FINAL REPORT – FEBRUARY 4, 2021

Reed Canal Park Bridge Replacement Feasibility Study

City of South Daytona

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River to Sea TPO

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EXECUTIVE SUMMARY

The City of South Daytona applied for Project Prioritization to the River to Sea Transportation Planning Organization for the replacement of the existing aging wood bridge located at the entrance to Reed Canal Park off of Reed Canal Road with a new bridge with enhanced pedestrian accommodations including a new crosswalk at the park entrance with Rapid Rectangular Flashing Beacons (RRFB). To facilitate construction and allow the existing park entrance to remain open during construction, this study evaluated the new bridge being located approximately 200 feet to the west at the intersection of Reed Canal Road and Lakeview Drive.

After reviewing available existing information, completing field investigations, reviewing other relevant projects and studies in the corridor, and completing a preliminary hydraulic analysis, concept plans and typical sections were developed. The concept developed, presented in **Appendix A**, can be constructed within the existing apparent ROW however, a new maintenance agreement between the City of South Daytona and Volusia County will need to be developed. This section of Reed Canal is within a FEMA Flood Zone A Special Flood Hazard Area (SFHA). No impacts to wetlands are anticipated. Manatees are unlikely to be present in Reed Canal. However, per the U.S. Fish and Wildlife Service (USFWS) Standard Manatee Conditions for In-Water Work, grating shall be installed over the proposed outfall. A Contech "B" series arch culvert with a 48 ft span and a rise of 10 ft would be feasible for this project. Additional hydraulic analysis will be required during design and permits from SJRWMD and USACE will need to be obtained. The design phase will also need to address a conflict with the overhead utilities and include geotechnical evaluation for bridge foundation determination. The engineer's estimate of probable cost for this concept is $2.7 million in 2021 dollars.

INTRODUCTION

This study is provided at the request of the River to Sea Transportation Planning Organization (R2CTPO) in response to an Application for Project Prioritization submitted by the City of South Daytona (City). The purpose of this project is to evaluate the feasibility of replacing the aging wood bridge located at the entrance to Reed Canal Park (Park) in the City of South Daytona with a new structure that includes enhanced pedestrian and bicyclist accommodations. Reed Canal Park is the City's largest and busiest park with an estimated 135,000 visitors per year. It is near many of the City's neighborhoods, apartment complexes, condominiums, and mobile home parks.

Currently, there is no sidewalk along the south side of Reed Canal and no crosswalk from the northside at the entrance to the park. While the existing bridge does include a dedicated bicycle and pedestrian walkway, the angle of entrance from Reed Canal road does not provide easy access to and from the park. The only alternative entrance to the park is located along Nova Road which is a five-lane divided Principal Arterial with significantly more traffic and a much higher speed limit (50 MPH), both of which result in a higher risk of vehicle-pedestrian conflicts. The replacement of this bridge with a new bridge including enhanced bicycle and pedestrian accommodations will greatly contribute to the livability of the community.

PROJECT PURPOSE AND SCOPE

The purpose of this project is to replace an aging wood bridge located at the entrance to the Park in the City of South Daytona with a new structure that includes enhanced pedestrian and bicyclist accommodations. The existing bridge, located approximately 1100 feet east of Nova Road, is maintained by the City. Reed Canal Road is maintained by Volusia County (County). Refer to **Figure 1** for the Project Location Map.

At the initial scoping meeting held on June 25, 2020 with representatives from the City, County, FDOT, and the R2CTPO, RS&H proposed locating the new bridge approximately 200 feet west of the existing bridge at the intersection with Lakeview Drive. The intent is to facilitate construction of the new bridge while still allowing the existing bridge to remain open. Upon completion of the new bridge, the existing bridge can be demolished, maintaining park access from Reed Canal throughout construction. All parties in attendance were in favor of this approach.

FIGURE 1:
PROJECT LOCATION MAP

At the request of the City, the new bridge should be an engineered span, with similar aesthetics to the Oak Lea Drive and Lantern Drive bridges located to the east of the park on Reed Canal Road. The new bridge should include a 10 to 12-foot wide bicycle/pedestrian path on one side that provides a connection between the sidewalk along the north side of Reed Canal Road and the park located on the south side with a special emphasis crosswalk. The study will also evaluate installation of a Rapid Rectangular Flashing Beacon (RRFB) for crossing Reed Canal Road at the park entrance. The concept will include modifications to the existing parking lot based on the new park entrance at Lakeview Drive and closing of the current entrance when the existing bridge is demolished.

As indicated in the City's application, there are numerous residential communities within one mile of the Park including single family housing development, apartments, condominiums, and mobile home parks. The Lakeview Mobile Home Park is located directly across from the proposed Park entrance on the north side of Reed Canal Road and includes 453 units. Also located within one mile are numerous school bus stops, a nursing home, retail centers, a fire station, and two schools: Atlantic High School and South Daytona Elementary School. Given the proximity of the Park to so many of the City's residents and community resources, improving the bicycle and pedestrian access will be of great benefit to the community.

There are four related studies and projects that are relevant to this proposed bridge replacement that have been considered in preparing this feasibility study as summarized below:

Reed Canal Road Sidewalk Feasibility Study

A feasibility study was completed earlier this year (February 2020) by Traffic Engineering Data Solutions, Inc. (TEDS) for the replacement of the sidewalk along the north side of Reed Canal Road from Nova Road to US-1. That study included a new patterned pavement crosswalk, signage, and RRFBs at the Park entrance, similar to the proposed pedestrian enhancements included in this study. At this time, it is unknown which of these projects will be funded for design and construction first. If the sidewalk project is advanced first, the City may want to consider delaying the installation of a new crosswalk with RRFBs at the existing Park entrance since it will be relocated when the new bridge is constructed. In addition, the sidewalk project proposes some cross slope correction of Reed Canal Road in the area of Lakeview Drive which will need to be coordinated between the two projects.

Sauls Street Bridge Replacement Feasibility Study

TEDS also completed a feasibility study in February 2020 for the replacement of the Sauls Street Bridge which is located approximately 2100 feet east of this project at the intersection of Sauls Street and Reed Canal Road. During the initial scoping meeting previously referenced, it was discussed that the Sauls Street Study was very similar in scope to this study for the Park Bridge. While the two projects are independent of each other, they are both part of the City's efforts to update and replace all of the existing bridges along Reed Canal Road between Nova Road and US-1 with a consistent aesthetic through the corridor.

St. Johns River to Sea (SJR2C) Loop Project Development and Environmental (PD&E) Study

Under FM 439865-1-22-01 FDOT District 5 is conducting a Project Development and Environment (PD&E) Study for the SJR2C Loop trail segment along US-1 or alternate route from SR 44 in the City of New Smyrna Beach, through the City of Port Orange and in to the City of South Daytona to Beville Road. Based on a review of the PD&E and discussions with the City, we understand that this future trail will be located along the south bank of Reed Canal from Sauls Street to Anastasia Drive, continuing south along Sauls Street. While the SJR2C Loop trail is not currently planned to extend further west along Reed Canal Road and therefore will have no direct connection to Park, it is close enough in proximity to note.

CDM Smith Flood Study

In July 2010 Camp Dresser & McKee, Inc. (CDM now known as CDM Smith) completed the Nova Canal Flood Control and Integrated Water Resource Program for the East Volusia Regional Water Authority (EVRWA). We obtained a copy of this report from CDM Smith's project manager Michael F. Schmidt. This study was developed under a Joint Project Agreement (JPA) between the Cities of Ormond Beach, Holly Hill, Daytona Beach, South Daytona, and Port Orange, the County, and the Florida Department of Transportation (FDOT) to assess flooding and evaluate potential flood control improvements along the LPGA Canal, Reed Canal and Halifax Canal. CDM Smith's study was used as a reference in generating the existing hydraulic conditions model in this feasibility study.

Field reviews were conducted during the study for the purposes of data collection, concept development, corridor evaluation and cost estimation. The concept plans, analysis and cost estimate are based on field observations and available project information provided by the City. As such, this document should only be used for planning, estimating, and budgeting purposes. If the project is advanced to final design additional work, including the preparation of a detailed right of way survey, construction plans and an updated cost estimate will be required.

The graphics within this report include notes, diagrams and callouts identifying the apparent right of way, existing utilities, location of proposed bridge, and street names. Considerations include conformance to the requirements of the Americans with Disabilities Act (ADA), FDOT Florida Design Manual, FDOT Standard Plans, FDOT Traffic Engineering Manual, American Association of State Highway and Transportation Officials (AASHTO) and the Manual on Uniform Traffic Control Devises (MUTCD).

EXISTING CONDITIONS

GENERAL DESCRIPTION

The existing bridge at the Park entrance is located approximately 1100 feet east of Nova Road on Reed Canal Road. Reed Canal Road is a two-lane minor collector road with a posted speed of 30 mph. There is existing curb and gutter and single face guardrail along the south side of Reed Canal Road through the limits of this study. The existing bridge spans Reed Canal which runs parallel to Reed Canal Road along the south side, **Figure 2**. On the south side of the existing bridge the driveway continues with approximately 30 feet of asphalt roadway, ending at the Park's dirt parking lot. There is no sidewalk along the south side of the road but there is an existing sidewalk along the north side of Reed Canal Road. The existing intersection at the park entrance has no signalization and there is no cross walk. The minor movements of Lakeview Drive and Park exit are both stop-controlled while Reed Canal Road traffic in uncontrolled, **Figure 3**.

FIGURE 2:
LOOKING WEST FROM REED CANAL PARK BRIDGE

FIGURE 3:
FACING SOUTH FROM LAKEVIEW DRIVE INTERSECTION

EXISTING BRIDGE

The existing Park entrance road bridge over Reed Canal (Bridge No.796500) was constructed in 1983 and has a sufficiency rating of 28.1 with a health index value of 87.52. The May 2020 Inspection Report lists the existing bridge as functionally obsolete (for the Inspection Report, see **Appendix B**). The overall bridge length is 57 feet and comprised of four spans. The superstructure is comprised of timber running boards on timber stringer/girders supported by timber pile bents. The bridge is posted with weight limit restrictions at 11 tons. The existing bridge typical section consists of two travel lanes with a separated sidewalk. The sidewalk is located adjacent to the northbound lane and separated by a timber railing. The overall bridge width varies from 33 feet minimum to a flared end connection at Reed Canal Road.

FIGURE 4
EXISTING BRIDGE NO. 796500

RIGHT-OF-WAY (ROW) AND MAINTENANCE

The existing ROW depicted in the concept plans was obtained from a CADD file provided by the City. It is denoted as Apparent ROW and is generally 130 feet wide in the study area, extending from just north of the existing sidewalk on the north side of the road to the southern canal bank on the south side of the road. In 2019, in coordination with the Reed Canal Sidewalk Feasibility Study, the County's Survey Department prepared draft maintenance maps (**Appendix C**) along Reed Canal Road which included identifying the existing ROW along the north side of the road. The northern ROW limit shown in these maps generally aligns with the ROW in the City provided CADD file. The maintenance maps do not include survey for the southern ROW limit. The County maintains Reed Canal Road. The City maintains the existing bridge and owns and maintains the Park.

UTILITIES

A utilities assessment was made during field reviews and supplemented with information provided by the City. Overhead power lines, owned by Florida Power & Light Company (FPL), are located along the south side of Reed Canal Road as seen in **Figure 5**. The poles are located directly behind the existing curb and gutter. Streetlights are installed on several, but not all of the electrical poles. Neither the information provided by the City nor our field review indicated the presence of buried utilities along the south side of Reed Canal Road. There appear to be City owned buried water and sanitary sewer lines along the north side of Reed Canal Road as well as a fire hydrant.

FIGURE 5:
EXISTING OVERHEAD UTILITIES

SOILS

Tuscawilla fine sand and Tuscawilla urban complex exist throughout the study corridor as depicted on the soils survey map prepared by the Natural Resources Conservation Service and provided in **Appendix D**.

DRAINAGE

The existing Reed Canal Bridge is located approximately 1100 feet east of Nova Road in South Daytona Beach. The existing bridge crosses the Reed Canal and is used as an entrance into Reed Canal Park. Reed Canal is a conveyance system that connects with the Nova Road Canal, also known as the Halifax Canal through a triple 10' x 12' concrete box culvert and flows to the east to the Halifax River. During the site visit on October 14, 2020, stormwater from the existing bridge was observed to sheet flow into the canal, which outfalls to the Halifax River.

According to the FEMA FIRM Panel 12127C0369J effective September 29, 2017, the project area is within a Flood Zone A Special Flood Hazard Area (SFHA). The FEMA map is provided in **Appendix E**.

In July 2010, CDM Smith conducted a flood study using SWMM5, which included Reed Canal. This study was referenced for the existing hydraulic conditions model for this feasibility study. Information from

node 13104 titled Reed Canal at Nova Road and link 81243 titled Start of Reed Canal were included in the existing conditions HY-8 model. See **Table 1** and **Table 2** for a summary of the model results for the existing bridge. Excerpts from the CDM Smith Flood Study are in **Appendix F.**

HY-8 (version 7.60) was used to calculate the headwater elevation for the existing bridge during the 25-year and 100-year storms. Two existing models were created using the flows and water surface elevations in Reed Canal for the 25-year, 96-hour and 100-year, 96-hour storm events using information from the "100 YR Stillwater" results contained in the CDM Smith Flood Study. One model represents the existing bridge without any proposed improvements described in the CDM Smith Flood Study and the second model represents the existing bridge with the flows and stages from Alternative 1 from the CDM Smith Flood Study. The stages in the CDM Smith Flood Study reference NGVD 1929 and were converted to NAVD 1988 for this preliminary analysis. The conversion from NGVD 1929 to NAVD 1988 is the following:

$$NAVD\ 88 = NGVD\ 29 - 1.20'$$

See **Appendix G** for the existing HY-8 model results.

TABLE 1: EXISTING CONDITIONS (25YR-96HR STORM EVENT)

Existing Conditions (25YR-96HR Storm Event)				
Model	**Headwater Elev. (ft.)**	**Discharge (cfs)**	**Velocity (fps)**	**Tailwater Elev. (ft.)**
Exist. Bridge	7.21	706	1.94	7.07
Exist. Bridge Alt. 1	7.01	730	2.00	6.87

TABLE 2: EXISTING CONDITIONS (100YR-96HR STORM EVENT)

Existing Conditions (100YR-96HR Storm Event)				
Model	**Headwater Elev. (ft.)**	**Discharge (cfs)**	**Velocity (fps)**	**Tailwater Elev. (ft.)**
Exist. Bridge	7.75	808	2.22	7.57
Exist. Bridge Alt. 1	7.55	821	2.25	7.37

ENVIRONMENTAL

Wetlands and Surface Waters

The project area was evaluated for wetlands and surface waters in accordance with Florida Administrative Code (FAC) 62.302.400 and the United States Army Corp of Engineers (USACE) 1987 Wetland Delineation Manual. Project scientists identified no wetlands within the Preferred Alternative; therefore, no impacts to wetlands are anticipated.

One surface water is located within the project limits. Reed Canal is located adjacent to Reed Canal Road and was originally constructed in uplands. Reed Canal flows eastward before discharging into the Halifax River. The proposed replacement of the bridge leading into the Park is anticipated to result in minor impacts to Reed Canal. A map of wetlands and surface waters within the area is shown in **Appendix J**.

Threatened and Endangered Species

An environmental field review was performed for this project on October 19, 2020. No wildlife observations were noted during the field review.

For wildlife information, several resources were used to determine the potential issues with state and federally listed species. Information was obtained from the Florida Fish and Wildlife Conservation Commission (FFWCC) concerning species observations and Bald Eagle nests (FFWCC, 2018). State and federally listed species potentially occurring within the project area are outlined in **Table 3**.

TABLE 3: POTENTIAL SPECIES LIST

Scientific Name	Common Name	Status
Birds		
Mycteria americana	Wood stork	FT
Mammals		
Trichechus manatus	West Indian manatee	FT
Reptiles		
Drymarchon corais couperi	Eastern indigo snake	FT
Gopherus polyphemus	Gopher tortoise	ST

Note: SSC = Species of Special Concern; ST = State-designated Threatened; FT = Federally-designated Threatened; FE = Federally-designated Endangered
Source: Florida Fish and Wildlife Conservation Commission. Florida's Endangered and Threatened Species. Official Lists, October 11, 2018; U.S. Fish and Wildlife Service, County Listed Species; and Florida's Imperiled Species Management Plan 2016

Water Permits

State of Florida/St. Johns River Water Management District

The proposed replacement of the Park Entry Road (Structure No. 796500) is anticipated to result in minor impacts to Reed Canal. The state agency involved in the permitting process would be the St. Johns River Water Management District (SJRWMD). Permits would be required for all dredge and fill work in, on, or over wetlands or other surface waters (Chapter 62-330.020 FAC). A general Environmental Resource Permit under section 62-330.443 is anticipated for this project.

Federal/U.S. Army Corps of Engineers

Federal agencies which may require permits for the proposed improvements are the U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (USEPA). As the Reed Canal outfalls to a traditionally navigable waterway, permitting will be required with the USACE. The work described in the preferred alternative likely qualifies for Nationwide Permit 14.

Contamination

A contamination screening evaluation of the proposed improvements was conducted in accordance with FDOT's *PD&E Manual, Part 2, Chapter 20.* Desktop research was performed to identify potential contamination sites defined by the following distances from the ROW that have the potential to impact the concept or adjacent properties:

- All contamination sites within 500 feet
- Non-landfill solid waste sites within 1,000 feet
- Solid waste landfills, Comprehensive Environmental Response Compensation, and Liability Act (CERCLA), or National Priority List (NPL) sites within a ½ mile

Resources included historical aerial photographs, FDEP Map Direct Website, FDEP OCULUS Document Management System, DEP Enterprise Information Portal, topographic maps, soil surveys, and other information provided by the Florida Department of Environmental Protection. No contamination sites were identified.

BRIDGE AND SHARED-USE PATH CONCEPT PLAN

The City application requested evaluation of replacing the existing Park Bridge with a pre-engineered arch type structure with aesthetics that match the previously constructed bridges at the intersections of Oak Lea and Lantern Drive. The bridge is to include a 12-foot wide shared use path on one side providing a connection between the park and the existing sidewalk along the north side of Reed Canal Road. The City also desires an enhanced crosswalk with a user actuated RRFB at the intersection. The following section further describes the concept for the proposed bridge and related roadway, drainage, and utility improvements necessary to execute this project. Refer to **Appendix A** for the concept Typical Section and Plans.

BRIDGE AND SHARED-USE PATH CONCEPT PLAN

The existing Park Entrance Road bridge over Reed Canal is to be replaced with a new pre-engineered arch culvert. The proposed 48-foot span length has been established to accommodate the Reed Canal drainage criteria. The pre-engineered arch culvert is comprised of precast sections which minimize the construction duration compared to a cast-in-place concrete flat slab bridge type. The proposed structure will be designed to satisfy the latest FDOT Load Rating Manual therefore posted weight limit restrictions will not be required. The proposed 58.25-foot culvert width accommodates two (2) 12-foot lanes with curb & gutter and a 12-foot shared use path. The proposed foundation type, shallow vs. deep, will be determined during the design phase following a geotechnical investigation. Rubble rip-rap will be used along wingwalls and under the proposed bridge.

The proposed aesthetics are to match the recent adjacent bridge replacements at Oak Lea Drive and Lantern Drive (including stone facade and decorative lighting). Please note that decorative bridge features may not be eligible for federal funding. Railings and headwalls need to satisfy TL-2 criteria (per 2016

Florida Greenbook section 17.C.3.c), stopping sight distance, and ADA criteria. Additionally, the shared use path geometry shall satisfy ADA criteria of 2% maximum cross slope and 5% maximum longitudinal slope. Per FDM 224.7, a 4-foot clear space should be provided on either side of the shared-use path. For restricted conditions, bridge abutments, sign columns, fencing and railing may be located within 4 feet of the edge of pavement. See **Appendix A** for the concept Plan and Elevation and concept Typical Section.

Similar to previous bridge replacements at nearby Reed Canal Road intersections, a detour is anticipated for Reed Canal Road to facilitate construction. Coordination with Lakeview Estates will be required regarding gated access along Lemon Road for Lakeview Estates residents when the intersection at Reed Canal Road and Lakeview Drive is closed. The proposed Park Entrance Road bridge is located west of the existing park entrance, allowing for the existing bridge to remain open during the proposed bridge construction. Temporary critical sheet piling will be required parallel to Reed Canal Road to facilitate the pre-engineered culvert, wingwall, and foundation construction. Temporary earthen berms are anticipated in Reed Canal on each side of the bridge with a temporary pipe or pumping to convey water and enable the proposed bridge construction location to be dewatered (see **Appendix A** for the preliminary Typical Section). Existing overhead utilities will require relocation to facilitate construction.
The bridge replacement assumptions are noted below:

- The existing bridge will be replaced on an offset alignment allowing the Park entrance to remain open during construction
- The proposed bridge crossing is a pre-engineered arch culvert
- A detour is available for access to Lakeview Drive and Reed Canal Road can be closed
- Critical Temporary Sheet Piling is installed parallel to Reed Canal Road
- Existing overhead utilities can be relocated
- Temporary berms can be used in Reed Canal on each side of the bridge to facilitate dewatering
- Foundations are shallow spread footings (pending geotechnical investigation)
- Aesthetics are to match Oak Lea Drive and Lantern Street, including stone facade and decorative lighting
- Bridge is to accommodate two (2) 12-foot wide travel lanes and a 12-foot wide shared use path
- Asphalt and base depth is 2 feet or less above the culvert

ROADWAY AND SIGNING AND PAVEMENT MARKINGS

Construction of the proposed bridge across from Lakeview Drive, and subsequent demolition of the existing bridge will result in some related roadway construction. New Type F curb and gutter will be needed along the south side of Reed Canal Road through the limits of construction. The existing single face guardrail will also need to be removed and replaced with new single face guardrail per current FDOT standards along with approach end anchorages on either side of the new bridge.

The new bridge will require adjustments to the parking lot to accommodate the new entrance location. New asphalt roadway is proposed up to the existing parking lot with Type D curb to delineate the entrance and limits of the first parking spaces. It is estimated that 5 parking spaces will be eliminated with the new park entrance road. Two parking spaces can be added at the existing entrance after it is closed.

Additional modifications to the parking lot would be needed to replace the other three eliminated spaces. The 12-foot wide concrete shared-use path will extend to the existing parking lot. It aligns with an existing sidewalk located across the parking lot. In the future if this lot is paved, the trail and sidewalk would be aligned to allow for a marked crosswalk. The gates at the current park entrance are to be removed and retained by the City. New gates shall be installed at the new entrance. All existing Park signs will be relocated to the new entrance.

The existing asphalt apron adjacent to the existing bridge will be removed. The area will need to be regraded and sodded to harmonize with the surrounding ground and define the new limit of the parking lot. Two new wheel stops are proposed, replacing two of the parking spacing eliminated at the new entrance.

The City has expressed a desire to have RRFBs and a new crosswalk installed at the intersection of Reed Canal Road and the Park entrance. Each RRFB assembly includes a rectangular beacon and signs for each approach, sign support structure, cabinet, electronics, wiring, and accessible pedestrian push-button detector. Two assemblies are needed, one for each side of the crossing. As stated in the FDOT Traffic Engineering Manual (TEM) (January 2021 Edition) section 5.2.7.3, all new RRFB installations shall include an audible warning message that states "WAIT FOR TRAFFIC TO STOP THEN CROSS WITH CAUTION" when activated. This crosswalk will be located at an existing intersection of which one leg is uncontrolled (Reed Canal Road) and the other leg is stop-controlled (park entrance and Lakeview Drive). The FDOT TEM Section 5.2.4 requires that special emphasis crosswalks be used for all uncontrolled approaches with a crosswalk, therefore the crosswalk over Reed Canal Road must be special emphasis. The City has requested a patterned pavement crosswalk, like those installed at Lantern Drive and Lea Drive. This location is eligible for a patterned pavement crosswalk, per FDM Section 226.4 since Reed Canal Road has a posted speed limit below 45 MPH and is not part of the State Highway System. TEM Section 5.2.5.2 allows for the installation of RRFBs on roadways with posted speed limits of 35 MPH or less, four (4) or fewer through lanes, and a marked special emphasis crosswalk. Reed Canal Road is a two-lane facility with a posted speed of 30 MPH. Therefore, with the installation of a special emphasis crosswalk, this location satisfies the criteria outlined in the TEM and is recommended for installation. Per TEM Section 5.2.7.3 local agencies must receive Federal Highway Administration (FHWA) approval prior to installing RRFBs on their local roads.

Per FDOT TEM Figure 5.2-11, overhead lighting is required with the installation of RRFBs at an unsignalized intersection. Four luminaires are recommended for the crosswalk, one in advance of the crosswalk and one after the crosswalk, for each direction of travel. It is also recommended that these luminaires be installed by FPL and attached to their wooden overhead utility poles. This effort will need to be coordinated with FPL during design.

Milling and resurfacing of the top lift of asphalt on Reed Canal Road is proposed within the limits of construction. Maintenance of traffic will likely require some temporary striping. In addition, the installation of the new RRFB and patterned pavement crosswalk will result in the final striping being different than the current striping. Milling and resurfacing the roadway will eliminate the scarring from old striping and provide a new surface for the final pavement markings.

DRAINAGE AND PERMITTING

The proposed Reed Canal Bridge will be placed approximately 870 ft east of Lake Nova Road and connected to the entrance of Lakeview Drive and Reed Canal Park. The existing bridge located 175 ft east of the proposed bridge will be demolished. The proposed bridge will have a gentle slope where stormwater will be captured by inlets at the end of the bridge and outfall into the canal.

A meeting with the St. Johns River Water Management District was conducted to discuss the feasibility study and the permitting that would be required. See **Appendix I** for meeting minutes. It was concluded that when this project enters the design phase it would require an environmental resource permit for construction under either FAC Chapter 62-330.443 or 62-330.449. The treatment volume requirements for these general permits could be satisfied by providing the necessary compensating treatment volume within Reed Canal Park. This project would not be eligible for exemption because the proposed arch culvert is longer than 30-ft from top-of-bank to top-of-bank. It was discussed that the proposed improvements need to meet section 3.3.2 of the SJRWMD Applicant's Handbook Vol. II. The proposed improvements must produce less than a one-foot increase in the 100-year flood elevation immediately upstream of the proposed crossing and no more than a one-tenth of a foot increase in the 100-year flood elevation 500 feet upstream of the proposed crossing. Currently in this feasibility stage, modeling of the proposed arch culvert produces an approximate rise of 0.10 foot in the 100-year flood stage immediately upstream of the proposed arch culvert, but further analysis during the design phase will be necessary.

A Contech "B" series arch culvert with a 48 ft span and a rise of 10 ft would be feasible for this project. HY-8 (version 7.60) was used to calculate the headwater elevation for the proposed arch culvert replacement during the 25-year and 100-year storms. Two proposed models were created using the flows and water surface elevations in Reed Canal for the 25-year, 96-hour and 100-year, 96-hour storm events using information from the "100 YR Stillwater" results contained in the CDM Smith Flood Study. One model represents the proposed arch culvert without any proposed improvements described in the CDM Smith Flood Study and the second model represents the proposed arch culvert with the flows and stages from Alternative 1 from the CDM Smith Flood Study. The stages in the CDM Smith Flood Study reference NGVD 1929 and were converted to NAVD 1988 as described in **Existing Conditions**.

See **Appendix F** for excerpts from the CDM Smith Nova Canal Flood Control and Integrated Water Resource Program. The rise in calculated headwater elevations immediately upstream of the crossing from the existing condition to the proposed condition are approximately 0.10 ft, which satisfy the SJRWMD criteria of a maximum one-foot rise immediately upstream of the proposed crossing during the 100-year storm. See **Table 4** and **5** for a summary of the proposed model results. See **Appendix H** for the HY-8 model results for the proposed arch culvert.

TABLE 4: PROPOSED CONDITIONS (25YR-96HR STORM EVENT)

Proposed Conditions (25YR-96HR Storm Event)				
Model	**Headwater Elev. (ft.)**	**Discharge (cfs)**	**Velocity (fps)**	**Tailwater Elev. (ft.)**
Prop. Bridge	7.22	706	2.13	7.07
Prop. Bridge Alt. 1	7.03	730	2.20	6.87

TABLE 5: PROPOSED CONDITIONS (100YR-96HR STORM EVENT)

Proposed Conditions (100YR-96HR Storm Event)				
Model	**Headwater Elev. (ft.)**	**Discharge (cfs)**	**Velocity (fps)**	**Tailwater Elev. (ft.)**
Prop. Bridge	7.77	808	2.44	7.57
Prop. Bridge Alt. 1	7.57	821	2.47	7.37

ENVIRONMENTAL

The West Indian manatee is listed by the USFWS as threatened. USFWS Standard Manatee Conditions for In-Water Work (2011) will be followed. During construction, grating shall be installed and maintained over any proposed pipes or culverts greater than 8 inches, but smaller than 8 feet in diameter that are submerged or partially submerged and reasonably accessible to manatees. For this project, there is one outfall that will require manatee grates.

Following the Florida Fish and Wildlife Conservation Commission's Gopher Tortoise Permitting Guidelines (2020), gopher tortoise survey should be conducted by a qualified Gopher Tortoise Agent (GTA) prior to construction activities.

UTILITIES

There is one existing utility pole owned by FPL with overhead power lines as well as several other utility lines located on the pole, that is in direct conflict with the proposed bridge. This utility pole will need to be removed and replaced with two new poles, one on either side of the new bridge. Coordination with FPL will be required during design and construction.

ROW AND MAINTENACE

Based on the apparent ROW information available during this study, all the proposed improvements are expected to fit within the existing ROW of Reed Canal Road and the Park with the exception of the proposed light pole on the north side of the cross walk. As depicted in the concept plans an easement will likely be needed from the Lakeview Mobile Home Park. The City has preliminarily discussed this easement with the property manager at the mobile home park and they do not anticipate any issues with obtaining the easement. As previously stated, the County maintains Reed Canal Road. The City maintains the

existing Park bridge and they own and maintain the Park. Based on coordination with the City, it is anticipated that the City will maintain the new bridge as well as the new RRFBs and associated improvements upon completion of this project. Coordination will be required between the City and County to establish an updated maintenance agreement to be in place at the completion of construction.

FINANCIAL FEASIBILITY

A preliminary cost estimate for the design and construction of the proposed bridge replacement is presented in **Appendix K**. This cost estimate is to be considered an opinion of probable costs based solely on the results of this feasibility study and the assumptions documented in this report. The item numbers and units of measure are based on the FDOT Basis of Estimates Manual. The unit prices are based on historical average costs for each pay item as provided by FDOT. Some unit prices may have been inflated due to the small nature of the project. **Appendix L** includes some preliminary cost information provided by CONSPAN which has been used in the estimate for this study. The cost estimate does not include permitting fees that may be associated with the final design phase. Based on the field review, no additional right of way will need to be purchased to accommodate the proposed conceptual design.

To adjust for potential future increases in the project's cost estimate, an annual inflationary factor may be applied. The FDOT provides annual inflation factors for roadway construction costs which may be used as a guideline for this project. The cost estimate provided herein has been adjusted by the FDOT inflationary factors noted in **Appendix M** to determine inflation-adjusted cost estimates for the proposed bridge replacement concept. The total cost estimate in 2021 dollars for the concept presented in **Appendix A** is $2,685,606. The inflation-adjusted cost estimates for 2022, 2023, and 2024 are $2,758,117, $2,836,000, and $2,916,568 respectively. The R2CTPO Resolution 2020-23 (**Appendix N**) states that for a mixed project such as this, that is not a stand-alone bicycle/pedestrian project, the cost component of the bicycle/pedestrian portion of the project must be at least 20% of the total cost to be accepted and ranked under that category for future funding. Based on the estimate prepared for this study, approximately 17% of the total cost, or $449,670, is attributed to the bicycle/pedestrian improvements proposed.

