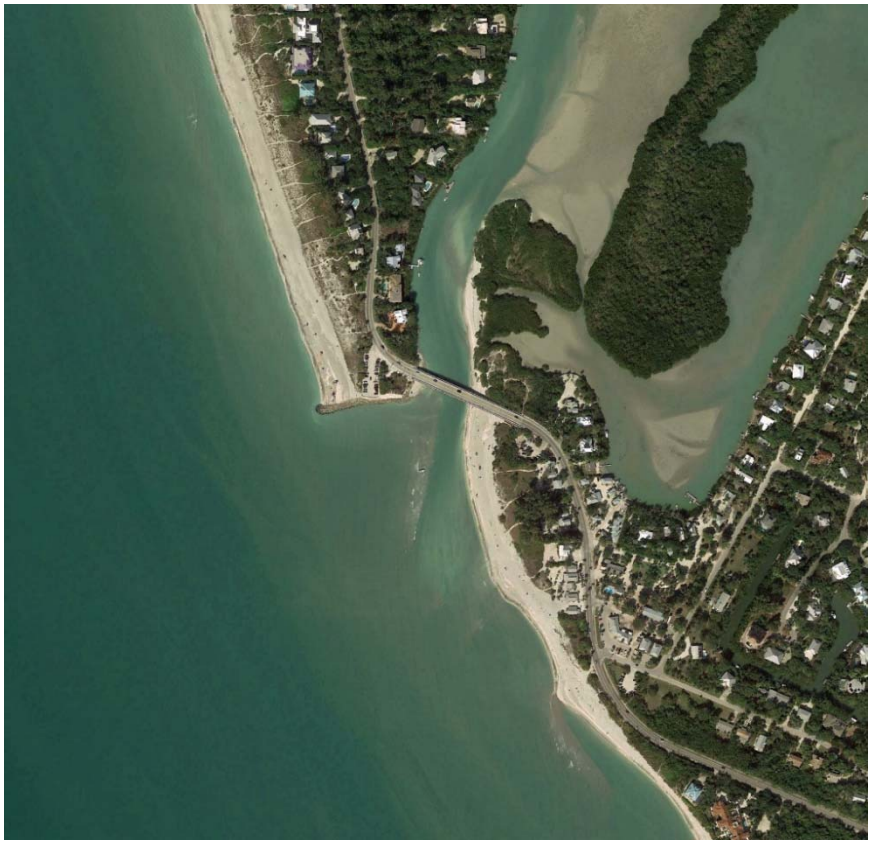
BLIND PASS MAINTENANCE DREDGING PROJECT

2018 FIRST YEAR MONITORING REPORT



Prepared for:

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CEC File No. 18.030

Prepared by:

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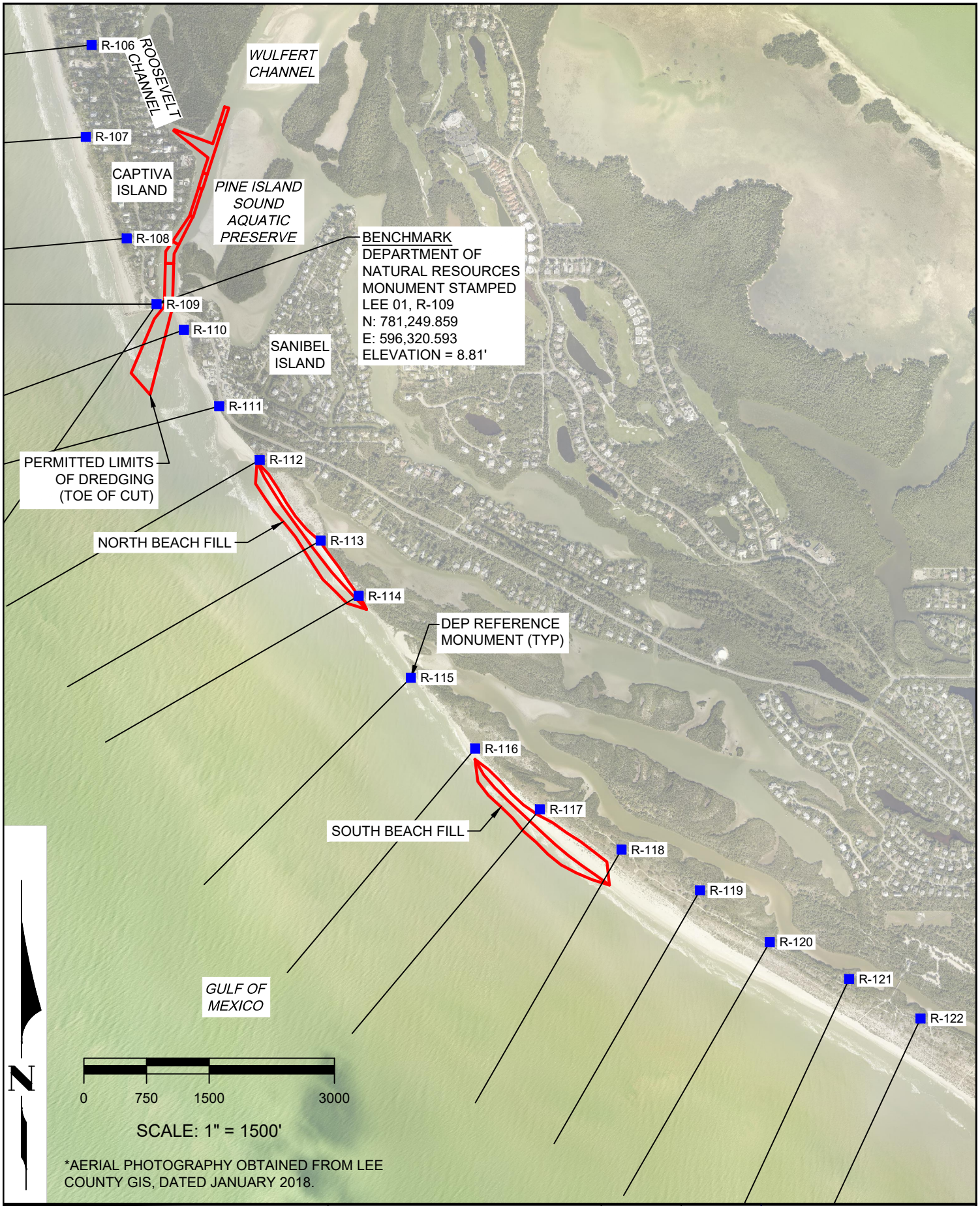
1 INTRODUCTION

Blind Pass was originally opened through hydraulic dredging during the 2009 restoration project. In June 2013, Lee County completed the first maintenance dredging of the pass. In June 2017, the second maintenance dredging of the pass was completed. This report summarizes the results of the first year monitoring survey. The work was performed by Coastal Engineering Consultants (CEC).

An overall location map of the project area which includes R-monument survey lines is presented in Figure 1. Figure 2 presents a location map of Blind Pass and depicts ebb shoal and dredge template survey lines.

During the project completed on June 3, 2017, approximately 89,700 cubic yards were excavated from the permitted dredge template between Stations 0+00 to 35+16 within Wulfert Channel and between Stations 100+50 to 105+26 within Roosevelt Channel. Approximately 67,060 cubic yards were placed within the North Beach fill area between R-112 and R-114+200 and approximately 22,640 cubic yards were placed within the South Beach fill area between R-116 and R-118.

By comparing the post-construction and first year monitoring surveys, CEC computed shoreline and volumetric changes along the Project area's beach and volumetric changes within the permitted dredge template to assess Project performance.



*AERIAL PHOTOGRAPHY OBTAINED FROM LEE COUNTY GIS, DATED JANUARY 2018.

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CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

TITLE: FIGURE 1
OVERALL PROJECT LOCATION MAP

DATE:	5/8/2018
SCALE:	AS NOTED
DRAWN:	SDB
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ACAD NO.	18030-LOC MAP.dwg
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SHEET 1
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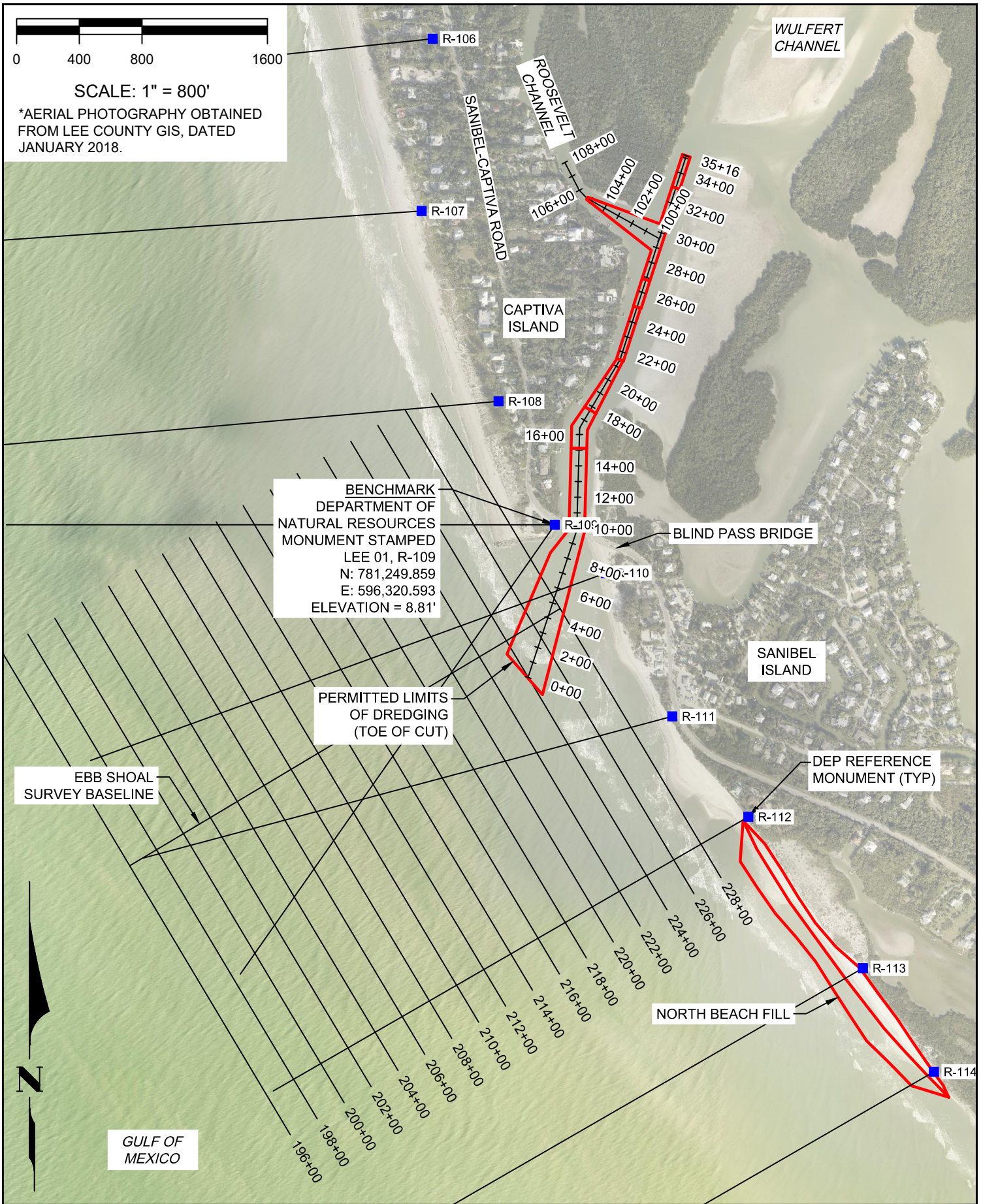

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TITLE:
FIGURE 2
BLIND PASS LOCATION MAP

DATE:	5/8/2018
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SHEET 1
FILE NO.: 18030-LOC MAP

2 SCOPE OF WORK

The following Scope of Work was conducted to address the monitoring requirements of FDEP Permit No 0265943-003-JM.

Blind Pass: Conduct first year monitoring survey of Blind Pass, Wulfert Channel and Roosevelt Channel as described herein. The survey lines shall be spaced no greater than 200 feet apart and shall be aligned parallel to the shoreline. The alignment spacing shall be sufficient to document the channel position and any potential flood shoal formation. The work shall extend 1,000 feet either side of the pass or to the Mean High Water (MHW) line, whichever is less. The landward extent of the survey shall be 600 feet inland past the work area. Data points shall be collected at a maximum spacing of 25 feet. The inlet shoreline position (MHW) shall also be measured for analyses described in the reporting section.

Ebb Shoal Survey: Conduct first year monitoring survey of the ebb shoal as described herein. The survey lines shall be spaced no greater than 200 feet apart, and shall be aligned parallel to the shoreline. The alignment spacing shall be sufficient to document the channel position and shoal formation. The work shall extend 1000 feet either side of the pass or to MHW, whichever is less. The seaward extent of the surveys shall be a minimum of 3,000 feet offshore. Data points shall be collected at a maximum spacing of 25 feet.

Beach Profiles: Conduct first year monitoring survey of the beach profiles as described herein. Profile surveys of the active beach zone will be collected along the shoreline at each reference monument (R monument) from R106, north of Blind Pass, to R122, south of the fill area and will include half monuments from R110.5 to R118.5. The surveys shall be utilized to identify the shoreline position, average beach width and sediment transport rates in the vicinity of Blind Pass. The beach portion of the profile survey shall extend from a minimum of 150 feet landward of the monument or from the edge of a building or road, whichever is the most seaward, to a wading depth deep enough to provide a 50-foot overlap with the offshore portion of the profile survey where environmental conditions allow. Profile data points along the beach portion of the profile survey shall be collected at a maximum interval of 25 feet and at all breaks in grade. The offshore portion of the profile survey shall extend from as close to shore as safely possible to provide at least a 50-foot overlap with the beach portion of the profile survey where environmental conditions allow to length of at least 3,000 feet from the MHW line or an elevation of -30 feet NAVD, whichever is more landward. Profile data points along the offshore portion of the profile survey shall be collected at a maximum interval of 25 feet.

Blind Pass Interior: Conduct Blind Pass interior survey to include Dinken Channel south and east of Albright Key, Wulfert Channel north of Runyan Key, and a 400-foot extension of Roosevelt Channel. The survey lines shall be spaced no greater than 200 feet apart and follow the channel alignment. The alignment spacing shall be sufficient to document the channel position and any potential flood shoal formation. Locate existing aids to navigation.

3 EQUIPMENT AND QA/QC PROCEDURES

3.1 Survey Report

The Survey Report is presented in Appendix 1.

3.2 Equipment

The following equipment was utilized for the survey work performed by CEC.

Upland: CEC employed two Trimble R10 Real Time Kinematic (RTK) Global Positioning Systems (GPS) with GLONASS capability for the upland surveys along with a Trimble R8 base receiver installed on an established control point. These systems are capable of delivering RTK positions with coordinate accuracy of ±10mm+2ppm. The standard 2-meter antenna rod allows for data collection seaward of the mean high water line up to 5 feet deep while protecting the equipment from the elements.

Offshore: The CEC survey vessel used for this work was a 20-foot fiberglass hull powered by an outboard. An Innerspace 456 single beam echo sounder was used with a side mounted transducer. The GPS antenna was mounted directly above the transducer. A Trimble R8 GLONASS RTK GPS receiver was integrated with the on-board computer system. The HYPACK 2017 software package was the hydrographic guidance program utilized.

3.3 QA/QC Procedures

CEC employs an advanced QA/QC program to ensure work performed by us meets the FDEP accuracy standards. CEC upland field crews utilize RTK systems for data collection. CEC also incorporates the necessary equipment on the survey vessel to collect bathymetric survey data "Real-Time". To meet the specification calling for an approximate 50-foot overlap in data between the boat and the upland crew, CEC implements the following procedure. Utilizing "Real-Time" data collection, the boat crew immediately accounts for the tide correction, as well as the draft, and reports measured water depth in NAVD88 at each profile with the upland crew. This gives the upland crew, who simultaneously collects the upland and nearshore profile data, the necessary information to achieve the "overlap" specification.

Upland Data Collection: CEC mobilized one operator and GPS rover unit to collect survey data from the approximate MHW line landward while an additional operator and unit collected data just landward of MHW seaward to wading depth or approximately –5 feet NAVD88. The recorded data was maintained within tolerances of ±3.00 feet horizontal and ±0.16 feet vertical. QA/QC procedures were maintained by both comparison of values with higher accuracy and by repeat measurement.

The Trimble base station was setup on a suitable control point for GPS observations, either a point with provided GPS coordinates or a point with coordinates derived from observations performed during monumentation. The point designation, record coordinates, ellipsoidal height, GEIOD model and antenna height are logged in the field book. At least one check shot was recorded for each RTK rover on a point with known coordinates and GPS observations were collected on known previously established survey control points throughout the day to ensure the integrity of the data.

An electronic list of R-monument coordinates and profile azimuths was loaded into the rover units and measurements were recorded along the azimuth line at intervals no greater than 25 feet or wherever geographical features dictated. The measurements were taken landward along the azimuth line to a minimum of 150 feet landward of the R-monument or to the edge of a building

or road, whichever is the most seaward. When possible, a measurement was taken on the R-monument. The extent of the vegetation line and prominent features such as seawalls were also noted in the data collection. The measurements were taken seaward along the azimuth line to a minimum depth of –5 feet NAVD88 or as far as conditions dictated, to maintain a minimum of 50 feet of overlap with the data being collected by the offshore survey crew. This data was then compiled and merged with the offshore data to produce the profile drawings.

Offshore Data Collection: All survey equipment was properly calibrated and operated in accordance with FDEP standards. Bar checks to calibrate the fathometer were performed periodically throughout the survey. Bathymetric survey data collection was conducted in calm seas. Maximum wave heights during the data collection period were less than 3 feet. The data was collected at intervals not exceeding 25 feet and at all grade breaks along the profile sufficient to accurately describe the bathymetry at the profile locations. The beach profile survey extended seaward to a minimum of 3,000 feet from MHW.

The vertical accuracy of the profile data meets or exceeds the GPS-derived heights (0.2 to 0.5 feet) standard. The horizontal positioning system accuracy of the data was within 2 feet and the off-line horizontal deviation was within 30 feet. Measure downs from a known point to the water's surface were taken periodically throughout the survey as a check for the tides measured by the RTK GPS as necessary.

Bathymetric survey data collection was performed as close in time as possible with the upland topographic survey data collection. This significantly increased efficiency by conducting the work with the same base station set-up. Safety was also increased by having both crews visible to each other at all times.

3.4 Data Reduction and Deliverables

The data from the upland and offshore surveys were merged together using the HYPACK 2017 subroutines. The reduced data was converted to "xyz" and FDEP formats. The survey report is provided in Appendix 1. The "xyz" data file was imported into AutoCAD to generate beach profiles and channel cross sections to the specified scale. These profiles and cross sections are presented in Appendices 2 and 3, respectively.

4 PHYSICAL MONITORING

4.1 Survey Dates

CEC conducted the first year monitoring survey of the Blind Pass project area on June 7, 2018 (interior landward of bridge) and June 12, 2018 (beach, ebb shoal and channel exterior seaward of bridge) noting that the post-construction survey was conducted by CEC on June 26-27, 2017.

4.2 Depth of Closure

Based on the Birkemeier depth of closure (DOC) formulation (Birkemeier, 1985), CEC estimated DOC near Blind Pass to be -13.3 feet NAVD88 (CEC, 2011). It is consistent with DOC values reported by others, e.g., Coastal Planning & Engineering (CPE) used DOC equal to -13.0 feet NAVD88 for their Captiva and Sanibel Islands Beach Renourishment Project (CPE, 2007).

4.3 Beach Profiles

Appendix 2 presents the beach profiles measured between R-106 and R-122 at each R-monument and also includes half R-monuments from R-110.5 to R-118.5 for the June (CB&I) and August (CEC) 2016, June 2017, and June 2018 surveys.

Table 1 presents the 2017 and 2018 shoreline positions at Mean High Water (MHW = +0.28 feet NAVD88) along with the shoreline changes between the two surveys.

Table 1. Shoreline Positions and Changes at MHW between June 2017 Post-Construction and 2018 Monitoring Surveys.

Mon	Post-Con Position June 2017 (ft)	Monitoring Position June 2018 (ft)	2017-2018 Shoreline Change (ft)	2017-2018 Average Shoreline Change (ft)	
R-106	534.2	530.4	-3.7	20.9	**Updrift of Blind Pass**
R-107	171.1	170.5	-0.6		
R-108	229.3	264.7	35.3		
R-109	287.8	340.5	52.7		
Blind Pass					
R-110	111.8	45.5	-66.3	-69.7	**Downdrift of Blind Pass**
R-110.5	284.4	106.7	-177.8		
R-111	109.3	55.6	-53.6		
R-111.5	174.8	193.7	18.9		
R-112	109.8	148.0	38.2	-0.6	**North Beach Fill**
R-112.5	444.0	470.5	26.5		
R-113	132.1	92.9	-39.2		
R-113.5	75.7	62.4	-13.3		
R-114	38.7	23.7	-15.0		
R-114.5	-44.9	-59.0	-14.1	-51.9	**Downdrift of North Beach Fill**
R-115	-28.5	-68.5	-40.0		
R-115.5	73.6	-28.2	-101.8		
R-116	128.3	30.3	-98.0	-28.1	**South Beach Fill**
R-116.5	182.7	125.7	-57.0		
R-117	208.0	191.6	-16.3		
R-117.5	338.0	339.5	1.5		
R-118	436.4	466.0	29.6		
R-118.5	505.8	547.5	41.8	19.4	**Downdrift of South Beach Fill**
R-119	564.5	608.9	44.4		
R-120	446.3	502.4	56.1		
R-121	523.3	500.2	-23.0		
R-122	531.5	509.2	-22.2		

A summary of the shoreline changes based on the comparisons between the 2017 post-construction and 2018 monitoring surveys at the R-monuments is presented below.

Updrift of Blind Pass: The beach segment north of Blind Pass, extending from R-106 to R-109, advanced on average approximately 20.9 feet. The range of shoreline change measured at MHW was from 3.7 feet of recession at R-106 to 52.7 feet of advancement at R-109.

Downdrift of Blind Pass: The beach segment south of Blind Pass, extending from R-110 to R-112, receded on average approximately 69.7 feet. The range of shoreline change measured at MHW was from 177.8 feet of recession at R-110.5 to 18.9 feet of advancement at R-111.5.

North Beach Fill: This fill segment extended from R-112 to R-114+200 (Figure 1), within which approximately 67,060 cubic yards were placed during the 2017 construction project. The segment's shoreline measured at MHW receded on average approximately 0.6 feet. The range of shoreline change was from 39.2 feet of recession at R-113 to 38.2 feet of advancement at R-112.

Downdrift of North Beach Fill: The beach segment extending from R-114+200 to R-116 receded on average approximately 51.9 feet. The range of shoreline recession measured at MHW was from 14.1 feet at R-114.5 to 101.8 feet at R-115.5.

South Beach Fill: This fill segment extended from R-116 to R-118 (Figure 1), within which approximately 22,640 cubic yards were placed during the 2017 construction project. The segment's shoreline measured at MHW receded on average approximately 28.1 feet. The range of shoreline change was from 98.0 feet of recession at R-116 to 29.6 feet of advancement at R-118.

Downdrift South Beach Fill: The beach segment extending from R-118 to R-122 advanced on average approximately 19.4 feet. The range of shoreline change measured at MHW was from 23.0 feet of recession at R-121 to 56.1 feet of advancement at R-120.

Figure 3 presents a schematic of the historic annual MHW shoreline positions relative to the 2012 dredging project pre-construction positions that serves as a baseline.

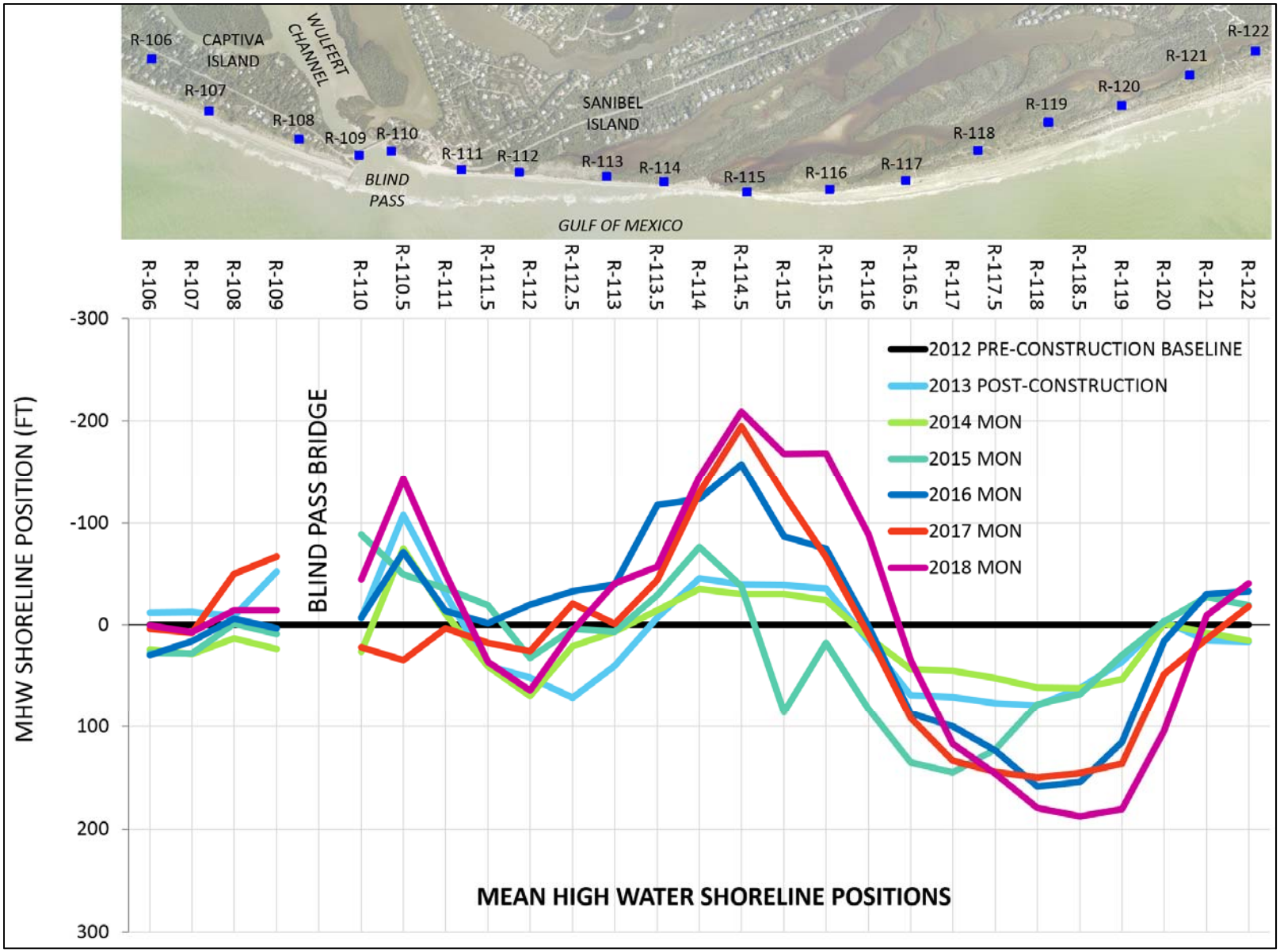

Figure 3. MHW Shoreline Positions Relative to 2012 Pre-Construction MHW Shoreline.

Tables 2 and 3 present volumetric changes to MHW and DOC, respectively, calculated from comparing the 2017 post-construction and 2018 monitoring surveys. A summary of the volumetric changes to MHW and DOC is presented below.

Updrift of Blind Pass: The beach segment north of Blind Pass, extending from R-106 to R-109, gained approximately 13,290 cubic yards above MHW and gained approximately 24,980 cubic yards to DOC.

Downdrift of Blind Pass: The beach segment south of Blind Pass, extending from R-110 to R-112, gained approximately 2,600 cubic yards above MHW but lost approximately 12,210 cubic yards to DOC. It should be noted that while this segment gained 2,600 cubic yards above MHW, the segment's shoreline receded on average approximately 69.7 feet. This shoreline segment which is immediately south of the inlet is very dynamic. Post-dredge adjustments occurred along the shoreline and the nearshore. Further, Hurricane Irma may have contributed to the nearshore erosion between R-110 and R-111 and overwash between R-111 and R-112.

North Beach Fill: The fill segment extending from R-112 to R-114+200, within which approximately 67,060 cubic yards were placed in 2017, gained approximately 5,380 cubic yards above MHW but lost approximately 2,230 cubic yards to DOC.

Downdrift of North Beach Fill: The beach segment extending from R-114+200 to R-116 lost approximately 7,420 cubic yards above MHW and lost approximately 35,000 cubic yards to DOC.

South Beach Fill: The fill segment extending from R-116 to R-118, within which approximately 22,640 cubic yards were placed in 2017, lost approximately 9,410 cubic yards above MHW and lost approximately 6,730 cubic yards to DOC.

Downdrift of South Beach Fill: The beach segment extending from R-118 to R-122 gained approximately 24,070 cubic yards above MHW and gained approximately 57,710 cubic yards to DOC.

Figures 4 and 5 present bar charts of the 2017-2018 volumetric change rates to MHW and DOC, respectively, noting that they were annualized to be consistent with prior years' monitoring reports.

Table 2. Volumetric Changes to MHW between June 2017 Post-Construction and 2018 Monitoring Surveys.

Mon	Area (cy/ft)	Average Area (cy/ft)	Length (ft)	Volume (cy)	Total Volume (cy)	
R-106	-0.4					
		-0.6	1,101	-651		
R-107	-0.8					
		3.8	1,310	5,014	13,294	**Updrift of Blind Pass**
R-108	8.5					
		10.3	866	8,932		
R-109	12.2					
Blind Pass						
R-110	0.4					
		-0.6	525	-313		
R-110.5	-1.6					
		-2.2	482	-1,053	2,599	**Downdrift of Blind Pass**
R-111	-2.8					
		1.4	411	592		
R-111.5	5.7					
		8.4	401	3,372		
R-112	11.1					
		7.9	731	5,746		
R-112.5	4.6					
		1.6	658	1,081		
R-113	-1.3				5,384	**North Beach Fill**
		-1.7	449	-754		
R-113.5	-2.1					
		-1.9	356	-688		
R-114	-1.8					
		-3.0	577	-1,711		
R-114.5	-4.1					
		-2.5	585	-1,491		
R-115	-1.0				-7,417	**Downdrift of North Beach Fill**
		-2.7	573	-1,529		
R-115.5	-4.4					
		-4.7	572	-2,687		
R-116	-5.0					
		-4.1	533	-2,171		
R-116.5	-3.1					
		-5.3	532	-2,802		
R-117	-7.4				-9,406	**South Beach Fill**
		-7.1	531	-3,764		
R-117.5	-6.7					
		-1.2	567	-669		
R-118	4.4					
		5.8	529	3,067		
R-118.5	7.2					
		8.2	531	4,338		
R-119	9.1					
		10.9	1,040	11,321	24,070	**Downdrift of South Beach Fill**
R-120	12.6					
		5.9	1,048	6,218		
R-121	-0.8					
		-0.9	977	-872		
R-122	-1.0					

Table 3. Volumetric Changes to DOC between 2017 Post-Construction and 2018 Monitoring Surveys.

