FINAL

LOCATION HYDRAULIC REPORT

Florida Department of Transportation

District One

SR 72 (Clark Road) PD&E Study

From East of I-75 to Lorraine Road

Sarasota County, Florida

Financial Management Number: 444634-1

ETDM Number: 14441

Date: September 15, 2024

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by FDOT pursuant to 23 U.S.C. §327 and a Memorandum of Understanding dated May 26, 2022, and executed by FHWA and FDOT.

PROFESSIONAL ENGINEER CERTIFICATION

LOCATION HYDRAULIC REPORT

Project: SR 72 (Clark Road) PD&E Study

ETDM Number: 14441

Financial Project ID: 444634-1-22-01

Federal Aid Project Number: N/A

This location hydraulic report contains engineering information that fulfills the purpose and need for SR 72 (Clark Road) Project Development & Environment Study from East of I-75 to Lorraine Road in Sarasota County, Florida. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering as applied through professional judgment and experience.

I hereby certify that I am a registered professional engineer in the State of Florida practicing with Kimley-Horn and Associates Inc., and that I have prepared or approved the evaluation, findings, opinions, conclusions, or technical advice for this project.

Victor Gallo

Victor Gallo
2025.04.01
22:06:41-04'00'

This item has been digitally signed and sealed by Victor H. Gallo, P.E. 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.

EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) District One is conducting a Project Development and Environment (PD&E) Study along SR 72 in Sarasota County to evaluate roadway capacity and safety improvements. The PD&E study limits extend approximately 3 miles from east of I-75 to Lorraine Road. The project corridor is characterized by commercial and residential development comprised of mobile home parks, recreational parks, a plant nursery, and reclaimed recreational properties (historical golf courses).

SR 72 is currently classified by FDOT as an urban minor arterial within the study project area. The proposed typical section consists of a 4-lane divided highway with a 22-foot median and 12-foot shared-use paths along both sides of the road. The existing roadside stormwater ditches would be replaced by a closed drainage system with curb and gutter.

The purpose of this Location Hydraulic Report is to address base floodplain encroachments resulting from the roadway improvements evaluated in the PD&E Study. In accordance with Executive Order 11988 "Floodplain Management", USDOT Order 5650.2, "Floodplain Management Protection", and Federal-Aid Policy Guide 23 CFR 650A, Floodplains must be protected. The intent of these regulations is to avoid or minimize highway encroachments within the 100-year (base) floodplains and to avoid supporting land use development incompatible with floodplain values.

Floodplain encroachment areas resulting from the proposed SR 72 roadway widening were analyzed and quantified. It is determined that impacts will occur to the floodplain due to the proposed widening throughout the project limits and the lengthening and potential upsizing of the six (6) existing cross drains in the area. These proposed improvements will result in transverse floodplain encroachments to the effective Federal Emergency Management Agency (FEMA) floodplain.

Floodplain impacts were based on the FEMA effective floodplain panels 12115C0164G, 12115C0168G and 12115C0169G dated March 27, 2024. It was concluded that the project will impact approximately 0.97 acres of the effective floodplain based on the proposed roadway alignment. Due to the isolated nature of the majority of the flood zones, it was determined that the floodplain encroachment is classified as "minimal". Minimal encroachments on a floodplain occur when there is a floodplain involvement, but the impacts on human life, transportation facilities, and natural and beneficial floodplain values are not significant and can be resolved with minimal efforts. There are no federally regulated floodways within the project limits.

The proposed cross drains and floodplain compensation (FPC) areas will perform hydraulically in a manner equal to or greater than the existing condition, and backwater surface elevations are not expected to increase. As a result, there will be no significant change in flood risk, and there will not be a significant change in the potential for interruption or termination of emergency service or in emergency evacuation routes. Therefore, it has been determined that this encroachment is not significant.

TABLE OF CONTENTS

LIST OF FIGURES

Figure Page Number

LIST OF TABLES

Table Page Number

APPENDICES

Appendix A – Exhibits

Appendix B – FDOT Straight-Line Diagram and SWFWMD ERP 40200.001 Permitted Plans

Appendix C – Existing Cross Drain Analysis

Appendix D – FEMA FIRM Panels

Appendix E – Correspondence

Appendix F – Proposed Cross Drain Analysis

1.0 Project Description

The Florida Department of Transportation (FDOT) District One is conducting a Project Development and Environment (PD&E) Study along SR 72 (Clark Road) in Sarasota County to evaluate roadway capacity and safety improvements. The PD&E study limits extend approximately 3 miles from east of I-75 to Lorraine Road within unincorporated Sarasota County (**Figure 1**) and is shown in the Location Map located in **Appendix A**. The purpose of this project is to improve the operational capacity of SR 72 (Clark Road) from east of I-75 to Lorraine Road to accommodate future travel demand projected as a result of area-wide population and employment growth. Other goals of the project include enhancing safety conditions and accommodating multimodal activity. The PD&E study will evaluate the benefits, costs and impacts of widening this portion of SR 72 from a two-lane undivided roadway to a four-lane divided roadway. In keeping with the objectives of the Sarasota/Manatee Metropolitan Planning Organization (MPO), the proposed project may include shared-use paths on both sides of the roadway to enhance bicycle and pedestrian mobility.

The existing roadway right-of-way is generally 100 feet in width; intermittent wider and narrower sections exist along the length of the corridor. Additional right-of-way is anticipated to accommodate the proposed improvements.

The primary vertical datum in this report and in the calculations is the North American Vertical Datum of 1988 (NAVD 88).

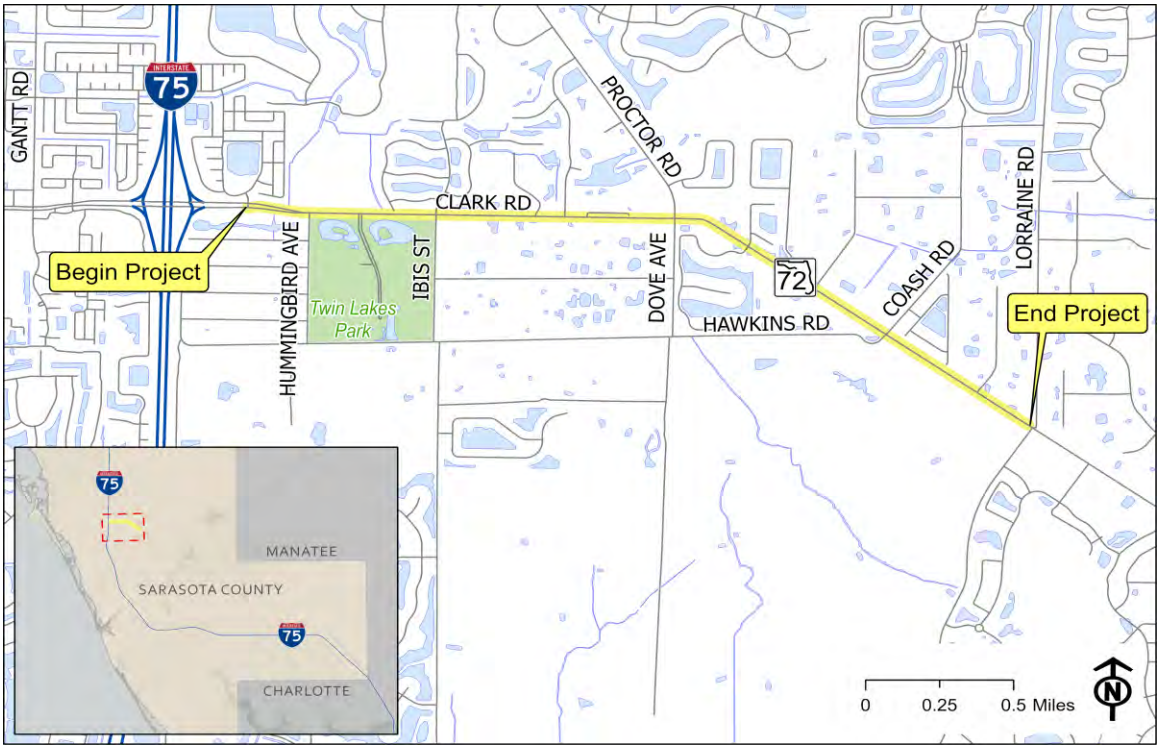


Figure 1: Project Location Map

1.1 Existing Typical Section

The existing typical section of this roadway is a 2-lane undivided highway with 5-foot bike lanes on both sides of the road on flushed shoulders. Roadway run-off is collected with an open drainage system, utilizing swales to convey run-off to one of six outfalls located within the project limits. See **Figure 2** below for the Existing Typical Section of SR 72.

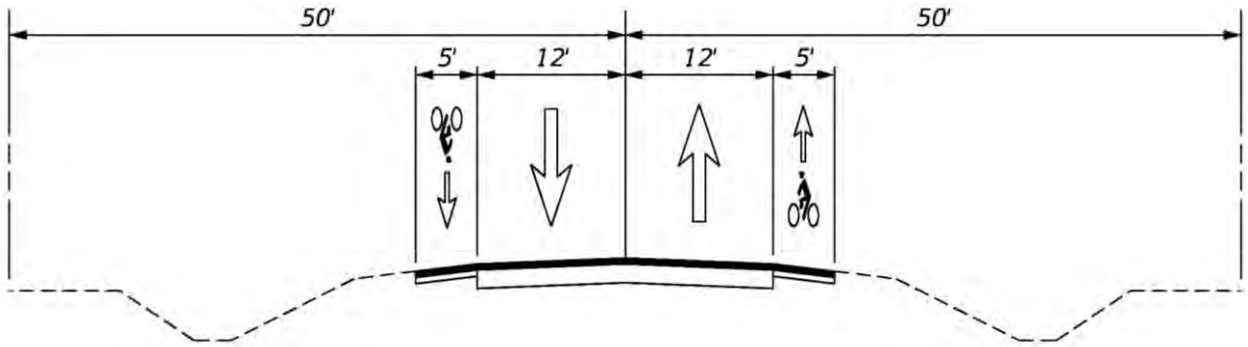


Figure 2: Existing Typical Section

1.2 Proposed Typical Section

The proposed typical section was developed in consideration of input from local agencies and public comments received at the public meetings. The proposed typical section includes providing a 4-lane divided highway with a 22-foot median and 12-foot shared-use paths along both sides of the road. The existing roadside stormwater ditches would be replaced by a closed drainage system with curb and gutter. See **Figure 3** below for the Proposed Typical Section of SR 72.

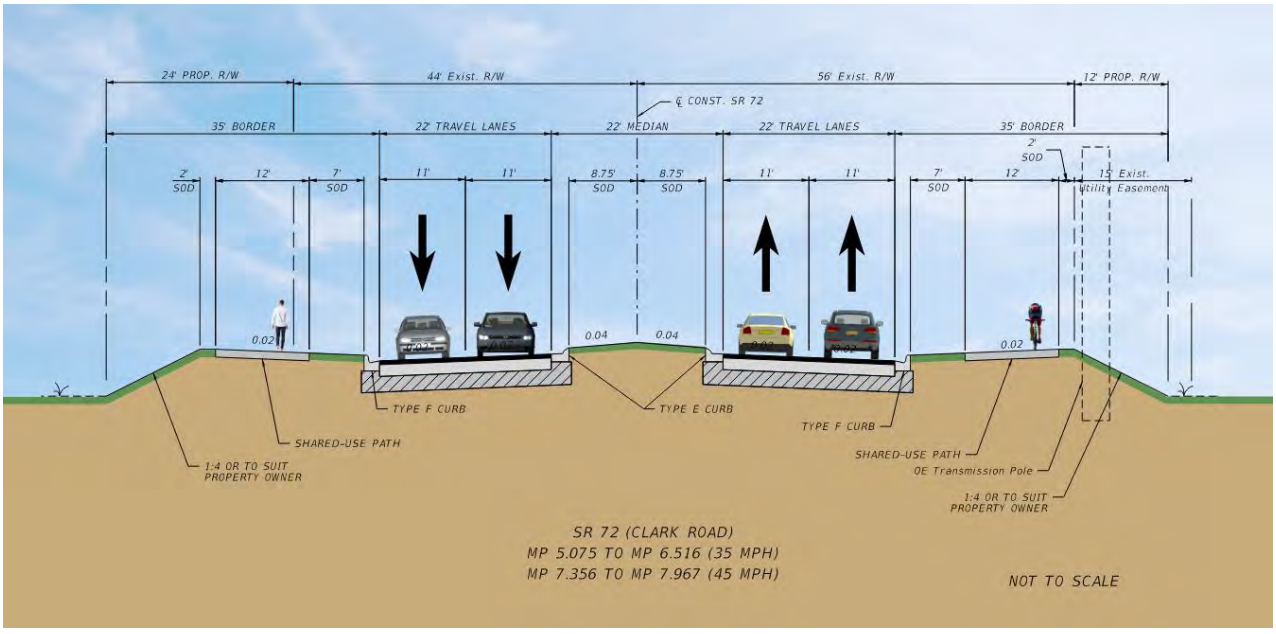


Figure 3: Proposed Typical Section

2.0 Data Collection

The design team collected and reviewed data from the following sources:

- FDOT Drainage Manual, January 2024
- FDOT Drainage Design Guide, January 2024
- Environmental Resource Permit Information Manual, 2014
- Environmental Resource Permit Applicant's Handbook Volume I, December 22, 2020
- Environmental Resource Permit Applicant's Handbook Volume II, June 1, 2018
- Federal Emergency Management Agency (FEMA), Panel Nos. 12115C0164G, 12115C0168G, and 12115C0169G dated March 27, 2024
- U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey of Sarasota County, Florida, 2021
- 1-foot contours from National Oceanic and Atmospheric Administration (NOAA) LiDAR for Sarasota County, 2007
- SWFWMD Environmental Resource Permitting Website
- Comprehensive Verified List of Impaired Water Bodies, Florida Department of Environmental Protection (FDEP), November 2022
- Sarasota County Property Appraiser's Website (GIS parcel lines), 2023
- Sarasota County ICPR4 watershed models for Phillippi Creek and Dona Bay (Sarasota County FTP site), 2022
- National Wetland Inventory (NWI) from U.S. Fish and Wildlife Service (USFWS)
- FDOT PD&E Manual: Topic No. 650-000-001 Project Development and Environment Manual, Floodplains, effective July 31, 2024

3.0 Existing Drainage Conditions

3.1 Topography & Hydrologic Features

The topography of the project area is relatively flat with elevations ranging from a high of 36 feet to a low of 25 feet NAVD 88. There are six (6) existing cross drains within the study limits of SR 72, allowing for conveyance of offsite and onsite runoff to the Phillippi Creek (Basins 1 and 2) and to Cow Pen Slough Canal (Basins 3 and 4). Information on the size, geometry, lengths, inverts, flow directions, and outfall tailwater of each of the cross drains was obtained from the Sarasota County ICPR4 watershed models for Phillippi Creek and Dona Bay (Cow Pen Slough). The size and geometry of the existing cross drains were confirmed with the FDOT Straight-Line Diagram of Road Inventory for SR 72 and SWFWMD Environmental Resource Permits. Please refer to **Table 1** for a summary of existing cross drains.

Table 1: Summary of Existing Cross Drains

Structure Number	Basin	Approx. Station	Description
CD-01	Basin 1	305+00	Double 42" Pipe
CD-02	Basin 1	322+10	Double 30" Pipe
CD-03	Basin 2	345+10	Double 36" Pipe
CD-04	Basin 3	398+36	Single 24" Pipe
CD-05	Basin 4	440+00	Single 30" Pipe
CD-06	Basin 4	455+11	Double 30" Pipe

A Topographic Map and an Existing Drainage Map are included in **Appendix A**. See **Appendix B** for the FDOT Straight-Line Diagram and SWFWMD ERP 40200.001 Permitted Plans for SR 72. See **Appendix C** for the Existing Cross Drain Analysis.

3.2 Soils Data & Geotechnical Features

The project traverses several different soil types according to the Natural Resource Conservation Service (NRCS) Soil Survey for Sarasota County. Most of the soils have a hydrologic soil group (HSG) of A/D or B/D and relatively high SHGWT elevations. Refer to **Table 2** for a summary of the predominant soil types found along the project and **Appendix A** for a Soils Map.

Table 2: Summary of Predominant Soil Types

NRCS Map Unit	Soil Type	HSG	Depth to Water Table (ft)	Approximate Percentage of Area
10	EauGallie, Myakka fine sands	B/D	0.5 - 1.5	10.0%
22	Holopaw fine sand, frequently ponded	A/D	0	3.2%
30	Ona fine sand	B/D	0.5 - 1.5	3.1%
51	Bradenton fine sand- Urban land complex	B/D	0.25 - 1.5	1.0%
55	EauGallie-Myakka fine sands-Urban land complex	B/D	0.5 - 1.5	39.2%
62	Gator-Gator drained mucks, ponded-Urban land complex	C/D	0 - 0.5	1.0%
63	Holopaw fine sand- Urban land complex	A/D	0	17.4%
67	Ona Fine Sand- Urban land complex	B/D	0.5 - 1.5	21.0%
69	Pineda fine sand- Urban land complex	A/D	0.5 - 1.5	0.5%
99	Water	-	0	3.6%

3.3 Environmental Characteristics

3.3.1 Land Use Data

This project begins just to the east of the intersection of SR 72 with I-75 and spans 2.9 miles east of that intersection. The project corridor is characterized by commercial and residential development comprised of mobile home parks, recreational parks, a plant nursery, and reclaimed recreational properties (historical golf courses). The Sarasota County Evacuation Map lists SR 72 (Clark Road) as an Evacuation Route. SR 72 is listed as an Evacuation Route Level E for potential storm tide heights greater than 33.0' and up to 35.0'. Future land use of this corridor is anticipated to stay consistent with existing land use conditions. See for **Appendix A** for the Sarasota County Evacuation Map and the Sarasota County Future Land Use Map.

3.3.2 Cultural Features

A desktop analysis for the Cultural Resource Assessment was performed by Archaeological Consultants, Inc. to determine, preliminarily, if any significant or potentially significant cultural resources, including archaeological sites and historic resources, will be impacted by the construction of any of the proposed improvement alternatives within the project corridor in Sarasota County. The background research indicated that no archaeological sites had been recorded within the study corridor but there is a low to moderate probability for aboriginal archaeological sites within the study corridor and a low probability for historic archaeological sites. The historic findings during the desktop analysis noted approximately 32 historic resources (11 previously recorded, 21 newly identified) located within the project corridor. A field survey will be necessary for proper identification and evaluation of each historic resource within the project corridor at which time an Area of Potential Effects (APE) will be set prior to field work. See **Appendix C - Cultural Resource Assessment Desktop Analysis Report** within the **Pond Siting Report** for further information.

3.3.3 Natural and Biological Features

The following threatened or endangered species have the potential to occur within the study area:

- Bald eagle
- Crested caracara
- Florida bonneted bat

There are two bald eagle nest sites located near the project limits, one near Basin 1 and one near Basin 4. Species surveys are underway for the crested caracara and Florida bonneted bat. No impacts to the habitats of these species are anticipated.

3.4 Floodplains/ Floodways

The Federal Emergency Management Agency (FEMA) has developed a Flood Insurance Rate Map (FIRM) for the study area. The relevant FIRM panel numbers are 12115C0164G and 12115C0168G for Sarasota County, Florida dated March 27, 2024. The majority of the project lies within Flood

Zone X, areas outside of the 100-year floodplain. Some portions of Basins 1 and 2 are designated as Zone AE. See **Appendix A** for the Effective FEMA Floodplain Map.

Due to the proposed roadway widening, floodplain impacts are anticipated in Basins 1 and 2. There are twelve areas where the proposed improvements will encroach into the effective floodplain, with a total of approximately 4.62 Ac-ft of floodplain impacts. See **Appendix A** for the FEMA Floodplain Impact Areas Map and see **Appendix D** for the FEMA FIRM panels 12115C0164G and 12115C0168G.

3.4.1 Flooding History and Maintenance Concerns

There are no reports of flooding within the project limits. An Environmental Look-Around (ELA) meeting was conducted on March 1, 2023 at the UF/IFAS Green Room located at Twin Lakes Park. Those that attended the ELA meeting included the project study team, members of the SR 72 widening design project team, FDOT staff, representatives for Sarasota County, representatives for FPL, and representatives for Twin Lakes Park and the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS). No concerns with the existing cross drains or with flooding throughout the project study area was reported. A summary of the meeting can be found in **Appendix F - ELA Meeting Summary** of the **Pond Siting Report**.

Overseers of the SR 72 Roundabout at Proctor Road and the SR 72 Roundabout at Lorraine Road were contacted after the September 2022 hurricane, Hurricane Ian, to see how those projects faired the storm. Both of these projects were in the construction phase during Hurricane Ian. The overseers of both projects reported minimal to no impacts. See **Appendix E** for the Correspondence.

3.5 Wetland Impacts

The existing wetlands within the project corridor include freshwater emergent wetlands, freshwater ponds and riverines. Minor impacts to freshwater emergent wetlands are anticipated between Proctor Road and Churchill Downs Road given the widening of the roadway, proposed sidewalk, and proposed roundabout. Gravity walls behind the sidewalk and other mitigation measures may be feasible to minimize wetland impacts. No wetland impacts are anticipated from the stormwater management facilities. See **Appendix A** for a Wetlands Map

4.0 Proposed Drainage Conditions

The stormwater runoff from the project limits will be collected and conveyed in a curb inlet and pipe network to the proposed wet detention ponds. The ponds will discharge at or near the same cross drains that carry the roadway runoff in the existing condition. The proposed ponds have been sized to achieve the required water quality treatment and water quantity attenuation and serve as a budgetary estimation tool for right-of-way acquisition for the project to the

Department. The Proposed Drainage Map is included in **Appendix A**. Please refer to the **Pond Siting Report** prepared for this study.

To keep the offsite drainage conditions consistent with the existing conditions, modifications to the existing cross drains and ditches in the project area are required. See **Appendix A** for the Cross Drain Locations Map showing the cross drain locations and the proposed interceptor ditches. The size and extents of the interceptor ditches are approximate and will need to be finalized based on topographical survey information during the design phase.

4.1 Cross Drain Analysis

Improvements to the existing cross drains along the SR 72 project limits will be required to maintain existing drainage patterns. The proposed cross drain improvements will include extending the cross drains to accommodate for the roadway widening and potentially upsizing the cross drains as needed. The existing cross drains were analyzed using the Federal Highway Administration HY-8 (v. 7.70) cross drain modeling software. The proposed cross drains were modeled by keeping flow line inverts and tailwater elevations the same and using the necessary extended length to accommodate for the roadway widening. CD-02, CD-04, and CD-05 had proposed headwaters that were higher than 0.1′ above the existing headwater so those cross drains were proposed to be upsized. See **Table 3** for a summary of this cross drain analysis and see **Appendix F** for the Proposed Cross Drain Analysis.

During the design phase more accurate information regarding the tailwater conditions and roadway profile will be available to the designer and a more detailed analysis of these cross drains will be required.

Table 3: Summary of Existing and Proposed Cross Drain Analysis

Structure	Exist. Geometry	Exist. Headwater	Prop. Geometry	Prop. Headwater	Flow (cfs)
CD-01	120′ – (2)42"	30.54′	139′ – (2)42"	30.56′	62.89
CD-02	**58′ – (2)30"**	**31.84′**	**152′ – (2)42"**	**31.67′**	**58.65**
CD-03	62′ – (2)36″	30.45′	126′ – (2)36″	30.48′	28.27
CD-04	**60′ – 24"**	**33.78′**	**133′ – 30"**	**33.43′**	**14.32**
CD-05	**50′ – 30"**	**27.07′**	**117′ – 36"**	**26.76′**	**24.40**
CD-06	70′ – (2)30"	24.33′	79′ – (2)30"	24.33′	54.25

4.2 Longitudinal & Traverse Floodplain Impacts

The proposed widening of SR 72 will result in transverse impacts to the 100-year floodplain. The transverse impacts are due to the extension or replacement of the six existing cross drains. To minimize upstream impacts, FDOT design criteria for conveyance systems allows no significant rise in flood stages at the upstream end of the structures. During design, efforts should be made to ensure that proposed base headwater elevations do not surpass 0.1 feet of rise from the existing condition, and every necessary action should be taken to minimize upstream impacts.

There are no longitudinal impacts to the effective FEMA floodplain.

4.3 Project Classification

The floodplain encroachment area is classified as "minimal". Minimal encroachments on a floodplain occur when there is a floodplain involvement, but the impacts on human life, transportation facilities, and natural and beneficial floodplain values are not significant and can be resolved with minimal efforts. Normally, these minimal efforts to address the impacts will consist of applying the Department's drainage design standards and following the Water Management District's procedures to achieve results that will not increase or significantly change the flood elevations and/or limits.

4.4 Risk Evaluation

There is no change in flood "Risk" associated with this project. The encroachments will not have a significant potential for interruption or termination of transportation facilities needed for emergency vehicles or used as an evacuation route. In addition, no significant adverse impacts on natural and beneficial floodplain values are anticipated and no significant impacts to drivers are expected.

4.5 PD&E Manual Requirements with Minimal Encroachment

1. The history of flooding of the existing facilities and/or measures to minimize any impacts due to the proposed project improvements.

   There are no documented reports of flooding along SR 72. Floodplain Compensation areas will be constructed to mitigate loss of storage in the floodplain due to the project improvements. In addition, stormwater treatment areas are proposed to attenuate runoff. The project will have no adverse impact on the existing condition.

2. Determination of whether the encroachment is longitudinal or transverse, and if it is a longitudinal encroachment an evaluation and discussion of practicable avoidance alternatives.

   There are only transverse encroachments to the effective floodplain. The transverse floodplain impacts from the project occur due to the extension or replacement of the existing cross drains. The impacts at these locations are not analyzed during this study and will need to be addressed during the design phase.

3. The practicability of avoidance alternatives and/or measures to minimize impacts.

   The project will take every effort to minimize floodplain impacts resulting from the roadway fill. The centerline of the roadway has been shifted six feet south to help to reduce the volume of floodplain impacts along the northern side of the existing road. Additionally, the maximum allowable roadway embankment slope will be used within the floodplain area to minimize the floodplain impacts.

4. Impact of the proposed improvements on emergency services and evacuation.

   The proposed cross drains will perform hydraulically in a manner equal to or greater than the existing condition, and backwater elevations are not expected to increase. As a result, there will be no significant change in flood risk, and there will not be a significant change in the potential for interruption or termination of emergency service or in emergency evacuation routes.

5. Impacts of the proposed improvement on the base flood, likelihood of flood risk, overtopping, location of overtopping, backwater, etc.

   The proposed cross drains will perform hydraulically in a manner equal to or greater than the existing condition. As a result, there will be no significant change in flood risk or overtopping.

6. Determination of the impact of the proposed improvements on regulatory floodways, if any, and documentation of coordination with FEMA and local agencies to determine the project's consistency with the regulatory floodway.

   There is no involvement with regulatory floodways on this project.

7. The impacts on natural and beneficial floodplain values, and measures to restore and preserve these values (this information may also be addressed as part of the wetland impact evaluation and recommendations).

   Will be addressed as part of the Natural Resource Evaluation Report.

8. Consistency of the proposed improvements with the local floodplain development plan or the land use elements in the Comprehensive Plan, and the potential impacts of encouraging development within the 100-year base floodplain.

   The project will remain consistent with local floodplain development plans. The project will not support base floodplain development that is incompatible with existing floodplain management programs.

9. A map showing project, location and impacted floodplains. Provide copies of all applicable FIRM maps should be included within the final LHR report appendix.

   See Appendix A for the Project Location Map, FEMA Map, and the Floodplain Impacts Map and Appendix D for the effective FEMA FIRM panel maps.

10. Results of any and all project risk assessments performed.

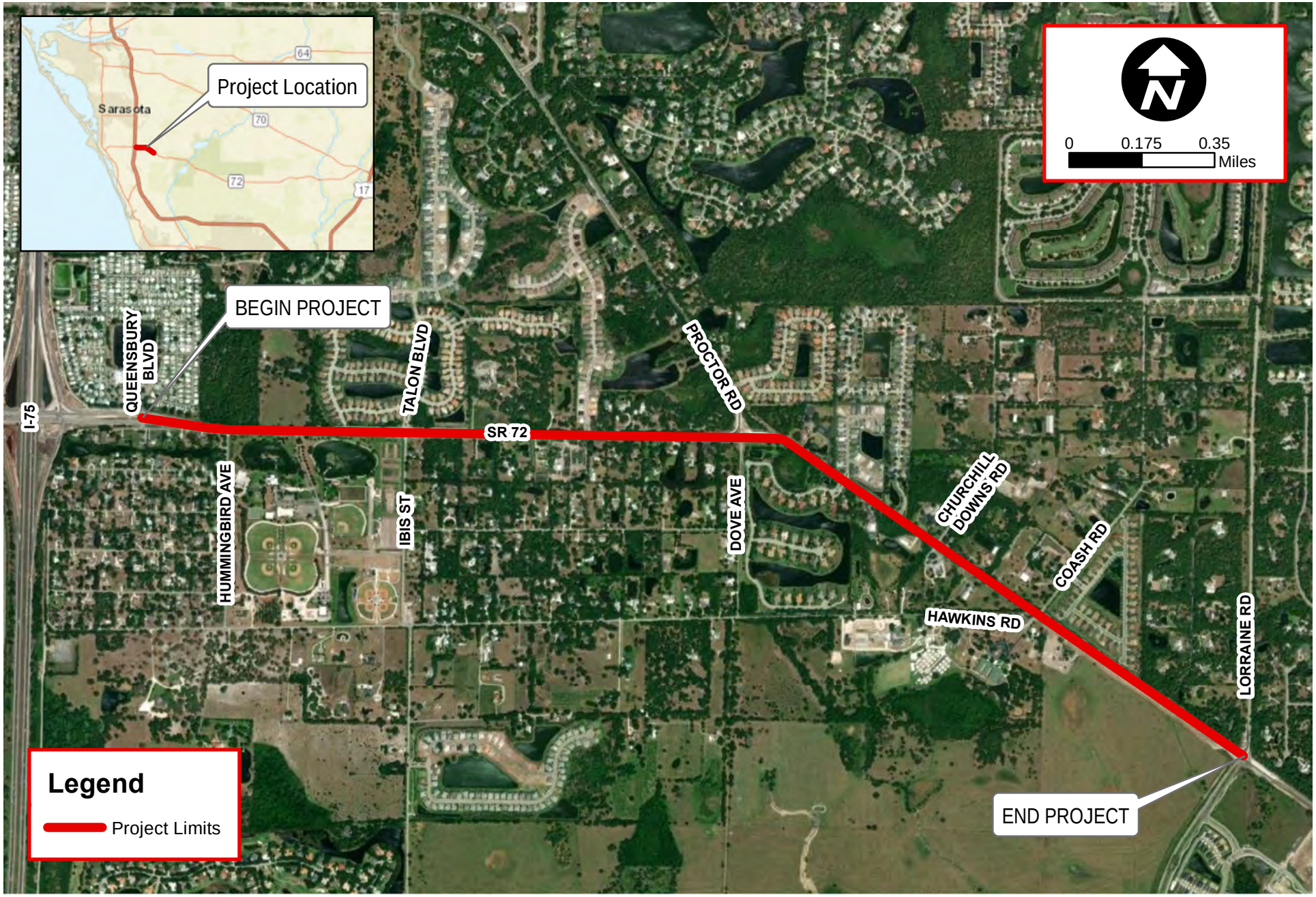
    The proposed cross drains will perform hydraulically in a manner equal to or greater than the existing condition. As a result, there will be no significant change in flood risk.

5.0 Conclusions and Recommendations

The analysis of the six existing cross drains within project limits showed that all cross drains were operating as designed in the existing condition. The proposed modifications to the existing structures include lengthening the cross drains due to the roadway widening and upsizing the cross drains as determined by the modeled proposed conditions. The improvements will be hydraulically equivalent to or greater than the existing conditions. Backwater surface elevations are not expected to increase, and these changes will cause minimal increases in flood heights and flood limits.

Floodplain encroachments will occur due to the proposed roadway widening and structure modifications. This project will not result in any new or increased adverse environmental impacts. There will be no significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that these encroachments are not significant.

APPENDIX A – EXHIBITS



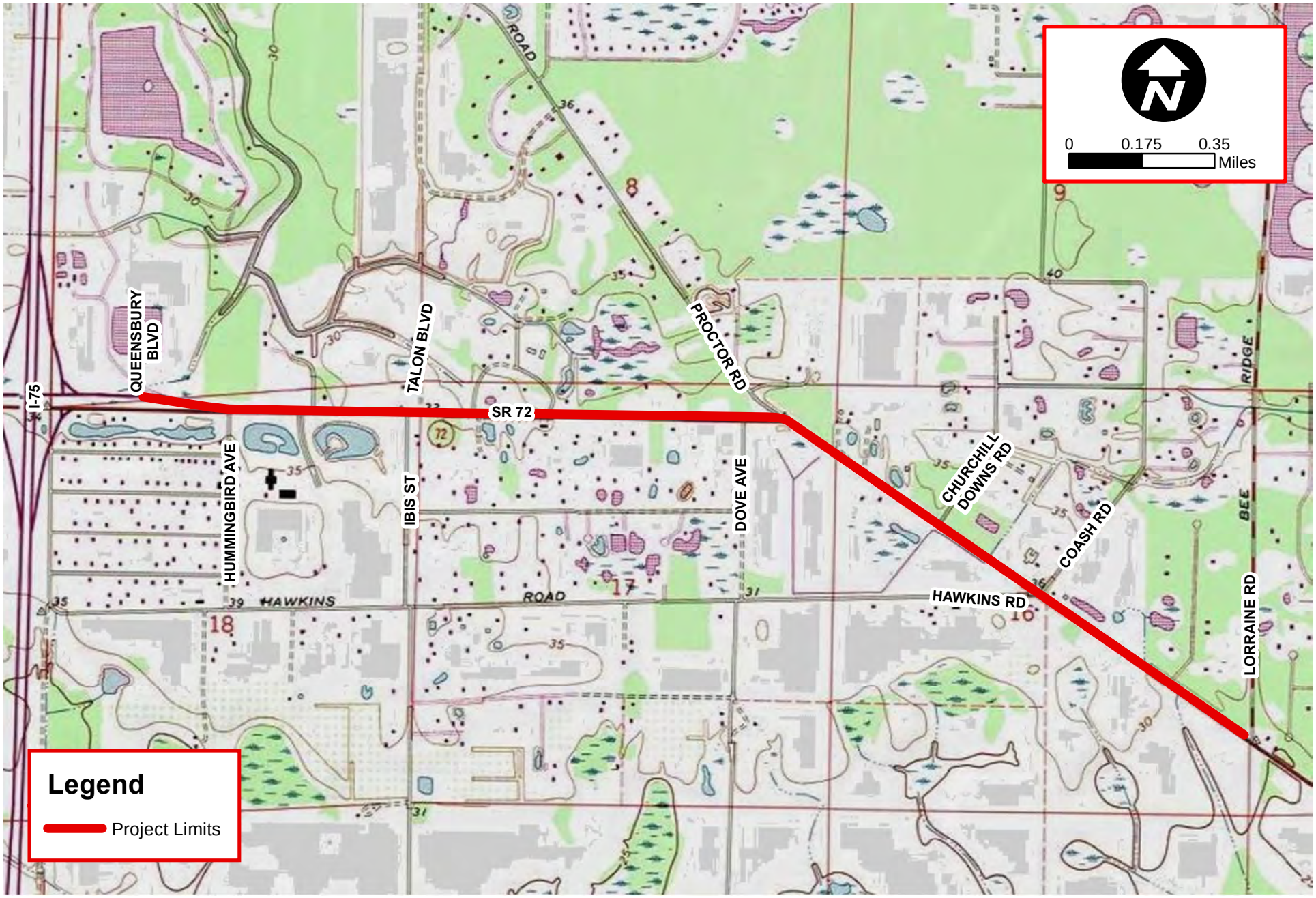
Kimley»Horn

200 South Orange Ave, Suite 600
Orlando, FL 32801
www.kimley-horn.com CA 00000696

LOCATION MAP

SR 72

SARASOTA COUNTY, FLORIDA



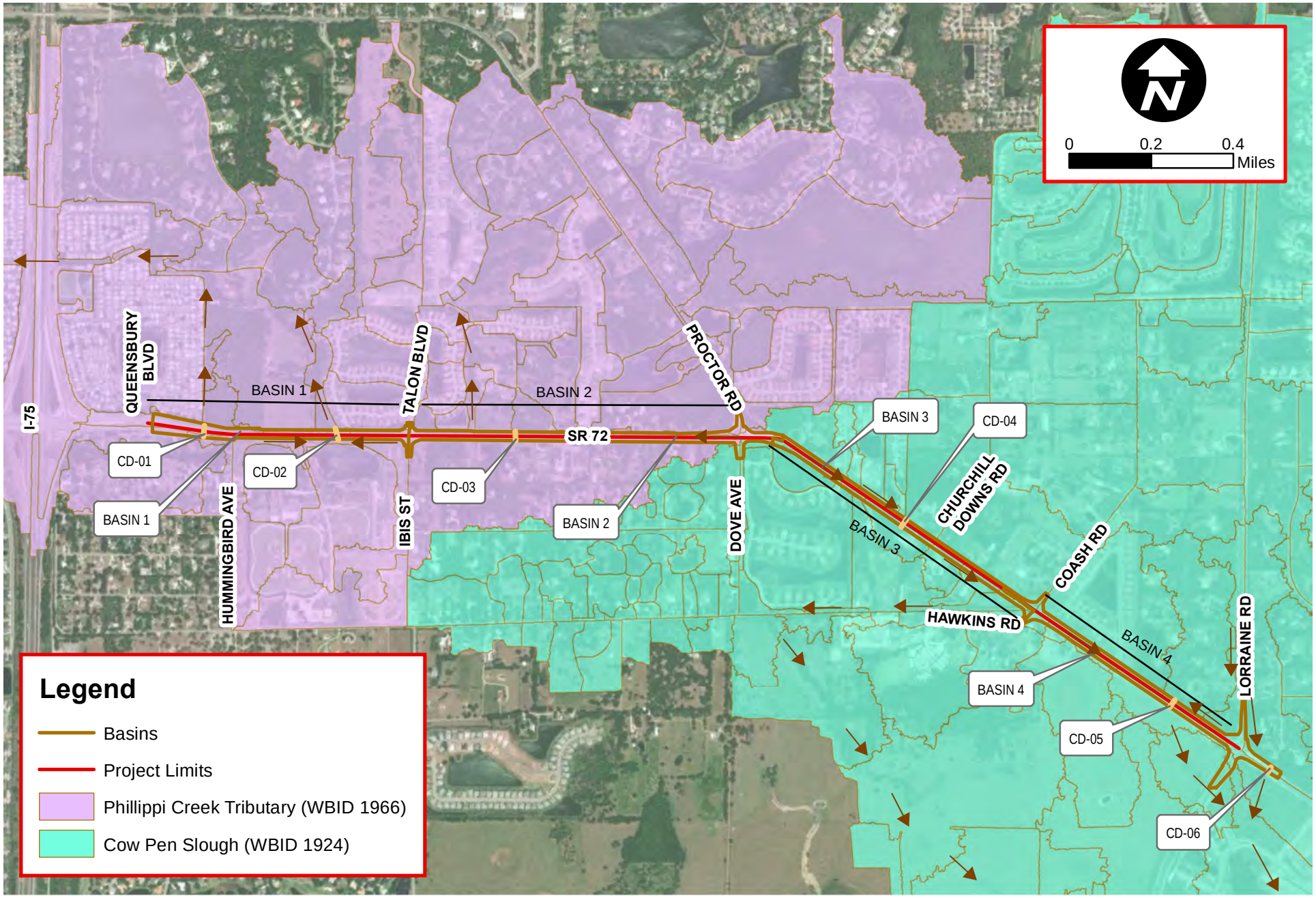
Kimley»Horn

200 South Orange Ave, Suite 600
Orlando, FL 32801
www.kimley-horn.com CA 00000696

TOPOGRAPHY MAP

SR 72

SARASOTA COUNTY, FLORIDA



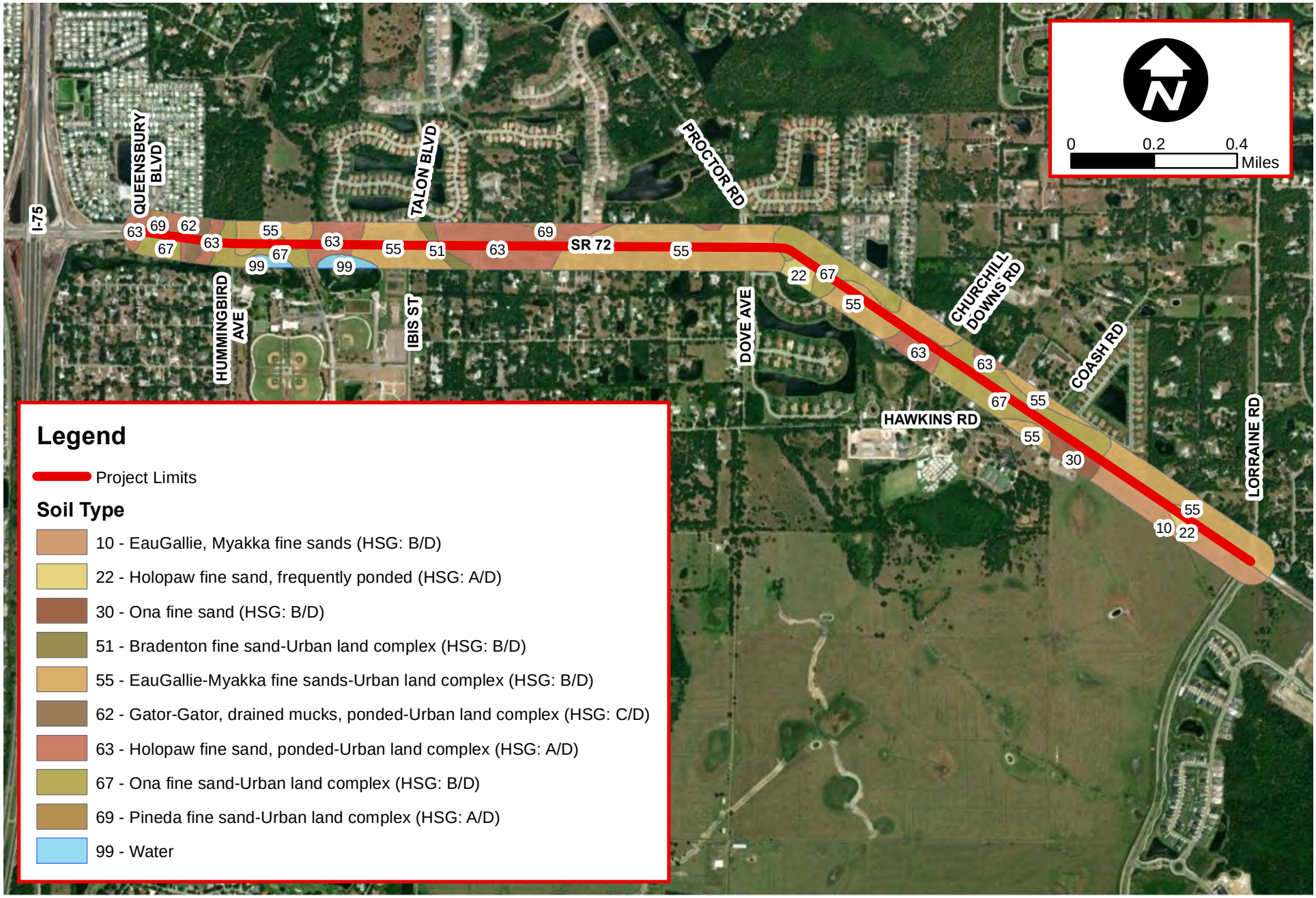
Kimley»Horn

200 South Orange Ave, Suite 600
Orlando, FL 32801
www.kimley-horn.com CA 00000696

EXISTING DRAINAGE MAP

SR 72

SARASOTA COUNTY, FLORIDA



Kimley»Horn

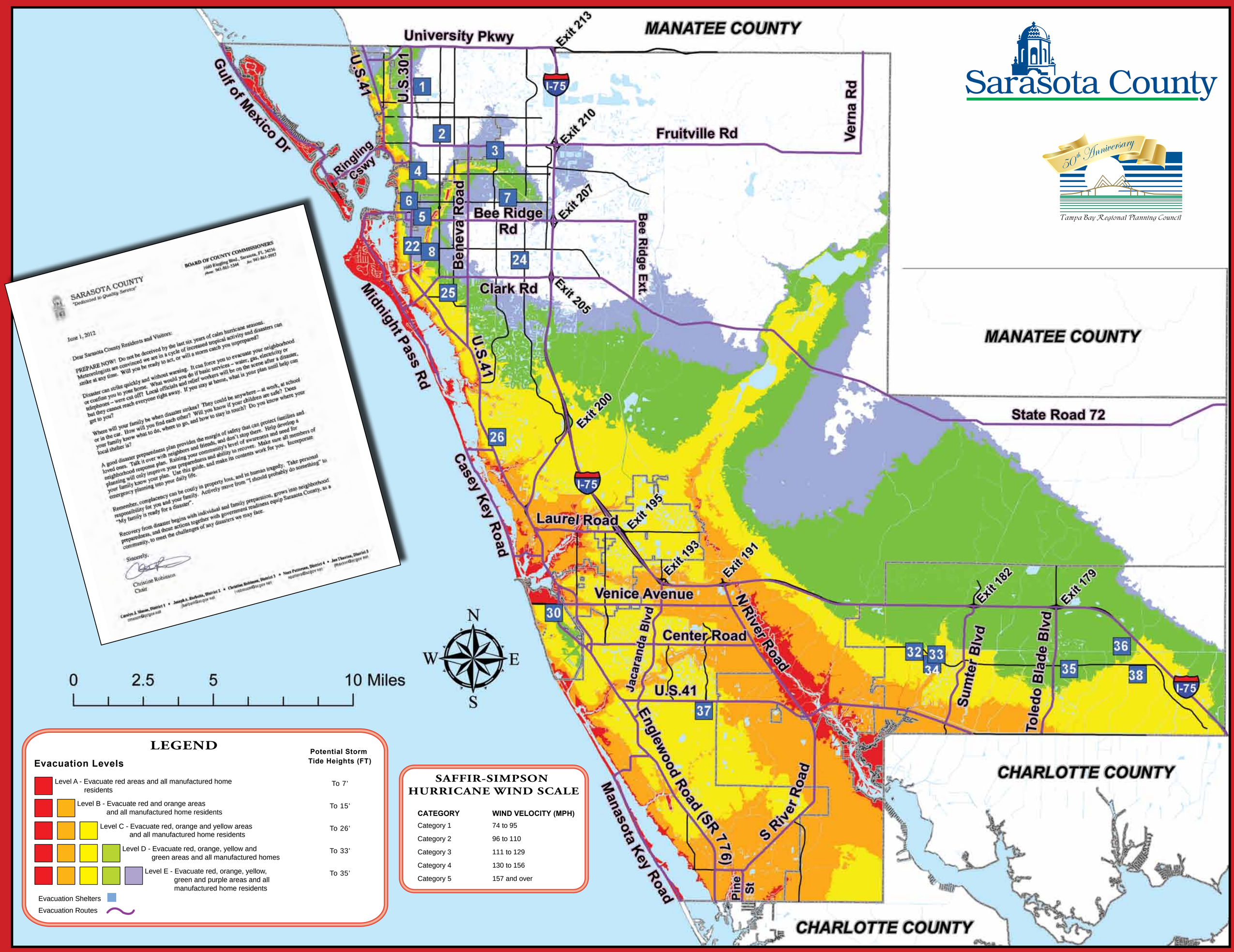
200 South Orange Ave, Suite 600
Orlando, FL 32801
www.kimley-horn.com CA 00000696

SOILS MAP

SR 72

SARASOTA COUNTY, FLORIDA

Sarasota County Evacuation Map



Sarasota County

50th Anniversary
Tampa Bay Regional Planning Council

SARASOTA COUNTY
"Dedicated to Quality Service"

BOARD OF COUNTY COMMISSIONERS
1660 Ringling Blvd., Sarasota, FL 34236
Phone: 941-861-5344 Fax: 941-861-5987

June 1, 2012

Dear Sarasota County Residents and Visitors:

PREPARE NOW! Do not be deceived by the last six years of calm hurricane seasons. Meteorologists are convinced we are in a cycle of increased tropical activity and disasters can strike at any time. Will you be ready to act, or will a storm catch you unprepared?

