AGENDA

Lake Park Town Commission
Town of Lake Park, Florida
Special Call Commission Meeting
Monday, March 21, 2016, 6:00 PM,
Lake Park Town Hall
535 Park Avenue

James DuBois	**—**	**Mayor**
Kimberly Glas-Castro	**—**	**Vice-Mayor**
Erin T. Flaherty	**—**	**Commissioner**
Michael O'Rourke	**—**	**Commissioner**
Kathleen Rapoza	**—**	**Commissioner**
Anne Lynch	**—**	**Commissioner-Elect**
John O. D'Agostino	**—**	**Town Manager**
Thomas J. Baird, Esq.	**—**	**Town Attorney**
Vivian Mendez, CMC	**—**	**Town Clerk**

PLEASE TAKE NOTICE AND BE ADVISED, that if any interested person desires to appeal any decision of the Town Commission, with respect to any matter considered at this meeting, such interested person will need a record of the proceedings, and for such purpose, may need to ensure that a verbatim record of the proceedings is made, which record includes the testimony and evidence upon which the appeal is to be based. ***Persons with disabilities requiring accommodations in order to participate in the meeting should contact the Town Clerk's office by calling 881-3311 at least 48 hours in advance to request accommodations.***

A. CALL TO ORDER/ROLL CALL

B. PLEDGE OF ALLEGIANCE

C. RESOLUTION(S) - ACCEPTING ELECTION RESULTS

1. RESOLUTION No. 13-03-16 Accepting the Certified Results of the Municipal Election **Tab 1**

A RESOLUTION OF THE TOWN COMMISSION OF THE TOWN OF LAKE PARK, FLORIDA, CERTIFYING THE RESULTS OF THE MUNICIPAL ELECTION HELD ON MARCH 15, 2016 FOR FOUR (4) COMMISSIONERS.

D. SWEARING IN CEREMONY:

2. Swearing in Ceremony for Commissioners Conducted by the Town Clerk **Tab 2**

E. 3. SELECTING A VICE-MAYOR: Tab 3

F. RESOLUTION:

4. Resolution No. 14-03-16 Designation of Signatories for Town Bank Accounts Tab 4

G. PUBLIC COMMENT:

This time is provided for addressing items that do not appear on the Agenda. Please complete a comment card and provide it to the Town Clerk so speakers may be announced. Please remember comments are limited to a TOTAL of three minutes.

H. QUASI-JUDICIAL HEARING(S):

******************OPEN PUBLIC HEARING ********************

5. Site Plan Application for a Proposed 125-foot Stealth "Yard Arm" Telecommunications Tower at the Lake Park Harbor Marina Tab 5

A. Staff Report
B. Public Comments
C. Commission Deliberation

*********** CLOSE PUBLIC HEARINGS*************

I. TOWN ATTORNEY, TOWN MANAGER, COMMISSIONER COMMENTS:

J. ADJOURNMENT:

Next Scheduled Regular Commission Meeting will be held on Wednesday, April 6, 2016

RG TOWERS SITE PLAN APPLICATION

AND ASSOCIATED DOCUMENTATION

LAKE PARK

Original Application

TOWN OF LAKE PARK
COMMUNITY DEVELOPMENT DEPARTMENT

APPLICATION FOR SITE PLAN REVIEW OR AMENDMENT

For Planned Unit Development (PUD) applications, please refer to Section 78-77 of the Town Code of Ordinances for additional requirements

Project Name: RGT Lake Park

Project Address: 105 Lake Shore Drive

Property Owner: Town of Lake Park

APPLICANT INFORMATION:

Applicant Name: RG Towers LLC

Applicant Address: 2141 AL+A1A S. Ste 440 Jupiter FL 33477

Phone: 561-748-0302 Fax: 561-748-0303 E-Mail: hvaldez@rgpartners.com

SITE INFORMATION:

General Location: Lake Park Marina

Address: 105 Lake Shore Dr.

Zoning District: P-Public Future Land Use: _____ Acreage: _____

Property Control Number (PCN): 36-43-42-21-00-004-0010

ADJACENT PROPERTY:

DIRECTION	ZONING	BUSINESS NAME	USE
North	R1AA	Lake Harbour Towers	0400 - Condo
East	NA	Water	NA
South	RS5	Various Owners	0100 Single Family
West	R2A	Harbour View Condo	0400 - Condo

JUSTIFICATION:

Information concerning all requests (attach additional sheets if needed)

1. Please explain the nature of the request:

RG Towers requests approval for 125' Stealth tower to meet growing demand of indoor, outdoor & in car coverage.

2. What will be the impact of the proposed change to the surrounding area?

A stealth Yardarm type tower will blend nicely with the surrounding area

3. How does the proposed Project comply with the Town of Lake Park's zoning requirements?

No variances are requested.

LEGAL DESCRIPTION:

The subject property is located approximately .12 mile(s) from the intersection of Lake Shore Dr & Cypress on the ___ north, ✓ east, ___ south, ___ west side of the Lake Shore Dr (street/road).

Legal Description:
21-42-43- PT of GOV LT 4 E OF LAKESHORE DR & WOF TOWN BULK HEAD LINE LYG BETWEEN ELY EXTENSION OF N LINE OF LT 17

I hereby certify that I am the owner(s) of record of the above described property or that I/we have written permission from the owner(s) of record to request this action.

S Ell — 2/10/15

OWNER/APPLICANT Signature — Date

PLEASE DO NOT DETACH FROM APPLICATION.

SIGNATURE REQUIRED BELOW.

Please be advised that Section 51-6 of the *Town of Lake Park Code of Ordinances* provides for the Town to be reimbursed, in addition to any application or administrative fees, for any supplementary fees and costs the Town incurs in processing development review requests.

These costs may include, but are not limited to, advertising and public notice costs, legal fees, consultant fees, additional Staff time, cost of reports and studies, NPDES stormwater review and inspection costs, and any additional costs associated with the building permit and the development review process.

For further information and questions, please contact the Community Development Department at 561-881-3318.

I, Scott Richard, have read and understand the regulations above regarding cost recovery.

~~Property Owner~~ Lessee Holder / Applicant Signature

2/10/15
Date

REVISED: 10/29/2013, previous versions obsolete

5. A description of the maintenance plan for the proposed structure and respective compound facilities is required.

RG Towers, LLC contracts with a national tower maintenance company for the upkeep of our tower locations

Routine Scope of Work performed

- Mow around all compounds & apply herbicides where necessary
- Mow site's parking areas, around utilities & apply herbicides
- Blow leaves out of compounds on each visit of the year (if necessary)
- Apply pre-emergence and contact herbicide in all SOW areas.
- Spray around compound
- Take full before & after photo documentation of all scope of work areas

(Prior to P&Z Board Meeting)

RG Towers Reply to Conditions of Approval

(1) Site Plan, Compound Plan, Notes Plan, Elevations Plans, Wood Fence Details Plan, Trench Details Plan, referenced as Sheets C-1 through C-7; and Electrical Plans referenced as Sheets E-1 through E-6; Landscaping Plan references as Sheet L-1; and Irrigation Plan referenced as Sheet IR-1; All prepared by Michael Phillips, Registered Engineer and Jason Rinard, Landscape Architect, of Caltrop Telecom, signed and sealed November 18, 2015 and received by the Department of Community Development on November 25, 2015.

REPLY: Acknowledged – sheets T-1, C-1, C-2 , L1 and IR-1 have been revised 1/14 and are being submitted at this time.

(2) The Insurance liability limits in the Lease Option Agreement fall within the Town's minimum requirements. The requirement of a waiver of subrogation is also a well-reasoned inclusion. They will be required to send a technician to exact repairs from time to time. This technician will have to be on Lake Park property in order to complete his/her appointed repairs on the Tower. The Town needs to be certain that the tenant maintains an active workers' compensation policy in case their technicians should injure themselves in the course of those repairs while on Lake Park property. We do not see any language in the insurance section of the agreement referring to a workers' compensation. Therefore, we would recommend adding a requirement for evidence of workers' compensation insurance, also to include a waiver of subrogation.

REPLY: RG Towers feels like the existing insurance provisions from the ground lease meet the requirements and waiver of subrogation is already in section 11b. of the ground lease

(3) Renderings identifying the future ground space needs for future collocators should be identified prior to Town Commission review.

REPLY: A Phase II has been identified on the Site Plan which shows the potential location for future collocators, all subject to additional Town review of approval.

(4) Applicant shall upgrade the proposed landscape to incorporate material that exists within the surrounding area. The proposed materials should include:

a. Under-planting material to include seagrape and saw palmetto and/or other existing material types that blend planting beds north of the proposed lease area.

b. Planting design shall take into account the existing bed lines and incorporate into an overall design which compliments the park.

c. Canopy palm trees top include Royal Palms, clusters of Coconut Palms or Gumbo Limbo; Materials to be a size that exceeds code and matches the existing size, spacing and height.

d. Design to be reviewed and approved by Town Staff.

REPLY: The landscape plan has been revised according to Planning and Zoning request, the Plan now includes Gumbo Limbo trees.

(5) Applicant shall modify the fence details to incorporate decorative elements that soften the fence aesthetics.

REPLY: The fence will be completely screened from the Cocoplum hedge, decorative features are not required and will not match an adjacent existing wood fence around dumpster enclosure.

(6) The Applicant modify the plans to utilize its approved leased area for the required landscaping and be responsible for its maintenance and that these revised plans are submitted to the Town prior to Town Commission consideration. Separate irrigation meters will also be required.

REPLY: The lease area will not be modified; the proposed plan complies with Exhibit "B" from the Lease. The applicant will utilize a separate meter if feasible. Otherwise, the applicant will pay the Town for usage pursuant to Section 7(d) of the Lease.

(7) A Letter of Credit (LOC) is required for the construction and restoration of the site. The applicant must submit a LOC prior to the issuance of any development permit. The LOC requires Town Attorney review and approval. Cost estimates for construction and restoration should accompany the LOC since the amount on the LOC will need to be 110% of these values.

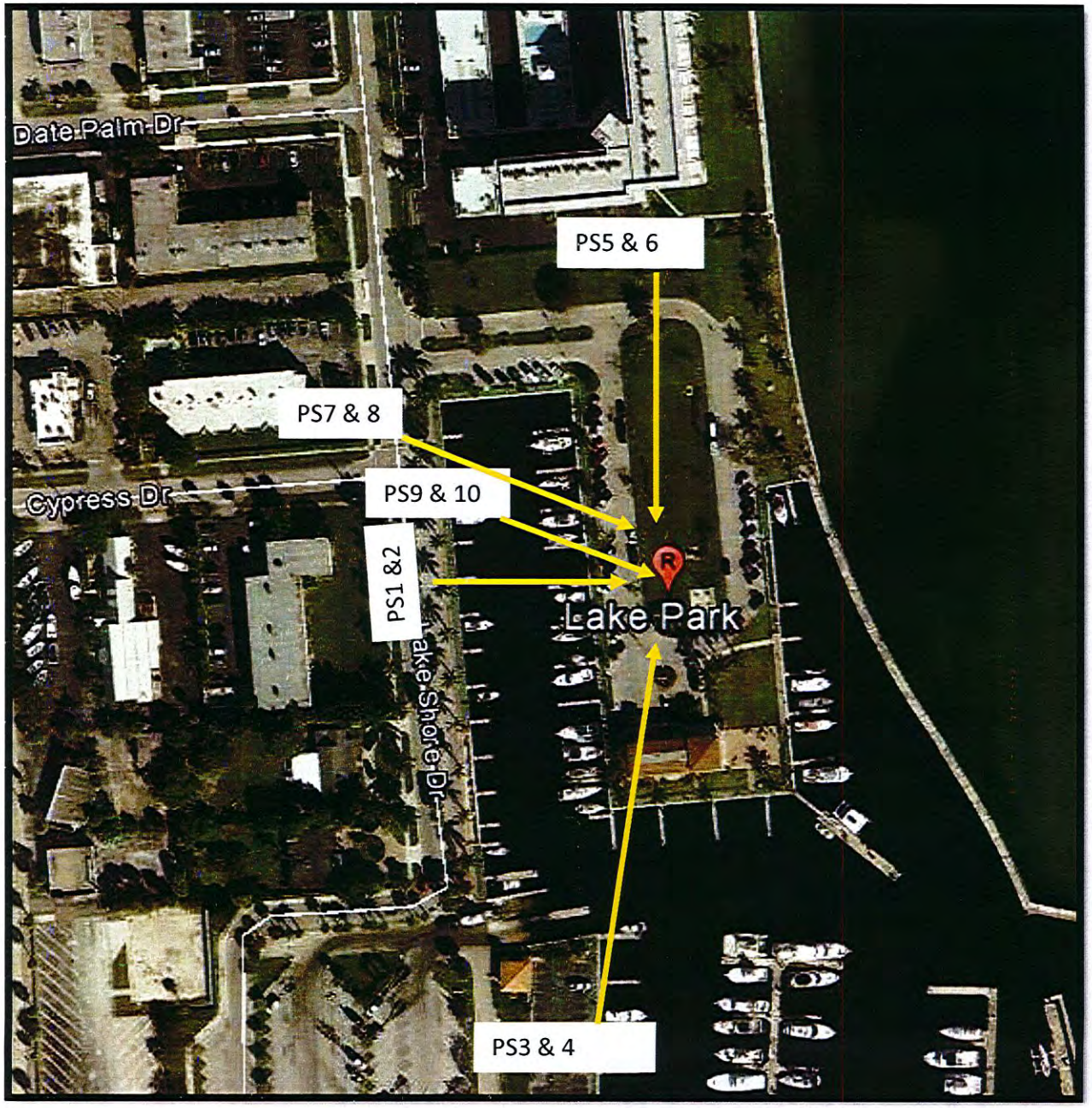
REPLY: A Letter of Credit for 110% of the value will be provided at issuance of building permit

(8) If the Tower is approved with flag that require lighting, a Photometric Plan must be submitted prior to the issuance of any development permit.

REPLY: If the Town chooses an American Flag design the American Flag will be lit at night. If the town chooses to proceed without an American flag or to just install nautical flags no lighting will be necessary.

(9) Cost Recovery. All fees and costs, including legal fees incurred by the Town in reviewing the Application and billed to the Owner shall be paid to the Town within 10 days of receipt of an invoice from the Town. Failure by an Owner or an Applicant to reimburse the Town within the 10 day time period may result in the suspension of any further review of plans or building activities, and may result in the revocation of the approved Development Order.

REPLY: The applicant will comply with the Town's Cost Recovery Regulations as outlined in the Town Code. RG Towers requests that the town provide applicant of accounting to date as well as send physical invoices going forward.



PS1 &PS2
Approximately 251' west of tower location
Looking east from 220 Lake Shore Drive
2 Floors

PS3 & PS4
Approximately 590' south of tower location
Looking north from Marina Office
1 floor

PS5 & PS6
Approximately 325' north of tower location
Looking south from 301 Lake Shore Drive
8 floors

PS7 & PS8
Approximately 340' NW of tower location
Looking east from 302 Lake Shore Drive
2 floors

PS9 & PS10
Approximately 245' NW of tower location
Looking SE from west-side marina walkway

REV	DATE	DESCRIPTION
0	3/25/14	FOR REVIEW

PROJECT NO.: 110-441.01

DRAWN BY:	CHECKED BY:
M. GOMEZ	M. ABREY

CALTROP Telecom

T··Mobile·
stick together

LAKE PARK MARINA

WP1273D

SHEET NAME

EXISTING STREETSCAPE FACING EAST

SHEET NUMBER

PS1

REV	DATE	DESCRIPTION
0	2/25/14	FOR REVIEW

PROJECT NO.: 110-441.01

DRAWN BY:	CHECKED BY:
W. CORTEZ	M. ABBEY

CALTROP Telecom

T-Mobile stick together

LAKE PARK MARINA

WP1273D

SHEET NAME

PROPOSED STREETSCAPE FACING EAST

SHEET NUMBER

PS2

REV	DATE	DESCRIPTION
0	12/29/14	FOR REVIEW

PROJECT NO.:	110-441.21
DRAWN BY:	CHECKED BY:
# COPIES:	## ASSY:

CALTROP Telecom
8400 LANDER DRIVE
SUITE 300
SARASOTA, FL 34231
CERTIFICATE OF AUTHORIZATION 29174

T-Mobile
stick together
1300 CONCORD TERRACE
SUITE 350
SUNRISE, FL 33323

LAKE PARK MARINA

WP12730

110 LAKE SHORE DRIVE
LAKE PARK, FL 33403

SHEET NAME:

EXISTING STREETSCAPE FACING NORTH

SHEET NUMBER:

PS3

REV	DATE	DESCRIPTION
4	12/15/14	FOR REVIEW

PROJECT NO.: 110-441.01

DRAWN BY: | CHECKED BY:

R. CORTEZ | M. ABBEY

CALTROP Telecom

T··Mobile·
stick together

LAKE PARK MARINA

WP12730

SHEET NAME

PROPOSED STREETSCAPE FACING NORTH

SHEET NUMBER

PS4

Lake Park Marina

105 Lake Shore Drive
Lake Park, FL 33403

View looking
South from 301
Lake Shore Drive

PS5

Lake Park Marina

105 Lake Shore Drive
Lake Park, FL 33403

View looking
South from 301
Lake Shore Drive

PS6

Lake Park Marina

105 Lake Shore Drive
Lake Park, FL 33403

View looking East from 302 Lake Shore Drive

PS7

Lake Park Marina

105 Lake Shore Drive
Lake Park, FL 33403

View looking East from 302 Lake Shore Drive

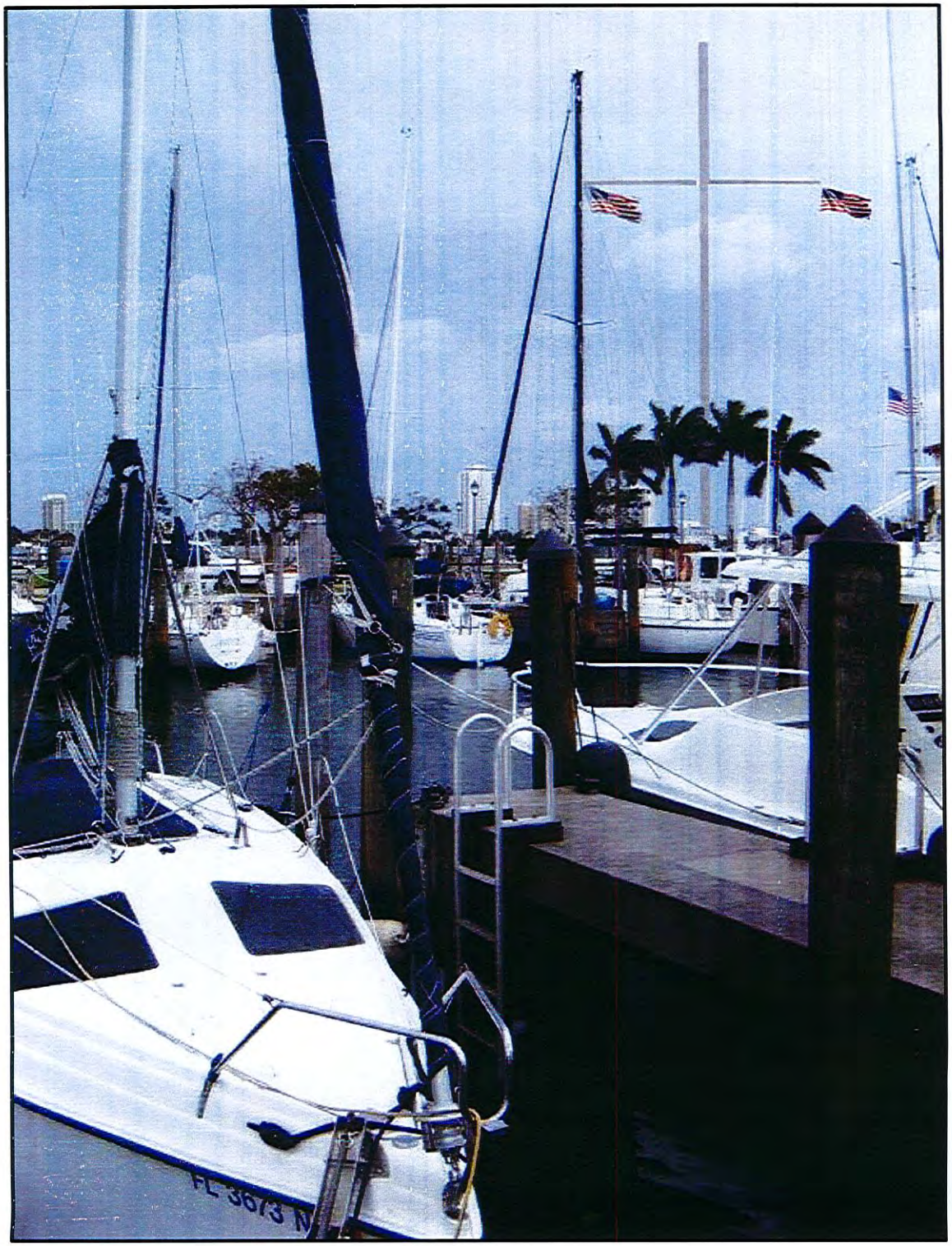
PS8

Lake Park Marina

105 Lake Shore Drive
Lake Park, FL 33403

View looking
From west-side
marina walkway

PS9



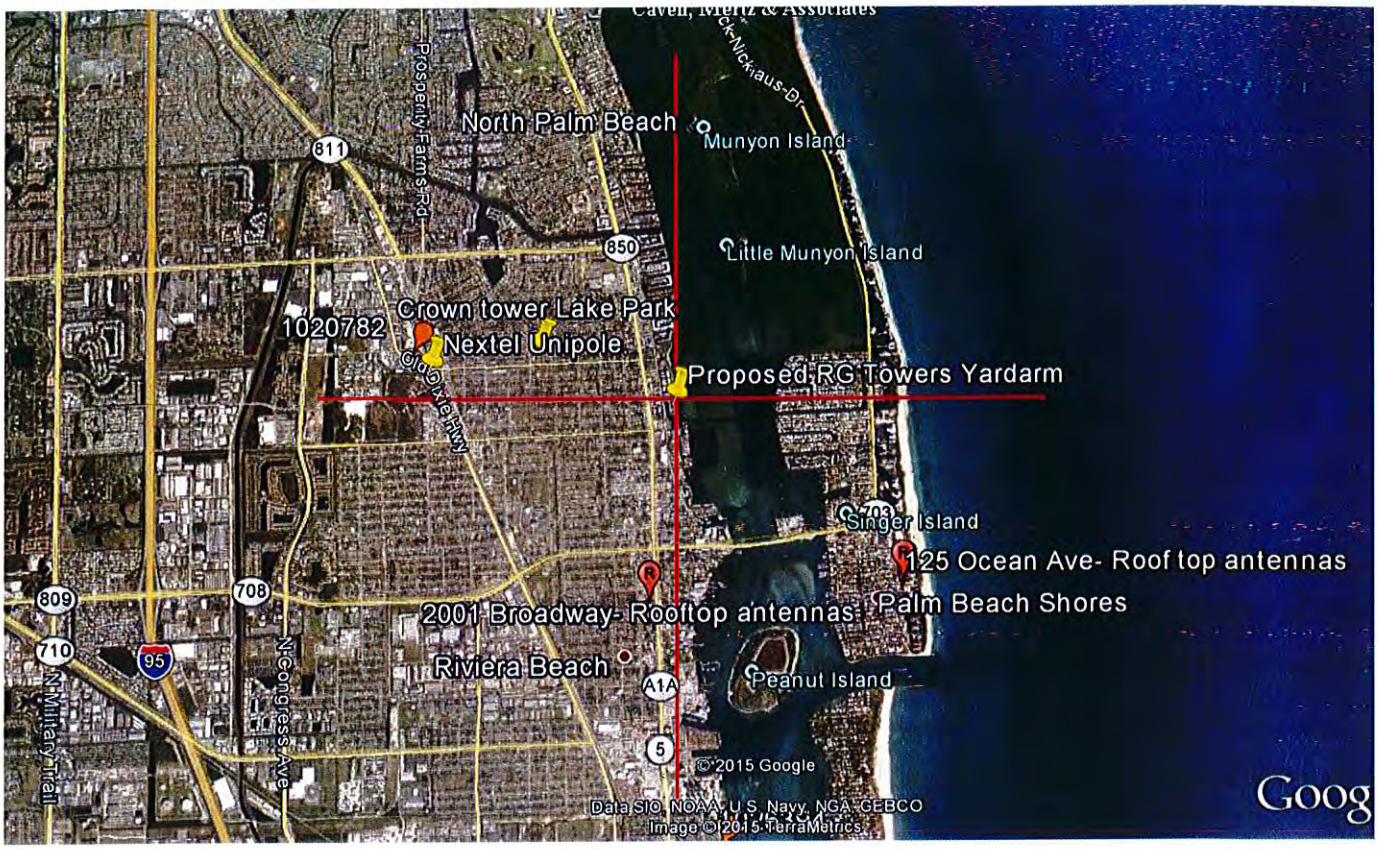
Lake Park Marina

105 Lake Shore Drive
Lake Park, FL 33403

View looking
From west-side
marina walkway

PS10

Lake Park Competitive Analysis



Reg Number	Tower Owner	Distance	Height	Tower Type	Carriers	Address	Comments
Unregistered	Nextel Corp South	1.37 mi	150'	Unipole	unknown	640 Old Dixie Highway, Lake Park FL	Decommissioned per Lake Park Attorney
1020782	SpectraSite Communications, LLC. through American Towers, LLC	1.46 miles	482	Self-Support Tower	1 or 2	1115 Old Dixie Hwy (302758) W. Palm Beach, FL	Provides strong indoor coverage levels for approximately one mile at which point service levels start to become inadequate
unregistered	Crown Castle	0.82 mile	125'	Monopole	1	535 Park Avenue, Lake Park, FL 33403	This non stealth unregistered monopole is .8 miles West of the Marina and the site will not adequately solve low signal areas

Lake Park Competitive Analysis

Rooftop	T-Mobile	1.04 miles		Roof top antennas	1	2001 Broadway, Riviera Beach FL	This rooftop antenna installation works well for approximately three quarters of a mile but the signal strength has dropped off significantly by E/W 28th ST
Rooftop	T-Mobile	1.56 miles		Roof top antennas	1	125 Ocean Ave, Palm Beach Shores FL	This rooftop facility provides good levels to the vicinity but levels across the water to the west are too weak for reliable service.

RG TOWERS, LLC.

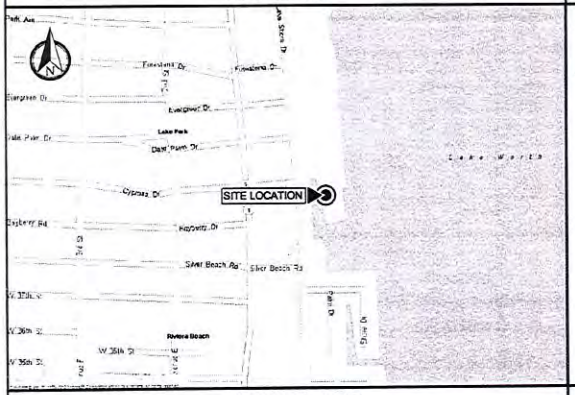
LAKE PARK MARINA

105 LAKE SHORE DRIVE
LAKE PARK, FL 33403

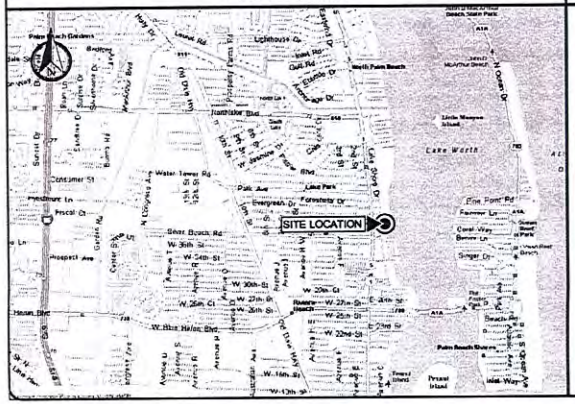
SFL13

NEW SITE BUILD

LOCAL MAP



VICINITY MAP



PROPERTY SUMMARY

FOLIO

36-43-42-21-00-004-0010

PROPERTY OWNER

TOWN OF LAKE PARK
535 PARK AVENUE
WEST PALM BEACH, FL 33403

LATITUDE

26.794194°N

LONGITUDE

80.052242°W

ZONING JURISDICTION

CITY OF LAKE PARK

DESIGN CRITERIA

DESIGN WIND SPEED: 169 MPH (ULTIMATE, 3-SECOND GUST)
131 MPH (NOMINAL, 3-SECOND GUST)

EXPOSURE: C
RISK CATEGORY: II
OPEN STRUCTURE

PROJECT DESCRIPTION

1. THE WIRELESS COMMUNICATIONS FACILITY IS NOT INTENDED FOR HUMAN OCCUPANCY.
2. THIS FACILITY DOES NOT REQUIRE POTABLE WATER AND WILL NOT PRODUCE ANY SEWAGE.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
4. THE SCOPE OF WORK CONSISTS OF:
   - INSTALLATION OF NEW TELECOMMUNICATIONS TOWER
   - INSTALLATION OF NEW FENCED COMPOUND

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.

INDEX OF DRAWINGS

SHT. NO.	DESCRIPTION	REV. NO.
T1	TITLE SHEET	4
T2	NOTES	0
C1	SITE PLAN	4
C2	COMPOUND PLAN	3
C3	ELEVATION	2
C4	WOOD FENCE DETAILS	1
C5	TRENCH DETAIL	2
C6	SIGNAGE DETAILS	1
C7	COMPOUND DETAIL	1
E1	ELECTRICAL NOTES	0
E2	GROUNDING NOTES	0
E3	UTILITY ROUTING SITE PLAN	1
E4	ONE-LINE DIAGRAM	0
E5	GROUNDING PLAN AND NOTES	2
E6	ELECTRICAL DETAILS	1
L1	LANDSCAPING PLAN	1
IR1	IRRIGATION PLAN	0

REV	DATE	DESCRIPTION
A	12/18/14	PRELIMINARY
0	1/27/15	FOR PERMIT
1	7/14/15	REVISED
2	9/28/15	REVISED
3	11/18/15	REVISED
4	1/14/16	REVISED

PROJECT NO.: 14-1004.01

DRAWN BY:	CHECKED BY:
F. PARRADO	M. ABBEY

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

RG TOWERS, LLC.
2141 ALTERNATE A1A, SOUTH
SUITE 440
JUPITER, FL 33477

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

DATE OF SIGNATURE: 1/14/16

LAKE PARK MARINA
SFL13
105 LAKE SHORE DRIVE
LAKE PARK, FL 33403

SHEET NAME
TITLE SHEET

SHEET NUMBER
T1

GENERAL NOTES

1. FOR THE PURPOSES OF THESE CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
   - OWNER – RG TOWERS, LLC
   - 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. CONSTRUCTION STAGING AREA SHALL BE LOCATED INSIDE THE LEASE AREA OF 750 SQ FT AS DEPICTED ON SHEET C1. CONTRACTOR SHALL RESTORE AREAS DISTURBED DURING CONSTRUCTION TO EXISTING OR BETTER CONDITION (INCLUDING RE–SODDING).
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, LANDSCAPING, 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 TEN (10) 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.

