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Memorandum Date: July 10, 2018

Subject: Technical Memorandum: Project Development & Environment  
Location Hydraulics Report and Phase II Design Comparison  
Financial Project ID No. 419344-3-52-01  
SR 710 from US 441 to L-63N Canal  
Okeechobee County, Florida

In May of 2012, the Florida Department of Transportation (FDOT) published a Location Hydraulics Report (LHR) for a Project Development and Environment (PD&E) Study that was conducted for SR 710 from US 441 to CR 714 (SW Martin Highway) in Okeechobee and Martin Counties, which included the project segment. Since that time, the FDOT has identified the need to modify the proposed alignment of SR 710 from US 441 to L-63N Canal to improve highway operations, safety, and regional mobility. This Memorandum presents a comparison between the proposed stormwater cross drain and 100-year floodplain compensation design required for the proposed improvements and the PD&E facilities.

## 1. Project Description

The revised improvements include a new four-lane suburban typical section. The roadway will consist of two 12-foot wide travel lanes in each direction, separated by a raised 30-foot wide grassed median. This roadway section will also include four-foot shoulders to the inside of the travel lanes and six and one-half-foot (eight-foot useable) shoulders adjacent to the outside travel lanes to function as a bike lane. Type E curb and gutter will be provided along the median and outside edges of the roadway along with a closed storm-water conveyance system. The total length of the project is 3.8 miles. The project also includes a widening of the existing bridge over the L-63N Canal and a new bridge culvert over Taylor Creek. Acquisition of ROW will be required for the new roadway alignment and stormwater ponds.

## 2. Cross Drain Analysis

The SR 710 PD&E identified four (4) new cross drains. Refer to Figure 1 for location of PD&E crossings. For PD&E proposed pipes, size was based on the Rational Method using the velocity method of 4 ft/s.