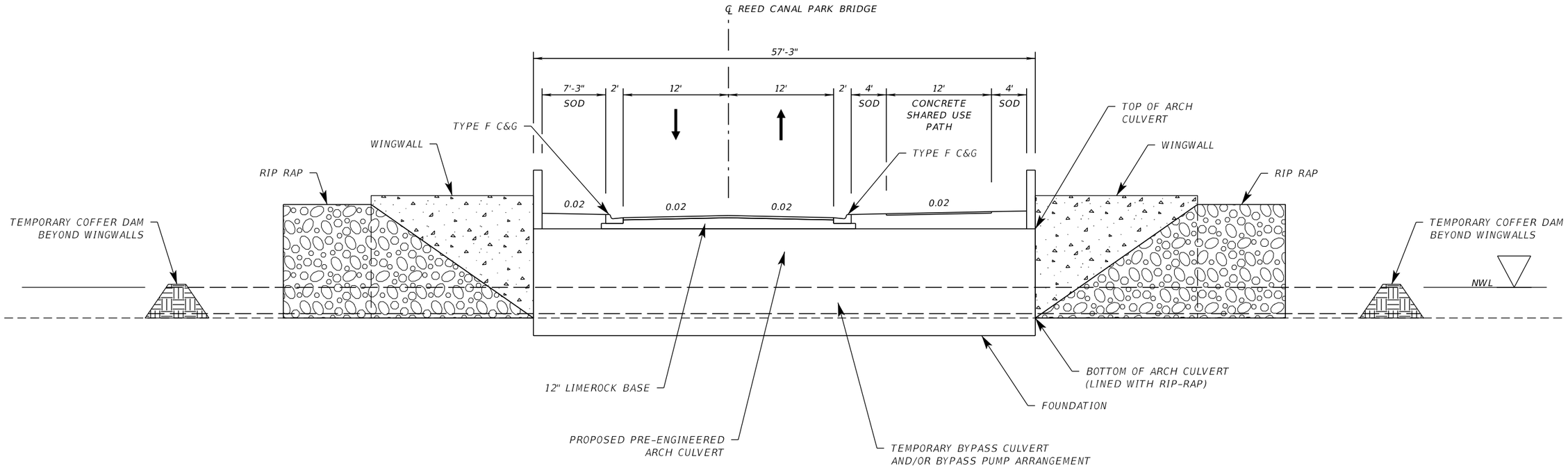
CONCLUSION

The purpose of this study was to evaluate the feasibility of replacing the existing Park entrance bridge with a new pre-engineered arch culvert over Reed Canal approximately 200 feet to the east at the intersection of Lakeview Drive and Reed Canal Road with enhanced bicycle and pedestrian accommodations. The proposed improvements include a Contech “B” series arch culvert with a 48 ft span and a rise of 10 ft to satisfy the hydraulic requirements. The bridge includes two (2) 12-foot lanes with curb & gutter and a 12-foot shared use path with enhanced aesthetics including decorative lighting and railing, and a stone façade. The decorative bridge features will need to be reviewed at the time of construction funding to determine if they are eligible for federal funding. The new entrance to the park should include roadway pavement up to the dirt parking lot with new curbing to define the entrance.

Based on the preliminary investigations of this study the new patterned pavement crosswalk with RRFBs is recommended to be installed. Construction of the proposed bridge and crosswalk, and subsequent demolition of the existing bridge, will necessitate the installation of new guardrail, curb and gutter, additional lighting, updated signing and pavement markings, and milling and resurfacing within the construction limits. During the design phase additional hydraulic analysis will be required for final design and permitting. A geotechnical investigation will be necessary to establish the bridge foundation design. Coordination with FPL will be required to remove the utility pole in conflict with the improvements and install the proposed lighting. ROW acquisition is not anticipated. However, an updated maintenance agreement will need to be established between the City and County upon completion of this project. Based on the findings of this study, it has been determined that the Park Bridge replacement as described herein is feasible. The engineering and construction costs associated with these improvements are anticipated to be $2,685,606.

APPENDIX A

Concept Typical Section and Plans



NEW CONSTRUCTION

OPTIONAL BASE GROUP 11 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC C) (1½") AND
FRICTION COURSE FC-9.5 (1") (PG 76-22)

REED CANAL ROAD MILLING AND RESURFACING

MILL EXISTING ASPHALT PAVEMENT (1" AVG. DEPTH)
FRICTION COURSE FC-9.5 (TRAFFIC C) (1") (PG 76-22)

REVISIONS					
DATE	DESCRIPTION	DATE	DESCRIPTION		
				RS&H, INC. 301 E. PINE ST, SUITE 350 ORLANDO, FLORIDA 32801	TYPICAL SECTION

SHEET NO. A-1

$USER$ $DATE$ $TIME$ $MODELNAME$ $FILE$

REED CANAL ROAD MILLING AND RESURFACING

MILL EXISTING ASPHALT PAVEMENT (1" AVG. DEPTH)
FRICTION COURSE FC-9.5 (TRAFFIC C) (1") (PG 76-22)

EXIST. UTILITIY POLE
W16-9p x1
AHEAD
W11-2 x1
RELOCATED EXIST. "KEEP VOLUSIA BEAUTIFUL" SINGLE-POST SIGN
EXIST. APPARENT R/W
REED CANAL PARK
RELOCATED
REED CANAL
REED CANAL ROAD
EXIST. APPARENT R/W
EXIST. SIDEWALK
250'
6" WHITE
EXIST. "KEEP VOLUSIA BEAUTIFUL" SINGLE-POST SIGN TO BE RELOCATED
PROP. UTILITY POLE WITH LUMINAIRE (BY FPL)
SINGLE FACE GUARDRAIL WITH PARALLEL APPROACH END ANCHORAGE
6" DOUBLE YELLOW
6" WHITE
M06-04 x1 TO BE REMOVED
OM1-3 x1 TO BE REMOVED
APPLE
REED CANAL PARK
RIP RAP
TYPE F CURB AND GUTTER
W11-2 x1
HERE TO
24" WHITE
WALL MOUNTED LIGHTING (TYP)
PROPOSED GATE
3.5' CONCRETE FLUME
SOD
RIP RAP
TYPE P CURB AND GUTTER
ELECTRIC CONDUIT EMBEDDED IN WALL
EXIST. UTILITY POLE TO BE REMOVED
MILL & RESURFACE EXISTING PAVEMENT
TYPE D CURB
RELOCATED EXIST. "REED CANAL PARK" MULTI-POST SIGN
TYPE F CURB AND GUTTER
6" DOUBLE YELLOW
6" WHITE
12" WHITE
LAKEVIEW DRIVE
PROPOSED GATE
SOD
6" WHITE
24" WHITE
PATTERED PAVEMENT CROSSWALK MARKING, SCHEME 1 CROSSWALK W/ 12" WHITE PAVEMENT MARKING
CR-F
CR-F
PROP. LIGHT POLE
PROP. EASEMENT
W16-7pL x1
W11-2 x1
W11-2 x1
W16-7pL x1
W16-7P x1
W11-2 x1
W11-2 x1
W16-7P x1
DETECTABLE WARNINGS
SOD
TYPE D CURB
12' CONCRETE SHARED USE PATH
WALL MOUNTED LIGHTING (TYP)
ELECTRIC CONDUIT EMBEDDED IN WALL
PROP. 18" PIPE CULVERT
WINGWALL
PROP. MANHOLE
PROP. 18" PIPE CULVERT
PROP. MES WITH MANATEE GRATE/GUARD PER FDOT INDEX 280
RIP RAP
EXIST. APPARENT R/W
STOP
REED CANAL RD
LAKEVIEW DR
R1-1 x1
W16-08P x2
DETECTABLE WARNINGS
RIP RAP
PROP. UTILITIY POLE WITH LUMINAIRE
6" DOUBLE YELLOW
SINGLE FACE GUARDRAIL WITH PARALLEL APPROACH END ANCHORAGE
6" WHITE
24" WHITE
HERE TO
R1-5bL x1
EXIST. APPARENT R/W
TYPE F CURB AND GUTTER
PROP. LIGHT POLE
EXIST. SIDEWALK
6" WHITE
REED CANAL PARK
RELOCATED

0 10 30
Feet

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

RS&H, INC.
301 E. PINE ST, SUITE 350
ORLANDO, FLORIDA 32801

CONCEPT PLAN (1 OF 2)

SHEET NO.
A-2

REED CANAL ROAD MILLING AND RESURFACING

MILL EXISTING ASPHALT PAVEMENT (1" AVG. DEPTH)
FRICTION COURSE FC-9.5 (TRAFFIC C) (1") (PG 76-22)

EXIST. APPARENT R/W
EXIST. GATE TO BE REMOVED
EXIST. "REED CANAL PARK" MULTI-POST SIGN TO BE RELOCATED
SOD
WHEEL STOPS
EXIST. GATE TO BE REMOVED
REED CANAL PARK
EXIST. APPARENT R/W
SINGLE-FACED GUARDRAIL
6" WHITE
EXIST. UTILITIY POLE TO REMAIN
EXIST. BRIDGE REMOVAL
3.5' CONCRETE FLUME
R12-01 x1 TO BE REMOVED
WEIGHT LIMIT 11 TONS
6" WHITE
SINGLE-FACED GUARDRAIL
REED CANAL
REED CANAL ROAD
REED CANAL PARK TO BE RELOCATED
TYPE F CURB AND GUTTER
R12-01 x1 TO BE REMOVED
EXIST. APPARENT R/W
6" DOUBLE YELLOW
MILL & RESURFACE EXISTING PAVEMENT
EXIST. SIDEWALK
6" WHITE
EXIST. FIRE HYDRANT TO REMAIN
REED CANAL PARK TO BE RELOCATED
W11-2 x1
AHEAD
W16-9P x1
EXIST. APPARENT R/W

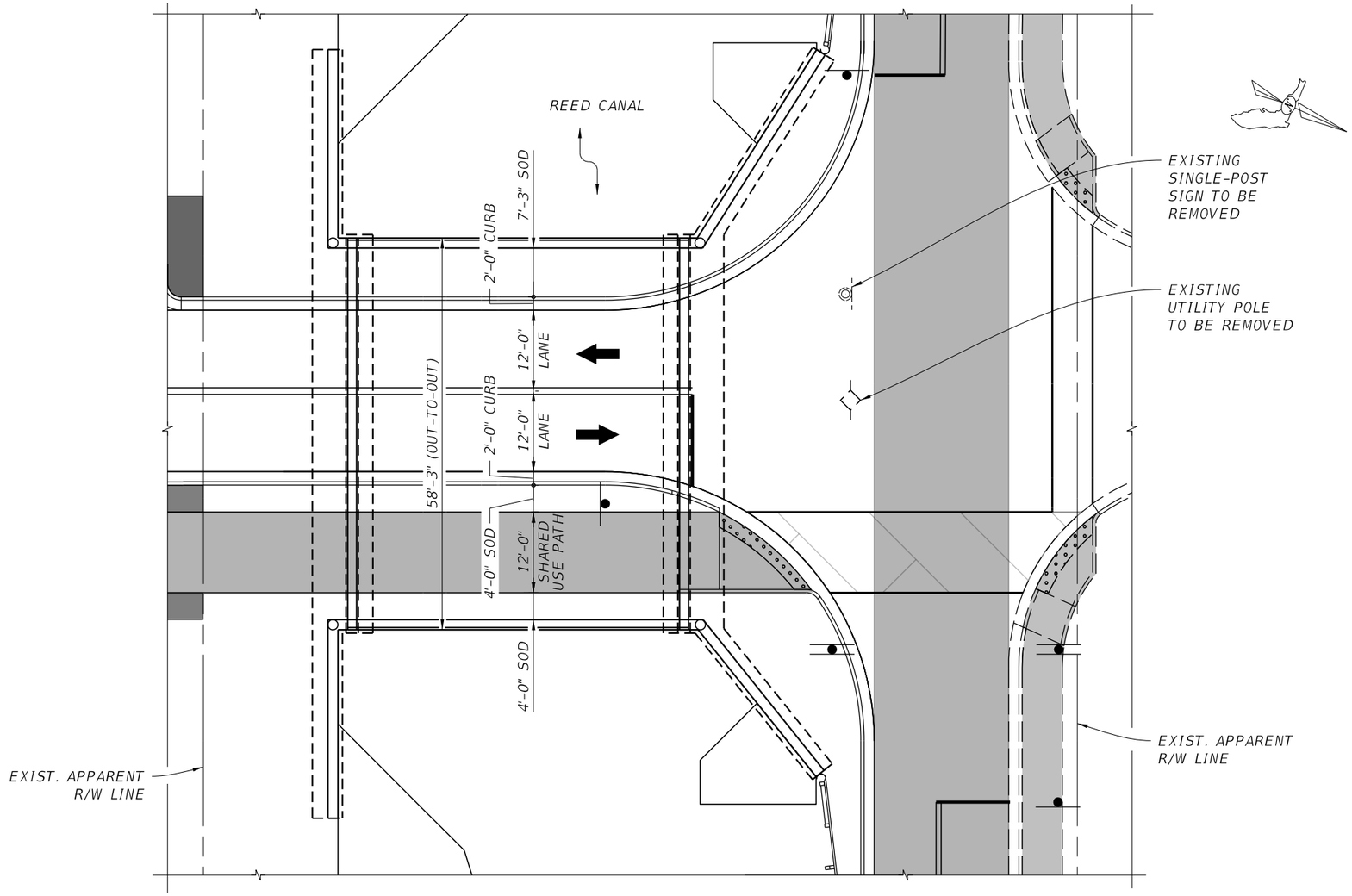
0 10 30
Feet

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

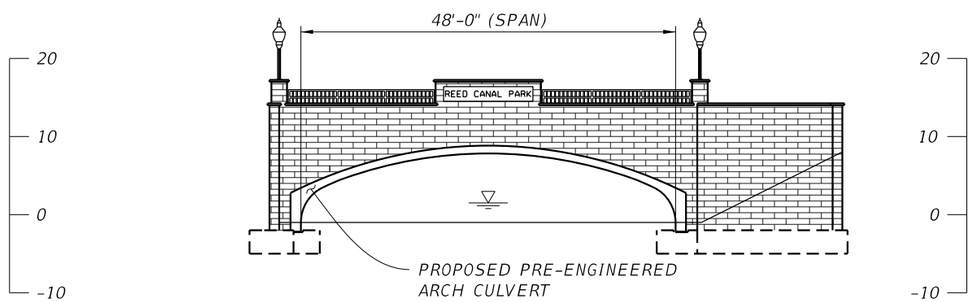
RS&H, INC.
301 E. PINE ST, SUITE 350
ORLANDO, FLORIDA 32801

CONCEPT PLAN (2 OF 2)

SHEET NO.
A-3



PLAN



ELEVATION

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

RS&H, INC.
301 E PINE ST, SUITE 350
ORLANDO, FLORIDA 32801

DRAWN BY:
CHECKED BY:
DESIGNED BY:
CHECKED BY:

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	VOLUSIA	

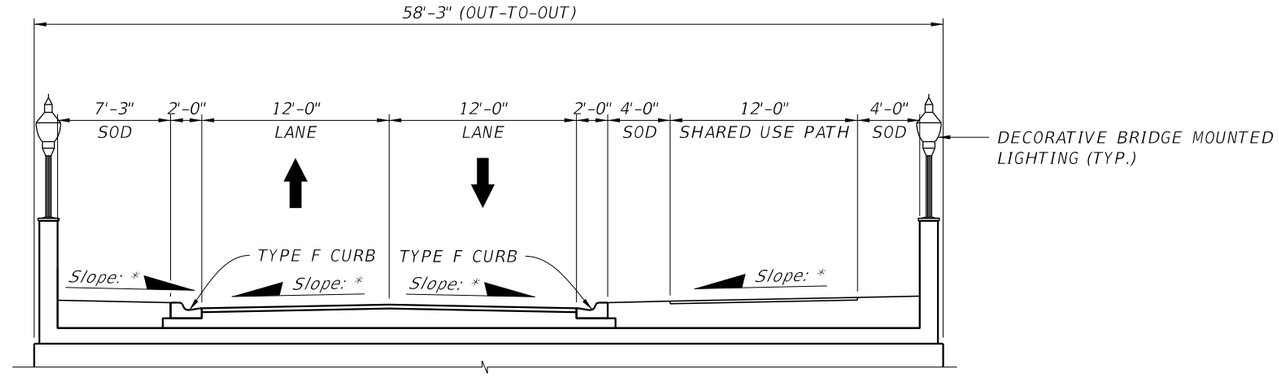
SHEET TITLE: PLAN AND ELEVATION

REF. DWG. NO.

PROJECT NAME: REED CANAL PARK BRIDGE REPLACEMENT

SHEET NO. A-4

$USER$ $DATE$ $TIME$ $FILE$



*0.02 FT/FT

TYPICAL SECTION

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

RS&H, INC.
301 E PINE ST, SUITE 350
ORLANDO, FLORIDA 32801

DRAWN BY:
CHECKED BY:
DESIGNED BY:
CHECKED BY:

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	VOLUSIA	

SHEET TITLE: TYPICAL SECTION

REF. DWG. NO.:

PROJECT NAME: REED CANAL PARK BRIDGE REPLACEMENT

SHEET NO.: A-5

$USER$ $DATE$ $TIME$ $FILE$

APPENDIX B

Reed Canal Park Entrance Bridge Inspection Report – May 2020

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR Report with PDF attachment(s)
Inspection

Structure ID: 796500

DISTRICT: D5 - Deland **INSPECTION DATE: 5/14/2020 GGSX**

BY:	Ayres Associates	STRUCTURE NAME:	Reed Cnl Prk Ent Rd-Reed
OWNER:	4 City/Municipal Hwy Agy	YEAR BUILT:	1983
MAINTAINED BY:	4 City/Municipal Hwy Agy	SECTION NO.:	79 000 115
STRUCTURE TYPE:	7 Wood or Timber - 02 Stringer/Girder	MP:	1.260
LOCATION:	Intrsect w Reed Canal Rd	ROUTE:	00000
SERV. TYPE ON:	5 Highway-pedestrian	FACILITY CARRIED:	Reed Ca Prk Ent Rd
SERV. TYPE UNDER:	5 Waterway	FEATURE INTERSECTED:	Reed Canal

[X] FUNCTIONALLY OBSOLETE [ ] STRUCTURALLY DEFICIENT

TYPE OF INSPECTION: Regular NBI

DATE FIELD INSPECTION WAS PERFORMED: ABOVE WATER: 5/14/2020 UNDERWATER: 5/14/2020

SUFFICIENCY RATING: 28.1
HEALTH INDEX: 87.52

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR Report with PDF attachment(s)
Inspection

Structure ID: 796500

DISTRICT: D5 - Deland **INSPECTION DATE: 5/14/2020 GGSX**

BY:	Ayres Associates	STRUCTURE NAME:	Reed Cnl Prk Ent Rd-Reed
OWNER:	4 City/Municipal Hwy Agy	YEAR BUILT:	1983
MAINTAINED BY:	4 City/Municipal Hwy Agy	SECTION NO.:	79 000 115
STRUCTURE TYPE:	7 Wood or Timber - 02 Stringer/Girder	MP:	1.260
LOCATION:	Intrsect w Reed Canal Rd	ROUTE:	00000
SERV. TYPE ON:	5 Highway-pedestrian	FACILITY CARRIED:	Reed Ca Prk Ent Rd
SERV. TYPE UNDER:	5 Waterway	FEATURE INTERSECTED:	Reed Canal

☐ THIS BRIDGE CONTAINS FRACTURE CRITICAL COMPONENTS

☐ THIS BRIDGE IS SCOUR CRITICAL

☐ THIS REPORT IDENTIFIES DEFICIENCIES WHICH REQUIRE PROMPT CORRECTIVE ACTION

☒ FUNCTIONALLY OBSOLETE ☐ STRUCTURALLY DEFICIENT

TYPE OF INSPECTION: Regular NBI

DATE FIELD INSPECTION WAS PERFORMED: ABOVE WATER: 5/14/2020 UNDERWATER: 5/14/2020

OVERALL NBI RATINGS:

DECK:	6 Satisfactory	CHANNEL:	5 Bank Prot Eroded
SUPERSTRUCTURE:	7 Good	CULVERT:	N N/A (NBI)
SUBSTRUCTURE:	5 Fair	SUFF. RATING:	28.1
PERF. RATING:	Fair	HEALTH INDEX:	87.52

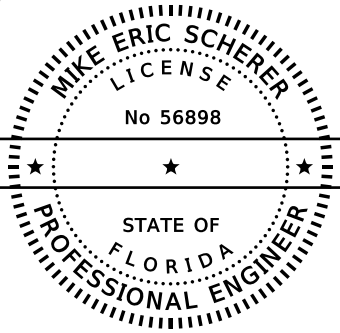
FIELD PERSONNEL / TITLE / NUMBER:	**INITIALS**
Steege, Casey - Bridge Inspector (CBI#00525) (lead)	CS
Jensen, Denise - Bridge Inspector (CBI #00592) - Diver	
Kelleher, Shane - Asst Bridge Inspector - Diver	

REVIEWING BRIDGE INSPECTION SUPERVISOR:

Maslyn, Rick - Bridge Inspector (CBI #00271) RM

CONFIRMING REGISTERED PROFESSIONAL ENGINEER:

Scherer, Michael - Professional Engineer (P.E.#56898) Ayres Associates (C. A. #4356)
8875 Hidden River Pkwy
Suite 200
Tampa FL 33637



SIGNATURE:

DATE:

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY

ON THE DATE ADJACENT TO THE SEAL.

PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR Report with PDF attachment(s)
Inspection

Structure ID: 796500

DISTRICT: D5 - Deland **INSPECTION DATE: 5/14/2020 GGSX**

All Elements

DECKS : Decks/Slabs

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	31 / 3	Timber Deck	1536	75.44	500	24.56	0	.	0	.	2036 sq.ft
0	1140 / 3	Decay/Section Loss	0	.	300	100	0	.	0	.	300 sq.ft
0	1150 / 3	Check/Shake	0	.	200	100	0	.	0	.	200 sq.ft
0	510 / 3	Wearing Surfaces	0	.	2036	100	0	.	0	.	2036 sq.ft
0	3230 / 3	Effectiveness (Wearing Surface)	0	.	2036	100	0	.	0	.	2036 sq.ft

Element Inspection Notes:

31/3 Note: The tops of the transverse timber deck planks are not visible due to the longitudinal timber planks. The deck has a full width 3in. x 8in. longitudinal deck timber wearing surface and a lower layer of transverse 4in. x 12in. deck timbers.

Previously Noted:
Deck Underside (Transverse Timber Planks):
CS2 (1150) = The transverse timber decking typically has weathering splits and checks up to 1/2in. wide with areas of decay and staining, both sides. (200SF)

CS2 (1140) = The undersides of transverse decking Timbers 1-5, 1-9, 1-26, 1-31, 1-32, 1-33, 1-34, 1-35, 1-41 and 1-42 each have areas of decay up to 8in. x 4in. in the left end. (50SF)

CS2 (1140) = The right ends of transverse timbers have areas of moderate decay and moderate vegetation growth, that can be probed up to 1ft. deep. Refer to Photo 1. (200SF) REPAIR

CS2 (1140) = There are minor areas of decay at deck underside. (50SF)

INCIDENTAL:
The curbs have splinters up to 3in. x 3in. x 1in. deep.

1140/3 Refer to Parent Element

1150/3 Refer to Parent Element

510/3 Previously Noted:
CS2 (3230) = The longitudinal timber (running boards) are weathered and checked and the nails are beginning to back out. Refer to Photo 2. (2036SF) REPAIR.

In the wearing surface, Running Board 11 over Bent 3 has moderate wear.

In Span 4, Running Board 32 (from the left curb) has a splinter 10in. x 3in. wide 12ft. from Abutment 5.

3230/3 Refer to Parent Element

MISCELLANEOUS : Channel

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8290 / 3	Channel	0	.	0	.	1	100	0	.	1 (EA)
0	9120 / 3	Degradation	0	.	0	.	1	100	0	.	1 (EA)

Element Inspection Notes:

8290/3 Previously Noted:

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR Report with PDF attachment(s)
Inspection

Structure ID: 796500

DISTRICT: D5 - Deland **INSPECTION DATE: 5/14/2020 GGSX**

CS3 (9120) = The south and north channel banks are heavily eroded/washed out and the centerline of channel bottom in line with Bent 3 has scoured under the west side of the structure. The channel bottom scour starts approximately 10ft. west (upstream) of the structure and tapers back up to and near the center as do the areas of channel bank erosion. Refer to Photo 3. (1EA) REPAIR

The cement rip rap bags placed along the north and south channel banks are displaced due to the channel bank erosion. Refer to Photo 3. REPAIR

There is scattered drift throughout the channel.

9120/3 Refer to Parent Element

MISCELLANEOUS : Other Elements

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8476 / 3	Timber Walls	55	40.74	0	.	80	59.26	0	.	135 ft
0	1140 / 3	Decay/Section Loss	0	.	0	.	80	100	0	.	80 ft

Element Inspection Notes:

8476/3 Previously Noted:
CS3 (1140) = The vertical timber walls typically exhibit moderate to heavy decay at ground line. (30FT)

CS3 (1140) = The timber walls have areas of decay up to 6in. x 4in. x 3in. deep. (25FT)

CS3 (1140) = The eastern 5ft. of the northeast wingwall has moderate decay throughout and moderate backfill migration. There is a similar condition at the southwest wingwall. (5FT)

CS3 (1140) = At Abutment 5 the backwall timbers above the abutment cap have areas of decay with fill migration between Piles 5-10 and 5-12. (10FT) REPAIR

CS3 (1140) = At Abutment 1, bays 1-1 and 1-2, the timber backwall above the abutment cap has heavy decay and minor fill migration. Refer to Photo 4. (10FT) REPAIR

1140/3 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	216 / 3	Timber Abutment	0	.	120	95.24	6	4.76	0	.	126 ft
0	1140 / 3	Decay/Section Loss	0	.	0	.	6	100	0	.	6 ft
0	1150 / 3	Check/Shake	0	.	120	100	0	.	0	.	120 ft

Element Inspection Notes:

216/3 Previously Noted:
CS3 (1140) = The eastern 3ft. of both abutment caps exhibit moderate to heavy decay; minor at the west end. Refer to Photo 5. (6FT) REPAIR

CS2 (1150) = The timber abutment caps have weather checks up to 3/16in. wide. (110FT)

CS2 (1150) = Abutment 5 cap has a weather check up to 3/8in. wide between Piles 5-10 and 5-12. (10FT)

INCIDENTAL:
There is moderate accumulation of moisture retaining dirt and vegetation on the top of the timber abutment caps.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR Report with PDF attachment(s)
Inspection

Structure ID: 796500

DISTRICT: D5 - Deland **INSPECTION DATE: 5/14/2020 GGSX**

1140/3 Refer to Parent Element

1150/3 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	228 / 3	Timber Pile	27	77.14	4	11.43	4	11.43	0	.	35 (EA)
0	1140 / 3	Decay/Section Loss	0	.	0	.	4	100	0	.	4 (EA)
0	1150 / 3	Check/Shake	0	.	4	100	0	.	0	.	4 (EA)

Element Inspection Notes:

228/3 Note: Sister piles have been installed at Piles 4-1, 4-7 and 5-11. The sister piles were driven along the south face of Bent 4 cap and through bolted to Bent 4 cap with a steel angle to provide bearing for Bent 4 cap. Piles 4-1, 4-7 and 5-11 will be placed in CS3 due to deficiencies noted. Refer to Photo 6.

Previously Noted::
CS3 (1140) = Pile 4-1 has decay with up to 1/2in. shell remaining, starting below the cap extending to below the waterline. (1EA)

CS3 (1140) = Pile 4-7 has decay with up to 1/4in. shell remaining, starting at the cap and extending to the waterline. (1EA)

CS3 (1140) = Pile 5-11 has an all-around, 12in. x 3/4in. area of decay at the ground line. (1EA)

CS3 (1140) = Pile 3-3 has a 34in. x 4in. x 2in. deep area of decay in the northwest quadrant 6ft. below the cap. Refer to Photo 7. (1EA) REPAIR.

CS2 (1150) = Pile 1-5 has a 16in. L x 8in. W x 1in. D splinter in the southwest quadrant, at ground line. (1EA)

CS2 (1150) = Pile 2-2 has a 52in. shake at the north face, 1ft. below the cap. (1EA)

CS2 (1150) = Pile 4-5 has 12in. L x 12in. W x 1-1/2in. D splintered area at the east face, at ground line. (1EA)

CS2 (1150) = Pile 5-12 has a 12in. L x 6in. W x 1in. D splintered area in the upper east quadrant (1EA)

CS1 = The piles typically have minor weather checks up to 1/8in. deep.

The outside 1/8in. of the piles is soft.

The west end of the cross bracing on the south face of Pile 3-1 has a 10in. (full height) x 4in. (full width) x 4in. D area of decay exposing the connecting hardware, which is in good condition.

1140/3 Refer to Parent Element

1150/3 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	235 / 3	Timber Pier Cap	0	.	132	100	0	.	0	.	132 ft

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR Report with PDF attachment(s)
Inspection

Structure ID: 796500

DISTRICT: D5 - Deland **INSPECTION DATE: 5/14/2020 GGSX**

0	1140 / 3	Decay/Section Loss	0	.	9	100	0	.	0	.	9 ft
0	1150 / 3	Check/Shake	0	.	123	100	0	.	0	.	123 ft

Element Inspection Notes:

235/3 Previously Noted:
CS2 (1150) = The intermediate bent caps typically have weather checks up to 1/4in. wide. (113FT)

CS2 (1150) = Bent 2, south face east end, has a 10ft. x 3/8in. weather check. (10FT)

CS2 (1140) = Bent 4, west end at connection plate, has a 12in. x 6in. x 1in. area of decay and the east end has a 3ft. x 8in. x full penetration area of decay. Refer to Photo 8. (4FT) REPAIR

CS2 (1140) = The horizontal timber brace adjacent to Bent 4 cap which supports a bridge rail post and knee brace has heavy decay 4in. x 12in. x 3in. at the east end. Refer to Photo 8. (1FT) REPAIR

CS2 (1140) = The horizontal tie beam between the left ends of Bent 4 cap and Abutment 5 cap has an area of decay and vegetation in the west face 12in. x 6in. x 1in. at the steel connection plate. (1FT)

CS1 = At bents 2 and 3 the cap splices are not over the piles and cantilever on Piles 2-4 and 3-4.

Noted This Inspection:
CS2 (1140) = Bent 2 cap in the top face at the east end, there is an area of decay 3ft. x 3in. x 3in. deep which does not extend beneath the outside stringer. (3FT)

1140/3 Refer to Parent Element

1150/3 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8396 / 3	Other Abutment Slope Protection	1198	83.02	245	16.98	0	.	0	.	1443 (SF)
0	4000 / 3	Settlement	0	.	245	100	0	.	0	.	245 (SF)

Element Inspection Notes:

8396/3 Note: This element represents the sand-cement rip rap bag slope protection.

Previously Noted:
CS2 (4000) = Original portions of the sand cement bags have areas with displacement. Abutment 1 slope between Piles 2-1 and 2-1 and Abutment 5 slope between Piles 4-1 and 4-3. (245SF)

4000/3 Refer to Parent Element

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	111 / 3	Timber Open Girder	766	86.26	121	13.63	1	0.11	0	.	888 ft
0	1140 / 3	Decay/Section Loss	0	.	0	.	1	100	0	.	1 ft
0	1150 / 3	Check/Shake	0	.	121	100	0	.	0	.	121 ft

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR Report with PDF attachment(s)
Inspection

Structure ID: 796500

DISTRICT: D5 - Deland **INSPECTION DATE: 5/14/2020 GGSX**

Element Inspection Notes:

111/3 Previously Noted:
CS3 (1140) = Stringer 4-19 2ft. north of Bent Cap 4 has area of decay 9in. L x 3in. W x 5in. D. Refer to Photo 9. (1FT) REPAIR

CS2 (1150) = Numerous stringers have longitudinal checks in their lower left and right faces, up to 8ft.-9in. L x up to 1/8in. W, typically emanating from the nail penetration points of the timber cross bracing. (95FT)

CS2 (1150) = The lower west face of Stringer 1-1 has a 13ft. L x up to 1/8in. W longitudinal check 2-1/2in. above the bottom, starting at Abutment 1. (13FT)

CS2 (1150) = The lower west face of Stringer 1-7 has a 12ft.-4in. L x 1/8in. W longitudinal check at mid-span. (13FT)

CS1 = There are four missing and two disconnected stringer cross braces (spacer blocks) in Bays 1-1 and 2-1.

