

DRAFT POND SITING REPORT



**Florida Department of Transportation
District Five**

**S.R. 401 Bridge Replacement PD&E Study
Brevard County, Florida**

**Financial Project Identification (FPID) Number: 444787-1-22-01
ETDM Number: 14397**

May 2022

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by FDOT pursuant to 23 U.S.C. & 327 and Memorandum of Understanding dated 12/14/2016 and executed by Federal Highway Administration and FDOT.

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EXECUTIVE SUMMARY

This Pond Siting Report is part of the Preliminary Engineering Report for the Project Development and Environmental (PD&E) Study for the SR 401 (Cape Road) Bridge Replacement from SR 528 (A1A) interchange to Port Canaveral in Brevard County, Florida. See **Exhibit 1** in **Appendix A** for a location map.

The three bascule bridges span the Barge Canal and connect Port Canaveral to SR 528. On the northbound bridge three 12-foot-wide lanes are provided with limited shoulders. The center southbound bridge provides two, 12-foot-wide lanes with limited shoulders. There is a second southbound bridge with a single 18-foot-wide lane along with a 8'-7" inside shoulder. The preferred alternative includes a high-level fixed bridge with three 12-foot-wide lanes and 10-foot-wide shoulders in each direction. Typical sections of the existing and proposed bridges are in **Appendix B**.

Identified in this report are the existing drainage systems within the proposed project limits, available stormwater management facility options that comply with FDOT and environmental permitting criteria, and the pond site selected. Located in Brevard County, Florida, the environmental permitting agencies include the St. John's River Water Management District (SJRWMD) and United States Army Corps of Engineers (USACE).

For the north basin, linear dry detention or dry retention swales are recommended depending on the seasonal high-water elevations determined by ongoing Geotech analysis. For the south basin, infield wet detention ponds 12A and 12B are recommended to be modified after installation under the SR 528 project. The major receiving water bodies for these systems include the Barge Canal and the Banana Lagoon River (BLR) located south and north of S.R. 528.

TABLE 1
POND SITING MATRIX

Basin	North	North	North	South
Pond Alt.	1	2	3	1
Pond Site Area (ac)	Linear swales	Linear swales	3.34	2.42
Pond Type	Dry Detention or Retention	Dry Detention or Retention	Privately Owned Wet Detention Pond Modification	Wet Detention
Right-of-Way Needs	Uses existing roadway R/W	Uses existing roadway R/W	Requires easement from Port	Uses existing roadway R/W
Satisfies Hydraulic Requirements	Yes	Yes	Yes	Yes
Wetland Impacts	Low	Low	Low	Low
Airport Proximity	>5 miles	>5 miles	>5 miles	>5 miles
Species Impact	Low	Low	Low	N/A
Contamination Impact	Low	Low	Low	Low
Cultural Impact	Low	Low	Low	Low
Utility Impact	Low	Low	Low	Low
Proximity to Outfall	Excellent	Good	Excellent	Excellent
Ranking	1	2	3	1

1. INTRODUCTION

A Project Development and Environment (PD&E) study is being conducted in accordance with the Florida Department of Transportation requirements for the SR 401 bascule bridges at Port Canaveral, in Brevard County. The purpose of this report is to document the evaluation of pond site alternatives for the proposed improvements.

2. PROJECT DESCRIPTION

The Florida Department of Transportation (FDOT), District Five, is conducting a Project Development and Environment (PD&E) study to evaluate replacement alternatives for the three existing bascule bridges with either a new medium-level movable bridge or a new high-level fixed span bridge over the Canaveral Barge Canal, in Brevard County, Florida *Exhibit 1* in *Appendix A* shows the project location map.

The S.R. 401 bridges over the Canaveral Barge Canal provide a vital connection to Port Canaveral's operations including major cruise and cargo terminals. The bridges also serve as the primary access to Cape Canaveral Air Force Station, Naval Ordnance Test Unit, facilities for the U.S. Coast Guard, and access to Space Florida operations.

The existing 354-foot single-leaf bascule bridges consists of three separate structures accommodating southbound and northbound traffic with three travel lanes in each direction:

- Bridge No. 700030 (southbound), constructed in 1963
- Bridge No. 700031 (southbound), constructed in 1963
- Bridge No. 7000117 (northbound), constructed in 1972

Based on bridge inspections conducted in September 2019, the existing S.R. 401 bridges have been classified as functionally obsolete. Bridge improvements will provide additional capacity to address future traffic growth resulting from strategic expansion plans for Port Canaveral and military stakeholders in the immediate area. The PD&E study will assess navigational needs from the surrounding community to assist in determining the appropriate replacement structure for the bridge.

3. SITE INFORMATION

3.1 Topography

The existing ground is primarily level beyond the bridge approaches and sloping to a high point on the bridge.

3.2 Land Use Description

North of the bridges, the project area to the east is bordered by Port Canaveral facilities, Charles M. Rowland Drive and parking lots. To the west the project is bordered by the shoreline revetment, and an existing pond.

South of the bridges, the project area to the east is bordered by Mullet Road and marina facilities. To the west the project is bordered by Mullet Road and marsh land.

4. EXISTING DRAINAGE CHARACTERISTICS

4.1 Existing Drainage Basins

The bridges' midspans drain through grated decks directly into the Barge Canal. The southernmost two spans and approaches of bridges 700117 and 700030 drain to storm sewer inlets that discharge to the SR 528 ramp infield ponds. The southernmost two spans of Bridge 700031 drain down the slope pavement directly into the Barge Canal. The northernmost two spans of Bridge 700031 drain down the slope pavement directly into the Barge Canal.

