

SURVEYOR'S REPORT

Specific Purpose Survey of

Weather Tower Marsh

Collier County, Florida

Prepared for:

South Florida Water Management District

Prepared by:



301 East Atlantic Boulevard

Pompano Beach, Florida 33060-6643

Ph. (954) 788-3400 Fax (954) 788-3500

Licensed Business (L.B.) 6860

South Florida Water Management District's

Purchase Order number 4500012430

Keith and Associates project number 07050.02,

Task 001

Report Date: August 20, 2007

Submittal: First

SURVEYOR'S REPORT

TABLE OF CONTENTS

Purpose	1
Project location	1
Deliverables	2
Datum	2
Leveling Methods	2
Vertical Control	3-6
Site Photos	7-9
Project Results	10
Site Drawing	11
Comments	12
Surveyor's Certificate	12

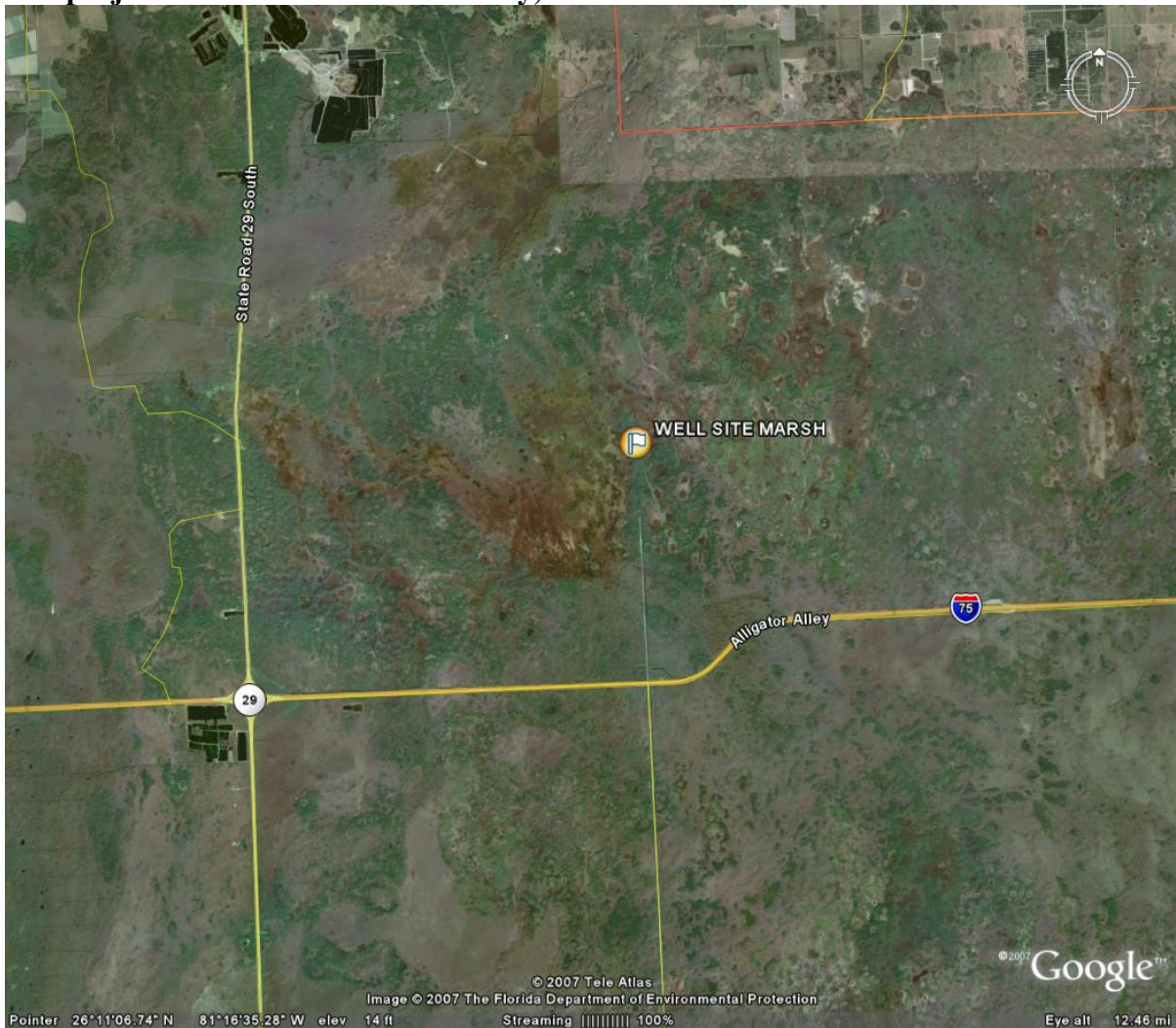
SURVEYOR'S REPORT

PURPOSE

To establish (NAVD 1988 and NGVD 1929) vertical data at the site.
Set a site benchmark and elevate the well.
Locate the antenna base and obtain ground elevations adjacent to the base.

LOCATION OF PROJECT

The project is located in Collier County, Florida.



SURVEYOR'S REPORT

ITEMS DELIVERED TO THE DISTRICT

1. Electronic copy of field notes.
2. Electronic copy of all computation sheets.
3. CORPSMET 95 file.