Disaster can strike quickly and without warning. It can force you to evacuate your neighborhood or confine you to your home. What would you do if basic services – water, gas, electricity or telephones – were cut off? Local officials and relief workers will be on the scene after a disaster, but they cannot reach everyone right away. If you stay at home, what is your plan until help can get to you?

Where will your family be when disaster strikes? They could be anywhere – at work, at school or in the car. How will you find each other? Will you know if your children are safe? Does your family know what to do, where to go, and how to stay in touch? Do you know where your local shelter is?

A good disaster preparedness plan provides the margin of safety that can protect families and loved ones. Talk it over with neighbors and friends, and don't stop there. Help develop a neighborhood response plan. Raising your community's level of awareness and need for planning will only improve your preparedness and ability to recover. Make sure all members of your family know your plan. Use this guide, and make its contents work for you. Incorporate emergency planning into your daily life.

Remember, complacency can be costly in property loss, and in human tragedy. Take personal responsibility for you and your family. Actively move from "I should probably do something" to "My family is ready for a disaster".

Recovery from disaster begins with individual and family preparation, grows into neighborhood preparedness, and those actions together with government readiness equip Sarasota County, as a community, to meet the challenges of any disasters we may face.

Sincerely,

Christine Robinson
Chair

Carolyn J. Mason, District 1 • Joseph A. Barbetta, District 2 • Christine Robinson, District 3 • Nora Patterson, District 4 • Jon Thaxton, District 5
cmason@scgov.net jbarbett@scgov.net crobinson@scgov.net npatterson@scgov.net jthaxton@scgov.net

LEGEND

Evacuation Levels

Potential Storm Tide Heights (FT)

- Level A - Evacuate red areas and all manufactured home residents — To 7'
- Level B - Evacuate red and orange areas and all manufactured home residents — To 15'
- Level C - Evacuate red, orange and yellow areas and all manufactured home residents — To 26'
- Level D - Evacuate red, orange, yellow and green areas and all manufactured homes — To 33'
- Level E - Evacuate red, orange, yellow, green and purple areas and all manufactured home residents — To 35'
- Evacuation Shelters
- Evacuation Routes

SAFFIR-SIMPSON HURRICANE WIND SCALE

CATEGORY	WIND VELOCITY (MPH)
Category 1	74 to 95
Category 2	96 to 110
Category 3	111 to 129
Category 4	130 to 156
Category 5	157 and over

Sarasota County Shelter Information

No.	Shelter Name	address	approx. elevation	dog/Cat Shelter
1	Booker Middle School	2250 Myrtle St.	30'	
2	Tuttle Elementary School	2863 8th St.	34'	
3	Bishop Nevins Academy	4380 Fruitville Rd.	26'	
4	Sarasota High School	1000 S. School Ave.	11' - 23'	
5	Brookside Middle School	3636 S. Shade Ave.	27'	
6	Southside Elementary School	1901 Webber St.	22'	
7	Brentwood Elementary School	2500 Vinson Ave.	25'	
8	Riverview High School	1 Ram Way	18'	
22	Phillippi Shores Elementary School	4747 S. Tamiami Trail	32'	
24	Ashton Elementary School	5110 Ashton Rd.	30'	
25	Gulf Gate Elementary School	6500 S. Lockwood Ridge Rd.	21'	
26	Pine View School	501 Old Venice Rd.	15'	
30	Venice Community Center	326 S. Nokomis Ave.	19'	
32	Glenallen Elementary School	7050 Glenallen Blvd.	20'	
33	North Port High School	6400 W. Price Blvd.	21'	
34	Heron Creek Middle School	6501 W. Price Blvd.	21'	
35	Toledo Blade Elementary School	1201 Geranium Ave.	24'	
36	Woodland Middle School	2700 Panacea Blvd.	31'	
37	Taylor Ranch Elementary School	2500 Taylor Ranch Rd.	19'	
38	Atwater Elementary School	4701 Huntsville Ave.	25'	

In the event of a community emergency, Sarasota County has 20 emergency shelters for residents and visitors available as a last resort. Become familiar with the shelter information provided and make sure everyone in your household knows the following shelter facts:

- ✓ Shelters are opened on an "as-needed" basis.
- ✓ Shelter openings may vary with each emergency.
- ✓ Pet friendly shelters require current vaccination records for dogs and cats.
- ✓ Never go to a shelter unless local officials have announced it is open.
- ✓ Current shelter information is available from local radio and television stations, the Sarasota County Call Center at **(941) 861-5000** and Access Sarasota. More information is available on the county website, www.scgov.net.

Emergency Shelters

Shelter openings may vary with each emergency. Stay tuned to local media for a listing of shelters that will be open. Do not go to a shelter until local officials announce in the media that the shelter is open. Shelter openings will differ by size and intensity of a disaster. See map and shelter list above.

Special Needs Shelters

Sarasota County provides a shelter program for those residents requiring special medically related care. Special needs shelters will be available for persons requiring more skilled medical care than available in a public shelter but not requiring an acute care facility such as a hospital. If this type of extended care is needed, contact the Sarasota County Emergency Management offce at **941-861-5000** or go online to www.scgov.net to be considered for registration into this program.

Functional Needs Support Services (FNSS)

Functional Needs Support Services are services that enable children and adults to maintain their usual level of independence in a general population shelter. Those requiring FNSS may have physical, sensory, mental health, cognitive and/or intellectual disabilities affecting their ability to function independently without assistance. Individuals will not be turned away from general population shelters, or inappropriately placed in other environments. Upon arrival to a Sarasota County general population shelter, inform Shelter Management staff of your request for services to ensure the most effective approach. Sarasota County will make every effort to meet functional and access needs at approved County shelters upon request.

dog and Cat Friendly Shelters

Sarasota County offers six dog and cat-friendly shelters, indicated on the shelter list of this guide. ***If you are unable to meet these requirements, please make other arrangements to shelter your pet.***

- ✓ Provide proof of current license and vaccination
- ✓ Pet must be in an appropriate pet crate
- ✓ Provide all items required for your pet
- ✓ You are responsible for the care of your pet while in the shelter
- ✓ Cohabitation of pets and owners is not permitted

USING YOUR COUNTY MAP

1. Locate where you live and work on the map.
2. Determine whether you are in an evacuation area, and if so, what level (color).
3. If you are in an evacuation area, or mobile home/manufactured home/RV, decide where you will go if ordered to evacuate. Your choices include:
   - ✓ Home of a relative or friend outside the evacuation zone
   - ✓ Hotel/motel outside the evacuation zone (make arrangements early)
   - ✓ Go to a public shelter
   - ✓ As a last resort leave the area entirely
4. If you must go to a public shelter, use your county map to decide which one is convenient. Make sure you verify the shelter is open before you go.

HURRICANE THREAT

- ✓ The colored areas on the map are vulnerable to storm surge. Storm surge is the saltwater flooding that rushes over coastal areas when the eye of a hurricane crosses land.
- ✓ Storm surge creates a path of destruction, wiping out structures as it rapidly surges inland and then recedes. This is a life threatening situation for anyone who ignores mandatory evacuation orders and stays in vulnerable areas.
- ✓ Hurricanes are categorized on a scale of 1 to 5, depending on wind strength and destructive power. The evacuation zones are color coded to designate the level of storm surge likely to occur with the five categories.
- ✓ If you live in an area ordered to evacuate, gather your family/pets and emergency supplies, secure your home and leave immediately. Failure to obey a mandatory evacuation order is a violation of state and local laws.

Note: all persons living in mobile homes/manufactured homes/rvs must evacuate for all mandatory evacuation orders, regardless of where you are located in the county.

NOAA WEATHER RADIO

A NOAA weather radio can provide you with valuable hurricane information as well as vital warning information for tornadoes, severe thunderstorms and other dangerous weather phenomena. It also broadcasts warning and post-event information for all types of hazards such as chemical releases and significant matters of public safety.

WEB BASED HURRICANE INFORMATION

Sarasota County Government maintains a special web site to relay important hurricane information for local residents. You can find out which, if any, evacuation zone you live in, your nearest public shelters, special needs registration forms and much more. For more information, visit www.scgov.net, keyword: all hazards.

MEDICAL RESERVE CORPS (MRC) OF SARASOTA VOLUNTEER OPPORTUNITY

The MRC is a community-based group of medical and non-medical volunteers. Training is provided to help members fulfill their roles. Examples include dispensing of medication or vaccinations, serving in hurricane shelters, assisting with disease outbreak investigation and community outreach. Please call **941-861-2900** or visit www.mrcsarasota.org if you would like to volunteer.

STORM DEBRIS

Remember to separate storm debris into the following categories:

- ✓ Garbage – place spoiled food in containers, or double bag it for pick-up
- ✓ Household goods – furniture, clothes, books, toys and carpet
- ✓ Vegetative – tree limbs and trunks
- ✓ Construction materials – drywall, roof shingles, aluminum
- ✓ Appliances – refrigerators, water heaters, televisions and computers

tips:

- ✓ Avoid stacking debris by utility poles, under power lines, on top of water meter or other water connections, by fire hydrants, by vehicles, next to mailboxes or fences or on storm drains
- ✓ Do not place storm debris in the street

Live on a private road? If so, residents must grant the county the right to enter the roadway for debris removal. For further information or to obtain the Right-of-Entry/Hold Harmless form, call **941-861-5000**.

If a storm causes damage to your property, call **941-861-5000** for instructions on how to prepare storm-related debris for removal. If debris is not properly prepared, the property owner/resident is responsible for debris disposal and the cost for removal.

SARASOTA COUNTY NOTIFICATION SYSTEM – CodeRED

Sarasota County utilizes the CodeRED Notification System - a free, secure, advanced and effective emergency system that allows you to receive calls, emails alerts or text messages about events that could impact your neighborhood or help protect your family or property. This system allows us to send critical communications to all or targeted areas within the county when immediate actions are required. Your contact information remains private, and will only be used for PUBLIC HEALTH, SAFETY and WELLNESS purposes. Anyone with a physical address in Sarasota County may participate. Visit www.scgov.net for more information, to register now or update information, or call **941-861-5000**.

important Contact information

SARASOTA COUNTY CALL CENTER	941-861-5000 WWW.SCGOV.NET
EVACUATION INFORMATION	941-861-5000
TDD-DEAF COMMUNICATIONS	941-861-1833
SPECIAL NEEDS REGISTRY	941-861-5000
AMERICAN RED CROSS SW FLORIDA CHAPTER	941-379-9300
SUNCOAST COMMUNITIES BLOOD BANKS 1760 Mound Street Sarasota, FL 34236 1097 N. Tamiami Trail Nokomis, FL 34275 710 N. Brevard Ave. Arcadia, FL 34266	For more information, call toll free 1-866-97-BLOOD or visit WWW.SCBB.ORG.
CATHOLIC CHARITIES	941-355-4680
VOLUNTEER COMMUNITY CONNECTIONS	941-953-5965
SALVATION ARMY	941-954-4673
UNITED WAY	941-366-2686
211 REFERRAL LINE	211
ANIMAL SERVICES	941-861-9500
FLORIDA POWER AND LIGHT	800-468-8243
HIGHWAY PATROL	941-492-5850
SHERIFF	941-861-5800
SOLID WASTE	941-861-5000
NOAA WEATHER RADIO, VENICE	FREQ 162.40 MHz FIPS code 012115
AM AND FM RADIO STATIONS	**radio am** WLSS 930 WSRQ 1220 WTMY 1320 WBRD 1420 WWPR 1490 WENG 1530 **radio fm** WJIS 88.1 WKZM 104.3 WSMR 89.1 WTZB 105.9 WLTQ 92.1 WCTQ 106.5 WHPT 102.5 WSRZ 107.9 WSRQ 106.9

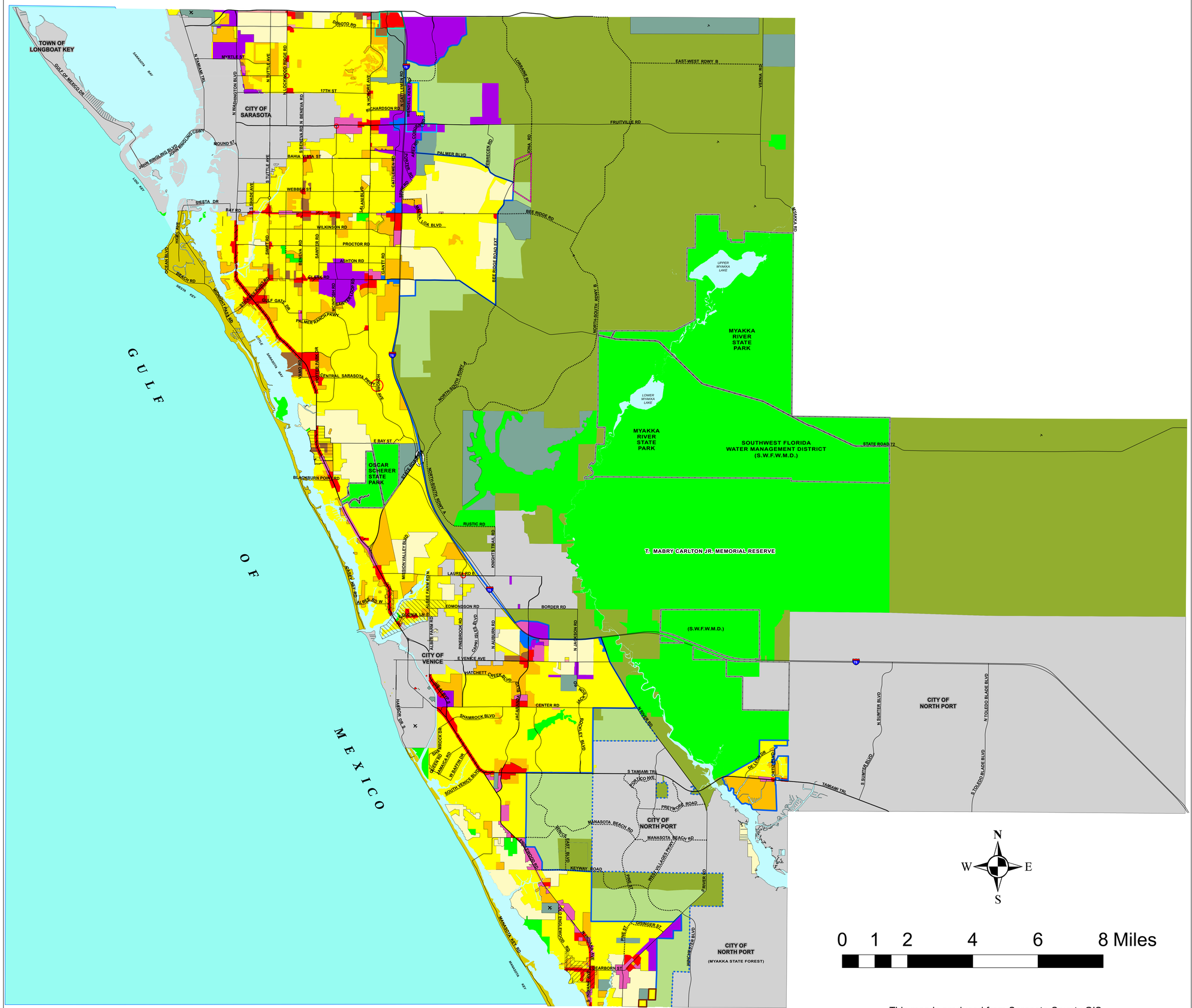
do Not Call 9-1-1 For hurricane information

A PARENT'S GUIDE ON WHAT TO BRING TO A SHELTER FOR YOUR CHILDREN

- ✓ Please bring age appropriate items for your child
- ✓ Baby food jars - combination of vegetables, fruits, cereals and meats
- ✓ Cereal (child age specific)
- ✓ Favorite snacks
- ✓ Healthy snacks
- ✓ Diaper wipes
- ✓ Diapers / pull-ups
- ✓ Formula (powered and/or ready-made)
- ✓ Oral electrolyte solution, such as Pedialyte
- ✓ Juice boxes
- ✓ Baby bottles
- ✓ Baby feeding spoons
- ✓ Nipples for baby bottles
- ✓ Diaper rash ointment
- ✓ Disposable changing pads
- ✓ Infant bathing basin, wash cloths and towels
- ✓ Infant hat and booties
- ✓ Lightweight blankets
- ✓ Portable crib
- ✓ Toddler potty seat
- ✓ Small toys that don't make noise such as books, cards, puzzles, handheld games, extra batteries, and any special item that the child may be attached to that provides comfort.

FUTURE LAND USE MAP

SARASOTA COUNTY
OCTOBER 2016



This map is produced from Sarasota County GIS, and is representative information only. The County does not warrantee, guarantee, or assume any responsibility for geographic information completeness and/or accuracy. This map should not be used as guide for navigation.

LEGEND

FUTURE LAND USE

- PUBLIC CONSERVATION/PRESERVATION
- RURAL
- SEMI-RURAL
- LOW DENSITY RESIDENTIAL (< 2 DUs/ACRES)
- MODERATE DENSITY RESIDENTIAL (≥ 2 AND < 5 DUs/ACRE)
- MEDIUM DENSITY RESIDENTIAL (≥ 5 AND ≤ 9 DUs/ACRE)
- HIGH DENSITY RESIDENTIAL(> 9 AND ≤ 13 DUs/ACRE)
- LIGHT OFFICE
- COMMERCIAL CENTER
- COMMERCIAL CORRIDOR
- COMMERCIAL HIGHWAY INTERCHANGE
- MAJOR EMPLOYMENT CENTER - MEC
- MAJOR GOVERNMENT USES
- OFFICE/MULTI-FAMILY RESIDENTIAL
- BARRIER ISLAND
- INCORPORATED AREA
- WATER

AREA NAME

- COMMERCIAL CENTER UNDEFINED BOUNDARIES

AIRPORT FACILITY

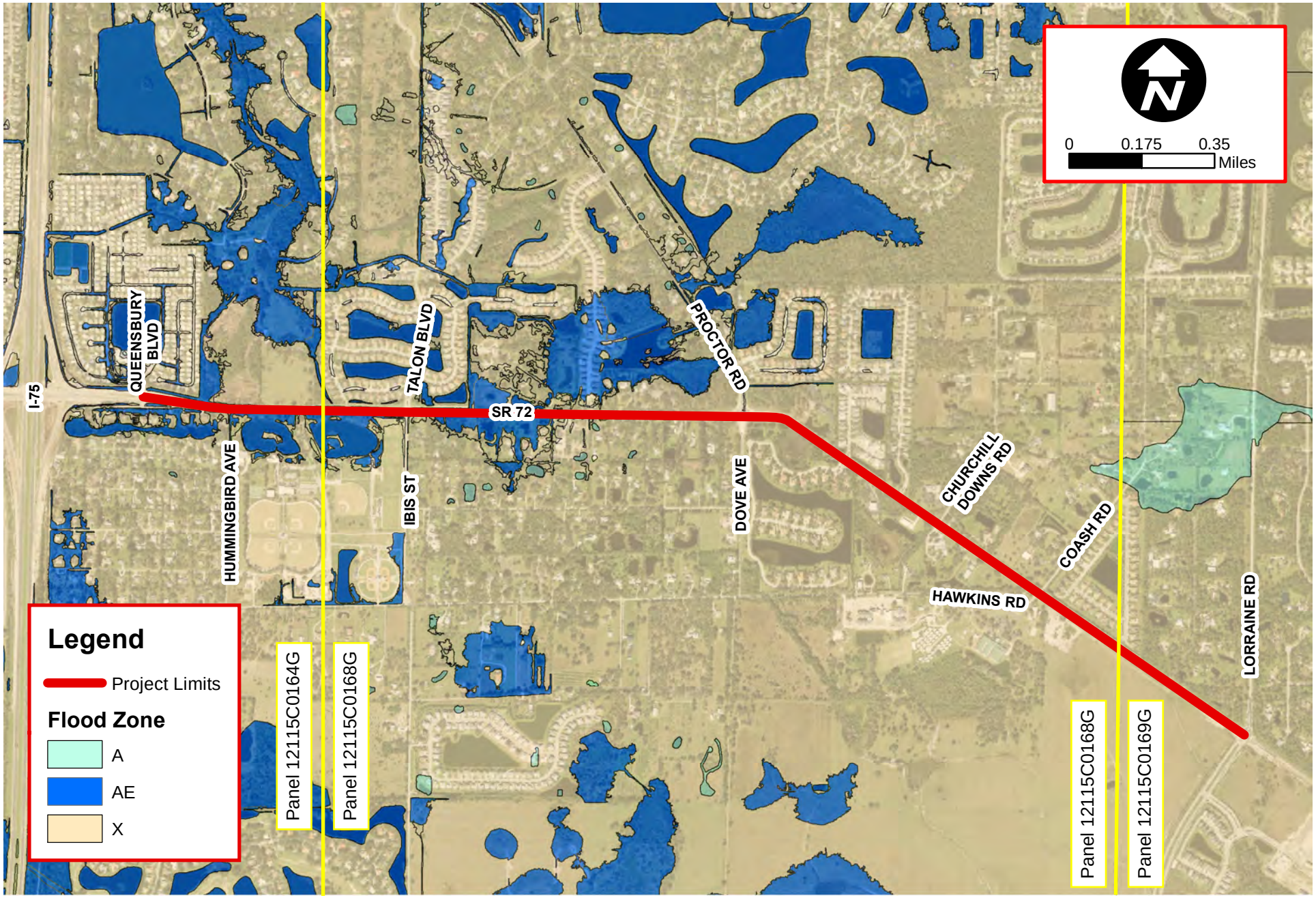
- Public
- Private
- URBAN SERVICE AREA BOUNDARY
- FUTURE URBAN SERVICE AREA BOUNDARY
- ENGLEWOOD TOWN CENTER
- NOKOMIS VILLAGE CENTER
- OSPREY VILLAGE CENTER
- FUTURE FULL ACCESS INTERCHANGE
- AFFORDABLE HOUSING OVERLAY
- SPECIAL PLANNING AREA 1 - UNIVERSITY TOWN CENTER - SIPOC
- SPECIAL PLANNING AREA 2 - MEDICAL BOULEVARD
- SPECIAL PLANNING AREA 3 - FRUITVILLE INTERCHANGE EAST COMPACT URBAN EcoDev
- FUTURE THOROUGHFARE

NOTE: THIS MAP CANNOT BE CORRECTLY INTERPRETED INDEPENDENT OF THE SARASOTA COUNTY COMPREHENSIVE PLAN AS ADOPTED BY SARASOTA COUNTY ORDINANCE NO. 89-18, AS THE SAME MAY BE AMENDED FROM TIME TO TIME. THE BOUNDARIES OF LAND USE DESIGNATIONS, WHERE THEY HAVE BEEN ESTABLISHED, MAY BE REVIEWED AT SARASOTA COUNTY PLANNING SERVICES, 1660 RINGLING BOULEVARD, SARASOTA, FLORIDA.

PREPARED BY SARASOTA COUNTY GIS

Map published using ArcGIS 10.x on Thursday, May 04, 2017

Path: N:\Growth Management\Land Use Land Cover\FUTURE_LANDUSE\2016Updates\2016OCTOBER_FLU_LDUSE36x48.mxd



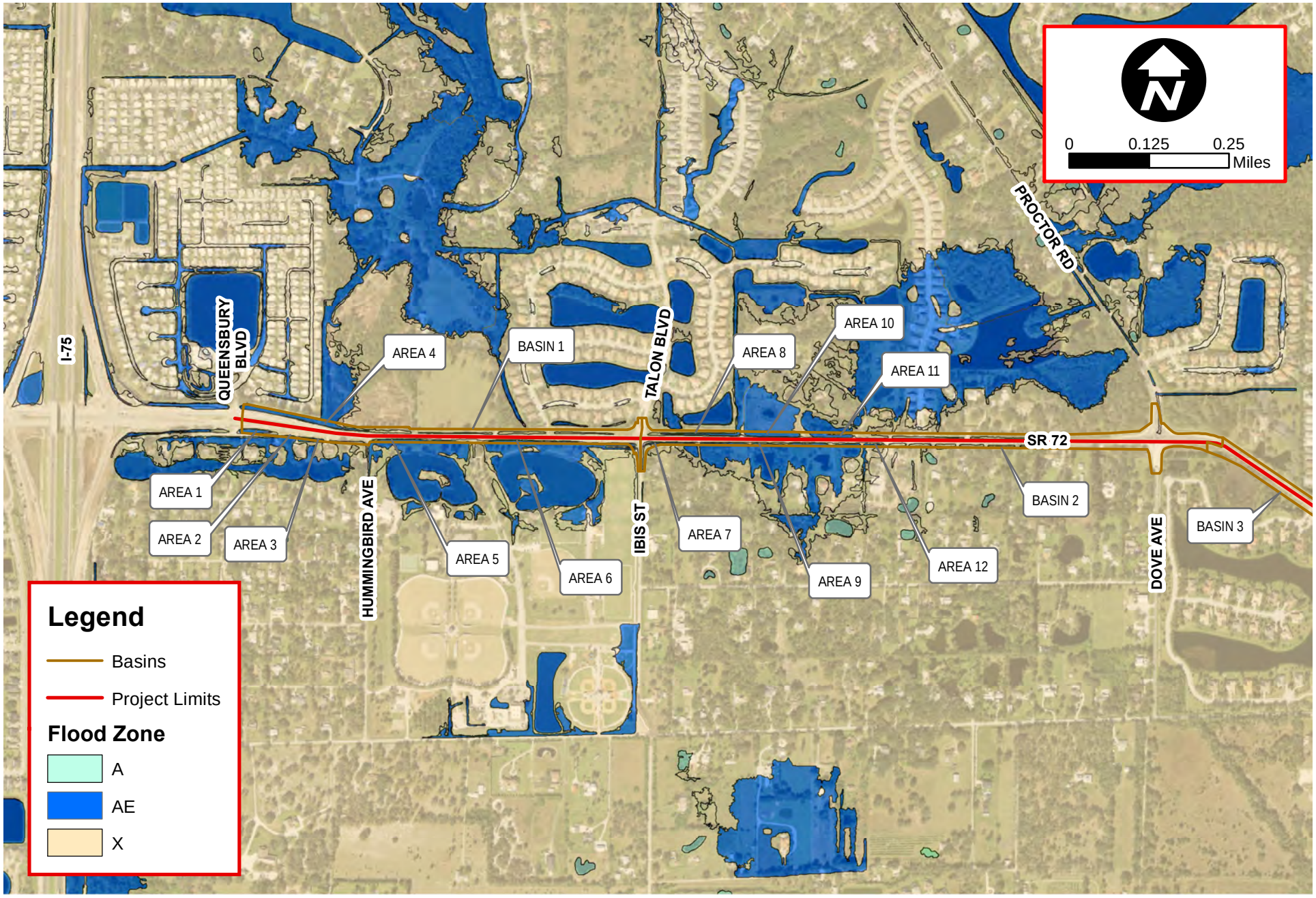
Kimley»Horn

200 South Orange Ave, Suite 600
Orlando, FL 32801
www.kimley-horn.com CA 00000696

EFFECTIVE FEMA FLOODPLAIN MAP

SR 72

SARASOTA COUNTY, FLORIDA



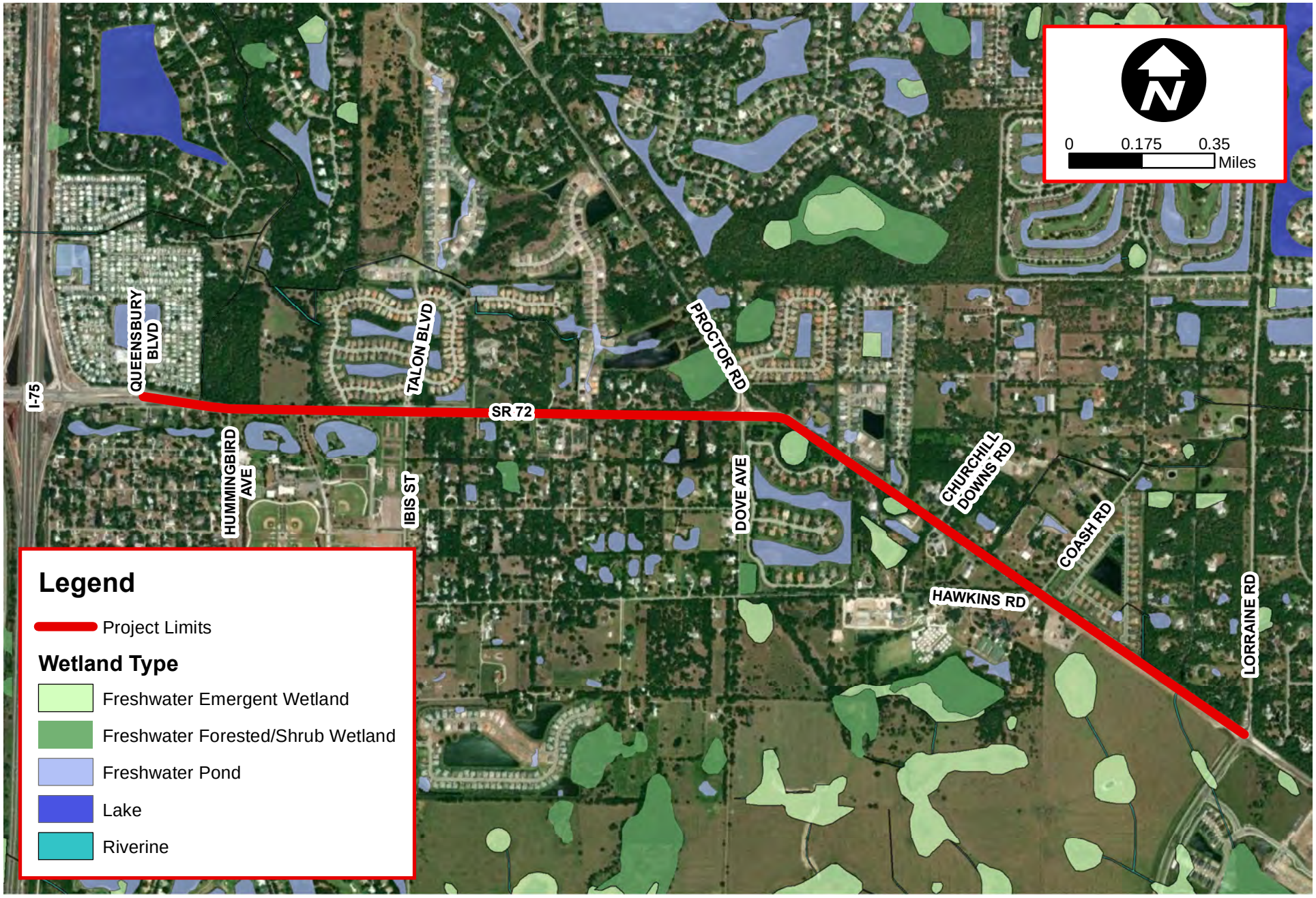
Kimley»Horn

200 South Orange Ave, Suite 600
Orlando, FL 32801
www.kimley-horn.com CA 00000696

FEMA FLOODPLAIN IMPACT AREAS MAP

SR 72

SARASOTA COUNTY, FLORIDA



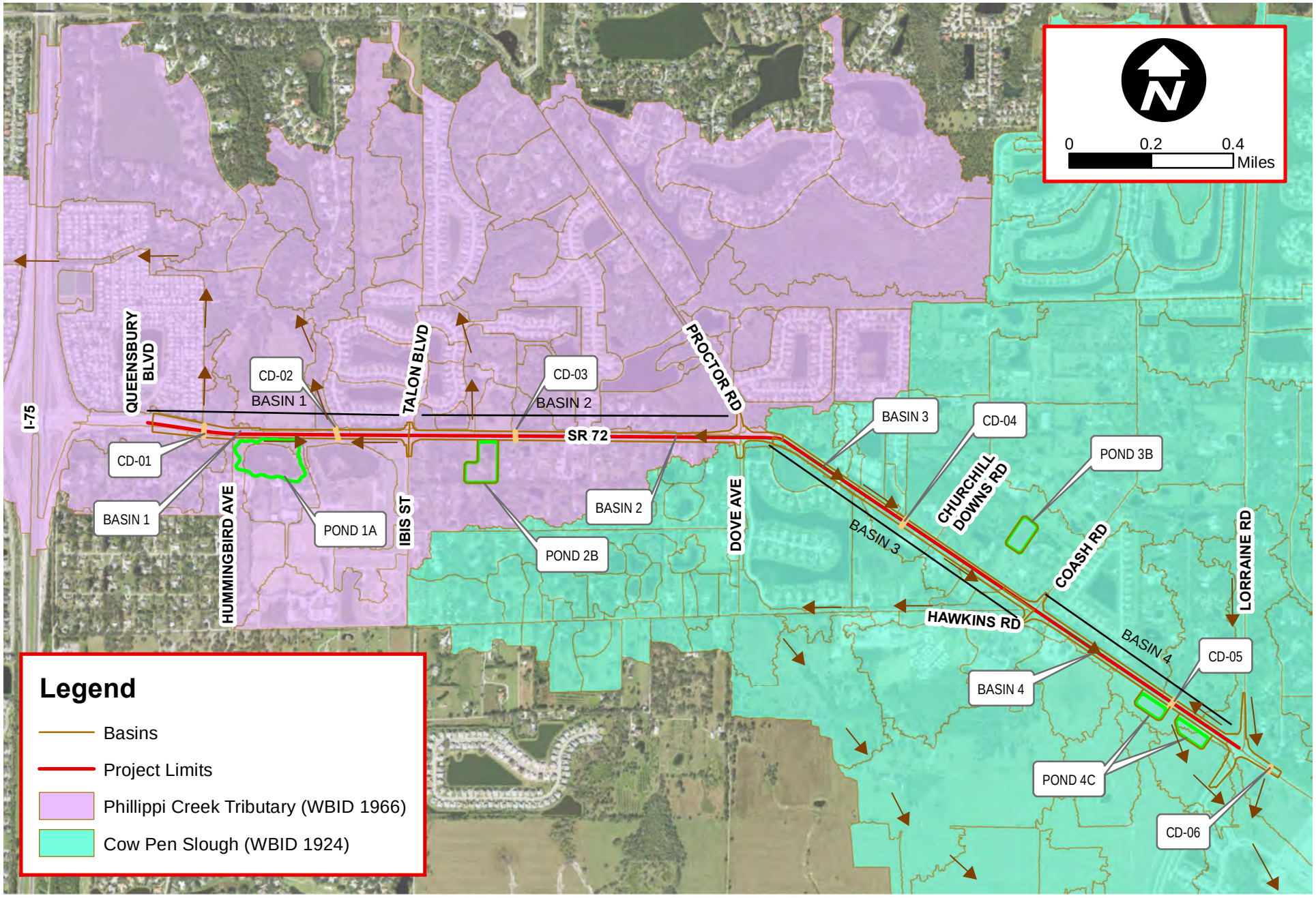
Kimley»Horn

200 South Orange Ave, Suite 600
Orlando, FL 32801
www.kimley-horn.com CA 00000696

WETLANDS MAP

SR 72

SARASOTA COUNTY, FLORIDA

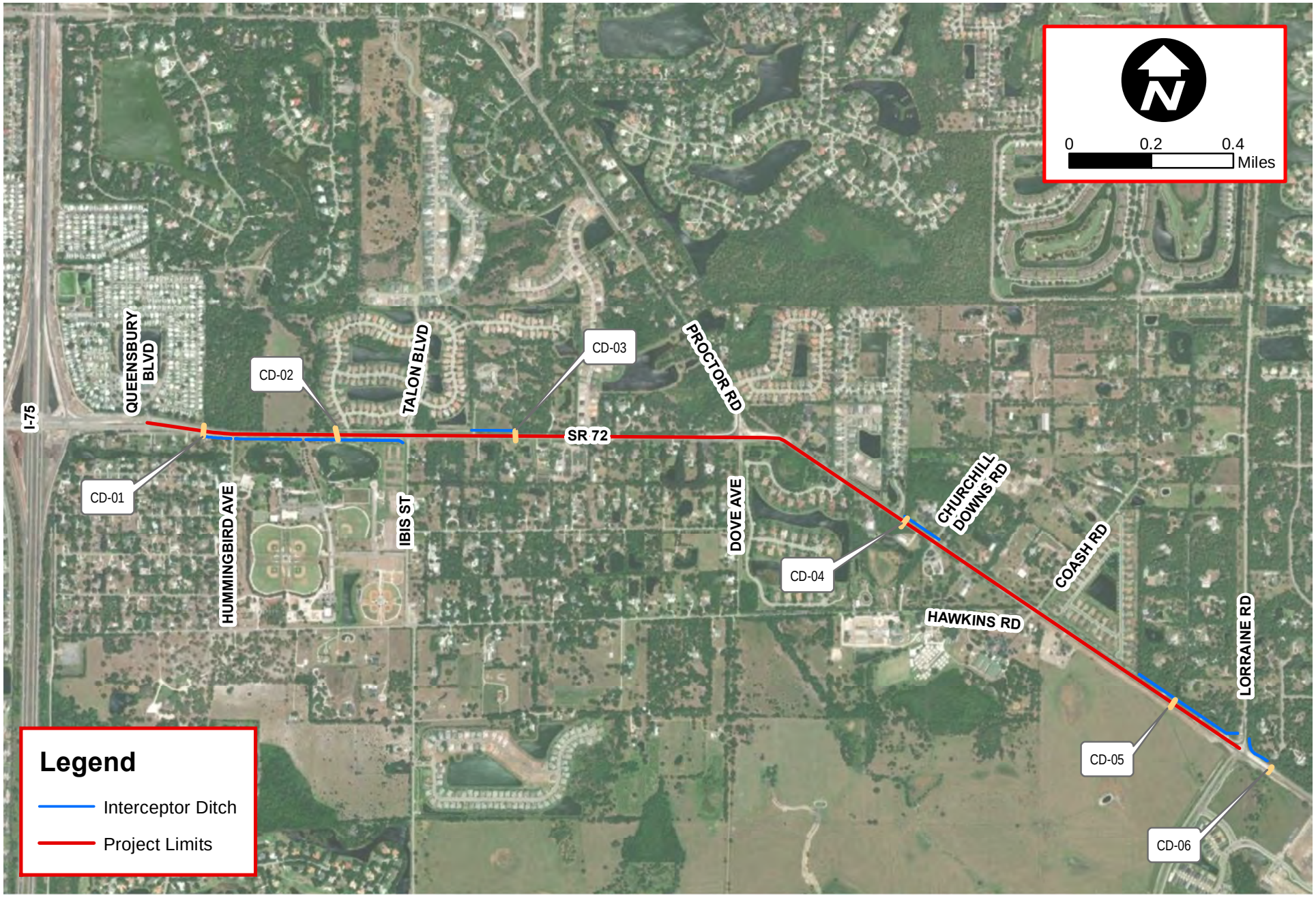


200 South Orange Ave, Suite 600
Orlando, FL 32801
www.kimley-horn.com CA 00000696

PROPOSED DRAINAGE MAP

SR 72

SARASOTA COUNTY, FLORIDA



Kimley»Horn

200 South Orange Ave, Suite 600
Orlando, FL 32801
www.kimley-horn.com CA 00000696

CROSS DRAIN LOCATIONS

SR 72

SARASOTA COUNTY, FLORIDA

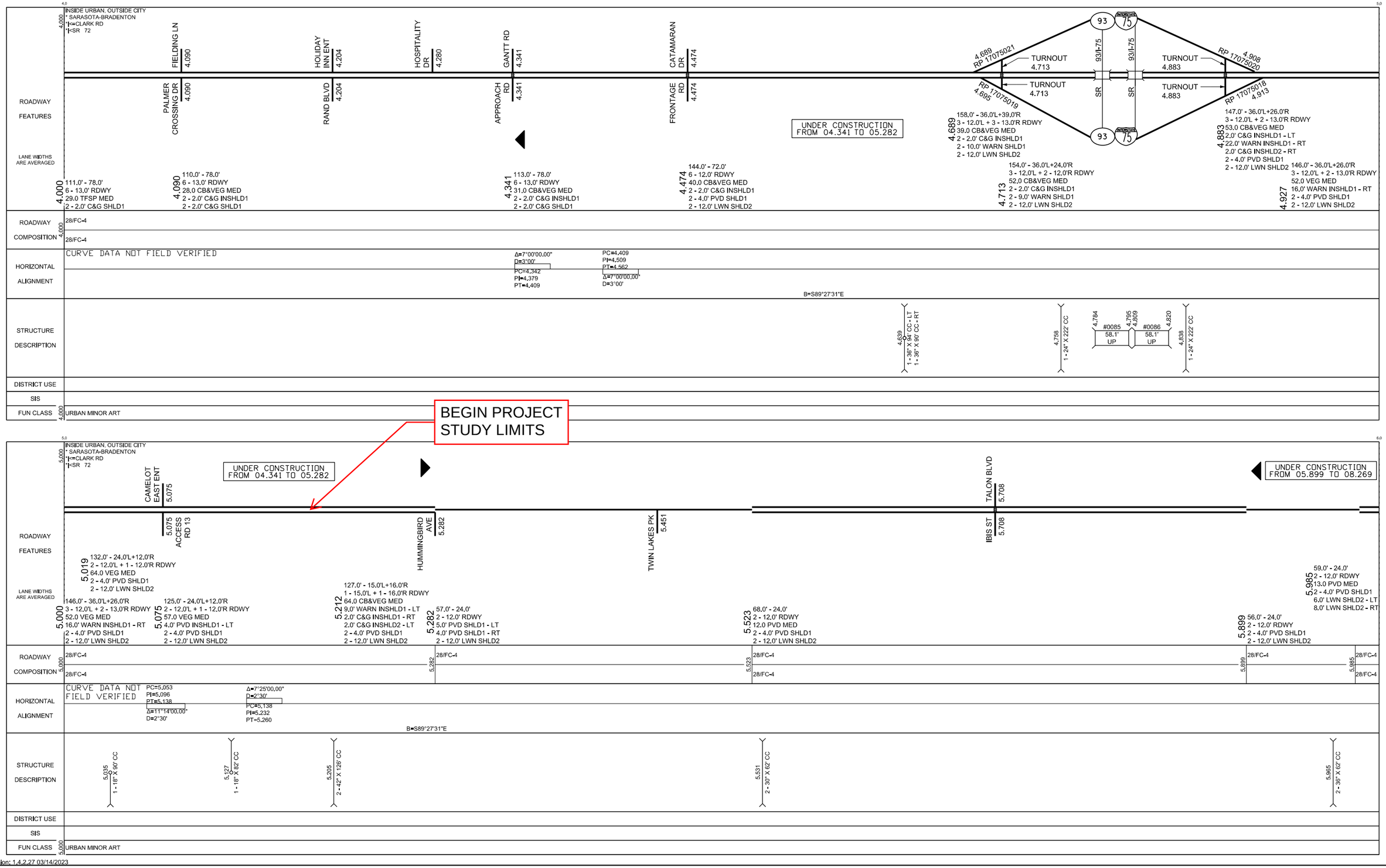
APPENDIX B – FDOT STRAIGHT-LINE DIAGRAM AND SWFWMD ERP 40200.001 PERMITTED PLANS

