



# 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

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

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) – RESOLUTION:**

\*\*\*\*\*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: RGT Towers LLC  
Applicant Address: 2141 AL+A1A S. Ste 440 Jupiter FL 33477  
Phone: 561-748-0302 Fax: 561-748-0303 E-Mail: hvaldeza@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 1.2 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 & W OF 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.

[Signature]  
OWNER/APPLICANT Signature

2/10/15  
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, <u>Scott Risher</u> , have read and understand the regulations above regarding cost recovery.	
<u>S Risher</u> Property Owner Signature Leasholder / Applicant	<u>2/10/15</u> Date

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

RG Towers Reply to Conditions of Approval

*(Prior to  
P&Z Board  
Meeting)*

- (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.

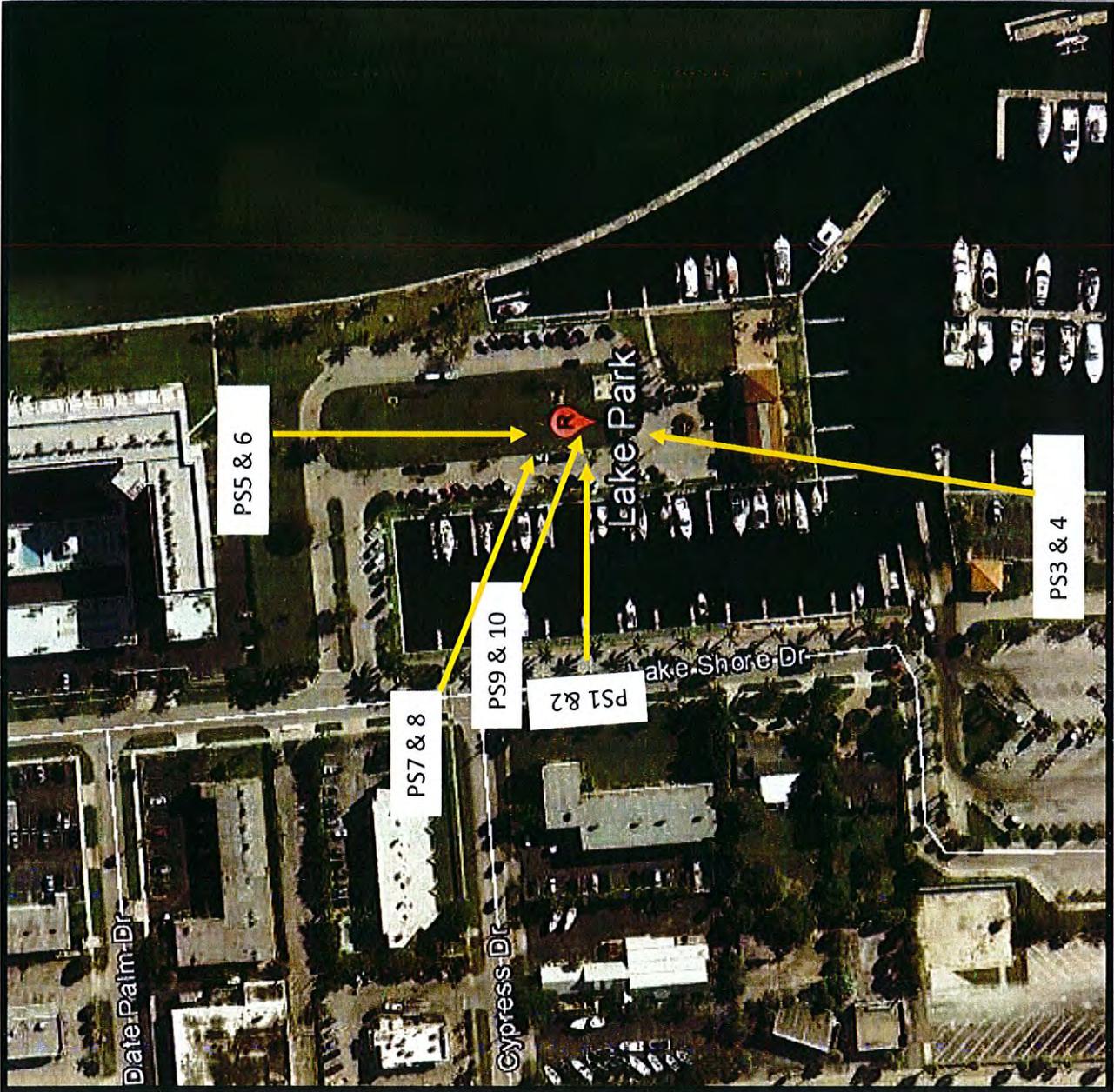
**REPLY: A Letter of Credit for 110% of the value will be provided at issuance of building permit**