Mon	Area (cy/ft)	Average Area (cy/ft)	Length (ft)	Volume (cy)	Total Volume (cy)	
R-106	1.2					
		2.2	1,101	2,456		
R-107	3.2					
		8.3	1,310	10,836	24,984	**Updrift of Blind Pass**
R-108	13.3					
		13.5	866	11,692		
R-109	13.7					
Blind Pass						
R-110	51.5					
		0.3	525	155		
R-110.5	-50.9					
		-31.0	482	-14,937	-12,206	**Downdrift of Blind Pass**
R-111	-11.1					
		-3.3	411	-1,350		
R-111.5	4.5					
		9.8	401	3,925		
R-112	15.0					
		13.0	731	9,511		
R-112.5	11.0					
		-12.9	658	-8,467		
R-113	-36.7				-2,233	**North Beach Fill**
		-12.9	449	-5,803		
R-113.5	10.9					
		7.1	356	2,526		
R-114	3.3					
		-5.8	577	-3,356		
R-114.5	-15.0					
		-16.7	585	-9,755		**Downdrift of North Beach Fill**
R-115	-18.4				-34,995	
		-18.9	573	-10,851		
R-115.5	-19.5					
		-19.3	572	-11,033		
R-116	-19.1					
		-15.1	533	-8,043		
R-116.5	-11.1					
		-4.6	532	-2,467		
R-117	1.8				-6,730	**South Beach Fill**
		0.9	531	503		
R-117.5	0.1					
		5.8	567	3,277		
R-118	11.5					
		15.1	529	7,992		
R-118.5	18.7					
		20.4	531	10,825		
R-119	22.1					
		18.7	1,040	19,462	57,707	**Downdrift of South Beach Fill**
R-120	15.4					
		10.8	1,048	11,272		
R-121	6.1					
		8.4	977	8,157		
R-122	10.6					

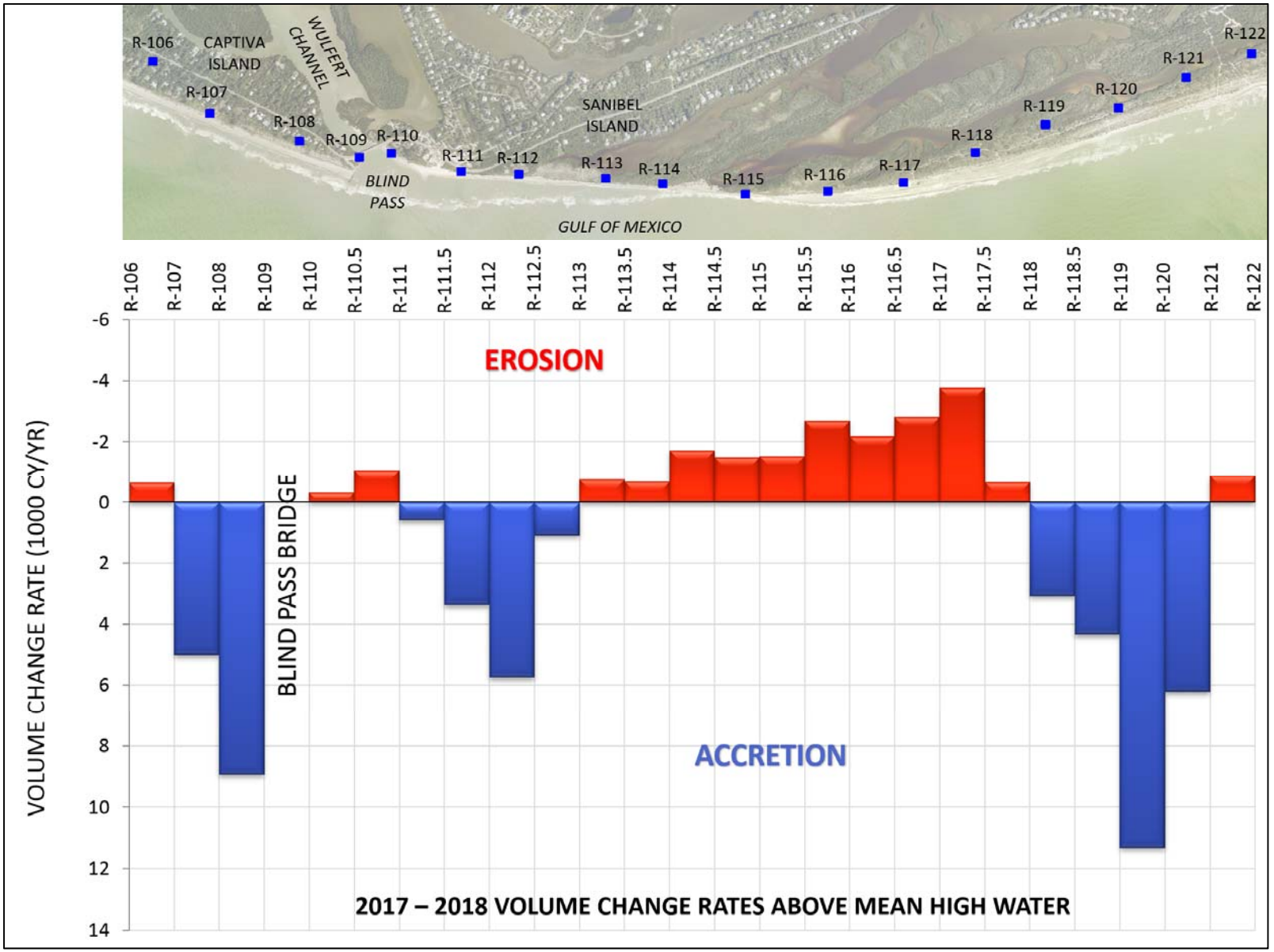

Figure 4. Volumetric Change Rates to MHW between 2017 and 2018 Surveys.

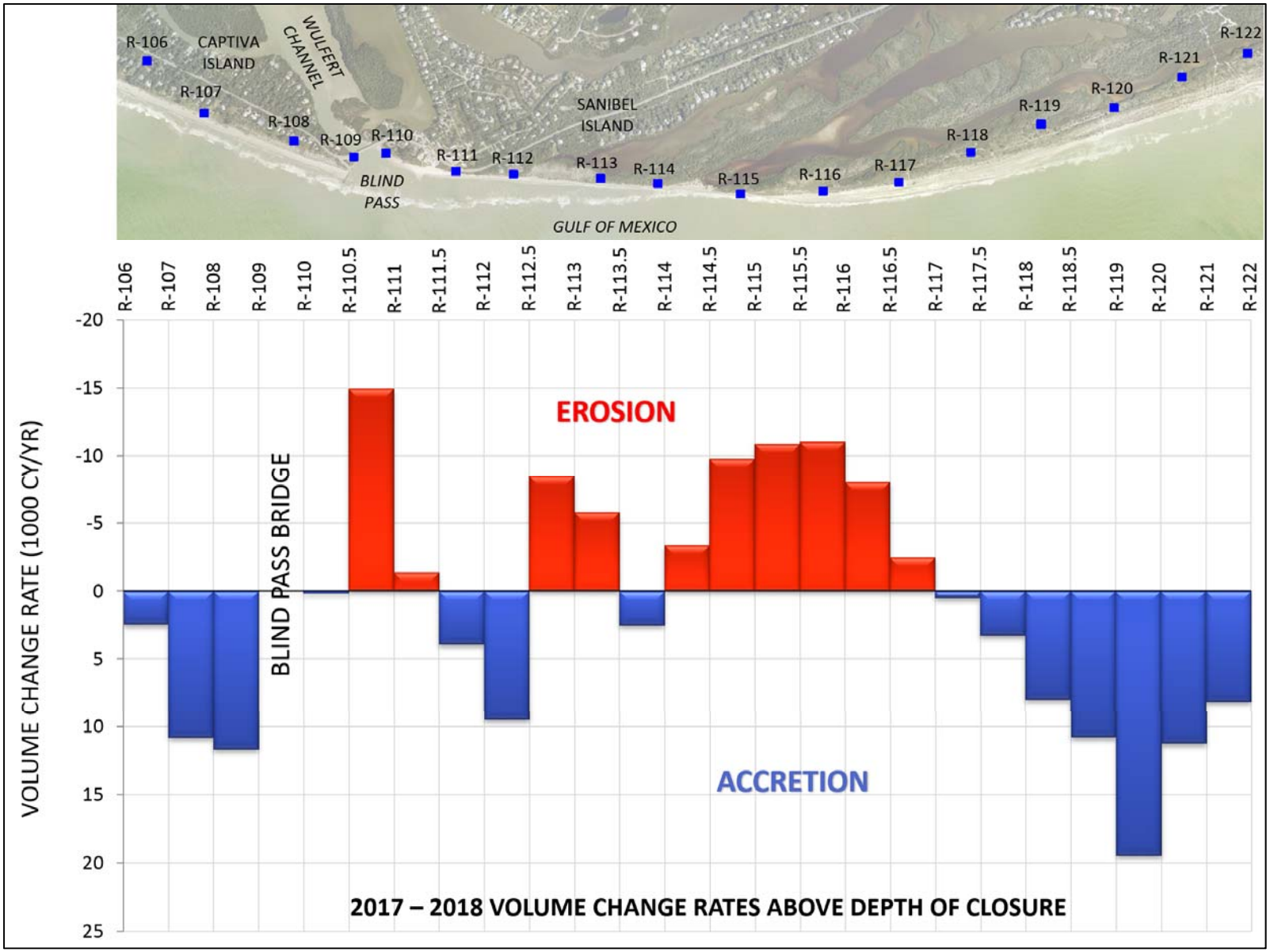

Figure 5. Volumetric Change Rates to DOC between 2017 and 2018 Surveys.

Figures 6 and 7 present contour maps based on the 2017 post-construction and 2018 monitoring survey data, respectively. The figures depict the limits of dredging and fill placement.

Figure 8 presents a morphology change map depicting changes in elevations that occurred between the two surveys. It illustrates infilling of the channel dredged in 2017, nearshore erosion immediately south of the pass between R-110 and R-111, erosion between the two fill areas between R-114 and R-116, erosion within the South Beach Fill Area, and accretion between R-118 and R-121.

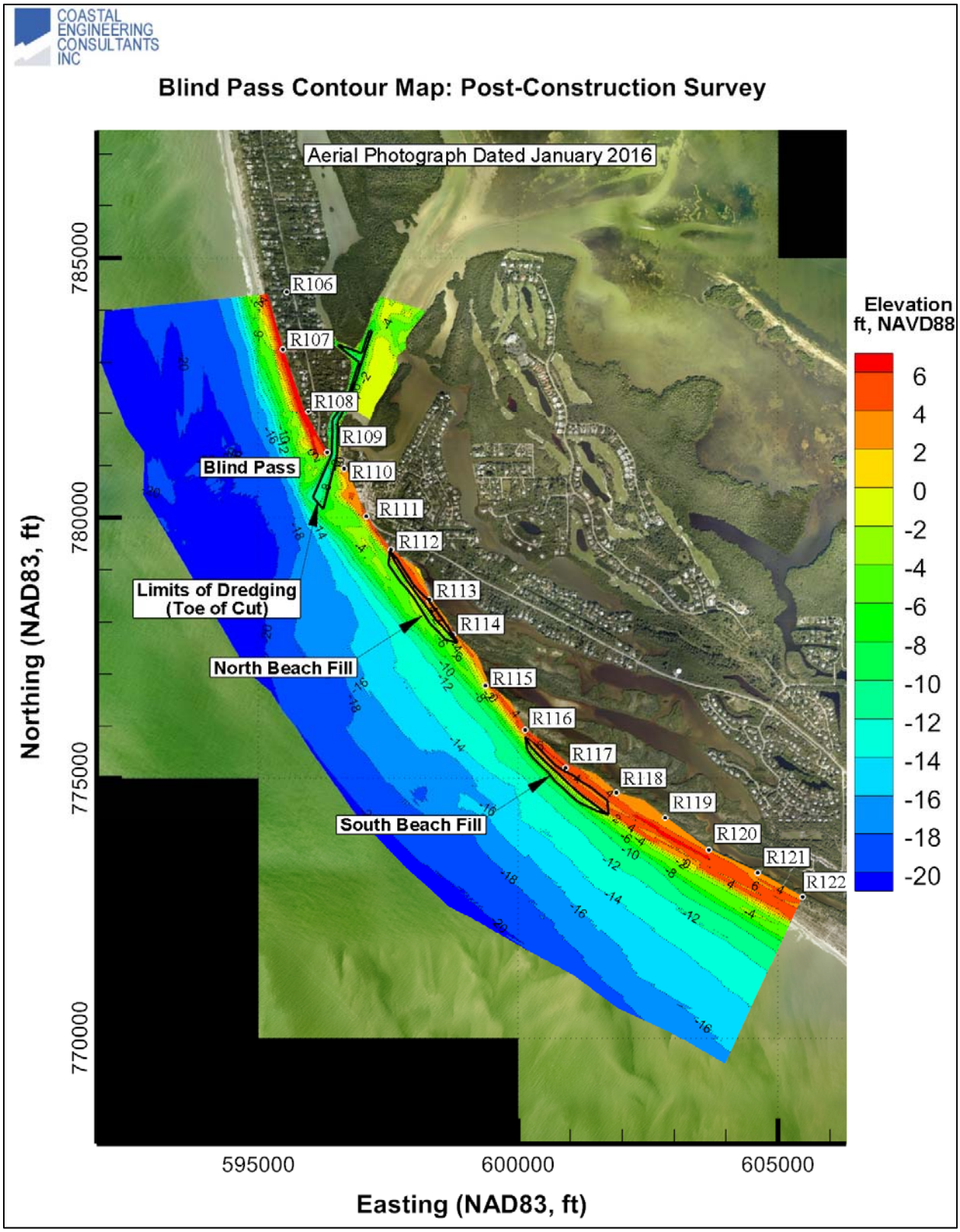

Figure 6. 2017 Post-construction Survey Contour Map.

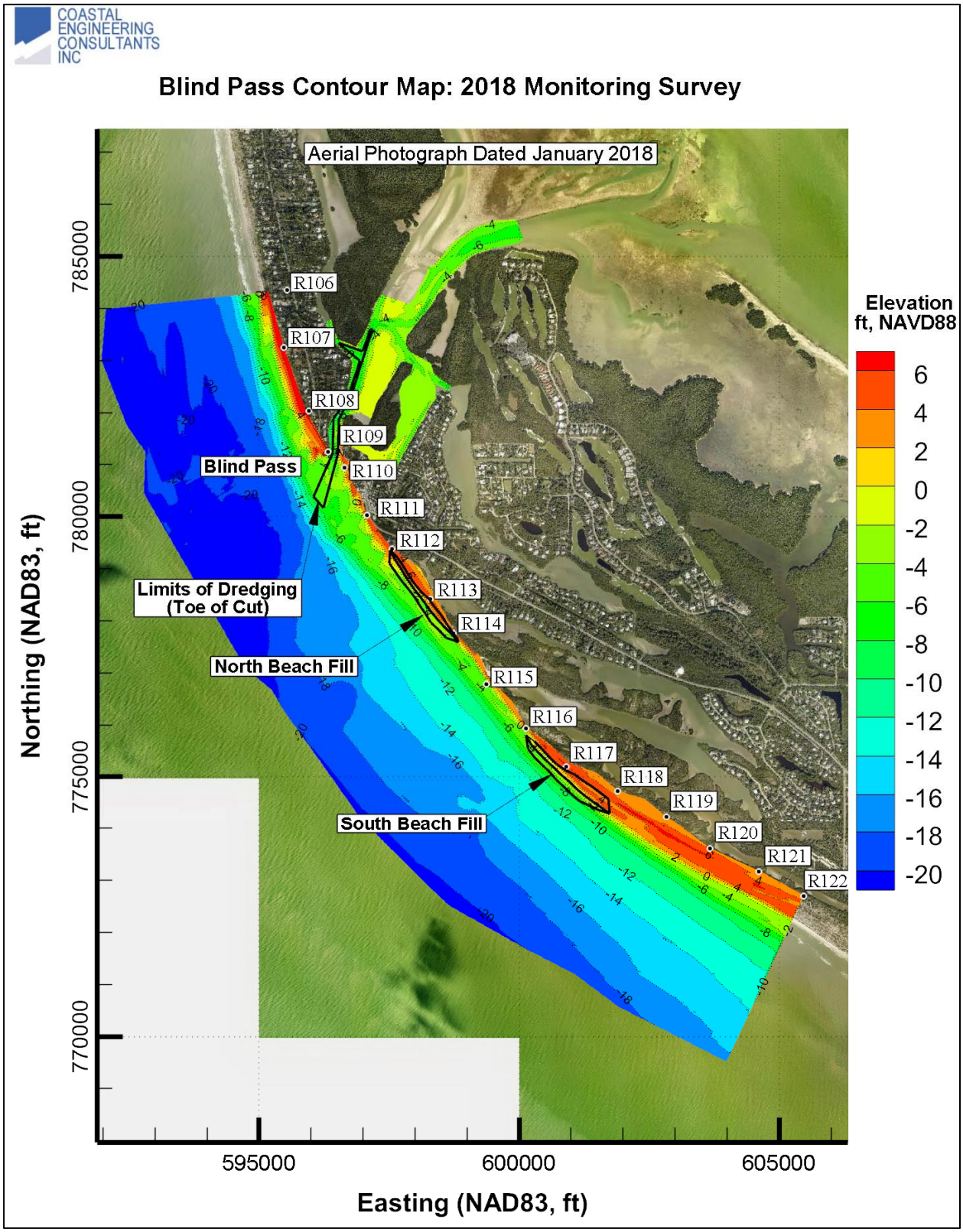

Figure 7. 2018 Monitoring Survey Contour Map.

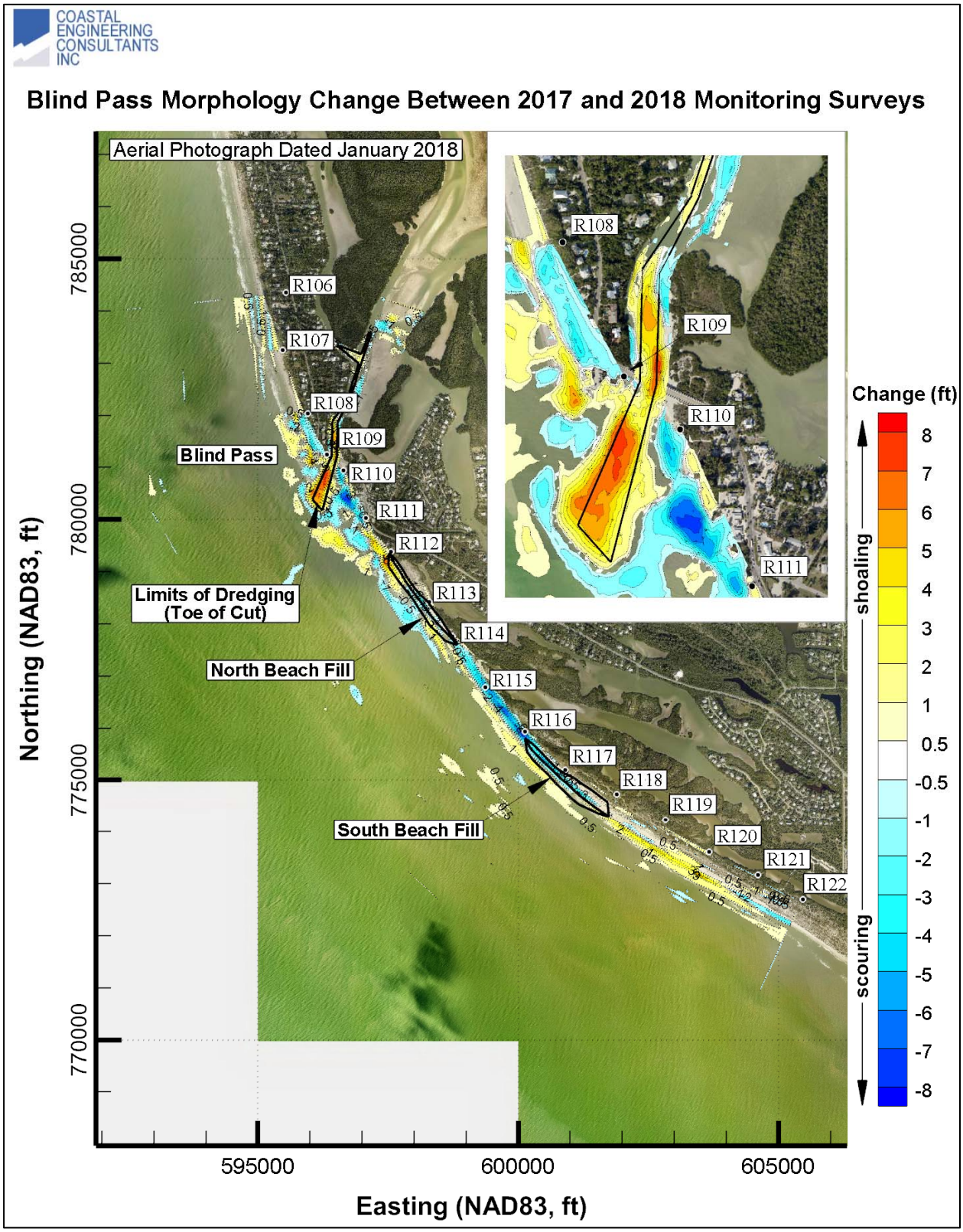

Figure 8. 2017 – 2018 Morphologic Changes.

4.4 Ebb Shoal

Appendix 3 presents the ebb shoal cross sections, 200-foot increment Stations 196+00 through 228+00, depicted in Figure 2. The ebb shoal was surveyed in August 2016 (pre-construction survey), June 2017 (post-construction survey), and June 2018 (monitoring), noting that the dredge template's seaward end is located along Station 224+00. The survey data comparison indicates no significant changes seaward of Station 220+00. Station 222+00 indicates that the ebb shoal migrated slightly to the south (right side along the baseline) compared to the 2017 survey. Further landward, along Stations 224+00 and 228+00, the sections show infilling of the dredged channel and ebb shoal recovery.

4.5 Blind Pass

Appendix 3 presents the Blind Pass cross sections surveyed in February 2017 (pre-construction survey), June 2017 (post-construction survey), and June 2018 (monitoring). The dredge template and stations are depicted in Figure 2. It should be noted that the bridge precludes accurate surveying of Station 10+00 due to its orientation, instead two offset stations were surveyed, Stations 9+50 and 10+50, to monitor changes near the bridge.

Table 4 presents the volume change within the channel which was calculated from comparing the June 2017 post-construction and June 2018 monitoring surveys. The total volume change within the dredge template including the 1-foot tolerance indicated channel infilling and was computed to be approximately 55,680 cubic yards utilizing the 200-foot station survey lines with the addition of Stations 9+50 and 10+50 due to the presence of the bridge. For comparison, the volume of material excavated from the template during the 2017 construction project was 89,700 cubic yards.

Figure 9 presents a bar chart of the volumetric changes within the dredge template between the 2017 post-construction and 2018 monitoring surveys.

Based on the June 2018 survey, the total volume remaining within the Blind Pass dredge template was approximately 80,480 cubic yards (Table 5), of which approximately 62,850 cubic yards were within the design cut and 17,630 cubic yards were within the overdredge tolerance.

Table 4. Volume Change within Dredge Template between 2017 Post-Construction and 2018 Monitoring Surveys.

Station	Area (cy/ft)	Average Area (cy/ft)	Length (ft)	Volume (cy)
Wulfert Channel				
0+00	23.5			
		39.4	200	7,874
2+00	55.2			
		56.7	200	11,339
4+00	58.2			
		54.9	200	10,981
6+00	51.6			
		35.3	200	7,057
8+00	18.9			
		15.9	150	2,383
9+50	12.8			
		17.0	100	1,701
10+50	21.2			
		20.2	150	3,034
12+00	19.3			
		20.8	200	4,168
14+00	22.4			
		13.4	200	2,684
16+00	4.4			
		2.1	200	422
18+00	-0.2			
		1.1	200	227
20+00	2.5			
		3.1	200	620
22+00	3.7			
		2.9	200	580
24+00	2.1			
		1.5	200	294
26+00	0.9			
		0.8	200	169
28+00	0.8			
		1.9	200	389
30+00	3.1			
		2.2	200	446
32+00	1.4			
		0.5	200	107
34+00	-0.3			
		-0.2	100	-17
35+00	0.0			
Roosevelt Channel				
101+00	7.0			
		5.5	100	554
102+00	4.1			
		2.8	200	557
104+00	1.5			
		1.1	100	111
105+00	0.7			
Total				**55,679**

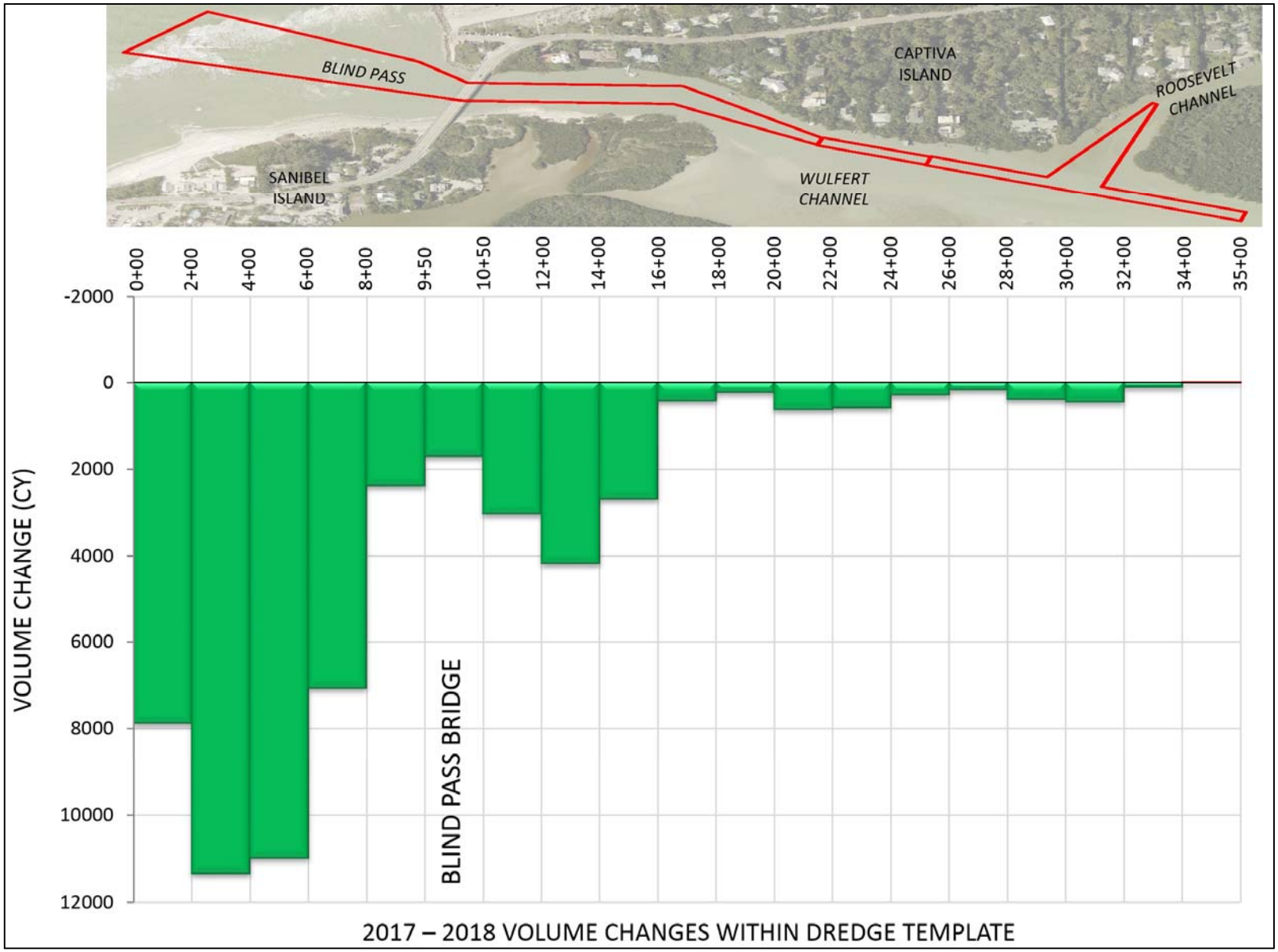

Figure 9. Volumetric Changes within Dredge Template between 2017 and 2018 Surveys.

Table 5. Volume Remaining within Dredge Template after June 2018 Survey.

Station	Area (cy/ft)	Average Area (cy/ft)	Length (ft)	Volume (cy)
Wulfert Channel				
0+00	33.2			
		48.3	200	9,665
2+00	63.5			
		66.0	200	13,195
4+00	68.5			
		64.2	200	12,838
6+00	59.9			
		53.9	200	10,771
8+00	47.8			
		33.2	150	4,973
9+50	18.5			
		24.7	100	2,469
10+50	30.9			
		28.8	150	4,314
12+00	26.6			
		29.3	200	5,868
14+00	32.0			
		23.4	200	4,686
16+00	14.8			
		10.1	200	2,030
18+00	5.5			
		6.5	200	1,300
20+00	7.5			
		7.0	200	1,404
22+00	6.5			
		5.8	200	1,159
24+00	5.1			
		3.7	200	746
26+00	2.4			
		2.1	200	420
28+00	1.8			
		3.7	200	744
30+00	5.6			
		5.3	200	1,064
32+00	5.0			
		2.8	200	552
34+00	0.5			
		0.3	100	26
35+00	0.0			
Roosevelt Channel				
101+00	14.0			
		9.9	100	991
102+00	5.8			
		4.9	200	972
104+00	3.9			
		2.9	100	294
105+00	2.0			
Total				**80,480**

5 CONCLUSION

This report describes the first annual physical monitoring results of Lee County's Blind Pass restoration project completed in June 2017. The information presented herein provides the necessary data for both Lee County and FDEP to regularly observe and assess, with quantitative measurements, the performance of the project, any adverse effects which have occurred, and the need for any adjustments, modifications, or mitigative response to the project. The monitoring process also provides the County and FDEP information necessary to plan, design, and optimize subsequent follow-up projects, potentially reducing the need for and costs of unnecessary work, as well as potentially reducing any environmental impacts that may have occurred or be expected.

The data used in the analysis included surveys conducted by CEC in February 2017 (pre-construction), June 2017 (post-construction) and June 2018 (monitoring).

Based on the 2017 post-construction and 2018 monitoring surveys, the total volume change within the dredge template including the 1-foot tolerance indicated channel infilling and was approximately 55,680 cubic yards, noting that the volume of material excavated from the template in 2017 was approximately 89,700 cubic yards.

As of June 2018, the total volume remaining within the Blind Pass dredge template was approximately 80,480 cubic yards cubic yards.

Based on the shoreline change analysis conducted by comparing MHW positions between the 2017 and 2018 surveys at the R-monuments:

- beach segment north of Blind Pass, extending from R-106 to R-109, advanced on average approximately 20.9 feet;
- beach segment south of Blind Pass, extending from R-110 to R-112, receded on average approximately 69.7 feet;
- North Beach Fill segment extending from R-112 to R-114+200 receded on average approximately 0.6 feet;
- beach segment downdrift on North Beach Fill extending from R-114+200 to R-116 receded on average approximately 51.9 feet;
- South Beach Fill segment extending from R-116 to R-118 receded on average approximately 28.1 feet; and
- beach segment downdrift on South Beach Fill extending from R-118 to R-122 advanced on average approximately 19.4 feet.

Based on the beach volumetric change analysis conducted by comparing volume changes above MHW and to DOC between the 2017 and 2018 surveys at the R-monuments:

- beach segment north of Blind Pass, extending from R-106 to R-109, gained approximately 13,290 cubic yards above MHW and gained approximately 24,980 cubic yards to DOC;
- beach segment immediately south of Blind Pass, extending from R-110 to R-112, gained approximately 2,600 cubic yards above MHW but lost approximately 12,210 cubic yards to DOC. This shoreline segment is very dynamic which is indicated by the post-dredge adjustments that occurred along the shoreline and the nearshore. Further, Hurricane Irma

may have contributed to the nearshore erosion between R-110 and R-111 and overwash between R-111 and R-112;

- North Beach Fill segment extending from R-112 to R-114+200 gained approximately 5,380 cubic yards above MHW but lost approximately 2,230 cubic yards to DOC;
- beach segment downdrift on North Beach Fill extending from just south of R-114+200 to R-116 lost approximately 7,420 cubic yards above MHW and lost approximately 35,000 cubic yards to DOC;
- South Beach Fill segment extending from R-116 to R-118 lost approximately 9,410 cubic yards above MHW and lost approximately 6,730 cubic yards to DOC; and
- beach segment downdrift on South Beach Fill extending from R-118 to R-122 gained approximately 24,070 cubic yards above MHW and gained approximately 57,710 cubic yards to DOC.

Based on the monitoring, there were no documented adverse impacts to the natural resources or coastal system within the project area as a result of construction.

