

# **NEPA/Section 404 Concurrence Point 2A: Bridging and Alignment Review**

## **Cape Fear Crossing** Brunswick and New Hanover Counties

**STIP Project  
U-4738**

**North Carolina Department of Transportation**



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## 1.0 Purpose of Today's Meeting

The purpose of today's meeting is to review alternatives for the proposed Cape Fear Crossing and gain concurrence on bridge locations and lengths.

## 2.0 Project Description

The North Carolina Department of Transportation (NCDOT) proposes to construct a new location project in Brunswick and New Hanover Counties. The project area is shown in Figure 1. The project is included in the *2016-2025 State Transportation Improvement Program (STIP)* as the proposed Cape Fear Crossing (STIP Project U-4738). The project includes a fully controlled access facility extending from the vicinity of US 17 Bypass and I-140 in Brunswick County to US 421 in New Hanover County, including a crossing of the Cape Fear River.

## 3.0 Project Schedule/Cost

The proposed project is funded for planning and environmental studies only in the draft 2017-2027 STIP. Neither right of way acquisition nor construction are currently funded. The schedule for preparation of environmental documentation is as follows:

Draft Environmental Impact Statement – fall 2017

Corridor Public Hearing – spring 2018

Concurrence on Least Environmentally Damaging Practicable Alternative (CP 3) – fall 2018

Final Environmental Impact Statement – winter 2018/2019

Record of Decision – summer 2019

Construction cost estimates for the project are provided in Table 1. Right-of-way cost estimates are currently being prepared.

**Table 1. Construction Cost per Alternative**

<b>Alternative</b>	<b>Estimated Construction Cost (millions)</b>
Alternative B	\$760
Alternative C	\$768
Alternative F	\$425
Alternative G	\$779
Alternative J	\$675
Alternative M Avoidance	\$774
Alternative N Avoidance	\$763
Alternative P	\$380
Alternative Q	\$745
Alternative T	\$733
Alternative VA	\$511
Alternative VF	\$553

## 4.0 Project Purpose and Need

The purpose of the project is to improve traffic flow and enhance freight movement beginning in the vicinity of US 17 and I-140 in Brunswick County across the Cape Fear River to US 421 near the Port of Wilmington in southern New Hanover County.

## 5.0 Project Status

The project was initiated in 2006, and public meetings were conducted at that time. The project was then placed on hold in 2011, before being reinitiated in 2013. The Section 404/NEPA Merger Team agreed on the purpose of and need for the project at their December 12, 2013 Concurrence Point (CP) 1 meeting. The Merger Team concurred on alternatives to be studied in detail at their February 10, 2014 CP 2 meeting. Detailed environmental and technical studies began in 2015 and are ongoing.

Two Citizens Informational Workshops (CIWs) were held for the project in April 2006 to introduce the project, provide information to the public, and solicit feedback. Two additional CIWs were held in March 2011 in New Hanover and Brunswick Counties to present the project purpose and need and preliminary alternatives, and to solicit input from the public on these topics.

A newsletter was mailed to the project mailing list on April 2, 2014 to notify the public of the selection of the 12 detailed study alternatives, as well as the next steps in the project development process.

## 6.0 Detailed Study Build Alternatives

NCDOT has selected 12 alternatives for detailed study in addition to the No-Build Alternative. These detailed study alternatives include two alternatives that will upgrade existing US 17, four alternatives on new location, and six “hybrid” alternatives that incorporate upgrade of existing US 17 and new location roadway. The detailed study alternatives are described below and shown in Appendix B. A comparison of alternatives in relation to environmental features is shown in Table 3.

### **Upgrade Existing Alternatives:**

- Alternatives F/P: These two alternatives include upgrading US 17 from the I-140/US 17 interchange, to US 421 in the City of Wilmington. The alternatives will be designed as a freeway (Alternative F) and as a standard widening (Alternative P).

### **New Location Alternatives:**

- Alternative B: This alternative begins at I-140 and crosses US 17, travels between the Brunswick Forest and Mallory Creek developments, and crosses the Cape Fear River to terminate at Shipyard Boulevard.
- Alternative C: This alternative begins at I-140 and crosses US 17, travels parallel to Wire Road, and crosses the Cape Fear River to terminate at Independence Boulevard. This alternative would also include upgrading US 421 to Shipyard Boulevard.
- Alternatives M Avoidance and N Avoidance: These alternatives begin at the I-140/US 17 interchange, avoid the Snee Farm/Stoney Creek subdivisions, travel south of Brunswick Forest,

and cross the Cape Fear River to terminate at either Independence Boulevard (Alternative M Avoidance) or Shipyard Boulevard (Alternative N Avoidance). Alternative M Avoidance would also include upgrading US 421 to Shipyard Boulevard.

### **“Hybrid” Alternatives:**

- Alternatives G/Q: These two alternatives begin at the I-140/US 17 interchange, upgrade existing US 17 for approximately two miles, then continue on new location between the Brunswick Forest and Mallory Creek developments, and cross the Cape Fear River to terminate at Independence Boulevard. These alternatives would also include upgrading US 421 to Shipyard Boulevard. Alternative G and Alternative Q follow the same alignment, but Alternative G will be designed as a freeway for its entire length, while Alternative Q will be designed as a standard widening along US 17 and a freeway on its new location portion.
- Alternatives J/T: These two alternatives begin at the I-140/US 17 interchange, upgrade existing US 17 for approximately two miles, then continue on new location parallel to Wire Road, and cross the Cape Fear River to terminate at Shipyard Boulevard. Alternative J and Alternative T follow the same alignment, but Alternative J will be designed as a freeway for its entire length, while Alternative T will be designed as a standard widening along US 17 and a freeway on its new location portion.
- Alternative V (Arterial Widening (V-A) and Freeway (V-F) option): This alternative will include upgrading US 17 to the US 17/US 421 interchange, then travel south along Eagle Island on new location, and cross the Cape Fear River to terminate at US 421 just north of the Port of Wilmington. This alternative will have two options: it will be designed as a freeway with service roads and interchanges, and as a standard widening with access remaining similar to its current function.

### **No-Build Alternative:**

The No-Build Alternative assumes the local transportation system would evolve as currently planned, but without implementation of the proposed project. With the exception of routine maintenance, no change would take place along the existing corridors within the study area.

## **7.0 Travel Time Benefits**

Based on the results of the Traffic Simulation Report (September 2015), Alternative F would provide the most benefit to the roadway network in both the AM and PM peak periods. Alternatives G, J, V (Freeway), and V (Arterial) provide the most positive regional impacts of the remaining alternatives in the peak periods. Alternative M Avoidance has the fewest positive impacts in both time periods.

The AM and PM peak period region wide network speeds increase by approximately 6 mph with Alternative F in place. This is a 25% increase in the average speed of the No-Build Alternative. Alternative V (Freeway) has the second highest impacts to the regional speeds with improvements only slightly lower than Alternative F. Alternative M Avoidance provided the least improvements to the regional speeds with increases of approximately 2 mph in both the AM and PM peak periods.

The freeway hybrid alternatives (G and J) ranked third and fourth in regional network speed improvements. Of the strictly new location alternatives, Alternative B provided the most improvement in the AM peak period, and Alternative C ranked highest in the PM peak period.

Comparisons of Average Delay provided similar results. Alternatives F and VF reduced the average trip

time by approximately three minutes (38 percent decrease from the No-Build Alternative) in both peak periods. Alternative M Avoidance had the least improvements by only reducing average trip times by less than one minute (12 percent decrease from the No-Build Alternative). The freeway hybrid alternatives (G and J) also ranked highly in reducing the average trip times.

The results of the travel time study are summarized in Table 2.

**Table 2. Travel Time Benefits per Alternative**

<b>Alternative</b>	<b>Overall Corridor Travel Time (mm:ss)</b>	<b>% Decrease in Travel Time Compared to 2040 No-Build</b>	<b>Corridor Travel Time Savings Ranking</b>
<b>2040 No-Build</b>	120:31	n/a	13
<b>Alternative B</b>	83:52	30.41	5
<b>Alternative C</b>	87:54	27.07	9
<b>Alternative F</b>	67:09	44.28	1
<b>Alternative G</b>	84:55	29.54	8
<b>Alternative J</b>	83:54	30.38	6
<b>Alternative M Avoidance</b>	84:57	29.51	7
<b>Alternative N Avoidance</b>	87:56	27.04	10
<b>Alternative P</b>	77:14	35.92	3
<b>Alternative Q</b>	90:48	24.66	12
<b>Alternative T</b>	88:09	26.86	11
<b>Alternative VA</b>	77:29	35.71	4
<b>Alternative VF</b>	69:16	42.52	2

## 8.0 Wetlands, Streams and Ponds

Jurisdictional wetlands, streams and ponds are located in the study corridors. Named streams within the project corridors include Cape Fear River, Piney Branch, Morgan Branch, Jackeys Creek, Alligator Creek, Brunswick River, Bishop Branch, Mallory Creek, Little Mallory Creek, Goodland Branch and Greenfield Creek. These streams are considered jurisdictional surface waters under Section 404 of the Clean Water Act. Unnamed tributaries to these streams and unnamed tributaries to Barnards Creek, Greenfield Lake, Town Creek and Sturgeon Creek were also located within the project corridor and are considered jurisdictional surface waters under Section 404 of the Clean Water Act.

The project lies within the Cape Fear River Basin. The North Carolina Department of Marine Fisheries (NCDMF) and the North Carolina Wildlife Resources Commission (NCWRC) have identified the Cape Fear River, the Brunswick River, and Alligator Creek in the study corridor as anadromous fish spawning areas. Additionally, the Cape Fear and Brunswick rivers are identified as primary nursery areas by the NCDMF. These waters are also identified as sturgeon spawning waters by the National Marine Fisheries Service (NMFS). Based on these designations, an in-water construction moratorium is in effect for these waters from February 1 through June 30.

There are no designated High Quality Waters (HQW), Outstanding Resource Waters (ORW), or water supply watersheds (WS-I or WS-II) within one mile downstream of the study area. The Cape Fear River and Brunswick River have been designated by the USACE as Navigable Waters under Section 10 of the Rivers and Harbors Act.

Total impacts by alternative for streams, wetlands and ponds are shown in Table 3. Characteristics of the jurisdictional streams are included in Table 4. Characteristics of jurisdictional wetlands are provided in Table 5.

Jurisdictional areas identified during original field investigations were verified by Brad Shaver of the U.S. Army Corps of Engineers (USACE) and Mason Herndon of the NC Division of Water Resources (NCDWR) during numerous field visits held between December 17, 2013 and March 19, 2014. Jurisdictional areas identified during investigations of additional extended study areas were verified on March 30, 2017.

## 9.0 Hydraulic Crossings

Major hydraulic crossings are those with a contributing drainage area requiring conveyance greater than a 72-inch pipe. A total of 42 potential major hydraulic crossings were identified for the proposed project. These structures are described in Table 6 and shown in Appendix A.

**Table 3. Comparison of Build Alternatives**

Resource	B	C	F	G	J	MA	NA	P	Q	T	VA	VF
Length of Corridor (Miles)	11.1	11.3	12.0	11.3	11.2	12.3	12.2	12.0	11.5	11.4	11.8	11.8
Construction Cost (Millions \$)	760	768	425	779	675	774	763	380	745	733	511	553
Number of Interchanges	5	4	6	5	5	4	4	3	4	4	6	7
Number of Railroad Crossings	2	1	1	1	2	1	2	1	1	2	2	2
Number of Major Power Easment Crossings	2	2	4	3	2	1	1	4	2	2	4	4
Business Relocations (Number within Proposed Right of Way)	74	30	42	30	74	30	74	39	30	74	37	38
Residential Relocations (Number within Proposed Right of Way)	95	82	145	39	116	53	98	137	31	108	52	60
Total Relocations	169	112	187	69	190	83	172	176	61	182	89	98
Minority and/or Low-Income Populations Present	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Archaeological Sites (Number within Impact Area)	0	0	0	0	0	1	1	0	0	0	0	0
Historic Properties (Adverse Effect)	0	0	2	0	0	0	0	2	0	0	1	1
Section 4(f) Lands (Acres within Proposed Right of Way)	1.2	0.0	73.9	0.0	1.2	0.0	1.2	73.9	0.0	1.2	16.7	16.7
Wetlands (Acres within Impact Area)	107.9	111.1	74.1	62.4	54.5	72.4	66.8	58.9	49.8	42.4	140.9	155.9
Surface Waters/Ponds (Acres within Impact Area)	0.05	0.05	0.07	0.05	0.05	0.00	0.00	0.05	0.04	0.04	0.05	0.07
Floodplains (Acres within Impact Area)	16.6	15.8	135.0	50.4	46.2	44.2	42.5	119.1	34.0	29.8	218.2	234.3
Streams (Linear Feet within Impact Area)	2,528	7,944	3,466	8,539	2,456	13,170	7,439	2,125	7,748	1,667	2,098	3,510
Federally-Protected Species Habitat Present	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Potential Noise Receptors*	1167	781	2717	865	1449	552	1052	2468	779	1367	1508	1799
Lands Managed for Conservation and Open Space (Acres within Impact Area)	0.0	0.0	5.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	76.5	76.5
Community Facilities Impacted (Number within Proposed Right of Way)												
Cemeteries	1	0	0	0	1	0	1	0	0	1	0	0
Churches	3	3	4	4	4	4	4	3	3	3	4	5
Fire Stations	0	1	0	1	0	1	0	0	1	0	0	0
Section 6f (Number within Proposed Right of Way)	0	0	3	0	0	0	0	3	0	0	2	2
Forested Land (Acres within Impact Area)	110.3	123.2	44.7	141.9	121.2	178.6	161.7	10.7	106.3	84.7	10.7	44.7
Farmland soils (Acres within Proposed Right of Way)	477.5	551.2	280.6	512.9	466.7	550.1	490.1	151.6	413.3	367.0	151.4	280.8
Parks (Number within Proposed Right of Way)	0	0	3	0	0	0	0	3	0	0	3	3

Note: Screening factors where no impacts were found within any corridors and therefore are not included in impact table include: libraries, gamelands, VADs/EVADs, 303(d) streams (listed due to sedimentation), and SA/HQW/ORW waters

Impact area equals the slope stakes limits plus 40 feet

\* Noise receptors include count within 700 feet of centerline (350 feet on either side) along existing roadways and 600 feet (300 feet on either side) of new location alternatives

