FL01

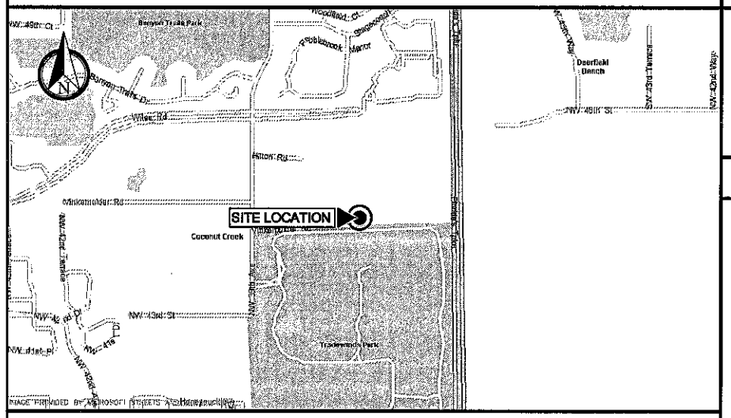
3601 VINKEMULDER ROAD
COCONUT CREEK, FL 33073

3rd CARRIER OVERLAY

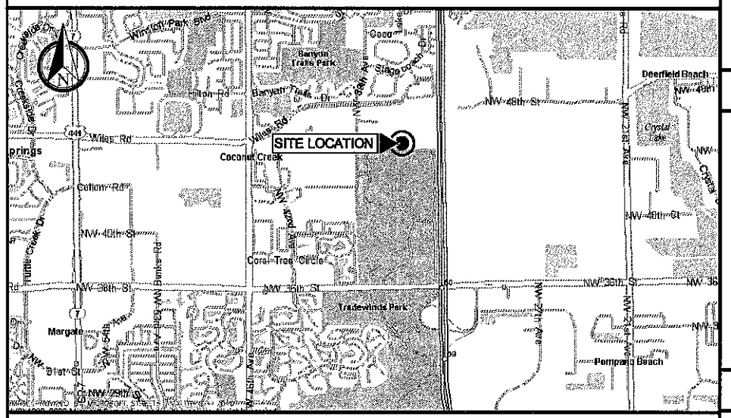
REV	DATE	DESCRIPTION
0	2/05/14	FOR PERMIT

PROJECT NO.:	130-729.02
DRAWN BY: G. DE LA CRUZ	CHECKED BY: M. ABBEY

LOCAL MAP



VICINITY MAP



DRIVING DIRECTIONS

FROM MASTEC'S BOCA RATON OFFICE HEAD SOUTH ON I-95 FOR 8.5 MILES TO EXIT 39 (SR-834/SAMPLE RD), HEAD WEST ON SAMPLE FOR 3.7 MILES TO NW 46th AVE (LYONS RD), TURN RIGHT AND HEAD NORTH ON LYONS FOR 0.8 MILES TO WILES RD, TURN RIGHT AND HEAD EAST ON WILES FOR 0.7 MILES TO NW 39th AVE, TURN RIGHT AND HEAD SOUTH ON 39th FOR 0.3 MILES TO VINKEMULDER RD, TURN LEFT AND HEAD EAST ON VINKEMULDER FOR 0.2 MILES TO SITE ON LEFT SIDE OF ROAD.

PROPERTY SUMMARY

FOLIO #:	4842-17-02-0010
LATITUDE:	26.285308° N
LONGITUDE:	80.172783° W
ZONING JURISDICTION:	CITY OF COCONUT CREEK
ZONING CLASSIFICATION:	AGRICULTURAL DISTRICT

CONTACTS

APPLICANT

MIKE KRISSEL
AT&T MOBILITY
5201 CONGRESS AVENUE
BOCA RATON, FL 33487
(561) 451-7496

PROPERTY OWNER

FLORIDA CELLULAR PHONE C/O AT&T WIRELESS
P.O. BOX 97061
REDMOND, WA 98073

RF DESIGN VERIFICATION

DESIGN BASED ON RFDS REV 0.2 DATED 11/21/13. CONTRACTOR SHALL REQUEST CURRENT RFDS AND WORKBOOK FROM MASTEC NETWORK SOLUTIONS CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION

PROJECT INFORMATION

1. THIS IS AN UNMANNED FACILITY AND WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNALS FOR THE PURPOSE OF PROVIDING PUBLIC CELLULAR SERVICE.
2. NO POTABLE WATER SUPPLY IS TO BE PROVIDED AT THIS LOCATION.
3. NO WASTEWATER WILL BE GENERATED AT THIS LOCATION.
4. NO SOLID WASTE WILL BE GENERATED AT THIS LOCATION.

DESIGN CRITERIA

DESIGN WIND SPEED:	170 MPH (ULTIMATE, 3-SECOND GUST) 132 MPH (NOMINAL, 3-SECOND GUST)
EXPOSURE:	C
RISK CATEGORY:	II
OPEN STRUCTURE	

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

1. 2010 FLORIDA BUILDING CODE WITH 2012 SUPPLEMENT.
2. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 70, NATIONAL ELECTRICAL CODE, 2008 EDITION.
3. TIA-222-G WITH ADDENDUM 1 APPLICABLE STANDARDS.
4. LIFE SAFETY CODE NFPA-101-2009.
5. 2010 FLORIDA FIRE PREVENTION CODE.
6. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) 360-05 AND 341-05.
7. UNDERWRITERS LABORATORIES (U.L.) APPROVED ELECTRICAL PRODUCTS.
8. LOCAL JURISDICTIONAL REQUIREMENTS.
9. CITY/COUNTY ORDINANCES.

NOTE:

THERE SHALL BE NO PIPES, CONDUITS OR CABLES RAN THROUGH THE STAIRS OR ITS ENVELOPE.

LEGAL DESCRIPTION

COCONUT CREEK CELL SITE "A" 126-31 B & 17-48-42 PARCEL A & TOGETHER WITH E 75 OF S 100 OF:NW1/4 OF NE1/4 SEC 17 & WITH S 20 OF:NW1/4 OF NE1/4 LESS IN 1058.20 & LESS W 1152.90 & LESS P/P/A 126-13 B

SCOPE OF WORK

1. REMOVAL OF (6) EXISTING AT&T ANTENNAS.
2. INSTALLATION OF (9) NEW AT&T ANTENNAS.
3. INSTALLATION OF (6) NEW REMOTE RADIO HEADS (RRHs).
4. INSTALLATION OF (2) NEW SURGE SUPPRESSORS.
5. INSTALLATION OF (3) NEW ANTENNA MOUNTS (WILL CAUSE THE SITE BE OFF-AIR FOR APPROXIMATELY 3 TO 7 DAYS).

INDEX OF DRAWINGS

SHT. NO.	DESCRIPTION	REV. NO.
T1	TITLE SHEET	0
C1	NOTES	0
C2	COMPOUND PLAN	0
C3	ELEVATION AND ANTENNA LAYOUTS	0
C4	DETAILS	0
E1	DC ELECTRICAL DETAILS	0
E2	GROUNDING DETAILS AND NOTES	0

ADMINISTRATIVE APPROVAL 02-24-14
APPROVED

CALTROP Telecom
3400 LAKESIDE DRIVE
SUITE 525
MIRAMAR, FL 33027
CERTIFICATE OF AUTHORIZATION 29214

at&t

MICHAEL A. PHILLIPS LICENSE No. 68312 STATE OF FLORIDA PROFESSIONAL ENGINEER

DATE OF SIGNATURE: 02/05/14

FL01

3601 VINKEMULDER ROAD
COCONUT CREEK, FL 33073

SHEET NAME

TITLE SHEET

SHEET NUMBER

T1

1. FOR THE PURPOSES OF THESE CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:

   OWNER – AT&T MOBILITY
   ENGINEER – CALTROP CORPORATION
   CONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)

2. PRIOR TO SUBMITTING HIS BID, THE CONTRACTOR SHALL VISIT THE JOB SITE IN ORDER TO (1) VERIFY ALL EXISTING CONDITIONS, (2) CONFIRM WHETHER ALL DIMENSIONS ARE AS SHOWN ON THE PLANS AND (3) CONFIRM WHETHER THE WORK MAY BE ACCOMPLISHED AS SHOWN. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER.

3. A 20–FOOT HORIZONTAL CLEARANCE DISTANCE SHALL BE MAINTAINED FROM ALL EXISTING POWER LINES.

4. THE CONTRACTOR'S USE OF A CONSTRUCTION STAGING AREA SHALL BE COORDINATED WITH THE OWNER WELL IN ADVANCE OF THE CONSTRUCTION START DATE.

5. LABOR, MATERIAL, TOOLS, EQUIPMENT, TRANSPORTATION AND TEMPORARY POWER SERVICES NECESSARY FOR AND INCIDENTAL TO COMPLETION OF ALL WORK SHALL BE PROVIDED AS INDICATED ON THE DRAWINGS AND/OR AS SPECIFIED HEREIN. LABOR AND MATERIALS SHALL BE FURNISHED AS REQUIRED FOR COMPLETE SYSTEMS, INCLUDING ALL ELEMENTS OBVIOUSLY OR REASONABLY INCIDENTAL TO A COMPLETE INSTALLATION, WHETHER OR NOT SPECIFICALLY INDICATED ON THE PLANS.

6. FOR TASKS REQUIRED TO BE PERFORMED BUT NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL NOT START WORK ON SUCH TASKS WITHOUT HAVING RECEIVED WRITTEN AUTHORIZATION FROM THE CONSTRUCTION MANAGER TO PROCEED.

7. THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS AND EQUIPMENT UNLESS OTHERWISE INDICATED BY DIMENSIONS OR DETAILS. EXACT EQUIPMENT LOCATIONS MAY BE MODIFIED AS REQUIRED BY ACTUAL FIELD CONDITIONS. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE ENGINEER AND THE CONSTRUCTION MANAGER.

8. THE CONTRACTOR SHALL OBTAIN, PAY FOR AND DELIVER ALL REQUIRED PERMITS, CERTIFICATES OF INSPECTION, INCLUDING UTILITY CONNECTION FEES, ETC., REQUIRED BY THE AUTHORITIES HAVING JURISDICTION AND SHALL DELIVER SUCH DOCUMENTS TO THE OWNER PRIOR TO FINAL ACCEPTANCE OF THE WORK.

9. THE CONTRACTOR'S OPERATIONS SHALL BE CONFINED TO AREAS OF NEW CONSTRUCTION.

10. ALL NECESSARY PROVISIONS SHALL BE MADE TO PROTECT EXISTING IMPROVEMENTS, PAVING, CURBS, GALVANIZED SURFACES, ETC, AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO SAME RESULTING FROM THE CONSTRUCTION WORK. ALL DISTURBED AND DAMAGED AREAS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION OR BETTER UPON COMPLETION OF ALL WORK TO THE SATISFACTION OF THE CONSTRUCTION MANAGER.

11. THE FOLLOWING CLEANUP TASKS SHALL BE PERFORMED AS FOLLOWS: (1) ON A DAILY BASIS, KEEP THE GENERAL AREA CLEAN AND HAZARD FREE, REMOVING ALL WASTE, DEBRIS AND TRASH FROM THE SITE AND DISPOSING OF SAME IN A LEGAL MANNER. (2) UPON COMPLETION, LEAVE THE PREMISES IN A CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.

12. ALL EQUIPMENT AND MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH THE RESPECTIVE MANUFACTURER'S RECOMMENDATIONS EXCEPT WHERE IT IS SPECIFICALLY INDICATED OTHERWISE IN THE CONTRACT DOCUMENTS OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.

13. ALL WORK PERFORMED AND MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY HAVING JURISDICTION OVER THE PERFORMANCE OF THE WORK. MECHANICAL AND ELECTRICAL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AS WELL AS LOCAL AND STATE CODES, ORDINANCES AND APPLICABLE REGULATIONS.

14. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AT ALL TIMES, USING THE BEST SKILLS AND ATTENTION. HE SHALL BE SOLELY RESPONSIBLE FOR ALL OF THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK, INCLUDING CONTACT AND COORDINATION WITH THE CONSTRUCTION MANAGER AND WITH THE OWNER'S AUTHORIZED REPRESENTATIVE.

15. WITHIN TWENTY ONE (21) WORKING DAYS AFTER PROJECT COMPLETION, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF AS–BUILT DRAWINGS, SWEEP TEST, CYLINDER TESTS, LIEN RELEASES, AND OTHER CLOSEOUT DOCUMENTATION AS REQUIRED BY THE OWNER. ALL SYSTEMS SHALL BE COMPLETELY ASSEMBLED, TESTED, ADJUSTED AND DEMONSTRATED TO BE READY FOR OPERATION PRIOR TO THE OWNER'S ACCEPTANCE.

GENERAL NOTES | 1

1. THE APPROPRIATE UTILITY LOCATING SERVICES SHALL BE CONTACTED PRIOR TO THE START OF CONSTRUCTION IN ORDER TO VERIFY THE EXACT LOCATION OF ALL EXISTING UNDERGROUND UTILITIES.

2. THE INSTALLATION OF NEW UTILITIES SHALL BE COORDINATED WITH LOCAL AUTHORITIES.

3. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SUCH UTILITIES SHALL BE RELOCATED AS DIRECTED BY THE CONSTRUCTION MANAGER. EXTREME CAUTION SHALL BE USED WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES.

4. RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.

5. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES THAT INTERFERE WITH THE EXECUTION OF THE WORK SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS THAT WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF THE LANDLORD AND/OR LOCAL UTILITIES.

6. DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION SHALL BE MINIMIZED.

7. ANY AREAS OF THE CONSTRUCTION SITE DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE. SUCH GRADING SHALL CAUSE SURFACE WATER TO FLOW AWAY FROM ANY EQUIPMENT SHELTER AND TOWER AREAS AND THE SOIL SHALL BE STABILIZED TO PREVENT EROSION. EROSION CONTROL MEASURES,IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

8. THE SUB–GRADE SHALL BE COMPACTED AND BROUGHT TO A UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.

9. BACKFILL SHALL CONSIST OF CLEAN SAND FILL APPROVED FOR USE BY THE ENGINEER. NO UNAPPROVED MATERIAL WILL BE ALLOWED. CLEAN SAND FILL SHALL BE FREE OF ALL ROOTS, BOULDERS, OR OTHER DELETERIOUS MATERIAL.

10. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS TO EQUAL TO OR BETTER CONDITION THAN ORIGINAL.

11. SITE SIGNAGE SHALL BE PROVIDED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS FOR SUCH SIGNAGE AS MAY BE CONTAINED IN THESE DRAWINGS.

SITE WORK NOTES | 2

1. MATERIAL:
   A. ALL STRUCTURAL STEEL WORK SHALL CONFORM TO THE LATEST EDITION OF THE AISC "STEEL CONSTRUCTION MANUAL".
   B. ALL STRUCTURAL STEEL WF BEAMS SHALL BE ASTM A992 AND "HOT DIPPED" GALVANIZED IN ACCORDANCE WITH ASTM A123 AND ASTM A153 STANDARDS.
   C. ALL STRUCTURAL PLATES, ANGLES, AND CHANNELS SHALL BE ASTM A36 AND "HOT DIPPED" GALVANIZED IN ACCORDANCE WITH ASTM A123 AND ASTM A153 STANDARDS.
   D. ALL TS MEMBERS SHALL BE ASTM A500 GRADE B (Fy=46ksi), AND "HOT DIPPED" GALVANIZED IN ACCORDANCE WITH ASTM A123 AND ASTM A153 STANDARDS.
   E. ALL STRUCTURAL PIPE MEMBERS SHALL BE ASTM A500 GRADE B (Fy=42ksi), AND "HOT DIPPED" GALVANIZED IN ACCORDANCE WITH ASTM A123 AND ASTM A153 STANDARDS.
   F. ALL NON_STRUCTURAL PIPE MEMBERS SHALL BE ASTM A53 GRADE B, AND "HOT DIPPED" GALVANIZED IN ACCORDANCE WITH ASTM A123 AND ASTM A153 STANDARDS.

2. DESIGN, FABRICATION, AND CONSTRUCTION OF ALL CONNECTIONS SHALL CONFORM TO AISC STEEL CONSTRUCTION MANUAL.

3. WELDING:
   A. ALL WELDS, WELDERS, AND WELD INSPECTIONS SHALL CONFORM TO THE REQUIREMENTS OF AWS D 1.1, LATEST REVISION.
   B. ALL WELDS SHALL BE MADE WITH E70XX LOW HYDROGEN ELECTRODES.
   C. ALL STEEL SHALL BE SPRAY GALVANIZED AFTER WELDING.

4. ALL BOLTS SHALL BE GALVANIZED ¾" DIAMETER, A325–N, UNLESS NOTED OTHERWISE AND TIGHTENED TO A "SNUG TIGHT" CONDITION AS DEFINED BY AISC. SECURE NUT WITH LOCKING WASHER.

5. ANCHOR BOLTS SHALL CONFORM TO ASTM A307, UNLESS NOTED OTHERWISE.

6. THE CONTRACTOR/STEEL FABRICATOR SHALL LOCATE ANY REINFORCEMENT IN THE STRUCTURAL MEMBERS IN SUCH A MANNER SO THAT THERE WILL NOT BE CONFLICT WITH THE REINFORCEMENT WHEN INSTALLING ANCHORS. THE ANCHORS SHALL BE INSTALLED PER THE MANUFACTURER'S INSTRUCTION.

7. THE CONTRACTOR/STEEL FABRICATOR SHALL CONFORM TO THE MINIMUM EDGE DISTANCE REQUIREMENTS IN ACCORDANCE WITH THE AISC MANUAL OF STEEL CONSTRUCTION.

8. ALL STRUCTURAL STEEL SHALL BE FABRICATED TO FIT AT BOLTED CONNECTIONS WITHIN $\frac{1}{16}$ INCH TOLERANCE. STRUCTURAL STEEL SHALL NOT BE FLAME CUT UNDER ANY CIRCUMSTANCES WITHOUT APPROVAL OF THE ENGINEER.

9. THE CONTRACTOR/STEEL FABRICATOR SHALL CAP OR SEAL ALL PIPES AS REQUIRED TO PREVENT RAINWATER INTRUSION.

10. THE CONTRACTOR/STEEL FABRICATOR SHALL SUBMIT SHOP DRAWINGS FOR REVIEW PRIOR TO ANY STEEL FABRICATION. AT THE CONTRACTOR'S OPTION, FIELD SPLICES MAY BE USED FOR ERECTION PURPOSES. IF FIELD SPLICES ARE USED, THE SHOP DRAWINGS SHALL INCLUDE ALL DETAILS FOR THE PROPOSED FIELD SPLICES.

11. AT THE CONTRACTOR'S OPTION, SHOP WELDS MAY BE USED INSTEAD OF FIELD WELDS.

12. SUBMIT ORIGINAL SHOP DRAWINGS, INCLUDING COMPLETE DETAILS, SCHEDULES OF FABRICATION AND ASSEMBLY, PROCEDURES, AND DIAGRAMS. INCLUDE DETAILS OF CUTS, CONNECTIONS, CAMBER, HOLE, AND OTHER PERTINENT DATA. INDICATE WELDS BY STANDARD AWS A2.1 AND A2.4 SYMBOLS, AND SHOW SIZE, LENGTH, AND TYPE OF WELD. PROVIDE SETTING DRAWINGS, TEMPLATES, AND DIRECTIONS FOR INSTALLATION OF ANCHOR BOLTS AND OTHER ANCHORAGES TO BE INSTALLED AS WORK OF OTHERS' SECTIONS.

STRUCTURAL STEEL NOTES | 3

REV	DATE	DESCRIPTION
0	2/05/14	FOR PERMIT

PROJECT NO.:	130–729.02
DRAWN BY:	CHECKED BY:
G. DE LA CRUZ	M. ABBEY

CALTROP Telecom
3400 LAKESIDE DRIVE
SUITE 525
MIRAMAR, FL 33027
CERTIFICATE OF AUTHORIZATION 29214

at&t

MICHAEL A. PHILLIPS
LICENSE
No. 68312
STATE OF FLORIDA
PROFESSIONAL ENGINEER

DATE OF SIGNATURE: 02/05/14

FL01

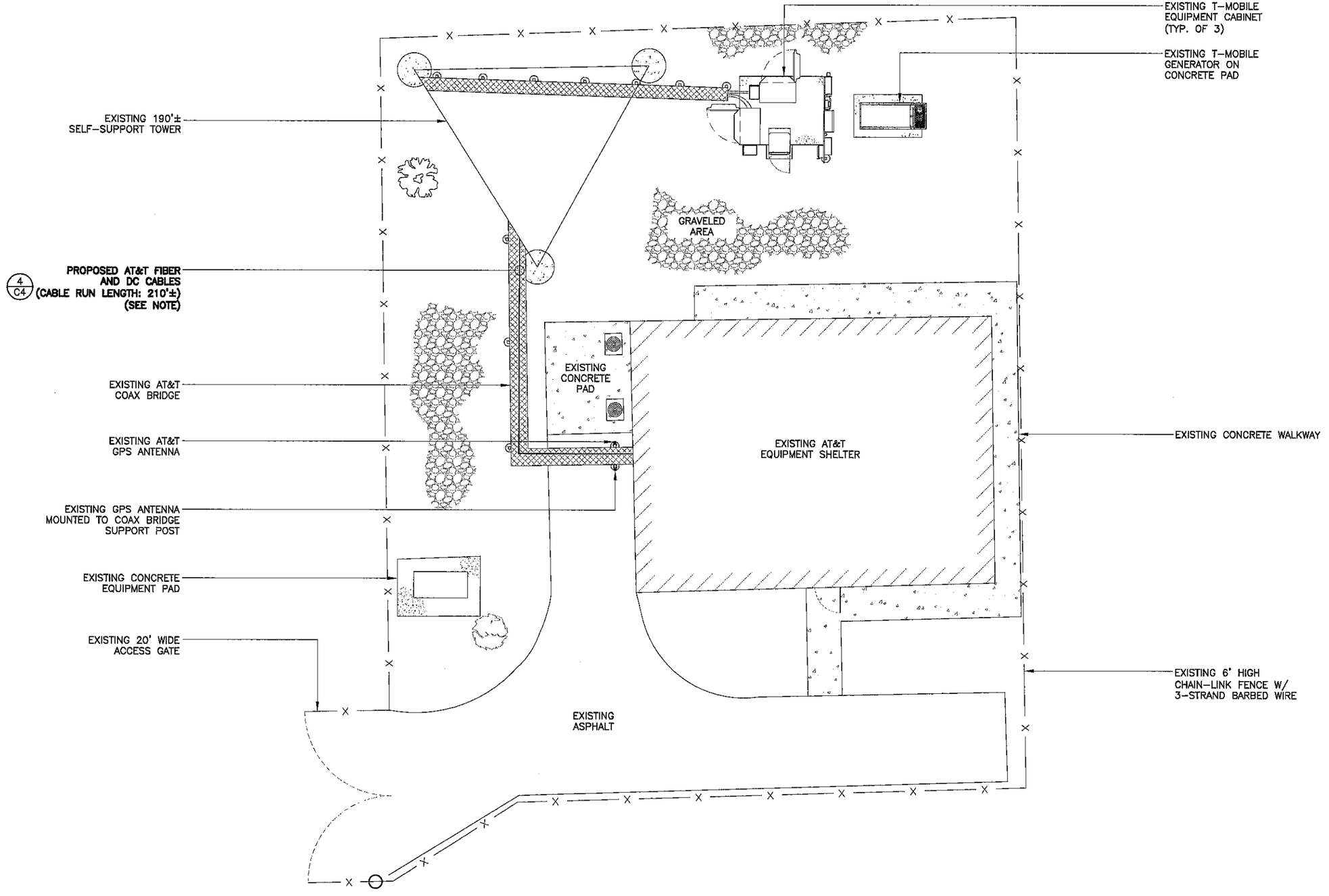
3601 VINKEMULDER ROAD
COCONUT CREEK, FL 33073

SHEET NAME

NOTES

SHEET NUMBER

C1



NOTE:

CONTRACTOR SHALL REMOVE EXISTING UNUSED CABLES AS NEEDED TO CREATE SPACE FOR PROPOSED CABLES.

COMPOUND PLAN

GRAPHIC SCALE 0 6' 12'

1

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PROJECT NO.:	130–729.02
DRAWN BY:	CHECKED BY:
G. DE LA CRUZ	M. ABBEY

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MIRAMAR, FL 33027
CERTIFICATE OF AUTHORIZATION 29214

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MICHAEL A. PHILLIPS LICENSE No. 68312 STATE OF FLORIDA PROFESSIONAL ENGINEER

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FL01

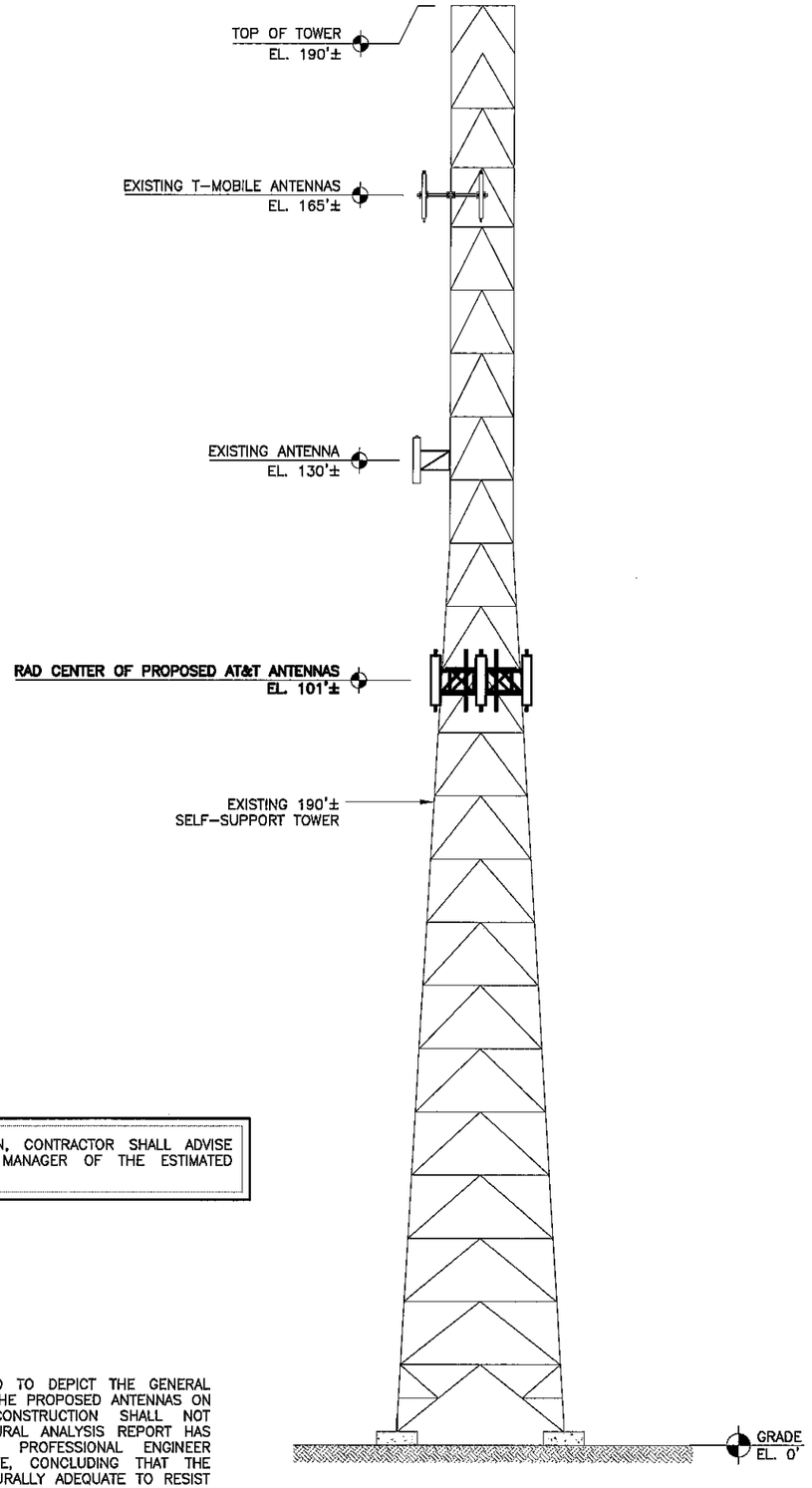
3601 VINKEMULDER ROAD
COCONUT CREEK, FL 33073