The SR 401 roadways south of the bridges drain to the SR 528 ramp infield ponds. These infield ponds are connected to an existing mitigation pond in the loop ramp located in the southeast quadrant of the SR 528/SR 401 interchange. This pond connects to a smaller mitigation pond between the on-ramp and off-ramp which discharges to surface waters contiguous to the Banana River Lagoon (BRL). The mitigation areas provide no stormwater treatment but serve to reduce freshwater discharges to the BRL.

The SR 401 roadways north of the bridges drain in the following manner. A small portion of the southbound lanes drain directly down the side slope to the barge canal or to the Port Canaveral West Pond. Further north a shoulder gutter system collects runoff and delivers flow to the Port Canaveral interconnected pond system. This system consists of three ponds known as the West Pond, North Pond and South Pond. The West Pond is located west of SR 401 and the others are located east of SR 401. They share a common weir elevation of 7.0 feet and treat the first flush of runoff. The other bridges and approaches drain north to storm sewer systems which deliver flow to a roadside ditch on the eastside of SR 401 which drains southward to the Barge Canal. A minor amount of runoff from the SR 401 embankments sheet flows directly into the BRL.

4.2 Receiving Waterbody

The primary receiving water bodies are the Barge Canal, the BRL located south of S.R. 528 and the BRL located north of S.R. 528. The Barge Canal, which includes the Turning Basins, has a direct connection to the Atlantic Ocean. The BRL south of S.R. 528 is an Aquatic Preserve and an Outstanding Florida Water (OFW) and has waterbody identification number (WBID) 3057B. The BRL north of barge canal and S.R. 528 causeway has WBID 3057C. The BRL waters are impaired for nutrients (P and N) with seagrass as a parameter of concern. The BRL is a "negative estuary", characterized by low freshwater inflows and poor flushing resulting in long water residence time.

4.3 FEMA Floodplain

The Barge Canal has a 100-yr flood elevation of 7 to 9 feet. In the Banana River the 100-yr flood elevation of 3 feet. **See Exhibit 4 in Appendix A.**

4.4 Sea Level Rise

Anticipated storm management facilities are recommended to be designed for existing tailwater conditions. Although sea level rise is assessed to determine the vulnerability of flooding over the design life of a project, the stormwater management facilities are recommended to be designed according to current tailwater conditions to ensure proper functionality. However, stormwater management facilities are recommended to be modified in the future as needed to address evident sea level rise. This approach results in a better functioning system until sea level rise occurs.

4.5 Existing Permits

Existing permits will need to be modified in areas where improvements are proposed. The following is a list of existing FDEP permits in the project area:

- **Permit No. 88466-1 New Barge Canal Bridges Rehabilitation**

This permit was issued in 2003 for the FDOT District 5 to make improvements to the existing bridges. Temporary pavement used to shift traffic during construction was left in place for future use to aid maintenance. Stormwater treatment of the new pavement is provided through infiltration in the basins of the infield areas located south of the bridges. This permit may require a modification for the preferred alternative.

- **Permit No. 186093-5 Canaveral Port Authority West Pond**

A wet detention pond was permitted to allow modifications to the existing ponds. This system consists of three ponds known as the West Pond, North Pond and South Pond. The West Pond is located west of S.R. 401 and the others are located east of S.R. 401. They share a common weir elevation of 7.0 feet and treat the first flush of runoff. It is likely this pond could be modified to satisfy treatment requirements for the project if cooperation can be garnered from the Port.

- **Permit No. 23918-1 Canaveral Port Authority**

Located on northeast side of project area at Charles M Rowland Dr. this permit was issued in 1992 and was to add a new 4-lane roadway alignment and removal of an existing 4-lane roadway. Permit is within the project area and may require a modification depending on proposed improvements.

- **Permit No. 23919-1 WTB Navigation Relief, Grouper Road Realignment**

Located on the south side of the bridges including the interchange with S.R. 528. This permit was issued in 1992 and was to add a new 4-lane roadway alignment and removal of an existing 4-lane roadway. Stormwater treatment is provided by use of retention in roadway ditches utilizing ditch blocks. Permit is most likely outside the project area.

- **Permit No. 16070-4 West Turning Basin Improvement Modification**

Located to east of bridges and S.R. 401 and most likely outside of project area.

- **Permit No. 16328-1 Port Canaveral Master Drainage Plan**

A master drainage plan was issued in 1988 for development of drainage systems throughout the port area. Most of the system has been implemented or revised.

Additionally, a US Army Corp of Engineers (USACE) permit will be required for dredge and fill activity in wetlands or surface waters. The BRL is retained by the USACE for permitting.

5. DRAINAGE DESIGN CRITERIA

The preliminary design of the proposed stormwater pond alternatives is provided with the intention of satisfying the project design criteria in accordance with the following documents:

- FDOT Drainage Manual (January 2022)
- FDOT Drainage Design Guide (January 2022)

5.1 FDOT Criteria

Pavement Hydraulics / Bridge Deck Drainage

- Keep 8 ft of the lane clear for design speed less than or equal to 55 MPH and greater than 45 MPH.
- Spread resulting from 10-year storm will not exceed one foot, three inches outside the gutter in the direction toward the front slope.
- Standard scuppers are 4 inches in diameter and spaced on 10-foot centers, unless spread calculations indicate closer spacing is required.

Stormwater Management

- Minimum 20 feet of horizontal clearance between top edge of the control elevation and the right-of-way line. Minimum 15 feet berm at a slope of 1:8 or flatter.
- At least one foot of freeboard between the maximum design stage of the pond and the inside top of berm. For linear treatment swales, the minimum freeboard is 0.5 foot.
- Half the retention volume must recover in 7 days, with the total volume available in 30 days.
- Treatment of existing untreated areas that discharge to the same receiving water body may be substituted in lieu of treating the project area where it cannot be feasibly achieved.
- Minimum permanent pool depth is six feet for wet detention ponds.