The timber stringers have random checks up to 1/16in. wide.

1140/3 Refer to Parent Element

1150/3 Refer to Parent Element

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	332 / 3	Timb Bridge Railing	192	95.05	10	4.95	0	.	0	.	202 ft
0	1020 / 3	Connection	0	.	10	100	0	.	0	.	10 ft

Element Inspection Notes:

332/3 Previously Noted:
CS2 = Bridge rail Posts 2-3, 3-3, and 3-4 on the right side (west) are loose.

CS1 = The timber handrails, posts, and curbs have up to 1/8in. wide checks and are weathered throughout.

INCIDENTAL:
The protective coating is peeling throughout the bridge rails. This was not observed in the 2020 routine inspection.

1020/3 Refer to Parent Element

Total Number of Elements*: 9
*excluding defects/protective systems

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR Report with PDF attachment(s)
Inspection

Structure ID: 796500

DISTRICT: D5 - Deland **INSPECTION DATE: 5/14/2020 GGSX**

Structure Notes

BRIDGE OWNER: CITY OF SOUTH DAYTONA

Bridge inventoried from south to north.

TRAFFIC RESTRICTIONS:
Based on the current load rating analysis dated 1/2/85, posting is required for the SU and C type vehicles as follows: SU = 15 tons and C = 24 tons. The structure is currently posted at the northwest and northeast corners of the bridge (south approach is a dead end) for 11 tons. Refer to Posting Photos.

This structure is on a 12 month inspection frequency due to SIA Item 70, Bridge Posting, being coded a 2.

On 07-19-10, A.DeVault retracted the reconstruction date of 2007 at Item 106. The repairs did not constitute a reconstruction as defined by the BMS Coding guide.

As stated in section 3.4 of the Bridge and Other Structures Inspection and Reporting as of 11/24/2009 superstructure unit numbering (Section 3.4.2.2) and substructure unit numbering (Section 3.4.3) are designated NOT BY ORDER IN WHICH THE ELEMENTS WERE CONSTRUCTED AND PUT INTO SERVICE. Plans sheet or drawing in Topic G, Bridge Description and Drawings section of the bridge folder can confirm all references to these elements prior to this date.

INSPECTION NOTES: GGSX 5/14/2020

LOAD CAPACITY EVALUATION: A cursory review of the current load rating analysis dated1/02/85 was conducted during this inspection by Michael Scherer, P.E. 6/19/2020. The findings of this review and inspection reveal no substantial deterioration, geometric changes or additional dead load to the bridge that warrant the need for a new load rating analysis; therefore, the current load rating is considered applicable.

The lead underwater inspector for the current routine inspection is Denise Jensen (CBI #00592).

The following elements were inspected underwater:
228 Timber Pile - Bent 3 with four Timber Piles; Bent 4 with nine Timber Piles
8290 Channel
8396 Abutment Slope Protection

Non-Structural Items:

Signs:
Noted This Inspection:
CORRECTIVE ACTION TAKEN:
The signs have been moved to the correct locations.

Sufficiency Rating Calculation Accepted on 6/19/2020.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
BRIDGE INSPECTION REPORT
ADDENDUM

CONTENTS OF ADDENDUM

	Bridge Location Map		Sketches and Photos
*	Additional Element Inspection Notes		Recommended Corrective Action
	Load Rating Analysis Summary		Scour Evaluation
	Posting Photos	*	Fracture Critical Inspections

* This section is not included in this report.

PREPARED FOR: FDOT
BRIDGE OWNER: CITY OF SOUTH DAYTONA
PREPARED BY: AYRES ASSOCIATES

REPORT IDENTIFICATION

Bridge Number: 796500 – Regular NBI	Inspection Date: 05/14/2020

Bridge Name: Reed Canal Park Entrance Road over Reed Canal

Facility Carried: Reed Canal Park Entrance Road

Featured Intersected: Reed Canal

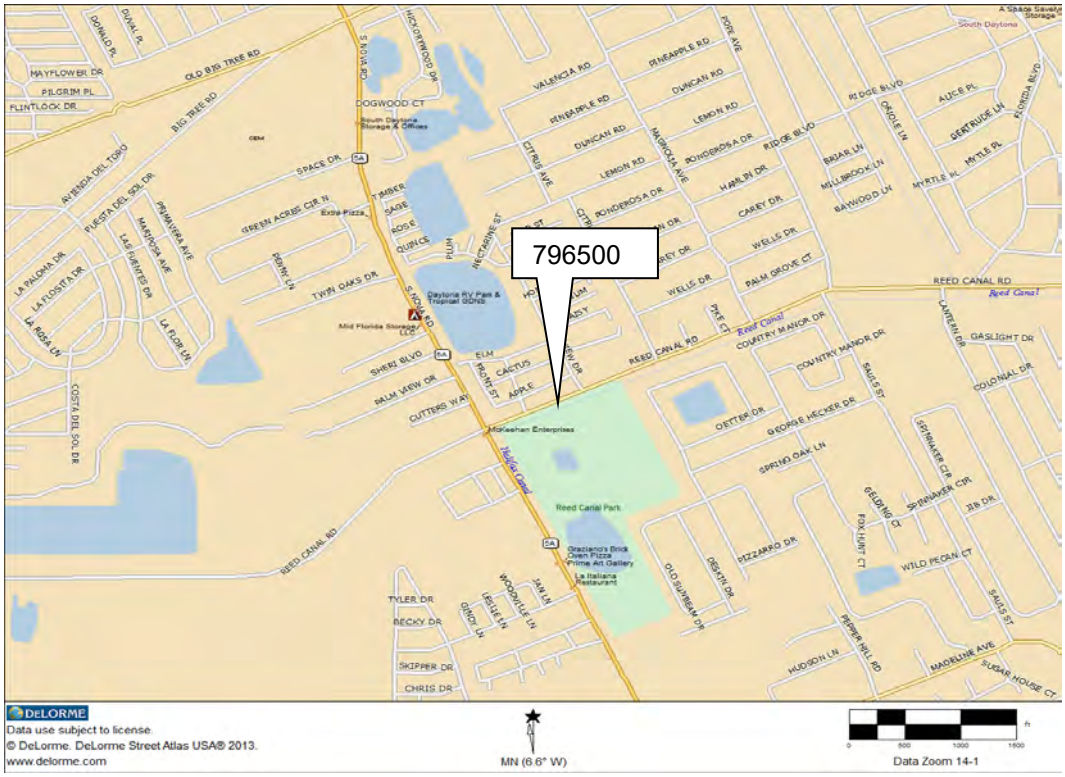
South Approach Looking North

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
BRIDGE INSPECTION REPORT

Bridge No: 796500 Inspection Date: 05/14/2020

BRIDGE LOCATION MAP

East Elevation



Reed Canal Park Entrance Road over Reed Canal Intersect with Reed Canal Rd

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
BRIDGE INSPECTION REPORT

Bridge No: 796500 Inspection Date: 05/14/2020

LOAD RATING ANALYSIS SUMMARY

Bridge No. 796500

D. LOAD APACITY INFORM TION

GUIDE

LOAD RATING SUMMARY

Computations and/or Computer Coding Performed By: [signature] P.E. # 23379

Date of Computations: 1-2-85, Computer Program: N.A.

Loading Classification	TYPE OF LOADING	RATING LEVEL	Moment Capacity of Planking	Moment Capacity of Stringers	Shear Capacity of Stringers		Critical Rating			Posting Req'd			
Florida Legal Loading	SU2 GVW=17T	Inventory	11.2	15.1	15.1		11.2	<	17 T	✓	*		
		Operating	14.9	20.7	20.5	<	14.9		13				
	SU3 GVW=33T	Inventory	21.8	20.1	18.1		18.1	<	33 T	✓			
		Operating	29.0	27.5	24.6	<	24.6		22				
	SU4 GVW=35T	Inventory	27.2	19.9	19.8		19.8	<	35 T	✓			
		Operating	36.2	27.3	27.0	<	27.0		24				
	C3 GVW=28T	Inventory	18.5	24.9	23.9		18.5	<	28 T	✓			
		Operating	24.6	34.1	32.5	<	24.6		22				
	C4 GVW=36.636T	Inventory	24.2	22.3	20.1		20.1	<	36.6 T	✓			
		Operating	32.2	30.5	27.3	<	27.3		24				
	C5 GVW=40T	Inventory	26.4	24.3	22.0		22.0	<	40 T	✓			
		Operating	35.1	33.3	29.9	<	29.9		27				
Design Loading	H	Inventory	H 9.1	H 12.2	H 12.1		H 9.1						
		Operating	H 12.1	H 16.7	H 16.6		H 12.1						
	HS	Inventory	HS 9.1	HS 12.2	HS 12.1	<	HS 9.1		14.8				
		Operating	HS 12.1	HS 16.7	HS 16.6	<	HS 12.1		19.7				

* See next page for recommended posting!

NOTES:
1. Supporting computer load rating analysis computations are included in this topic.
2. Governing span length for Design Load is 14.33' 4.37m
3. Moment/Shear controls for this structure.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
BRIDGE INSPECTION REPORT

Bridge No: 796500 Inspection Date: 05/14/2020

POSTING PHOTOS

Northwest Weight Limit Sign

Northeast Weight Limit Sign

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
BRIDGE INSPECTION REPORT

Bridge No: 796500 Inspection Date: 05/14/2020

SKETCHES AND PHOTOS

Photo 1: Element 31: Outer ends of transverse timber deck are wet, soft, and decayed.

Photo 2: Element 31: Showing weathered and checked timber running boards.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
BRIDGE INSPECTION REPORT

Bridge No: 796500 Inspection Date: 05/14/2020

SKETCHES AND PHOTOS

Photo 3: Element 8290: Showing channel bank erosion and displaced rip rap bags.

Photo 4: Element 8476: Showing fill migration and decay at Abutment 1 backwall.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
BRIDGE INSPECTION REPORT

Bridge No: 796500 Inspection Date: 05/14/2020

SKETCHES AND PHOTOS

Photo 5: Element 216: Showing heavy decay at east end of Abutment 1 cap.

Photo 6: Element 228: Pile 4-7 bracing.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
BRIDGE INSPECTION REPORT

Bridge No: 796500 Inspection Date: 05/14/2020

SKETCHES AND PHOTOS

Photo 7: Element 228: Showing heavy decay at Pile 3-3.

Photo 8: Element 235: Showing heavy decay at Bent 4 cap and horizontal brace.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
BRIDGE INSPECTION REPORT

Bridge No: 796500 Inspection Date: 05/14/2020

SKETCHES AND PHOTOS

Photo 9: Element 111: Showing decay at timber stringer 4-19.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
BRIDGE INSPECTION REPORT

Bridge No: 796500 Inspection Date: 05/14/2020

RECOMMENDED CORRECTIVE ACTION

31 Timber Deck
Monitor timber deck for further decay.
Set any backed out wearing surface nails.

8290 Channel
Re-grade the channel slopes.
Repair all areas of displaced rip-rap bags.

8476 Timber Walls
Repair the back walls above Abutment 1 and5 caps which are decayed and have fill migration.

216 Timber Abutment
Remove dirt and vegetation accumulation from on top of abutment caps.
Cut back the east end of Abutment 1 and Abutment 5 cap and apply an antifungal treatment.

228 Timber Piles
Replace Piles 3-3.

235 Timber Pier Cap
Repair decayed east ends of Bent 4 cap and the associated bridge rail knee brace support beams.
Remove vegetation from west face of tie beam between Cap 4 and Abutment 5 cap and apply antifungal treatment.

111 Timber Open Girder
Repair or replace the decayed area of Stringer 4-19.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
BRIDGE INSPECTION REPORT

Bridge No: 796500 Inspection Date: 05/14/2020

SCOUR EVALUATION

LEFT (WEST) SIDE

		01/29/88	05/25/18	05/14/20	
Abutment 1		3.6	5.0	5.2	-0.2
Bent 2		10.5	13.3	13.7	-0.4
Bent 3		11.8	15.6	13.0	2.6
Bent 4		11.0	14.4	13.5	0.9
Abutment 5		4.5	4.8	5.0	-0.2

Waterline at Bent 3	10.8	10.6	10.5

RIGHT (EAST) SIDE

		01/29/88	05/25/18	05/14/20	
Abutment 1		4.0	4.3	4.4	-0.1
Bent 2		10.4	11.1	10.6	0.5
Bent 3		11.8	11.9	11.8	0.1
Bent 4		10.5	12.8	11.9	0.9
Abutment 5		6.6	4.2	4.3	-0.1

Waterline at Bent 3	10.8	9.9	9.9

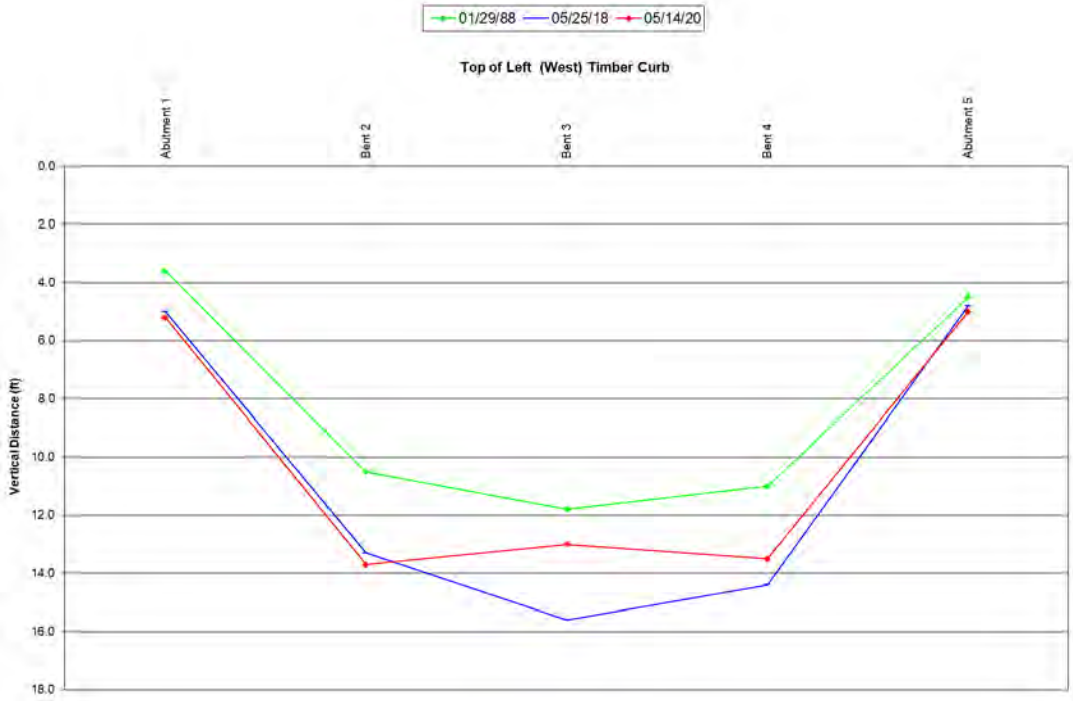
NOTE: - = An increase in degradation.
Blank box = No previous measurement available.
Relative Channel Plots Are Not To Scale.
Any Vertical Curvature Of Datum Point Is Not Reflective In Plot.
The waterline and mudline measurements in reference to the top of timber curb.
All measurements are in feet.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
BRIDGE INSPECTION REPORT

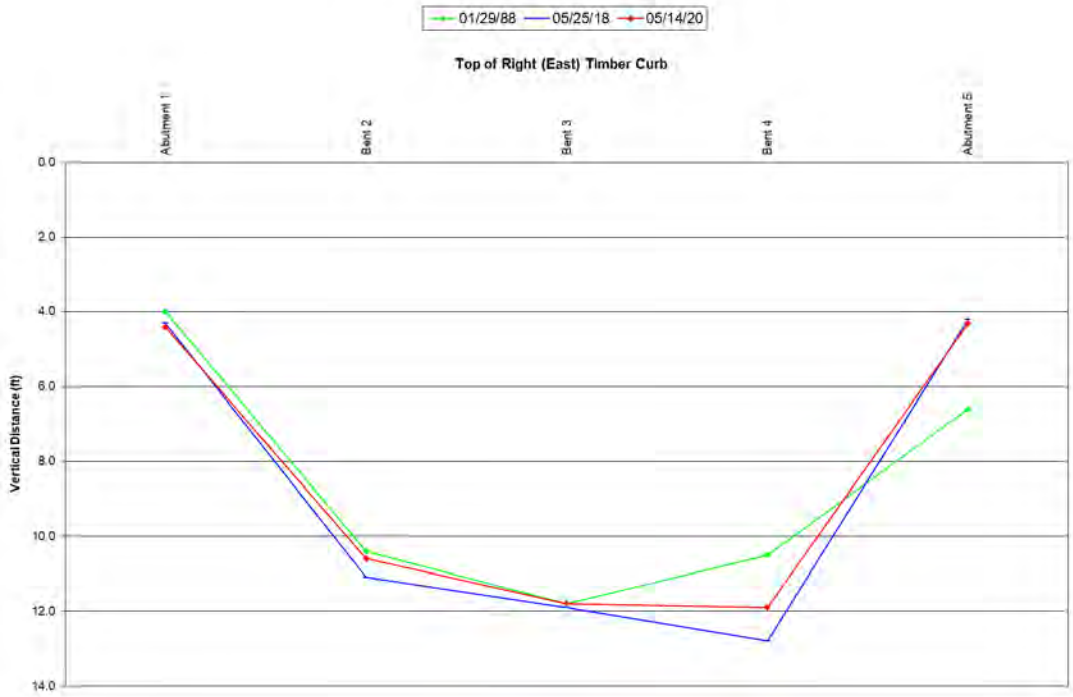
Bridge No: 796500 Inspection Date: 05/14/2020

SCOUR EVALUATION

LEFT (WEST) SIDE SOUNDINGS



RIGHT (EAST) SIDE SOUNDINGS



Relative Channel Plots Are Not To Scale.
Any Vertical Curvature Of Datum Point Is Not Reflective In Plot.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
BRIDGE INSPECTION REPORT

Bridge No: 796500 Inspection Date: 05/14/2020

SCOUR EVALUATION

West Channel

East Channel

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
BRIDGE INSPECTION REPORT

Bridge No: 796500 Inspection Date: 05/14/2020

FIELD PREPARATION

A. Tools and Equipment

Full Size Cargo Van:	Yes:	X	No:		Pick-up Truck:	Yes:		No: X
Automobile:	Yes:		No:	X				
Camera:	Yes:	X	No:		Video:	Yes:		No: X
NDT Equipment:	Yes:		No:	X				
NDT Type: N/A								
Binoculars:	Yes:		No:	X				
Diving Performed:	Yes:	X	No:		Max Depth:	3.2ft.	Current:	Light

Dive Mode: Level II Commercial Scuba

Hand Tools: (i.e. Chipping Hammer, 6' Ruler, etc.)

1. Standard Inspection Tools
2. Chipping Hammers
3. Flashlights
4. Carpenter Ruler
5. Inspection Hand Tools
6. Camera

Other:

B. Services

Flag Crew: N/A
Electrician: N/A
Snooper: N/A
Other: N/A

C. Scheduling (Brief Explanation)

Topside with Underwater:
Topside Hours: 4 hrs. Underwater Hours: 1 hrs. Travel Time: 3 hrs.

D. Site Conditions

Boat Needed: Yes Type of Boat: Jon Boat

Location of Boat Ramp: N/A

Lengthy Travel Required: NO

Difficult Access: NO

Water Obviously Polluted: NO

Water quality is fair (partially meets use): YES

Strong Water Current: NO

Other: NONE

E. UNDERWATER ELEMENTS INSPECTED:

228 Timber Piles – Bent 3 with four Timber Piles; Bent 4 with seven Timber Piles
8290 Channel
8396 Abutment Slope Protection

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 — **Inspection/CIDR Report with PDF attachment(s)**

Structure ID: 796500 — **CIDR** — **DATE PRINTED: 6/24/2020**

Description

Structure Unit Identification

Bridge/Unit Key: 796500 0
Structure Name: Reed Cnl Prk Ent Rd-Reed
Description: SPANS 1 THRU 4
Type: M - Main

Roadway Identification

NBI Structure No (8): 796500
Position/Prefix (5): 1 - Route On Structure
Kind Hwy (Rte Prefix): 5 City Street
Design Level of Service: 0 None of the below
Route Number/Suffix: 00000 / 0 N/A (NBI)
Feature Intersect (6): Reed Canal
Critical Facility: Not Defense-crit
Facility Carried (7): Reed Ca Prk Ent Rd
Mile Point (11): 1.26
Latitude (16): 029d09'20.5" Long (17): 081d00'58.9"

Roadway Traffic and Accidents

Lanes (28): 2 Medians: 0 Speed: 15 mph
ADT Class: 2 ADT Class 2
Recent ADT (29): 6900 Year (30): 2020
Future ADT (114): 11972 Year (115): 2042
Truck % ADT (109): 5
Detour Length (19): 99 mi
Detour Speed: 0 mph
Accident Count: -1 Rate:

Roadway Classification

Nat. Hwy Sys (104): 0 Not on NHS
National base Net (12): 0 - Not on Base Network
LRS Inventory Rte (13a): 79 000 115 Sub Rte (13b): 00
Functional Class (26): 17 Urban Collector
Federal Aid System: ON
Defense Hwy (100): 0 Not a STRAHNET hwy
Direction of Traffic (102): 2 2-way traffic
Emergency: [X]

Roadway Clearances

Vertical (10): 99.99 ft Appr. Road (32): 20 ft
Horiz. (47): 25 ft Roadway (51): 25 ft
Truck Network (110): 0 Not part of natl netwo
Toll Facility (20): 3 On free road
Fed. Lands Hwy (105): 0 N/A (NBI)
School Bus Route: [ ]
Transit Route: [ ]

NBI Project Data

Proposed Work (075A): Not Applicable (P)
Work To Be Done By (075B): Not Applicable (P)
Improvement Length (076): 0 ft

Improvement Cost (094): $ 0.00
Roadway Improvement Cost (095): $ 0.00
Total Cost (096): $ 0.00
Year of Estimate (097):

NBI Rating

Channel (61): 5 Bank Prot Eroded
Deck (58): 6 Satisfactory
Superstructure (59): 7 Good
Substructure (60): 5 Fair

Culvert (62): N N/A (NBI)
Waterway (71): 8 Equal Desirable
Unrepaired Spalls: -1 sq.ft.
Review Required: [X]

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 — **Inspection/CIDR Report with PDF attachment(s)**

Structure ID: 796500 — **CIDR** — **DATE PRINTED: 6/24/2020**

Structure Identification

Admin Area: River to Sea
District (2): D5 - Deland
County (3): (79)Volusia
Place Code (4): South Daytona
Location (9): Intrsect w Reed Canal Rd
Border Br St/Reg (98): Not Applicable (P) Share: 0 %
Border Struct No (99):
FIPS State/Region (1): 12 Florida Region 4-Atlanta
NBIS Bridge Len (112): Y - Meets NBI Length

Parallel Structure (101): No || bridge exists
Temp. Structure (103): Not Applicable (P)
Maint. Resp. (21): 4 City/Municipal Hwy Agy
Owner (22): 4 City/Municipal Hwy Agy
Historic Signif. (37): 5 Not eligible for NRHP

Geometrics

Spans in Main Unit (45): 4
Approach Spans (46): 0
Length of Max Span (48): 15.6 ft
Structure Length (49): 57 ft
Total Length: 57 ft
Deck Area: 2036 sqft
Structure Flared (35): 1 Yes, flared

Age and Service

Year Built (27): 1983
Year Reconstructed (106): 0
Type of Service On (42a): 5 Highway-pedestrian
Under (42b): 5 Waterway
Fracture Critical Details: Not Applicable

Structure Type and Material

Curb/Sidewalk (50): Left: 0 ft Right: 6.4 ft
Bridge Median (33): 0 No median
Main Span Material (43A): 7 Wood or Timber
Appr Span Material (44A): Not Applicable (P)
Main Span Design (43B): 02 Stringer/Girder
Appr Span Design (44B): Not Applicable (P)

Deck Type and Material

Deck Width (52): 33 ft
Skew (34): 0 deg
Deck Type (107): 8 Wood or Timber
Surface (108): 7 Wood or Timber
Membrane: 0 None
Deck Protection: None

Appraisal

Structure Appraisal

Open/Posted/Closed (41): P Posted for load
Deck Geometry (68): 2 Intolerable - Replace
Underclearances (69): N Not applicable (NBI)
Approach Alignment (72): 8-No Speed Red thru Curv
Bridge Railings (36a): 0 Substandard
Transitions (36b): 0 Substandard

Approach Guardrail (36c): 0 Substandard
Approach Guardrail Ends (36d): 0 Substandard
Scour Critical (113): 5 Stable w/in footing

Navigation Data

Navigation Control (38): Permit Not Required
Nav Vertical Clr (39): 0 ft
Nav Horizontal Clr (40): 0 ft
Min Vert Lift Clr (116): 0 ft
Pier Protection (111): Not Applicable (P)

NBI Condition Rating

Sufficiency Rating: 28.1
Health Index: 87.52
Structural Eval (67): 3 Intolerable - Correct
Deficiency: Functionally Obsolete

Minimum Vertical Clearance

Over Structure (53): 99.99 ft
Under (reference) (54a): N Feature not hwy or RR
Under (54b): 0 ft

Minimum Lateral Underclearance

Reference (55a): N Feature not hwy or RR
Right Side (55b): 0 ft
Left Side (56): 0 ft

Schedule

Current Inspection

Inspection Date: 05/14/2020
Inspector: KNAAACS - Casey Steege
Bridge Group: CA429
Alt. Bridge Group:
Primary Type: Regular NBI
Review Required: [X]

Next Inspection Date Scheduled

NBI: 05/14/2022
Element: 05/14/2021
Fracture Critical:
Underwater: 05/14/2022
Other/Special: 05/14/2021
Inventory Photo Update Due: 05/31/2028

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 — **Inspection/CIDR Report with PDF attachment(s)**

Structure ID: 796500 — **CIDR** — **DATE PRINTED: 6/24/2020**

Schedule Cont.

Inspection Types Performed NBI [X] Element [X] Fracture Critical [ ] Underwater [X] Other Special [X]

Inspection Intervals	Required (92)	Frequency (92)	Last Date (93)
Fracture Critical	[ ]	mos	
Underwater	[X]	24 mos	05/14/2020
Other Special	[X]	12 mos	05/14/2020
NBI		24 mos (91)	05/14/2020 (90)

Inspection Resources

Crew Hours:	4
Flagger Hours:	0
Helper Hours:	0
Snooper Hours:	0
Special Crew Hours:	3
Special Equip Hours:	0

Bridge Related

General Bridge Information

Parallel Bridge Seq:
Channel Depth: 3.2 ft
Radio Frequency: -1
Phone Number:
Exception Date:
Exception Type: Unknown
Accepted By Maint: 01/01/1983
Warranty Expiration: 00/00/0000
Performance Rating: Fair

Bridge Rail 1: Timber post and rail
Bridge Rail 2: Not applicable-No rail
Electrical Devices: No electric service
Culvert Type: Not applicable
Maintenance Yard: Not FDOT Maintained
FIHS ON / OFF: No Routes on FIHS
Previous Structure:
2nd Previous Structure:
Replacement Structure:

Permitted Utilities: Power [ ] Water [ ] Gas [ ] Fiber Optic [ ] Sewage [ ] Other [ ]

Bridge Load Rating Information

Inventory Type (065): 2 AS Allowable Stress
Operating Type (063): 2 AS Allowable Stress
Original Design Load (031): 2 M 13.5 (H 15)
Date: 01/02/1985
Initials: JH
Load Rating Rev. Recom.:
Load Rating Plans Status: Unknown

Inventory Rating (066): 16.4 tons
Operating Rating (064): 21.8 tons
FL120 Permit Rating: -1.0 tons
HS20/FL120 Max Span Rating: 21.8 tons
Dynamic Impact in Percent: 30 %
Governing Span Length: 14.4 ft
Minimum Span Length:
Distribution Method: AASHTO formula

Load Rating Notes:

LEGAL LOADS

SU2: 14.9 tons
SU3: 24.6 tons
SU4: 27.0 tons
C3: 24.6 tons
C4: 27.3 tons
C5: 29.9 tons
ST5: -1.0 tons
Posting (070): 2 20.0-29.9%below
Open/Posted/Closed (041): P Posted for load

POSTING

Recom. SU Posting: 15 tons
Recom. C Posting: 24 tons
Recom. ST5 Posting: 99 tons
Actual SU Posting: 99 tons
Actual C Posting: 99 tons
Actual ST5 Posting: 99 tons
Actual Blanket Posting: 11 tons
Emergency Vehicle: 1 EV inapplicable

FLOOR BEAM (FB) FB Present: No

FB Span Length, Gov: 0.0 ft
FB Spacing, Gov: 0.0 ft
FB OPR Rating: 0.0 tons
FB SU4 OPR Rating: 0.0 tons
FB FL120 Rating: 0.0 tons

SEGMENTAL (SEG)

SEG Wing-Span: -1.0 ft
SEG Web-to-Web Span: -1.0 ft
SEG Transverse HL93 Operating: -1.00 RF

Bridge Scour and Storm Information

Pile Driving Record: No pile driving records
Foundation Type: No foundation details
Mode of Flow: Tidal
Rating Scour Eval: Low Risk - High
Highest Scour Eval: Phase III completed
Scour Evaluation Method:

Scour Recommended I: Stop scour evaluations
Scour Recommended II: No recommendation
Scour Recommended III: No recommendation
Scour Elevation: 999 ft
Action Elevation: 999 ft
Storm Frequency: 999

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 — **Inspection/CIDR Report with PDF attachment(s)**

Structure ID: 796500 — **CIDR** — **DATE PRINTED: 6/24/2020**

Elements

Inspection Date: 05/14/2020 **GGSX**

DECKS : Decks/Slabs

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	31 / 3	Timber Deck	1536	75.44	500	24.56	0	.	0	.	2036 sq.ft
0	1140 / 3	Decay/Section Loss	0	.	300	100	0	.	0	.	300 sq.ft
0	1150 / 3	Check/Shake	0	.	200	100	0	.	0	.	200 sq.ft
0	510 / 3	Wearing Surfaces	0	.	2036	100	0	.	0	.	2036 sq.ft
0	3230 / 3	Effectiveness (Wearing Surface)	0	.	2036	100	0	.	0	.	2036 sq.ft

MISCELLANEOUS : Channel

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8290 / 3	Channel	0	.	0	.	1	100	0	.	1 (EA)
0	9120 / 3	Degradation	0	.	0	.	1	100	0	.	1 (EA)

MISCELLANEOUS : Other Elements

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8476 / 3	Timber Walls	55	40.74	0	.	80	59.26	0	.	135 ft
0	1140 / 3	Decay/Section Loss	0	.	0	.	80	100	0	.	80 ft

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	216 / 3	Timber Abutment	0	.	120	95.24	6	4.76	0	.	126 ft
0	1140 / 3	Decay/Section Loss	0	.	0	.	6	100	0	.	6 ft
0	1150 / 3	Check/Shake	0	.	120	100	0	.	0	.	120 ft

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	228 / 3	Timber Pile	27	77.14	4	11.43	4	11.43	0	.	35 (EA)
0	1140 / 3	Decay/Section Loss	0	.	0	.	4	100	0	.	4 (EA)
0	1150 / 3	Check/Shake	0	.	4	100	0	.	0	.	4 (EA)

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	235 / 3	Timber Pier Cap	0	.	132	100	0	.	0	.	132 ft
0	1140 / 3	Decay/Section Loss	0	.	9	100	0	.	0	.	9 ft
0	1150 / 3	Check/Shake	0	.	123	100	0	.	0	.	123 ft

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8396 / 3	Other Abutment Slope Protection	1198	83.02	245	16.98	0	.	0	.	1443 (SF)
0	4000 / 3	Settlement	0	.	245	100	0	.	0	.	245 (SF)

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	111 / 3	Timber Open Girder	766	86.26	121	13.63	1	0.11	0	.	888 ft
0	1140 / 3	Decay/Section Loss	0	.	0	.	1	100	0	.	1 ft
0	1150 / 3	Check/Shake	0	.	121	100	0	.	0	.	121 ft

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 — **Inspection/CIDR Report with PDF attachment(s)**

Structure ID: 796500 — **CIDR** — **DATE PRINTED: 6/24/2020**

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	332 / 3	Timb Bridge Railing	192	95.05	10	4.95	0	.	0	.	202 ft
0	1020 / 3	Connection	0	.	10	100	0	.	0	.	10 ft

Total Number of Elements*: 9
*excluding defects/protective systems

Inspection Information

Inspection Date: 05/14/2020 **Type:** Regular NBI

Inspector: KNAAACS - Casey Steege

Inspection Notes: LOAD CAPACITY EVALUATION: A cursory review of the current load rating analysis dated1/02/85 was conducted during this inspection by Michael Scherer, P.E. 6/19/2020. The findings of this review and inspection reveal no substantial deterioration, geometric changes or additional dead load to the bridge that warrant the need for a new load rating analysis; therefore, the current load rating is considered applicable.

