



SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Rev. 1/16

U.S.G.S. Station Name: F-291	U.S.G.S. Station Number: 26001008085001	Agency: SFWM D	Date of Field Work: 09/19/19
Party Chief: T. AVERY	Field Book: SFWM D #1	Page(s): 11-14	Report Prepared by: DEWBERRY

SITE SPECIFIC DATA

Site Benchmark: F-291	Benchmark Elevation(s) (NAVD88): 7.60 feet	Corpscon 6.0.1 Conversion Factor (NAVD88 to NGVD29) + 1.60 feet	
Well Reference Elevation (NAVD88): 9.49'		Ground Elevation (NAVD88): 7.6'	Pad Elevation (NAVD88): N/A

GEOGRAPHIC DATA

Section 22	Township 51 SOUTH	Range 42 EAST
Well Latitude: 26°00'11.38"N	Well Longitude: 80°08'48.77"W	Location Source: AVERAGED FPRN & TRIMBLE VRSNOW RTK
State Plane Coordinates:	Northing (Y) = 607754'	Easting (X) = 936373'

Notes: NAVD88 – North American Vertical Datum of 1988; NGVD29- National Geodetic Vertical Datum of 1929; Corpscon 6.0.1 - A U.S. Army Corps of Engineers Engineering Research and Development Center Topographic Engineering Center Alexandria, Virginia Windows-based program to convert coordinates and elevations between datum's using vertcon05.txt and vertcon05.05 files supplied by the U.S. Army Corps of Engineers South Atlantic Division, Jacksonville FL.

PICTURES



Benchmark "F-291"
Latitude: 26°00'10.8"
Longitude: 80°08'48.8"
NAVD88 EL = 7.60 FEET



Well Site
Latitude: 26°00'11.38"
Longitude: 80°08'48.77"

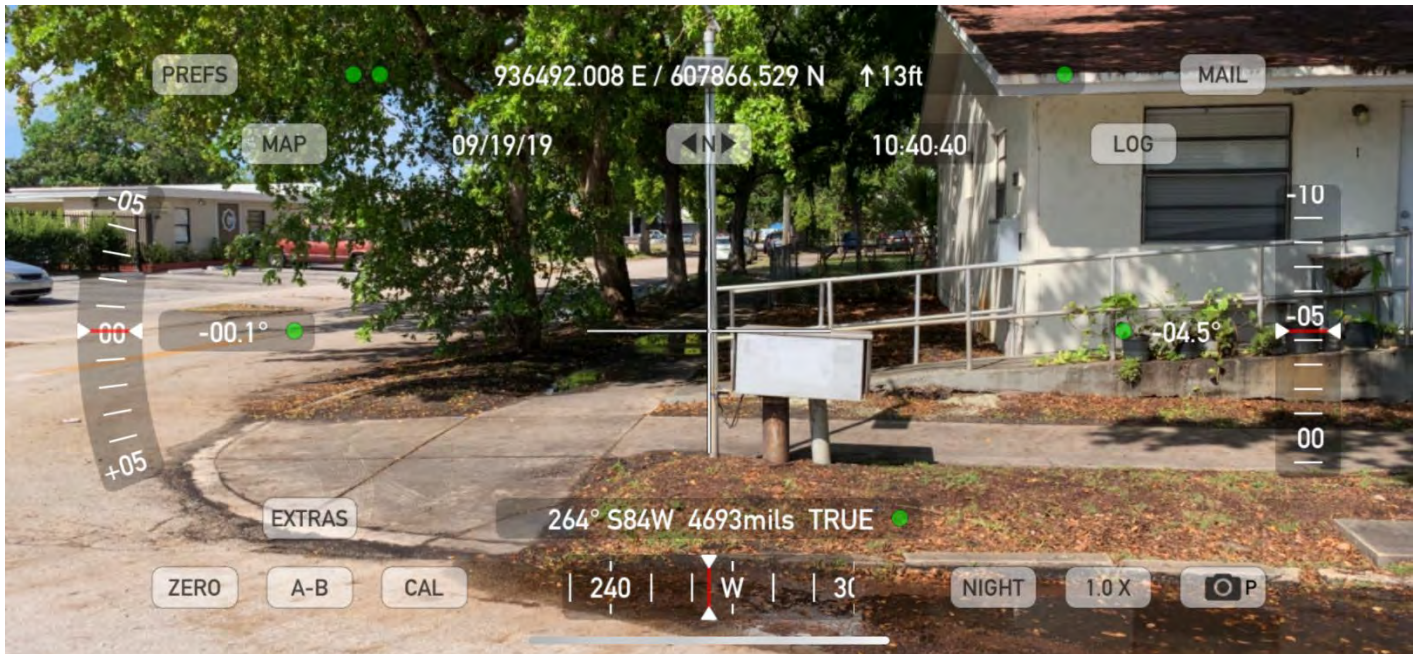
Not to scale (GoogleEarth product)