Stormwater Treatment

- Off-line retention of the first one-half inch of runoff or 1.25 inches of runoff from the impervious area, whichever is greater.
- On-line retention of an additional one-half inch of runoff from the drainage area over that volume specified for off-line treatment.
- On-line retention that provides for percolation of the runoff from the three year, one-hour storm.
- System should be designed to provide for the drawdown of the appropriate treatment volume within 72 hours.
- The retention system must provide the capacity for the appropriate treatment volume of stormwater within 72 hours following a storm event.
- Off-line detention of the first one inch of runoff or 2.5 inches of runoff from the impervious area, whichever is greater. The outfall structure shall be designed to drawdown one-half the required treatment volume specified above between 24 and 30 hours following a storm event.

6. PROPOSED STORMWATER ALTERNATIVES

6.1 Stormwater Quantity

All roadway alternatives utilize the same stormwater quantity approach. For basins with discharge that is directly connected to the Atlantic Ocean, peak discharge requirements will not be required. Discharges to the BRL will be required to meet peak requirements for the mean annual storm to reduce freshwater flows. The 25-year storm will likely not be required to meet pre-post requirements because of the tidal conditions.

The existing pavement on the south basin is currently attenuated in the SR 528 ramp infield ponds. An FDOT SR 528 improvement project (FPID No. 407402-4) is under design and permitting that will modify the existing stormwater ponds at the SR 401 interchange. The proposed improvements include converting the infield dry ponds into wet detention ponds and utilizing the existing pipe connection under SR 528 to connect to the existing mitigation pond system in the southeast quadrant. The stormwater ponds could be modified as necessary to satisfy the preferred alternative.

For the north basin, additional attenuation is not needed for those areas that drain to the Barge Canal which is directly connected to the Atlantic Ocean.

6.2 Stormwater Quality

All roadway alternatives utilize the same stormwater quality approach and include additional impervious areas that will require nutrient removal and water quality treatment per FDEP criteria. Reconstructed pavement or new pavement area will require stormwater treatment although milled and resurfaced areas will not.

6.3 North Basin

6.3.1 Alternative 1:

Alternative 1 includes the use of roadside linear dry detention or dry retention swales. The advantage of this alternative is the swale system would be contained within the proposed project limits and existing right-of-way. Ditch blocks placed in the swale will provide the treatment volume. The swale system will maintain the existing outfall at the Barge Canal. There are no anticipated wetland or environmental impacts. This the preferred alternative.

6.3.2 Alternative 2:

Similarly, Alternative 2 consists of roadside linear dry detention or dry retention swales located uphill of the proposed work area. The linear treatment system starts near the outfall point near the barge canal on the east side of SR 401 and continues north along the project limits with the length dictated by the treatment needed as seen on the proposed Drainage Maps in **Appendix C**. Treatment compensation of existing pavement would be utilized to satisfy requirements. The treatment system would be at the high end of the basin leading to better percolation. Geotechnical investigations will need to confirm the suitability of this approach. An advantage of positioning the treatment system at the high end of the basin is that flow accumulation is less for on-line systems leading to lower discharge rates over the ditch block weirs. A stormwater bypass system may be needed to carry upstream ditch flow around the linear treatment system. With this alternative, there are no anticipated wetland or environmental impacts.

6.3.3 Alternative 3:

Alternative 3 is to expand the existing pond known as West Pond. The pond is owned by the Port and appears to have additional treatment capacity. The existing weir is set at an elevation of 7 feet. The control structure has a 36" pipe that outfalls to the Barge Canal. Although the West Pond is owned by the Port and appears to have additional treatment capacity, it is not recommended to modify this pond as the Port may need it for future improvements. Coordination with the Port is necessary if this alternative is advanced.

6.4 South Basin

6.4.1 Alternative 1:

Alternative 1, is to modify the wet detention ponds to be install with the SR 528 project (FPID No. 407402-4). The proposed improvements in that project include converting the infield dry ponds at the SR 401 interchange into wet detention ponds. Existing pipe connection under SR 528 will connect the infield ponds to the existing mitigation pond system in the southeast quadrant. The stormwater pond control structure and pond side slopes would be modified as necessary to satisfy treatment and attenuation rules. In the case of needing to modify the control structure, the weir would be raised to increase treatment volumes to compensate for the additional impervious added due to the project. No other alternatives are provided for this basin.

7. RECOMMENDATIONS

For the north basin, impervious areas from the southbound lanes are recommended to be treated in the West Pond at an equal amount to existing areas. For the impervious areas from the northbound lanes, a linear treatment system is recommended to satisfy treatment requirements.

For the south basin, suggested modifications to the infield wet detention ponds from the SR 528 project are recommended.

The proposed improvements require coordination and approval from several permitting agencies including the St. Johns River Water Management District, United States Coast Guard and U.S. Army Corps of Engineers. The recommendations and conclusions within this report may be updated pending the ongoing coordination and conditions of the permits obtained from these agencies.