- (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











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

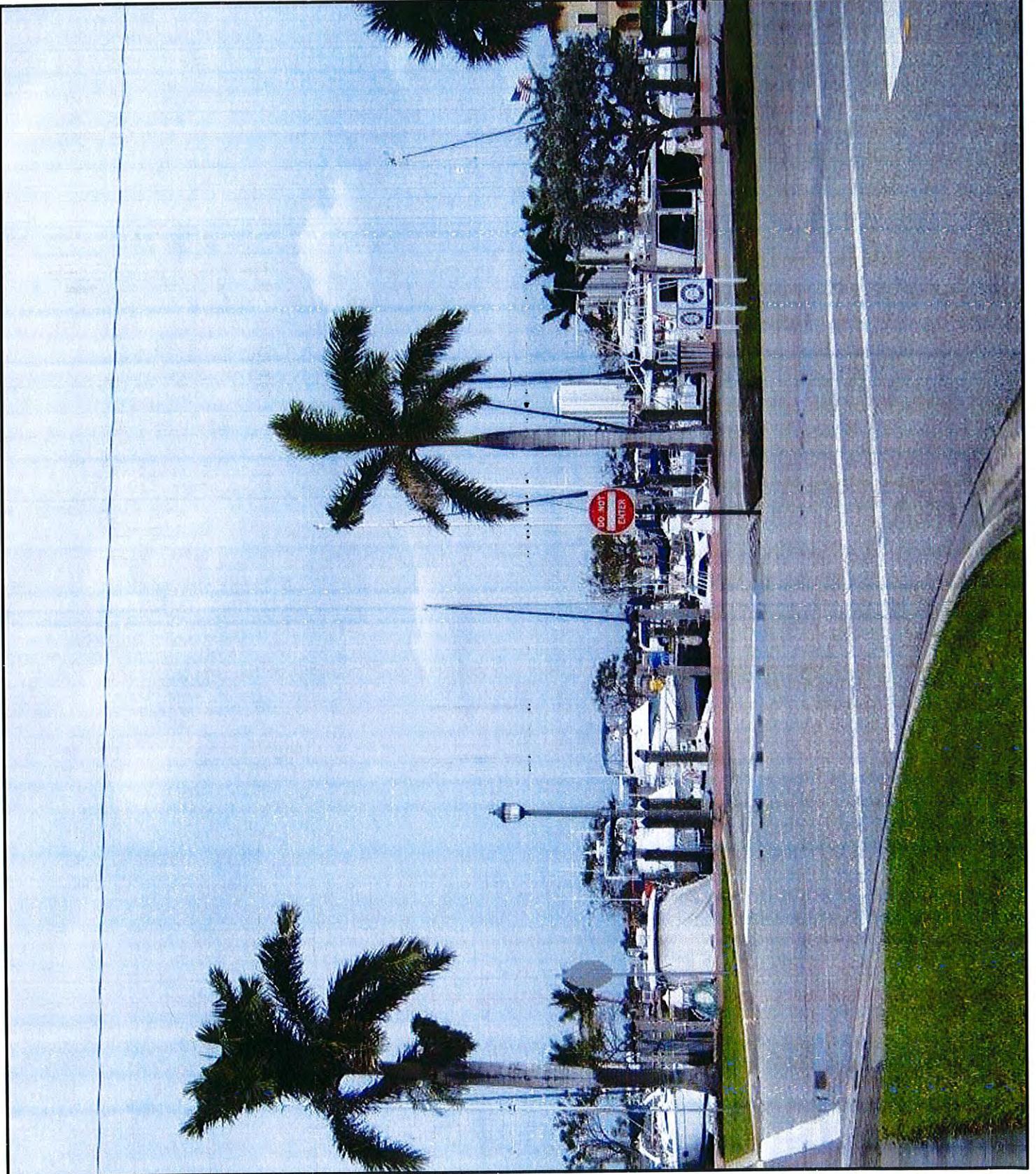




Lake Park Marina  
105 Lake Shore Drive  
Lake Park, FL 33403

View looking East  
from 302 Lake  
Shore Drive

PS7



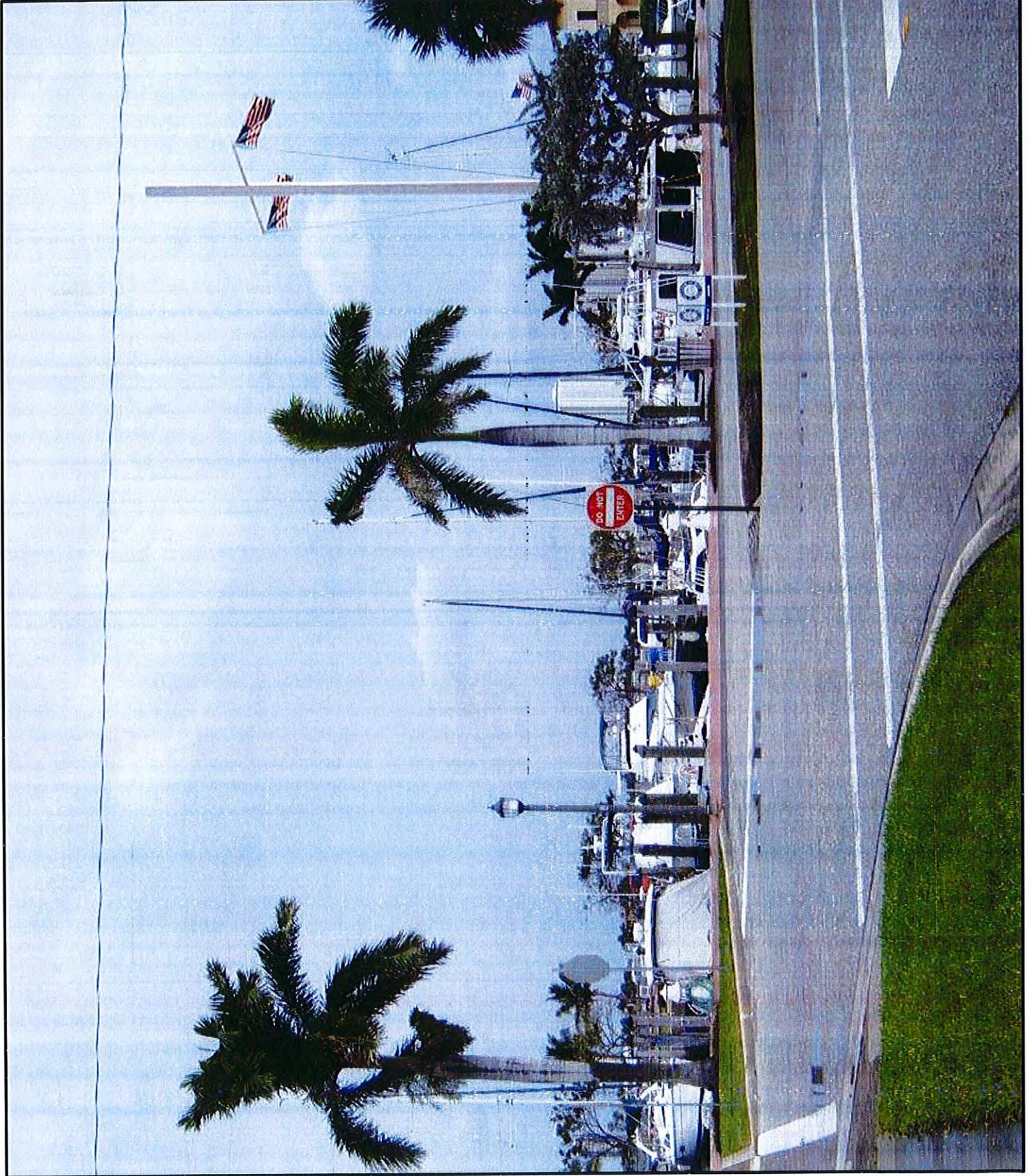


Lake Park Marina

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

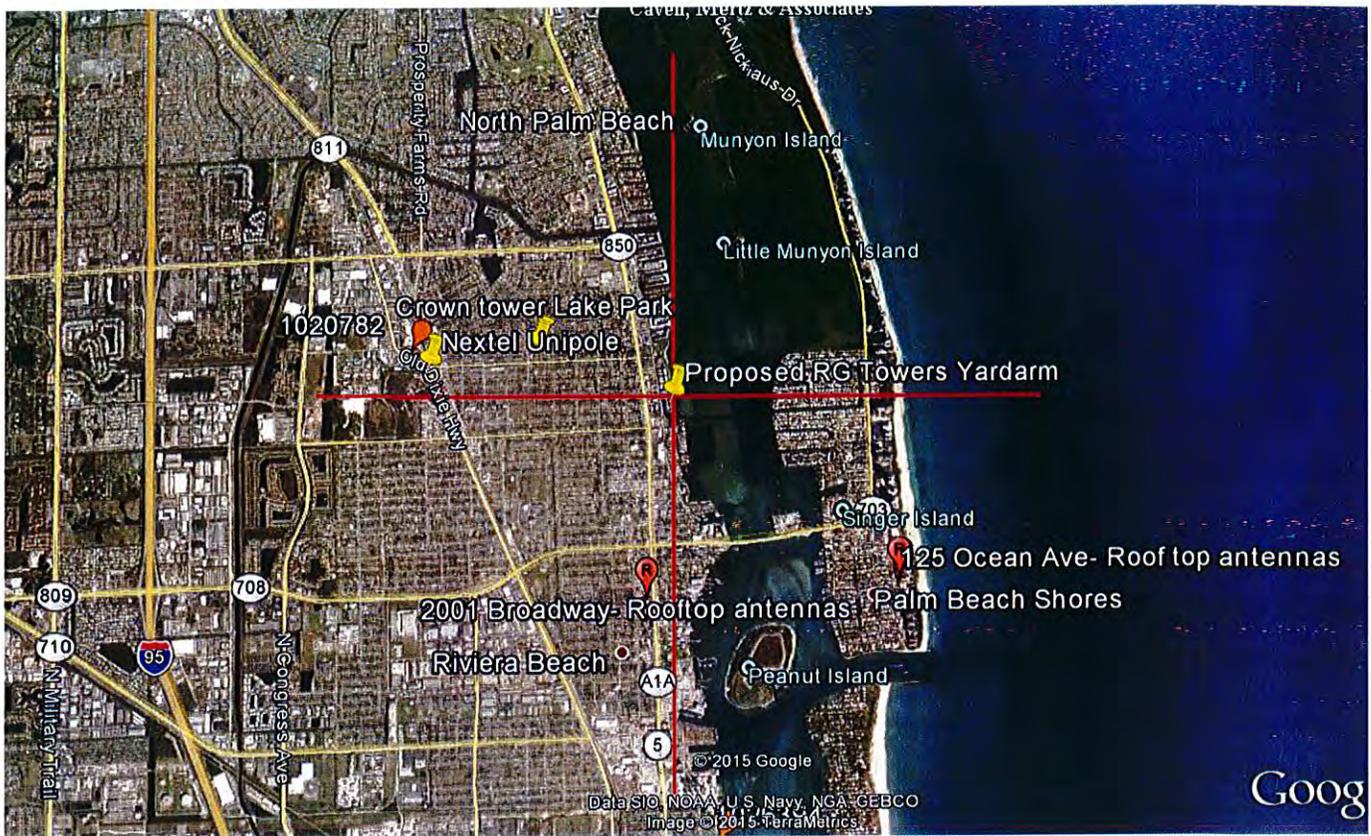
105 Lake Shore Drive  
Lake Park, FL 33403

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.

# LAKE PARK MARINA

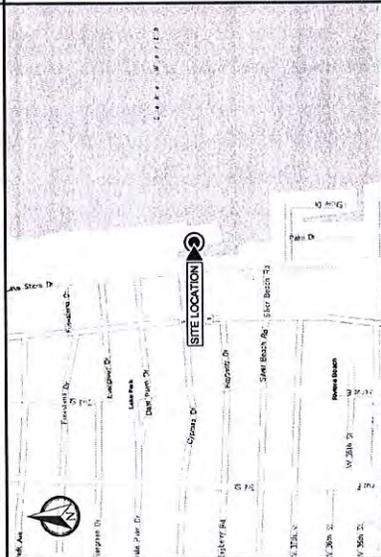
105 LAKE SHORE DRIVE  
LAKE PARK, FL 33403

## SFL13

### NEW SITE BUILD



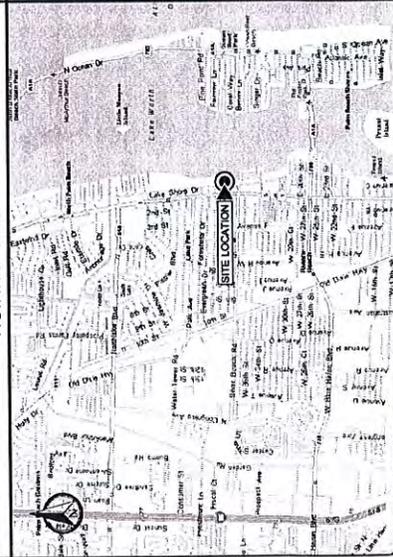
#### LOCAL MAP



#### PROPERTY SUMMARY

**EDLD**  
36-43-12-21-00-004-0010  
**PROPERTY OWNER**  
TOWN OF LAKE PARK  
535 PARK AVENUE  
WEST PALM BEACH, FL 33403  
**LATITUDE**  
28.794194°N  
**LONGITUDE**  
80.052242°W  
**ZONING JURISDICTION**  
CITY OF LAKE PARK

#### VICINITY MAP



#### DESIGN CRITERIA

DESIGN WIND SPEED: 169 MPH (ULTIMATE, 3-SECOND GUST)  
131 MPH (NOMINAL, 3-SECOND GUST)  
EXPOSURE: II  
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 ELECTRICAL CODE 2008 EDITION.
  3. TAM-222-G WITH ADDENDUM 1 APPLICABLE STANDARDS.
  4. LIFE SAFETY CODE NFPA-101-2009.
  5. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC).
  6. 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
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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	12/8/14	PRELIMINARY
0	1/27/15	FOR PERMIT
1	7/14/15	REVISED
2	8/28/15	REVISED
3	11/19/15	REVISED
4	1/14/16	REVISED

PROJECT NO.: 14-100A.01  
DRAWN BY: F. PARKROD  
CHECKED BY: M. ABBEY

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3400 LAKEVIEW DRIVE  
SUITE 320  
MIAMI, FL 33133  
CORPORATE OF INCORPORATION 2014

2141 ALTERNATE A.A. SOUTH  
SUITE 101  
JUNIOR, FL 33477

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



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

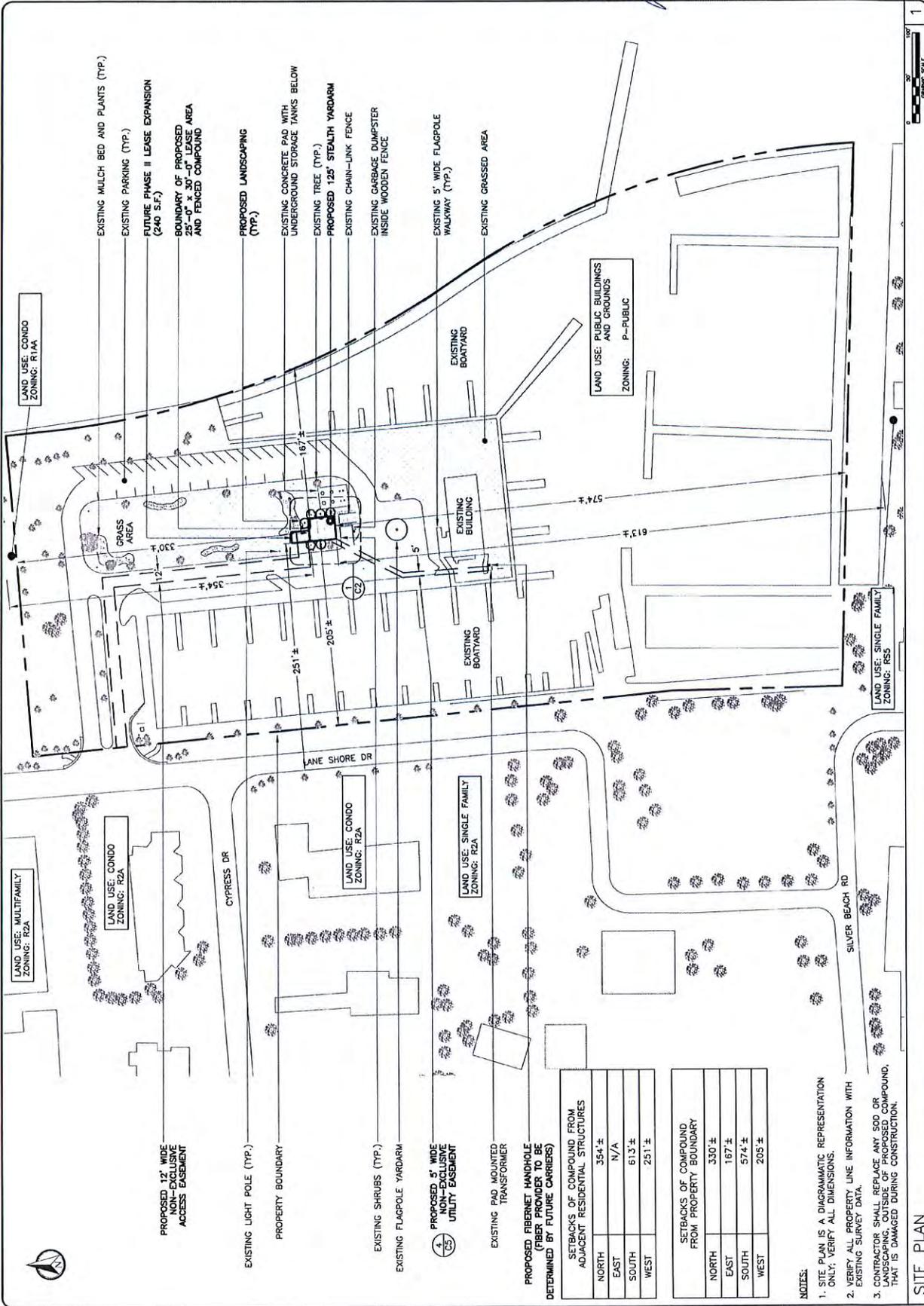
PROJECT NO.: 14-1004-01  
 DRAWN BY: F. PARRADO  
 CHECKED BY: M. ABBEY  
 THIS DRAWING IS UNREGISTERED AND IS PRODUCED SOLELY FOR USE BY THE REPRODUCER OR USER OF THIS DRAWING AND NO OTHER INFORMATION CONTAINED IN THIS DRAWING IS TO BE TAKEN IN ANY MANNER AS A REPRESENTATION OF THE ENGINEER'S PROFESSIONAL OPINION OR AS A BASIS FOR ANY ACTION UNLESS SO STATED ON THIS DRAWING.