4. Site photographs.
5. Surveyor's Report.
6. District Benchmark Sheet.
7. AutoCad drawing.

DATUM FOR THE PROJECT

The vertical datum for the project is National Geodetic Vertical Datum (NGVD) of 1929 and North American Vertical Datum (NAVD) of 1988. NGVD 1929 elevations and offset were derived using the NGVD 1929.txt file supplied by the South Florida Water Management District. Horizontal datum is NAD (North American Datum) 1983/03.

LEVELING METHODS

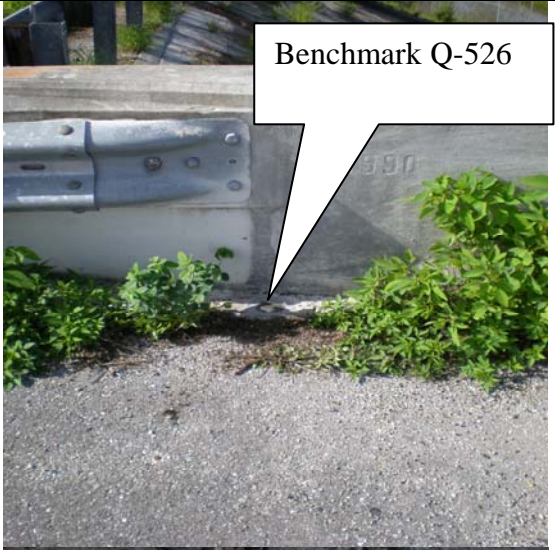

Site Benchmark "Marsh 2007" is a 3-1/2" SFWMD brass disk set in poured concrete approximately 580 feet west and 70 feet north of the Marsh weather antenna. A level loop was run starting at NGS benchmark Q-526, through NGS Benchmark I-75 H 34, through NGS benchmark I-75 J 34, through site Benchmark "Marsh 2007", and back to Q-526. Site Benchmark "Marsh 2007" was used to as-built the well. A Leica NA2 conventional level was used for the level run and the site As-Built. The level run meets or exceeds the closure requirement of "the square root of the level run in miles x 0.03'.

HORIZONTAL LOCATIONS

Horizontal locations were obtained using a Trimble 5700 receiver and RTK cellular link.