The lead underwater inspector for the current routine inspection is Denise Jensen (CBI #00592).

The following elements were inspected underwater:
228 Timber Pile - Bent 3 with four Timber Piles; Bent 4 with nine Timber Piles
8290 Channel
8396 Abutment Slope Protection

Non-Structural Items:

Signs:
Noted This Inspection:
CORRECTIVE ACTION TAKEN:
The signs have been moved to the correct locations.

Sufficiency Rating Calculation Accepted on 6/19/2020.

Inspection Date: 05/16/2019 **Type:** Interim

Inspector: KNAAACS - Casey Steege

Inspection Notes: Sufficiency Rating Calculation Accepted on 6/24/2019.

LOAD CAPACITY EVALUATION: A cursory review of the current load rating analysis dated1/02/85 was conducted during this inspection by Michael Scherer, P.E. 6/18/19. The findings of this review and inspection reveal no substantial deterioration, geometric changes or additional dead load to the bridge that warrant the need for a new load rating analysis; therefore, the current load rating is considered applicable.

This Interim inspection is being performed due to SIA Item 70 being coded 4 or less, as well as SIA Item 60 Substructure being coded a 4 – Poor. Based on the load rating analysis and substructure rating, Elements 31 Timber Deck,228 Timber Pile, and 111 Timber Open Girder, were evaluated and included with this report. For a comprehensive list of all deficiencies noted refer to the routine inspection dated 5/25/2018.

Note: The overall NBI Rating for Item (60) Substructure has been raised from a 4 - Poor to 5 - Fair due to repairs made to Piles 4-1, 4-7 and 5-11.

The lead underwater inspector for the current routine inspection is David Crissey (CBI #00321).

The following elements were inspected underwater:
228 Timber Pile - Bent 3 with four Timber Piles; Bent 4 with nine Timber Piles

Non-Structural Items:

Signs:
Noted This Inspection:
The posting signs at the northwest and northeast corners of the structure do not indicate posting is for the park entrance. Refer to posting photos. REPAIR

Inspection Date: 05/25/2018 **Type:** Regular NBI

Inspector: KNAAARO - Rick O'Connor

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 — **Inspection/CIDR Report with PDF attachment(s)**

Structure ID: 796500 — **CIDR** — **DATE PRINTED: 6/24/2020**

Inspection Information

Inspection Notes: Sufficiency Rating Calculation Accepted by knaaafd at 6/29/2018 7:06:53 AM

LOAD RATING EVALUATION:
This inspection noted no change in the structure condition that would warrant a new load rating. The current load rating dated 1/2/85 appears to still apply.

The lead underwater inspector for the current routine inspection is Jonathan Ivey (CBI #00527).

The following underwater elements were inspected:

228 Timber Pile - Bent 3 with four Timber Piles; Bent 4 with seven Timber Piles
8290 Channel
8396 Abutment Slope Protection

Non-Structural Items:

Hazard Markers:
Noted This Inspection:
The lower edge of the southeast hazard marker is slightly bent.

Inspection Date: 05/16/2017 **Type:** Special-Posted Bridge

Inspector: KNAAAOJ - John O'Grady

Inspection Notes: Sufficiency Rating Calculation Accepted by knaaaoj at 6/8/2017 9:54:06 AM

LOAD RATING EVALUATION:
This inspection noted nothing that warrants a new load rating. The current load rating dated 1/2/85 appears to still apply.

Note: This interim inspection is being conducted based on S.I.A. Item #70 Bridge Posting being rated a 2 and S.I.A. Item #60 Substructure being rated a 4 due to the condition of the timber piling. Only BRM elements 31 Timber Deck, 111 Timber Open Girder and 228 Timber Pile were reviewed and included in this report. For a comprehensive list of all other deficiencies, refer to the previous routine inspection report dated 5/25/2016.

Inspection Date: 05/25/2016 **Type:** Regular NBI

Inspector: KNAAARN - Ricardo Narvaez

Inspection Notes: Sufficiency Rating Calculation Accepted by knaaarn-P at 2016-07-06 11:37:52

LOAD RATING EVALUATION:
This inspection noted nothing that warrants a new load rating. The current load rating dated 1/2/85 appears to still apply.

The lead underwater inspector for the current routine inspection is Ricardo Narvaez (CBI #00447).

The following underwater elements were inspected:

206 Timber Piling – Bent 3 with four Timber Piles; Bent 4 with seven Timber Piles
290 Channel
396 Abutment Slope Protection

Inspection Date: 05/06/2015 **Type:** Special-Posted Bridge

Inspector: KNVOLSE - Steve Eorgan

Inspection Notes: Sufficiency Rating Calculation Accepted by KNVOLEM-P at 2015-05-18 10:01:56

LOAD RATING EVALUATION:
This inspection noted nothing that warrants a new load rating. The current load rating dated 1/2/85 appears to still apply.

This is a Special Posted Inspection, only Elements 31 Timber Deck and 111 Timber Open Girder were inspected and included in this report.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 — **Inspection/CIDR Report with PDF attachment(s)**

Structure ID: 796500 — **CIDR** — **DATE PRINTED: 6/24/2020**

Inspection Information

Inspection Date: 05/06/2014 **Type:** Regular NBI

Inspector: KNVOLDW - Dave Walker

Inspection Notes: Sufficiency Rating Calculation Accepted by KNVOLCW-P at 2014-05-13 14:37:08

LOAD RATING EVALUATION:
This inspection noted nothing that warrants a new load rating. The current load rating dated 1/2/85 appears to still apply.

The lead underwater inspector for the current routine inspection is Victoria Hitch (CBI #00414).

The following underwater elements were inspected:
206 Timber Piling – Bent 3 with four Timber Piling; Bent 4 with seven Timber Piling
290 Channel
396 Abutment Slope Protection

Inspection Date: 05/15/2013 **Type:** Special-Posted Bridge

Inspector: KNVOLSH - Scott Hughes

Inspection Notes: Sufficiency Rating Calculation Accepted by KNVOLCW-P at 2013-05-22 10:09:35

LOAD RATING EVALUATION:
This inspection noted nothing that warrants a new load rating. The current load rating dated 1/2/85 appears to still apply.

This Special Posted Inspection Report was conducted based on SIA Item 70, Posting, being coded 2, only the controlling members (Elements 31 Timber Deck and 111 Timber Open Girder) were inspected, evaluated, and included in this report. For all other deficiencies, refer to the previous Routine Inspection Report dated 5/2/12.

Inspection Date: 05/02/2012 **Type:** Regular NBI

Inspector: KNVOLRO - Rick O'Connor

Inspection Notes: Sufficiency Rating Calculation Accepted by KNVOLCW-P at 2012-05-21 14:05:29

LOAD RATING EVALUATION:
This inspection noted nothing that warrants a new load rating. The current load rating dated 1/2/85 appears to still apply.

The lead underwater inspector for the current routine inspection is Keith Hoogland (CBI #00341).

The following underwater elements were inspected:
206 Timber Piling – Bent 3 with four Timber Piling; Bent 4 with seven Timber Piling
290 Channel
396 Abutment Slope Protection

Inspection Date: 05/16/2011 **Type:** Special-Posted Bridge

Inspector: KNAAAOJ - John O'Grady

Inspection Notes: Sufficiency Rating Calculation Accepted by KNKCARS-P at 2011-06-27 16:41:24

This Interim inspection is being conducted based on SIA Items 70, Bridge Posting, and 61, Channel, being coded a 4 or less. Only Pontis Elements 31 Timber Deck, 111 Timber Open Girder, 396 Other Abut Slope Pro and 290 Channel were inspected and evaluated during this inspection. For a list of all other deficiencies, refer to the 5/12/2010 routine inspection report.

Inspection Date: 05/12/2010 **Type:** Regular NBI

Inspector: INACTIVE1337 - Paul Elborne

Inspection Notes: Sufficiency Rating Calculation Accepted by KNKCAAC-P at 2010-06-24 08:51:22

Non-Pontis Items:

Approach Roadways:
Previously Noted:
The earthen south approach slope exhibits moderate erosion of the channel embankment up to 6ft. x 6ft. x 2ft. behind the west end of Abutment 1.

Inspection Date: 05/29/2009 **Type:** Special-Posted Bridge

Inspector: KNKCAMB - Brice McMinn

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 — **Inspection/CIDR Report with PDF attachment(s)**

Structure ID: 796500 — **CIDR** — **DATE PRINTED: 6/24/2020**

Inspection Information

Inspection Notes: Sufficiency Rating Calculation Accepted by kn538pl-P at 2009-07-10 08:46:36

Note 1: This interim inspection is being performed due to SIA Item #70 Bridge Posting rated a 4 or less. Only Pontis Elements 31 (Timber Deck) and 111 (Timber Open Girder) were inspected and evaluated during this inspection. For a list of all other deficiencies, refer to the 5/20/08 routine inspection report.

Note 2: During the time of this inspection, there were a section of bridge rail removed by a maintenance crew to remove a buildup of vegetation against the piles on the south side of the channel, prior to this inspection, during a storm that had occurred. The crew was also in the process of placing rubble at the channel banks in that area to to counter erosion that had occurred in the past and during the previous storm. Refer to photos 6, 7 and 8.

Inspection Date: 05/20/2008 **Type:** Regular NBI

Inspector: KNAAAOJ - John O'Grady

Inspection Notes: Sufficiency Rating Calculation Accepted by kn538oj-P at 2008-06-27 09:28:21

Non-Pontis Items:

Approach Roadways -
Previously Noted:
The earthen south approach roadway slope exhibits moderate erosion of channel embankment up to 6ft. x 6ft. x 2ft. behind the west end of the abutment.

Noted This Inspection:
Corrective Action Taken:
The south approach embankment is now level with the roadway.

Inspection Date: 05/24/2007 **Type:** Special-Posted Bridge

Inspector: KNKCAST - Timothy Sweeney

Inspection Notes: Sufficiency Rating Calculation Accepted by knkcapo-P at 2007-07-03 10:51:08

Note: This interim inspection is being performed due to SIA Item #70 Bridge Posting rated a 4 or less. Only Pontis Elements 31 (Timber Deck) and 111 (Timber Open Girder) were inspected and evaluated during this inspection. For a list of all other deficiencies, refer to the 5/23/06 routine inspection report.

Inspection Date: 05/23/2006 **Type:** Regular NBI

Inspector:

Inspection Notes: Sufficiency Rating Calculation Accepted by knkcana-P at 2006-06-21 14:51:47

Non-Pontis Items:

Approach Roadways -
Previously Noted:
The earthen south approach roadway slope exhibits moderate erosion of channel embankment up to 6ft. x 6ft. x 2ft. behind the end bent wall. The south approach embankment is up to 6in. higher than the roadway.

Inspection Date: 05/09/2005 **Type:** Interim

Inspector: KNKCAGW - William Greer

Inspection Notes: Sufficiency Rating Calculation Accepted by knkcagw-P at 2005-06-20 10:43:54

NOTE: This interim inspection is being preformed due to SIA Item #70 Posting rated 2. Pontis Elements 31 (Timber Deck) and 111 (Timber Open Girders) were evaluated during this inspection. For a list of all other deficiencies, refer to the 5/25/2004 routine report.

Inspection Date: 05/25/2004 **Type:** Regular NBI

Inspector:

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 — **Inspection/CIDR Report with PDF attachment(s)**

Structure ID: 796500 — **CIDR** — **DATE PRINTED: 6/24/2020**

Inspection Information

Inspection Notes:
Sufficiency Rating Calculation Accepted by kn738dc-P at 2004-07-01 13:24:12
Non-Pontis Items:

Approach Roadway -
Previously Noted:
The earthen south approach roadway slope exhibits moderate erosion of channel embankment up to 6ft. x 6ft. x 2ft. behind the end bent wall. This area is well vegetated. The south approach embankment is up to 6in. higher than the roadway.

Signs -
Noted This Inspection:
Corrective Action Taken:
The structure is posted at the north approach for both westbound and eastbound traffic.

Inspection Date: 05/07/2003 **Type:** Interim

Inspector: KN853DL - Donville Lawes

Inspection Notes:
Sufficiency Rating Calculation Accepted by kn538ca-P at 2003-06-16 16:54:41
Structure 796500 -
Date 2003-05-07 - This structure was inventoried from south to north.

Non-PONTIS Items:

Approach Roadway -
> The earthen south approach roadway slope exhibits moderate erosion of channel embankment up to 6' L x 6' W x 2' D behind the end bent wall.
> Noted this inspection, the south approach embankment is up to 6" higher than the roadway. See Photo 8.

The previously noted erosion caused difference in elevation between south approach roadway and bridge deck were not found.

Signs -
> The structure is currently posted on Reed Canal Road at the northwest approach with a weight restriction of 11 tons for all vehicles. See Photo 1.
> The weight limit sign for the northeast approach to the structure is missing.

Inspection Date: 05/22/2002 **Type:** Regular NBI

Inspector: KNTCCSA - Steven Shaup

Inspection Notes:
Sufficiency Rating Calculation Accepted by kn538sf at 8/22/02 10:20:48
KN538SS inspection comments -
Structure 796500 -
Date 5/22/02 - This structure was inventoried from south to north.

Non-PONTIS Items:

Approach Roadway -
> The earthen south approach roadway exhibits moderate erosion channels up to 1' W x 4" D which have subsequently caused the western half of the asphalt approach roadway to be up to 2" lower in elevation than the bridge deck over a 3' length. See Photo 7.

Signs -
> The structure is currently posted on Reed Canal Road at the northwest approach with a weight restriction of 11 tons for all vehicles. See Photo 1.
> Noted this inspection, the weight limit sign for the northeast approach to the structure is missing.

Inspection Date: 05/09/2001 **Type:** Interim

Inspector:

Inspection Notes:
Sufficiency Rating Calculation Accepted by kn538rr at 6/1/01 16:43:54
KN538RR inspection comments -
Structure 796500 -
Date 5/9/01 - This structure was inventoried from south to north.

Non-PONTIS Items

Approach Roadway
The earthen south approach roadway exhibits moderate erosion channels which has subsequently caused the western half of the asphalt approach roadway to be up to 4" higher in elevation, in an area approximately 10' long near centerline.

Signs
The structure is currently posted on Reed Canal Road at the northeast and northwest approaches to the structure with a weight restriction of 11 tons for all vehicles. Refer to Photo 1 in the Addendum.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 — **Inspection/CIDR Report with PDF attachment(s)**

Structure ID: 796500 — **CIDR** — **DATE PRINTED: 6/24/2020**

Inspection Information

Inspection Date: 05/24/2000 **Type:** Regular NBI
Inspector:
Inspection Notes:

Inspection Date: 05/21/1999 **Type:** Interim
Inspector:
Inspection Notes:

Structure Notes

BRIDGE OWNER: CITY OF SOUTH DAYTONA

Bridge inventoried from south to north.

TRAFFIC RESTRICTIONS:
Based on the current load rating analysis dated 1/2/85, posting is required for the SU and C type vehicles as follows: SU = 15 tons and C = 24 tons. The structure is currently posted at the northwest and northeast corners of the bridge (south approach is a dead end) for 11 tons. Refer to Posting Photos.

This structure is on a 12 month inspection frequency due to SIA Item 70, Bridge Posting, being coded a 2.

On 07-19-10, A.DeVault retracted the reconstruction date of 2007 at Item 106. The repairs did not constitute a reconstruction as defined by the BMS Coding guide.

As stated in section 3.4 of the Bridge and Other Structures Inspection and Reporting as of 11/24/2009 superstructure unit numbering (Section 3.4.2.2) and substructure unit numbering (Section 3.4.3) are designated NOT BY ORDER IN WHICH THE ELEMENTS WERE CONSTRUCTED AND PUT INTO SERVICE. Plans sheet or drawing in Topic G, Bridge Description and Drawings section of the bridge folder can confirm all references to these elements prior to this date.

Schedule Notes

APPENDIX C

DRAFT ROW Maintenance Maps

R/W
MAP BOOK_____,PG._____

INDEX:

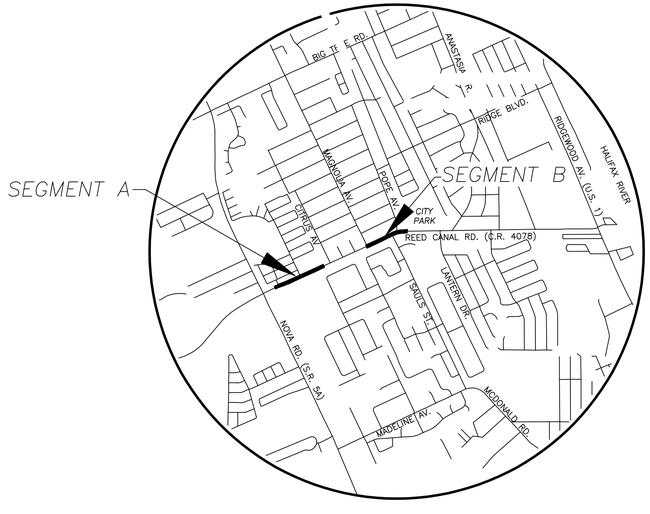
COUNTY ROAD No. 4078
REED CANAL ROAD

"MAINTENANCE MAP"
SEGMENT A
FROM NOVA ROAD TO JUST WEST OF CITRUS AVE.
SEGMENT B
FROM MAGNOLIA AVE. TO JUST EAST OF SAULS RD.
IN SECTIONS 42 & 43 ALL
IN TOWNSHIP 15 SOUTH, RANGE 33 EAST

Volusia County
FLORIDA

SURVEYORS NOTES:

1. THE BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE FLORIDA STATE PLANE COORDINATE SYSTEM, EAST ZONE, 1983 NORTH AMERICAN DATUM, 2007 ADJUSTMENT, AS ESTABLISHED FROM MULTIPLE OBSERVATIONS USING THE LENGEMANN REAL TIME KINEMATIC REFERENCE STATIONS, ALSO KNOWN AS THE L-NET (TopNET GNSS Network).
   A. DERIVING A BEARING OF N 85°04'53" E ALONG THE NORTH RIGHT OF WAY LINE OF REED CANAL ROAD ACCORDING TO THE FLORIDA DEPARTMENT OF TRANSPORTATION RIGHT OF WAY MAP OF STATE ROAD NO. 5A (NOVA ROAD), SECTION NO. 79190-2510 SHEET 7 OF 17, FOR THE BEARING BASE OF SEGMENT A, AS MAPPED ON SHEET 2 OF 3, OF THIS SURVEY.
   B. DERIVING A BEARING OF N 85°45'44" E ALONG THE SOUTH LINE OF LOTS 49 TO 55, PALM GROVE SUBDIVISION NINTH ADDITION, RECORDED IN MAP BOOK 31, PAGE 39, OF THE PUBLIC RECORDS OF VOLUSIA COUNTY, FOR THE BEARING BASE OF SEGMENT B, AS MAPPED ON SHEET 3 OF 3, OF THIS SURVEY.
2. THE SPECIFIC PURPOSE OF THIS SURVEY IS TO:
   A. ESTABLISH THE SURVEY BASELINES AS DESCRIBED HEREON.
   B. ESTABLISH AND MAP THE MAINTAINED NORTHERLY RIGHT OF WAY OF REED CANAL ROAD ALONG SEGMENTS A AND B AS SHOWN HEREON.
3. ON MARCH 28, 2017, TADD KASBEER (ASSISTANT VOLUSIA COUNTY ENGINEER), BENJAMIN BARTLETT (ENGINEERING SECTION MANAGER VOLUSIA COUNTY ROAD AND BRIDGE DEPARTMENT) AND LES GILLIS (CITY OF SOUTH DAYTONA, PUBLIC WORKS DIRECTOR), MET IN THE FIELD TO DETERMINE THE LIMITS OF THE MAINTAINED RIGHT OF WAY.
4. THE VOLUSIA COUNTY MAINTAINED RIGHT OF WAY HAS BEEN DETERMINED BY BENJAMIN BARTLETT TO BE 1.00 FOOT NORTH OF THE EDGE OF SIDEWALK.
5. THE CITY OF SOUTH DAYTONA BEACH MAINTAINED UTILITY LIMITS ,SHOWN HEREON, HAVE BEEN DETERMINED BY LES GILLIS.
6. THE DISTANCES SHOWN HEREON ARE IN US SURVEY FEET AND ARE FIELD MEASURED OR CALCULATED FROM FIELD MEASUREMENTS UNLESS OTHERWISE NOTED.
7. PROPERTY LINES ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY AND ARE NOT TO BE CONSIDERED SURVEY QUALITY.
8. UNDERGROUND UTILITIES AND FOUNDATIONS HAVE NOT BEEN LOCATED AS A PART OF THIS SURVEY.
9. ALL RECORDING INFORMATION SHOWN HEREON IS RECORDED IN THE PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA.
10. ONLY PERTINENT FIXED IMPROVEMENTS, SUCH AS EVIDENCE OF BOUNDARY INCLUDING BUT NOT LIMITED TO, FENCES, SIDEWALKS, AND UTILITY LINES, HAVE BEEN SHOWN IN RELATIONSHIP TO THE MAINTAINED RIGHT OF WAY.
11. THE FIELD DATE OF THIS SURVEY IS MAY 26, 2017.



Segment A (Survey Baseline description):

Commence at a Copper Coated Rod with Cap stamped FDOT marking the Southerly corner of the Right of Way corner clip at the northeasterly corner of Nova Road and Reed Canal Road as depicted on Sheet 7 of 17 of the Right of Way Map for State Road 5A (Nova Road) Section 79190-2510; thence run N 85°04'53" E (N 85°03'55" E, FDOT Map), along the north Right of Way line of said Reed Canal Road, a distance of 310.35 feet (310.28 feet, FDOT Map) to a Copper Coated Rod with Cap stamped FDOT; thence N 68°42' 55" E (N 68°45'30" E, FDOT Map) along said right of way a distance of 170.35 feet (170.44 feet FDOT map) to a Copper Coated Rod with Cap stamped FDOT; thence S 24°59'29" E (S 24°55'49" E, FDOT Map), a distance of 44.05 feet (44.00 feet, FDOT Map) to a Parker-Kalon Nail (P.K. Nail) with disk stamped FDOT and the Point of Beginning: thence departing said Right of Way line, N 65°49'28" E, a distance of 948.75 feet to the Point of Terminus.

Segment B (Survey Baseline description):

Beginning at the intersection of the westerly projection of the southerly line of Lots 49 through 55 inclusive and the centerline of Right of Way of Magnolia Avenue, a 60.00 foot-wide Right of Way, as depicted on the plat of Palm Grove Sub., Ninth Addition, as recorded in Map Book 31, Page 39; thence run N 65°45'44" E, along said westerly projection, the South line of said lots and the easterly projection thereof, a distance of 795.18 feet; thence departing said easterly projection, N 88°47'46'E, a distance of 388.38 feet to the Point of Terminus.

CERTIFICATE OF APPROVAL BY THE CITY OF SOUTH DAYTONA PUBLIC WORKS DIRECTOR

THIS IS TO CERTIFY, That UTILITIES ALONG REED CANAL ROAD have been constructed, maintained or repaired, continuously and uninterruptedly for more than 4 years by the City of South Daytona Public Works Department and that this Maintenance Map shall vest all right, title, easement and appurtenances in and to the road to the County of Volusia, in accordance with subsection (1) of Chapter 95.361 of the Florida Statutes of 2013.

BY: _____
MR. LES GILLIS
CITY OF SOUTH DAYTONA, PUBLIC WORKS DIRECTOR

CERTIFICATE OF APPROVAL BY JEFF W BARNES
REGISTERED LAND SURVEYOR FOR VOLUSIA COUNTY

THIS IS TO CERTIFY, That on _____a survey of the prescriptive roadway was performed under my direction and supervision and that this Maintenance Map is a correct representation of the existing roadway and is in compliance with Chapter 95.361 of the Florida Statutes of 2013.

BY: _____
JEFF W. BARNES, P.S.M. # 5576
REGISTERED LAND SURVEYOR

CERTIFICATE OF APPROVAL BY THE VOLUSIA COUNTY ROAD AND BRIDGE DIRECTOR

THIS IS TO CERTIFY, That REED CANAL ROAD was constructed, maintained or repaired, continuously and uninterruptedly for more than 4 years by Volusia County Road and Bridge Division and that this Maintenance Map shall vest all right, title, easement and appurtenances in and to the road to the County of Volusia, in accordance with subsection (1) of Chapter 95.361 of the Florida Statutes of 2013.

BY: _____
JUDY GRIM
VOLUSIA COUNTY ROAD AND BRIDGE DIRECTOR

CERTIFICATE OF APPROVAL BY THE COUNTY COUNCIL OF VOLUSIA COUNTY, FLORIDA

THIS IS TO CERTIFY, That on _____ the foregoing map was approved by the County Council of Volusia County, Florida.

_____
Ed Kelley, Chair of the County Council of Volusia County County Seal

Attest: _____
James Dinneen, County Manager of Volusia County and Ex-officio Clerk

CERTIFICATE OF CLERK
I HEREBY CERTIFY, That I have examined the foregoing map and find that it complies in form of Chapter 95.361 Florida Statutes, and was filed

for record on _____at_____

RECORDED IN RIGHT OF WAY BOOK _____ PAGE _____

_____
Clerk of the Circuit Court
in and for Volusia County, Florida

LEGEND & ABBREVIATIONS

= BENCHMARK
= CENTRAL ANGLE
= CONCRETE
= CONCRETE MONUMENT
= DEGREES
= ELECTRIC BOX
= FIRE HYDRANT
= GUY ANCHOR
= GUY POLE
= IRON PIPE
= LIGHT POLE
= POWER POLE
= ROD & CAP
= SANITARY MANHOLE
= STORMWATER MANHOLE
= TELEPHONE SERVICE BOX, CABLE TV BOX or SANITARY VALVE BOX
= UTILITY POLE
= WATER METER
= WATER VALVE or RECLAIMED WATER VALVE

A/C = AIR CONDITIONER
ASPH = ASPHALT
(C) = CALCULATED
C/L = CENTERLINE
C.B. = CHORD BEARING
CH. = CHORD DISTANCE
C.M. = CONCRETE MONUMENT
CONC. = CONCRETE
CONST. = CONSTRUCTION
(D) = DEED
ELEV. = ELEVATIONS
EXIST = EXISTING
F.D.O.T. = FLORIDA DEPARTMENT OF TRANSPORTATION
FND. = FOUND
F.M. = FIELD MEASURED
ID = IDENTIFICATION
I.P. = IRON PIPE
IRC = IRON ROD W/ CAP
LT = LEFT
L = ARC LENGTH
(P) = PLAT
P.O.B. = POINT OF BEGINNING
P.O.C. = POINT OF COMMENCEMENT
P.C. = POINT OF CURVATURE
P.I. = POINT OF INTERSECTION
P.K. = PARKER – KALON
P.T. = POINT OF TANGENCY
P/L = PROPERTY LINE
PROP. = PROPOSED
PVMT. = PAVEMENT
R = RADIUS
RNG. = RANGE
RT = RIGHT
RWV = RECLAIMED WATER VALVE
R/W = RIGHT OF WAY
SEC. = SECTION
STA = STATION
SVB = SANITARY VALVE BOX
T = TANGENT
TELS = TELEPHONE SERVICE BOX
TVBX = CABLE TV BOX
TWP. = TOWNSHIP
VOL. CO. = VOLUSIA COUNTY

Volusia County
FLORIDA

COUNTY OF VOLUSIA
PUBLIC WORKS DEPARTMENT
ENGINEERING & CONSTRUCTION
SURVEY DIVISION
123 W. INDIANA AVE., DELAND, FL. 32720
PHONE 1-386-736-5967 FAX 1-386-822-5736

	NAME	DATE
CADD	MEM	5/17
SURVEY DATE	MM / MB	5/26/17
CHECKED	JB	5/17
FIELD BOOK NO.	378	

PLOT DATE: 6/8/17
SCALE: N/A

SURVEYORS CERTIFICATE:
NOT VALID WITHOUT THE ORIGINAL SIGNATURE AND RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER

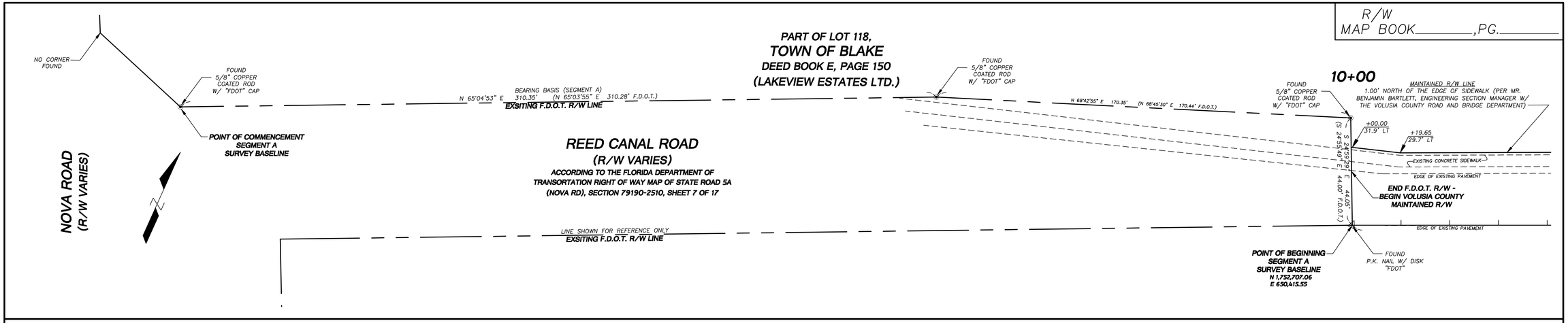
JEFF W. BARNES, P.S.M. #5576

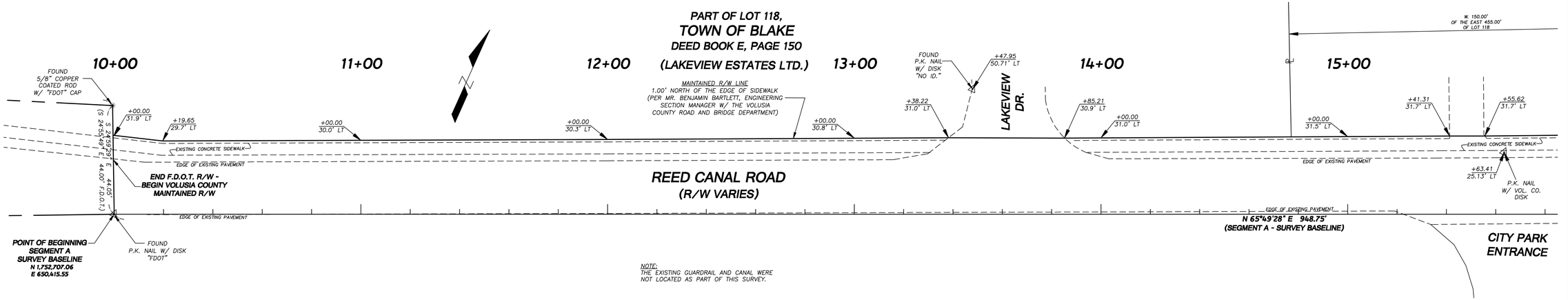
REED CANAL ROAD
SEGMENTS A AND B
NORTH R/W LIMITS BY MAINTENANCE

TYPE OF SURVEY
SPECIFIC PURPOSE SURVEY

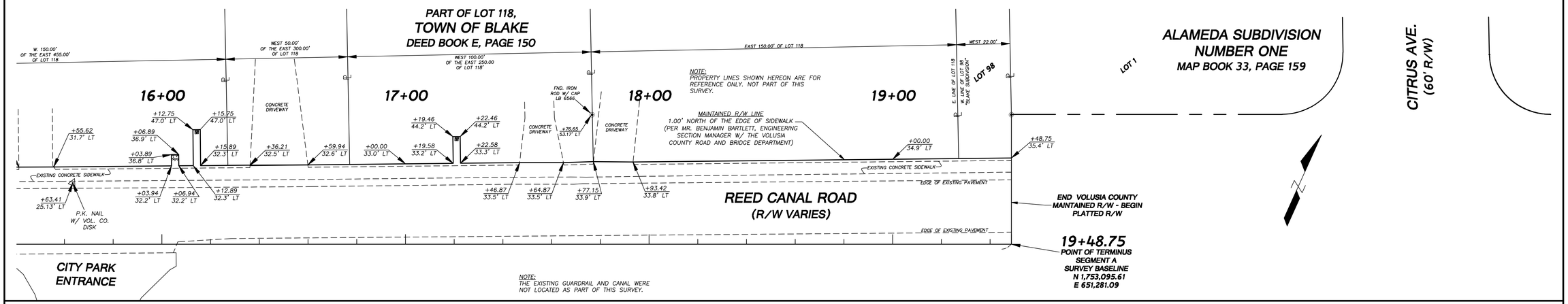
Proj. No: N/A
Draw No: 2443
Sh No: 1 OF 3

R/W
MAP BOOK_____, PG._____





NOTE:
THE EXISTING GUARDRAIL AND CANAL WERE NOT LOCATED AS PART OF THIS SURVEY.



