Part 1 of the project required calculations based on AASHTO standards to determine loads at the base of a mounting system used to attach a dish/panel antenna array to the side of a water tower. The calculation set is shown on pages 0 thru 13 of the attached document and is loosely based on a proposed installation in Washington state. The general arrangement of that installation can be found in Appendix 1. Some of the geometric values used in the attached calculations such as the horizontal distances between components were scaled from this document.

Multiple exceptions and assumptions were employed in the execution of the calculation set. They are listed below in no specific order of priority.

1) The height above ground of the antenna array has been arbitrarily set to 200'.
2) The antenna array was assumed to have full exposure from a rear wind situation.
3) The exposure of the vertical pole was assumed to be negligible for front & rear wind situations.
4) The exposure of the various clamps, brackets, and hardware was assumed to inconsequential.
5) Loads per magnetic bracket in some cases were assumed to be evenly distributed even though the actual distribution is statically indeterminate.
6) Allowable loads per magnet and per magnetic bracket as well as the layout of the magnets on each bracket were supplied by the client.
7) The radius of curvature of the water tank was assumed to be negligible.
8) Ice loads, if applicable, are assumed to cover the entire component in question.

Constants used in the calculation set were taken from the AASHTO standard and are included in the appendix. All wind velocities were taken from the map on Appendix 2. It should be noted here that while the nominal wind velocities were used in generating the attached values, local building codes should be consulted in areas designated as special wind regions. The exposure factor, which is based on the height of the structure being analyzed relative to the local terrain, is taken from an AASHTO table and is shown in Appendix 3. A drawing of the magnet mounting plate is shown on Appendix 5. The magnets are attached to the 0.44 diameter thru holes. Other constants used in this report are the minimum gust factor of 1.14, a wind importance factor of 1.0, a drag co-efficient of 1.12, and an ice load of 3 lbs/ft^2.

The scope of Part 2 of this project involved the creation of an excel spreadsheet to be used in generating approximations of loadings where the installation is similar to the condition shown in Appendix 1. The results of this spreadsheet should be considered only as an approximation as each site should be carefully reviewed to apply the appropriate AASHTO values. A digital copy of this file has been supplied under separate cover under the file name of 74035genericR01.xls. A printed copy of a completed spreadsheet based on a specific example is shown on Appendix 4. A simplified general arrangement of

the loading condition depicted by this spreadsheet is shown on page 15 of the calculation set. The tutorial on its use begins on page 14. The cells within the spreadsheet are NOT write protected. The overall accuracy can be verified using the example on pages 1 thru 13 and making allowances for round-off error.

Conclusion

Calculations for factors of safety for the conditions presented here-in are well within range of generally accepted safe working conditions.

ENGINEERING CALCULATIONS

Project# 74035 Client Metal-Cable Corp Date 07-08-10

Subject Antenna Mount Calculations - Abbreviations Page# 0 Next Page# 1

BB	Bottom bracket
FFBB	Front wind force @ bottom bracket
FFD	Wind load at front of dish antenna
FFP	Wind load at front of panel antenna
FFTB	Front wind force @ top bracket
FIB	Force @ magentic bracket from ice load
FID	Ice load on dish antenna
FIP	Ice load on panel antenna
FIT	Ice load on vertical tube
FMB	Force @ magentic bracket from component mass
FP	Force @ magentic pad
FRBB	Rear wind force @ bottom bracket
FRD	Wind load at rear of dish antenna
FRP	Wind load at rear of panel antenna
FRTB	Rear wind force @ top bracket
FSB	Shear load @ mounting bracket
FSD	Wind load at side of dish antenna
FSP	Wind load at side of panel antenna
FST	Wind load at side of vertical tube
FSV	Vertical shear force @ magnetic pad
MD	Mass of dish antenna
MP	Mass of panel antenna
MT	Mass of vertical tube
TB	Top bracket

BEACH & ASSOCIATES
MECHANICAL DESIGN & ENGINEERING
P.O. 185, WATEFORD, WI 53185
TELEPHONE 262-534-9001

ENGINEERING CALCULATIONS

Project# 74035 Client Metal-Cable Corp Date 07-08-10

Subject Antenna Mount Calculations - Wind Loads Page# 1 Next Page# 2

Wind Load Equation (AASHTO LTS-4)

$P_z(lbs/ft^2) = .00256\ K_z G\ V^2 I_f C_d$

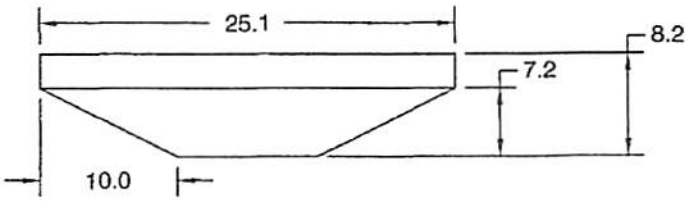
- C_d → Drag Coefficient
- I_f → Wind Importance Factor
- V^2 → Wind Velocity (mph)
- G → Gust Factor
- K_z → Exposure Factor *

Calculate Dish Antenna Area & Wind Load (Front or Rear Exposure)

- 25.1" Dia (given)
- Area = $\pi r^2 = (\pi)(12.55^2) = 494.8\ in^2$
- $494.8\ in^2 / 144 = 3.44\ ft^2$
- $P_z(lbs/ft^2) = (.00256(1.46)(1.14)(85^2)(1.0)(1.12) = 34.47 lbs/ft^2$
- FFD = FRD = (34.47)(3.44) = 118.58 lbs.

Calculate Dish Antenna Area & Wind load (Top or Side Exposure)

- Simplified profile shown below



- Area = (25.1)(8.2)-(10)(7.2) = $133.82\ in^2$
- $133.82\ in^2 / 144 = .93\ ft^2$
- $P_z(lbs/ft^2) = (.00256(1.46)(1.14)(85^2)(1.0)(1.12) = 34.47 lbs/ft^2$
- FSD = (34.47)(.93) = 32.06 lbs.

* Arbitrarily set at 200'

ff/calcgrid 990418

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P.O. 185, WATEFORD, WI 53185
TELEPHONE 262-534-9001

ENGINEERING CALCULATIONS

Project# 74035 Client Metal-Cable Corp Date 07-08-10

Subject Antenna Mount Calculations - Wind Loads Page# 2 Next Page# 3

Calculate Panel Antenna Area & Wind Load (Front or Rear Exposure)
- 12.7 " x 42" profile (given)
- Area = (12.7)(42) = 533.4 in ^{2}
- 533.4 in ^{2} / 144 = 3.70 ft ^{2}
- P_z (lbs/ft ^{2}) = (.00256(1.46)(1.14)(85 ^{2})(1.0)(1.12) = 34.47lbs/ft ^{2}
- FFP = FRP = (34.47)(3.7) = 127.54 lbs.

Calculate Panel Antenna Area & Wind Load (Side Exposure)
- 2.7 " x 42" profile (given)
- Area = (2.7)(42) = 113.4 in ^{2}
- 113.4 in ^{2} / 144 = .79 ft ^{2}
- P_z (lbs/ft ^{2}) = (.00256(1.46)(1.14)(85 ^{2})(1.0)(1.12) = 34.47lbs/ft ^{2}
- FSP = (34.47)(.79) = 27.23 lbs.

Calculate Panel Antenna Area (Top Exposure)
- 12.7 " x 2" profile (given)
- Area = (12.7)(2) = 34.29 in ^{2}
- 34.29 in ^{2} / 144 = .24 ft ^{2}

Calculate Tube Projected Area (Front or Rear or Side Exposure)
- 4.5 " OD (given) x 140" long
- Area = (4.5)(140) = 630in ^{2}
- 630 ^{2}/ 144 = 4.4 ft ^{2}
- P_z (lbs/ft ^{2}) = (.00256(1.46)(1.14)(85 ^{2})(1.0)(1.12) = 34.47lbs/ft ^{2}
- FST = (34.47)(4.4) = 151.66 lbs.

BEACH & ASSOCIATES
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TELEPHONE 262-534-9001

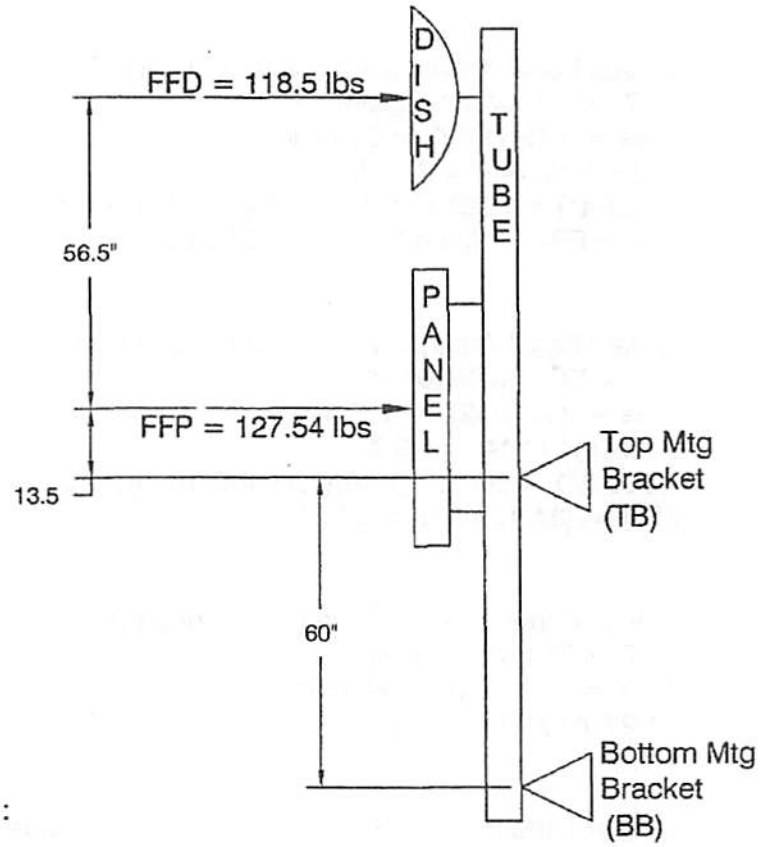
ENGINEERING CALCULATIONS

Project# 74035 Client Metal-Cable Corp Date 07-08-10

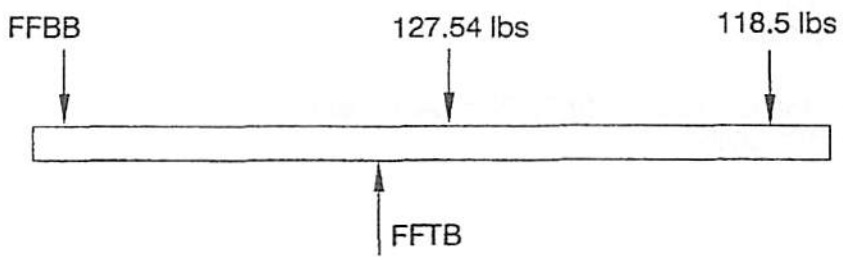
Subject Antenna Mount Calculations - Frontal Wind Loads Page# 3 Next Page# 4