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Well Site and Well Head



Well: 6" Metal Well Head
 Reference Point: Top of screw at well opening

Reference Point El. =
9.49 feet NAVD88

Distance to water =
 -8.79 feet from reference point
 (09/19/19 at 10:30 AM)





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New Aluminum Tag





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USGS RMs

RM 2 – SW corner of concrete slab



Latitude: 26° 00' 11.5"
Longitude: W80° 08' 48.7"
NAVD88 EL = 7.58 FEET

Well F-291



RM 3 – Nail and disc in asphalt



Latitude: 26° 00' 10.8"
Longitude: 80° 08' 48.7"
NAVD88 EL = 7.24 FEET

RM 1 – Nail and disc in asphalt



Latitude: 26° 00' 10.8"
Longitude: 80° 08' 48.6"
NAVD88 EL = 7.56 FEET



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Site Benchmark



Site BM: F291



Latitude: **26°00'10.8"**
Longitude: **80°08'48.8"**
NAVD88 EL = 7.60 FEET

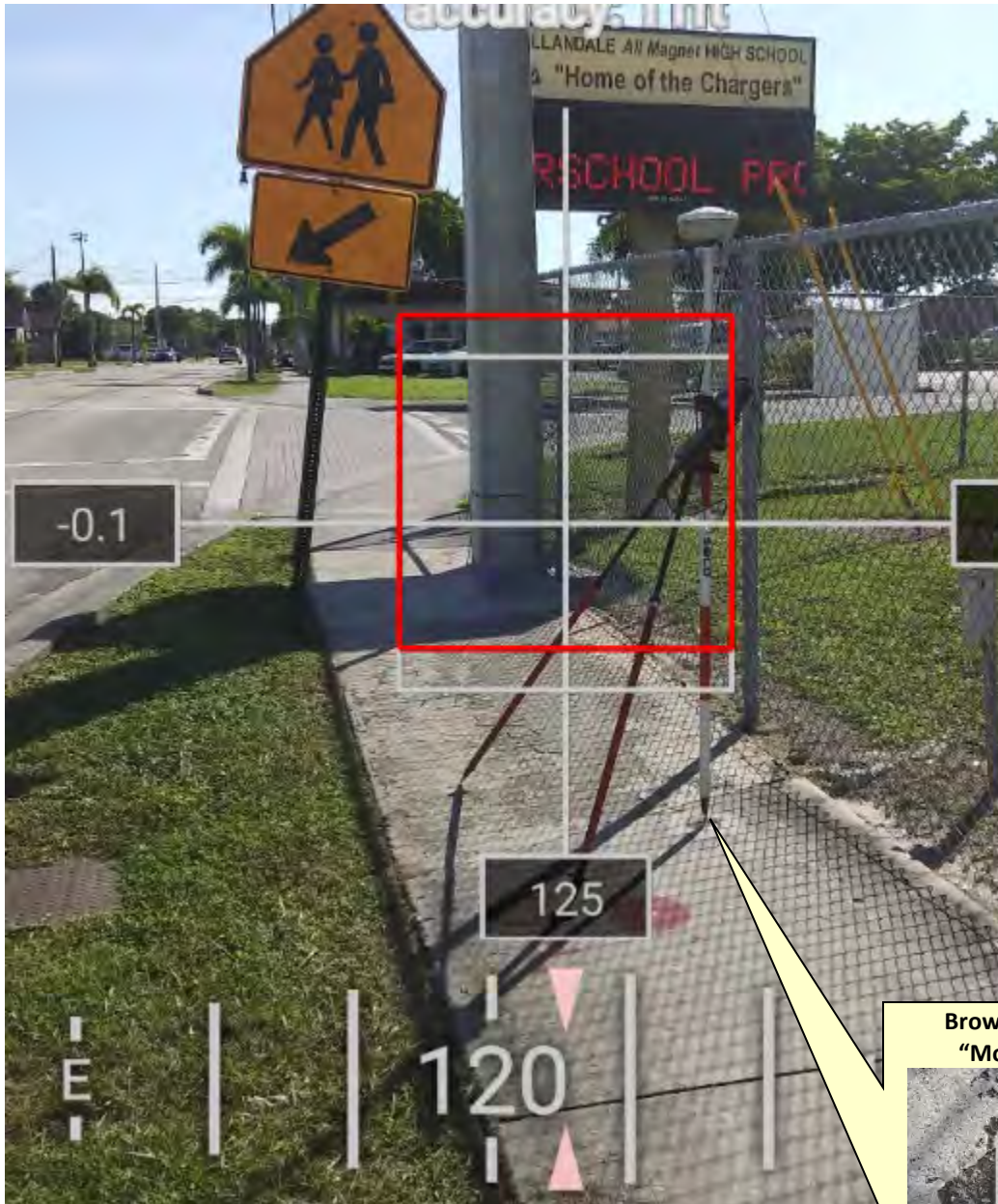




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Source Benchmarks



**Broward County Benchmark
"Morris AZ MK" (AC4697)**



Latitude: **25°59'39.7"**
Longitude: **80°09'40.1"**
NAVD88 EL = 12.30 FEET



South Florida Water Management District Benchmark Datasheet

Designation: F-291	Project Name: USGS Ph 2, BROWARD	Type: V	State Plane Zone: FL East
Stamping: F291 2019	Field Book Name: W210	Field Book Page: 53	
Established By: DEWBERRY / WHIDDEN	Recovered By: N/A	Recovery Date: N/A	
Surveyor: WILLIAM D. DONLEY	Established Date: 11/26/19	Status: New	

GEOGRAPHIC POSITION INFORMATION