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	02/01/2023	03/14/2023				
BY	FTE	FTE				

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
02		SR 72	SARASOTA	01	17070000	2 OF 7



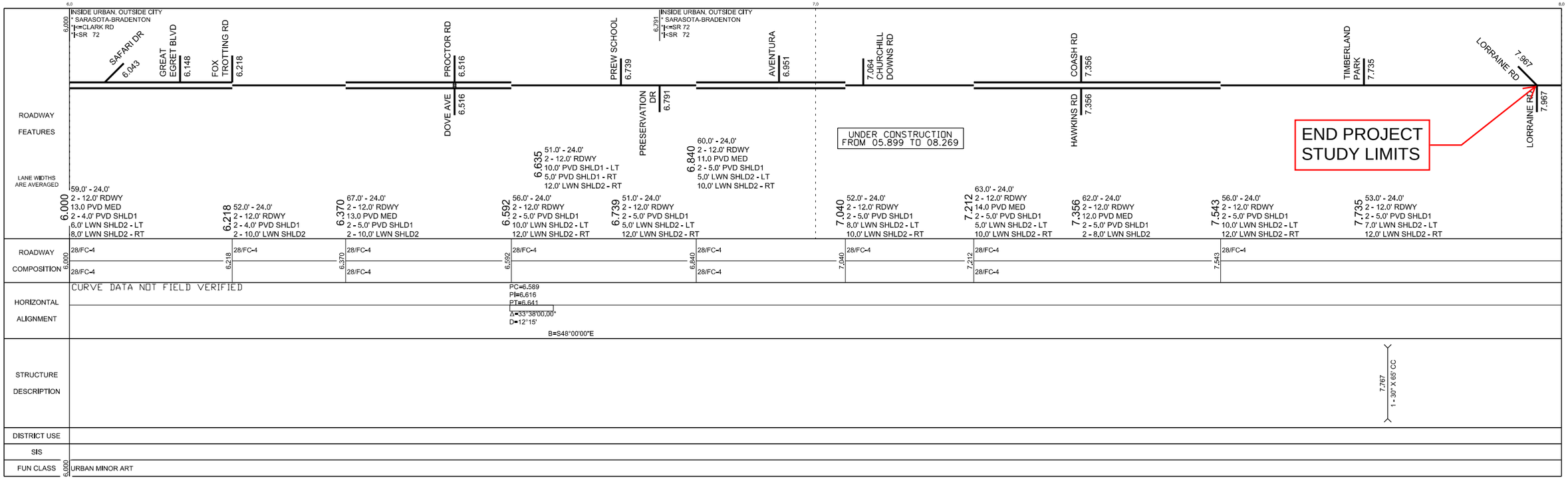
BEGIN PROJECT STUDY LIMITS

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	02/01/2023	03/14/2023				
BY	FTE	FTE				

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO.
02		SR 72	SARASOTA	01	17070000	3 OF 7

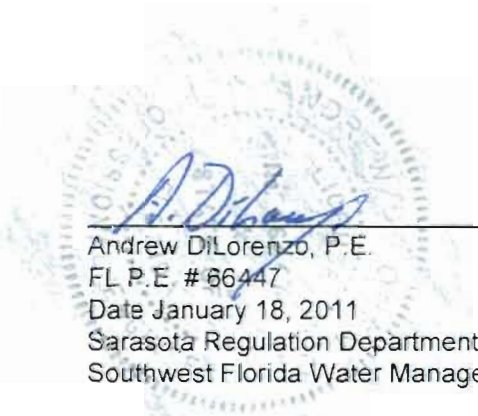


Version: 1.4.2.27 03/14/2023

PROFESSIONAL CERTIFICATION*
FOR THE ENGINEERING EVALUATION REPORT

MSSW/ERP Permit Number:	47040200.001
Date Application Received:	December 29, 2010
Permittee's Name:	Florida Department of transportation
Address:	Post Office Box 1249 Bartow, FL 33831-1249
Project Name:	SR 72 from Proctor Road to Saddle Creek Trail
Project Description:	Roadway
Project Size:	37.0 acres
Activity:	Construction
Section(s)/Township/Range:	15,16,17,22,23/37S/19E

I HEREBY CERTIFY that the engineering features described in the referenced application to construct and/or operate a surface water management system associated with the indicated project have been evaluated regarding provision of reasonable assurance of compliance with Part IV, Chapter 373, Florida Statutes, and Chapters 40D-4, 40D-40 or 40D-400, Florida Administrative Code (F.A.C.), as applicable. I have not evaluated and do not make any certifications as to other aspects of the proposal.



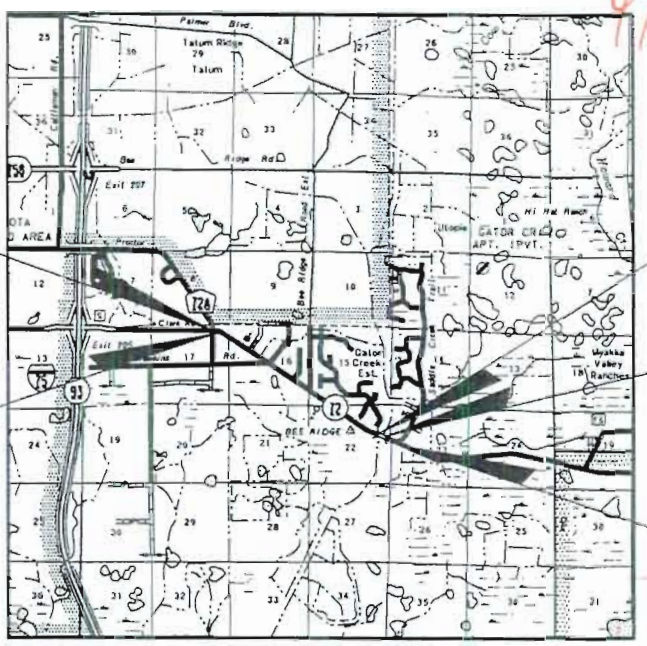
_____(Seal)
Andrew DiLorenzo, P.E.
FL P.E. # 66447
Date January 18, 2011
Sarasota Regulation Department
Southwest Florida Water Management District

* When required by Subsection 61G15-26.001(1), F.A.C., a professional engineer's seal, signature and date (i.e., "Professional Certification") means that the work indicated has been conducted under the responsible supervision, direction or control of a person licensed by the State to practice engineering, who by authority of their license is required to have some specialized knowledge of engineering. Professional Certification is not a guaranty or warranty of fitness or suitability, either explicit or implied.

043816

IMAGED

4704020 0.001



SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD)
PERMITTED DRAWINGS

For construction permits, the permittee shall notify in writing the SWFWMD Sarasota Regulation Department, when construction begins.

RDiLorenzo

FPID 425254-1-52-01
STATE ROAD NO. 72
SARASOTA COUNTY (17070)

FILE OF RECORD

400-400.447

FROM PROCTOR ROAD
TO EAST OF SADDLE CREEK TRAIL
MP 6.589 TO MP 9.648

SOUTHWEST FLORIDA WATER MGMT DISTRICT

DEC 29 2010

RR SARASOTA

863-519-2557

BT Setchell 12-21-10

BRENT SETCHELL, P.E. DATE

P.E. NUMBER 63134

FL. DEPT. OF TRANSPORTATION
801 N. BROADWAY AVE.
BARTOW, FL 33831

FLORIDA DEPARTMENT OF TRANSPORTATION
SR 72 RESURFACING

STATE ROAD NO. 72 SARASOTA COUNTY

	BY	FROM PROCTOR RD. TO E. OF SADDLE CR. TR.	
DRAWN	MWS	F.P.I.D. 425254-1-52-01	SHEET 1 OF 17
CHECKED	JRW		

GENERAL NOTES

1. The Florida Department of Transportation proposes to mill and resurface a 3.05 mile stretch of SR 72 in Sarasota County, Florida. The project includes the construction of five foot paved shoulders with the regrading of the front slopes, which will result in minor surface water and wetland impacts to the existing linear ditches that parallel SR 72.

2. Strict adherence to Section 104 of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction used in conjunction with this application provide reasonable assurance that water quality will not be violated.

3. Types of equipment involved in the construction will include: gradeall, dump trucks, bulldozer, and front end loader. The equipment will be trucked or self propelled to the site.

4. Turbidity curtains, silt fences, inlet protection barriers, synthetic bales or some combination of these items will be used as directed by the project engineer to maintain State Water Quality Standards.

5. Any unsuitable material excavated during the installation of the shoulders will be disposed of and contained in upland sites provided by the contractor.

6. Traffic will be maintained on SR 72 during construction.

47040200.001

7. All fill shall be comprised of clean, suitable, borrow materials.

8. All elevations shown in this permit application are referenced to U.S.G.S. National Vertical Datum of 1929.

9. No dewatering will be conducted for this project.

10. Approximately 0.015 acres of wetland impacts are proposed for this project.

11. Approximately 0.483 acres of other surface water impacts (relatively permanent water impact) are proposed for this project.

12. The following volume represents fill within wetlands and other surface waters of the State:

Wetland Jurisdictional Fill: 72 cubic yards (+/- 0.015 Acres)
Other Surface Water Excavation: 94 cubic yards
Other Surface Water Fill: 441 cubic yards

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD)
PERMITTED DRAWINGS
For construction permits, the permittee shall notify in writing the SWFWMD Sarasota Regulation Department, when construction begins.

STATEMENT OF CERTIFICATION FOR DNR SUBMERGED LANDS

Pursuant to Section 339.135, F.S., the Florida Department of Community Affairs has determined that this project is not Inconsistent with the local comprehensive plan for the affected area.

FILE OF RECORD

SOUTHWEST FLORIDA WATER MGMT DISTRICT
DEC 29 2010
RR SARASOTA

12-21-10
BRENT SETCHELL, P.E. DATE
P.E. NUMBER 63134
FL. DEPT. OF TRANSPORTATION
801 N. BROADWAY AVE.
BARTOW, FL 33831

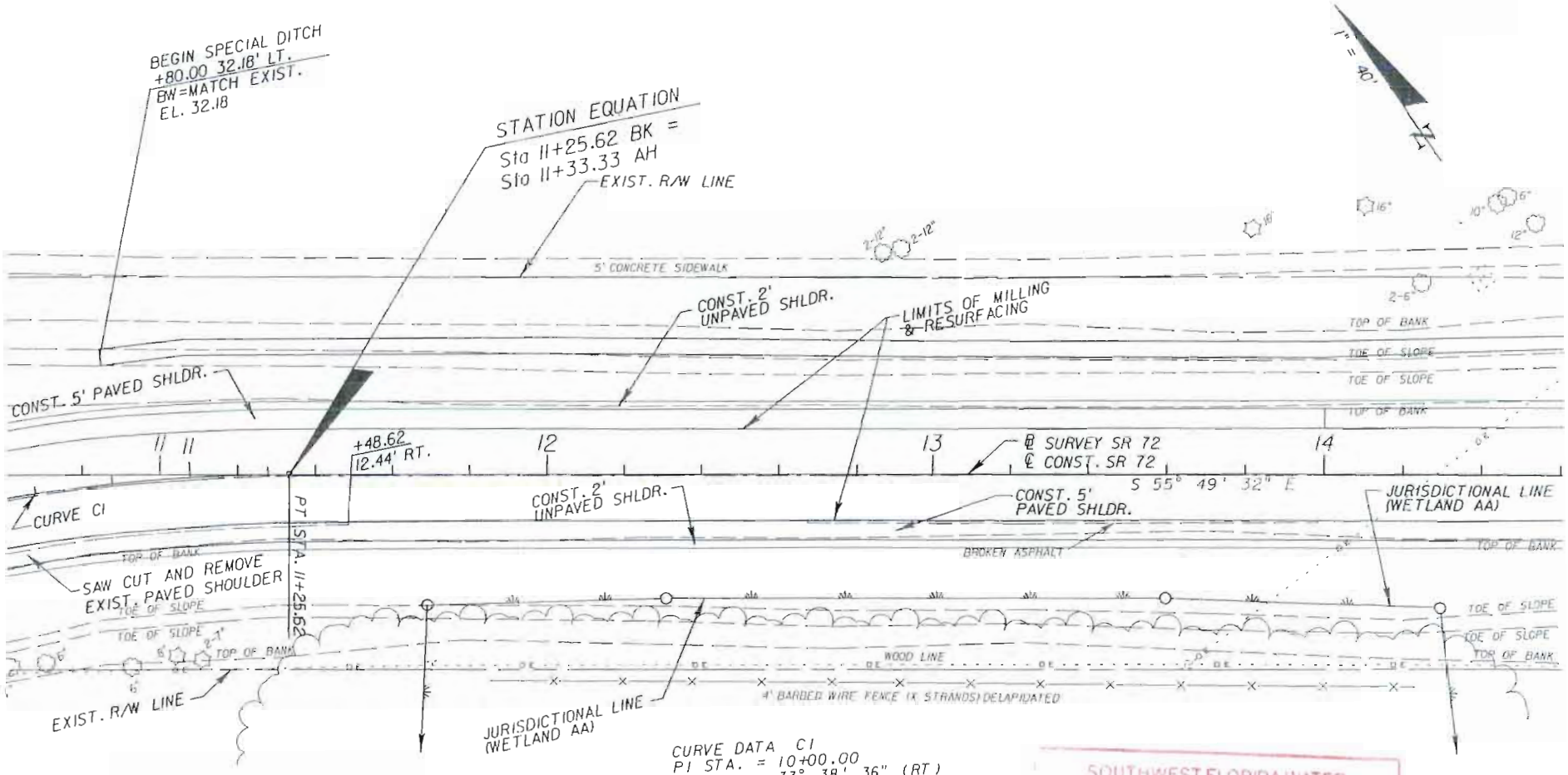
FLORIDA DEPARTMENT OF TRANSPORTATION
SR 72 RESURFACING

STATE ROAD NO. 72 SARASOTA COUNTY

	BY
DRAWN	MWS
CHECKED	JRW

FROM PROCTOR RD. TO E. OF SADDLE CR. TR.

F.P.I.D. 425254-1-52-01 SHEET 2 OF 17



CURVE DATA C1

PI STA.	=	10+00.00
DELTA	=	33° 38' 36" (RT)
D	=	12° 59' 32"
T	=	133.33
L	=	258.95
R	=	441.00
PC STA.	=	8+66.67
PT STA.	=	11+25.62
e	=	0.051

47040200.001

OTHER SURFACE WATER IMPACT (RELATIVELY PERMANENT WATER IMPACT)

JURISDICTIONAL FILL

FILE OF RECORD

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD) PERMITTED DRAWINGS

For construction permits, the permittee shall notify in writing the SWFWMD Sarasota Regulation Department when construction begins.

A DiLorenzo

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
RECEIVED
DEC 29 2010
REGULATION DEPT. SARASOTA

BRENT SETCHELL, P.E. DATE 12-21-10

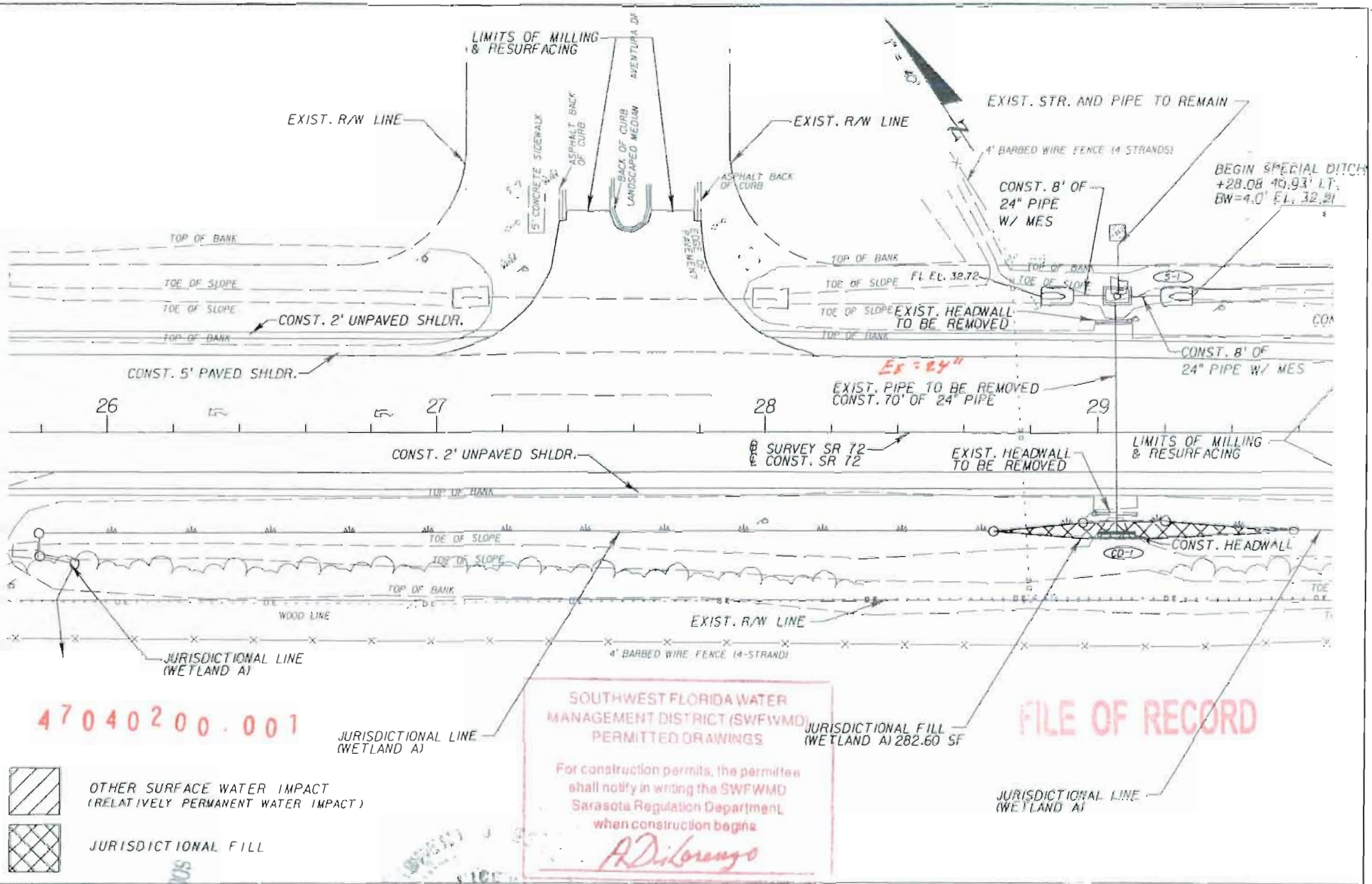
P.E. NUMBER 63134

FL. DEPT. OF TRANSPORTATION
801 N. BROADWAY AVE.
BARTOW, FL 33831

FLORIDA DEPARTMENT OF TRANSPORTATION
SR 72 RESURFACING

STATE ROAD NO. 72 SARASOTA COUNTY

	BY	
		FROM PROCTOR RD. TO E. OF SADDLE CREEK TR.
DRAWN	MWS	F.P.I.D. 425254-1-52-01 SHEET 3 OF 17
CHECKED	JRW	



47040200.001

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD) PERMITTED DRAWINGS

For construction permits, the permittee shall notify in writing the SWFWMD Sarasota Regulation Department when construction begins.

A Dibrango

FILE OF RECORD

DEC 29 2010
FDOT SARASOTA

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

Brent Setchell 63134 12-21-10
BRENT SETCHELL, P.E. DATE

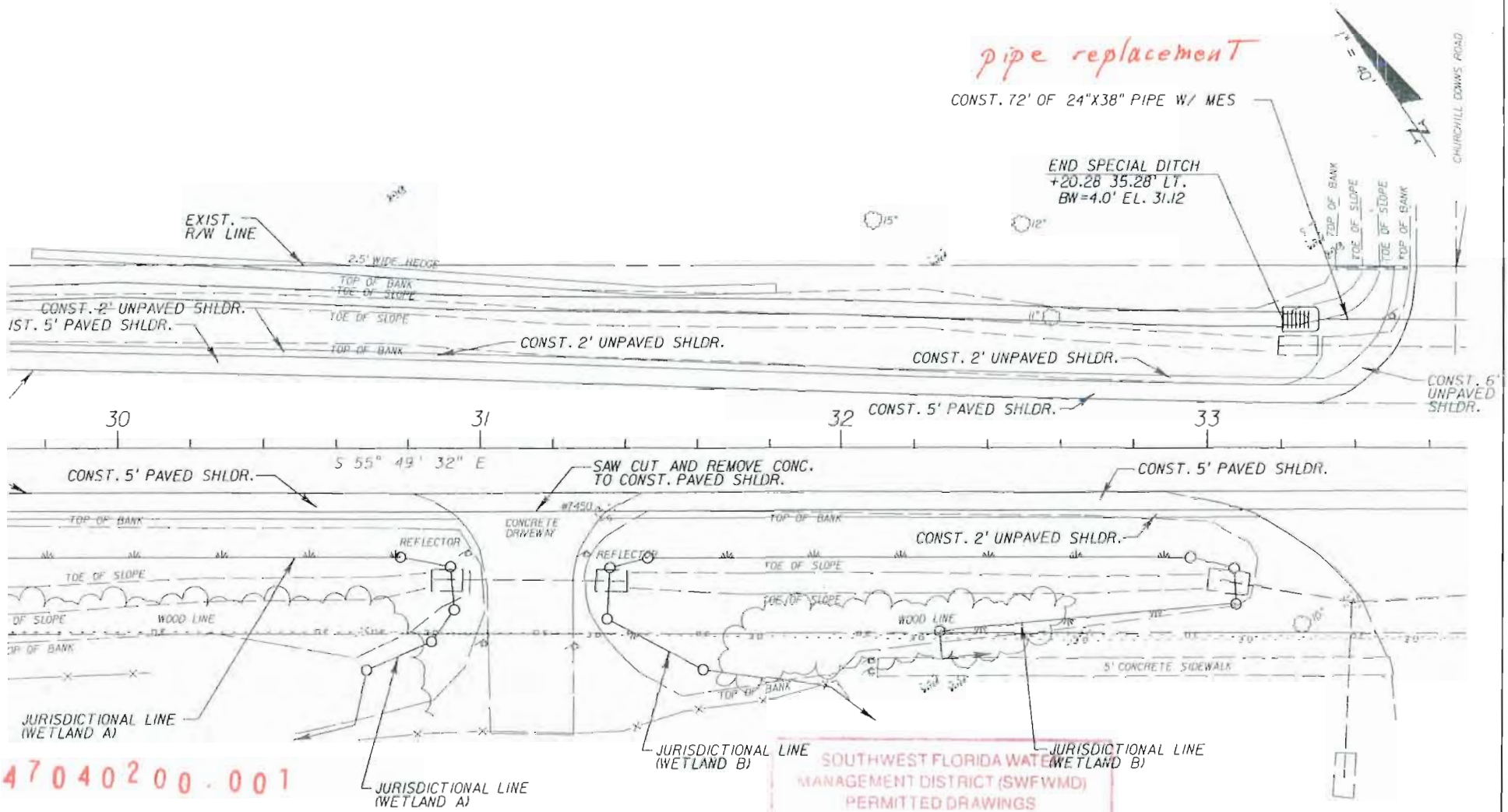
P.E. NUMBER 63134

FL. DEPT. OF TRANSPORTATION
801 N. BROADWAY AVE.
BARTOW, FL 33831

FLORIDA DEPARTMENT OF TRANSPORTATION
SR 72 RESURFACING

STATE ROAD NO. 72 SARASOTA COUNTY

	BY	FROM PROCTOR RD. TO E. OF SADDLE CREEK TR.
DRAWN	MWS	
CHECKED	JRW	F.P.I.D. 425254-1-52-01 SHEET 4 OF 17



47040200.001

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD) PERMITTED DRAWINGS

For construction permits, the permittee shall notify in writing the SWFWMD Sarasota Regulation Department, when construction begins.

A Dilorenzo

FILE OF RECORD

DEC 29 2010 SARASOTA

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

DRAWN

12-21-10

BRENT SETCHELL, P.E. DATE

P.E. NUMBER 63134

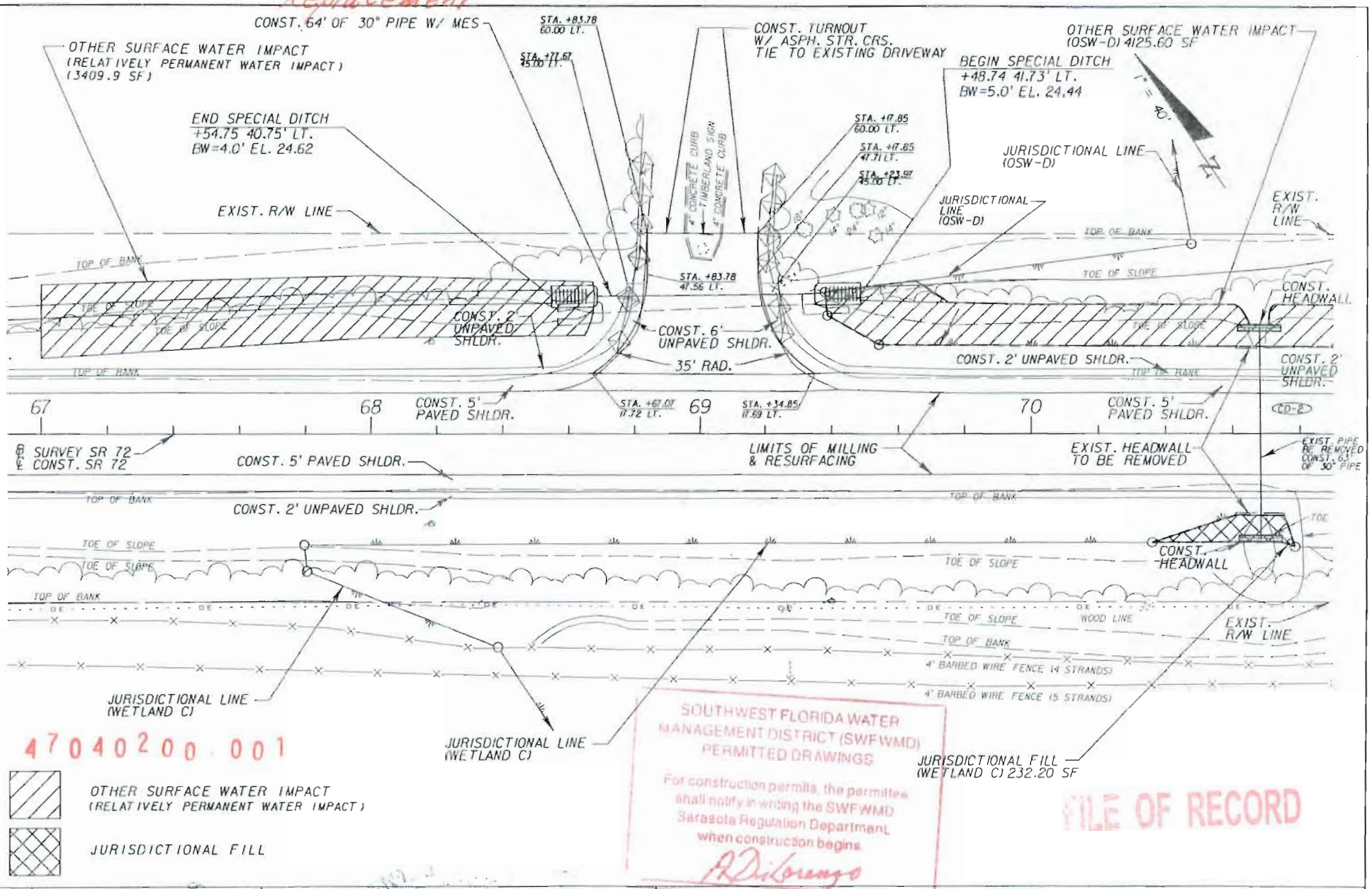
FL. DEPT. OF TRANSPORTATION
801 N. BROADWAY AVE.
BARTOW, FL. 33831

FLORIDA DEPARTMENT OF TRANSPORTATION
SR 72 RESURFACING

STATE ROAD NO. 72 SARASOTA COUNTY

	BY	FROM PROCTOR RD. TO E. OF SADDLE CREEK TR.	
DRAWN	MWS		
CHECKED	JRW	F.P.I.D. 425254-1-52-01	SHEET 5 OF 17

Replacement



4704020.001

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD) PERMITTED DRAWINGS

For construction permits, the permittee shall notify in writing the SWFWMD Sarasota Regulation Department when construction begins.

A DiGrango

FILE OF RECORD

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
RECEIVED
DEC 29 2010
REGULATION DEPT. SARASOTA

Brent Setchell 12-21-10
BRENT SETCHELL, P.E. DATE

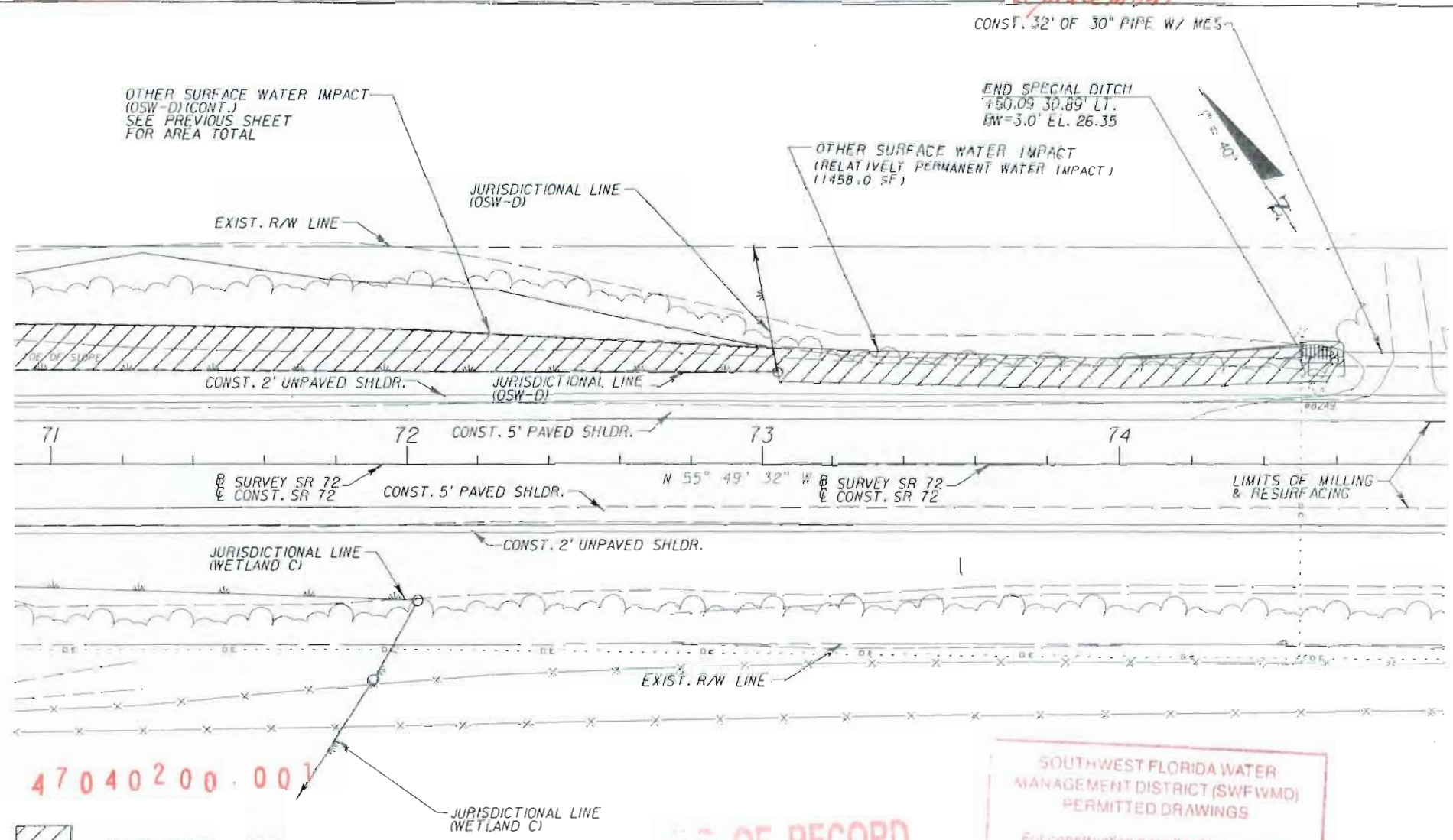
P.E. NUMBER 63134
FL. DEPT. OF TRANSPORTATION
801 N. BROADWAY AVE.
BARTOW, FL 33831

FLORIDA DEPARTMENT OF TRANSPORTATION
SR 72 RESURFACING

STATE ROAD NO. 72 SARASOTA COUNTY

	BY	FROM PROCTOR RD. TO E. OF SADDLE CREEK TR.	
DRAWN	MWS	F.P.I.D. 425254-1-52-01	SHEET 6 OF 17
CHECKED	JRW		

Replacement



47040200.001

OTHER SURFACE WATER IMPACT
(RELATIVELY PERMANENT WATER IMPACT)

JURISDICTIONAL FILL

TITLE OF RECORD

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD) PERMITTED DRAWINGS

For construction permits, the permittee shall notify in writing the SWFWMD Sarasota Regulation Department, when construction begins.

R DiLorenzo

DEC 29 2010
FDOT SARASOTA
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

B A Setchell 12-21-10
BRENT SETCHELL, P.E. DATE

P.E. NUMBER 63134
FL. DEPT. OF TRANSPORTATION
801 N. BROADWAY AVE.
BARTOW, FL 33831

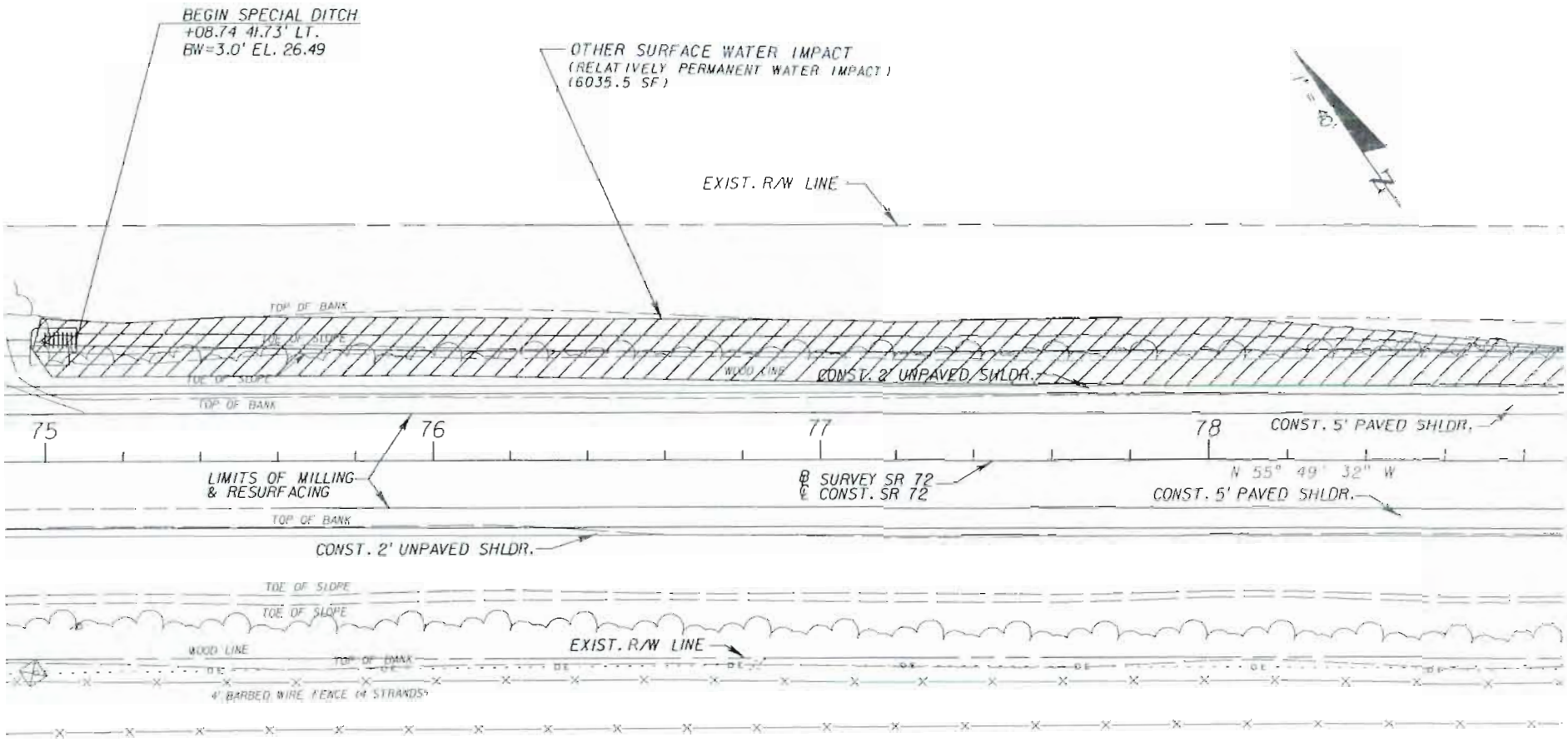
FLORIDA DEPARTMENT OF TRANSPORTATION
SR 72 RESURFACING

STATE ROAD NO. 72 SARASOTA COUNTY

	BY
DRAWN	MBS
CHECKED	JRW

FROM PROCTOR RD. TO E. OF SADDLE CREEK TR.

F.P.I.D. 425254-1-52-01 SHEET 7 OF 17



47040200.001

OTHER SURFACE WATER IMPACT
(RELATIVELY PERMANENT WATER IMPACT)

JURISDICTIONAL FILL

BRENT SETCHELL, P.E. 12-21-10
DATE

P.E. NUMBER 63134

FL. DEPT. OF TRANSPORTATION
801 N. BROADWAY AVE.
BARTOW, FL 33831

FLORIDA DEPARTMENT OF TRANSPORTATION
SR 72 RESURFACING

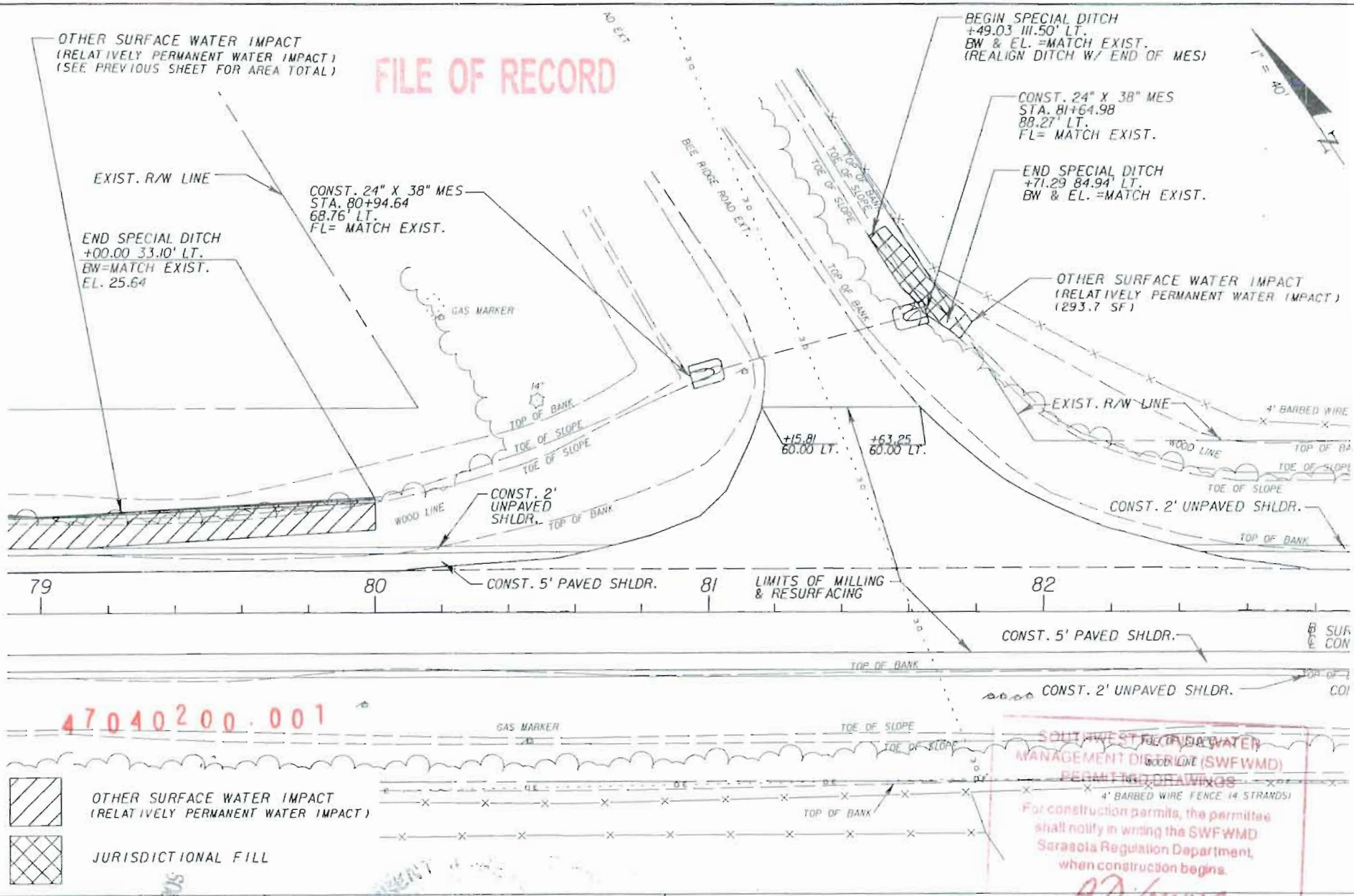
STATE ROAD NO. 72 SARASOTA COUNTY

	BY
DRAWN	RWS
CHECKED	JRW

FROM PROCTOR RD. TO E. OF SADDLE CREEK TR.