Frontal Wind Loading

The top mounting bracket becomes the "pivot" for all horizontal forces in this configuration



Sum Moments about FFTB (cw= +):



ΣM @ TB = 0 = (13.5)(127.54)+(70)(118.5)-(60)(FFBB)

FFBB = ((13.5)(127.54)+(70)(118.5))/60 = 166.94 lbs

Solve for FFTB:

ΣF = 0 = 127.54+118.5 +166.94 - FFTB

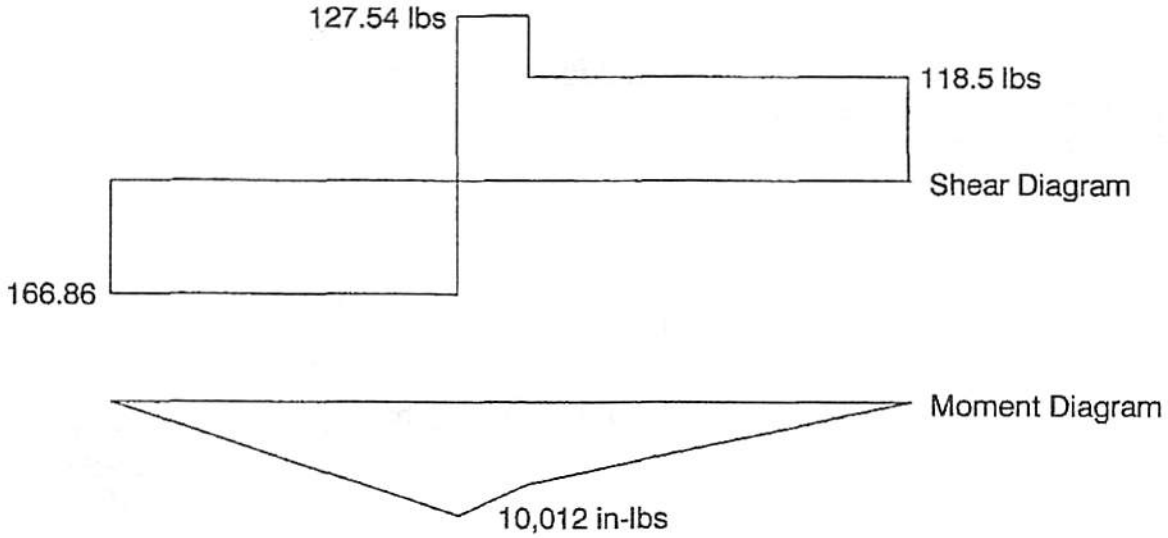
FFTB = 412.98 lbs

BEACH & ASSOCIATES
MECHANICAL DESIGN & ENGINEERING
P.O. 185, WATEFORD, WI 53185
TELEPHONE 252-534-9001

ENGINEERING CALCULATIONS

Project# 74035 Client Metal-Cable Corp Date 07-08-10

Subject Antenna Mount Calculations - Frontal Wind Loads Page# 4 Next Page# 5



The frontal wind condition puts the top magnetic mounting bracket into compression and applies a tensile load to the lower mounting bracket. Per the equations on the previous page, that total tensile load (FFBB) is 166.82 lbs. Assuming equal distribution on all magnets, each individual magnet is subject to 166.86/24 or 6.95 lbs.

BEACH & ASSOCIATES
MECHANICAL DESIGN & ENGINEERING
P.O. 185, WATEFORD, WI 53185
TELEPHONE 262-534-9001

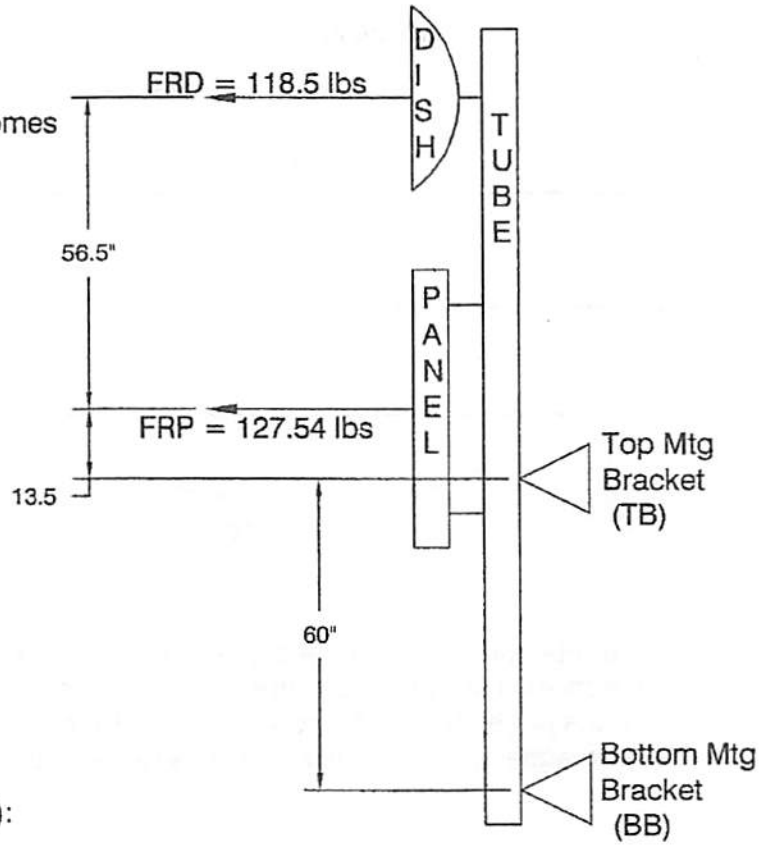
ENGINEERING CALCULATIONS

Project# 74035 Client Metal-Cable Corp Date 07-08-10

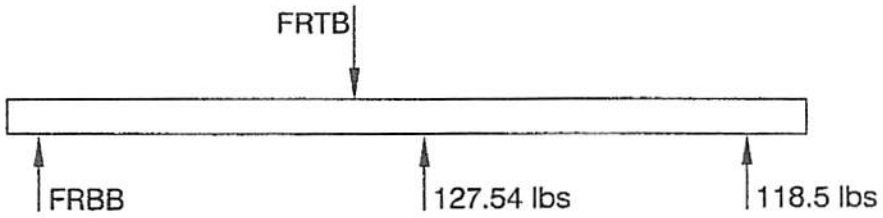
Subject Antenna Mount Calculations - Rear Wind Loads Page# 5 Next Page# 6

Rear Wind Loading

The "bottom" mounting bracket becomes the "pivot" for all horizontal forces in this configuration



Sum Moments about FRBB (cw= +):



ΣM @ BB = 0 = (60)(FRTB) - (73.5)(127.54) - (118.5)(130)

FRTB = ((73.5)(127.54)+(130)(118.5))/60 = 412.98 lbs

Solve for FRBB:

ΣF = 0 = 127.54+118.5 - 412.98 + FRBB

FRBB = 166.94 lbs

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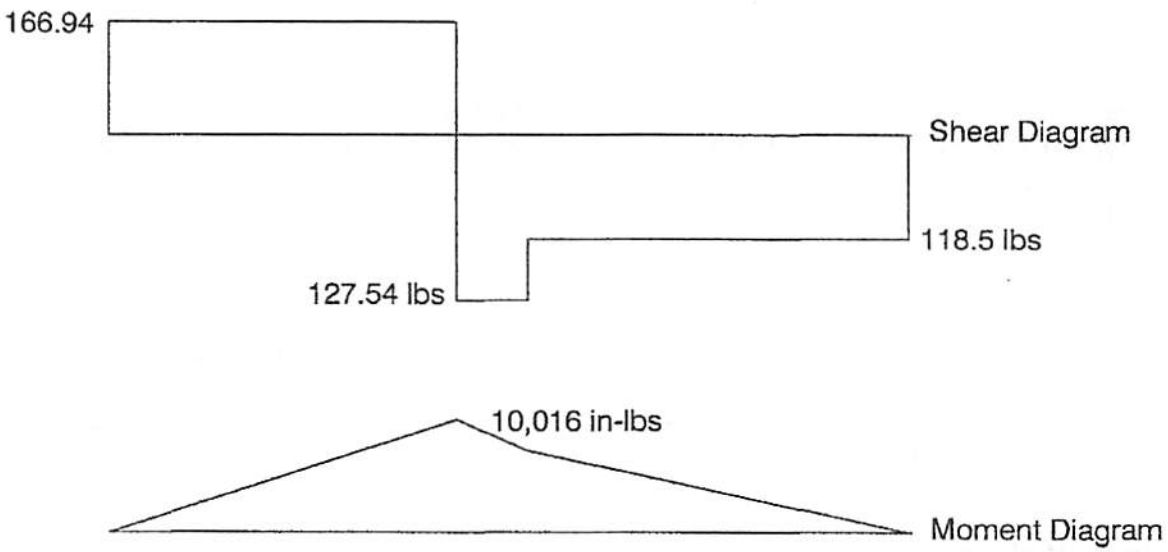
ENGINEERING CALCULATIONS

Project# 74035 Client Metal-Cable Corp Date 07-08-10

Subject Antenna Mount Calculations - Rear Wind Loads Page# 6 Next Page# 7



The rear wind condition puts the bottom magnetic mounting bracket into compression and applies a tensile load to the top mounting bracket. Per the equations on the previous page, that total tensile load (FRTB) is 412.98 lbs. Assuming equal distribution on all magnets, each individual magnet is subject to 412.98/24 or 17.20 lbs.

The analysis generated to this point indicates that the tensile loads created by the wind from the rear of the structure create higher "tensile" forces on the magnetic pads than do the winds from the front of the structure.

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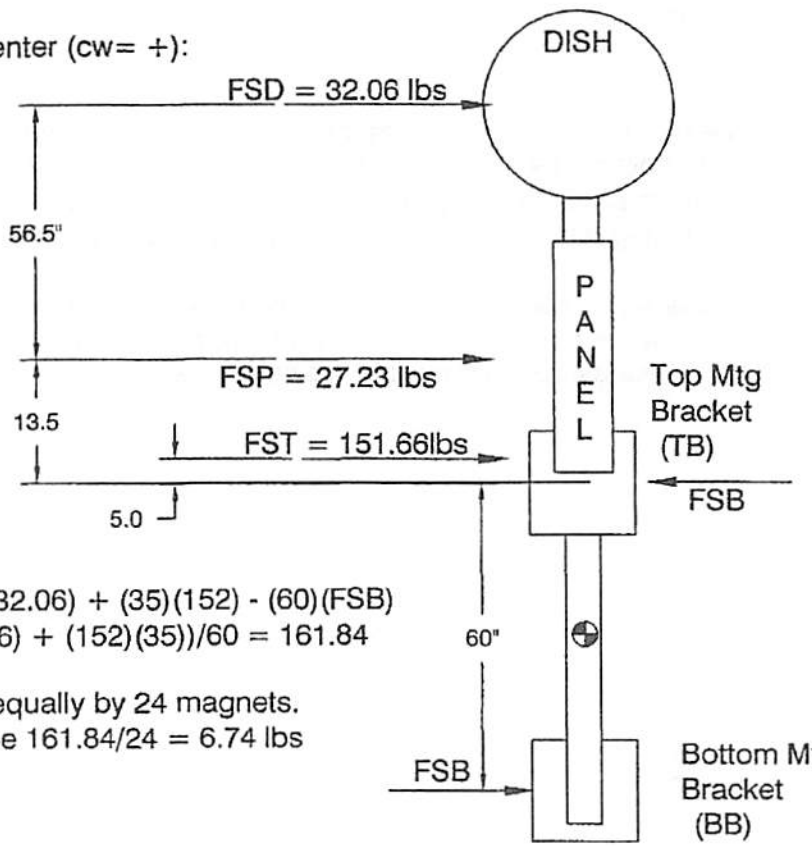
Side Wind Loading

Two types of loads are generated by winds blowing at the side profiles of the antennae. The first type of load is a shear loading which is discussed below. The second loading produces tensile and compressive loads on the magnets and is discussed on the following page.