NOTE:
THE EXISTING GUARDRAIL AND CANAL WERE NOT LOCATED AS PART OF THIS SURVEY.

LEGEND & ABBREVIATIONS

- = BENCHMARK
- = CENTRAL ANGLE
- = CONCRETE
- = CONCRETE MONUMENT
- = DEGREES
- = ELECTRIC BOX
- = FIRE HYDRANT
- = GUY ANCHOR
- = GUY POLE
- = IRON PIPE
- = LIGHT POLE
- = POWER POLE
- = ROD & CAP
- = SANITARY MANHOLE
- = STORMWATER MANHOLE
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P.C. = POINT OF CURVATURE
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	NAME	DATE
CADD	MEM	5/17
SURVEY DATE	MM / MB	5/26/17
CHECKED	JB	5/17
FIELD BOOK NO.	378	

PLOT DATE: 6/8/17
SCALE: 1" = 20'

SEE SHEET 1 OF 3 FOR SURVEYORS NOTES, BASELINE DESCRIPTION AND CERTIFICATIONS

REED CANAL ROAD, SEGMENT A

FROM NOVA RD. TO JUST WEST OF CITRUS AVE.

SECTION'S 42 & 43, TWP. 15 SOUTH, RNG. 33 EAST

TYPE OF SURVEY
SPECIFIC PURPOSE SURVEY

Proj. No: N/A
Draw No: 2443
Sh No: 2 OF 3

R/W
MAP BOOK_____, PG._____

50+00 51+00 52+00 53+00 54+00 55+00

C/L OF R/W
30.00' 30.00'
MAGNOLIA AVE. (60' R/W)
S 25°40'17" E 307.73'
S 26°45'40" E 37.59'
INTERSECTION POINT
SET P.K. NAIL W/ VOL. CO. DISK
POINT OF BEGINNING SURVEY BASELINE - SEGMENT B STATION 50+00
N 1,753,588.35
E 652,272.14
WESTERLY PROJECTION OF THE SOUTH LINE OF LOTS 49 THROUGH 55 INCLUSIVE
SET IRON ROD W/ VOL. CO. TRAV. CAP
(BEARING BASIS FOR SEGMENT B) EXSITING R/W LINE & SURVEY BASELINE
LOT 49 LOT 50 LOT 51 LOT 52 LOT 53
PALM GROVE SUB. NINTH ADDITION MAP BOOK 31, PAGE 39
MAINTAINED R/W LINE
1.00' NORTH OF THE EDGE OF SIDEWALK (PER MR. BENJAMIN BARTLETT, ENGINEERING SECTION MANAGER W/ THE VOLUSIA COUNTY ROAD AND BRIDGE DEPARTMENT)
FIRE HYDRANT
ROCK HEADWALL
FND. DISK STAMPED L.B. 7743 (STA 53+44.56)
FND. DISK STAMPED L.B. 7743 (STA 54+41.47)
CONC. DRIVE
EXIST. CONC. SIDEWALK
EDGE OF EXIST. PVMT.
+41.70 7.8' LT
+48.84 7.8' LT
+41.70 0.00' LT
+48.84 0.00' LT
+50.22 1.9' LT
+52.22 1.9' LT
+50.22 0.2' LT
+42.44 0.00' LT
+52.22 0.2' LT
+64.04 0.4' LT
+79.83 0.8' LT
+45.52 10.2' LT
+51.91 10.3' LT
+45.66 1.9' LT
+61.91 3.2' LT
+52.04 2.0' LT
+11.88 4.3' LT
+28.02 4.8' LT
+69.12 6.1' LT
+05.53 6.9' LT
+34.22 18.1' LT
+39.24 18.2' LT
+34.47 7.6' LT
+57.71 8.1' LT
+80.58 6.3' LT
+21.56 7.3' LT
+39.49 7.7' LT
+71.20 8.9' LT
N 65°45'44" E 795.18'
(SURVEY BASELINE - SEGMENT B)
REED CANAL ROAD
(R/W VARIES)
NOTE:
THE EXISTING GUARDRAIL AND CANAL WERE NOT LOCATED AS PART OF THIS SURVEY.

55+00 56+00 57+00 58+00

LOT 53 LOT 54 LOT 55
PALM GROVE SUB. NINTH ADDITION MAP BOOK 31, PAGE 39
MAINTAINED R/W LINE
1.00' NORTH OF THE EDGE OF SIDEWALK (PER MR. BENJAMIN BARTLETT, ENGINEERING SECTION MANAGER W/ THE VOLUSIA COUNTY ROAD AND BRIDGE DEPARTMENT)
POPE AVE. (60' R/W PER PLAT)
SET 1/2" IRON ROD W/ VOL. CO. CAP
P.I. STATION = 58+49.57
N 1,753,937.11
E 653,046.82
= 59+00
PART OF LOT 78 TOWN OF BLAKE DEED BOOK E, PAGE 150
S. LINE OF "TOWN OF BLAKE SUB." N. LINE OF "DUNLAWTON" = 60+00
PART OF LOT 1 , BLOCK 4 DUNLAWTON MAP BOOK M, PAGE 187
SOUTHERLY PROJECTION OF THE EAST LINE OF PALM GROVE 9TH ADDITION = 61+00
SAULS STREET (R/W VARIES)
FND. NAIL W/ DISK L.B. 3019 (STA. 57+54.84)
CONC. DRIVE
CONC. CURB AND GUTTER
EXIST. CONC. SIDEWALK
EDGE OF EXIST. PVMT.
+08.72 10.1' LT
+34.66 11.1' LT
+68.04 11.7' LT
+11.19 11.2' LT
+57.29 11.6' LT
+87.83 9.4' LT
+11.39 0.1' RT
+39.07 8.3' RT
+68.09 8.9' RT
+93.33 6.7' RT
+26.32 1.9' LT
+16.69 5.5' RT
+28.31 1.9' LT
+42.12 4.5' RT
+26.58 5.1' RT
+28.58 5.1' RT
+98.12 2.7' RT
N 65°45'44" E 795.18'
(SURVEY BASELEINE - SEGMENT B)
N 88°47'56" E 388.38'
(SURVEY BASELINE - SEGMENT B)
REED CANAL ROAD
(R/W VARIES)
NOTE:
THE EXISTING GUARDRAIL AND CANAL WERE NOT LOCATED AS PART OF THIS SURVEY.

58+00 59+00 60+00 61+00 62+00 62+37.95

POPE AVE. (60' R/W PER PLAT)
SET 1/2" IRON ROD W/ VOL. CO. CAP
P.I. STATION = 58+49.57
N 1,753,937.11
E 653,046.82
S. LINE OF "TOWN OF BLAKE SUB." N. LINE OF "DUNLAWTON"
PART OF LOT 1 , BLOCK 4 DUNLAWTON MAP BOOK M, PAGE 187
SOUTHERLY PROJECTION OF THE EAST LINE OF PALM GROVE 9TH ADDITION
C.M. NO ID. +61.48 10.25' LT
MAINTAINED R/W LINE
1.00' NORTH OF THE EDGE OF SIDEWALK (PER MR. BENJAMIN BARTLETT, ENGINEERING SECTION MANAGER W/ THE VOLUSIA COUNTY ROAD AND BRIDGE DEPARTMENT)
END VOLUSIA COUNTY MAINTAINED R/W
CITY OF SOUTH DAYTONA PROPERTY
EXSITING R/W LINE PER DEEDS AND MONUMNETATION
POINT OF TERMINUS SURVEY BASELINE - SEGMENT B
N 1,753,945.26
E 653,435.11
SET P.K. NAIL W/ VOL. CO. DISK
FND. NAIL W/ DISK L.B. 3019 (STA. 57+54.84)
EXIST. CONC. SIDEWALK
CONC. CURB AND GUTTER
EDGE OF EXIST. PVMT.
+11.39 0.1' RT
+39.07 8.3' RT
+68.09 8.9' RT
+26.32 1.9' LT
+16.69 5.5' RT
+28.31 1.9' LT
+42.12 4.5' RT
+98.12 2.7' RT
+26.58 5.1' RT
+28.58 5.1' RT
+57.87 3.6' LT
+63.50 4.8' LT
+41.37 2.0' RT
+46.60 1.4' RT
N 88°47'56" E 388.38'
(SURVEY BASELINE - SEGMENT B)
REED CANAL ROAD
(R/W VARIES)
NOTE:
THE EXISTING GUARDRAIL AND CANAL WERE NOT LOCATED AS PART OF THIS SURVEY.

LEGEND & ABBREVIATIONS

= BENCHMARK
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	NAME	DATE
CADD	MEM	5/17
SURVEY DATE	MM / MB	5/26/17
CHECKED	JB	5/17
FIELD BOOK NO.	378	

PLOT DATE: 6/8/17
SCALE: 1" = 20'

SEE SHEET 1 OF 3 FOR SURVEYORS NOTES, BASELINE DESCRIPTION AND CERTIFICATIONS

REED CANAL ROAD, SEGMENT B

FROM MAGNOLIA AVE. TO JUST EAST OF SAULS RD.

SECTIONS 42 & 43 , TWP. 15 SOUTH, RNG. 33 EAST

TYPE OF SURVEY
SPECIFIC PURPOSE SURVEY

Proj. No: N/A
Draw No: 2443
Sh No: 3 OF 3

APPENDIX D

Soil Survey Map

Map Scale: 1:788 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 10 20 40 60

Feet: 0 35 70 140 210

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 17N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Volusia County, Florida
Survey Area Data: Version 19, Jun 10, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 6, 2019—Feb 25, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
69	Tuscawilla fine sand	0.1	3.9%
70	Tuscawilla-Urban land complex	1.4	96.1%
Totals for Area of Interest		**1.5**	**100.0%**

APPENDIX E

FEMA

National Flood Hazard Layer FIRMette

FEMA

81°1'17"W 29°9'36"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

81°0'40"W 29°9'5"N

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) *Zone A, V, A99*
	With BFE or Depth *Zone AE, AO, AH, VE, AR*
	Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
	Future Conditions 1% Annual Chance Flood Hazard *Zone X*
	Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
	Area with Flood Risk due to Levee *Zone D*
OTHER AREAS	NO SCREEN Area of Minimal Flood Hazard *Zone X*
	Effective LOMRs
	Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer
	Levee, Dike, or Floodwall
OTHER FEATURES	20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
	Coastal Transect
	Base Flood Elevation Line (BFE)
	Limit of Study
	Jurisdiction Boundary
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
MAP PANELS	Digital Data Available
	No Digital Data Available
	Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/9/2020 at 1:38 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX F

Excerpts from CDM Smith Flood Study

Nova Canal Flood Control and Integrated Water Resources Project
Project Alternative 1 - Peak Flows for 96-Hour Design Storms
Reed Canal System

1-Year Stillwater													
			Peak flow (cfs)										
Location	Jurisdiction	SWMM5 Conduit	Existing Mean Annual	Alternative 1 Mean Annual	Change	Existing 10-Year	Alternative 1 10-Year	Change	Existing 25-Year	Alternative 1 25-Year	Change	Existing 100-Year	Alternative 1 100-Year	Change
Reed Canal at US 1 Culvert	SD	81211	1,020	1,381	361	1,280	1,539	259	1,456	1,506	50	1,677	1,618	-59
Reed Canal downstream of Railroad	SD	81285	1,004	1,311	307	1,252	1,316	64	1,370	1,316	-55	1,499	1,339	-161
Reed Canal downstream of Stevens Canal	SD	81281	930	998	69	1,148	1,190	42	1,261	1,313	52	1,383	1,397	14
Reed Canal at Saul Drive culverts	SD	81221	218	232	13	251	256	6	285	289	3	326	326	0
		81221A	218	232	13	251	256	6	285	289	3	326	326	0
		81221B	218	232	13	251	256	6	285	289	3	326	326	0
Start of Reed Canal	SD	81243	611	642	31	710	708	-3	763	768	5	855	853	-2
Stevens Canal at Ridge Drive culvert	SD	81102	111	116	5	170	177	7	192	194	2	215	204	-11
Stevens Canal at Big Tree Road culvert	SD	81012	23	23	0	38	39	2	42	43	1	47	46	-1

100-Year Stillwater													
			Peak flow (cfs)										
Location	Jurisdiction	SWMM5 Conduit	Existing Mean Annual	Alternative 1 Mean Annual	Change	Existing 10-Year	Alternative 1 10-Year	Change	Existing 25-Year	Alternative 1 25-Year	Change	Existing 100-Year	Alternative 1 100-Year	Change
Reed Canal at US 1 Culvert	SD	81211	795	1,179	384	1,021	1,086	65	1,170	1,156	-13	1,346	1,250	-96
Reed Canal downstream of Railroad	SD	81285	783	1,131	348	1,005	1,131	126	1,106	1,131	25	1,214	1,219	4
Reed Canal downstream of Stevens Canal	SD	81281	723	925	202	928	1,138	210	1,020	1,213	193	1,114	1,242	127
Reed Canal at Saul Drive culverts	SD	81221	192	222	30	231	252	21	266	275	9	309	316	7
		81221A	192	222	30	231	252	21	266	275	9	309	316	7
		81221B	192	222	30	231	252	21	266	275	9	309	316	7
Start of Reed Canal	SD	81243	540	621	81	634	680	47	706	730	25	808	821	13
Stevens Canal at Ridge Drive culvert	SD	81102	85	108	23	134	142	8	154	154	0	189	168	-21
Stevens Canal at Big Tree Road culvert	SD	81012	19	23	4	29	32	3	34	34	0	39	37	-2

SD = South Daytona

Nova Canal Flood Control and Integrated Water Resources Project
Project Alternative 1 - Peak Stages for 96-hour Design Storms
Reed Canal System

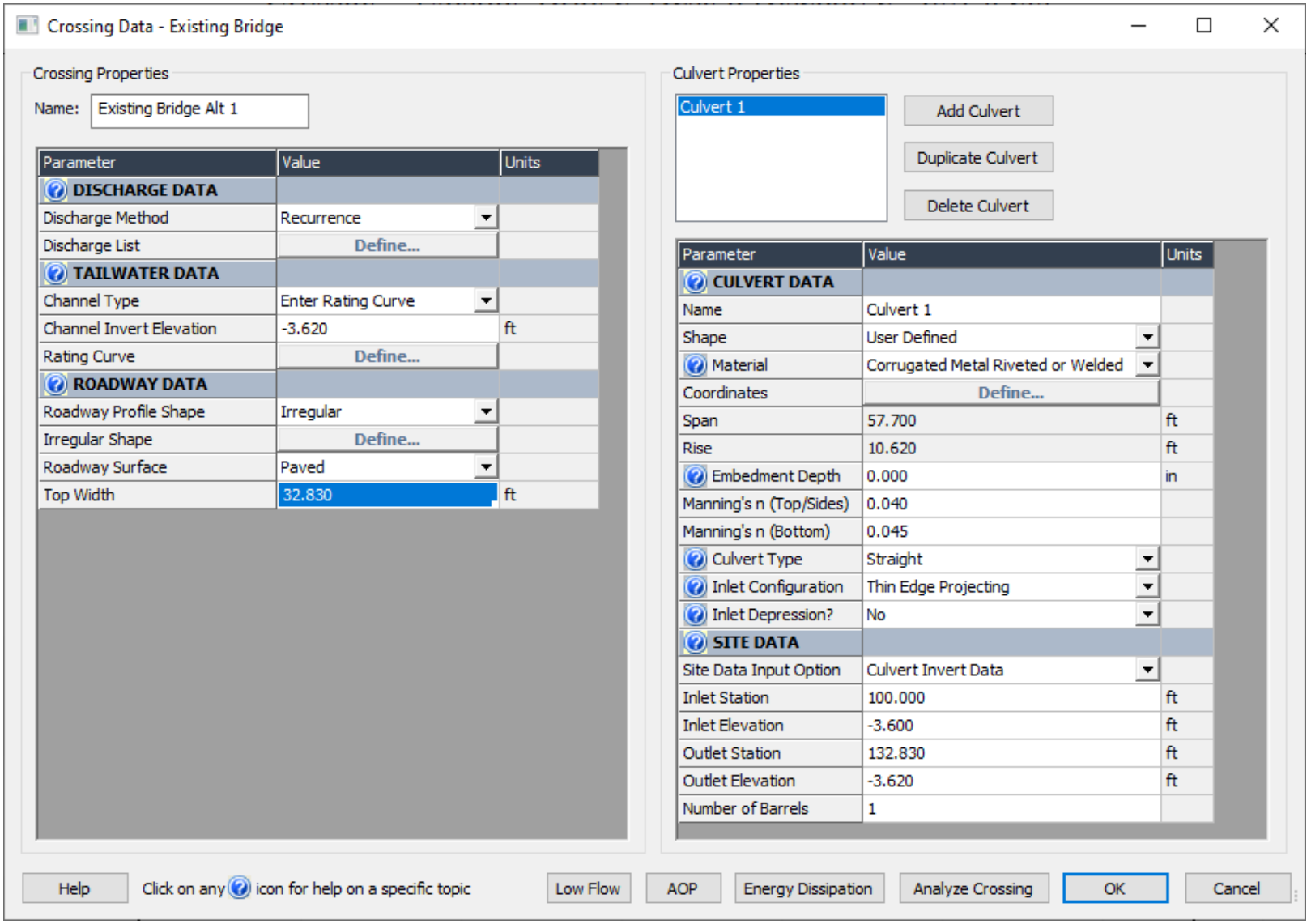
SJRWMD 96-hr Design Storm with 1-Year Stillwater															
				Peak Stages (ft NGVD)											
Location	Jurisdiction	Model Node	Indicator Elevation (ft NGVD)	Existing Mean Annual	Alt. 1 Mean Annual	Change (ft)	Existing 10-Year	Alt. 1 10-Year	Change (ft)	Existing 25-Year	Alt. 1 25-Year	Change (ft)	Existing 100-Year	Alt. 1 100-Year	Change (ft)
Reed Canal Outfall	SD	12102	-	2.2	2.2	0.0	2.2	2.2	0.0	2.2	2.2	0.0	2.2	2.2	0.0
Upstream of US 1	SD	12101	7.5	2.6	2.9	0.3	2.8	3.1	0.3	3.0	3.0	0.1	3.2	3.2	-0.1
Downstream of RR / Upstream of Proposed Gate	SD	12804	11.5	4.2	3.0	-1.2	4.8	5.1	0.3	5.1	5.6	0.5	5.4	6.1	0.7
Reed Canal at Stevens Canal	SD	128	8.8	5.4	4.7	-0.7	6.2	6.2	0.0	6.6	6.7	0.1	7.0	7.2	0.2
Saul Drive	SD	122	9.6	6.1	5.8	-0.4	6.9	6.9	0.0	7.3	7.3	0.0	7.8	7.9	0.1
Reed Canal at Nova Road	SD	13104	9.2	7.0	6.9	-0.2	7.9	7.8	0.0	8.3	8.3	0.0	8.9	8.9	0.0
Downstream end of Stevens Canal	SD	11901	5.4	5.5	4.8	-0.7	6.4	6.4	0.0	6.8	6.9	0.1	7.3	7.5	0.1
Stevens Canal at Ridge Drive	SD	11001	6.9	5.8	5.3	-0.4	6.8	6.8	-0.1	7.3	7.3	0.0	7.8	7.8	0.0
Stevens Canal at Big Tree Road	SD	10101	8.6	6.1	5.9	-0.2	7.4	7.3	0.0	7.9	7.9	0.0	8.4	8.4	0.0
Upstream end of Stevens Canal	SD	101	6.6	6.3	6.1	-0.1	7.6	7.5	0.0	8.0	8.0	0.0	8.5	8.5	0.0

SJRWMD 96-hr Design Storm with 100-Year Stillwater															
				Peak Stages (ft NGVD)											
Location	Jurisdiction	Model Node	Indicator Elevation (ft NGVD)	Existing Mean Annual	Alt. 1 Mean Annual	Change (ft)	Existing 10-Year	Alt. 1 10-Year	Change (ft)	Existing 25-Year	Alt. 1 25-Year	Change (ft)	Existing 100-Year	Alt. 1 100-Year	Change (ft)
Reed Canal Outfall	SD	12102	-	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
Upstream of US 1	SD	12101	7.5	6.2	6.5	0.3	6.4	6.4	0.0	6.5	6.5	0.0	6.7	6.6	-0.1
Downstream of RR / Upstream of Proposed Gate	SD	12804	11.5	6.4	6.4	0.0	6.7	6.4	-0.3	6.8	6.6	-0.2	7.0	6.9	-0.1
Reed Canal at Stevens Canal	SD	128	8.8	6.8	6.2	-0.6	7.3	6.9	-0.3	7.5	7.3	-0.2	7.7	7.7	-0.1
Saul Drive	SD	122	9.6	7.1	6.2	-0.9	7.7	7.3	-0.3	7.9	7.7	-0.3	8.3	8.2	-0.1
Reed Canal at Nova Road	SD	13104	9.2	7.7	7.1	-0.6	8.3	8.1	-0.3	8.7	8.5	-0.2	9.3	9.0	-0.2
Downstream end of Stevens Canal	SD	11901	5.4	6.8	5.7	-1.1	7.4	7.0	-0.4	7.7	7.4	-0.3	7.9	7.8	0.0
Stevens Canal at Ridge Drive	SD	11001	6.9	6.9	5.9	-1.0	7.5	7.2	-0.4	7.9	7.6	-0.3	8.4	8.1	-0.4
Stevens Canal at Big Tree Road	SD	10101	8.6	7.0	6.2	-0.8	7.9	7.5	-0.3	8.2	8.0	-0.3	8.7	8.5	-0.3
Upstream end of Stevens Canal	SD	101	6.6	7.1	6.3	-0.8	8.0	7.6	-0.3	8.3	8.1	-0.2	8.8	8.6	-0.2

SD = South Daytona

APPENDIX G

Existing HY-8 Model


Crossing Data - Existing Bridge
Crossing Properties
Name: Existing Bridge Alt 1
Parameter | Value | Units
DISCHARGE DATA
Discharge Method | Recurrence
Discharge List | Define...
TAILWATER DATA
Channel Type | Enter Rating Curve
Channel Invert Elevation | -3.620 | ft
Rating Curve | Define...
ROADWAY DATA
Roadway Profile Shape | Irregular
Irregular Shape | Define...
Roadway Surface | Paved
Top Width | 32.830 | ft
Culvert Properties
Culvert 1
Add Culvert
Duplicate Culvert
Delete Culvert
Parameter | Value | Units
CULVERT DATA
Name | Culvert 1
Shape | User Defined
Material | Corrugated Metal Riveted or Welded
Coordinates | Define...
Span | 57.700 | ft
Rise | 10.620 | ft
Embedment Depth | 0.000 | in
Manning's n (Top/Sides) | 0.040
Manning's n (Bottom) | 0.045
Culvert Type | Straight
Inlet Configuration | Thin Edge Projecting
Inlet Depression? | No
SITE DATA
Site Data Input Option | Culvert Invert Data
Inlet Station | 100.000 | ft
Inlet Elevation | -3.600 | ft
Outlet Station | 132.830 | ft
Outlet Elevation | -3.620 | ft
Number of Barrels | 1
Help
Click on any icon for help on a specific topic
Low Flow
AOP
Energy Dissipation
Analyze Crossing
OK
Cancel

HY-8 Analysis Results

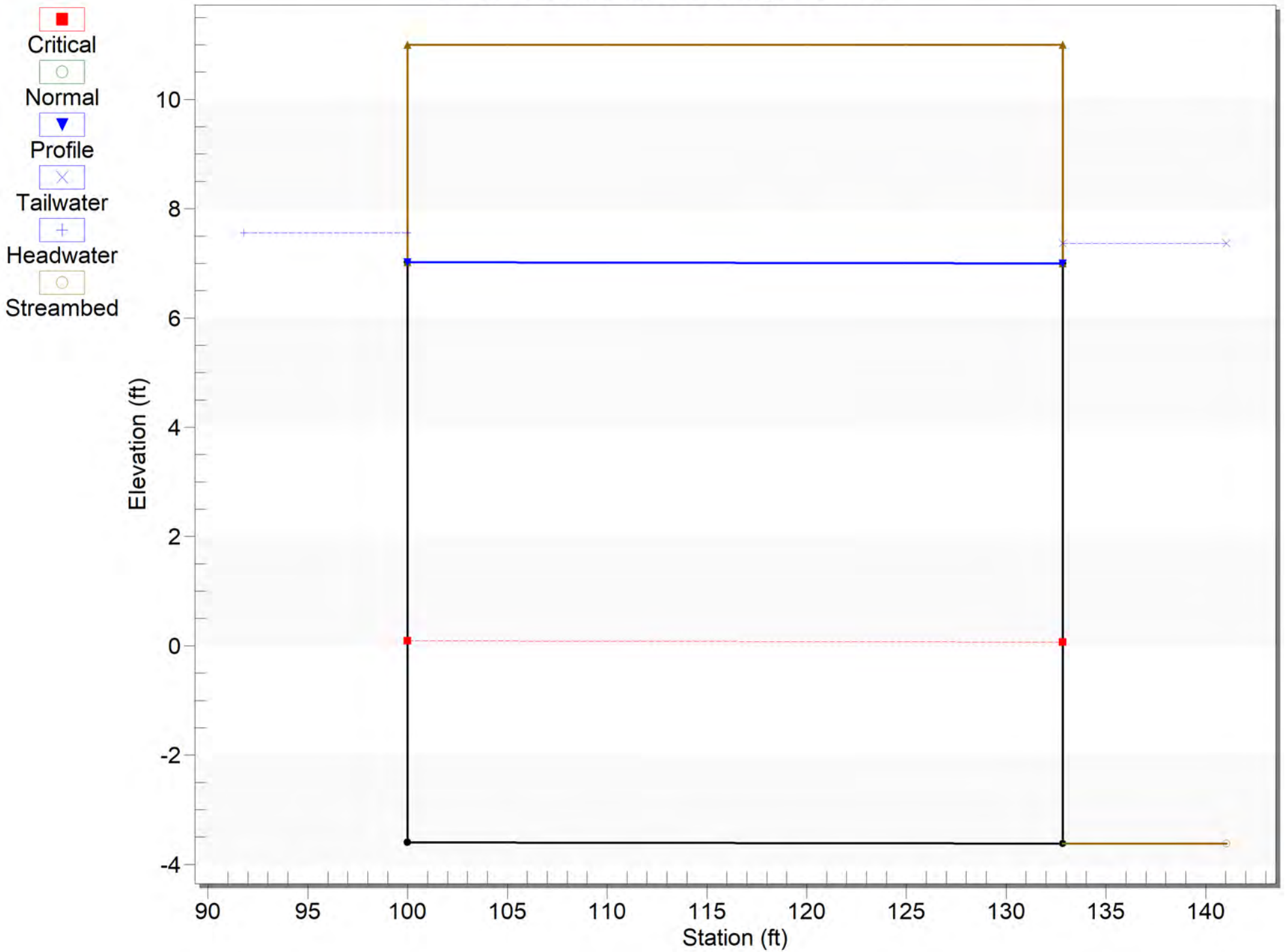
Culvert Summary Table - Culvert 1

Culvert Crossing: Existing Bridge

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
25 year	730.00	730.00	7.01	3.95	10.61	3-M2t	10.62	3.45	10.49	10.49	2.00	1.25
100 year	821.00	821.00	7.55	4.21	11.15	4-FFf	10.62	3.69	10.62	10.99	2.25	1.50

Crossing - Existing Bridge, Design Discharge - 821.0 cfs

Culvert - Culvert 1, Culvert Discharge - 821.0 cfs



HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Recurrence

Table 1 - Summary of Culvert Flows at Crossing: Existing Bridge

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7.01	25 year	730.00	730.00	0.00	1
7.55	100 year	821.00	821.00	0.00	1
9.00	Overtopping	2441.41	2441.41	0.00	Overtopping