Section: 22	Township: 51 SOUTH	Range: 42 EAST
County: BROWARD	Quadrangle: FORT LAUDERDALE SOUTH	Quad Index: 1702
NAD83 Adj. Year: 2011	Vertical Datum: NAVD1988	Horizontal Datum: NAD1983
NAVD88 Elevation (feet): 7.6	NGVD29 Elevation (feet): 9.198	2022 Elevation: N/A
NAVD88 Class: N/A	NGVD29 Class: N/A	Other Elevation: N/A
NAVD88 Order: 3	NGVD29 Order: N/A	Other Elevation Type: N/A
	NGS Source BM(s): MORRIS AZ MK	NGS PID(s): AC4697
	NGS NAVD88 Elev (ft): 12.3	NGS NAVD88 Elev (m): 3.75
	NGS 2022 Elev (ft): N/A	

CORPSCON 6.0.1 CONVERSION FACTOR (NAVD88 TO NGVD29): (A U.S. Army Corps of Engineers Engineering Research and Development Center Topographic Engineering Center Alexandria, Virginia Windows-based program to convert coordinates and elevations between datum's using vertcon05.txt and vertcon05.05 files supplied by the U.S. Army Corps of Engineers South Atlantic Division, Jacksonville FL.)

Vertical Datum Offset: + 1.60	Actual NGS Elevation or ngvd29.txt file: N/A	OPUS Ortho Height: N/A
Northing (Y) (feet): 607690.7	Easting (X) (feet): 936374.8	Source of Latitude & Longitude: AVERAGED FPRN & TRIMBLE VRSNOW RTK
Latitude: 26	0	80
DD°	MM'	SS"
Longitude: 80	8	48.75
DD°	MM'	SS"
Latitude (Decimal Degrees): 26.002986	Longitude (Decimal Degrees): -80.146875	

RECOVERY DATA

How to Reach: **1. FROM US-1, HEAD WEST ON WASHINGTON STREET FOR 0.25 MI
2. TURN LEFT ONTO S 20TH AVE, CONTINUE 378 FEET TO THE MARK ON THE RIGHT LOCATED APPROXIMATELY 3.5 FEET EAST OF SIDEWALK EDGE AND 13 FEET SOUTH OF LIGHT POLE AT THE SW CORNER OF DEWEY STREET AND S 20TH AVE.**