Side Wind Loading - Shear

The shear loads generated by winds blowing at the side profiles of the antennae are resisted by a couple centered at the midpoint of the distance between the two magnetic mounting pads. By definition, both forces of a couple are equal to each other. Therefore, for subsequent shear calculations, FSBB and FSTB are renamed simply as FSB.

Sum Moments about couple center (cw= +):



$\Sigma M = 0 = (43.5)(27.23) + (100)(32.06) + (35)(152) - (60)(FSB)$

$FSB = ((43.5)(27.23)+(100)(32.06) + (152)(35))/60 = 161.84$

Each shear load will be resisted equally by 24 magnets.
the resulting individual load will be 161.84/24 = 6.74 lbs

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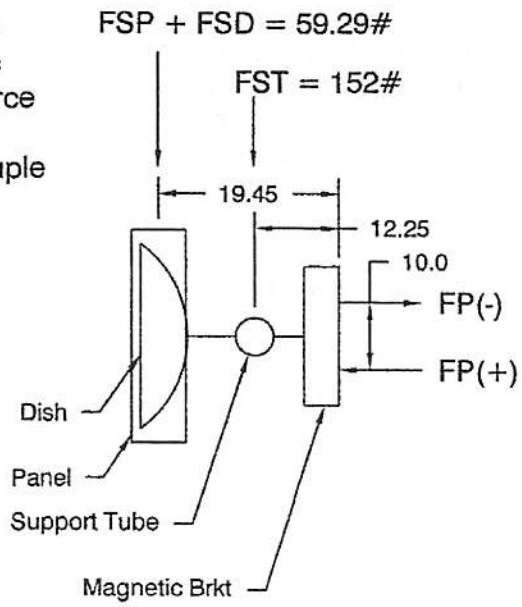
Project# 74035 Client Metal-Cable Corp Date 07-08-10

Subject Antenna Mount Calculations - Side Wind Loads Page# 8 Next Page# 9

Side Wind Loading - Tension & Compression

The relative orientation of the antennae to each other and to the magnetic brackets is shown in the plan view to the right. The antennae are offset from the magnetic brackets by the distance shown. The indicated side force creates a moment about the pad. This moment is resisted by a "couple" at the pad. Each force of the couple is located halfway from the center of the bracket to the center of its outer magnet.



Sum Moments about couple center (cw= +):

$\Sigma M = 0 = (10)FP - (12.25)(152) - (19.45)(59.29)$
$FP = ((19.45)(59.29) + (12.25)(152))/10 = 302$ lbs

Each component of the couple will be shared equally by 12 magnets/bracket.
The resulting individual load will be 302/24 = 12.56 lbs

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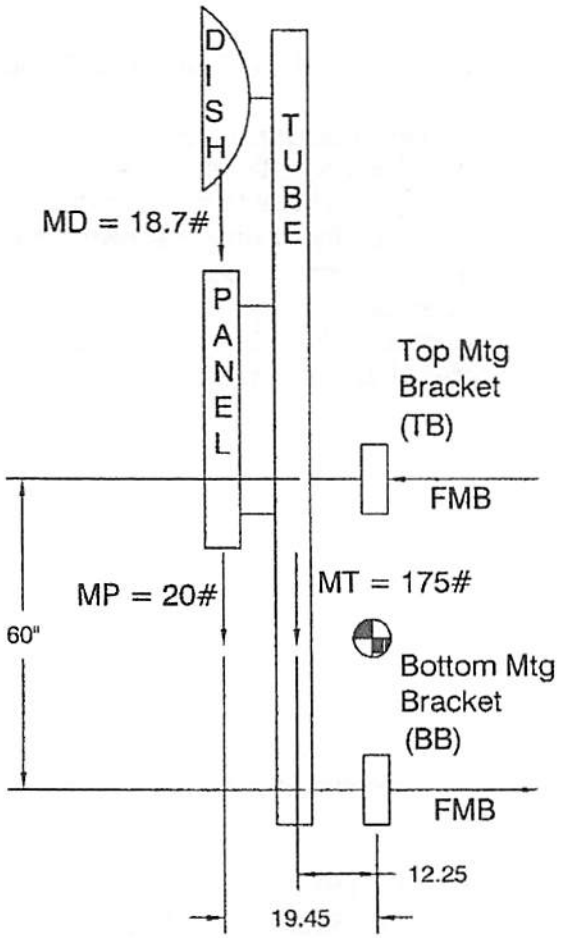
Subject Antenna Mount Calculations - Mass Loads Page# 9 Next Page# 10

Mass Loads

Mass loads from the individual components are resisted by a force couple with its center halfway between the upper and lower mounting brackets. This couple is similar to that created by wind side loads. This force couple is solved on this page. The mass loads are also resisted by a vertical shear and are also discussed on this page.



Shear Forces from Mass Loads

The total shear force will be shared equally among 48 magnets. The load per individual magnet will be (20 + 18.7 + 175)/48 = FSV

4.45 lbs = FSV

Tensile and Compressive Forces from Mass Loads

Sum Moments about couple center (cw= +):

$\Sigma M = 0 = (60)(FMB) - (175)(12.25) - (18.7)(19.45) - (20)(19.45)$

$FMB = ((12.25)(175)+(18.7)(19.45) + (20)(19.45))/60 = 48.27$ lbs

The tensile load on the top bracket will be shared equally by 24 magnets. The load per individual magnet will be 48.27/24 = 2 lbs.

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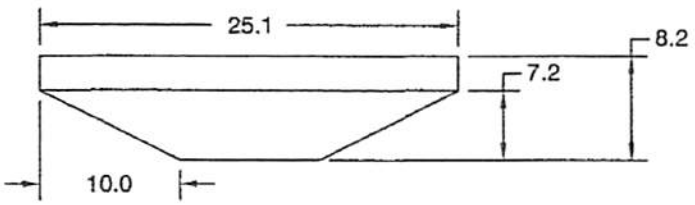
Project# 74035 Client Metal-Cable Corp Date 07-08-10

Subject Antenna Mount Calculations - Ice Loads Page# 10 Next Page# 11

Ice Loads

Ice loads resulting from the coatings on individual components are calculated in exactly the same method as were the mass loads on the previous page. The mass of the ice is based on a constant of 3 lbs/ft of the surface being coated. Calculations of total areas and the corresponding ice masses are shown on this page.

Ice Surface Area - Dish Antenna
- Simplified profile shown below



- Area calculated via Solid Works = 8.18 ft ^{2}
- FID = (8.18)(3.0) = 24.55 lbs.

Ice Surface Area - Panel Antenna
- 12.7 " x 42" x 2.7" profile (given)
- Area = ((12.7)(42)(2) + (12.7)(2.7)(2) + (2)(2.7)(42))/144 = 9.45 ft ^{2}
- FIP = (9.45)(3.0) = 28.35 lbs.

Ice Surface Area - Support Tube
- 4.5 " OD (given) x 140" long
- Area = ((4.5)(140)(π) + (π)(2.25 ^{2})(2))/144 = 13.96 ft ^{2}
- FIT = (13.96)(3.0) = 41.9 lbs.

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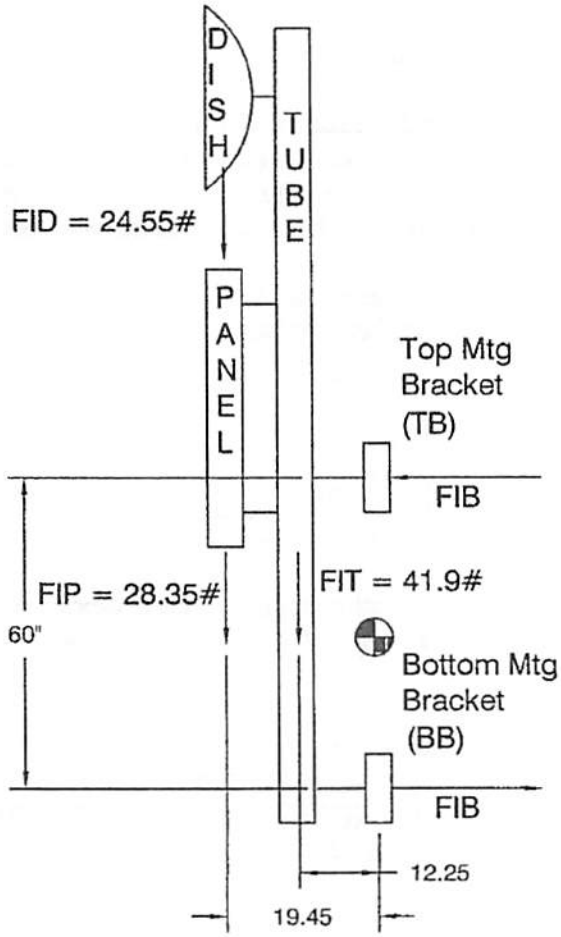
Project# 74035 Client Metal-Cable Corp Date 07-08-10

Subject Antenna Mount Calculations - Ice Loads Page# 11 Next Page# 12

Shear Forces from Ice Loads

The total shear force will be shared equally among 48 magnets. The load per individual magnet will be (24.55 + 28.35 + 41.9)/48 = 1.98 lbs.



Tensile and Compressive Forces from Ice Loads

Sum Moments about couple center (cw= +):

$\Sigma M = 0 = (60)(FIB) - (41.9)(12.25) - (24.55)(19.45) - (28.35)(19.45)$

$FIB = ((12.25)(41.9)+(24.55)(19.45) + (28.35)(19.45))/60 = 25.70$ lbs

The tensile load on the top bracket will be shared equally by 24 magnets. The load per individual magnet will be 48.27/24 = 1.07 lbs.