Appendix A - Exhibits



Exhibit 1 – Project Location



Exhibit 2 – USGS Quadrangle Map



Exhibit 3 – NRCS Soil Survey



Exhibit 4 – Flood Hazard Map

Appendix B – Typical Sections

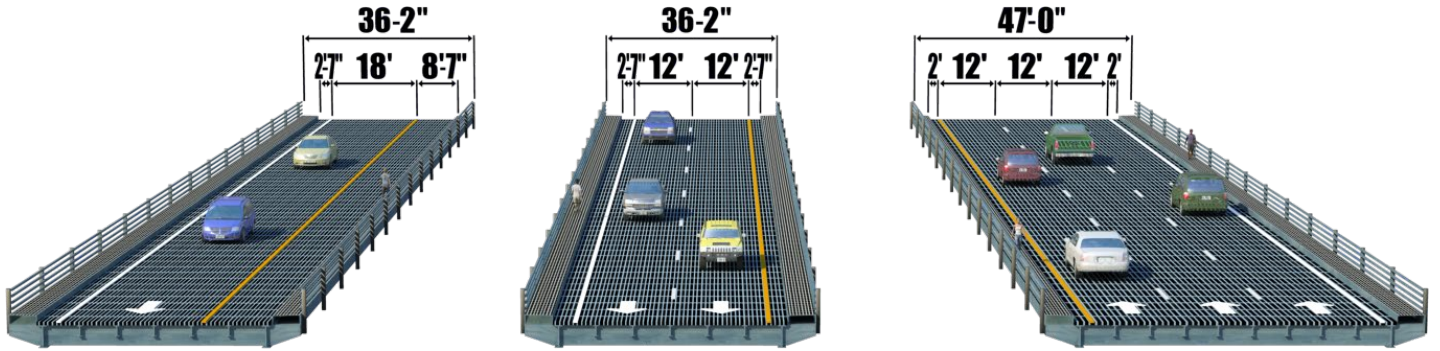
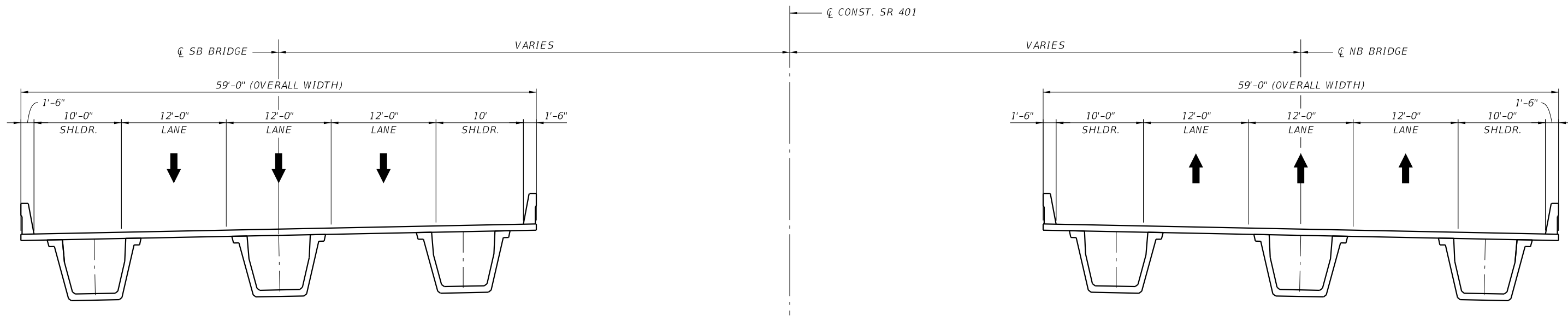


Exhibit 5
Existing Bridge Typical



BRIDGE TYPICAL SECTION

HIGH-LEVEL FIXED ALTERNATIVE

REVISIONS						SHANNON D. MARPLE, P.E. P.E. LICENSE NO. 74772 PARSONS TRANSPORTATION GROUP, INC. 201 E. PINE STREET, SUITE 900 ORLANDO, FL 32801 PHONE: (407) 702-6800	Drawn By: XXX MM-YY Checked by: XXX MM-YY Designed by: XXX MM-YY Checked by: XXX MM-YY	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET TITLE: BRIDGE TYPICAL SECTION		REF. DWG. NO.
Date	By	Description	Date	By	Description			ROAD NO.	COUNTY	FINANCIAL PROJECT ID	PROJECT NAME: SR 401 OVER CANAVERAL BARGE CANAL AND MULLET ROAD		SHEET NO.
						SR 401	BREVARD	444787-1-22-01					