SURVEYOR'S REPORT

VERTICAL CONTROL

Q-526		Elevation:	NAVD 1988	39.065'	NGVD 1929	40.447'
PID AJ6583		Latitude	26°09'20.15306"		From NGVD 29.txt file	
State/County FL/Collier		Longitude	-81°15'57.31946"			
USGS QUAD Miles City (1983)						
Vertical Order Class	First II	<p>The orthometric height was determined by differential leveling and adjusted by the NATIONAL GEODETIC SURVEY in June 2002.</p> <p>The mark is about 83.3 km (51.75 mi) west of Andytown near Naples in estimated Section 6, Township 50 South, Range 31 East, Collier County Florida. Ownership- Florida Department of Transportation To reach the mark from the intersection of I-75 and State Road 29 (I-75 exit 14 A, about 45.1 km (28.0 mi) east of Naples) go east on I-75, 7.9 km (4.9 mi) to the east end of the of concrete bridge no. I-75 030264 over CR 839 and the mark on the left. The mark is set flush on the southeast abutment of concrete bridge no. I-75 030245 over CR 839 (west bound lane bridge), about the same level as the bridge deck, 5.70 m (18.7 ft) south of the centerline of the westbound lanes of I-75, 0.85 m (2.8 ft) west of the east end of the abutment guardrail, 2.44 m (8.0 ft) east of the expansion joint (between bridge and approach slab), 0.91 m (3.0 ft) east of the east edge of the concrete approach slab and 0.09m (0.3 ft) north of concrete guardrail.</p>				
Horizontal Order	First					
 <p style="text-align: center;">Benchmark Q-526</p>						
						



SURVEYOR'S REPORT

VERTICAL CONTROL (CONTINUED)

I-75 H 34		Elevation:	NAVD 1988	40.905'	NGVD 1929	42.265'
PID AH1998	Latitude		26°09'20.56084		From NGVD 29.txt file	
State/County FL/Collier	Longitude		-81°15'57.42412			
USGS QUAD Miles City (1983)						
Vertical Order First Class II	<p>The orthometric height was determined by differential leveling and adjusted by the NATIONAL GEODETIC SURVEY in December 2001.</p> <p>The station is located approximately 33.0 miles (53.1 km) east of Naples, at the interstate Highway 75 and County Road 839 Interchange. To reach station from west toll booth on interstate highway 75 (Alligator Alley), proceed east on Interstate Highway 75 for 19.6 miles (31.5 km) to the State Road 29 interchange, proceed easterly 5.0 miles (8.0 km) along Interstate Highway 75 to bridge number 030264 and the station. The station is flush with the north concrete guardrail of the westbound bridge, 1 foot (0.3 m) west of an expansion joint, 12.0 feet (3.7 m) west of the east end of the concrete guardrail and 23.0 feet (7.0 m) north of the center of the westbound lanes.</p>					
Horizontal Order First						
						
						

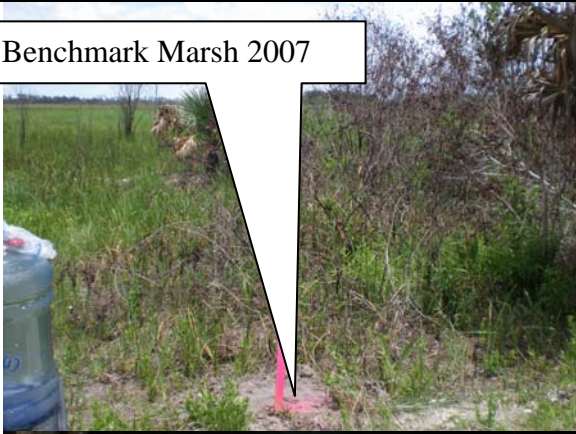

SURVEYOR'S REPORT

VERTICAL CONTROL (CONTINUED)