Description/Notes: **2" ALUMINUM SFWMD DISK SET IN A POURED IN PLACE CONCRETE MONUMENT**

Notable Landmarks:

Other Source Benchmarks: **N/A**

PICTURES

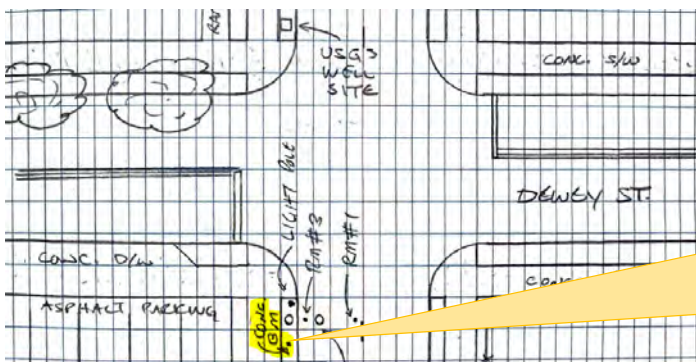
Aerial View of Overall Site

NOT TO SCALE. AERIAL FROM GOOGLE EARTH.



PICTURES

Site Sketch





“Morris AZ MK” Benchmark Datasheet (1 of 2)

The NGS Data Sheet

See file [dsdata.pdf](#) for more information about the datasheet.

PROGRAM = datasheet95, VERSION = 8.12.5.4
1 National Geodetic Survey, Retrieval Date = NOVEMBER 19, 2019
AC4697 *****
AC4697 DESIGNATION - MORRIS AZ MK
AC4697 PID - AC4697
AC4697 STATE/COUNTY - FL/BROWARD
AC4697 COUNTRY - US
AC4697 USGS QUAD - NORTH MIAMI (1988)
AC4697
AC4697 *CURRENT SURVEY CONTROL
AC4697
AC4697* NAD 83(1986) POSITION- 25 59 39.7 (N) 080 09 40.0 (W) HD_HELD2
AC4697* [NAVD 88](#) ORTHO HEIGHT - 3.750 (meters) 12.30 (feet) ADJUSTED
AC4697
AC4697 GEOID HEIGHT - -25.558 (meters) GEOID18
AC4697 DYNAMIC HEIGHT - 3.744 (meters) 12.28 (feet) COMP
AC4697 MODELED GRAVITY - 979,052.3 (mgal) NAVD 88
AC4697
AC4697 VERT ORDER - FIRST CLASS II
AC4697
AC4697.The horizontal coordinates were established by autonomous hand held GPS
AC4697.observations and have an estimated accuracy of +/- 10 meters.
AC4697.
AC4697.The orthometric height was determined by differential leveling and
AC4697.adjusted by the NATIONAL GEODETIC SURVEY
AC4697.in May 1994.
AC4697
AC4697.Significant digits in the geoid height do not necessarily reflect accuracy.
AC4697.GEOID18 height accuracy estimate available [here](#).
AC4697
AC4697.Click [here](#) to see if photographs exist for this station.
AC4697
AC4697.The dynamic height is computed by dividing the NAVD 88
AC4697.geopotential number by the normal gravity value computed on the
AC4697.Geodetic Reference System of 1980 (GRS 80) ellipsoid at 45
AC4697.degrees latitude (g = 980.6199 gals.).
AC4697
AC4697.The modeled gravity was interpolated from observed gravity values.
AC4697
AC4697;
AC4697;SPC FL E - North East Units Estimated Accuracy
AC4697; - 184,260. 283,989. MT (+/- 10 meters HH2 GPS)
AC4697
AC4697_U.S. NATIONAL GRID SPATIAL ADDRESS: 17RNJ8395975328(NAD 83)
AC4697
AC4697 SUPERSEDED SURVEY CONTROL
AC4697
AC4697 NGVD 29 (09/01/92) 4.239 (m) 13.91 (f) ADJUSTED 1 2
AC4697
AC4697.Superseded values are not recommended for survey control.
AC4697
AC4697.NGS no longer adjusts projects to the NAD 27 or NGVD 29 datums.
AC4697.See file [dsdata.pdf](#) to determine how the superseded data were derived.
AC4697
AC4697_MARKER: DZ = AZIMUTH MARK DISK
AC4697_SETTING: 7 = SET IN TOP OF CONCRETE MONUMENT
AC4697_STAMPING: MORRIS 1971 1977