6 REFERENCES

Birkemeier, W.A. 1985. Field Data on Seaward Limit of Profile Change, *Journal of Waterway, Port, Coastal and Ocean Engineering*, vol. 111, number 3, pp. 598-602.

Coastal Engineering Consultants (CEC). 2011. Lee County Blind Pass Restoration Project 1-Year Monitoring Report, March 2010.

Coastal Planning & Engineering (CPE). 2007. Captiva and Sanibel Islands; Beach Renourishment Project; 1 Year Post-Construction Engineering Monitoring Report. May 2007.

APPENDIX 1

SURVEY REPORT

COASTAL ENGINEERING CONSULTANTS INC.

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Coastal and Marine Engineering
Environmental and Geological Services
Land and Marine Survey and Mapping
Website: www.coastalengineering.com

BLIND PASS, SANIBEL-CAPTIVA LEE COUNTY, FLORIDA
2018 MONITORING SURVEY REPORT

All Surveys were conducted utilizing multiple Trimble Real Time Kinematic (RTK) Global Positioning Systems (GPS). The Pre-Construction Surveys were performed on June 7 and June 12, 2018. Department of Environmental Protection (FDEP) Bureau of Beaches and Coastal Systems (BBCS) and meets or exceeds Geospatial Positioning Accuracy Standards, Range VIII.

All "R monument" and intermediate beach profiles were collected on the State Plane Coordinate System Grid, Florida West Zone and survey data was collected along FDEP established grid bearings as outlined in the project Scope of Work. The horizontal and vertical datums were North American Datum (NAD) of 1983/1990 Adjustment and North American Vertical Datum (NAVD) of 1988, Geoid 2012A, respectively.

All survey control was established as part of the upland topographic survey control work, and conducted in accordance with the FDEP Monitoring Standards for Beach Erosion Control Projects. These surveys meet the requirements set forth in Chapter 5J-17 (F.A.C.) Florida Administrative Code.

The following National Geodetic Survey Benchmarks were used during this Survey:

FLDEP TIDAL 872 5383B PID No. DL8722, Elevation: 5.18 feet NAVD 1988
FLDEP TIDAL 872 5383 TIDAL 1 PID No. AG1761, Elevation: 3.25 feet NAVD 1988

Equipment

Upland: CEC employed two Trimble R10 Real Time Kinematic (RTK) Global Positioning Systems (GPS) with GLONASS capability for the upland surveys along with a Trimble R8 base receiver installed on an established control point. These systems are capable of delivering RTK positions with coordinate accuracy of ±10mm+2ppm. The standard 2-meter antenna rod allows for data collection seaward of the mean high water line up to 5 feet deep while protecting the equipment from the elements.

Offshore: The CEC survey vessel used for this work was a 20-foot fiberglass hull powered by an outboard. An Innerspace 456 single beam echo sounder was used with a side mounted transducer. The GPS antenna was mounted directly above the transducer. A Trimble R8 GLONASS RTK GPS receiver was integrated with the on-board computer system. The HYPACK 2016 software package was the hydrographic guidance program utilized.

QA/QC Procedures

CEC employs an advanced QA/QC program to ensure our work meets the FDEP accuracy standards. CEC upland field crews utilize RTK systems for data collection. CEC also incorporates the necessary equipment on the survey vessel to collect bathymetric survey data "Real-Time". To meet the specification calling for an approximate 50-foot overlap in data between the boat and the upland crew, CEC implements the following procedure. Utilizing "Real-Time" data collection, the boat crew immediately accounts for the tide correction and reports measured water depth in NAVD88 at each profile with the upland crew. This gives the upland crew, who simultaneously collects the upland and near shore profile data, the necessary information to achieve the "overlap" specification.

Upland Data Collection: CEC mobilized one operator and GPS rover unit to collect survey data from the approximate mean high water line landward while an additional operator and unit collected data just landward of the mean high water seaward to wading depth or approximately –5 feet NAVD88. The recorded data was maintained within tolerances of ±3.00 feet horizontal and ±0.16 feet vertical. QA/QC procedures were maintained by both comparison of values with higher accuracy and by repeat measurement.

The Trimble base station was setup on a suitable control point for GPS observations, either a point with provided GPS coordinates or a point with coordinates derived from observations performed during monumentation. The point designation, record coordinates, ellipsoidal height, GEIOD model and antenna height are logged in the field book. At least one check shot was recorded for each RTK rover on a point with known coordinates and GPS observations were collected on known previously established survey control points throughout the day to ensure the integrity of the data.

An electronic list of R-monument coordinates and profile azimuths was loaded into the rover units and measurements were recorded along the azimuth line at intervals no greater than 25 feet or wherever geographical features dictated. The measurements were taken landward along the azimuth line to a minimum of 150 feet landward of the R-monument or to the edge of a building or road, whichever is the most seaward. When possible, a measurement was taken on the R-monument. The extent of the vegetation line and prominent features such as seawalls were also noted in the data collection. The measurements were taken seaward along the azimuth line to a minimum depth of –5 feet NAVD88 or as far as conditions dictated, to maintain a minimum of 50 feet of overlap with the data being collected by the offshore survey crew. This data was then compiled and merged with the offshore data to produce the profile drawings.

Offshore Data Collection: All survey equipment was properly calibrated and operated in accordance with FDEP standards. Bar checks to calibrate the fathometer were performed periodically throughout the survey. Bathymetric survey data collection was conducted in calm seas. Maximum wave heights during the data collection period were less than 3 feet. The data was collected at intervals not exceeding 25 feet and at all grade breaks along the profile sufficient to accurately describe the bathymetry at the profile locations. The beach profile survey extended seaward to a minimum of 3,000 feet from MHW.

The vertical accuracy of the profile data meets or exceeds the GPS-derived heights (0.2 to 0.5 feet) standard. The horizontal positioning system accuracy of the data was within 2 feet and the off-line horizontal deviation was within 30 feet. Measure downs form a known point to the water's surface

were taken periodically throughout the survey as a check for the tides measured by the RTK GPS as necessary.

Bathymetric survey data collection was performed as close in time as possible with the upland topographic survey data collection. This significantly increased efficiency by conducting the work with the same base station set-up. Safety was also increased by having both crews visible to each other at all times.

COASTAL ENGINEERING CONSULTANTS, INC.
FLORIDA BUSINESS AUTHORIZATION NO. LB 2464

Richard J. Ewing, P.S.M.
Professional Surveyor and Mapper
Florida Certificate No. 5295
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THE ORIGINAL RAISED SEAL OF A FLORIDA
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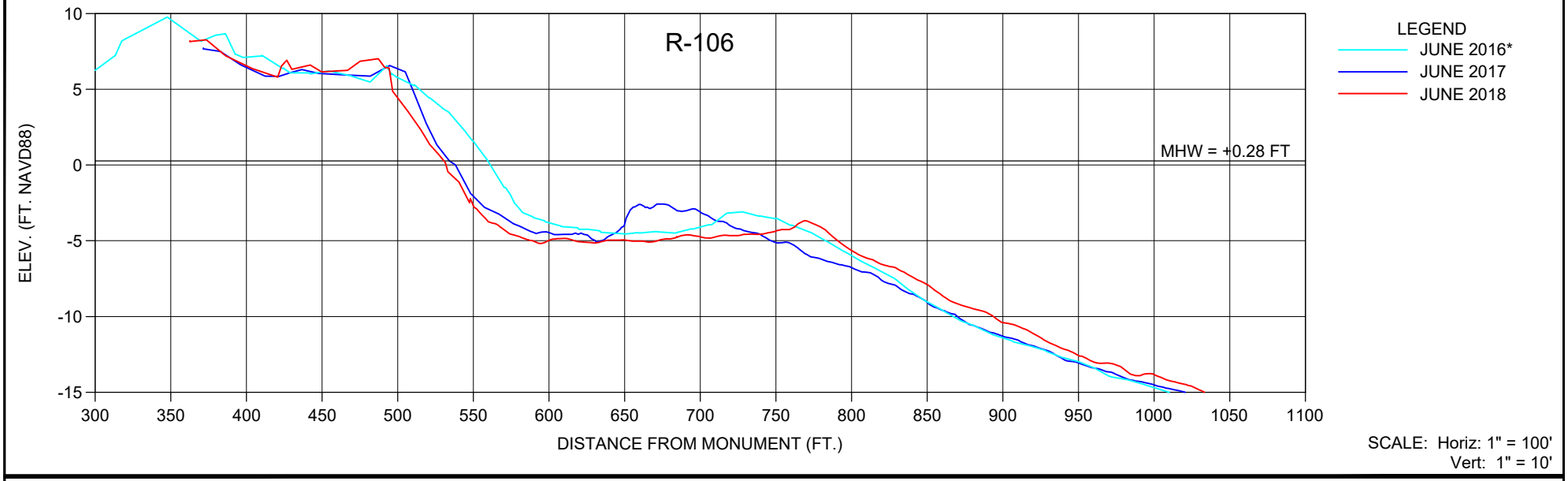
APPENDIX 2

BEACH PROFILES



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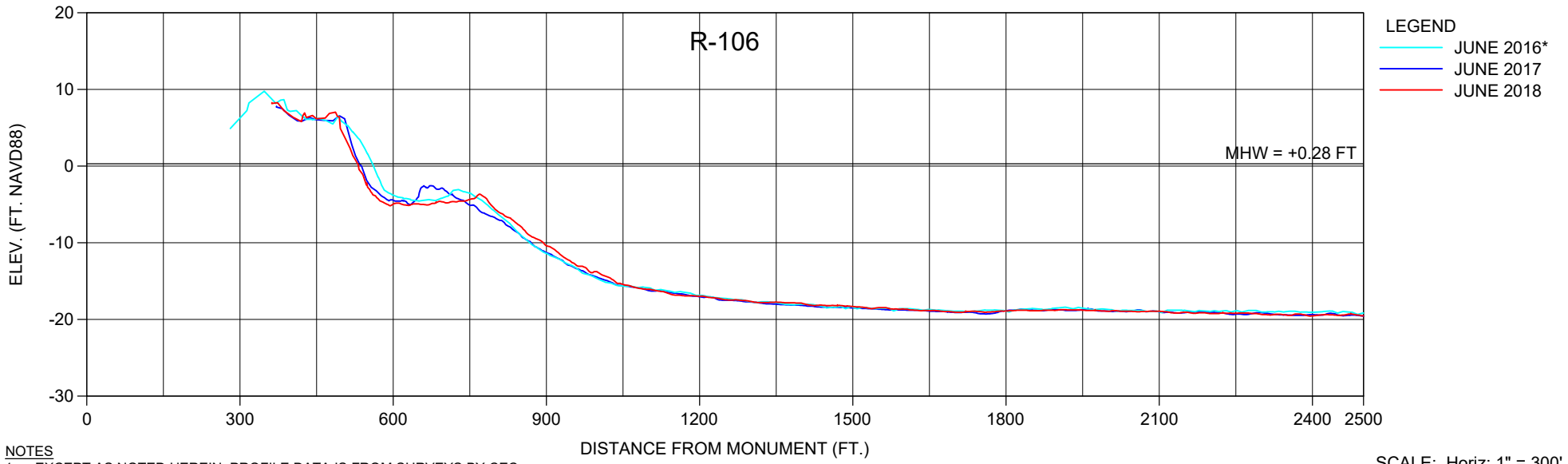

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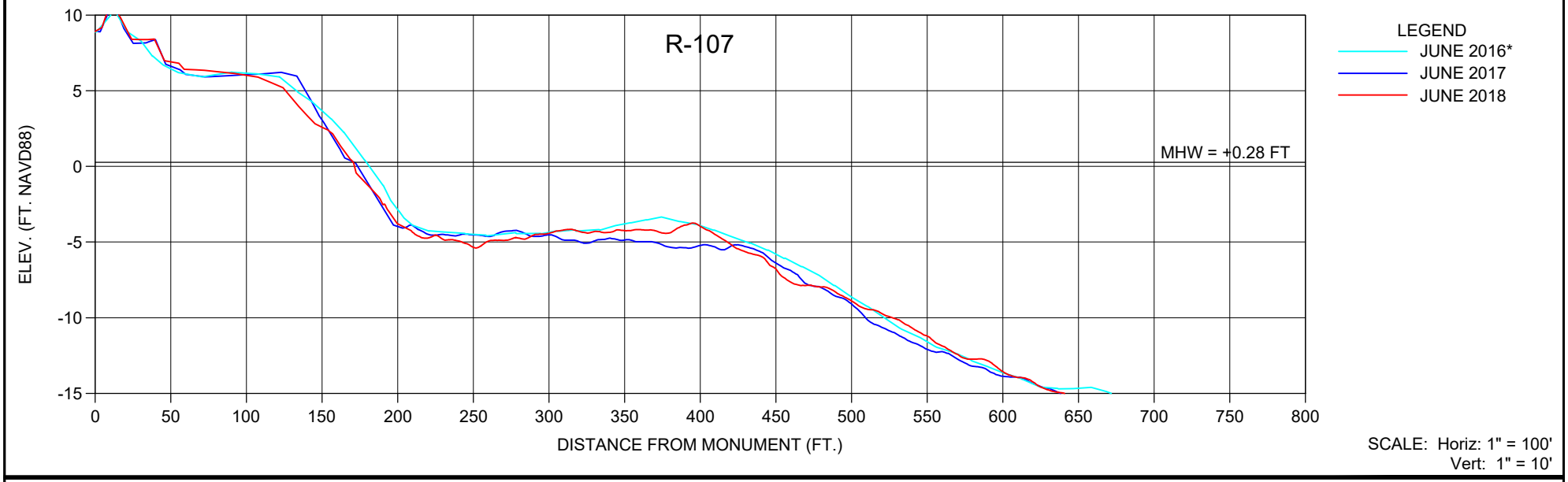

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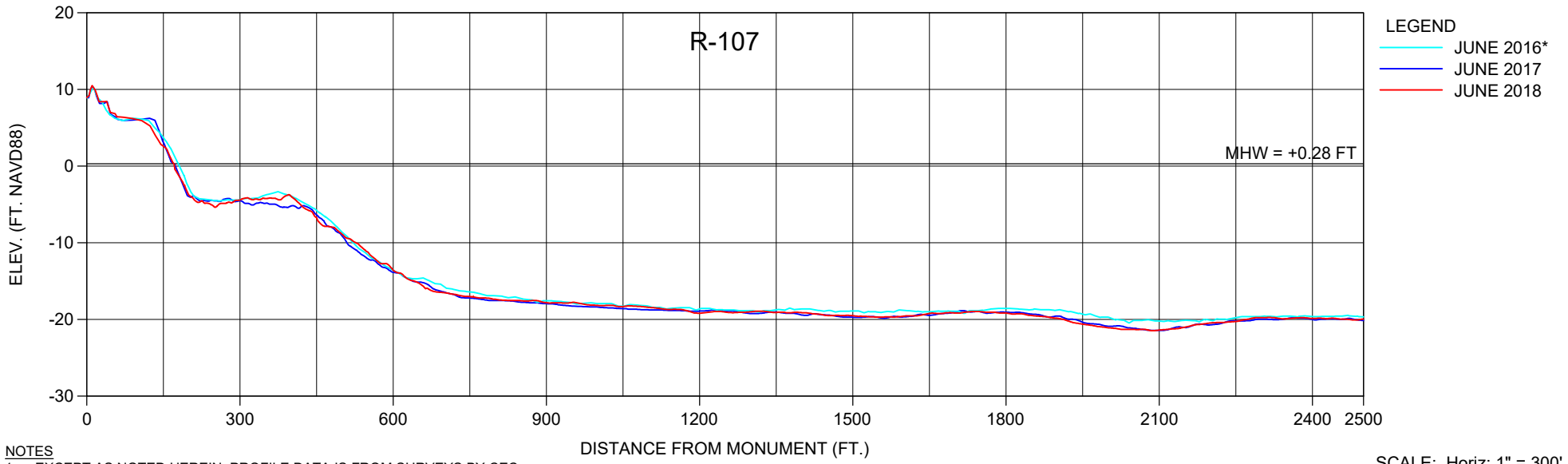

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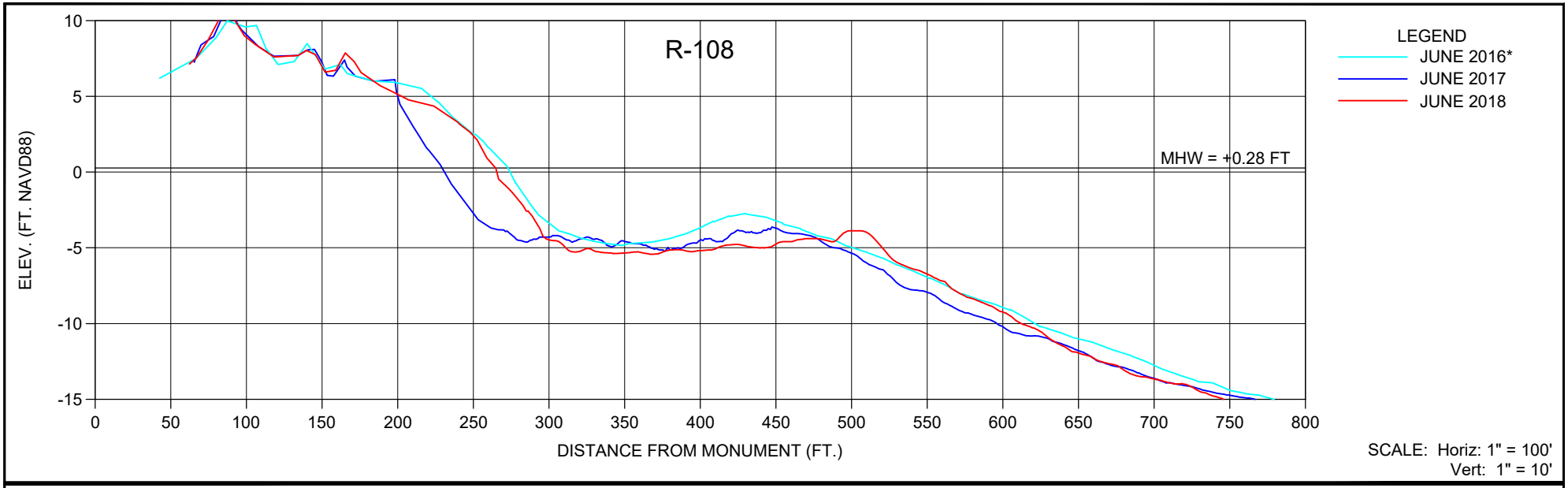

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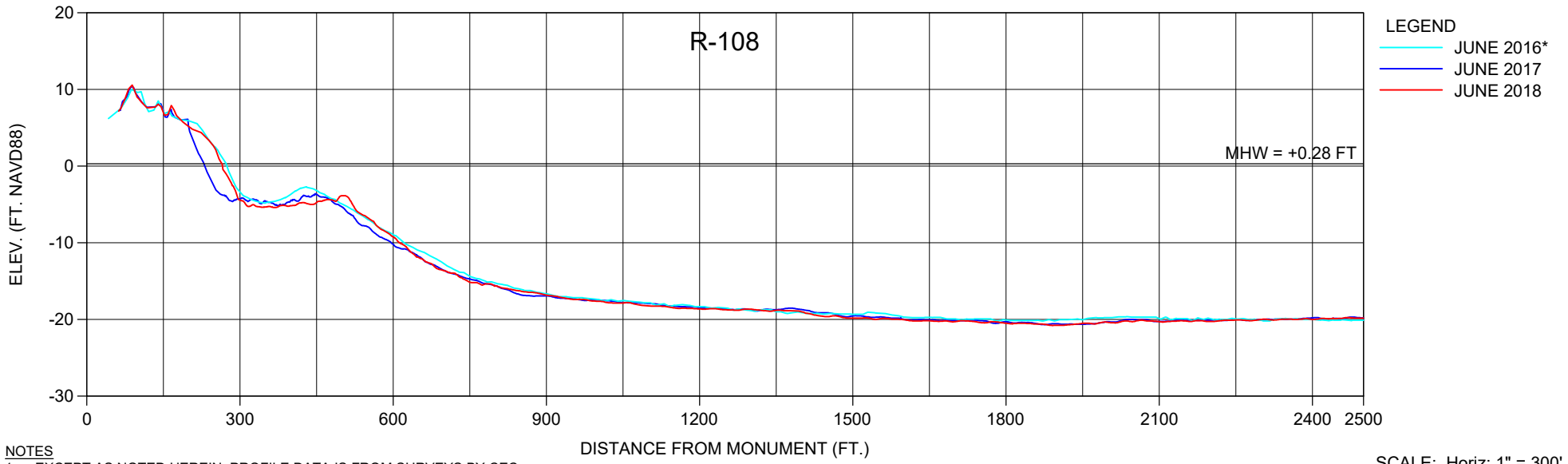

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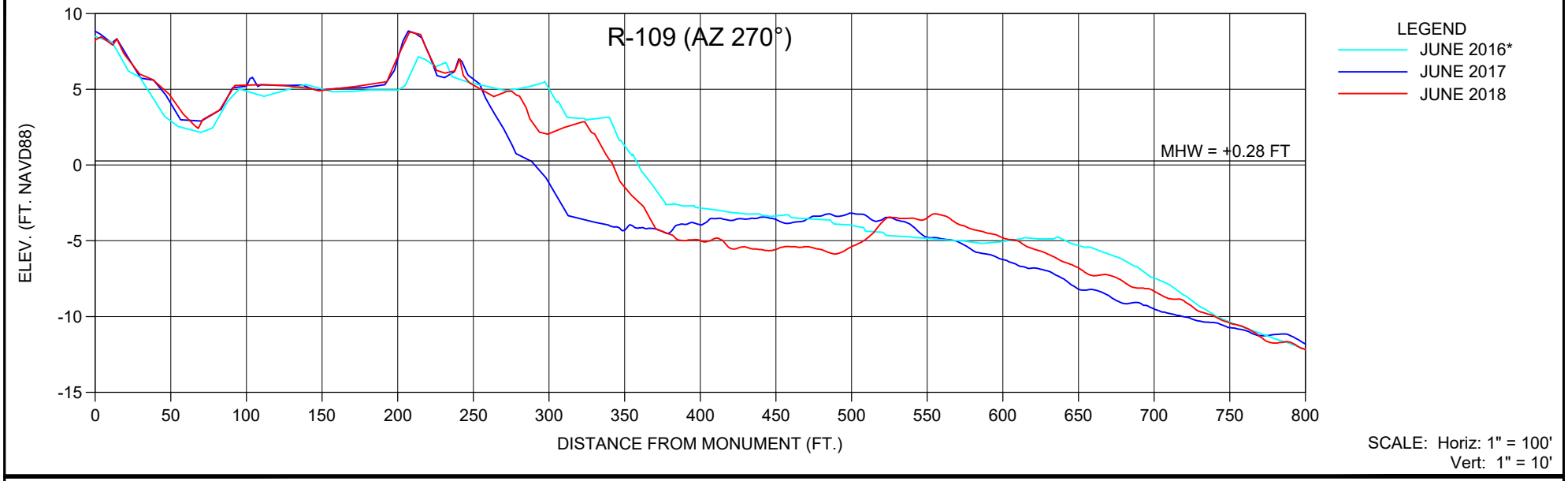

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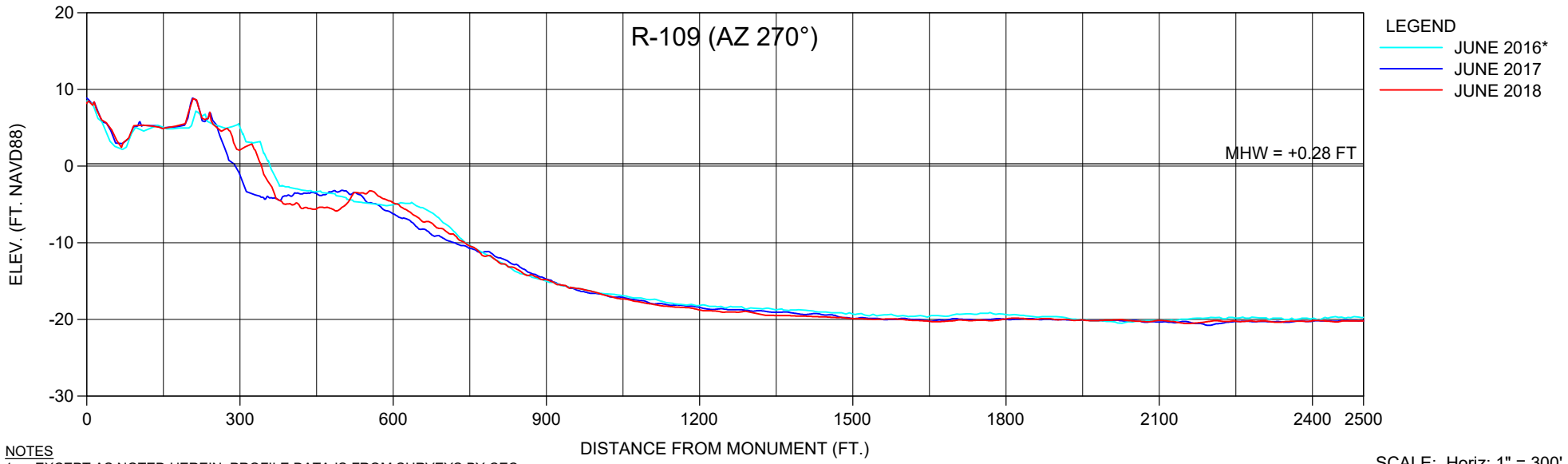

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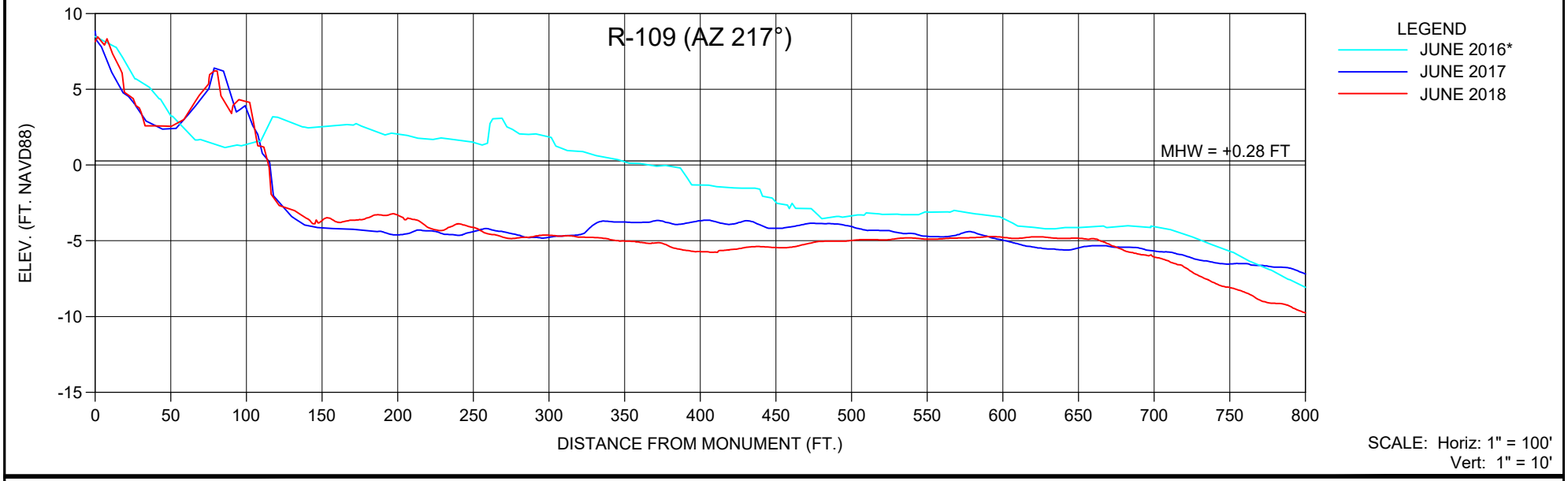

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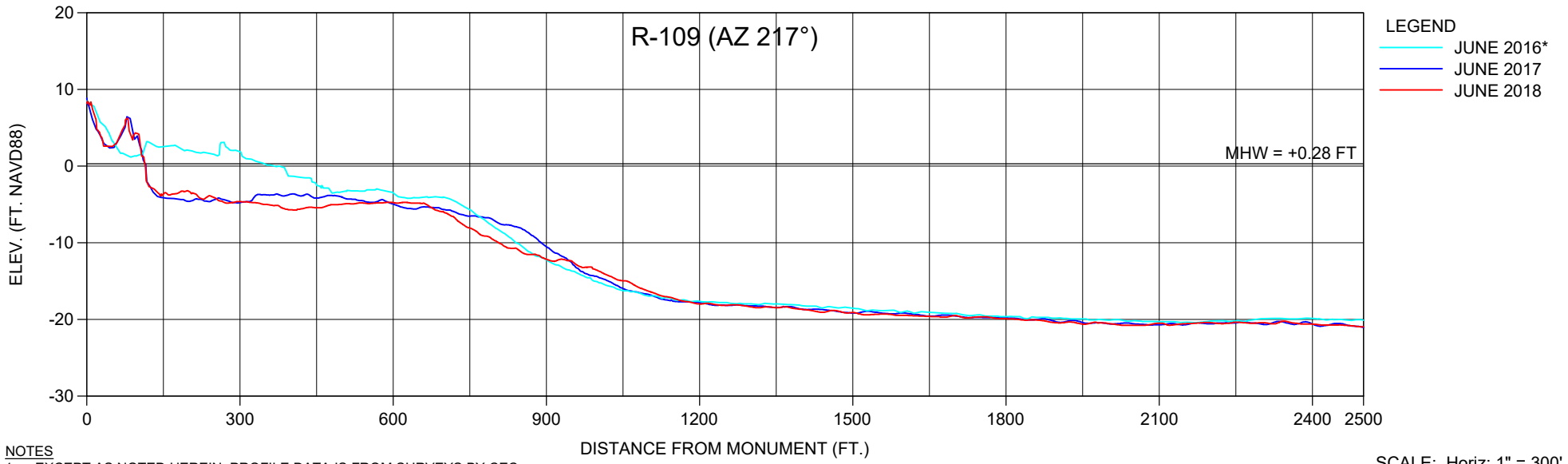

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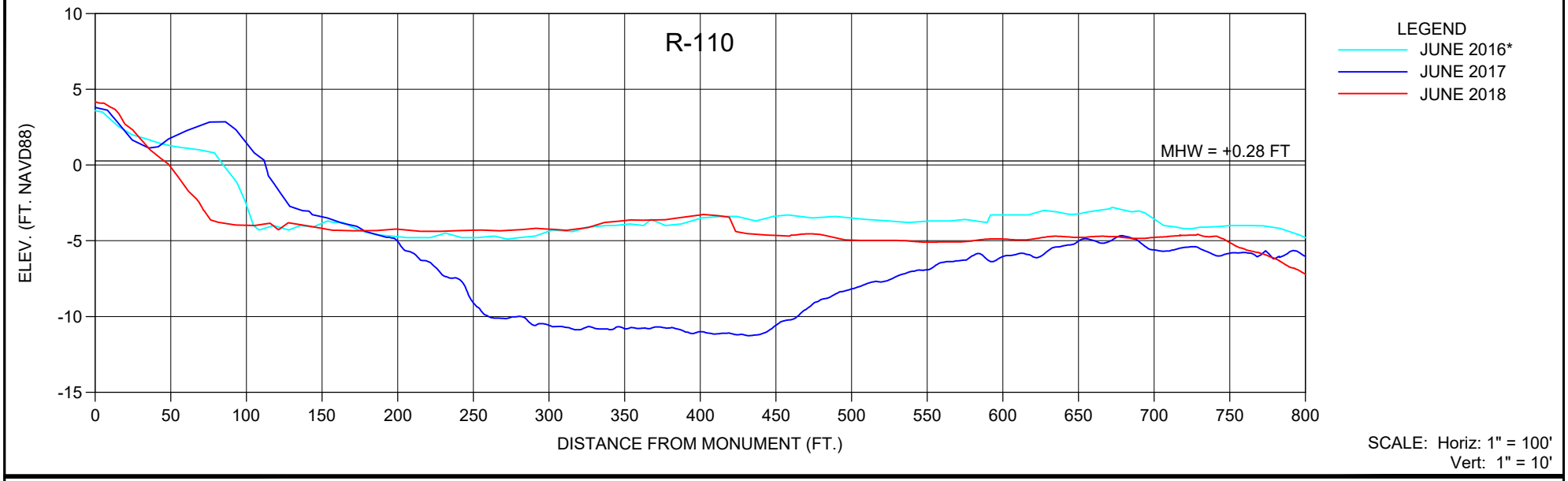