SHEET NAME

COMPOUND PLAN

SHEET NUMBER

C2

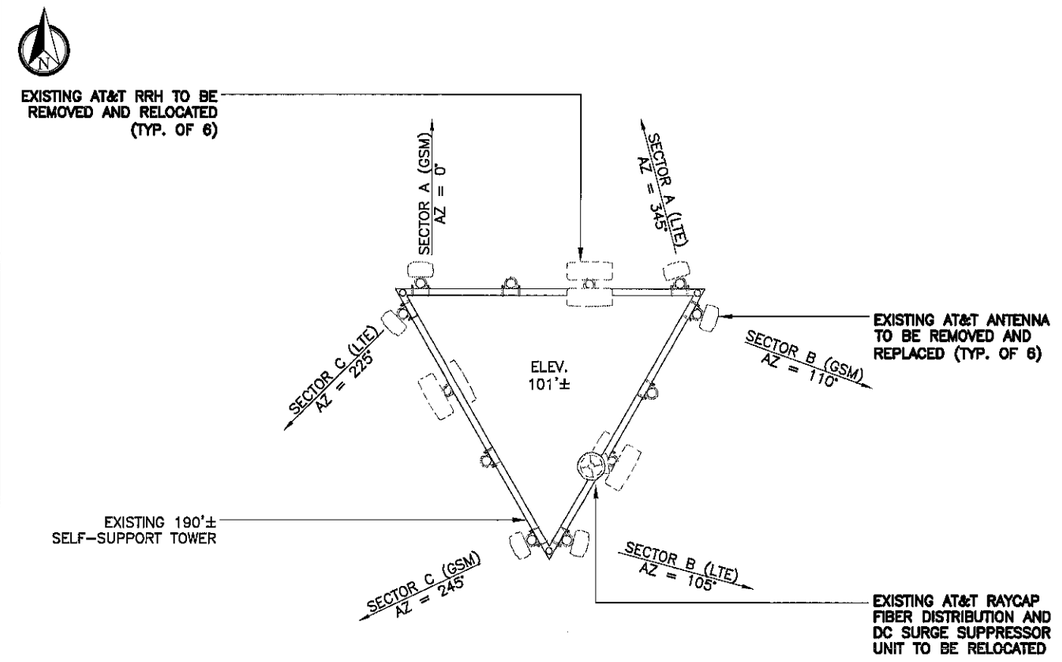


PRIOR TO CONSTRUCTION, CONTRACTOR SHALL ADVISE MASTEC CONSTRUCTION MANAGER OF THE ESTIMATED SITE DOWN TIME.

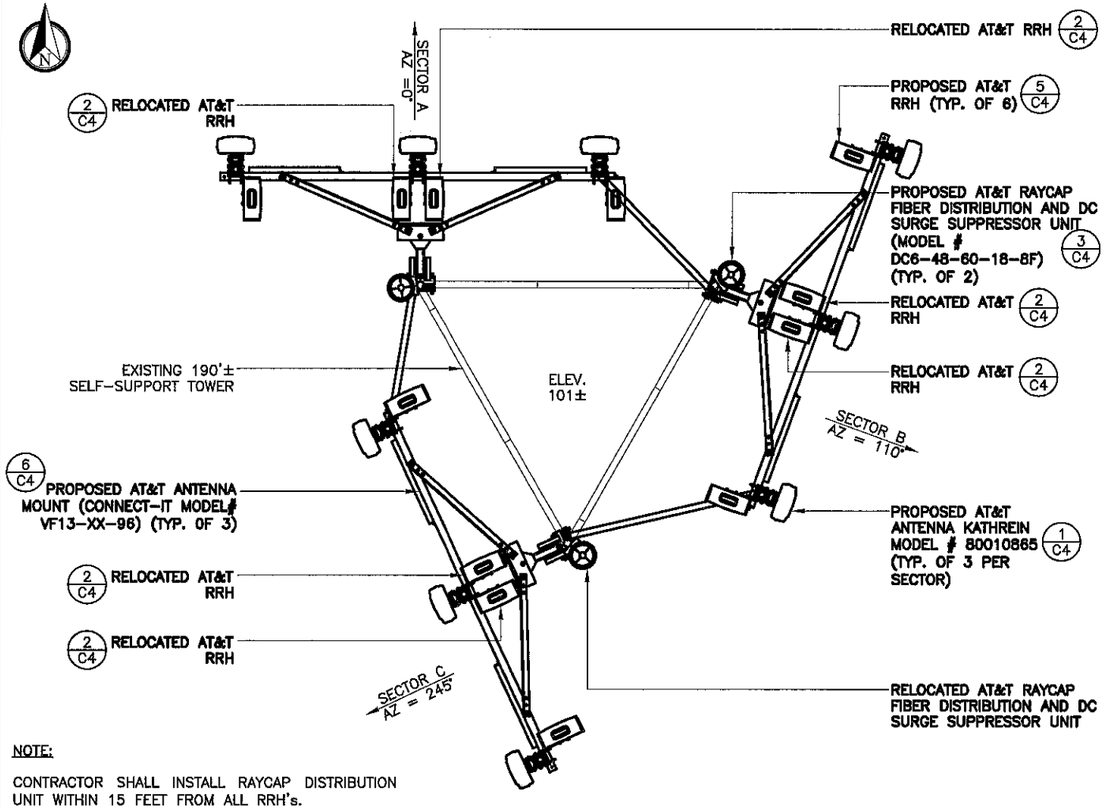
NOTE:

THIS DRAWING IS INTENDED TO DEPICT THE GENERAL LOCATION AND HEIGHT OF THE PROPOSED ANTENNAS ON THE EXISTING TOWER. CONSTRUCTION SHALL NOT PROCEED UNTIL A STRUCTURAL ANALYSIS REPORT HAS BEEN COMPLETED BY A PROFESSIONAL ENGINEER REGISTERED IN THIS STATE, CONCLUDING THAT THE EXISTING TOWER IS STRUCTURALLY ADEQUATE TO RESIST THE EXISTING AND PROPOSED LOADS.

ELEVATION — GRAPHIC SCALE 0 6' 12' — 1



EXISTING ANTENNA AND RRH LAYOUT — NTS — 2



NOTE:

CONTRACTOR SHALL INSTALL RAYCAP DISTRIBUTION UNIT WITHIN 15 FEET FROM ALL RRH's.

PROPOSED ANTENNA AND RRH LAYOUT — NTS — 3

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0	2/05/14	FOR PERMIT

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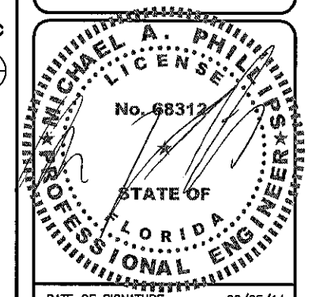


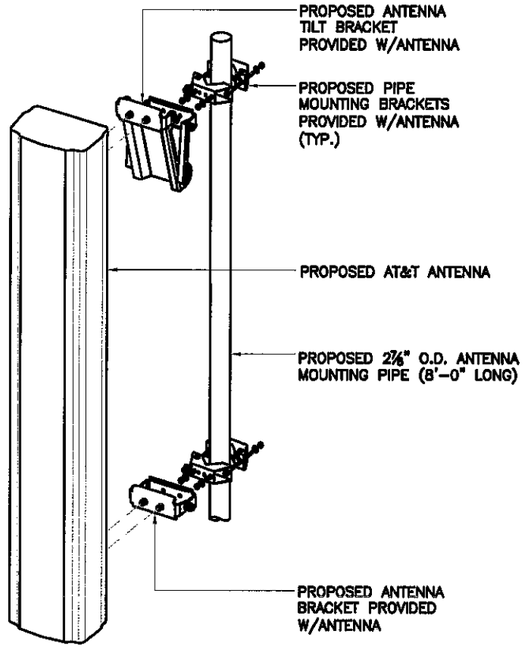
DATE OF SIGNATURE: 02/05/14

FL01

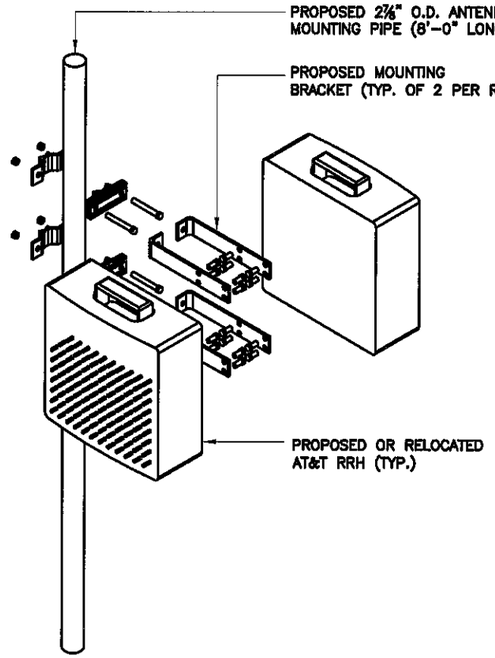
3601 VINKEMULDER ROAD
COCONUT CREEK, FL 33073

SHEET NAME
ELEVATION AND ANTENNA LAYOUTS

SHEET NUMBER
C3



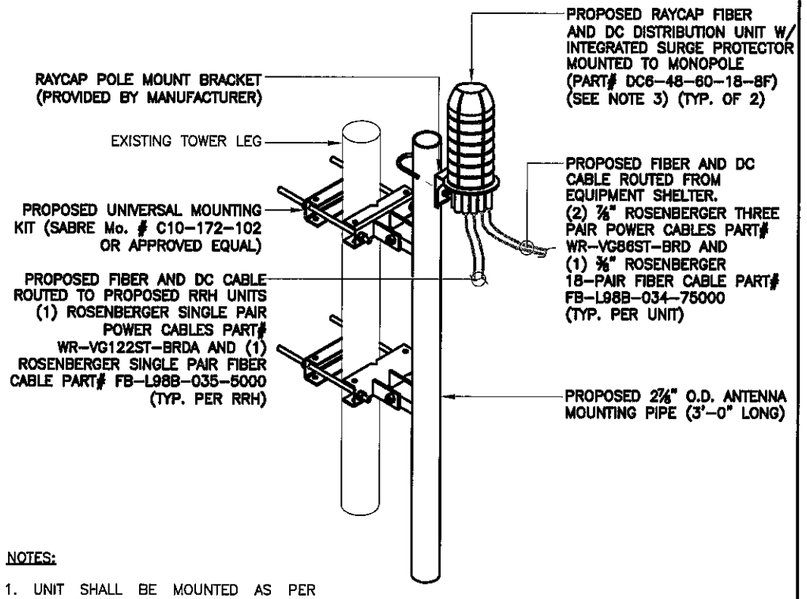
ANTENNA MOUNTING DETAIL NTS 1



NOTES:

1. UNIT SHALL BE MOUNTED AS PER MANUFACTURER'S RECOMMENDATIONS.
2. CONTRACTOR SHALL TIGHTEN ALL BOLTS TO A "SNUG TIGHT" CONDITION AS DEFINED BY AISC.

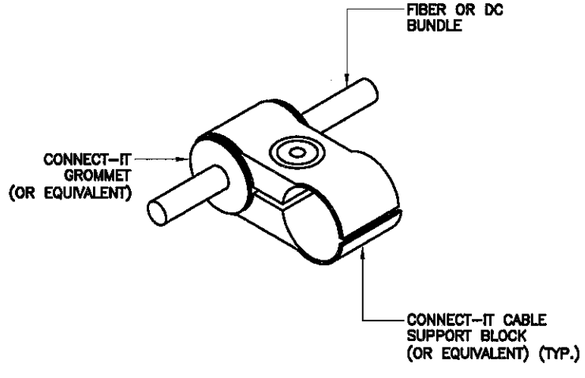
RRH UNIT MOUNTING DETAIL NTS 2



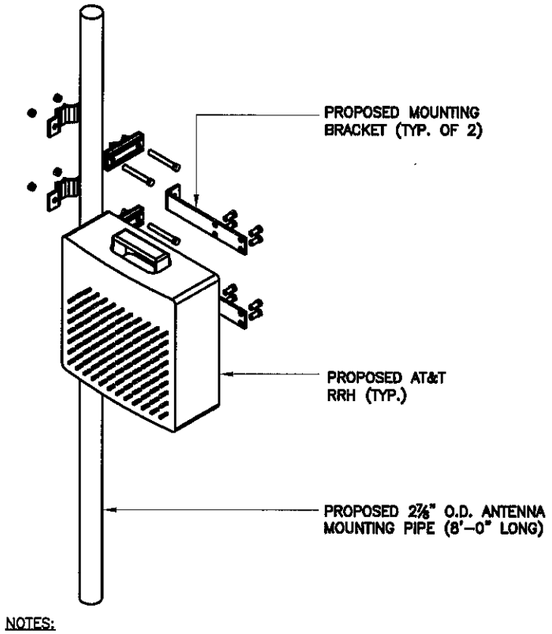
NOTES:

1. UNIT SHALL BE MOUNTED AS PER MANUFACTURER'S RECOMMENDATIONS.
2. CONTRACTOR SHALL TIGHTEN ALL BOLTS TO A "SNUG TIGHT" CONDITION AS DEFINED BY AISC.
3. CONTRACTOR SHALL INSTALL RAYCAP DISTRIBUTION UNIT WITHIN 15 FEET FROM ALL RRH'S.