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"Morris AZ MK" Benchmark Datasheet (2 of 2)

AC4697_MARK LOGO: NGS
AC4697_PROJECTION: FLUSH
AC4697_STABILITY: C = MAY HOLD, BUT OF TYPE COMMONLY SUBJECT TO
AC4697+STABILITY: SURFACE MOTION
AC4697_SATELLITE: THE SITE LOCATION WAS REPORTED AS SUITABLE FOR
AC4697+SATELLITE: SATELLITE OBSERVATIONS - September 20, 2014

AC4697

AC4697 HISTORY	- Date	Condition	Report By
AC4697 HISTORY	- 1977	MONUMENTED	NGS
AC4697 HISTORY	- 19901218	GOOD	NGS
AC4697 HISTORY	- 20140920	GOOD	GEOCAC

AC4697

STATION DESCRIPTION

AC4697

AC4697'DESCRIBED BY NATIONAL GEODETIC SURVEY 1990
AC4697'1.8 KM (1.1 MI) WESTERLY ALONG PEMBROKE ROAD (STATE HIGHWAY 824) FROM
AC4697'THE INTERSECTION OF U.S. HIGHWAY 1 IN HALLANDALE, THENCE 0.2 KM (0.1
AC4697'MI) SOUTHERLY ALONG NORTHWEST 9TH AVENUE, 19.0 M (62.3 FT) WEST OF
AC4697'THE AVENUE CENTERLINE, 7.1 M (23.3 FT) SOUTHWEST OF AND LEVEL WITH
AC4697'THE CENTERLINE OF FOSTER ROAD, 6.4 M (21.0 FT) WEST OF UTILITY POLE
AC4697'NUMBER 87570087906, 1.0 M (3.3 FT) NORTH OF A WITNESS POST, 1.0 M
AC4697'(3.3 FT) SOUTH OF THE NORTH EDGE OF A SIDEWALK, AND THE MONUMENT IS
AC4697'FLUSH WITH AND SURROUNDED BY A SIDEWALK. NOTE--THE ORIGINAL
AC4697'DESCRIPTION STATES THAT THE MONUMENT WAS SET IN A CONCRETE POST AND
AC4697'IT DOES APPEAR THAT THE SIDEWALK WAS POURED AROUND THE MONUMENT.

AC4697

STATION RECOVERY (2014)

AC4697

AC4697'RECOVERY NOTE BY GEOCACHING 2014 (KEN)
AC4697'RECOVERED IN GOOD CONDITION.

*** retrieval complete.
Elapsed Time = 00:00:01



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Dewberry Field Notes (1 of 4)

SPECTRA S/RG SFWMD 09/19/10
 ROVER S/N 0360 USGS WELLS - Rm3 62'
 TRIMBLE NETWORK JOB # 5009999 PAPER CL.
 HORIZONTAL LOCATIONS

SITE F-291

PT#	(N)ERR	(E)ERR	(Z)ERR	PT#	DESC.	DURATION
S/O 1	-0.018	0.000	F 0.125	5002	CHK IN F291 BM	180 SEC
* LOCATED PTS 12000-12009						
S/O 1	0.081	-0.050	F 0.022	5003	CHK OUT " F291 BM	

PT#	DESCRIPTION
12000	NDF RM3 "USGS SURVEY MARKER RM3"
12001	NDF PK - RMI (NO ID)
12002	RM2 SW CORNER OF CONC. PAD 7.5 N. OF WELL EX
12003	NORTH EDGE OF WELL HEAD ENCLOSURE BASE PLATE @ OPENING
12004	MP1 - TOP (TOP OF SCREW)

TASK: OBTAIN DISTANCE FROM MEASURING POINT TO WATER LINE: 8.79'