**Table 4. Jurisdictional Characteristics of Streams for Detailed Study Alternatives**

Map ID	Stream Name	DWQ Index Number	Best Usage Classification	Bank Height (ft)	Bankful Width (ft)	Water Depth (in)	Channel Substrate	Velocity	Clarity	Length (ft)	Jurisdictional Classification	Compensatory Mitigation Required
1SB	UT to Jackeys Creek	18-77-3	C;Sw	0.5-1	0.5	2-6	Sand	Slow	Slightly Turbid	1218	Perennial	Yes
1SC	UT to Jackeys Creek	18-77-3	C;Sw	0.5-1	2-4	2-4	Sand	Slow	Slightly Turbid	1268	Intermittent	Yes
										242	Perennial	
2SC	UT to Piney Branch	18-77-3-1	C;Sw	4-8	3-4	4-6	Silt/Sand	Moderate	Slightly Turbid	1226	Intermittent	Yes
										464	Perennial	
Piney Branch	Piney Branch	18-77-3-1	C;Sw	3-5	3-7	6-12	Sand	Moderate	Clear	1345	Perennial	Yes
3SA	UT to Mallory Creek	18-78	C;Sw	2-3	2-3	6-12	Silt/Sand	Moderate	Clear	574	Intermittent	Yes
3SB	UT to Mallory Creek	18-78	C;Sw	3-4	2-3	6-12	Silt/Sand	Moderate	Clear	1121	Intermittent	Yes
3SC <sup>1</sup>	UT to Mallory Creek	18-78	C;Sw							3239	Perennial	Yes
5SA	UT to Barnards Creek	18-80	C;Sw	0.5	2-4	2-6	Silt/Sand	Slow	Clear	717	Intermittent	Yes
5SB	UT to Barnards Creek	18-80	C;Sw	4-6	2-4	2-6	Silt/Sand	Slow	Slightly Turbid	730	Intermittent	Yes
5SD	UT to Barnards Creek	18-80	C;Sw	4-6	2-4	2-6	Silt/Sand	Slow	Slightly Turbid	153	Intermittent	Yes
5SF	UT to Barnards Creek	18-80	C;Sw	0.5-2	2-3	2-8	Sand	Moderate	Slightly Turbid	3446	Intermittent	Yes
5SG	UT to Barnards Creek	18-80	C;Sw	0.5	3-4	24-36	Sand	Moderate	Slightly Turbid	2923	Perennial	Yes
5SH	UT to Barnards Creek	18-80	C;Sw	0.5	2-4	6-12	Sand	Moderate	Clear	483	Perennial	Yes
5SI	UT to Barnards Creek	18-80	C;Sw	0.5	2-4	6-12	Sand	Moderate	Slightly Turbid	499	Perennial	Yes
5SJ	UT to Barnards Creek	18-80	C;Sw	0.5	3-4	24-36	Sand	Moderate	Slightly Turbid	421	Perennial	Yes
5SK	UT to Barnards Creek	18-80	C;Sw	0.5-2	2-5	2-18	Si/Sa/G	Moderate	Slightly Turbid	388	Intermittent	Yes
										631	Perennial	
5SX	UT to Barnards Creek	18-80	C;Sw	0.5-1	2-4	12-24	Silt/Sand	Slow	Clear	1252	Perennial	Yes
5SZ	UT to Barnards Creek	18-80	C;Sw	0.5-2	3-5	2-8	Sand	Moderate	Slightly Turbid	423	Intermittent	Yes
										824	Perennial	
Marina	Cape Fear River - Marina	18-(71)	SC	4-10	400	>120	Silt/Sand	Slow	Turbid	1443	Perennial	Yes
Morgan Branch	Morgan Branch	18-81-7	C;Sw	2-7	4-40	12 - >120	Silt/Sand	Moderate	Slightly Turbid	1967	Perennial	Yes
6SC	UT to Jackeys Creek	18-77-3	C;Sw	2-3	3-5	6	Sand	Slow	Slightly Turbid	1082	Intermittent	Yes
Jackeys Creek	Jackeys Creek	18-77-3	C;Sw	1-2	6-10	10-24	Sand	Slow	Turbid	601	Perennial	Yes
7SB	UT to Jackeys Creek	18-77-3	C;Sw	1-2	1-2	4-6	Sand	Slow	Slightly Turbid	237	Perennial	Yes
8SA	UT to Brunswick River	18-77	SC	0.5-1	4-5	6-18	Silt/Sand	Slow	Slightly Turbid	708	Perennial	Yes
8SB	UT to Brunswick River	18-77	SC	2-4	3-4	2-6	Sand	Slow	Slightly Turbid	135	Perennial	Yes
8SC	UT to Brunswick River	18-77	SC	4-5	3-4	1-5	Sand	Slow	Slightly Turbid	305	Intermittent	Yes
Alligator Creek	Alligator Creek	18-75	SC;Sw	4-10	100	>120	Silt/Sand	Moderate	Turbid	1080	Perennial	Yes
Brunswick River	Brunswick River	18-77	SC	4-10	300	>120	Silt/Sand	Moderate	Turbid	1766	Perennial	Yes

**Table 4. Jurisdictional Characteristics of Streams for Detailed Study Alternatives (cont.)**

Map ID	Stream Name	DWQ Index Number	Best Usage Classification	Bank Height (ft)	Bankful Width (ft)	Water Depth (in)	Channel Substrate	Velocity	Clarity	Length (ft)	Jurisdictional Classification	Compensatory Mitigation Required
9SA	UT to Cape Fear River	18-(71)	SC	4-10	40	>120	Silt/Sand	Moderate	Turbid	708	Perennial	Yes
Cape Fear River	Cape Fear River	18-(71)	SC	4-10	3,000	>120	Silt/Sand	Moderate	Turbid	3909	Perennial	Yes
Bishop Branch	Bishop Branch	18-81-7-1	C;Sw	1-2	5-10	10-24	Silt/Sand	Moderate	Turbid	5865	Perennial	Yes
10SA	UT to Morgan Branch	18-81-7	C;Sw	1-2	2-4	6-10	Sand	Slow	Slightly Turbid	473	Perennial	Yes
10SB	UT to Bishop Branch	18-81-7-1	C;Sw	0.5-1.5	2-4	6-12	Silt	Slow	Turbid	2685	Intermittent	Yes
10SD	UT to Bishop Branch	18-81-7-1	C;Sw	1-2	2-3	4-8	Silt/Sand	Slow	Slightly Turbid	23	Intermittent	Yes
10SE	UT to Bishop Branch	18-81-7-1	C;Sw	0.5-1	5-6	6-12	Sand	Slow	Turbid	142	Intermittent	Yes
										1311	Perennial	
10SF <sup>2</sup>	UT to Bishop Branch	18-81-7-1	C;Sw							222	Intermittent	Yes
10SG	UT to Morgan Branch	18-81-7	C;Sw	0.5	2-4	1-5	Sand	Moderate	Slightly Turbid	1387	Perennial	Yes
10SH	UT to Morgan Branch	18-81-7	C;Sw	0.5	2-4	1-5	Sand	Slow	Slightly Turbid	877	Perennial	Yes
10SI	UT to Morgan Branch	18-81-7	C;Sw	0.5	3-5	12	Sand	Slow	Slightly Turbid	299	Perennial	Yes
10SJ	UT to Morgan Branch	18-81-7	C;Sw	0.5	1-2	1-3	Sand	Slow	Slightly Turbid	93	Intermittent	Yes
10SK	UT to Morgan Branch	18-81-7	C;Sw	0.5-1	5-15	12-36	Sand	Slow	Slightly Turbid	114	Perennial	Yes
10SL	UT to Morgan Branch	18-81-7	C;Sw	0.5-1	5-12	12-36	Sand	Slow	Slightly Turbid	889	Perennial	Yes
10SN <sup>2</sup>	UT to Morgan Branch	18-81-7	C;Sw							113	Intermittent	Yes
10SO2	UT to Morgan Branch	18-81-7	C;Sw							281	Intermittent	Yes
13SA	UT to Greenfield Lake	18-76-1	C;Sw	0.5-1	1-2	4	Sand	Slow	Clear	451	Perennial	Yes
Mallory Creek <sup>3</sup>	Mallory Creek	18-78	C;Sw	2-10	8-25	12-96	Silt/Sand	Moderate	Slightly Turbid	7056	Perennial	Yes
Little Mallory Creek	Little Mallory Creek	18-78-1	C;Sw	2-10	2-30	4-96	Silt/Sand	Moderate	Slightly Turbid	2527	Perennial	Yes
Goodland Branch	Goodland Branch	18-81-8	C;Sw							1358	Perennial	Yes
20SA	UT to Town Creek	18-81	C;Sw	1-2	2-4	2-6	Silt/Sand	Slow	Clear	692	Intermittent	Yes
20SC	UT to Goodland Branch	18-81-8	C;Sw	0.5-1	2-3	0-6	Silt/Sand	Slow	Clear	1175	Intermittent	Yes
20SD	UT to Goodland Branch	18-81-8	C;Sw	0.5-1	3-4	0-6	Silt/Sand	Slow	Clear	214	Intermittent	Yes
20SE	UT to Goodland Branch	18-81-8	C;Sw	0.5-1	3-4	0-6	Silt/Sand	Slow	Clear	1469	Perennial	Yes
20SF	UT to Goodland Branch	18-81-8	C;Sw	0.5-1	2-3	0-6	Silt/Sand	Moderate	Clear	581	Intermittent	Yes
20SY	UT to Town Creek	18-81	C;Sw	0.5-1	3-5	4-12	Silt/Sand	Slow	Slightly Turbid	612	Perennial	Yes
Greenfield Creek	Greenfield Creek	18-76	SC;Sw	4-6	10-15	12-24	Silt/Sand	Moderate	Turbid	1080	Perennial	Yes
26SB	UT to Greenfield Creek	18-76	SC;Sw	4-6	10-15	12-24	Silt/Sand	Moderate	Turbid	1004	Perennial	Yes
26SC	UT to Greenfield Creek	18-76	SC;Sw	4-5	10	12-24	Si/Sa/G	Moderate	Slightly Turbid	115	Perennial	Yes
5XSA	UT to Piney Branch	18-77-3-1	C;Sw	1-2	3-4	6-12	Silt/Sand	Moderate	Clear	452	Perennial	Yes
5XSB	UT to Piney Branch	18-77-3-1	C;Sw	4-6	8-10	6-18	Silt/Sand	Moderate	Clear	183	Perennial	Yes
6XSA	UT to Mallory Creek	18-78	C;Sw	1-2	4-5	6-12	Silt/Sand	Slow	Clear	441	Intermittent	Yes
9XSB	UT to Greenfield Lake	18-76-1	C;Sw	6-8	10-12	6-18	Si/Sa/G	Moderate	Clear	285	Perennial	Yes
9XSC	UT to Greenfield Lake	18-76-1	C;Sw	0.5-1	2-3	0-6	Silt/Sand	Slow	Clear	481	Intermittent	Yes
28XSA	UT to Jackeys Creek	18-77-3	C;Sw	8	4	18-24	Sand	Stagnant	Clear	748	Intermittent	Yes

**Table 4. Jurisdictional Characteristics of Streams for Detailed Study Alternatives (cont.)**

Map ID	Stream Name	DWQ Index Number	Best Usage Classification	Bank Height (ft)	Bankful Width (ft)	Water Depth (in)	Channel Substrate	Velocity	Clarity	Length (ft)	Jurisdictional Classification	Compensatory Mitigation Required
28XSB	UT to Jackeys Creek	18-77-3	C;Sw	4	4	12-18	Sand	Stagnant	Clear	321	Intermittent	Yes
28XSC	UT to Brunswick River	18-77	SC	4-5	5-7	6-18	Silt/Sand	Slow	Slightly Turbid	342	Intermittent	Yes
28XSD	UT to Brunswick River	18-77	SC	4-5	8-10	6-12	Si/Sa/G	Moderate	Clear	586	Perennial	Yes
29XSA	UT to Sturgeon Creek	18-77-1	C;Sw	1-1.5	3-4	4-12	Silt/Sand	Moderate	Clear	210	Perennial	Yes
29XSB	UT to Sturgeon Creek	18-77-1	C;Sw	1-1.5	3-4	2-8	Silt/Sand	Moderate	Clear	236	Perennial	Yes
32XSA	UT to Jackeys Creek	18-77-3	C;Sw	6-8	8-10	6-12	Silt	Slow	Clear	913	Perennial	Yes
32XSB	UT to Jackeys Creek	18-77-3	C;Sw	6-8	10-12	6-12	Silt	Moderate	Clear	1231	Perennial	Yes

<sup>1</sup> Feature drawn from GIS/Topographic map due to flooded site conditions at time of field surveys

<sup>2</sup> Feature added from R-2633A delineations after field surveys were completed

<sup>3</sup> Feature partially drawn from GIS/Topographic map due to flooded site conditions at time of field surveys

**Table 5. Jurisdictional Characteristics of Wetlands for Detailed Study Alternatives**

Map ID	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Wetland Area (ac.) in Study Corridor
1WR	Pocosin	Non-riparian	32	113.0
1WS	Pocosin	Non-riparian	24	6.2
1WT	Headwater Forest	Riparian	24	0.6
1WV	Headwater Forest	Non-riparian	23	8.6
1WW	Pocosin	Non-riparian	31	7.4
1WX	Headwater Forest	Non-riparian	23	0.4
1WY	Pine Flat	Non-riparian	40	32.6
1WZ	Pocosin	Non-riparian	27	2.2
2WA	Pine Flat	Non-riparian	31	75.9
2WB	Headwater Forest	Non-riparian	13	3.8
2WC	Bottomland Hardwood Forest	Riparian	47	4.6
2WE	Headwater Forest	Non-riparian	10	0.0
3WA	Headwater Forest	Riparian	64	4.5
	Riverine Swamp Forest			28.6
3WB	Pocosin	Non-riparian	14	1.5
3WC	Headwater Forest	Riparian	25	1.4
3WD	Pocosin	Non-riparian	18	1.1
3WE	Pocosin	Non-riparian	4	0.2
3WF	Pocosin	Non-riparian	4	0.1
3WG	Non-Riverine Swamp Forest	Riparian	59	7.1
3WH	Pocosin	Non-riparian	14	0.5
3WI	Pocosin	Riparian	23	0.3
3WJ	Headwater Forest	Riparian	23	1.0
5WA	Pocosin	Non-riparian	10	0.5
5WC	Headwater Forest	Non-riparian	10	0.2
5WD	Headwater Forest	Non-riparian	16	3.3
5WF	Headwater Forest	Non-riparian	8	0.1
5WG	Headwater Forest	Non-riparian	8	0.1
5WH	Headwater Forest	Riparian	37	16.5
5WI	Headwater Forest	Riparian	13	1.0
5WJ	Pine Flat	Non-riparian	30	2.9
5WK	Pocosin	Non-riparian	4	0.1
5WL	Bottomland Hardwood Forest	Riparian	42	8.7
5WM	Pocosin	Non-riparian	10	0.1
5WO	Salt/Brackish Marsh	Tidal	56	9.6
5WP	Headwater Forest	Riparian	18	0.8
5WQ	Headwater Forest	Riparian	18	0.3
6WA <sup>1</sup>	Seep	Riparian	10	0.1