DC UNIT MOUNTING DETAIL NTS 3



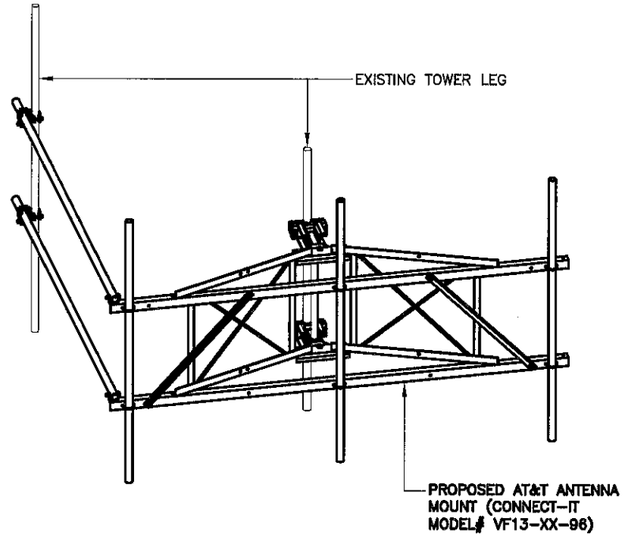
FIBER AND DC CABLE MOUNTING DETAIL NTS 4



NOTES:

1. UNIT SHALL BE MOUNTED AS PER MANUFACTURER'S RECOMMENDATIONS.
2. CONTRACTOR SHALL TIGHTEN ALL BOLTS TO A "SNUG TIGHT" CONDITION AS DEFINED BY AISC.

RRH UNIT MOUNTING DETAIL NTS 5



ANTENNA MOUNT DETAIL NTS 6

REV	DATE	DESCRIPTION
0	2/05/14	FOR PERMIT

PROJECT NO.: 130-729.02

DRAWN BY:	CHECKED BY:
G. DE LA CRUZ	M. ABBEY

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3400 LAKESIDE DRIVE
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FL01

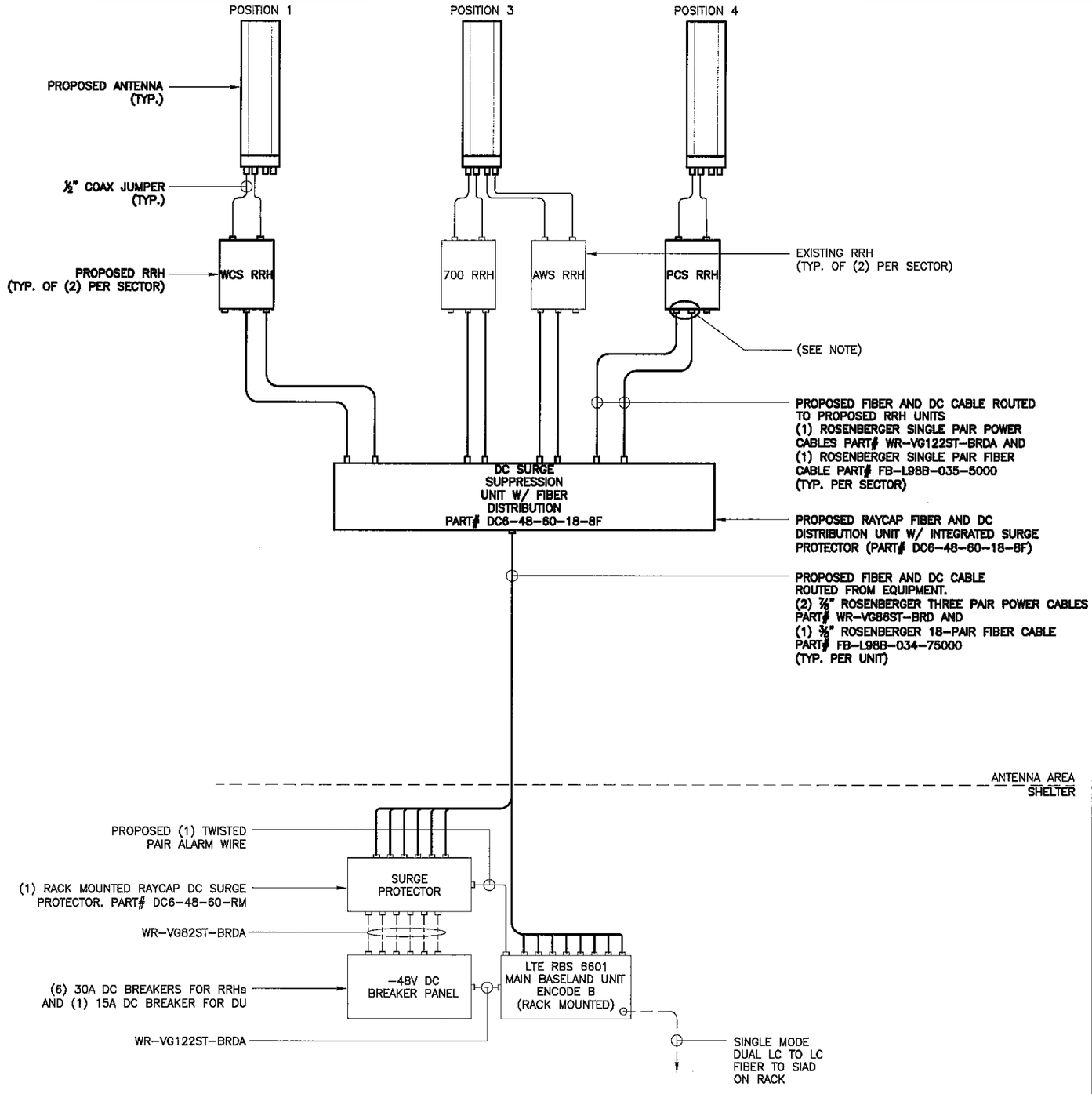
3601 VINKEMULDER ROAD
COCONUT CREEK, FL 33073

SHEET NAME

DETAILS

SHEET NUMBER

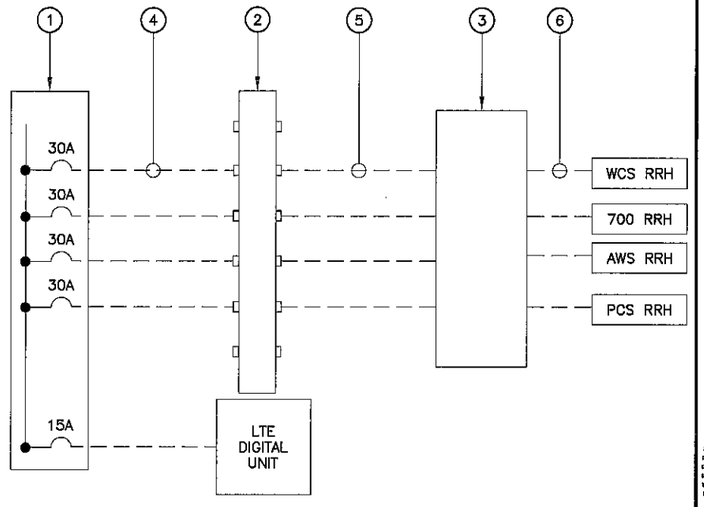
C4



NOTES:

1. CONTRACTOR SHALL USE ERICSSON PROVIDED DC POWER CABLE CONNECTOR.
2. CONTRACTOR SHALL REMOVE EXISTING UNUSED CABLES AS NEEDED TO CREATE SPACE FOR PROPOSED CABLES.

RISER DIAGRAM (TYP. PER SECTOR) NTS 1



KEYNOTE LEGEND:

1. -48V DC POWER PLANT.
2. (1) RACK MOUNTED RAYCAP DC SURGE PROTECTOR (DC6-48-60-RM).
3. RAYCAP FIBER AND DC DISTRIBUTION UNIT (DC6-48-60-18)
4. #8 AWG CONDUCTORS.
5. PROVIDE (2) 6-CONDUCTOR #8 AWG BUNDLES FOR DC POWER FROM RACK MOUNTED RAYCAP SURGE PROTECTION UNIT TO THE RAYCAP FIBER AND DISTRIBUTION UNIT ON TOWER
6. PROPOSED FIBER AND DC CABLE ROUTED TO PROPOSED RRH UNITS

DC RISER DIAGRAM NTS 2

REV	DATE	DESCRIPTION
0	2/05/14	FOR PERMIT

PROJECT NO.: 130-729.02

DRAWN BY:	CHECKED BY:
G. DE LA CRUZ	M. ABBEY

CALTROP Telecom
3400 LAKESIDE DRIVE
SUITE 525
MIRAMAR, FL 33027
CERTIFICATE OF AUTHORIZATION 29214

at&t

MICHAEL A. PHILLIPS LICENSE No. 68312 STATE OF FLORIDA PROFESSIONAL ENGINEER

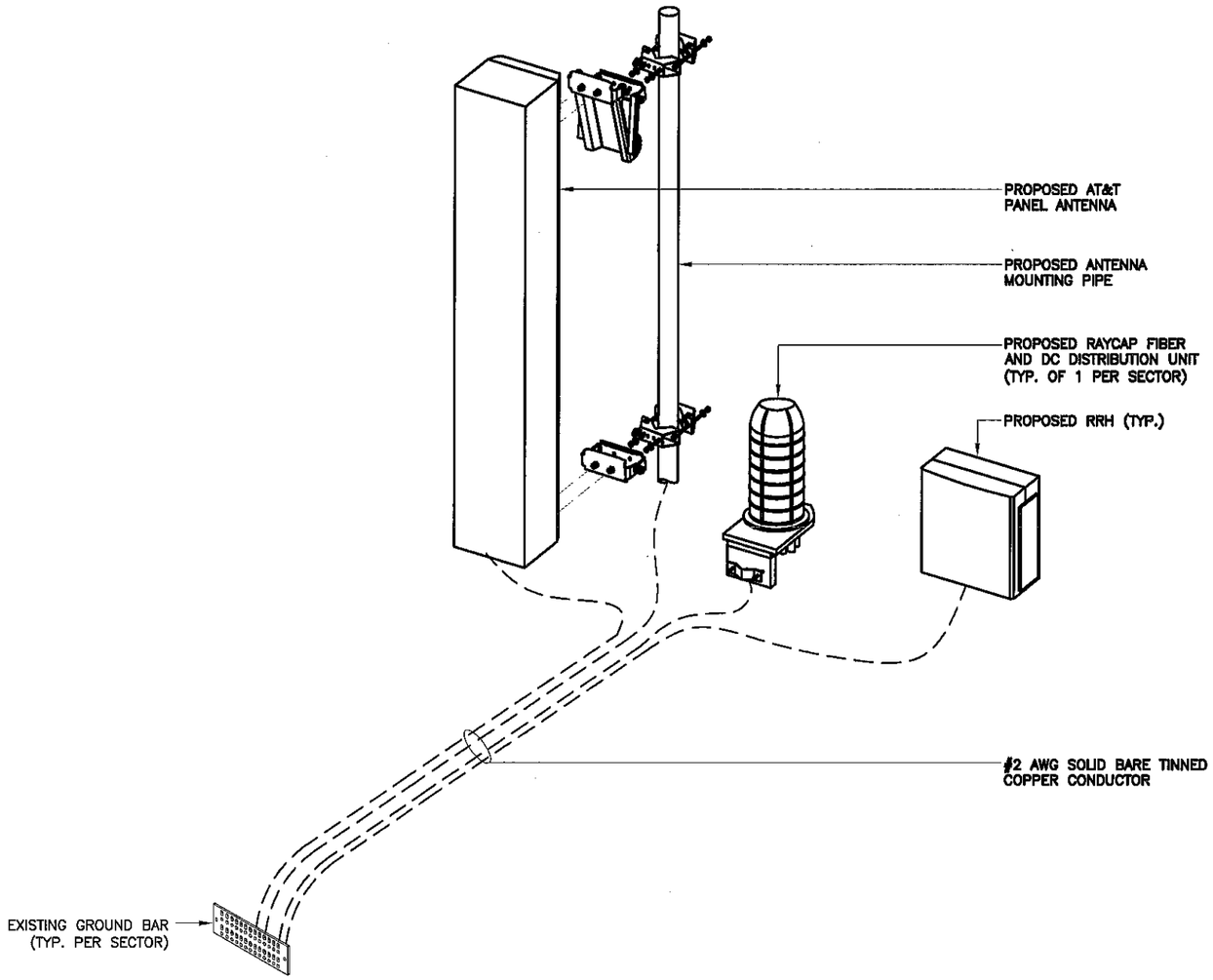
DATE OF SIGNATURE: 02/05/14

FL01

3601 VINKEMULDER ROAD
COCONUT CREEK, FL 33073

SHEET NAME
DC ELECTRICAL DETAILS

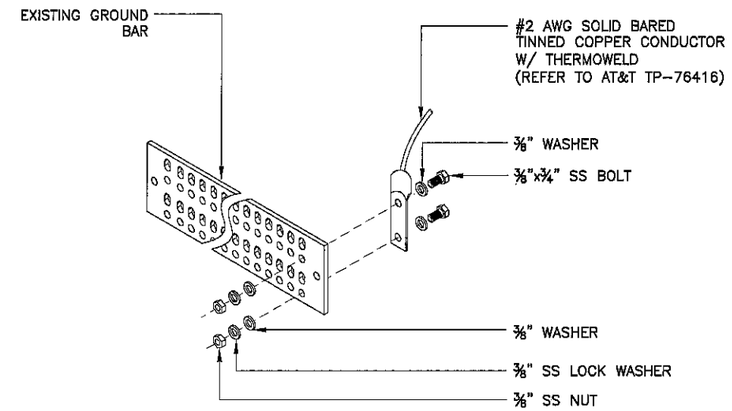
SHEET NUMBER
E1



NOTES:

1. CONTRACTOR SHALL REFER TO AT&T GROUNDING AND BONDING PRACTICE TP-76416.
2. PROVIDE WEATHER PROOFING AND GROUNDING KIT TO BOND DC POWER CABLE SHIELD TO EXTERNAL HATCH PLATE GROUND BAR.
3. PROVIDE GROUND CONNECTION FOR DC POWER CABLE SHIELD TO "P" SECTION OF CRGB WITHIN SHELTER.