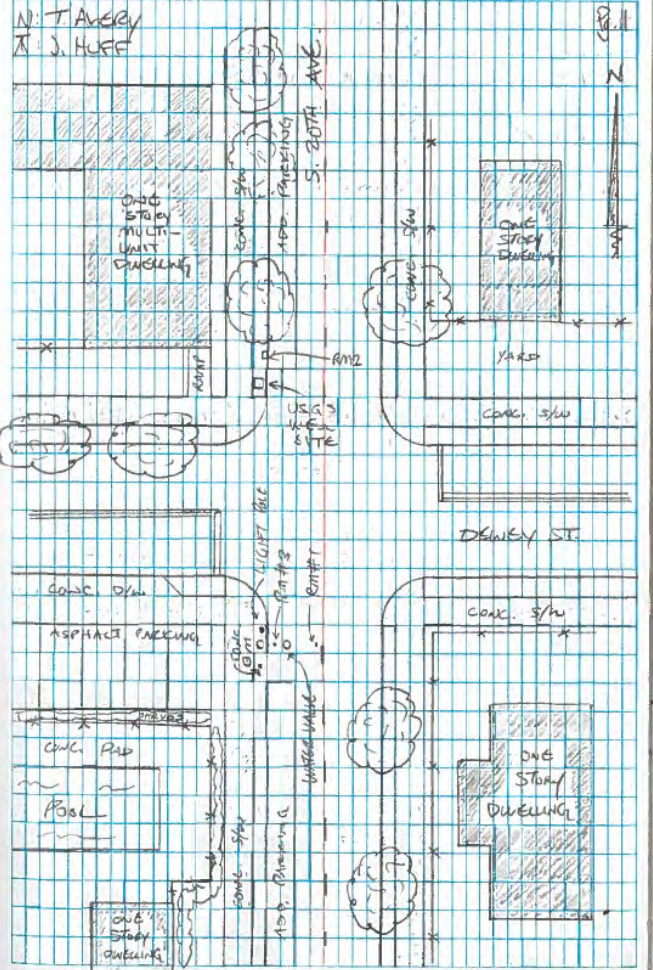
6" METAL WELL HEAD

09/23/10

* SITE WAS RE-SHOT DUE TO DATA COLLECTOR BEING STOLEN.

PT#	(N)ERR	(E)ERR	(Z)ERR	PT#	DESC.	DURATION
S/O 1	-0.028	0.008	F 0.296	5012	same	same
* LOCATED PT #'S 12015-12018						
S/O 1	0.004	0.049	C 0.013	5013	" " "	"

PT#	DESCRIPTION
12015	NDF - RM3 "USGS SURVEY MARKER RM3"
12016	NDF - RM1 "USGS SURVEY MARKER RM1"
12017	SW CORNER OF CONC. 7.5' NORTH OF WELL
12018	MP @ TOP OF SCREW



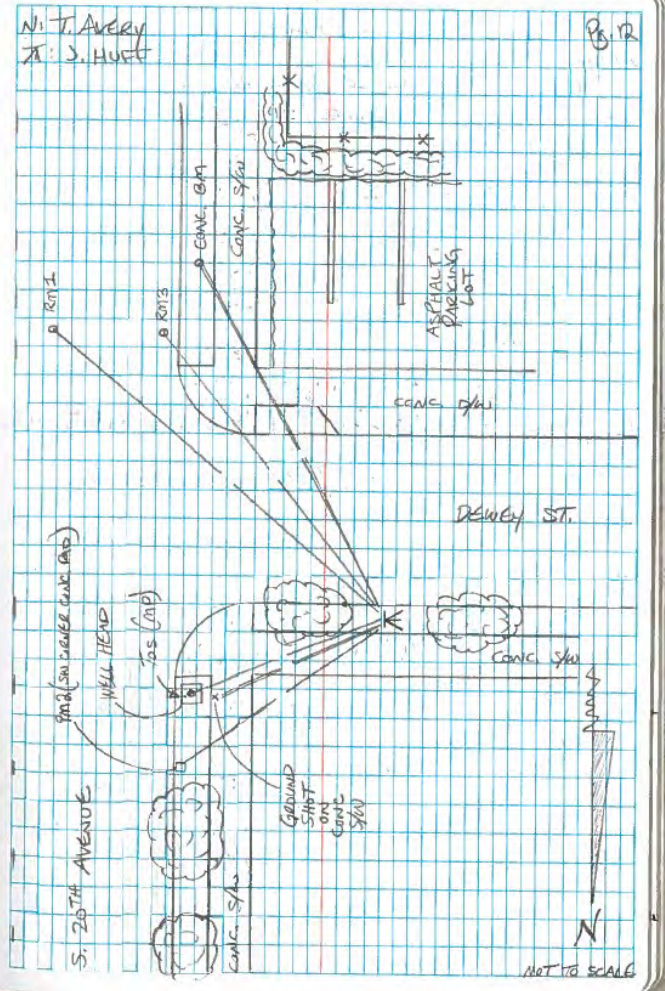


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Dewberry Field Notes (2 of 4)