I-75 J 34		Elevation:	NAVD 1988	41.929'	NGVD 1929	43.290'
PID AH1999		Latitude	26°09'20.15306"		From NGVD 29.txt file	
State/County FL/Collier		Longitude	-81°15'57.31946"			
USGS QUAD Miles City (1983)						
Vertical Order	First	<p>The orthometric height was determined by differential leveling and adjusted by the NATIONAL GEODETIC SURVEY in January 2002. The station is located approximately 33.0 miles (53.1 km) east of Naples, at the Interstate Highway 75 and County Road 839 Interchange. To reach station from west toll booth on Interstate Highway 75 (Alligator Alley), proceed east on Interstate Highway 75 for 19.6 miles (31.5 km) to the State Road 29 Interchange, proceed easterly 5.0 miles (8.0 km) along Interstate Highway 75 to bridge number 030264 and the station. The station is flush with the north concrete guardrail of the eastbound bridge, 0.8 foot (24.4 cm) west of an expansion joint, 11.8 feet (3.6 m) west of the east end of the concrete guardrail and 19.0 feet (5.8 m) north of the center of the eastbound lanes.</p>				
Class	II					
Horizontal Order	First					
						
						

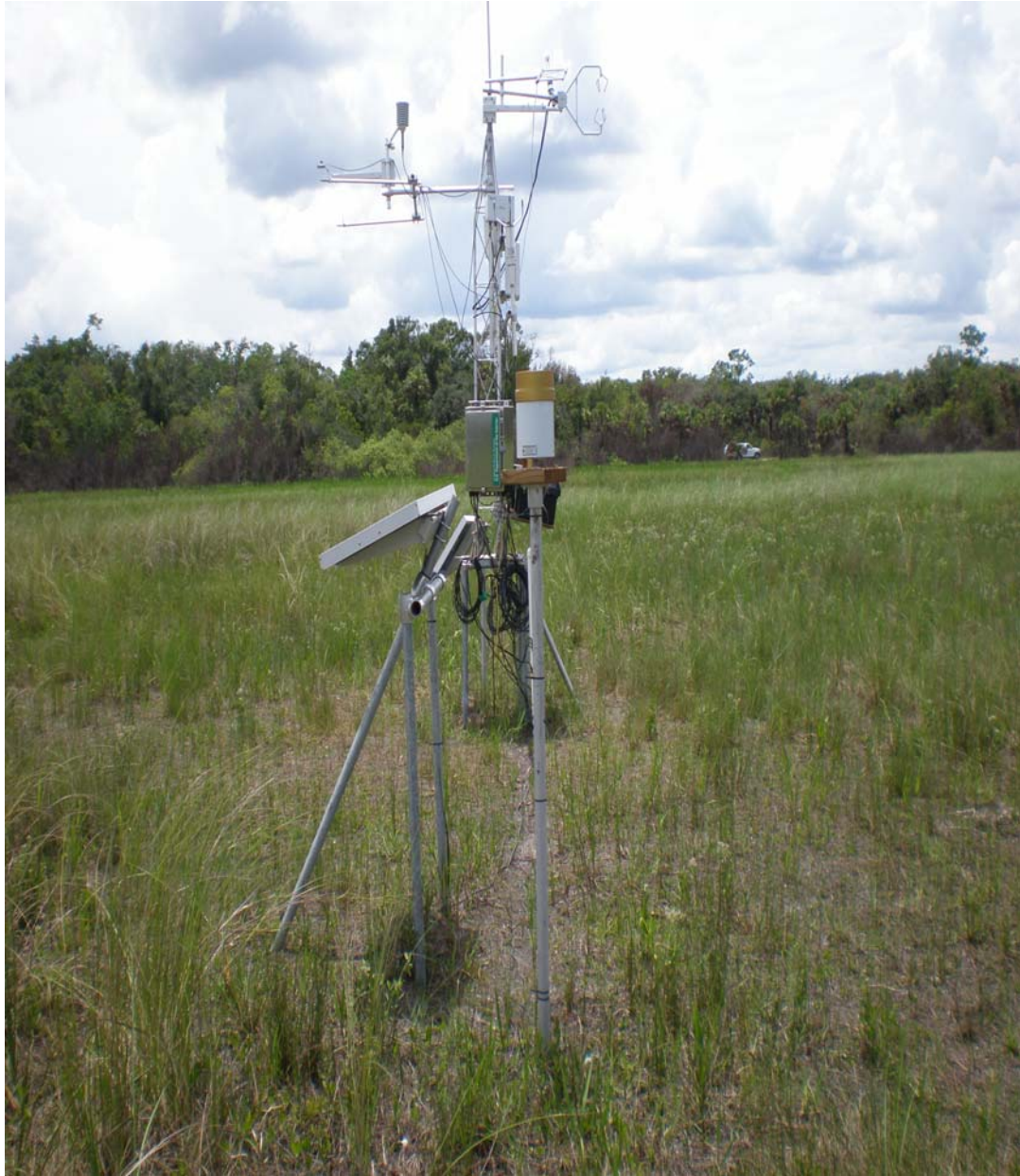
SURVEYOR'S REPORT

VERTICAL CONTROL (CONTINUED)

BM MARSH		Elevation:	NAVD 1988	13.897'	NGVD 1929	15.257'
	Latitude		26°11'57.8"	Derived from the above described level loop.		Derived from the above described level loop.
State/County FL/Collier	Longitude		-81°16'03.3"			
USGS QUAD Miles City (1983)						
Vertical Order	Third	To reach the mark from the intersection of I-75 and CR 839 proceed 1.69 miles north on CR 839 (Turner River Road) to the intersection of a rock road on the right, turn right and proceed through the gate (contact USGS for the combination to the gate) and along the rock road for 1.54 miles to the mark on the right. The mark is a SFWMD 3-1/2" brass disk stamped "Marsh 2007" approximately 580' west of and 70' north of the weather tower in the field. The disk was set in poured concrete level with the road. 6' east of the centerline of the rock road, 5.4 miles south of the green gate and 1.8 miles south of the fork in the road.				
Horizontal Order	Third					
<div style="border: 1px solid black; padding: 5px; display: inline-block;">Benchmark Marsh 2007</div> 						
						