Rating Curve Plot for Crossing: Existing Bridge

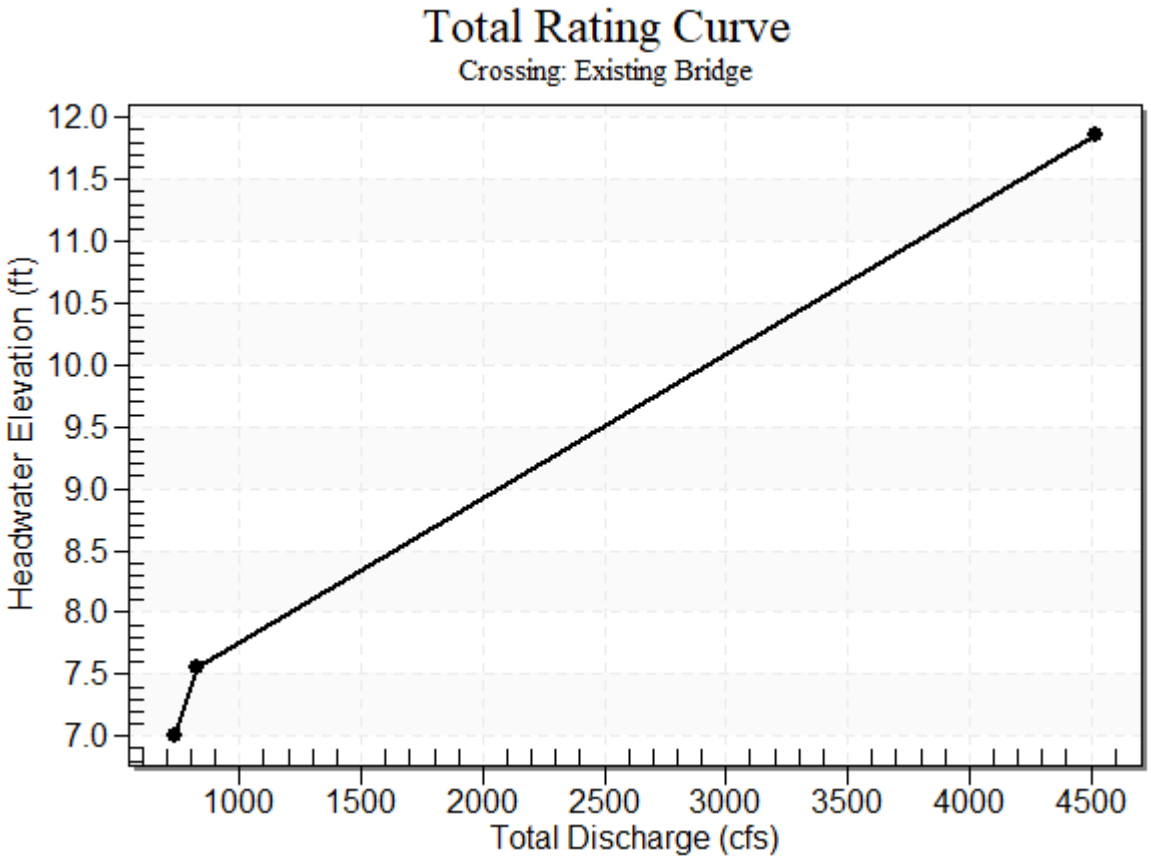


Table 2 - Culvert Summary Table: Culvert 1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)
25 year	730.00	730.00	7.01	3.948	10.612	3-M2t	10.620	3.453	10.490	10.490	2.003
100 year	821.00	821.00	7.55	4.212	11.154	4-FFf	10.620	3.688	10.620	10.990	2.251

****

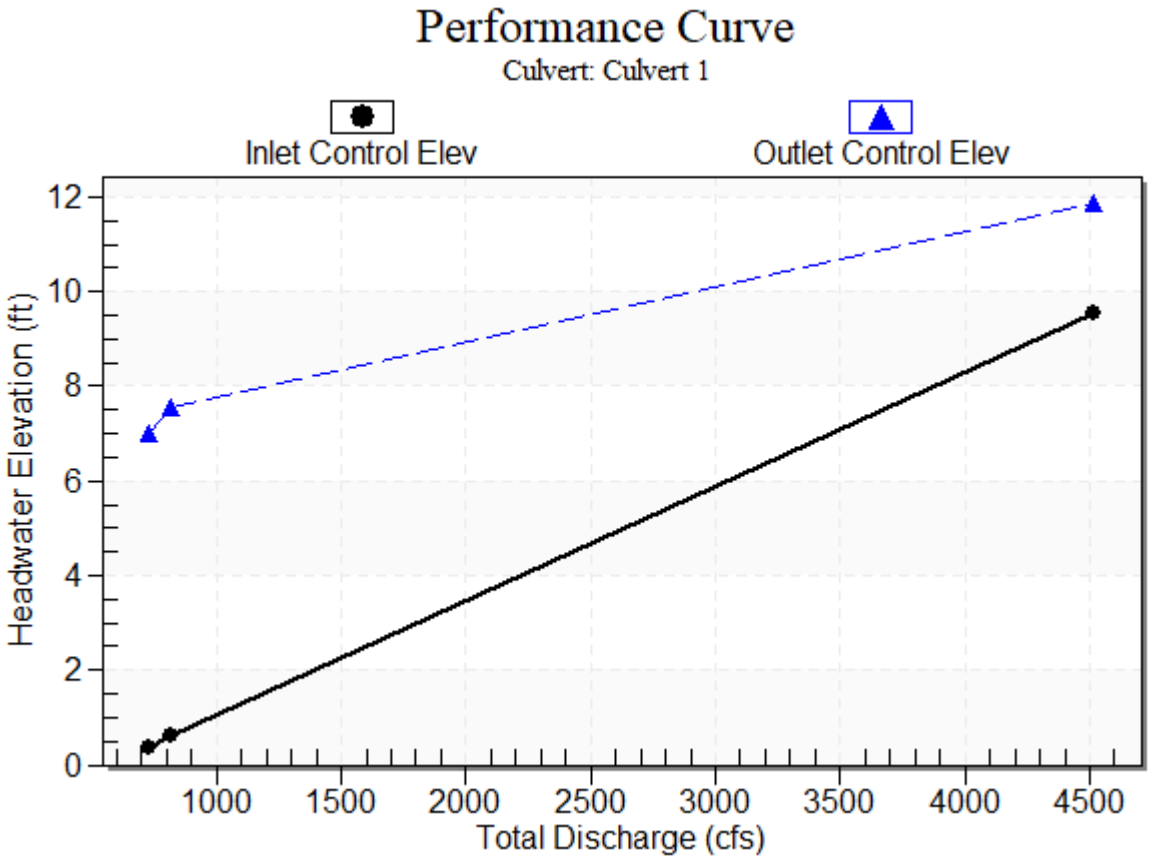
Straight Culvert

Inlet Elevation (invert): -3.60 ft, Outlet Elevation (invert): -3.62 ft

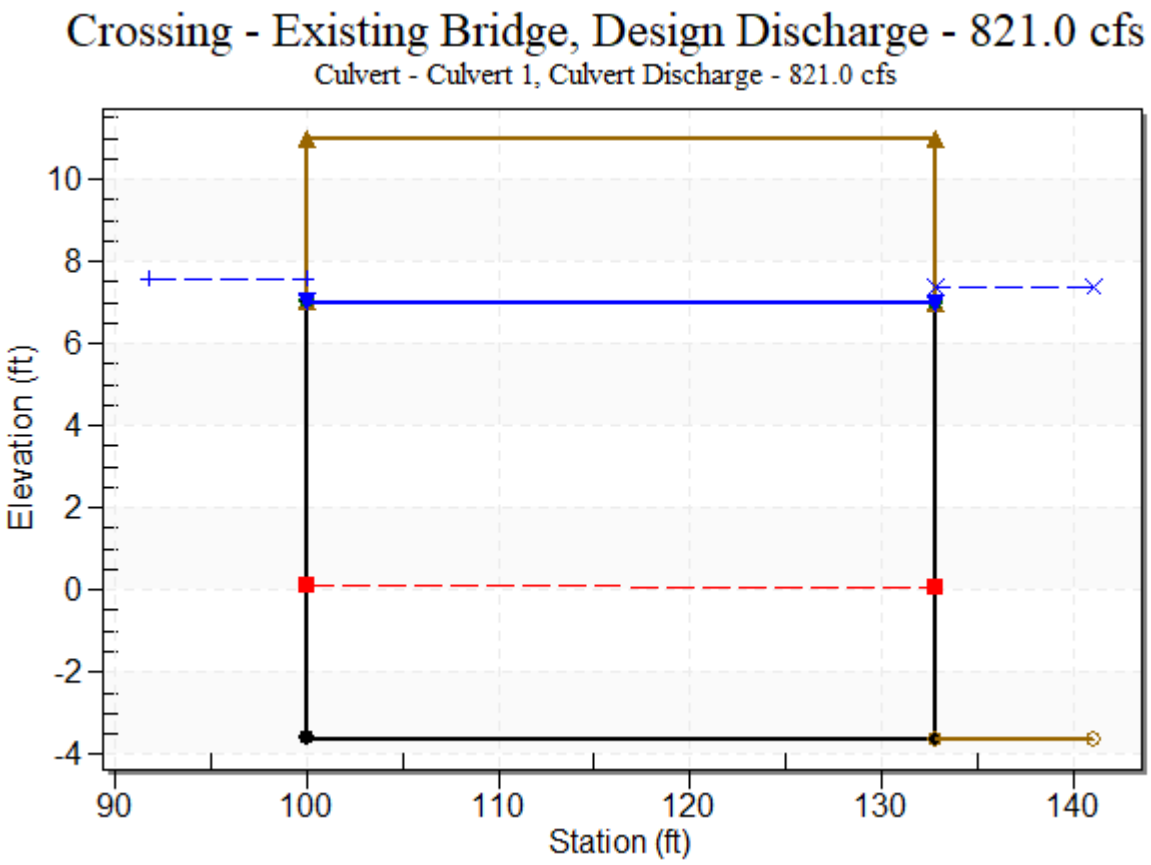
Culvert Length: 32.83 ft, Culvert Slope: 0.0006

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 100.00 ft

Inlet Elevation: -3.60 ft

Outlet Station: 132.83 ft

Outlet Elevation: -3.62 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: User Defined

Barrel Span: 57.70 ft

Barrel Rise: 10.62 ft

Barrel Material: Corrugated Metal Riveted or Welded

Embedment: 0.00 in

Barrel Manning's n: 0.0400 (top and sides)

Manning's n: 0.0450 (bottom)

Culvert Type: Straight

Inlet Configuration: Thin Edge Projecting

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: Existing Bridge)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)
730.00	6.87	6.87	1.25
821.00	7.37	7.37	1.50

Tailwater Channel Data - Existing Bridge

Tailwater Channel Option: Enter Rating Curve

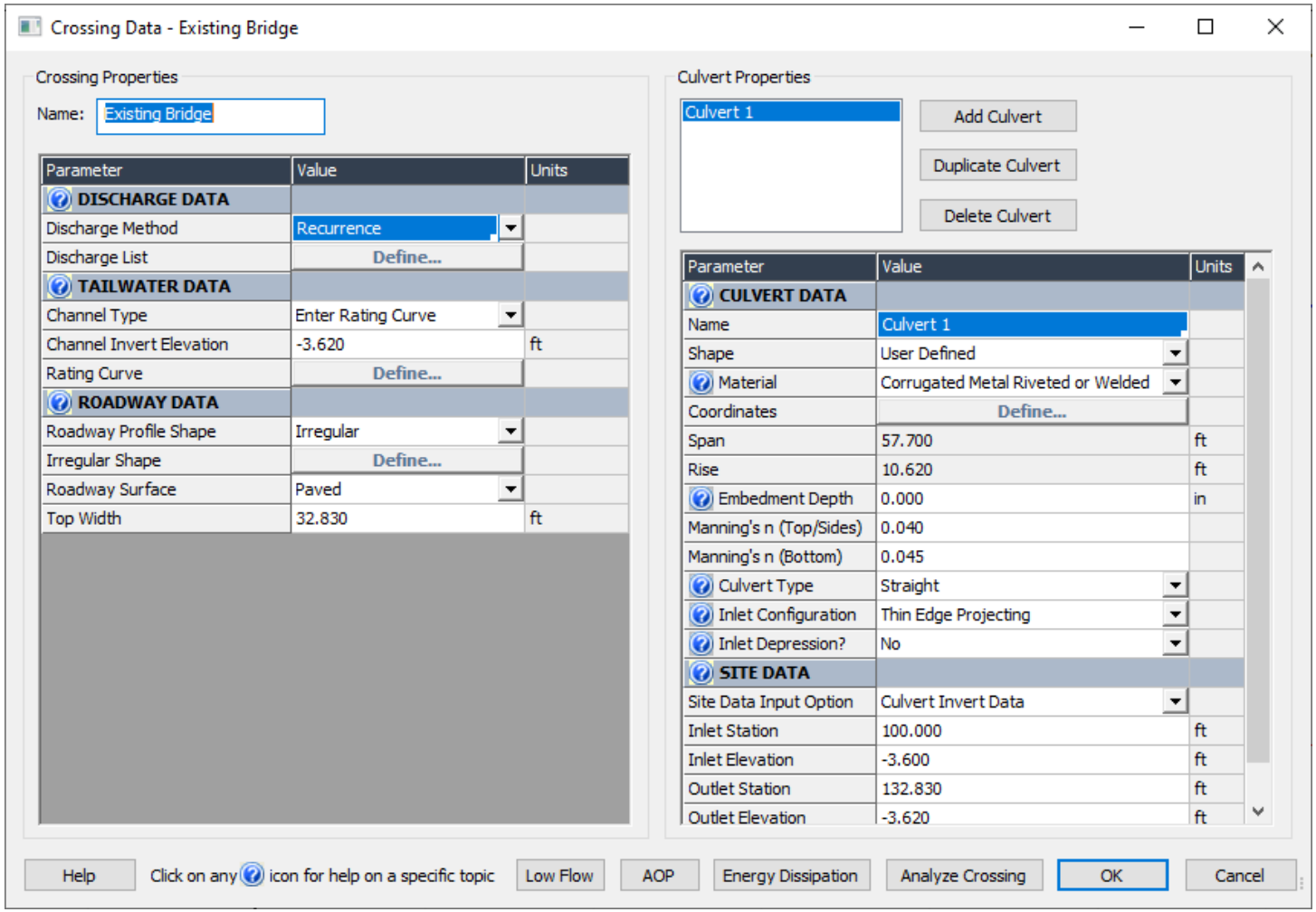
Channel Invert Elevation: -3.62 ft

Roadway Data for Crossing: Existing Bridge

Roadway Profile Shape: Irregular Roadway Shape (coordinates)

Roadway Surface: Paved

Roadway Top Width: 32.83 ft


Crossing Data - Existing Bridge
Crossing Properties
Name: Existing Bridge
Parameter
Value
Units
DISCHARGE DATA
Discharge Method
Recurrence
Discharge List
Define...
TAILWATER DATA
Channel Type
Enter Rating Curve
Channel Invert Elevation
-3.620
ft
Rating Curve
Define...
ROADWAY DATA
Roadway Profile Shape
Irregular
Irregular Shape
Define...
Roadway Surface
Paved
Top Width
32.830
ft
Culvert Properties
Culvert 1
Add Culvert
Duplicate Culvert
Delete Culvert
Parameter
Value
Units
CULVERT DATA
Name
Culvert 1
Shape
User Defined
Material
Corrugated Metal Riveted or Welded
Coordinates
Define...
Span
57.700
ft
Rise
10.620
ft
Embedment Depth
0.000
in
Manning's n (Top/Sides)
0.040
Manning's n (Bottom)
0.045
Culvert Type
Straight
Inlet Configuration
Thin Edge Projecting
Inlet Depression?
No
SITE DATA
Site Data Input Option
Culvert Invert Data
Inlet Station
100.000
ft
Inlet Elevation
-3.600
ft
Outlet Station
132.830
ft
Outlet Elevation
-3.620
ft
Help
Click on any icon for help on a specific topic
Low Flow
AOP
Energy Dissipation
Analyze Crossing
OK
Cancel

HY-8 Analysis Results

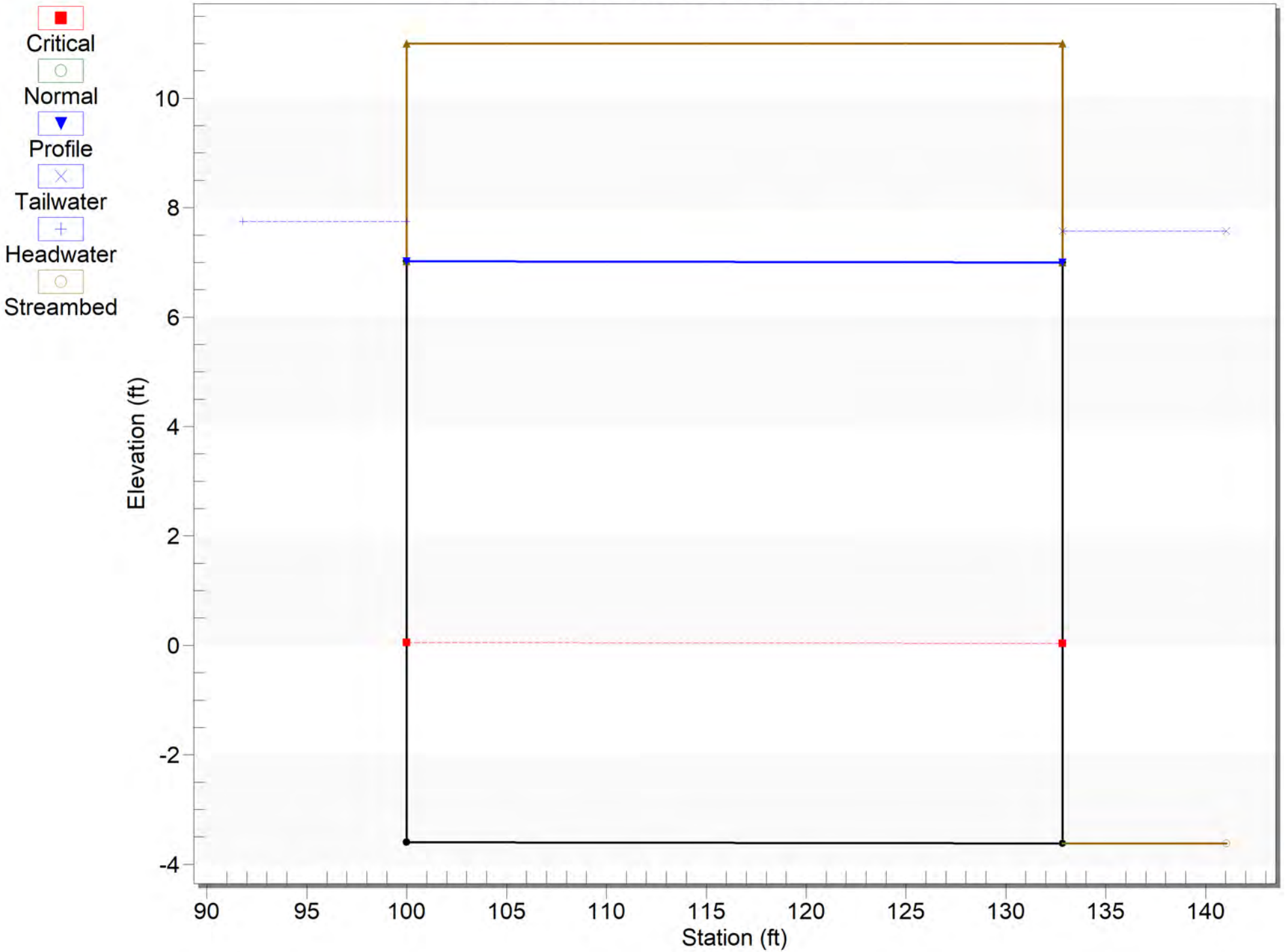
Culvert Summary Table - Culvert 1

Culvert Crossing: Existing Bridge

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
25 year	706.00	706.00	7.21	3.88	10.81	4-FFf	10.62	3.39	10.62	10.69	1.94	1.25
100 year	808.00	808.00	7.75	4.18	11.35	4-FFf	10.62	3.66	10.62	11.19	2.22	1.50

Crossing - Existing Bridge, Design Discharge - 808.0 cfs

Culvert - Culvert 1, Culvert Discharge - 808.0 cfs



HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Recurrence

Table 1 - Summary of Culvert Flows at Crossing: Existing Bridge

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7.21	25 year	706.00	706.00	0.00	1
7.75	100 year	808.00	808.00	0.00	1
9.00	Overtopping	2286.69	2286.69	0.00	Overtopping

Rating Curve Plot for Crossing: Existing Bridge

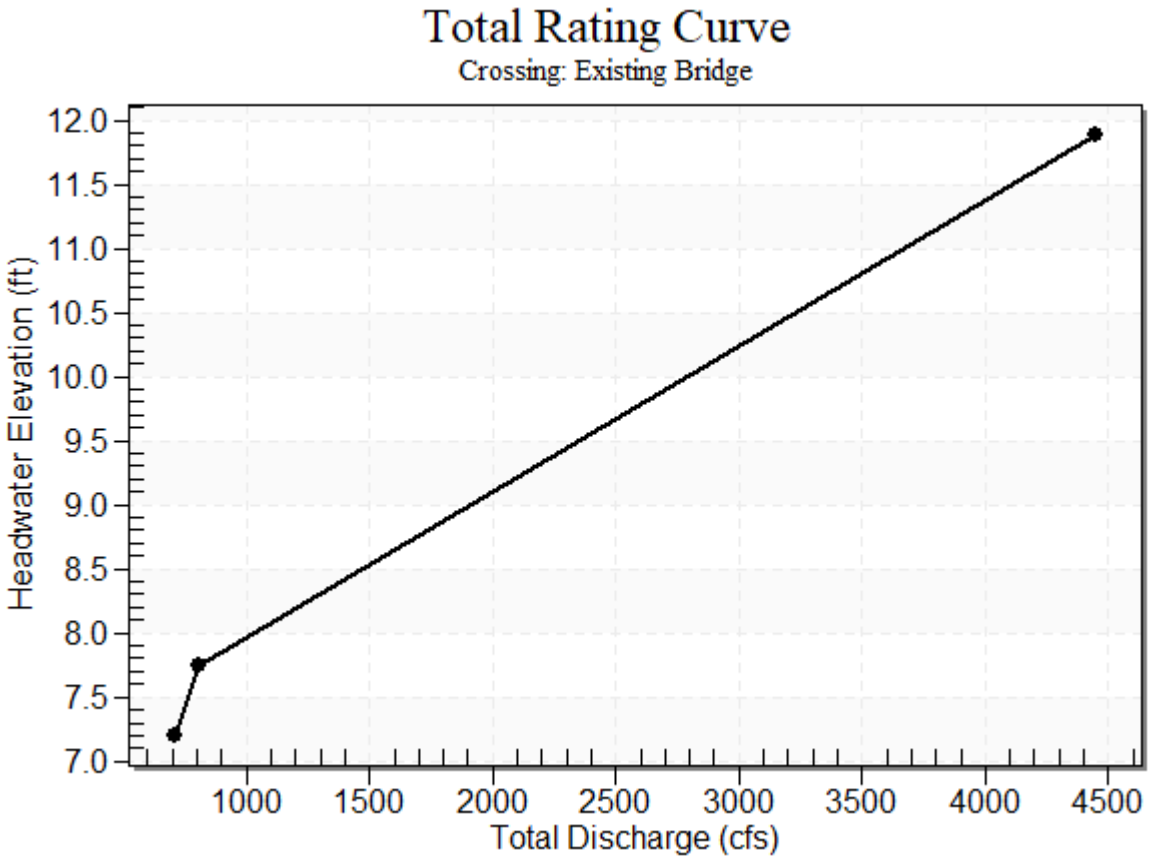


Table 2 - Culvert Summary Table: Culvert 1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)
25 year	706.00	706.00	7.21	3.876	10.806	4-FFf	10.620	3.388	10.620	10.690	1.936
100 year	808.00	808.00	7.75	4.175	11.349	4-FFf	10.620	3.655	10.620	11.190	2.216

****

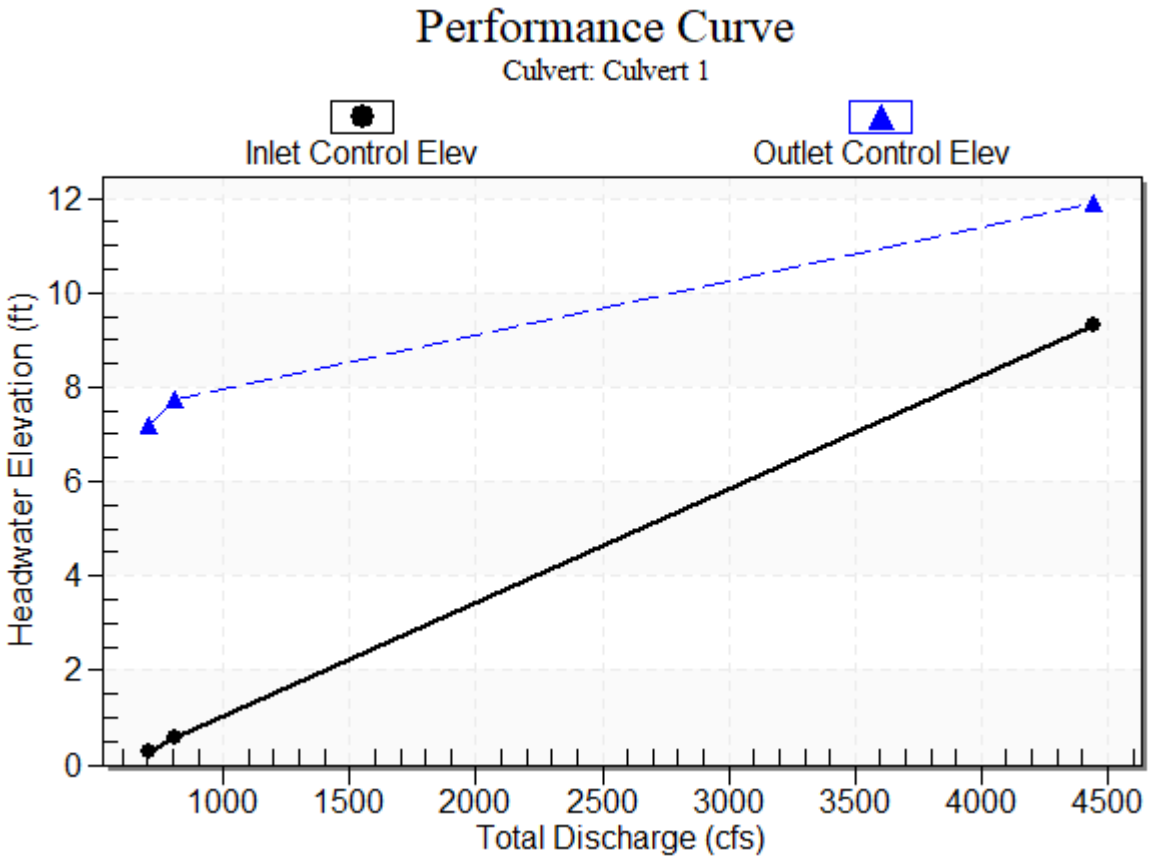
Straight Culvert

Inlet Elevation (invert): -3.60 ft, Outlet Elevation (invert): -3.62 ft

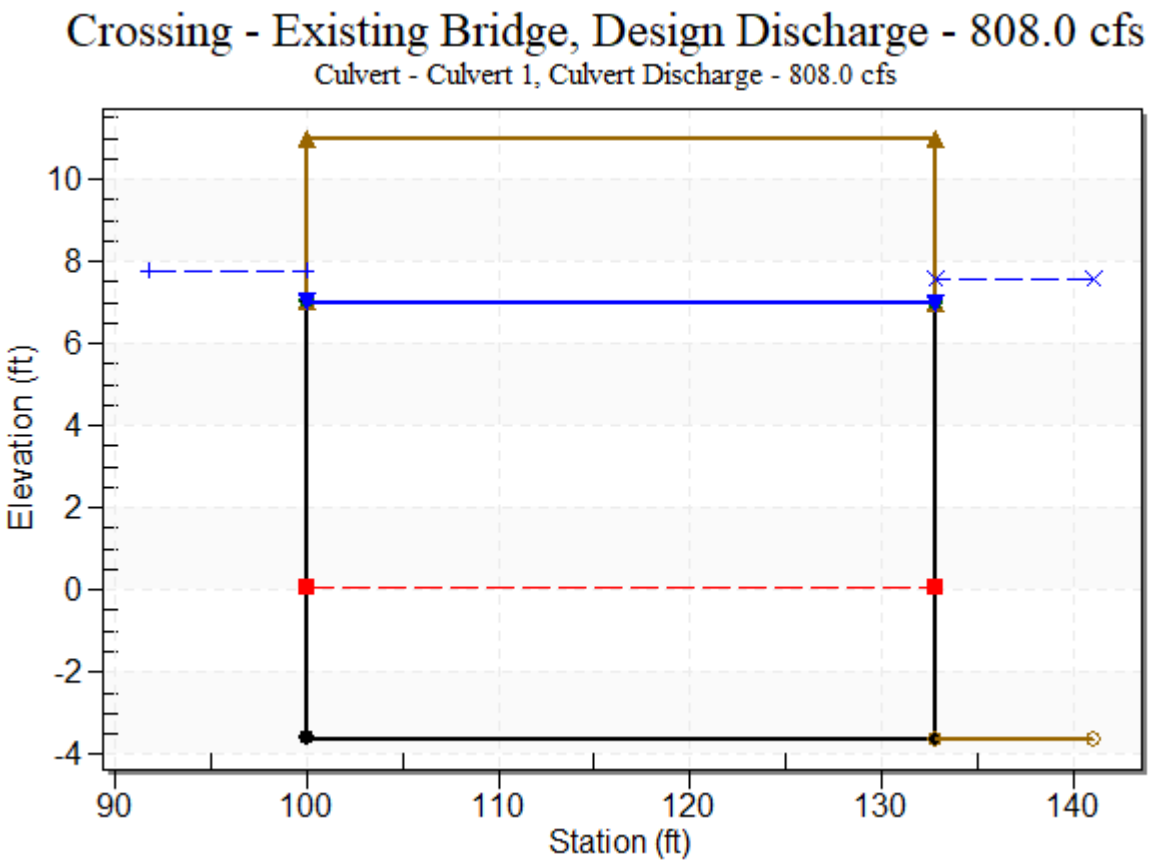
Culvert Length: 32.83 ft, Culvert Slope: 0.0006

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 100.00 ft

Inlet Elevation: -3.60 ft

Outlet Station: 132.83 ft

Outlet Elevation: -3.62 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: User Defined

Barrel Span: 57.70 ft

Barrel Rise: 10.62 ft

Barrel Material: Corrugated Metal Riveted or Welded

Embedment: 0.00 in

Barrel Manning's n: 0.0400 (top and sides)

Manning's n: 0.0450 (bottom)

Culvert Type: Straight

Inlet Configuration: Thin Edge Projecting

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: Existing Bridge)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)
706.00	7.07	7.07	1.25
808.00	7.57	7.57	1.50