3400 LAKEVIEW DRIVE  
 WINTER HAVEN, FL 33927  
 CERTIFICATE OF AUTHORIZATION 2014

2141 ALTERNATE A.A. SOUTH  
 AUSTIN, TX 78747

DATE OF SIGNATURE: 1/14/16

LAKE PARK MARINA  
 SFL13  
 105 LAKE SHORE DRIVE  
 LAKE PARK, FL 33403  
 SHEET NAME: SITE PLAN  
 SHEET NUMBER: C1



SETBACKS OF COMPOUND FROM ADJACENT RESIDENTIAL STRUCTURES	
NORTH	354' ±
EAST	11/A
SOUTH	613' ±
WEST	251' ±

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

- NOTES:
- SITE PLAN IS A DIAGRAMMATIC REPRESENTATION ONLY; VERIFY ALL DIMENSIONS.
  - VERIFY ALL PROPERTY LINE INFORMATION WITH EXISTING SURVEY DATA.
  - CONTRACTOR SHALL REPLACE ANY SOG OR OTHER PLANTING THAT IS DAMAGED DURING CONSTRUCTION.

REV	DATE	DESCRIPTION
A	1/27/14	PRELIMINARY
B	1/27/13	FOR PERMIT
2	1/14/13	REVISED
3	1/14/13	REVISED
3	1/14/13	REVISED

PROJECT NO. 14-1004.01  
 DRAWN BY: F. PARADO  
 CHECKED BY: M. LEBBY

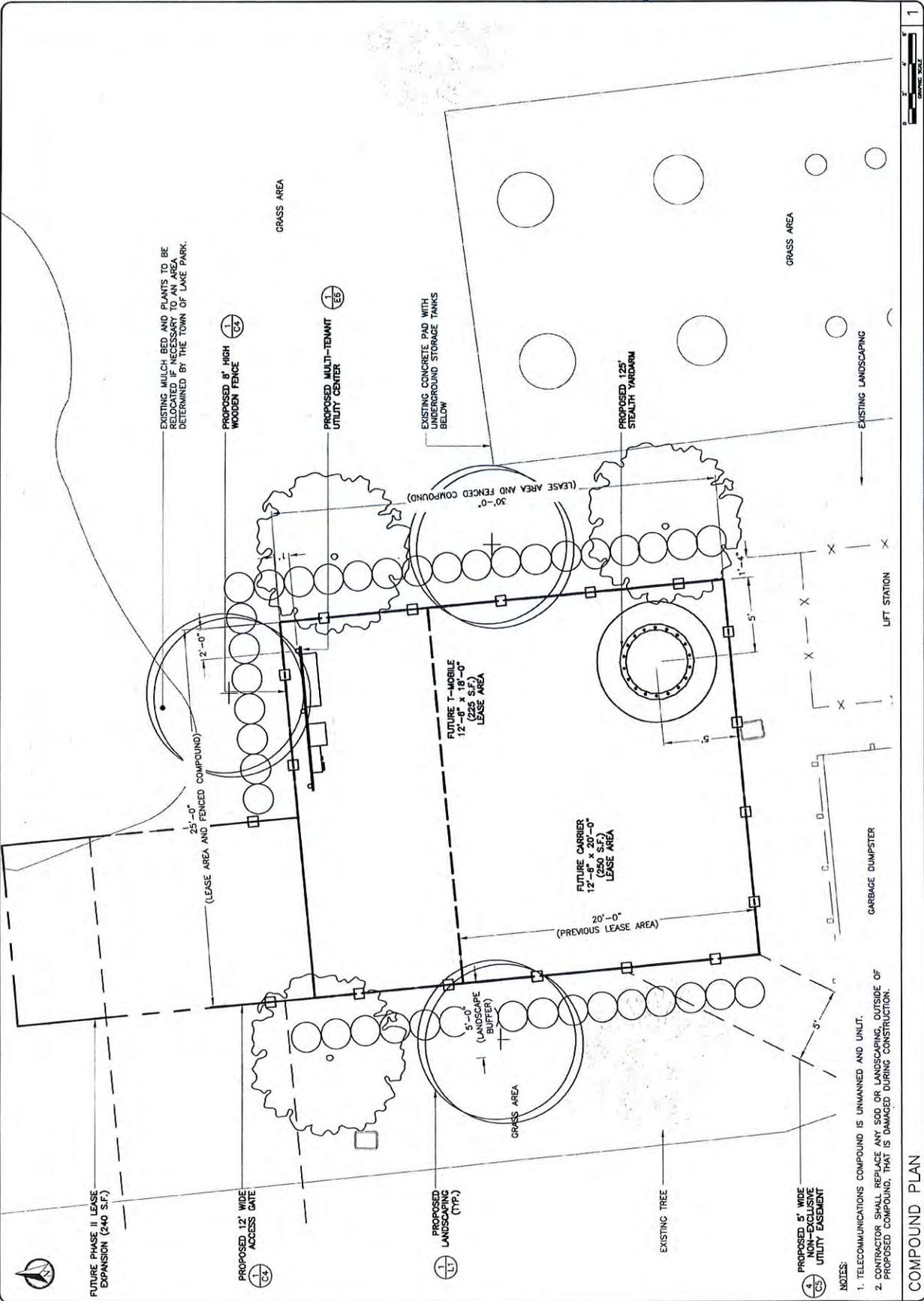
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**CALTRIP**  
**Telecom**  
 1400 LAKEVIEW DRIVE  
 SUITE 202  
 WOODBRIDGE, VA 22192  
 COMMERCIAL & RESIDENTIAL 703/714

**RG**  
**RG TOWERS, LLC.**  
 2143 ALTERNATE AVA, SOUTH  
 JUPITER, FL 33477

Professional Engineer  
 No. 68312  
 STATE OF FLORIDA  
 MICHAEL A. PHILLIPS  
 DATE OF SIGNATURE: 1/14/19

LAKE PARK MARINA
SFL13
105 LAKE SHORE DRIVE LAKE PARK, FL 33403
COMPONENT PLAN
SHEET NAME
SHEET NUMBER
C2



- NOTES:**
1. TELECOMMUNICATIONS COMPOUND IS UNMANNED AND UNLT.
  2. CONTRACTOR SHALL REPLACE ANY SOO OR LANDSCAPING, OUTSIDE OF PROPOSED COMPOUND, THAT IS DAMAGED DURING CONSTRUCTION.