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Project# 74035 Client Metal-Cable Corp Date 07-08-10

Subject Antenna Mount Calculations - Combined Loads Page# 12 Next Page# 13

Group I combined loads - Rear Wind Situation

This per magnet loading is a combination of the following components:
- Tensile from rear wind - 17.17 lbs
- Tensile from mass - 2.0 lbs
- Tensile from ice - 1.07 lbs
- Shear from mass - 4.45 lbs
- Shear from ice - 1.98 lbs

The shear forces resulting from ice and mass act in the same direction and can be added algebraically to form a single component.
That vector is 4.45(mass) + 1.98(ice) = 6.43 lbs
Factor of Safety = 35/6.43 = 5.44

Likewise, all tensile forces are acting in the same direction and can added algebraically to form a single component.
That vector is 17.17(wind) + 2.0(mass) + 1.07(ice) = 20.24 lbs
Factor of Safety = 100/20.24 = 4.94

Group II combined loads - Side Wind Situation

This per magnet loading is a combination of the following components:
- Tensile from side wind - 12.56 lbs
- Tensile from mass - 2.0 lbs
- Tensile from ice - 1.07 lbs
- Shear from side wind - 6.74 lbs
- Shear from mass - 4.45 lbs
- Shear from ice - 1.98 lbs

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ENGINEERING CALCULATIONS

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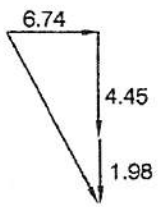
Subject Antenna Mount Calculations - Combined Loads Page# 13 Next Page# 14

The shear forces resulting from ice and mass act in the same direction and can be added algebraically to form a single component. The shear vector from the wind load acts in in the same plane but at right angles to the ice & mass vector all three can be combined per the diagram below.

Combined Shear



(4.45 + 1.98 = 6.43)

Combined Shear = $((6.74^2) + (6.43^2))^{1/2}$ = 9.31 lbs
Factor of Safety = 35/9.31 = 3.76

All tensile forces are acting in the same direction and can be added algebraically to form a single component.
That vector is 12.56(wind) + 2.0(mass) + 1.07(ice) = 15.63 lbs
Factor of Safety = 100/15.63 = 6.4

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Note: The file 74035genericR01.xls is NOT write protected. Cells A7 thru A33 are user entered data and are relative to the geometry of specific components within the general arrangement being investigated. See page 0 of this calculation set to identify abbreviations for specific forces and reactions and see the next page to identify components and dimensions discussed below. Dimensions and mass values on the next page are marked with the appropriate cell where they should be entered (A19 thru A29). The user should not enter data into or alter any cells other than those discussed below. Note units where applicable.

Cell A7	Wind speed (mph) at location. See Appendix 02.
Cell A8	Exposure Factor based on elevation. See Appendix 03.
Cell A9	Ice Load Area? See Appendix 02. Enter 3 for yes and 0 for no.
Cell A11*	Antenna 1 exposure to rear winds (ft^2)
Cell A12*	Antenna 1 exposure to side winds (ft^2)
Cell A14*	Antenna 2 exposure to rear winds (ft^2)
Cell A15*	Antenna 2 exposure to side winds (ft^2)
Cell A17*	Vertical tube exposure area to side winds (ft^2)
Cell A19	Vertical distance between mounts. (in)
Cell A20	Vertical distance - Bottom mount to antenna #1 CG. (in)
Cell A21	Vertical distance - Bottom mount to antenna #2 CG. (in)
Cell A22	Vertical distance - Bottom mount to vertical tube CG. (in)
Cell A23	Horizontal distance - Magnet face to antenna #1 CG. (in)
Cell A24	Horizontal distance - Magnet face to antenna #2 CG. (in)
Cell A25	Horizontal distance - Magnet face to vertical tube CG. (in)
Cell A27	Mass (lbs) of antenna #1 (manufacturer supplied data)
Cell A28	Mass (lbs) of antenna #2 (manufacturer supplied data)
Cell A29*	Mass (lbs) of vertical tube.
Cell A31*	Ice surface area** (ft^2) of antenna #1
Cell A32*	Ice surface area** (ft^2) of antenna #2
Cell A33*	Ice surface area** (ft^2) of vertical tube

* Requires offline user calculation

** Ice surface area = Total outside surface

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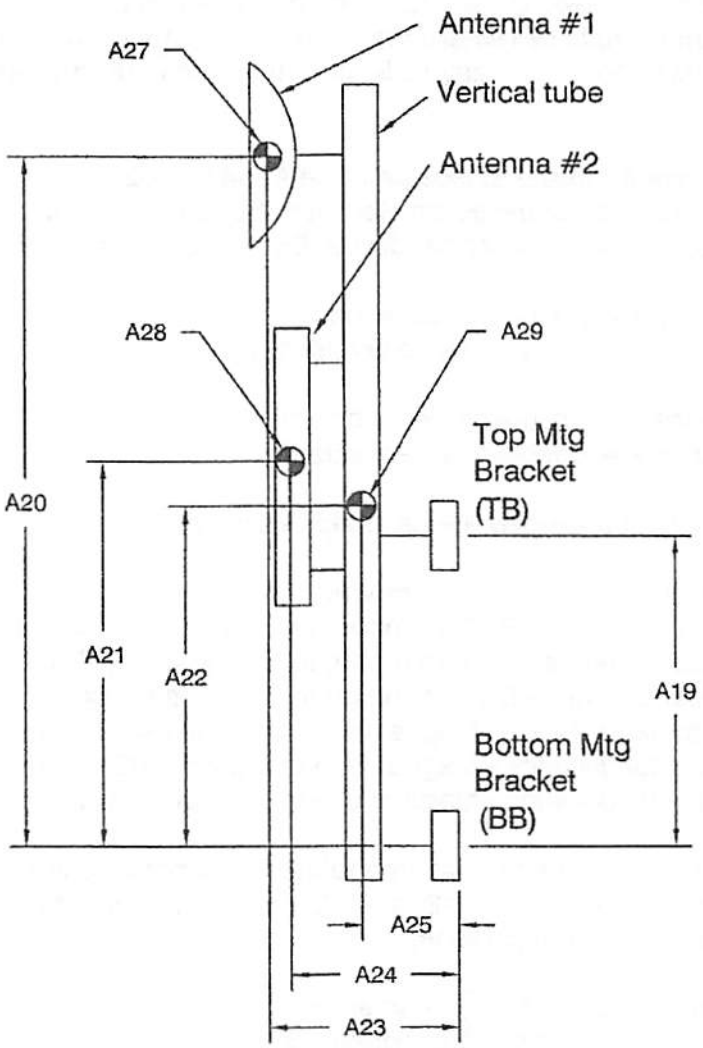
ENGINEERING CALCULATIONS

Project# 74035 Client Metal-Cable Corp Date 07-08-10

Subject Antenna Mount Calcs - Spreadsheet Example Page# 15 Next Page# -



ff/calcgrid 99C418

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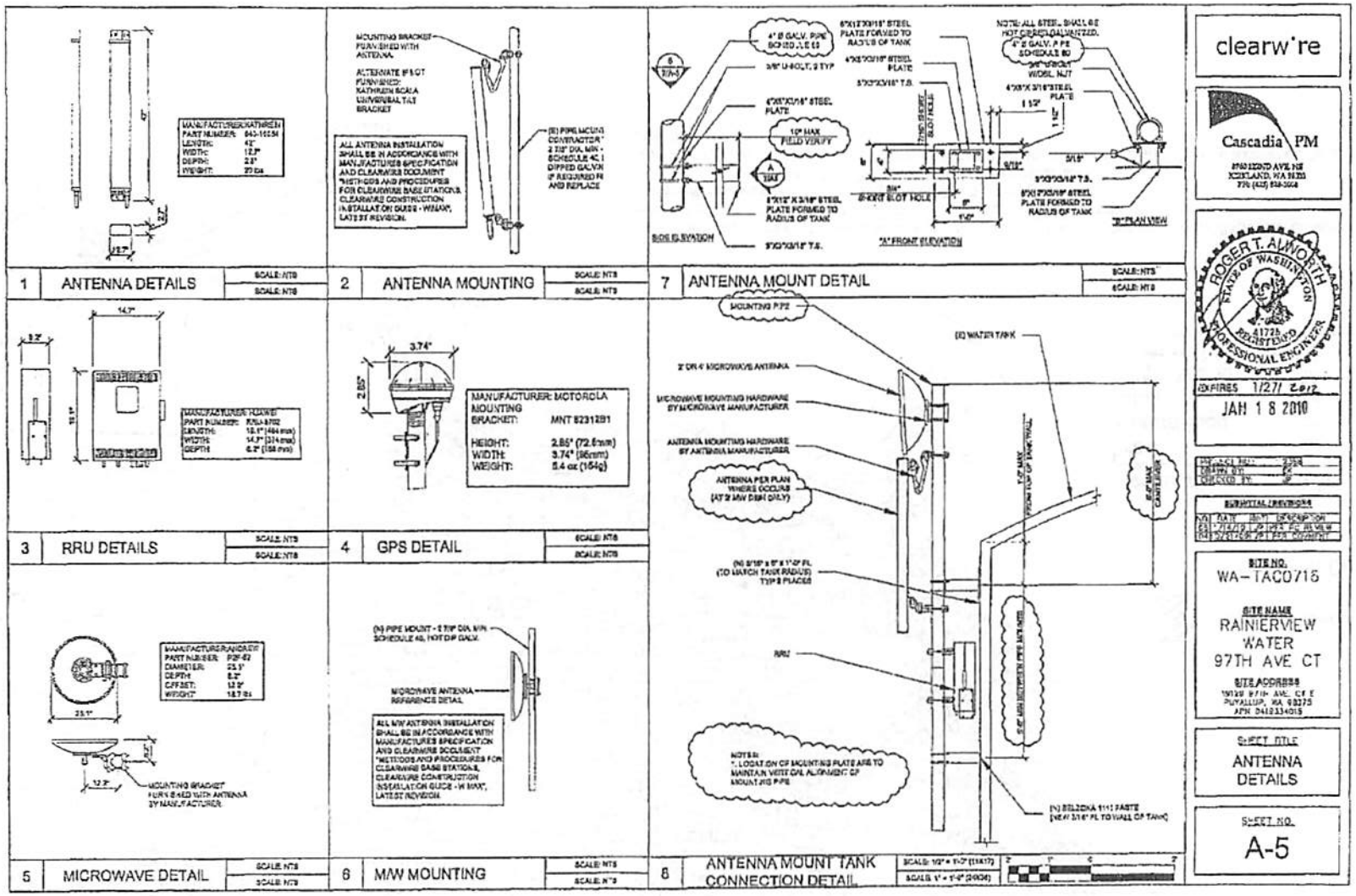
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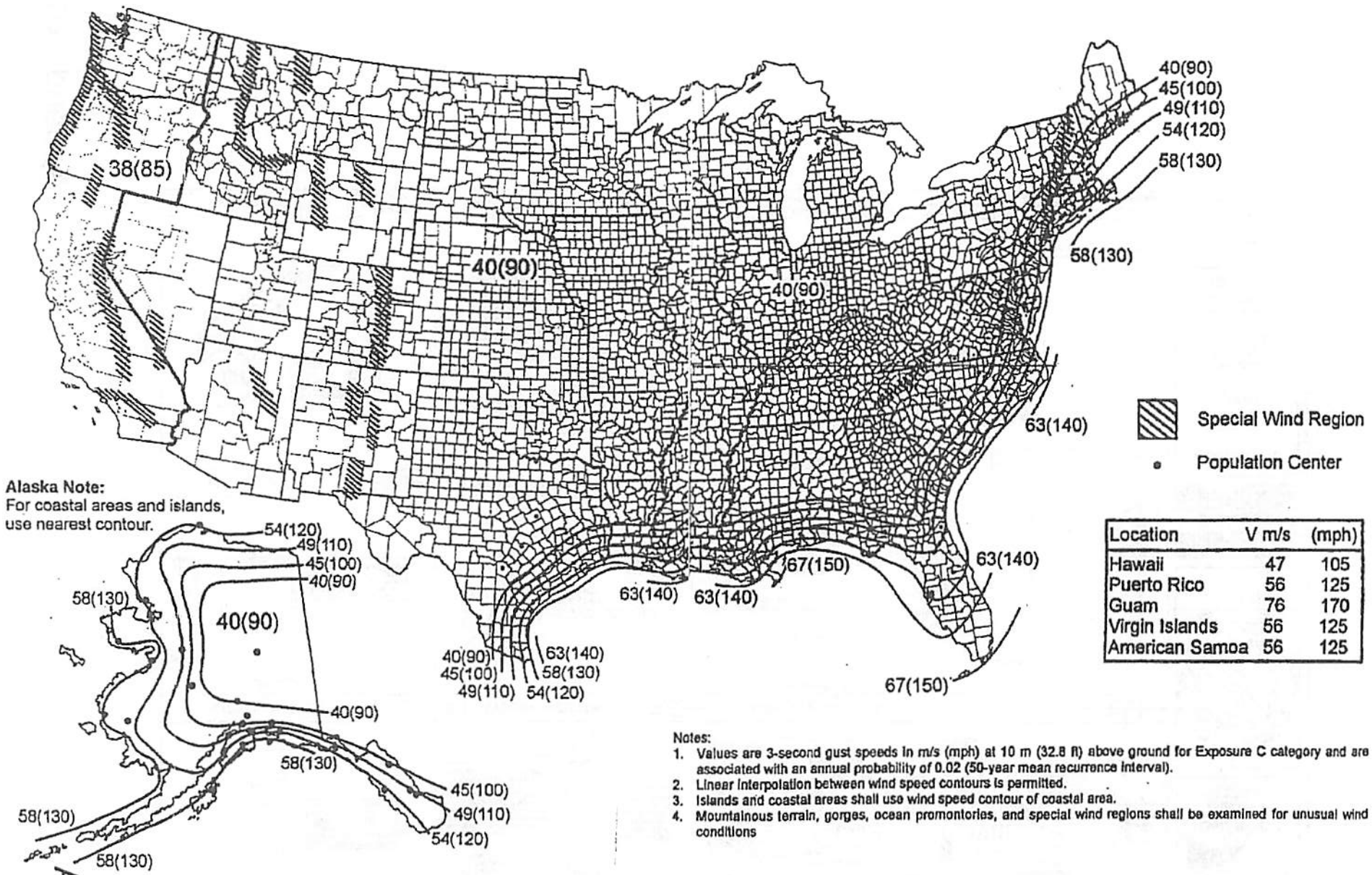
2 ANTENNA MOUNTING
7 ANTENNA MOUNT DETAIL
3 RRU DETAILS
4 GPS DETAIL
5 MICROWAVE DETAIL
6 M/W MOUNTING
8 ANTENNA MOUNT TANK CONNECTION DETAIL
clearw're
Cascadia PM
ROGER T. ALWORTH
STATE OF WASHINGTON
PROFESSIONAL ENGINEER
EXPIRES 1/27/ 2012
JAN 1 8 2010
SITE NO.
WA-TAC0715
SITE NAME
RAINIERVIEW WATER 97TH AVE CT
SHEET TITLE
ANTENNA DETAILS
SHEET NO.
A-5