Appendix C – Drainage Maps

BEGIN BRIDGE
STA. 19+61.08 @ CONST. SR 401

BEGIN PROJECT
STA. 10+00.00 @ CONST. SR 401

END BRIDGE
STA. 35+88.92 @ CONST. SR 401

EXIST. GRADE @ SR 401

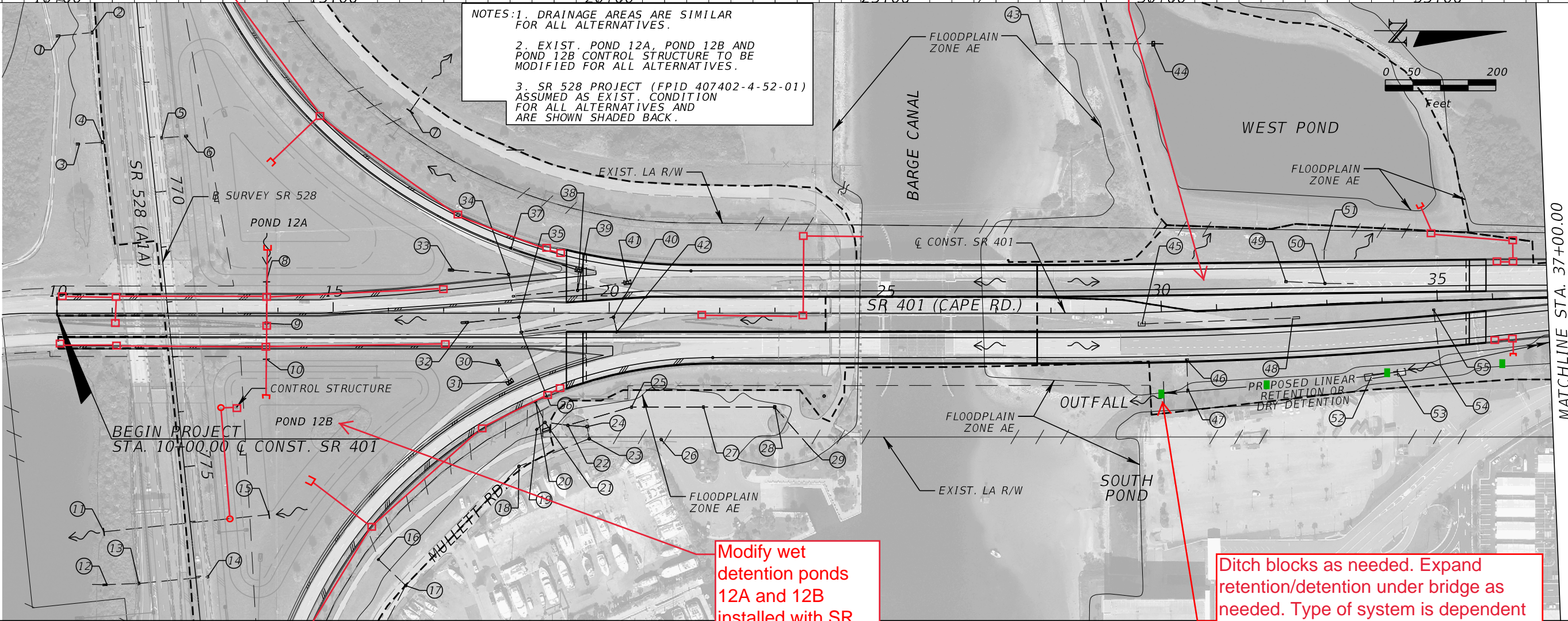
MULLETT RD

BARGE CANAL

Proposed SB
bridge to drain to
West Pond to
simulate existing
conditions.

SCALE: 1"=200' HORIZ.
1"=20' VERT.

NOTES: 1. DRAINAGE AREAS ARE SIMILAR FOR ALL ALTERNATIVES.
2. EXIST. POND 12A, POND 12B AND POND 12B CONTROL STRUCTURE TO BE MODIFIED FOR ALL ALTERNATIVES.