TOLAN		S. F. W. M. D.		09/19/19		
ATC12		U.S.G.S. WELLS E. 3ms		82°		
1/1: 1439		JOB # 50999999		PARTY CL.		
ELEVATE PTS						
BM ELEVATION: 100.00 7.60 (WHEDDEN)						
STA ID	B/S (+)	MEAN	TR	F/S (-)	MEAN	ASMD. ELEV. ADJ. ELEV.
						100.00 7.60
		5.19				
E291 BM	4.89	4.89	104.89			
	4.59		12.49			
	60°/60°					
				5.365		
R123			12.49	5.08	5.0783	99.811 7.4117
				4.79		
				57.5°		
				5.31		
E11			12.49	5.00	5.0000	92.8000 7.49
				4.69		
				62°		
				4.885		
R112			12.49	4.695	4.6950	100.1950 7.795
				4.505		
				38°		
				3.165		
TOS (TOP OF SCREEN)			12.49	3.005	3.0050	101.8850 9.485
				2.845		
				32°		
* CONTINUED ON PG. 13						





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Dewberry Field Notes (3 of 4)

TRON S.F.W.M.D. 09/19/19
 AFG2 USGS WELLS & BMS
 S/N: 1409 JOB # 50099999
 ELEVATE PIS CONT'D

STA ID	B/S (+)	MEAN	IK	F/S (-)	MEAN	ELEV.	ADJ. ELEV.
		12.89					
		12.49		5.055			
GS (on GNC.)				4.905	4.9050	99.9850	7.585
				4.750			
				30' / 2'			

* BREAK SET-UP

	4.94			5.07			
GS	4.79	4.7883	12.7733	4.77	4.7700	100.0000	7.6033
	4.635		12.3733	4.47			
	30' / 2'			60' / 180.5'			

* END LEVEL LOOP

ADDITIONAL INFORMATION

WELL LEVEL READING WAS TAKEN ON 09/19/19 @ 10:30 AM (EST)

READING FROM WATER LINE TO MEASURING POINT @ TOP OF STAFF WAS: 8.79'

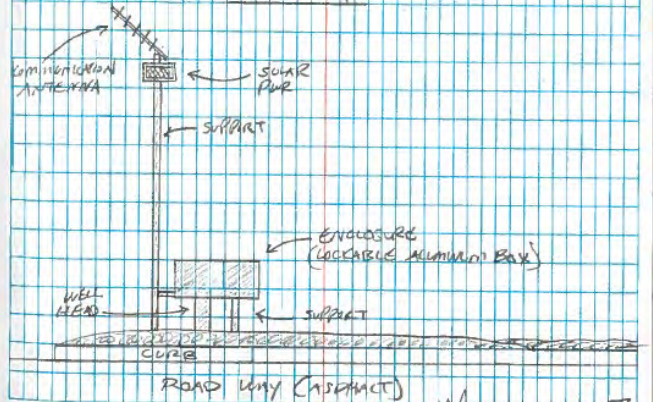
N: J. AVERY
 T: J. HUEF

BIB

* CLOSED ON BM (BACK ON STARTING POINT)