SITE WORK NOTES

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. ANY DISTURBANCE SHALL BE REPAIRED AND RESTORED BY CONTRACTOR
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.

STRUCTURAL STEEL NOTES

1. ALL STRUCTURAL STEEL WORK SHALL CONFORM TO THE LATEST EDITION OF THE AISC "STEEL CONSTRUCTION MANUAL".
2. MATERIAL:
   A. ALL STRUCTURAL STEEL WF BEAMS SHALL BE ASTM A992 AND "HOT DIPPED" GALVANIZED IN ACCORDANCE WITH ASTM A123 AND ASTM A153 STANDARDS.
   B. ALL STRUCTURAL PLATES, ANGLES, AND CHANNELS SHALL BE ASTM A36 AND "HOT DIPPED" GALVANIZED IN ACCORDANCE WITH ASTM A123 AND ASTM A153 STANDARDS, UNLESS NOTED OTHERWISE.
   C. ALL TS MEMBERS SHALL BE ASTM A500 GRADE B (Fy=46ksi), AND "HOT DIPPED" GALVANIZED IN ACCORDANCE WITH ASTM A123 AND ASTM A153 STANDARDS.
   D. 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, UNLESS NOTED OTHERWISE
   E. ALL NON–STRUCTURAL PIPE MEMBERS SHALL BE ASTM A53 GRADE B, AND "HOT DIPPED" GALVANIZED IN ACCORDANCE WITH ASTM A123 AND ASTM A153 STANDARDS.
3. DESIGN, FABRICATION, AND CONSTRUCTION OF ALL CONNECTIONS SHALL CONFORM TO AISC STEEL CONSTRUCTION MANUAL.
4. 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.
5. 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.
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 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 WATER 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.

REV	DATE	DESCRIPTION
A	12/18/14	PRELIMINARY
0	1/27/15	FOR PERMIT
1	11/18/15	REVISED

PROJECT NO.:	14–1004.01
DRAWN BY:	CHECKED BY:
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CERTIFICATE OF AUTHORIZATION 29214

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

DATE OF SIGNATURE: 1/14/16

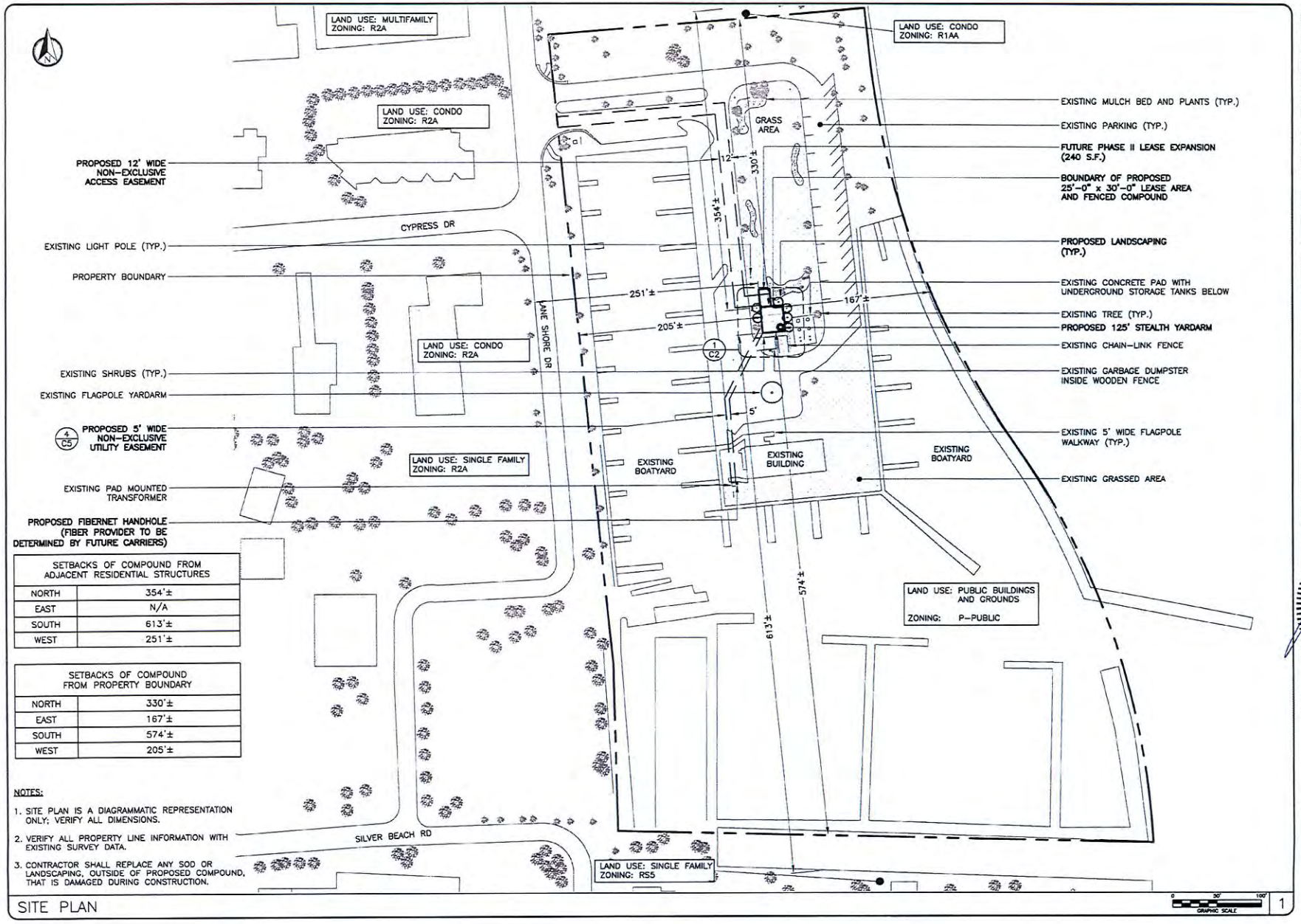
LAKE PARK MARINA

SFL13

105 LAKE SHORE DRIVE
LAKE PARK, FL 33403

SHEET NAME
NOTES

SHEET NUMBER
T2



SETBACKS OF COMPOUND FROM ADJACENT RESIDENTIAL STRUCTURES	
NORTH	354'±
EAST	N/A
SOUTH	613'±
WEST	251'±

SETBACKS OF COMPOUND FROM PROPERTY BOUNDARY	
NORTH	330'±
EAST	167'±
SOUTH	574'±
WEST	205'±

NOTES:

1. SITE PLAN IS A DIAGRAMMATIC REPRESENTATION ONLY; VERIFY ALL DIMENSIONS.
2. VERIFY ALL PROPERTY LINE INFORMATION WITH EXISTING SURVEY DATA.
3. CONTRACTOR SHALL REPLACE ANY SOD OR LANDSCAPING, OUTSIDE OF PROPOSED COMPOUND, THAT IS DAMAGED DURING CONSTRUCTION.

SITE PLAN

1

REV	DATE	DESCRIPTION
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0	1/27/15	FOR PERMIT
1	7/14/15	REVISED
2	9/28/15	REVISED
3	11/18/15	REVISED
4	1/14/16	REVISED

PROJECT NO.: 14-1004.01

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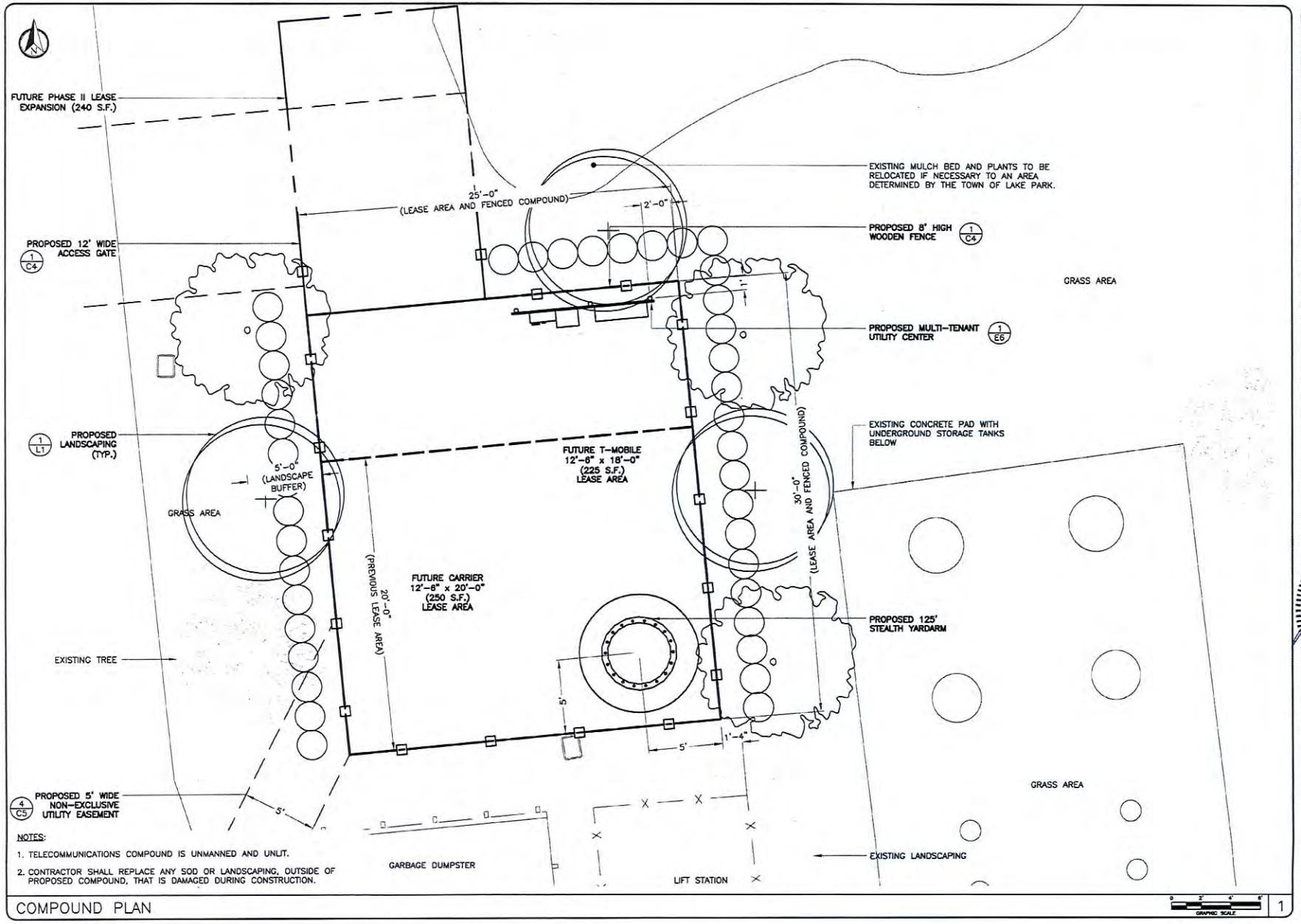
SFL13

105 LAKE SHORE DRIVE
LAKE PARK, FL 33403

SHEET NAME
SITE PLAN

SHEET NUMBER
C1



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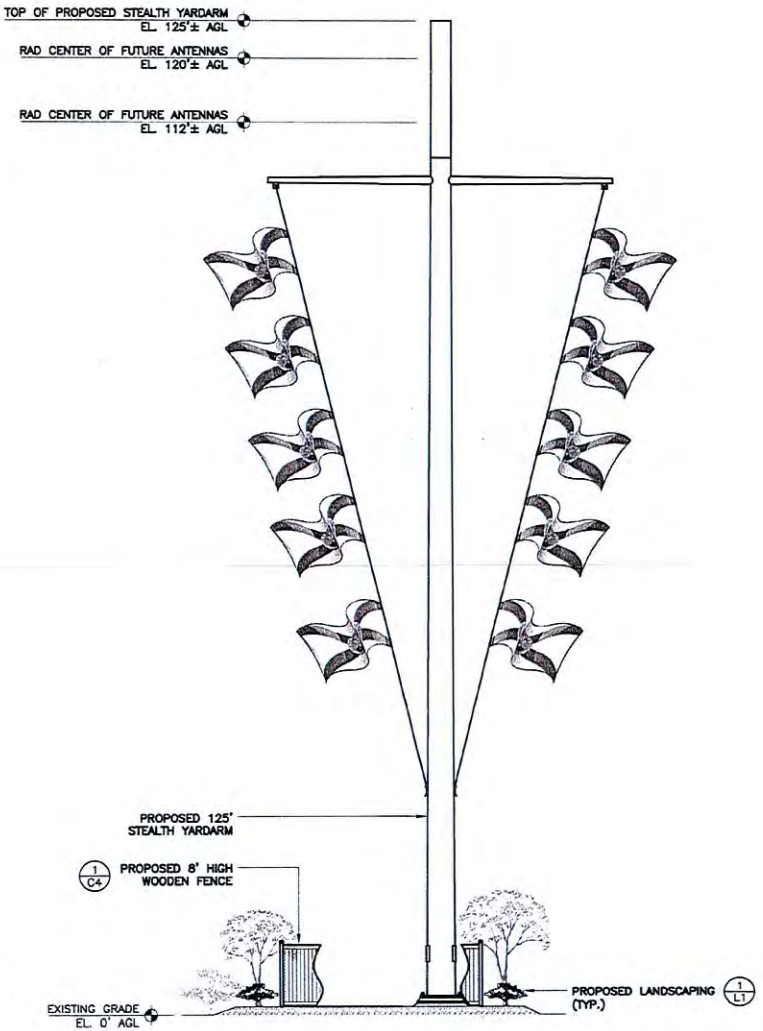
SHEET NAME
COMPOUND PLAN

SHEET NUMBER
C2



NOTES:

1. TOWER SHALL BE PAINTED WHITE WITH COLOR/FINISH APPROVED BY TOWN OF LAKE PARK.
2. FLAG TYPE AND QUANTITY TO BE DETERMINED BY THE TOWN OF LAKE PARK.
3. TOWER LIGHTING SHALL BE DETERMINED WHEN FLAG TYPE IS DETERMINED.
4. FLAG SHALL BE MAINTAINED BY RG TOWERS, LLC

ELEVATION

GRAPHIC SCALE 0 5 10 15

1

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LAKE PARK MARINA

SFL13

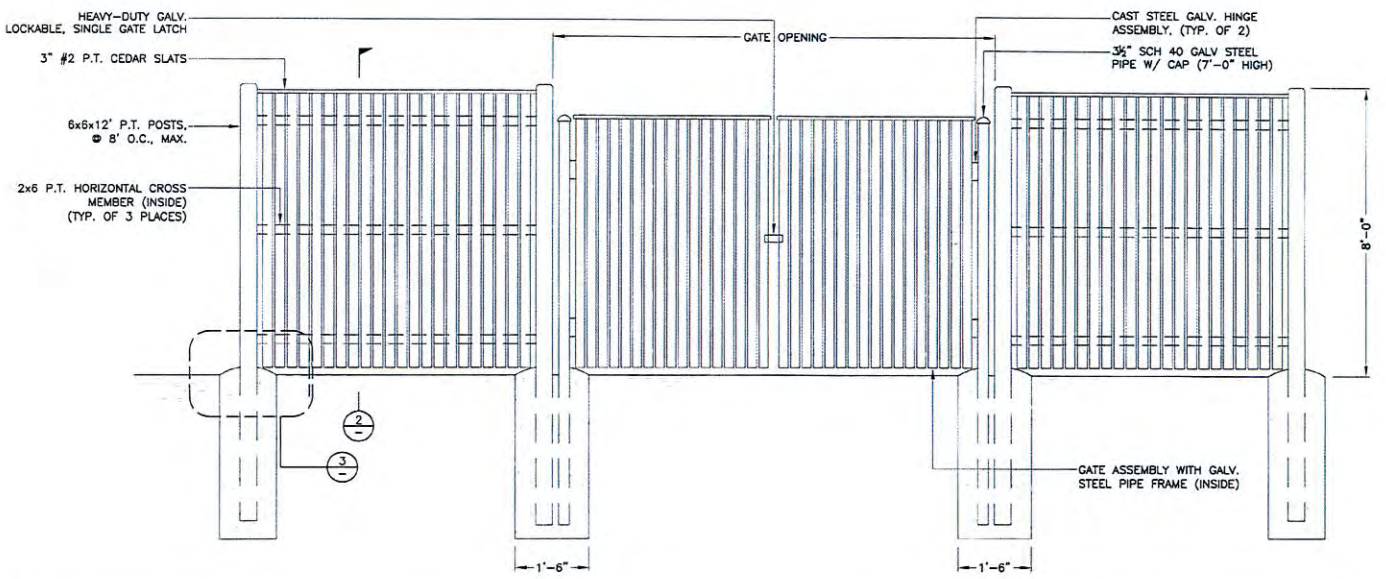
105 LAKE SHORE DRIVE
LAKE PARK, FL 33403

SHEET NAME

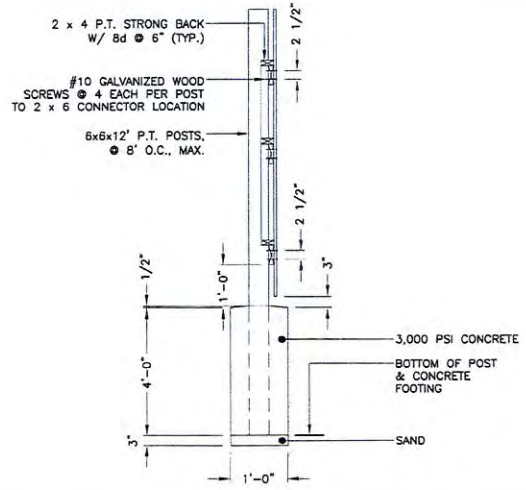
ELEVATION

SHEET NUMBER

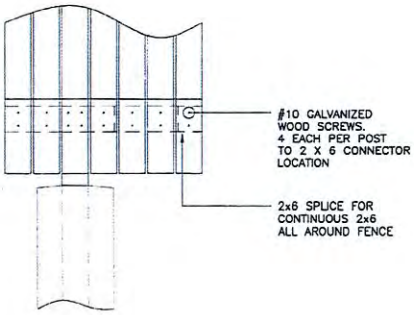
C3



WOOD FENCE AND MAIN GATE DETAIL — NTS — 1



FENCE DETAIL — NTS — 2



FENCE DETAIL — NTS — 3

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SFL13

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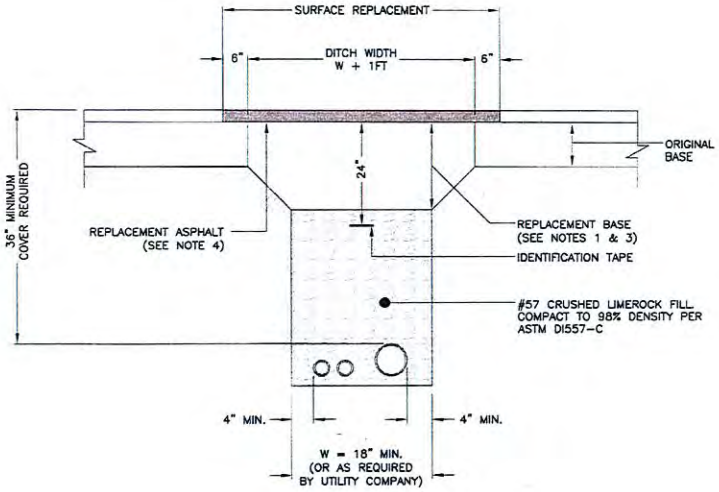
LAKE PARK, FL 33403

SHEET NAME
WOOD FENCE DETAILS

SHEET NUMBER
C4

1. REPLACEMENT BASE MATERIAL OVER DITCH SHALL BE TWICE THE THICKNESS OF THE ORIGINAL BASE OR 12" MINIMUM, WHICHEVER IS GREATER.
2. ASPHALT CONCRETE PAVEMENT JOINTS SHALL BE MECHANICALLY SAWED AND BUTT-JOINTED.
3. BASE MATERIAL (PER ROADWAY PRODUCTION DESIGN STANDARDS) SHALL BE PLACED IN 6" MAX LAYERS AND EACH LAYER THOROUGHLY ROLLED OR TAMPED TO 98% DENSITY PER ASTM D1557-C.
4. REPLACEMENT ASPHALT MATERIAL SHALL MATCH EXISTING ASPHALT THICKNESS OR 1.5" MINIMUM, WHICHEVER IS GREATER.

TRENCH NOTES | 1



TRENCH DETAIL | NTS | 2

(NOT USED) | 3

(NOT USED) | 4

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105 LAKE SHORE DRIVE
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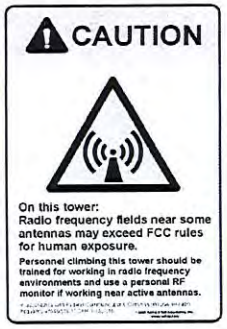
SHEET NAME
TRENCH DETAIL

SHEET NUMBER
C5

NO TRESPASSING SIGN NTS 1

FCC REGISTRATION SIGN NTS 2



RF WARNING SIGN NTS 3

1. SIGNS SHALL BE MADE OF UV-RESISTANCE SOLID PLASTIC W/ ¼" DRILLED HOLES ½" FROM EACH CORNER TO HANG SIGNS.
2. SIGNS SHALL BE INSTALLED AS FOLLOWS:
   - 2.1. GATE: FCC TOWER REGISTRATION NUMBER
   - 2.2. NO TRESPASSING
   - 2.3. RF WARNING
   - 2.4. A "NO TRESPASSING" SIGN SHALL BE INSTALLED IN THE CENTER OF EACH SIDE OF THE COMPOUND THAT DOES NOT HAVE A GATE, AND SPACED NO MORE THAN 40' APART.
   - 2.5. SIGNS SHALL BE INSTALLED ON POLE IN FRONT OF SHRUBS AT A HEIGHT TO MATCH EXISTING POST SIGN.
   - 2.6. IF SIGNS ARE OBSTRUCTED BY LANDSCAPING, THE SIGNS SHALL BE INSTALLED ON POLE.

SIGNAGE NOTES 4

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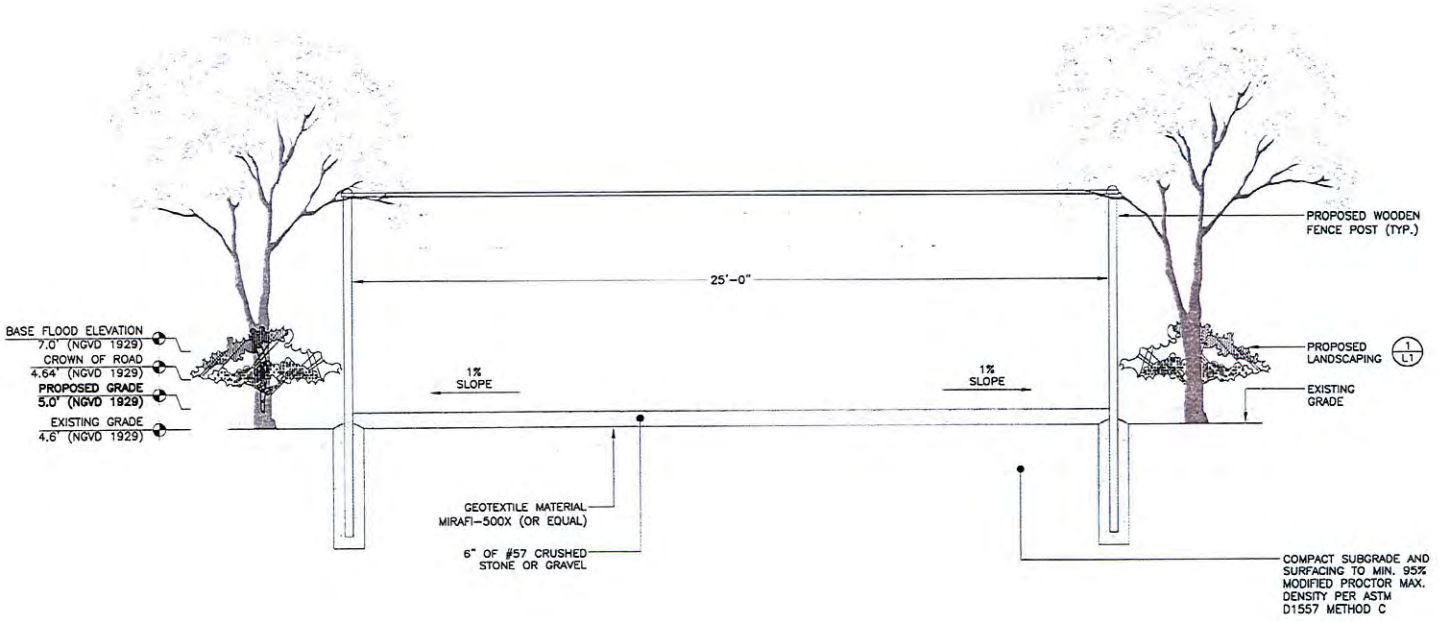
SHEET NAME
SIGNAGE DETAILS

SHEET NUMBER
C6



SITE COMPOUND CROSS SECTION

NTS | 1

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LAKE PARK MARINA

SFL13

105 LAKE SHORE DRIVE
LAKE PARK, FL 33403

SHEET NAME
COMPOUND DETAIL

SHEET NUMBER
C7

A – GENERAL

A1. ALL ELECTRICAL WORK SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE (EDITION ADOPTED BY LOCAL JURISDICTION) AND APPLICABLE LOCAL CODES.

A2. GROUNDING SHALL COMPLY WITH ARTICLE 250 OF THE NATIONAL ELECTRIC CODE.

A3. ALL ELECTRICAL EQUIPMENT AND ACCESSORIES SHALL BE U.L. APPROVED OR LISTED.

A4. ALL POWER WIRING SHALL BE STRANDED COPPER, TYPE THHN/THHW, AND 90 DEGREES C RATED.

A5. GROUNDING ELECTRODE CONDUCTORS SHALL BE BARE, TIN COATED COPPER AND EQUIPMENT GROUND CONDUCTORS SHALL BE GREEN INSULATED, UNLESS OTHERWISE NOTED.

A6. ALL POWER WIRING SHALL BE INSTALLED IN GALVANIZED RIGID STEEL CONDUIT, PVC, OR FLEXIBLE LIQUIDTIGHT CONDUIT, AS INDICATED.

A7. CONTRACTOR SHALL OBTAIN ALL PERMITS, PAY PERMIT FEES, AND SCHEDULE INSPECTIONS.

A8. CONTRACTOR SHALL APPLY FOR ELECTRICAL SERVICE AS SOON AS POSSIBLE AND COORDINATE REQUIREMENTS, SERVICE ROUTING, AND METER SOCKET TYPE WITH LOCAL POWER COMPANY.

A9. CONTRACTOR SHALL APPLY FOR TELEPHONE SERVICE AS SOON AS POSSIBLE AND COORDINATE REQUIREMENTS AND SERVICE ROUTING WITH TELEPHONE COMPANY.

A10. PROVIDE ALL LABOR AND MATERIAL DESCRIBED ON THIS DRAWING, AND ALL ITEMS INCIDENTAL TO COMPLETING AND PRESENTING THIS PROJECT AS FULLY OPERATIONAL.

A11. WHERE LONG POWER CABLE RUNS PREVAIL, CONTRACTOR SHALL CALCULATE THE VOLTAGE DROP AND SIZE WIRES AND CONDUIT ACCORDINGLY.

A12. WHERE TRANSFORMER IS REQUIRED FOR ELECTRICAL SERVICE, TRANSFORMER SECONDARY SHALL BE GROUNDED PER N.E.C., ARTICLE 250–26.

A13. REFER TO SITE SPECIFIC DWGS FOR ELEVATIONS.

A14. ALL ELECTRICAL DEVICES EXPOSED TO WEATHER SHALL BE OF RAINPROOF CONSTRUCTION AND SHALL REQUIRE WATER TIGHT CONDUIT HUBS.

A15. CONTRACTOR SHALL COIL CABLES AT HANDHOLE WITH LENGTHS AS REQUIRED BY ELECTRICAL UTILITY FOR CONNECTION BY UTILITY.

A16. ALL UNDERGROUND SERVICE ENTRANCE POWER CABLES SHALL BE TYPE FOR SUCH USE. CONTRACTOR SHALL CALCULATE VOLTAGE DROP AND RE–SIZE CABLES PER NEC REQUIREMENTS FOR CABLE RUNS EXCEEDING 250 FEET.

B – POWER CABLE AND SERVICE

B1. CONTRACTOR SHALL PROVIDE CONDUIT AND WIRING TO BTS AND VERIFY EXACT CONDUIT ROUTING. RACEWAY SYSTEM MATERIALS AND DEVICES FURNISHED SHALL BE IN ACCORDANCE WITH APPLICABLE STANDARDS OF ANSI, NEMA, AND UL. RACEWAY SYSTEM COMPONENTS SHALL BE INSTALLED IN ACCORDANCE WITH APPLICABLE REQUIREMENTS OF THE N.E.C.

B2. A COIL OF WIRE SHALL EXTEND A MINIMUM OF 10 FEET FROM CONDUIT TO PERMIT TERMINATION BY OTHERS.

B3. CONTRACTOR SHALL SEAL AROUND ALL CONDUIT PENETRATIONS THROUGH WALLS, FLOORS AND ROOFS TO PREVENT MOISTURE PENETRATION OR VERMIN INFESTATION.