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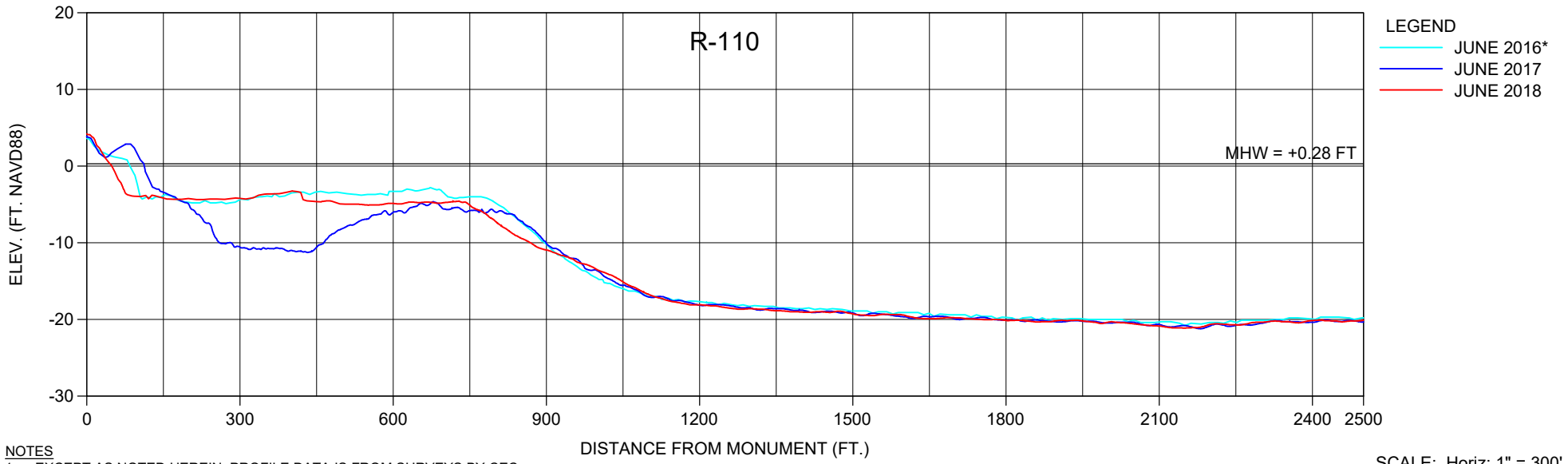

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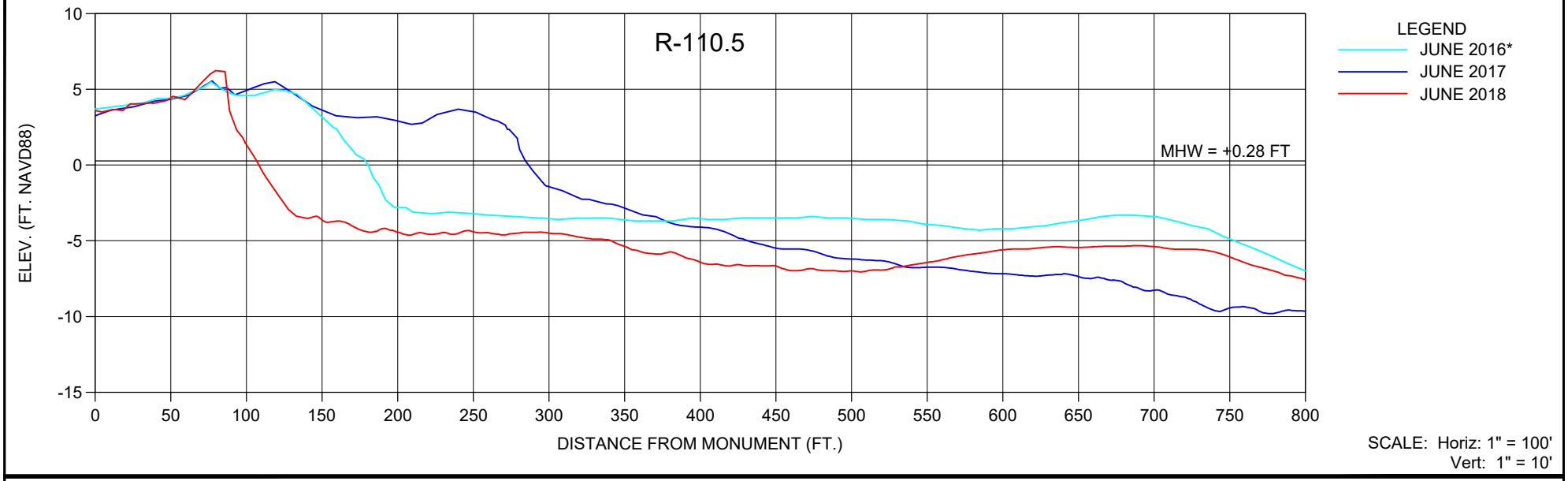

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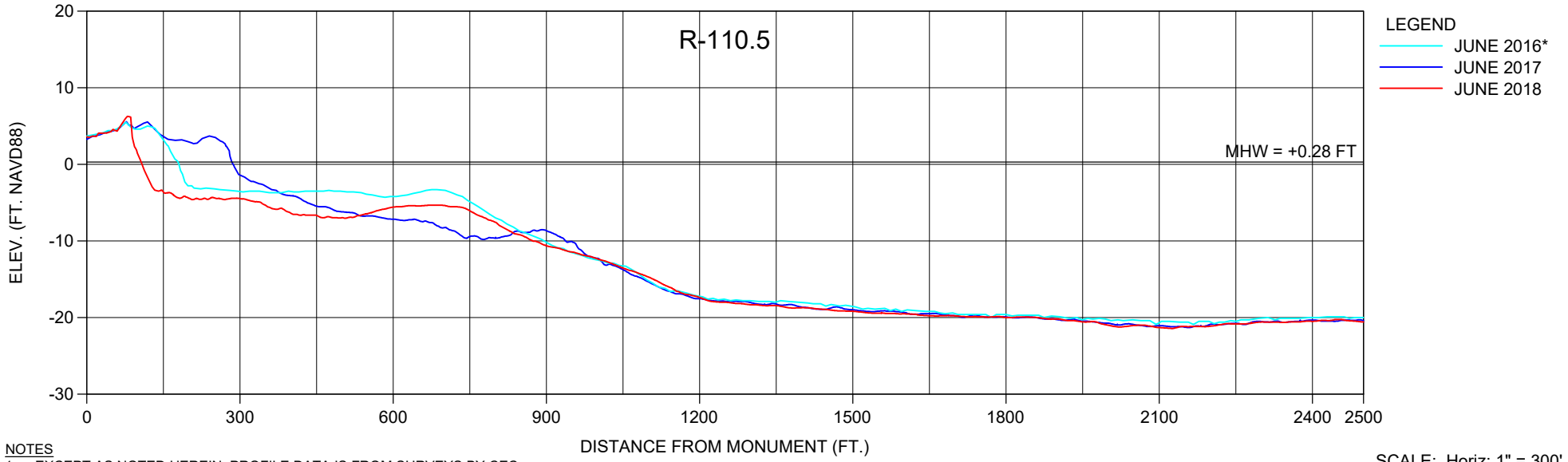

SCALE: Horiz: 1" = 300'
Vert: 1" = 20'

NOTES
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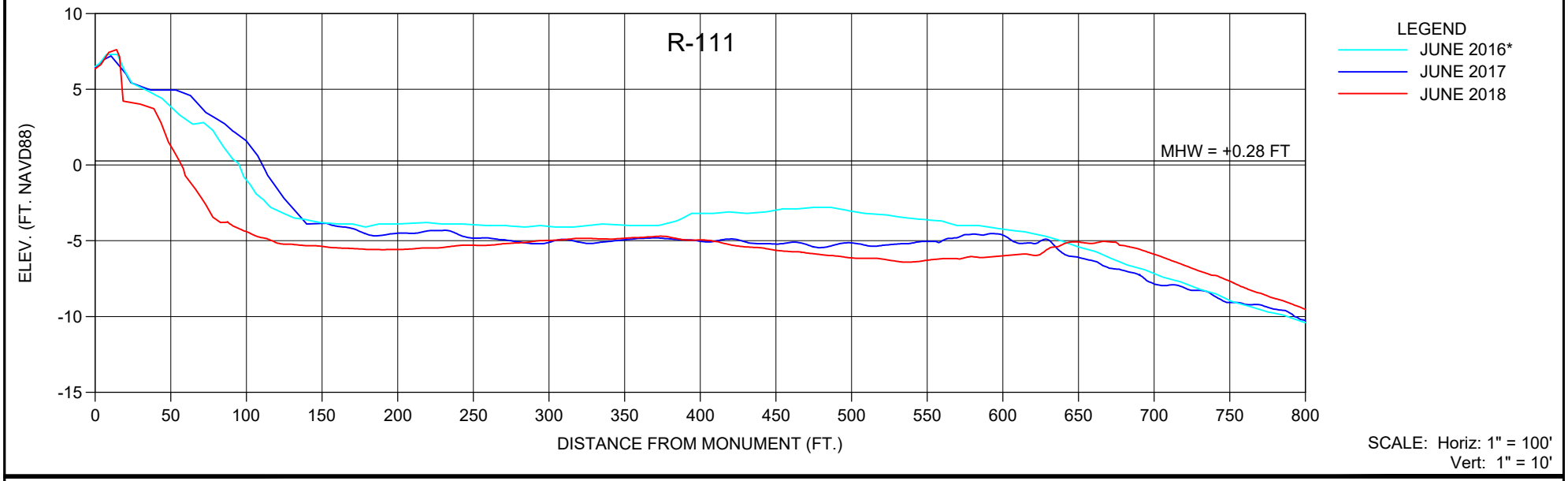
CLIENT: LEE COUNTY

TITLE: R-110.5 MONITORING SURVEY

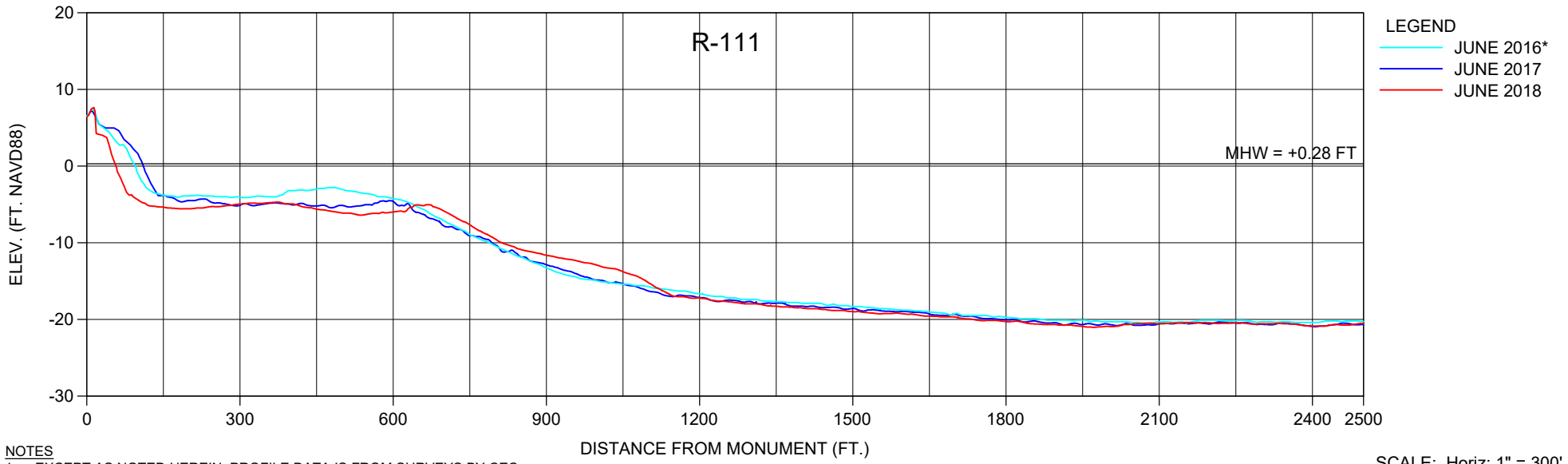
DATE: 6/14/2018	SCALE: AS SHOWN		
DRAWN: SDB	F.B.		
CHECKED: MTP	PG.		
SEC.	TWP.	RNG.	
ACAD NO. 18030-2018 Mon-RMON.dwg			
REF. NO. 18.030			

NO.	DATE	BY	REVISION DESCRIPTION

SHEET 7
FILE NO.: 18030-R-110.5



SCALE: Horiz: 1" = 100'
Vert: 1" = 10'



SCALE: Horiz: 1" = 300'
Vert: 1" = 20'

NOTES
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SHEET 1 8
FILE NO.: 18030-R-111

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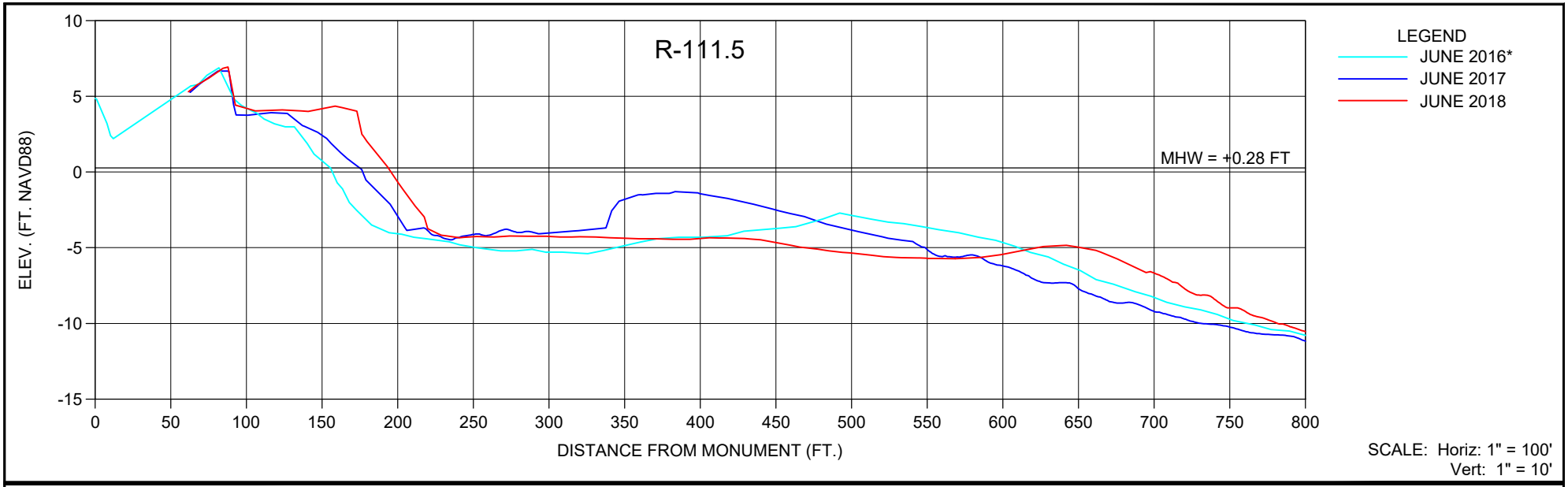
CLIENT: LEE COUNTY

TITLE: R-111 MONITORING SURVEY

DATE:	6/14/2018	SCALE:	AS SHOWN
DRAWN:	SDB	F.B.	
CHECKED:	MTP	PG.	
SEC.	TWP.	RNG.	
ACAD NO.	18030-2018 Mon-RMON.dwg		
REF. NO.	18.030		

NO.	DATE	BY	REVISION DESCRIPTION



SCALE: Horiz: 1" = 100'
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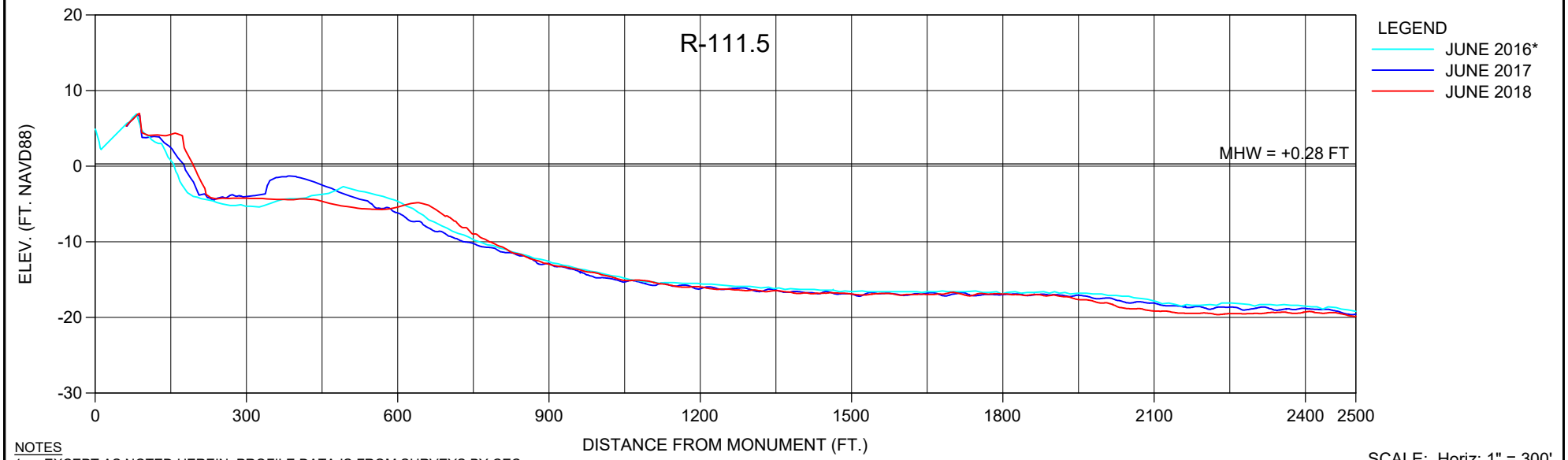

SCALE: Horiz: 1" = 300'
Vert: 1" = 20'

NOTES
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SHEET 19
FILE NO.: 18030-R-111.5

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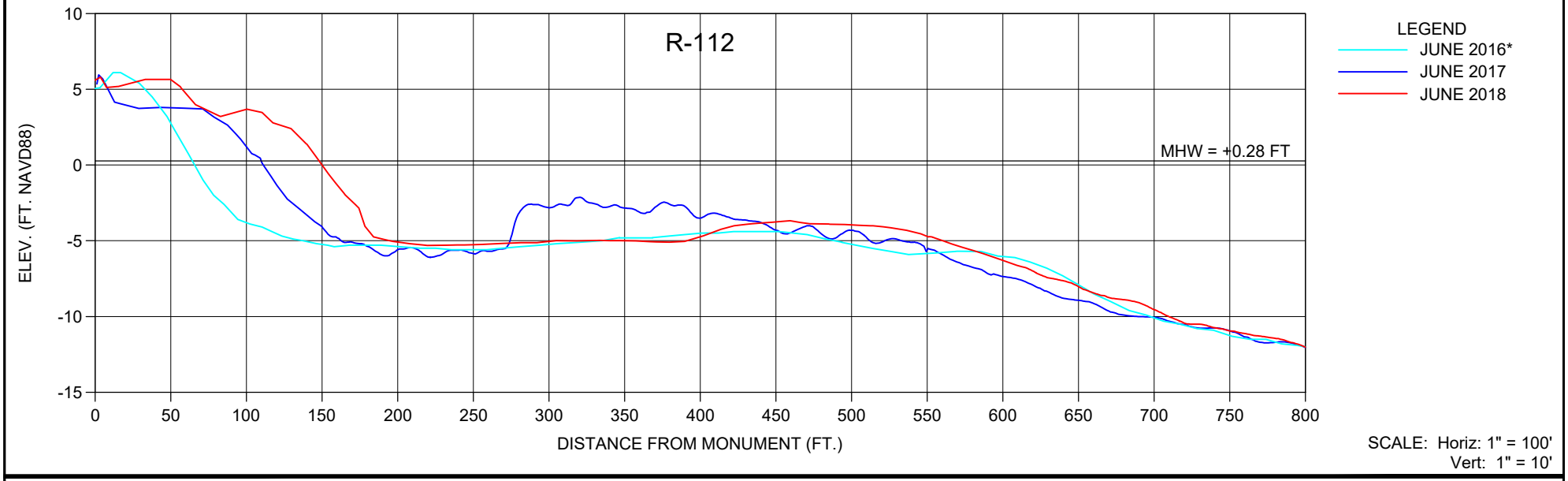
TITLE: R-111.5 MONITORING SURVEY

DATE:	6/14/2018	SCALE:	AS SHOWN
DRAWN:	SDB	F.B.	
CHECKED:	MTP	PG.	
SEC.	TWP.	RNG.	
ACAD NO.	18030-2018 Mon-RMON.dwg		
REF. NO.	18.030		

NO.	DATE	BY	REVISION DESCRIPTION



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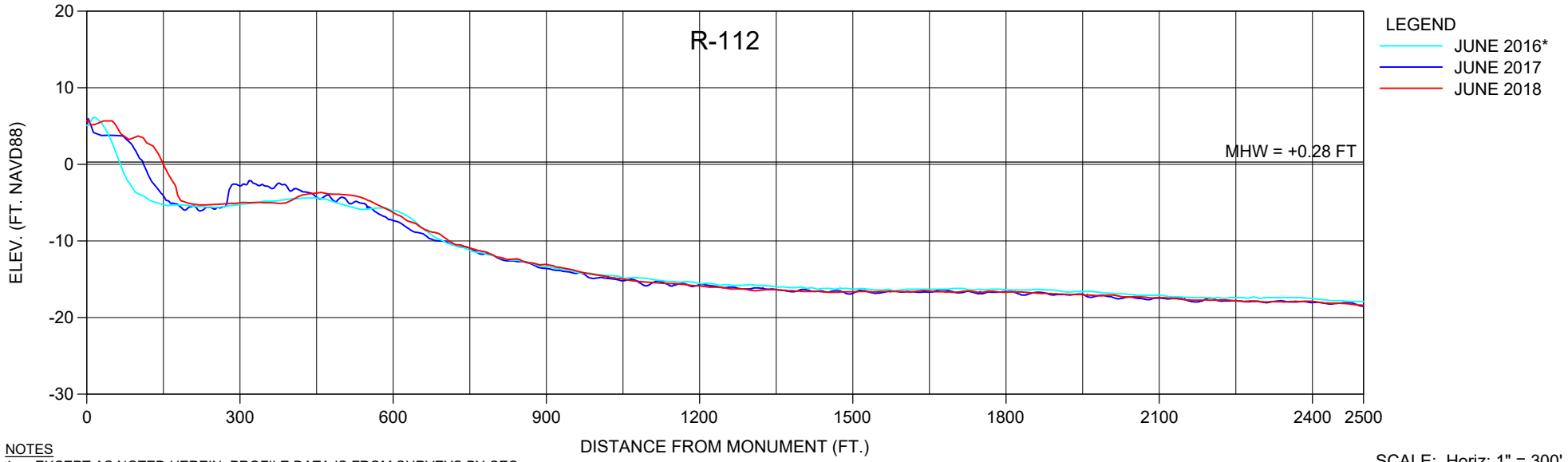
Vert: 1" = 10'



SCALE: Horiz: 1" = 300'
Vert: 1" = 20'

NOTES
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SHEET 10
FILE NO.: 18030-R-112

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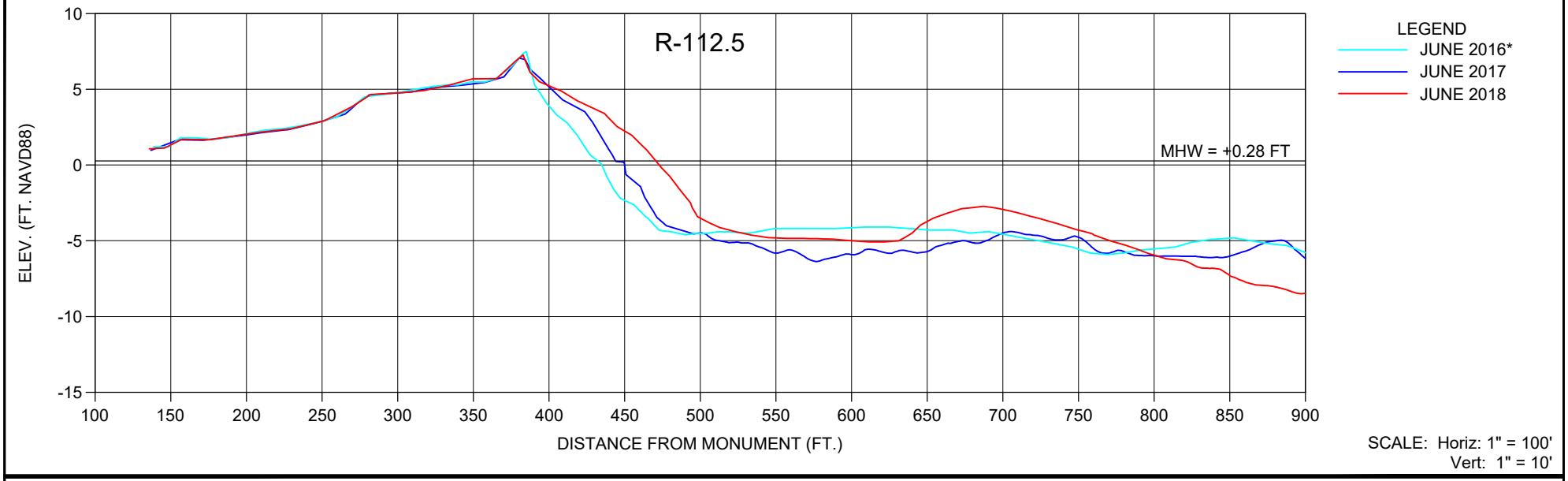
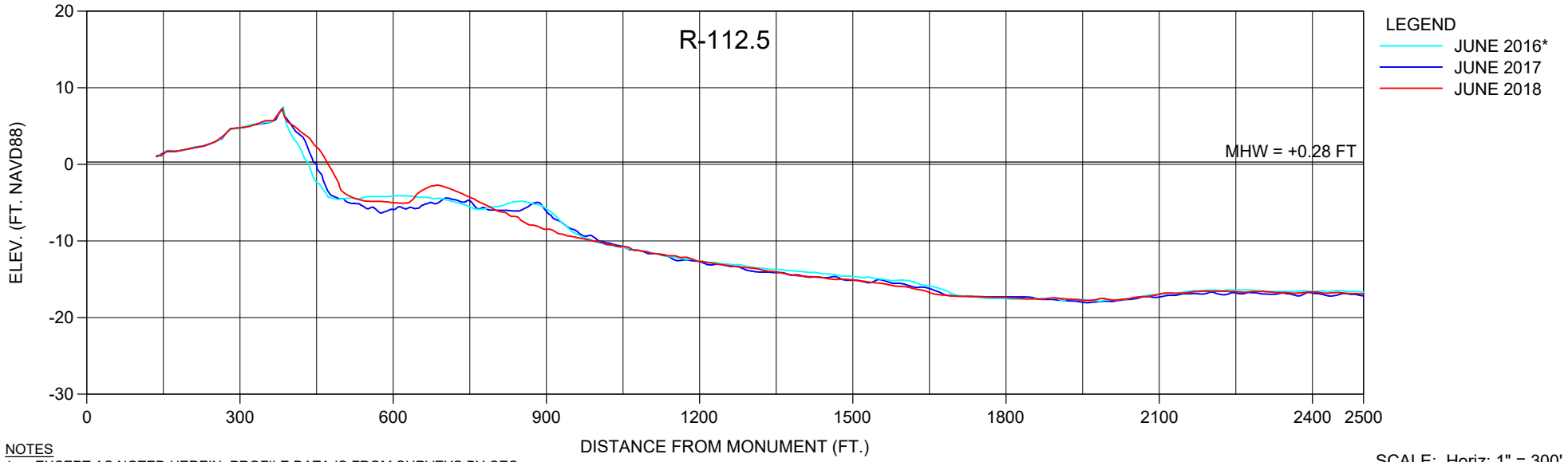
TITLE: R-112 MONITORING SURVEY

DATE:	6/14/2018	SCALE:	AS SHOWN
DRAWN:	SDB	F.B.	
CHECKED:	MTP	PG.	
SEC.	TWP.	RNG.	
ACAD NO.	18030-2018 Mon-RMON.dwg		
REF. NO.	18.030		

NO.	DATE	BY	REVISION DESCRIPTION



SCALE: Horiz: 1" = 100'
Vert: 1" = 10'



SCALE: Horiz: 1" = 300'
Vert: 1" = 20'

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TITLE: R-112.5 MONITORING SURVEY

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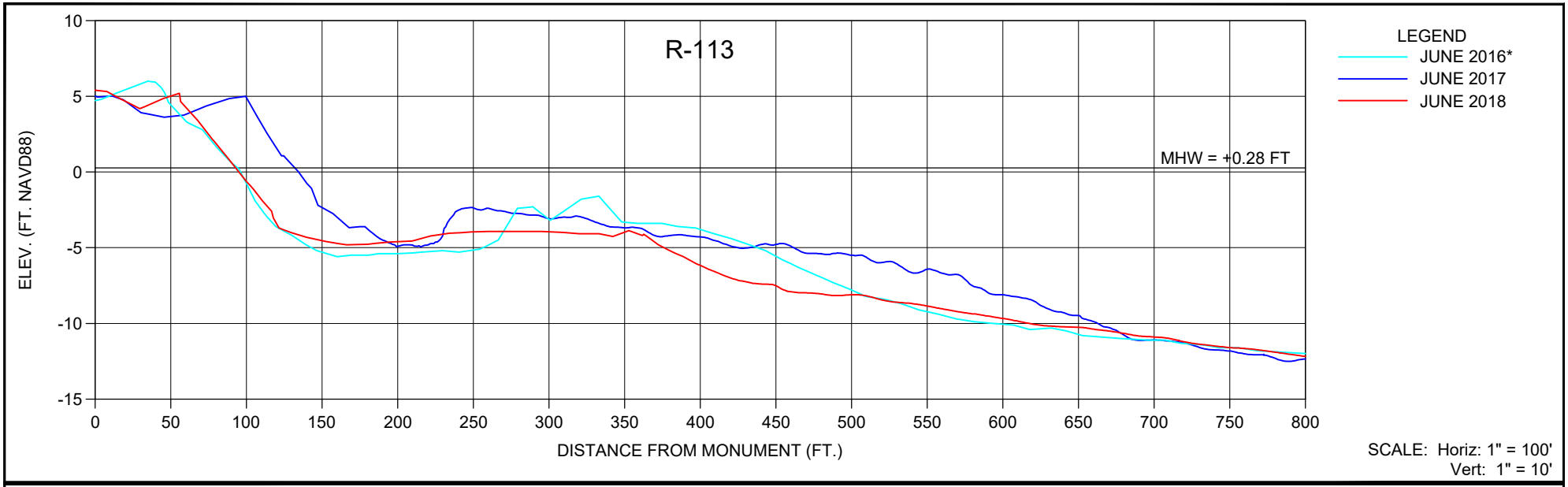
DRAWN: SDB	F.B.		
CHECKED: MTP	PG.		
SEC.	TWP.	RNG.	
ACAD NO. 18030-2018 Mon-RMON.dwg			
REF. NO. 18.030			