CHECK IN = +0.003

SKETCH

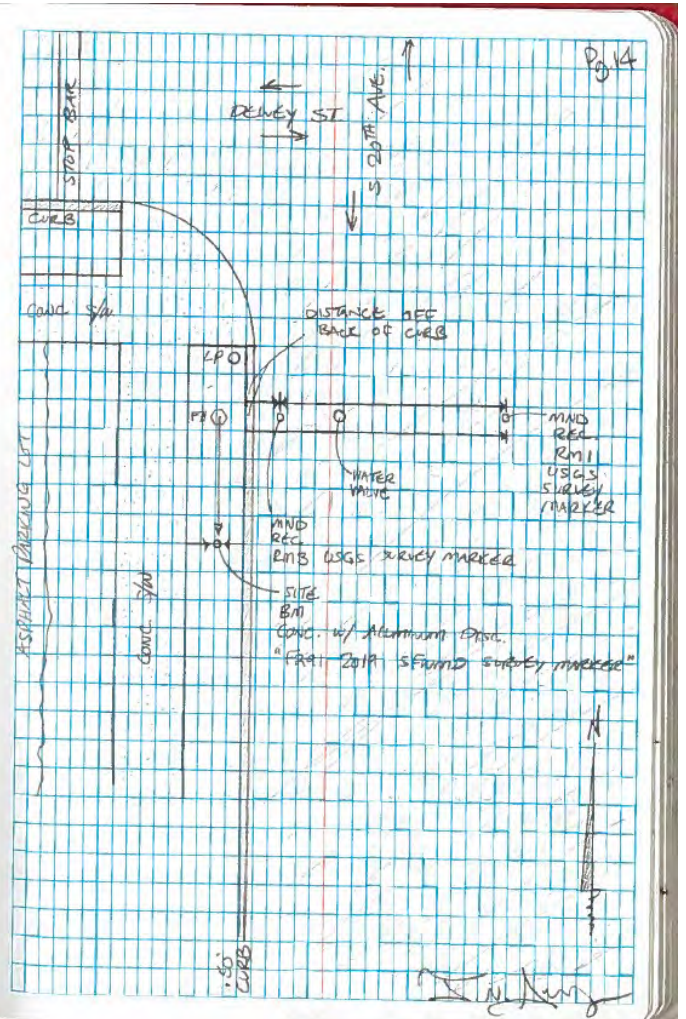
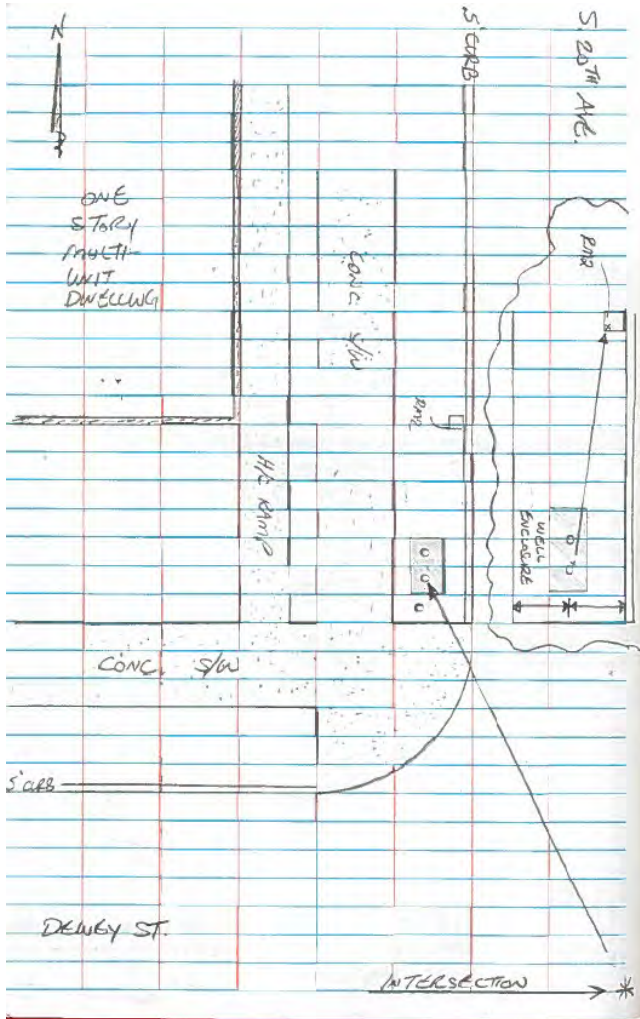




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Dewberry Field Notes (4 of 4)





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Whidden Field Notes (1 of 1)

F291

TRIMBLE RB BASE S/N 4639122.231

TRIMBLE RB-2 ROVER S/N 4639122.445

OCCUPY F291 - STANDARD SFWMO ALUMINUM DISK
IN CONCRETE

HI. 5.55 FT 1.692 M
MEAS. TO BASE OF ANT.

START: 9:09 AM

STOP: ~~10:12 AM~~
1:12 AM

CHECK SHOT: MORRIS AZ MK (AC-4697)

STORE PT: 30000 (180 epochs)

* UNCORRECTED EL = 12.26 NAVD83

PUBLISHED EL = 12.30 NAVD83

26 Nov 19

CM
MK

W210/58

SUNNY 72°