Appendix 01



Location	V m/s	(mph)
Hawaii	47	105
Puerto Rico	56	125
Guam	76	170
Virgin Islands	56	125
American Samoa	56	125

Notes:

1. Values are 3-second gust speeds in m/s (mph) at 10 m (32.8 ft) above ground for Exposure C category and are associated with an annual probability of 0.02 (50-year mean recurrence interval).
2. Linear interpolation between wind speed contours is permitted.
3. Islands and coastal areas shall use wind speed contour of coastal area.
4. Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions

Appendix 02

Height and Exposure Factors, K_z	
Height, m(ft)	K_z
5.0(16.4) or less	0.87
7.5 (24.6)	0.94
10.0 (32.8)	1.00
12.5 (41.0)	1.05
15.0 (49.2)	1.09
17.5 (57.4)	1.13
20.0 (65.6)	1.16
22.5 (73.8)	1.19
25.0 (82.0)	1.21
27.5 (90.2)	1.24
30.0 (98.4)	1.26
35.0 (114.8)	1.30
40.0 (131.2)	1.34
45.0 (147.6)	1.37
50.0 (164.0)	1.40
55.0 (180.5)	1.43
60.0 (196.9)	1.46
70.0 (229.7)	1.51
80.0 (262.5)	1.55
90.0 (295.3)	1.59
100.0 (328.1)	1.63

Generic Antenna Approximations
74035genericR01.xls
7/24/2010

User Entered Data

85.00	Wind Speed (mph)
1.46	Exposure Factor (per attached AASHTO table)
3.00	Ice (psf)
3.44	Antenna 1 Rear Exposure Area (square feet)
0.93	Antenna 1 Side Exposure Area (square feet)
3.70	Antenna 2 Rear Exposure Area (square feet)
0.79	Antenna 2 Side Exposure Area (square feet)
4.40	Vertical Tube Side Exposure Area (square feet)
60.00	Vertical Distance Between Mounts (in)
130.00	Vertical Distance - Bottom mount to antenna 1 CG (in)
73.50	Vertical Distance - Bottom mount to antenna 2 CG (in)
65.00	Vertical Distance - Bottom mount to vertical tube CG. (in)
19.45	Horizontal Distance - Magnet face to antenna 1 CG (in)
19.45	Horizontal Distance - Magnet face to antenna 2 CG (in)
12.25	Horizontal Distance - Magnet face to vertical tube CG (in)
18.70	Mass of Antenna #1 (lbs)
20.00	Mass of Antenna #2 (lbs)
175.00	Mass of Vertical Mount Tube (lbs)
8.18	Ice surface area antenna 1 (square feet)
9.45	Ice surface area antenna 2 (square feet)
13.96	Ice surface area vertical tube (square feet)

Calculated Constants

30.00	1/2 distance between magnetic mounts (in)

Calculated Component Wind Loads

118.61	FR1 (wind force (lbs) at rear of antenna 1)
32.07	FS1 (wind force (lbs) at side of antenna 1)
127.57	FR2 (wind force (lbs) at rear of antenna 2)
27.24	FS2 (wind force (lbs) at side of antenna 2)
151.71	FST (wind force (lbs) at side of mounting tube)

Calculated Component Ice Loads

24.54	Ice Load (lbs) Antenna 1
28.35	Ice Load (lbs) Antenna 2
41.88	Ice Load (lbs) Vertical Tube

Mounting Bracket Forces From Rear Winds

413.26	FRTB (top bracket force - rear wind)
167.08	FRBB (bottom bracket force - rear wind)
17.22	Top Mount Tension per magnet from rear wind

Mounting Bracket Forces from Side Winds

161.69	FSB horizontal "shear" load per bracket
6.74	Horizontal "shear" load per magnet from side wind
301.19	FP (mounting pad (lbs tension and compression) load from Side wind Loads
12.55	Tension load per magnet from side wind load

Mass Loads

106.85	FSVM Vertical "shear" load per bracket
4.45	Vertical "shear" load per magnet
48.27	FP (mounting pad (lbs tension and compression) load from Mass Loads
2.01	Tension load per magnet from Mass Load

Ice Loads

94.77	FSVI Vertical "shear" load per bracket
1.97	Vertical "shear" load per magnet
25.70	FP (mounting pad (lbs tension and compression) load from Mass Loads
1.07	Tension load per magnet from Mass Load

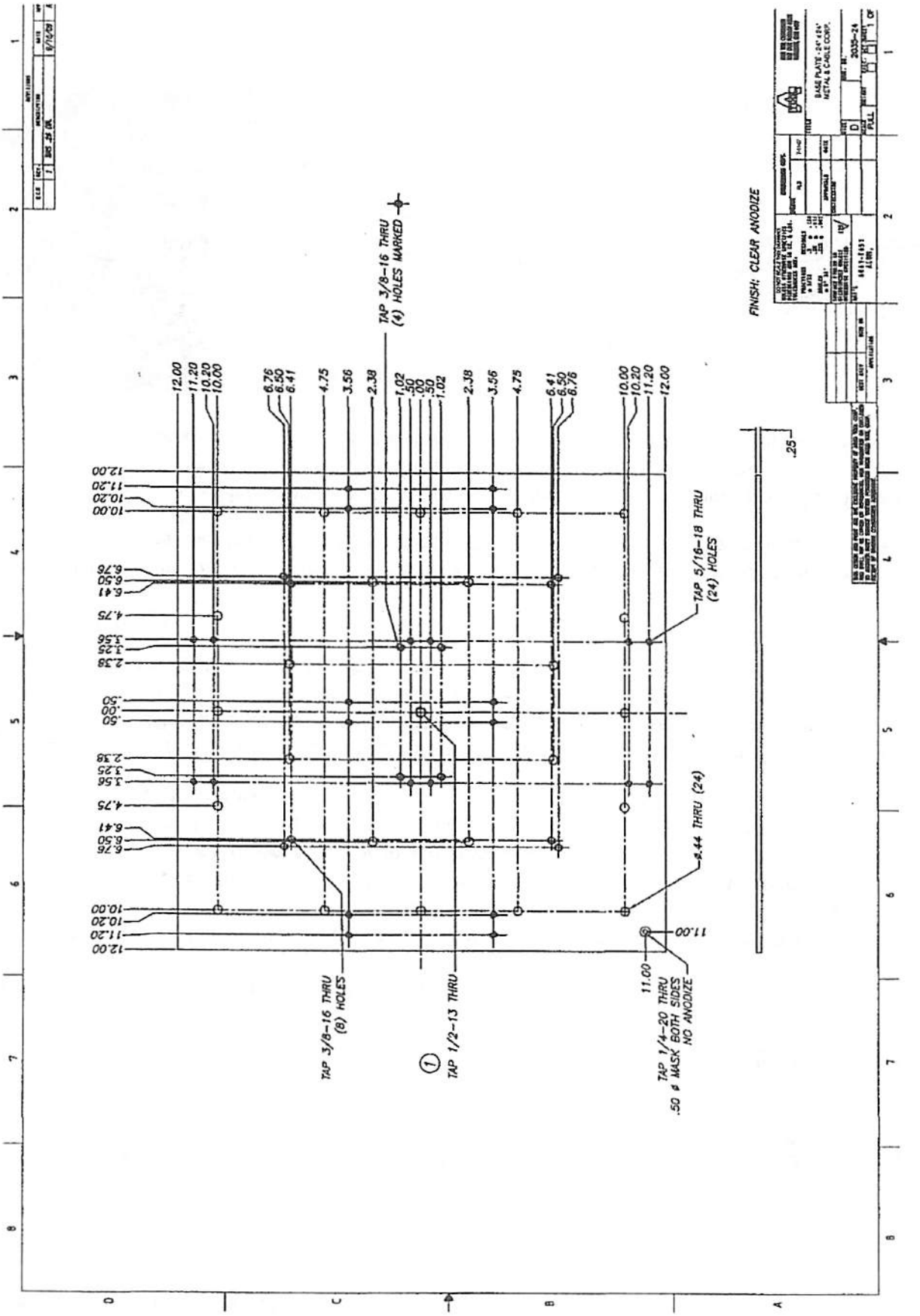
Combined Loads - Rear Wind Situation

6.43	Vertical "shear" (mass + ice)
5.45	Factor of Safety
20.30	Tensile Load (wind + mass + ice)
4.93	Factor of Safety

Combined Loads - Side Wind Situation

9.31	Combined "shear" (wind + mass + ice)
3.76	Factor of Safety
15.63	Tensile Load (wind + mass + ice)
6.40	Factor of Safety