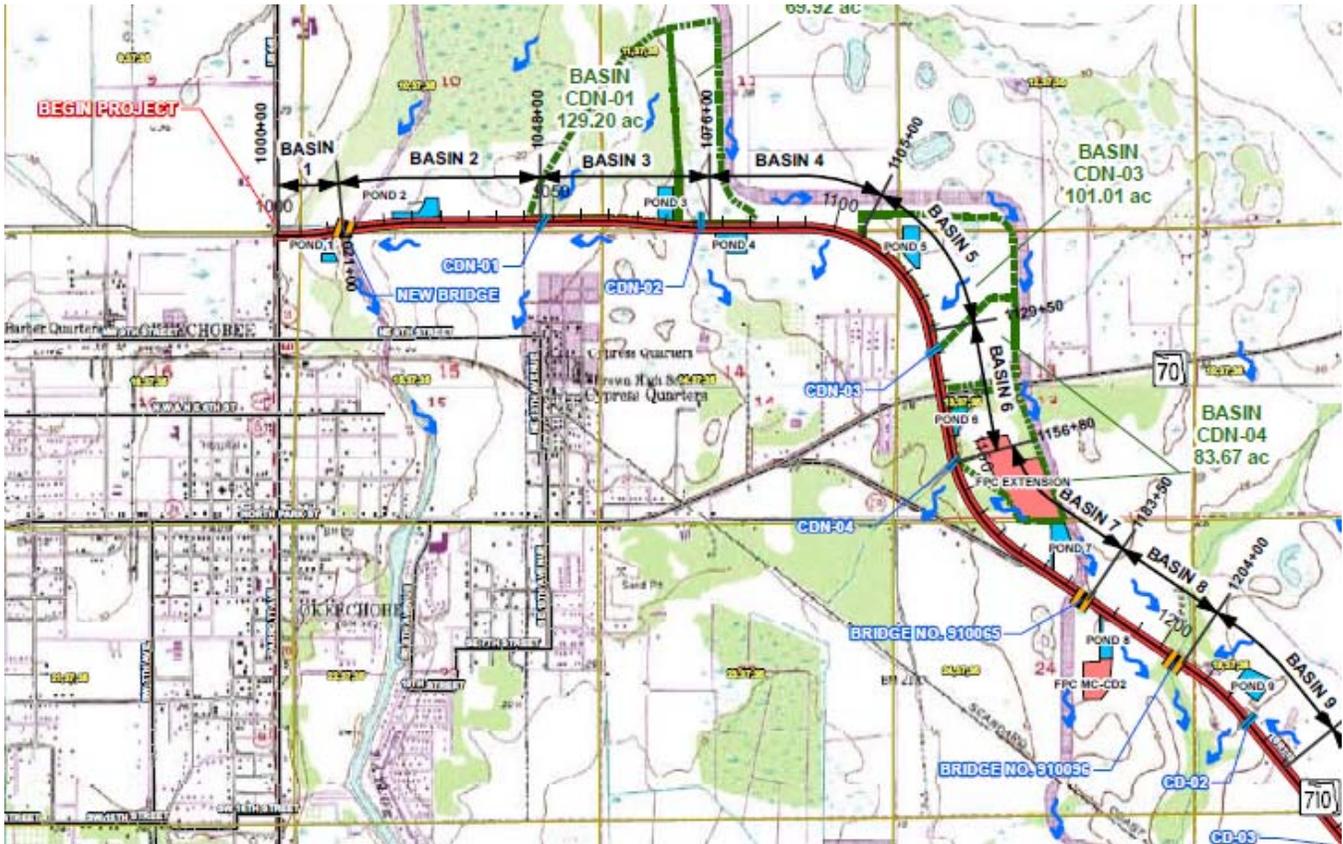


Figure 1: Proposed Cross Drain Locations (From Figure 3-1 LHR 2012)

In the proposed Phase II design, there are eleven (11) cross drains. Along the alignment, there are several areas where historic depressions are being impacted. This impact to storage is being accounted for in the routing calculations utilizing ICPR. A bypass conveyance system has been designed to convey offsite runoff to the L-63N. The peak stages were analyzed at all off-site locations to insure the post-development peak stages are at or below the pre-development peak stages or that no adverse impacts are associated with the increase.

Table 1 below compares the PD&E, existing cross drain information and proposed design.

**Table 1: Summary of PD&E and Design Cross Drain Information**

PD&E Analysis			Proposed Design		
Name	Location <sup>(1)</sup>	Size	Name	Location	Size
			S-504/S-505	516+70	2-36"
CDN-01	548+00	48"	CD-3	548+60	7-24"
			CD-4	565+40	6-24"x38"
CDN-02	576+00	36"	CD-5	576+15	2-24"
			CD-6	606+57	36"
			CD-7	619+30	2-36"
CDN-03	624+00	54"	CD-8	623+50	36"
			CD-9	629+50	36"
			CD-10	637+66	14"x23"
CDN-04	651+60	48"	CD-11	651+96	4-29"x45"
			CD-12	666+50	36"

*(1) Location was estimated using the current SR 710 Stationing*

### 3. Floodplain Analysis

The 100-year floodplain will not be impacted due to the encroachment as significantly as depicted in the original PD&E LHR due to an update in the FEMA Flood Maps in 2015. The PD&E utilized Effective FEMA maps dated February 1981, which showed a majority of the alignment within Flood Zone A, which does not have an established 100-year floodplain elevation. The PD&E identified two locations of floodplain encroachment within the project segment. Refer to **Figure 2** for the PD&E floodplains. For the new alignment from US 441 to SR 70, 12,000 linear feet of floodplain encroachment was identified with an estimated floodplain elevation of 23.3 ft NAVD from information provided from the Lakeside Ranch STA. Encroachment into the floodplain associated with Mosquito Creek was also identified. The base flood elevation for the creek floodplain was based on the original bridge hydraulic recommendation sheet, which is 23.0 ft NAVD. The floodplain impacts resulting from the bridge/bridge culvert widening/replacement were not considered during the PD&E.