SURVEYOR'S REPORT

SITE PHOTOS



Marsh Tower and Rain Gauge

SURVEYOR'S REPORT

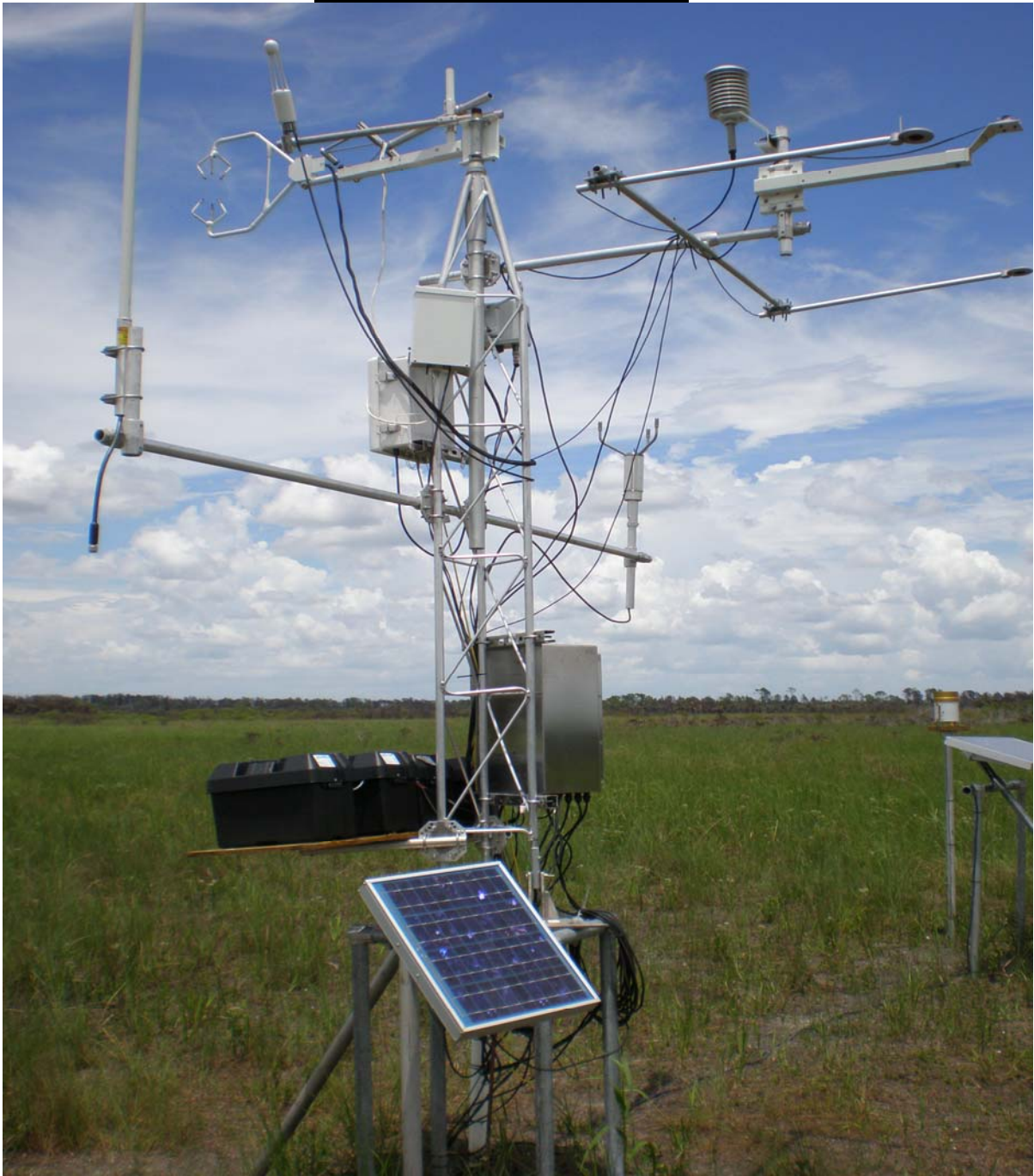
SITE PHOTOS (CONTINUED)



Marsh Well

SURVEYOR'S REPORT

SITE PHOTOS (CONTINUED)



Marsh Solar Panels

SURVEYOR'S REPORT

PROJECT RESULTS

Well Site Marsh

Reference mark: **Fnd. X-Mark on PVC pipe.**

New Information at the site:

Mark El. **17.53'** (NGVD 29).