F.P.I.D. 425254-1-52-01

SHEET 8 OF 17



SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD)
PERMIT NUMBER DRAWINGS
For construction permits, the permittee shall notify in writing the SWFWMD Sarasota Regulation Department, when construction begins.

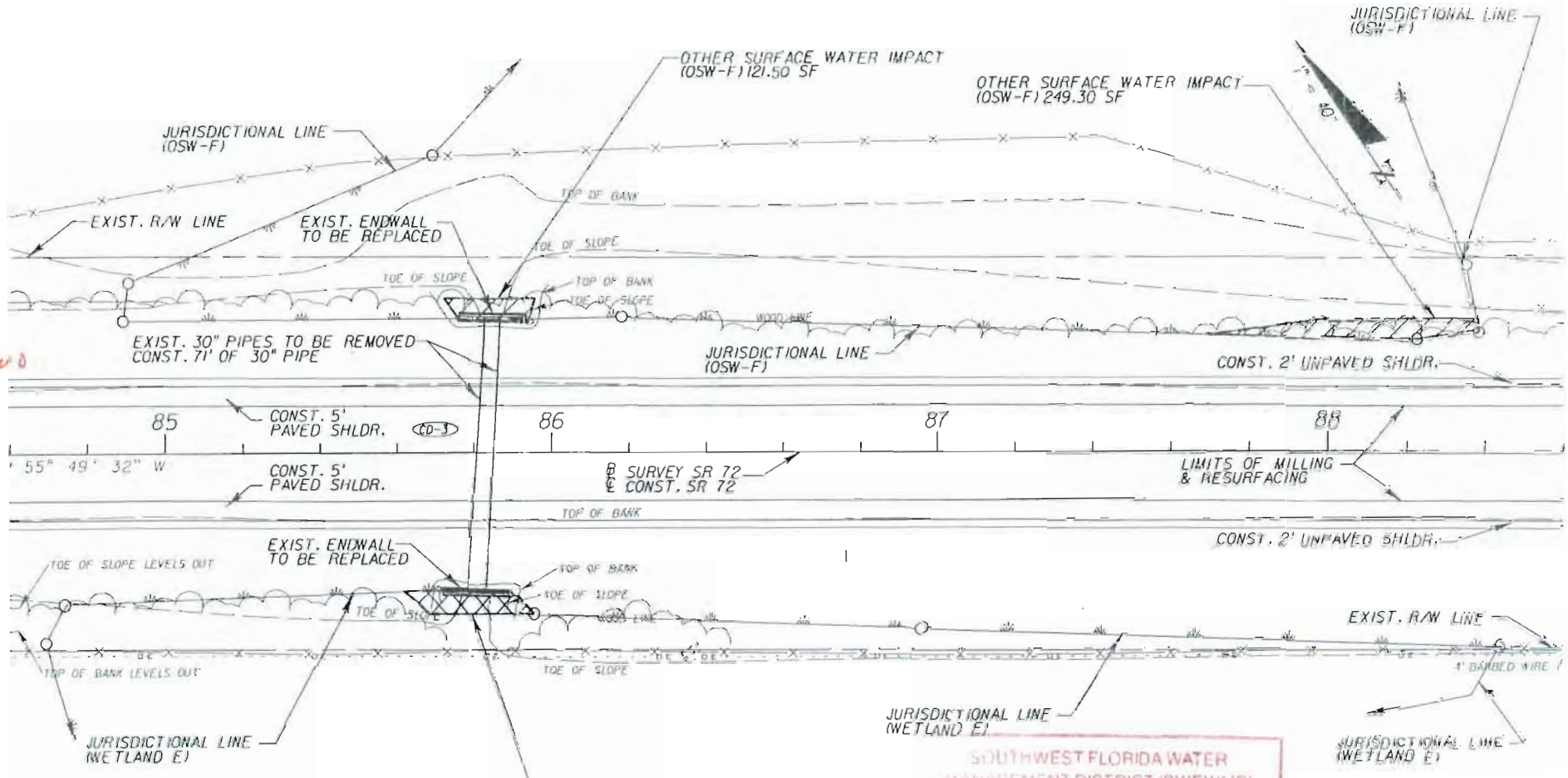
RECEIVED
DEC 29 2010
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
SARASOTA

Bt Setchell 12-21-10
BRENT SETCHELL, P.E. DATE
P.E. NUMBER 53134
FL. DEPT. OF TRANSPORTATION
801 N. BROADWAY AVE.
BARTOW, FL 33831

FLORIDA DEPARTMENT OF TRANSPORTATION
SR 72 RESURFACING

STATE ROAD NO. 72 SARASOTA COUNTY

	BY	FROM PROCTOR RD. TO E. OF SADDLE CREEK TR.	
DRAWN	MWS	F.P.I.D. 425254-1-52-01	SHEET 9 OF 17
CHECKED	JRW		



47040200.001

OTHER SURFACE WATER IMPACT
(RELATIVELY PERMANENT WATER IMPACT)

JURISDICTIONAL FILL

TITLE OF RECORD

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD) PERMITTED DRAWINGS

For construction permits, the permittee shall notify in writing the SWFWMD Sarasota Regulation Department, when construction begins.

R DiLorenzo

RECEIVED
DEC 29 2010
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
REGULATION

BRENT SETCHELL, P.E. 12-21-10
DATE

P.E. NUMBER 63134

FL. DEPT. OF TRANSPORTATION
801 N. BROADWAY AVE.
BARTOW, FL 33831

FLORIDA DEPARTMENT OF TRANSPORTATION
SR 72 RESURFACING

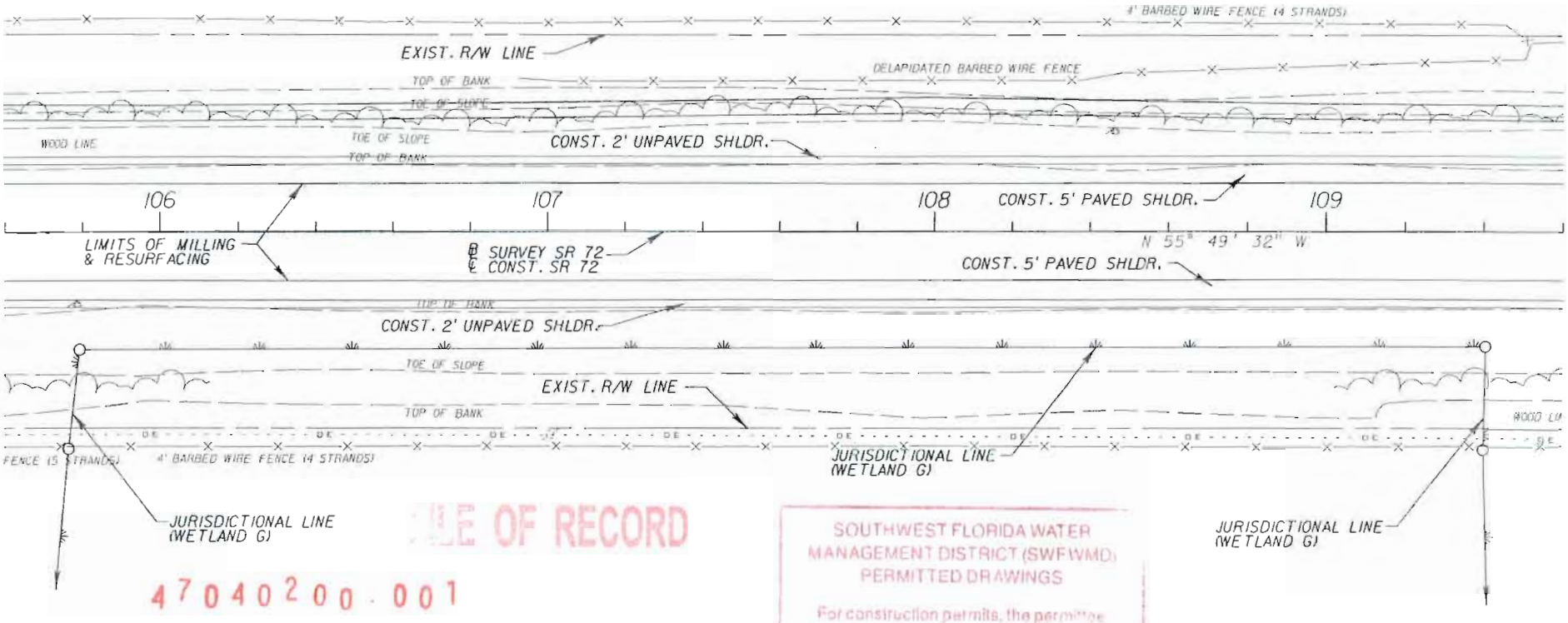
STATE ROAD NO. 72 SARASOTA COUNTY

FROM PROCTOR RD. TO E. OF SADDLE CREEK TR.

	BY
DRAWN	MWS
CHECKED	JRW

F.P.I.D. 425254-1-52-01

SHEET 10 OF 17



OTHER SURFACE WATER IMPACT
(RELATIVELY PERMANENT WATER IMPACT)

JURISDICTIONAL FILL

LE OF RECORD

47040200.001

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD) PERMITTED DRAWINGS

For construction permits, the permittee shall notify in writing the SWFWMD Sarasota Regulation Department when construction begins.

A DiLorenzo

RECEIVED DEC 29 2010 SARASOTA

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

12-21-10

BRENT SETCHELL, P.E. DATE

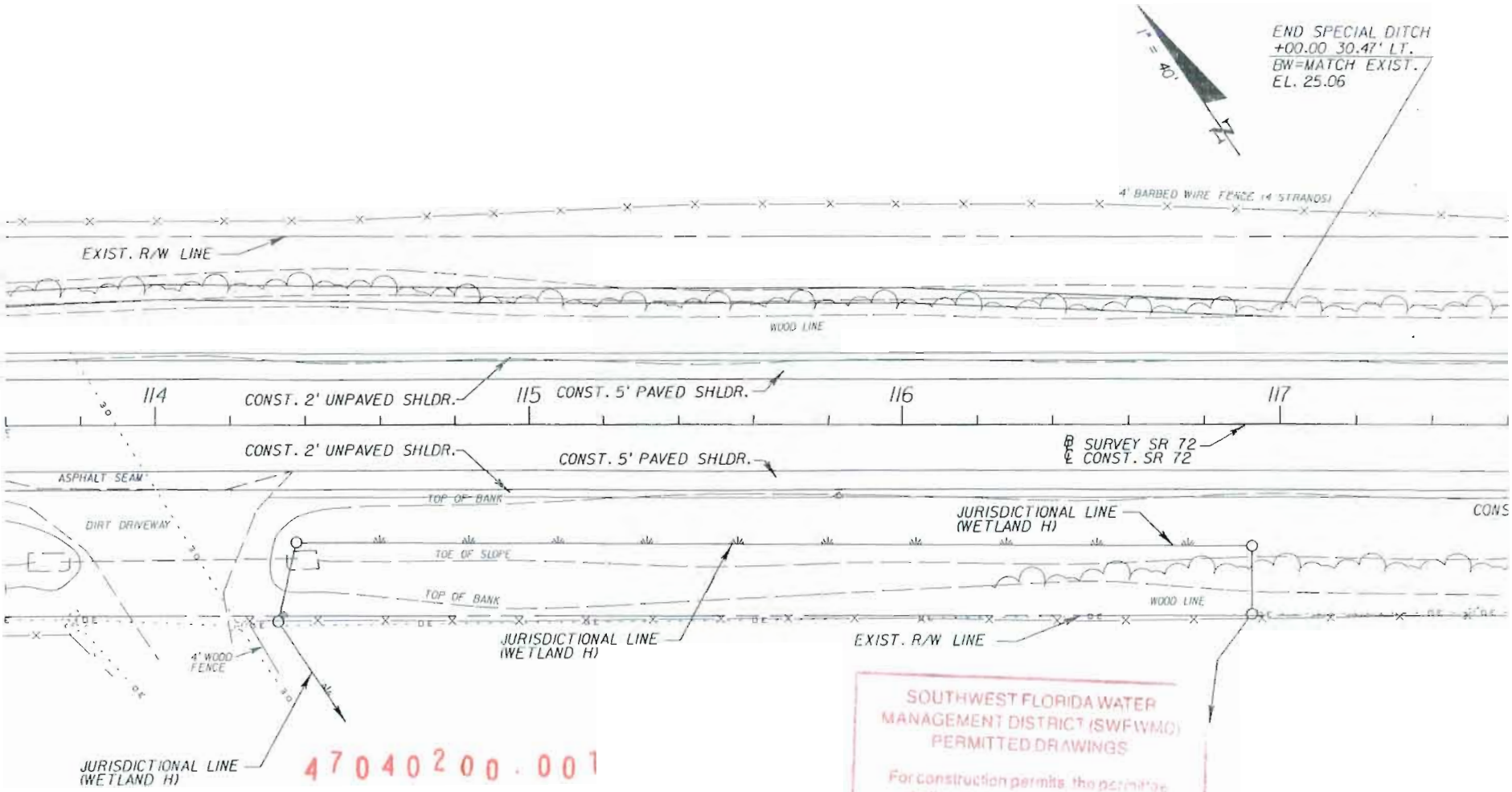
P.E. NUMBER 63134

FL. DEPT. OF TRANSPORTATION
801 N. BROADWAY AVE.
BARTOW, FL 33831

FLORIDA DEPARTMENT OF TRANSPORTATION
SR 72 RESURFACING

STATE ROAD NO. 72 SARASOTA COUNTY

	BY	FROM PROCTOR RD. TO E. OF SADDLE CREEK TR.	
DRAWN	MWS	F.P.I.D. 425254-1-52-01	SHEET 11 OF 17
CHECKED	JRW		



47040200.001

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD)
PERMITTED DRAWINGS

For construction permits, the permittee shall notify in writing the SWFWMD Sarasota Regulation Department when construction begins.

A DiLorenzo

FILE OF RECORD

RECEIVED
DEC 29 2010
FLORIDA DEPARTMENT OF TRANSPORTATION
SARASOTA

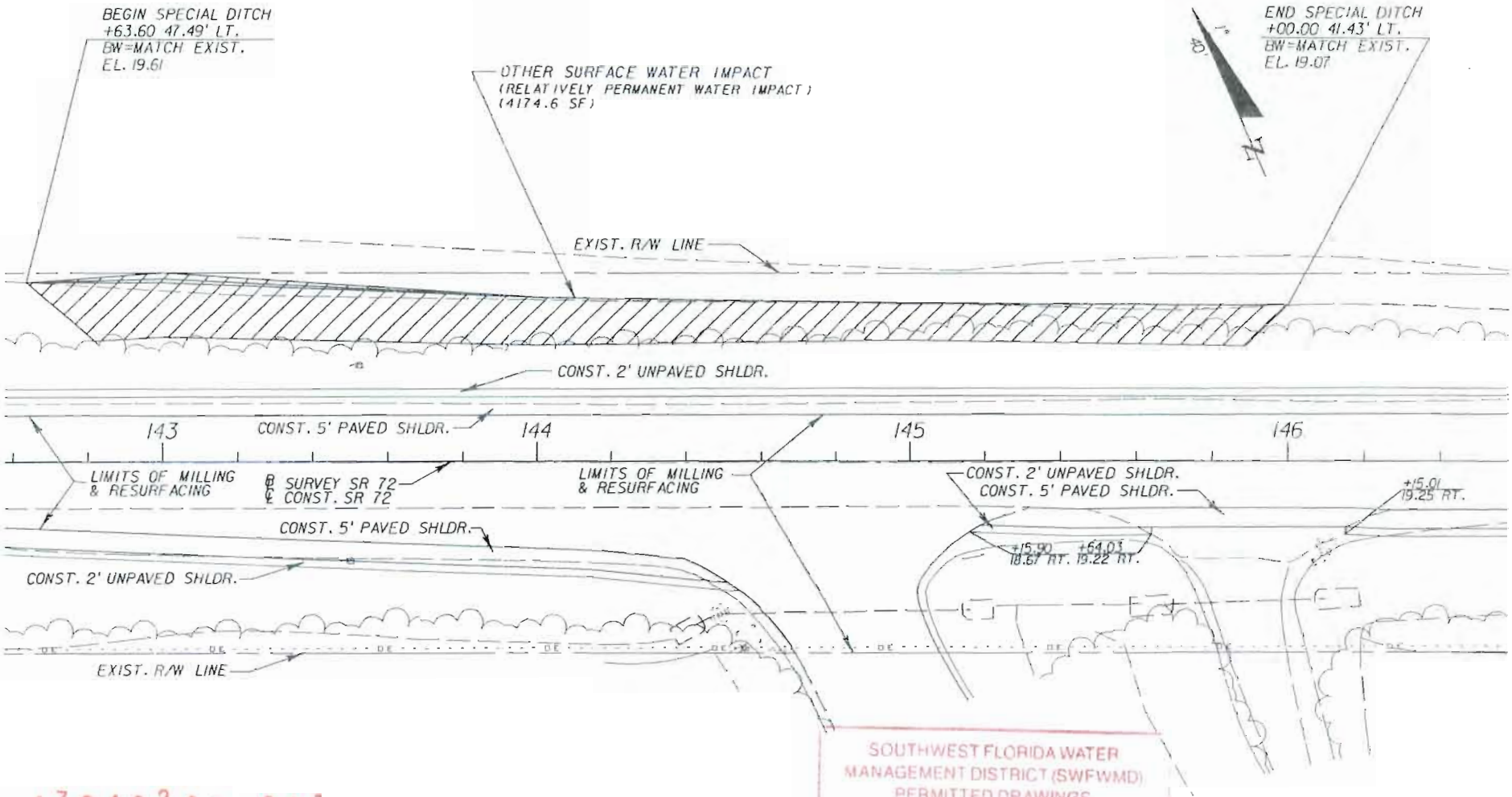
B. Setchell 12-21-10
BRENT SETCHELL, P.E. DATE

P.E. NUMBER 63134
FL. DEPT. OF TRANSPORTATION
801 N. BROADWAY AVE.
BARTOW, FL 33831

FLORIDA DEPARTMENT OF TRANSPORTATION
SR 72 RESURFACING

STATE ROAD NO. 72 SARASOTA COUNTY

	BY	FROM PROCTOR RD. TO E. OF SADDLE CREEK TR.	
DRAWN	MWS	F.P.I.D. 425254-1-52-01	SHEET 12 OF 17
CHECKED	JRW		



47040200.001

FILE OF RECORD

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD) PERMITTED DRAWINGS

For construction permits, the permittee shall notify in writing the SWFWMD Sarasota Regulation Department, when construction begins.

A DiLorenzo

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
DEC 29 2010
FR-SARASOTA

Brent Setchell 12-21-10
BRENT SETCHELL, P.E. DATE

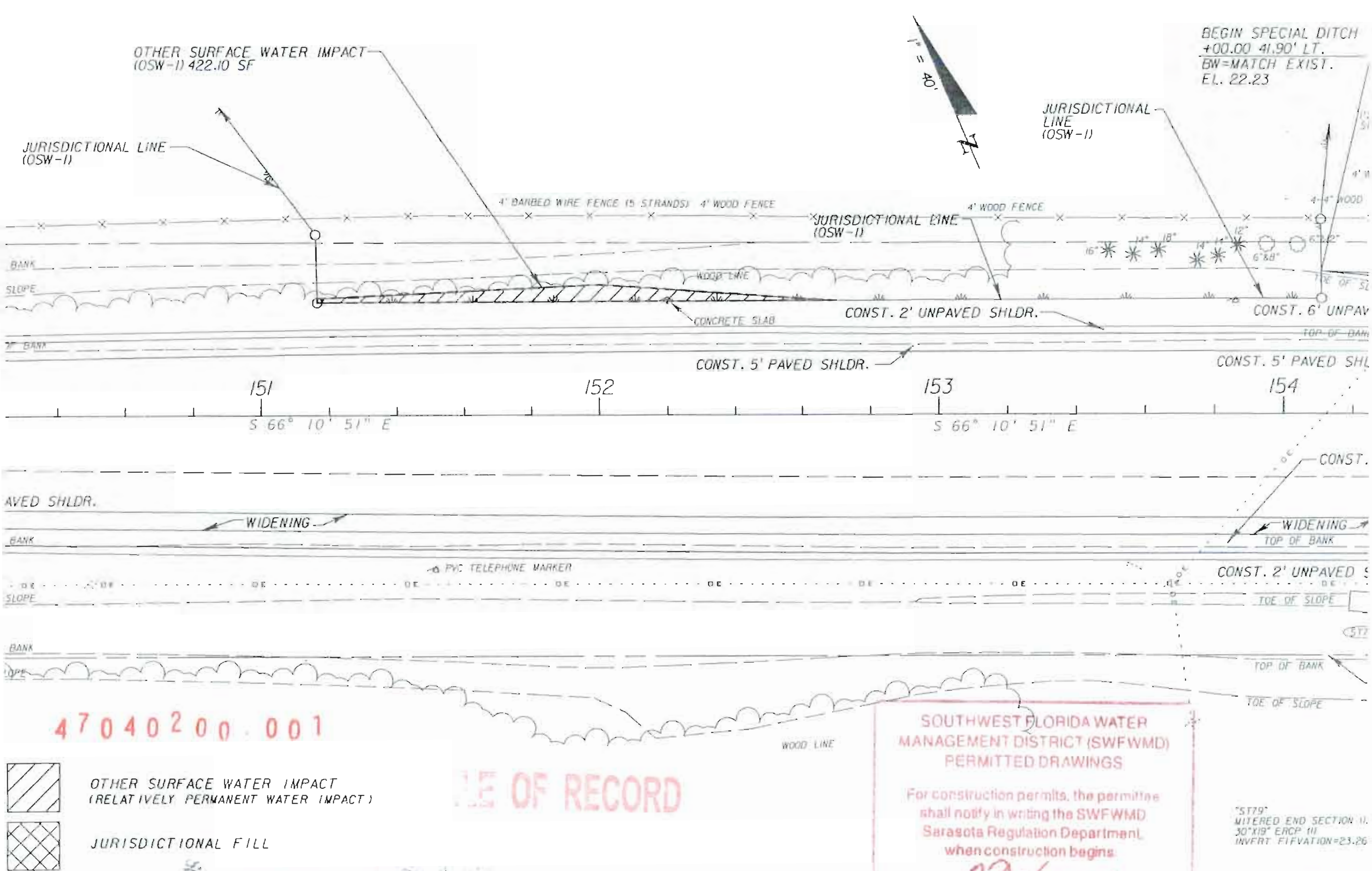
P.E. NUMBER 63134

FL. DEPT. OF TRANSPORTATION
801 N. BROADWAY AVE.
BARTOW, FL 33831

FLORIDA DEPARTMENT OF TRANSPORTATION
SR 72 RESURFACING

STATE ROAD NO. 72 SARASOTA COUNTY

	BY	FROM PROCTOR RD. TO E. OF SADDLE CREEK TR.	
DRAWN	MWS	F.P.I.D. 425254-1-52-01	SHEET 13 OF 17
CHECKED	JRW		



OTHER SURFACE WATER IMPACT (OSW-1) 422.10 SF
JURISDICTIONAL LINE (OSW-1)
1" = 40'
N
BEGIN SPECIAL DITCH +00.00 41.90' LT. BW=MATCH EXIST. EL. 22.23
JURISDICTIONAL LINE (OSW-1)
4' BARBED WIRE FENCE (5 STRANDS) 4' WOOD FENCE
JURISDICTIONAL LINE (OSW-1)
4' WOOD FENCE
WOOD LINE
CONCRETE SLAB
CONST. 2' UNPAVED SHLDR.
CONST. 6' UNPAV
CONST. 5' PAVED SHLDR.
CONST. 5' PAVED SHL
151
152
153
154
S 66° 10' 51" E
S 66° 10' 51" E
CONST.
AVED SHLDR.
WIDENING
WIDENING
TOP OF BANK
PVC TELEPHONE MARKER
CONST. 2' UNPAVED
TOE OF SLOPE
TOP OF BANK
TOE OF SLOPE
WOOD LINE
"ST79" MITERED END SECTION 30"X19" ERCP INVERT ELEVATION=23.26
47040200.001
OTHER SURFACE WATER IMPACT (RELATIVELY PERMANENT WATER IMPACT)
JURISDICTIONAL FILL
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD) PERMITTED DRAWINGS
For construction permits, the permittee shall notify in writing the SWFWMD Sarasota Regulation Department when construction begins.

DEC 29 2010
RR SARASOTA

Brent Setchell 12-21-10

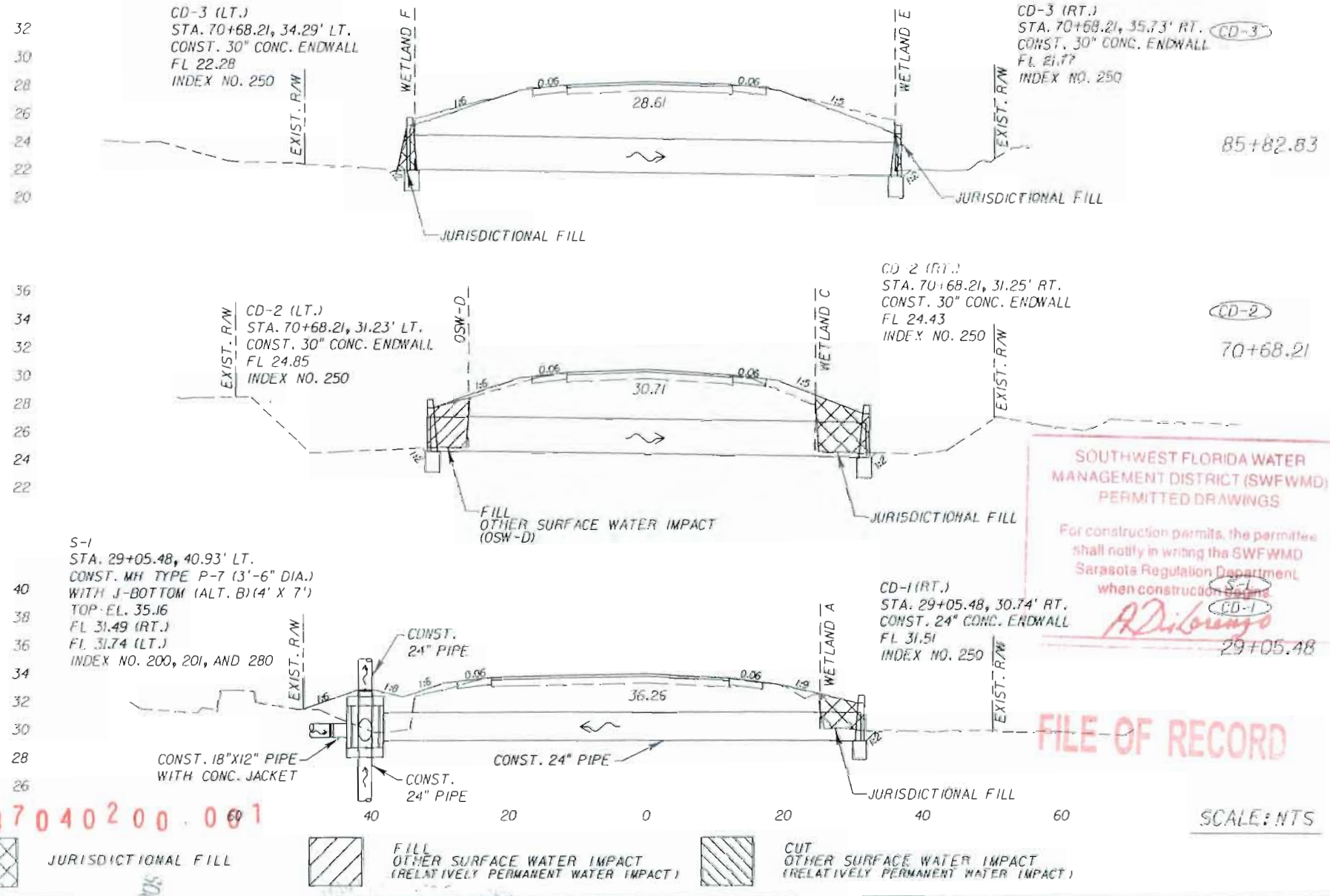
BRENT SETCHELL, P.E. DATE

P.E. NUMBER 63134

FL. DEPT. OF TRANSPORTATION
801 N. BROADWAY AVE.
BARTOW, FL 33831

FLORIDA DEPARTMENT OF TRANSPORTATION
SR 72 RESURFACING

STATE ROAD NO. 72		SARASOTA COUNTY
	BY	FROM PROCTOR RD. TO E. OF SADDLE CREEK TR.
DRAWN	MWS	
CHECKED	JRW	F.P.I.D. 425254-1-52-01 — SHEET 14 OF 17



SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD) PERMITTED DRAWINGS

For construction permits, the permittee shall notify in writing the SWFWMD Sarasota Regulation Department when construction begins.

FILE OF RECORD

47040200.001

RECEIVED DEC 29 2010 SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT SARASOTA

BRENT SETCHELL, P.E. 12-21-10
DATE

P.E. NUMBER 63134

FL. DEPT. OF TRANSPORTATION
801 N. BROADWAY AVE.
BARTOW, FL 33831

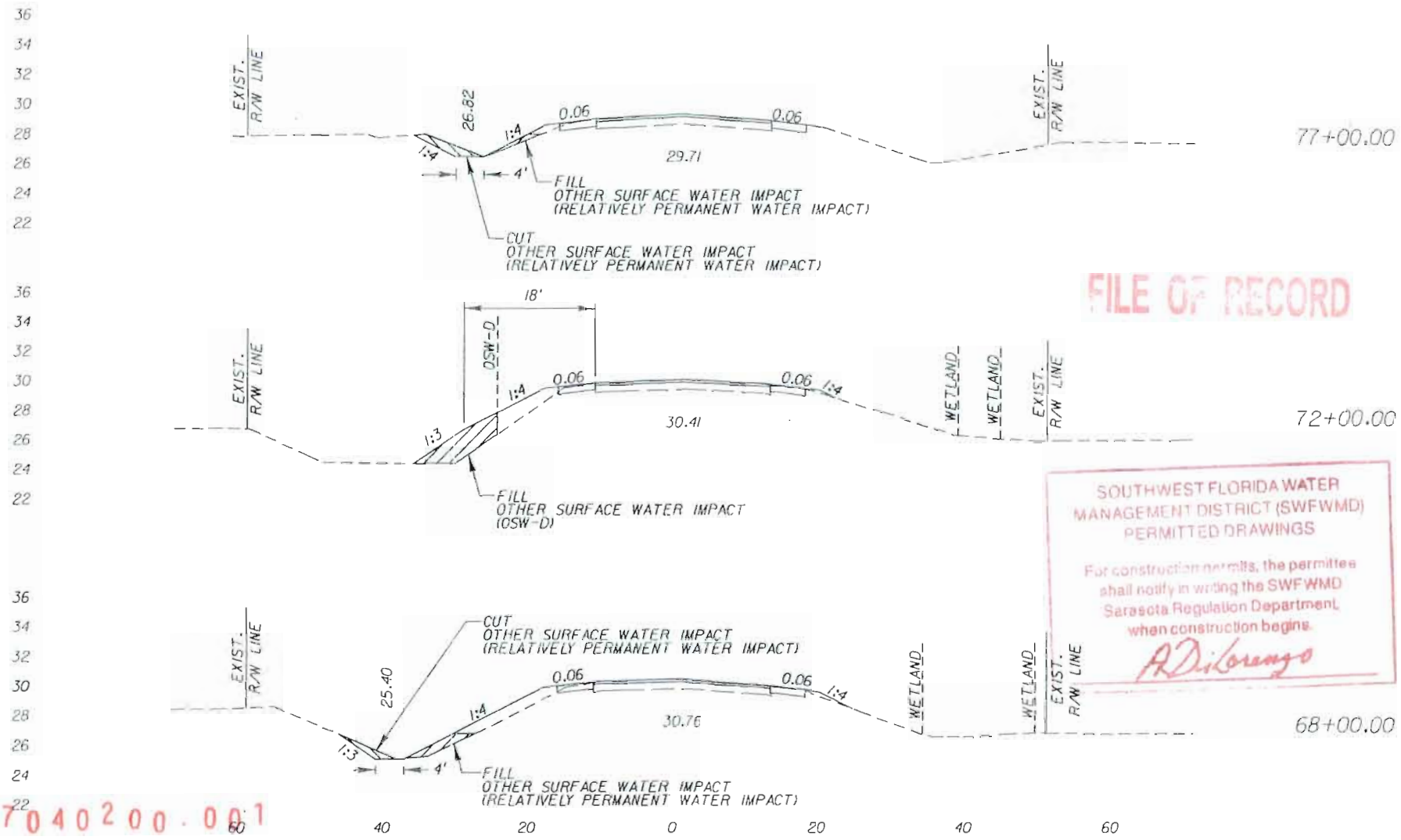
FLORIDA DEPARTMENT OF TRANSPORTATION
SR 72 RESURFACING

STATE ROAD NO. 72 SARASOTA COUNTY

FROM PROCTOR RD. TO E. OF SADDLE CREEK TR.

	BY
DRAWN	MNS
CHECKED	JRW

F.P.I.D. 425254-1-52-01 SHEET 15 OF 17



FILE OF RECORD

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT (SWFWMD) PERMITTED DRAWINGS

For construction permits, the permittee shall notify in writing the SWFWMD Sarasota Regulation Department when construction begins.

A DiLorenzo

4704020.0001

SCALE: NTS

JURISDICTIONAL FILL

FILL OTHER SURFACE WATER IMPACT (RELATIVELY PERMANENT WATER IMPACT)

CUT OTHER SURFACE WATER IMPACT (RELATIVELY PERMANENT WATER IMPACT)

RECEIVED DEC 29 2010 REG. SARASOTA

Brent Setchell 12-21-10
BRENT SETCHELL, P.E. DATE

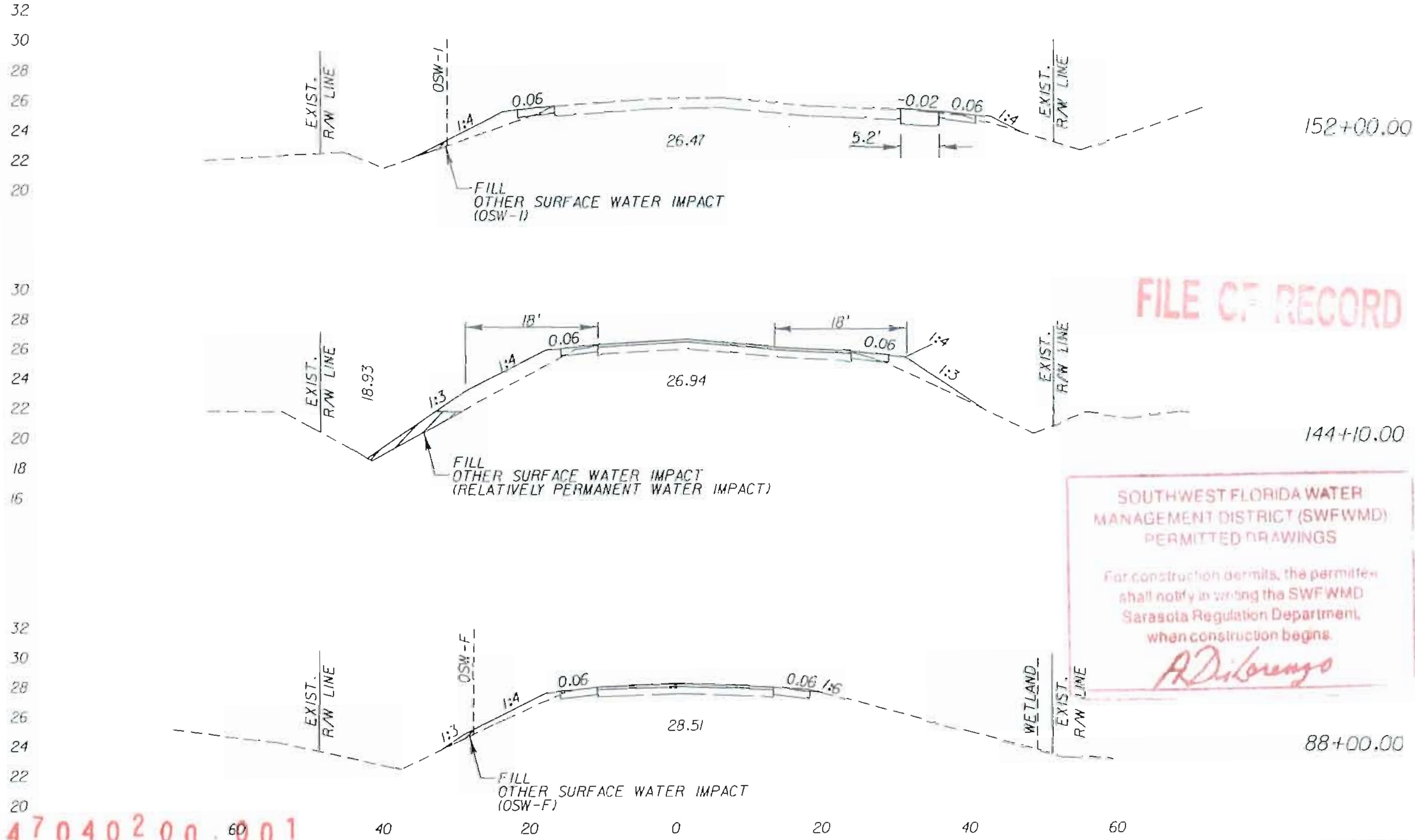
P.E. NUMBER 63134

FL. DEPT. OF TRANSPORTATION
801 N. BROADWAY AVE.
BARTOW, FL 33831

FLORIDA DEPARTMENT OF TRANSPORTATION
SR 72 RESURFACING

STATE ROAD NO. 72 SARASOTA COUNTY

	BY	FROM PROCTOR RD. TO E. OF SADDLE CREEK TR.	
DRAWN	MWS	F.P.I.D. 425254-1-52-01	SHEET 16 OF 17
CHECKED	JRW		



JURISDICTIONAL FILL

FILL
OTHER SURFACE WATER IMPACT
(RELATIVELY PERMANENT WATER IMPACT)

CUT
OTHER SURFACE WATER IMPACT
(RELATIVELY PERMANENT WATER IMPACT)

Brent Setchell 12-21-10

BRENT SETCHELL, P.E. DATE

P.E. NUMBER 63134

FL. DEPT. OF TRANSPORTATION
801 N. BROADWAY AVE.
BARTOW, FL 33831

FLORIDA DEPARTMENT OF TRANSPORTATION
SR 72 RESURFACING

STATE ROAD NO. 72			SARASOTA COUNTY
	BY	FROM PROCTOR RD. TO E. OF SADDLE CREEK TR.	
DRAWN	MWS	F.P.I.D. 425254-1-52-01	SHEET 17 OF 17
CHECKED	JRW		

APPENDIX C – EXISTING CROSS DRAIN ANALYSIS

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 57.27 cfs

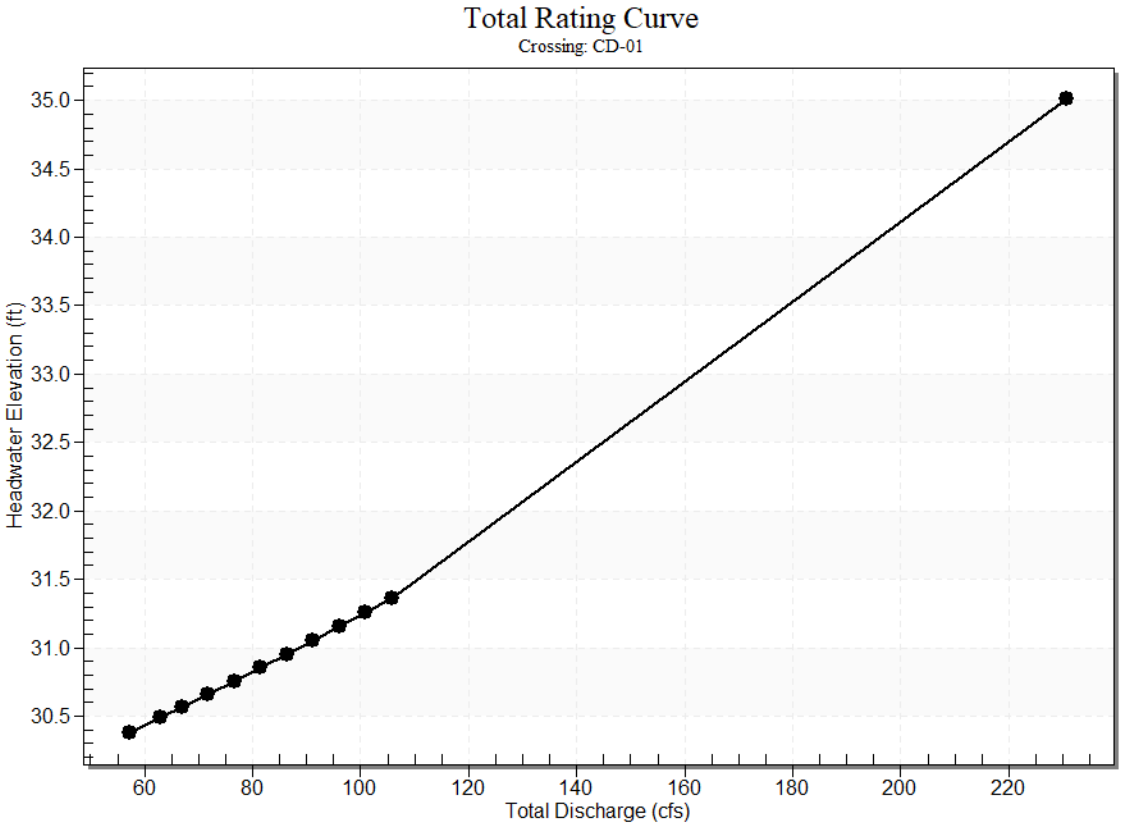
Design Flow: 62.89 cfs

Maximum Flow: 105.73 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-01

Headwater Elevation (ft)	Total Discharge (cfs)	Pre Discharge (cfs)	Roadway Discharge (cfs)	Iterations
30.38	57.27	57.27	0.00	1
30.49	62.89	62.89	0.00	1
30.57	66.96	66.96	0.00	1
30.66	71.81	71.81	0.00	1
30.76	76.65	76.65	0.00	1
30.85	81.50	81.50	0.00	1
30.95	86.35	86.35	0.00	1
31.05	91.19	91.19	0.00	1
31.15	96.04	96.04	0.00	1
31.26	100.88	100.88	0.00	1
31.36	105.73	105.73	0.00	1
35.00	226.51	226.51	0.00	Overtopping