B4. CONDUCTORS RUNNING ALONG HORIZONTAL SURFACES (ROOF TOP OR SLAB) SHALL BE INSTALLED IN RIGID CONDUIT SUPPORTED ON SLEEPERS.

B5. ALL VERTICAL RUNS OF POWER CABLE EXCEEDING 80 FEET IN LENGTH SHALL BE SUPPORTED PER N.E.C. ARTICLE 300 USING KELLEMS GRIPS OR ACCEPTABLE EQUAL CABLE SUPPORT SYSTEM.

B6. WHERE A SEPARATE ELECTRICAL SERVICE DROP IS ADDED, CONTRACTOR SHALL INSTALL PERMANENT SERVICE DISCONNECT OR GROUPING THEREOF, DENOTING ALL OTHER SERVICE ENTRANCES, LOCATION OF EACH AND THE AREAS SERVED BY EACH.

B7. WHERE ELECTRICAL POWER IS TO BE SUB–FED FROM AN EXISTING DISTRIBUTION SYSTEM, THE FOLLOWING SHALL APPLY:
- A) CONTRACTOR SHALL PERFORM LOAD TESTING TO DETERMINE MAXIMUM FEEDER DEMAND PER N.E.C. ARTICLE 220–35.
- B) CONTRACTOR SHALL VERIFY WHETHER EXISTING FEEDER CAPACITY EXCEEDS VALUE CALCULATED PER N.E.C. ARTICLE 220–35
- C) EACH BRANCH CIRCUIT PROTECTIVE DEVICE SHALL HAVE SAME INTERRUPTING RATING AS EQUIPMENT SUPPLYING IT.
- D) PREFERRED MEANS OF SUPPLY SHALL BE A BRANCH CIRCUIT PROTECTIVE DEVICE LOCATED IN EXISTING PANEL.
- E) IF A BRANCH CIRCUIT PROTECTIVE DEVICE CANNOT BE OBTAINED OR SPACE IS NOT AVAILABLE, A BRANCH CIRCUIT MAY BE TAPPED FROM EXISTING FEEDER CONDUCTORS USING AN INSTALLED 2–POLE FUSED DISCONNECT AND METER BASE PER N.E.C. ARTICLE 240–21 WITH TEN FOOT (10) MAXIMUM TAP CONDUCTORS. FUSED DISCONNECT SHALL BE LISTED SAME OR BETTER INTERRUPTING RATING AS EXISTING SOURCE OF SUPPLY.

C – RF (COAX) AND LOW VOLTAGE CABLE

C1. RF CABLES AND LOW VOLTAGE CABLING BETWEEN BTS, LNA OR TMA AND ANTENNA SHALL BE SUPPORTED USING ANDREW "SNAP–IN" HANGERS OR ACCEPTABLE EQUAL.

C2. RF CABLES AND LOW VOLTAGE CABLING BETWEEN BTS, LNA OR TMA AND ANTENNA SHALL BE ROUTED AS FOLLOWS:
- A) RUNNING ALONG HORIZONTAL SURFACES: USE WAVEGUIDE SUPPORTS OR BRIDGE KIT MOUNTED ON CONCRETE SLEEPERS.
- B) RUNNING ALONG VERTICAL TOWER FACE: WAVEGUIDE LADDER W/HANGERS OR KELLEMS GRIPS.
- C) RUNNING ALONG OR ADJACENT TO BTS PLATFORM: USE 12 X 3 OPEN OR COVERED ELECTRICAL LADDER TRAY.

D – IDENTIFICATION

D1. LOCATE NAMEPLATE, MARKING, OR OTHER IDENTIFICATION MEANS ON OUTSIDE EQUIPMENT OR BOX FRONT COVERS.

D2. PROVIDE NAMEPLATE ENGRAVED WITH EQUIPMENT DESIGNATION FOR EACH SAFETY SWITCH AND ALL OTHER ELECTRICAL CABINETS, ETC.

D3. DURING TRENCH BACK–FILLING FOR EACH UNDERGROUND ELECTRICAL, TELEPHONE, SIGNAL AND COMMUNICATIONS LINE, PROVIDE A CONTINUOUS UNDERGROUND WARNING TAPE TWELVE INCHES BELOW FINISHED GRADE.

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LAKE PARK MARINA

SFL13

105 LAKE SHORE DRIVE
LAKE PARK, FL 33403

SHEET NAME
ELECTRICAL NOTES

SHEET NUMBER
E1

A – GENERAL

A1. INSTALLATION OF GROUNDING ELECTRODE SYSTEM SHALL COMPLY WITH ARTICLE 250 OF THE NATIONAL ELECTRIC CODE AND WITH ALL BUILDING CODES OF AUTHORITIES HAVING JURISDICTION.

A2. GROUNDING CONDUCTORS SHALL BE #2 AWG TINNED SOLID BARE COPPER BELOW AND ABOVE GRADE, UNLESS OTHERWISE NOTED AND SHALL BE ROUTED IN A DOWNWARD PATH TOWARDS GROUND BARS.

A3. GROUNDING CONDUCTORS SHALL BE KEPT AS SHORT AND DIRECT AS POSSIBLE WITH MINIMUM BEND RADIUS OF 12 INCHES.

A4. ALL BELOW GRADE CONNECTIONS SHALL BE CADWELD TYPE CONNECTIONS AND ALL CONNECTIONS TO EQUIPMENT AND GROUND BARS SHALL BE 2–HOLE BRONZE COMPRESSION CONNECTORS UNLESS OTHERWISE NOTED.

A5. CONTRACTOR SHALL INSTALL NEW PCS GROUNDING SYSTEM PER SPECIFICATIONS AND INTERCONNECT NEW SYSTEMS TO ANY EXISTING GROUNDING SYSTEMS AS REQUIRED BY NFPA 70 AND 780 (THIS APPLIES TO ELECTRICAL POWER DISTRIBUTION GROUNDING SYSTEM, LIGHTNING PROTECTION GROUNDING SYSTEM, COAX CABLE GROUNDING SYSTEM AND ANY OTHER EXISTING GROUNDING SYSTEMS).

A6. GROUNDING CONDUCTORS SHALL BE BONDED TO CABLE SUPPORTS, ANTENNA FRAMES, AND ANY SUPPORT FRAMES OR RACKS USING CADWELD OR MECHANICAL CONNECTIONS.

A7. CONTRACTOR SHALL PROVIDE LOCK WASHERS FOR ALL MECHANICAL CONNECTIONS FOR GROUND CONDUCTORS, STAINLESS STEEL HARDWARE SHALL BE USED THROUGHOUT.

A8. GROUNDING CONDUCTORS EMBEDDED IN CONCRETE OR PENETRATING WALLS AND FLOORS SHALL BE ENCASED IN PVC CONDUIT. NO METALLIC CONDUIT SHALL BE USED FOR GROUNDING CONDUCTORS UNLESS REQUIRED BY LOCAL CODES OR OTHERWISE INDICATED ON DRAWINGS. CONTRACTOR SHALL SEAL AROUND ALL CONDUIT PENETRATIONS TO PREVENT MOISTURE PENETRATION AND VERMIN INFESTATION.

A9. CONTRACTOR SHALL BOND PCS GROUNDING SYSTEM VIA THE MASTER GROUND BAR TO ALL METAL OBJECTS WITHIN 12 FEET OF EQUIPMENT, CONDUIT AND CABLES.

A10. BONDING OF GROUNDED CONDUCTOR (NEUTRAL) AND GROUNDING CONDUCTOR SHALL BE AT SERVICE DISCONNECTING MEANS. BONDING JUMPER SHALL BE INSTALLED PER N.E.C. ARTICLE 250–28.

A11. CONTRACTOR SHALL VERIFY EXACT CONDUIT ROUTING FOR GROUNDING CONDUCTORS WHERE APPLICABLE.

A12. A GROUND LEAD IS REQUIRED ONLY FOR BTS SUPPORTED ON STEEL FRAME. AN ADDITIONAL GROUND LEAD IS REQUIRED IF CABLE TRAY IS USED.

A13. CONNECTIONS TO CGB SHALL BE ARRANGED IN THE FOLLOWING THREE GROUPS:

- SURGE PRODUCERS (COAXIAL CABLE GROUND KITS, TELCO CABINET AND POWER PEDESTAL GROUND).
- SURGE ABSORBERS (GROUNDING ELECTRODE RING OR BUILDING STEEL).
- NON–SURGING OBJECTS (EGB GROUND IN BTS).

A14. DOUBLING OR STACKING OF ANY GROUNDING CONNECTIONS IS NOT ACCEPTABLE.

A15. ALL GROUND BARS SHALL BE INSTALLED WITH STAND OFF INSULATORS.

B – PREPARATION

B1. SURFACES: ALL CONNECTIONS SHALL BE MADE TO BARE METAL. ALL PAINTED SURFACES SHALL BE FIELD INSPECTED TO ENSURE PROPER CONTACT. ALL GALVANIZED SURFACES ON WHICH GALVANIZING HAS BEEN REMOVED BY CUTTING, DRILLING, OR ANY OTHER OPERATION SHALL BE RE–GALVANIZED IN ACCORDANCE WITH ASTM A780 USING "ZINC RICH" COATING AS MANUFACTURED BY ZRC CHEMICAL PRODUCTS COMPANY (LOCATED IN QUINCY, MASSACHUSETTS), OR ACCEPTABLE EQUAL. NO WASHERS ARE ALLOWED BETWEEN ITEMS BEING GROUNDED. ALL CONNECTIONS ARE TO HAVE A NON–OXIDIZING AGENT ("COPPER SHIELD") APPLIED PRIOR TO INSTALLATION.

B2. GROUND BAR: ALL COPPER GROUND BARS SHALL BE CLEANED, POLISHED AND A NON–OXIDIZING AGENT ("COPPER SHIELD") APPLIED. NO FINGER PRINTS OR DISCOLORED COPPER SHALL BE PERMITTED.

C – BUILDINGS

C1. ELECTRICAL CONTRACTOR SHALL PERFORM REQUIRED TESTING ON GROUNDING SYSTEM ONCE GROUNDING SYSTEM IS COMPLETELY CONSTRUCTED AND BEFORE SERVICE POWER AND GROUND IS CONNECTED (SEE NOTE T1 FOR TEST DESCRIPTION).

C2. A #4/0 AWG COPPER CONDUCTOR SHALL BE ROUTED FROM MASTER GROUND BAR AT BTS SITE TO MAIN METAL COLD WATER PIPE AND BONDED TO PIPE WITH BRONZE 2–HOLE PIPE CLAMP. CLAMP SHALL BE CONNECTED TO WATER PIPE WITHIN 5 FEET OF ENTRY OF PIPE INTO BUILDING WITH NO DEVICES BETWEEN ENTRY POINT AND CONNECTION AND SHALL COME IN CONTACT WITH PIPE FOR A MINIMUM DISTANCE OF 4 INCHES.

C3. METAL RACEWAYS, ENCLOSURES, FRAMES AND OTHER NON–CURRENT CARRYING PARTS OF ELECTRICAL EQUIPMENT SHALL BE KEPT AT LEAST 6 FEET AWAY FROM LIGHTNING ROD CONDUCTORS OR THEY MUST BE BONDED TO LIGHTING ROD CONDUCTORS AT THE LOCATION WHERE SEPARATION DISTANCE IS LESS THAN 6 FEET.

C4. A MASTER GROUND BAR (MGB) SHALL BE INSTALLED NEAR BTS WITH BUILDING PRINCIPAL GROUND BAR (BPG) INSTALLED NEAR ENTRANCE OF MAIN METAL COLD WATER PIPE INTO BUILDING. A #4/0 AWG STRANDED COPPER DOWN CONDUCTOR (VERTICAL GROUND RISER) SHALL BE USED TO INTERCONNECT GROUND BARS.

C5. VERTICAL RISER SHALL CONSIST OF A #4/0 AWG (THWN) STRANDED COPPER CONDUCTOR INSIDE ¾" CONDUIT.

C6. CONTRACTOR SHALL BOND BUILDING PRINCIPAL GROUND BAR (BPG) NEAR MAIN METAL COLD WATER PIPE TO EXISTING BUILDING GROUND RING AS WELL AS TO MAIN METAL COLD WATER PIPE WITH #4/0 AWG (THWN) STRANDED COPPER CONDUCTOR.

C7. ANTENNA GROUND BARS (AGB) SHALL BE INSTALLED NEAR ANTENNAS AND SHALL BE BONDED TO MASTER GROUND BAR (MGB) WITH #2 AWG TINNED SOLID BARE COPPER CONDUCTOR.

C8. F CODES REQUIRE VERTICAL RISER TO BE ISOLATED IN CONDUIT, PVC CONDUIT IS PREFERRED. IF METALLIC CONDUIT IS USED, GROUNDING BUSHINGS SHALL BE INSTALLED ON EACH END OF THE CONDUIT AND BONDED TO GROUND BARS USING #2 AWG (THWN) STRANDED COPPER CONDUCTORS WITH GREEN INSULATION.

D – LAND BUILDS AND CO–LOCATES

D1. THE GROUND ELECTRODE SYSTEM SHALL CONSIST OF DRIVEN GROUND RODS UNIFORMLY SPACED AROUND THE EQUIPMENT FOUNDATION AND AROUND THE PERIMETER OF THE TOWER FOUNDATION. THE GROUND RODS SHALL BE ⅝" X 10'–0" COPPER CLAD STEEL. INTERCONNECTED WITH #2 SOLID TINNED BARE COPPER GROUND CONDUCTOR TO FORM A GROUND RING AT A DEPTH OF 30 INCHES BELOW THE SURFACE OF THE SOIL. A MINIMUM OF 1 FOOT AND A MAXIMUM OF 3 FEET CLEARANCES SHALL BE MAINTAINED FROM FOUNDATIONS. TOWER AND EQUIPMENT GROUND RINGS SHALL BE INTERCONNECTED WITH TWO GROUNDING CONDUCTORS OF EQUAL LENGTH AND MATERIALS.

D2. GROUND RODS SHALL BE BONDED TO GROUND RINGS AND INTERCONNECTING CONDUCTORS AT EQUAL INTERVALS OF APPROXIMATELY 10 FEET.

D3. WAVEGUIDE BRIDGE SHALL BE BONDED TO GROUND RINGS OR INTERCONNECTING CONDUCTORS WITH GROUNDING CONDUCTORS BONDED TO DIAGONALLY OPPOSED SUPPORT POSTS.

D4. GROUND BARS SHALL BE BONDED TO GROUND RING WITH SINGLE GROUNDING CONDUCTOR.

D5. BONDS TO ANTENNA MASTS, FENCE POSTS, WAVEGUIDE BRIDGE, TOWER STEEL (UNLESS PROHIBITED BY TOWER MANUFACTURER) AND THOSE BELOW GRADE SHALL BE EXOTHERMIC TYPE (CADWELD). ALL OTHER BONDS SHALL BE BRONZE 2–HOLE COMPRESSION FITTINGS UNLESS OTHERWISE NOTED.

D6. GROUNDING CONDUCTORS MAKING A TRANSITION FROM ABOVE TO BELOW GRADE SHALL BE INSULATED FROM EARTH CONTACT BY PASSING THROUGH PVC CONDUIT. THE CONDUIT SHALL EXTEND AT LEAST 6 INCHES ABOVE AND 12 INCHES BELOW GRADE LEVEL.

E – LIGHTNING PROTECTION

E1. IF EXISTING BUILDING HAS AN NFPA 780 AIR TERMINAL SYSTEM, EXISTING SYSTEM SHALL BE BONDED TO A GROUND BAR TO BOND THE EXISTING SYSTEM TO THE NEW SYSTEM. SHOULD THE EXISTING SYSTEM COME WITHIN 8 FEET OF ANTENNA STRUCTURES, EXISTING SYSTEM SHALL ALSO BE BONDED TO COAX GROUND BARS.

E2. IF SITE IS IN A HIGH RISK AREA AND ANTENNAS DO NOT FALL WITHIN EXISTING CONE OF PROTECTION FOR BUILDING, AIR TERMINALS SHALL BE INSTALLED AT ANTENNAS. A SINGLE AIR TERMINAL MAY BE USED WHEN TWO ANTENNAS ARE MOUNTED ON SAME STRUCTURE AND IT HAS BEEN DETERMINED THAT BOTH ANTENNAS WILL FALL WITHIN LIGHTNING CONE OF PROTECTION FOR SINGLE AIR TERMINAL.

REV	DATE	DESCRIPTION
A	12/18/14	PRELIMINARY
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PROJECT NO.:	14–1004.01
DRAWN BY:	CHECKED BY:
F. PARRADO	M. ABBEY

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RG TOWERS, LLC.
2141 ALTERNATE A1A, SOUTH
SUITE 440
JUPITER, FL 33477

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

DATE OF SIGNATURE: 1/14/16

LAKE PARK MARINA

SFL13

105 LAKE SHORE DRIVE
LAKE PARK, FL 33403

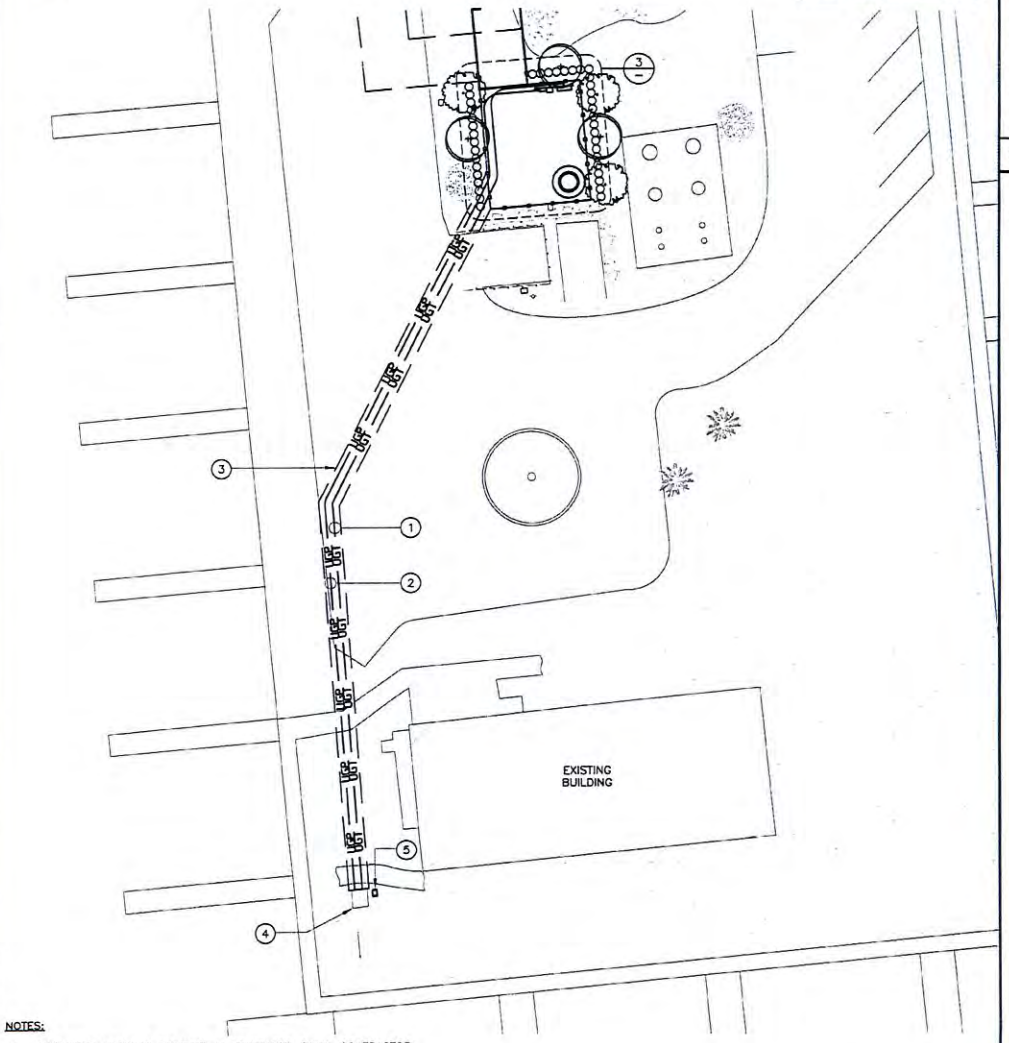
SHEET NAME
GROUNDING NOTES

SHEET NUMBER
E2

CALL 48 HOURS BEFORE YOU DIG

IT'S THE LAW !
1-800-432-4770

SUNSHINE STATE ONE CALL OF FLORIDA, INC.



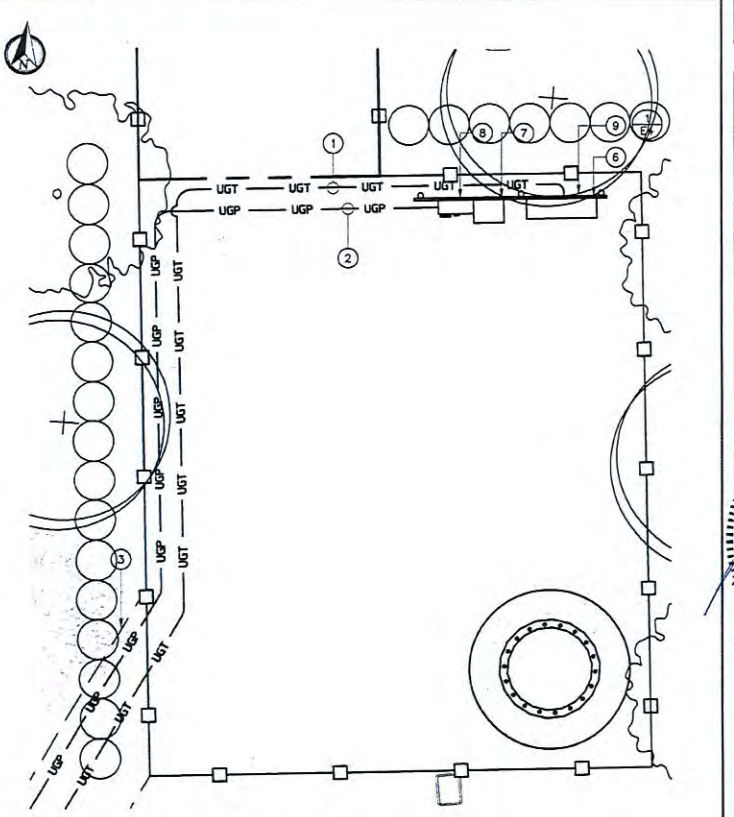
NOTES:

1. PROPOSED CONDUIT ROUTING IS SCHEMATIC ONLY, CONTRACTOR SHALL DETERMINE SUITABLE ROUTING IN THE FIELD.
2. LANDSCAPING NOT SHOWN FOR CLARITY.

UTILITY ROUTING SITE PLAN — GRAPHIC SCALE 0 10' 20' 30' — 1

(1) (2) PROPOSED 2"ø CONDUITS FOR TELCO (240'± IN LENGTH). (SEE DETAIL 3, SHEET E6)
(2) PROPOSED 4"ø CONDUIT FOR POWER (230'± IN LENGTH). (SEE DETAIL 3, SHEET E6)
(3) PROPOSED 5' WIDE NON-EXCLUSIVE UTILITY EASEMENT
(4) EXISTING FPL TRANSFORMER. COORDINATE WITH FPL REPRESENTATIVE, MIKE FETTO AT 561-575-6302 PRIOR TO START OF WORK
(5) PROPOSED FIBERNET HANDHOLE (FIBER PROVIDER TO BE DETERMINED BY FUTURE CARRIERS)
(6) PROPOSED FIBER CABINET
(7) PROPOSED 400A METER TERMINAL BOX
(8) PROPOSED 225A METER STACK
(9) PROPOSED MULTI-TENANT H-FRAME

CONSTRUCTION KEY NOTES — 2



UTILITY ROUTING COMPOUND PLAN — GRAPHIC SCALE 0 2' 4' 8' — 3

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MICHAEL A. PHILLIPS
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PROFESSIONAL ENGINEER

DATE OF SIGNATURE: 1/14/16

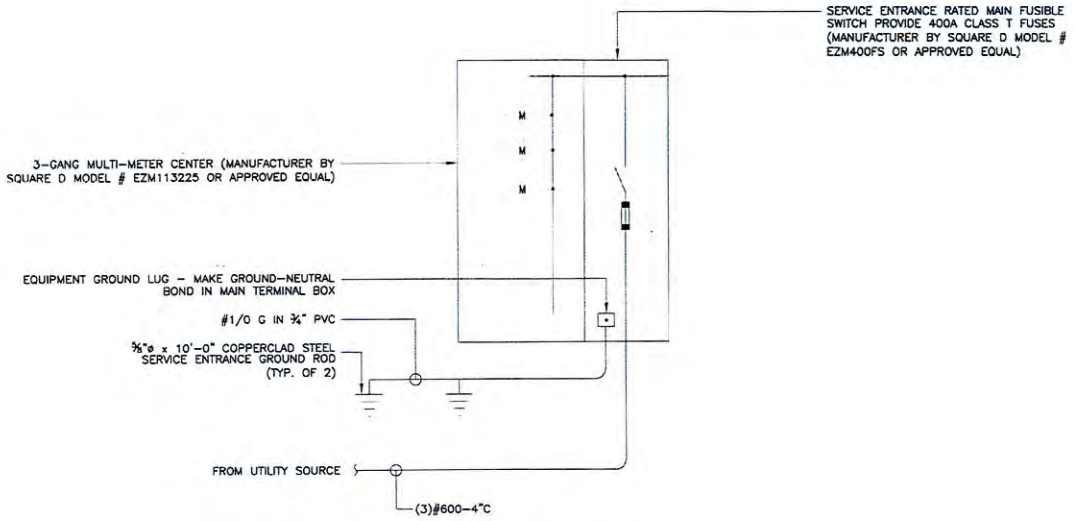
LAKE PARK MARINA

SFL13

105 LAKE SHORE DRIVE
LAKE PARK, FL 33403

SHEET NAME
UTILITY ROUTING SITE PLAN

SHEET NUMBER
E3



ONE-LINE DIAGRAM

NTS | 1

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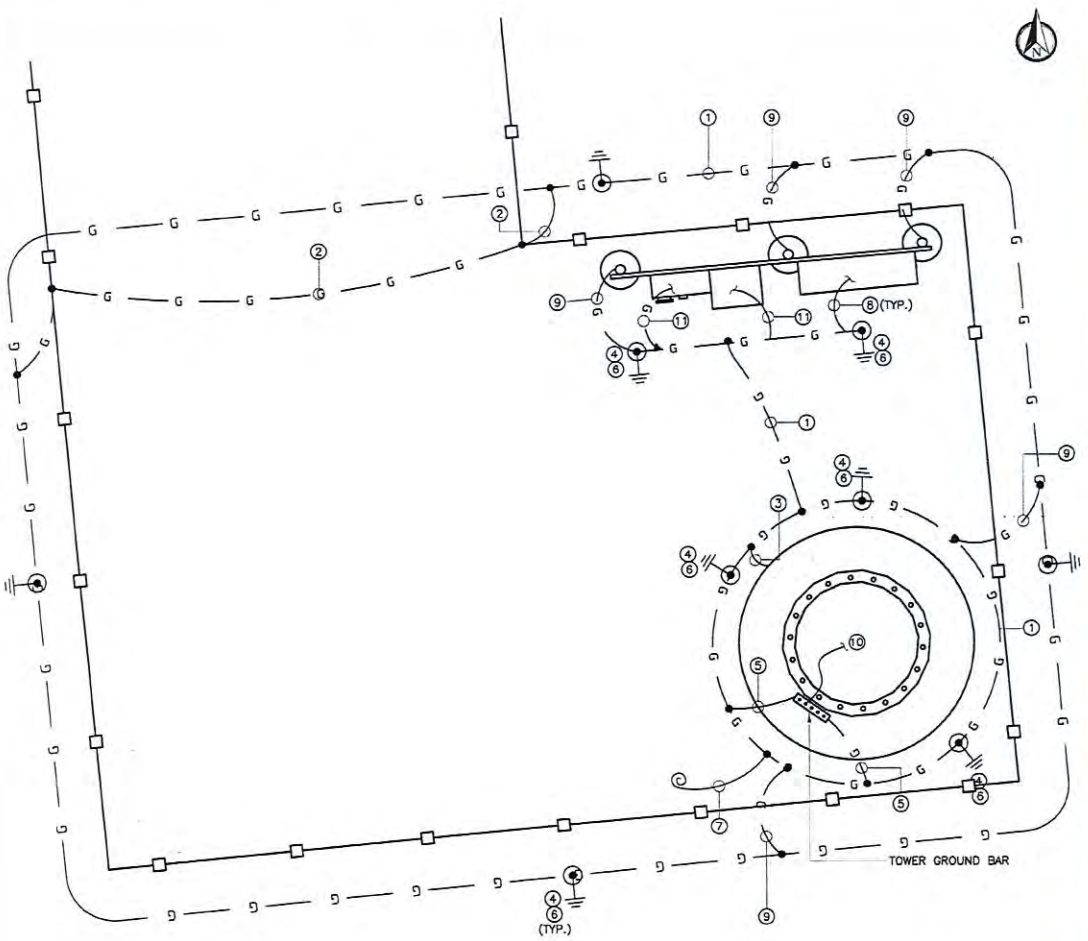
SFL13

105 LAKE SHORE DRIVE
LAKE PARK, FL 33403

SHEET NAME
ONE-LINE DIAGRAM

SHEET NUMBER
E4



NOTES:

1. CONTRACTOR SHALL INSPECT AND TEST GROUNDING SYSTEM WITH A BIDDLE–MEGGER TESTER UTILIZING THE FALL OF POTENTIAL METHOD AND CONTACT CONSTRUCTION MANAGER IF RESISTANCE EXCEEDS 5 OHMS AND SHALL FIELD MODIFY GROUNDING SYSTEM AS NECESSARY TO ACHIEVE COMPLIANCE. TEST RESULTS AND CONCLUSIONS SHALL BE RECORDED FOR PROJECT CLOSE–OUT DOCUMENTATION.
2. CONTRACTOR SHALL PROVIDE PRE–CAST CONCRETE INSPECTION WELL WITH CAST IRON TRAFFIC RATED LID WHEN WELL WILL BE IN AN AREA WHERE THEY CAN BE DAMAGED.