**Table 5. Jurisdictional Characteristics of Wetlands for Detailed Study Alternatives (cont.)**

Map ID	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Wetland Area (ac.) in Study Corridor
6WB	Headwater Forest	Riparian	10	1.6
6WC	Bottomland Hardwood Forest	Riparian	28	0.6
6WD	Pocosin	Non-riparian	14	0.5
6WE	Pocosin	Non-riparian	14	14.5
6WF	Pocosin	Non-riparian	18	2.3
6WG	Pocosin	Non-riparian	26	32.4
7WA	Headwater Forest	Non-riparian	10	2.3
7WB	Hardwood Flat	Non-riparian	47	62.6
7WC	Headwater Forest	Non-riparian	16	0.7
7WD	Pocosin	Non-riparian	24	8.0
7WE	Headwater Forest	Non-riparian	26	13.9
7WF	Bottomland Hardwood Forest	Riparian	49	2.2
7WG	Headwater Forest	Riparian	16	0.6
8WA	Salt/Brackish Marsh	Tidal	70	47.8
8WB	Headwater Forest	Riparian	28	2.3
8WC	Non-Riverine Swamp Forest	Riparian	20	1.4
8WD	Bottomland Hardwood Forest	Riparian	24	1.1
8WE	Basin Wetland	Non-riparian	11	0.3
9WA	Salt/Brackish Marsh	Tidal	70	270.5
9WB	Estuarine Woody Wetland	Tidal	74	94.2
10WA	Riverine Swamp Forest	Riparian	68	52.5
10WB	Riverine Swamp Forest	Riparian	60	10.4
10WC	Bottomland Hardwood Forest	Riparian	33	2.5
10WD	Headwater Forest	Non-riparian	10	1.6
10WE	Bottomland Hardwood Forest	Riparian	35	3.6
10WH/WI	Headwater Forest	Riparian	31	1.5
10WJ	Headwater Forest	Riparian	31	0.6
10WK	Headwater Forest	Non-riparian	16	0.3
10WL	Seep	Riparian	16	0.0
10WM	Headwater Forest	Riparian	48	2.8
10WN	Headwater Forest	Non-riparian	27	0.8
10WO	Headwater Forest	Non-riparian	18	0.2
10WP	Pocosin	Non-riparian	26	3.1
10WQ	Headwater Forest	Non-riparian	18	0.4
10WR	Non-Riverine Swamp Forest	Riparian	22	0.7

**Table 5. Jurisdictional Characteristics of Wetlands for Detailed Study Alternatives (cont.)**

Map ID	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Wetland Area (ac.) in Study Corridor
10WT	Headwater Forest	Non-riparian	18	0.8
10WU	Headwater Forest	Non-riparian	45	2.1
13WA	Salt/Brackish Marsh	Tidal	42	2.7
13WD	Salt/Brackish Marsh	Tidal	42	1.5
14WA	Headwater Forest	Riparian	27	5.8
14WB	Headwater Forest	Non-riparian	20	3.3
14WC	Pocosin	Non-riparian	12	0.2
15WA	Riverine Swamp Forest	Riparian	64	79.8
15WB	Basin Wetland	Non-riparian	10	0.2
20WA	Riverine Swamp Forest	Riparian	43	2.8
20WB	Headwater Forest	Non-riparian	24	0.6
20WC	Headwater Forest	Non-riparian	39	2.8
20WD	Pine Flat	Non-riparian	56	8.3
20WF	Pocosin	Non-riparian	53	1.1
	Pine Flat			41.3
20WG	Bottomland Hardwood Forest	Riparian	53	8.2
20WH	Riverine Swamp Forest	Riparian	30	2.9
20WI	Riverine Swamp Forest	Riparian	30	2.3
20WJ	Headwater Forest	Riparian	21	2.2
20WK	Headwater Forest	Riparian	21	0.8
20WL	Pine Flat	Non-riparian	46	24.0
20WM	Headwater Forest	Non-riparian	17	1.0
20WZ	Pine Flat	Non-riparian	36	18.5
21WA	Headwater Forest	Non-riparian	22	1.6
21WB	Headwater Forest	Non-riparian	16	0.2
21WC	Basin Wetland	Non-riparian	16	0.2
21WD	Headwater Forest	Non-riparian	36	1.7
21WE	Headwater Forest	Non-riparian	32	0.5
21WF	Salt/Brackish Marsh	Tidal	64	13.5
21WG	Pine Flat	Non-riparian	17	12.4
21WH	Headwater Forest	Non-riparian	16	0.5
21WI	Pocosin	Non-riparian	14	1.3
21WJ	Headwater Forest	Non-riparian	18	3.5
21WK	Pocosin	Non-riparian	22	2.2
22WA	Salt/Brackish Marsh	Tidal	0	359.3
26WA	Riverine Swamp Forest	Riparian	34	14.0
26WB	Headwater Forest	Non-riparian	19	0.2
26WC	Riverine Swamp Forest	Riparian	25	0.4
26WD	Salt/Brackish Marsh	Tidal	57	0.8
1XWB	Headwater Forest	Riparian	34	0.5

**Table 5. Jurisdictional Characteristics of Wetlands for Detailed Study Alternatives (cont.)**

Map ID	NCWAM Classification	Hydrologic Classification	DWQ Wetland Rating	Wetland Area (ac.) in Study Corridor
1XWC	Headwater Forest	Riparian	36	0.6
3XWA	Headwater Forest	Riparian	27	0.5
3XWC	Non-Tidal Freshwater Marsh	Riparian	49	1.3
5XWA	Headwater Forest	Riparian	26	1.9
6XWA	Headwater Forest	Riparian	19	0.2
6XWB	Headwater Forest	Riparian	24	5.2
6XWC	Pocosin	Non-riparian	11	0.2
6XWD	Headwater Forest	Riparian	23	0.4
9XWA	Headwater Forest	Riparian	72	0.6
13XWA	Basin Wetland	Non-riparian	16	0.4
13XWB	Basin Wetland	Non-riparian	13	0.1
13XWC	Basin Wetland	Non-riparian	18	0.1
21XWA	Pine Flat	Non-riparian	20	13.0
28XWA	Pine Flat	Non-riparian	19	4.7
28XWB	Hardwood Flat	Non-riparian	39	1.0
28XWC	Headwater Forest	Non-riparian	21	0.1
28XWD	Headwater Forest	Riparian	25	0.2
29XWA	Headwater Forest	Riparian	44	0.5
32XWA	Headwater Forest	Riparian	40	0.9
33XWA	Headwater Forest	Riparian	30	0.2
34XWA	Pine Flat	Non-riparian	31	0.9
35XWA	Pine Flat	Non-riparian	19	20.9
35XWB	Headwater Forest	Riparian	48	0.3
35XWC	Headwater Forest	Riparian	29	0.6
47XWA	Headwater Forest	Riparian	47	0.1
48XWA	Non-Riverine Swamp Forest	Non-riparian	53	1.5

<sup>1</sup> Feature added from R-2633A delineations after field surveys were completed

**Table 6. Summary Table of Hydraulic Recommendations**

SITE NUMBER	ALTERNATIVE	STREAM/WETLAND ID	STREAM NAME	EXISTING STRUCTURE	PROPOSED STRUCTURE	Stream Impact (feet)/ Wetland Impact (acres)
1*	MA, NA	Bishop Branch/10WA	Bishop Branch	3 @ 72" RCP	Extend: 3 @ 8x6 RCBC	288/0.42
2	MA, NA	Bishop Branch/10WA	Bishop Branch	none	3 @ 8x6 RCBC	1,525/6.49
2A	MA, NA	Bishop Branch/10WA	Bishop Branch	none	3 @ 8x6 RCBC	
3	MA, NA	10WA	Morgan Branch	none	Bridge: proposed length 565'	0/1.89
4	MA, NA	Goodland Branch/20WG	Goodland Branch	none	3 @ 6x6 RCBC	367/2.33
5	MA, NA	20SD/20SE/20WH	UT to Goodland Branch	none	2 @ 6x6 RCBC	214/513/1.20
6	MA, NA	20SC/20SF/20WI	UT to Goodland Branch	none	1 @ 6x6 RCBC	415/334/1.14
7	MA, NA	20SA/20WC	UT to Town Creek	none	1 @ 6x6 RCBC	618/1.55
8	MA, NA	Little Mallory Creek/20WF	Little Mallory Creek	none	1 @ 8x6 RCBC	255/7.51
10	B, C, G, Q, J, T, MA, NA	22WA	Mallory Creek	none	Bridge: Proposed length - B,G,Q: 1,822'; C,J,T: 1,722'; MA: -Y8S_RPD1:-1,837' -L: 16,403'; NA: -Y8S_RPD1:- 1,878' -L: 15,842'	B,G,Q: 0/0.46; C,J,T: 0/0.45; MA,NA:0/0.16
11	B, C, G, Q, J, T, MA, NA	22WA	UT to Mallory Creek	none	Bridge <sup>1</sup> Proposed length - B,J,T: 15,705'; C,G,Q: 16,353'; MA: 16,403'; NA:15,842'	0
11A	B, C, G, Q, J, T, MA, NA	22WA	UT to Mallory Creek	none	Bridge <sup>1</sup> - Proposed length - B,J,T: 15,705'; C,G,Q: 16,353'; MA: 16,403'; NA:15,842'	0
12	C, G, Q, MA	Cape Fear River	Cape Fear River	none	Bridge: Proposed length - C,G,Q:16,353'; MA: 16,403'	0
13	C, G, Q, MA	5SX/5WH	UT to Barnards Creek	none	Bridge <sup>1</sup> : Proposed length - C,G,Q:16,353'; MA: 16,403'	0
14	C, G, Q, MA	5SG/5WL	UT to Barnards Creek	none	3 @ 6x6 RCBC	421/1.20
15	C, G, Q, MA	5SG/5WL	UT to Barnards Creek	none	2 @ 6x6 RCBC	633/0.34
16*	C, G, Q, MA	5SF/5SG/5WG	UT to Barnards Creek	unknown	2 @ 6x6 RCBC	186/87/0.01
18*	F, P, G, Q, J, T, M, N, VF, VA	10SA/10WB	UT to Morgan Branch	3 @ 72" RCP	3 @ 8x6 RCBC	F, G, J, VF: 61/0.95; P,Q,T,VA: 34/0.59; M, N: 0/0.96
19*	F, P, G, Q, J, T, VF, VA	6SB/6WC	Morgan Branch	3 @ 72" RCP	3 @ 8x6 RCBC	217/0.19
20*	MA, NA	10SG	UT to Morgan Branch	approx. 150' bridge length	Widen Bridge	0
21*	MA, NA	10SH	UT to Morgan Branch	approx. 236' bridge length	Widen Bridge	0
22	B, C	1WR	UT to Morgan Branch	none	1 @ 8x6 RCBC	0/36.6
23	B, C	1WR	UT to Morgan Branch	none	1 @ 8x6 RCBC	
24	B, C	N/A	UT to Jackeys Creek	none	Bridge: Proposed length - 142'	0
26	B, C	25C	UT to Piney Branch	none	1 @ 7x6 RCBC	B,C: 474/0
27	B, C, G, Q, J, T	25D/2WVC	Piney Branch	none	3 @ 7x6 RCBC	479/1.26
28	B, G, Q	3WA	Mallory Creek Tributary	none	Bridge: Proposed length 165'	0/1.26
29	B, G, Q	15WA	Mallory Creek	none	Bridge: Proposed length 410'	0/2.65
30	C, J, T	15WA	Mallory Creek	none	Bridge: Proposed length 355'	0/2.12
33*	B, C, G, Q, J, T, MA, NA	N/A	Mallory Creek	approx. 80' bridge length	Bridge: Proposed length 95'	0
34	B, C, G, Q, J, T,	N/A	Mallory Creek	none	Bridge: Proposed length - B,J,T: 15,705';C,G,Q: 16,353'	0
35	B, J, T, NA	Cape Fear River	Cape Fear River	none	Bridge: Proposed length - B,J,T: 15,705';NA:15,842'	0
36*	B, C, F, P, G, Q, J, T, VF, VA	7WF	Jackeys Creek	42' bridge length	Bridge: Proposed length 240'	B,C: 0; F,VF: 1.15; P,VA: 0.41; G,Q,J,T: 0.33
38*	F, P, VF, VA	8WA	Brunswick River	approx. 776' bridge length	Widen Bridge	0.35
39*	F, P, VF, VA	8WA	Alligator Creek	approx. 233' (WB) 287' (EB) bridge length	Widen Bridge	F,P: 0; VF,VA: 1.86
40	F, P	N/A	Cape Fear River	Truss Lift Bridge	Bridge: Proposed length 3,456'	0
41	VF, VA	N/A	Cape Fear River	none	Bridge: Proposed length 4,951'	0
42	VF, VA	N/A	UT to Greenfield Creek	none	Bridge <sup>1</sup> : Proposed length 4,951'	0
43	VF, VA	N/A	Greenfield Creek	none	Bridge: Proposed length 4,951'	0
44*	F, P, VF, VA	26SA/26WA	Greenfield Creek	3 @ 8x6 RCBC	Extend: 3 @ 8x6 RCBC	83/0.02
45	C, G, Q, MA	N/A	Unnamed Tributary	none	Bridge <sup>1</sup> : Proposed length - C,G,Q:16,353'; MA: 16,403'	0
46	C, G, Q, MA	5SF/5WG	East Fork Creek	none	2 @ 6x6 RCBC	313/0.07