Rating Curve Plot for Crossing: CD-01



Culvert Data: Pre

Table 1 - Culvert Summary Table: Pre

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)
57.27 cfs	57.27 cfs	30.38	2.37	3.771	4-FFf	-1.00	1.65	3.50	4.22	2.98	0.71
62.89 cfs	62.89 cfs	30.49	2.50	3.882	4-FFf	-1.00	1.73	3.50	4.28	3.27	0.68
66.96 cfs	66.96 cfs	30.57	2.59	3.960	4-FFf	-1.00	1.79	3.50	4.32	3.48	0.67
71.81 cfs	71.81 cfs	30.66	2.70	4.053	4-FFf	-1.00	1.86	3.50	4.36	3.73	0.66
76.65 cfs	76.65 cfs	30.76	2.80	4.147	4-FFf	-1.00	1.92	3.50	4.40	3.98	0.66
81.50 cfs	81.50 cfs	30.85	2.90	4.242	4-FFf	-1.00	1.99	3.50	4.44	4.24	0.66

86.35 cfs	86.35 cfs	30.95	3.00	4.340	4-FFf	-1.00	2.05	3.50	4.48	4.49	0.66
91.19 cfs	91.19 cfs	31.05	3.10	4.439	4-FFf	-1.00	2.11	3.50	4.51	4.74	0.66
96.04 cfs	96.04 cfs	31.15	3.20	4.541	4-FFf	-1.00	2.16	3.50	4.55	4.99	0.66
100.88 cfs	100.88 cfs	31.26	3.31	4.645	4-FFf	-1.00	2.22	3.50	4.58	5.24	0.66
105.73 cfs	105.73 cfs	31.36	3.41	4.752	4-FFf	-1.00	2.27	3.50	4.61	5.49	0.67

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

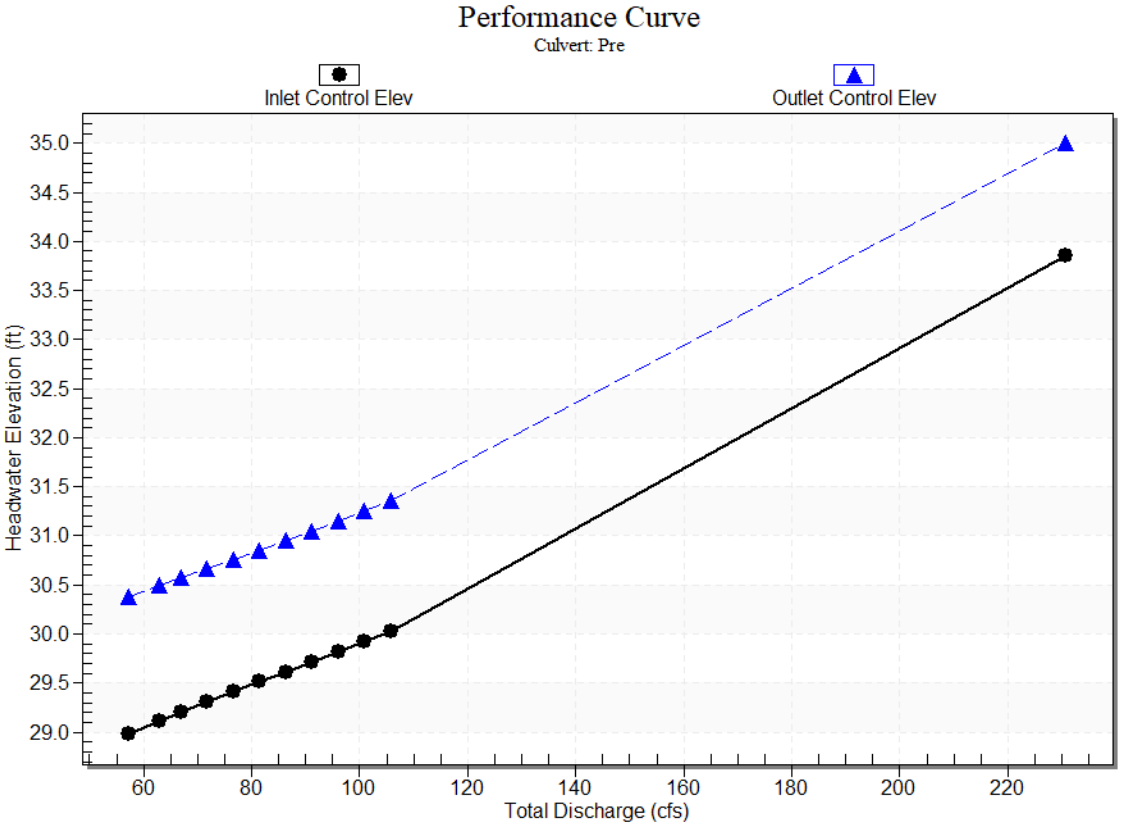
Inlet Elevation (invert): 26.61 ft,

Outlet Elevation (invert): 26.61 ft

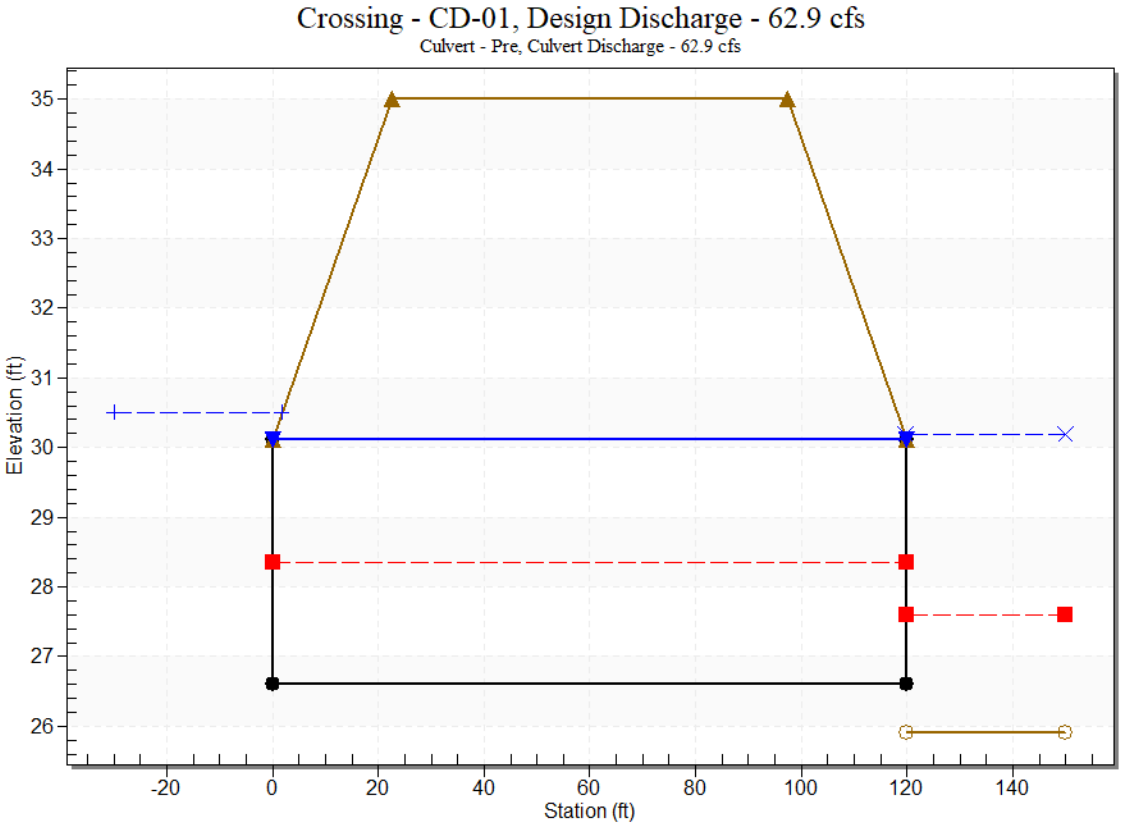
Culvert Length: 120.00 ft,

Culvert Slope: 0.0000

Culvert Performance Curve Plot: Pre



Water Surface Profile Plot for Culvert: Pre



Site Data - Pre

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 26.61 ft

Outlet Station: 120.00 ft

Outlet Elevation: 26.61 ft

Number of Barrels: 2

Culvert Data Summary - Pre

Barrel Shape: Circular

Barrel Diameter: 3.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Beveled Edge (1:1) (Ke=0.2)

Inlet Depression: None

Tailwater Data for Crossing: CD-01

Table 2 - Downstream Channel Rating Curve (Crossing: CD-01)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
57.27	30.13	4.22	0.71	0.34	0.19
62.89	30.19	4.28	0.68	0.35	0.18
66.96	30.23	4.32	0.67	0.35	0.17
71.81	30.27	4.36	0.66	0.35	0.16
76.65	30.31	4.40	0.66	0.36	0.15
81.50	30.35	4.44	0.66	0.36	0.15
86.35	30.39	4.48	0.66	0.36	0.14
91.19	30.42	4.51	0.66	0.37	0.14
96.04	30.46	4.55	0.66	0.37	0.14
100.88	30.49	4.58	0.66	0.37	0.14
105.73	30.52	4.61	0.67	0.37	0.13

Tailwater Channel Data - CD-01

Tailwater Channel Option: Irregular Channel

Channel Slope: Irregular Channel

User Defined Channel Cross-Section

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	-0.10	50.12	0.1000
2	0.00	35.15	0.1000
3	7.50	35.10	0.0800
4	27.00	26.28	0.0800
5	30.00	25.91	0.0800
6	32.00	26.42	0.0800
7	38.00	29.03	0.0800
8	48.00	29.51	0.0800
9	65.00	29.92	0.1000
10	220.00	30.17	0.1000
11	220.10	45.12	0.0000

Roadway Data for Crossing: CD-01

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 1500.00 ft

Crest Elevation: 35.00 ft

Roadway Surface: Paved

Roadway Top Width: 75.00 ft

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 51.92 cfs

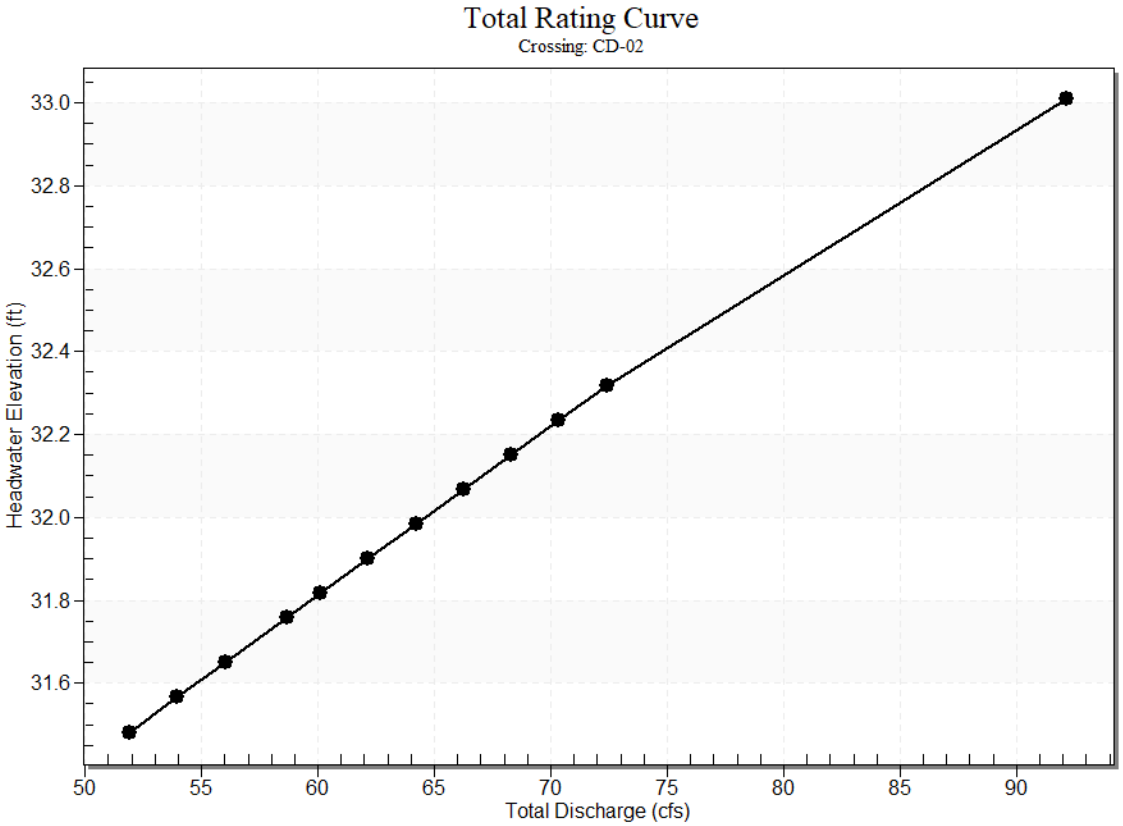
Design Flow: 58.65 cfs

Maximum Flow: 72.40 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-02

Headwater Elevation (ft)	Total Discharge (cfs)	Pre Discharge (cfs)	Roadway Discharge (cfs)	Iterations
31.48	51.92	51.92	0.00	1
31.57	53.97	53.97	0.00	1
31.65	56.02	56.02	0.00	1
31.76	58.65	58.65	0.00	1
31.82	60.11	60.11	0.00	1
31.90	62.16	62.16	0.00	1
31.98	64.21	64.21	0.00	1
32.07	66.26	66.26	0.00	1
32.15	68.30	68.30	0.00	1
32.23	70.35	70.35	0.00	1
32.32	72.40	72.40	0.00	1
33.00	88.83	88.83	0.00	Overtopping

Rating Curve Plot for Crossing: CD-02



Culvert Data: Pre

Table 1 - Culvert Summary Table: Pre

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)
51.92 cfs	51.92 cfs	31.48	2.38	3.111	1-S1f	1.44	1.64	3.00	3.13	3.67	0.74
53.97 cfs	53.97 cfs	31.57	2.44	3.196	1-S1f	1.48	1.68	3.00	3.18	3.82	0.75
56.02 cfs	56.02 cfs	31.65	2.49	3.281	1-S1f	1.51	1.71	3.00	3.24	3.96	0.75
58.65 cfs	58.65 cfs	31.76	2.56	3.388	4-FFf	1.55	1.75	3.00	3.31	4.15	0.76
60.11 cfs	60.11 cfs	31.82	2.60	3.447	4-FFf	1.57	1.78	3.00	3.35	4.25	0.77
62.16 cfs	62.16 cfs	31.90	2.65	3.531	4-FFf	1.61	1.81	3.00	3.40	4.40	0.77

64.21 cfs	64.21 cfs	31.98	2.71	3.614	4-FFf	1.64	1.84	3.00	3.46	4.54	0.78
66.26 cfs	66.26 cfs	32.07	2.76	3.697	4-FFf	1.67	1.87	3.00	3.51	4.69	0.79
68.30 cfs	68.30 cfs	32.15	2.82	3.780	4-FFf	1.70	1.90	3.00	3.56	4.83	0.79
70.35 cfs	70.35 cfs	32.23	2.87	3.864	4-FFf	1.73	1.93	3.00	3.61	4.98	0.80
72.40 cfs	72.40 cfs	32.32	2.93	3.948	4-FFf	1.77	1.96	3.00	3.65	5.12	0.80

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

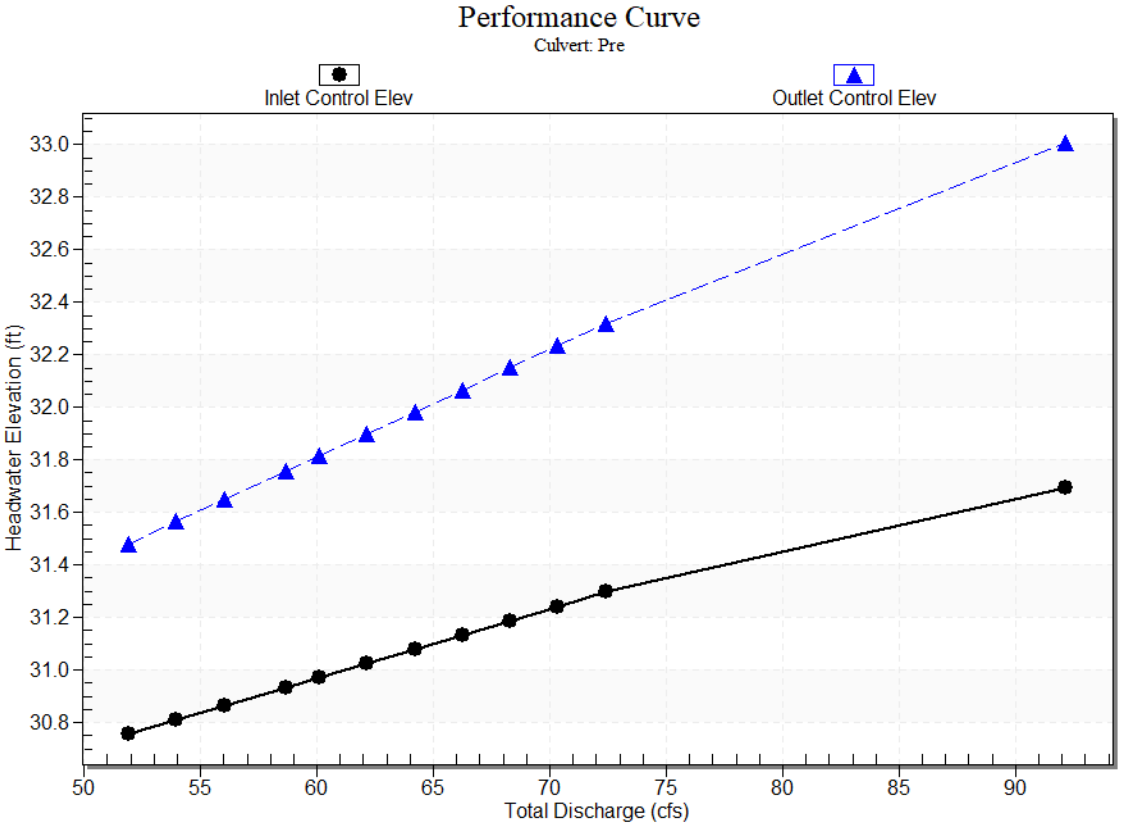
Inlet Elevation (invert): 28.37 ft,

Outlet Elevation (invert): 28.03 ft

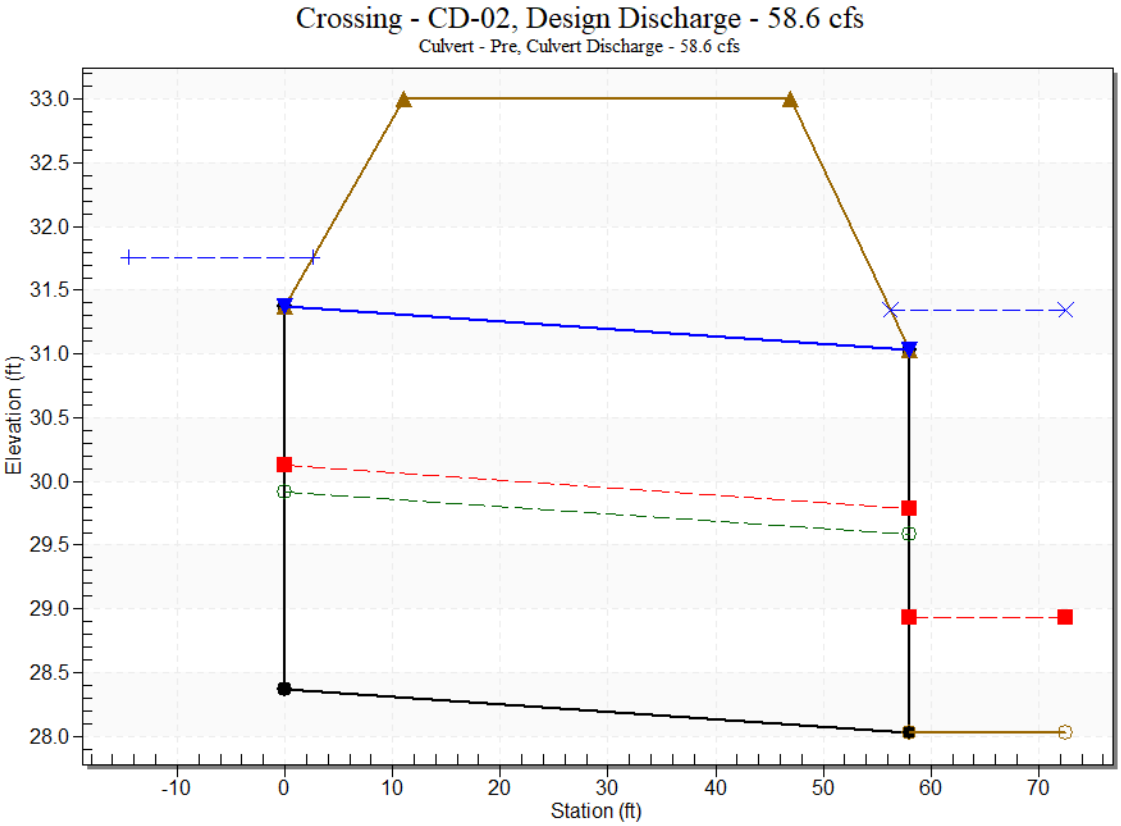
Culvert Length: 58.00 ft,

Culvert Slope: 0.0059

Culvert Performance Curve Plot: Pre



Water Surface Profile Plot for Culvert: Pre



Site Data - Pre

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 28.37 ft

Outlet Station: 58.00 ft

Outlet Elevation: 28.03 ft

Number of Barrels: 2

Culvert Data Summary - Pre

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Beveled Edge (1:1) (Ke=0.2)

Inlet Depression: None

Tailwater Data for Crossing: CD-02

Table 2 - Downstream Channel Rating Curve (Crossing: CD-02)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
51.92	31.16	3.13	0.74	0.20	0.09
53.97	31.21	3.18	0.75	0.20	0.09
56.02	31.27	3.24	0.75	0.20	0.09
58.65	31.34	3.31	0.76	0.21	0.09
60.11	31.38	3.35	0.77	0.21	0.09
62.16	31.43	3.40	0.77	0.21	0.09
64.21	31.49	3.46	0.78	0.22	0.09
66.26	31.54	3.51	0.79	0.22	0.09
68.30	31.59	3.56	0.79	0.22	0.09
70.35	31.64	3.61	0.80	0.23	0.09
72.40	31.68	3.65	0.80	0.23	0.09

Tailwater Channel Data - CD-02

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 10.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0010

Channel Manning's n: 0.1000

Channel Invert Elevation: 28.03 ft

Roadway Data for Crossing: CD-02

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2500.00 ft

Crest Elevation: 33.00 ft

Roadway Surface: Paved

Roadway Top Width: 36.00 ft

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 25.38 cfs

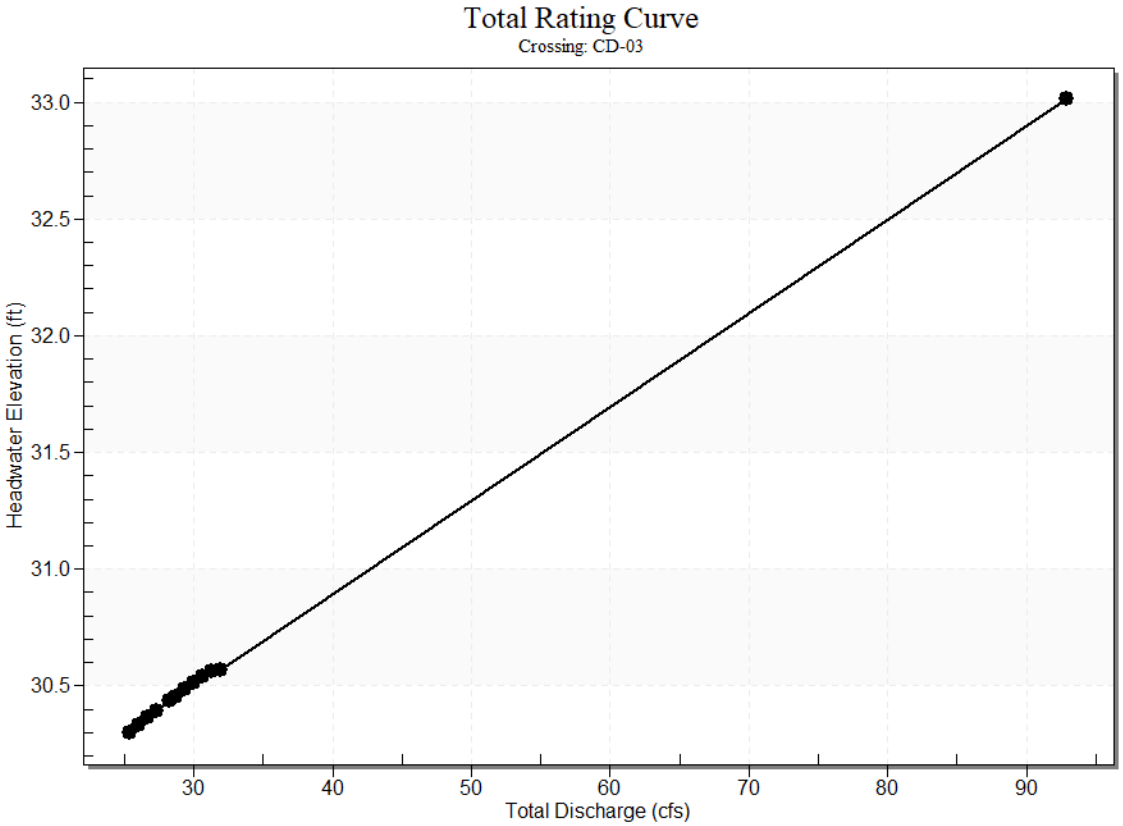
Design Flow: 28.27 cfs

Maximum Flow: 31.93 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-03

Headwater Elevation (ft)	Total Discharge (cfs)	Pre Discharge (cfs)	Roadway Discharge (cfs)	Iterations
30.30	25.38	25.38	0.00	1
30.33	26.04	26.04	0.00	1
30.36	26.69	26.69	0.00	1
30.39	27.34	27.34	0.00	1
30.44	28.27	28.27	0.00	1
30.45	28.66	28.66	0.00	1
30.48	29.31	29.31	0.00	1
30.51	29.96	29.96	0.00	1
30.54	30.62	30.62	0.00	1
30.56	31.27	31.27	0.00	1
30.57	31.93	31.93	0.00	1
33.00	89.22	89.22	0.00	Overtopping

Rating Curve Plot for Crossing: CD-03



Culvert Data: Pre

Table 1 - Culvert Summary Table: Pre

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)
25.38 cfs	25.38 cfs	30.30	1.57	2.830	7-A2t	-1.00	1.13	2.55	2.21	1.98	0.61
26.04 cfs	26.04 cfs	30.33	1.59	2.861	7-A2t	-1.00	1.15	2.58	2.24	2.01	0.61
26.69 cfs	26.69 cfs	30.36	1.62	2.892	7-A2t	-1.00	1.16	2.61	2.27	2.05	0.62
27.34 cfs	27.34 cfs	30.39	1.64	2.923	7-A2t	-1.00	1.18	2.63	2.29	2.08	0.62

28.27 cfs	28.27 cfs	30.44	1.68	2.966	7-A2t	-1.00	1.20	2.67	2.33	2.13	0.63
28.66 cfs	28.66 cfs	30.45	1.69	2.983	7-A2t	-1.00	1.21	2.69	2.35	2.15	0.63
29.31 cfs	29.31 cfs	30.48	1.71	3.013	7-A2t	-1.00	1.22	2.71	2.37	2.18	0.63
29.96 cfs	29.96 cfs	30.51	1.74	3.043	7-A2t	-1.00	1.23	2.74	2.40	2.21	0.64
30.62 cfs	30.62 cfs	30.54	1.76	3.073	7-A2t	-1.00	1.25	2.77	2.43	2.25	0.64
31.27 cfs	31.27 cfs	30.56	1.78	3.091	7-A2t	-1.00	1.26	2.79	2.45	2.28	0.64
31.93 cfs	31.93 cfs	30.57	1.81	3.095	7-A2t	-1.00	1.28	2.82	2.48	2.32	0.65

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

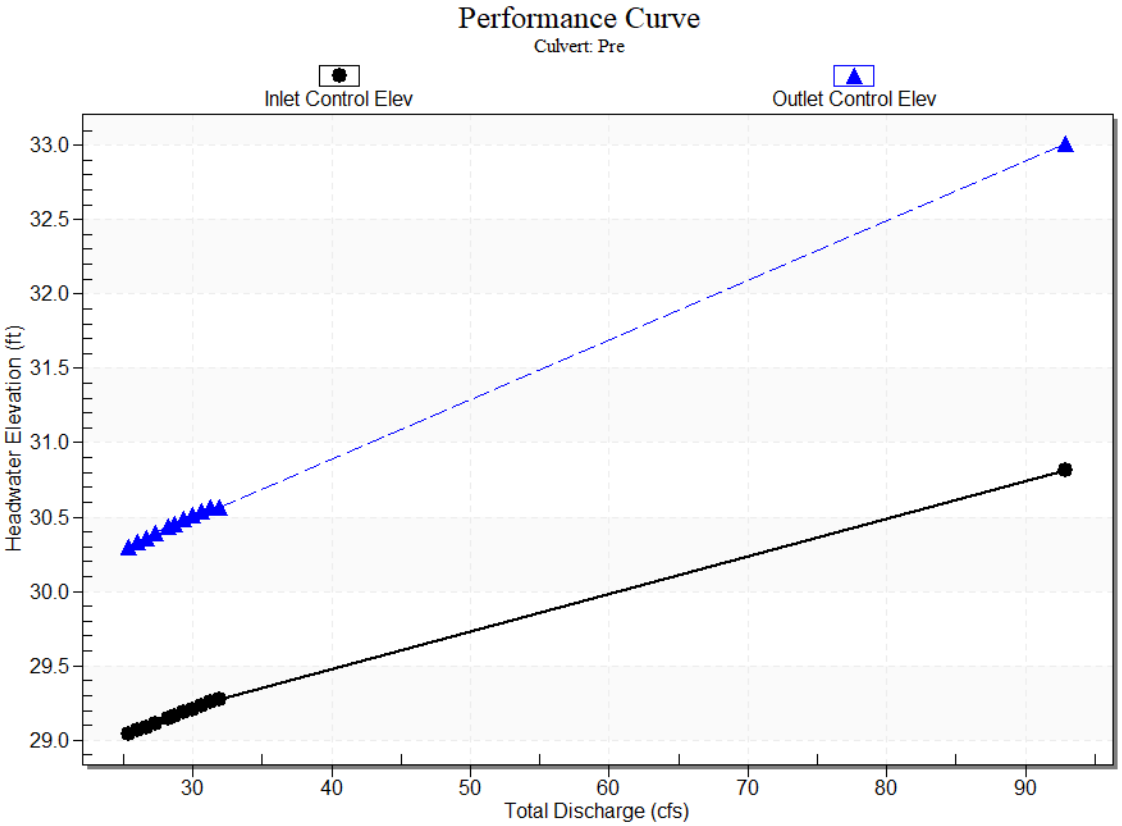
Inlet Elevation (invert): 27.47 ft,

Outlet Elevation (invert): 27.66 ft

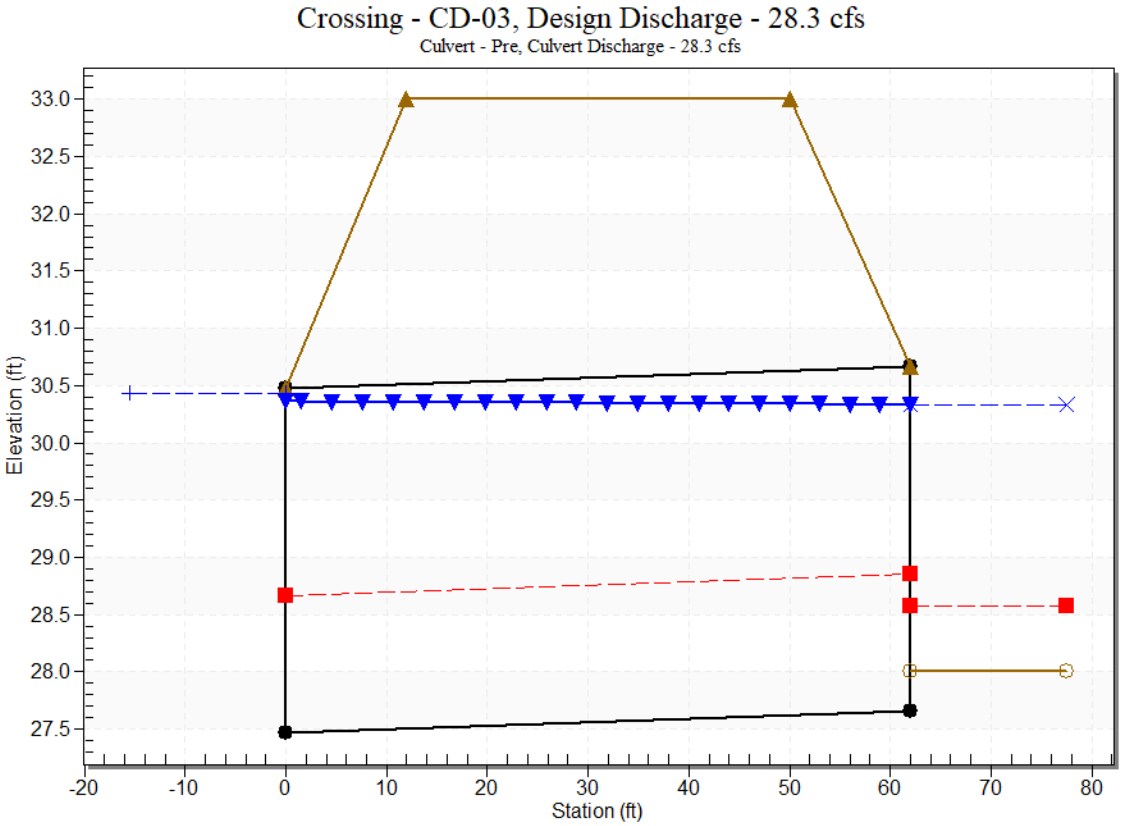
Culvert Length: 62.00 ft,

Culvert Slope: -0.0031

Culvert Performance Curve Plot: Pre



Water Surface Profile Plot for Culvert: Pre



Site Data - Pre

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 27.47 ft

Outlet Station: 62.00 ft

Outlet Elevation: 27.66 ft

Number of Barrels: 2

Culvert Data Summary - Pre

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Beveled Edge (1:1) (Ke=0.2)

Inlet Depression: None

Tailwater Data for Crossing: CD-03

Table 2 - Downstream Channel Rating Curve (Crossing: CD-03)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
25.38	30.21	2.21	0.61	0.14	0.09
26.04	30.24	2.24	0.61	0.14	0.09
26.69	30.27	2.27	0.62	0.14	0.09
27.34	30.29	2.29	0.62	0.14	0.09
28.27	30.33	2.33	0.63	0.15	0.09
28.66	30.35	2.35	0.63	0.15	0.09
29.31	30.37	2.37	0.63	0.15	0.09
29.96	30.40	2.40	0.64	0.15	0.09
30.62	30.43	2.43	0.64	0.15	0.09
31.27	30.45	2.45	0.64	0.15	0.09
31.93	30.48	2.48	0.65	0.15	0.09

Tailwater Channel Data - CD-03

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 10.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0010

Channel Manning's n: 0.1000

Channel Invert Elevation: 28.00 ft

Roadway Data for Crossing: CD-03

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 1500.00 ft

Crest Elevation: 33.00 ft

Roadway Surface: Paved

Roadway Top Width: 38.00 ft

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 12.23 cfs

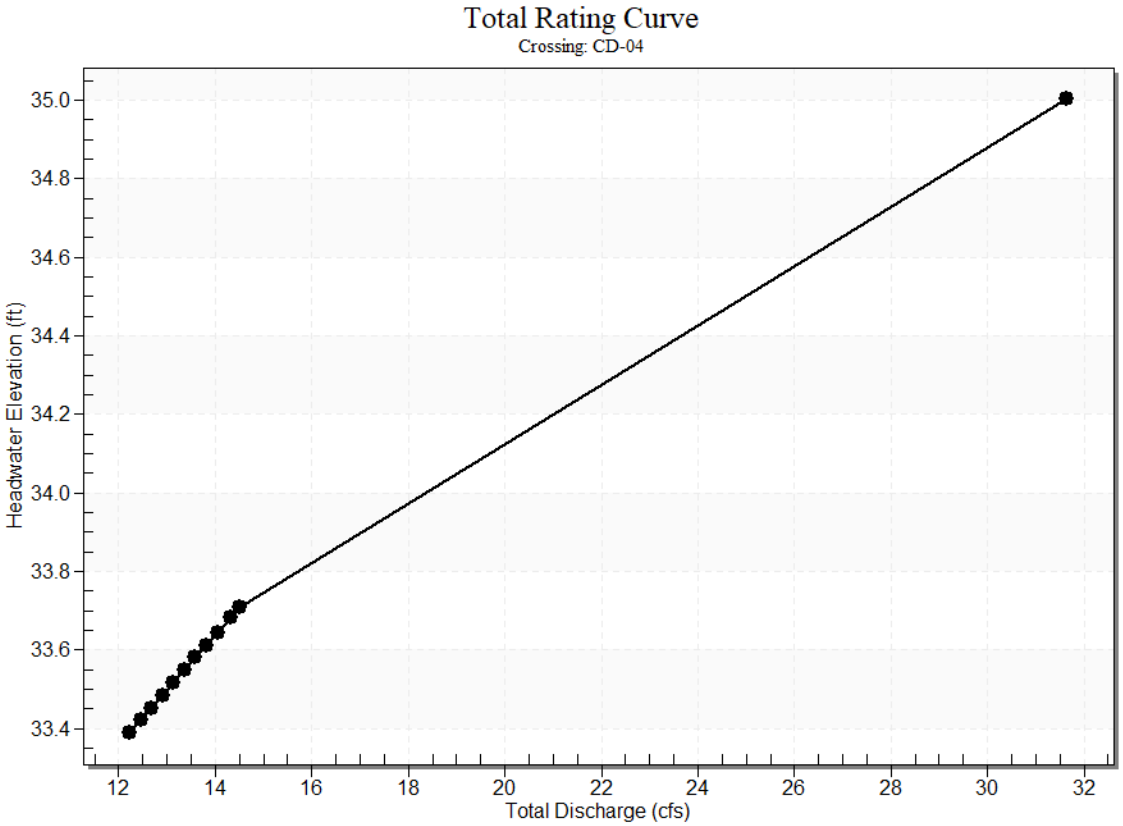
Design Flow: 14.32 cfs

Maximum Flow: 14.50 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-04

Headwater Elevation (ft)	Total Discharge (cfs)	Pre Discharge (cfs)	Roadway Discharge (cfs)	Iterations
33.39	12.23	12.23	0.00	1
33.42	12.46	12.46	0.00	1
33.45	12.68	12.68	0.00	1
33.48	12.91	12.91	0.00	1
33.52	13.14	13.14	0.00	1
33.55	13.37	13.37	0.00	1
33.58	13.59	13.59	0.00	1
33.61	13.82	13.82	0.00	1
33.64	14.05	14.05	0.00	1
33.68	14.32	14.32	0.00	1
33.71	14.50	14.50	0.00	1
35.00	30.42	30.42	0.00	Overtopping

Rating Curve Plot for Crossing: CD-04



Culvert Data: Pre

Table 1 - Culvert Summary Table: Pre

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)
12.23 cfs	12.23 cfs	33.39	1.87	3.039	4-FFf	2.00	1.26	2.00	2.04	3.89	0.55
12.46 cfs	12.46 cfs	33.42	1.89	3.071	4-FFf	2.00	1.27	2.00	2.05	3.97	0.55
12.68 cfs	12.68 cfs	33.45	1.91	3.102	4-FFf	2.00	1.28	2.00	2.07	4.04	0.56
12.91 cfs	12.91 cfs	33.48	1.93	3.134	4-FFf	2.00	1.29	2.00	2.08	4.11	0.56
13.14 cfs	13.14 cfs	33.52	1.96	3.166	4-FFf	2.00	1.30	2.00	2.10	4.18	0.56
13.37 cfs	13.37 cfs	33.55	1.98	3.198	4-FFf	2.00	1.32	2.00	2.11	4.25	0.56

13.59 cfs	13.59 cfs	33.58	2.00	3.230	4-FFf	2.00	1.33	2.00	2.13	4.33	0.57
13.82 cfs	13.82 cfs	33.61	2.03	3.262	4-FFf	2.00	1.34	2.00	2.14	4.40	0.57
14.05 cfs	14.05 cfs	33.64	2.05	3.294	4-FFf	2.00	1.35	2.00	2.16	4.47	0.57
14.32 cfs	14.32 cfs	33.68	2.08	3.333	4-FFf	2.00	1.36	2.00	2.17	4.56	0.57
14.50 cfs	14.50 cfs	33.71	2.10	3.359	4-FFf	2.00	1.37	2.00	2.18	4.62	0.58