TYPICAL SITE GROUNDING DIAGRAM | NTS | 1

1. PROVIDE A #2 AWG SOLID BARE TINNED COPPER GROUND RING AROUND THE TOWER, AND COMPOUND AS SHOWN. ALL EXTERIOR GROUNDING CONDUCTORS SHALL BE BURIED A MINIMUM OF 18" BELOW GRADE. THE GROUND RING SHALL BE INSTALLED 1'–0" AWAY FROM FOUNDATIONS (MINIMUM UNLESS SHOWN OTHERWISE ON DRAWINGS). WHERE REQUIRED DUE TO SOIL CONDITIONS AND THE PRESENCE OF ROCK, THE ROUTING OF THE GROUND RING MAY BE ADJUSTED. ALL BONDS TO THE BURIED GROUND RING SHALL BE WITH EXOTHERMIC WELDS.
2. BOND GATE POST TO BURIED GROUND RING. EXOTHERMICALLY WELD A #2 AWG SOLID BARE TINNED COPPER CONDUCTOR TO THE GATE POST AT 12" ABOVE GRADE AND CONNECT TO THE BURIED GROUND RING. PROVIDE CONDUCTOR LENGTH AS REQUIRED TO MAKE CONNECTION. BOND OPPOSITE SIDES OF FENCE, AND FENCE POST TO FENCE GATE AS SHOWN USING A WELDING CABLE GROUNDING STRAP
3. BOND REBAR IN CONCRETE FOR PAD TO THE BURIED GROUND RING. EXOTHERMICALLY WELD A #2 AWG SOLID BARE TINNED COPPER CONDUCTOR TO THE REBAR (AT THE END OF THE REBAR) AND CONNECT THE BURIED GROUND RING.
4. PROVIDE A 6" DIAMETER PVC INSPECTION SLEEVE WITH REMOVABLE COVER WHERE SHOWN FOR ALL PRIMARY CONNECTIONS TO BURIED GROUND RING. SEE GROUND ROD INSPECTION WELL DETAIL. FOR TYPICAL GROUND RING INSPECTION SLEEVE. NOTE: INSPECTION SLEEVE CAN BE USED AS A TEST WELL FOR GROUND WATER LEVEL INSPECTION AND GROUND RESISTANCE TESTING.
5. INSTALL GROUNDING CONDUCTOR(S) FROM THE BURIED GROUND RING FOR CONNECTION TO THE GROUND BAR AT BOTTOM OF TOWER. VERIFY EXACT LOCATION OF GROUNDING BAR AND PROPER CONDUCTOR LENGTH. EXOTHERMICALLY WELD (2) #2 AWG SOLID BARE TINNED COPPER GROUNDING CONDUCTOR (LENGTH AS REQUIRED) TO THE GROUND BAR. GROUNDING CONDUCTORS MUST BE HELD AWAY FROM TOWER BY USING STAND–OFFS OR ROUTING THE CONDUCTORS IN FLEXIBLE PVC CONDUIT. COORDINATE LOCATION WITH CONSTRUCTION MANAGER. SEE TOWER GROUNDING.
6. INSTALL ⅝" x 10'–0" LONG COPPERCLAD STEEL GROUND RODS. SPACING BETWEEN RODS NOT TO EXCEED 20'–0" (NON–LINEAR). TYPICAL FOR ALL GROUND RODS SHOWN, UNLESS NOTED OTHERWISE. SEE GROUND ROD DETAIL. GROUND ROD MAY BE INSTALLED WITH A MAXIMUM VARIATION OF 30° FROM VERTICAL IF ROCK IS ENCOUNTERED AND CONTRACTOR SHALL BE PREPARED TO CORE DRILL TO INSTALL GROUND RODS AND BACKFILL WITH GROUND ENHANCEMENT MATERIAL.
7. COIL (1) 10'–0" SECTION OF #2 AWG SOLID WIRE ADJACENT TO FUTURE T–MOBILE EQUIPMENT.
8. BOND EQUIPMENT TO BURIED GROUND RING.
9. BOND CABLE BRIDGE/H–FRAME POSTS TO BURIED GROUND RING (TYP.). EXOTHERMICALLY WELD A #2 AWG SOLID BARE TINNED COPPER CONDUCTOR TO THE POST AT 12" ABOVE GRADE AND CONNECT TO THE BURIED GROUND RING. PROVIDE CONDUCTOR LENGTH AS REQUIRED TO MAKE CONNECTION.
10. INSTALL GROUNDING CONDUCTOR(S) FROM THE GROUND BAR AT BOTTOM OF TOWER TO TOWER MOUNTED UPPER GROUND BAR(S). VERIFY EXACT LOCATION OF GROUNDING BARS AND PROPER CONDUCTOR LENGTH. EXOTHERMICALLY WELD (2) #2 AWG SOLID BARE TINNED COPPER GROUNDING CONDUCTORS (LENGTH AS REQUIRED) TO THE GROUND BARS.
11. PROVIDE GROUND CONDUCTOR IN PVC CONDUIT. REFER TO ONE LINE DIAGRAM FOR WIRE AND CONDUIT SIZE.
12. SYSTEM GROUND RESISTANCE SHALL NOT EXCEED 5 OHMS. A THREE POINT SYSTEM RESISTANCE TEST SHALL BE PERFORMED BY THE CONTRACTOR.
    A. PERFORM THREE TESTS AT EACH SITE.
    B. CONTRACTOR SHALL PROVIDE A WRITTEN REPORT CONSISTING OF THE FOLLOWING: SITE NAME, ADDRESS AND IDENTIFICATION NUMBER, DESCRIPTION OF SITE SOIL AND MOISTURE CONDITION, DESCRIPTION OF WEATHER, MODEL NUMBER OF TESTING EQUIPMENT, DATE OF LAST CALIBRATION, SITE SKETCH SHOWING LOCATION OF TEST PROBES, AND ALL FIELD DATA COLLECTED (READINGS, RANGE, TEST, MILLIAMPS, ETC.).
    C. CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER IF THERE ARE ANY DIFFICULTIES PERFORMING SYSTEM RESISTANCE TESTS OR IF MEASUREMENTS ARE ABOVE 5 OHMS. THE CONSTRUCTION MANAGER SHALL PROVIDE INSTRUCTIONS TO THE CONTRACTOR TO INSTALL ADDITIONAL GROUNDING MEASURES TO MEET THE 5 OHM REQUIREMENT.

GROUNDING KEY NOTES | 2

REV	DATE	DESCRIPTION
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1	7/14/15	REVISED
2	11/18/15	REVISED

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PROFESSIONAL ENGINEER

DATE OF SIGNATURE: 1/14/16

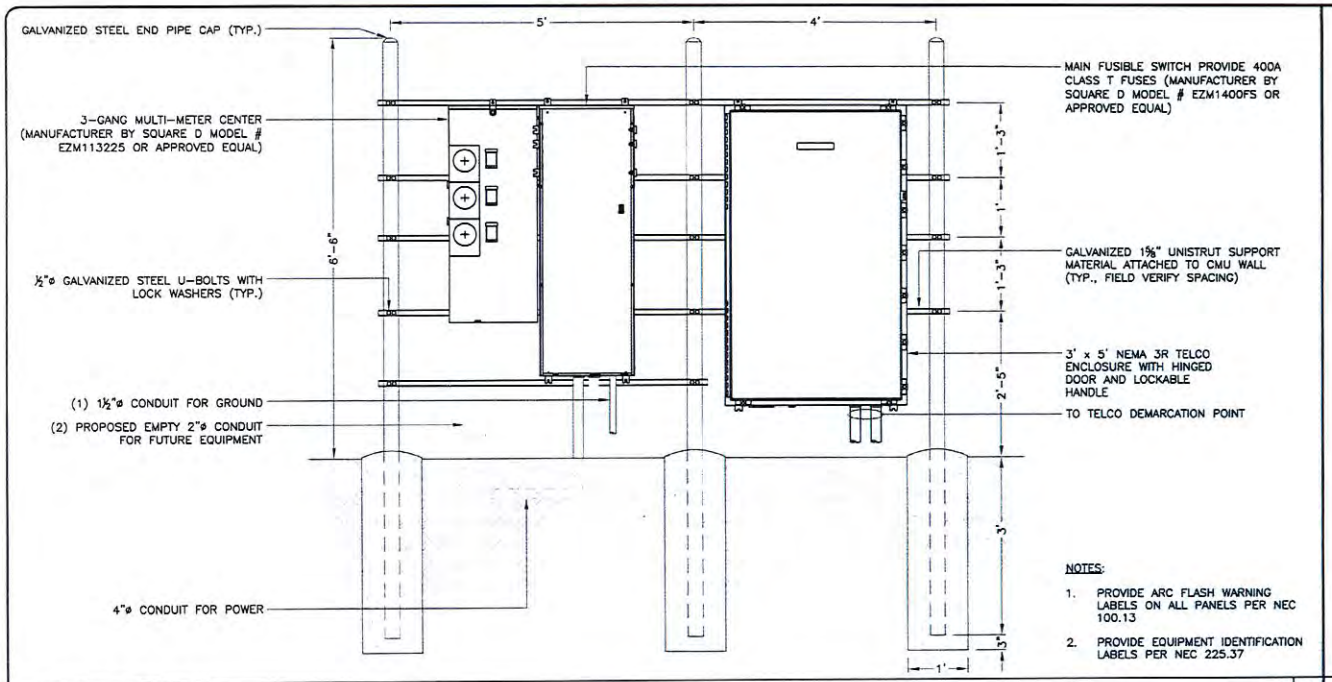
LAKE PARK MARINA

SFL13

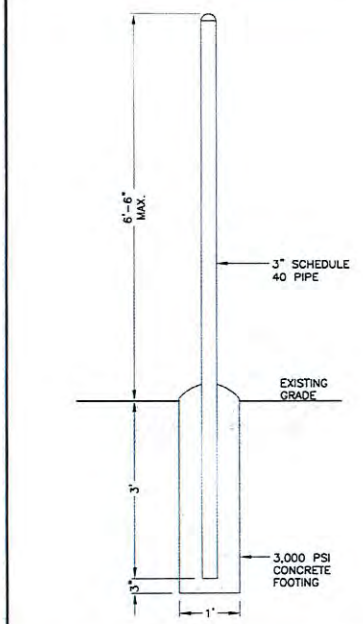
105 LAKE SHORE DRIVE
LAKE PARK, FL 33403

SHEET NAME
GROUNDING PLAN AND NOTES

SHEET NUMBER
E5



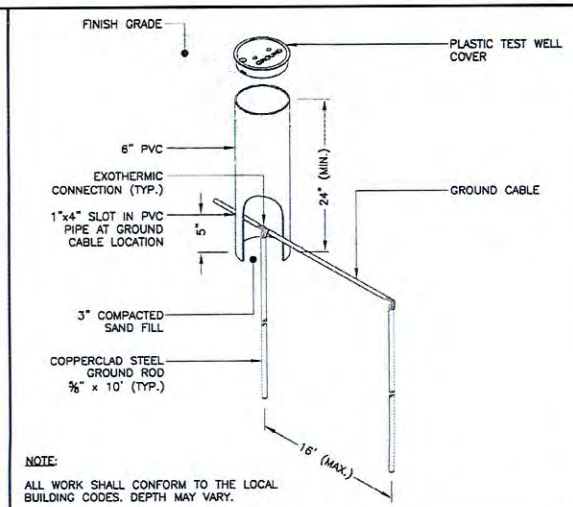
UTILITY RACK DETAIL NTS 1



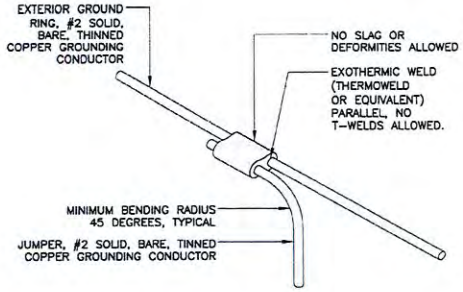
UTILITY RACK POST DETAIL NTS 2

DETAIL REMOVED

TRENCH DETAIL NTS 3



GROUND ROD INSPECTION WELL DETAIL 4



WELD CONNECTION DETAIL NTS 5

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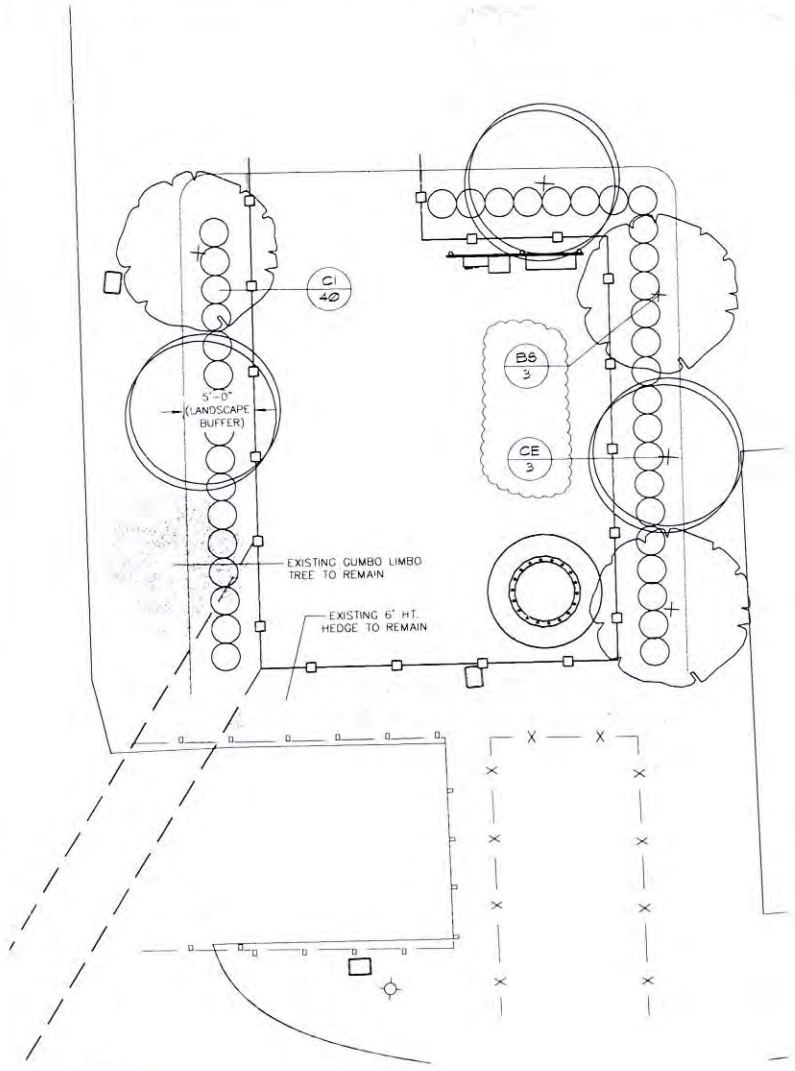
LAKE PARK MARINA

SFL13

105 LAKE SHORE DRIVE
LAKE PARK, FL 33403

SHEET NAME
ELECTRICAL DETAILS

SHEET NUMBER
E6



8' 0' 4' 8'

FOR 24"x36" DRAWINGS
GRAPHIC SCALE: 1/4" = 1'-0"
FOR 11"x17" DRAWINGS
GRAPHIC SCALE: 1/8" = 1'-0"

LANDSCAPE MATERIALS LIST

QTY	KEY	BOTANICAL NAME	COMMON NAME	SPECIFICATIONS	NATIVE
1	BS	Bursera simaruba	Gumbo Limbo	B/B, min. 12' Oah X 5' spr., 3" caliper	Y
3	CE	Conocarpus erectus 'Sericeus'	Silver Buttonwood	B/B, min. 12' Oah X 5' spr., 3" caliper	Y
40	CI	Chrysobalanus icaco	Cocoplum	min. 7 gallon 30" ht. @ 24" o.c.	Y
	SOD	Hespalum notatum	Argentine Bahia Sod	sq.ft.	
	MULCH	Pine Bark mulch	Pine Bark Mulch	Cu.Yd.	

LANDSCAPE REQUIREMENTS

As per Town of Lake Park communication facility landscape code (Section 74-405)

The maximum spacing of planted trees along any perimeter buffer along a public street shall be 20 ft or fraction thereof, on center, with a min. of (2) trees on any one street frontage. Buffers not adjacent to public streets shall contain (1) tree for each 40 ft.

A hedge to screen the area from public view at 2 ft on center and 30" on center

Palms shall have a minimum of 8' gray trunk at planting. All non-specimen palms planted shall be installed in group three

Trees shall have a minimum of 12' ht., 5' spr. @ 3" caliper at time of planting. 75% of all trees shall be native species.

Adjacent to r.o.w.

East - 30' / 20' = 1.5 = (2) trees required; and provided

West - 30' / 20' = 1.5 = (2) trees (1) existing tree to remain and (1) tree provided

Not adjacent to r.o.w.

North - 13' / 40' = (1) tree required; and provided

South - existing to remain

GENERAL LANDSCAPE NOTES

1. All landscape material shall be fla. no. 1 grade or better, as specified in grades and standards for nursery plants, parts I and II, by Division of Plant Industry, Florida Department of Agriculture and Consumer Services, and shall conform to current American Association of Nurserymen Standards for Nursery Stock. Landscape material shall be planted according to Sound Nursery Practices.

2. All shrubs shall be a minimum of 30" high at the time of planting and spaced no greater than 24" on center. Shrubs shall not adversely impact existing tree root systems and shall be field adjusted if necessary.

3. All required palm trees shall be a minimum of 8' gray trunk height at time of planting and all required trees shall be a minimum of 12' ht. and 3" caliper at time of planting. Adjust tree locations as necessary to avoid utilities, obstructions, etc. see materials list for exact specifications.

4. All required trees shall be located a minimum of 5 feet from impervious surfaces, all shrubs 2 feet.

5. An automatic underground irrigation system shall be installed to maintain the landscape area in a healthy manner and provide 100% coverage.

6. The contractor shall sod all disturbed areas. All planting shall be mulched to a 3" minimum depth.

7. The contractor shall be responsible for the clean up of premises and removal of all discarded and surplus materials, and rubbish.

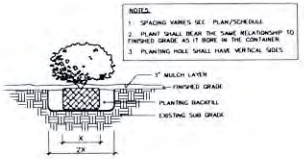
8. Verify the locations of existing trees, lawns, and shrubs. Remove nuisance/exotic materials such as rocks, branches, building materials or unacceptable soils prior to planting sod, trees, and shrubs, where encountered.

9. Contractor shall become acquainted with the related paving, site grading, and all utilities (including water, sewer, and electrical supply) to preclude any misunderstandings and ensure a trouble free installation.

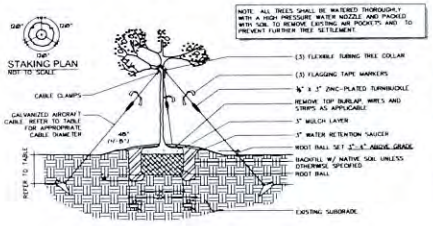
10. The exact location of all existing structures, underground utilities , and pipes may not be as indicated on drawings; the contractor shall determine the location of these items and shall conduct his work in a manner to prevent interruption or damage to existing systems which must remain operational. The contractor shall protect existing structures and utility services which must remain operational and shall be responsible for their replacement if damaged by him.

11. Contractor shall call Sunshine State One-Call at least 48 hours prior to digging, (1-800-432-4770).

12. Quantities on plan take precedence over materials list. Quantities on materials list are provided as a courtesy only.



SHRUB/ GROUND COVER
PLANTING DETAIL
NOT TO SCALE



TYPICAL TREE PLANTING AT GRADE
NOT TO SCALE

NOTE:
THE DUCKBILL ANCHORING SYSTEM IS DESIGNED TO BE USED WITH MANUFACTURER-SUPPLIED COMPONENTS. INSTALL ANCHORS AS PER MANUFACTURERS SPECIFICATIONS.

DUCKBILL EARTH ANCHOR TABLE

TREE CALIPER	MODEL NUMBER	RATED CAPACITY	MINIMUM DEPTH OF INSTALLATION
UP TO 3"	40-DTS	500 LBS. EA.	20"
UP TO 6"	68-DTS	1,100 LBS. EA.	30"
UP TO 11"	88-DTS	3,000 LBS. EA.	42"
NOT RATED	138-DTS	5,000 LBS. EA.	60"

NOTE: RATED FOR WINDS UP TO 50 MPH

HAMERMAN-KINSEY & ASSOCIATES, INC.
Landscape Architecture

REV	DATE	DESCRIPTION
1	01-08-16	PER COMMENTS

PROJECT NO. 14-1004.01

DRAWN BY:	CHECKED BY:
KC	JER

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

RG TOWERS, LLC.
2141 ALTERNATE A1A, SOUTH
SUITE 440
JUPITER, FL 33477

JASON E. RINARD, R.L.A.
REG. NO. LA0001608
LANDSCAPE ARCHITECT
REGISTERED LANDSCAPE ARCHITECT
JASON E. RINARD
LA 0001608
STATE OF FLORIDA
THIS ITEM IS NOT VALID UNLESS SIGNED, DATED & RAISED SEAL AFFIXED

DATE OF SIGNATURE: 01-14-16

LAKE PARK MARINA

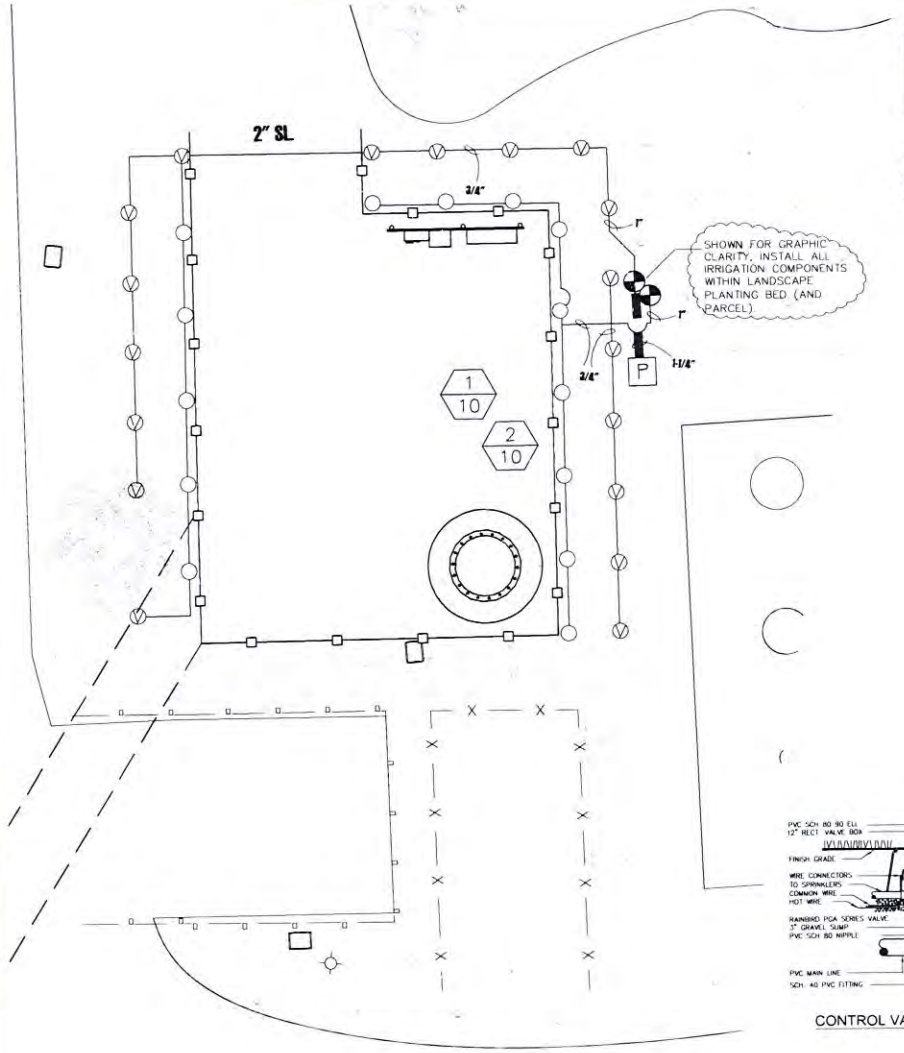
SFL13

105 LAKE SHORE DRIVE
LAKE PARK, FL 33403

SHEET NAME
LANDSCAPING PLAN

SHEET NUMBER
L1

CALL 48 HOURS BEFORE YOU DIG
It's the Law!
1-800-432-4770
SUNSHINE STATE ONE CALL OF FLORIDA, INC.



8' 0' 4' 8'

FOR 24"x36" DRAWINGS
GRAPHIC SCALE: 1/4" = 1'-0"
FOR 11"x17" DRAWINGS
GRAPHIC SCALE: 1/8" = 1'-0"

IRRIGATION LEGEND:

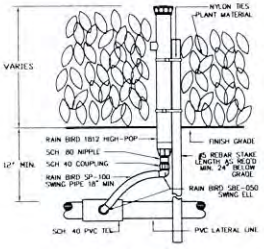
- RAIN BIRD VAN SERIES W/ 6' NOZZLE (ARC AS NEEDED)
- RAIN BIRD VAN SERIES W/ 6' NOZZLE ON 12" FIXED PVC SCH 40 RISER (ARC AS NEEDED)
- RAIN BIRD PGA-100 1" REMOTE CONTROL VALVE
- P — Point of Connection - Proposed system will be connected to existing irrigation infrastructure. Exact tie-in point to be determined. (10 gpm @ 50 gpm) (See irrigation notes for instructions.)
- MAIN LINE - SCH 40 PVC (unless otherwise required by local code) size as indicated
- LATERAL LINE - pvc class 160 (unless otherwise required by local code) - to be sized not to exceed a velocity of 5 fps and max. psi loss in zone lines not to exceed 10% of operating psi - minimum pipe size to be 3/4"
- SLEEVING - PVC SCH 40 (4" unless noted)

1 — STATION NUMBER
12 — GALLONS PER MINUTE

VALVE DESIGNATION GUIDE

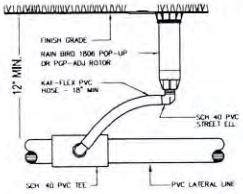
IRRIGATION NOTES:

1. Irrigation contractor shall exercise care so as to not damage existing utilities. Irrigation contractor shall verify existing utilities. Irrigation contractor shall be responsible for the immediate repairs of any damage caused by his work.
2. All main line piping shall be buried at a depth to have a minimum cover of 18". All lateral line piping to have a minimum cover of 12".
3. Irrigation contractor to be responsible for all electrical hook-ups.
4. Supply piping shall be flushed free of all dirt, debris, and chips prior to the installation of the back flow preventor.
5. Sleeves shall be required under all sidewalks and driveways. minimum sleeve size shall be 2".
6. 12" high pop-ups shall be used in all shrubbery areas. Support the riser with a #5 rebar stake and nylon cable ties.
7. All 24 volt wires from the irrigation controller to the remote control valves shall be AWG size 14, type UF direct burial, single strand wire. Wires are to be bundled together then tied to the bottom of the main line pipe wiles at 10' intervals. Wire buried in trenches w/out main line pipe shall be inserted in 1/2" CL 160 pvc. pipe and buried with a minimum cover of 18".
8. Refer to the landscape plan when trenching to avoid trees and shrubs.
9. All pvc piping for mainline, sleeves and risers shall be sch. 40, all other piping shall be class 160 pvc for piping > 1" and class .315 pvc for piping < 1". Piping specifications shall comply with local code requirements.
10. All pop-up rotors and sprays shall be installed using an 18" flex pipe connection.
11. Adjust all nozzles to reduce water waste on hard surfaces and walls.
12. Throttle valves on spray zones as required to prevent fogging.
13. Irrigation contractor shall prepare an as-built drawing on reproducible paper showing all installation that deviates from these drawings. The as-built shall locate all main line piping, control wires and valves by showing exact measurements from hard surfaces.
14. All valves, gate valves and quick coupling valves shall be installed in valve boxes. valve boxes shall have a min. 3" bed of pea gravel.
15. Any piping shown outside the property line or running outside a landscaped area is shown there for clarity only. All lines shall be installed on the property or right of ways and inside the landscape areas.
16. All risers shall be placed a min. of 12" from any sidewalk, patio or road.
17. Exact controller location to be coordinated with an owner's representative prior to installation.
18. Properly ground the controller to a 5/8" x 8' copper clad ground rod with awg #6 bare solid copper wire. All splices and connections to the 24 volt control wire shall be made with king technology #6 wire connector.



12" POP-UP SPRAY

CONTROL VALVE



POP-UP TURF SPRINKLER

CALL 48 HOURS BEFORE YOU DIG
It's the Law!
1-800-432-4770

HARDEMAN-KINNISON & ASSOCIATES, INC.

REV	DATE	DESCRIPTION
1	01-08-16	revised note

PROJECT NO.: 14-1004.01

DRAWN BY	CHECKED BY
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THIS ITEM IS NOT VALID UNLESS SIGNED, DATED & RAISED SEAL AFFIXED.