Mark El. **16.17'** (NAVD 88).

Initials: **K&A**

Date: **08/09/07**

Offset : **1.36'**

Previous Information at the site:

None

Reference Mark Elevation(s)

El. **N/A**

Date: **N/A**

Initials: **N/A**

Reference Mark location

N/A

DTW (Distance to water inside well)

Reference mark:

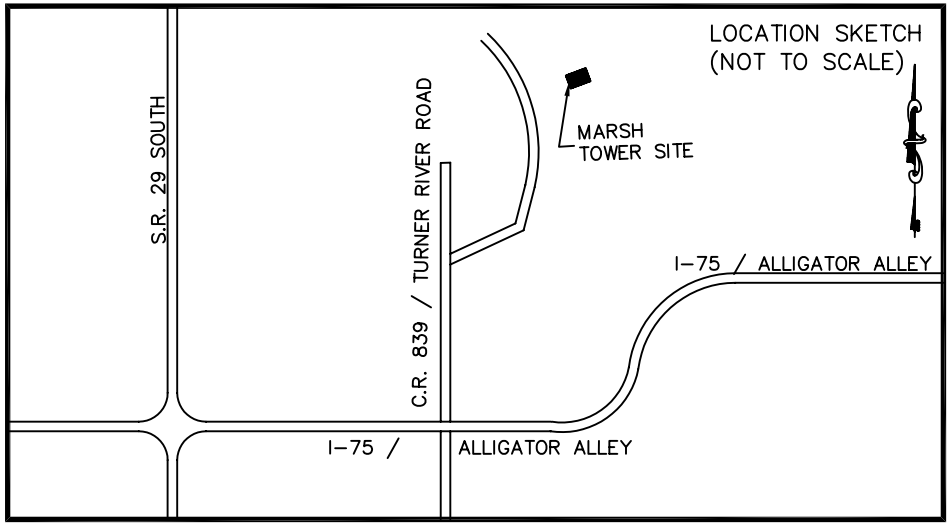
Same as Fnd. Mark above

El. **xx'** (NGVD 29)