COMPOUND PLAN



























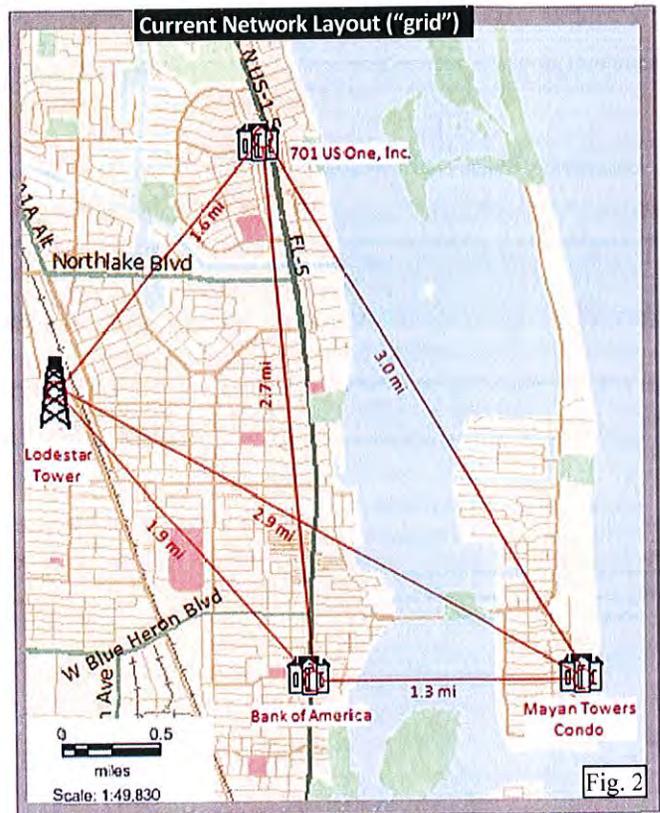


# 6WP1273D – Lake Park Marina Network Configuration and Design Requirements

Department: T-Mobile Engineering & Operations – Miami Market

Last Updated: 01/25/16

## Network Density and Site Spacing



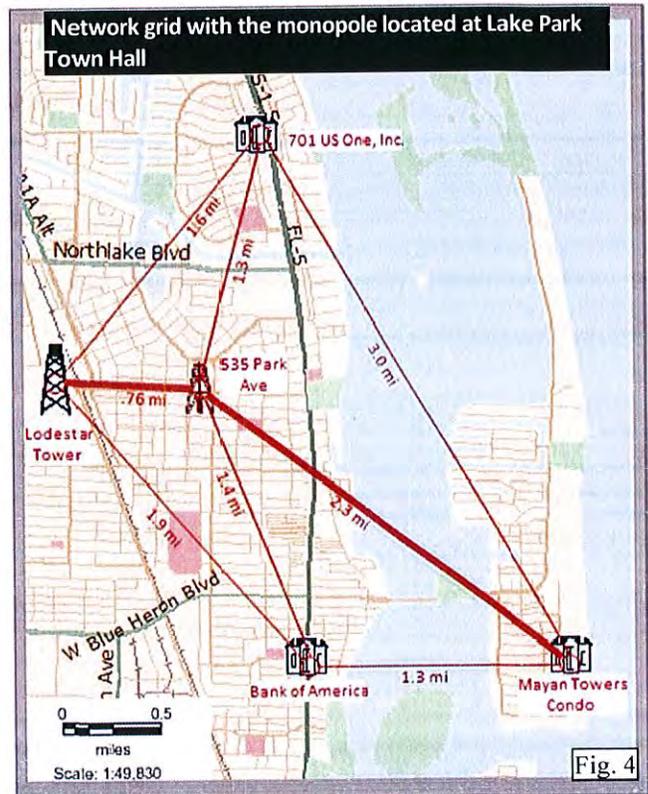
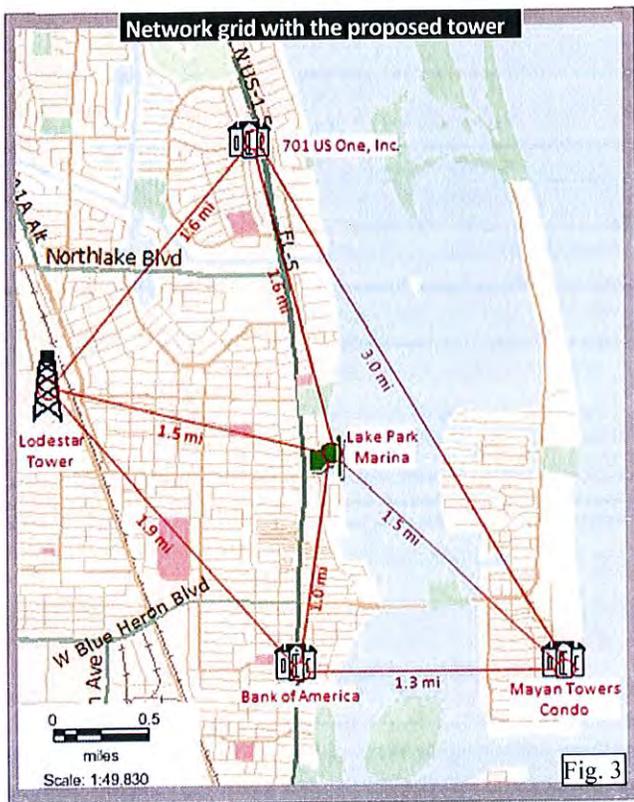
The purpose of this document is to provide supplemental information supporting the selection of a tower at Lake Park Marina. In previous engineering reports a relative coverage gap had been described in many commercial and residential areas surrounding the proposed tower. And although signal measurements 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.

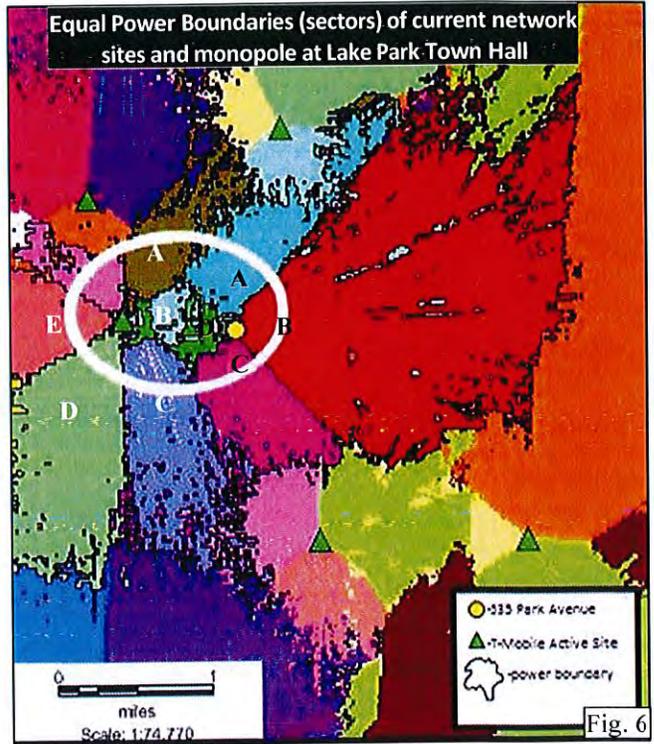
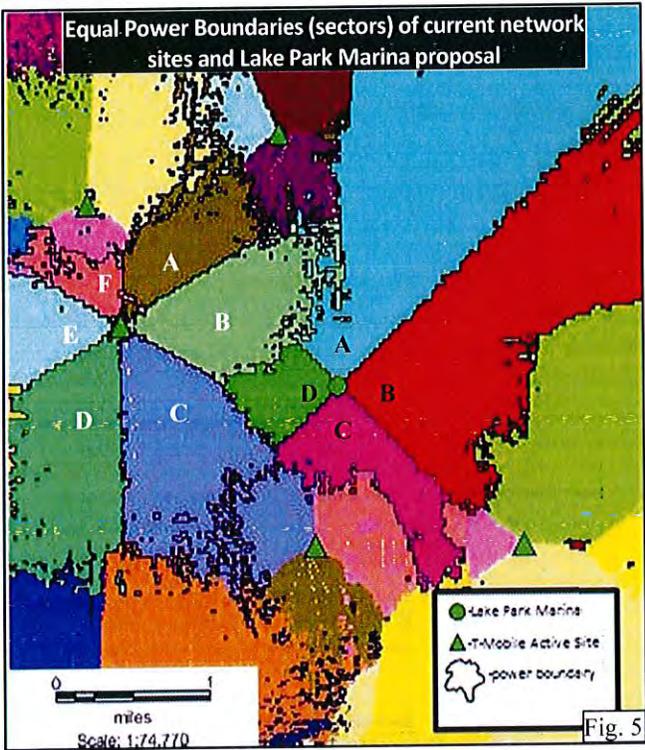
A common design feature in the deployment of cellular networks is the concept of a "grid" or the spacing between facilities. In theory the placement of towers and antenna employments at equidistant locations with equal antenna heights would provide the most efficient and comprehensive coverage for mobile 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 local 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 additional 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**



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 relatively well defined border with the polygons to the west. (the polygons labeled B/C in white)

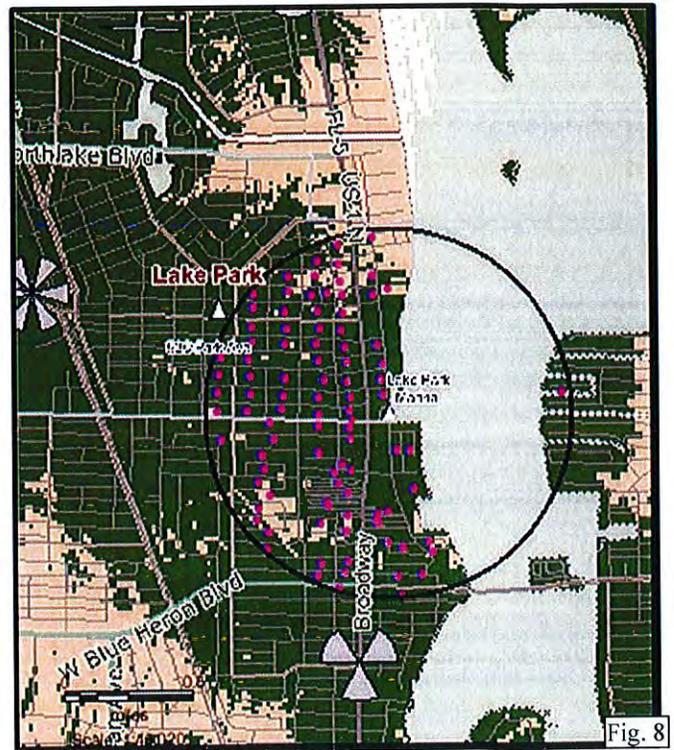
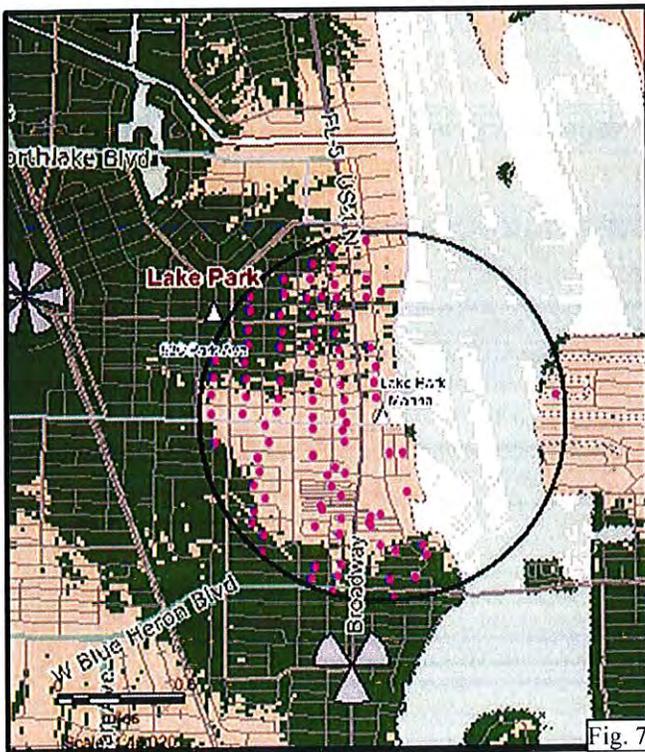
In the plot on the right side the predictions from the 535 Park Avenue tower are shown. As can be seen from the highlighted area (white oval) there is no clear border between the neighboring facilities. While this situation can be somewhat mitigated, the redundant radio energy and lack of dominant serving 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 its 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.

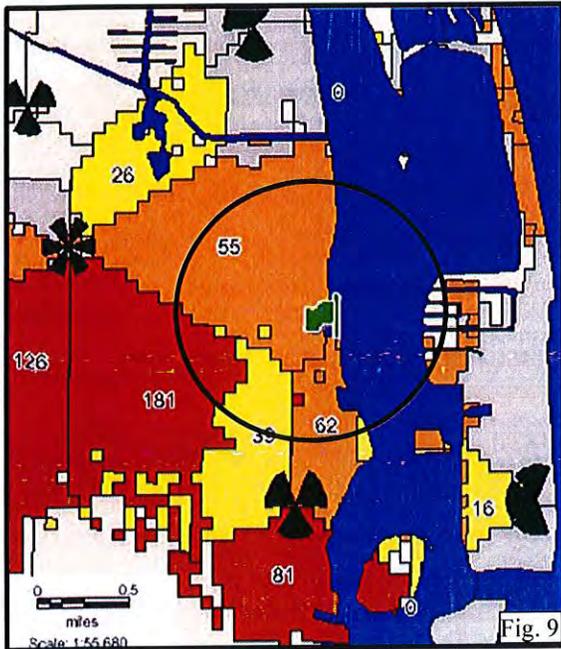
### Network Coverage



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 6<sup>th</sup> St in the west to the Intracoastal Waterway and from E 30<sup>th</sup> 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.