DATE OF SIGNATURE: 01-14-16

LAKE PARK MARINA

SFL13

105 LAKE SHORE DRIVE
LAKE PARK, FL 33403

SHEET NAME
IRRIGATION PLAN

SHEET NUMBER
IR1

T · ·Mobile

6WP1273D – Lake Park Marina

Network Configuration and Design Requirements

Department: T-Mobile Engineering & Operations – Miami Market

Last Updated: 01/25/16

Network Density and Site Spacing

Fig. 1

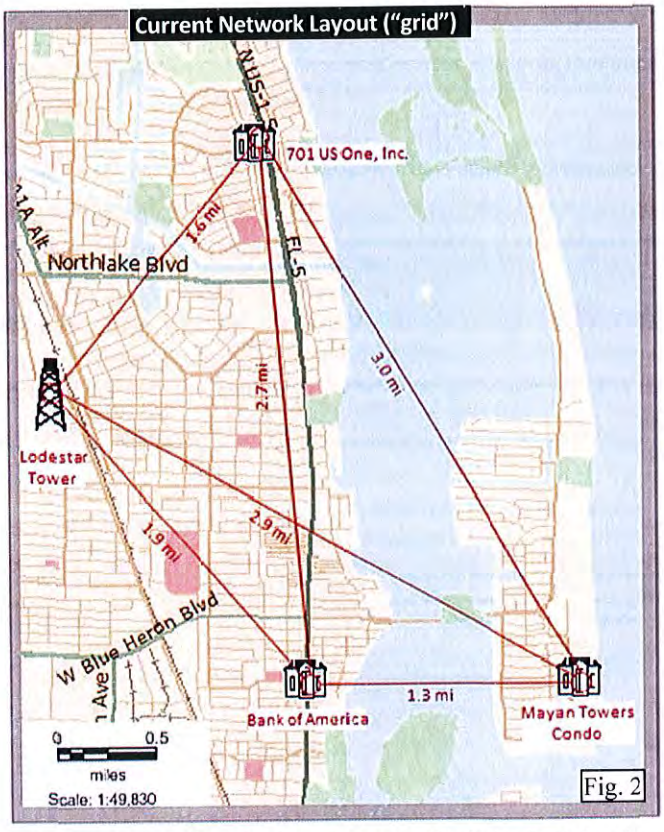


Fig. 2

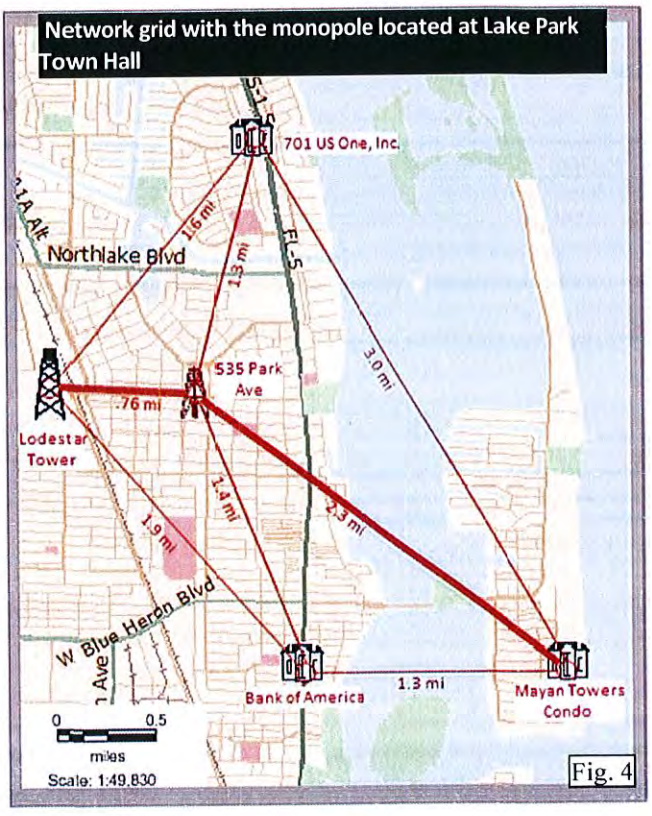
The purpose of this document is to provide supplemental information supporting the selection of a tower at Lake Park Marina. In previous engineering reports a relative coverage gap had been described in many commercial and residential areas surrounding the proposed tower. And although signal measurements and many users' experiences are within generally accepted key performance indicators (KPI) there is a recognizable difference between good signal levels and good service levels. Currently, there are deficiencies in the coverage that contribute to overall network performance issues evidenced in the number of dropped calls, ineffective service attempts and sometimes unreliable connection rates. Of greatest concern are cell phone users who are indoors and possibly experiencing very poor or non-existent service. Emergency calls could potentially fail in some scenarios even though average signal levels in the area are generally adequate for the placement of basic call services. *

During an extensive engineering review no structures of sufficient height or local were identified to include the 125' Crown Monopole at Lake Park Town Hall. This tower is too far east to provide the necessary coverage and could result in the need for another facility in the future particularly in the proximity of Kelsey Park. Following is a more detailed description of the strategies used for the determination of tower location and configuration.

* During public hearing it was noted by some residents that customer phone service was available at their building but qualified their statements by mentioning that their observations were made on upper floors or outside on their porch. A phenomena of wireless communications is that signal levels improve with the increase in height of the antennas or with line of site (LOS) to the serving tower. Although individual or anecdotal service experiences are important considerations in the formulation of design strategies average signal levels are a much more significant indicator of the need for additional facilities.

A common design feature in the deployment of cellular networks is the concept of a "grid" or the spacing between facilities. In theory the placement of towers and antenna employments at equidistant locations with equal antenna heights would provide the most efficient and comprehensive coverage for mobile users. In practice this is highly unrealisable due to the difficulties in locating antennas in consideration of the various jurisdictional and landlord requirements and restrictions. This "grid" feature is not always applicable though as new facilities may be proposed in order to "solve" capacity or network performance issues where local area morphology, e.g. commercial centers, dense residential and roadways and recreational areas contribute to the high usage of cell phones. The rather more recent development of high speed data and social media applications has also necessitated the need for additional serving towers in areas that may not have needed them in the past.

The area morphologies or geographic classes of the Lake Park area are shown above in Figure 1. Of note is the relative density of local roads and residential areas including the presence of two major roadways, US1 and A1A. The circle surrounding the proposed location at Lake Park marina represents the coverage area of concern. In Figure 2 the current network grid is shown with the distances between each of the loca serving sites and their "neighbour(s)". The closest inter-site distance for this local area network of sites is one and a third miles with the greatest distance between facilities at three miles. Based on experience and knowledge of network planning in this part of south Florida inter-site distance is most practical and efficient at one to one and a half miles. With distances greater than this network performance issues as noted before are more prevalent.



In Figure 3 the Lake Park Marina proposal is shown with the inter-site distances and the existing sites. This arrangement is close to an idealized network grid with the majority of inter-neighbor distances being within a few percentage points of each other. The greatest distance of three miles between sites is not as critical in this case as radio signals travel further over water and there is a marginal chance of users encountering poor levels here. As a counter-example the site spacing introduced with the location of antennas at Crown Monopole at Lake Park Town Hall (Fig 4) is "off-grid" and over the long term would manifest itself in the possibility of a need to add additonal antenna locations in the future particularly in the proximity of Kelsey Park.

Power Boundaries Comparisons - Lake Park Proposal and Crown monopole at Lake Park Town Hall

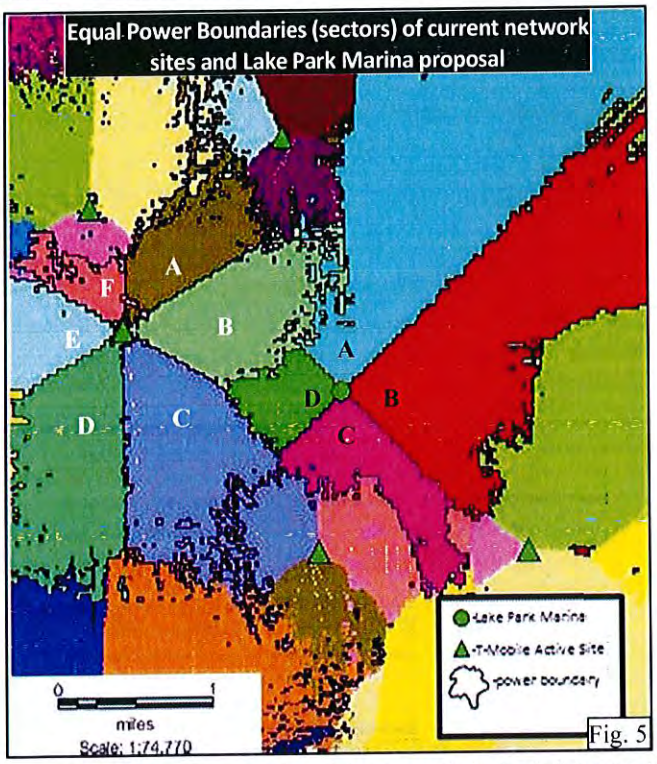


Fig. 5

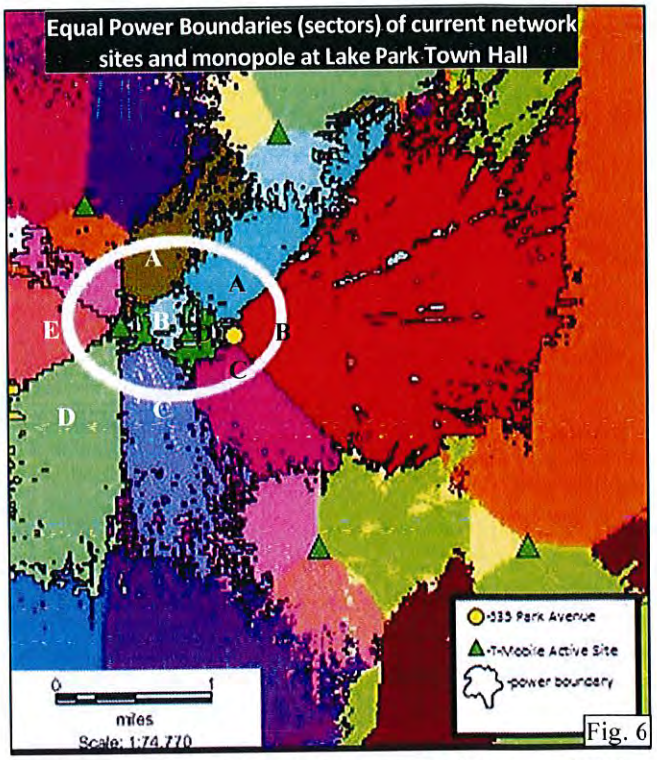


Fig. 6

An important concept in cellular network design is "site spacing" or the inter-facility distance between towers/structures. In this part of the T-Mobile network idealized site spacing is approximately 1.25 to 1.5 miles. This means that all the towers need to be nearly equal in their distance from each other in order to maintain a "balanced" network load and service area. In the above boundary plots, the theoretical coverage array for each individual antenna is shown by the colored polygons. In the plot on the left the proposed Lake Park Marina coverage boundaries are shown as A/B/C/D. Each colored polygon represents the coverage pattern for individual "sectors". The "A" sector points north and like the "B" sector shows that the coverage pattern extends north for what appears to be a longer distance than the "C" or "D" sectors. This can be explained by the fact that radio energy travels further on water bodies. (The Intracoastal Waterway in this case) Of note, the "D" sector has a relativley well defined border with the polygons to the west. (the polygons labeled B/C in white)

In the plot on the right side the predictions from the 535 Park Avenue tower are shown. As can be seen from the highlighted area (white oval) there is no clear border between the neighboring facilities. While this situation can be somewhat mitigated, the redundant radio energy and lack of dominant serving sectors will always act as a compromising element in this local part of the network.

In conclusion the tower located at 535 Park Avenue cannot be utilized for the network development for T-Mobile due to it's proximity to an existing T-Mobile facility and the lack of adequate spacing between sites.

Additional supporting evidence for the need of new facility in the proposed location at Lake Park Marina

Determination of location and configuration for a new serving facility requires analysis of a number of different engineering considerations. Along with average signal level measurements, customer complaints, user experience, emergency call exigencies and area geography influence design choices. In general exposed towers with physical space for multiple antennas and amplifiers is preferred but in the case of Lake Park Marina a "stealth" tower was deemed appropriate for the local area. In the following maps and diagrams a more detailed analysis of the engineering decision making process is presented.

Network Coverage

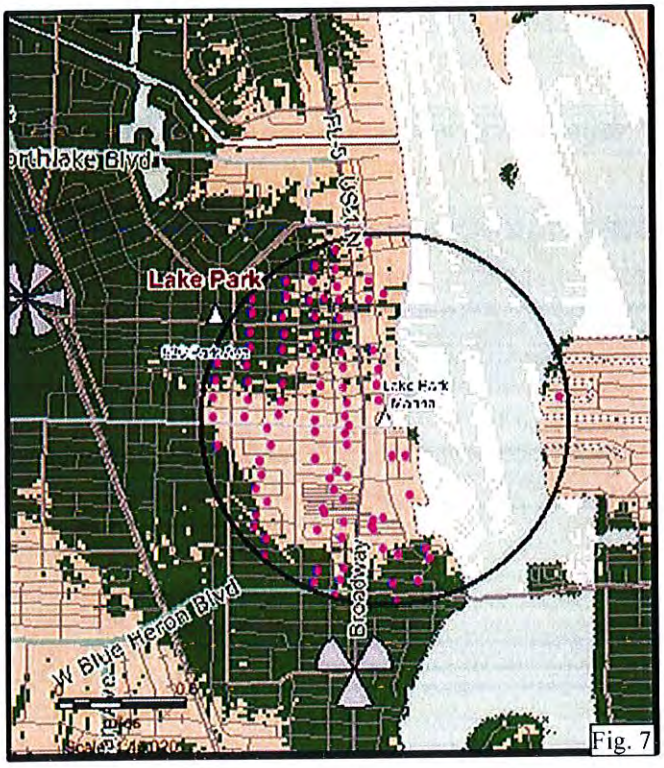


Fig. 7

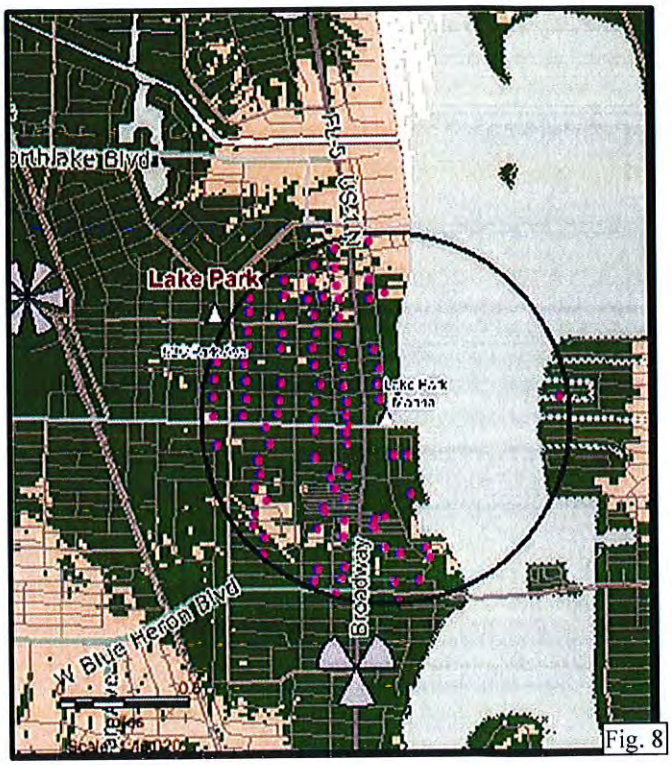


Fig. 8

As has been communicated in previous reports there is a relative coverage gap in many areas of Lake Park that contribute to significant network performance issues. In more detail cell phones being used from approximately 6th St in the west to the Intracoastal Waterway and from E 30th St in the south to north of Kelsey Park operate in a compromised coverage area. This includes the heavily traveled US1 corridor in addition to the residential neighborhoods to the east across the water. Outdoor signal levels are adequate for most voice calls and moderate data speeds in non-busy hours. During peak periods of the day (normally during rush hours) these mobile phones may often experience call quality issues and or call failures. Depicted in Figure 7 is the current average network coverage with reliable and strong indoor levels shaded in dark green and the outdoor or less reliable signal levels in beige. Also shown is the target coverage area with a circle and the census counts as dots within. In Figure 8 the predicted coverage for the Lake Park Marina is shown with the color schemes and graphical representations as the previous figure. In previous engineering studies provided as part of due diligence a comparison of the Lake Park proposal and the Crown monopole at the Lake Park Town Hall showed that the marina site would provide a much better coverage overlay for both the population and surrounding infrastructure.

Key Performance Indicators (KPI)

3G E911 Calls 12/12/15-1/12/15

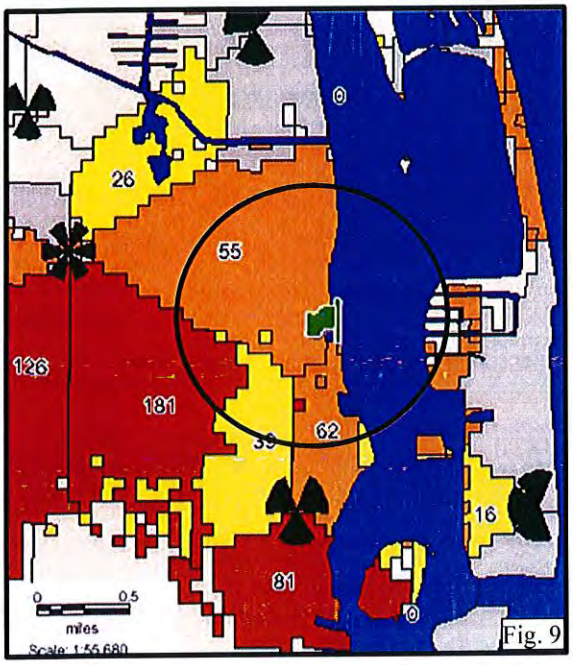


Fig. 9

This map shows the network configuration of antenna locations represented by the triangular shaped wedges colored black. The footprint for each of these wedges ("sectors") is shown as a radiated pattern extending away from the central connection point. These coverage areas are color coded to show the number of emergency calls in the commercial and residential areas surrounding the proposed tower. As can be seen in the graphic a coverage radius from the Lake Park Marina tower (dark circle) overlaps the existing tower coverage. It is expected that any E911 calls made within this circle radius would be handled by the new tower. Any emergency calls currently being made by users within the geographic area described by the proposed coverage area are more likely to fail due to the distance to the serving facility or cell site.

Customer Complaints

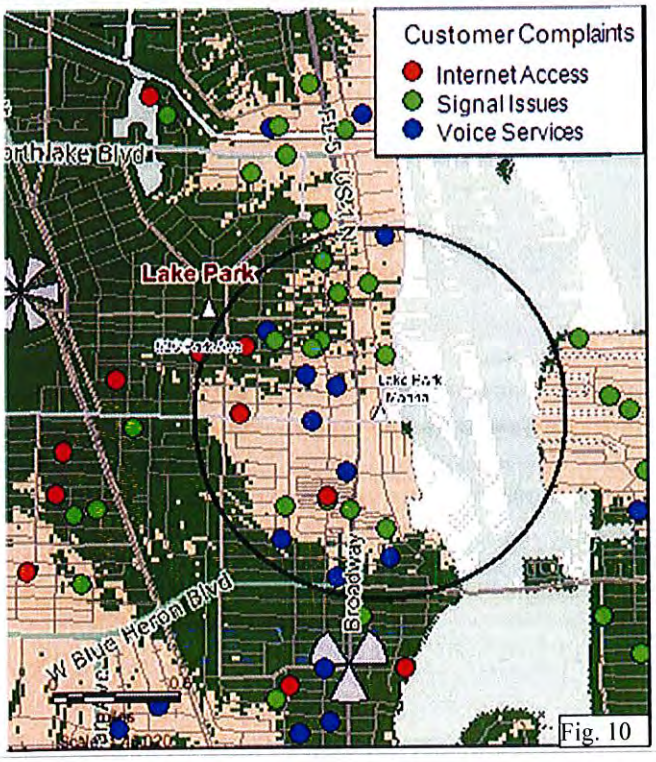


Fig. 10

Historical records of customer complaints in this area indicate that the low signal areas have the highest concentration of "Signal Issues" and "Voice Services". Both of these categories of customer service problems are related to the lack of signal in the area. Depending on whether a user is indoors or outdoors or driving in a vehicle call quality is compromised. The dark green shaded areas indicate where a customer might expect to have good indoor service levels.

Percentage of Calls Made in Poor Signal Level Areas 12/12/15-1/12/15

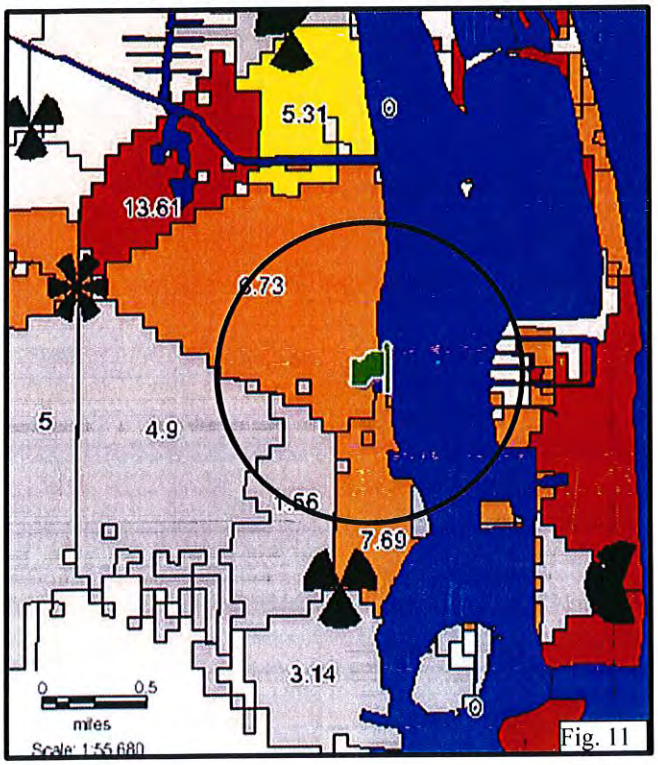


Fig. 11

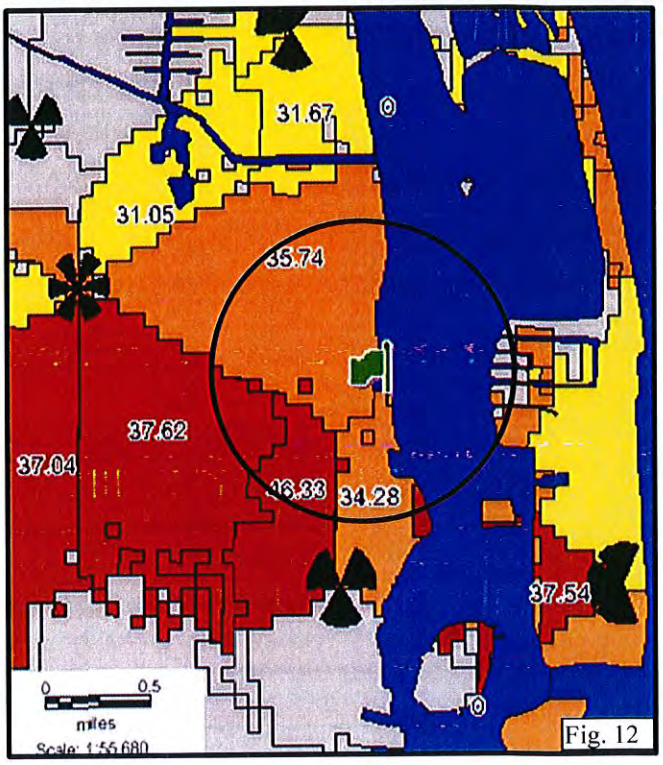


Fig. 12

These maps show the network configuration of antenna locations represented by the triangular shaped wedges colored black. The footprint for each of these wedges ("sectors") is shown as a radiated pattern extending away from the central connection point. These coverage areas are color coded to show the percentage of calls made by users with poor signal levels at the call commencement. Figure 11 represents the percentage of users initiating calls at the lowest possible thresholds within current technological constraints. As an example, 6.73 of the users within the coverage area of the serving tower to the northwest are at the lower end of service levels. A user would not be able to place a call with any further degradation in signal strength. Figure 12 shows the percentage of users that could not place a call from an indoor location. (A person in this situation could possibly stand near a window or step outside to successfully connect)

Ineffective Call Attempts 12/12/15-1/12/15

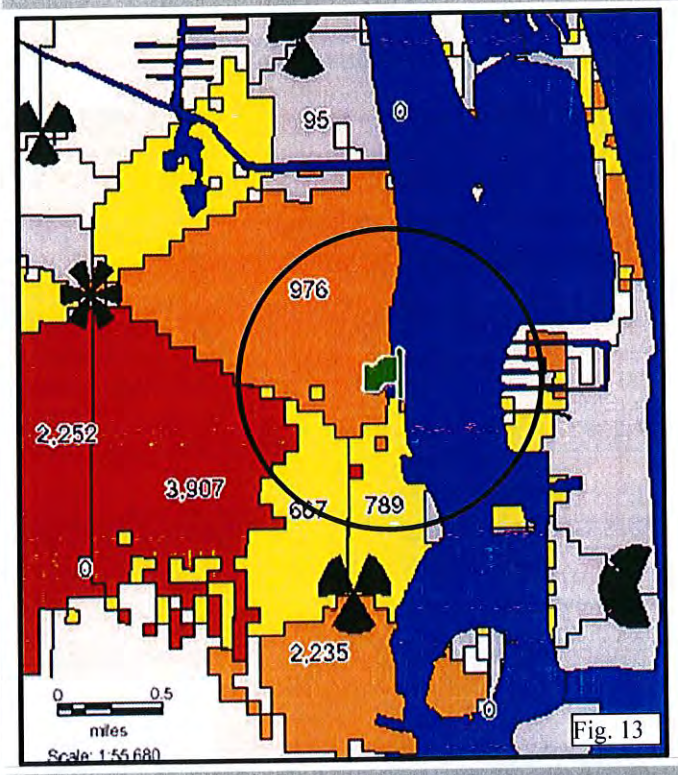


Fig. 13

This map shows the network configuration of antenna locations represented by the triangular shaped wedges colored black. The footprint for each of these wedges ("sectors") is shown as a radiated pattern extending away from the central point. These coverage areas are color coded to show the number of calls made by users who cannot access the network. In normal situations the phones algorithms are programmed to keep attempting to connect until some threshold of failures have been reached. When a user is experiencing long set up times to connect to the network it may be because of poor coverage, overloaded capacity or other mitigating circumstances. Due to the distance from the serving cell sites to the user it is often related to the signal thresholds if the user is in the geographic area described by the proposed tower's coverage area. (black ring) This could be significant if the user were making an emergency call.

Dropped Calls 12/12/15-1/12/15

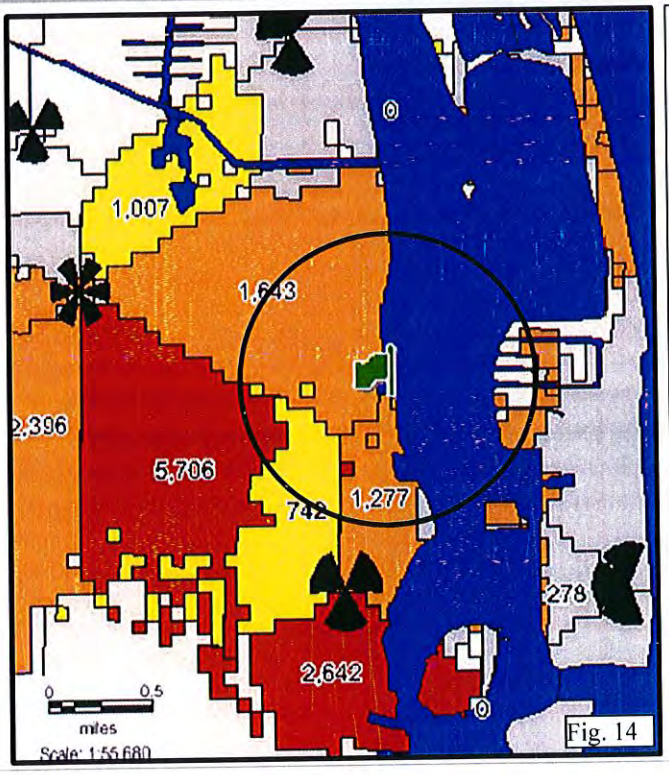


Fig. 14

This map shows the network configuration of antenna locations represented by the triangular shaped wedges colored black. The footprint for each of these wedges ("sectors") is shown as a radiated pattern extending away from the central point. These coverage areas are color coded to show the number of calls that disconnected before either user in the conversation terminated the call. There is no mechanism for the network to reconnect without the user experiencing a discontinuation in conversation. Due to the distance from the serving cell sites to the user it is often related to the signal thresholds if the user is in the geographic area described by the proposed towers coverage area. (black ring)

Drive Test Data

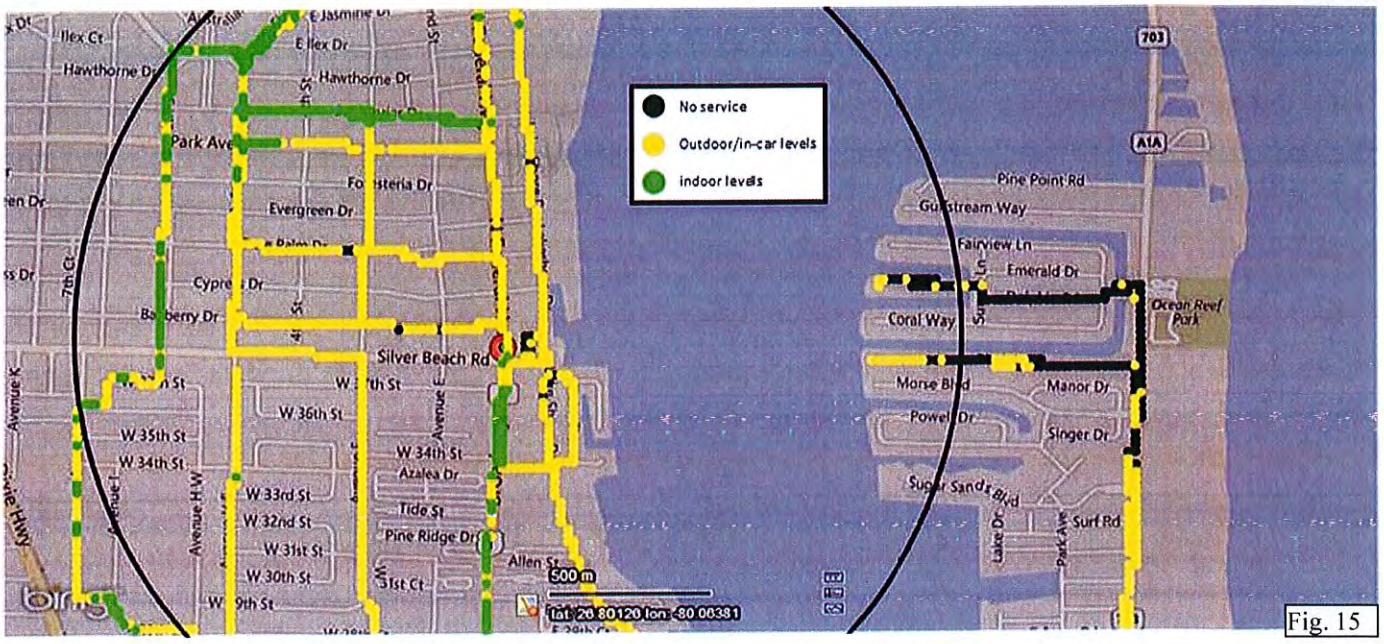


Fig. 15

Shown above is a map representing data collected from test equipment in an automobile in the coverage area of concern. (noted with black ring) The thresholds for service levels are shown with green indicating service areas where a user could expect to have realiable indoor service. Since the signals were measured at street level interpolations for residential and commercial structures must be made. Outdoor or in-car thresholds as shown in yellow indicate area where a user may have issues using the cell phone indoors. Once again interpolations must be made reagarding the actual indoor service. On roads displayed with black dots the test equipment measured levels that are considered too low to support any phone calls at all. It can be safe to assume that people living nearby or in commmercial areas would not be able to use their phone in these locals. The introduction of the tower at Lake Park Marina would essentially mitigate these issues.