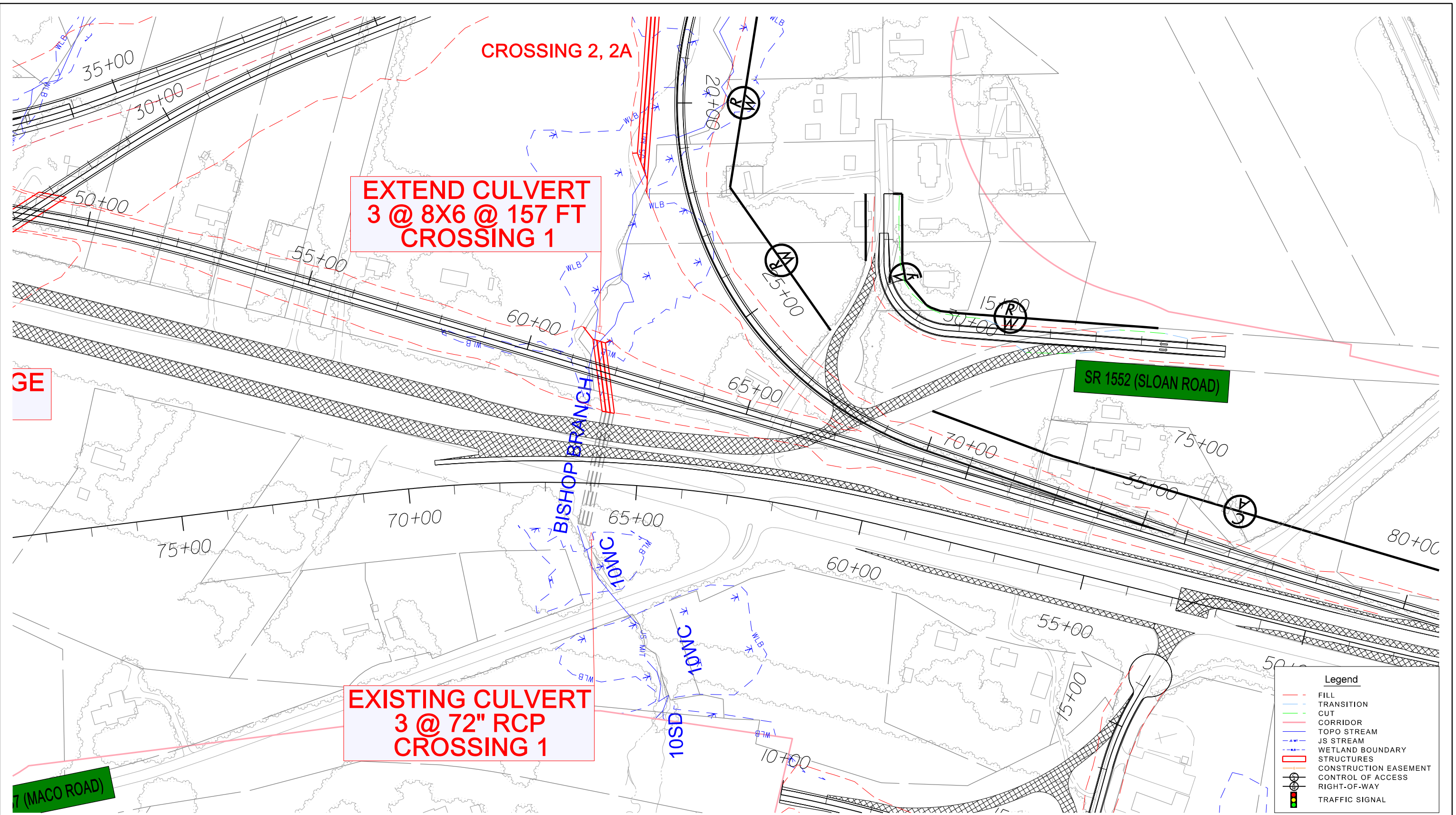
\* Denotes crossing with existing major hydraulic structure.

1) A bridge is proposed in the current functional designs, however, a culvert is the minimum required structure as noted in the 2016 Hydraulic Analysis Report

Note: Major Crossings - conveyance greater than 72" pipe (This table should be used for Merger CP2A concurrence.)

Note: Provided in planning document

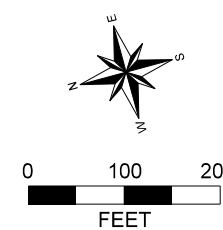
**Appendix A**  
Hydraulic Crossing Locations



North Carolina  
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HYDRAULIC CROSSING NO. 1

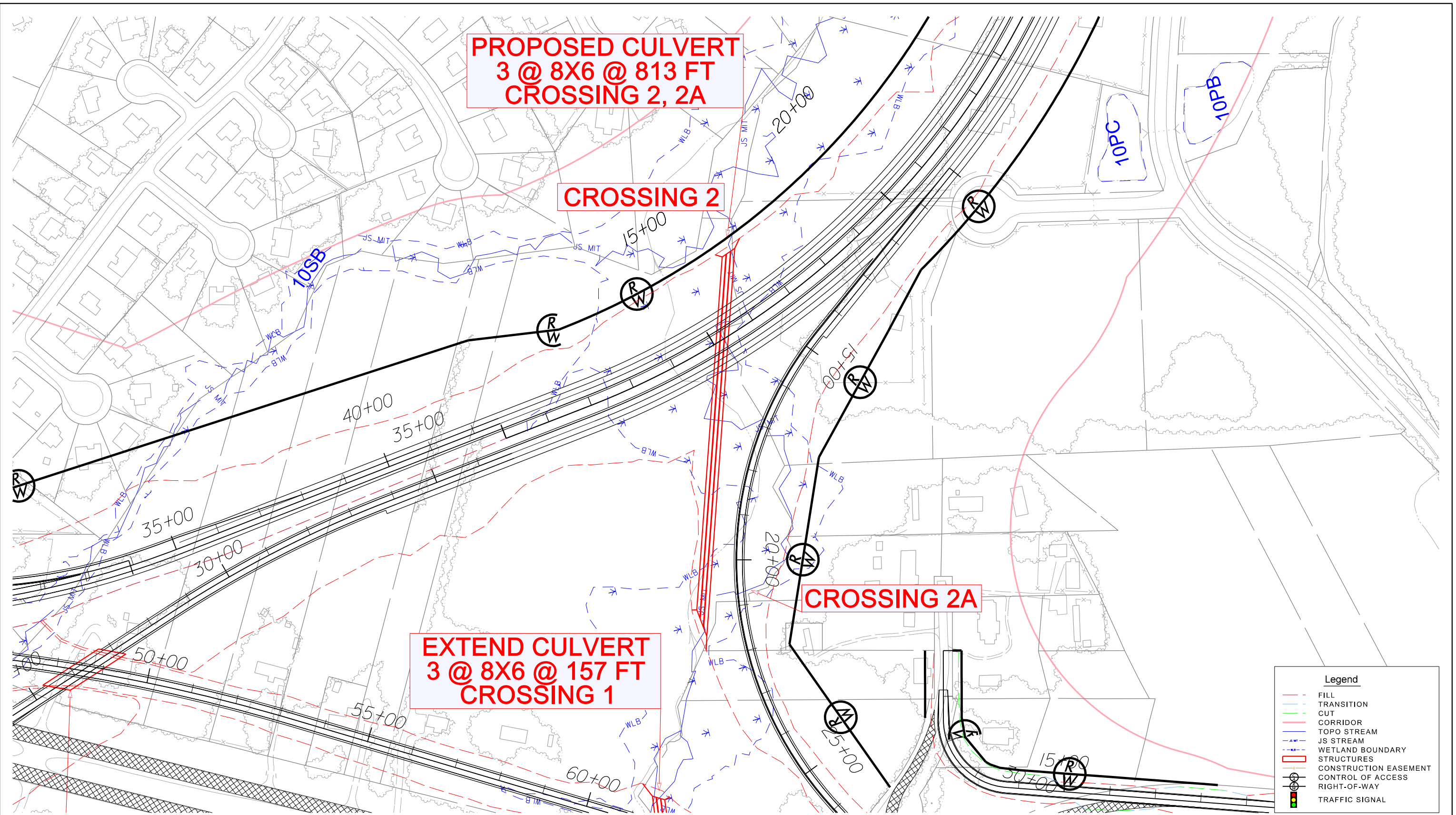


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-MA, NA



**PROPOSED CULVERT  
3 @ 8X6 @ 813 FT  
CROSSING 2, 2A**

**CROSSING 2**

**EXTEND CULVERT  
3 @ 8X6 @ 157 FT  
CROSSING 1**

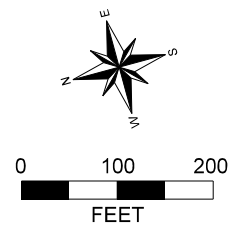
**CROSSING 2A**

Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 2 & 2A

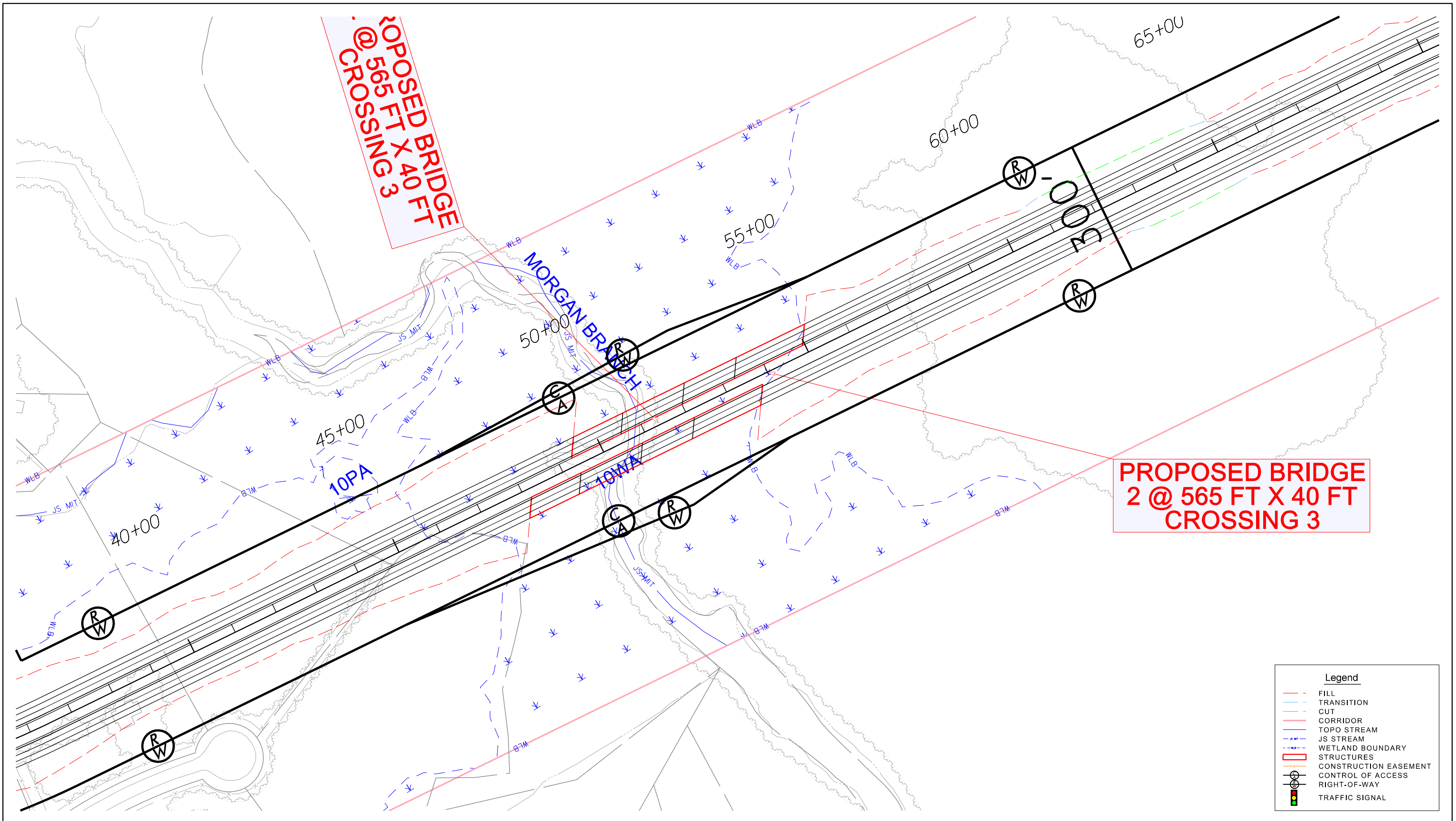


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-MA, NA



**PROPOSED BRIDGE  
2 @ 565 FT X 40 FT  
CROSSING 3**

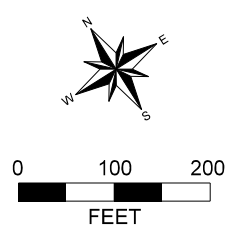
**PROPOSED BRIDGE  
2 @ 565 FT X 40 FT  
CROSSING 3**

Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation

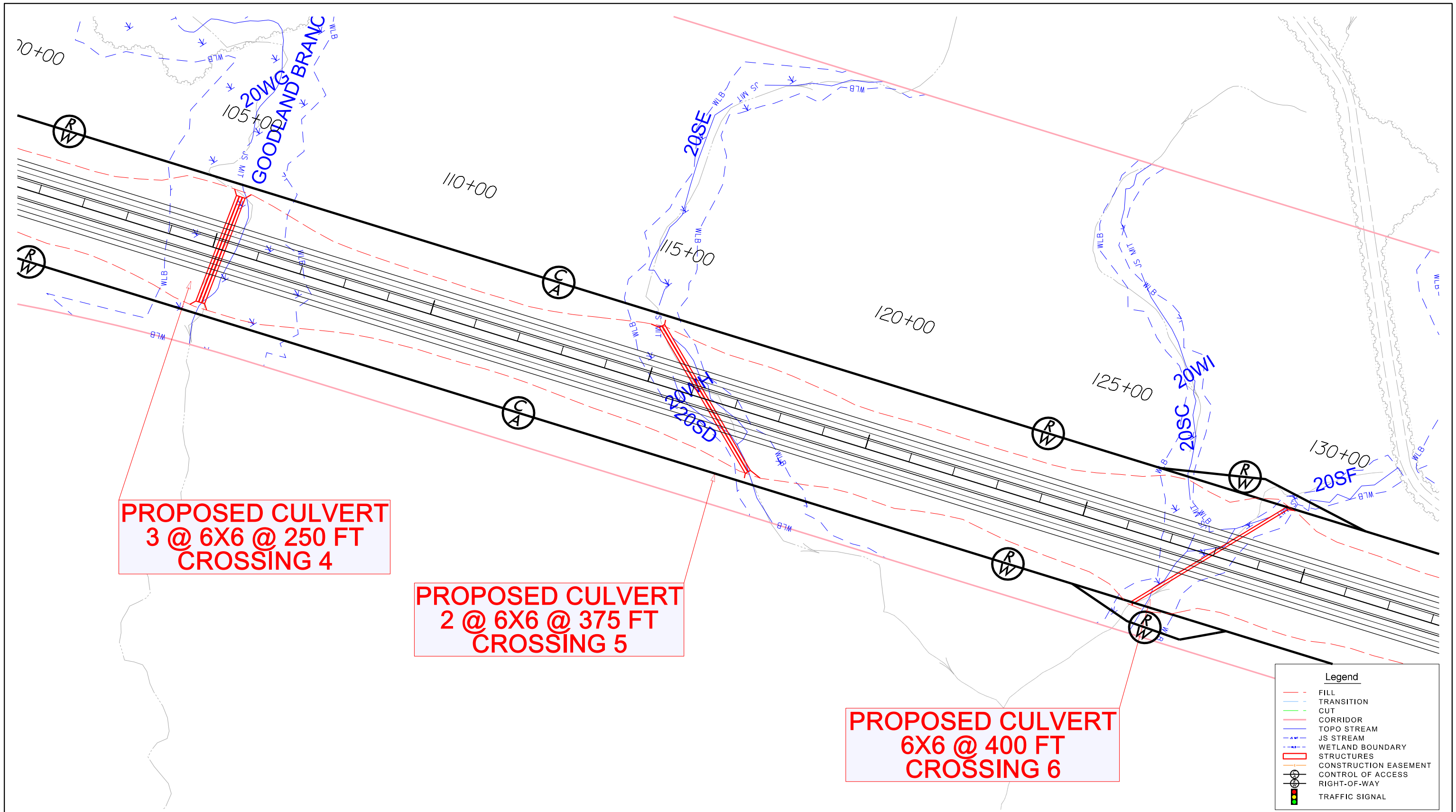


HYDRAULIC CROSSING NO. 3



HYDRAULIC CROSSINGS

Date: May 2017  
U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties  
ALT-MA, NA