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

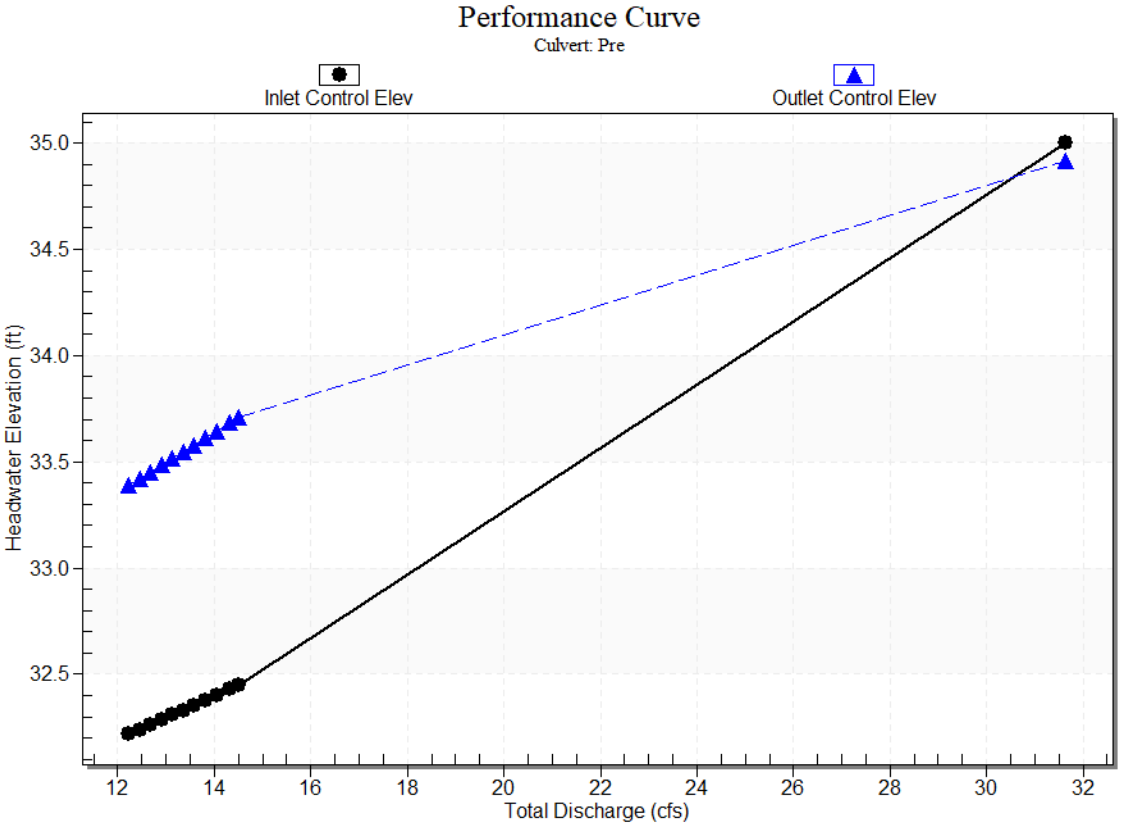
Inlet Elevation (invert): 30.35 ft,

Outlet Elevation (invert): 30.30 ft

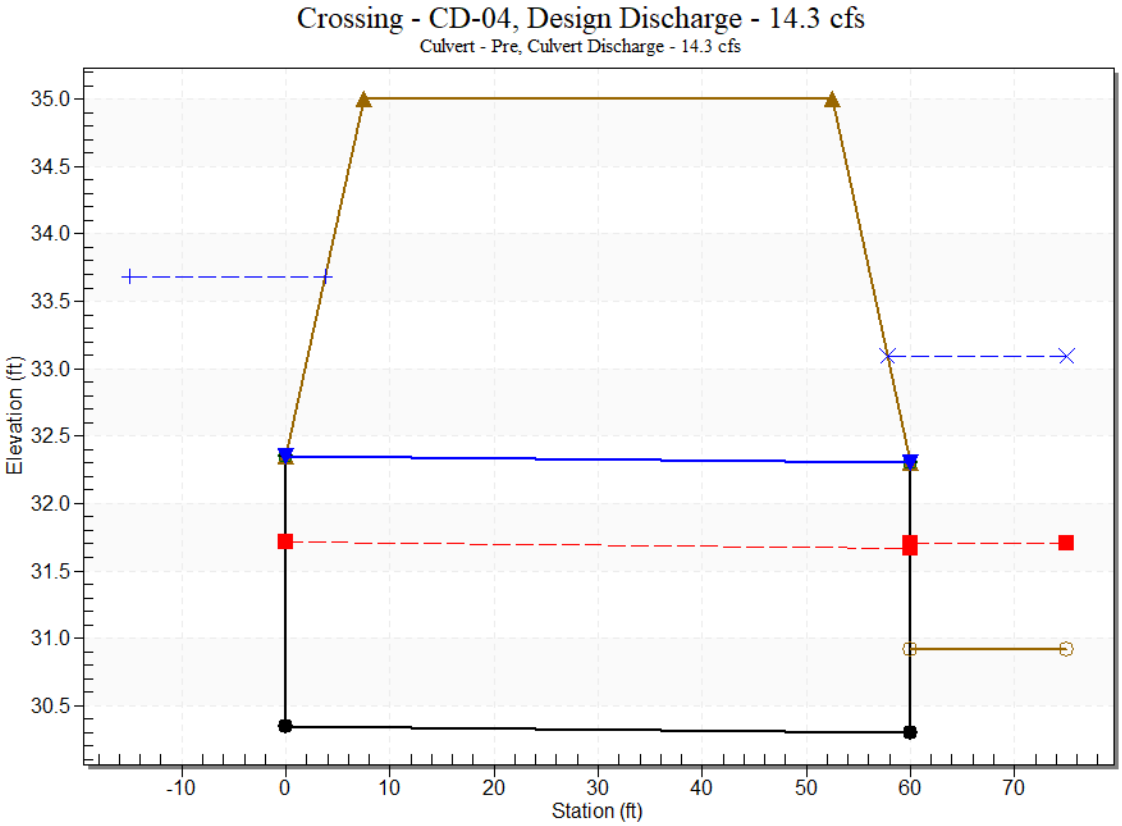
Culvert Length: 60.00 ft,

Culvert Slope: 0.0008

Culvert Performance Curve Plot: Pre



Water Surface Profile Plot for Culvert: Pre



Site Data - Pre

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 30.35 ft

Outlet Station: 60.00 ft

Outlet Elevation: 30.30 ft

Number of Barrels: 1

Culvert Data Summary - Pre

Barrel Shape: Circular

Barrel Diameter: 2.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Beveled Edge (1:1) (Ke=0.2)

Inlet Depression: None

Tailwater Data for Crossing: CD-04

Table 2 - Downstream Channel Rating Curve (Crossing: CD-04)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
12.23	32.96	2.04	0.55	0.03	0.09
12.46	32.97	2.05	0.55	0.03	0.09
12.68	32.99	2.07	0.56	0.03	0.09
12.91	33.00	2.08	0.56	0.03	0.09
13.14	33.02	2.10	0.56	0.03	0.09
13.37	33.03	2.11	0.56	0.03	0.09
13.59	33.05	2.13	0.57	0.03	0.09
13.82	33.06	2.14	0.57	0.03	0.09
14.05	33.08	2.16	0.57	0.03	0.09
14.32	33.09	2.17	0.57	0.03	0.09
14.50	33.10	2.18	0.58	0.03	0.09

Tailwater Channel Data - CD-04

Tailwater Channel Option: Irregular Channel

Channel Slope: Irregular Channel

User Defined Channel Cross-Section

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	1000.00	33.22	0.0450
2	1006.00	31.72	0.0450
3	1010.00	30.92	0.0450
4	1014.00	31.42	0.0450
5	1024.00	33.62	0.0000

Roadway Data for Crossing: CD-04

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 1900.00 ft

Crest Elevation: 35.00 ft

Roadway Surface: Paved

Roadway Top Width: 45.00 ft

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 23.45 cfs

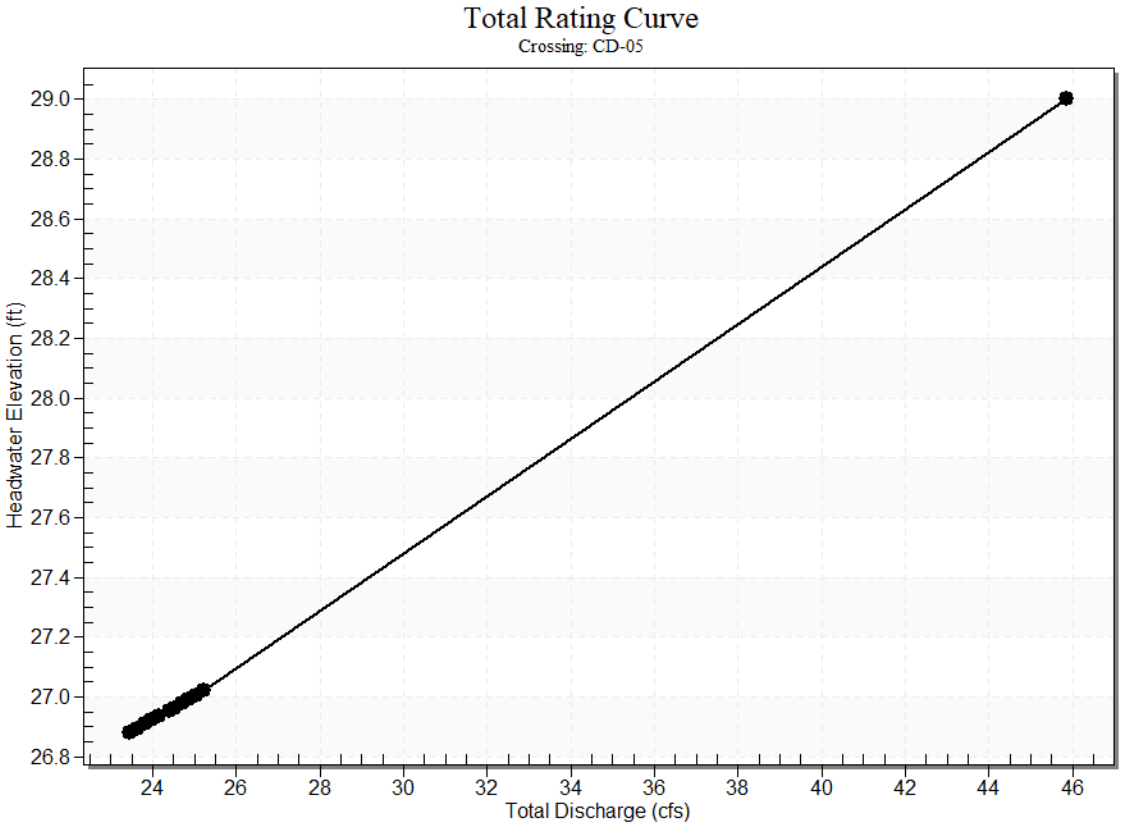
Design Flow: 24.40 cfs

Maximum Flow: 25.22 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-05

Headwater Elevation (ft)	Total Discharge (cfs)	Pre Discharge (cfs)	Roadway Discharge (cfs)	Iterations
26.88	23.45	23.45	0.00	1
26.90	23.63	23.63	0.00	1
26.91	23.80	23.80	0.00	1
26.92	23.98	23.98	0.00	1
26.94	24.16	24.16	0.00	1
26.96	24.40	24.40	0.00	1
26.96	24.51	24.51	0.00	1
26.98	24.69	24.69	0.00	1
26.99	24.87	24.87	0.00	1
27.01	25.04	25.04	0.00	1
27.02	25.22	25.22	0.00	1
29.00	45.49	45.49	0.00	Overtopping

Rating Curve Plot for Crossing: CD-05



Culvert Data: Pre

Table 1 - Culvert Summary Table: Pre

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)
23.45 cfs	23.45 cfs	26.88	2.47	3.092	4-FFf	1.41	1.65	2.50	1.60	4.78	1.21
23.63 cfs	23.63 cfs	26.90	2.49	3.105	4-FFf	1.42	1.65	2.50	1.60	4.81	1.22
23.80 cfs	23.80 cfs	26.91	2.50	3.119	4-FFf	1.43	1.66	2.50	1.61	4.85	1.22
23.98 cfs	23.98 cfs	26.92	2.51	3.133	4-FFf	1.43	1.67	2.50	1.61	4.89	1.22
24.16 cfs	24.16 cfs	26.94	2.53	3.147	4-FFf	1.44	1.67	2.50	1.62	4.92	1.23
24.40 cfs	24.40 cfs	26.96	2.54	3.165	4-FFf	1.45	1.68	2.50	1.63	4.97	1.23

24.51 cfs	24.51 cfs	26.96	2.55	3.174	4-FFf	1.45	1.69	2.50	1.63	4.99	1.23
24.69 cfs	24.69 cfs	26.98	2.57	3.188	4-FFf	1.46	1.69	2.50	1.63	5.03	1.24
24.87 cfs	24.87 cfs	26.99	2.58	3.202	4-FFf	1.47	1.70	2.50	1.64	5.07	1.24
25.04 cfs	25.04 cfs	27.01	2.59	3.216	4-FFf	1.47	1.70	2.50	1.64	5.10	1.24
25.22 cfs	25.22 cfs	27.02	2.61	3.230	4-FFf	1.48	1.71	2.50	1.65	5.14	1.25

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

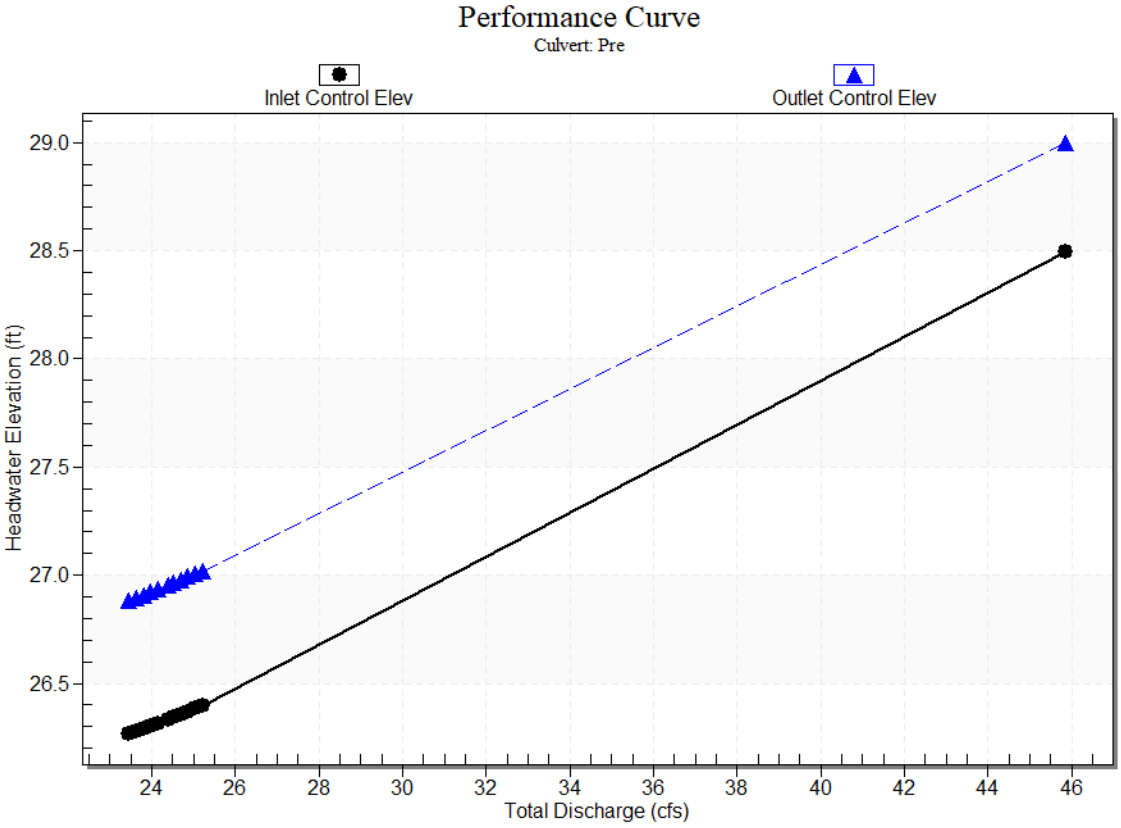
Inlet Elevation (invert): 23.79 ft,

Outlet Elevation (invert): 23.42 ft

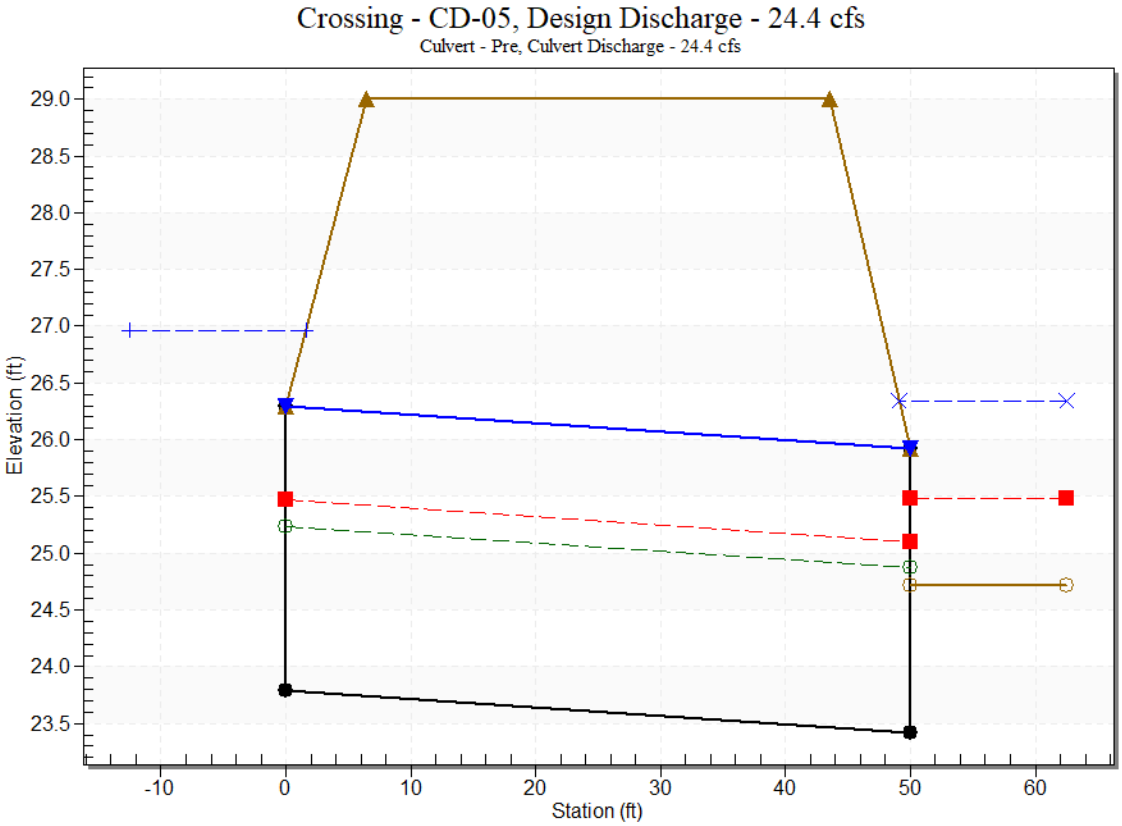
Culvert Length: 50.00 ft,

Culvert Slope: 0.0074

Culvert Performance Curve Plot: Pre



Water Surface Profile Plot for Culvert: Pre



Site Data - Pre

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 23.79 ft

Outlet Station: 50.00 ft

Outlet Elevation: 23.42 ft

Number of Barrels: 1

Culvert Data Summary - Pre

Barrel Shape: Circular

Barrel Diameter: 2.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Beveled Edge (1:1) (Ke=0.2)

Inlet Depression: None

Tailwater Data for Crossing: CD-05

Table 2 - Downstream Channel Rating Curve (Crossing: CD-05)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
23.45	26.32	1.60	1.21	0.13	0.21
23.63	26.32	1.60	1.22	0.13	0.21
23.80	26.33	1.61	1.22	0.13	0.21
23.98	26.33	1.61	1.22	0.13	0.21
24.16	26.34	1.62	1.23	0.13	0.21
24.40	26.35	1.63	1.23	0.13	0.21
24.51	26.35	1.63	1.23	0.13	0.21
24.69	26.35	1.63	1.24	0.13	0.21
24.87	26.36	1.64	1.24	0.13	0.21
25.04	26.36	1.64	1.24	0.13	0.21
25.22	26.37	1.65	1.25	0.13	0.21

Tailwater Channel Data - CD-05

Tailwater Channel Option: Irregular Channel

Channel Slope: Irregular Channel

User Defined Channel Cross-Section

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	1000.00	29.00	0.0450
2	1000.00	26.12	0.0450
3	1006.00	24.72	0.0450
4	1009.00	24.72	0.0450
5	1012.00	25.02	0.0450
6	1018.00	26.02	0.0450
7	1018.00	29.00	0.0000

Roadway Data for Crossing: CD-05

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2500.00 ft

Crest Elevation: 29.00 ft

Roadway Surface: Paved

Roadway Top Width: 37.00 ft

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 41.94 cfs

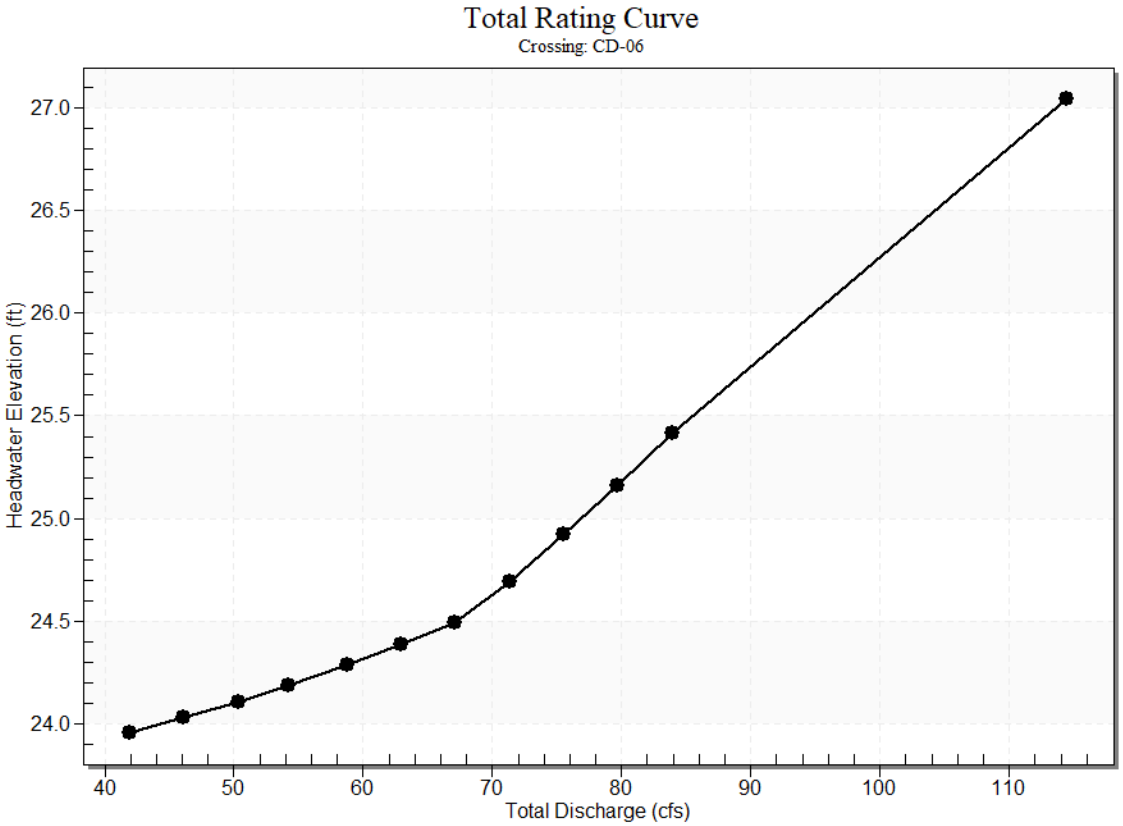
Design Flow: 54.25 cfs

Maximum Flow: 83.92 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-06

Headwater Elevation (ft)	Total Discharge (cfs)	Pre Discharge (cfs)	Roadway Discharge (cfs)	Iterations
23.96	41.94	41.94	0.00	1
24.03	46.14	46.14	0.00	1
24.11	50.34	50.34	0.00	1
24.19	54.25	54.25	0.00	1
24.29	58.73	58.73	0.00	1
24.39	62.93	62.93	0.00	1
24.49	67.13	67.13	0.00	1
24.69	71.33	71.33	0.00	1
24.92	75.52	75.52	0.00	1
25.16	79.72	79.72	0.00	1
25.42	83.92	83.92	0.00	1
27.00	106.83	106.83	0.00	Overtopping

Rating Curve Plot for Crossing: CD-06



Culvert Data: Pre

Table 1 - Culvert Summary Table: Pre

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)
41.94 cfs	41.94 cfs	23.96	2.33	2.840	7-A2c	-1.00	1.56	1.56	1.84	6.53	1.79
46.14 cfs	46.14 cfs	24.03	2.48	2.912	7-A2c	-1.00	1.63	1.63	1.91	6.78	1.85
50.34 cfs	50.34 cfs	24.11	2.64	2.990	7-A2c	-1.00	1.71	1.71	1.99	7.04	1.90
54.25 cfs	54.25 cfs	24.19	2.79	3.069	7-A2c	-1.00	1.78	1.78	2.05	7.28	1.94

58.73 cfs	58.73 cfs	24.29	2.97	3.167	7-A2c	-1.00	1.85	1.85	2.12	7.55	1.99
62.93 cfs	62.93 cfs	24.39	3.16	3.266	7-A2c	-1.00	1.91	1.91	2.19	7.82	2.03
67.13 cfs	67.13 cfs	24.49	3.36	3.372	7-A2c	-1.00	1.97	1.97	2.25	8.09	2.07
71.33 cfs	71.33 cfs	24.69	3.57	3.484	7-JA2c	-1.00	2.03	2.03	2.31	8.37	2.11
75.52 cfs	75.52 cfs	24.92	3.80	3.604	7-JA2c	-1.00	2.08	2.08	2.37	8.66	2.15
79.72 cfs	79.72 cfs	25.16	4.04	3.730	7-JA2t	-1.00	2.13	2.13	2.43	8.95	2.18
83.92 cfs	83.92 cfs	25.42	4.30	3.863	7-JA2t	-1.00	2.17	2.19	2.49	9.22	2.21

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

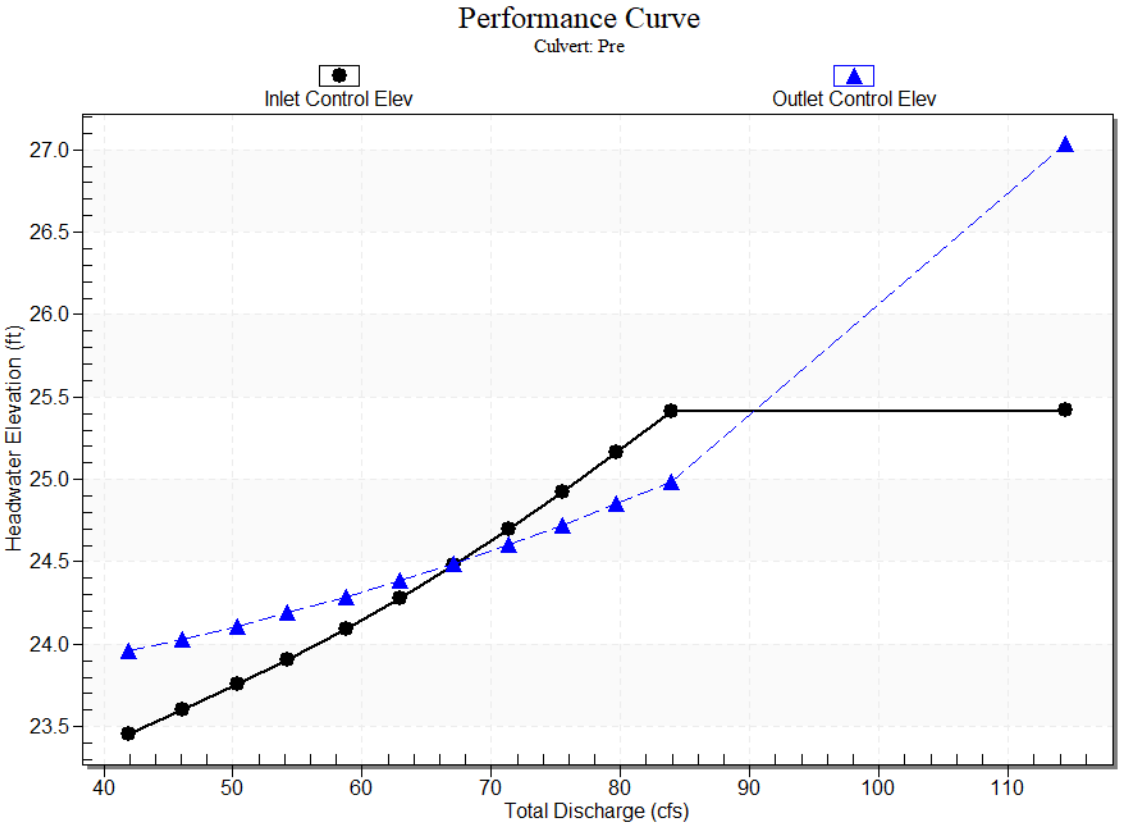
Inlet Elevation (invert): 21.12 ft,

Outlet Elevation (invert): 22.52 ft

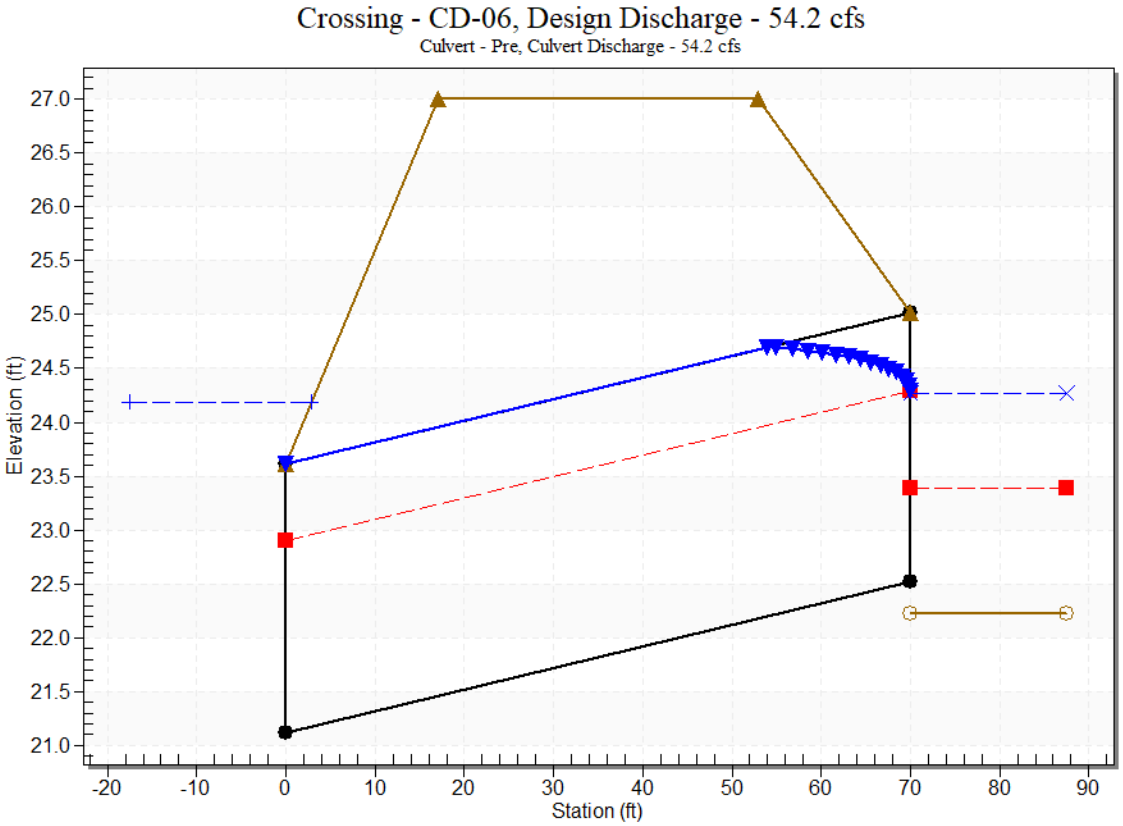
Culvert Length: 70.01 ft,

Culvert Slope: -0.0200

Culvert Performance Curve Plot: Pre



Water Surface Profile Plot for Culvert: Pre



Site Data - Pre

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 21.12 ft

Outlet Station: 70.00 ft

Outlet Elevation: 22.52 ft

Number of Barrels: 2

Culvert Data Summary - Pre

Barrel Shape: Circular

Barrel Diameter: 2.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Beveled Edge (1:1) (Ke=0.2)

Inlet Depression: None

Tailwater Data for Crossing: CD-06

Table 2 - Downstream Channel Rating Curve (Crossing: CD-06)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
41.94	24.06	1.84	1.79	0.30	0.30
46.14	24.13	1.91	1.85	0.31	0.30
50.34	24.21	1.99	1.90	0.32	0.30
54.25	24.27	2.05	1.94	0.33	0.30
58.73	24.34	2.12	1.99	0.34	0.30
62.93	24.41	2.19	2.03	0.35	0.31
67.13	24.47	2.25	2.07	0.37	0.31
71.33	24.53	2.31	2.11	0.38	0.31
75.52	24.59	2.37	2.15	0.38	0.31
79.72	24.65	2.43	2.18	0.39	0.31
83.92	24.71	2.49	2.21	0.40	0.31

Tailwater Channel Data - CD-06

Tailwater Channel Option: Irregular Channel

Channel Slope: Irregular Channel

User Defined Channel Cross-Section

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	1000.00	27.00	0.0450
2	1000.00	24.72	0.0450
3	1011.00	22.42	0.0450
4	1014.00	22.22	0.0450
5	1018.00	22.52	0.0450
6	1024.00	23.92	0.0450
7	1024.00	27.00	0.0000

Roadway Data for Crossing: CD-06

Roadway Profile Shape: Constant Roadway Elevation

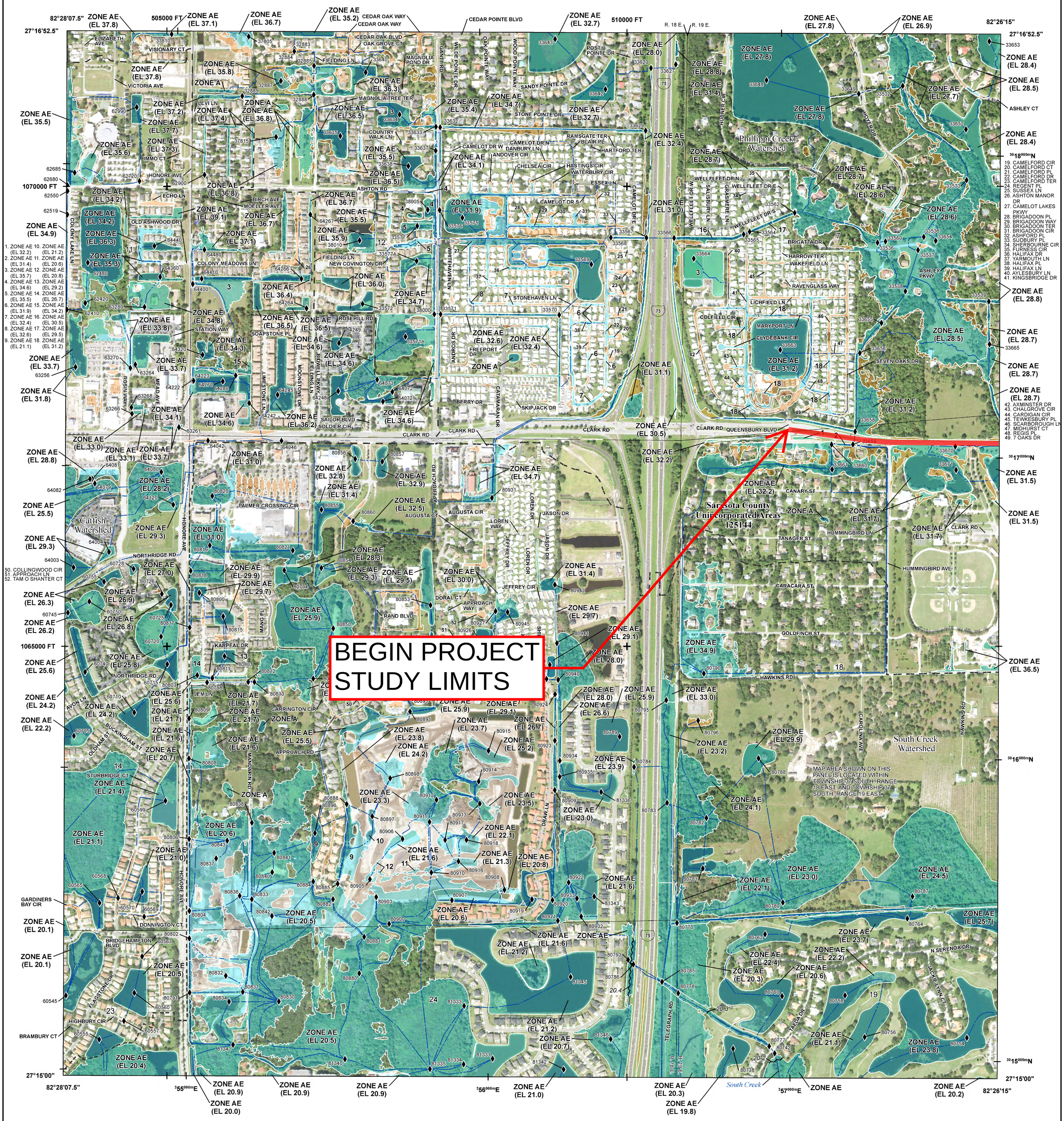
Crest Length: 1300.00 ft

Crest Elevation: 27.00 ft

Roadway Surface: Paved

Roadway Top Width: 36.00 ft

APPENDIX D – FEMA FIRM PANELS



FLOOD HAZARD INFORMATION

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

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTPS://MSC.FEMA.GOV

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*
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- E 18.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 — Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was provided in digital format by the Southwest Florida Water Management District, National Geodetic Survey, Sarasota County GIS, United States Geologic Survey, and the United States Fish and Wildlife Service. Ortho imagery was originally produced by National Agriculture Imagery Program (NAIP) in 2018 and has a 1- meter ground sample distance.

Watershed Boundary

SCALE

N

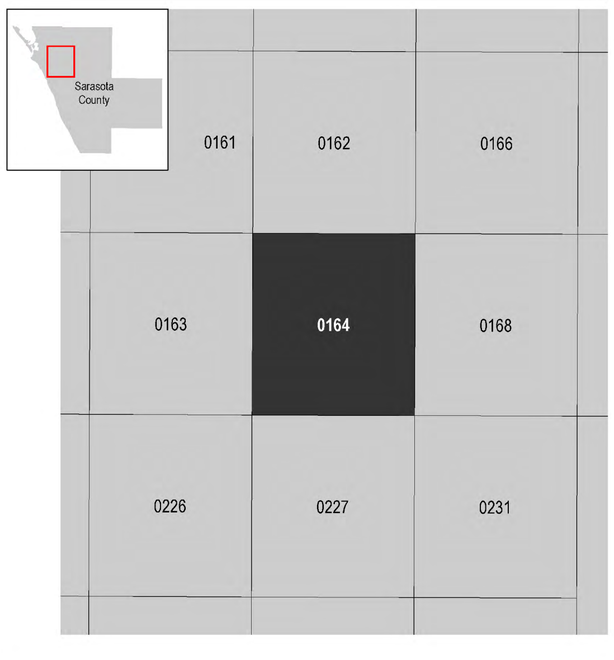
Map Projection:
HARN State Plane Transverse Mercator, Florida West Zone 0902H; North American Datum 1983; Western Hemisphere; Vertical Datum: NAVD 88

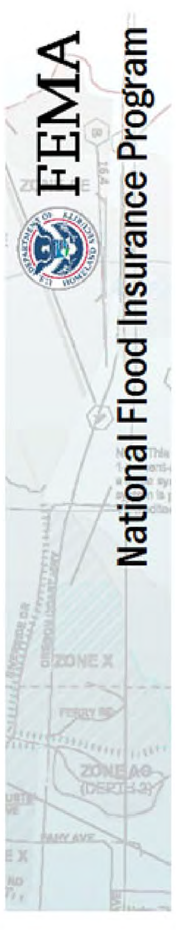
1 inch = 500 feet 1:6,000

0 250 500 750 1,000 2,000 feet

0 125 250 500 meters

PANEL LOCATOR





NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

SARASOTA COUNTY, FLORIDA
and Incorporated Areas

PANEL 164 OF 475

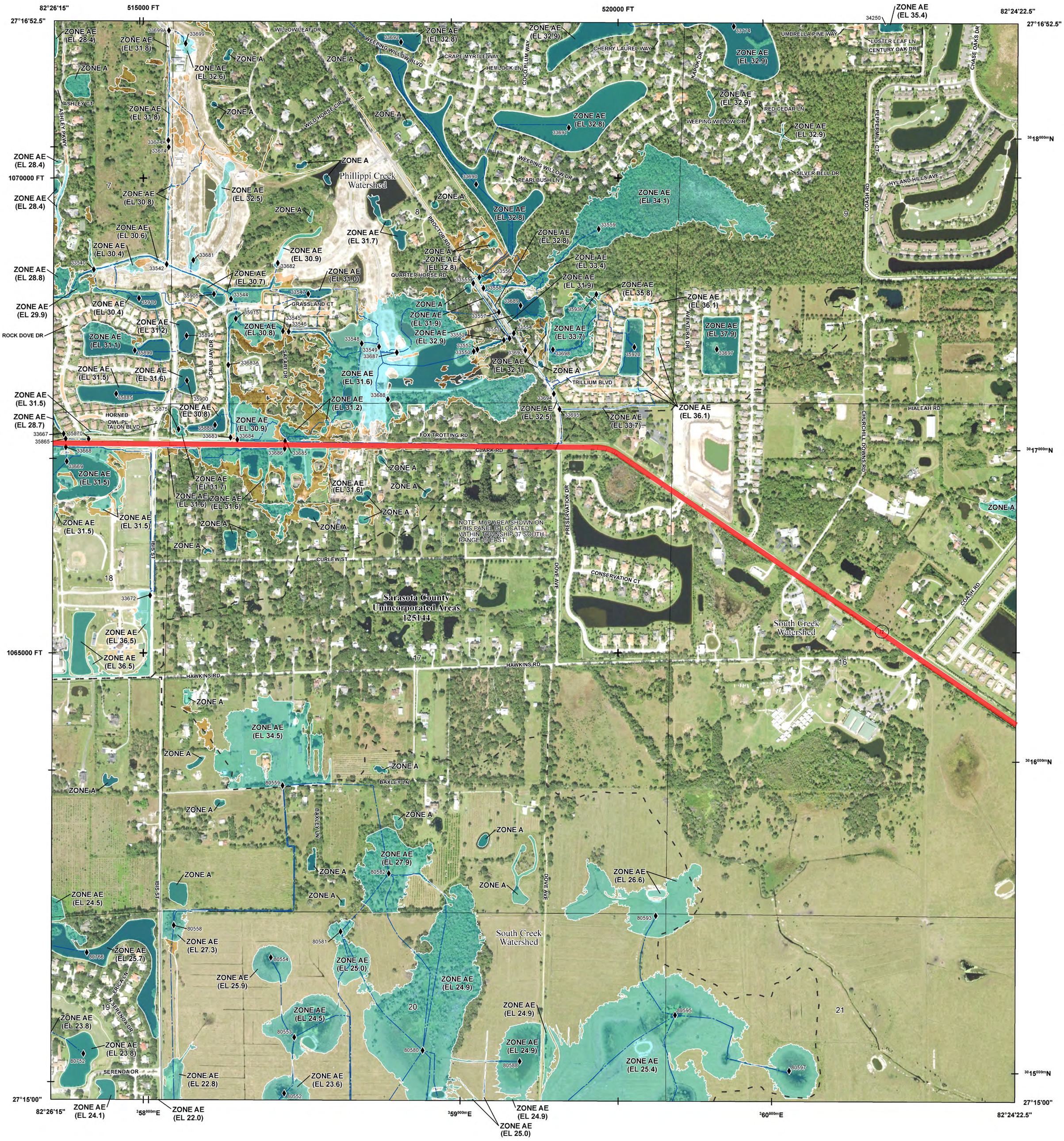
Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
SARASOTA COUNTY	125144	0164	G

VERSION NUMBER
2.4.3.0

MAP NUMBER
12115C0164G

MAP REVISED
MARCH 27, 2024



FLOOD HAZARD INFORMATION

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

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTPS://MSC.FEMA.GOV

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*
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES

- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES

- E 18.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation
- 8 — Coastal Transect
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 — Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was provided in digital format by the Southwest Florida Water Management District, National Geodetic Survey, Sarasota County GIS, United States Geologic Survey, and the United States Fish and Wildlife Service. Ortho imagery was originally produced by National Agriculture Imagery Program (NAIP) in 2018 and has a 1- meter ground sample distance.