April 23, 1996

FEDERAL COMMUNICATIONS COMMISSION

FACT SHEET

Information provided by the Wireless Telecommunications Bureau

NEW NATIONAL WIRELESS TOWER SITING POLICIES

The Telecommunications Act of 1996 contains important provisions concerning the placement of towers and other facilities for use in providing personal wireless services. Most state and local communities have worked closely with cellular and other wireless service providers on such placement plans, but this new law establishes new responsibilities for communities and for the Federal Communications Commission (FCC). The rapid expansion in the wireless industry makes these issues even more important.

This fact sheet is intended to explain the new provisions and to help state and local governments as they deal with the complex issues of facilities siting in their local communities. At the end of this fact sheet, you will find names of contacts for additional information about this area and other issues before the FCC.

Section 704 of the Telecommunications Act of 1996 (the "1996 Act") governs federal, state and local government oversight of siting of "personal wireless service" facilities. The 1996 Act establishes a comprehensive framework for the exercise of jurisdiction by state and local zoning authorities over the construction, modification and placement of facilities such as towers for cellular, personal communications service (PCS), and specialized mobile radio (SMR) transmitters:

- The new law preserves local zoning authority, but clarifies when the exercise of local zoning authority may be preempted by the FCC.

- Section 704 prohibits any action that would discriminate between different providers of personal wireless services, such as cellular, wide-area SMR and broadband PCS. It also prohibits any action that would ban altogether the construction, modification or placement of these kinds of facilities in a particular area.

- The law also specifies procedures which must be followed for acting on a request to place these kinds of facilities, and provides for review in the courts or the FCC of any decision by a zoning authority that is inconsistent with Section 704.

SUMMARY OF SECTION 704 OF THE TELECOMMUNICATIONS ACT OF 1996
The following is a summary of key provisions. The text of Section 704 is reproduced in its entirety as an attachment to this summary.

1. Local Zoning Authority Preserved
Section 704(a) of the 1996 Act amends Section 332(c) of the Communications Act ("Mobile Services") by adding a new paragraph (7). It preserves the authority of state and local governments over decisions regarding the placement, construction, and modification of personal wireless service facilities, except as provided in the new paragraph (7).

2. Exceptions

a. States and Localities May Not Take Discriminatory or Prohibiting Actions

Section 704(a) of the 1996 Act states that the regulation of the placement, construction, and modification of personal wireless service facilities by any State or local government or instrumentality thereof shall not unreasonably discriminate among providers of functionally equivalent services and shall not prohibit or have the effect of prohibiting the provision of personal wireless services. 47 U.S.C. §332(c)(7)(B)(i).

Review: Any person that is adversely affected by a state or local government's action or failure to act that is inconsistent with Section 332(c)(7) may seek expedited review in the courts. 47 U.S.C. §332(c)(7)(B)(v).

b. Procedures for Ruling on Requests to Place, Construct or Modify Personal Wireless Service Facilities

Section 704(a) also requires a State or local government to act upon a request for authorization to place, construct, or modify personal wireless service facilities within a reasonable time. Any decision to deny a request must be made in writing and be supported by substantial evidence contained in a written record. 47 U.S.C. §332(c)(7)(B)(ii), (iii).

c. Regulations Based On Environmental Effects of RF Emissions Preempted

Section 704(a) of the 1996 Act expressly preempts state and local government regulation of the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the FCC's regulations concerning such emissions. 47 U.S.C. §332(c)(7)(B)(iv).

Review: Parties may seek relief from the FCC if they are adversely affected by a state or local government's final action or failure to act that is inconsistent with this provision. 47 U.S.C. § 332(c)(7)(B)(v).

3. Federal Guidelines Concerning RF Emissions

FEDERAL COMMUNICATIONS COMMISSION
WIRELESS TELECOMMUNICATIONS BUREAU
2025 M Street, N.W., Washington, DC 20554

FACT SHEET #2

SEPTEMBER 17, 1996

NATIONAL WIRELESS FACILITIES SITING POLICIES

The Telecommunications Act of 1996 (the 1996 Act) contains important provisions concerning the placement of antenna structures and other facilities for use in providing personal wireless services. State and local governments have already been working closely with wireless service providers to place such facilities within their localities. The new law establishes a framework for the exercise of jurisdiction by state and local zoning authorities over the construction, modification and placement of facilities for personal wireless services.

The new law also directs the Commission to offer assistance to state and local governments in resolving wireless facilities siting issues. In that capacity, the Commission has formed a Wireless Facilities Siting Task Force to serve as a focal point for collection and dissemination of information relating to the efforts of state and local governments, as well as providers of personal wireless services, to address facilities siting concerns. The Task Force believes it can serve as a valuable information resource for state and local governments and for the industry as they carry out the responsibilities assigned them under the new law. Proper implementation of the new law will ultimately benefit the American public by preserving local zoning and land use authority, while at the same time, promoting the broad availability of these exciting new technologies.

On April 23, 1996, the Wireless Telecommunications Bureau issued **Fact Sheet #1** to inform the public about the provisions of Section 704 of the 1996 Act, and to assist state and local governments as they deal with the complex issues of personal wireless facilities siting in their local communities. **Fact Sheet #1** summarized key provisions of Section 704, reprinted the complete text of Section 704 of the 1996 Act, provided technical information concerning personal wireless services, and, finally, answered frequently asked questions.

This **Fact Sheet #2** consists of four parts :

- PART I is a new compilation of frequently asked questions and answers;
- PART II summarizes the Commission's radiofrequency (RF) emission rules governing personal wireless services, adopted August 1, 1996, and sets forth the

Register, issued on March 29, 1996. For more information on the use of federal property to site wireless antenna facilities, please contact James Herbert, Office of Property Acquisition and Realty Services, Public Building Service, General Services Administration, at (202) 501-0376, or write to GSA at 18th & F Streets, NW, Washington, DC 20405.

Section 704 also mandated the Commission to provide technical support to states in order to encourage them to make property, rights-of-way and easements under their jurisdiction available for the placement of new spectrum-based telecommunications services. For more information on how the Commission can be of assistance to the state and local governments in this area, please contact Steve Markendorff, Chief of the Broadband Branch, Commercial Wireless Division, Wireless Telecommunications Bureau, at (202) 418-0620, or fax (202) 418-1412, or email "smarkend@fcc.gov."

RADIOFREQUENCY (RF) EMISSIONS

16. Does Section 704 preempt state and local governments from basing regulation of the placement, construction or modification of personal wireless facilities directly or indirectly on the environmental effects of RF emissions?

Answer: Yes. Section 704 states that "No State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects of radio frequency emissions to the extent that such facilities comply with the Commission's regulations concerning such emissions."

17. Have any studies been conducted on potential health hazards of locating an antenna structures close to residential communities?

Answer: Many governmental agencies, scientists, engineers and professional associations have conducted studies of exposure levels due to RF emissions from cellular transmitter facilities. These levels have been found to be typically thousands of times below the levels considered to be safe by expert entities such as the Institute of Electrical and Electronics Engineers, Inc. (IEEE), and the National Council on Radiation Protection and Measurements (NCRP), as reflected in the Commission's rules governing RF emissions.

18. Has the Commission adopted new guidelines for evaluating RF exposures?

Answer: Yes. In light of revised guidelines developed by the Institute of Electrical and Electronics Engineers, Inc. and adopted by the American National Standards Institute in 1992 (ANSI/IEEE C95.1-1992), the Commission initiated a proceeding in 1993 to determine whether the Commission should adopt these guidelines to replace the 1982 ANSI guidelines. Section 704 of the 1996 Act required the Commission to complete this rulemaking proceeding (ET Docket 93-62) and have in place revised RF exposure guidelines by August 7, 1996. The Commission adopted a *Report and Order*, FCC 96-326, on August 1, 1996, which revised the guidelines that

Department of Planning, Zoning & Building

2300 North Jog Road
West Palm Beach, FL 33411-2741
(561) 233-5000

Planning Division 233-5300
Zoning Division 233-5200
Building Division 233-5100
Code Enforcement 233-5500
Contractors Certification 233-5525
Administration Office 233-5005
Executive Office 233-5228
www.pbcgov.com/pzb

February 25, 2014

Dina Bazzill
Environmental Corporation of America
1375 Union Hill Industrial Court, Suite A
Alpharetta, GA 30004

RE: Historical and Archaeological Resource Review for:
SFL13 (Lake Park Marina)
105 Lake Shore Dr., Lake Park, Palm Beach County, Florida
ECA Project #: R0400

This correspondence is in reply to your request for a review of the above referenced property in regard to the identification of any cultural resources (historical and archaeological resources) located on or within 500 feet of this property. Please note that this property is in the Town of Lake Park and thus not within Palm Beach County's jurisdiction.

Staff's review of the County's survey of historic/architecturally significant structures, and of properties designated for inclusion in the National Register of Historic Places (NRHP), has identified no historic or architecturally significant resources on or within 500 feet of the above referenced property.

Staff review of the County's map of known archaeological sites has identified no known archaeological resources located on or within 500 feet of the above referenced property.

Lastly, should skeletal remains be encountered during construction, per Florida Statue 872, construction must stop around the remains and the local sheriff and medical examiner contacted.

Should you have any questions or comments, please contact me at (561) 233-5331.

Sincerely,

Christian Davenport MA, RPA
Palm Beach County Archeologist

cc: Nadia DiTommaso, Community Development Director, Town of Lake Park

T:\Planning\Archaeology\County Departments\Planning\Land Use Amendments and Development Review\ECA\Lake Park Marina.doc

ENVIRONMENTAL CORPORATION OF AMERICA

ENVIRONMENTAL | GEOTECHNICAL | WETLANDS | ECOLOGY | CULTURAL RESOURCES

Community February 13, 2015

FEB 20 2015

Development

Town of Lake Park
535 Park Avenue
Lake Park, FL 33403

Subject: **Section 106 Review**
TCNS ID #122807
Proposed 125-Foot Overall Height Stealth Yardarm Telecommunications Structure
SFL13 (Lake Park Marina)
105 Lake Shore Drive
Lake Park, Palm Beach County, Florida
ECA Project #: R0400

To Whom It May Conern:

RG Towers, LLC is proposing to construct a 125-foot overall height stealth yardarm telecommunications structure located at 105 Lake Shore Drive, Lake Park, Palm Beach County, Florida. In accordance with the Federal Communications Commission regulation at 47 C.F.R. 1.1307(a)(4), we are providing notice to you and seeking any comments that you may have regarding the effect of the proposed action described above on **Historic Properties** in your community. A map is included for your reference. Based on your level of interest in the proposed project, you may wish to become a consulting party. ***This notice is not intended to supplant any local zoning or permitting requirements, but is necessary before we can request review of the proposed action by the State Historic Preservation Office.***

We welcome any comments that you may have regarding any **Historic Properties** that could be potentially affected by the proposed action. Please direct your comments to Dina Bazzill, Environmental Corporation of America, 1375 Union Hill Industrial Court, Suite A, Alpharetta, Georgia 30004, 770-667-2040 x111. Because we would like to submit their project to the SHPO for review as soon as possible, we request that you provide any documents that you may have within 30 days. Thank you for your cooperation.

Sincerely,
Environmental Corporation of America

Karen Sauler
Karen Sauler
Project Manager

Eric Johnson
Senior Project Manager

UNIVERSAL
ENGINEERING SCIENCES

REPORT OF A LIMITED GEOTECHNICAL EXPLORATION

Lake Park Marina Tower
105 Lake Shore Drive
Lake Park, Broward County, Florida

UES Project No. 0930.1500032.0000
UES Report No. 1255351

August 7, 2015

PREPARED FOR

RG Towers, LLC
2141 Alternate A1A, Suite 440
Jupiter, FL 33477

PREPARED BY

Universal Engineering Sciences, Inc.
5561 Florida Mining Boulevard South
Jacksonville, FL 32257
(904) 296-0757

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ENGINEERING SCIENCES
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• Reddedge, FL
• Sarasota, FL
• St. Augustine, FL
• Tampa, FL
• West Palm Beach, FL

August 7, 2015

RG Towers, LLC
2141 Alternate A1A, Suite 440
Jupiter, FL 33477

Attention: Mr. Scott Richards

Subject: Report of a Limited Geotechnical Exploration
Lake Park Marina Tower
105 Lake Shore Drive
Lake Park, Broward County, Florida
UES Project No. 0930.1500032.0000 and Report No. 1255351

Dear Mr. Richards:

Universal Engineering Sciences (UES) has completed a limited geotechnical exploration for the Lake Park Marina Tower site in Lake Park, Broward County, Florida. Our services were provided in general accordance with your request and our quote of February 26, 2015. Authorization to proceed with our services was provided by Mr. Eric Johnson of Environmental Corporation of America on July 20, 2015. This report briefly describes our understanding of the proposed construction, documents the field exploration and testing performed, presents the data obtained, and provides our geotechnical engineering evaluation of the site and subsurface conditions with respect to the proposed construction.

We appreciate the opportunity to be of service as your geotechnical consultant on this phase of the project and look forward to a continued relationship. If you have any questions, or if we may be of any further service, please contact us.

Very truly yours,

UNIVERSAL ENGINEERING SCIENCES

Matt McLeer, P.E.
Senior Geotechnical Engineer
Registered, Florida No. 85027

Lewis E. Hay, P.E.
Senior Geotechnical Engineer
Registered, Florida No. 48098

TABLE OF CONTENTS

1.0 SCOPE OF WORK

UES was engaged to provide geotechnical engineering consulting services for the Lake Park Marina Tower site at 105 Lake Shore Drive in Lake Park, Broward County, Florida. This report briefly discusses our understanding of the project, describes our exploratory procedures and presents our findings, conclusions and recommendations.

The primary objective of this study was to perform a geotechnical exploration within the area of the proposed construction and to assess the findings as they relate to the geotechnical aspects of the planned site development. The authorized geotechnical engineering services included a site reconnaissance, a soil test boring and sampling program, in-situ testing, engineering evaluation of the field data, and the preparation of this report.

The services were performed substantially in accordance with your request of February 26, 2015 and in general accordance with industry standards.

As authorized, the completed geotechnical report was to include:

- A description of the site, fieldwork, laboratory testing and general soil conditions encountered, including a Boring Location Plan and an individual Boring Record; and
- Foundation system recommendations for the proposed tower, including geotechnical design parameters to assist with the design of drilled shaft foundations.

The assessment of the presence of wetlands, floodplains or water classified as State Waters of Florida and the potential for karst activity was beyond the scope of this study. Additionally, the assessment of site environmental conditions, including the detection of pollutants in the soil, rock or groundwater, at the site was also beyond the scope of this geotechnical study. If desired, UES can provide these services.

2.0 PROJECT INFORMATION

2.1 Site Location and Description

The proposed tower site is located at 105 Lake Shore Drive in Lake Park, Broward County, Florida. The proposed lease area is in a grassed area north of an existing building. The site topography is relatively level and no standing surface water was observed on the site at the time of our exploration. The surface soils consisted of brown fine sands with some roots.

2.2 Project Description

Project information was provided by Mr. Eric Johnson of Environmental Corporation of America during recent phone conversations and e-mails. We have been provided a Set of Plans prepared by Caltrop Telecom (including Sheets C-1, C-1 and C-3) dated January 8, 2015. We

were also provided a FAA 1A Letter dated February 26, 2014 prepared by Caltrop Telecom. The proposed communication tower will consist of a stealth yardarm structure supported by a single drilled shaft foundation designed to resist the shear and overturning moments. We understand that the tower will be approximately 125 feet in height. A light weight support structure may be constructed near the base of the tower. We understand that the coordinates of the proposed tower are 26.794194° N and 80.052242° W. The ground surface elevation at the tower location is 2 feet, NAVD 88.

We have assumed that less than a foot of fill will be required to establish the desired site grades. If actual fill heights exceed two feet, the recommendations in this report may require re-evaluation.

3.0 FIELD EXPLORATION

3.1 SPT Boring

To explore the subsurface conditions in the proposed tower construction area, we drilled one (1) Standard Penetration Test (SPT) boring (B1) to a depth of 60 feet at the center of the proposed tower location. The field services were performed on August 3, 2015. The SPT boring was drilled in general accordance with ASTM D 1586. Upon completion, the borehole was grouted. The boring location was established in the field by our drill crew using taped measurements from existing features shown on the site plan furnished to us. The ground surface elevation at the boring location was provided by the project surveyor. A description of the field drilling and sampling procedure is included in Appendix A of this report. Split-spoon soil samples recovered during performance of the boring were visually classified in the field by the driller. Representative portions of the samples were returned to our office and examined by a geotechnical engineer to verify the field classifications. The samples were visually classified in general accordance with ASTM D-2488 (Unified Soil Classification System.)

4.0 GENERAL SUBSURFACE CONDITIONS

4.1 General Soil Profile

The subsurface conditions outlined below highlight the major subsurface stratifications encountered during our geotechnical exploration of the site. When reviewing the Boring Log and the subsurface conditions outlined below, it should be understood that the subsurface conditions will vary away from the boring location.

Beneath a thin grass root zone, the SPT boring encountered brown to light brown fine sand (SP) with some roots and shell fragments to a depth of 4 feet. Boring was advanced with a hand auger in this zone to avoid damaging underground utilities and standard penetration testing was not performed. Medium dense to very loose light brown to brown and grey to light grey fine sand (SP) was then penetrated to a depth of 32 feet. The standard penetration test values in this layer ranged from 4 to 12 blows per foot. Medium dense light brown to brown and grey fine sand

(SP) with some shell fragments was next encountered to a depth of 53 feet. The standard penetration test value in this layer ranged from 13 to 27 blows per foot. Very dense light grey cemented sand (SP) then extended to the boring termination depth of 60 feet. The standard penetration test values in this lower zone ranged from 56 blows per foot to 50 blows = 2 inches.

4.2 Groundwater Level

The groundwater level was encountered at a depth of approximately 4.0 feet below the ground surface at the boring location at the time of drilling. The depth to the groundwater is noted on the Boring Log in Appendix A. It should be anticipated that the groundwater level will fluctuate due to seasonal climatic variations, surface water runoff patterns, construction operations, ditches, and other interrelated factors. For the purpose of our evaluation, we have assumed the groundwater level will temporarily rise to existing ground surface during heavy, prolonged rainfall events.

5.0 DESIGN RECOMMENDATIONS

5.1 General

Our geotechnical engineering evaluation of the site and subsurface conditions at the property with respect to the planned tower construction are based on (1) our site observations, (2) the field data obtained, and (3) our understanding of the project information as presented in this report. Should the location of the proposed tower be changed or the fill heights in the area of the support structure exceed two feet, please contact us so that we can review our recommendations. The discovery of any site or subsurface conditions during construction which deviate from the data obtained during this geotechnical exploration should also be reported to us for our evaluation.

Based on the project information provided, it is anticipated that the proposed tower will be supported on a single drilled shaft foundation. The design of the foundation should include a lateral load and an axial load capacity analysis. Should the loading information become available, we would be pleased to provide our professional services to perform these analyses.

5.2 Drilled Shaft Foundation Design Recommendations

5.2.1 Soil Parameters

Laboratory analysis to determine actual soil shear strength properties was beyond the authorized scope of services. Based on our experience with similar soils and construction, we have provided estimates of geotechnical design parameters to aide in drilled shaft foundation design as presented in the table below. Our estimates are based on the analysis of an 84-inch diameter drilled shaft using the computer program FB-Deep 2.03. The total settlement of the shaft was limited to 0.5 inches or approximately 0.595 percent of the shaft diameter. By limiting

the amount of settlement, the allowable end bearing values may appear somewhat lower than otherwise anticipated.

DESIGN PARAMETERS

Depth (ft)		Unified Soil Classification	Effective Unit Effective Weight (pcf)	Friction Angle (degree)	Unconfined Compressive Strength (ksf)	Earth Pressure Coefficients			Allowable Skin Friction[1] (ksf)	Allowable End Bearing[1] (ksf)
From	To					Active Ka	Passive Kp	At-Rest Ko		
0.0	4.0	SP	55	30	0	0.33	3.00	0.50	--	--
4.0	6.0	SP	55	31	0	0.32	3.12	0.48	0.13	--
6.0	12.0	SP	55	29	0	0.35	2.88	0.52	0.08	--
12.0	17.0	SP	50	29	0	0.35	2.88	0.52	0.12	1.0
17.0	24.0	SP	50	30	0	0.33	3.00	0.50	0.15	1.2
24.0	28.0	SP	50	31	0	0.32	3.12	0.48	0.28	1.7
28.0	32.0	SP	60	30	0	0.33	3.00	0.50	0.30	1.9
32.0	37.0	SP	60	33	0	0.29	3.39	0.46	0.62	2.2
37.0	42.0	SP	60	33	0	0.29	3.39	0.46	0.66	2.6
42.0	47.0	SP	55	31	0	0.32	3.12	0.48	0.59	3.5
47.0	53.0	SP	60	33	0	0.29	3.39	0.46	--	--
53.0	57.0	SP	60	35	0	0.27	3.69	0.43	--	--
57.0	60.0	SP	60	35	0	0.27	3.69	0.43	--	--

[1]Note: A safety factor of 2 for skin friction has been applied to the allowable values presented in the table above. A safety factor of approximately 5 has been applied to the allowable end bearing values. We recommend that skin friction in the upper 5 feet be ignored for design purposes.

The design parameters presented above are based upon the analysis of an 84-inch diameter drilled shaft. Design parameters will change slightly for different shaft diameters and should be confirmed when the design is more advanced.

5.2.2 Drilled Shaft Construction Recommendations

The installation of the drilled shaft foundation should be in accordance with FDOT Specification 455-23 (Drilled Shaft Foundations). Based on the unconsolidated nature of the soils existing at the site, the drilled shaft should be installed using the "wet" construction method utilizing either a polymer or bentonite slurry to stabilize the shaft excavation. A temporary surface casing is recommended to help stabilize the upper loose sandy soils.

The successful construction of a drilled shaft with a continuous cross section from top to bottom is critical for the support a monopole tower founded on a single drilled shaft foundation. Prevention of the formation of a "mud cake" on the sidewalls of the shaft resulting from the use of stabilizing slurry is of particular concern due to the detrimental impact on shaft skin friction. The drilled shaft should therefore be installed by an experienced contactor that can demonstrate numerous successful shaft installations in similar soil conditions. In addition, the installation of

the shaft should be observed and documented by a qualified engineer or senior engineering technician from this office.

We recommend that seven (one per foot of shaft diameter), full length, minimum 1.5-inch diameter steel access tubes be equally spaced around the outside perimeter of the drilled shaft rebar cage. The tubes should be capped on both ends and filled with water prior to concrete placement. These tubes will facilitate cross-hole sonic logging (CSL) or other drilled shaft testing techniques in the event it becomes necessary to verify the continuity and integrity of the drilled shaft concrete.

The concrete used to construct the shaft should have a minimum 28 day compressive strength of 4000 psi and a slump of at least 6 inches at the time of placement. The concrete should be placed as soon as possible once the shaft excavation is completed. The concrete should be placed by either pumping or using the tremmie method.

5.3 Support Structure

A small, one-story, lightly loaded support structure near the base of the tower could be supported on a shallow foundation system. Shallow footings for the support structure could be designed with an allowable soil bearing capacity of 2,000 psf and a minimum footing width of 16 inches. A small structure could also be supported by a monolithic slab foundation. The turned down edges of the slab should have a minimum width of 12 inches. The foundation should be embedded a minimum depth of 12 inches below the finished exterior grade. The bearing level soils, after compaction, should exhibit densities equivalent to at least 95 percent of the Modified Proctor maximum dry density (ASTM D 1557) to a depth of at least one foot below the foundation bearing level.

6.0 REPORT LIMITATIONS

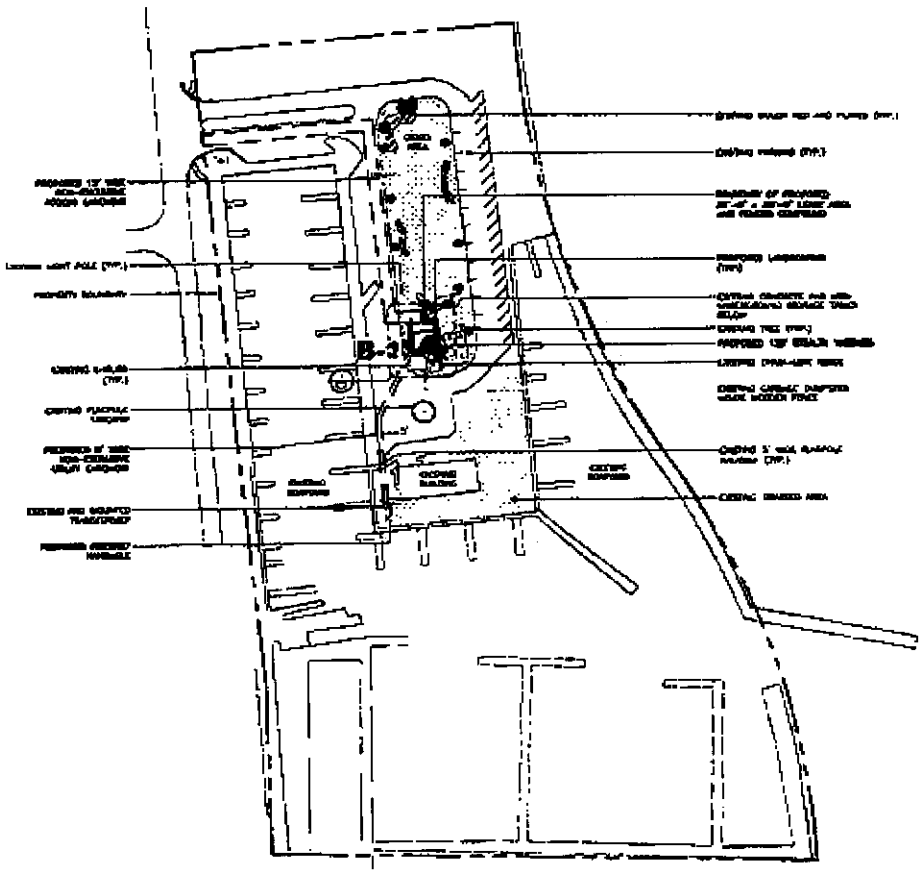
Our geotechnical exploration has been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. Universal Engineering (UES) is not responsible for any independent conclusions, interpretation, opinions or recommendations made by others based on the data contained in this report. This report does not reflect any variations which may occur away from the soil boring. The discovery of any site or subsurface condition during construction which deviates from the data obtained during this geotechnical exploration should be reported to us for our evaluation. Also, in the event of any change to the location of the tower, please contact us so that we can review our recommendations.

During the early stages of most construction projects, geotechnical issues not addressed in this report may arise. Because of the natural limitations inherent in working with the subsurface, it is not possible for a geotechnical engineer to predict and address all possible problems. A Geotechnical Business Council publication, "Important Information About This Geotechnical Engineering Report" appears in Appendix B, and will help explain the nature of geotechnical issues.

Further, we present documents in Appendix B: Constraints and Restrictions, to bring to your attention the potential concerns and the basic limitations of a typical geotechnical report.

APPENDIX A

BORING LOCATION PLAN
BORING LOG
KEY TO BORING LOGS
FIELD EXPLORATION PROCEDURES



North

0 100 200

(IN FEET)

1 inch = 200 ft.