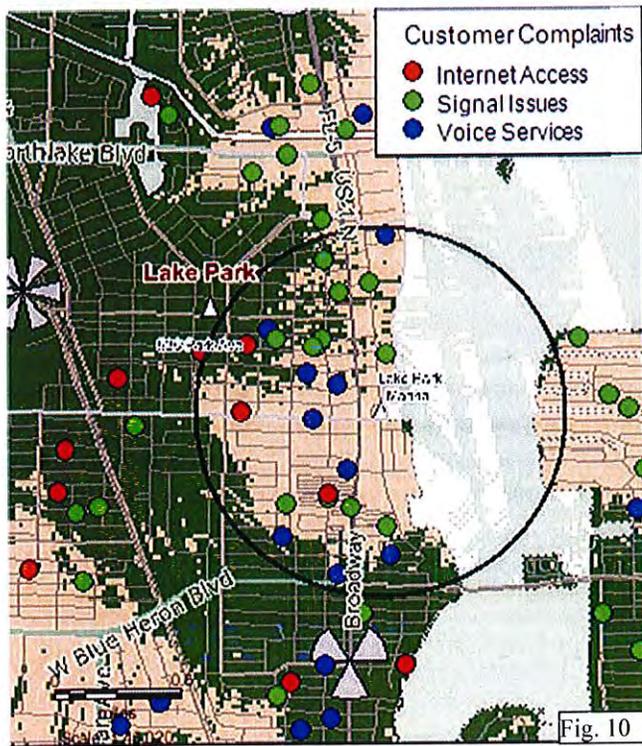
**Key Performance Indicators (KPI)**

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



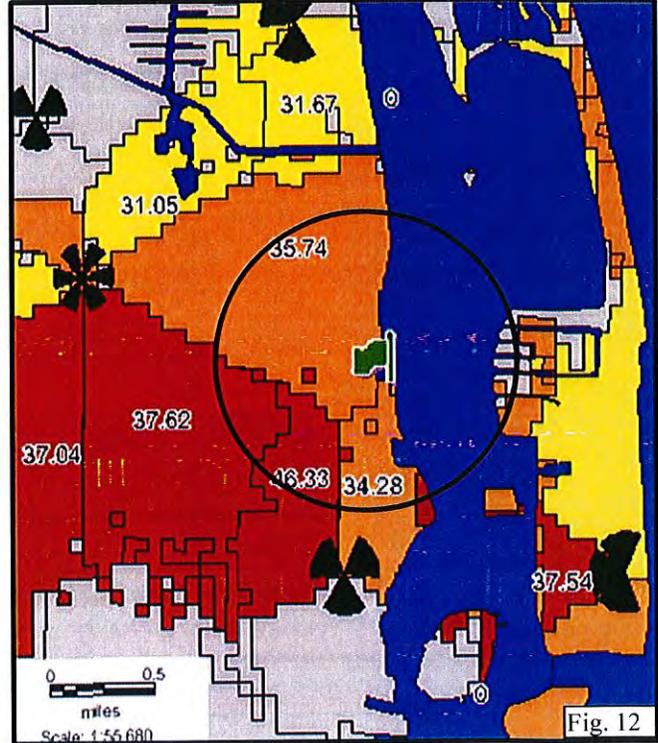
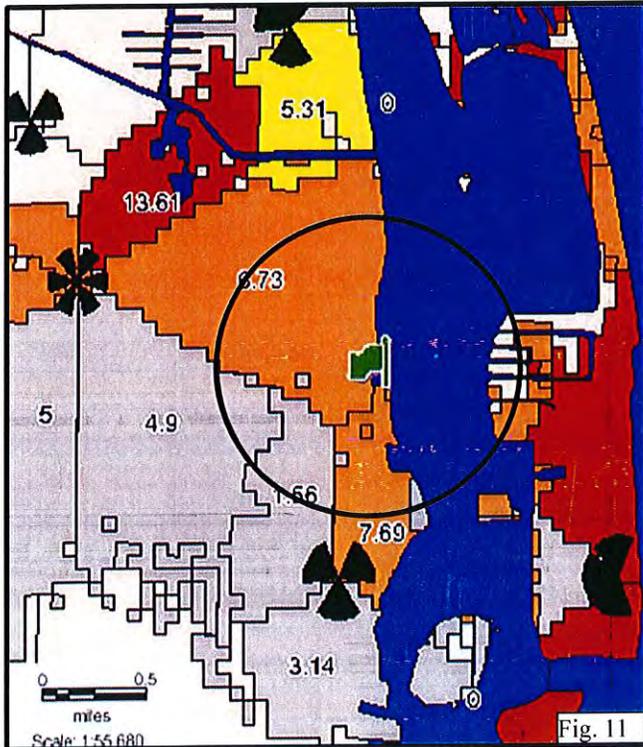
This map shows the network configuration of antenna locations represented by the triangular shaped wedges colored black. The footprint for each of these wedges (“sectors”) is shown as a radiated pattern extending away from the central connection point. These coverage areas are color coded to show the 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**



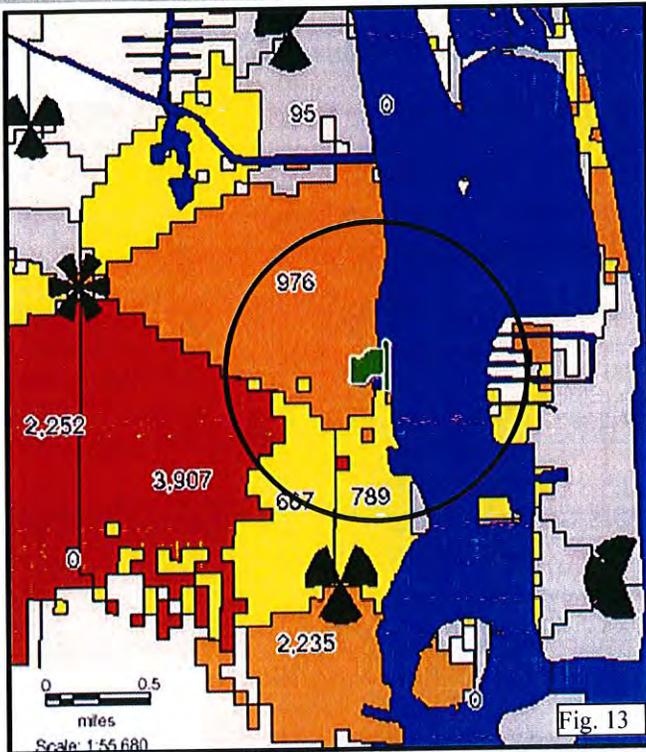
Historical records of customer complaints in this area indicate that the low signal areas have the highest concentration of “Signal Issues” and “Voice Services”. Both of these categories of customer service problems are related to the lack of signal in the area. Depending on whether a user is indoors 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**



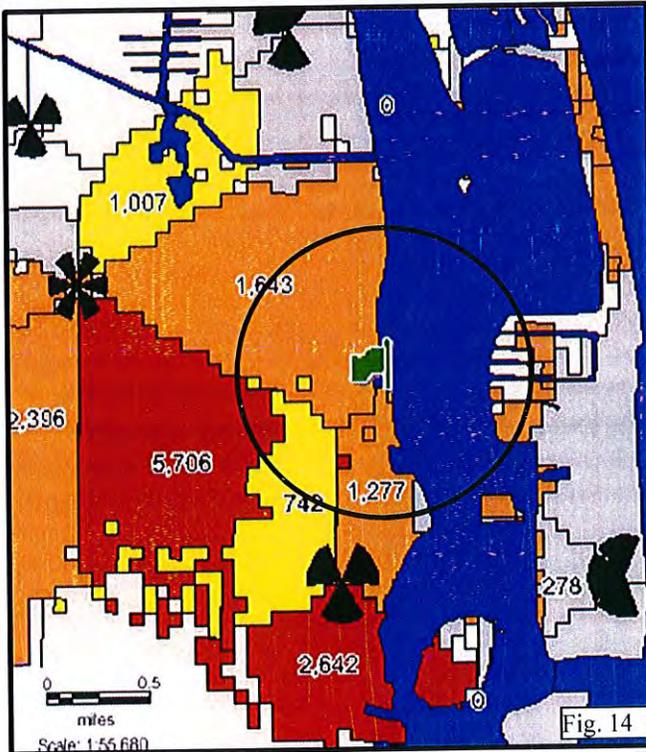
These maps show the network configuration of antenna locations represented by the triangular shaped wedges colored black. The footprint for each of these wedges ("sectors") is shown as a radiated pattern extending away from the central connection point. These coverage areas are color coded to show the 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**



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**



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)

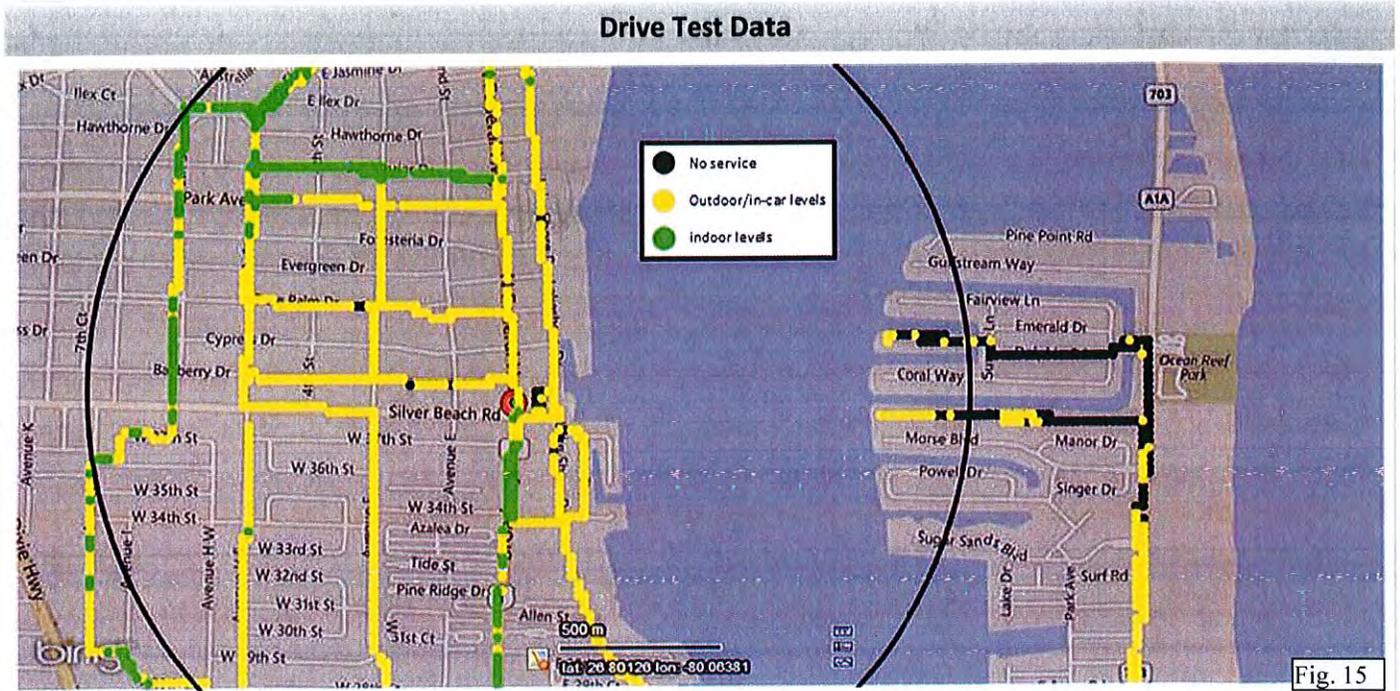


Fig. 15

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 reliable 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 regarding 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 commercial 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 233-5100  
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

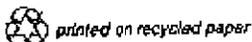
**Palm Beach County  
Board of County  
Commissioners**

Shelley Vana, Mayor  
Mary Lou Berger, Vice Mayor  
Hal R. Valeche  
Paulette Burdick  
Steven L. Abrams  
Melissa McKinlay  
Priscilla A. Taylor

**County Administrator**

Robert Weisman

"An Equal Opportunity  
Affirmative Action Employer"