**PROPOSED CULVERT  
3 @ 6X6 @ 250 FT  
CROSSING 4**

**PROPOSED CULVERT  
2 @ 6X6 @ 375 FT  
CROSSING 5**

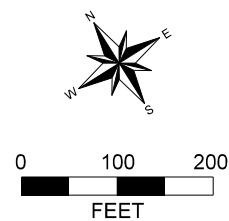
**PROPOSED CULVERT  
6X6 @ 400 FT  
CROSSING 6**

Legend	
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	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 4, 5, & 6

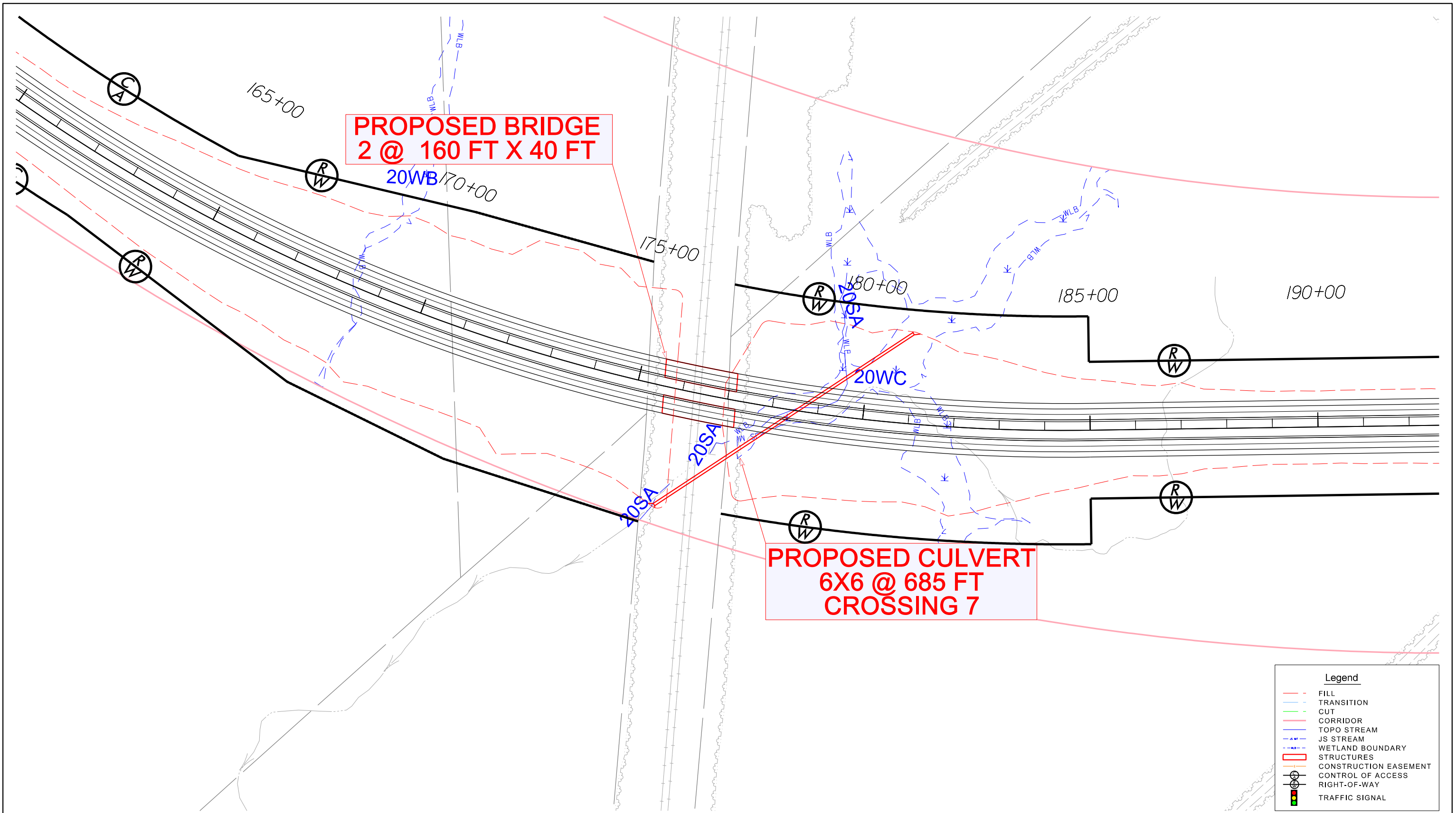


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

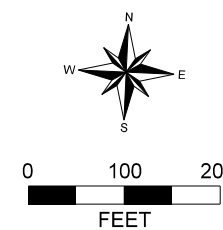
ALT-MA, NA



North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 7

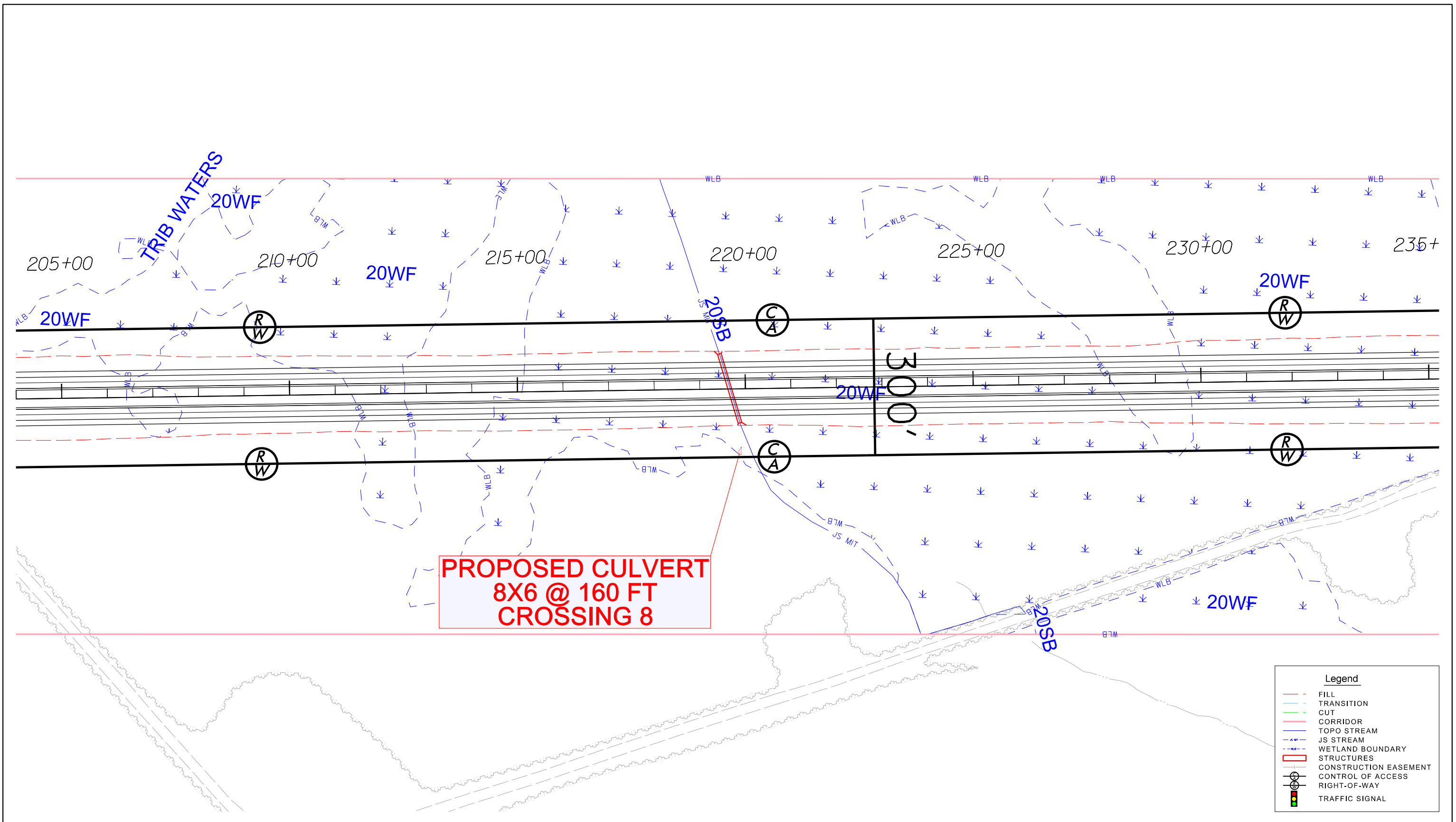


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

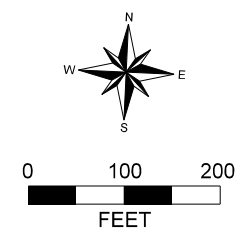
ALT-MA, NA



North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 8

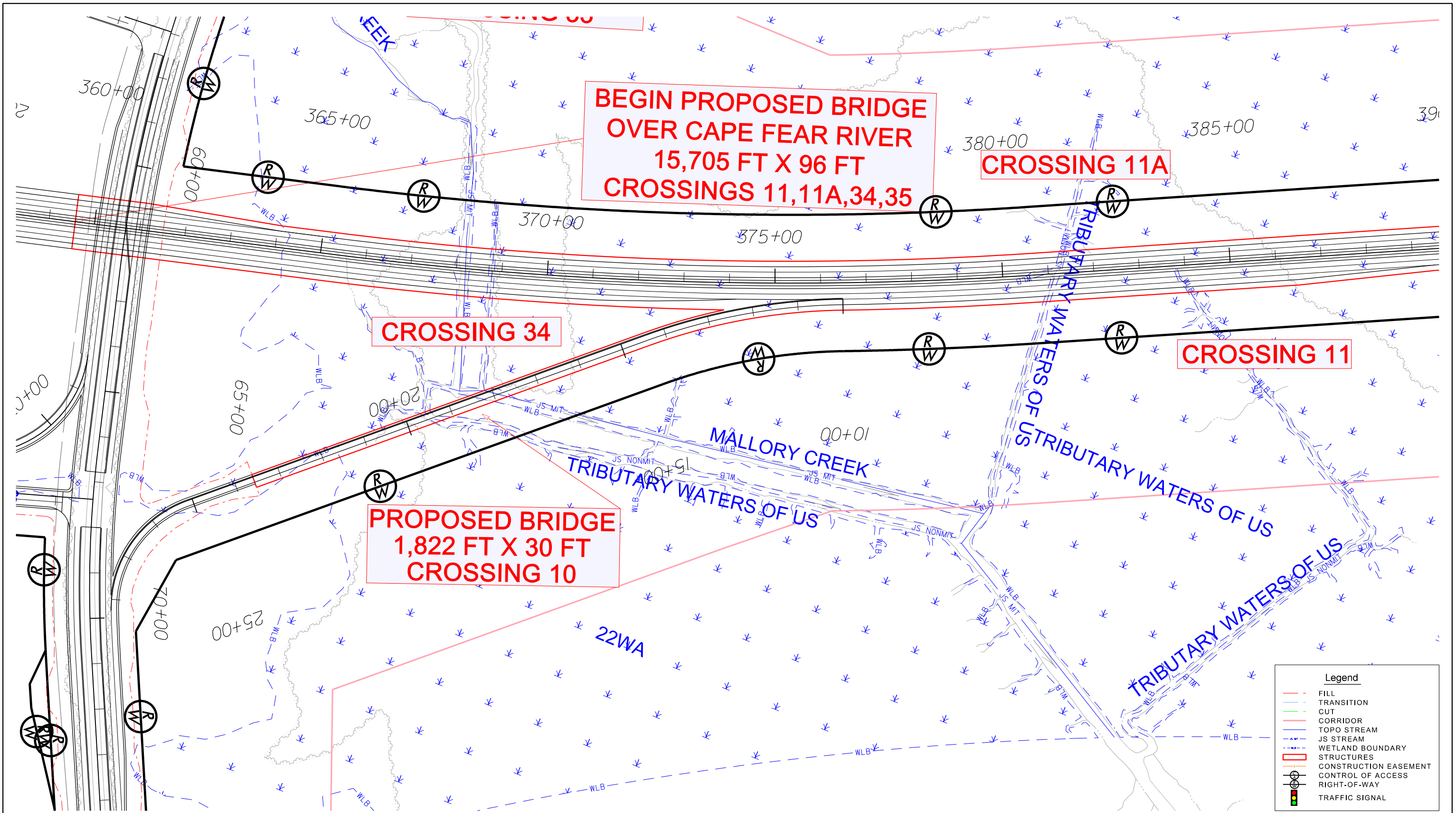


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-MA, NA

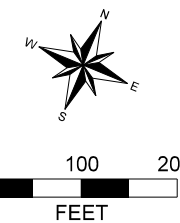


Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 10, 11, 11A, & 34

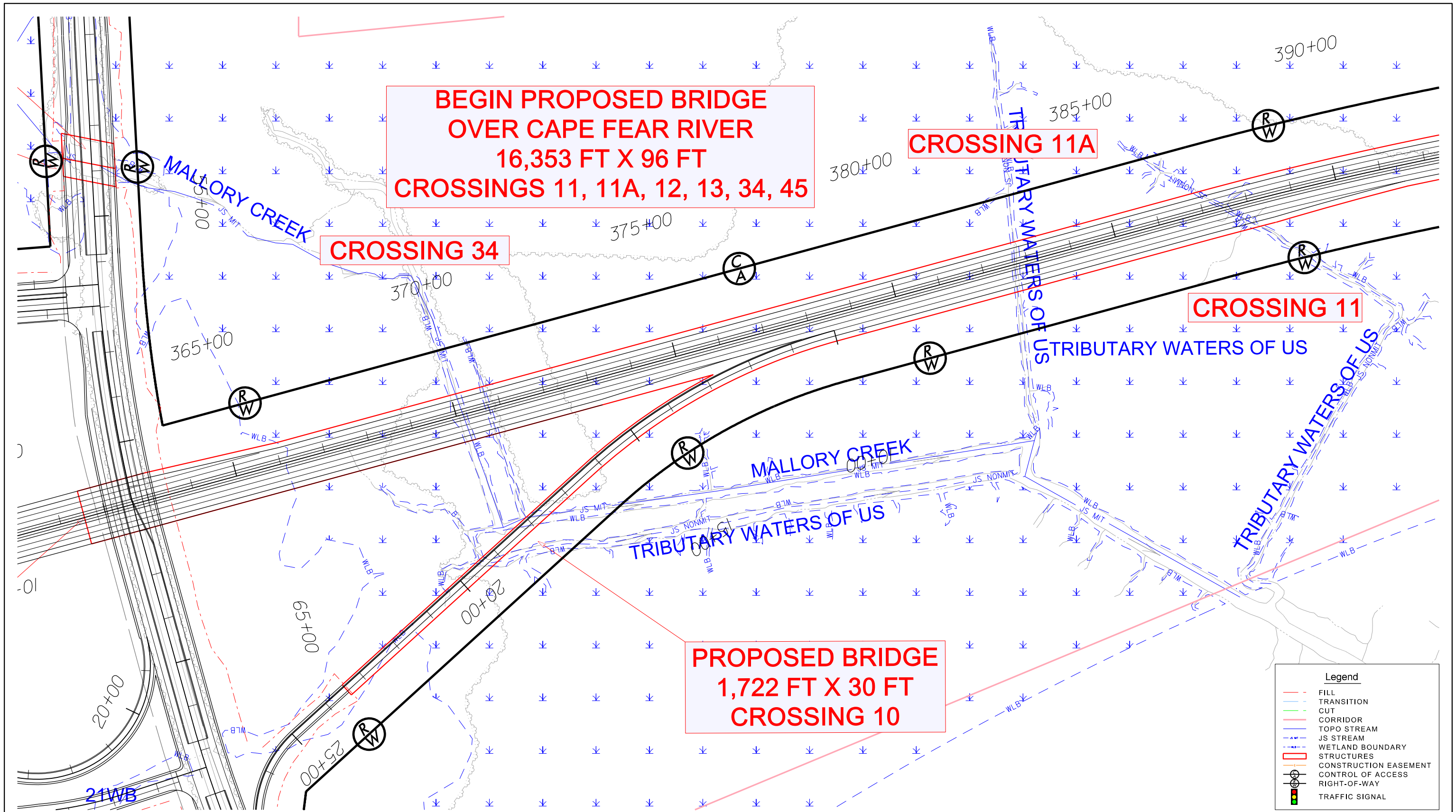


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-B



**BEGIN PROPOSED BRIDGE  
OVER CAPE FEAR RIVER  
16,353 FT X 96 FT  
CROSSINGS 11, 11A, 12, 13, 34, 45**

**CROSSING 34**

**CROSSING 11A**

**CROSSING 11**

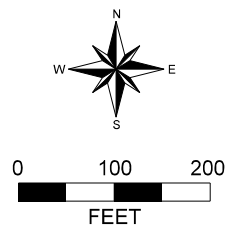
**PROPOSED BRIDGE  
1,722 FT X 30 FT  
CROSSING 10**

Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 10, 11, 11A, & 34



HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-C

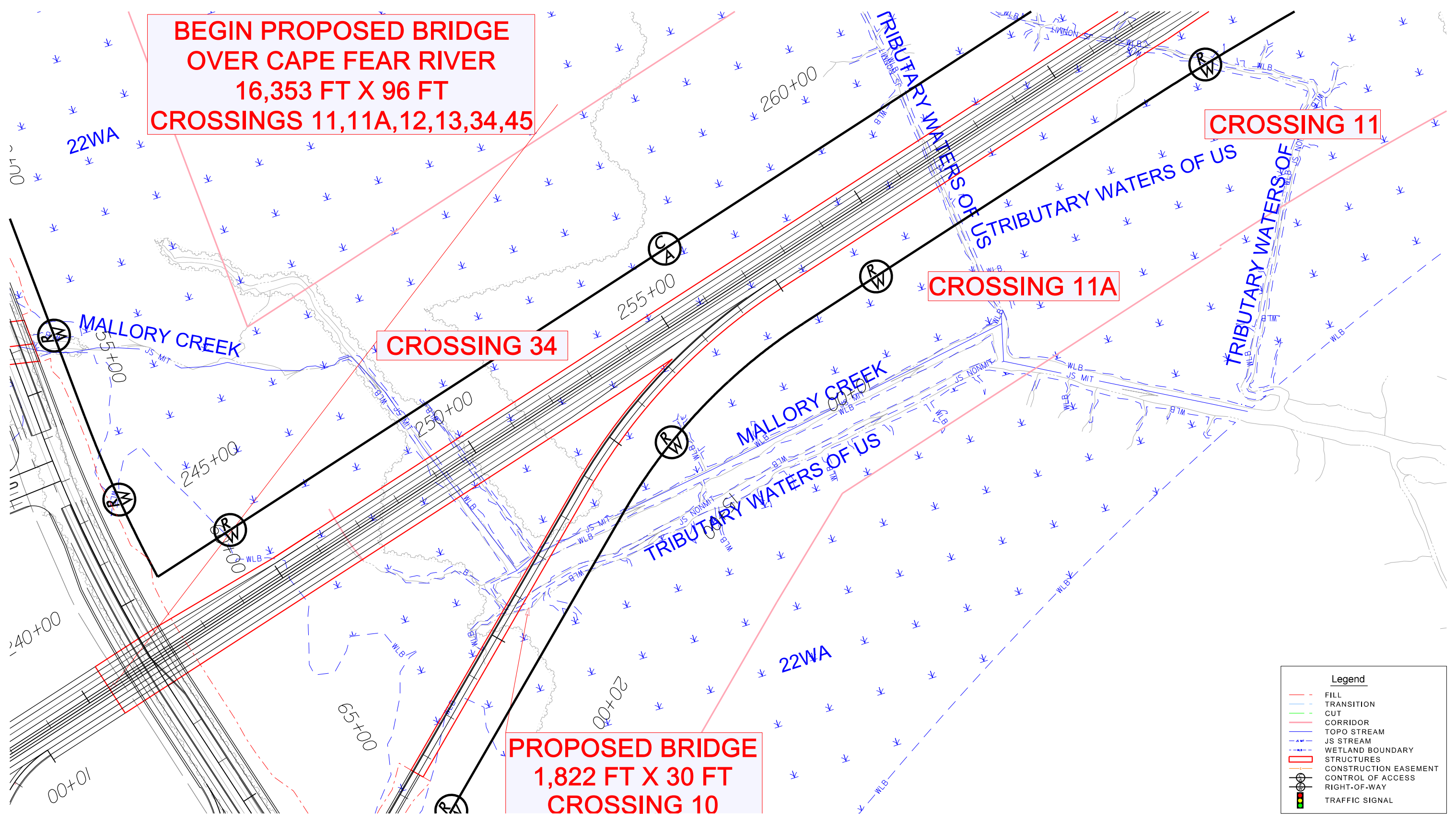
**BEGIN PROPOSED BRIDGE  
OVER CAPE FEAR RIVER  
16,353 FT X 96 FT  
CROSSINGS 11,11A,12,13,34,45**