LEGEND

SPT BORING LOCATIONS

UNIVERSAL
ENGINEERING SCIENCES

GEOTECHNICAL EXPLORATION
LAKE PARK MARINA TOWER
105 LAKE SHORE DRIVE
PENSACOLA, FLORIDA

BORING LOCATION PLAN

DRAWN BY: TW	DATE: 8/6/15	CHECKED BY: LEH	DATE: 8/6/15
SCALE: 1"=100'	PROJECT NO: 0930.1500032.0000	REPORT NO:	PAGE NO: FIGURE 1

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.	0930 150 0032 0000
REPORT NO.	125535
PAGE	A-1

PROJECT: GEOTECHNICAL EXPLORATION
LAKE PARK MARINA TOWER
, FLORIDA

CLIENT: ENVIRONMENTAL CORPORATION OF AMERICA

LOCATION: SEE BORING LOCATION PLAN

REMARKS: Grouted borehole upon completion

BORING DESIGNATION: **B-1** SHEET: **1 of 2**
SECTION: TOWNSHIP: RANGE:

G.S. ELEVATION (ft): DATE STARTED: 8/3/15
WATER TABLE (ft): 4 DATE FINISHED: 8/3/15
DATE OF READING: 8/03/2015 DRILLED BY: JR/AC
EST. W.S.W.T. (ft): TYPE OF SAMPLING: ASTM D-1586

DEPTH (FT.)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/FT.)	WT	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/DAY)	ORG. CONT (%)
0						Brown fine SAND (SP) w/ some roots						
		Hand Auger	--									
		Hand Auger	--	▼		Light brown fine SAND (SP) w/ some shell fragments						
5		8-8-4-4	12			Medium Dense light brown fine SAND (SP) w/ some shell fragments						
		2-2-2-2	4			Very Loose to Loose light brown fine SAND (SP) w/ some shell fragments						
		2-2-3-3	5			Loose to Very Loose brown to grey fine SAND (SP)						
10												
15		2-2-2-2	4									
20		2-3-4-4	7									
25		3-4-5-7	9			Loose light grey fine SAND (SP) w/ some cemented zones						
		3-4-4-6	8			Loose light brown fine SAND (SP) w/ some shell fragments						
30												

BORING LOG 0930 150 0032 0000 - LAKE PARK MARINA TOWER.GPJ UNIENGSC.GDT 8/5/15

UNIVERSAL ENGINEERING SCIENCES
BORING LOG

PROJECT NO.	0930 150-0032 0000
REPORT NO :	
PAGE.	A-2

PROJECT: GEOTECHNICAL EXPLORATION
LAKE PARK MARINA TOWER
, FLORIDA

BORING DESIGNATION: **B-1** SHEET: **2 of 2**
SECTION: TOWNSHIP: RANGE:

DEPTH (FT)	SAMPLE	BLOWS PER 6" INCREMENT	N (BLOWS/FT)	W.T	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS LL	ATTERBERG LIMITS PI	K (FT/DAY)	ORG. CONT (%)
30						Loose light brown fine SAND (SP) w/ some shell fragments						
						Medium Dense light brown to brown and grey fine SAND (SP) w/ some shell fragments						
35	X	8-11-18-18	27									
	X	8-9-11-9	20									
40												
	X	3-5-8-5	13									
45												
	X	9-10-10-6	20									
50												
	X	50=2"	50=2"			Very Dense light grey cemented SAND (SP)						
55												
	X	24-30-26-26	56									
60												

BORING LOG 0930 1500032 0000 LAKE PARK MARINA TOWER GPJ UNIENGSC.GDT 8/5/15

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KEY TO BORING LOGS

SYMBOLS

SYMBOL	DESCRIPTION
N	No. of blows of a 140-lb weight falling 30 inches required to drive standard spoon 1 foot.
WOR	Weight of Drill Rods
WOH	Weight of Drill Rods and Hammer
% REC	Percent Core Recovery from Rock Core Drilling
RQD	Rock Quality Designation
EOB	End Of Boring
BT	Boring Terminated
-200	Fines Content or % Passing No. 200 Sieve
MC	Moisture Content
LL	Liquid Limit
PI	Plasticity Index
K	Coefficient of Permeability
O.C.	Organic Content
▽	Estimated seasonal high groundwater level
▼	Measured groundwater level at time of drilling

UNIFIED CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOLS	TYPICAL NAMES
COARSE-GRAINED SOILS More than 50% retained on No. 200 sieve*	GRAVELS 50% or more of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS	GW	Well-graded gravels and gravel-sand mixtures, little or no fines
			GP	Well-graded gravels and gravel-sand mixtures, little or no fines
		GRAVELS WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	SANDS More than 50% of coarse fraction passes No. 4 sieve	CLEAN SANDS	SW**	Well-graded sands and gravelly sands, little or no fines
			SP**	Well-graded sands and gravelly sands, little or no fines
		SANDS WITH FINES	SM**	Silty sands, sand-silt mixtures
			SC**	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS 50% or more passes No. 200 sieve*	SILTS AND CLAYS Liquid limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS Liquid limit greater than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
			CH	Organic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity
			PT	Peat, muck and other highly organic soils

* Based on the material passing the 3-in. (75 mm) sieve.
** Use dual symbol (such as, SP-SM and SP-SC) for soil with more than 5% but less than 12% passing through No. 200 sieve.

RELATIVE DENSITY
(sand-silt)

Very Loose - Less Than 4 Blows/Ft
Loose - 4 to 10 Blows/Ft.
Medium - 11 to 30 Blows/Ft
Dense - 31 to 50 Blows/Ft
Very Dense - More Than 50 Blows/Ft.

CONSISTENCY
(clay)

Very Soft - Less than 2 Blows/Ft.
Soft - 2 to 4 Blows/Ft.
Medium - 5 to 8 Blows/Ft
Stiff - 9 to 15 Blows/Ft.
Very Stiff - 16 to 30 Blows/Ft.
Hard - More Than 30 Blows/Ft.

RELATIVE HARDNESS
(Limestone)

Soft - 100 Blows for more than 2"
Hard - 100 Blows for less than 2"

MODIFIERS

These modifiers provide our estimate of the amount of minor constituents (SILT or CLAY sized particles) in the soil sample.
Trace - 5% or less
With SILT or with CLAY - 6% to 11%
SILTY or CLAYEY - 12% to 30%
Very SILTY or Very CLAYEY - 31% to 50%

These modifiers provide our estimate of the amount of organic components in the soil sample.
Trace - 1% to 2%
Few - 3% to 4%
Some - 5% to 8%
Many - Greater than 8%

These modifiers provide our estimate of the amount of other components (Shell, Gravel, Etc.) in the soil sample
Trace - 5% or less
Few - 6% to 12%
Some - 13% to 30%
Many - 31% to 50%

FIELD EXPLORATION PROCEDURES

Standard Penetration Test Boring

The penetration boring was made in general accordance with the latest revision of ASTM D 1586, "Penetration Test and Split-Barrel Sampling of Soils". The boring was advanced by rotary drilling techniques using a circulating bentonite fluid for borehole flushing and stability. At 2 ½ to 5 foot intervals, the drilling tools were removed from the borehole and a split-barrel sampler inserted to the borehole bottom and driven 18 inches into the soil using a 140 pound hammer falling on the average 30 inches per hammer blow. The number of blows for the final 12 inches of penetration is termed the "penetration resistance, blow count, or N-value". This value is an index to several in-place geotechnical properties of the material tested, such as relative density and Young's Modulus.

After driving the sampler 18 inches (or less if in hard rock-like material), the sampler was retrieved from the borehole and representative samples of the material within the split-barrel were placed in glass jars and sealed. After completing the drilling operations, the samples for each boring were transported to our laboratory where they were examined by our engineer in order to verify the driller's field classification.

APPENDIX B

IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL ENGINEERING REPORT

CONSTRAINTS AND RESTRICTIONS

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical- engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply this report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by:* the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. *Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold-prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical-engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with you GBC-Member geotechnical engineer for more information.

GEOTECHNICAL BUSINESS COUNCIL
of the Geoprofessional Business Association

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org

CONSTRAINTS AND RESTRICTIONS

WARRANTY

Universal Engineering Sciences has prepared this report for our client for his exclusive use, in accordance with generally accepted soil and foundation engineering practices, and makes no other warranty either expressed or implied as to the professional advice provided in the report.

UNANTICIPATED SOIL CONDITIONS

The analysis and recommendations submitted in this report are based upon the data obtained from soil borings performed at the locations indicated on the Boring Location Plan. This report does not reflect any variations which may occur between these borings.

The nature and extent of variations between borings may not become known until excavation begins. If variations appear, we may have to re-evaluate our recommendations after performing on-site observations and noting the characteristics of any variations.

CHANGED CONDITIONS

We recommend that the specifications for the project require that the contractor immediately notify Universal Engineering Sciences, as well as the owner, when subsurface conditions are encountered that are different from those present in this report.

No claim by the contractor for any conditions differing from those anticipated in the plans, specifications, and those found in this report, should be allowed unless the contractor notifies the owner and Universal Engineering Sciences of such changed conditions. Further, we recommend that all foundation work and site improvements be observed by a representative of Universal Engineering Sciences to monitor field conditions and changes, to verify design assumptions and to evaluate and recommend any appropriate modifications to this report.

MISINTERPRETATION OF SOIL ENGINEERING REPORT

Universal Engineering Sciences is responsible for the conclusions and opinions contained within this report based upon the data relating only to the specific project and location discussed herein. If the conclusions or recommendations based upon the data presented are made by others, those conclusions or recommendations are not the responsibility of Universal Engineering Sciences.

CHANGED STRUCTURE OR LOCATION

This report was prepared in order to aid in the evaluation of this project and to assist the architect or engineer in the design of this project. If any changes in the design or location of the structure as outlined in this report are planned, or if any structures are included or added that are not discussed in the report, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions modified or approved by Universal Engineering Sciences.

USE OF REPORT BY BIDDERS

Bidders who are examining the report prior to submission of a bid are cautioned that this report was prepared as an aid to the designers of the project and it may affect actual construction operations.

Bidders are urged to make their own soil borings, test pits, test caissons or other investigations to determine those conditions that may affect construction operations. Universal Engineering Sciences cannot be responsible for any interpretations made from this report or the attached boring logs with regard to their adequacy in reflecting subsurface conditions which will affect construction operations.

STRATA CHANGES

Strata changes are indicated by a definite line on the boring logs which accompany this report. However, the actual change in the ground may be more gradual. Where changes occur between soil samples, the location of the change must necessarily be estimated using all available information and may not be shown at the exact depth.

OBSERVATIONS DURING DRILLING

Attempts are made to detect and/or identify occurrences during drilling and sampling, such as: water level, boulders, zones of lost circulation, relative ease or resistance to drilling progress, unusual sample recovery, variation of driving resistance, obstructions, etc.; however, lack of mention does not preclude their presence.

WATER LEVELS

Water level readings have been made in the drill holes during drilling and they indicate normally occurring conditions. Water levels may not have been stabilized at the last reading. This data has been reviewed and interpretations made in this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall, temperature, tides, and other factors not evident at the time measurements were made and reported. Since the probability of such variations is anticipated, design drawings and specifications should accommodate such possibilities and construction planning should be based upon such assumptions of variations.

LOCATION OF BURIED OBJECTS

All users of this report are cautioned that there was no requirement for Universal Engineering Sciences to attempt to locate any man-made buried objects during the course of this exploration and that no attempt was made by Universal Engineering Sciences to locate any such buried objects. Universal Engineering Sciences cannot be responsible for any buried man-made objects which are subsequently encountered during construction that are not discussed within the text of this report.

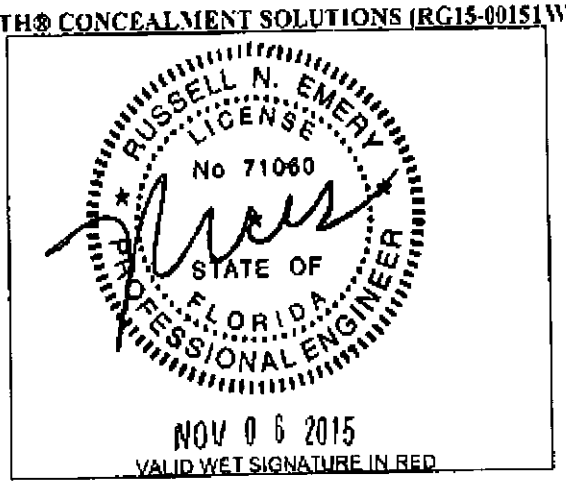
TIME

This report reflects the soil conditions at the time of investigation. If the report is not used in a reasonable amount of time, significant changes to the site may occur and additional reviews may be required.

UTAH OFFICES
Sandy
Layton
St George

Community
NOV 20 2015
Development

STRUCTURAL CALCULATIONS
for
LAKE PARK MARINA TOP SECTION (SITE # SFL13)
at
105 LAKE SHORE DRIVE
LAKE PARK, FL 33403
for
RG PARTNERS
&
STEALTH® CONCEALMENT SOLUTIONS (RG15-00151W-05R0)



BY: RUSSEL N. EMERY, P.E.
PROJECT ENGINEER

FL Firm License Number: COA 26626

PROJECT #: U0142-575-151

DATE: February 6, 2015

NOTE:
The calculations presented in this package are intended for a single use at the location indicated above, for the client listed above. These calculations shall not be reproduced, reused, "card filed", sold to a third party, or altered in any way without the written authorization of Vector Structural Engineering, LLC and STEALTH® Concealment Solutions.

VECTOR ENGINEERS

JOB NO.: U0142-575-151 DESIGNED: SRM
DATE: 02/06/15 CHECKED: TPH

PROJECT: LAKE PARK MARINA

Design Criteria:

Code: Structural design is based on the Florida Building Code, 2010 Edition (2009 IBC) w/ Amendments

Wind: Basic wind speed = 169 mph (3-second gust) per the ASCE 7-10 standard
Risk category / Structure class: II
Wind exposure: D
Topographic category: 1
Crest height: 0 ft

Ice: None per the TIA-222-G standard

General Notes:

1 The contractor shall verify dimensions, conditions and elevations before starting work. The engineer shall be notified immediately if any discrepancies are found.
2 The typical notes and details shall apply in all cases unless specifically detailed elsewhere. Where no detail is shown, the construction shall be as shown for other similar work and as required by the building code.
3 These calculations are limited to the structural members shown in these calculations only. The connection of the members shown in these calculations to the existing structure shall be by others.
4 The contractor shall be responsible for compliance with local construction safety orders. Approval of shop drawings by the architect or structural engineer shall not be construed as accepting this responsibility.
5 All structural framing members shall be adequately shored and braced during erection and until full lateral and vertical support is provided by adjoining members.

Structural Steel:

1 All structural steel code checks based on the AISC-LRFD, 3rd Edition per the TIA-222-G standard
2 All steel pipe to be per ASTM A53 GR. B (35 KSI), U.N.O.
3 All other structural steel shapes & plates shall be per ASTM A36, U.N.O.
4 All bolts for steel-to-steel connections shall be per ASTM A325N, U.N.O.
5 All bolted connections shall be tightened per the "turn-of-nut" method as defined by AISC.
6 All welding shall be performed by certified welders in accordance with the latest edition of the American Welding Society (AWS) D1.1
7 All steel surfaces shall be galvanized in accordance with ASTM A123 and ASTM A153 standards, thoroughly coated with a rust inhibitive red oxide primer, or otherwise protected as noted on the structural drawings.

VECTOR ENGINEERS

JOB NO.: U0142-575-151
DATE: 02/06/15

DESIGNED: SRM
CHECKED: TPH

PROJECT: LAKE PARK MARINA

User Forces

Ice Thickness[in]:	0.00
Ice Density [pcf]:	56
Cylinder Shape:	18-Sided
Shape Factor:	0.65 (supercritical)
	1.20 (subcritical)

Elev. @ Top of Base Pole [ft]:	89.0
Elev. @ Bottom of Base Pole [ft]:	1.0

(Refer to CF Values in Table 2-7, TIA-222-G)
(Applies for CaAc w/ Ice per Table 2-7)

		Diameter [in]			Weight [lb]		CaAc [ft^2]	
Cylinder	Length [ft]	No Ice	w/ Ice	Plates	No Ice	w/ Ice	No Ice	w/ Ice
				Top Plate	250	250	11.2	20.7
1	12.0	34	34.00					
				Bulkhead	350	350	22.4	41.4
2	12.0	34	34.00					
				Bulkhead	350	350	22.4	41.4
3	12.0	34	34.00					
				Bottom Plate	250	250	11.2	20.7
					0	0	0.0	0.0
					0	0	0.0	0.0
					0	0	0.0	0.0
					0	0	0.0	0.0

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:
Tower is located in Palm Beach County, Florida.
ASCE 7-10 Wind Data is used.
Basic wind speed of 169 mph.
Risk Category II.
Exposure Category D.
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 pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	125.00-89.00	36.00	P12x.375 13th	A500-42 (42 ksi)	

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 125.00-89.00				0	0	1.08		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft²/ft	Weight plf
AVA7-50 (1-5/8 LOW DENSI. FOAM)	C	No	Inside Pole	95.00 - 89.00	8	No Ice	0.00	0.72
AVA7-50 (1-5/8 LOW DENSI. FOAM)	C	No	Inside Pole	107.00 - 89.00	8	No Ice	0.00	0.72
AVA7-50 (1-5/8 LOW DENSI. FOAM)	C	No	Inside Pole	119.00 - 89.00	8	No Ice	0.00	0.72

$G_H = 1.100$

Section Elevation ft	z ft	K_z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 125.00-89.00	107.13	1.45	101	38.250	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000		0.00	0.000	0.000
					C	0.000	0.000		0.00	0.000	0.000

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 125.00-89.00	107.13	1.45	11	38.250	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000		0.00	0.000	0.000
					C	0.000	0.000		0.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 125.00-89.00	311.04	1797.59	A	0	0.6	101	1	1	0.000	0.00	0.00	C
			B	0	0.6		1	1	0.000			
			C	0	0.6		1	1	0.000			
Sum Weight:	311.04	1797.59						OTM	0.00 lb-ft	0.00		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 125.00-89.00	311.04	1797.59	A	0	0.6	101	1	1	0.000	0.00	0.00	C
			B	0	0.6		1	1	0.000			
			C	0	0.6		1	1	0.000			
Sum Weight:	311.04	1797.59						OTM	0.00 lb-ft	0.00		

Tower Forces - No Ice - Wind 90 To Face

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	1797.59					
Bracing Weight	0.00					
Total Member Self-Weight	1797.59			0.00	0.00	
Total Weight	4508.63			0.00	0.00	
Wind 0 deg - No Ice		0.00	-7451.49	-135736.48	0.00	0.00
Wind 90 deg - No Ice		7451.49	0.00	0.00	-135736.48	0.00
Wind 180 deg - No Ice		0.00	7451.49	135736.48	0.00	0.00
Total Weight	4508.63			0.00	0.00	
Wind 0 deg - Service		0.00	-840.36	-15308.09	0.00	0.00
Wind 90 deg - Service		840.36	0.00	0.00	-15308.09	0.00
Wind 180 deg - Service		0.00	840.36	15308.09	0.00	0.00

Load Combinations

Comb No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 90 deg - No Ice
5	0.9 Dead+1.0 Wind 90 deg - No Ice
6	1.2 Dead+1.0 Wind 180 deg - No Ice
7	0.9 Dead+1.0 Wind 180 deg - No Ice
8	Dead+Wind 0 deg - Service
9	Dead+Wind 90 deg - Service
10	Dead+Wind 180 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	125 - 89	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-5393.29	-137623.19	0.00
			Max. Mx	4	-5393.29	-137623.19	0.00
			Max. My	2	-5393.29	0.00	137623.19
			Max. Vy	4	7463.76	-137623.19	0.00
			Max. Vx	2	-7463.76	0.00	137623.19

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	4	5410.36	-7451.40	0.00
	Max. H_x	10	4508.63	0.00	-840.32

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	9	0.00000001	0.00006341
3	Yes	9	0.00000001	0.00004977
4	Yes	9	0.00000001	0.00006341
5	Yes	9	0.00000001	0.00004977
6	Yes	9	0.00000001	0.00006341
7	Yes	9	0.00000001	0.00004977
8	Yes	8	0.00000001	0.00000001
9	Yes	8	0.00000001	0.00000001
10	Yes	8	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	125 - 89	1.194	8	0.2152	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.00	Top Plate	8	1.194	0.2152	0.0000	Inf
119.00	(4) Generic Panel 100# (enclosed)	8	0.995	0.1794	0.0000	Inf
113.00	Bulkhead	8	0.796	0.1435	0.0000	Inf
107.00	(4) Generic Panel 100# (enclosed)	8	0.597	0.1076	0.0000	Inf
101.00	Bulkhead	8	0.398	0.0717	0.0000	Inf
95.00	(4) Generic Panel 100# (enclosed)	8	0.199	0.0359	0.0000	Inf
89.00	Bottom Plate	0	0.000	0.0000	0.0000	Inf

Maximum Tower Deflections - Design Wind

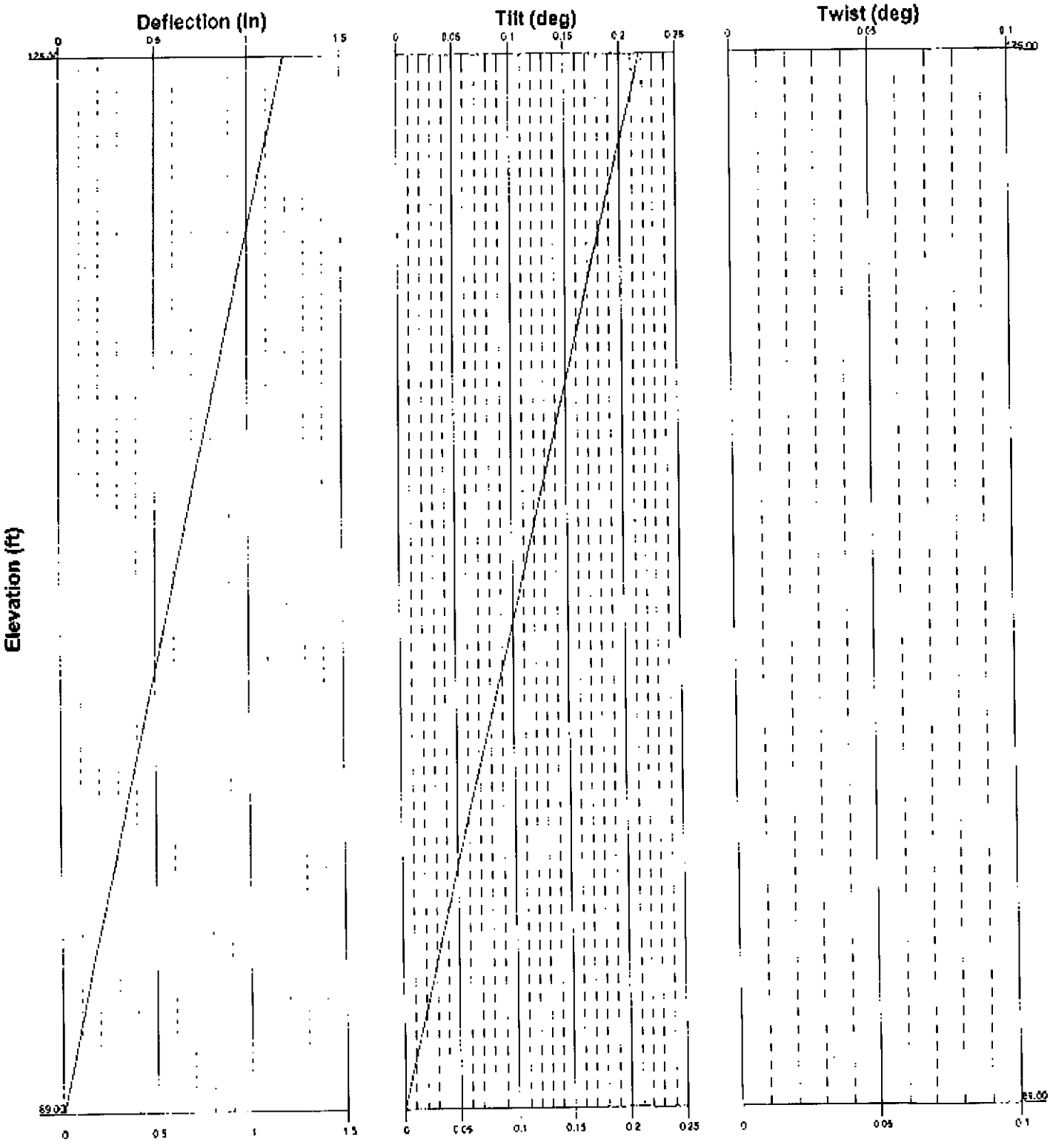
Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	125 - 89	10.612	2	1.9137	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.00	Top Plate	2	10.612	1.9137	0.0000	Inf

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	125 - 89	Pole	P12x.375 13th	1	-5096.05	313596.00	82.5	Pass
							Summary	
						Pole (L1)	82.5	Pass
						RATING =	82.5	Pass



Vector Engineering 9138 S State St. Suite 101 Sandy, UT 84070 Phone: (801) 990-1775 FAX: (801) 990-1776 www.vectorse.com	Job: Lake Park Marina - Top Section		
	Project: U0142-575-152		
	Client: STEALTH® Concealment Solutions	Drawn by: smontgomery	Appd:
	Code: TIA-222-G	Date: 02/05/16	Scale: N
	Path:		Dwg No:

VECTOR ENGINEERS

JOB NO.: U0142-575-151
DATE: 02/06/15

DESIGNED: SRM
CHECKED: TPH

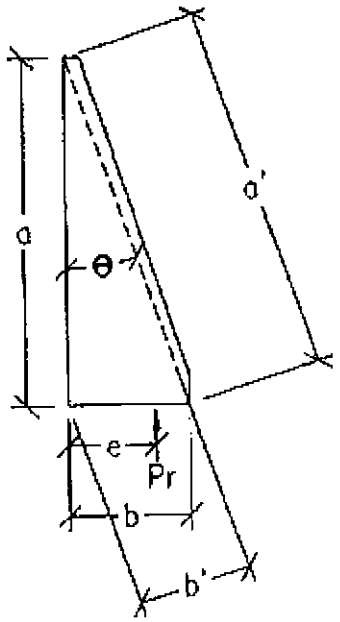
PROJECT: LAKE PARK MARINA TOP SECTION

Gusset Calculation

	LRFD φ	ASD Ω
Flexure:	0.9	1.67
Shear:	1	1.5

Analysis Type (ASD or LRFD)	LRFD
Pipe F_y (ksi)	42
Pipe F_U (ksi)	58

Pipe Outer Diameter (in)	12.75
Pipe Thickness (in)	0.375
Moment @ Splice M (kip-ft)	137.6
Axial @ Splice P (kips)	5.4
Shear @ Splice V (kips)	7.5



Gusset Loading

Bolt Circle Diameter BC (in)	15.75
Number of Gussets, n	12
P_r / Gusset (kips)	35.4
e (in):	1.6
M_u(Yielding) (kip-in):	56.1
M_u(Buckling) (kip-in):	16.8
N (kips):	34.2
V (kips):	9.7

Gusset Properties

Gusset Plate F_y (ksi)	36
Gusset Thickness t (in):	0.50
Gusset Height a (in):	9.00
Gusset Width b (in):	2.375

HSS Punching Shear Check (K1-3) = Okay

Flexural Yielding Check

Plate Z (in^3):	10.125	
M_n(Yielding) kip-in:	364.5	
Check:	17.1%	Okay

Shear Yielding Check

Angle θ (deg.):	14.8	
b' (in):	2.3	
V_n (kips):	24.8	
Shear Yielding Check:	38.9%	Okay

WINDSPEED BY LOCATION

Applied Technology Council

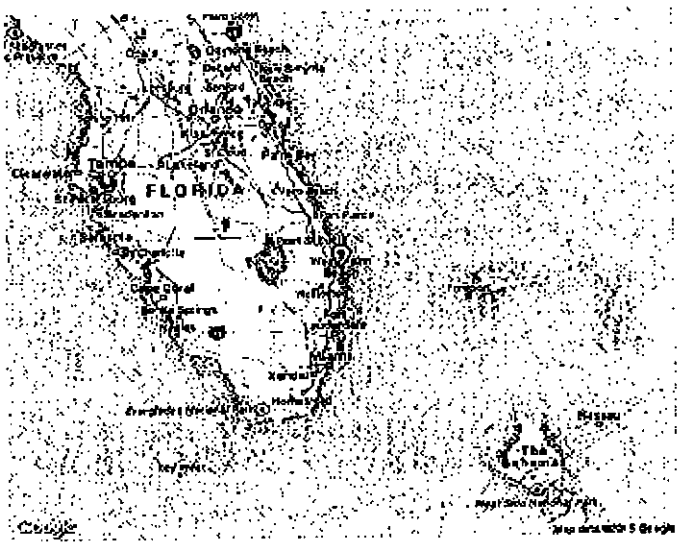
Search Results

Latitude: 26.7948
Longitude: -80.0524

ASCE 7-10 Wind Speeds (3-sec peak gust MPH*):

Risk Category I: 155
Risk Category II: 169
Risk Category III-IV: 180
MRI 10 Year:** 89
MRI 25 Year:** 112
MRI 50 Year:** 127
MRI 100 Year:** 138

ASCE 7-05: 144
ASCE 7-93: 104



*MPH (Miles per Hour)

**MRI Mean Recurrence Interval (years)

Users should consult with local building officials to determine if there are community-specific wind speed requirements that govern.

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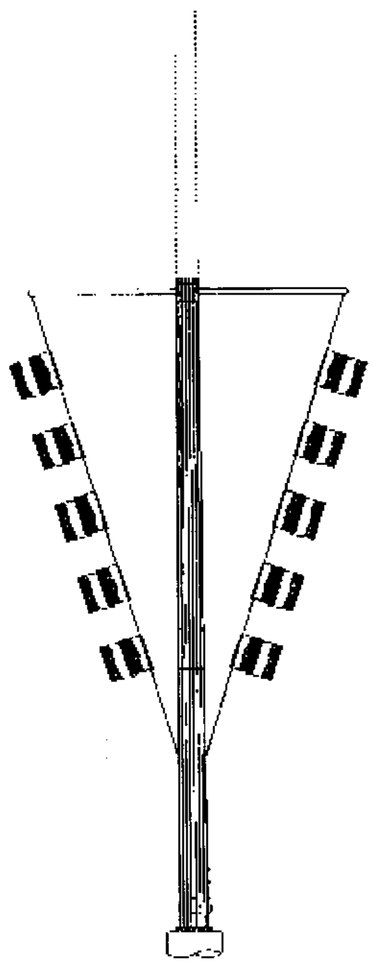

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FINAL ENGINEERING

RG PARTNERS
SITE: SFL13; LAKE PARK MARINA BASE POLE
BASE POLE
105 LAKE SHORE DRIVE
LAKE PARK, FL 33403

STEALTH JOB #: RG15-00151W-05R0

DRAWING INDEX

T1	TITLE SHEET
N1-N2	NOTES & SPECIFICATIONS
S1	ELEVATIONS
S2-S3	DETAILS
S4	FOUNDATION

RUSSELL N. EMERY
LICENSE No 71080
STATE OF FLORIDA
PROFESSIONAL ENGINEER
NOV 06 2015

T1
2

DESIGN NOTES:

STRUCTURAL DESIGN IS BASED ON THE FLORIDA BUILDING CODE, 2010 EDITION (2009 IBC) W/ AMENDMENTS & THE TIA-222-G STANDARD

SITE LOCATION:
PALM BEACH COUNTY, FL

DESIGN LOADS:
WIND:
BASIC WIND SPEED: [illegible] MPH (3 SEC. GUST) PER ASCE 7-10
RISK CATEGORY / STRUCTURE CLASS: II
EXPOSURE: D
TOPOGRAPHIC CATEGORY: 1
CREST HEIGHT: 0 FT

ICE: NONE

ESTIMATED WEIGHT:
[illegible] (POLE SHAFT AND BASE PLATE ONLY)

REACTIONS:

SHEAR, V = [illegible] (1.0 WIND)
AXIAL, P = [illegible] (1.2 DEAD)
MOMENT, M = [illegible] (1.0 WIND)

THE REACTIONS V & M LISTED ABOVE SHALL BE CONSIDERED TO ACT IN ANY HORIZONTAL DIRECTION.