Appendix 04


TAP 3/8-16 THRU (4) HOLES MARKED
TAP 5/16-18 THRU (24) HOLES
.44 THRU (24)
TAP 3/8-16 THRU (8) HOLES
1 TAP 1/2-13 THRU
TAP 1/4-20 THRU .50 ⌀ MASK BOTH SIDES NO ANODIZE
FINISH: CLEAR ANODIZE
.25
12.00
11.20
10.20
10.00
6.76
6.50
6.41
4.75
3.56
2.38
1.02
.50
.00
.50
1.02
2.38
3.56
4.75
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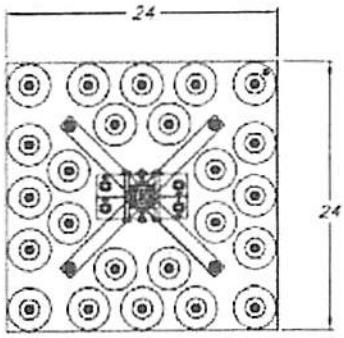
6.76
10.00
10.20
11.20
12.00
11.00

Appendix 05

METAL & CABLE CORP., INC.



Standard Magnemount MA model features include:

- 100 MPH wind speed capacity–5.5 ft^2 wind surface area
- 24" x 24" square footprint / Uses up to 120 magnets
- 300 grade stainless steel and anodized aluminum construction
- Maximum 1◦ mast deflection
- Mast Size: 2"OD x .375"W x 36"L (or: 3"OD x .375"W x 36"L)

MAGNETIC INSTALLATION / CLEAN ADVANTAGE:

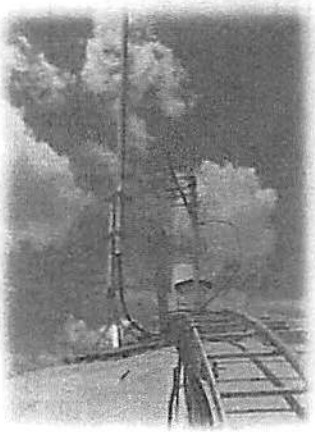
Key to the systems' cost efficient profile is its quick, clean installation; which requires no welders, painters, or special tools. After a swift hoist up the water tower with bearing and rope, installers simply pick a desired surface location and place the base plate. The magnets are then loosened-up to automatically orient themselves to their maximum capacity. The lock-nuts on each magnet need only one turn with a hand wrench to secure the mount in place. Once secured, the antenna is mounted and the installation is completed–typically within about 15 minutes.

According to Xact Communication's Owner, Josh Davis, "Installation on this system is fast and smooth; unlike welding which can often take weeks. It actually takes longer to hoist up the tower than to install it. Plus, there's no need for repairs or maintenance, like welding, which could potentially lead to voiding the paint job's warranty. That alone could represent unwanted time investment and significant expenditures."

RESULTS / CONCLUSION:

The MCWD installation was completed in less than a week (4thQ / 2010) and Xact Communications has since used about 25 Magnemounts for installation projects all throughout the Midwest and Southern states.

To date, the high-capacity Magnemount system has had no reported service failures or returns in six years of existence. Additionally, an unlimited lifetime warranty is given on all magnets and five years on the complete system. Both warrantees offer 100% free replacement or refund which includes freight (both ways).



CORPORATE PROFILE:
Since 1981, Metal & Cable Corp., Inc. has been an innovative manufacturer and distributor "hard-to-find" and custom made metals, and electrical wire and cable. The invention of the patent-pending Magnemount mounting system by Metal & Cable's President, David Klein, represents a major advancement in steel water tank antenna and cable tray mounting. Headquartered in Twinsburg, Ohio, Metal & Cable's progressive growth has been achieved through its commitment to its customers and continued dedication to innovation in a myriad of related markets.

For more detailed information, visit the Metal & Cable Corp., Inc. web site at:

www.metal-cable.com or call: 800-735-4051

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(216) 861-0862 / rayf@methmedia.net

METAL & CABLE CORP., INC.

FOR IMMEDIATE RELEASE:

MAGNETS HELP METERING GO GREEN:

MAGNEMOUNT ANTENNA SYSTEM PROVIDES CLEAN/LEAN SOLUTION FOR AMR / RF EQUIPMENT.

Twinsburg, OH–February 2011

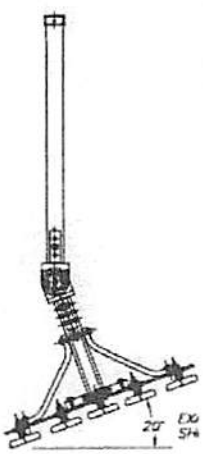
The Monroe County Water District (MCWD) in Paris, Missouri recently prepared to install antenna systems on eight key water towers to accommodate the rural areas' radio frequency (RF) conversion to automatic meter reading (AMR). During this process, concern arose over potential EPA issues arising from the potential risk of damage to the existing tanks protective surfaces, limited handrail mounting options, and the required capacity range that would be required to link the entire area for the county's automatic utility (water, gas, electric) use billing system.

The ensuing AMR system would save local utility providers the expense of periodic manual trips to each physical location to read meters–a task that could take meter-readers a month or more to complete in the rural county. The timely information, coupled with analysis, would ultimately help utility providers and consumers alike with better control of the use and production of utility consumption.

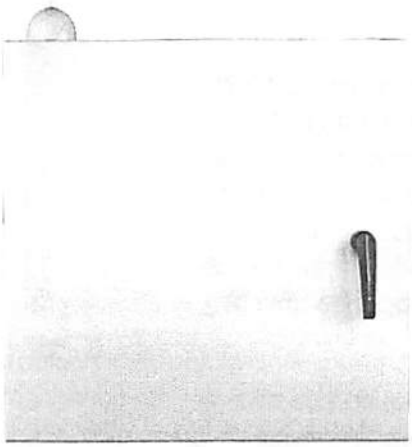
Given these exacting goals and AMR equipment issues, the MCWD consulted with their preferred AMR equipment installer Xact Communications, LLC (Royce City, Texas) to provide an efficient solution. Xact's Operations Manager David Hutchinson, quickly identified a patented, non-invasive, high-capacity magnetic solution they had used on a number of challenging installations throughout the Midwest and South called the Magnemount Antenna System developed by Metal & Cable Corp., Inc. (Twinsburg, OH).

MAGNETIC SOLUTION / GREEN ADVANTAGE:

The Magnemount system (Patent No.7,624,957) is engineered with a series of permanent magnets combined with an independently suspended mounting system to provide a non-invasive solution to adhering to the steel surfaces with varying curvatures of water towers. The mounting system is entirely magnetic thus, requires no invasive welding or epoxy coating which could adversely affect a water tank's protective surface coatings and bladder seals. This allowed the MCWD to avoid the risk of potential EPA issues and significant expenditures incurred from draining the tank and recoating its interior/exterior steel surfaces due to welding. Xact's Hutchinson noted an additional 'green' advantage stating, "Since there is no recoating required there is no need to isolate the area around the tower from potential fumes or contamination with protective curtains when prepping a surface."



The high-capacity mounting system is available in 5 basic designs, which can be modified to accommodate specific needs, and features a lifetime warranty on the magnets. The MCWD project utilized the adjustable MA model for its installations which features an un-guyed, adjustable upper mast that allowed them to aim an antenna to any orientation in the hemisphere above the plane of the mounting plate. This was pivotal to maximize RF coverage for the rural region on the eight water towers which had severe curved configurations including traditional five-legged and standpipe designs.



FlexNet M400B Base Station

Compact Point-to-Multipoint Base Station

The Sensus FlexNet® M400B Base Station offers a strategic communications option for public service providers with endpoints deployed in remote or densely populated areas.

FEATURES

- GPS receiver for time synchronization
- Duplexer for single antenna
- IP-addressable power supply with hot-swap capability
- 8-hour battery backup
- Alarms and reporting capability
- Backhaul via Ethernet/IP
- Heated battery for cold weather environments
- Modular construction for easy serviceability

APPLICATIONS

- Two-way Advanced Meter Infrastructure (AMI)
- Distribution Automation (DA)
- Demand Response (DR)
- Home Area Networks (HAN)
- Sensus VantagePoint® Lighting Control

The efficient transceiver can transmit and receive in a 200kHz band of spectrum. 200kHz enables more dedicated channels, resulting in higher network capacity, allowing more granular data and more channels of data. And the Sensus FlexNet communication network delivers double the transmit power of competitive systems over primary-use licensed spectrum - ensuring reliability for mission critical applications.

The tower-based architecture enables reliable communication of status and usage information with fewer access points than other network architectures. These compact, efficient base stations fit in space-constrained environments and require no air conditioning.