3. SR 528 PROJECT (FPID 407402-4-52-01) ASSUMED AS EXIST. CONDITION FOR ALL ALTERNATIVES AND ARE SHOWN SHADED BACK.



BEGIN PROJECT
STA. 10+00.00 @ CONST. SR 401

Modify wet
detention ponds
12A and 12B
installed with SR
528 project.

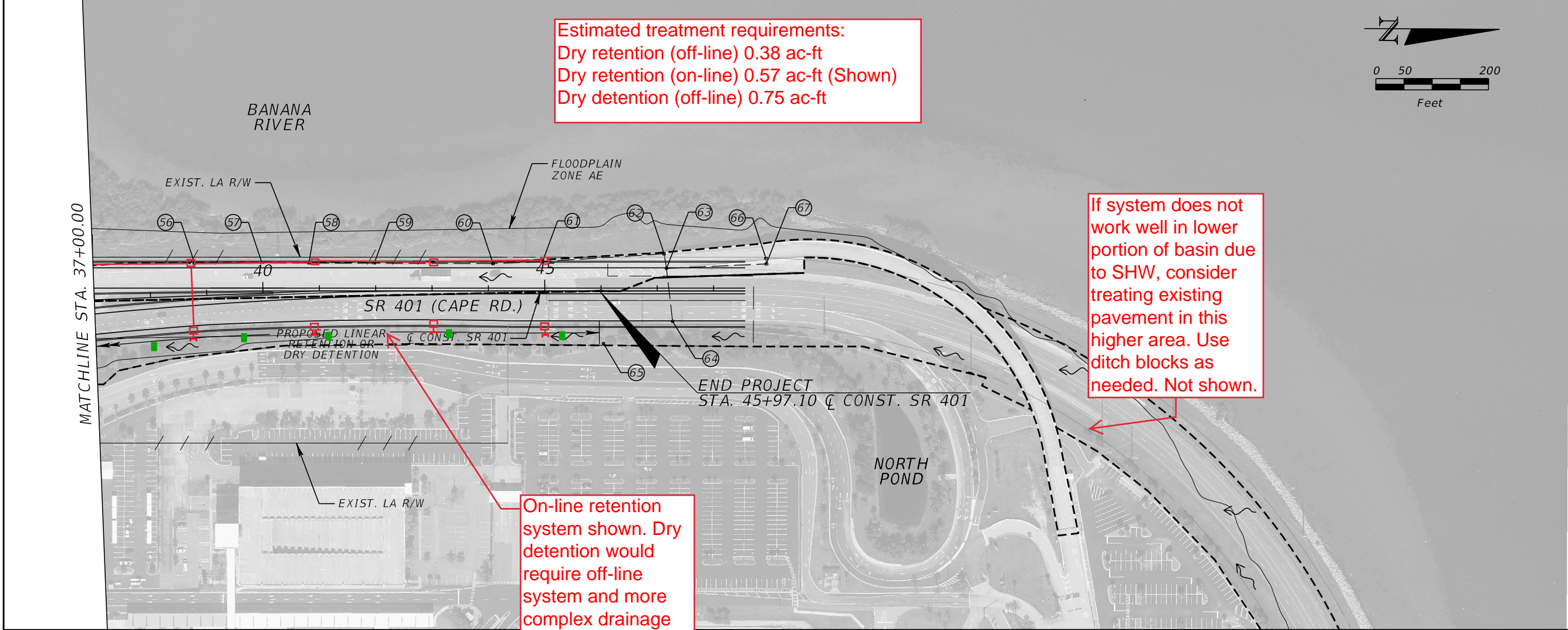
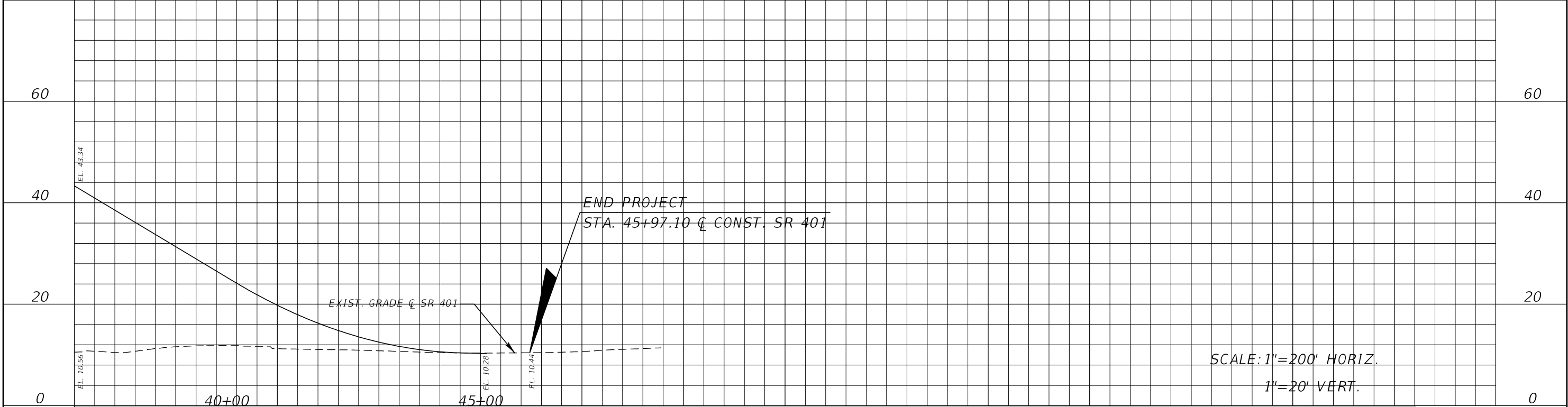
Ditch blocks as needed. Expand
retention/detention under bridge as
needed. Type of system is dependent
on seasonal high water elevation and
infiltration rates.