GENERAL:

1. THE TYPICAL NOTES SHALL APPLY FOR ALL CASES UNLESS OTHERWISE SPECIFICALLY DETAILED WITHIN THE DRAWINGS. SOME NOTES MAY NOT BE APPLICABLE IN PART OR IN WHOLE FOR EVERY PROJECT.
2. ANY ITEMS REFERENCED AS BEING ON "HOLD" ARE TO BE INCLUDED IN THE WORK AS SHOWN. HOWEVER, CONSTRUCTION OR FABRICATION IS NOT TO BEGIN UNTIL THE "HOLD" REFERENCE IS REMOVED.
3. DIMENSIONS CONTAINED WITHIN MUST BE FIELD VERIFIED AND CUSTOMER APPROVED PRIOR TO FABRICATION OF MATERIALS.
4. THE MODIFICATIONS DEPICTED IN THESE DRAWINGS ARE INTENDED TO PROVIDE STRUCTURAL SUPPORT FOR THE ADDITION OF THE ANTENNA SCREENING SYSTEMS OUTLINED WITHIN. THE EXISTING STRUCTURE OR BUILDING SHALL BE ANALYZED AND RETROFITTED AS REQUIRED, BY OTHERS, TO WITHSTAND THE LOADS IMPOSED BY THE NEW STEALTH® PRODUCT SHOWN ON THE DRAWINGS.
5. ANTENNA CONCEALMENT PRODUCTS SHALL BE INSTALLED BY A CONTRACTOR EXPERIENCED IN SIMILAR WORK. CARE SHALL BE TAKEN IN THE INSTALLATION OF ANY AND ALL MEMBERS IN ACCORDANCE WITH ACCEPTED INDUSTRY STANDARDS AND PROCEDURES. ALL APPLICABLE OSHA SAFETY GUIDELINES ARE TO BE FOLLOWED. STEALTH® IS NOT PROVIDING FIELD INSTALLATION SUPERVISION.
6. THESE DRAWINGS INDICATE THE MAJOR OPERATIONS TO BE PERFORMED, BUT DO NOT SHOW EVERY FIELD CONDITION THAT MAY BE ENCOUNTERED. THEREFORE, PRIOR TO BEGINNING OF WORK THE CONTRACTOR SHOULD SURVEY THE JOB SITE THOROUGHLY TO MINIMIZE FIELD PROBLEMS.
7. PROTECTION OF EXISTING STRUCTURES DURING THE COURSE OF THE CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.
8. THE STRUCTURAL INTEGRITY OF THIS STRUCTURE IS DESIGNED TO BE ATTAINED IN ITS COMPLETED STATE. WHILE UNDER CONSTRUCTION ANY TEMPORARY BRACING OR SHORING WHICH MAY BE REQUIRED TO MAINTAIN STABILITY PRIOR TO COMPLETION SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.
9. THE PLANS AND DETAILS WITHIN DO NOT INCLUDE DETAILS OR DESIGN FOR DRAINAGE FROM OR WATERPROOFING OF EXTERIOR OR INTERIOR SURFACES OF THE EXISTING BUILDING OR STRUCTURE. THESE ITEMS MUST BE COMPLETED BY OTHERS.

COAX NOTE:

ROUTING THE LARGE QUANTITY OF COAX CABLES THROUGH THE CONCEALMENT ENCLOSURES IS POSSIBLE (WHEN LAID OUT ON PAPER), BUT WILL BE VERY DIFFICULT IN REAL WORLD FIELD CONDITIONS. WHILE THE CABLES MAY PHYSICALLY FIT THROUGH THE BASE FLANGE ON TOP OF THE MONOPOLE AND THE SUBSEQUENT STEEL [illegible], ROUTING THEM PAST THE ANTENNAS IS UNPREDICTABLE, DEPENDING ON THE ANTENNA MOUNTING HARDWARE EMPLOYED, COAX CONNECTOR TYPE(S) USED, COAX ROUTING, AND RELATIVE AZIMUTH DIRECTIONS OF THE ANTENNAS IN THE POLE. STEALTH® CAN NOT GUARANTEE THAT ALL OF THE COAX CAN BE ROUTED WITHOUT INTERFERENCE TO SOME OR ALL ANTENNAS. IT IS HIGHLY RECOMMENDED THAT THE INSTALLER MOCK UP THE COAX RUNS WITHIN THE CONCEALMENT AND DEVELOP A COAX ROUTING PLAN PRIOR TO INSTALLATION.

MATERIAL NOTES:

1. UP-SIZED MONOPOLE STEEL SHALL CONFORM w/ ASTM A572 GR. 65, U.N.O.
2. ALL STEEL PIPE TO BE PER ASTM A500 GR. B 42 KSI, U.N.O.
3. BASE PLATE STEEL SHALL CONFORM w/ ASTM A572, GR. 50, U.N.O.
4. REINFORCED ACCESS PORT STEEL SHALL CONFORM w/ ASTM A572 GR. 65, U.N.O.
5. ALL OTHER STRUCTURAL STEEL SHAPES & PLATES SHALL CONFORM TO ASTM A36, U.N.O.
6. ALL BOLTS FOR THE STEEL-TO-STEEL CONNECTIONS SHALL CONFORM w/ [illegible], U.N.O.
7. ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS IN ACCORDANCE WITH THE LATEST VERSION OF THE AMERICAN WELDING SOCIETY (AWS) D1.1. ALL WELDING SHALL BE PERFORMED IN A SHOP APPROVED BY THE BUILDING [illegible]
8. ALL STEEL SURFACES SHALL BE GALVANIZED IN ACCORDANCE w/ ASTM A153 AND ASTM A123 STANDARDS.
9. ALL BOLTED CONNECTIONS SHALL BE TIGHTENED PER THE "TURN OF NUT" METHOD AS DEFINED BY AISC.

STEALTHSKIN PANELS:

1. FASTENER HOLES IN STEALTHSKIN FOAM COMPOSITE PANELS ARE NOT FACTORY DRILLED AND MUST BE DRILLED IN THE FIELD.
2. PANEL FASTENERS TO BE SPACED 12" O.C. MAX. AND LOCATED [illegible] HORIZONTALLY FROM EACH EDGE AT TOP AND BOTTOM OF PANEL. MAINTAIN 1 ½" MIN. EDGE DISTANCE FROM ALL EDGES. 4' WIDE PANELS REQUIRE (4) FASTENERS TOP AND BOTTOM. 5' WIDE PANELS REQUIRE (4) FASTENERS TOP AND BOTTOM. CORNER PANELS REQUIRE (3) FASTENERS TOP AND BOTTOM PER SIDE.
3. WHEN FASTENER BOLT HEAD OR NUT BEARS DIRECTLY ON SURFACE OF STEALTHSKIN PANEL, TIGHTEN PANEL BOLTS ONLY ¼ TURN PAST SNUG. APPLY THREAD LOCK COMPOUND TO THE THREADS OF METAL BOLTS. USE THREAD OR EPOXY TO LOCK THE NUTS OF FRP BOLTS AND STEALTH® STAINLESS STEEL PANEL BOLTS. USE WASHER OR FLANGED HEAD BOLT, OR FASTENER WITH LARGE BEARING SURFACE.
4. PANELS WILL EXPAND AND CONTRACT DUE TO TEMPERATURE. WHEN INSTALLING PANELS IN COLD TEMPERATURES, EVENLY SPACE PANELS ALONG LENGTH OF SCREEN WALL WITH EQUAL GAPS BETWEEN PANELS TO ALLOW FOR EXPANSION DURING WARM TEMPERATURES.
5. ADJACENT FLAT PANELS ARE JOINED BY A VERTICAL FOAM SPLINE THAT IS INSERTED INTO GROOVES CUT INTO THE SIDE OF EACH PANEL. DO NOT LIFT PANELS BY GROOVES. PANELS MUST BE LIFTED WITH FORCE DIRECTED ONTO PANEL SURFACE.
6. ADJACENT RADIUS PANELS ARE JOINED BY A VERTICAL H-CHANNEL. INSERT PANELS INTO EACH SIDE OF H-CHANNEL.
7. RADIUS PANELS MUST BE EVENLY SPACED ALONG RADIUS SUPPORT. CONTRACTOR TO MEASURE LENGTH OF RADIUS SUPPORT AND DIVIDE BY THE NUMBER OF RADIUS PANELS TO DETERMINE PROPER SPACING. H-CHANNEL CONNECTORS ARE USED TO COVER THE GAPS BETWEEN PANELS AND TO ALLOW FOR PANEL EXPANSION AND CONTRACTION.
8. SURFACES OF PANELS SHALL BE COATED WITH SUITABLE PAINT FOR UV PROTECTION. TOP EDGE OF PANEL MUST BE COVERED TO PREVENT WATER TRAVEL BETWEEN PANELS. USE SHERWIN WILLIAMS "CONFLEX [illegible]" OR THE APPROVED EQUIVALENT.
9. EXPOSED TOP AND SIDE FOAM EDGES OF PANELS MUST BE COVERED OR COATED FOR UV PROTECTION. STEALTH® WILL PROVIDE PANEL EDGE CAPS TO BE FIELD APPLIED FOR THIS PURPOSE FOR MOST APPLICATIONS. PANEL EDGE CAPS TO BE SECURED WITH TEK SCREWS INSTALLED @ 12" MAXIMUM SPACING ON THE INSIDE FACE OF THE PANEL.

SPECIAL INSPECTIONS & STRUCTURAL OBSERVATION:

1. STEEL FABRICATION SHALL BE DONE ON THE PREMISES OF A FABRICATOR REGISTERED AND APPROVED AS REQUIRED BY THE IBC TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION.
2. NO FIELD WELDING SHALL BE PERMITTED.
3. THE FOLLOWING SPECIAL INSPECTIONS (WHERE APPLICABLE) SHALL BE REQUIRED PER CHAPTER 17 OF THE IBC:
   - PERIODIC SPECIAL INSPECTION OF HIGH-STRENGTH BOLTING
   - CONTINUOUS SPECIAL INSPECTION OF ANCHOR BOLTS PRIOR TO AND DURING CONCRETE PLACEMENT
4. NO STRUCTURAL OBSERVATION IS REQUIRED.

DISCLAIMERS:

1. ALL STRUCTURAL COMPONENTS TO BE CONNECTED TOGETHER SHALL BE COMPLETELY FIT UP ON THE GROUND OR OTHERWISE VERIFIED FOR COMPATIBILITY PRIOR TO LIFTING ANY COMPONENT INTO PLACE. REPAIRS REQUIRED DUE TO FIT-UP OR CONNECTION COMPATIBILITY PROBLEMS AFTER INITIAL ERECTION ARE THE FINANCIAL RESPONSIBILITY OF THE CONTRACTOR.
2. ALTHOUGH RARE, EXCESSIVE DEFLECTION SEVERE ENOUGH TO CAUSE DAMAGE CAN OCCASIONALLY OCCUR IN SLIM LINE OR MONOPOLE STRUCTURES AT LOW WIND SPEEDS. BECAUSE THE PHENOMENON IS INFLUENCED BY MANY INTERACTING VARIABLES, MOVEMENT AND OSCILLATIONS ARE GENERALLY UNPREDICTABLE. THE TOWER OWNER MUST PERIODICALLY OBSERVE THE STRUCTURE FOR EXCESSIVE DEFLECTION AND ANY RESULTING STRUCTURAL DAMAGE OR BOLT LOOSENING. IN THE EVENT OF EXCESSIVE MOVEMENT, VECTOR STRUCTURAL ENGINEERS MUST BE NOTIFIED IMMEDIATELY. MODIFICATIONS TO THE STRUCTURE MAY BE REQUIRED AT THE OWNER'S EXPENSE. THE CHANGES MAY ALTER THE AESTHETIC APPEARANCE OF THE STRUCTURE.

VECTOR
ENGINEERS
[illegible] S. STATE STREET, SUITE [illegible]
SANDY, UT 84070
P. (801) 990-1775 F. (801) 990-1776

VECTOR PROJECT: [illegible]
ROGER L. [illegible], P.E.
FL LICENSE: [illegible]
FL CERTIFICATE OF AUTHORIZATION: [illegible]

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DRAWINGS NOT TO SCALE. [illegible]

NOTES & SPECIFICATIONS

RG PARTNERS

SITE: SFL13; LAKE PARK MARINA BASE POLE
BASE POLE
105 LAKE SHORE DRIVE
LAKE PARK, FL 33403

JOB #: [illegible]
DRAWN: [illegible]
DESIGNED: [illegible]
REVISED: [illegible]

N1

[illegible] 2

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REVISION TABLE

REVISION	DESIGNER	DATE	SCOPE OF REVISION
0	SRM-VSE	2/5/15	FINAL ENGINEERING
1	SRM-VSE	7/9/15	REMOVE ASSEMBLY C
2	KON-VSL	11/2/15	ADDED FOUNDATION

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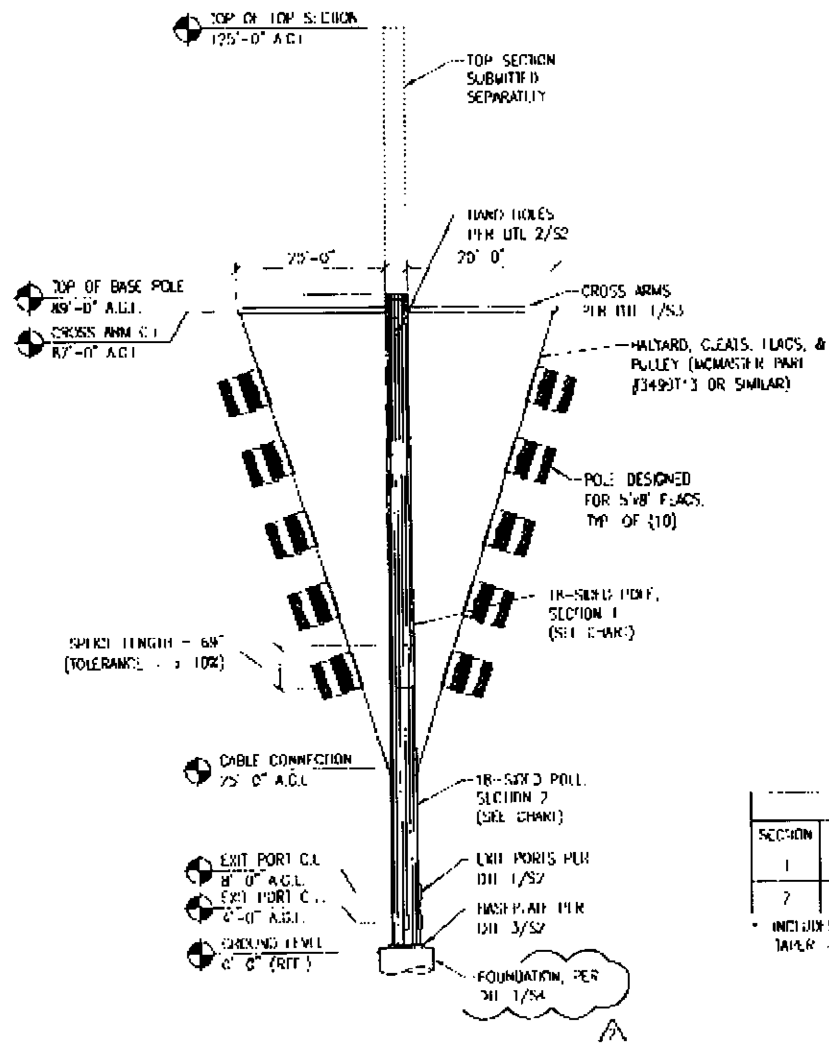
N2
11/2/15
REVISION 2



MONOPOLE SECTION CHART

SECTION	LENGTH	TOP Ø	BOTTOM Ø	THICKNESS	WEIGHT
1	53'-0"	34.00"	41.42"	7/32"	5.0 K
2	40'-9"	40.18"	45.88"	1/4"	6.2 K*

* INCLUDES BASEPLATE & PORT WEIGHT
TAPER = 0.14 IN/FT

ELEVATION (1)
N.T.S.

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SANDY, UT 84070
P: (801) 990-1775 F: (801) 990-1776
VECTOR PROJECT: U0142-575-151
ROGER T. ALWORTH, P.E.
FL LICENSE: 57664
FL CERTIFICATE OF AUTHORIZATION: 26476

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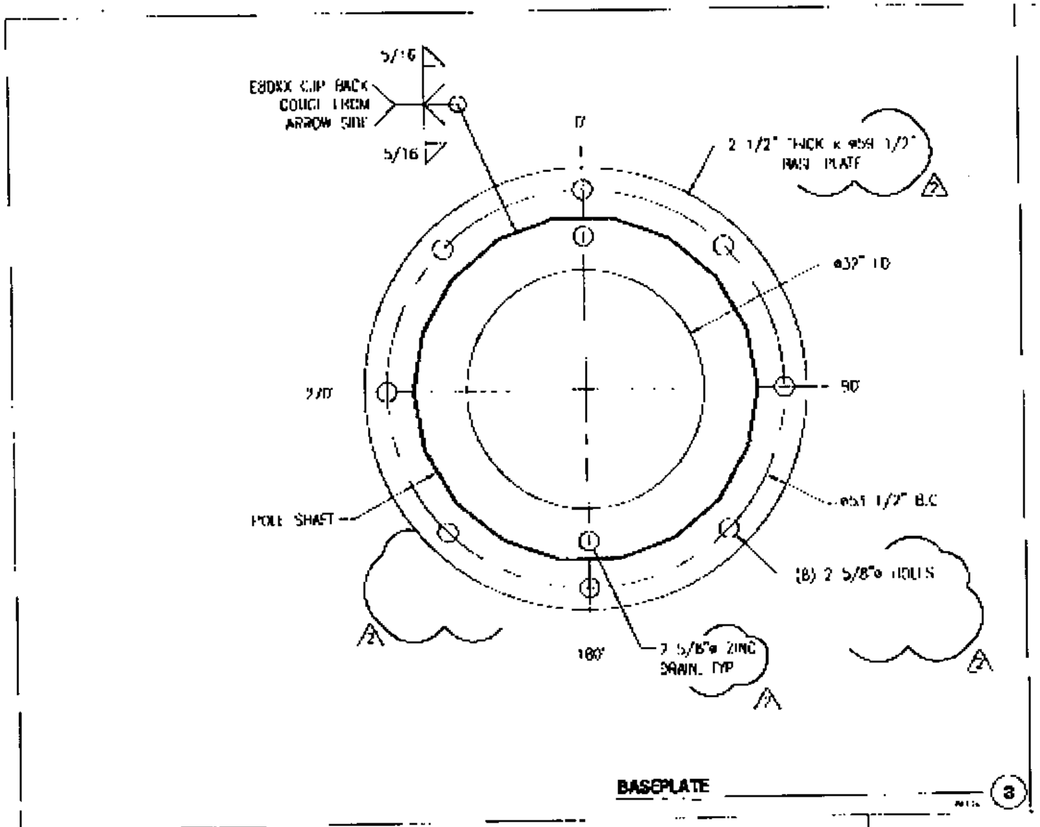
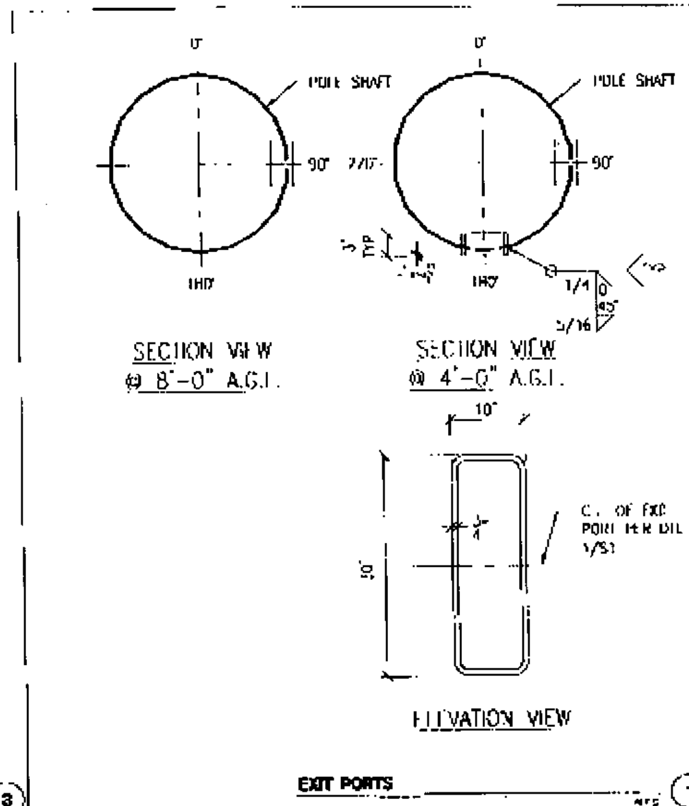
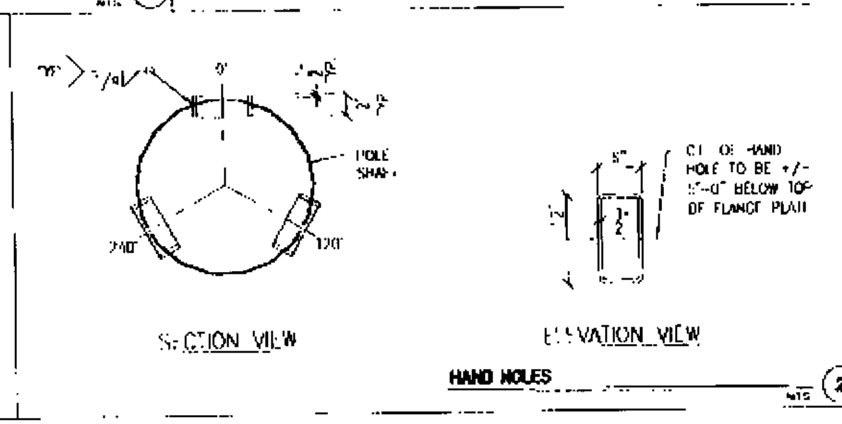
S1
11/2/15
2







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BASE POLE
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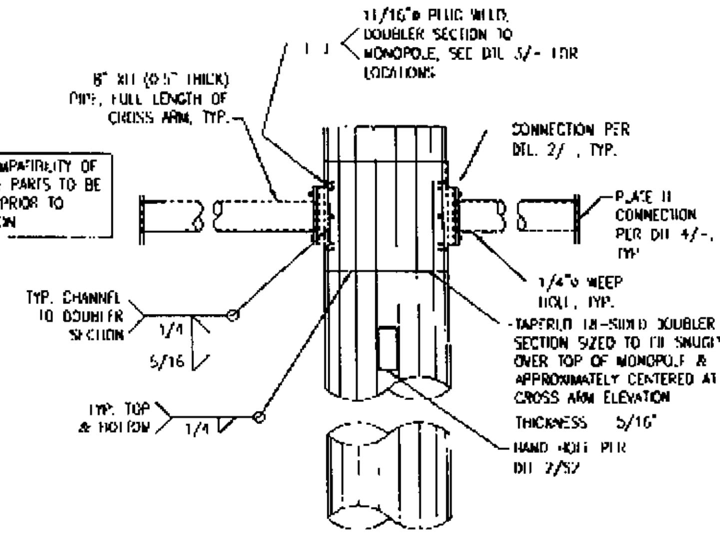
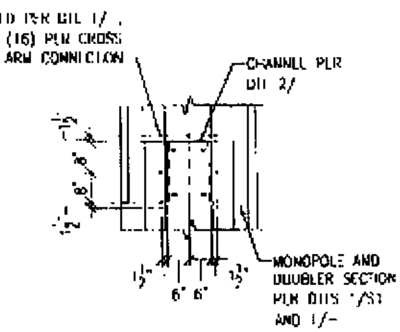
S2

REVISION 2

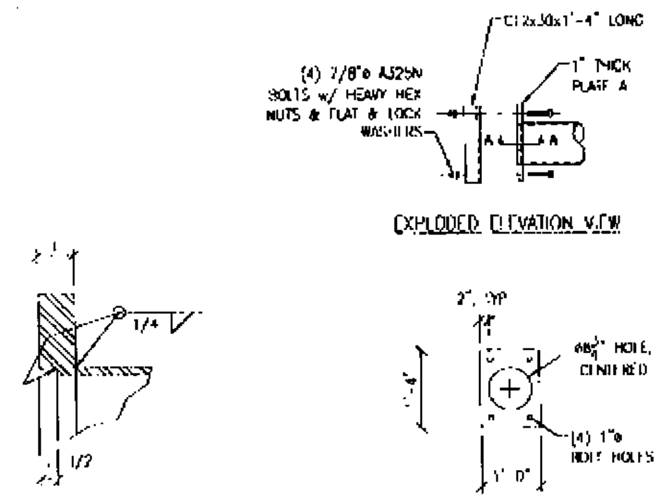


NOTE: COMPATIBILITY OF PULLEY & PARTS TO BE VERIFIED PRIOR TO FABRICATION

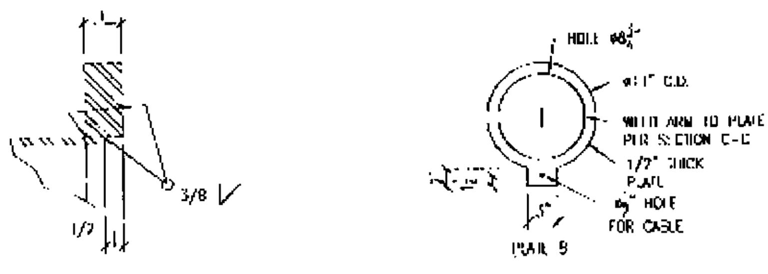
CROSS ARMS — NTS (1)



PLUG WELDS — NTS (3)



NTS (2)



TAB PLATE B — NTS (4)

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LAKE PARK, FL 33403

S3
2

VECTOR ENGINEERS

FOUNDATION NOTES:

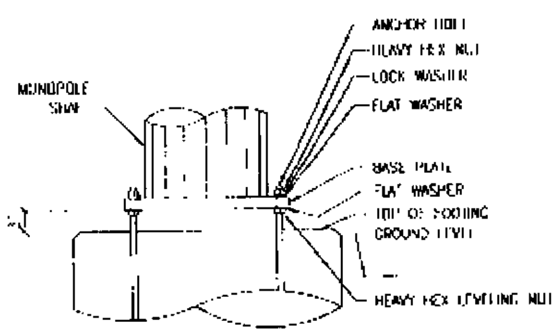
1. FOUNDATION DESIGN IS BASED ON THE FOLLOWING GEOTECHNICAL REPORT.

   UNIVERSAL ENGINEERING SCIENCES
   REPORT: [illegible]
   DATE: AUGUST 7, 2015

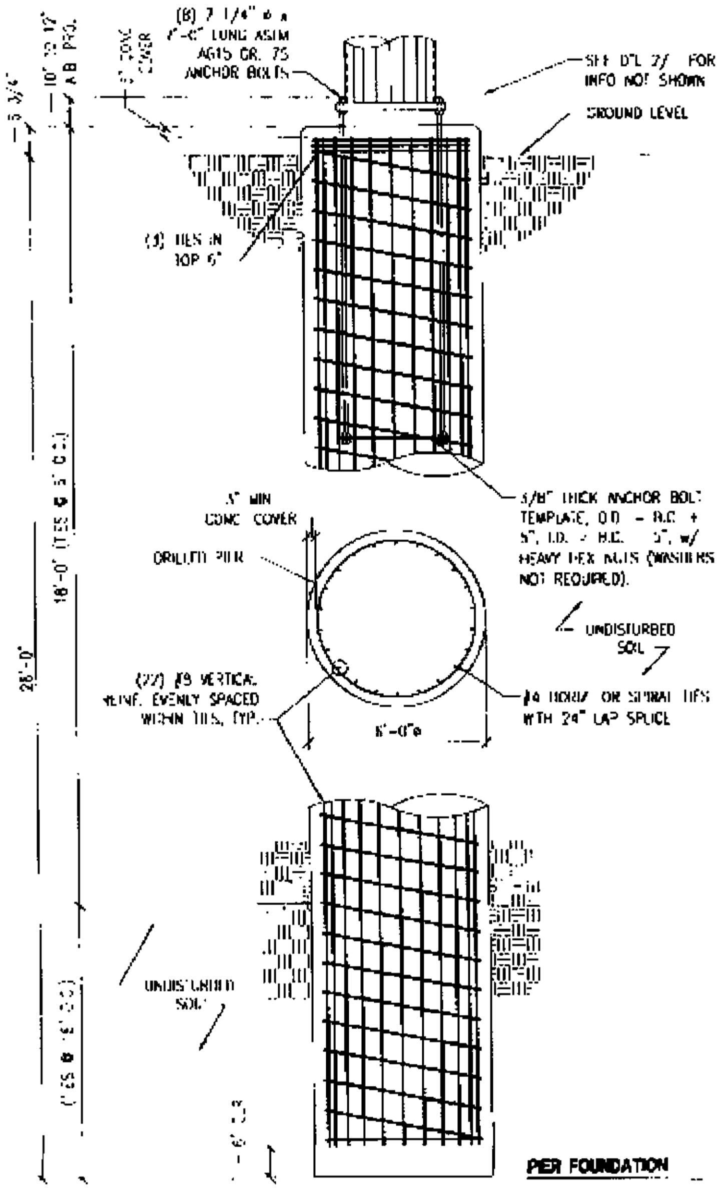
2. ALL CONCRETE SHALL USE TYPE II PORTLAND CEMENT AND HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS. CONCRETE SHALL BE AIR ENTRAINED (6 ± 1.5%). CONCRETE SHALL HAVE A MAXIMUM WATER/CEMENT RATIO OF 0.50. CONCRETE SHALL HAVE A MINIMUM SLUMP OF 6" (PER GEOTECH). ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH "THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE," ACI 318-11. FOUNDATION INSTALLATION SHALL BE IN ACCORDANCE WITH ACI 336 "STANDARD SPECIFICATIONS FOR THE CONSTRUCTION OF DRILLED PIERS," LATEST EDITION.

3. REINFORCING STEEL SHALL CONFORM WITH THE REQUIREMENTS OF ASTM A615, GRADE 60. ALL REINFORCING DETAILS SHALL CONFORM TO "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES," ACI 315, LATEST EDITION, UNLESS DETAILED OTHERWISE ON THIS DRAWING.

4. INSTALLATION OF DRILLED PIERS MUST BE OBSERVED BY A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER. FINAL GEOTECHNICAL ENGINEER TO PROVIDE A NOTICE OF INSPECTION FOR THE BUILDING INSPECTOR FOR REVIEW AND RECORD PURPOSES.



(2) NTS



PIER FOUNDATION

(1) NTS

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PIER FOUNDATION

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REVISION 2

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