Licensed Radio Spectrum

In North America, FCC/IC protected primary-use spectrum avoids competition with other wireless services, interference from other radio devices and the risk of being taken over by emergency service providers

Fewer Access Points

Our point-to-multipoint architecture directly connects base stations to endpoints over large geographic areas - greatly reducing the number of network backhaul connections as well as O&M costs

Resilient Network Design

Sensus Base Stations continue to provide real time data during outages and emergencies because of eight hour plus battery backup - enabling better workforce management and faster service restoration

Small Footprint

Flexible pole or wall-mounting options enable strategic deployment with a discreet appearance

Industry Leading Security

Sensus has achieved GE/Wurldtech™ Achilles® communications certification for critical infrastructure security against cyber threats

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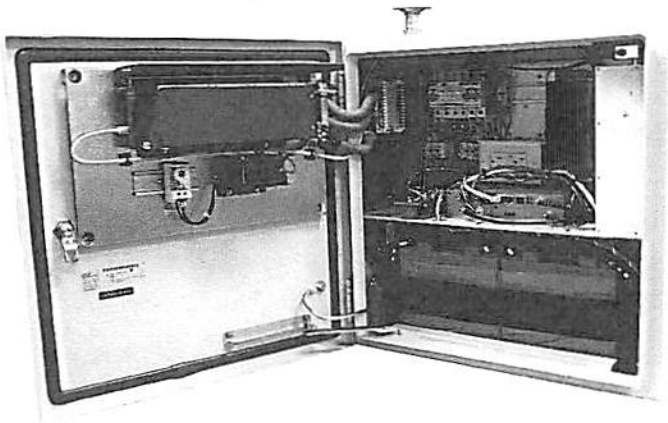
a xylem brand

FlexNet® M400B Base Station

Compact Point-to-Multipoint Base Station



Properties

Receive bandwidth	200 KHz
Transceivers	Single
Spectrum	Licensed 900 MHz PCS/MAS
Duplexing	Single transmit Sixteen receivers - simultaneous/dedicated
Applications	Single
Expandability	No
Compatibility	SNMP
FlexNet	Requires RNI 3.x or newer

Enclosures - Outdoor - Pole/Wall Mount

Height	22" (55.9 cm)
Width x Depth	22" (55.9 cm) x 10.5" (26.7 cm)
Capacity	One transceiver
Temperature	-40o to +122o F (-40° to +50° C)
Voltage	120 VAC
Battery backup	8 hours
NEMA rating	4
Air conditioned	No

SENSUS
a xylem brand

8601 Six Forks Rd, Ste 700
Raleigh, NC 27615
1-800-638-3748
sensus.com

Product Specifications

COMMSCOPE®

DB589-Y

1-port omni antenna, 890–960 MHz, 360° HPBW, fixed electrical tilt, fits on 38–51 mm (1-1/2 to 2 in) OD pipe

- Light weight, low profile omnidirectional antenna ideal for low to moderate gain applications
- Integral dual purpose mount allows top or side mounting

Electrical Specifications

Frequency Band, MHz	**890–960**
Gain, dBi	11.1
Beamwidth, Horizontal, degrees	360
Beamwidth, Vertical, degrees	9.0
Beam Tilt, degrees	0
VSWR | Return Loss, dB	1.5 | 14.0
PIM, 5th Order, 2 x 20 W, dBc	-153
Input Power per Port, maximum, watts	400
Polarization	Vertical
Impedance	50 ohm

Electrical Specifications, BASTA*

* 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.

General Specifications

Operating Frequency Band	890 – 960 MHz
Antenna Type	Omni
Band	Single band
Includes	V-bolts
Performance Note	Outdoor usage

Mechanical Specifications

RF Connector Quantity, total	1
RF Connector Quantity, low band	1
RF Connector Interface	N Female
Color	Horizon blue
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Radiator Material	Brass
Radome Material	Fiberglass, UV resistant
RF Connector Location	Bottom
Wind Loading, maximum	176.1 N @ 100 mph 39.6 lbf @ 100 mph
Wind Speed, maximum	201 km/h | 125 mph

Product Specifications

COMMSCOPE®

DB589-Y

Dimensions

Length	2794.0 mm | 110.0 in
Outer Diameter	38.1 mm | 1.5 in
Net Weight, without mounting kit	5.2 kg | 11.5 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

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

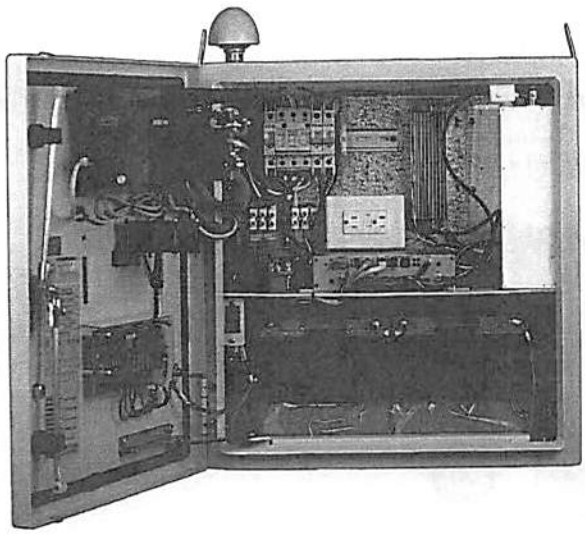
AQG-10007-02

M400B Cabinet

Quick Start Installation Guide

Description

The M400B is designed for pole mounting applications and the mounting hardware will accommodate varying applications and pole types. Pole installations should be on a minimum nine inch wood, metal, or concrete type pole. The pole mounting bracket can accommodate bolts, stainless steel strapping or a combination of both.



Required Hardware/Equipment (for Bolted Installations)

- 17mm socket with extension for the bolts that attach the cabinet to the mounting bracket.
- Two 1/2" diameter machine bolts (UNC thread); SAE (Grade 5 or better), length to suit the pole (not provided)
- Two 1/2" diameter (I.D.) zinc-plated flat washers
- Two 1/2" diameter (I.D.) hex nuts (UNC thread)
- Auger or drill for boring 9/16" diameter holes in the wood pole

Installation

MOUNT THE CABINET

1. Remove the mounting bracket from the enclosure and use it as a template to drill 2 holes into the pole. Follow local practices for drilling the holes.
2. Secure the mounting bracket to the pole with the specified machine bolts.
3. Hook the top of the mounting bracket under the enclosure attachment fitting.
4. Secure the cabinet to the mounting bracket.
5. As an option, you can use utility grade stainless steel pole straps to thread through the provided slots up to 2 1/2" wide with a minimum of 3 (of the wide type) if this is the primary support.

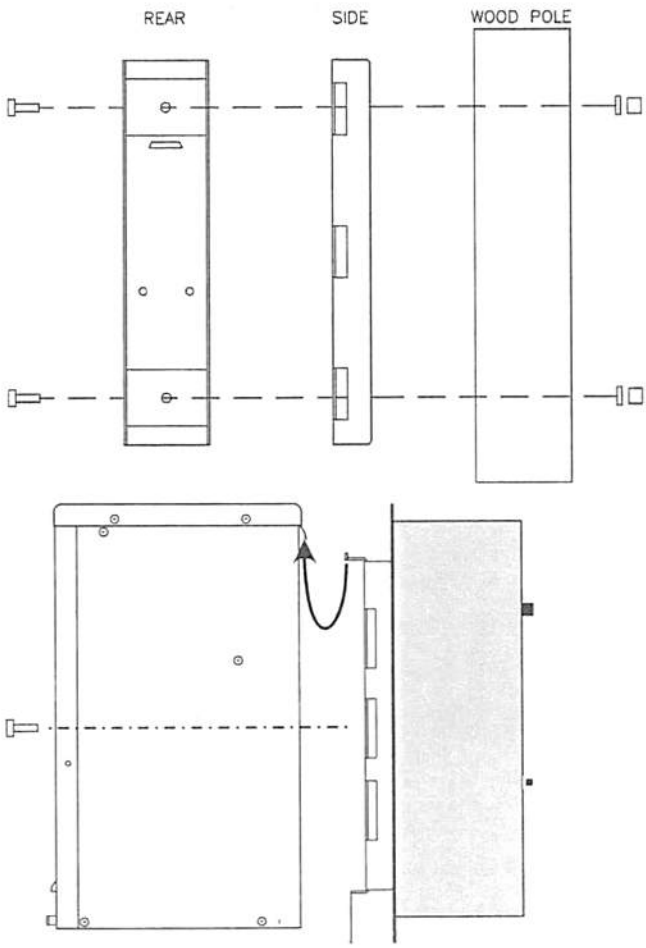


Figure 1: Cabinet Mounting

sensus

Installation cont.

BONDING/GROUNDING

Each M400B cabinet is equipped with a master ground bar (MGB) that should be used for all ancillary non AC type (lightning ground) bonding connections, along with three pre-cut conduit openings (1/2, 3/4, and 1") sized to accommodate industry standard seal-type conduit fittings, and three watertight plugs.

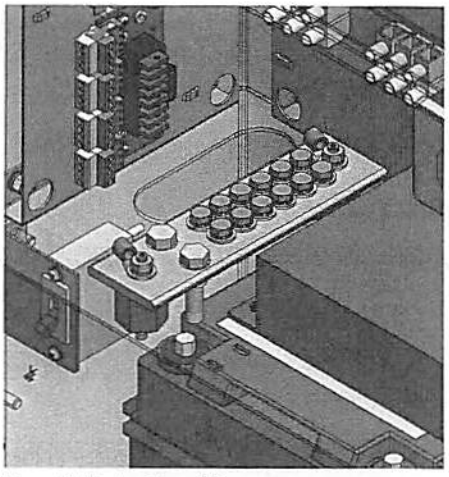


Figure 2: Master Ground Bar

1. After the cabinet is mounted, attach a #6 AWG minimum (#2 preferred) stranded or equivalent braided ground conductor to the master ground bar using a 3/8" diameter double-hole lug on a 1" center with hex bolts. Torque securely.
2. Remove one of the three water tight plugs from the base of the cabinet and run the #6 AWG (#2 preferred) stranded or equivalent braided ground conductor through the connector using the desired type and size of conduit as appropriate.
3. Connect the opposite end of the conductor running from the master ground bar to the appropriate lightning ground system; a ground source of 5 ohms or less is recommended.
4. Connect another ground conductor to the 1/4" diameter double-hole lug on a 5/8" center located on the back of the cabinet at the lower rear and then connect it to the appropriate lightning ground system. The cabinet and the master ground bar connection must be attached to the same ground wire source.

CONNECT AC POWER

1. Make sure that all three AC breakers are in the OFF position.
2. Remove the water tight plug from the base of the cabinet for the intended conduit attachment; any unused plugs should remain in place. Install the conduit, using the desired type and size of conduit as appropriate.
3. Base the input wiring size on voltage drop considerations and NEC Table 310-16 for copper wire. The AC power conductor size must be in the #10-#16 range. A 120 Volt, 15 Amp minimum circuit is required.
4. Connect the AC feed to the AC Input terminal block. Attach to the lugs marked L, N, and G as appropriate.

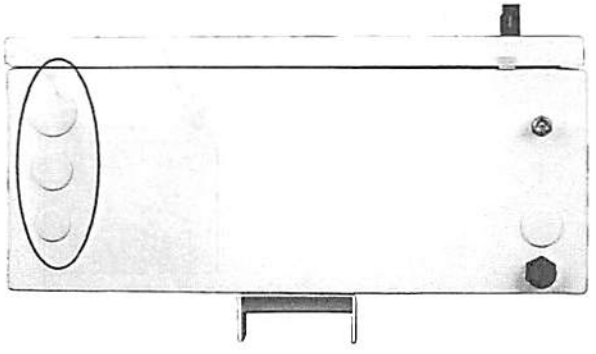


Figure 3: Plug Locations in the Cabinet Base

CONNECT THE BACKHAUL & ANTENNA

1. Connect the backhaul to the front of the transceiver using the provided ethernet cable.
2. There are two bulkhead connectors located to the right of the battery shelf on the bottom of the cabinet. The front connector is for the lightning arrestor for the FlexNet transceiver. Connect the antenna cable to this connector if not connected already.