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

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# ENVIRONMENTAL CORPORATION OF AMERICA

ENVIRONMENTAL | GEOTECHNICAL | WETLANDS | ECOLOGY | CULTURAL RESOURCES

**Community** February 13, 2015

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

FEB 20 2015

NAVULAMING

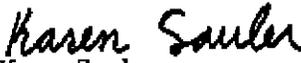
**Subject: Section 106 Review  
TCNS ID #122807  
Proposed 125-Foot Overall Height Stealth Yardarm Telecommunications  
Structure  
SFL13 (Lake Park Marina)  
105 Lake Shore Drive  
Lake Park, Palm Beach County, Florida  
ECA Project #: R0400**

To Whom It May Concern:

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  
Project Manager

  
Eric Johnson  
Senior Project Manager



# UNIVERSAL ENGINEERING SCIENCES

Community  
NOV 20 2015  
12 11 PM EST

## 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.  
5581 Florida Mining Boulevard South  
Jacksonville, FL 32257  
(904) 298-0757

### CONSULTANTS:

Geotechnical Engineering • Environmental Engineering • Construction Materials Testing  
Threshold Inspection • Private Provider Inspection • Geophysical Studies

OFFICES: Daytona Beach, FL • Fort Myers, FL • Fort Pierce, FL • Gainesville, FL • Jacksonville, FL • Leesburg, FL • Miami, FL • Norcross, GA • Ocala, FL  
Orlando, FL • Palm Coast, FL • Panama City, FL • Pensacola, FL • Rockledge, FL • Sarasota, FL • St. Augustine, FL • Tampa, FL • West Palm Beach, FL



# UNIVERSAL ENGINEERING SCIENCES

Consultants In: Geotechnical Engineering • Environmental Engineering • Construction Materials Testing •  
Threshold Inspection • Private Provider Inspection • Geophysical Studies

- Daytona Beach, FL
- Fort Myers, FL
- Fort Pierce, FL
- Gainesville, FL
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- Leesburg, FL
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- Norcross, GA
- Ocala, FL
- Orlando, FL
- Palm Coast, FL
- Panama City, FL
- Panama City, FL
- Roddedge, 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.

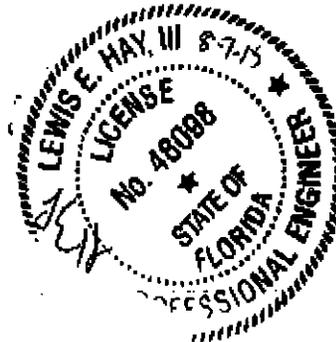
We appreciate the opportunity to be of service as your geotechnical consultant on this phase of the project and look forward to a continued relationship. If you have any questions, or if we may be of any further service, please contact us.

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



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### APPENDIX A

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

### APPENDIX B

IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT  
CONSTRAINTS AND RESTRICTIONS



## 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 Calltrop 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 <sup>1</sup> (ksf)	Allowable End Bearing <sup>1</sup> (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	--	--

<sup>1</sup>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.

### 6.2.2 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 contractor 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.



Lake Park Marina Tower  
Lake Park, FL  
RG Towers, LLC

UES Project No. 0830.1500032.0000  
August 7, 2015

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**





# UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO. 0930 1502032 0000

REPORT NO. 125 5351

PAGE A-1

PROJECT: GEOTECHNICAL EXPLORATION  
LAKE PARK MARINA TOWER  
. FLORIDA

BORING DESIGNATION  
SECTION:

**B-1**  
TOWNSHIP:

SHEET **1 of 2**  
RANGE:

CLIENT: ENVIRONMENTAL CORPORATION OF AMERICA

G.S. ELEVATION (ft):

DATE STARTED 6/3/15

LOCATION: SEE BORING LOCATION PLAN

WATER TABLE (ft): 4

DATE FINISHED 6/3/15

REMARKS: Grouted borehole upon completion

DATE OF READING: 8/3/2015

DRILLED BY JR/WC

EST W & WT (ft):

TYPE OF SAMPLING: ASTM D-1586

DEPTH (FT.)	SAMPLER	BLOWS PER 5" INCREMENT	N (BLOWS/ FT)	WT	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		K (FT / DAY)	ORG. CONT (%)
									LL	PI		
0	Hand Auger	-	-			Brown fine SAND (SP) w/ some roots						
	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						
10	2-2-3-3	5				Loose to Very Loose brown to grey fine SAND (SP)						
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						
30	3-4-4-6	8				Loose light brown fine SAND (SP) w/ some shell fragments						

BORING LOG 0930-1502032 0000 - LAKE PARK MARINA TOWER SPJ UNICONGSC GDT 8/3/15



# UNIVERSAL ENGINEERING SCIENCES BORING LOG

PROJECT NO. 4930 1503032 0000
REPORT NO.:
PAGE. A-2

PROJECT GEOTECHNICAL EXPLORATION  
LAKE PARK MARINA TOWER  
FLORIDA

BORING DESIGNATION **B-1**  
SECTION: TOWNSHIP:

SHEET: **2 of 2**  
RANGE:

DEPTH (FT)	SAMPLE	BLOWS PER 8" INCREMENT	N (BLOWS/FT)	W.T	SYMBOL	DESCRIPTION	-200 (%)	MC (%)	ATTERBERG LIMITS		K (FT/DAY)	ORG. CONT (%)
									LL	PI		
30						Loose light brown fine SAND (SP) w/ some shell fragments						
35		8-11-18-18	27			Medium Dense light brown to brown and grey fine SAND (SP) w/ some shell fragments						
40		8-9-11-9	20									
45		3-5-8-6	13									
50		9-10-10-8	20									
55		50=2'	50=2'			Very Dense light grey cemented SAND (SP)						
60		24-30-28-28	58									

BORING LOG DRBG 150032 0000 LAKE PARK MARINA TOWER CP UNIVERSAL ENGINEERING SCIENCES



**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

### 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'

### UNIFIED CLASSIFICATION SYSTEM

MAJOR DIVISIONS		GROUP SYMBOLS	TYPICAL NAMES	
COARSE-GRAINED SOILS More than 50% retained on No. 200 sieve*	GRAVELS 75% or more of coarse fraction retained on No. 4 sieve	CLEAN GRAVELS	GW Well-graded gravels and gravel-sand mixtures, little or no fines	
		GRAVELS WITH FINES	GP Well-graded gravels and gravel-sand mixtures, little or no fines	
	SANDS More than 50% of coarse fraction passing No. 4 sieve	CLEAN SANDS	GM Silty gravels, gravel-sand mixtures	
		SANDS WITH FINES	GC Clayey gravels, gravel-sand-clay mixtures	
	FINE-GRAINED SOILS 50% or more passing No. 200 sieve**	SILTS AND CLAYS Liquid limit 50% or less	SW** SP**	Well-graded sands and gravelly sands, little or no fines Well-graded sands and gravelly sands, little or no fines
			SM** SC**	Silty sands, sand-silt mixtures Clayey sands, sand-clay mixtures
ML			Inorganic silts, very fine sands, rock flour, silt or clayey fine sands	
CL			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
SILTS AND CLAYS Liquid limit greater than 50%		OH	Organic silts and organic silty clays of low plasticity	
		MH CH	Inorganic silts, micaceous or clayey silty fine sands or silts, elastic silts Organic clays or 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.

### 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 your GBC-Member geotechnical engineer for more information.



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

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## **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

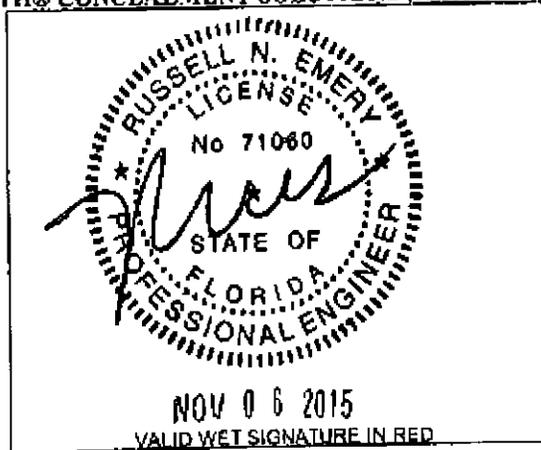
This report reflects the soil conditions at the time of investigation. If the report is not used in a reasonable amount of time, significant changes to the site may occur and additional reviews may be required.



UTAH OFFICES  
Sandy  
Layton  
St George

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)

~~COMMENTS~~  
NOV 20 2015  
~~COMMENTS~~



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.



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

DESIGNED: SRM  
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.



JOB NO.: U0142-575-151  
DATE: 02/08/15

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)

Cylinder	Length (ft)	Diameter (in)		Plates	Weight (lb)		CaAc (ft <sup>2</sup> )	
		No Ice	w/ Ice		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

<b>tnxTower</b>  <b>Vector Engineering</b> 9138 S State St. Suite 101 Sandy, UT 84070 Phone: (801) 990-1775 FAX: (801) 990-1776	Job	Lake Park Marina - Top Section	Page	1 of 9
	Project	U0142-575-152	Date	12:55:34 02/05/15
	Client	STEALTH® Concealment Solutions	Designed by	smontgomery

## 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 I.  
 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	A300-42 (42 ksi)	

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>s</sub>	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 <sub>d</sub> A <sub>s</sub>	Weight plf
AVA7-50 (1-5/8 LOW DENS. FOAM)	C	No	Inside Pole	95.00 - 89.00	8	No Ice	0.72
AVA7-50 (1-5/8 LOW DENS. FOAM)	C	No	Inside Pole	107.00 - 89.00	8	No Ice	0.72
AVA7-50 (1-5/8 LOW DENS. FOAM)	C	No	Inside Pole	119.00 - 89.00	8	No Ice	0.72

<b>inxTower</b>  <b>Vector Engineering</b> 9138 S State St. Suite 101 Sandy, UT 84070 Phone: (801) 990-1775 FAX: (801) 990-1776	Job	Lake Park Marina - Top Section	Page	3 of 9
	Project	U0142-575-152	Date	12:55:34 02/05/15
	Client	STEALTH® Concealment Solutions	Designed by	smonlgomery

$$G_H = 1.100$$

Section Elevation	z	K <sub>z</sub>	q <sub>z</sub>	A <sub>u</sub>	F a c e	A <sub>r</sub>	A <sub>s</sub>	A <sub>us</sub>	Leg %	C <sub>d</sub> A <sub>1</sub> In Face	C <sub>d</sub> A <sub>1</sub> Out Face
ft	ft		psf	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1 125.00-89.00	107.13	1.45	101	38.250	A B C	0.000 0.000 0.000	0.000 0.000 0.000	0.000	0.00 0.00 0.00	0.000 0.000 0.000	0.000 0.000 0.000

### Tower Pressure - Service

$$G_H = 1.100$$

Section Elevation	z	K <sub>z</sub>	q <sub>z</sub>	A <sub>u</sub>	F a c e	A <sub>r</sub>	A <sub>s</sub>	A <sub>us</sub>	Leg %	C <sub>d</sub> A <sub>1</sub> In Face	C <sub>d</sub> A <sub>1</sub> Out Face
ft	ft		psf	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1 125.00-89.00	107.13	1.45	11	38.250	A B C	0.000 0.000 0.000	0.000 0.000 0.000	0.000	0.00 0.00 0.00	0.000 0.000 0.000	0.000 0.000 0.000

### Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb				psf			ft <sup>2</sup>	lb	plf	
L1 125.00-89.00	311.04	1797.59	A B C	0 0 0	0.6 0.6 0.6	101	1 1 1	1 1 1	0.000 0.000 0.000	0.00 0.00 0.00	0.00 0.00 0.00	C
Sum Weight:	311.04	1797.59						OTM	0.00 lb-ft	0.00		

### Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	lb	lb				psf			ft <sup>2</sup>	lb	plf	
L1 125.00-89.00	311.04	1797.59	A B C	0 0 0	0.6 0.6 0.6	101	1 1 1	1 1 1	0.000 0.000 0.000	0.00 0.00 0.00	0.00 0.00 0.00	C
Sum Weight:	311.04	1797.59						OTM	0.00 lb-ft	0.00		

### Tower Forces - No Ice - Wind 90 To Face

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	Project	U0142-575-152	Date	12:55:34 02/05/15
	Client	STEALTH® Concealment Solutions	Designed by	smontgomery

### Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M <sub>x</sub> lb-ft	Sum of Overturning Moments, M <sub>y</sub> 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 <sub>x</sub>	10	4508.63	0.00	-840.32

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	Project	U0142-575-152	Date	12:55:34 02/05/15
	Client	STEALTH® Concealment Solutions	Designed by	smontgomery

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.0000001	0.0000001
2	Yes	9	0.0000001	0.00006341
3	Yes	9	0.0000001	0.00004977
4	Yes	9	0.0000001	0.00006341
5	Yes	9	0.0000001	0.00004977
6	Yes	9	0.0000001	0.00006341
7	Yes	9	0.0000001	0.00004977
8	Yes	8	0.0000001	0.0000001
9	Yes	8	0.0000001	0.0000001
10	Yes	8	0.0000001	0.0000001

### 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

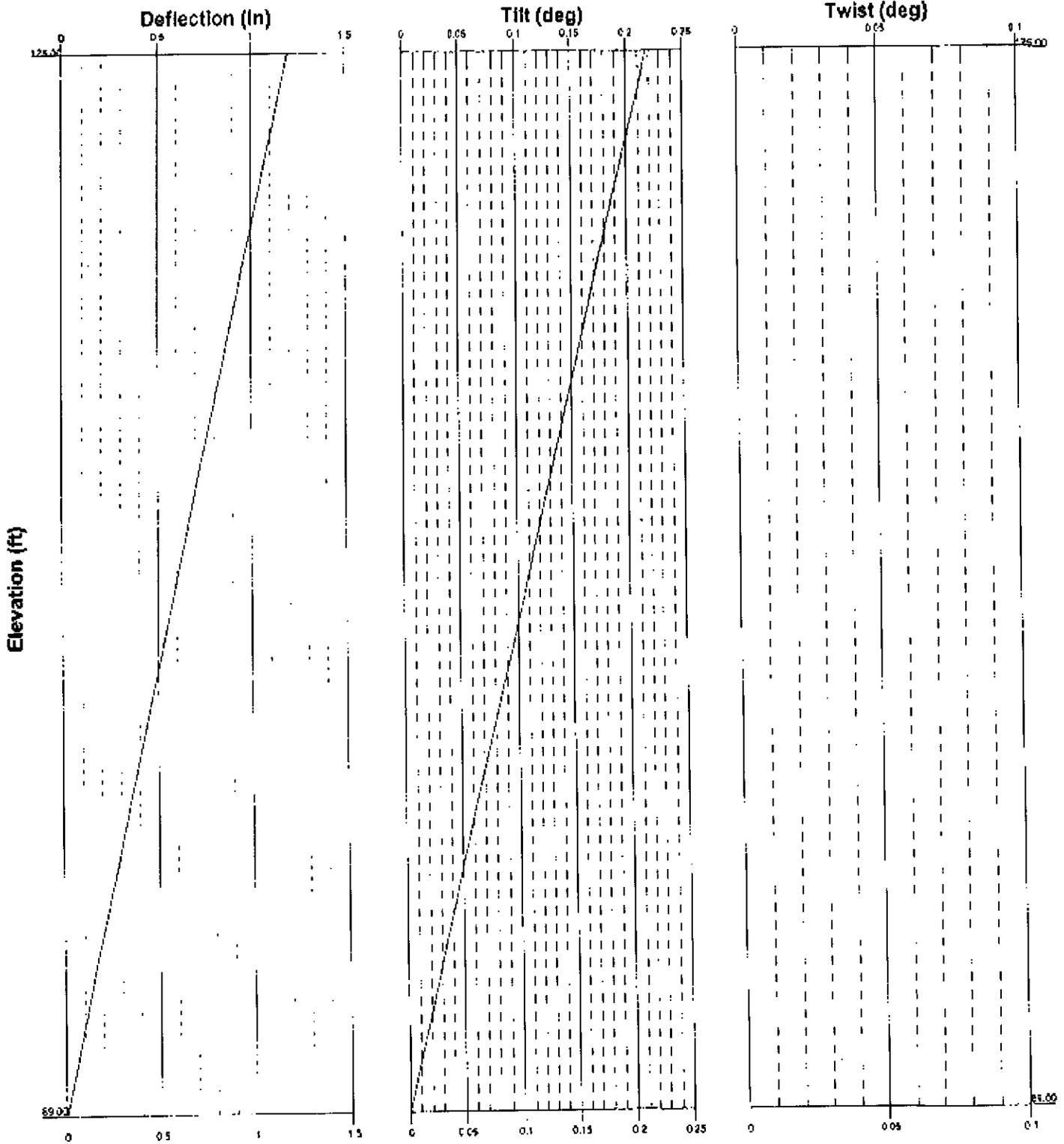
Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.00	Top Plate	2	10.612	1.9137	0.0000	Inf

<b>inxTower</b>  <b>Vector Engineering</b> 9138 S State St. Suite 101 Sandy, UT 84070 Phone: (801) 990-1775 FAX: (801) 990-1776	<b>Job</b> Lake Park Marina - Top Section	<b>Page</b> 9 of 9
	<b>Project</b> U0142-575-152	<b>Date</b> 12:56:34 02/05/15
	<b>Client</b> STEALTH® Concealment Solutions	<b>Designed by</b> smontgomery

**Section Capacity Table**

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	oP <sub>WIND</sub> lb	% Capacity	Pass Fail	
L1	125 - 89	Pole	P12x.375 13th	1	-5096.05	513596.00	82.5	Pass	
							Summary		
							Pole (L1)	82.5	Pass
							RATING =	82.5	Pass

Program Version 6.1.3.1 - 7/25/2013 File:No:2015 Projects\U0142 Stealth\U0142-575-151 Lake Park Marina (FL, Top Section & Base Pole, Vector CAD)\ENG\Top Section\Tower\Lake Park Marina - Top Section.eri



 <b>VECTOR</b> www.vectorse.com	<b>Vector Engineering</b> 9138 S State St. Suite 101 Sandy, UT 84070 Phone: (801) 990-1775 FAX: (801) 990-1776	<b>Lake Park Marina - Top Section</b>	
	Project: U0142-575-152	Drawn by: smon/gamen	App'd:
	Client: STEALTH® Concealment Solutions	Date: 02/05/16	Scale: A
	Code: TIA-222-G	Path:	Draw No:



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

DESIGNED: SRM  
CHECKED: TPH

**PROJECT: LAKE PARK MARINA TOP SECTION**

**Gusset Calculation**

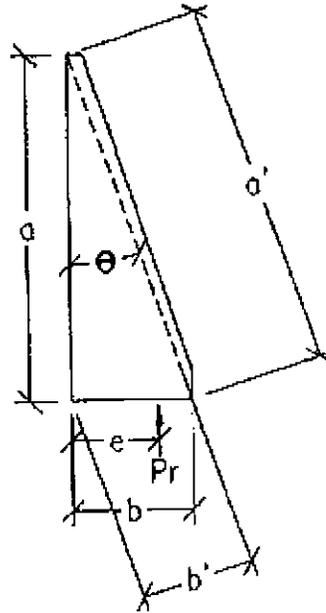
Analysis Type (ASD or LRFD)	LRFD
Pipe $F_y$ (ksi)	42
Pipe $F_u$ (ksi)	58

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

	LRFD $\phi$	ASD $\Omega$
Flexure:	0.9	1.67
Shear:	1	1.5

**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 <sup>3</sup> ):	10.125
$M_u$ (Yielding) kip-in:	384.5
Check:	17.1% Okay

**Shear Yielding Check**

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

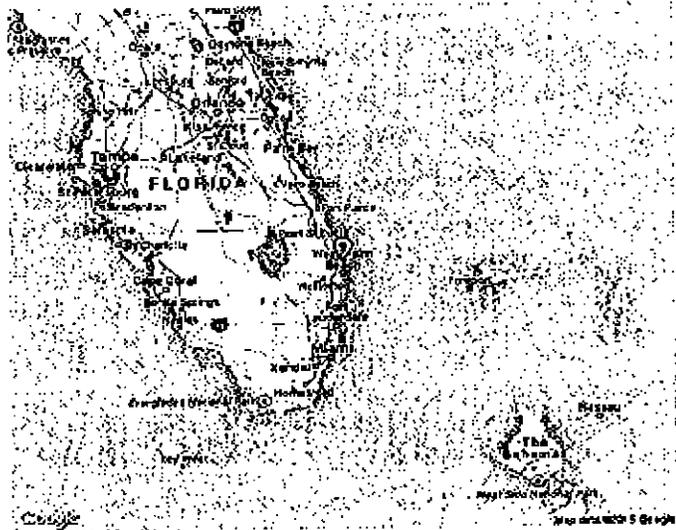
## Search Results

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)

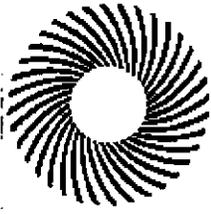
\*\*MRI Mean Recurrence Interval (years)

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

### WIND SPEED WEB SITE DISCLAIMER.

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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

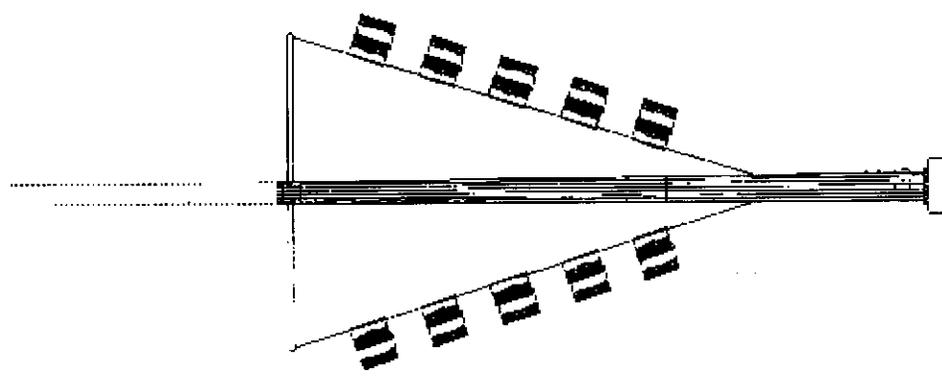
T1	TITLE SHEET
N1-N2	NOTES & SPECIFICATIONS
S1	ELEVATIONS
S2-S3	DETAILS
S4	FOUNDATION