**CROSSING 11**

**CROSSING 11A**

**CROSSING 34**

**PROPOSED BRIDGE  
1,822 FT X 30 FT  
CROSSING 10**

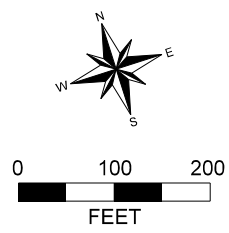


Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 10, 11, 11A, & 34

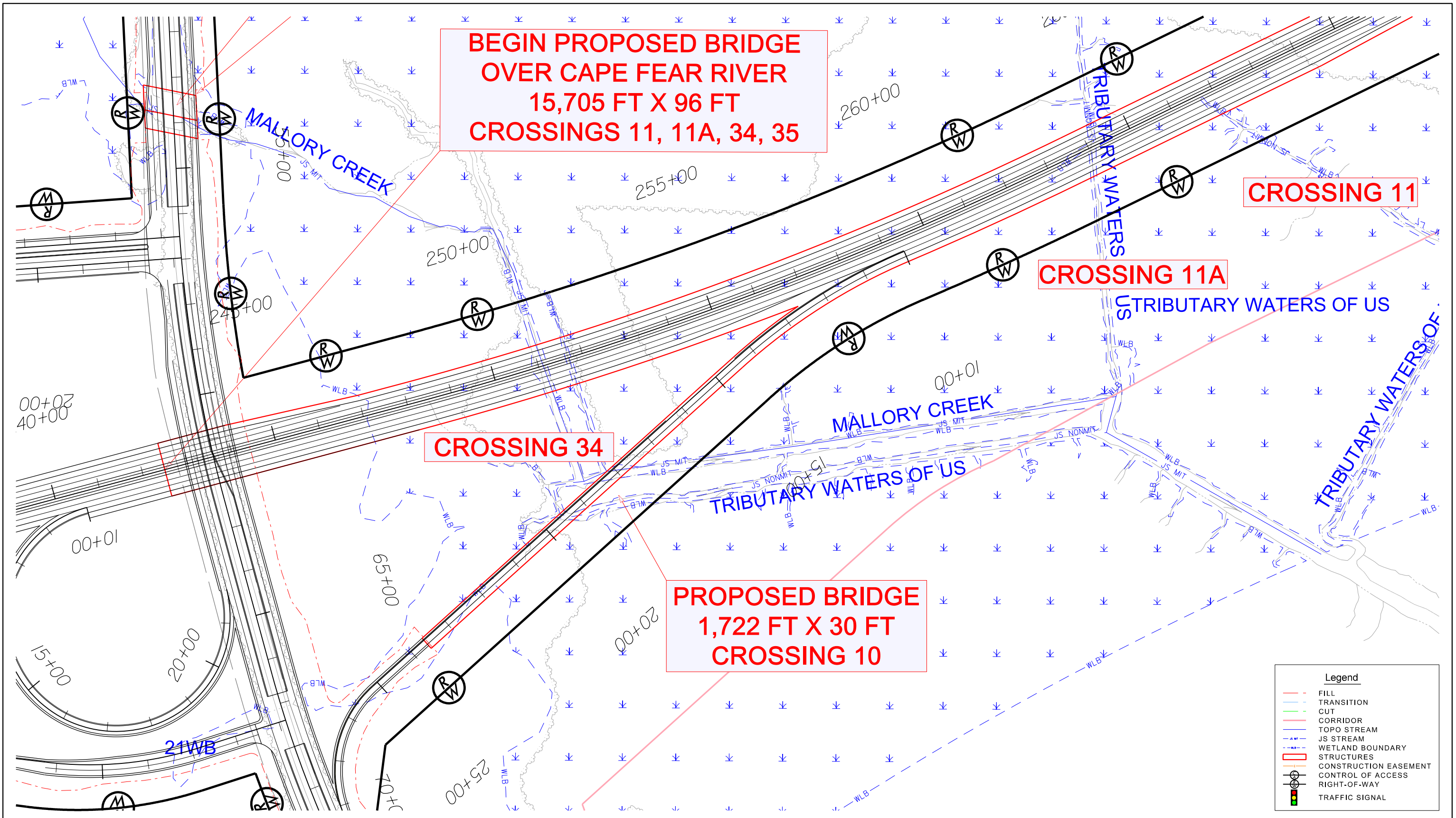


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

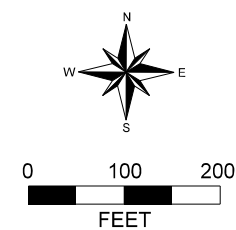
ALT-G, Q



North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 10, 11, 11A, & 34

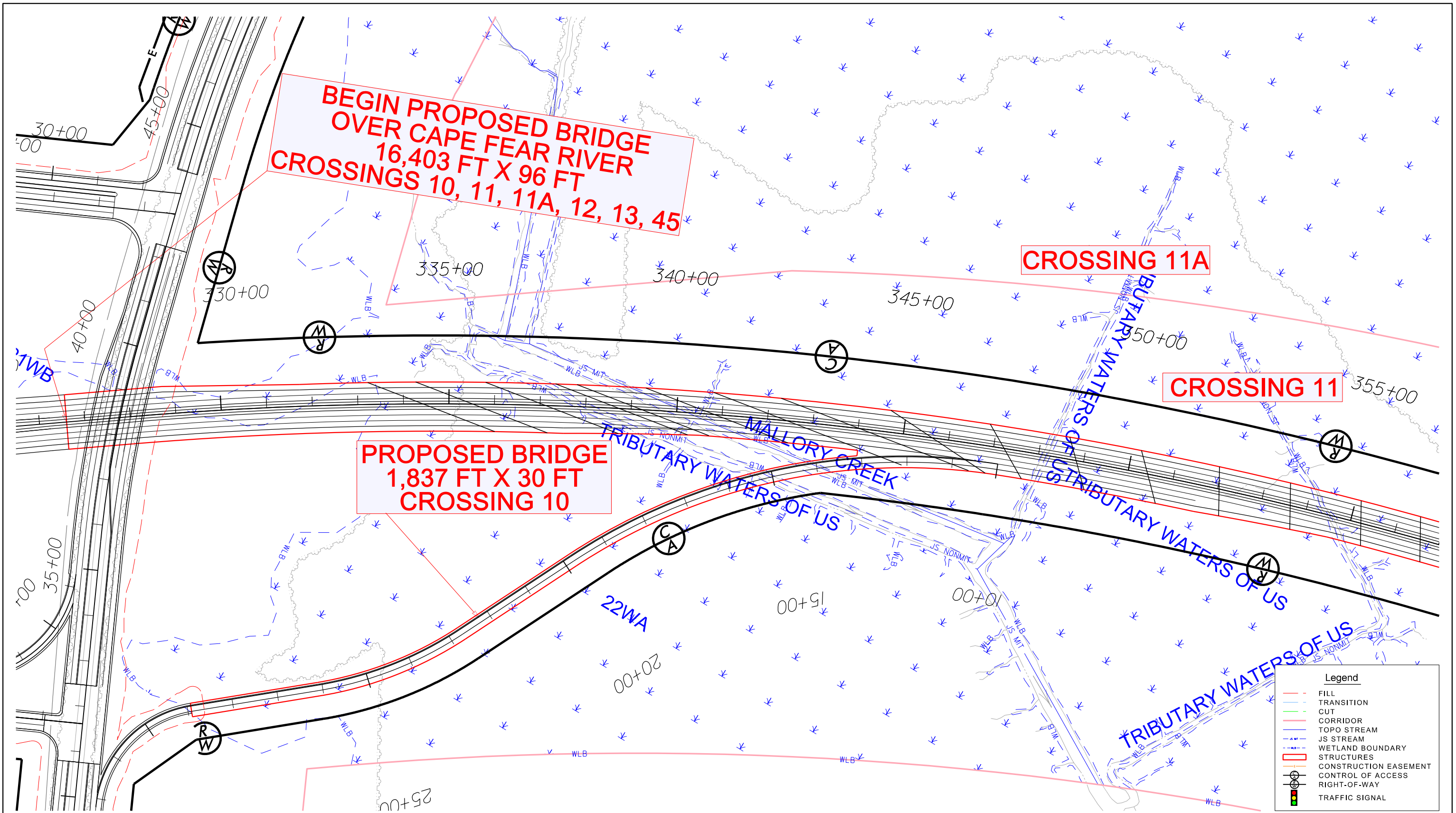


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

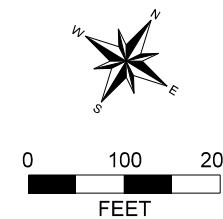
ALT-J, T



North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 10, 11, & 11A

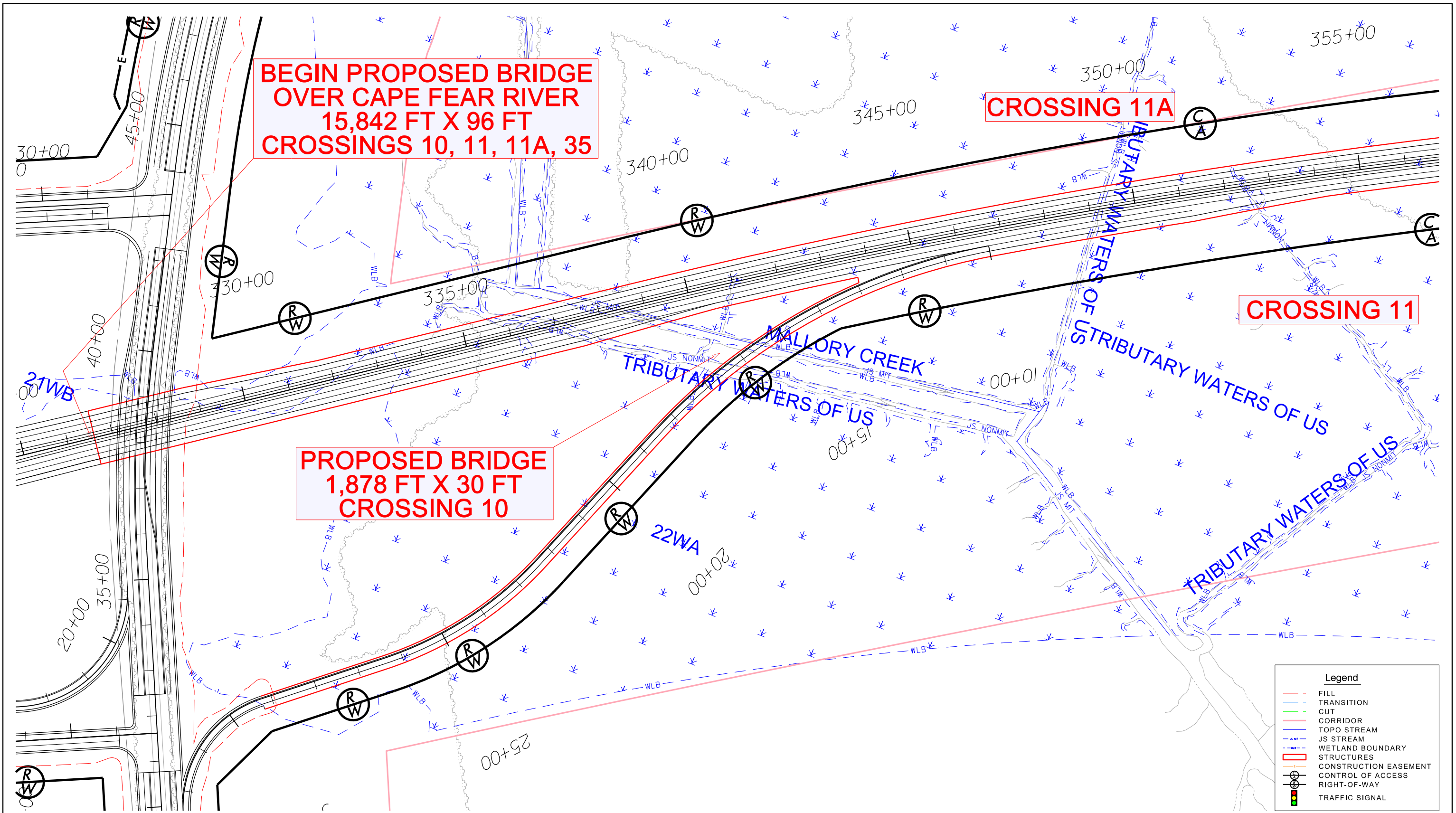


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-MA



**PROPOSED BRIDGE  
1,878 FT X 30 FT  
CROSSING 10**

**BEGIN PROPOSED BRIDGE  
OVER CAPE FEAR RIVER  
15,842 FT X 96 FT  
CROSSINGS 10, 11, 11A, 35**