NO.	DATE	BY	REVISION DESCRIPTION

SHEET 1 1
FILE NO.: 18030-R-112.5



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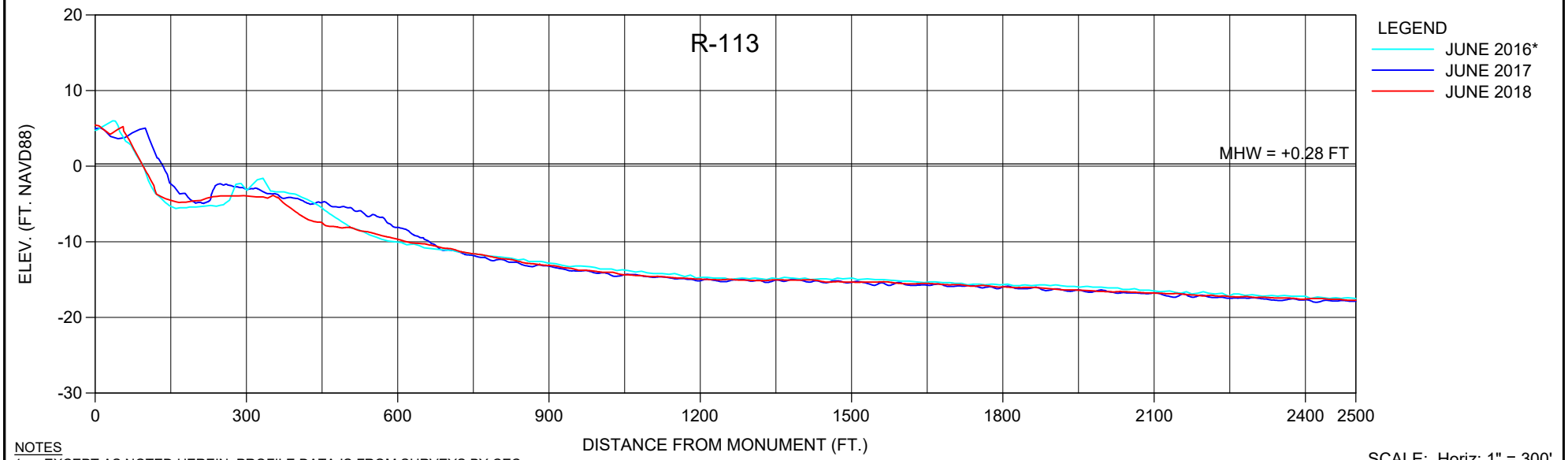

SCALE: Horiz: 1" = 300'
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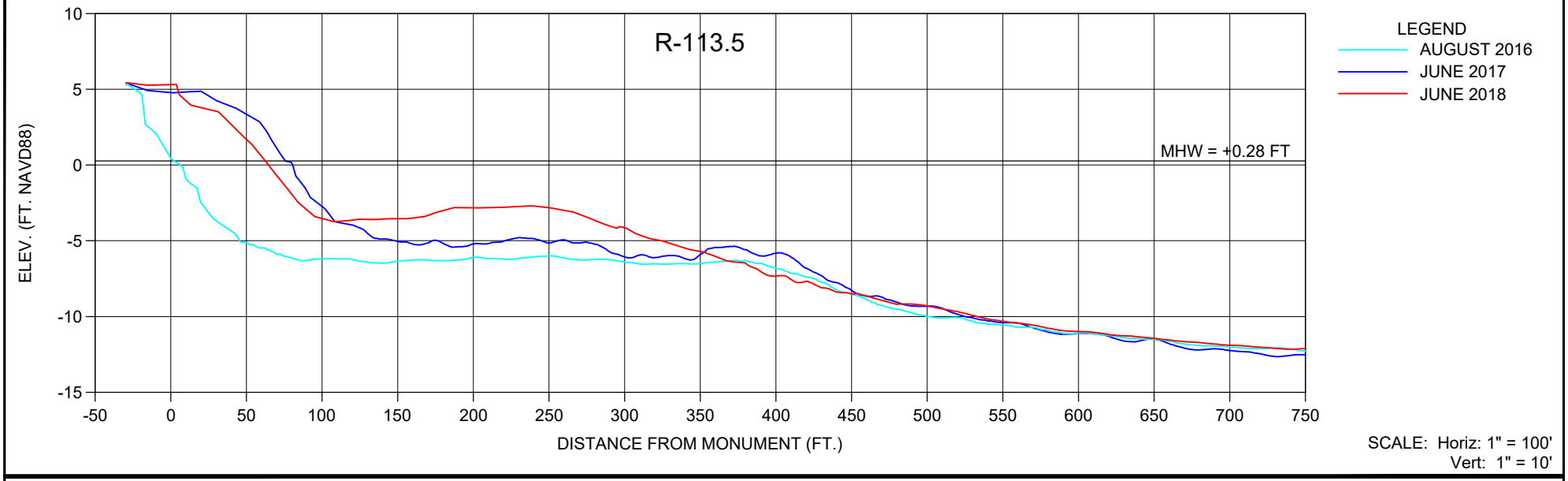
SHEET 12
FILE NO.: 18030-R-113

CLIENT: LEE COUNTY

TITLE: R-113 MONITORING SURVEY

DATE:	6/14/2018	SCALE:	AS SHOWN
DRAWN:	SDB	F.B.	
CHECKED:	MTP	PG.	
SEC.	TWP.	RNG.	
ACAD NO.	18030-2018 Mon-RMON.dwg		
REF. NO.	18.030		

NO.	DATE	BY	REVISION DESCRIPTION



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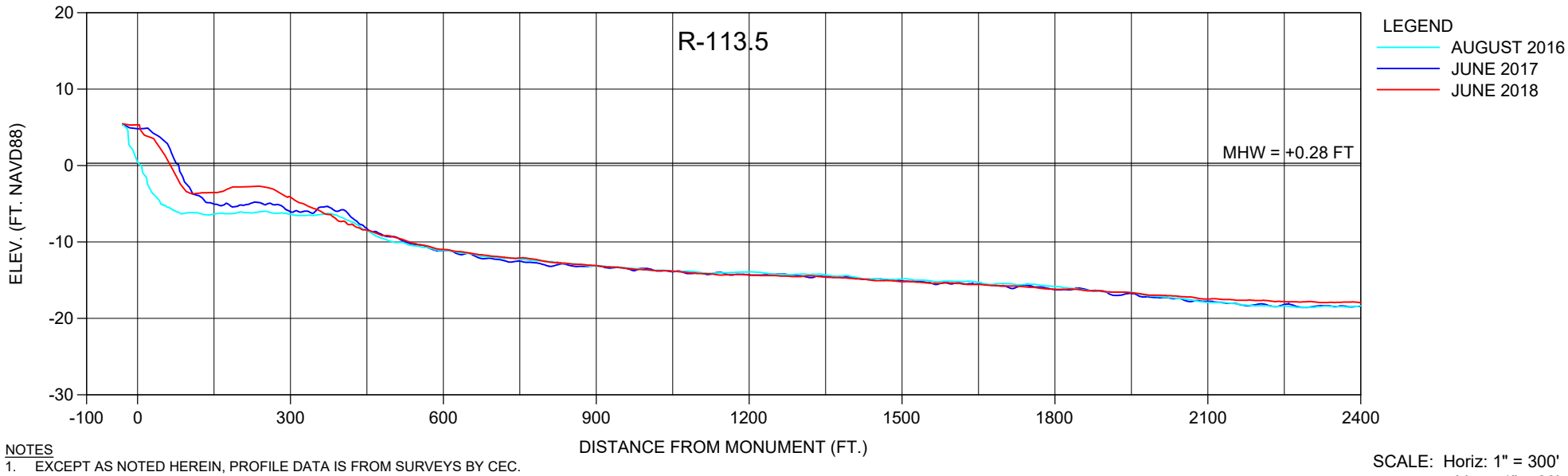

SCALE: Horiz: 1" = 300'
Vert: 1" = 20'

NOTES
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SHEET 13
FILE NO.: 18030-R-113.5

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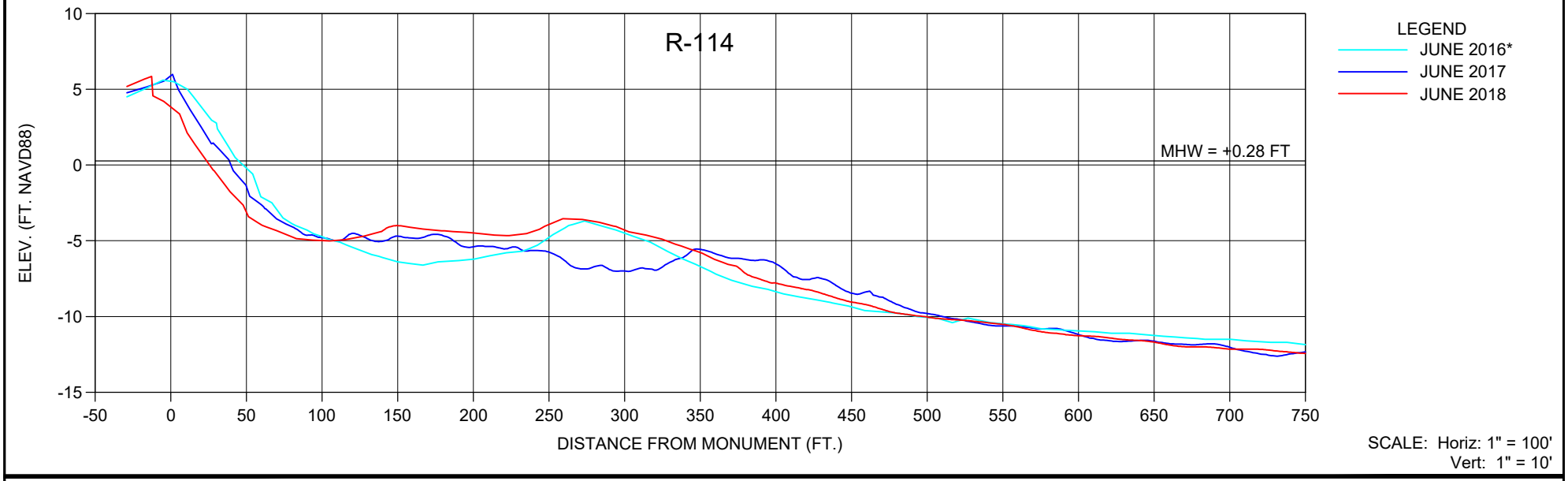
CLIENT: LEE COUNTY

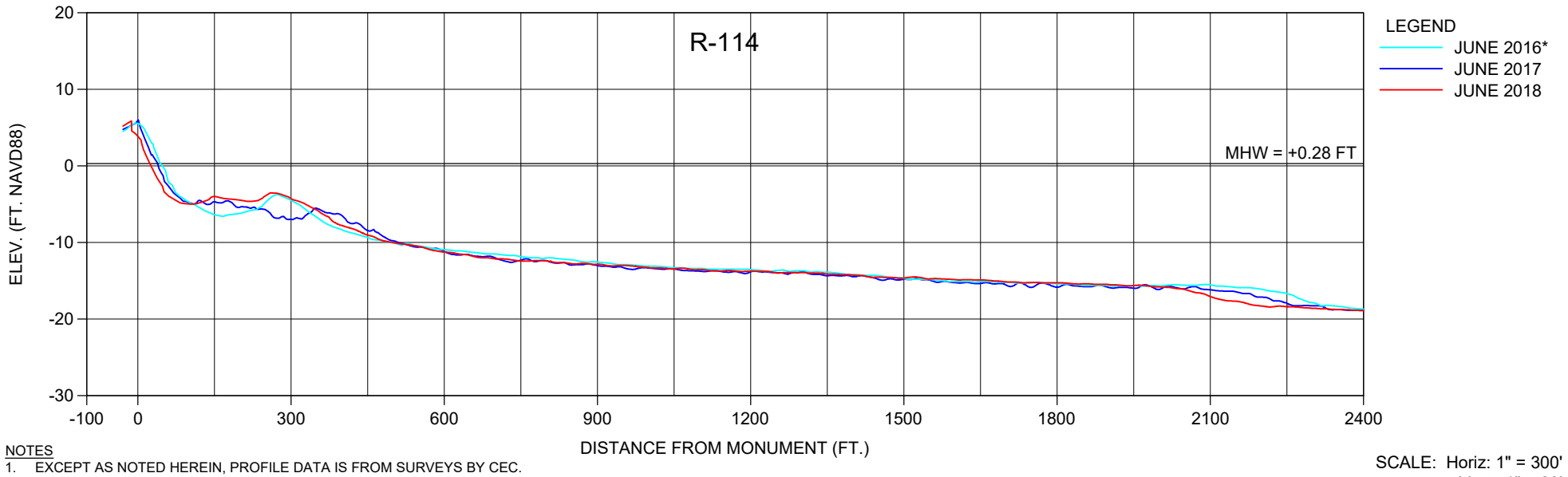
TITLE: R-113.5 MONITORING SURVEY

DATE: 6/14/2018	SCALE: AS SHOWN		
DRAWN: SDB	F.B.		
CHECKED: MTP	PG.		
SEC.	TWP.	RNG.	
ACAD NO. 18030-2018 Mon-RMON.dwg			
REF. NO. 18.030			

NO.	DATE	BY	REVISION DESCRIPTION



SCALE: Horiz: 1" = 100'
Vert: 1" = 10'



SCALE: Horiz: 1" = 300'
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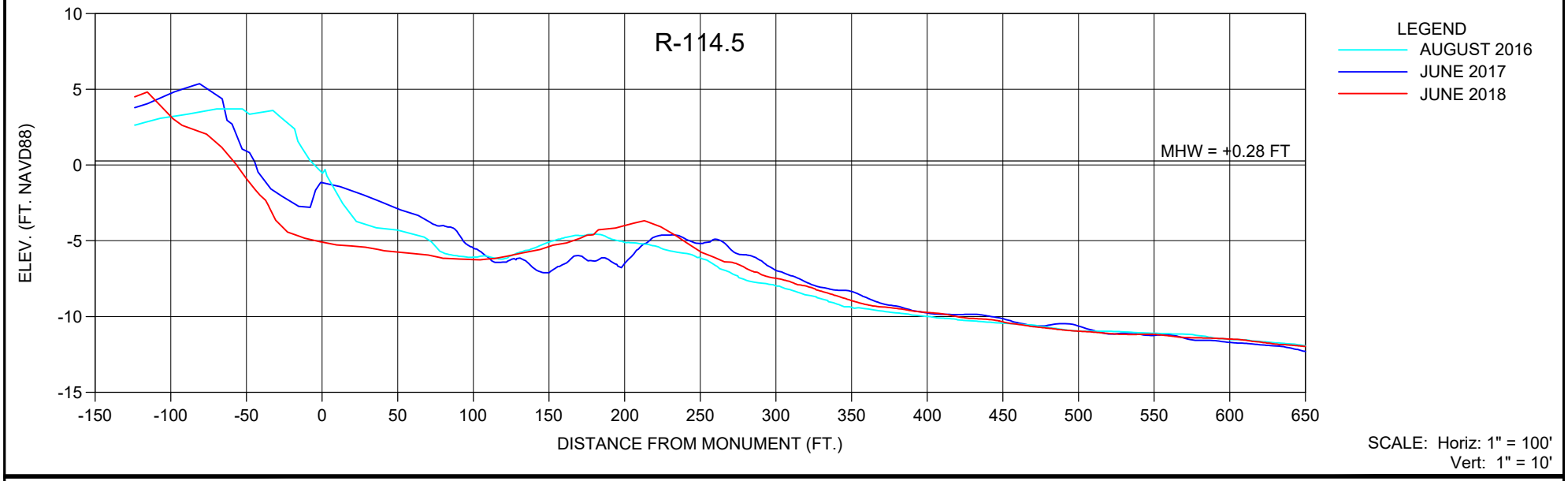
TITLE: R-114 MONITORING SURVEY

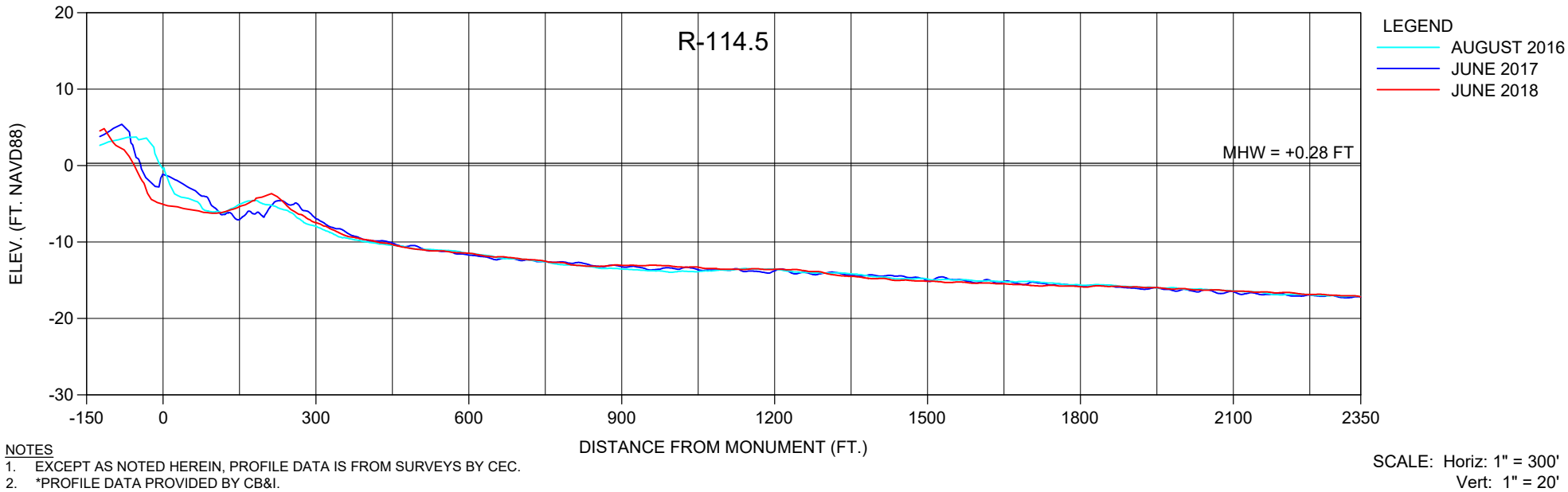
DATE: 6/14/2018	SCALE: AS SHOWN		
DRAWN: SDB	F.B.		
CHECKED: MTP	PG.		
SEC.	TWP.	RNG.	
ACAD NO. 18030-2018 Mon-RMON.dwg			
REF. NO. 18.030			

NO.	DATE	BY	REVISION DESCRIPTION

SHEET 14
FILE NO.: 18030-R-114



SCALE: Horiz: 1" = 100'
Vert: 1" = 10'



SCALE: Horiz: 1" = 300'
Vert: 1" = 20'

NOTES
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SHEET 15
FILE NO.: 18030-R-114.5

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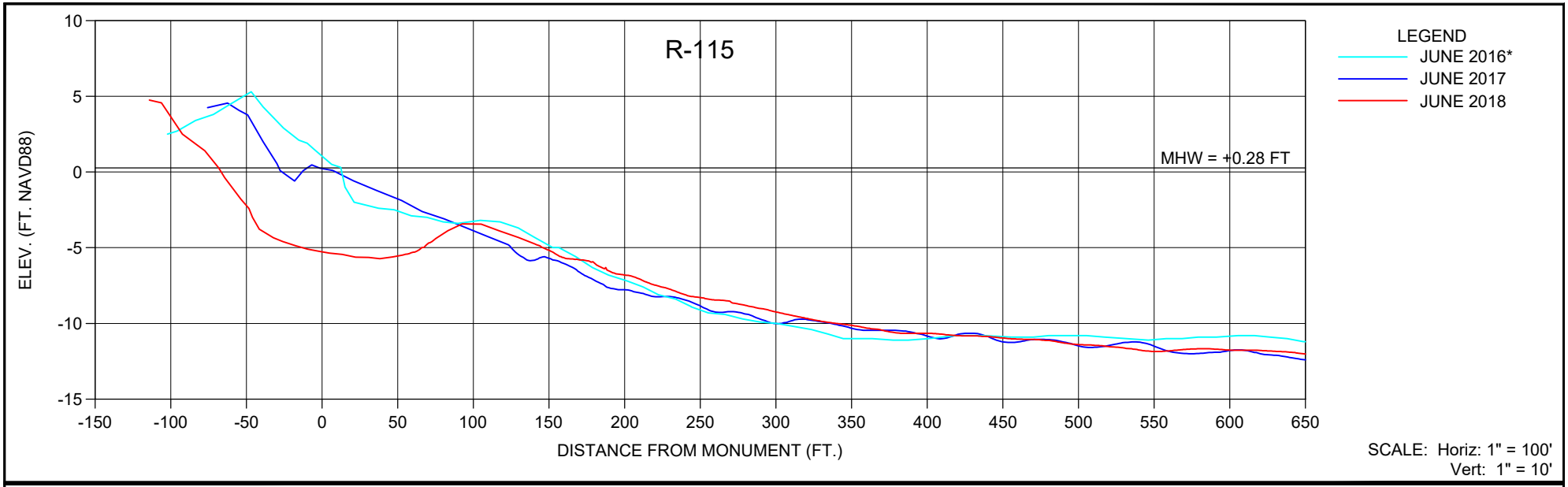
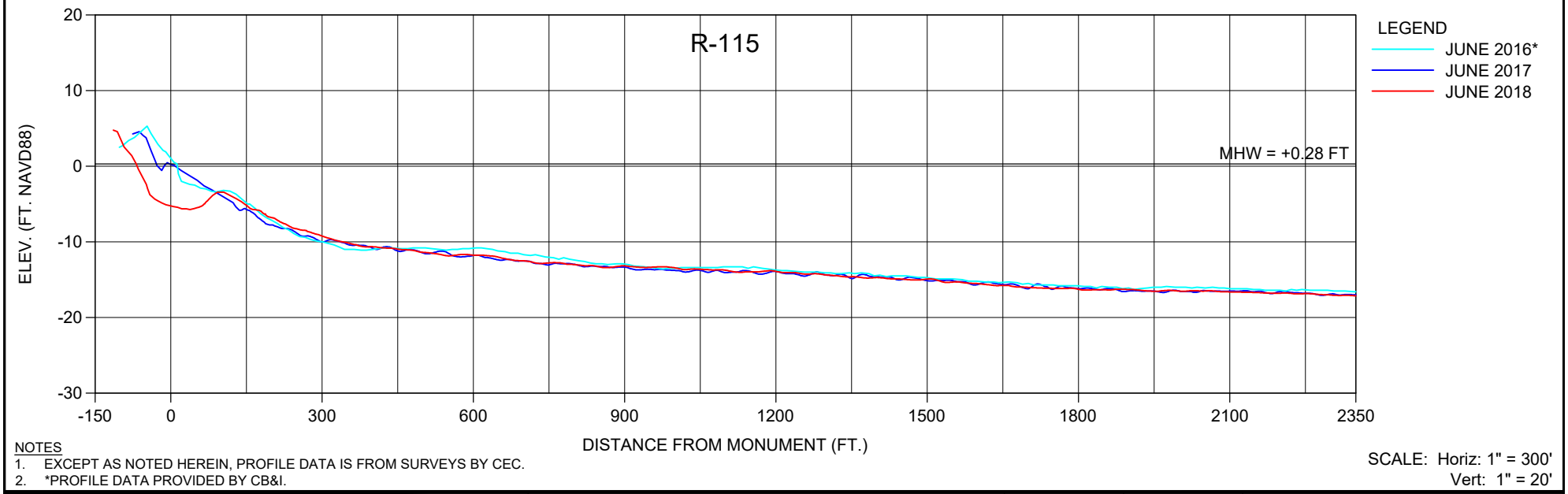
TITLE: R-114.5 MONITORING SURVEY

DATE: 6/14/2018	SCALE: AS SHOWN		
DRAWN: SDB	F.B.		
CHECKED: MTP	PG.		
SEC.	TWP.	RNG.	
ACAD NO. 18030-2018 Mon-RMON.dwg			
REF. NO. 18.030			

NO.	DATE	BY	REVISION DESCRIPTION



SCALE: Horiz: 1" = 100'
Vert: 1" = 10'



SCALE: Horiz: 1" = 300'
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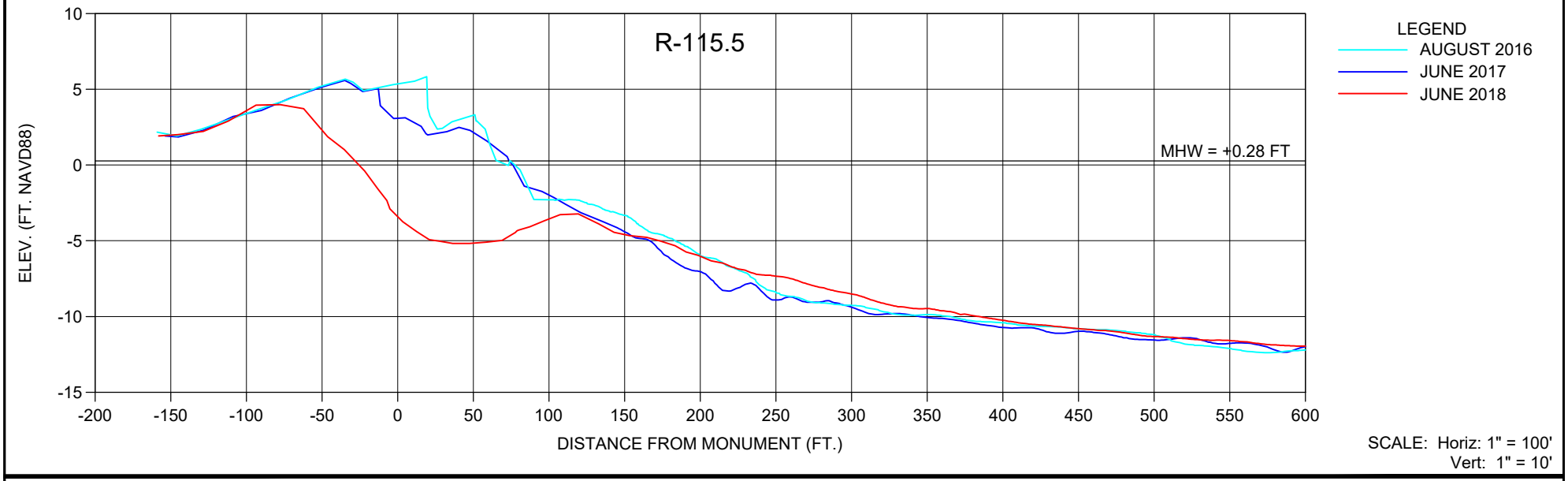
SHEET 16
FILE NO.: 18030-R-115

CLIENT: LEE COUNTY

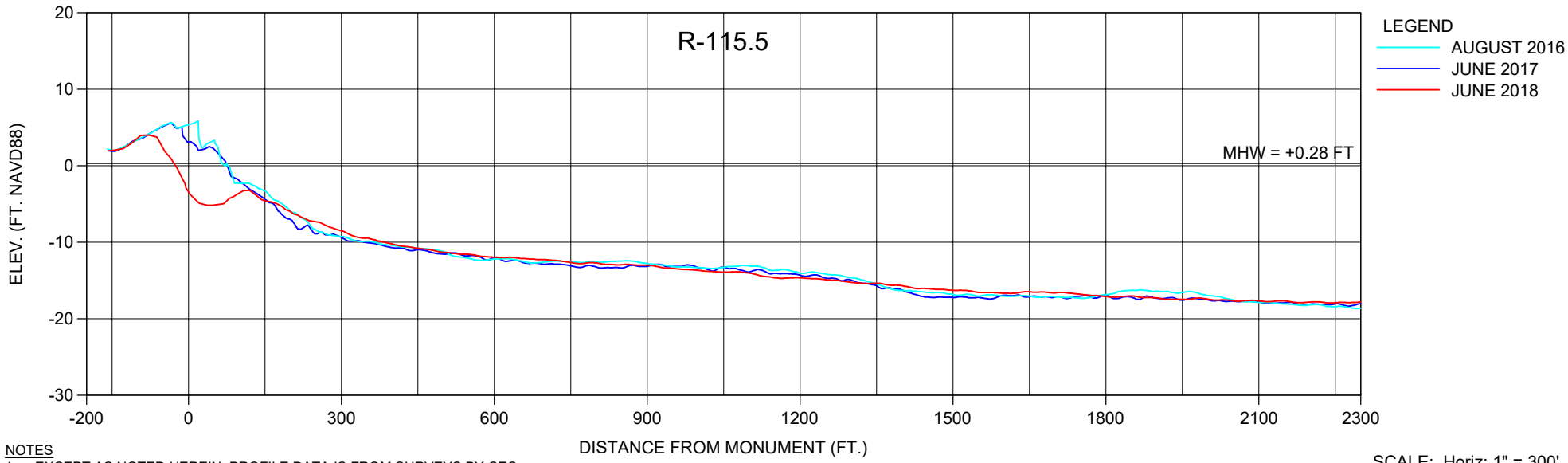
TITLE: R-115 MONITORING SURVEY

DATE: 6/14/2018	SCALE: AS SHOWN		
DRAWN: SDB	F.B.		
CHECKED: MTP	PG.		
SEC.	TWP.	RNG.	
ACAD NO. 18030-2018 Mon-RMON.dwg			
REF. NO. 18.030			

NO.	DATE	BY	REVISION DESCRIPTION



SCALE: Horiz: 1" = 100'
Vert: 1" = 10'



SCALE: Horiz: 1" = 300'
Vert: 1" = 20'

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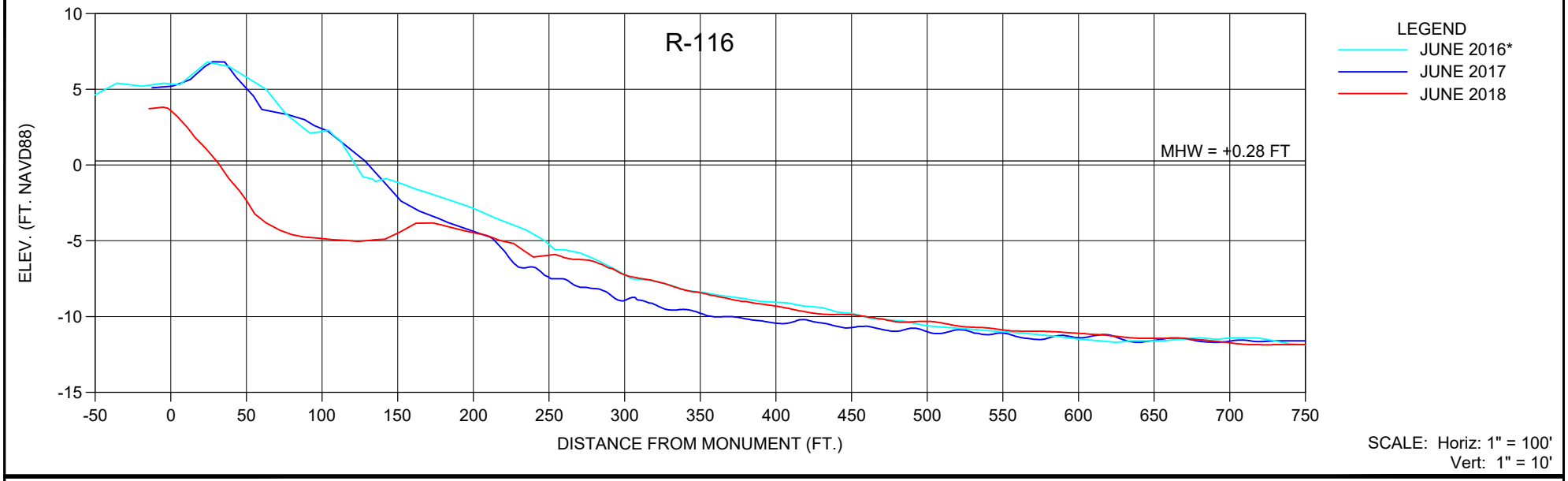
TITLE: R-115.5 MONITORING SURVEY