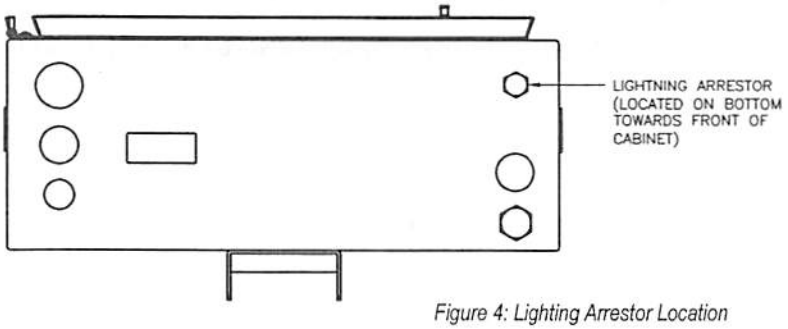


Figure 4: Lighting Arrestor Location

Installation cont.

3. The rear connector is for optional use when connecting auxiliary equipment. If this is applicable to your installation, install the necessary lightning arrestor and any other hardware as needed.
4. Connect the antenna as appropriate.

BATTERY

NOTE: BATTERIES ARE TYPICALLY PRE-INSTALLED AND CONNECTED

1. Turn off the battery breaker if it is not off.
2. Connect the battery cables leading from the Anderson style quick disconnect to the corresponding battery terminals.
3. Torque all connections according to the battery specifications.
4. Connect the Anderson style quick disconnect.
5. Turn the battery breaker on.

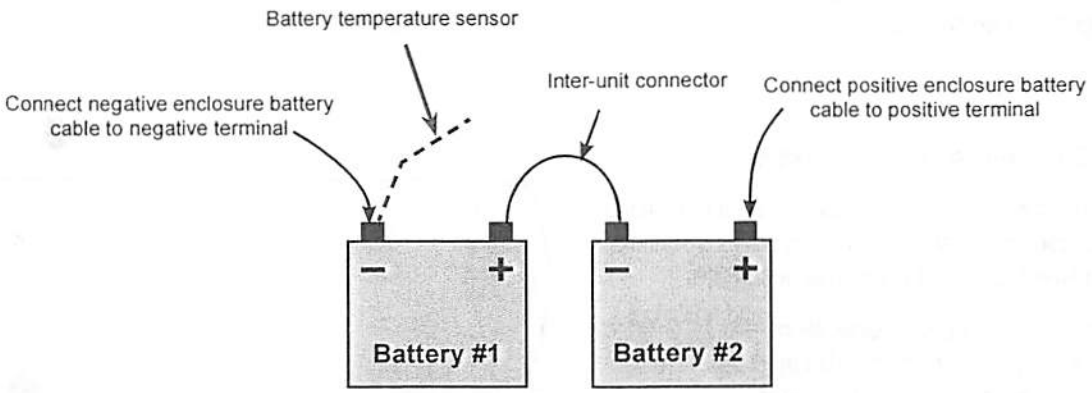


Figure 5: Battery Connections

AC BREAKERS

1. Turn all three AC breakers to the ON position. The power supply should start up normally.
2. Turn on the transceiver, if desired, using the switch on the front panel.

Compliance Statements

Warning!
The antenna used for this transmitter must not be co-located in conjunction with any other antenna or transmitter.

Attention!
For Class B - Unintentional Radiators:
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference and (2) this device must accept any interference received, including interference that may cause undesired operation.

Warning!
Hazardous voltages are present: to reduce the risk of electric shock and danger to personal health, follow instructions provided in the product manual.

Attention!
Any modifications made to this device that are not approved by Sensus may void the authority granted to the user by the FCC to operate equipment.

Attention!
ICES-003 Class B Notice—Avis NMB-003, Classe B
This Class B digital apparatus complies with Canadian ICES-003. Cet appareil numerique de la classe B est conforme à la norme NMB-003 du Canada.

Warning!
For products with multiple power cords, all power cords must be disconnected to completely remove power from the system.

Warning!
There is danger of explosion if batteries are mishandled or incorrectly replaced. On systems with replaceable batteries, replace only with the same manufacturer and type or equivalent type recommended per the instructions provided in the product manual.
Do not disassemble batteries or attempt to recharge them outside the system. Do not dispose of batteries in fire.
Dispose of batteries properly in accordance with the manufacturer's instructions and local regulations.

Attention!
Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- *Reorient or relocate the receiving antenna*
- *Increase the separation between the equipment and receiver*
- *Connect the equipment into an outlet on a circuit different form that to which the receiver is connected*
- *Consult the dealer or an experienced radio/TV technician for help*

Attention!
Do not dispose in fire, mix with other battery types, charge above specified rate, connect improperly, or short circuit, which may result in overheating, explosion or leakage of cell contents.

Attention!
This radio is intended for use in occupational/controlled conditions, where users have full knowledge of their exposure and can exercise control over their exposure to meet FCC limits. This radio device is NOT authorized for general population, consumer or any other use.

RF Radiation Hazard!
In order to satisfy the FCC RF exposure limit for transmitting devices, a separation distance of 1.52m (5 ft.) or more should be maintained while operating the Sensus M400 Transceiver. To ensure compliance, operations at closer than this distance are not recommended. This minimum safe distance is required between personnel and this antenna of this device.

Attention!
This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Attention!
This radio transmitter, M400 Transceiver, has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.
Le présent émetteur radio, M400 Transceiver, a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

- *DIPOLE 10dBd*

Attention!
Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada.
To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful
communication.
Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Warning!
ANTENNAS: An outdoor antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can come in contact with such power lines or circuits as death or serious injury can occur. Be sure the antenna ysstem is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electric Code (NEC) in the U.S.A. provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electordes and requirements for the grounding electrode. Antenna grounding shall be according to the National Electrical Code, ANSI/NFPA 70.

8601 Six Forks Road, Suite 700
Raleigh, NC 27615
1-800-638-3748

SENSUS

Product Specifications

COMMSCOPE®

AVA6-50

AVA6-50, HELIAX® Andrew Virtual Air™ Coaxial Cable, corrugated copper, 1-1/4 in, black PE jacket

Product Classification

Brand	HELIAX®
Product Series	AVA6-50
Product Type	Coaxial wireless cable

Standards And Qualifications

EN50575 CPR Cable EuroClass	Fca

Construction Materials

Jacket Material	PE
Outer Conductor Material	Corrugated copper
Dielectric Material	Foam PE
Flexibility	Standard
Inner Conductor Material	Corrugated copper tube
Jacket Color	Black

Dimensions

Nominal Size	1-1/4 in
Cable Weight	0.46 lb/ft | 0.68 kg/m
Diameter Over Dielectric	34.036 mm | 1.340 in
Diameter Over Jacket	39.624 mm | 1.560 in
Inner Conductor OD	14.0208 mm | 0.5520 in
Outer Conductor OD	36.068 mm | 1.420 in

Electrical Specifications

Cable Impedance	50 ohm ±1 ohm
Capacitance	22.0 pF/ft | 72.0 pF/m
dc Resistance, Inner Conductor	0.530 ohms/kft | 1.740 ohms/km
dc Resistance, Outer Conductor	0.230 ohms/kft | 0.750 ohms/km
dc Test Voltage	8500 V
Inductance	0.057 µH/ft | 0.187 µH/m
Insulation Resistance	100000 Mohms•km
Jacket Spark Test Voltage (rms)	10000 V
Operating Frequency Band	1 – 3700 MHz
Peak Power	180.0 kW
Velocity	92%

Product Specifications

COMMSCOPE®

AVA6-50

Environmental Specifications

Installation Temperature	-40 °C to +60 °C (-40 °F to +140 °F)
Operating Temperature	-55 °C to +85 °C (-67 °F to +185 °F)
Storage Temperature	-70 °C to +85 °C (-94 °F to +185 °F)

General Specifications

Brand	HELIAX®
Ordering Note	CommScope® standard product in Asia Pacific | CommScope® standard product in the United States and Canada

Mechanical Specifications

Bending Moment	29.8 N-m | 22.0 ft lb
Flat Plate Crush Strength	75.0 lb/in | 1.3 kg/mm
Minimum Bend Radius, Multiple Bends	203.20 mm | 8.00 in
Minimum Bend Radius, Single Bend	152.40 mm | 6.00 in
Number of Bends, minimum	15
Number of Bends, typical	40
Tensile Strength	154 kg | 340 lb

Note

Performance Note	Values typical, unless otherwise stated

Standard Conditions

Attenuation, Ambient Temperature	68 °F | 20 °C
Average Power, Ambient Temperature	104 °F | 40 °C
Average Power, Inner Conductor Temperature	212 °F | 100 °C

Return Loss/VSWR

Frequency Band	VSWR	Return Loss (dB)
680–800 MHz	1.13	24.30
806–960 MHz	1.13	24.30
1700–2170 MHz	1.13	24.30

Product Specifications

COMMSCOPE®

AVA6-50

Attenuation

Frequency (MHz)	Attenuation (dB/100 m)	Attenuation (dB/100 ft)	Average Power (kW)
0.5	0.056	0.017	117.01
1	0.079	0.024	82.63
1.5	0.097	0.03	67.41
2	0.113	0.034	58.33
10	0.253	0.077	25.89
20	0.36	0.11	18.21
30	0.443	0.135	14.80
50	0.576	0.176	11.39
85	0.758	0.231	8.66
88	0.772	0.235	8.51
100	0.825	0.251	7.96
108	0.858	0.262	7.65
150	1.019	0.311	6.44
174	1.102	0.336	5.96
200	1.186	0.361	5.53
204	1.198	0.365	5.48
300	1.471	0.448	4.46
400	1.717	0.523	3.82
450	1.829	0.558	3.59
500	1.937	0.59	3.39
512	1.962	0.598	3.34
600	2.14	0.652	3.07
700	2.329	0.71	2.82
800	2.507	0.764	2.62
824	2.548	0.777	2.58
894	2.666	0.813	2.46
960	2.774	0.846	2.37
1000	2.838	0.865	2.31
1218	3.171	0.967	2.07
1250	3.218	0.981	2.04
1500	3.569	1.088	1.84
1700	3.835	1.169	1.71
1794	3.955	1.206	1.66
1800	3.963	1.208	1.66
2000	4.212	1.284	1.56
2100	4.333	1.321	1.51
2200	4.452	1.357	1.47
2300	4.569	1.393	1.44
2500	4.798	1.463	1.37
2700	5.021	1.53	1.31
3000	5.345	1.629	1.23
3400	5.76	1.755	1.14
3700	6.06	1.847	1.08

** Values typical, guaranteed within 5%*

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant
China RoHS SJ/T 11364-2006	Compliant
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system
CENELEC	EN 50575 compliant, Declaration of Performance (DoP) available