GROUNDING DIAGRAM (TYP.) NTS 1



TYPICAL GROUND BAR CONNECTION DETAIL NTS 2

1. RECORD DRAWINGS: MAINTAIN A RECORD OF ALL CHANGES, SUBSTITUTIONS BETWEEN WORK AS SPECIFIED AND INSTALLED. RECORD CHANGES ON A CLEAN SET OF CONTRACT DOCUMENTS WHICH SHALL BE TURNED OVER TO THE CONSTRUCTION MANAGER UPON COMPLETION OF THE PROJECT.
2. GUARANTEE/WARRANTY: GUARANTEE INSTALLATION TO BE FREE OF DEFECTS, SHORTS, GROUNDS, ETC., FOR A PERIOD OF ONE YEAR. FURNISH WARRANTY SO THE DEFECTIVE MATERIAL AND/OR WORKMANSHIP WILL BE REPAIRED/REPLACED IMMEDIATELY UPON NOTIFICATION AT NO COST TO THE OWNER FOR PERIOD OF WARRANTY.
3. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
4. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40, OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
5. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
6. WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
7. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
8. METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED, OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
9. NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
10. CONTRACTOR SHALL REFER TO AT&T GROUNDING AND BONDING PRACTICE TP-76416.

GROUNDING NOTES 3

REV	DATE	DESCRIPTION
0	2/05/14	FOR PERMIT

PROJECT NO.:	130-729.02
DRAWN BY:	CHECKED BY:
G. DE LA CRUZ	M. ABBEY

CALTROP Telecom
3400 LAKESIDE DRIVE
SUITE 525
MIRAMAR, FL 33027
CERTIFICATE OF AUTHORIZATION 29214

at&t

MICHAEL A. PHILLIPS LICENSE No. 68312 STATE OF FLORIDA PROFESSIONAL ENGINEER

DATE OF SIGNATURE: 02/05/14

FL01

3601 VINKEMULDER ROAD
COCONUT CREEK, FL 33073

SHEET NAME
GROUNDING DETAIL AND NOTES

SHEET NUMBER
E2

MasTec Network Solutions
6100 Broken Sound Pkwy Suite 6
Boca Raton, FL 33487
(678) 896-9330

Kevin Clements
520 S. Main St., Suite 2531
Akron, Ohio 44311
(330) 572-2100
kclements@gpdgroup.com

GPD# 2013723.04.6990.02 Rev 1
February 3, 2014

REVISED RIGOROUS STRUCTURAL ANALYSIS REPORT

AT&T DESIGNATION:	**Site USID:**	**6990**
	Site FA:	**10070109**
	Site Name:	**FL01**
	AT&T Project:	**MOD_LTE_3C_11-08-2013**
ANALYSIS CRITERIA:	**Codes:**	**TIA-222-G, 2009 IBC & 2010 FBC** **132-mph Nominal 3-Second Gust with 0″ ice** **170-mph Ultimate 3-Second Gust with 0″ ice**
SITE DATA:		**3601 Vinkemulder Rd., Coconut Creek, FL 33073, Broward County** **Latitude 26° 17' 5.978" N, Longitude 80° 10' 21.979" W** **Market: South Florida** **192.3′ Rohn Self Support Tower**

Ms. Bridget Rohack,

GPD is pleased to submit this Rigorous Structural Analysis Report to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the existing and proposed loading configuration detailed in the analysis report.

Analysis Results

Tower Stress Level with Proposed Equipment:	103.2%	Pass
Foundation Ratio with Proposed Equipment:	99.3%	Pass

We at GPD appreciate the opportunity of providing our continuing professional services to you and MasTec Network Solutions. If you have any questions or need further assistance on this or any other projects please do not hesitate to call.

Respectfully submitted,

John N. Kabak, S.E.
Florida #: 75036

SUMMARY & RESULTS

The purpose of this analysis was to verify whether the existing structure is capable of carrying the proposed loading configuration as specified by AT&T to MasTec Network Solutions. This report was commissioned by Ms. Bridget Rohack of MasTec Network Solutions.

The analysis has been performed in accordance with the 2010 Florida Building Code based upon a strength design wind speed of 170 mph and the ASCE 7-10. Wind loading was taken from the 2010 FBC in accordance with Section 1620: High Velocity Hurricane Zones, with Exposure Category C, Risk Category II and a nominal design wind speed of 132 mph 3-second gust.

Modifications by FDH project #: 11-07019E S3, dated 1/13/12, have not been installed and were not considered in this analysis.

Modifications designed by GPD Project #: 2012771.41, dated 6/27/12, have been considered in this analysis.

The proposed DC, Fiber and RET lines to 100' shall be installed with the existing DC, Fiber and RET lines to form a (4) on (4) on (4) configuration for the analysis results to be valid. See Appendix C for the coax layout.

TOWER SUMMARY AND RESULTS

Member	Capacity	Results
Legs	91.9%	Pass
Diagonals	103.2%	Pass
Horizontals	102.6%	Pass
Member Bolts	61.1%	Pass
Anchor Rods	90.6%	Pass
Foundation	99.3%	Pass

Note: Ratings at or below 105% are within standard engineering tolerances and therefore are considered satisfactory.

ANALYSIS METHOD

tnxTower (Version 6.1.3.1), a commercially available software program, was used to create a three-dimensional model of the tower and calculate primary member stresses for various dead, live and wind load cases. Selected output from the analysis is included in Appendix B. The following table details the information provided to complete this structural analysis. This analysis is solely based on this information and is being provided without the benefit of a recent site visit.

DOCUMENTS PROVIDED

Document	Remarks	Source
Equipment Modification Form	AT&T Internal Loading Document, uploaded 11/12/13	Siterra
Tower Design	Not Provided	N/A
Foundation Design	Not Provided	N/A
Geotechnical Report	Ground Down Engineering Job #: 11-488, dated 8/26/11	Siterra
Tower Mapping	FDH Job #: 11-07013T T1, dated 8/23/11	Siterra
Foundation Mapping	FDH Job #: 1107019EN1, dated 7/15/11	Siterra
Modification Design	FDH Job #: 11-07019E S3, dated 1/13/12	Siterra
Modification Design	GPD Job #: 2012771.41, dated 6/27/12	Siterra
Previous Structural Analysis	GPD Job #: 2013723.6990.01, dated 3/19/13	Siterra

ASSUMPTIONS

This rigorous structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. GPD has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

1. The tower member sizes and shapes are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations.
6. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
7. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
8. All welds and connections are assumed to develop at least the member capacity unless determined otherwise and explicitly stated in this report.
9. All prior structural modifications are assumed to be as per data supplied/available and to have been properly installed.
10. Loading interpreted from photos is accurate to $\pm 5'$ AGL, antenna size accurate to ± 3.3 sf, and coax equal to the number of existing antennas without reserve.
11. All existing loading was obtained from the previous analysis by GPD Job #: 2013723.6990.01, dated 3/19/13, site photos, the provided EMF and is assumed to be accurate.
12. Modifications by FDH project #: 11-07019E S3, dated 1/13/12 have not been installed and were not considered in this analysis.
13. Modifications designed by GPD Project #: 2012771.41, dated 6/27/12, have been considered in this analysis.
14. Leg A is assumed to be at 50° per the tower mapping by FDH (Job #: 11-07013T T1, dated 1/13/12).
15. The loading considered in this analysis was confirmed through email correspondence with Ms. Bridget Rohack of MasTec Network Solutions, dated 11/23/13.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD Group should be allowed to review any new information to determine its effect on the structural integrity of the tower.

DISCLAIMER OF WARRANTIES

GPD GROUP has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD GROUP in connection with this Rigorous Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

GPD GROUP does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD GROUP provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the specified code recommended amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD GROUP, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

GPD GROUP makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD GROUP will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD GROUP pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

Tower Analysis Summary Form

Tower Analysis Summary Form

General Info

Site Name	FL01
Site Number	6990
FA Number	10070109
Date of Analysis	11/25/2013
Company Performing Analysis	GPD

The information contained in this summary report is not to be used independently from the PE stamped tower analysis.

Tower Info	Description	Date
Tower Type (G, SST, MP)	SST	
Tower Height (top of steel AGL)	192.3'	
Tower Manufacturer	Rohn	
Tower Model	n/a	
Tower Design	n/a	
Foundation Design	n/a	
Geotech Report	Ground Down Engineering Job #: 11-488	8/26/2011
Modification Drawings	FDH Job #: 11-07019E S3	1/13/2012
Previous Structural Analysis	GPD Job #: 2013723.6990.01	3/19/2013
Foundation Mapping	FDH Project #: 1107019EN1	7/15/2011
Modification Drawings	GPD Job #: 2012771.41	6/27/2012
Tower Mapping	FDH Job #: 11-07013T T1	8/23/2011

Design Parameters

Design Code Used	TIA-222-G, 2009 IBC & 2010 FBC
Location of Tower (County, State)	Broward, FL
Basic Wind Speed (mph)	132 - 3 second gust
Ice Thickness (in)	0
Structure Classification (I, II, III)	II
Exposure Category (B, C, D)	C
Topographic Category (1 to 5)	1

Analysis Results (% Maximum Usage)

Existing/Reserved + Future + Proposed Condition	
Tower (%)	103.2%
Anchor Rods (%)	90.6%
Foundation (%)	99.3%
Foundation Adequate?	Yes

Modifications by FDH Job #: 11-07019E S3, dated 1/13/12 have not been installed and were not considered in this analysis.

Modifications designed by GPD Job #: 2012771.41, dated 6/27/12, have been considered in this analysis.

Steel Yield Strength (ksi)

Legs	50
Bracing Members	50/36
Member Bolts	A325
Anchor Rods	A354-BC

Note: Steel grades assumed based on experience with similar towers.

Existing / Reserved Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face
Unknown	189	201	1	Dipole	Unknown	16 Element 20' x 2" Dipole		2	Unknown	8' Frames	2	Unknown	1-5/8"	Face B
Unknown	189	195.5	1	Yagi	Unknown	3 Element 18" x 12" Yagi				on the 8' Frames	2	Unknown	7/8"	Face B
Unknown	189	195	1	Omni	Unknown	3" x 8' Omni				on the 8' Frames				
Unknown	189	195	1	Omni	Unknown	2" x 8' Omni				on the 8' Frames				
T-Mobile	165	165	9	Panel	RFS	APX17DWV-17DWV-S-E-ACU	60/180/300	3	Unknown	11.5' T-Frames	12	Unknown	1-5/8"	Face C
T-Mobile	165	165	3	RRU	Nokia	FRIG				on the same mounts	1	Hybrid	1-5/8"	Face C
T-Mobile	165	165	3	RRU	Nokia	FXFB				on the same mounts				
T-Mobile	165	165	3	RRU	Nokia	FRIA				on the same mounts				
T-Mobile	165	165	1	COVP	Raycap	RCMDC-4010-PF-48				on the same mounts				
Unknown	133	137	1	Omni	Unknown	2" x 8' Omni		1	Unknown	2' Standoff	1	Unknown	7/8"	Face B
Unknown	133	133	1	Dish	Motorola	1' Square Dish				on the same mount				
AT&T Mobility	100	100	2	Panel	Kathrein	800 10122	0/245			Face Mounted	12	LDF7-50A	7/8"	Face B
AT&T Mobility	100	100	1	Panel	Kathrein	742 246	110			Face Mounted	1	RET Cable	3/8"	Face B
AT&T Mobility	100	100	1	Panel	Kathrein	800 10764	105			Face Mounted	1	12-pair fiber	3/8"	Face B
AT&T Mobility	100	100	2	Panel	Kathrein	800 10765	345/225			Face Mounted	2	DC Power	7/8"	Face B
AT&T Mobility	100	100	2	TMA	RFS	ATM192012B-0				Face Mounted				
AT&T Mobility	100	100	4	TMA	RFS	ATM19801712-0				Face Mounted				
AT&T Mobility	100	100	6	RET	Kathrein	860 10025				Face Mounted				
AT&T Mobility	100	100	6	RRU	Ericsson	RRUS 11				Face Mounted				
AT&T Mobility	100	100	6	Diplexer	Triasx	TBC0020F1V2				Face Mounted				
AT&T Mobility	100	100	1	Surge	Raycap	DC6-48-60-18-8F				Face Mounted				

Note: The existing loading besides (3) RRUS 11, (1) DC6-48-60-18-8F and all existing lines at 100' shall be removed prior to the installation of the proposed loading. (3) RRUS 11, (1) DC6-48-60-18-8F and all existing lines shall be relocated to the proposed mounts and reused.