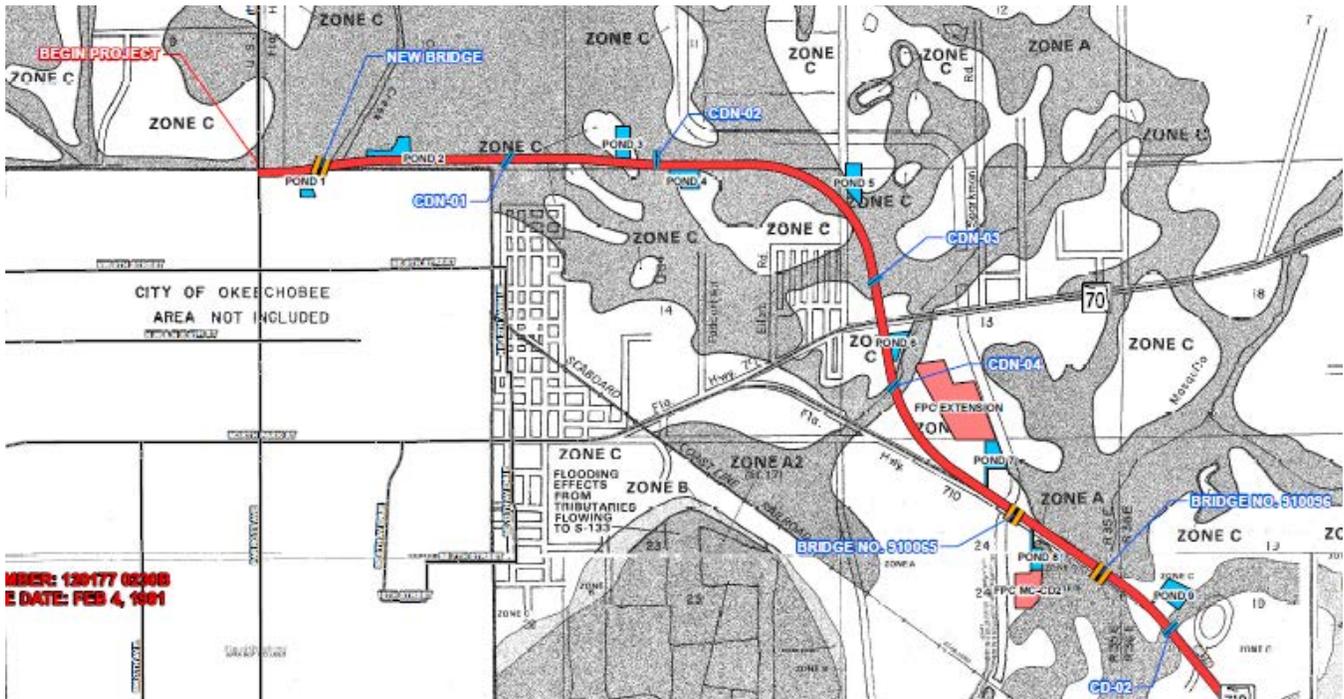


Figure 2: PD&E Floodplain Impacts (from Figure 7-1 LHR 2012)

FEMA Maps were updated and became effective on July 16, 2015. There are two areas of encroachment within the proposed design. The proposed roadway fill will encroach on the FEMA floodplain at Station 518+00 within Basin 2 (as part of the Taylor Creek Crossing) and Station 700+00 within Basin 5. Also, Pond 5 is located within the 2015 effective FEMA floodplain.

Figure A shows the proposed alignment and stormwater ponds with the proposed cross drains and 2015 floodplain information.

The floodplain impacts associated with the Taylor Creek crossing have been evaluated through hydraulic analysis to estimate the existing and proposed behavior. A No-Rise Analysis has been performed to demonstrate criteria is being met.

Floodplain compensation within Basin 5 is provided in an adjacent parcel located southeast of Pond 5 and northeast of SR 710, identified as FPC 5. Approximately 1-acre of right-of-way is need for FPC 5. FPC 5 provides compensation between elevation 19 ft NAVD (Normal Water level of Mosquito Creek) and the 100-year elevation of 23.3 ft NAVD for the impacts associated with the roadway and Pond 5.

Table 2 compares the PD&E with the proposed design for floodplain encroachment and compensation.

**Table 2: Summary of PD&E and Design Floodplain Information**

	PD&E Analysis	Proposed Design	PD&E Analysis	Proposed Design
<b>Location</b>	US 441 to SR 70 <sup>(1)</sup>	Taylor Creek	Mosquito Creek	Mosquito Creek
<b>100-year Elevation (NAVD)</b>	23.30	16.00	23.00	23.30
<b>Encroachment (ac-ft)</b>	7.10	No-Rise Analysis	3.84	1.56
<b>Compensation (ac-ft)</b>	8.10		4.61	1.79
<b>Compensation Location</b>	FPC Extension		FPC MC CD-2	FPC 5

*(1) In the PD&E, the floodplain extended from US 441 to SR 70; in the proposed design, the floodplain impacts are limited to the Taylor Creek area.*

#### 4. Conclusion

Work on this new alignment project will cause changes in flood stage and flood limits. The construction of the drainage structures proposed for this project will cause changes in flood stage and flood limits. These changes will not result in any significant adverse impacts on the natural and beneficial floodplain values or any significant changes in flood risk or damage. These changes will be reviewed by the appropriate regulatory authorities. There will not be significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that this encroachment is not significant.



**Legend**

- PostLink
- Proposed ROW
- Proposed Roadway
- Proposed Ponds

**Flood Zones**

- FLOODWAY
- 500 Year

**Water Bodies**

- MARSH
- Flood Zone A
- Flood Zone AE

**Notes:**

- The information on this sheet is for information purposes only and is not to be used for construction. The sheet is to be used for documentation and to assist agencies and construction personnel with drainage concerns.
- The existing contour information has been compiled from multiple sources including the National Elevation Dataset, Okeechobee County contours, LIDAR from Herbert Hooper Dike Area, existing permits, and recent survey files.