NOV 10 2015

T1  
2

3/12/15  
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NOV 20 2015

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MIRAGE, MI 48120  
P: (800) 998-1725 F: (401) 800-1774  
VECTOR PROJECT 00102-023-111  
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111 CHARLESTON AVENUE, SUITE 200  
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DATE: 11/20/15  
BY: [Signature]

**ELEVATIONS**  
**RG PARTNERS**  
SITE: \$FL13; LAKE PARK MARINA BASE POLE  
BASE POLE  
105 LAKE SHORE DRIVE  
LAKE PARK, FL 33403

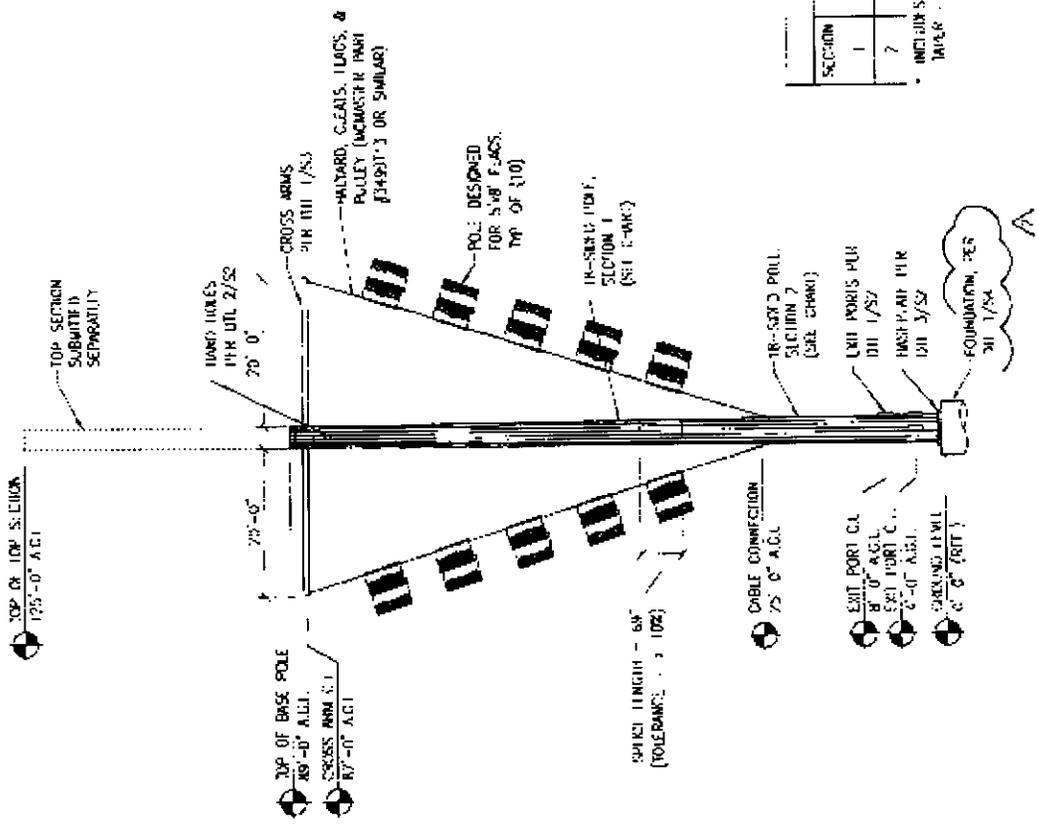
APP. 1" = 100' UNLESS OTHERWISE NOTED  
DATE: 11/20/15  
BY: [Signature]

1

ELEVATION

11/20/15

2



SECTION	LENGTH	TOP @ ELEVATION	THICKNESS	WEIGHT
1	55'-0"	34'-00"	7/32"	5.0 K
7	40'-9"	40'-18"	1/4"	8.7 K

INCLUDES BASE PLATE & PURE WEIGHT  
TOWER = 0.14 MFT

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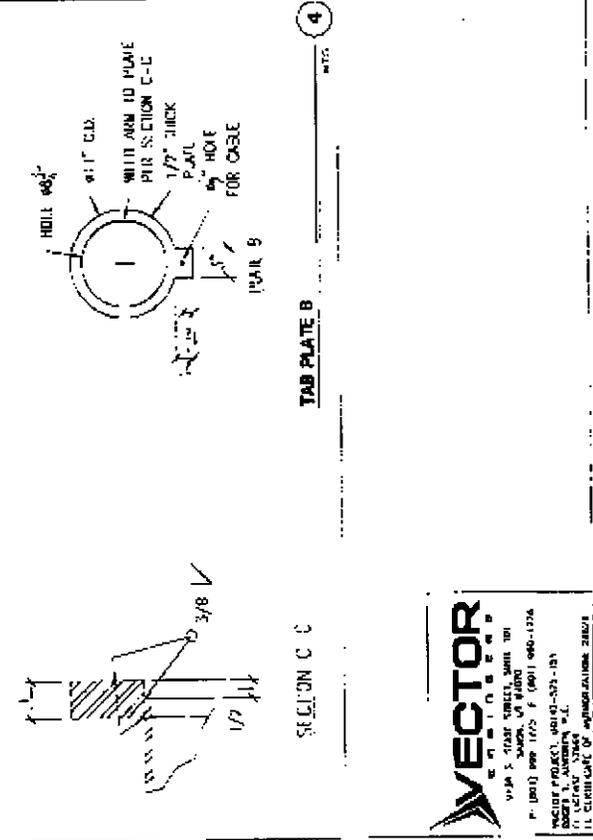
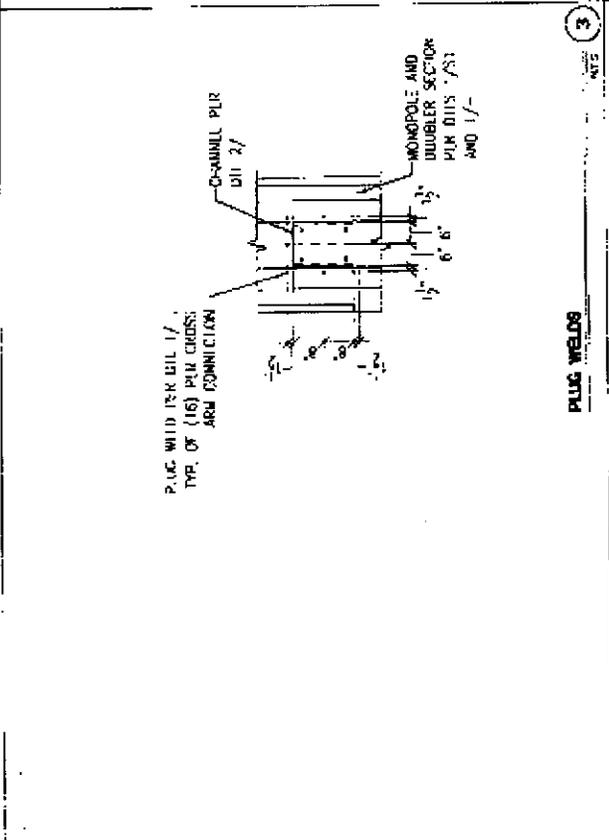
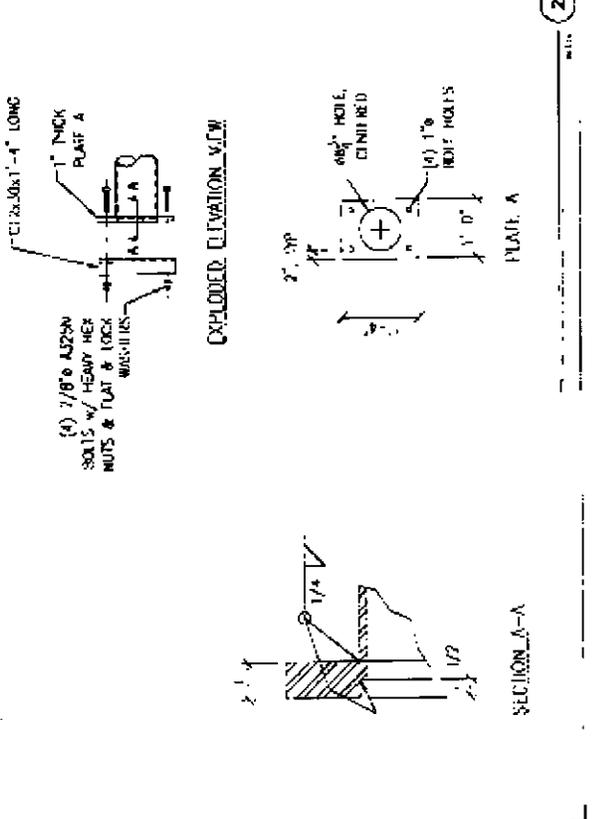
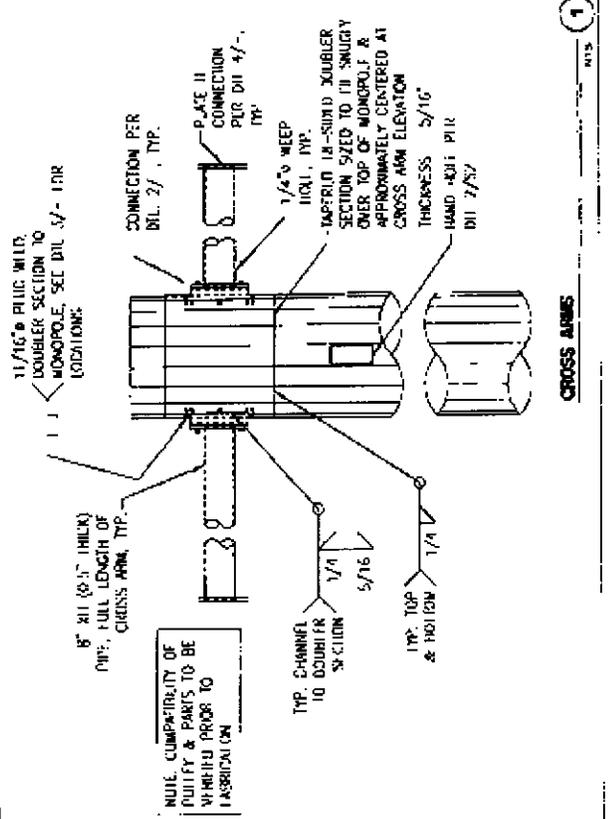


CONTRACT NO. 2017-00000000000000000000  
DATE: 03/20/2018  
DRAWN BY: [Signature]  
CHECKED BY: [Signature]

**RG PARTNERS**  
BASE POLE  
105 LAKE SHORE DRIVE  
LAKE PARK, FL 33403

DATE: 03/20/2018  
DRAWN BY: [Signature]  
CHECKED BY: [Signature]  
PROJECT: 1702018

**DETAILS**



**VECTOR**  
1924 S. STATE STREET, SUITE 301  
MADISON, WI 53704  
P: (608) 839-1275 F: (608) 839-1274  
WWW.VECTOR.COM  
VECTOR PROJECT: 101010-003-103  
SHEET 3 - DETAILS  
11. CONSULT THE APPROPRIATE CODES  
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