Proposed Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face
AT&T Mobility	100	100	9	Panel	Kathrein	800-10865	105/225/345	3	Connect-it	HDFM-15	2	RET Cable	3/8"	Face B
AT&T Mobility	100	100	9	RRU	Ericsson	RRUS 32				on the same mounts	2	18-pair fiber	3/8"	Face B
AT&T Mobility	100	100	2	Surge	Raycap	DC6-48-60-18-8F				on the same mounts	4	DC Power	7/8"	Face B

Note: The proposed equipment shall be in addition to the remaining existing/reserved loading at the same elevation.

Note: The proposed DC, Fiber and RET lines to 100' shall be installed with the existing DC, Fiber and RET lines to form a (4) on (4) on (4) configuration for the analysis results to be valid. See Appendix C for the coax layout.

Future Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Leg/Face

APPENDIX B

tnxTower Output File

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 192.33 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 7.50 ft at the top and 28.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Broward County, Florida.
Basic wind speed of 132 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	*Face or Leg*	*Allow Shield*	*Component Type*	*Placement* ft	*Face Offset* in	*Lateral Offset (Frac FW)*	*#*	*# Per Row*	*Clear Spacing* in	*Width or Diameter* in	*Perimeter* in	*Weight* plf
Lighting Cables	B	No	Ar (CaAa)	192.30 - 8.00	0.0000	0.21	1	1	0.7500	0.7500		0.33
LDF7-50A (1-5/8 FOAM)	B	No	Ar (CaAa)	190.00 - 8.00	0.0000	0.43	2	2	1.0000	1.9800		0.82
LDF5-50A (7/8 FOAM)	B	No	Ar (CaAa)	190.00 - 8.00	2.5000	0.43	2	2	1.0000	1.0900		0.33
Feedline Ladder (Af)	B	No	Af (CaAa)	190.00 - 8.00	0.0000	0.45	1	1	3.0000	3.0000		8.40
Feedline Ladder (Af)	B	No	Af (CaAa)	190.00 - 8.00	0.0000	0.25	1	1	3.0000	3.0000		8.40
Feedline Ladder (Af)	C	No	Af (CaAa)	190.00 - 8.00	0.0000	0.4	1	1	3.0000	3.0000		8.40
5/8" Step Bolts	A	No	Ar (CaAa)	190.00 - 8.00	0.0000	0.5	1	1	0.4167	0.4167		1.00
5/8" Step Bolts	B	No	Ar (CaAa)	190.00 - 8.00	0.0000	0.5	1	1	0.4167	0.4167		1.00
5/8" Step Bolts	C	No	Ar (CaAa)	190.00 - 8.00	0.0000	0.5	1	1	0.4167	0.4167		1.00
LDF7-50A (1-5/8 FOAM)	C	No	Ar (CaAa)	165.00 - 8.00	-0.7500	0.4	12	6	1.0000	1.9800		0.82
Hybrid 1-5/8	C	No	Ar (CaAa)	165.00 - 8.00	-0.7500	0.37	1	1	1.0000	1.5840		1.61
LDF5-50A (7/8 FOAM)	B	No	Ar (CaAa)	133.00 - 8.00	0.0000	0.2	1	1	1.0000	1.0900		0.33
LDF5-50A (7/8 FOAM)	B	No	Ar (CaAa)	100.00 - 8.00	0.0000	0.45	12	6	1.0000	1.0900		0.33
7/8" DC Power Cable	B	No	Ar (CaAa)	100.00 - 8.00	0.0000	0.22	6	2	0.8750	0.8750		0.60
3/8" Fiber Cable	B	No	Ar (CaAa)	100.00 - 8.00	0.0000	0.24	3	1	0.3750	0.3750		0.10
RET Cable	B	No	Ar (CaAa)	100.00 - 8.00	0.0000	0.25	3	1	0.4400	0.4400		0.08

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Flash Beacon Lighting	A	From Leg	0.00 0.00 0.00	0.0000	192.30	No Ice	2.70	2.70	50.00
8' Frame	B	From Leg	0.50 0.00 0.00	0.0000	189.00	No Ice	8.83	7.05	268.16
8' Frame	C	From Leg	0.50 0.00 0.00	0.0000	189.00	No Ice	8.83	7.05	268.16
16 Element 20' x 2" Dipole	B	From Leg	1.00 0.00 12.00	0.0000	189.00	No Ice	4.00	4.00	40.00
3 Element 18" x 12" Yagi	C	From Leg	1.00 0.00 6.50	0.0000	189.00	No Ice	0.07	0.07	5.00
3" x 8' Omni	C	From Leg	1.00 0.00 6.00	0.0000	189.00	No Ice	2.40	2.40	25.00
2" x 8' Omni	B	From Leg	1.00 0.00 6.00	0.0000	189.00	No Ice	1.60	1.60	20.00
11.5' T-Frame	A	From Leg	0.98 0.17 0.00	10.0000	165.00	No Ice	16.40	10.28	317.50
11.5' T-Frame	B	From Leg	0.98 0.17 0.00	10.0000	165.00	No Ice	16.40	10.28	317.50
11.5' T-Frame	C	From Leg	0.98 0.17 0.00	10.0000	165.00	No Ice	16.40	10.28	317.50
(3) APX17DWV-17DWV-S-E-A CU w/ Mount Pipe	A	From Leg	1.97 0.35 0.00	10.0000	165.00	No Ice	9.23	4.52	67.60
(3) APX17DWV-17DWV-S-E-A CU w/ Mount Pipe	B	From Leg	1.97 0.35 0.00	10.0000	165.00	No Ice	9.23	4.52	67.60
(3) APX17DWV-17DWV-S-E-A CU w/ Mount Pipe	C	From Leg	1.97 0.35 0.00	10.0000	165.00	No Ice	9.23	4.52	67.60
FRIG	A	From Leg	1.97 0.35 0.00	10.0000	165.00	No Ice	2.79	1.10	57.32
FRIG	B	From Leg	1.97 0.35 0.00	10.0000	165.00	No Ice	2.79	1.10	57.32
FRIG	C	From Leg	1.97 0.35 0.00	10.0000	165.00	No Ice	2.79	1.10	57.32
FXFB	A	From Leg	1.97 0.35 0.00	10.0000	165.00	No Ice	0.99	1.12	55.12
FXFB	B	From Leg	1.97 0.35 0.00	10.0000	165.00	No Ice	0.99	1.12	55.12

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
FXFB	C	From Leg	1.97 0.35 0.00	10.0000	165.00	No Ice	0.99	1.12	55.12
FRIA	A	From Leg	1.97 0.35 0.00	10.0000	165.00	No Ice	4.13	0.98	55.00
FRIA	B	From Leg	1.97 0.35 0.00	10.0000	165.00	No Ice	4.13	0.98	55.00
FRIA	C	From Leg	1.97 0.35 0.00	10.0000	165.00	No Ice	4.13	0.98	55.00
RCMDC-4010-PF-48	A	From Leg	1.97 0.35 0.00	10.0000	165.00	No Ice	3.22	1.16	20.00
2' Standoff	A	From Leg	1.00 0.00 0.00	0.0000	133.00	No Ice	2.97	2.99	55.00
2" x 8' Omni	A	From Leg	2.00 0.00 4.00	0.0000	133.00	No Ice	1.60	1.60	20.00
1' Square Dish	A	From Leg	2.00 0.00 0.00	0.0000	133.00	No Ice	1.40	0.08	3.00
15' T-Boom	A	From Leg	1.15 1.64 0.00	55.0000	100.00	No Ice	23.51	10.62	641.88
15' T-Boom	B	From Leg	1.15 1.64 0.00	55.0000	100.00	No Ice	23.51	10.62	641.88
15' T-Boom	C	From Leg	1.15 1.64 0.00	55.0000	100.00	No Ice	23.51	10.62	641.88
(3) 800-10865 w/ Mount Pipe	A	From Leg	2.29 3.28 0.00	55.0000	100.00	No Ice	11.70	7.94	106.32
(3) 800-10865 w/ Mount Pipe	B	From Leg	2.29 3.28 0.00	55.0000	100.00	No Ice	11.70	7.94	106.32
(3) 800-10865 w/ Mount Pipe	C	From Leg	2.29 3.28 0.00	55.0000	100.00	No Ice	11.70	7.94	106.32
(3) RRUS-32	A	From Leg	2.29 3.28 0.00	55.0000	100.00	No Ice	3.87	2.76	77.00
(3) RRUS-32	B	From Leg	2.29 3.28 0.00	55.0000	100.00	No Ice	3.87	2.76	77.00
(3) RRUS-32	C	From Leg	2.29 3.28 0.00	55.0000	100.00	No Ice	3.87	2.76	77.00
RRUS 11	A	From Leg	2.29 3.28 0.00	55.0000	100.00	No Ice	3.25	1.37	50.70
RRUS 11	B	From Leg	2.29 3.28 0.00	55.0000	100.00	No Ice	3.25	1.37	50.70

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert (ft / ft / ft)	Azimuth Adjustment (°)	Placement (ft)		C_AA_A Front (ft^2)	C_AA_A Side (ft^2)	Weight (lb)
RRUS 11	C	From Leg	2.29 3.28 0.00	55.0000	100.00	No Ice	3.25	1.37	50.70
DC6-48-60-18-8F Surge Suppression Unit	A	From Leg	2.29 3.28 0.00	55.0000	100.00	No Ice	1.47	1.47	18.90
DC6-48-60-18-8F Surge Suppression Unit	B	From Leg	2.29 3.28 0.00	55.0000	100.00	No Ice	1.47	1.47	18.90
DC6-48-60-18-8F Surge Suppression Unit	C	From Leg	2.29 3.28 0.00	55.0000	100.00	No Ice	1.47	1.47	18.90

Critical Deflections and Radius of Curvature - Service Wind

Elevation (ft)	Appurtenance	Gov. Load Comb.	Deflection (in)	Tilt (°)	Twist (°)	Radius of Curvature (ft)
192.30	Flash Beacon Lighting	32	2.367	0.1114	0.0167	583677
189.00	8' Frame	32	2.290	0.1113	0.0165	583677
165.00	11.5' T-Frame	32	1.732	0.1049	0.0110	106459
133.00	2' Standoff	32	1.098	0.0777	0.0060	62703
100.00	15' T-Boom	32	0.631	0.0569	0.0041	114466

Bolt Design Data

Section No.	Elevation (ft)	Component Type	Bolt Grade	Bolt Size (in)	Number Of Bolts	Maximum Load per Bolt (lb)	Allowable Load (lb)	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	192.333	Leg	A325N	0.7500	4	325.56	29820.60	0.011 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	3	779.64	7952.16	0.098 ✔	1	Bolt Shear
		Horizontal	A325N	0.6250	3	497.36	12425.20	0.040 ✔	1	Bolt Shear
T2	182.167	Leg	A325N	0.7500	4	3161.69	29820.60	0.106 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	3	2452.47	7952.16	0.308 ✔	1	Bolt Shear
		Horizontal	A325N	0.6250	3	1218.29	12425.20	0.098 ✔	1	Bolt Shear
T3	162	Leg	A325N	0.8750	4	11357.00	40589.10	0.280 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	3	3098.73	7952.16	0.390 ✔	1	Bolt Shear
		Horizontal	A325N	0.6250	3	1754.13	12425.20	0.141 ✔	1	Bolt Shear
T4	141.833	Leg	A325N	1.0000	4	19375.70	53014.40	0.365 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	3	2968.50	7952.16	0.373 ✔	1	Bolt Shear
		Horizontal	A325N	0.6250	3	2009.62	12425.20	0.162 ✔	1	Bolt Shear
T5	121.625	Leg	A325N	1.0000	6	17265.00	53014.40	0.326 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	3	3844.74	7952.16	0.483 ✔	1	Bolt Shear
		Horizontal	A325N	0.6250	3	2288.41	12425.20	0.184 ✔	1	Bolt Shear
T6	101.417	Leg	A325N	1.0000	6	23062.90	53014.40	0.435 ✔	1	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Diagonal	A325N	0.6250	3	5808.65	12425.20	0.467 ✔	1	Bolt Shear
		Horizontal	A325N	0.7500	3	3807.42	17892.40	0.213 ✔	1	Bolt Shear
T7	81.2082	Leg	A325N	1.0000	6	30039.80	53014.40	0.567 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	3	5973.76	12425.20	0.481 ✔	1	Bolt Shear
		Horizontal	A325N	0.7500	3	4161.67	17892.40	0.233 ✔	1	Bolt Shear
T8	60.9999	Leg	A325N	1.0000	8	27530.10	53014.40	0.519 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	3	6259.07	12425.20	0.504 ✔	1	Bolt Shear
		Horizontal	A325N	0.7500	3	4593.57	17892.40	0.257 ✔	1	Bolt Shear
T9	40.6666	Leg	A325N	1.0000	8	32386.80	53014.40	0.611 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	3	6506.12	12425.20	0.524 ✔	1	Bolt Shear
		Horizontal	A325N	0.7500	3	5003.97	17892.40	0.280 ✔	1	Bolt Shear
T10	20.3333	Diagonal	A325N	0.6250	6	4769.29	12425.20	0.384 ✔	1	Bolt Shear
		Horizontal	A325N	0.7500	3	5379.05	17892.40	0.301 ✔	1	Bolt Shear