Tailwater Channel Data - Existing Bridge

Tailwater Channel Option: Enter Rating Curve

Channel Invert Elevation: -3.62 ft

Roadway Data for Crossing: Existing Bridge

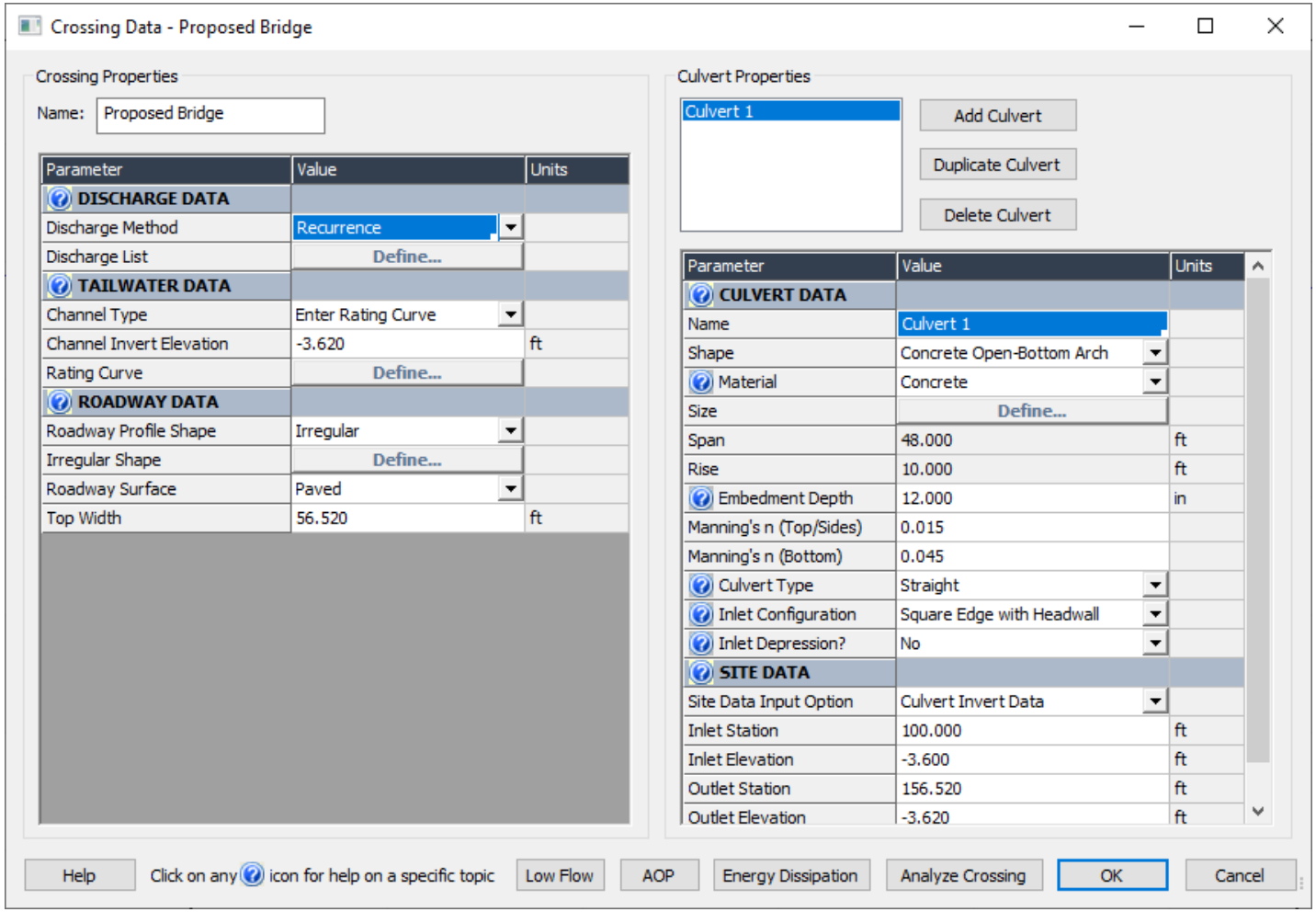
Roadway Profile Shape: Irregular Roadway Shape (coordinates)

Roadway Surface: Paved

Roadway Top Width: 32.83 ft

APPENDIX H

Proposed HY-8 Model


Crossing Data - Proposed Bridge
Crossing Properties
Name: Proposed Bridge
Parameter
Value
Units
DISCHARGE DATA
Discharge Method
Recurrence
Discharge List
Define...
TAILWATER DATA
Channel Type
Enter Rating Curve
Channel Invert Elevation
-3.620
ft
Rating Curve
Define...
ROADWAY DATA
Roadway Profile Shape
Irregular
Irregular Shape
Define...
Roadway Surface
Paved
Top Width
56.520
ft
Culvert Properties
Culvert 1
Add Culvert
Duplicate Culvert
Delete Culvert
Parameter
Value
Units
CULVERT DATA
Name
Culvert 1
Shape
Concrete Open-Bottom Arch
Material
Concrete
Size
Define...
Span
48.000
ft
Rise
10.000
ft
Embedment Depth
12.000
in
Manning's n (Top/Sides)
0.015
Manning's n (Bottom)
0.045
Culvert Type
Straight
Inlet Configuration
Square Edge with Headwall
Inlet Depression?
No
SITE DATA
Site Data Input Option
Culvert Invert Data
Inlet Station
100.000
ft
Inlet Elevation
-3.600
ft
Outlet Station
156.520
ft
Outlet Elevation
-3.620
ft
Help
Click on any icon for help on a specific topic
Low Flow
AOP
Energy Dissipation
Analyze Crossing
OK
Cancel

HY-8 Analysis Results

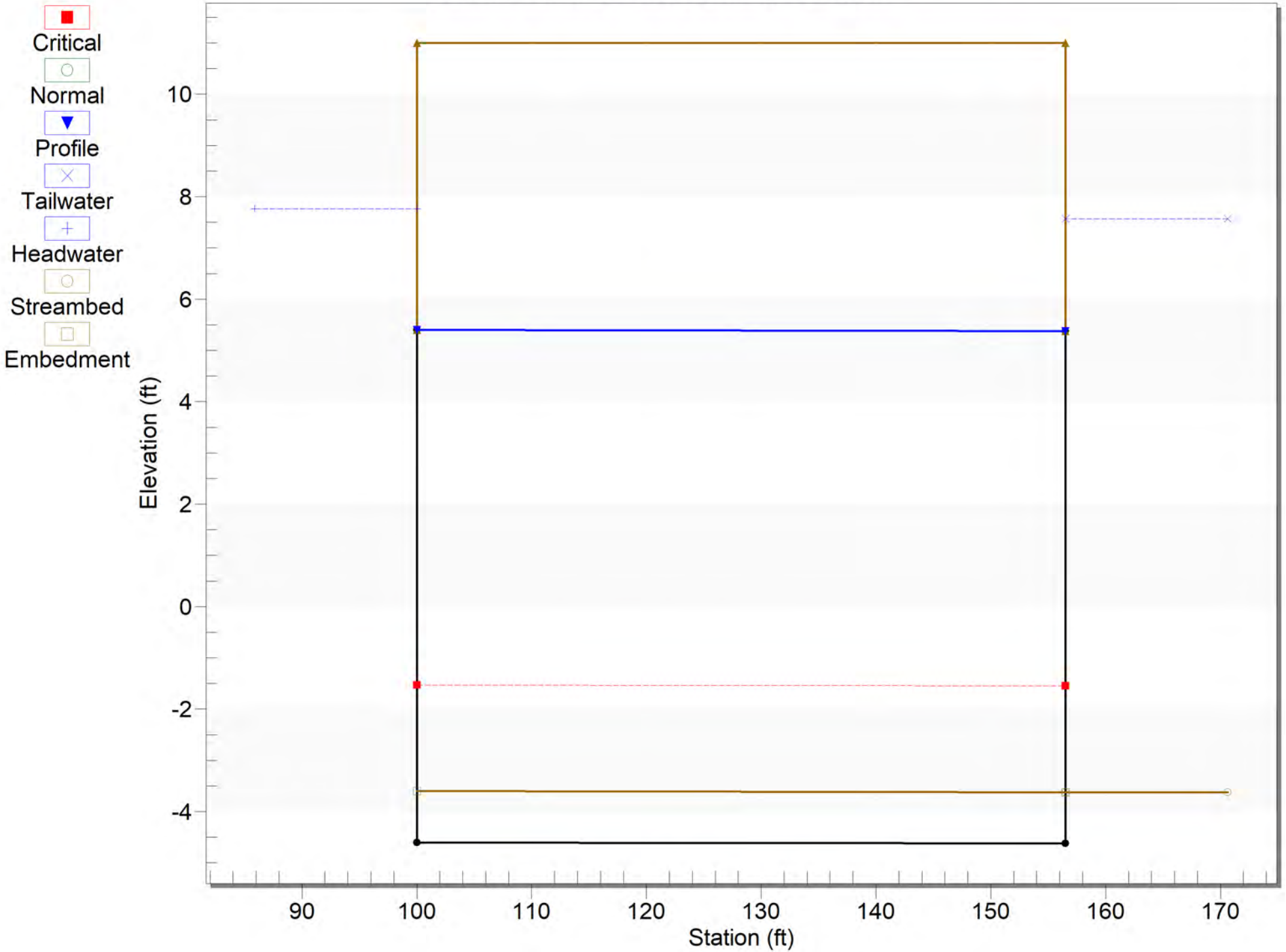
Culvert Summary Table - Culvert 1

Culvert Crossing: Proposed Bridge

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
25 year	706.00	706.00	7.22	3.25	10.82	4-FFf	9.00	1.89	9.00	10.69	2.13	2.25
100 year	808.00	808.00	7.77	3.56	11.37	4-FFf	9.00	2.07	9.00	11.19	2.44	2.50

Crossing - Proposed Bridge, Design Discharge - 808.0 cfs

Culvert - Culvert 1, Culvert Discharge - 808.0 cfs



HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Recurrence

Table 1 - Summary of Culvert Flows at Crossing: Proposed Bridge

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7.22	25 year	706.00	706.00	0.00	1
7.77	100 year	808.00	808.00	0.00	1
9.00	Overtopping	2208.95	2208.95	0.00	Overtopping

Rating Curve Plot for Crossing: Proposed Bridge

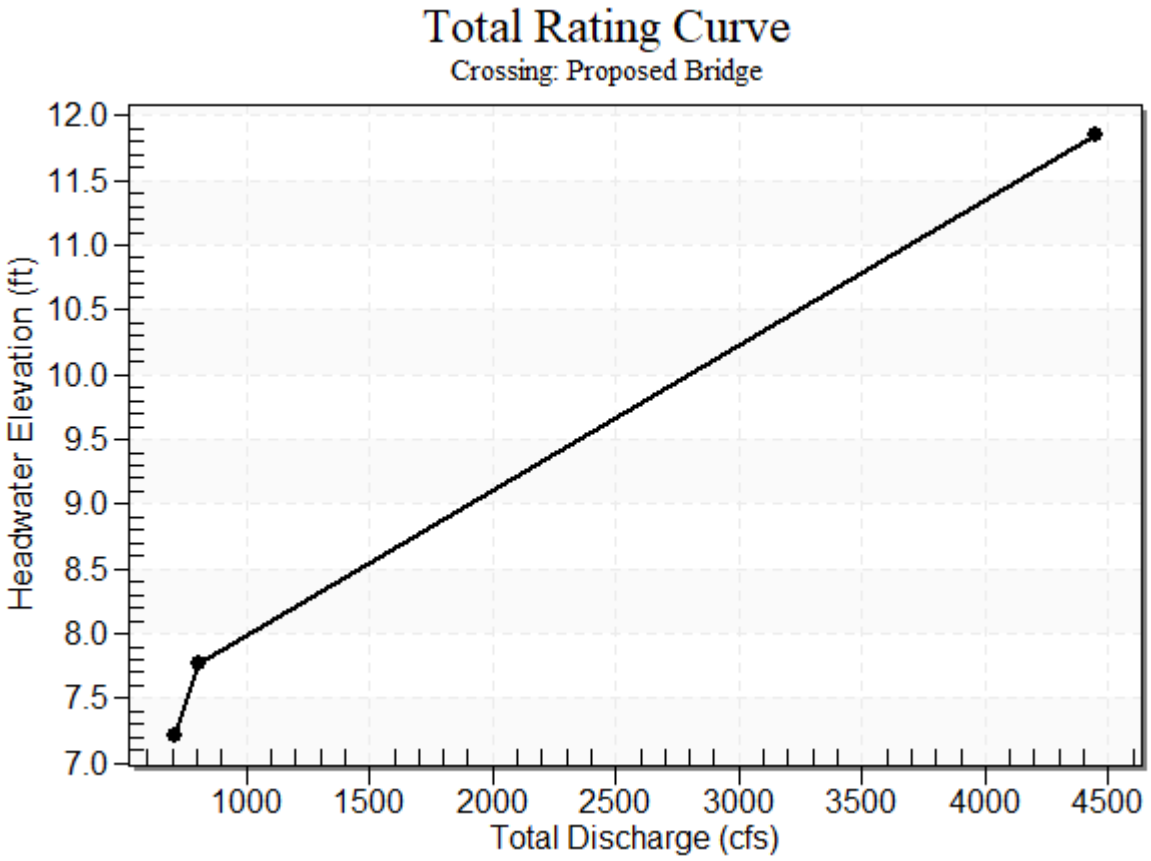


Table 2 - Culvert Summary Table: Culvert 1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)
25 year	706.00	706.00	7.22	3.250	10.820	4-FFf	9.000	1.891	9.000	10.690	2.128
100 year	808.00	808.00	7.77	3.559	11.367	4-FFf	9.000	2.070	9.000	11.190	2.435

****

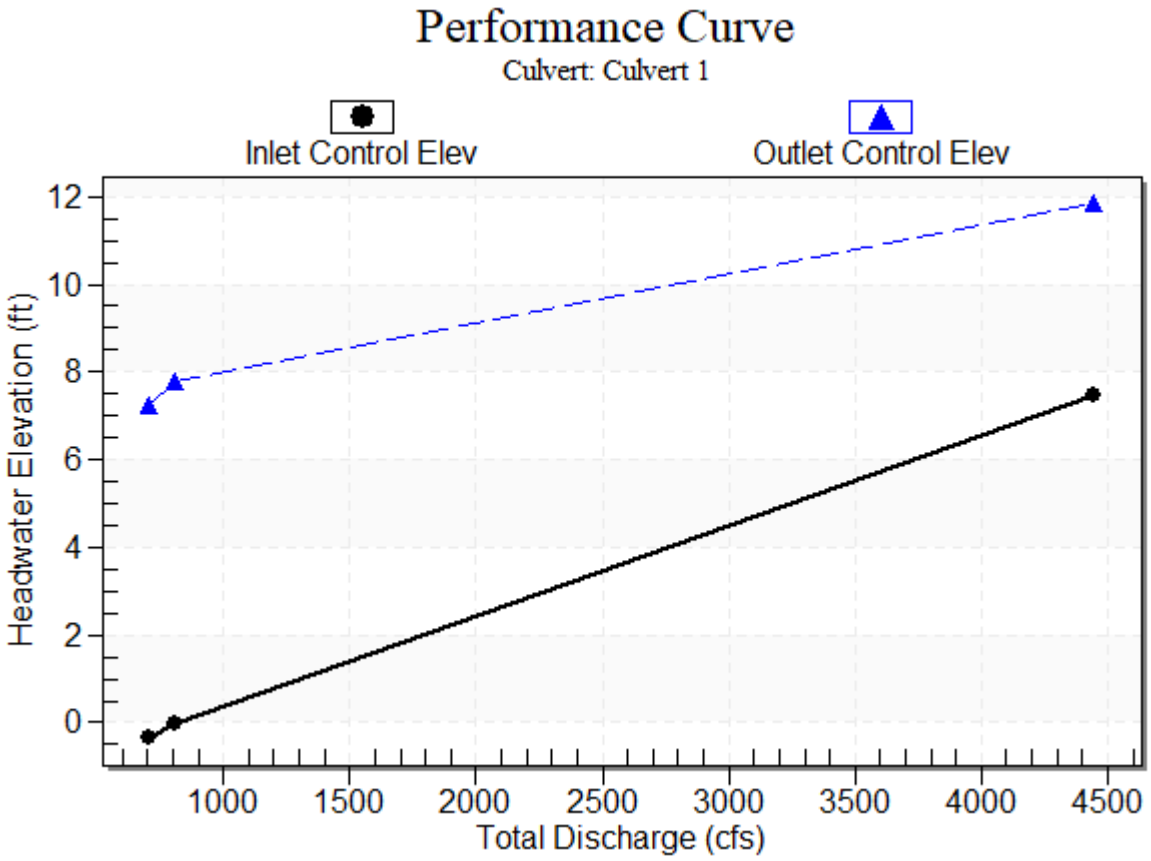
Straight Culvert

Inlet Elevation (invert): -3.60 ft, Outlet Elevation (invert): -3.62 ft

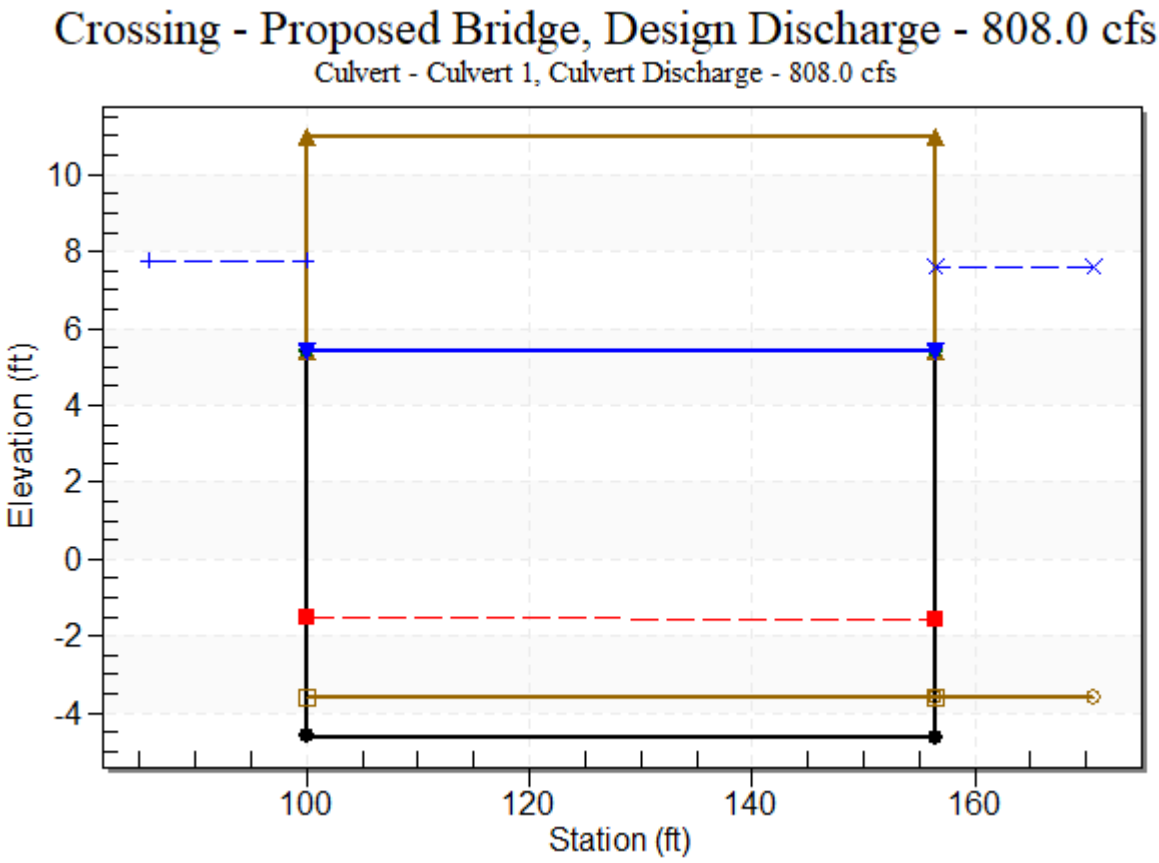
Culvert Length: 56.52 ft, Culvert Slope: 0.0004

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 100.00 ft

Inlet Elevation: -3.60 ft

Outlet Station: 156.52 ft

Outlet Elevation: -3.62 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Concrete Open-Bottom Arch

Barrel Span: 47.98 ft

Barrel Rise: 10.00 ft

Notes about selected shape: The selected span to rise ratio is outside of the range tested.

Barrel Material: Concrete

Embedment: 12.00 in

Barrel Manning's n: 0.0150 (top and sides)

Manning's n: 0.0450 (bottom)

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: Proposed Bridge)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)
706.00	7.07	7.07	2.25
808.00	7.57	7.57	2.50

Tailwater Channel Data - Proposed Bridge

Tailwater Channel Option: Enter Rating Curve

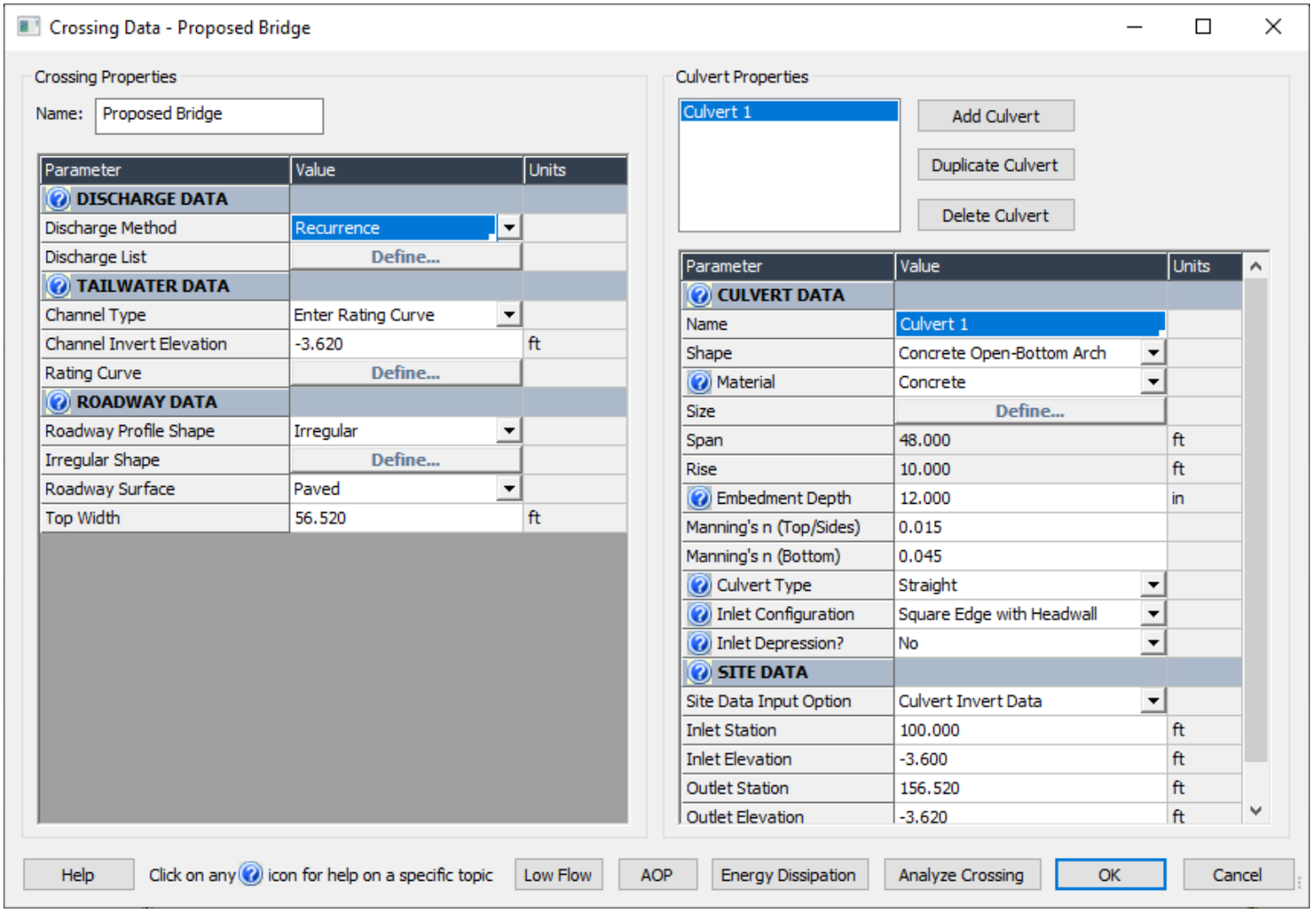
Channel Invert Elevation: -3.62 ft

Roadway Data for Crossing: Proposed Bridge

Roadway Profile Shape: Irregular Roadway Shape (coordinates)

Roadway Surface: Paved

Roadway Top Width: 56.52 ft


Crossing Data - Proposed Bridge
Crossing Properties
Name: Proposed Bridge
Parameter
Value
Units
DISCHARGE DATA
Discharge Method
Recurrence
Discharge List
Define...
TAILWATER DATA
Channel Type
Enter Rating Curve
Channel Invert Elevation
-3.620
ft
Rating Curve
Define...
ROADWAY DATA
Roadway Profile Shape
Irregular
Irregular Shape
Define...
Roadway Surface
Paved
Top Width
56.520
ft
Culvert Properties
Culvert 1
Add Culvert
Duplicate Culvert
Delete Culvert
Parameter
Value
Units
CULVERT DATA
Name
Culvert 1
Shape
Concrete Open-Bottom Arch
Material
Concrete
Size
Define...
Span
48.000
ft
Rise
10.000
ft
Embedment Depth
12.000
in
Manning's n (Top/Sides)
0.015
Manning's n (Bottom)
0.045
Culvert Type
Straight
Inlet Configuration
Square Edge with Headwall
Inlet Depression?
No
SITE DATA
Site Data Input Option
Culvert Invert Data
Inlet Station
100.000
ft
Inlet Elevation
-3.600
ft
Outlet Station
156.520
ft
Outlet Elevation
-3.620
ft
Help
Click on any icon for help on a specific topic
Low Flow
AOP
Energy Dissipation
Analyze Crossing
OK
Cancel

HY-8 Analysis Results

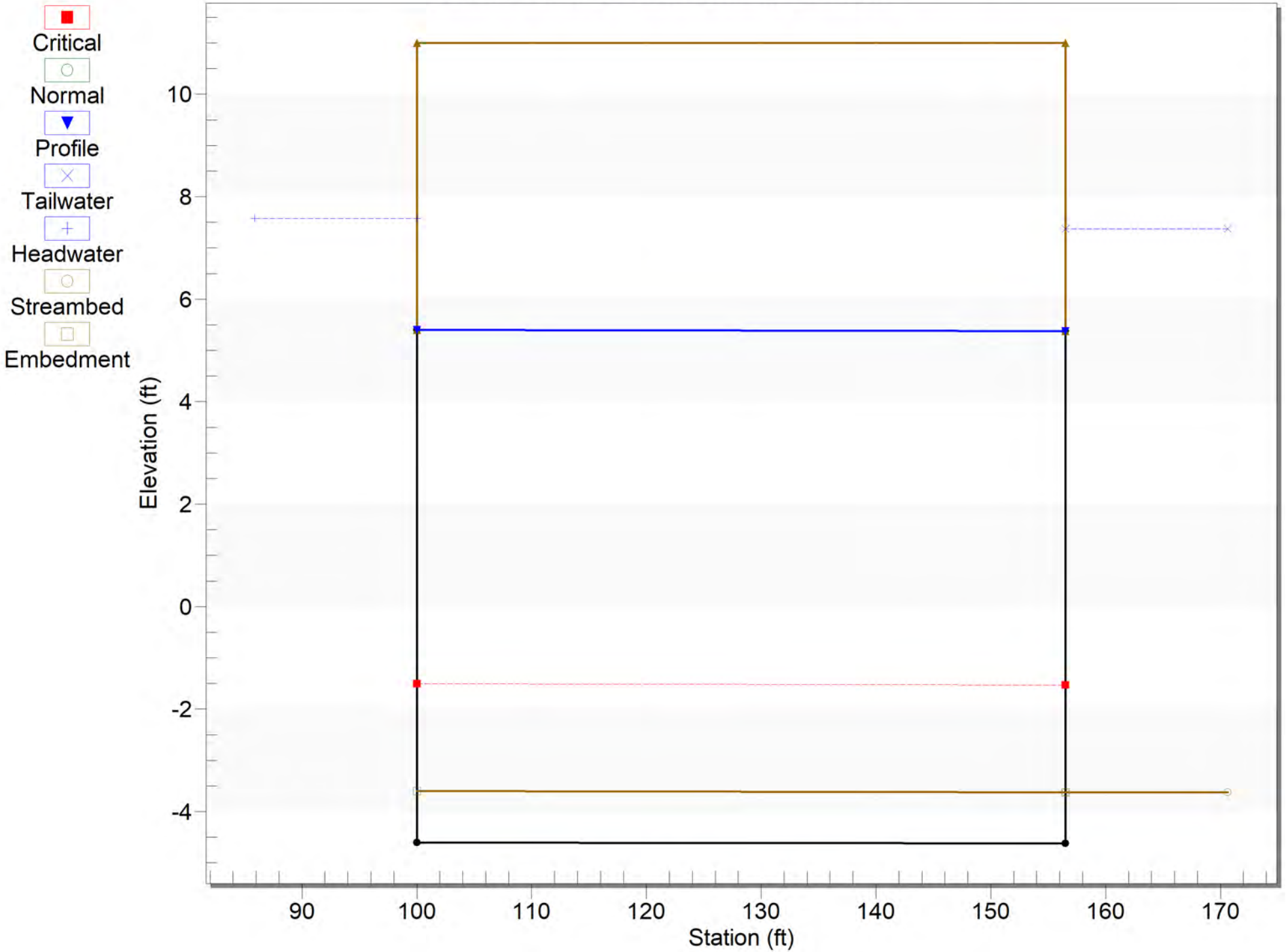
Culvert Summary Table - Culvert 1

Culvert Crossing: Proposed Bridge

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth(ft)	Outlet Control Depth(ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
25 year	730.00	730.00	7.03	3.32	10.63	4-FFf	9.00	1.93	9.00	10.49	2.20	2.25
100 year	821.00	821.00	7.57	3.60	11.17	4-FFf	9.00	2.09	9.00	10.99	2.47	2.50

Crossing - Proposed Bridge, Design Discharge - 821.0 cfs

Culvert - Culvert 1, Culvert Discharge - 821.0 cfs



HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Recurrence

Table 1 - Summary of Culvert Flows at Crossing: Proposed Bridge

Headwater Elevation (ft)	Discharge Names	Total Discharge (cfs)	Culvert 1 Discharge (cfs)	Roadway Discharge (cfs)	Iterations
7.03	25 year	730.00	730.00	0.00	1
7.57	100 year	821.00	821.00	0.00	1
9.00	Overtopping	2364.19	2364.19	0.00	Overtopping

Rating Curve Plot for Crossing: Proposed Bridge

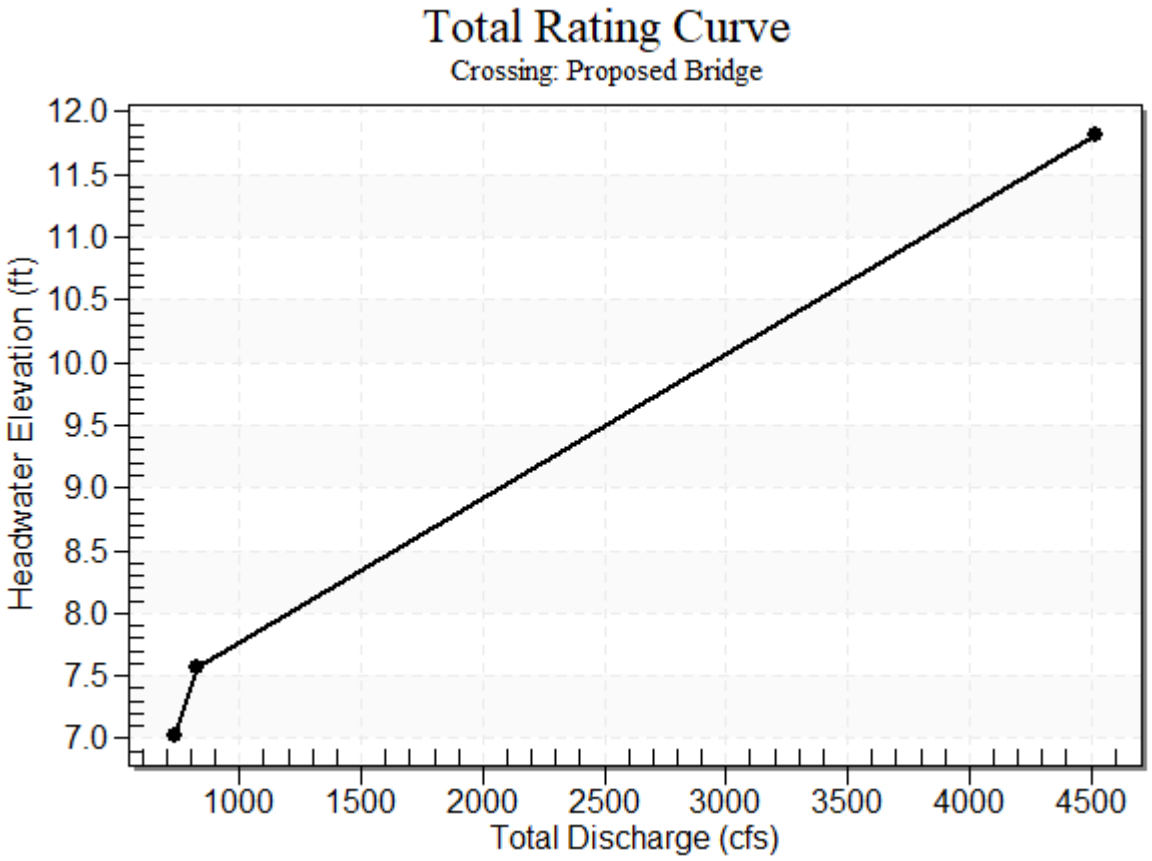


Table 2 - Culvert Summary Table: Culvert 1

Discharge Names	Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)
25 year	730.00	730.00	7.03	3.324	10.631	4-FFf	9.000	1.934	9.000	10.490	2.200
100 year	821.00	821.00	7.57	3.597	11.173	4-FFf	9.000	2.092	9.000	10.990	2.474