- - - - - - Watershed Boundary

SCALE

N

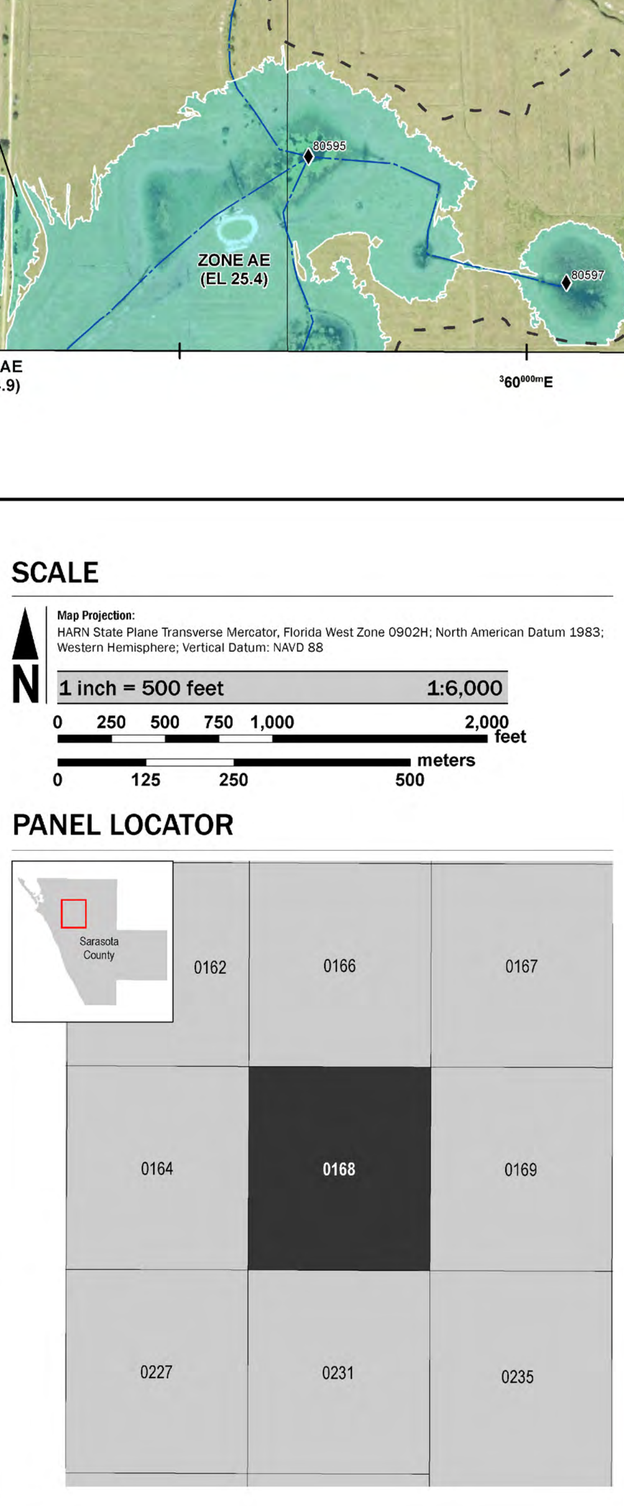
Map Projection:
HARN State Plane Transverse Mercator, Florida West Zone 0902H; North American Datum 1983; Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 500 feet 1:6,000

0 250 500 750 1,000 2,000 feet

0 125 250 500 meters

PANEL LOCATOR



FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

SARASOTA COUNTY, FLORIDA
and Incorporated Areas

PANEL 168 OF 475

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
SARASOTA COUNTY	125144	0168	G

VERSION NUMBER
2.4.3.0

MAP NUMBER
12115C0168G

MAP REVISED
MARCH 27, 2024

APPENDIX E – CORRESPONDENCE

Obrien, Kathryn

From: Catlin, Barbara <Barbara.Catlin@dot.state.fl.us>
Sent: Saturday, October 15, 2022 4:40 AM
To: Schooley, Cris
Subject: CONTACT: 440686-1 SR 72 Clark Road Roundabout at Proctor Road

Categories: External

Hi Cris,

Carl Harman is overseeing this project.

Construction Project Manager

Florida Department of Transportation

Manatee Operations

14000 SR 64 East

Bradenton, FL 34212-9263

941-708-4431 Office

941-465-0691 Cell

Carl.Harman@dot.state.fl.us

On Oct 14, 2022, at 5:41 PM, Schooley, Cris <Cris.Schooley@kimley-horn.com> wrote:

Barbara, can you tell me who at FDOT can provide the status/schedule of the subject project? Also, was it impacted by the hurricane flooding?

I am working on the SR 72 PD&E Study from I-75 to Lorrain Road (444634-1) with Patrick Bateman.

Regards,

Cris Schooley, PE, AICP
Kimley-Horn | 189 South Orange Ave., Suite 1000, Orlando, FL 32801
Direct: 407 768 3227 | Mobile: 407 334 2912

Obrien, Kathryn

From: Harman, Carl D <Carl.Harman@dot.state.fl.us>
Sent: Monday, October 17, 2022 8:14 AM
To: Schooley, Cris
Subject: RE: 440686-1 SR 72 Clark Road Roundabout at Proctor Road

Categories: External

Cris,
Good morning.
The SR 72 @ Proctor Road roundabout project is moving along rather slowly, currently anticipated completion March 2023.
We were fortunate and had minimal impacts from the hurricane, only minor washouts in a few areas.

I hope this helps.

Regards,

Carl Harman

Construction Project Manager
Florida Department of Transportation
Manatee Operations
14000 SR 64 East
Bradenton, FL 34212-9263
941-708-4431 Office
941-465-0691 Cell
Carl.Harman@dot.state.fl.us

From: Schooley, Cris <Cris.Schooley@kimley-horn.com>
Sent: Monday, October 17, 2022 8:02 AM
To: Harman, Carl D <Carl.Harman@dot.state.fl.us>
Subject: 440686-1 SR 72 Clark Road Roundabout at Proctor Road

Carl, can you tell me the status/schedule of the subject project? Also, was it impacted by hurricane flooding?

I am working on the SR 72 PD&E Study from I-75 to Lorraine Road (444634-1) with Patrick Bateman.

Regards,

Cris Schooley, PE, AICP
Kimley-Horn | 189 South Orange Ave., Suite 1000, Orlando, FL 32801
Direct: 407 768 3227 | Mobile: 407 334 2912

Obrien, Kathryn

From: Vilt, Curtis <Curtis.Vilt@dot.state.fl.us>
Sent: Monday, October 17, 2022 6:22 AM
To: Schooley, Cris
Subject: RE: SR 72 Roundabout at Lorraine Road

Categories: External

Good morning Chris,

This project is expected to be completed in November. There was no reported impact from the storm.

Respectfully

Curtis (Curt) Vilt
Maintenance Manager / Permits– FDOT
Manatee Operations
14000 SR 64 East
Bradenton, Fl 34212
Tel: 941-708-4447
Cell: 941-465-0737

From: Schooley, Cris <Cris.Schooley@kimley-horn.com>
Sent: Friday, October 14, 2022 5:47 PM
To: Vilt, Curtis <Curtis.Vilt@dot.state.fl.us>
Subject: SR 72 Roundabout at Lorraine Road

Curtis, can you tell me the status/schedule of the subject project being built by a developer? Also, was it impacted by the hurricane flooding?

I am working on the SR 72 PD&E Study from I-75 to Lorrain Road (444634-1) with Patrick Bateman.

Regards,

Cris Schooley, PE, AICP
Kimley-Horn | 189 South Orange Ave., Suite 1000, Orlando, FL 32801
Direct: 407 768 3227 **|** Mobile: 407 334 2912

Celebrating 15 years as one of FORTUNE's 100 Best Companies to Work For

APPENDIX F – PROPOSED CROSS DRAIN ANALYSIS

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 57.27 cfs

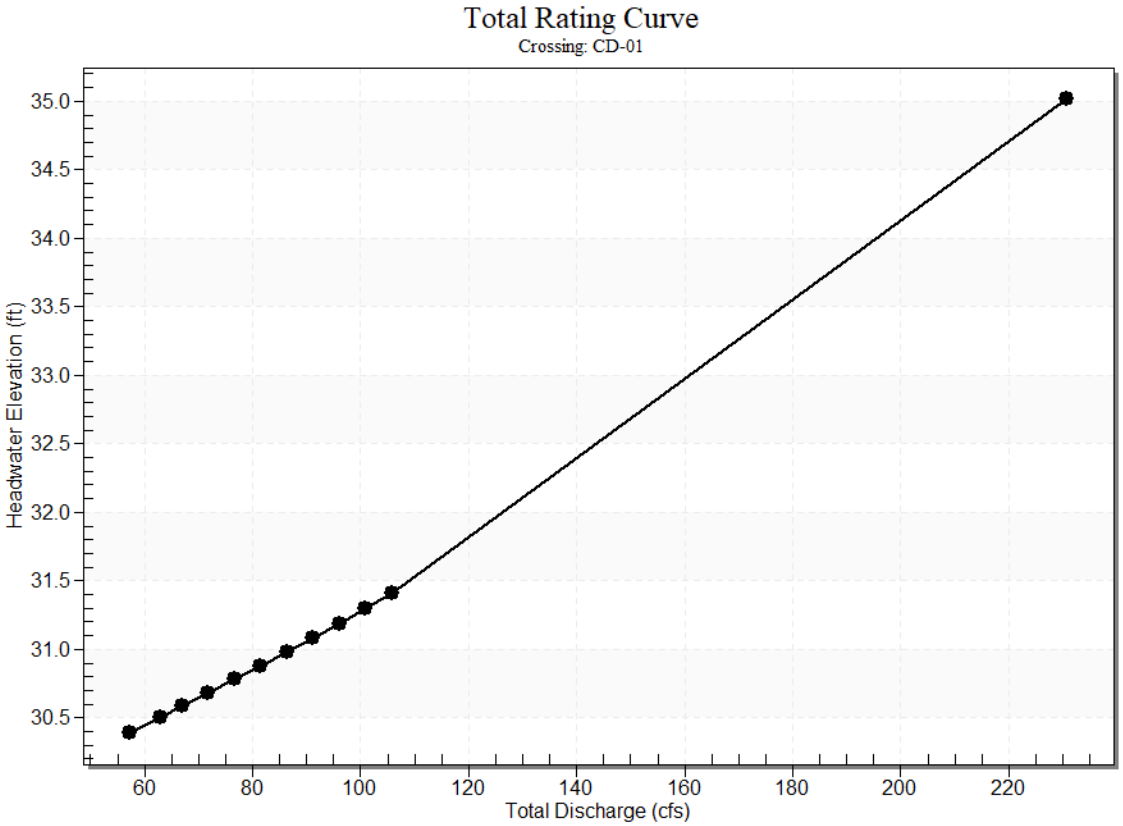
Design Flow: 62.89 cfs

Maximum Flow: 105.73 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-01

Headwater Elevation (ft)	Total Discharge (cfs)	Post Discharge (cfs)	Roadway Discharge (cfs)	Iterations
30.39	57.27	57.27	0.00	1
30.51	62.89	62.89	0.00	1
30.59	66.96	66.96	0.00	1
30.68	71.81	71.81	0.00	1
30.78	76.65	76.65	0.00	1
30.88	81.50	81.50	0.00	1
30.98	86.35	86.35	0.00	1
31.08	91.19	91.19	0.00	1
31.19	96.04	96.04	0.00	1
31.30	100.88	100.88	0.00	1
31.41	105.73	105.73	0.00	1
35.00	221.48	221.48	0.00	Overtopping

Rating Curve Plot for Crossing: CD-01



Culvert Data: Post

Table 1 - Culvert Summary Table: Post

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)
57.27 cfs	57.27 cfs	30.39	2.37	3.784	4-FFf	-1.00	1.65	3.50	4.22	2.98	0.71
62.89 cfs	62.89 cfs	30.51	2.50	3.898	4-FFf	-1.00	1.73	3.50	4.28	3.27	0.68
66.96 cfs	66.96 cfs	30.59	2.59	3.978	4-FFf	-1.00	1.79	3.50	4.32	3.48	0.67
71.81 cfs	71.81 cfs	30.68	2.70	4.073	4-FFf	-1.00	1.86	3.50	4.36	3.73	0.66
76.65 cfs	76.65 cfs	30.78	2.80	4.170	4-FFf	-1.00	1.92	3.50	4.40	3.98	0.66
81.50 cfs	81.50 cfs	30.88	2.90	4.268	4-FFf	-1.00	1.99	3.50	4.44	4.24	0.66

86.35 cfs	86.35 cfs	30.98	3.00	4.369	4-FFf	-1.00	2.05	3.50	4.48	4.49	0.66
91.19 cfs	91.19 cfs	31.08	3.10	4.472	4-FFf	-1.00	2.11	3.50	4.51	4.74	0.66
96.04 cfs	96.04 cfs	31.19	3.20	4.577	4-FFf	-1.00	2.16	3.50	4.55	4.99	0.66
100.88 cfs	100.88 cfs	31.30	3.31	4.685	4-FFf	-1.00	2.22	3.50	4.58	5.24	0.66
105.73 cfs	105.73 cfs	31.41	3.41	4.796	4-FFf	-1.00	2.27	3.50	4.61	5.49	0.67

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

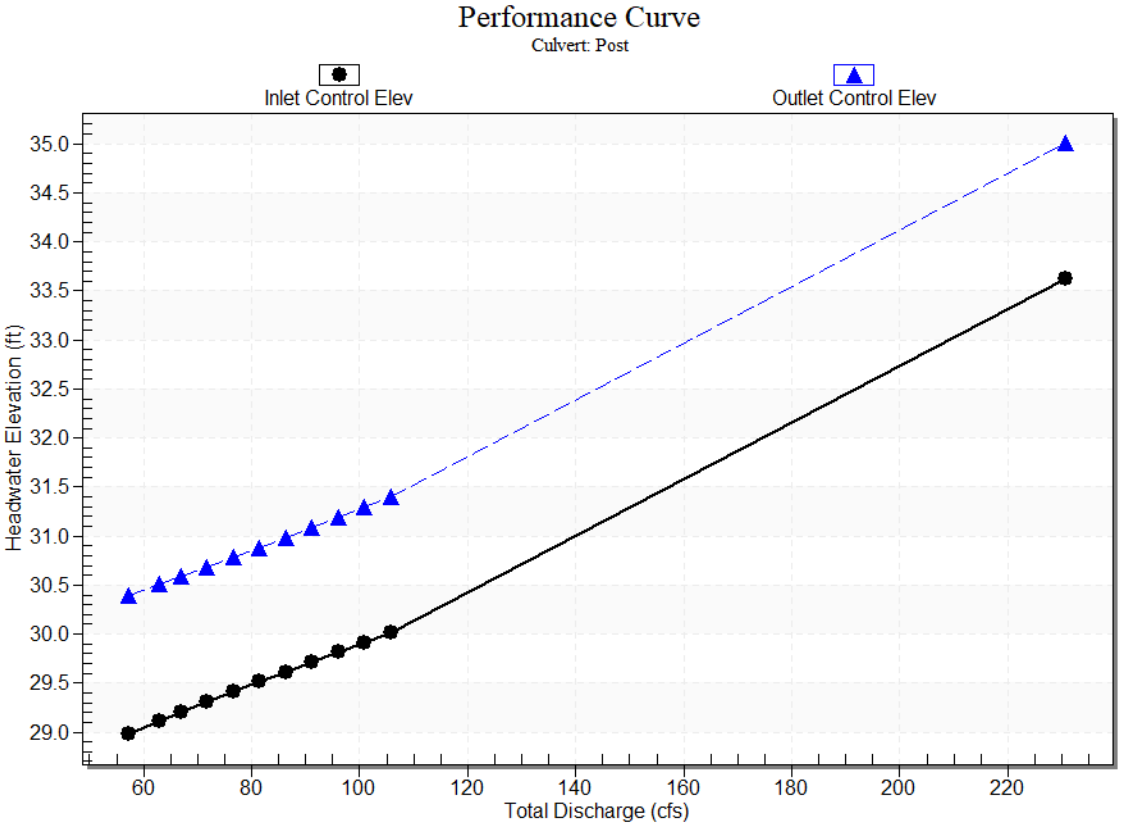
Inlet Elevation (invert): 26.61 ft,

Outlet Elevation (invert): 26.61 ft

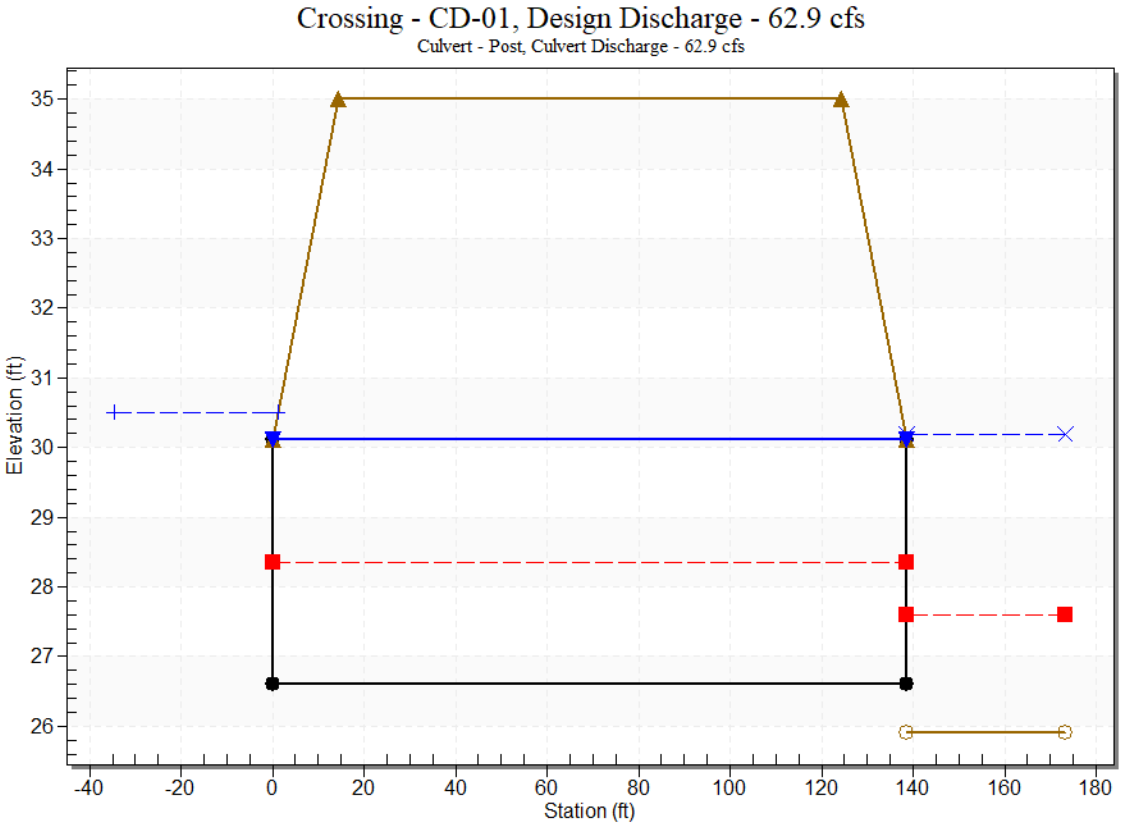
Culvert Length: 138.70 ft,

Culvert Slope: 0.0000

Culvert Performance Curve Plot: Post



Water Surface Profile Plot for Culvert: Post



Site Data - Post

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 26.61 ft

Outlet Station: 138.70 ft

Outlet Elevation: 26.61 ft

Number of Barrels: 2

Culvert Data Summary - Post

Barrel Shape: Circular

Barrel Diameter: 3.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Beveled Edge (1:1) (Ke=0.2)

Inlet Depression: None

Tailwater Data for Crossing: CD-01

Table 2 - Downstream Channel Rating Curve (Crossing: CD-01)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
57.27	30.13	4.22	0.71	0.34	0.19
62.89	30.19	4.28	0.68	0.35	0.18
66.96	30.23	4.32	0.67	0.35	0.17
71.81	30.27	4.36	0.66	0.35	0.16
76.65	30.31	4.40	0.66	0.36	0.15
81.50	30.35	4.44	0.66	0.36	0.15
86.35	30.39	4.48	0.66	0.36	0.14
91.19	30.42	4.51	0.66	0.37	0.14
96.04	30.46	4.55	0.66	0.37	0.14
100.88	30.49	4.58	0.66	0.37	0.14
105.73	30.52	4.61	0.67	0.37	0.13

Tailwater Channel Data - CD-01

Tailwater Channel Option: Irregular Channel

Channel Slope: Irregular Channel

User Defined Channel Cross-Section

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	-0.10	50.12	0.1000
2	0.00	35.15	0.1000
3	7.50	35.10	0.0800
4	27.00	26.28	0.0800
5	30.00	25.91	0.0800
6	32.00	26.42	0.0800
7	38.00	29.03	0.0800
8	48.00	29.51	0.0800
9	65.00	29.92	0.1000
10	220.00	30.17	0.1000
11	220.10	45.12	0.0000

Roadway Data for Crossing: CD-01

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 1500.00 ft

Crest Elevation: 35.00 ft

Roadway Surface: Paved

Roadway Top Width: 110.00 ft

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 51.92 cfs

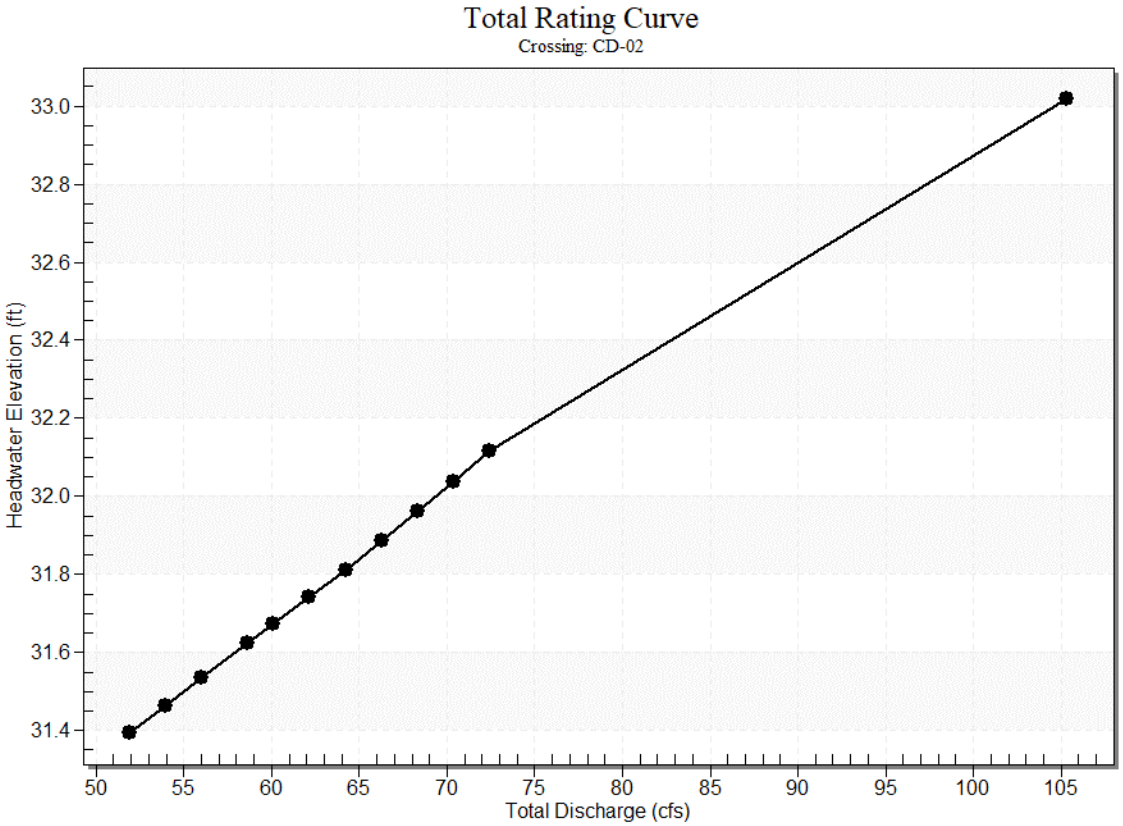
Design Flow: 58.65 cfs

Maximum Flow: 72.40 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-02

Headwater Elevation (ft)	Total Discharge (cfs)	Post Discharge (cfs)	Roadway Discharge (cfs)	Iterations
31.40	51.92	51.92	0.00	1
31.46	53.97	53.97	0.00	1
31.53	56.02	56.02	0.00	1
31.62	58.65	58.65	0.00	1
31.67	60.11	60.11	0.00	1
31.74	62.16	62.16	0.00	1
31.81	64.21	64.21	0.00	1
31.89	66.26	66.26	0.00	1
31.96	68.30	68.30	0.00	1
32.04	70.35	70.35	0.00	1
32.11	72.40	72.40	0.00	1
33.00	97.49	97.49	0.00	Overtopping

Rating Curve Plot for Crossing: CD-02



Culvert Data: Post

Table 1 - Culvert Summary Table: Post

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)
51.92 cfs	51.92 cfs	31.40	2.23	3.025	3-M1t	1.75	1.57	3.13	3.13	2.86	0.74
53.97 cfs	53.97 cfs	31.46	2.28	3.095	3-M1t	1.79	1.60	3.18	3.18	2.94	0.75
56.02 cfs	56.02 cfs	31.53	2.33	3.164	3-M1t	1.83	1.63	3.24	3.24	3.01	0.75
58.65 cfs	58.65 cfs	31.62	2.39	3.253	3-M1t	1.89	1.67	3.31	3.31	3.11	0.76

60.11 cfs	60.11 cfs	31.67	2.43	3.302	3-M1t	1.91	1.69	3.35	3.35	3.17	0.77
62.16 cfs	62.16 cfs	31.74	2.48	3.371	3-M1t	1.96	1.72	3.40	3.40	3.26	0.77
64.21 cfs	64.21 cfs	31.81	2.52	3.442	3-M1t	2.00	1.75	3.50	3.46	3.34	0.78
66.26 cfs	66.26 cfs	31.89	2.57	3.515	3-M1f	2.04	1.78	3.50	3.51	3.44	0.79
68.30 cfs	68.30 cfs	31.96	2.62	3.591	3-M1f	2.08	1.81	3.50	3.56	3.55	0.79
70.35 cfs	70.35 cfs	32.04	2.66	3.668	3-M1f	2.12	1.84	3.50	3.61	3.66	0.80
72.40 cfs	72.40 cfs	32.11	2.70	3.745	3-M1f	2.16	1.87	3.50	3.65	3.76	0.80

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

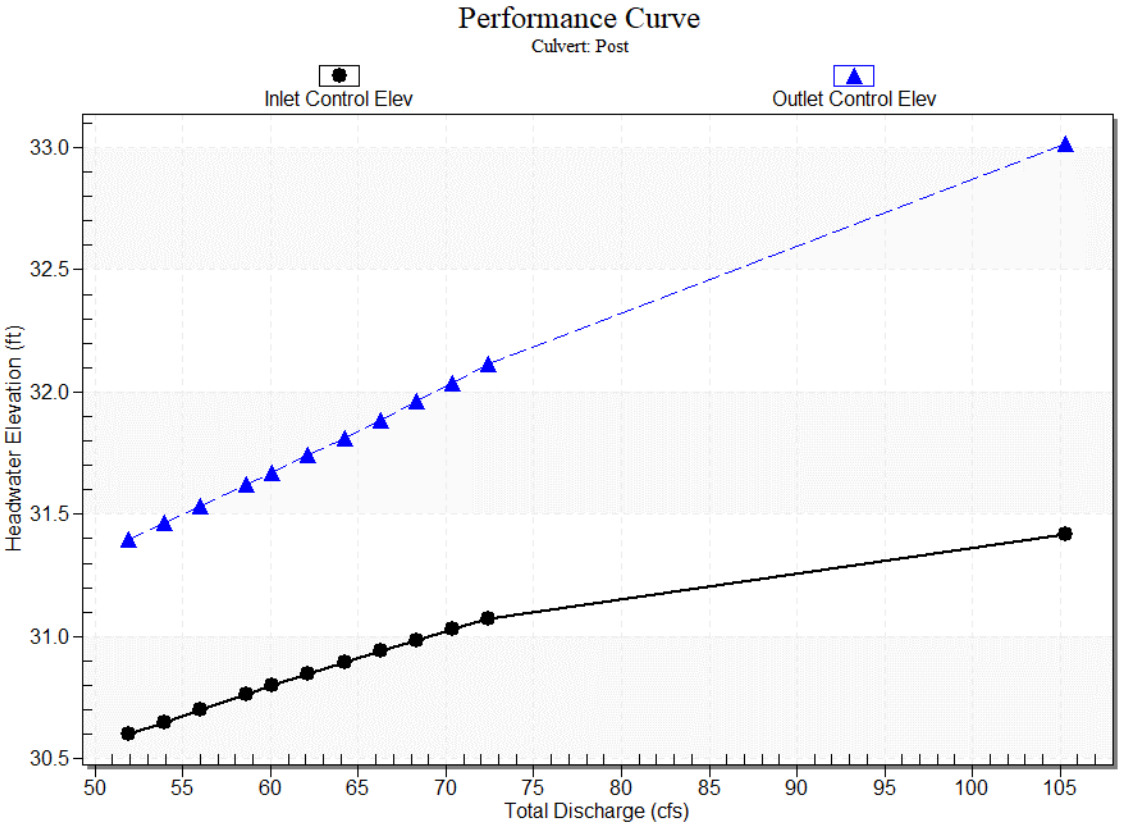
Inlet Elevation (invert): 28.37 ft,

Outlet Elevation (invert): 28.03 ft

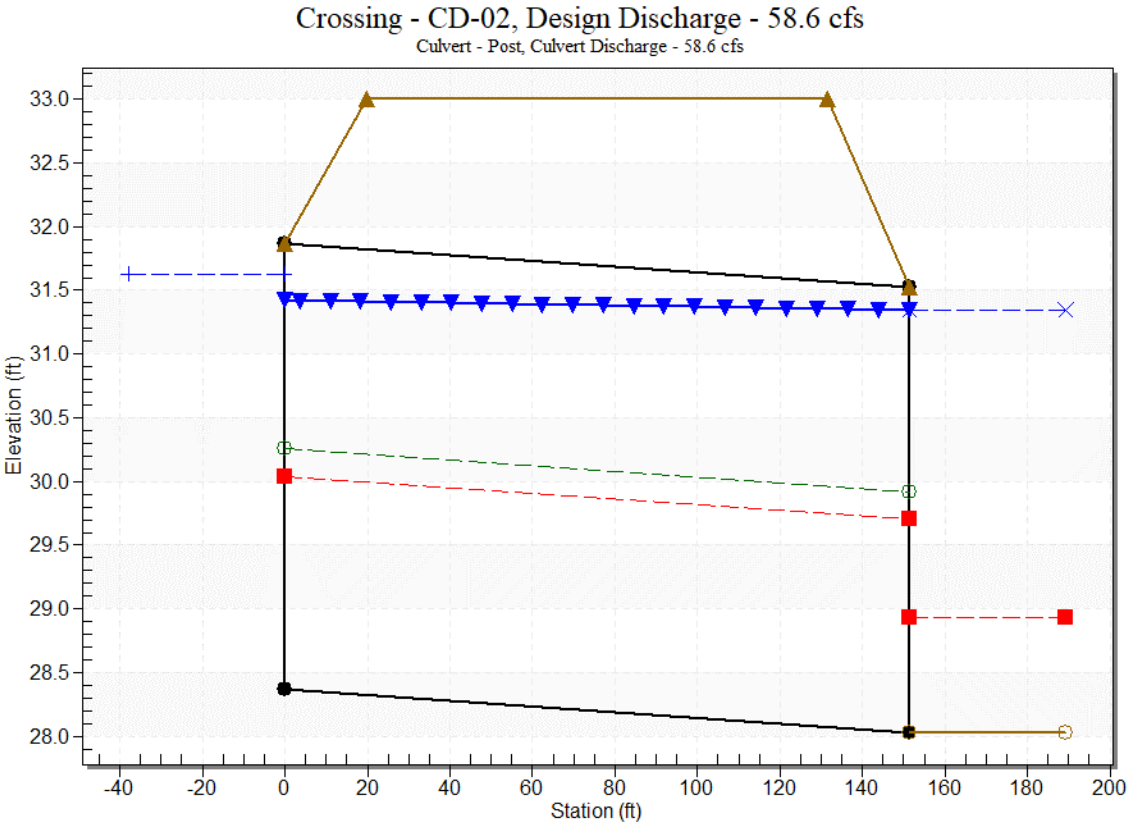
Culvert Length: 151.40 ft,

Culvert Slope: 0.0022

Culvert Performance Curve Plot: Post



Water Surface Profile Plot for Culvert: Post



Site Data - Post

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 28.37 ft

Outlet Station: 151.40 ft

Outlet Elevation: 28.03 ft

Number of Barrels: 2

Culvert Data Summary - Post

Barrel Shape: Circular

Barrel Diameter: 3.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Beveled Edge (1:1) (Ke=0.2)

Inlet Depression: None

Tailwater Data for Crossing: CD-02

Table 2 - Downstream Channel Rating Curve (Crossing: CD-02)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
51.92	31.16	3.13	0.74	0.20	0.09
53.97	31.21	3.18	0.75	0.20	0.09
56.02	31.27	3.24	0.75	0.20	0.09
58.65	31.34	3.31	0.76	0.21	0.09
60.11	31.38	3.35	0.77	0.21	0.09
62.16	31.43	3.40	0.77	0.21	0.09
64.21	31.49	3.46	0.78	0.22	0.09
66.26	31.54	3.51	0.79	0.22	0.09
68.30	31.59	3.56	0.79	0.22	0.09
70.35	31.64	3.61	0.80	0.23	0.09
72.40	31.68	3.65	0.80	0.23	0.09

Tailwater Channel Data - CD-02

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 10.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0010

Channel Manning's n: 0.1000

Channel Invert Elevation: 28.03 ft

Roadway Data for Crossing: CD-02

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2500.00 ft

Crest Elevation: 33.00 ft

Roadway Surface: Paved

Roadway Top Width: 112.00 ft

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 25.38 cfs

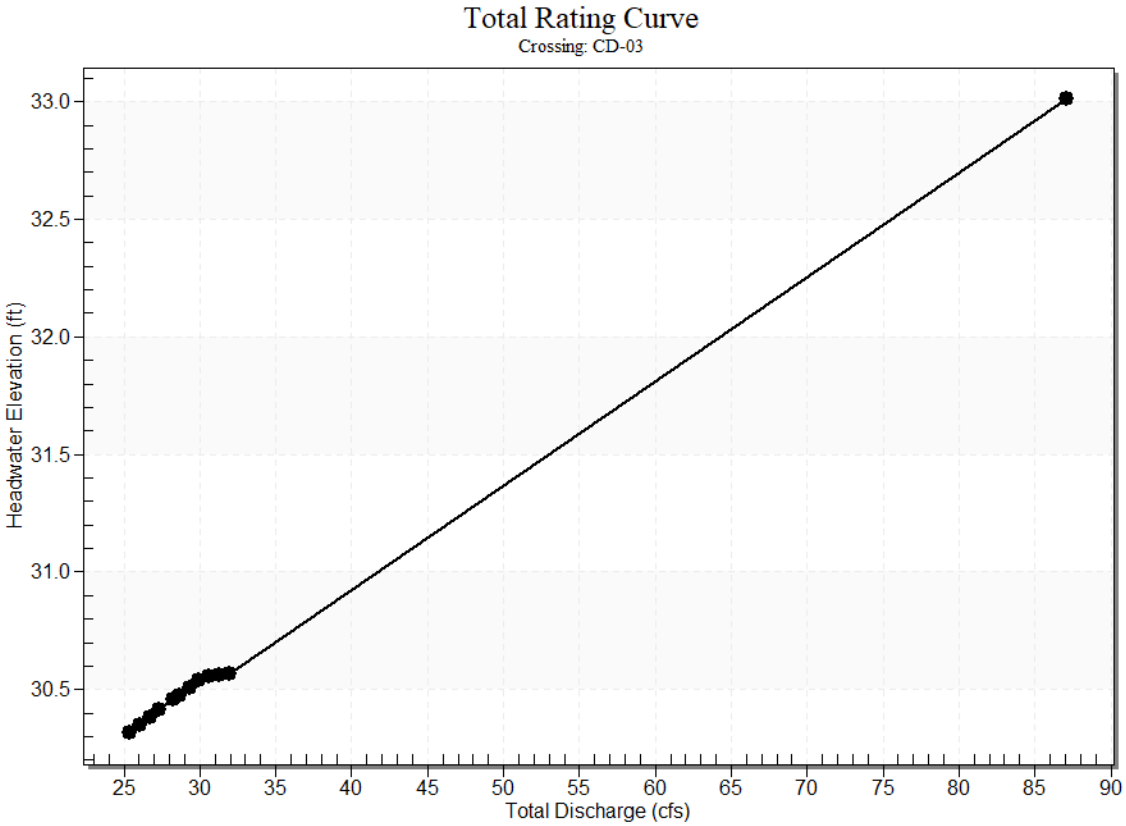
Design Flow: 28.27 cfs

Maximum Flow: 31.93 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-03

Headwater Elevation (ft)	Total Discharge (cfs)	Post Discharge (cfs)	Roadway Discharge (cfs)	Iterations
30.32	25.38	25.38	0.00	1
30.35	26.04	26.04	0.00	1
30.38	26.69	26.69	0.00	1
30.41	27.34	27.34	0.00	1
30.46	28.27	28.27	0.00	1
30.48	28.66	28.66	0.00	1
30.51	29.31	29.31	0.00	1
30.54	29.96	29.96	0.00	1
30.56	30.62	30.62	0.00	1
30.56	31.27	31.27	0.00	1
30.57	31.93	31.93	0.00	1
33.00	84.12	84.12	0.00	Overtopping

Rating Curve Plot for Crossing: CD-03



Culvert Data: Post

Table 1 - Culvert Summary Table: Post

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)
25.38 cfs	25.38 cfs	30.32	1.57	2.847	7-A2t	-1.00	1.13	2.55	2.21	1.98	0.61
26.04 cfs	26.04 cfs	30.35	1.59	2.880	7-A2t	-1.00	1.15	2.58	2.24	2.01	0.61
26.69 cfs	26.69 cfs	30.38	1.62	2.911	7-A2t	-1.00	1.16	2.61	2.27	2.05	0.62
27.34 cfs	27.34 cfs	30.41	1.64	2.943	7-A2t	-1.00	1.18	2.63	2.29	2.08	0.62

28.27 cfs	28.27 cfs	30.46	1.67	2.987	7-A2t	-1.00	1.20	2.67	2.33	2.13	0.63
28.66 cfs	28.66 cfs	30.48	1.69	3.005	7-A2t	-1.00	1.21	2.69	2.35	2.15	0.63
29.31 cfs	29.31 cfs	30.51	1.71	3.036	7-A2t	-1.00	1.22	2.71	2.37	2.18	0.63
29.96 cfs	29.96 cfs	30.54	1.74	3.067	7-A2t	-1.00	1.23	2.74	2.40	2.21	0.64
30.62 cfs	30.62 cfs	30.56	1.76	3.087	7-A2t	-1.00	1.25	2.77	2.43	2.25	0.64
31.27 cfs	31.27 cfs	30.56	1.78	3.091	7-A2t	-1.00	1.26	2.79	2.45	2.28	0.64
31.93 cfs	31.93 cfs	30.57	1.80	3.095	7-A2t	-1.00	1.28	2.82	2.48	2.32	0.65

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

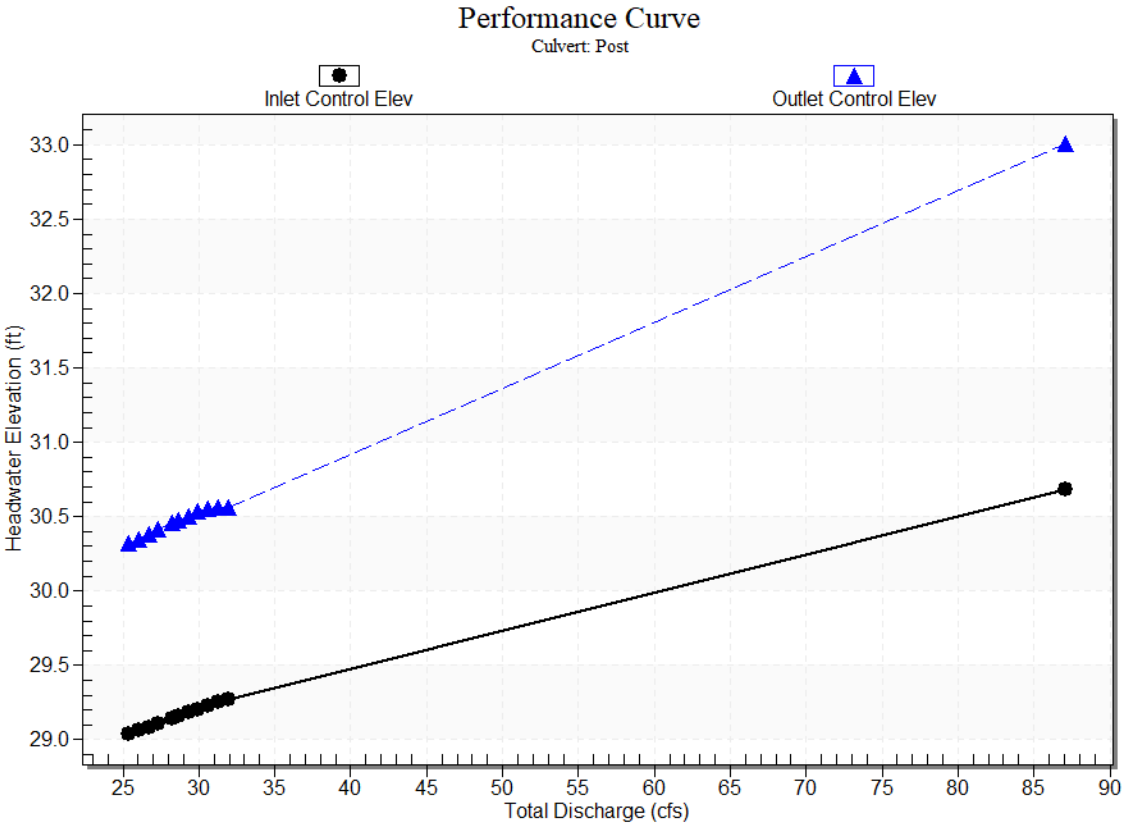
Inlet Elevation (invert): 27.47 ft,

Outlet Elevation (invert): 27.66 ft

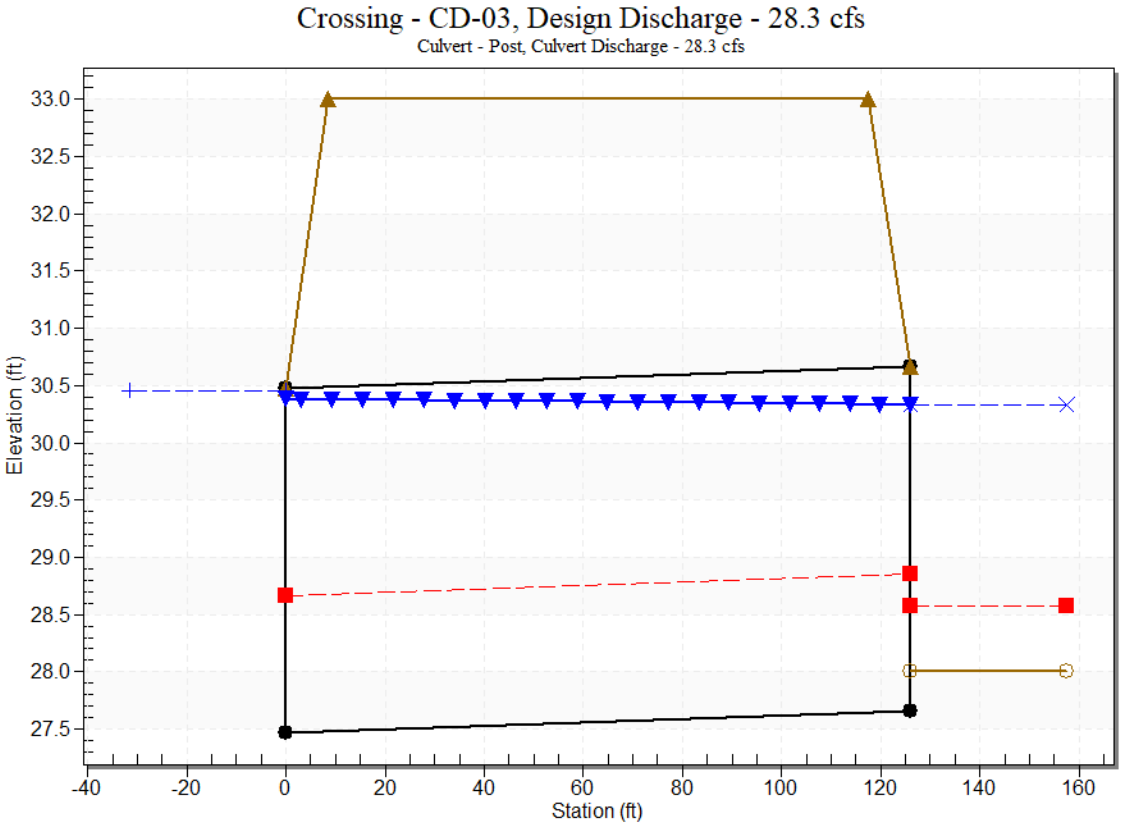
Culvert Length: 126.00 ft,

Culvert Slope: -0.0015

Culvert Performance Curve Plot: Post



Water Surface Profile Plot for Culvert: Post



Site Data - Post

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 27.47 ft

Outlet Station: 126.00 ft

Outlet Elevation: 27.66 ft

Number of Barrels: 2

Culvert Data Summary - Post

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Beveled Edge (1:1) (Ke=0.2)