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	192.333 - 182.167	Leg	ROHN 2.5 STD	2	-2122.04	56631.20	3.7	Pass
T2	182.167 - 162	Leg	ROHN 2.5 STD	29	-15671.40	45132.70	34.7	Pass
T3	162 - 141.833	Leg	ROHN 3 STD	68	-50409.40	70434.00	71.6	Pass
T4	141.833 - 121.625	Leg	ROHN 4 STD	107	-84403.40	115687.00	73.0	Pass
T5	121.625 - 101.417	Leg	ROHN 5 EH	146	-112522.00	199811.00	56.3	Pass
T6	101.417 - 81.2082	Leg	ROHN 6 STD	173	-152502.00	202708.00	75.2	Pass
T7	81.2082 - 60.9999	Leg	ROHN 6 EH	200	-197874.00	302220.00	65.5	Pass
T8	60.9999 - 40.6666	Leg	ROHN 6 EH	227	-241949.00	301385.00	80.3	Pass
T9	40.6666 - 20.3333	Leg	ROHN 8 STD	254	-284892.00	332967.00	85.6	Pass
T10	20.3333 - 0	Leg	ROHN 8 STD	281	-305924.00	332963.00	91.9	Pass
T1	192.333 - 182.167	Diagonal	ROHN 1.5 STD	9	-2338.91	13001.30	18.0	Pass
T2	182.167 - 162	Diagonal	ROHN 1.5 STD	33	-7357.40	8755.79	84.0	Pass
T3	162 - 141.833	Diagonal	ROHN 2 STD	71	-8546.09	15700.50	54.4	Pass
T4	141.833 - 121.625	Diagonal	ROHN 2 EH	110	-8905.51	16964.30	52.5	Pass
T5	121.625 - 101.417	Diagonal	ROHN 2.5 STD	149	-11520.30	15972.30	72.1	Pass
T6	101.417 - 81.2082	Diagonal	ROHN 2.5 EH	176	-17426.00	17775.30	98.0	Pass
T7	81.2082 - 60.9999	Diagonal	ROHN 3 EH	203	-17921.30	31452.30	57.0	Pass
T8	60.9999 - 40.6666	Diagonal	ROHN 3 EH	230	-18777.20	27400.10	68.5	Pass
T9	40.6666 -	Diagonal	ROHN 3 STD	257	-19518.40	18913.20	103.2	Pass

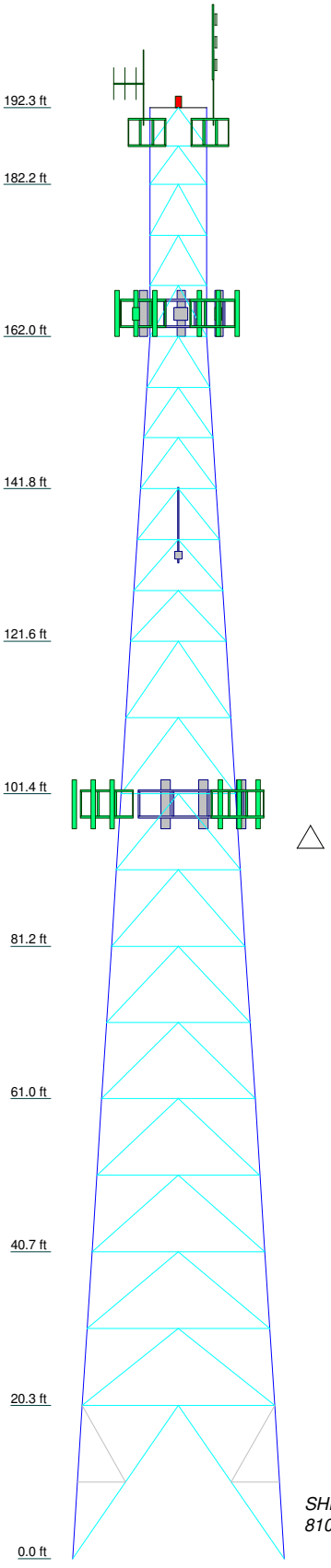
Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
	20.3333							
T10	20.3333 - 0	Diagonal	Rohn 2.875"x.552"	284	-28615.80	29533.20	96.9	Pass
T1	192.333 - 182.167	Horizontal	ROHN 1.5 STD	7	-1449.92	25150.70	5.8	Pass
T2	182.167 - 162	Horizontal	ROHN 1.5 STD	31	-3624.05	25150.70	14.4	Pass
T3	162 - 141.833	Horizontal	ROHN 1.5 STD	70	-5100.31	20971.10	24.3	Pass
T4	141.833 - 121.625	Horizontal	ROHN 2 EH	109	-6028.85	37168.20	16.2	Pass
T5	121.625 - 101.417	Horizontal	ROHN 2 EH	148	-6865.24	29606.80	23.2	Pass
T6	101.417 - 81.2082	Horizontal	ROHN 2 STD	175	-11422.30	16509.00	69.2	Pass
T7	81.2082 - 60.9999	Horizontal	ROHN 2.5 STD	202	-12478.60	28142.70	44.3	Pass
T8	60.9999 - 40.6666	Horizontal	ROHN 2.5 STD	229	-13767.20	21707.50	63.4	Pass
T9	40.6666 - 20.3333	Horizontal	ROHN 2.5 STD	256	-14963.20	17497.70	85.5	Pass
T10	20.3333 - 0	Horizontal	ROHN 2.5 STD	283	-16137.10	15731.30	102.6	Pass
T1	192.333 - 182.167	Top Girt	ROHN 1.5 STD	4	-316.86	25150.70	1.3	Pass
T10	20.3333 - 0	Redund Horz 1 Bracing	ROHN 1.5 STD	288	-5309.40	13524.50	39.3	Pass
T10	20.3333 - 0	Redund Diag 1 Bracing	ROHN 2 STD	293	-4873.43	8736.89	55.8	Pass
T10	20.3333 - 0	Redund Hip 1 Bracing	ROHN 2 STD	308	-93.91	24342.70	0.4	Pass
T10	20.3333 - 0	Redund Hip Diagonal Bracing	ROHN 2 STD	298	-63.02	4477.39	1.4	Pass
T1	192.333 - 182.167	Inner Bracing	L2x2x1/8	27	-5.49	7593.94	0.1	Pass
T2	182.167 - 162	Inner Bracing	L2x2x1/8	40	-6.30	7593.94	0.1	Pass
T3	162 - 141.833	Inner Bracing	L2x2x1/8	105	-10.67	7593.94	0.1	Pass
T4	141.833 - 121.625	Inner Bracing	L2x2x1/8	120	-8.43	3469.60	0.2	Pass
T5	121.625 - 101.417	Inner Bracing	L2x2x1/8	159	-8.17	2486.31	0.3	Pass
T6	101.417 - 81.2082	Inner Bracing	L2x2x1/8	186	-11.33	1773.07	0.6	Pass
T7	81.2082 - 60.9999	Inner Bracing	L3x3x1/4	213	-15.07	8754.32	0.2	Pass
T8	60.9999 - 40.6666	Inner Bracing	L3x3x1/4	240	-14.47	6800.49	0.2	Pass
T9	40.6666 - 20.3333	Inner Bracing	L3 1/2x3 1/2x1/4	267	-12.92	8765.33	0.3	Pass
T10	20.3333 - 0	Inner Bracing	ROHN 2.5 EH	310	-12.98	18687.20	0.2	Pass
						Summary	ELC:	Existing + Proposed + Future
						Leg (T10)	91.9	Pass
						Diagonal (T9)	103.2	Pass
						Horizontal (T10)	102.6	Pass
						Top Girt (T1)	1.3	Pass
						Redund Horz 1 Bracing	39.3	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
						(T10) Redund Diag 1 Bracing	55.8	Pass
						(T10) Redund Hip 1 Bracing	0.4	Pass
						(T10) Redund Hip Diagonal Bracing	1.4	Pass
						(T10) Inner Bracing (T6)	0.6	Pass
						Bolt Checks	61.1	Pass
						Rating =	103.2	Pass

APPENDIX C

Tower Elevation Drawing

Section	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	ROHN 8 STD		ROHN 6 EH		ROHN 6 STD	ROHN 5 EH	ROHN 4 STD	ROHN 3 STD	ROHN 2.5 STD	
Leg Grade				A572-50						
Diagonals	Rohn 2.875"x.552"	ROHN 3 STD		ROHN 3 EH	ROHN 2.5 EH	ROHN 2.5 STD	ROHN 2 EH	ROHN 2 STD	ROHN 1.5 STD	
Diagonal Grade	44 ksi			A572-50						
Top Girts				N.A.						A
Horizontals		ROHN 2.5 STD			ROHN 2 STD		ROHN 2 EH	ROHN 1.5 STD		
Red. Horizontals	ROHN 1.5 STD					N.A.				
Red. Diagonals	ROHN 2 STD					N.A.				
Red. Hips	ROHN 2 STD					N.A.				
Inner Bracing	ROHN 2.5 EH	L3 1/2x3 1/2x1/4		L3x3x1/4		L2x2x1/8				7.5
Face Width (ft) 28	25.42	22.86		20.3	15.18	12.62	10.06			2 @ 5.08335
# Panels @ (ft)	1 @ 20.3333	4 @ 10.1667			6 @ 10.1042		3 @ 6.7361	6 @ 6.72223		569.7
Weight (lb) 30214.5	5366.5	4651.5	4873.0	4604.3	2938.4	2726.3	2143.2	1326.4	1015.3	



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Flash Beacon Lighting	192.3	FRIA	165
8' Frame	189	RCMDC-4010-PF-48	165
8' Frame	189	2' Standoff	133
16 Element 20' x 2" Dipole	189	2" x 8' Omni	133
3 Element 18" x 12" Yagi	189	1' Square Dish	133
3" x 8' Omni	189	15' T-Boom	100
2" x 8' Omni	189	15' T-Boom	100
11.5' T-Frame	165	15' T-Boom	100
11.5' T-Frame	165	(3) 800-10865 w/ Mount Pipe	100
11.5' T-Frame	165	(3) 800-10865 w/ Mount Pipe	100
(3) APX17DWV-17DWV-S-E-ACU w/ Mount Pipe	165	(3) 800-10865 w/ Mount Pipe	100
		(3) RRUS-32	100
(3) APX17DWV-17DWV-S-E-ACU w/ Mount Pipe	165	(3) RRUS-32	100
		(3) RRUS-32	100
(3) APX17DWV-17DWV-S-E-ACU w/ Mount Pipe	165	RRUS 11	100
		RRUS 11	100
FRIG	165	RRUS 11	100
FRIG	165	DC6-48-60-18-8F Surge Suppression Unit	100
FRIG	165		
FXFB	165	DC6-48-60-18-8F Surge Suppression Unit	100
FXFB	165		
FXFB	165	DC6-48-60-18-8F Surge Suppression Unit	100
FRIA	165		
FRIA	165		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 1.5 STD		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	44 ksi	44 ksi	60 ksi

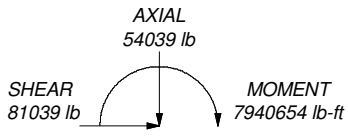
TOWER DESIGN NOTES

1. Tower is located in Broward County, Florida.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 132 mph basic wind in accordance with the TIA-222-G Standard.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 103.2%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 344819 lb
SHEAR: 47280 lb

UPLIFT: -313422 lb
SHEAR: 44863 lb



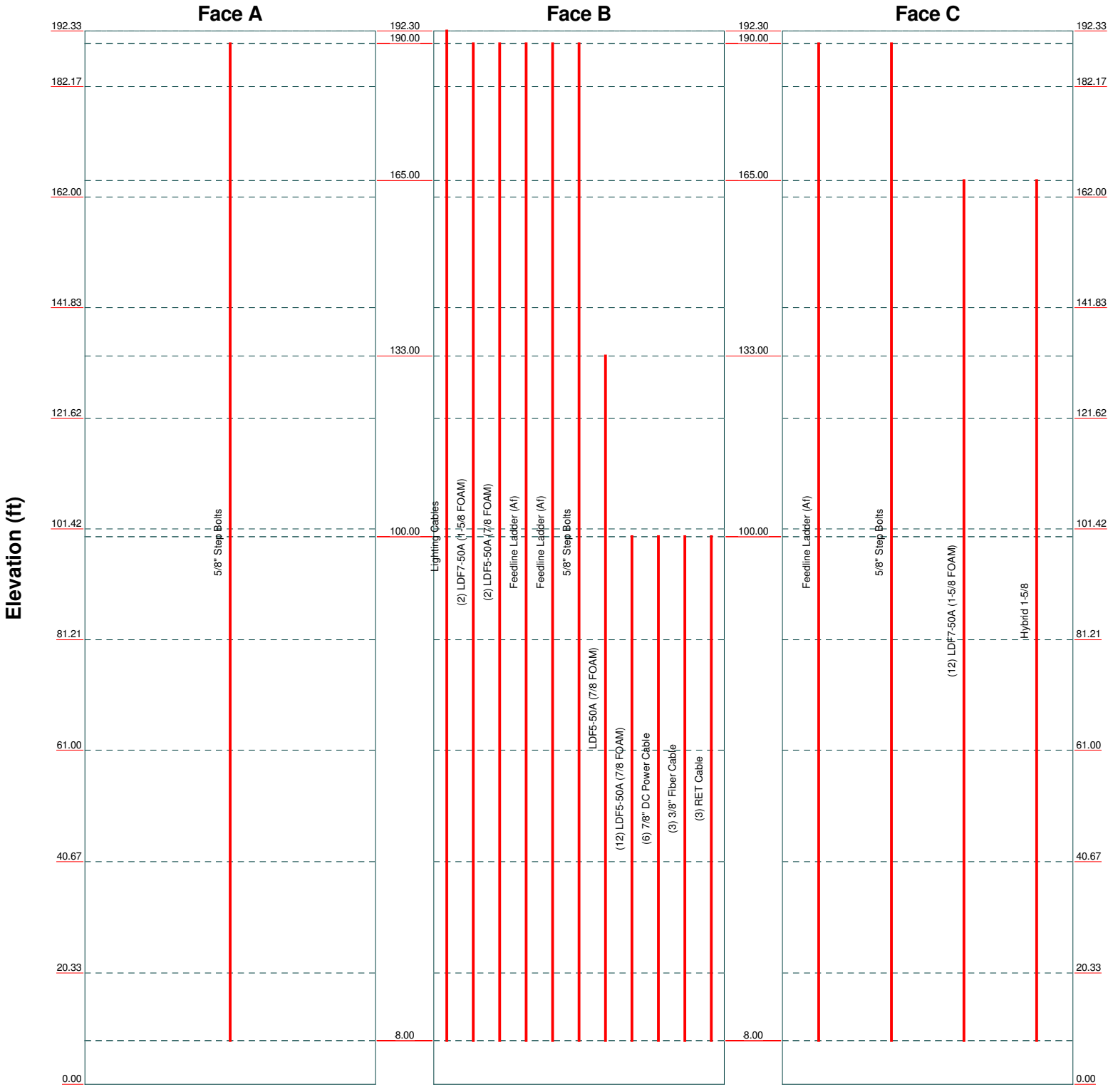
TORQUE 35972 lb-ft
REACTIONS - 132 mph WIND