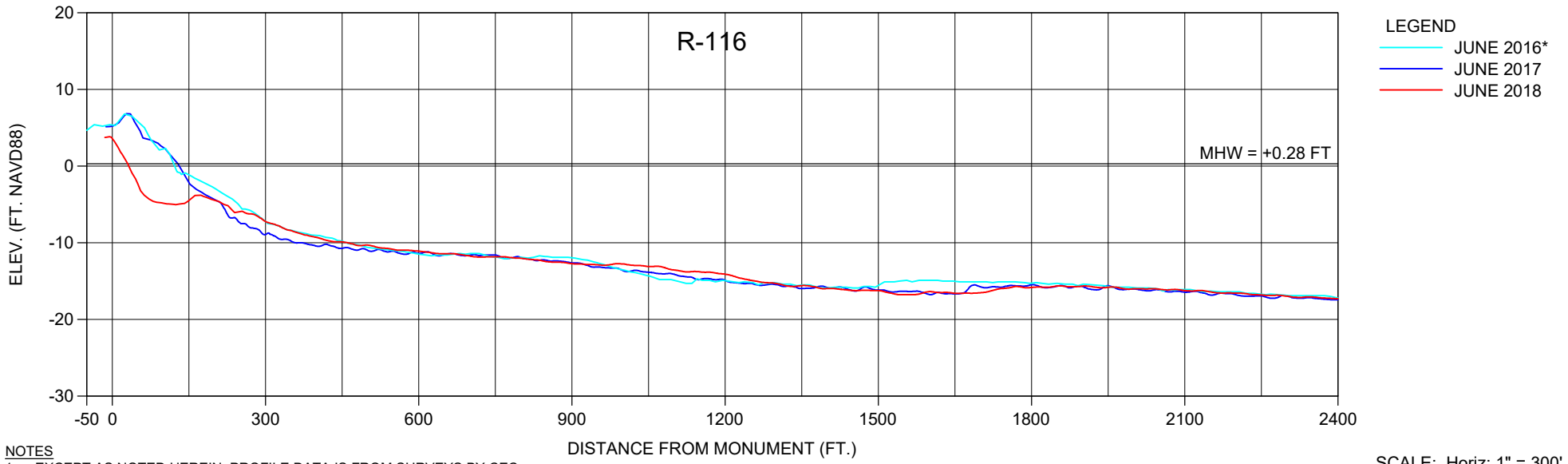
DATE:	6/14/2018	SCALE:	AS SHOWN
DRAWN:	SDB	F.B.	
CHECKED:	MTP	PG.	
SEC.	TWP.	RNG.	
ACAD NO.	18030-2018 Mon-RMON.dwg		
REF. NO.	18.030		

NO.	DATE	BY	REVISION DESCRIPTION

SHEET 17
FILE NO.: 18030-R-115.5



SCALE: Horiz: 1" = 100'
Vert: 1" = 10'



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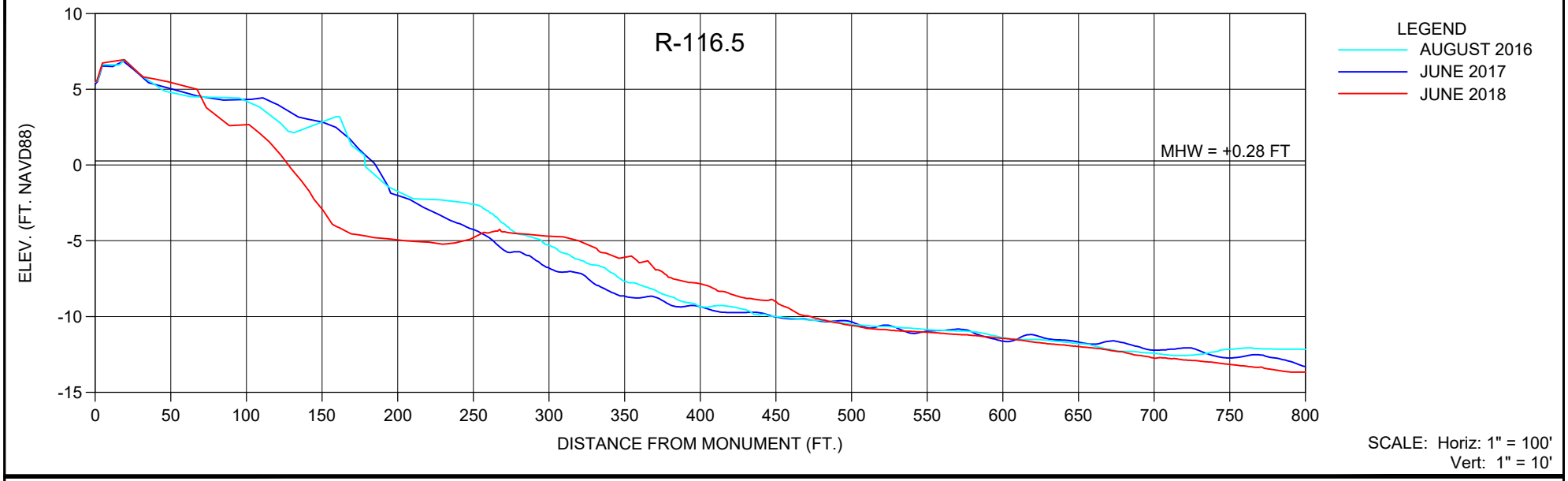
TITLE: R-116 MONITORING SURVEY

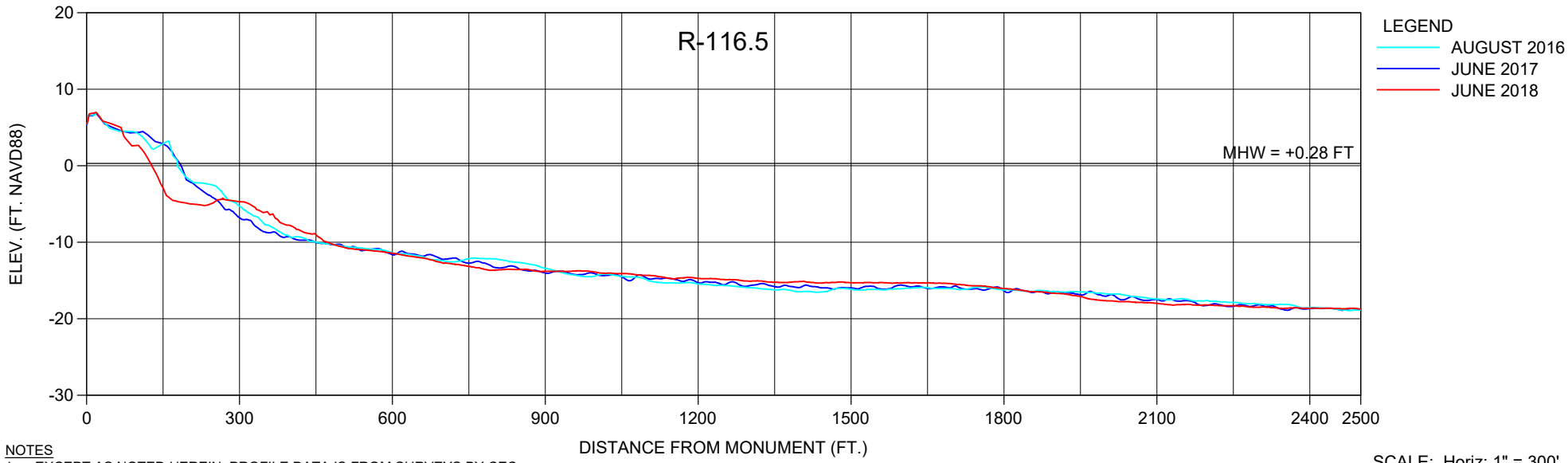
DATE: 6/14/2018	SCALE: AS SHOWN		
DRAWN: SDB	F.B.		
CHECKED: MTP	PG.		
SEC.	TWP.	RNG.	
ACAD NO. 18030-2018 Mon-RMON.dwg			
REF. NO. 18.030			

NO.	DATE	BY	REVISION DESCRIPTION

SHEET 18
FILE NO.: 18030-R-116



SCALE: Horiz: 1" = 100'
Vert: 1" = 10'



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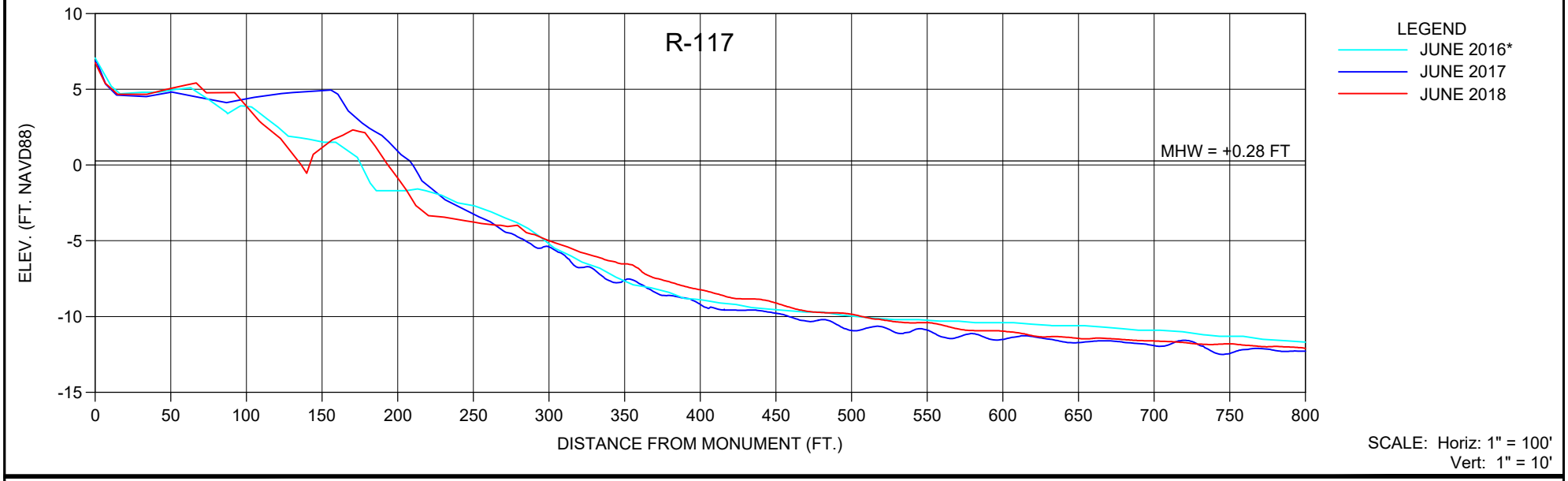
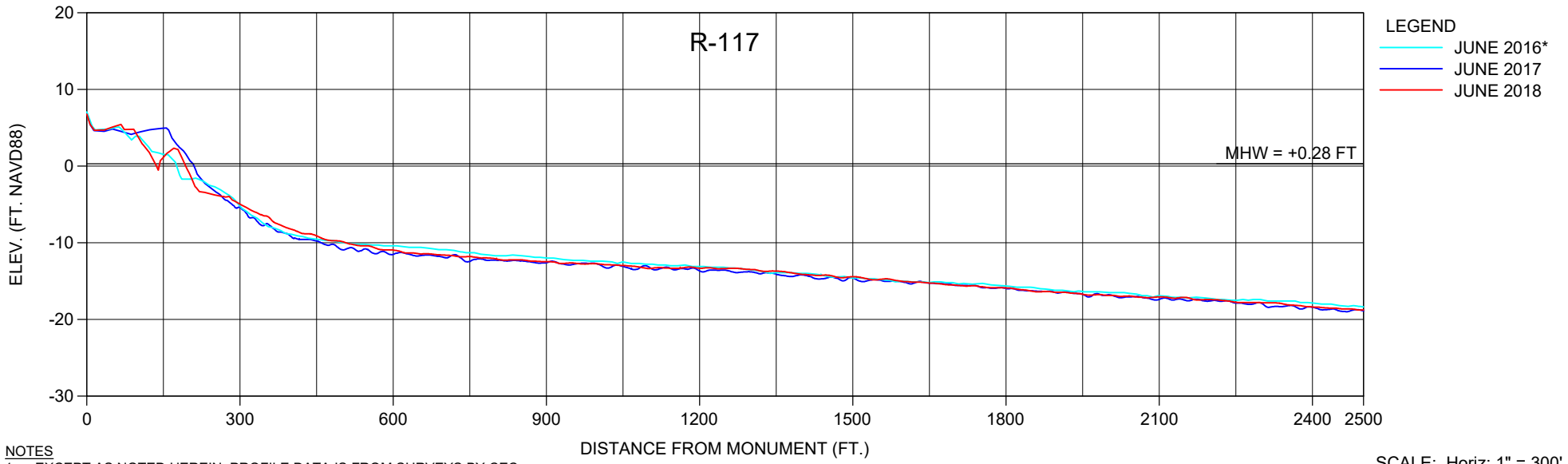
DATE:	6/14/2018	SCALE:	AS SHOWN
DRAWN:	SDB	F.B.	
CHECKED:	MTP	PG.	
SEC.	TWP.	RNG.	
ACAD NO.	18030-2018 Mon-RMON.dwg		
REF. NO.	18.030		

NO.	DATE	BY	REVISION DESCRIPTION

SHEET 19
FILE NO.: 18030-R-116.5



SCALE: Horiz: 1" = 100'
Vert: 1" = 10'



SCALE: Horiz: 1" = 300'
Vert: 1" = 20'

NOTES
1. EXCEPT AS NOTED HEREIN, PROFILE DATA IS FROM SURVEYS BY CEC.
2. *PROFILE DATA PROVIDED BY CB&I.

FILE NO.: 18030-R-117 SHEET 20

COASTAL ENGINEERING CONSULTANTS INC.
A CECI GROUP COMPANY
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3106 SOUTH HORSESHOE DRIVE
NAPLES, FLORIDA 34104

CIVIL ENGINEERING
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COASTAL ENGINEERING
ENVIRONMENTAL
PLANNING SERVICES

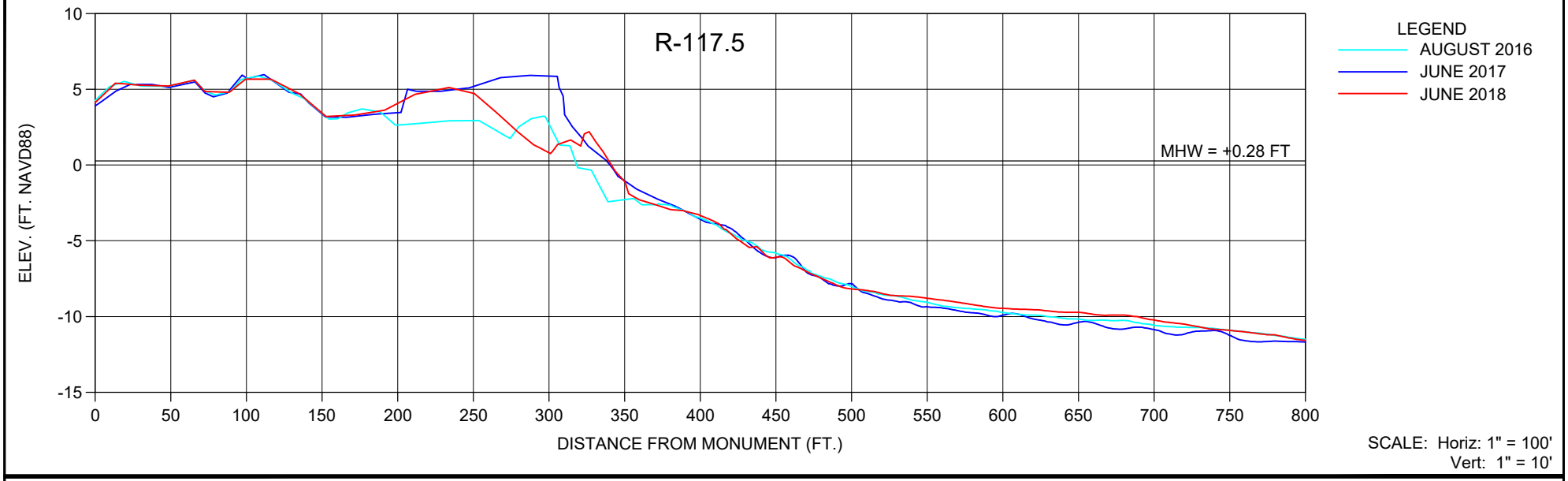
PHONE: (239)643-2324
FAX: (239)643-1143
www.coastalengineering.com
E-Mail: engcollier@cecifl.com

CLIENT: LEE COUNTY

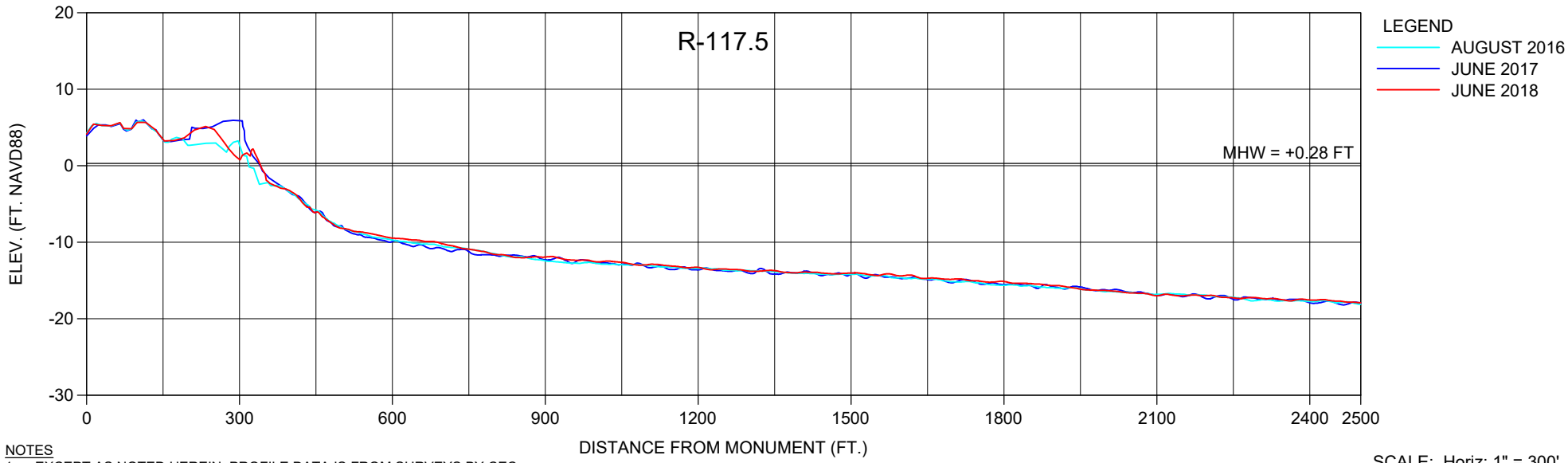
TITLE: R-117 MONITORING SURVEY

DATE: 6/14/2018	SCALE: AS SHOWN		
DRAWN: SDB	F.B.		
CHECKED: MTP	PG.		
SEC.	TWP.	RNG.	
ACAD NO. 18030-2018 Mon-RMON.dwg			
REF. NO. 18.030			

NO.	DATE	BY	REVISION DESCRIPTION



SCALE: Horiz: 1" = 100'
Vert: 1" = 10'



SCALE: Horiz: 1" = 300'
Vert: 1" = 20'

NOTES
1. EXCEPT AS NOTED HEREIN, PROFILE DATA IS FROM SURVEYS BY CEC.
2. *PROFILE DATA PROVIDED BY CB&I.

FILE NO.: 18030-R-117.5 SHEET 1 OF 1

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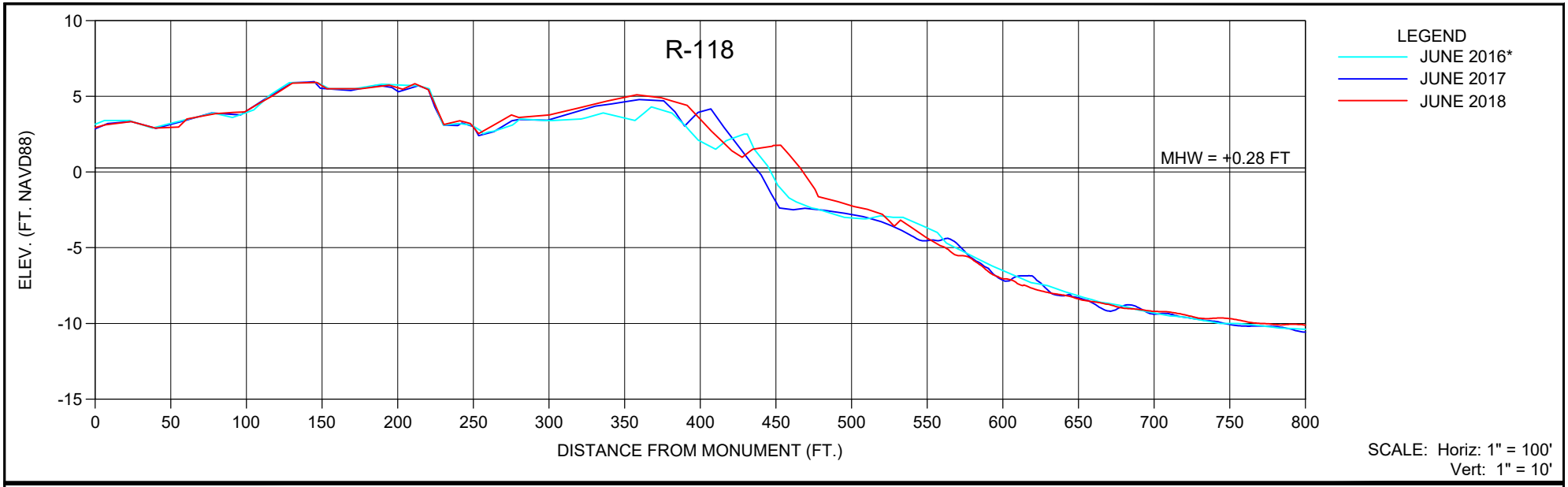
E-Mail: engcollier@cecifl.com

CLIENT: LEE COUNTY

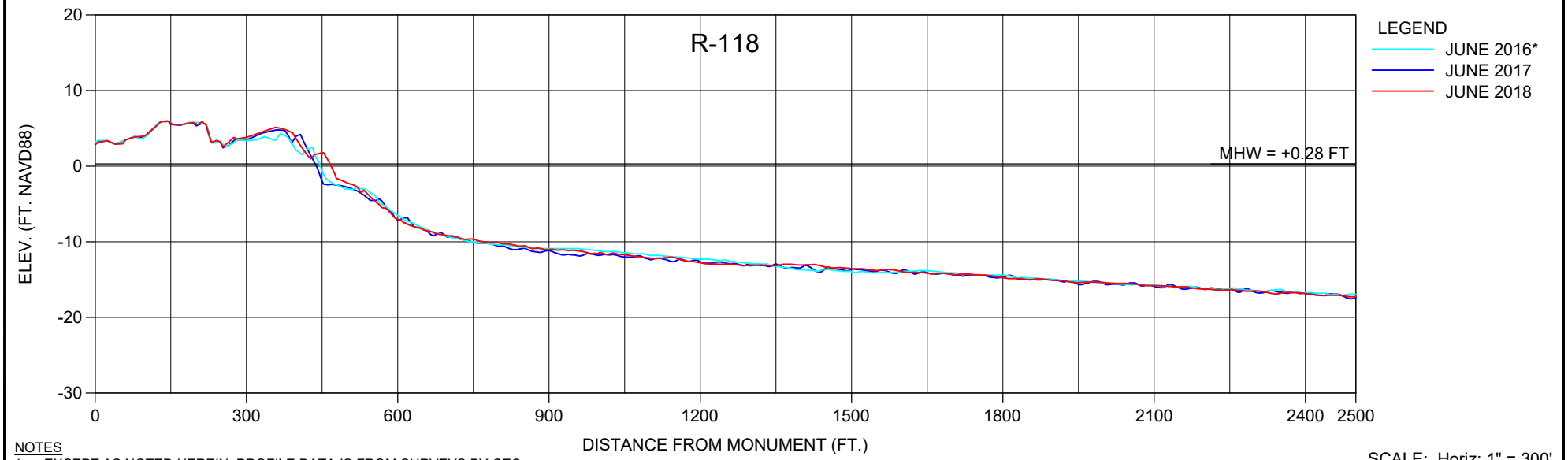
TITLE: R-117.5 MONITORING SURVEY

DATE:	6/14/2018	SCALE:	AS SHOWN
DRAWN:	SDB	F.B.	
CHECKED:	MTP	PG.	
SEC.	TWP.	RNG.	
ACAD NO.	18030-2018 Mon-RMON.dwg		
REF. NO.	18.030		

NO.	DATE	BY	REVISION DESCRIPTION



SCALE: Horiz: 1" = 100'
Vert: 1" = 10'



SCALE: Horiz: 1" = 300'
Vert: 1" = 20'

NOTES
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2. *PROFILE DATA PROVIDED BY CB&I.

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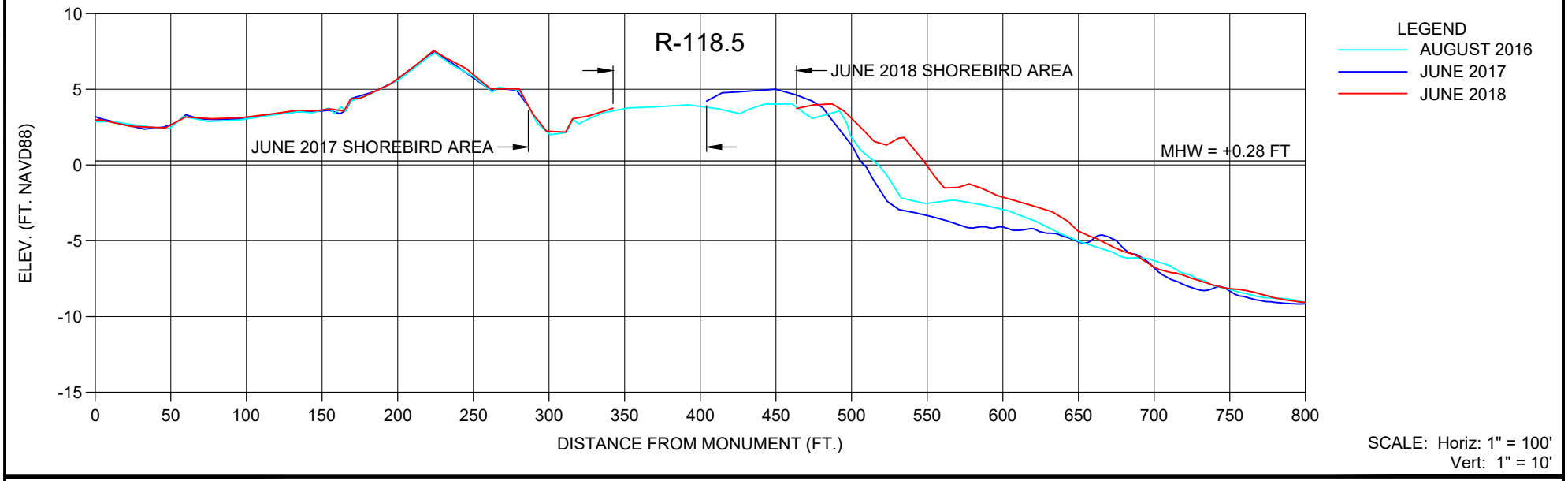
FILE NO.: 18030-R-118
SHEET 22

CLIENT: LEE COUNTY

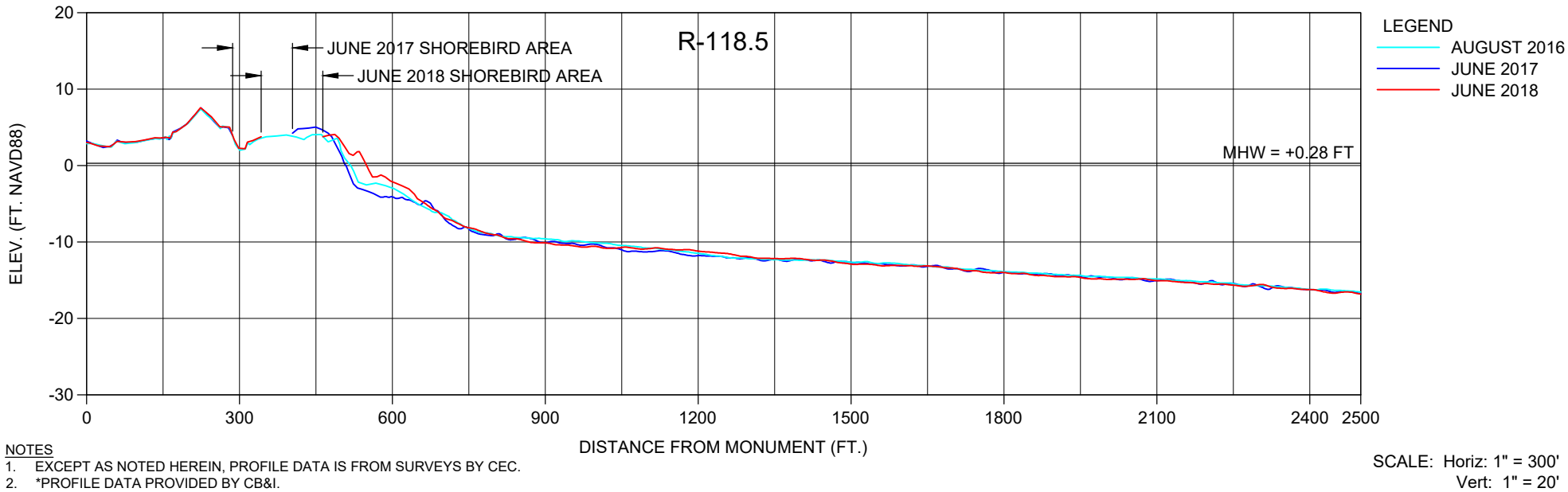
TITLE: R-118 MONITORING SURVEY

DATE:	6/14/2018	SCALE:	AS SHOWN
DRAWN:	SDB	F.B.	
CHECKED:	MTP	PG.	
SEC.	TWP.	RNG.	
ACAD NO.	18030-2018 Mon-RMON.dwg		
REF. NO.	18.030		

NO.	DATE	BY	REVISION DESCRIPTION



SCALE: Horiz: 1" = 100'
Vert: 1" = 10'



SCALE: Horiz: 1" = 300'
Vert: 1" = 20'

NOTES
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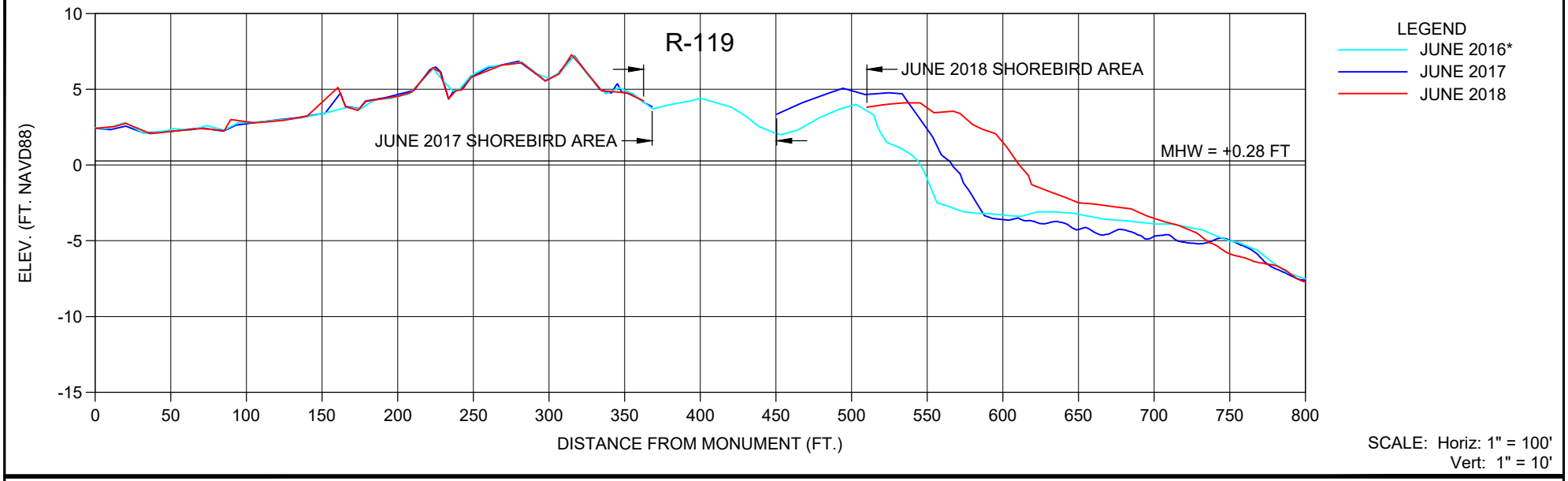
CLIENT: LEE COUNTY

TITLE: R-118.5 MONITORING SURVEY

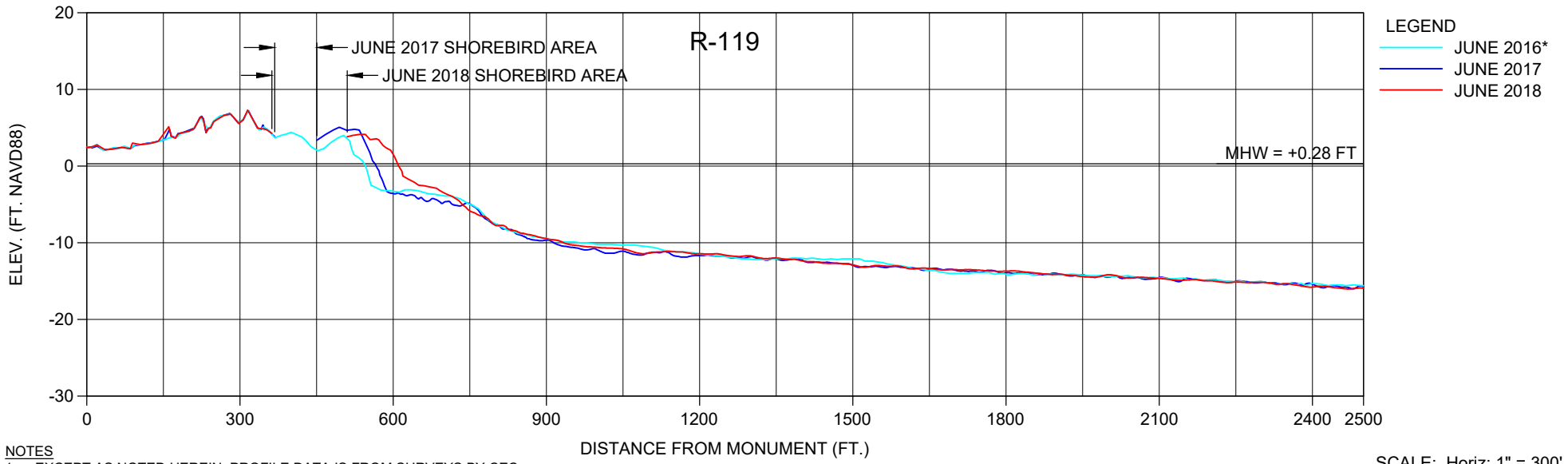
DATE:	6/14/2018	SCALE:	AS SHOWN
DRAWN:	SDB	F.B.	
CHECKED:	MTP	PG.	
SEC.	TWP.	RNG.	
ACAD NO.	18030-2018 Mon-RMON.dwg		
REF. NO.	18.030		

NO.	DATE	BY	REVISION DESCRIPTION

SHEET 23
FILE NO.: 18030-R-118.5



SCALE: Horiz: 1" = 100'
Vert: 1" = 10'



SCALE: Horiz: 1" = 300'
Vert: 1" = 20'

NOTES
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2. *PROFILE DATA PROVIDED BY CB&I.