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

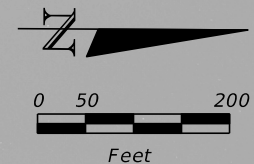
ALEJANDRO A. BARRIOS, P.E.
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PARSONS TRANSPORTATION GROUP, INC.
201 E. PINE STREET, SUITE 900
ORLANDO, FL 32801
PHONE: (407) 702-6800

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 401	BREVARD	444787-1-22-01

SHEET NO.



Estimated treatment requirements:
 Dry retention (off-line) 0.38 ac-ft
 Dry retention (on-line) 0.57 ac-ft (Shown)
 Dry detention (off-line) 0.75 ac-ft



If system does not work well in lower portion of basin due to SHW, consider treating existing pavement in this higher area. Use ditch blocks as needed. Not shown.

On-line retention system shown. Dry detention would require off-line system and more complex drainage system and more structures. Not shown.

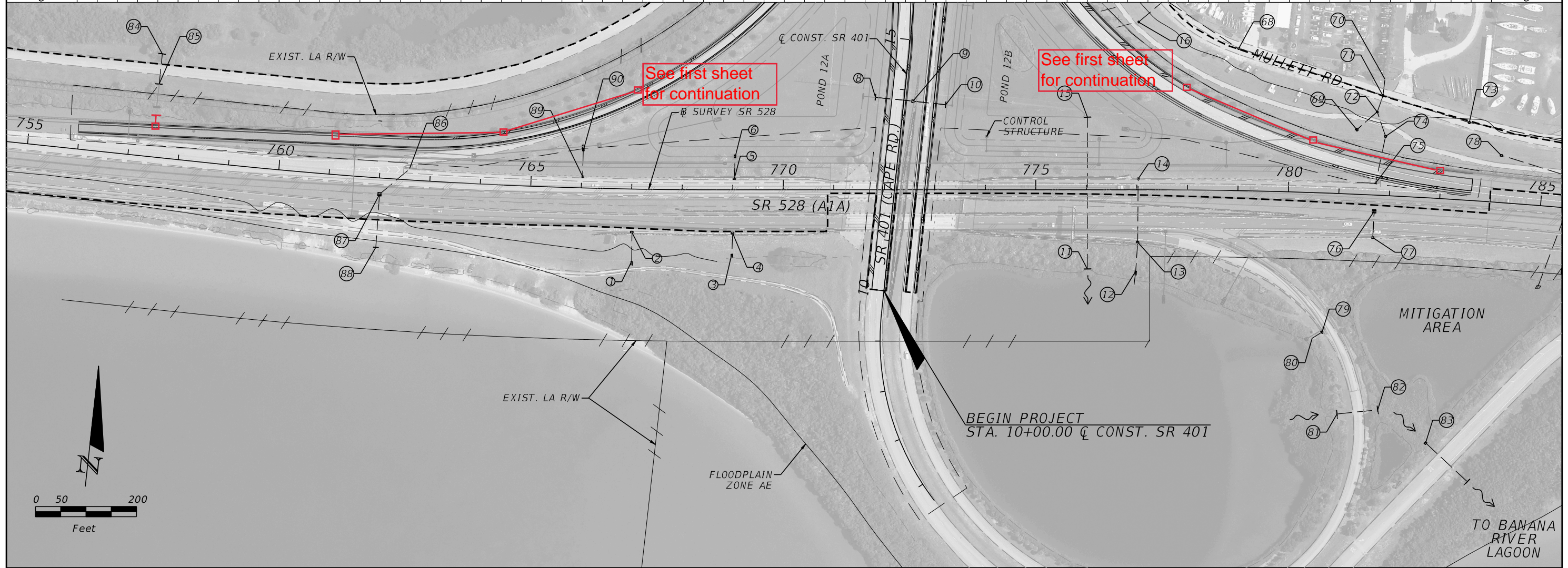
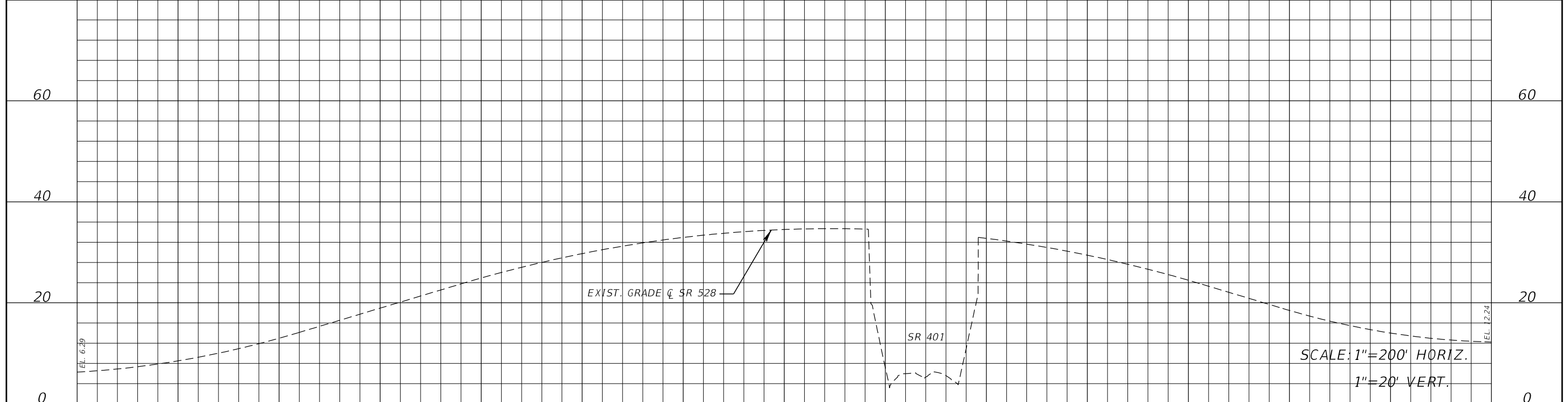
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 401	BREVARD	444787-1-22-01

DRAINAGE MAP

SHEET NO.



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 401	BREVARD	444787-1-22-01

DRAINAGE MAP

SHEET NO.