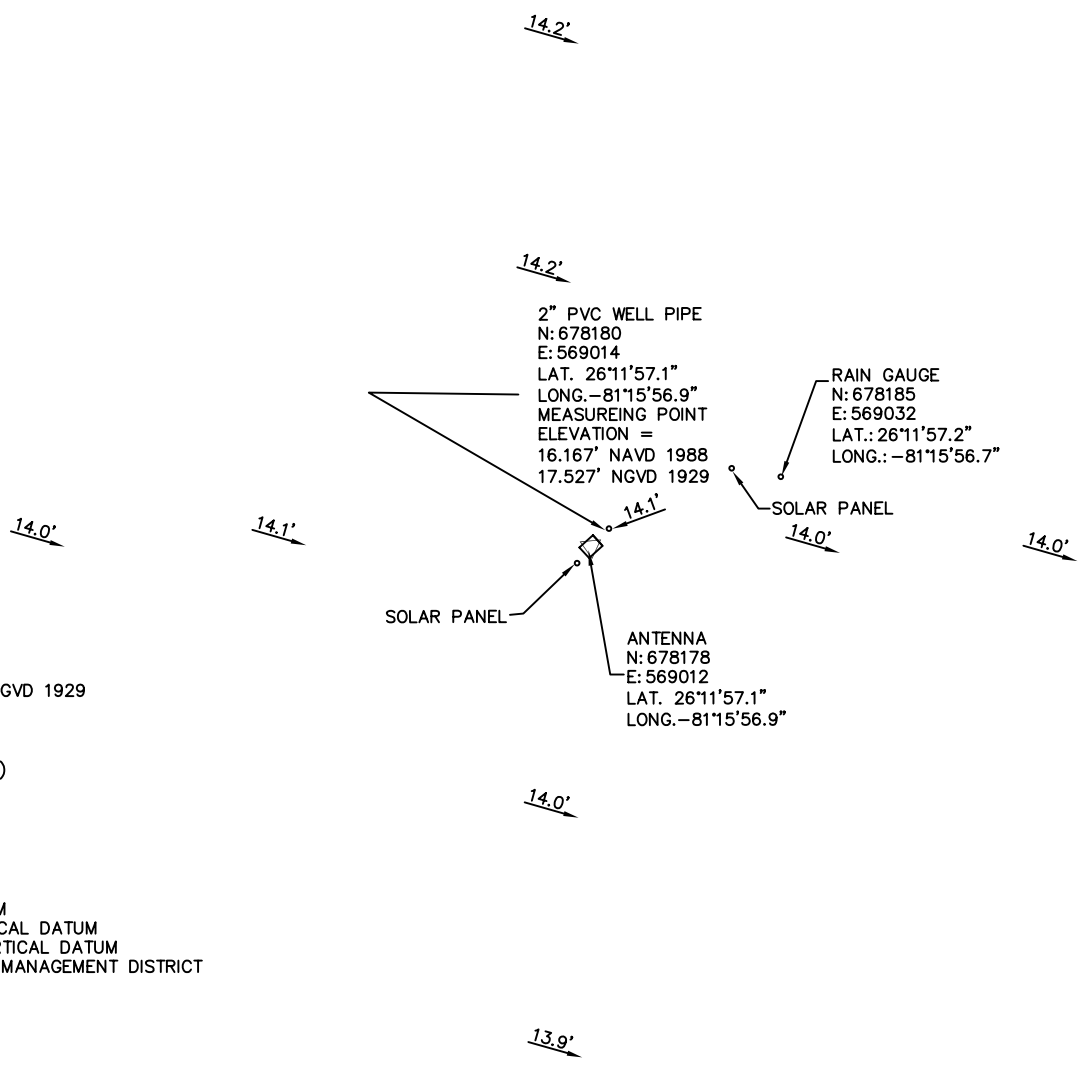
Measurement to water: **xx'**

Date: **9/25/07**

Time: **xx:xx x.x.**



SCALE: 1" = 20'