Inlet Depression: None

Tailwater Data for Crossing: CD-03

Table 2 - Downstream Channel Rating Curve (Crossing: CD-03)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
25.38	30.21	2.21	0.61	0.14	0.09
26.04	30.24	2.24	0.61	0.14	0.09
26.69	30.27	2.27	0.62	0.14	0.09
27.34	30.29	2.29	0.62	0.14	0.09
28.27	30.33	2.33	0.63	0.15	0.09
28.66	30.35	2.35	0.63	0.15	0.09
29.31	30.37	2.37	0.63	0.15	0.09
29.96	30.40	2.40	0.64	0.15	0.09
30.62	30.43	2.43	0.64	0.15	0.09
31.27	30.45	2.45	0.64	0.15	0.09
31.93	30.48	2.48	0.65	0.15	0.09

Tailwater Channel Data - CD-03

Tailwater Channel Option: Trapezoidal Channel

Bottom Width: 10.00 ft

Side Slope (H:V): 4.00 (_:1)

Channel Slope: 0.0010

Channel Manning's n: 0.1000

Channel Invert Elevation: 28.00 ft

Roadway Data for Crossing: CD-03

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 1500.00 ft

Crest Elevation: 33.00 ft

Roadway Surface: Paved

Roadway Top Width: 109.00 ft

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 12.23 cfs

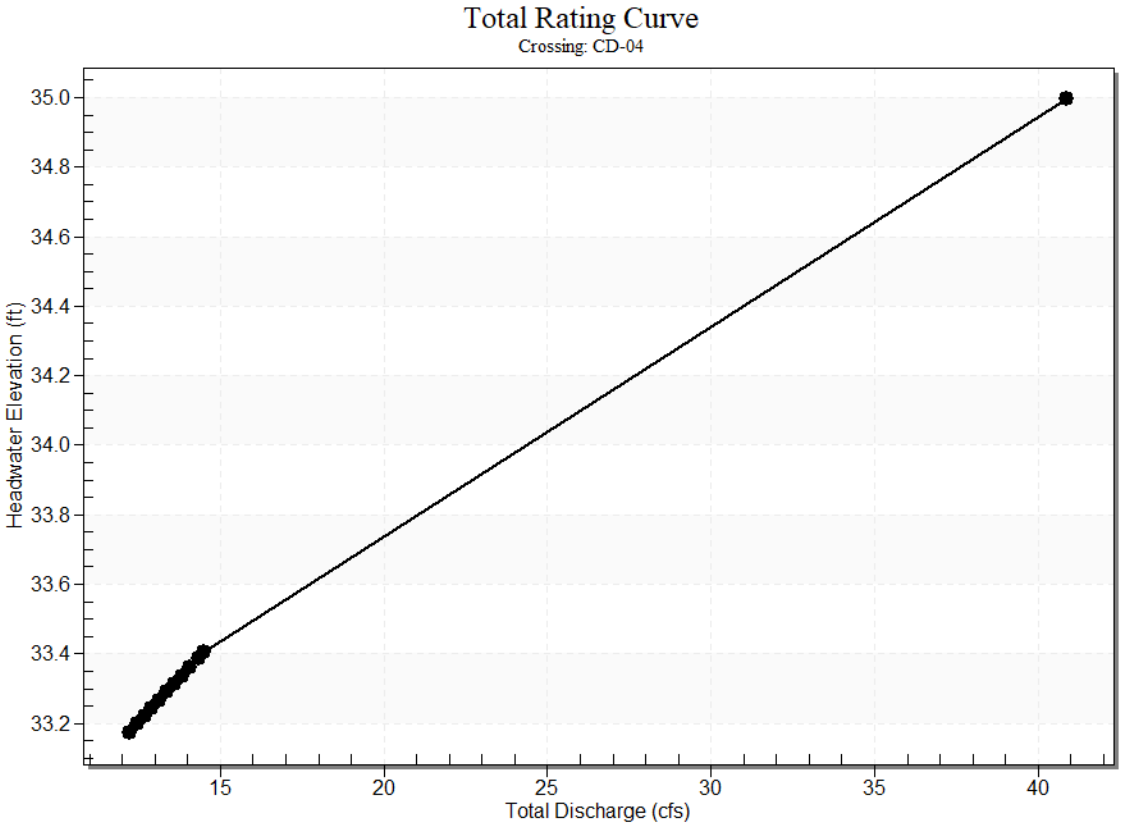
Design Flow: 14.32 cfs

Maximum Flow: 14.50 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-04

Headwater Elevation (ft)	Total Discharge (cfs)	Post Discharge (cfs)	Roadway Discharge (cfs)	Iterations
33.17	12.23	12.23	0.00	1
33.20	12.46	12.46	0.00	1
33.22	12.68	12.68	0.00	1
33.24	12.91	12.91	0.00	1
33.27	13.14	13.14	0.00	1
33.29	13.37	13.37	0.00	1
33.31	13.59	13.59	0.00	1
33.34	13.82	13.82	0.00	1
33.36	14.05	14.05	0.00	1
33.39	14.32	14.32	0.00	1
33.41	14.50	14.50	0.00	1
35.00	40.49	40.49	0.00	Overtopping

Rating Curve Plot for Crossing: CD-04



Culvert Data: Post

Table 1 - Culvert Summary Table: Post

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)
12.23 cfs	12.23 cfs	33.17	1.68	2.824	4-FFf	2.50	1.17	2.50	2.04	2.49	0.55
12.46 cfs	12.46 cfs	33.20	1.70	2.847	4-FFf	2.50	1.18	2.50	2.05	2.54	0.55
12.68 cfs	12.68 cfs	33.22	1.72	2.870	4-FFf	2.50	1.20	2.50	2.07	2.58	0.56
12.91 cfs	12.91 cfs	33.24	1.73	2.894	4-FFf	2.50	1.21	2.50	2.08	2.63	0.56
13.14 cfs	13.14 cfs	33.27	1.75	2.917	4-FFf	2.50	1.22	2.50	2.10	2.68	0.56
13.37 cfs	13.37 cfs	33.29	1.77	2.940	4-FFf	2.50	1.23	2.50	2.11	2.72	0.56

13.59 cfs	13.59 cfs	33.31	1.79	2.963	4-FFf	2.50	1.24	2.50	2.13	2.77	0.57
13.82 cfs	13.82 cfs	33.34	1.80	2.987	4-FFf	2.50	1.25	2.50	2.14	2.82	0.57
14.05 cfs	14.05 cfs	33.36	1.82	3.010	4-FFf	2.50	1.26	2.50	2.16	2.86	0.57
14.32 cfs	14.32 cfs	33.39	1.84	3.038	4-FFf	2.50	1.27	2.50	2.17	2.92	0.57
14.50 cfs	14.50 cfs	33.41	1.85	3.056	4-FFf	2.50	1.28	2.50	2.18	2.95	0.58

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

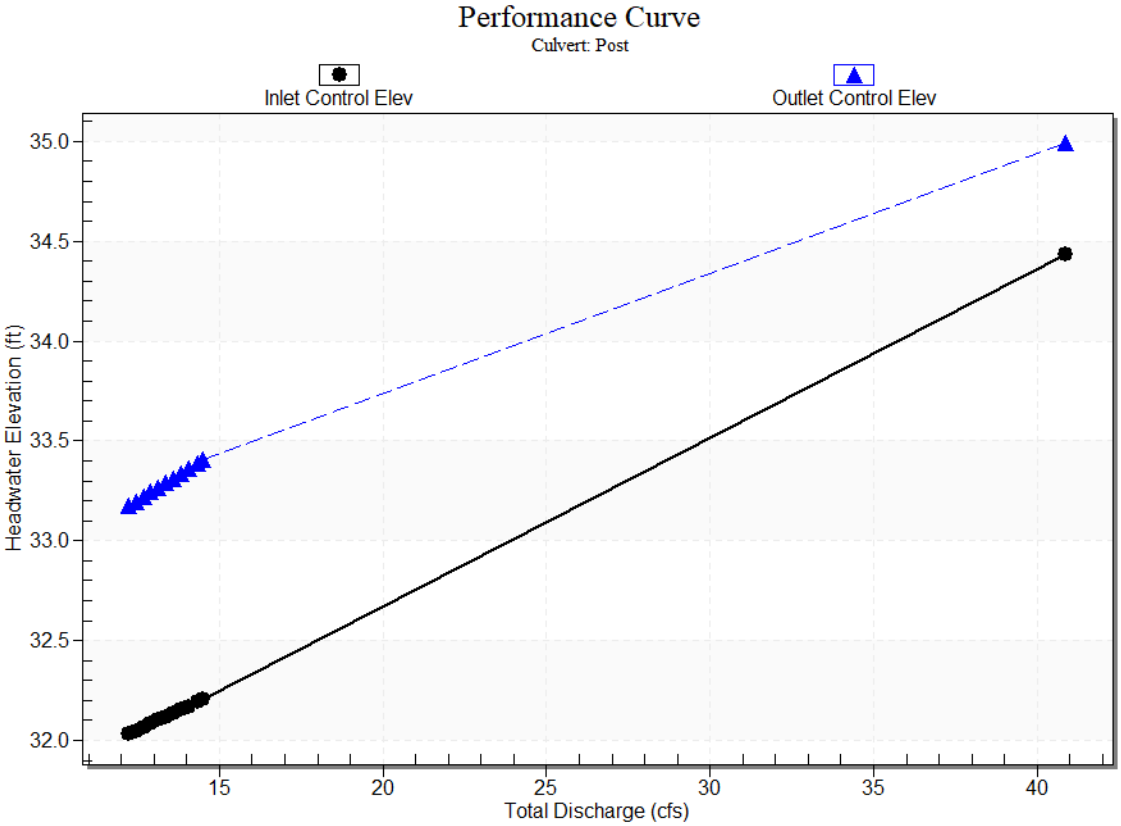
Inlet Elevation (invert): 30.35 ft,

Outlet Elevation (invert): 30.30 ft

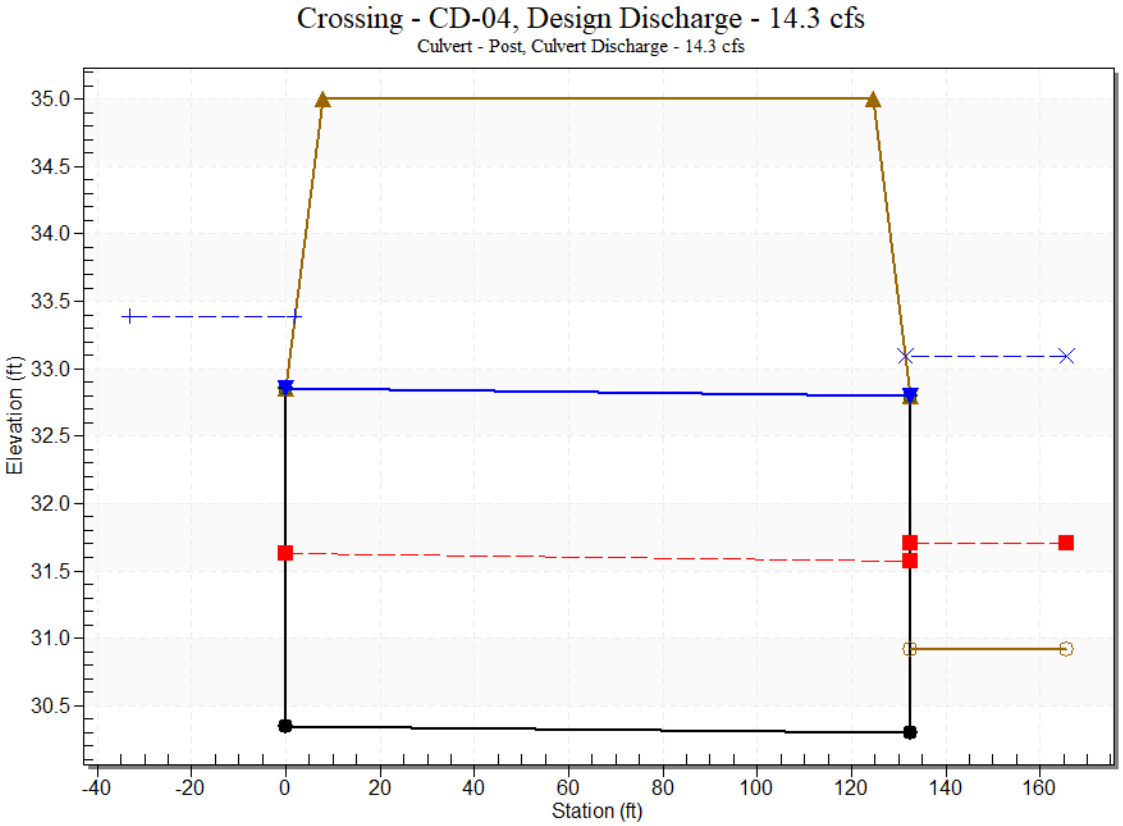
Culvert Length: 132.50 ft,

Culvert Slope: 0.0004

Culvert Performance Curve Plot: Post



Water Surface Profile Plot for Culvert: Post



Site Data - Post

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 30.35 ft

Outlet Station: 132.50 ft

Outlet Elevation: 30.30 ft

Number of Barrels: 1

Culvert Data Summary - Post

Barrel Shape: Circular

Barrel Diameter: 2.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Beveled Edge (1:1) (Ke=0.2)

Inlet Depression: None

Tailwater Data for Crossing: CD-04

Table 2 - Downstream Channel Rating Curve (Crossing: CD-04)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
12.23	32.96	2.04	0.55	0.03	0.09
12.46	32.97	2.05	0.55	0.03	0.09
12.68	32.99	2.07	0.56	0.03	0.09
12.91	33.00	2.08	0.56	0.03	0.09
13.14	33.02	2.10	0.56	0.03	0.09
13.37	33.03	2.11	0.56	0.03	0.09
13.59	33.05	2.13	0.57	0.03	0.09
13.82	33.06	2.14	0.57	0.03	0.09
14.05	33.08	2.16	0.57	0.03	0.09
14.32	33.09	2.17	0.57	0.03	0.09
14.50	33.10	2.18	0.58	0.03	0.09

Tailwater Channel Data - CD-04

Tailwater Channel Option: Irregular Channel

Channel Slope: Irregular Channel

User Defined Channel Cross-Section

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	1000.00	33.22	0.0450
2	1006.00	31.72	0.0450
3	1010.00	30.92	0.0450
4	1014.00	31.42	0.0450
5	1024.00	33.62	0.0000

Roadway Data for Crossing: CD-04

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 1900.00 ft

Crest Elevation: 35.00 ft

Roadway Surface: Paved

Roadway Top Width: 117.00 ft

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 23.45 cfs

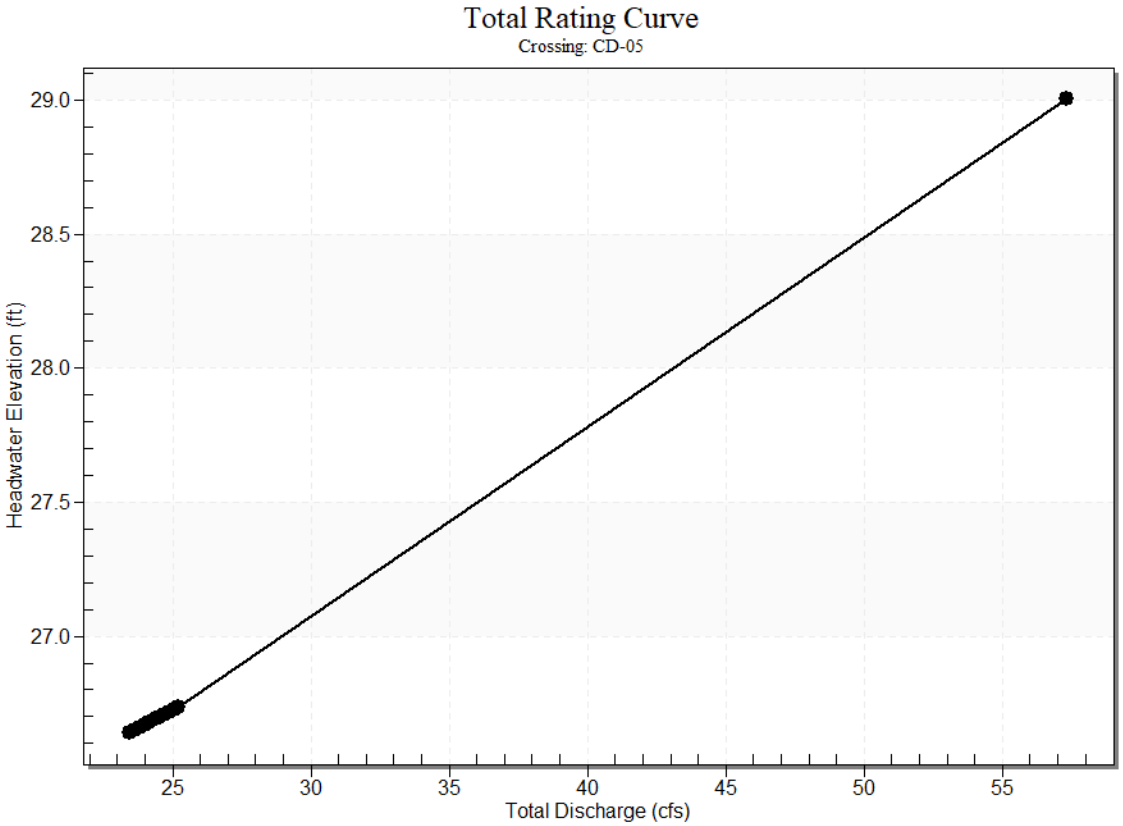
Design Flow: 24.40 cfs

Maximum Flow: 25.22 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-05

Headwater Elevation (ft)	Total Discharge (cfs)	Post Discharge (cfs)	Roadway Discharge (cfs)	Iterations
26.64	23.45	23.45	0.00	1
26.65	23.63	23.63	0.00	1
26.66	23.80	23.80	0.00	1
26.67	23.98	23.98	0.00	1
26.68	24.16	24.16	0.00	1
26.69	24.40	24.40	0.00	1
26.70	24.51	24.51	0.00	1
26.71	24.69	24.69	0.00	1
26.72	24.87	24.87	0.00	1
26.73	25.04	25.04	0.00	1
26.74	25.22	25.22	0.00	1
29.00	56.21	56.21	0.00	Overtopping

Rating Curve Plot for Crossing: CD-05



Culvert Data: Post

Table 1 - Culvert Summary Table: Post

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)
23.45 cfs	23.45 cfs	26.64	2.23	2.851	3-M1t	1.63	1.56	2.90	1.60	3.35	1.21
23.63 cfs	23.63 cfs	26.65	2.24	2.860	3-M1t	1.64	1.57	2.90	1.60	3.38	1.22
23.80 cfs	23.80 cfs	26.66	2.25	2.870	3-M1t	1.65	1.57	2.91	1.61	3.40	1.22
23.98 cfs	23.98 cfs	26.67	2.26	2.879	3-M1t	1.66	1.58	2.91	1.61	3.42	1.22

24.16 cfs	24.16 cfs	26.68	2.27	2.889	3-M1t	1.66	1.58	2.92	1.62	3.44	1.23
24.40 cfs	24.40 cfs	26.69	2.28	2.902	3-M1t	1.67	1.59	2.93	1.63	3.47	1.23
24.51 cfs	24.51 cfs	26.70	2.29	2.908	3-M1t	1.68	1.60	2.93	1.63	3.49	1.23
24.69 cfs	24.69 cfs	26.71	2.30	2.918	3-M1t	1.69	1.60	2.93	1.63	3.51	1.24
24.87 cfs	24.87 cfs	26.72	2.31	2.927	3-M1t	1.69	1.61	2.94	1.64	3.54	1.24
25.04 cfs	25.04 cfs	26.73	2.32	2.937	3-M1t	1.70	1.61	2.94	1.64	3.56	1.24
25.22 cfs	25.22 cfs	26.74	2.33	2.947	3-M1t	1.71	1.62	2.95	1.65	3.58	1.25

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

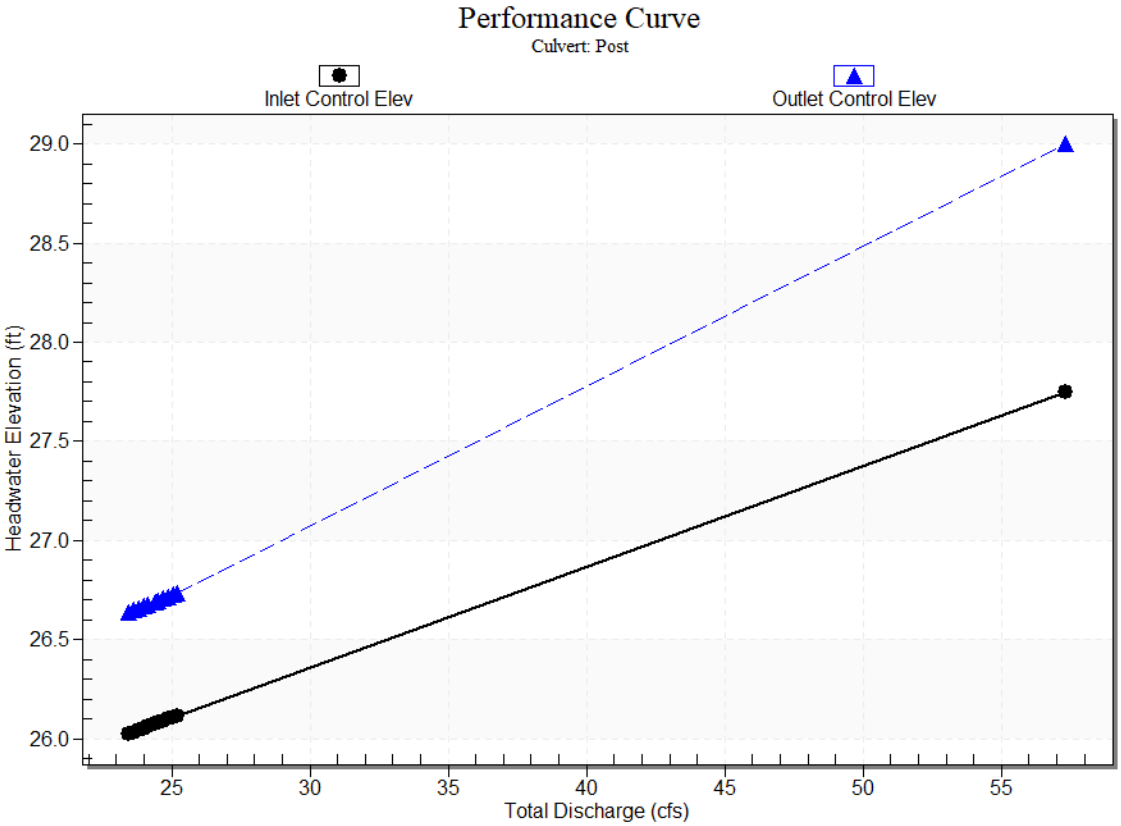
Inlet Elevation (invert): 23.79 ft,

Outlet Elevation (invert): 23.42 ft

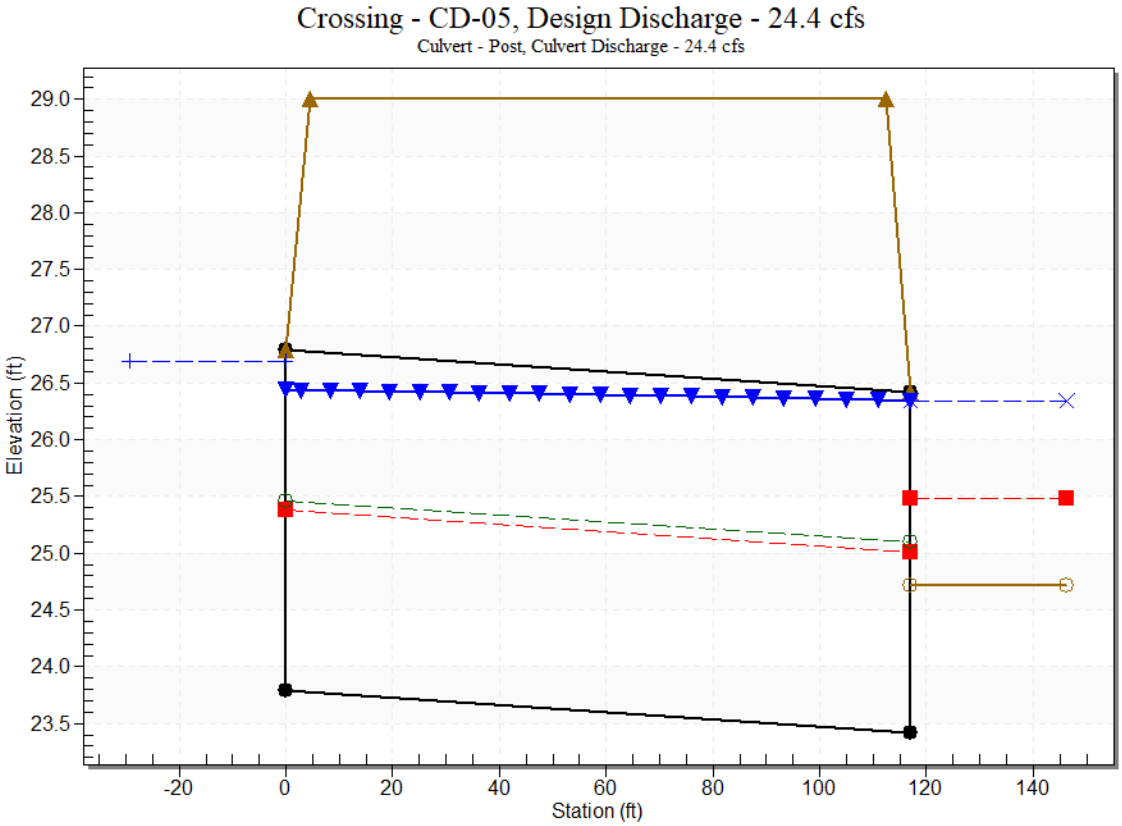
Culvert Length: 117.00 ft,

Culvert Slope: 0.0032

Culvert Performance Curve Plot: Post



Water Surface Profile Plot for Culvert: Post



Site Data - Post

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 23.79 ft

Outlet Station: 117.00 ft

Outlet Elevation: 23.42 ft

Number of Barrels: 1

Culvert Data Summary - Post

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Beveled Edge (1.5:1) (Ke=0.2)

Inlet Depression: None

Tailwater Data for Crossing: CD-05

Table 2 - Downstream Channel Rating Curve (Crossing: CD-05)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
23.45	26.32	1.60	1.21	0.13	0.21
23.63	26.32	1.60	1.22	0.13	0.21
23.80	26.33	1.61	1.22	0.13	0.21
23.98	26.33	1.61	1.22	0.13	0.21
24.16	26.34	1.62	1.23	0.13	0.21
24.40	26.35	1.63	1.23	0.13	0.21
24.51	26.35	1.63	1.23	0.13	0.21
24.69	26.35	1.63	1.24	0.13	0.21
24.87	26.36	1.64	1.24	0.13	0.21
25.04	26.36	1.64	1.24	0.13	0.21
25.22	26.37	1.65	1.25	0.13	0.21

Tailwater Channel Data - CD-05

Tailwater Channel Option: Irregular Channel

Channel Slope: Irregular Channel

User Defined Channel Cross-Section

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	1000.00	29.00	0.0450
2	1000.00	26.12	0.0450
3	1006.00	24.72	0.0450
4	1009.00	24.72	0.0450
5	1012.00	25.02	0.0450
6	1018.00	26.02	0.0450
7	1018.00	29.00	0.0000

Roadway Data for Crossing: CD-05

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2500.00 ft

Crest Elevation: 29.00 ft

Roadway Surface: Paved

Roadway Top Width: 108.00 ft

HY-8 Culvert Analysis Report

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 41.94 cfs

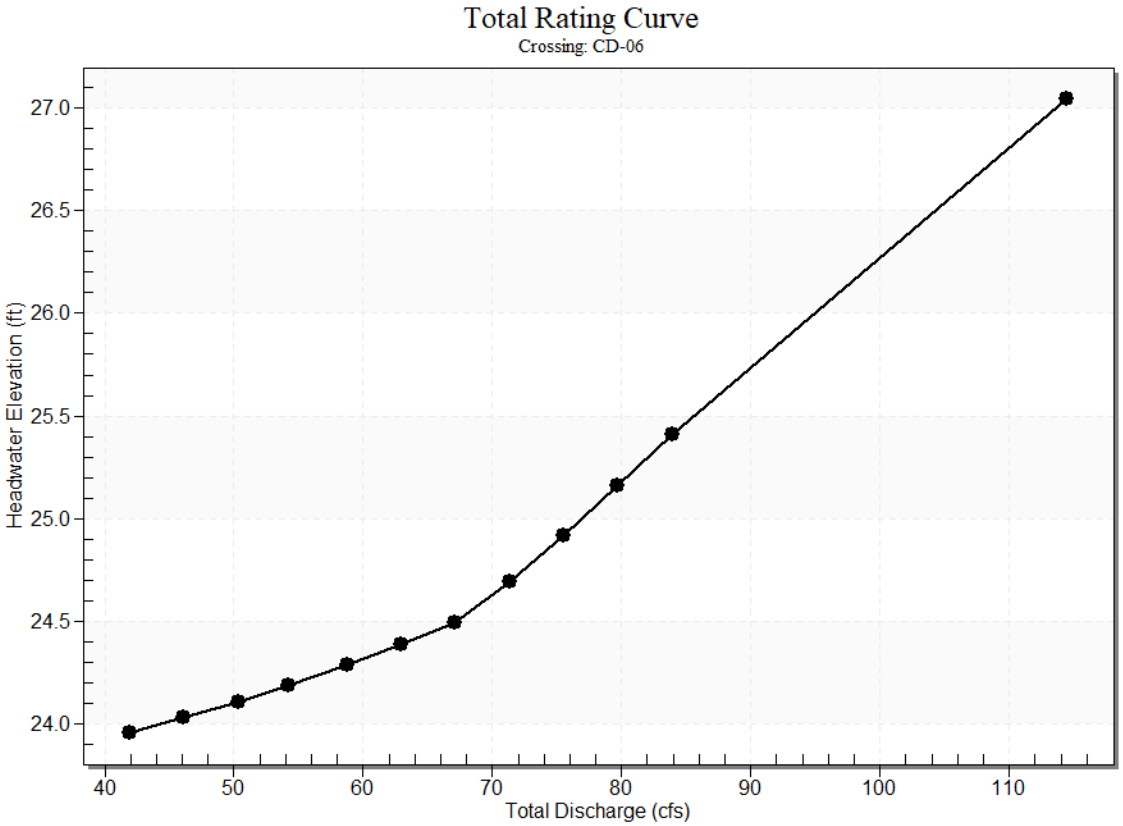
Design Flow: 54.25 cfs

Maximum Flow: 83.92 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-06

Headwater Elevation (ft)	Total Discharge (cfs)	Post Discharge (cfs)	Roadway Discharge (cfs)	Iterations
23.96	41.94	41.94	0.00	1
24.03	46.14	46.14	0.00	1
24.11	50.34	50.34	0.00	1
24.19	54.25	54.25	0.00	1
24.29	58.73	58.73	0.00	1
24.39	62.93	62.93	0.00	1
24.49	67.13	67.13	0.00	1
24.69	71.33	71.33	0.00	1
24.92	75.52	75.52	0.00	1
25.16	79.72	79.72	0.00	1
25.41	83.92	83.92	0.00	1
27.00	106.87	106.87	0.00	Overtopping

Rating Curve Plot for Crossing: CD-06



Culvert Data: Post

Table 1 - Culvert Summary Table: Post

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)
41.94 cfs	41.94 cfs	23.96	2.33	2.840	7-A2c	-1.00	1.56	1.56	1.84	6.53	1.79
46.14 cfs	46.14 cfs	24.03	2.48	2.912	7-A2c	-1.00	1.63	1.63	1.91	6.78	1.85
50.34 cfs	50.34 cfs	24.11	2.63	2.990	7-A2c	-1.00	1.71	1.71	1.99	7.04	1.90
54.25 cfs	54.25 cfs	24.19	2.79	3.069	7-A2c	-1.00	1.78	1.78	2.05	7.28	1.94

58.73 cfs	58.73 cfs	24.29	2.97	3.167	7-A2c	-1.00	1.85	1.85	2.12	7.55	1.99
62.93 cfs	62.93 cfs	24.39	3.16	3.266	7-A2c	-1.00	1.91	1.91	2.19	7.82	2.03
67.13 cfs	67.13 cfs	24.49	3.36	3.372	7-A2c	-1.00	1.97	1.97	2.25	8.09	2.07
71.33 cfs	71.33 cfs	24.69	3.57	3.484	7-JA2c	-1.00	2.03	2.03	2.31	8.37	2.11
75.52 cfs	75.52 cfs	24.92	3.80	3.604	7-JA2c	-1.00	2.08	2.08	2.37	8.66	2.15
79.72 cfs	79.72 cfs	25.16	4.04	3.730	7-JA2t	-1.00	2.13	2.13	2.43	8.95	2.18
83.92 cfs	83.92 cfs	25.41	4.29	3.863	7-JA2t	-1.00	2.17	2.19	2.49	9.22	2.21

Culvert Barrel Data

Culvert Barrel Type Straight Culvert

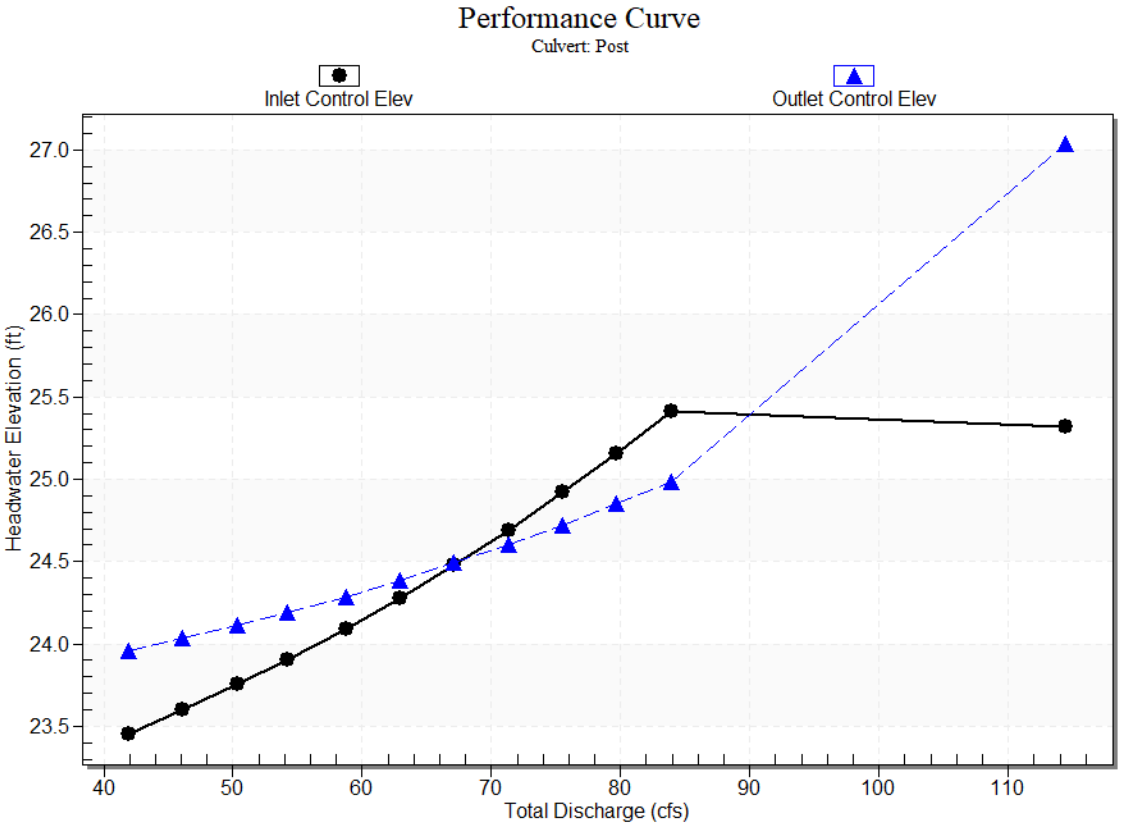
Inlet Elevation (invert): 21.12 ft,

Outlet Elevation (invert): 22.52 ft

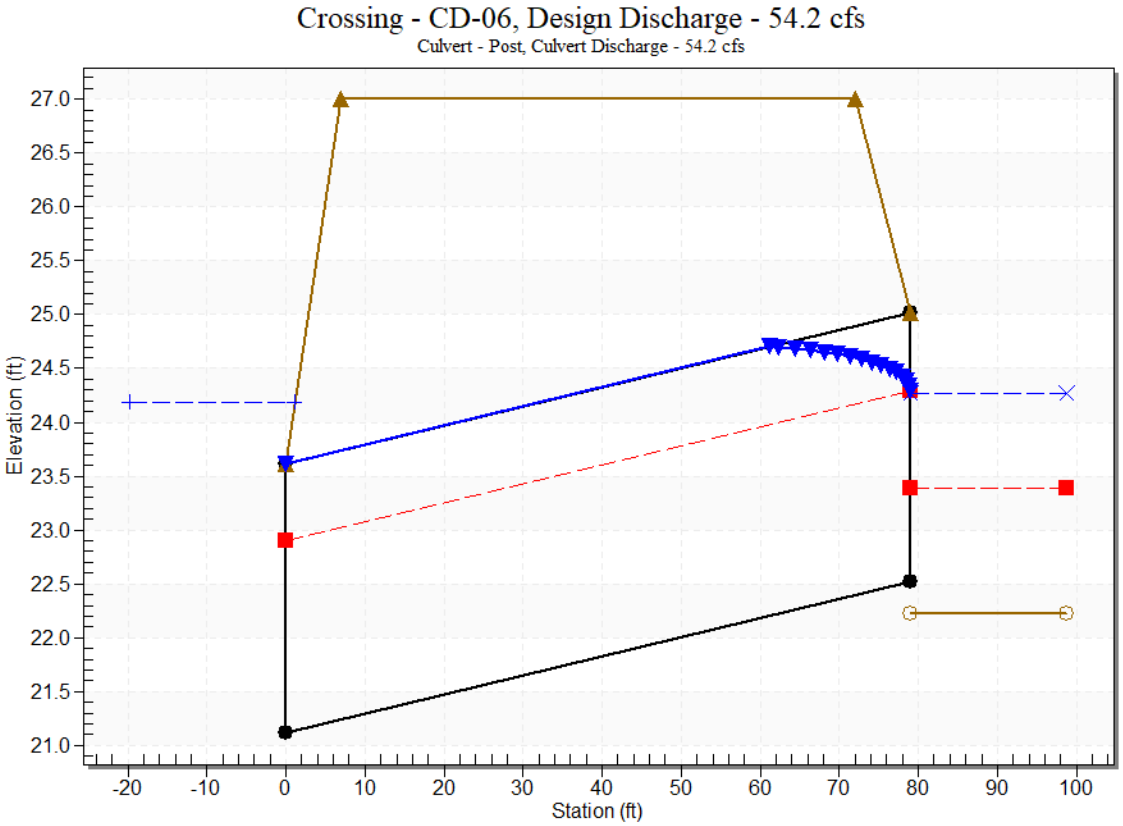
Culvert Length: 79.01 ft,

Culvert Slope: -0.0177

Culvert Performance Curve Plot: Post



Water Surface Profile Plot for Culvert: Post



Site Data - Post

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 21.12 ft

Outlet Station: 79.00 ft

Outlet Elevation: 22.52 ft

Number of Barrels: 2

Culvert Data Summary - Post

Barrel Shape: Circular

Barrel Diameter: 2.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Beveled Edge (1:1) (Ke=0.2)

Inlet Depression: None

Tailwater Data for Crossing: CD-06

Table 2 - Downstream Channel Rating Curve (Crossing: CD-06)

Flow (cfs)	Water Surface Elev (ft)	Velocity (ft/s)	Depth (ft)	Shear (psf)	Froude Number
41.94	24.06	1.84	1.79	0.30	0.30
46.14	24.13	1.91	1.85	0.31	0.30
50.34	24.21	1.99	1.90	0.32	0.30
54.25	24.27	2.05	1.94	0.33	0.30
58.73	24.34	2.12	1.99	0.34	0.30
62.93	24.41	2.19	2.03	0.35	0.31
67.13	24.47	2.25	2.07	0.37	0.31
71.33	24.53	2.31	2.11	0.38	0.31
75.52	24.59	2.37	2.15	0.38	0.31
79.72	24.65	2.43	2.18	0.39	0.31
83.92	24.71	2.49	2.21	0.40	0.31

Tailwater Channel Data - CD-06

Tailwater Channel Option: Irregular Channel

Channel Slope: Irregular Channel

User Defined Channel Cross-Section

Coord No.	Station (ft)	Elevation (ft)	Manning's n
1	1000.00	27.00	0.0450
2	1000.00	24.72	0.0450
3	1011.00	22.42	0.0450
4	1014.00	22.22	0.0450
5	1018.00	22.52	0.0450
6	1024.00	23.92	0.0450
7	1024.00	27.00	0.0000

Roadway Data for Crossing: CD-06

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 1300.00 ft

Crest Elevation: 27.00 ft

Roadway Surface: Paved

Roadway Top Width: 65.00 ft