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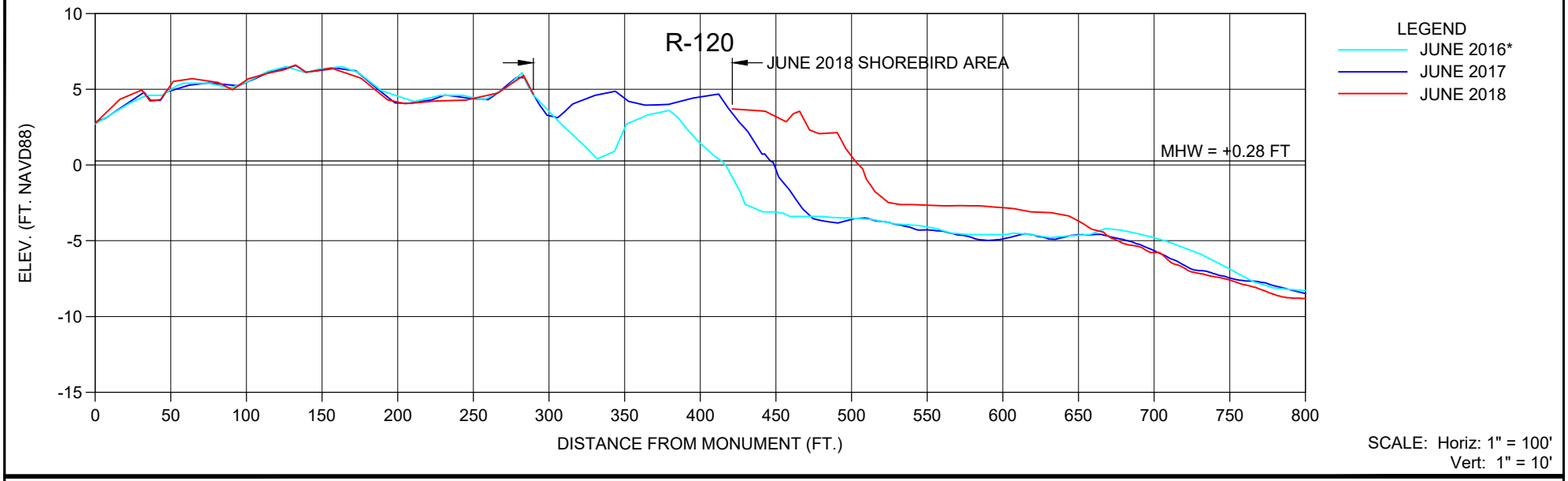
CLIENT: LEE COUNTY

TITLE: R-119 MONITORING SURVEY

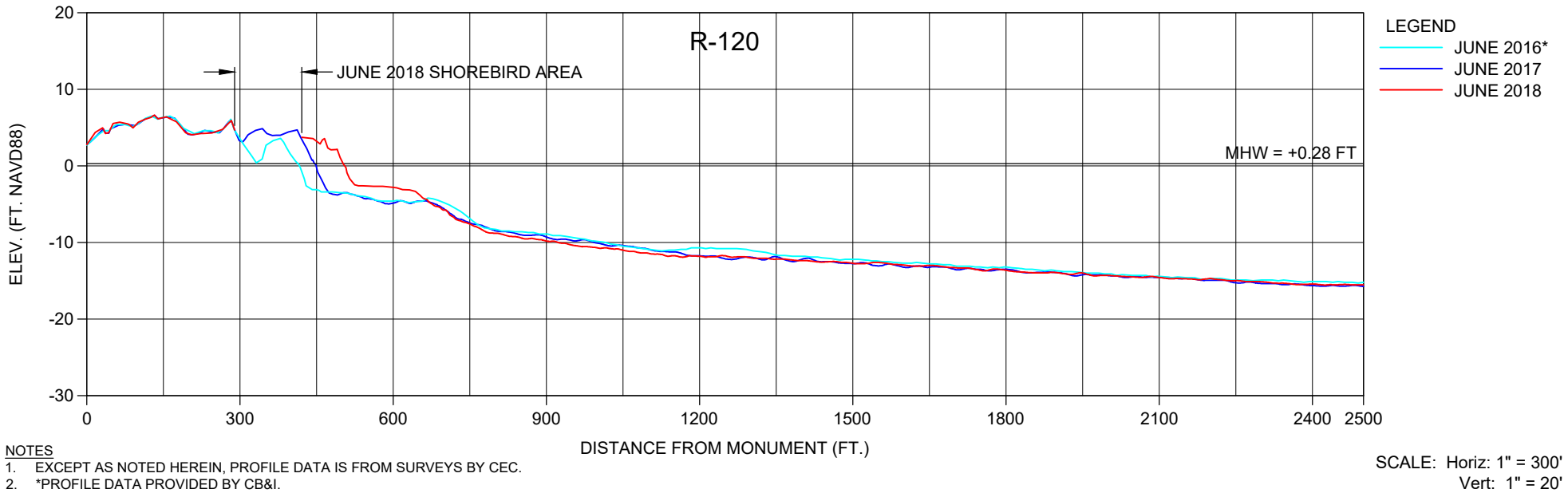
DATE:	6/14/2018	SCALE:	AS SHOWN
DRAWN:	SDB	F.B.	
CHECKED:	MTP	PG.	
SEC.	TWP.	RNG.	
ACAD NO.	18030-2018 Mon-RMON.dwg		
REF. NO.	18.030		

NO.	DATE	BY	REVISION DESCRIPTION

SHEET 24
FILE NO.: 18030-R-119



SCALE: Horiz: 1" = 100'
Vert: 1" = 10'



SCALE: Horiz: 1" = 300'
Vert: 1" = 20'

NOTES
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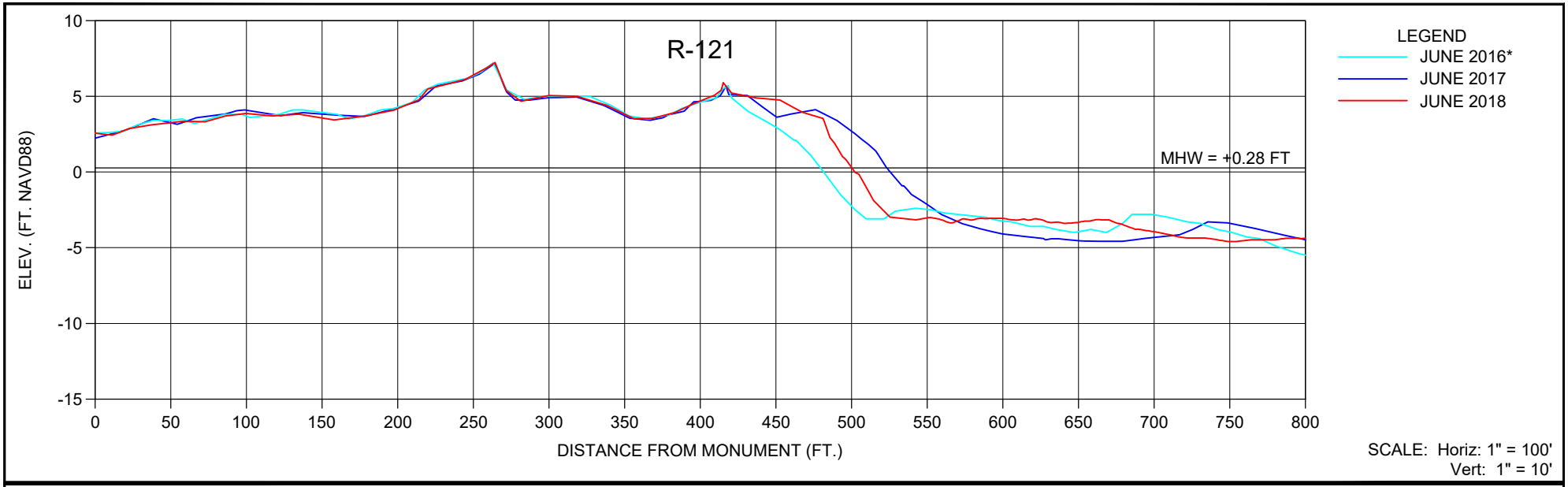
SHEET 25
FILE NO.: 18030-R-120

CLIENT: LEE COUNTY

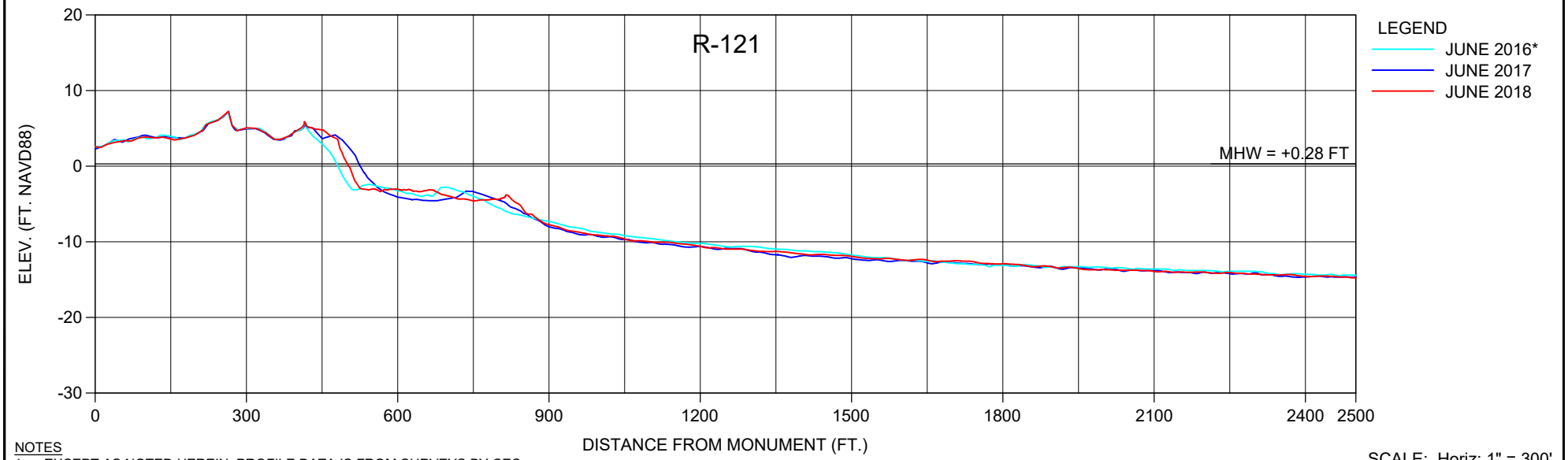
TITLE: R-120 MONITORING SURVEY

DATE: 6/14/2018	SCALE: AS SHOWN		
DRAWN: SDB	F.B.		
CHECKED: MTP	PG.		
SEC.	TWP.	RNG.	
ACAD NO. 18030-2018 Mon-RMON.dwg			
REF. NO. 18.030			

NO.	DATE	BY	REVISION DESCRIPTION



SCALE: Horiz: 1" = 100'
Vert: 1" = 10'



SCALE: Horiz: 1" = 300'
Vert: 1" = 20'

NOTES
1. EXCEPT AS NOTED HEREIN, PROFILE DATA IS FROM SURVEYS BY CEC.
2. *PROFILE DATA PROVIDED BY CB&I.

FILE NO.: 18030-R-121
SHEET 26

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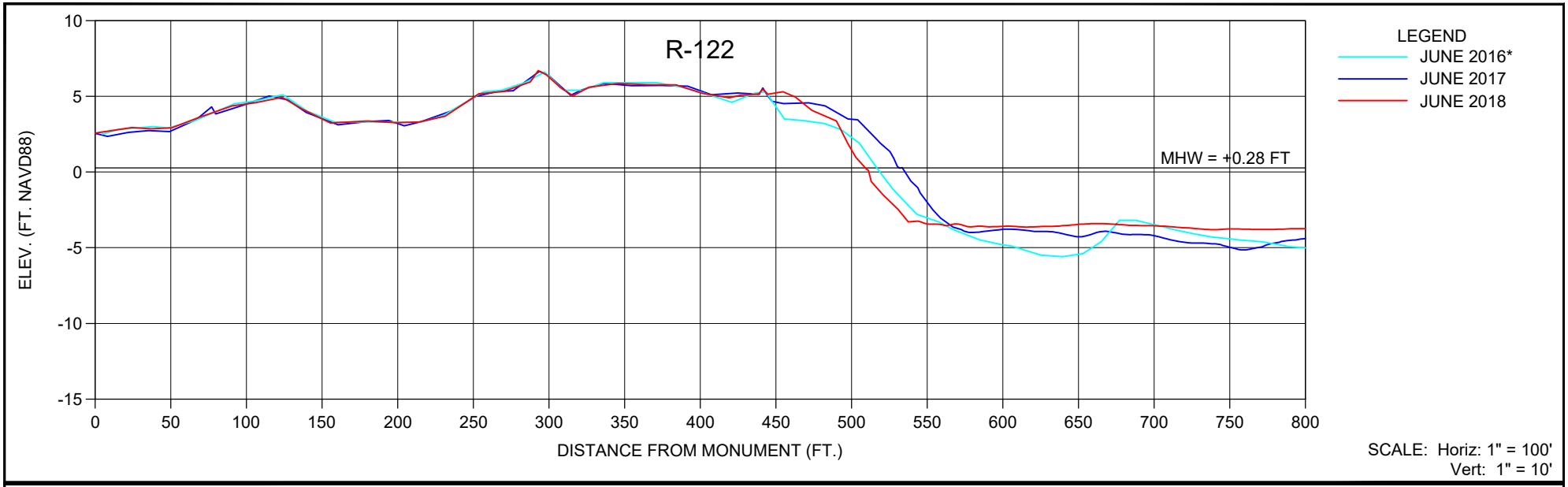
E-Mail: engcollier@cecifl.com

CLIENT: LEE COUNTY

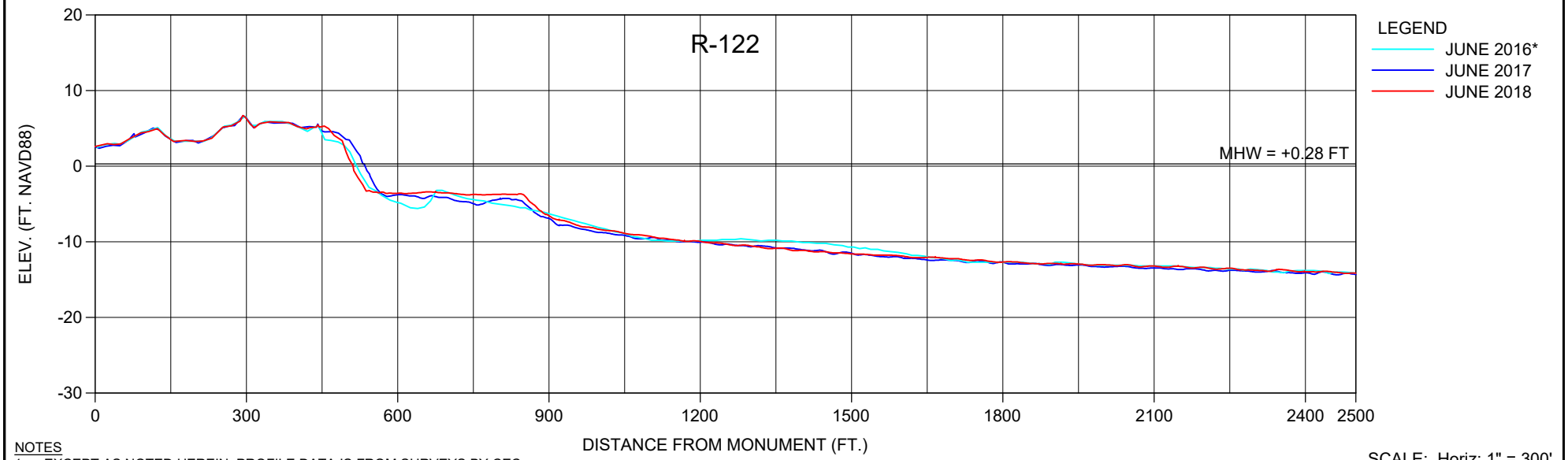
TITLE: R-121 MONITORING SURVEY

DATE:	6/14/2018	SCALE:	AS SHOWN
DRAWN:	SDB	F.B.	
CHECKED:	MTP	PG.	
SEC.	TWP.	RNG.	
ACAD NO.	18030-2018 Mon-RMON.dwg		
REF. NO.	18.030		

NO.	DATE	BY	REVISION DESCRIPTION



SCALE: Horiz: 1" = 100'
Vert: 1" = 10'



SCALE: Horiz: 1" = 300'
Vert: 1" = 20'

NOTES
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2. *PROFILE DATA PROVIDED BY CB&I.

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CLIENT: LEE COUNTY

TITLE: R-122 MONITORING SURVEY

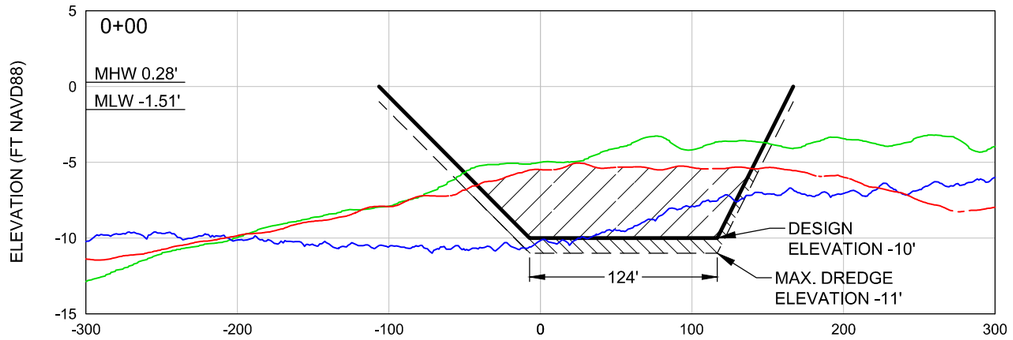
DATE: 6/14/2018	SCALE: AS SHOWN		
DRAWN: SDB	F.B.		
CHECKED: MTP	PG.		
SEC.	TWP.	RNG.	
ACAD NO. 18030-2018 Mon-RMON.dwg			
REF. NO. 18.030			

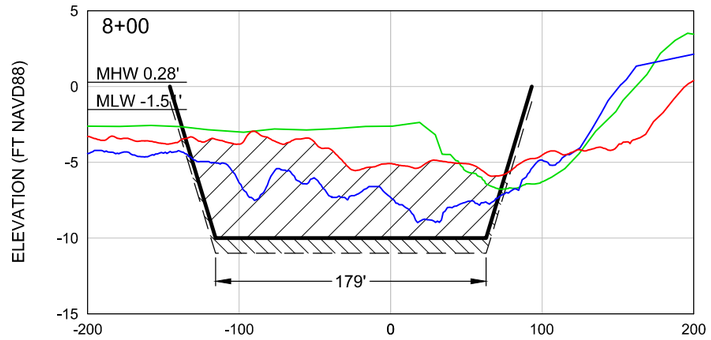
NO.	DATE	BY	REVISION DESCRIPTION

SHEET 27
FILE NO.: 18030-R-122

APPENDIX 3

BLIND PASS AND EBB SHOAL CROSS SECTIONS





LEGEND:

= FEB. 2017 SURVEY

= JUNE 2017 SURVEY

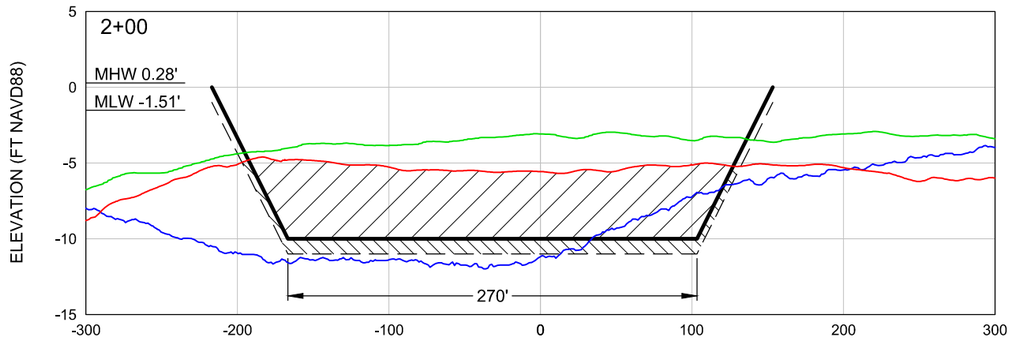
= JUNE 2018 SURVEY

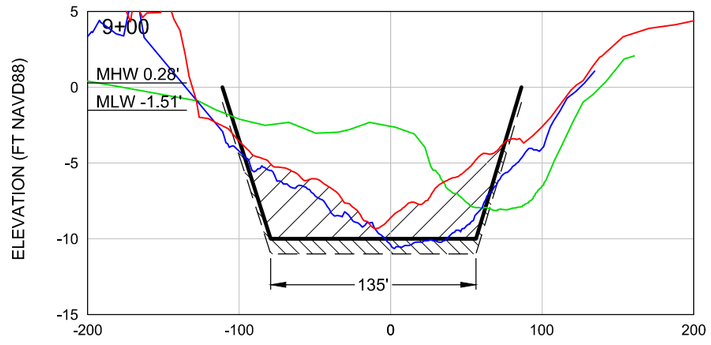
= DESIGN DREDGE AREA

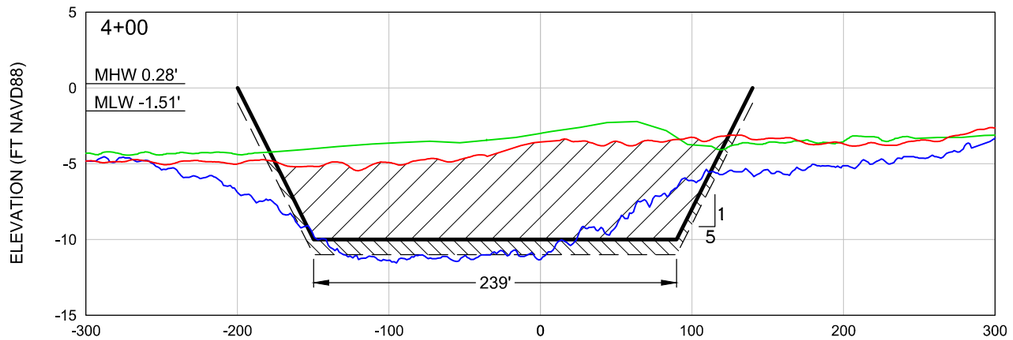
= OVERDREDGE AREA

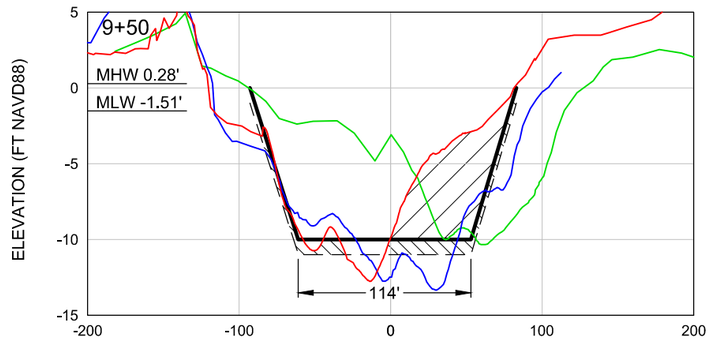
SCALE:

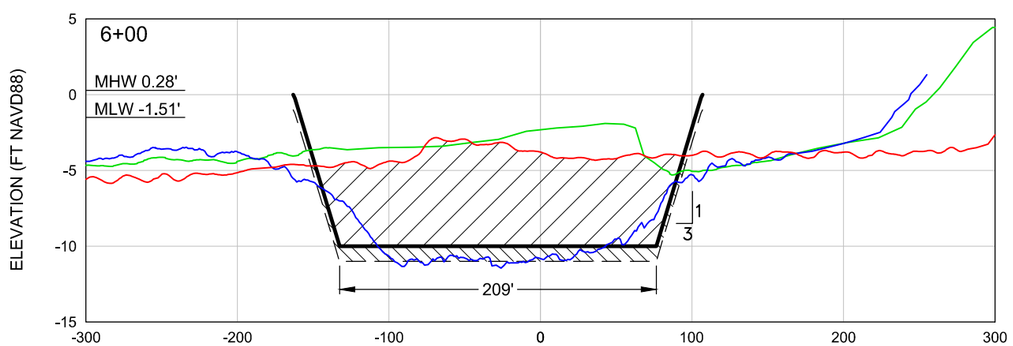
H: 1" = 100'
V: 1" = 10'

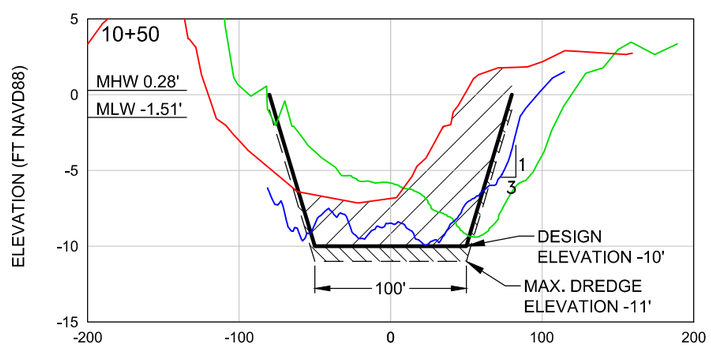












DISTANCE FROM SURVEY BASELINE (FT)

DISTANCE FROM SURVEY BASELINE (FT)

NO.	DATE	BY	REVISION DESCRIPTION

DATE: 6/14/2018
SCALE: AS NOTED
DRAWN: SDB
F.B.
CHECKED: MTP
P.G.
SEC.
TWP.
RNG.
ACAD NO. 18030-2018 Mon-PASS-XSECT.dwg
REF. NO. 18.030

CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

TITLE: BLIND PASS RESTORATION
CROSS SECTIONS
STA. 0+00 TO 12+00

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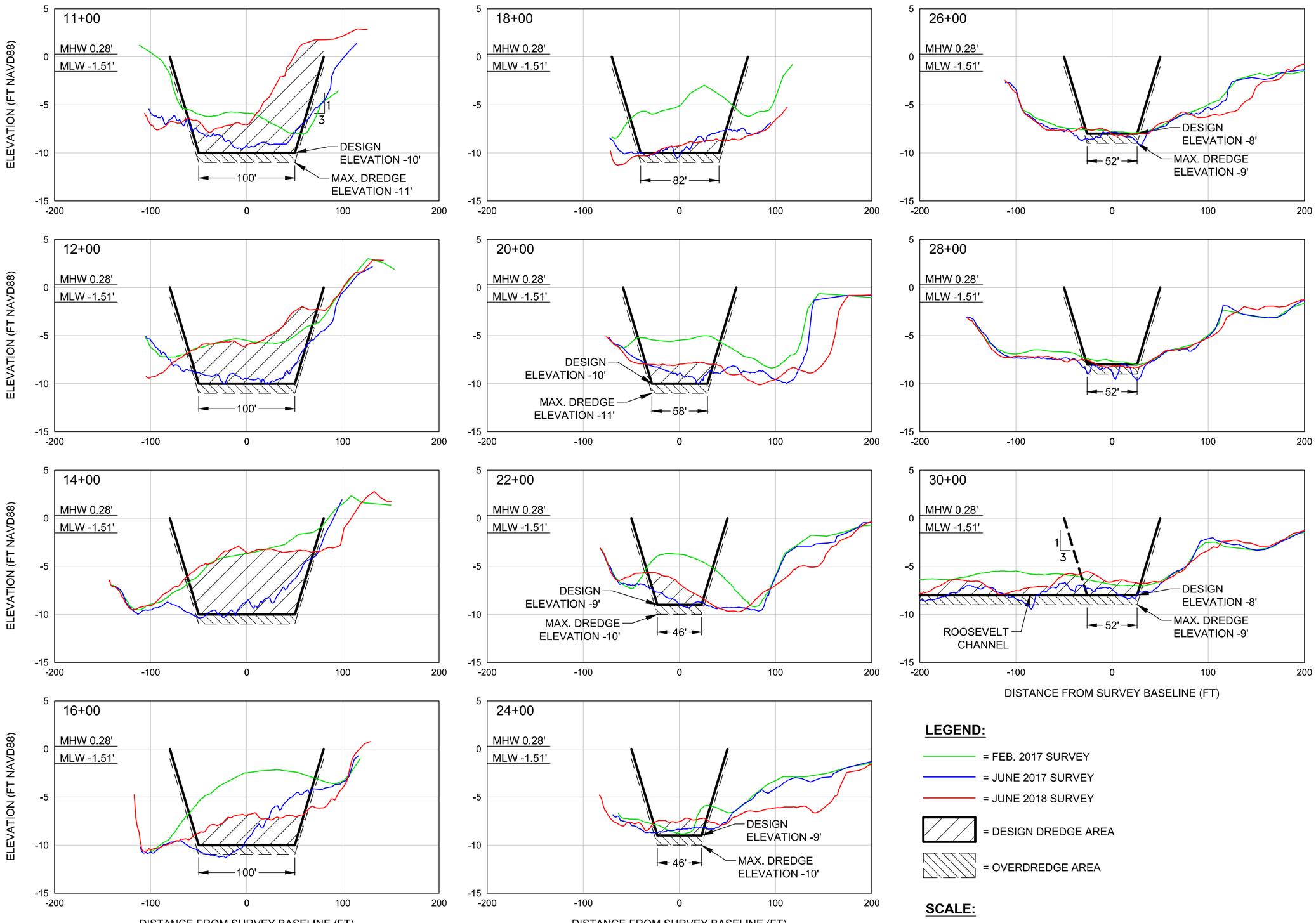
www.coastalengineering.com
E-Mail: info@cecifl.com
COASTAL & MARINE ENGINEERING
ENVIRONMENTAL & GEOLOGICAL SERVICES
LAND & MARINE SURVEY AND MAPPING