NOTE:
 ELEVATIONS SHOWN HEREON ARE NGVD 1929
 UNLESS OTHERWISE NOTED.
 HORIZONTAL DATUM SHOWN
 HEREON IS NAD 1983 WITH THE
 1990 ADJUSTMENT APPLIED (83/90)

- LEGEND:
- B.M. = BENCHMARK
 - LAT. = LATITUDE
 - LONG. = LONGITUDE
 - NAD = NORTH AMERICAN DATUM
 - NAVD = NORTH AMERICAN VERTICAL DATUM
 - NGVD = NATIONAL GEODETIC VERTICAL DATUM
 - SFWM = SOUTH FLORIDA WATER MANAGEMENT DISTRICT
 - PVC = POLYVINYL CHLORIDE
 - = EXISTING ELEVATION

MARSH TOWER SITE

TOWER AND EQUIPMENT
 LOCATIONS

KEITH
 ASSOCIATES, INC.
 consulting engineers
 301 EAST ATLANTIC BOULEVARD
 POMPANO BEACH, FLORIDA 33060-6643
 (954) 788-3400 FAX (954) 788-3500
 EMAIL: mail@keith-associates.com LB NO. 6860

SHEET 1 OF 1
 DRAWING NO. _____

DATE 8/15/07
 SCALE 1"=20'
 FIELD BK. 273
 DWNG. BY MMM
 CHK. BY AMK

DATE	REVISIONS

SURVEYOR'S REPORT

Comments

Elevations shown hereon are NGVD 1929 datum unless noted otherwise.

Party Chief: D. Ferels Field Book: 273 Pages 30-31, Field Book 278 Pages 39-50

Bench Mark: "MARSH 2007" El. 13.897', Vertical Datum: NAVD1988

El. 15.257', Vertical Datum: NGVD1929

Offset: 1.36' SFWMD VALUE (subtract this value to convert to NAVD 1988)

Offset: 1.36' NGS VALUE (subtract this value to convert to NAVD 1988)

The offset values referred to as "SFWMD VALUE" and "NGS VALUE" were derived by subtracting the published NAVD 1988 elevation from the NGVD 29.txt file value at Benchmark "I-75 H 34".

NAVD 88 - North American Vertical Datum of 1988

NGVD29 -National Geodetic Vertical Datum of 1929

NAD 83 -99 (Horizontal Datum) North American Datum

NGS - National Geodetic Survey

SFWMD - South Florida Water Management District

PVC - Polyvinyl Chloride

L.B. - Licensed Business

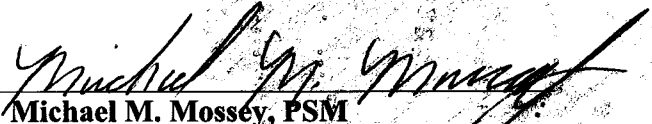
SURVEYOR'S CERTIFICATION

I hereby certify that this Specific Purpose Survey meets applicable portions of the Minimum Technical Standards set forth by the Florida Board of Professional Surveyors and Mappers in Chapter 61-G17, Florida Administrative Code. This report is prepared for the sole and specific use of the South Florida Water Management District and is not assignable.

Keith and Associates, Inc.

L.B. number 6860

By:



Michael M. Mossey, PSM
Professional Surveyor and Mapper
State of Florida
Certificate No. 5660

Date of Survey
August 9, 2007