**CROSSING 11A**

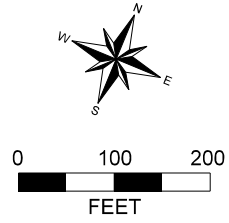
**CROSSING 11**

Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 10, 11, & 11A

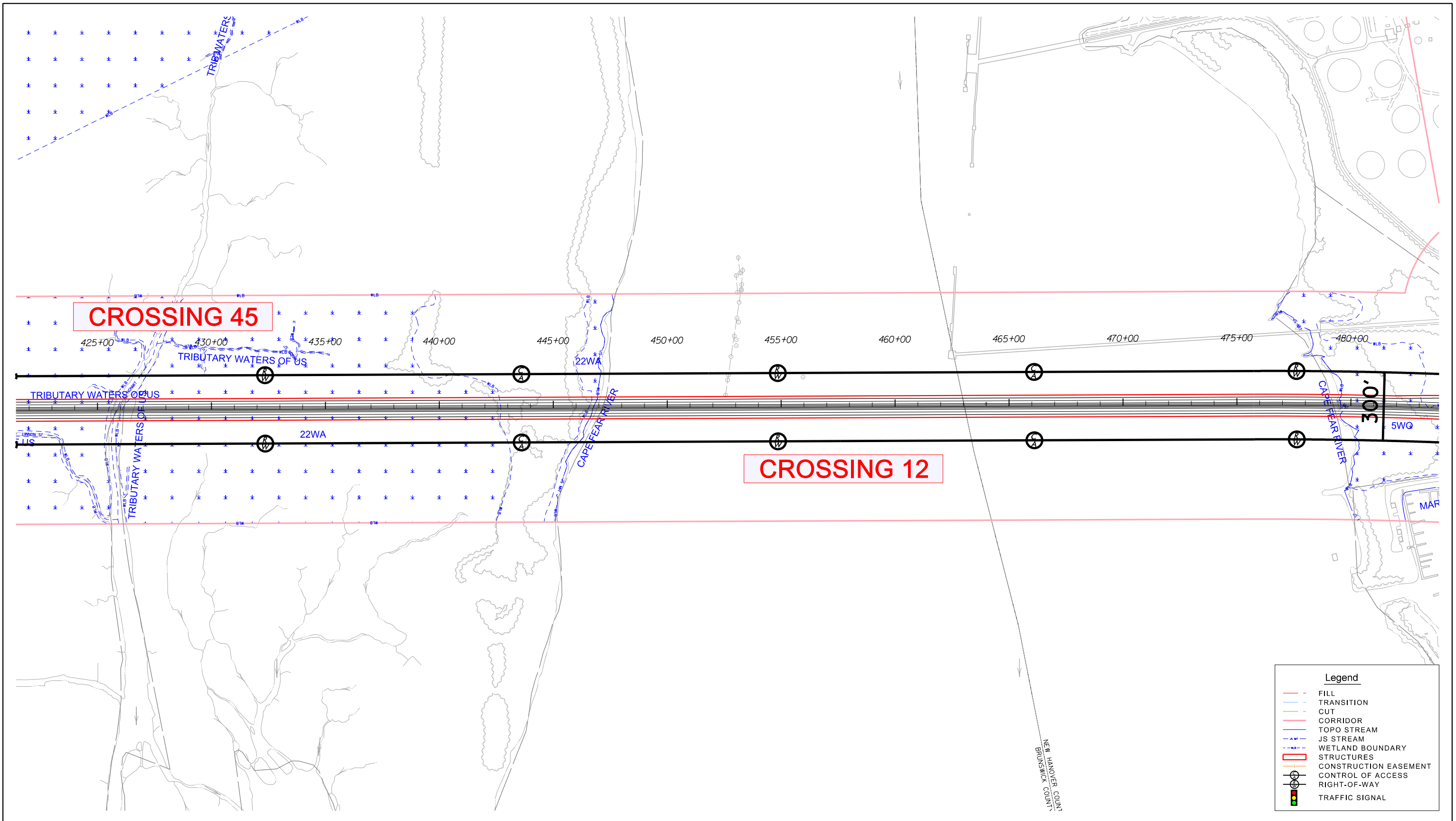


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

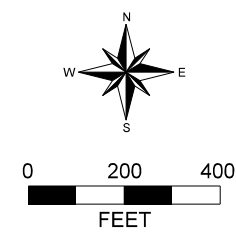
ALT-NA



North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 12 & 45

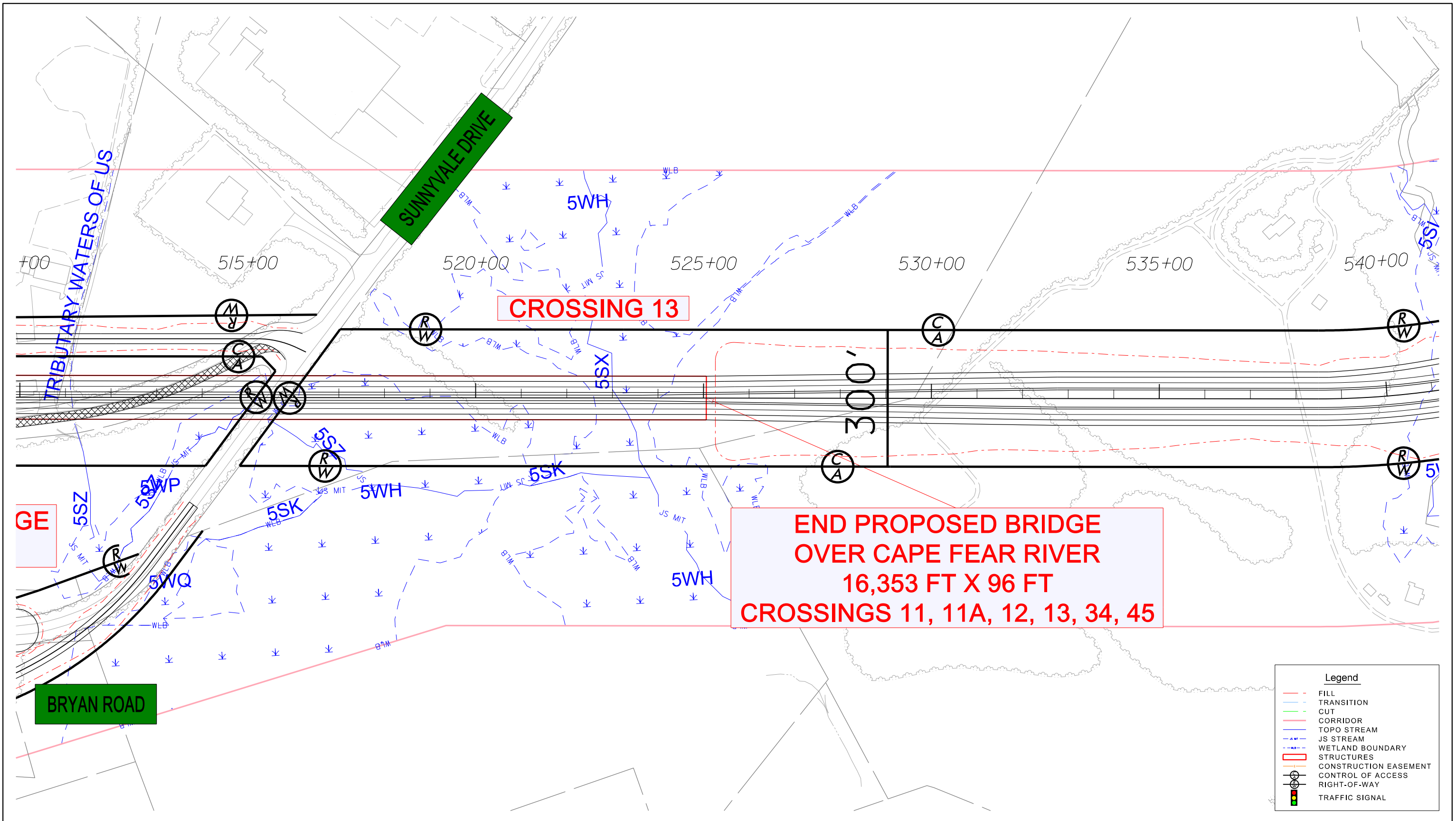


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

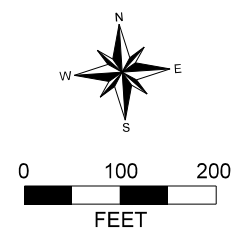
ALT-C, G, Q, MA



North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 13

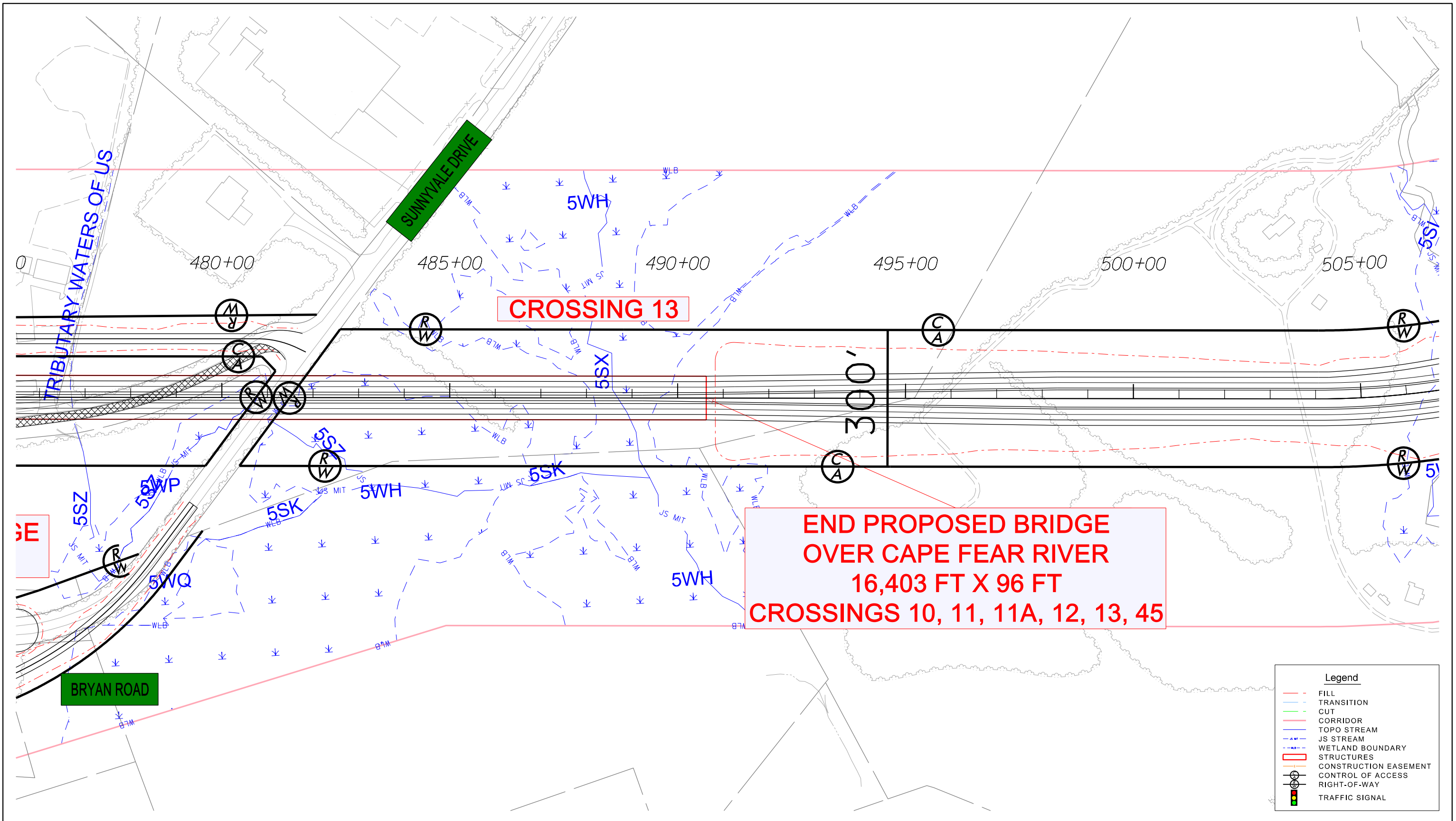


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

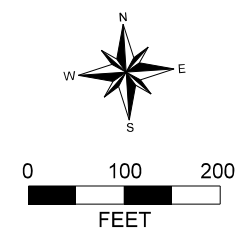
ALT-C, G, Q



North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 13

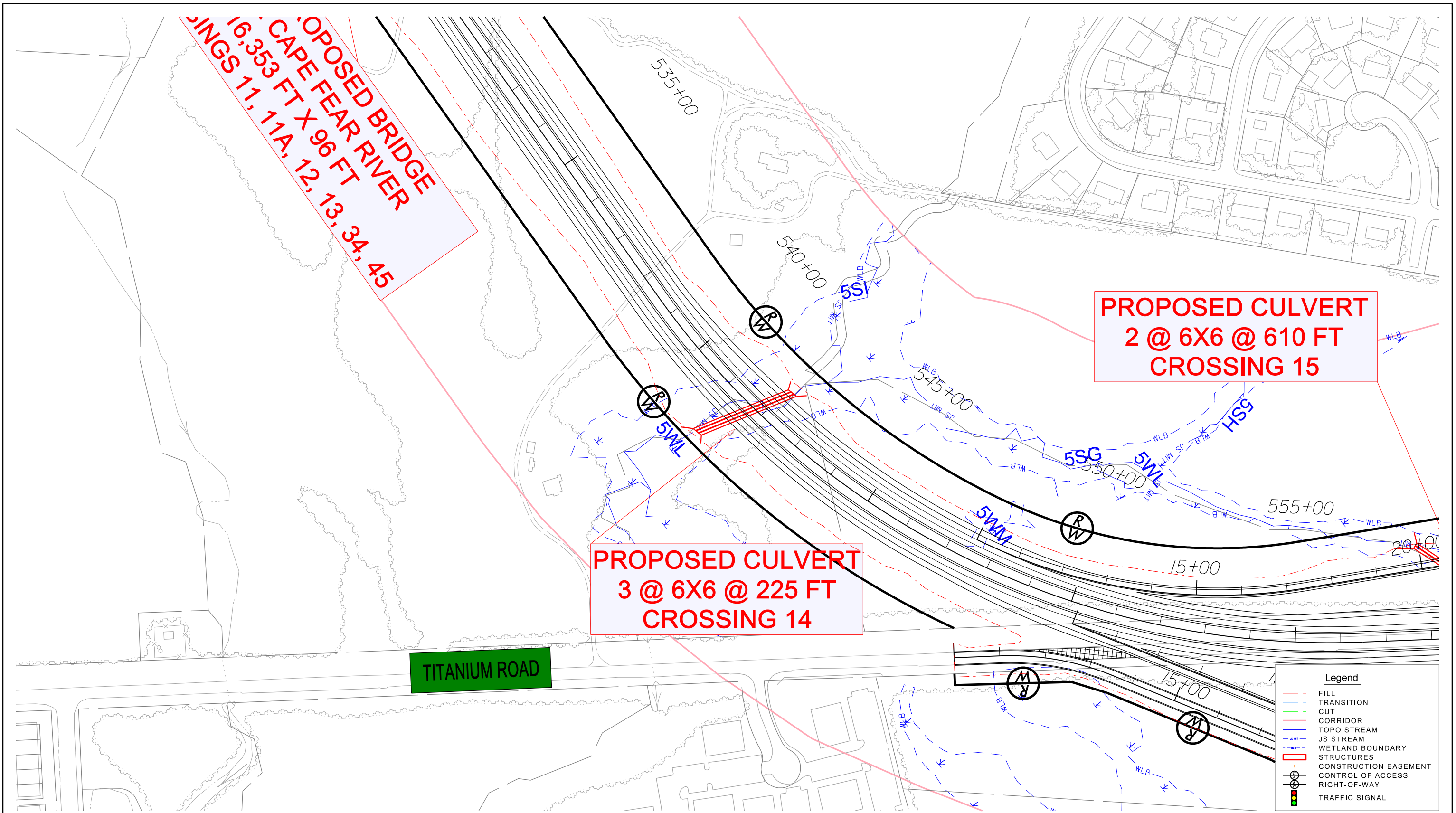


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

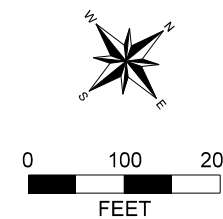