SHEET 1
FILE NO.: 18030-XS-1



LEGEND:

- = FEB. 2017 SURVEY
- = JUNE 2017 SURVEY
- = JUNE 2018 SURVEY
- = DESIGN DREDGE AREA
- = OVERDREDGE AREA

SCALE:

H: 1" = 100'
V: 1" = 10'

NO.	DATE	BY	REVISION DESCRIPTION

DATE: 6/14/2018
SCALE: AS NOTED
DRAWN: SDB
F.B.
CHECKED: MTP
PG.
SEC.
TWP.
RNG.
ACAD NO. 18030-2018 Mon-PASS-XSECT.dwg
REF. NO. 18.030

CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

TITLE: BLIND PASS RESTORATION
CROSS SECTIONS
STA. 14+00 TO 34+00

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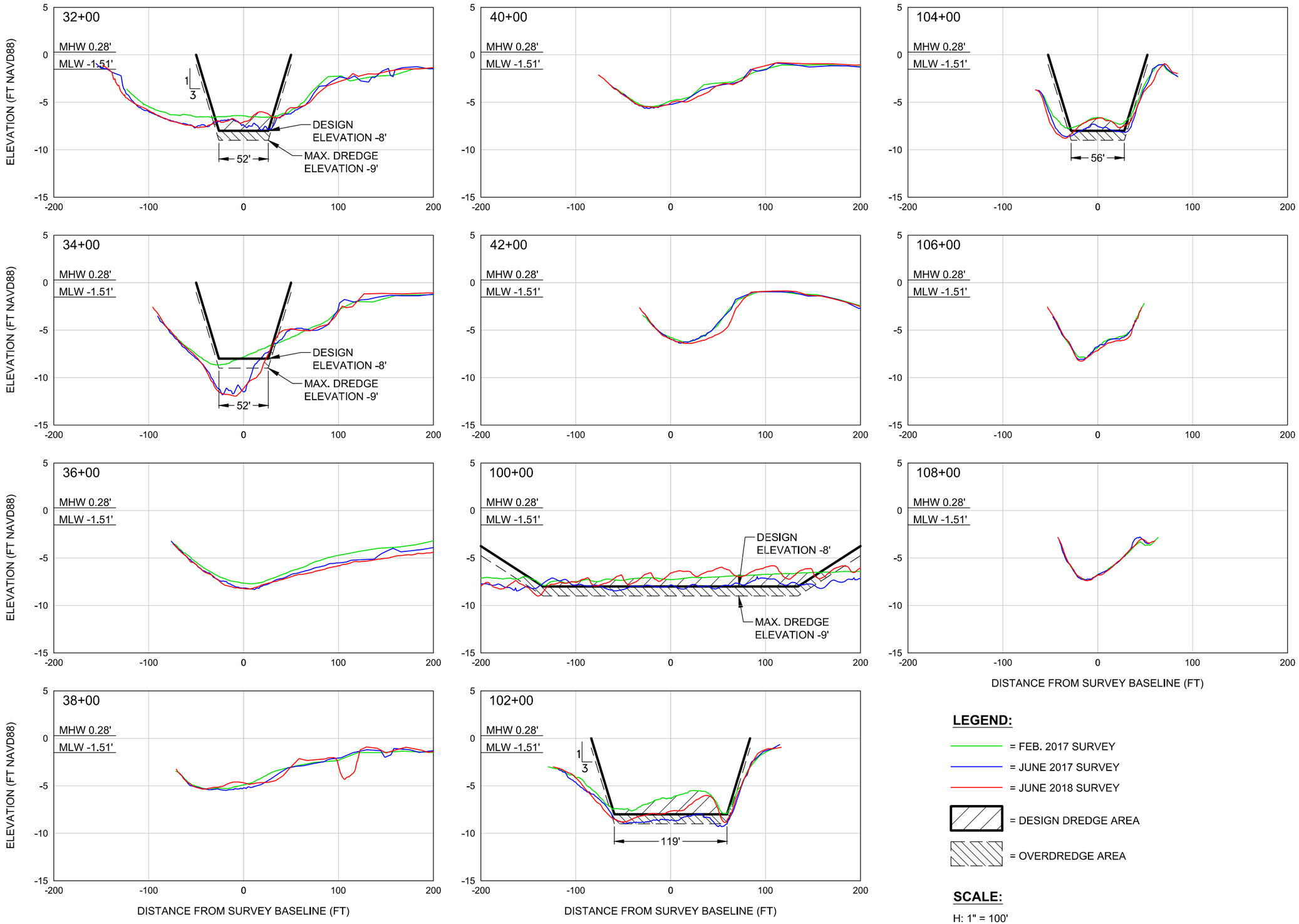
NAPLES, FLORIDA 34104

SHEET 2
FILE NO.: 18030-XS-2



LEGEND:

= FEB. 2017 SURVEY

= JUNE 2017 SURVEY

= JUNE 2018 SURVEY

= DESIGN DREDGE AREA

= OVERDREDGE AREA

SCALE:

H: 1" = 100'
V: 1" = 10'

NO.	DATE	BY	REVISION DESCRIPTION

DATE: 6/14/2018
SCALE: AS NOTED
DRAWN: SDB
F.B.
CHECKED: MTP
PG.
SEC.
TWP.
RNG.
ACAD NO. 18030-2018 Mon-PASS-XSECT.dwg
REF. NO. 18.030

CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

TITLE: BLIND PASS RESTORATION
CROSS SECTIONS STA 36+00 TO 42+00
ROOSEVELT STA 100+00 TO 108+00

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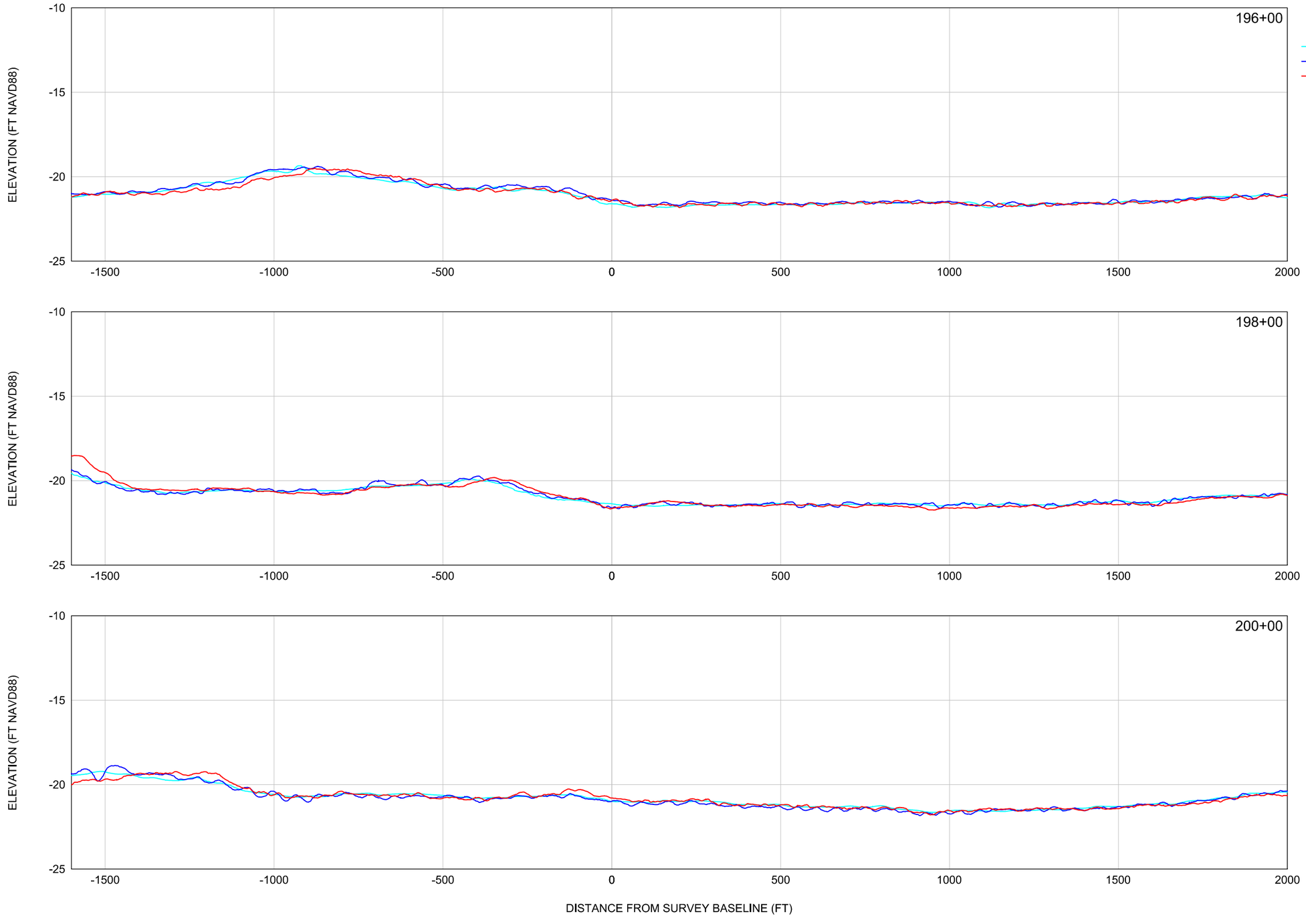
SHEET 3
FILE NO.: 18030-XS-3



NO.	DATE	BY	REVISION DESCRIPTION

DATE: 6/14/2018
SCALE: AS NOTED
DRAWN: SDB
F.B.
CHECKED: MTP
PG.
SEC.
TWP.
RNG.
ACAD NO. 18030-2018 Mon-PASS-XSECT.dwg
REF. NO. 18.030

CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

TITLE:
BLIND PASS RESTORATION
CROSS SECTIONS
EBB SHOAL: STA 196+00 TO 200+00

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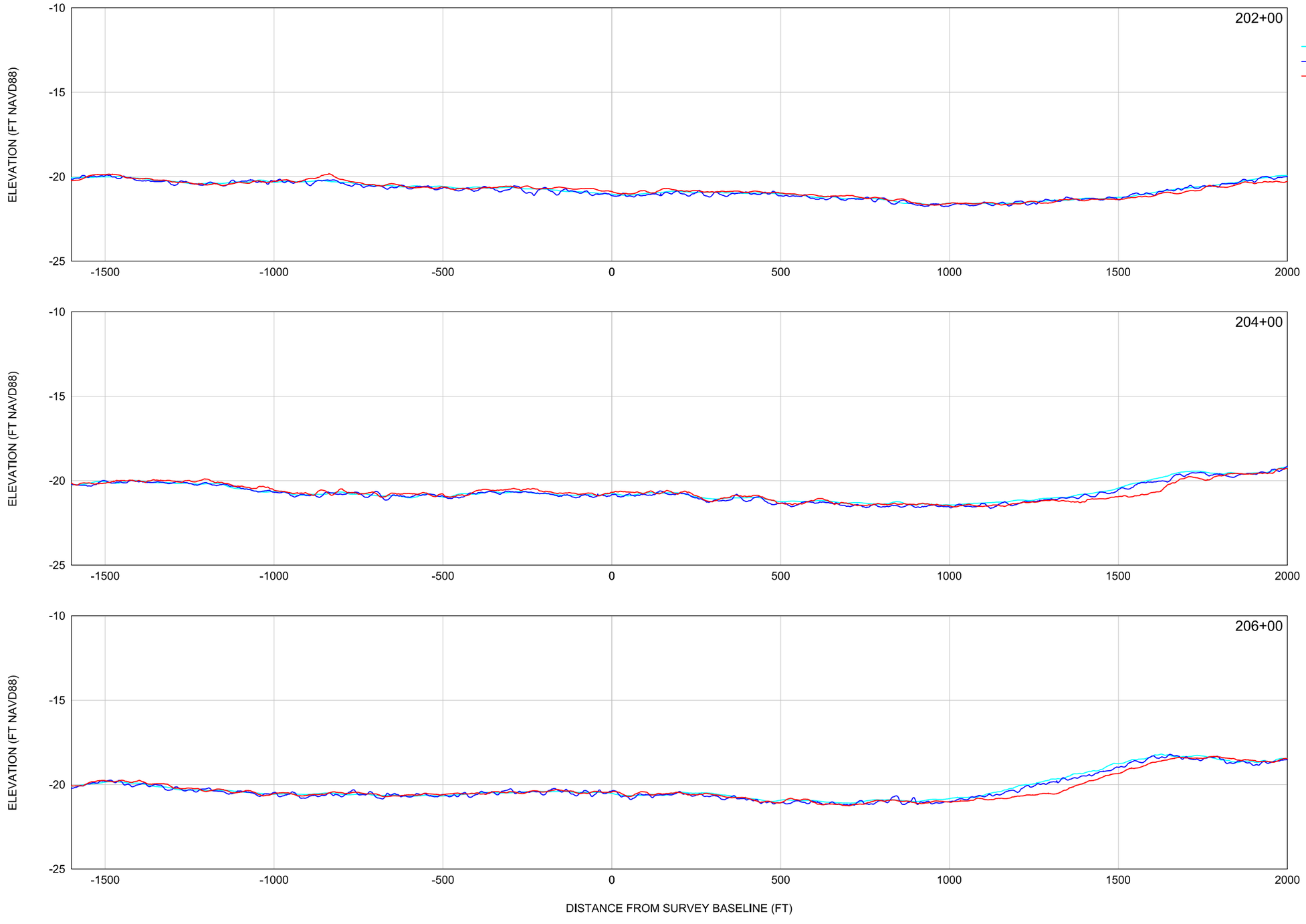
SHEET 4
FILE NO.: 18030-XS-4



NO.	DATE	BY	REVISION DESCRIPTION

DATE: 6/14/2018
SCALE: AS NOTED
DRAWN: SDB
F.B.
CHECKED: MTP
PG.
SEC.
TWP.
RNG.
ACAD NO. 18030-2018 Mon-PASS-XSECT.dwg
REF. NO. 18.030

CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

TITLE:
BLIND PASS RESTORATION
CROSS SECTIONS
EBB SHOAL: STA 202+00 TO 206+00

COASTAL ENGINEERING CONSULTANTS INC.
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Serving Florida Since 1977
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NAPLES, FLORIDA 34104
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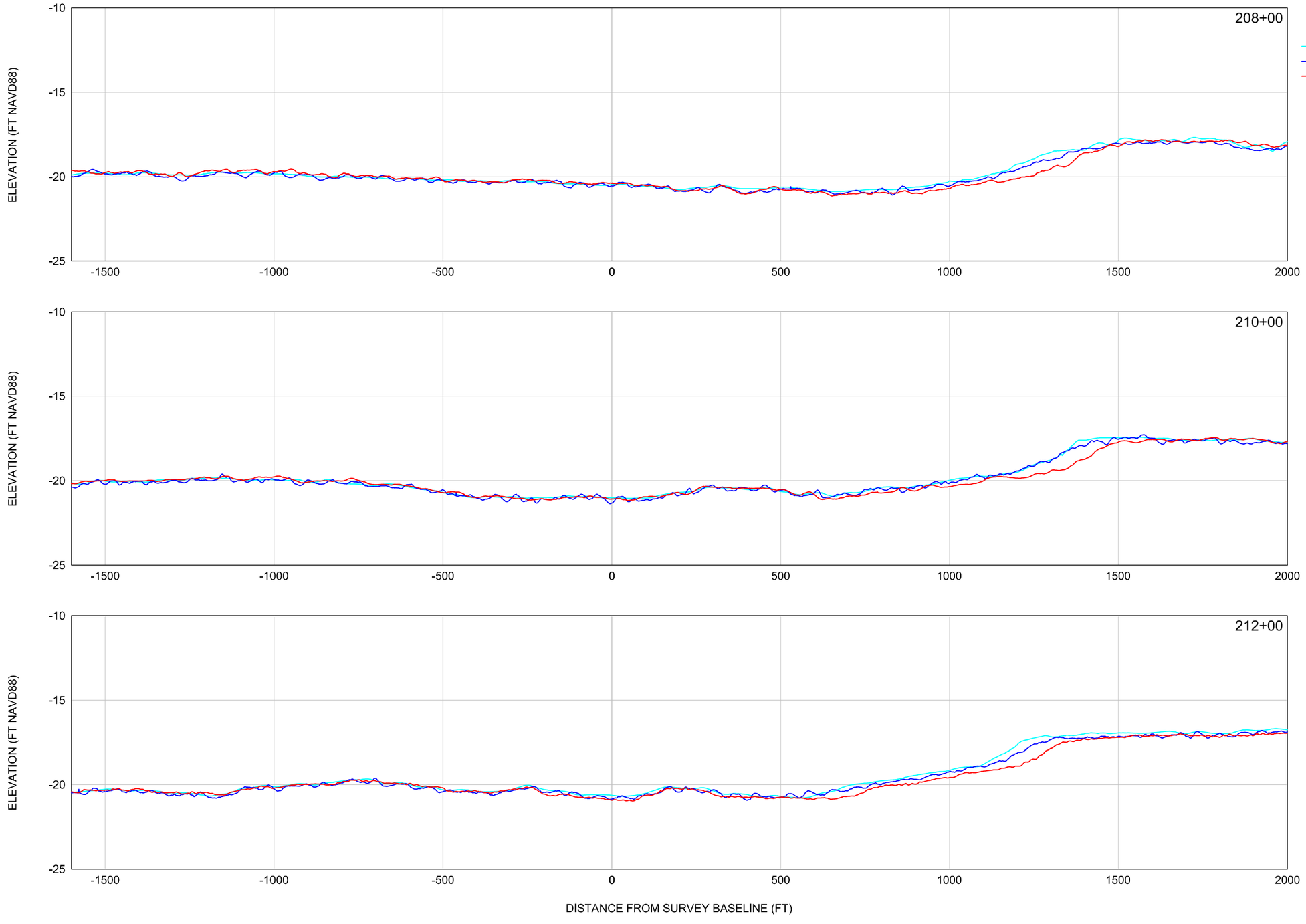
ENVIRONMENTAL & GEOLOGICAL SERVICES
LAND & MARINE SURVEY AND MAPPING
PHONE: (239)643-2324
FAX: (239)643-1143
www.coastalengineering.com
E-Mail: info@cecifl.com

SHEET 5
FILE NO.: 18030-XS-5



NO.	DATE	BY	REVISION DESCRIPTION

DATE: 6/14/2018 SCALE: AS NOTED
DRAWN: SDB F.B.
CHECKED: MTP PG.
SEC. TWP. RNG.
ACAD NO. 18030-2018 Mon-PASS-XSECT.dwg
REF. NO. 18.030

CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

TITLE: BLIND PASS RESTORATION
CROSS SECTIONS
EBB SHOAL: STA 208+00 TO 212+00

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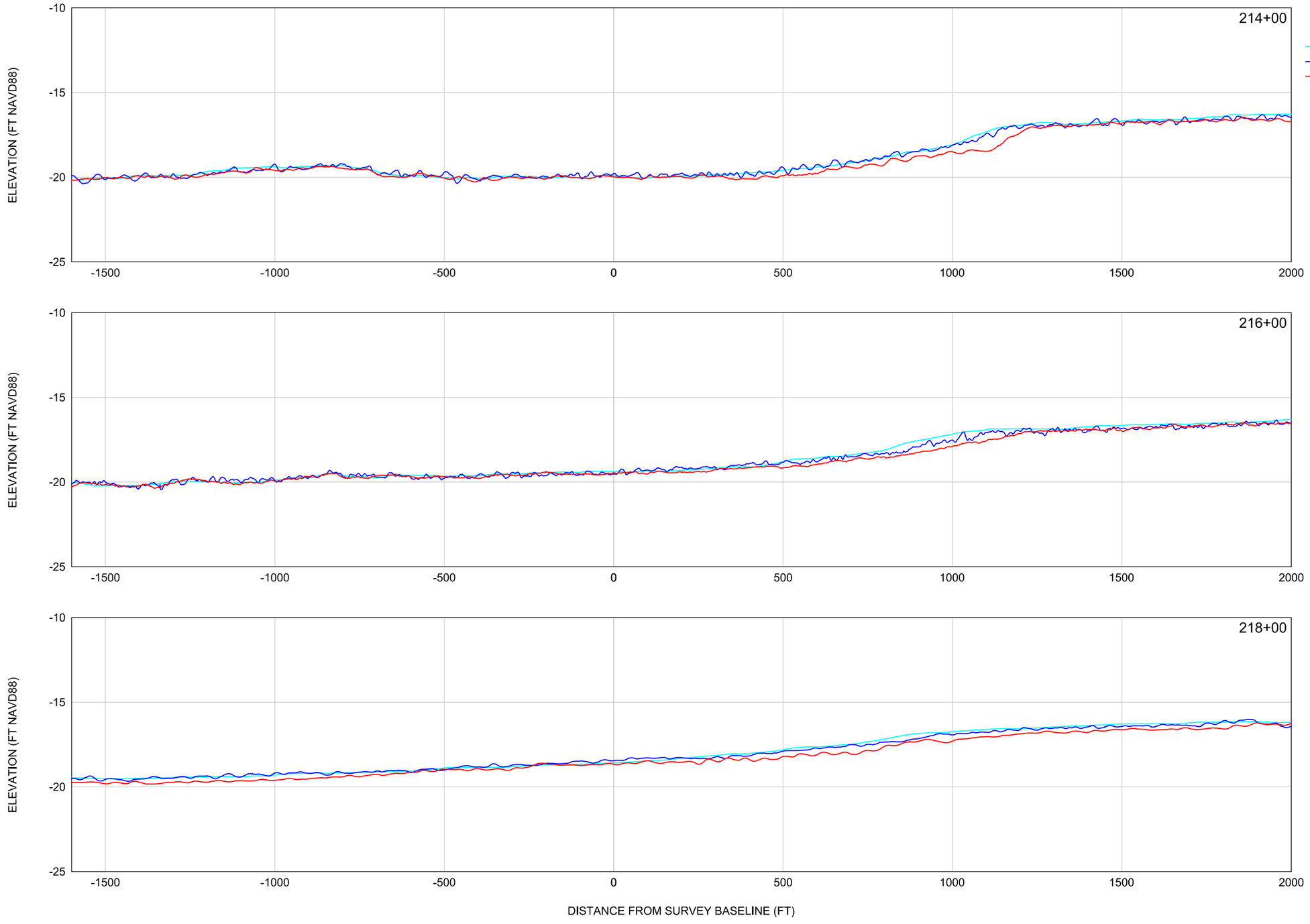
SHEET 6
FILE NO.: 18030-XS-6



NO.	DATE	BY	REVISION DESCRIPTION

DATE: 6/14/2018
SCALE: AS NOTED
DRAWN: SDB
F.B.
CHECKED: MTP
PG.
SEC.
TWP.
RNG.
ACAD NO. 18030-2018 Mon-PASS-XSECT.dwg
REF. NO. 18.030

CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

TITLE: BLIND PASS RESTORATION
CROSS SECTIONS
EBB SHOAL: STA 214+00 TO 218+00

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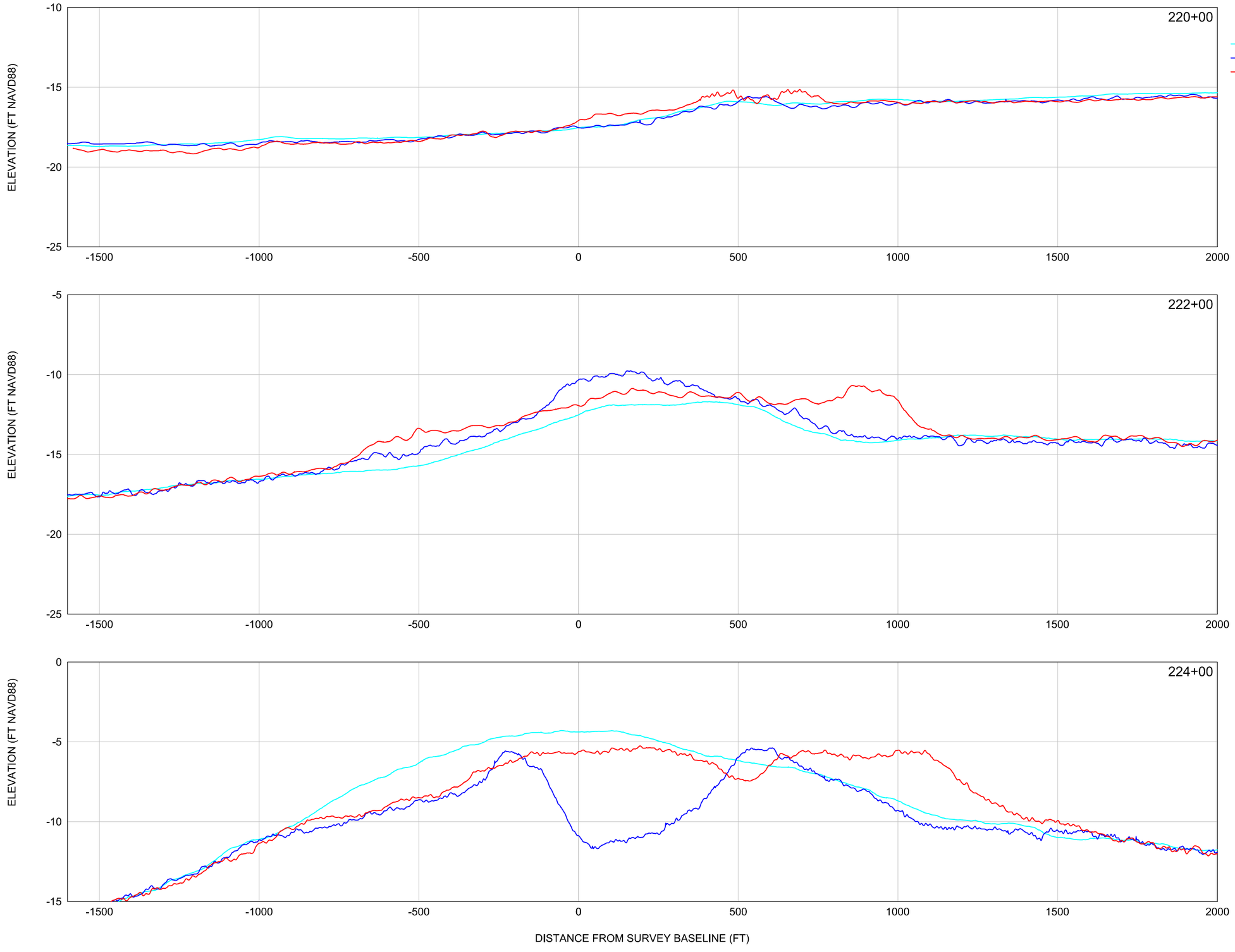
SHEET 7
FILE NO.: 18030-XS-7



NO.	DATE	BY	REVISION DESCRIPTION

DATE: 6/14/2018
DRAWN: SDB
CHECKED: MTP
SEC. TWP. RNG.
ACAD NO. 18030-2018 Mon-PASS-XSECT.dwg
REF. NO. 18.030
SCALE: AS NOTED
F.B.
PG.

CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

TITLE:
BLIND PASS RESTORATION
CROSS SECTIONS
EBB SHOAL: STA 220+00 TO 224+00

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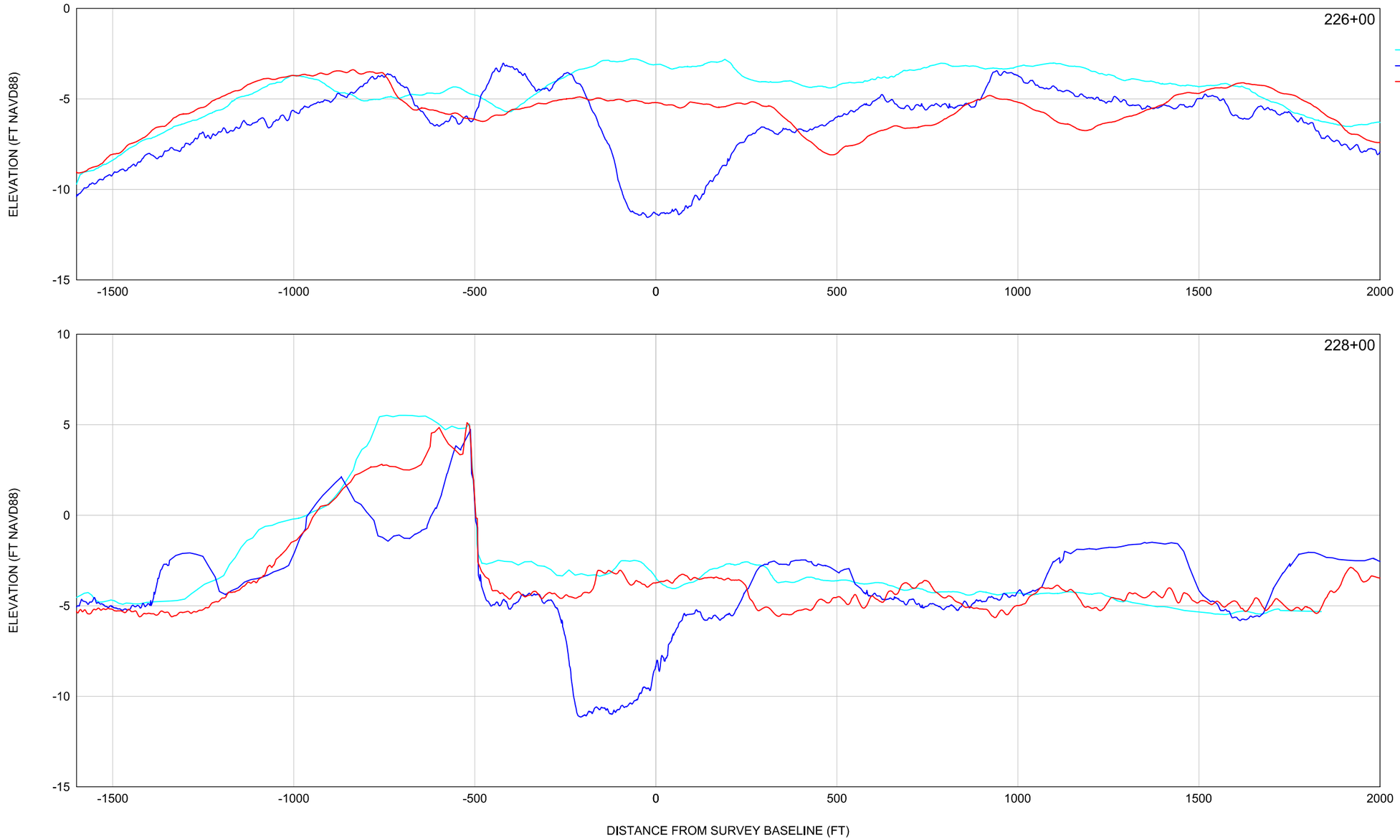
SHEET 8
FILE NO.: 18030-XS-8



NO.	DATE	BY	REVISION DESCRIPTION

DATE: 6/14/2018
DRAWN: SDB
CHECKED: MTP
SEC. TWP. RNG.
ACAD NO. 18030-2018 Mon-PASS-XSECT.dwg
REF. NO. 18.030
SCALE: AS NOTED
F.B.
PG.

CLIENT: LEE COUNTY BOARD OF COMMISSIONERS

TITLE: BLIND PASS RESTORATION
CROSS SECTIONS
EBB SHOAL: STA 226+00 TO 228+00

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SHEET 9
FILE NO.: 18030-XS-9