0 1,000 2,000 Feet

0 0.25 Miles

Figure A - Cross Drain & Floodplain Information

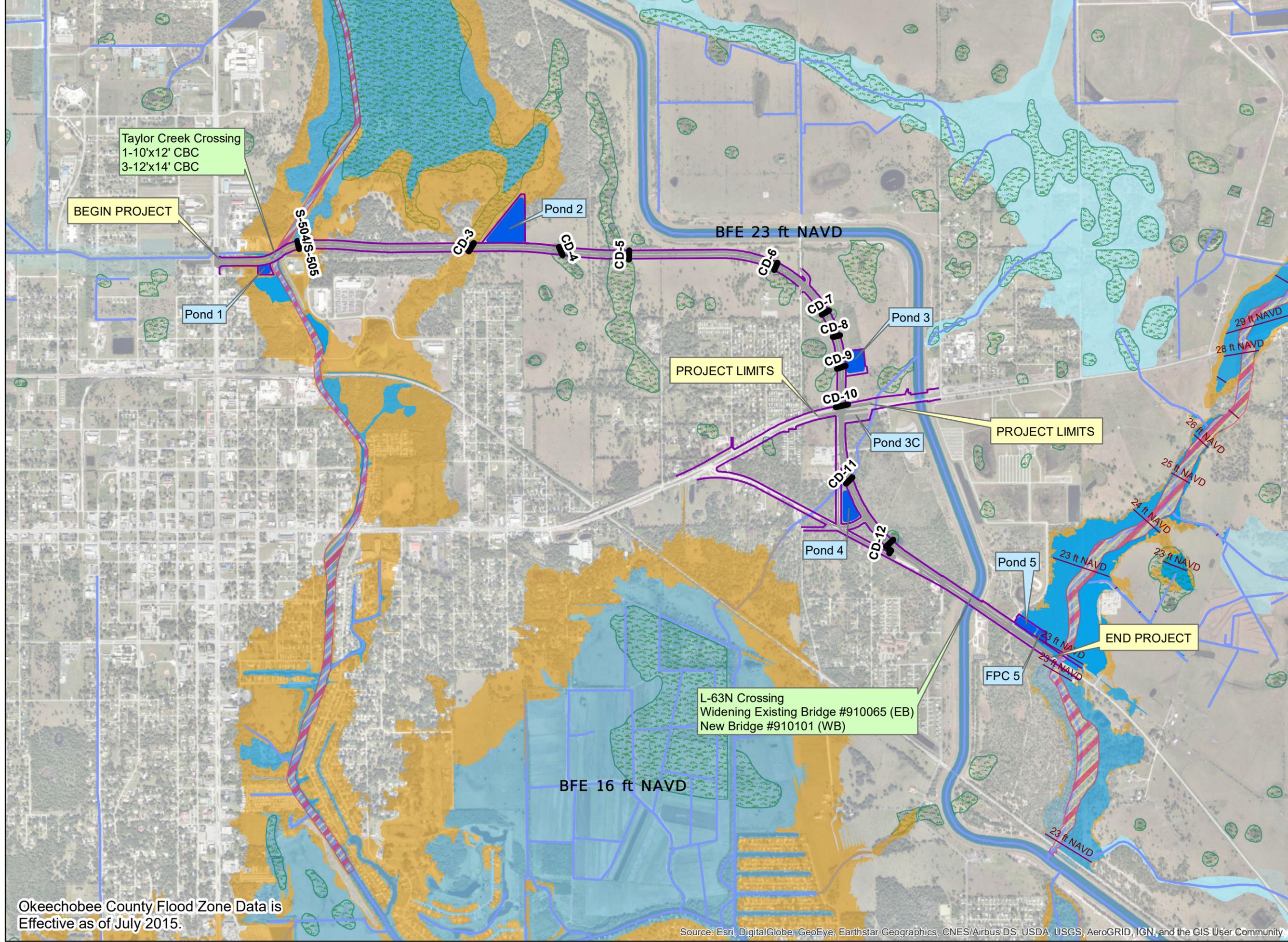
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SR 710 from US 441 to the L-63N Canal

Okeechobee County, Florida

Filename: F05_FEMM14g_S010.mxd	Map Date: 7/10/2018	Map Prepared By: The Balmoral Group
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Okeechobee County Flood Zone Data is Effective as of July 2015.