GPD Group
520 South Main St. Suite 2531
Akron, OH 44311
Phone: (330) 572-2100
FAX: (330) 572-2101

Job: **6990 FL01**			
Project: **2013723.04.6990.02**			
Client: MasTec Network Solutions	Drawn by: mhoudeshell	App'd:	
Code: TIA-222-G	Date: 11/25/13	Scale: NTS	
Path: N:\2011\ATandT\6990\7 2013723 04 6990 02 Nsoro SA\TNX\6990.eri		Dwg No. E-1	

Feed Line Distribution Chart
0' - 192'3-31/32"

Round | Flat | App In Face | App Out Face | Truss Leg



GPD Group
520 South Main St. Suite 2531
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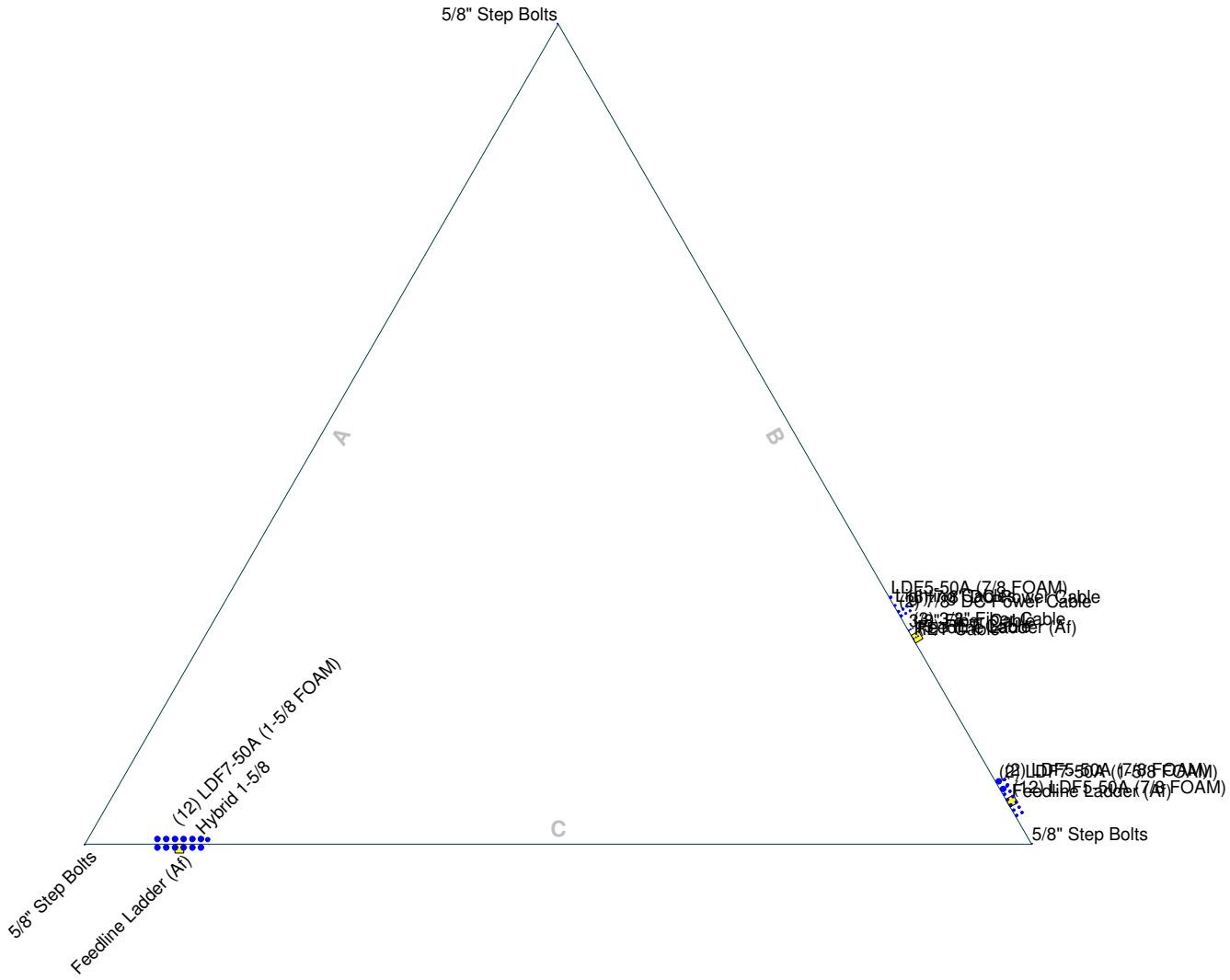
Phone: (330) 572-2100
FAX: (330) 572-2101

Job: ***6990 FL01***			
Project: ***2013723.04.6990.02***			
Client: MasTec Network Solutions	Drawn by: mhoudeshell	App'd:	
Code: TIA-222-G	Date: 11/25/13	Scale: NTS	
Path: N:\2011\ATandT\6990\7 2013723 04 6990 02 Nsoro SA\TNX\6990.eri		Dwg No. E-7	

Feed Line Plan

Round Flat App In Face App Out Face



GPD Group 520 South Main St. Suite 2531 Akron, OH 44311 Phone: (330) 572-2100 FAX: (330) 572-2101	Job: ***6990 FL01***		
	Project: ***2013723.04.6990.02***		
	Client: MasTec Network Solutions	Drawn by: mhoudeshell	App'd:
	Code: TIA-222-G	Date: 11/25/13	Scale: NTS
	Path: N:\2011\ATandT\6990\7 2013723 04 6990 02 Nsoro SA\TNX\6990.eri		Dwg No. E-7

APPENDIX D

Anchor Rod Analysis

Self Support Anchor Rod Analysis (Rev G)
6990 FL01
2013723.04.6990.02

Anchor Rod Check per Section 4.9.9 of TIA-222-G

Number of Anchor Rods=	8	
Anchor Rod Grade=	A354-BC	
Diameter of Anchor Rod=	1	in
V_u=	47.28	k
P_u=	344.819	k
F_{ub}=	125	ksi
A_n=	0.6060	in^2
R_{nt}=	75.75	k
ϕ=	0.8	
n=	0.5	**TIA-222-G Figure 4-4 & section 4.9.9**
Interaction=	0.9063	
Percent Capacity=	90.6%	**OK**

APPENDIX E

Foundation Analysis

GPD GROUP

Self Support Tower Caisson Analysis - Rev G
6990 FL01
2013723.04.6990.02 (skin friction adjusted to account for collar)

Tower Reactions		
Uplift	313.4	kips
Compression	344.8	kips

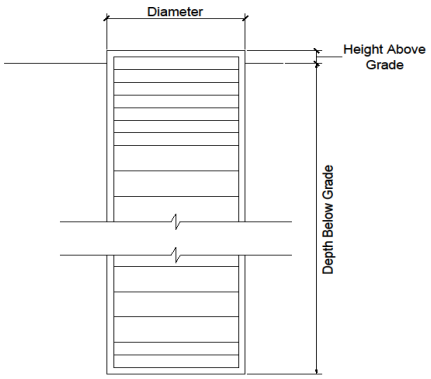
Overall Capacities		
Compression Capacity	142.5%	NG
Uplift Capacity	134.5%	NG
Reinforcement Capacity	61.6%	OK
As Min OK?	Yes	OK
Controlling Capacity	**142.5%**	**NG**

<--- Reinforcing steel unknown - minimums assumed (see report), field verification is recommended.

Caisson Details		
Diameter	4	ft
Height Above Grade	0.25	ft
Depth Below Grade	50.75	ft
Dead Load Factor	1.2	(TIA-222-G-1 Section 2.3.2)
Crossectional Area	12.6	ft^2
Perimeter	12.6	ft

Reinforcement Properties		
Reinforcing Known	No	
Vertical Bar Size	#8	
# of Existing Vertical Bars	12	
Horizontal Bar Type	Tie	
Horizontal Bar Size	#4	
Anchor Rod Embedment	110	in
Anchor Rod Circle	12	in
Min. Concrete Cover	3	in
f_c'	3000	psi
F_y	60	ksi

Soil Properties		
Water Table Depth	2	ft
Bearing Type	Net	
Ultimate End Bearing	4	ksf
ϕ (bearing)	0.75	(TIA-222-G-1 Section 9.4.1)
ϕ (skin friction - uplift)	0.75	(TIA-222-G-1 Section 9.4.1)
ϕ (skin friction - comp.)	0.75	(TIA-222-G-1 Section 9.4.1)



Soil Layer	Soil Layer Thickness (ft)	Ultimate Uplift Skin Friction (ksf)	Ultimate Compression Skin Friction (ksf)	Soil Unit Weight (kcf)	Concrete Dry Unit Weight (kcf)
1 (neglected)	3	0.000	0.000	0.105	0.150
2	2	0.198	0.282	0.105	0.150
3	2.75	0.520	0.748	0.115	0.150
4	2.25	0.136	0.000	0.115	0.150
5	2.75	0.218	0.000	0.115	0.150
6	7.25	0.218	0.312	0.115	0.150
7	10	0.322	0.458	0.110	0.150
8	10	0.428	0.610	0.115	0.150
9	10.75	0.536	0.766	0.115	0.150
Totals	50.75				

Soil Check

Soil Layer	Soil Layer Thickness (ft)	Effective Soil Unit Weight (kcf)	Effective Concrete Unit Weight (kcf)	Uplift Skin Friction Resistance (kips)	Compression Skin Friction Resistance (kips)	Effective Soil Weight Removed (kips)	Effective Concrete Weight Added (kips)
1 (neglected)	3.0	0.043	0.088	0	0	1.61	3.58
2	2.0	0.043	0.088	5	7	1.07	2.20
3	2.8	0.053	0.088	18	26	1.82	3.03
4	2.3	0.053	0.088	4	0	1.49	2.48
5	2.8	0.053	0.088	8	0	1.82	3.03
6	7.3	0.053	0.088	20	28	4.79	7.98
7	10.0	0.048	0.088	40	58	5.98	11.01
8	10.0	0.053	0.088	54	77	6.61	11.01
9	10.8	0.053	0.088	72	103	7.11	11.83
Totals	50.75			220.8	299.0	32.3	56.1

End Bearing Resistance:	37.7	kips	Caisson Weight Resistance:	67.4	kpis
Compression Skin Friction Resistance:	224.3	kips	Uplift Skin Friction Resistance:	165.6	kips
Total Compression Resistance:	262.0	kips	Total Uplift Resistance:	233.0	kips

Reinforcement Check

Compression			
A_{st}	9.4	in^2	
A_g	1809.6	in^2	
ϕ (compression)	0.7		(ACI 318-05 Section C.3.2.2)
ϕP_n	2887.3	k	(ACI 318-05 Section 10.3.6)
Compression Capacity	14.3%	**OK**	
Reinforcment Minimum			
A_g (effective)	904.7786842	in^2	(ACI 318-05 Section 10.8.4)
Compression A_s min. (in^2)	9.0	**OK**	(ACI 318-05 Section 10.9.1)
Tension			
Rebar Cage Diameter	40.0	in	
Rqr'd Development Lenth	54.8	in	(ACI 318-05 Section 12.2.2)
Development Length (in)	93.0	**OK**	
T_u	313.4	k	
Tensile Strength, ϕP_n (kip)	508.9		
Tensile Capacity	61.6%	**OK**	

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Sheet No. ____ Of ____ Checked By ____ Date ____

Caisson w/ Collar Check

TAX Reactions: Uplift = 313.422k
Compression = 344.819k

Collar Weight = $0.15(2.25')[(12'\times12') - (4^2)(\pi/4)] + 0.0876(5.75')[(12'\times12') - (4)^2(\pi/4)]$
= 44.36k + 66.20k = 110.56k

Uplift Check

resistance from Spreadsheet = 216.2k

total resistance = 216.2 + 0.9(110.56k) = 315.7k

Capacity = $\frac{313.422k}{315.7k} \times 100 = 99.3\%$

Compression Check

resistance from Spreadsheet = 262.0k

Collar Bearing = $[(12'\times12') - 4^2(\pi/4)](4ksf)(0.75) = 394.3k$

total resistance = 262k + 394.3k = 656.3k

Capacity = $\frac{344.819k + 1.2(110.56k)}{656.3k} \times 100 = 72.8\%$