- ① U ENDWALL
N-15" CMP Inv=3.76
- ② GUTTER INLET
S-15" CMP Inv=13.84
- ③ U ENDWALL
N-15" CMP Inv=2.57
- ④ GUTTER INLET
S-15" CMP Inv=19.12
- ⑤ GUTTER INLET
N-15" CMP Inv=18.92
- ⑥ U ENDWALL
S-15" CMP Inv=7.11
- ⑦ ENDWALL
N-30" RCP Inv=0.37
- ⑧ ENDWALL
E-24" RCP Inv=2.02
- ⑨ DBI
W-24" RCP Inv=1.51
E-24" RCP Inv=1.50
- ⑩ ENDWALL
W-24" RCP Inv=1.46
- ⑪ ENDWALL
N-30" RCP Inv=0.08
- ⑫ U ENDWALL
N-15" RCP Inv=4.47
- ⑬ GUTTER INLET
N-15" RCP Inv=13.95
S-15" RCP Inv=13.93
- ⑭ GUTTER INLET
S-15" RCP Inv=14.81
- ⑮ ENDWALL
S-30" RCP Inv=1.03
- ⑯ DBI
NE-24" HDPE Inv=3.27
- ⑰ MANHOLE
NW-36" HDPE Inv=3.35
E-36" HDPE Inv=4.20
SE-SIZE UNKNOWN Inv=3.34
SW-24" HDPE Inv=3.20
- ⑱ MANHOLE
N-36" HDPE Inv=3.02
S-36" HDPE Inv=3.31
- ⑲ DBI
N-15" RCP Inv=3.79
- ⑳ GUTTER INLET
NE-15" CMP Inv=7.40
- ㉑ MANHOLE
NE-15" RCP Inv=3.67
SE-15" RCP Inv=3.87
SW-15" CMP Inv=3.64
- ㉒ MANHOLE
N-15" RCP Inv=2.67
NW-15" RCP Inv=3.14
S-15" RCP Inv=3.28
- ㉓ MANHOLE
S-36" HDPE Inv=2.70
W-18" RCP Inv=1.81
- ㉔ GRATE INLET
E-18" RCP Inv=2.05
S-15" RCP Inv=2.17
- ㉕ GRATE INLET
N-18" RCP Inv=3.41
S-15" RCP Inv=3.40
- ㉖ MANHOLE
- ㉗ GRATE INLET
N-18" RCP Inv=3.72
S-18" RCP Inv=3.73
- ㉘ GRATE INLET
NE-18" RCP Inv=4.03
S-18" RCP Inv=3.91
- ㉙ GRATE INLET
SW-18" RCP Inv=4.44
- ㉚ U ENDWALL
E-18" RCP Inv=6.28
- ㉛ DBI
W-18" RCP Inv=7.44
- ㉜ U ENDWALL
N-18" RCP Inv=6.52
- ㉝ MES
N-18" RCP Inv=6.52
- ㉞ MANHOLE
E-18" RCP Inv=6.84
S-18" RCP Inv=6.78
- ㉟ MANHOLE
E-18" RCP Inv=7.37
S-18" RCP Inv=7.35
- ㊱ GRATE INLET
N-18" RCP Inv=7.85
W-18" RCP Inv=7.89
- ㊲ GRATE INLET
N-18" RCP Inv=8.93
- ㊳ DBI
E-18" RCP Inv=8.31
S-18" RCP Inv=8.31
- ㊴ MANHOLE
N-18" RCP Inv=8.14
S-18" RCP Inv=8.13
W-18" RCP Inv=8.14
- ㊵ MANHOLE
E-18" RCP Inv=9.36
S-18" RCP Inv=9.33
- ㊶ DBI
S-18" RCP Inv=8.58
- ㊷ GRATE INLET
W-18" RCP Inv=9.74
- ㊸ OUTFALL
N-36" RCP Inv=4.02
- ㊹ CONTROL STRUCTURE
S-36" RCP Inv=4.19
N-8" PVC Inv=0.56
N-8" PVC Inv=0.53
- ㊺ DBI
N-12" CMP Inv=13.28
- ㊻ GUTTER INLET
E-15" CMP Inv=13.87
- ㊼ U ENDWALL
W-15" CMP Inv=2.96
- ㊽ MES
S-12" CMP Inv=11.19
- ㊾ GUTTER INLET
N-15" CMP Inv=8.32
- ㊿ MANHOLE
S-15" CMP Inv=7.52
N-15" CMP Inv=6.99
- ① DBI
N-12" CMP Inv=13.28
- ② MES
N-36" RCP Inv=6.13
N-36" RCP Inv=5.98
- ③ MES
S-36" RCP Inv=6.08
S-36" RCP Inv=6.09
- ④ ENDWALL
W-12" RCP Inv=2.79
- ⑤ GRATE INLET
SW-18" RCP Inv=4.44
- ⑥ GUTTER INLET
N-15" CMP Inv=6.40
- ⑦ GUTTER INLET
S-15" CMP Inv=5.66
N-15" CMP Inv=5.50
- ⑧ GUTTER INLET
S-15" CMP Inv=5.19
N-15" CMP Inv=5.11
- ⑨ GUTTER INLET
S-15" CMP Inv=4.51
N-15" CMP Inv=4.52
- ⑩ GUTTER INLET
S-15" CMP Inv=3.74
N-15" CMP Inv=3.70
- ⑪ GUTTER INLET
N-15" CMP Inv=2.94
S-15" CMP Inv=3.19
- ⑫ GUTTER INLET
E-24" CMP Inv=1.59
S-15" CMP Inv=2.09
- ⑬ MANHOLE
E-24" CMP Inv=1.47
N-15" RCP Inv=1.87
W-24" CMP Inv=1.57
- ⑭ MANHOLE
W-24" CMP Inv=0.89
- ⑮ MANHOLE
UNKNOWN
- ⑯ BARRIER WALL INLET
E-15" CMP Inv=3.32
- ⑰ GUTTER INLET
W-15" CMP Inv=3.22
S-15" CMP Inv=3.07
- ⑱ MANHOLE
E-36" HDPE Inv=3.60
W-36" HDPE Inv=3.77
- ⑲ DBI
N-18" RCP Inv=1.91
- ⑳ MES
S-24" HDPE Inv=2.60
- ㉑ MANHOLE
N-24" HDPE Inv=3.03
E-42" HDPE Inv=4.62
S-24" HDPE Inv=1.12
W-36" HDPE Inv=4.60
- ㉒ DBI
N-24" HDPE Inv=1.41
SE-15" RCP Inv=2.16
SW-18" RCP Inv=1.76
- ㉓ MANHOLE
E-42" HDPE Inv=4.15
W-42" HDPE Inv=4.05
- ㉔ MANHOLE
N-15" RCP Inv=3.39
S-15" RCP Inv=3.32
- ㉕ CURB INLET
N-15" RCP Inv=6.12
- ㉖ DBI
N-15" RCP Inv=7.35
S-15" RCP Inv=7.36
- ㉗ GUTTER INLET
N-15" RCP Inv=8.02
- ㉘ DBI
E-18" RCP Inv=0.99
- ㉙ GUTTER INLET
S-15" RCP Inv=2.45
- ㉚ MES
N-15" RCP Inv=0.58
- ㉛ ENDWALL
E-30" RCP Inv=1.48
- ③ ENDWALL
W-30" RCP Inv=1.53
- ④ INLET
SE-36" RCP Inv=2.07
- ⑤ ENDWALL
S-30" RCP Inv=1.32
- ⑥ ENDWALL
N-30" RCP Inv=1.22
- ⑦ CURB INLET
SW-15" RCP Inv=1.79
- ⑧ DBI
NW-15" RCP Inv=0.72
S-18" RCP Inv=0.71
- ⑨ ENDWALL
N-18" RCP Inv=0.00
- ⑩ GUTTER INLET
N-15" RCP Inv=10.58
- ⑪ U ENDWALL
S-15" RCP Inv=4.61

REVISIONS				ALEJANDRO A. BARRIOS, P.E. P.E. LICENSE NO. 75972 PARSONS TRANSPORTATION GROUP, INC. 201 E. PINE STREET, SUITE 900 ORLANDO, FL 32801 PHONE: (407) 702-6800	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			DRAINAGE MAP	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION		ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 401	BREVARD	444787-1-22-01		