****

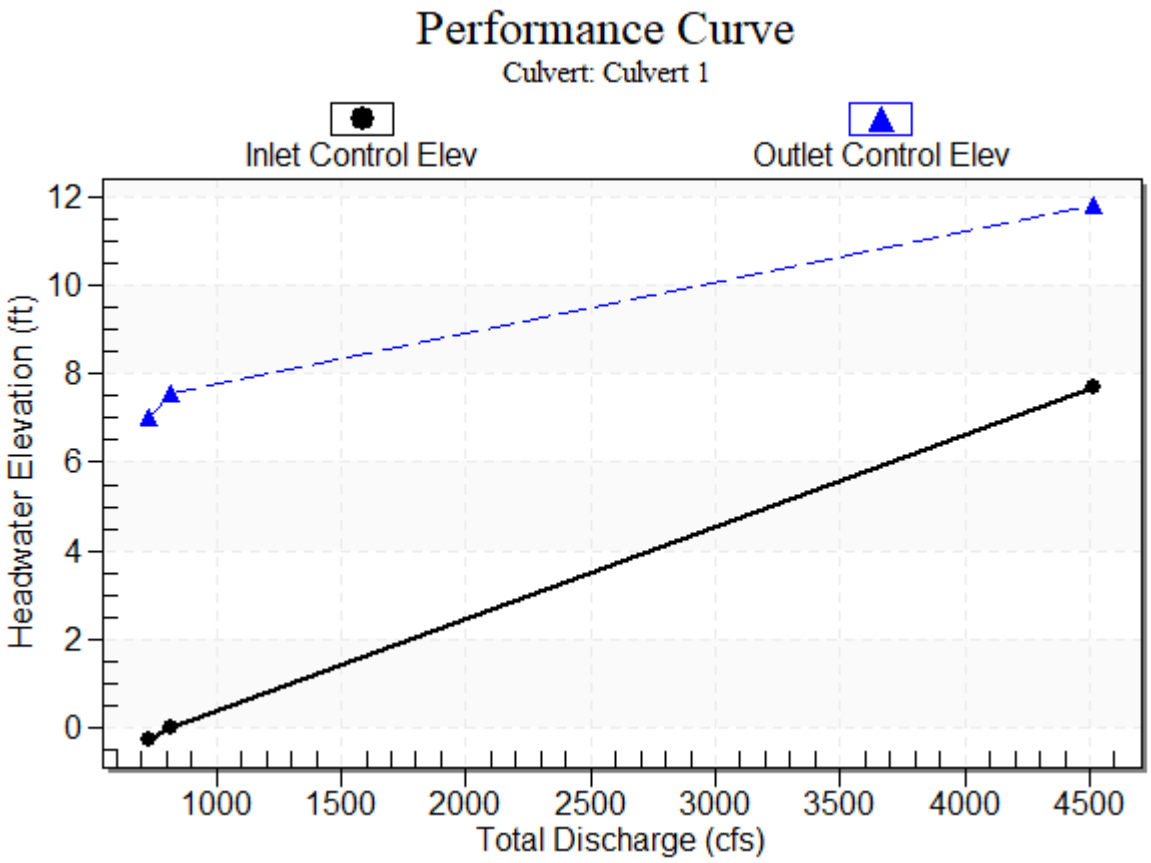
Straight Culvert

Inlet Elevation (invert): -3.60 ft, Outlet Elevation (invert): -3.62 ft

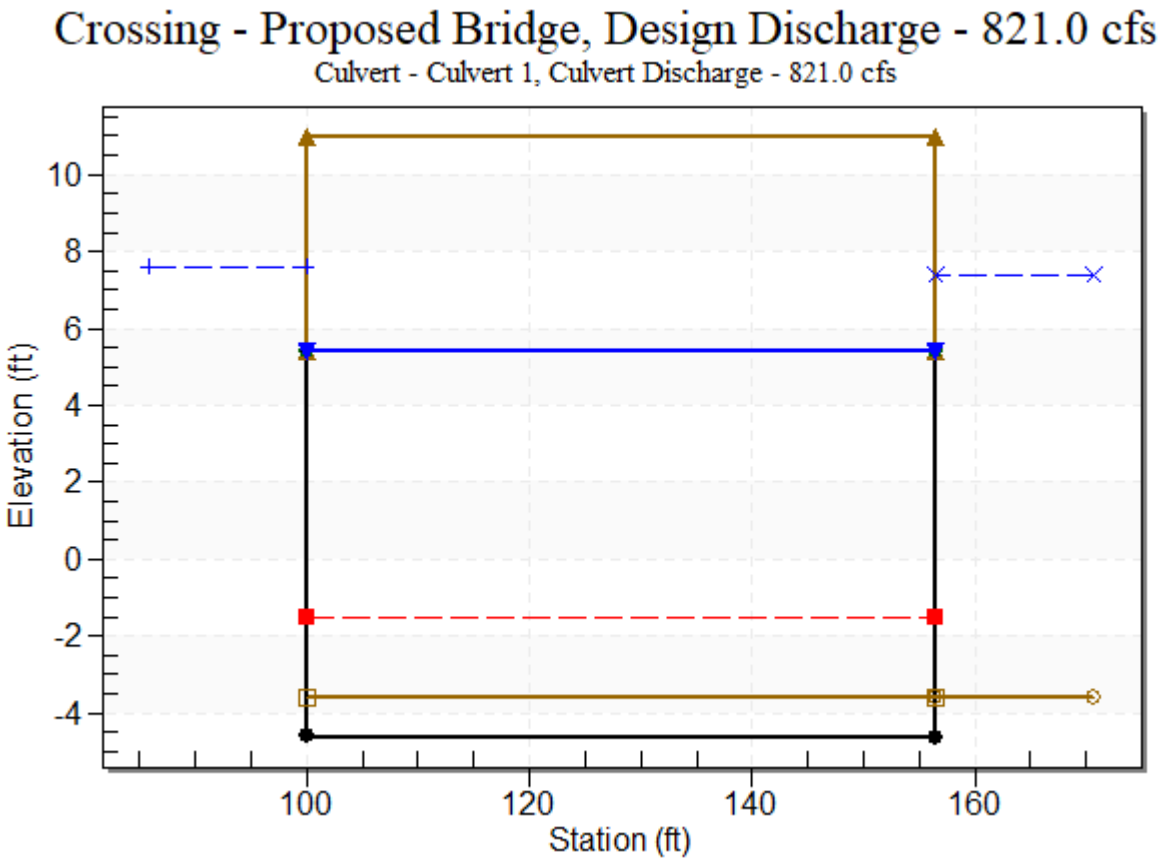
Culvert Length: 56.52 ft, Culvert Slope: 0.0004

****

Culvert Performance Curve Plot: Culvert 1



Water Surface Profile Plot for Culvert: Culvert 1



Site Data - Culvert 1

Site Data Option: Culvert Invert Data

Inlet Station: 100.00 ft

Inlet Elevation: -3.60 ft

Outlet Station: 156.52 ft

Outlet Elevation: -3.62 ft

Number of Barrels: 1

Culvert Data Summary - Culvert 1

Barrel Shape: Concrete Open-Bottom Arch

Barrel Span: 47.98 ft

Barrel Rise: 10.00 ft

Notes about selected shape: The selected span to rise ratio is outside of the range tested.

Barrel Material: Concrete

Embedment: 12.00 in

Barrel Manning's n: 0.0150 (top and sides)

Manning's n: 0.0450 (bottom)

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: None

Table 3 - Downstream Channel Rating Curve (Crossing: Proposed Bridge)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)	Velocity (ft/s)
730.00	6.87	6.87	2.25
821.00	7.37	7.37	2.50

Tailwater Channel Data - Proposed Bridge

Tailwater Channel Option: Enter Rating Curve

Channel Invert Elevation: -3.62 ft

Roadway Data for Crossing: Proposed Bridge

Roadway Profile Shape: Irregular Roadway Shape (coordinates)

Roadway Surface: Paved

Roadway Top Width: 56.52 ft

APPENDIX I

SJRWMD Meeting Minutes

RS&H

301 E. Pine Street, Suite 350
Orlando, Florida 32801

O 407-893-5800
rsandh.com

AGENDA:

Project: Reed Canal Bridge Feasibility Study

Meeting Date: October 27th, 2020 2pm-3pm

Meeting Place: Microsoft Teams

Participants: Hosanna Loreaux (SJRWMD), Carmen Cadenas (SJRWMD), Jeff Glenn (RS&H), Lauren Rhodes (RS&H), Miles Procko-Oliveri (RS&H), and David Furry (RS&H)

Subject: SJRWMD Pre-Application Meeting

I. Opening

- Introductions.

II. Project Overview

- Existing drainage conditions.
- Design approach.
    - Criteria for the proposed bridge
        - Existing bridge will be demolished and the new bridge will be placed west of the existing bridge.
        - Design storm

Design storms would be the 25yr-24hr and mean annual-24hr storms. Carmen Cadenas referenced the SJRWMD Volume II Handbook, Section 3.3.2. Jeff Glenn asked what the requirements are for stages in Reed Canal. Carmen stated that no more than 1 ft increase immediately upstream of the proposed bridge and no more than 0.1 ft increase 500 feet upstream of the bridge during the 100-year storm.

- Modeling from Saul's Bridge Feasibility Report

Lantern Park was a bridge that has already been built and required a permit. Carmen and Hosanna will talk to Mark on why the Lantern Park Bridge needed a permit.

III. Permitting

- Environmental Resource Permit.
    - What type of permit will be required during the design phase?
- Would this project qualify for exemption under FAC 62-330.051?

This project could be exempt under 62-330.051(4)(b) or 62-330.051(10). Jeff Glenn asked if it is not exempt, how could treatment be provided? Carmen explained that compensating treatment could be provided in Reed Canal Park. Reed Canal Park is under permit 89150-1 and there is a dry retention area in the park. If the project does not qualify for exemption, Carmen stated to look at FAC 62-330.443 and 62-330.449.

- No rise cert for FEMA/No Rise Report needed?

A No Rise Cert from FEMA is not required.

- Environmental Impacts

Miles Procko-Oliveri stated there was a low potential for gopher tortoise or manatee impacts.
Hosanna will look into whether manatees are known to be in this section of Reed Canal by looking into the permit history in the area.
No wetlands in the project area.
Hosanna stated Reed Canal is considered a non-navigable, upland-cut ditch.

IV. Open Discussion

V. Closing

- Action Items.
  - Lauren will assess whether the project qualifies for a permit exemption.
  - Hosanna will determine if manatees are in this section of Reed Canal.
  - Carmen will discuss with Mark on why Lantern Park did not receive a permit exemption.
- Carmen and Hosanna called Lauren Rhodes on 10/28/2020 to address the remaining action items.
  - Carmen spoke to Mark about Lantern Park. Lantern Park needed a permit because it did not meet the requirement where the crossing could not be longer than 30 feet from top of bank to top of bank and have a top width of more than 20 feet or a toe to toe width of more than 40 feet.
  - Hosanna said to contact the Florida Fish and Wildlife Conservation Commission to inquire whether manatees are in this section of Reed Canal.

Compiled By: Lauren Rhodes, EI, (407)-893-58614, lauren.rhodes@rsandh.com
Distribution: Participants
File Location: X:\P\1070077000 R2CTPO Bike-Ped 2018\4_Reed Canal Park Bridge\SJRWMD

APPENDIX J

Wetlands and Surface Waters Map

RIVER TO SEA TPO
Transportation Planning Organization
VISION - PLAN - IMPLEMENT

Reed Canal Park Bridge Replacement Feasibility Study
Volusia County, Florida

0 50 100 200 Feet

WETLANDS AND SURFACE WATERS MAP

Source: SJRWMD (2014)

APPENDIX K

Engineer's Opinion of Probable Cost

Reed Canal Park Bridge Replacement Feasibility Study
Engineer's Estimate of Probable Costs

PAY ITEM NO.	ITEM DESCRIPTION	UNIT	BASE QTY	BASE UNIT COST	TOTAL COST
101-1	MOBILIZATION	LS	1	10.00%	$ 186,059.55
102-1	MAINTENANCE OF TRAFFIC	LS	1	15.00%	$ 279,089.32
104-10-3	SEDIMENT BARRIER	LF	550	$ 0.82	$ 451.00
104-11	FLOATING TURBIDITY BARRIER	LF	144	$ 5.19	$ 747.36
110-1-1	CLEARING & GRUBBING	AC	0.42	$ 6,317.57	$ 2,675.63
110-3	REMOVAL OF EXISTING STRUCTURES/BRIDGE	SF	2,036	$ 44.48	$ 90,561.28
110-4-10	REMOVAL OF EXISTING CONCRETE	SY	66.70	$ 27.25	$ 1,817.58
120-1	REGULAR EXCAVATION	CY	480	$ 13.67	$ 6,561.60
120-6	EMBANKMENT	CY	84	$ 13.48	$ 1,132.32
160-4	TYPE B STABILIZATION	SY	319	$ 5.31	$ 1,693.89
285-711	OPTIONAL BASE, BASE GROUP 11	SY	418	$ 30.49	$ 12,744.82
327-70-1	MILLING EXIST ASPH PAVT, 1" AVG DEPTH	SY	1,008	$ 1.87	$ 1,884.96
334-1-13	SUPERPAVE ASPHALTICE CONCRETE (SP 9.5, TRAFFIC C, 1.5")	TN	310.6	$ 86.49	$ 26,863.79
0337-7-82	ASPHALT CONCRETE FRICTION COURSE, TRAFFIC C, FC-9.5, PG 76-22	TN	706.0	$ 139.73	$ 98,649.38
425-1-351	INLETS, CURB, TYPE P-5, <10'	EA	1	$ 4,750.89	$ 4,750.89
425-1-910	INLETS, CLOSED FLUME	EA	2	$ 4,020.00	$ 8,040.00
425-2-41	MANHOLE, P-7, <10'	EA	1	$ 5,133.43	$ 5,133.43
430-174-118	PIPE CULVERT, OPTIONAL MATERIAL, ROUND, 18" SD	LF	78	$ 87.05	$ 6,789.90
430-885-18	MANATEE GATE FOR 18" PIPE	EA	1	$ 3,572.00	$ 3,572.00
430-982-125	MITERED END SECTION, OPTIONAL ROUND, 18" CD	EA	1	$ 1,562.86	$ 1,562.86
455-133-2	SHEET PILING, STEEL (TEMPORARY, CRITICAL)	SF	7,740.00	$ 21.84	$ 169,041.60
515-2-211	PEDESTRIAN/BICYCLE RAILING (STEEL)	LF	70	$ 82.59	$ 5,781.30
520-1-10	CONCRETE CURB & GUTTER, TYPE F	LF	593	$ 23.57	$ 13,977.01
520-2-4	CONCRETE CURB, TYPE D	LF	61	$ 34.35	$ 2,095.35
522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6" THICK	SY	170	$ 56.60	$ 9,622.00
523-1	PATTERNED PAVEMENT (VEHICULAR AREAS)	SY	50	$ 139.57	$ 6,978.50
527-2	DETECTABLE WARNINGS	SF	58	$ 32.26	$ 1,871.08
530-3-3	RIPRAP-RUBBLE, BANK AND SHORE	TN	326.0	$ 88.60	$ 28,883.60
530-74	BEDDING STONE	TN	193.0	$ 124.53	$ 24,034.29
536-1-0	GUARDRAIL-ROADWAY, GENERAL/LOW SPEED TL-2	LF	225	$ 18.33	$ 4,124.25
536-73	GUARDRAIL REMOVAL	LF	300	$ 2.52	$ 756.00
536-85-24	GUARDRAIL END TREATMENT-PARALLEL APPROACH TERMINAL	EA	2	$ 2,963.85	$ 5,927.70
550-60-513	FENCE GATE, TUBULAR METAL PIPE, SINGLE, 12.1-18.0' OPENING	EA	2	$ 4,500.00	$ 9,000.00
570-1-3	PERFORMANCE TURF	SY	784	$ 3.50	$ 2,744.00
630-2-16	CONDUIT, FURNISH & INSTALL, EMBEDDED - CONCRETE BARRIERS AND TRAFFIC RAILINGS	LF	180	$ 9.56	$ 1,720.80
630-2-11	CONDUIT, FURNISH & INSTALL, (OPEN TRENCH) UNDERGROUND	LF	150	$ 8.00	$ 1,200.00
635-2-11	PULL & SPLICE BOX, F&I, 13"X24" COVER SIZE	EA	2	$ 722.68	$ 1,445.36
654-2-12	RECTANGULAR RAPID FLASHING BEACON ASSEMBLY (RRFB), FURNISH AND INSTALL - SOLAR POWERED, COMPLETE SIGN ASSEMBLY - BACK-TO-BACK	AS	2	$ 10,611.81	$ 21,223.62
700-1-11	SINGLE POST SIGN, F&I GROUND MOUNT, UP TO 12 SF	AS	5	$ 334.00	$ 1,670.00
700-1-50	SINGLE POST SIGN, RELOCATE	AS	2	$ 182.96	$ 365.92
700-1-60	SINGLE POST SIGN, REMOVE	AS	2	$ 28.87	$ 57.74
700-2-50	MULTI-POST SIGN, GROUND MOUNT, RELOCATE	AS	1	$ 3,083.94	$ 3,083.94
711-11-125	THERMOPLASTIC, STANDARD, WHITE, SOLID, 24" FOR STOP LINE AND CROSSWALK	LF	36	$ 4.07	$ 146.52
711-14-123	THERMOPLASTIC, PREFORMED, WHITE, SOLID, 12' FOR CROSSWALK AND ROUNDABOUT	LF	164	$ 7.69	$ 1,261.16
711-16-101	THERMOPLASTIC, STANDARD-OTHER SURFACES, WHITE, SOLID, 6"	GM	0.213	$ 4,129.34	$ 877.70
711-16-201	THERMOPLASTIC, STANDARD-OTHER SURFACES YELLOW, SOLID, 6"	GM	0.155	$ 4,195.86	$ 651.09
-	LIGHT POLE BY POWER COMPANY	EA	4	$ 5,500.00	$ 22,000.00
-	BRIDGE B-SERIES CONSPAN, WINGWALLS, HEADWALLS	LS	1	$ 530,218.00	$ 530,218.00
-	BRIDGE FOUNDATIONS	LS	1	$ 172,309.00	$ 172,309.00
-	BRIDGE INSTALLATION	LS	1	$ 526,895.25	$ 526,895.25
-	DECORATIVE BRIDGE FEATURES*	LS	1	$ 15,000.00	$ 15,000.00
				SUBTOTAL	**$ 2,325,744.32**
N/A	GOPHER TORTOISE SURVEY	LS	1	$ 1,000.00	$ 1,000.00
N/A	ENGINEERING AND DESIGN	LS	1	15.00%	$ 348,861.65
N/A	SURVEY	LS	1	$ 10,000.00	$ 10,000.00
				TOTAL	**$ 2,685,605.97**

	FDOT Inflation-Adjusted Estimate		*Inflation Factor*	*PDC Multiplier*	***Adjusted Cost Estimate***
	Year 1 Inflation-adjusted Estimate (2022)		2.7%	1.027	**$ 2,758,117.33**
	Year 2 Inflation-adjusted Estimate (2023)		2.8%	1.056	**$ 2,835,999.91**
	Year 3 Inflation-adjusted Estimate (2024)		2.9%	1.086	**$ 2,916,568.09**

* Decorative Bridge Features may not be covered by Federal Funding.

APPENDIX L

CONSPAN Bridge and Foundation Estimate

Contech Engineered Solutions LLC
9025 Centre Pointe Drive, Suite 400
West Chester, OH 45069
Phone: (513) 645-7000
Fax: (513) 645-7993
www.ContechES.com

11/10/2020

David Furry, Brooke Diaz
RS&H
1715 N Westshore Blvd
Suite 600
Tampa, FL 33607

Project: Reed Canal Park Bridge, South Daytona, FL

The following is a CON/SPAN Bridge System ENGINEER'S COST ESTIMATE for Reed Canal Park Bridge. This ESTIMATE is intended for preliminary estimating purposes only and should **not** be interpreted as a final QUOTATION. The information presented is based on the most current data made available to CONTECH.

CONTECH will fabricate and deliver the following described CON/SPAN Bridge components and appurtenances:

DESCRIPTION OF SUPPLIED MATERIALS:

- 58.25 L.F. of 48 FT. span x 10 FT. rise Precast Concrete units (4 FT. Typical Lay Length)
- Two (2) precast parapet headwalls (5.25 FT. Tall at Crown)
- Four (4) precast wingwalls with mounting hardware
  (3) 28 FT. Long x 16.25 FT. Tall
  (1) 33.167 FT. Long x 16.25 FT. Tall
- Joint sealant material
- Masonite shims
- Filter fabric and perforated drain tile
- On-site consultation during installation

ESTIMATE - $ 530,218 Delivered (F.O.B.)

ESTIMATED HEAVIEST CRANE PICK = 22 TONS
These costs do not include the foundation, or installation costs. As part of the construction process, the contractor is to perform the items listed below in accordance with the installation drawings:

- Excavate for the structure & foundations
- Construct Precast Express foundations
- Unload and set structure utilizing crane
- Grout the unit legs and wingwalls into the keyway
- Apply all joint sealing material
- Backfill the structure

Precast Express Foundations are a hybrid foundation system combining the speed of precast with the economy of cast-in-place concrete. Foundation sized based on available information, including an assumed allowable bearing capacity 3,500 psf. Final foundation size is subject to change based on final geotech report and bridge parameters.

DESCRIPTION OF SUPPLIED MATERIALS:

- Precast Express Foundation Shell for Bridge System
- Bridge Unit Foundations up to 12 FT. wide x 4 FT. thick at 120 LF. Total
- Wingwall Foundations up to 6 FT. wide x 2.5 FT. thick at 119 LF. Total
- All foundation reinforcing steel
- Any wingwall connection steel
- Signed and sealed foundation design along with shop drawings for review
- On-site consultation during installation
- Freight for precast components to the job site (or nearest truck-accessible location)

ESTIMATE - $ 172,309 Delivered (F.O.B.)

ESTIMATED HEAVIEST CRANE PICK = 18 TONS

The price does not include any site preparation or installation of any kind. For the Express Foundations, a contractor must perform the following:

- Prepare subgrade
- Unload and place Precast Express Foundations
    a. At time of P.O., contractor must specify max pick weight of Express Foundation segments.
- Place lap splice reinforcing (provided) at joints in foundations
- Install wingwall foundation threaded continuity reinforcing bars (provided)
- Fill foundation with required strength in-fill concrete (provided by Contractor)
    a. 197 CY of in-fill concrete required
    b. If in-fill concrete is to be placed prior to bridge unit installation it must reach 2,000 psi prior to bridge unit installation.
    c. In-fill concrete must reach design strength prior to backfilling.

Please contact me at 321-377-0129 should you have any questions or need additional information. Thank you for your interest in the CON/SPAN Bridge System.

Respectfully,

Joseph D. Allen

APPENDIX M

FDOT Inflation Factors

Inflation Factors

This *"Transportation Costs"* report is issued by the Office of Policy Planning. It provides information on inflation factors and other indices that may be used to convert Present Day Costs (PDC) to future Year Of Expenditure costs (YOE) or vice versa. This report is updated regularly based on the FDOT Work Program Instructions.

Please note that the methodology for inflationary adjustments relating to specific transportation projects should be addressed with the district office where the project will be located. For general use or non-specific areas, the guidelines provided herein may be used for inflationary adjustments.

Construction Cost Inflation Factors

The table on the next page includes the inflation factors and Present Day Cost (PDC) multipliers that are applied to the Department's Work Program for highway construction costs expressed in Fiscal Year 2019 dollars (FY 2019 runs from July 1, 2018 to June 30, 2019).

Other Transportation Cost Inflation Factors

Other indices may be used to adjust project costs for other transportation modes or non-construction components of costs. Examples are as follows:

The Consumer Price Index (CPI, also retail price index) is a weighted average of prices of a specified set of products and services purchased by wage earners in urban areas. As such, it provides one measure of inflation. The CPI is a fixed quantity price index and a reasonable cost-of-living index.

The Employment Cost Index (ECI) is based on the National Compensation Survey, administered by the Bureau of Labor Statistics (BLS). It measures quarterly changes in compensation costs, which include wages, salaries, and other employer costs for civilian workers (nonfarm private industry and state and local government).

The monthly series, Producer Price Index for Highway and Street Construction, is also available from BLS. It provides national-level estimates of past and recent highway construction inflation. The Producer Price Index (PPI) web site is http://www.bls.gov/ppi/home.htm.

Work Program
Highway Construction Cost Inflation Factors

Fiscal Year	Inflation Factor	PDC Multiplier
2019	~~Base~~	~~1.000~~
2020	~~2.6%~~	~~1.026~~
2021	BASE ~~2.6%~~	1.00 ~~1.053~~
2022	2.7%	1.027 1.081
2023	2.8%	1.056 1.111
2024	2.9%	1.086 1.144
2025	3.0%	1.178
2026	3.1%	1.214
2027	3.2%	1.253
2028	3.3%	1.295
2029	3.3%	1.337
2030	3.3%	1.381
2031	3.3%	1.427
2032	3.3%	1.474
2033	3.3%	1.523
2034	3.3%	1.573
2035	3.3%	1.625
2036	3.3%	1.679
2037	3.3%	1.734
2038	3.3%	1.791
2039	3.3%	1.850
Source: Offices of Work Program and Budget and Policy Planning (Fiscal Year 2019 is July 1, 2018 to June 30, 2019)		

Advisory Inflation Factors For Previous Years

Another *"Transportation Costs"* report covers highway construction cost inflation for previous years. "*Advisory Inflation Factors For Previous Years (1987-2018)* provides Present Day Cost (PDC) multipliers that enable project cost estimates from previous years to be updated to FY 2018. For the table and text providing this information, please go to https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/planning/policy/economic/retrocostinflation220259309.pdf?sfvrsn=ce29b2b6_2

APPENDIX N

River to Sea TPO Resolution 2020-23

RIVER TO SEA TRANSPORTATION PLANNING ORGANIZATION

RESOLUTION 2020-23

RESOLUTION OF THE RIVER TO SEA TRANSPORTATION PLANNING ORGANIZATION ESTABLISHING THE POLICY FOR THE ANNUAL ALLOCATION OF SURFACE TRANSPORTATION BLOCK GRANT PROGRAM (STBG) URBAN ATTRIBUTABLE (SU) FUNDING AND OTHER STATE AND FEDERAL FUNDS IDENTIFIED IN THE 2045 LONG RANGE TRANSPORTATION PLAN FOR LOCAL INITIATIVES

WHEREAS, Florida Statutes 339.175; 23 U.S.C. 134; and 49 U.S.C. 5303 require that every urbanized area with a population of 50,000 or more, as a condition to the receipt of federal capital or operating assistance, shall have a continuing, cooperative, and comprehensive transportation planning process that results in plans and programs consistent with the comprehensively planned development of the urbanized area; and

WHEREAS, the River to Sea Transportation Planning Organization (TPO) is the duly designated and constituted body responsible for carrying out the urban transportation planning and programming process for the designated Metropolitan Planning Area (MPA) comprised of Volusia County and the urbanized areas of Flagler County including the cities of Flagler Beach, Beverly Beach, and portions of Palm Coast and Bunnell; and

WHEREAS, 23 C.F.R. 450.104 provides that the River to Sea TPO shall annually endorse, and amend as appropriate, the plans and programs required, among which is the Surface Transportation Block Grant Program (STBG) projects list of the annual Transportation Improvement Program (TIP) submission; and

WHEREAS, each year the appropriate River to Sea TPO committees, made up of a cross-section of interested citizens and staff, are charged with the responsibility of drafting a list of prioritized projects; and

WHEREAS, it is the responsibility of the River to Sea TPO to establish project priorities that are equitable for all areas within the River to Sea TPO's planning boundaries ; and

WHEREAS, the River to Sea TPO reaffirms its commitment to the priority process and related policies;

NOW, THEREFORE, BE IT RESOLVED by the River to Sea TPO that:

1. Annual set-asides of the River to Sea TPO's total Surface Transportation Block Grant Program (STBG) Urban Attributable (SU) funding will be made in the following manner: 40% of the total SU funds will be used for Traffic Operations, Safety, and

Local Initiatives (traffic operations focused) Project Priorities, 30% of the total SU funds will be used for Transit Project Priorities, and 30% of the total SU funds will be used for Bicycle/Pedestrian, Transportation Alternatives, Regional Trails, and Local Initiatives (bicycle/pedestrian focused) Project Priorities;

2. Annual set-asides of other state and federal funds identified in the 2040 Long Range Transportation Plan for Local Initiatives will be made available in the following manner: 50% of the funds will be used for Traffic Operations, Safety, and Local Initiatives (traffic operations focused) Project Priorities and 50% will be used for Bicycle/Pedestrian, Transportation Alternatives, Regional Trails, and Local Initiatives (bicycle/pedestrian focused) Project Priorities;

3. Mixed projects (defined as a project that is not a stand-alone bicycle or pedestrian project) will only be accepted and ranked in both the bicycle/pedestrian focused and the traffic operations focused project categories if the bicycle/pedestrian cost component of the project is greater than 20% of the total project cost. Projects that do not meet this threshold shall be submitted and ranked in the traffic operations focused category only. The project applications shall include the cost breakdown between the bicycle/pedestrian component and the traffic operations component of the project. When programming mixed projects, funding amounts drawn down from each set-aside category (bicycle/pedestrian focused vs. traffic operations focused) shall be consistent with the cost component of that category;

4. For projects funded in whole or in part with Urban Attributable (SU) funding and/or other state and federal funds obtained through the TPO's Priority Project Process, if the recipient of the funds chooses to display any signs or markers at the project site, said signs or markers shall include language acknowledging the River to Sea TPO, Florida Department of Transportation (FDOT), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), and/or other funding partners, as may be applicable, for providing funding for the project. In addition to the language, the sign or marker shall include these agencies' official logos.

   Additionally, any public pronouncements made by or on behalf of the recipient regarding the project, including press releases, publications, annual reports, video credits, and dedications, shall acknowledge the funding support provided by the TPO, FDOT, FHWA, and FTA.

5. The policies set forth in this resolution shall remain in effect unless and until they are repealed or amended by the TPO; and

6. The Chairperson of the River to Sea TPO (or their designee) is hereby authorized and directed to provide a copy of this resolution to the:

   a. Florida Department of Transportation (FDOT);
   b. Federal Transit Administration (FTA) (through the Florida Department of Transportation); and

c. Federal Highway Administration (FHWA) (through the Florida Department of Transportation).

DONE AND RESOLVED at the regular meeting of the River to Sea TPO held on the **27th** day of **January 2021**.

RIVER TO SEA TRANSPORTATION PLANNING ORGANIZATION

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CITY OF NEW SMYRNA BEACH COMMISSIONER JASON MCGUIRK
CHAIRPERSON, RIVER TO SEA TPO

CERTIFICATE:

The undersigned duly qualified and acting Recording Secretary of the River to Sea TPO certified that the foregoing is a true and correct copy of a resolution, adopted at a legally convened meeting of the River to Sea TPO held on January 27, 2021.

ATTEST:

Debbie Stewart
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DEBBIE STEWART, RECORDING SECRETARY
RIVER TO SEA TRANSPORTATION PLANNING ORGANIZATION