ALT-MA



North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 14



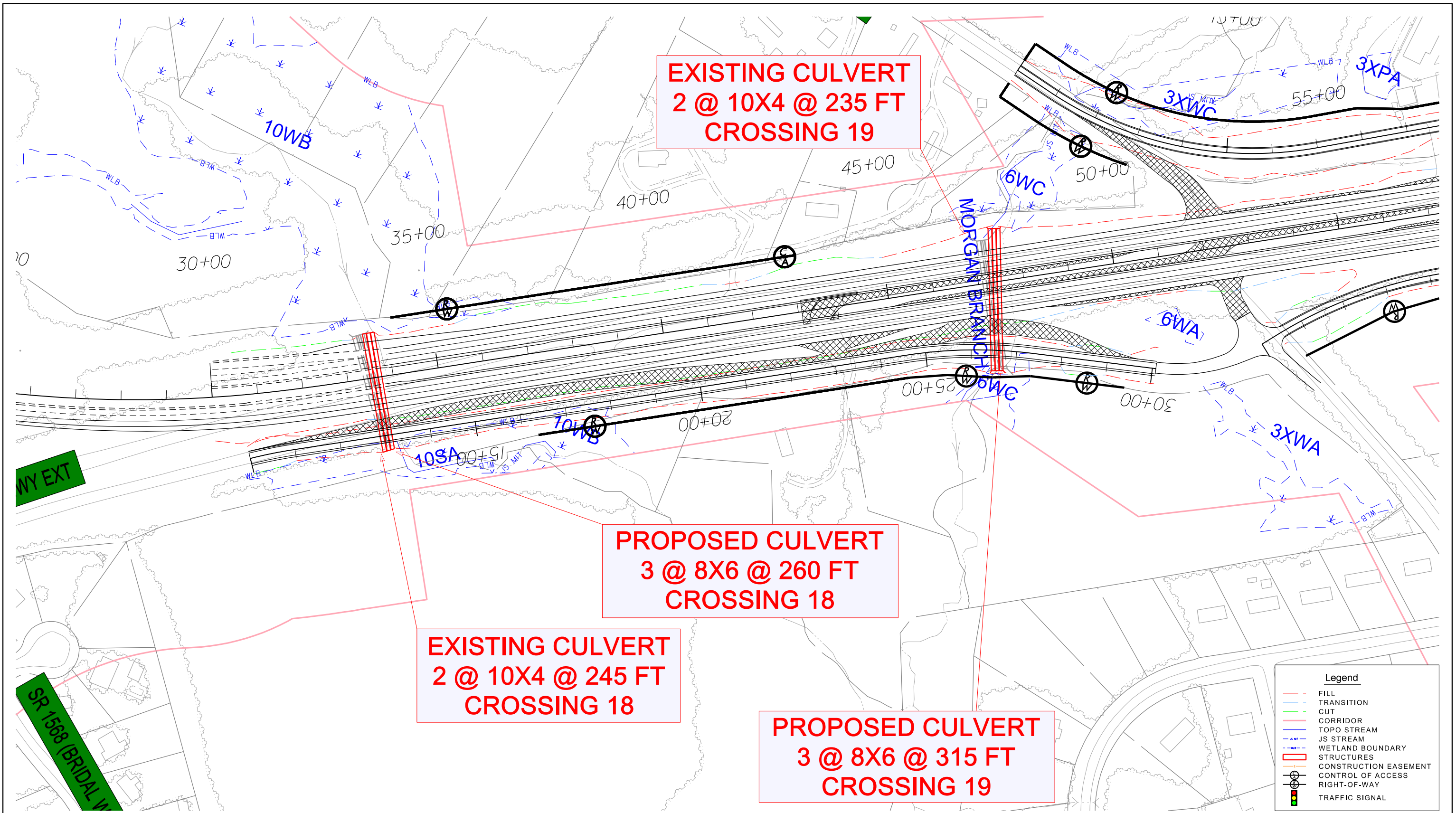
HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-C, G, Q, MA

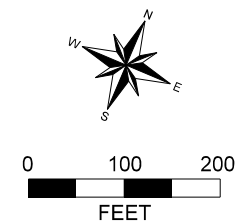




North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 18 & 19

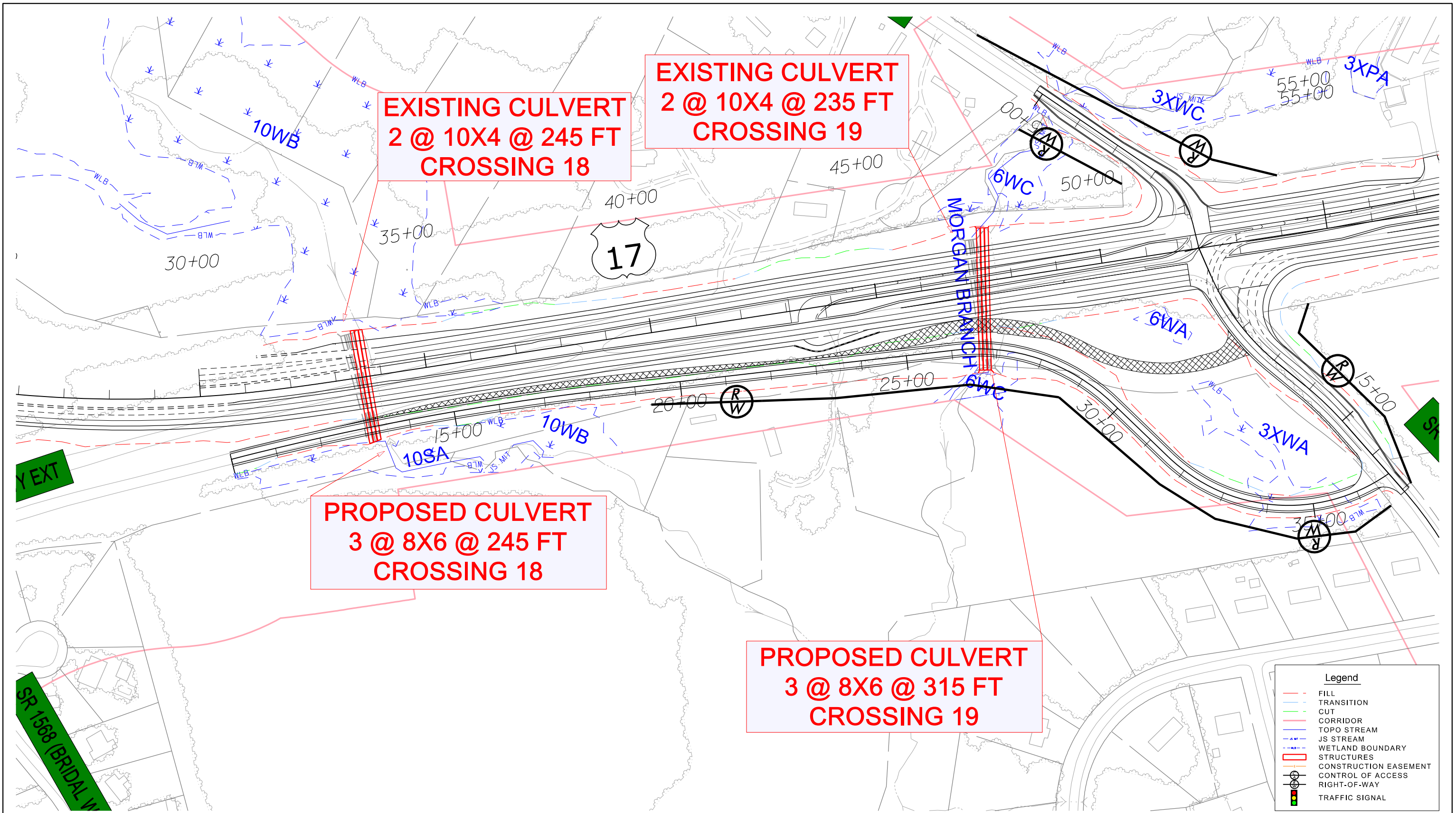


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-F, G, J, VF



**EXISTING CULVERT  
2 @ 10X4 @ 245 FT  
CROSSING 18**

**EXISTING CULVERT  
2 @ 10X4 @ 235 FT  
CROSSING 19**

**PROPOSED CULVERT  
3 @ 8X6 @ 245 FT  
CROSSING 18**

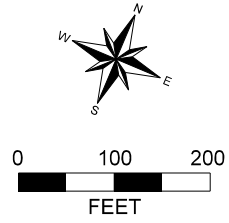
**PROPOSED CULVERT  
3 @ 8X6 @ 315 FT  
CROSSING 19**

- Legend**
- FILL
  - TRANSITION
  - CUT
  - CORRIDOR
  - TOPO STREAM
  - JS STREAM
  - WETLAND BOUNDARY
  - STRUCTURES
  - CONSTRUCTION EASEMENT
  - CONTROL OF ACCESS
  - RIGHT-OF-WAY
  - TRAFFIC SIGNAL

North Carolina  
Department of Transportation

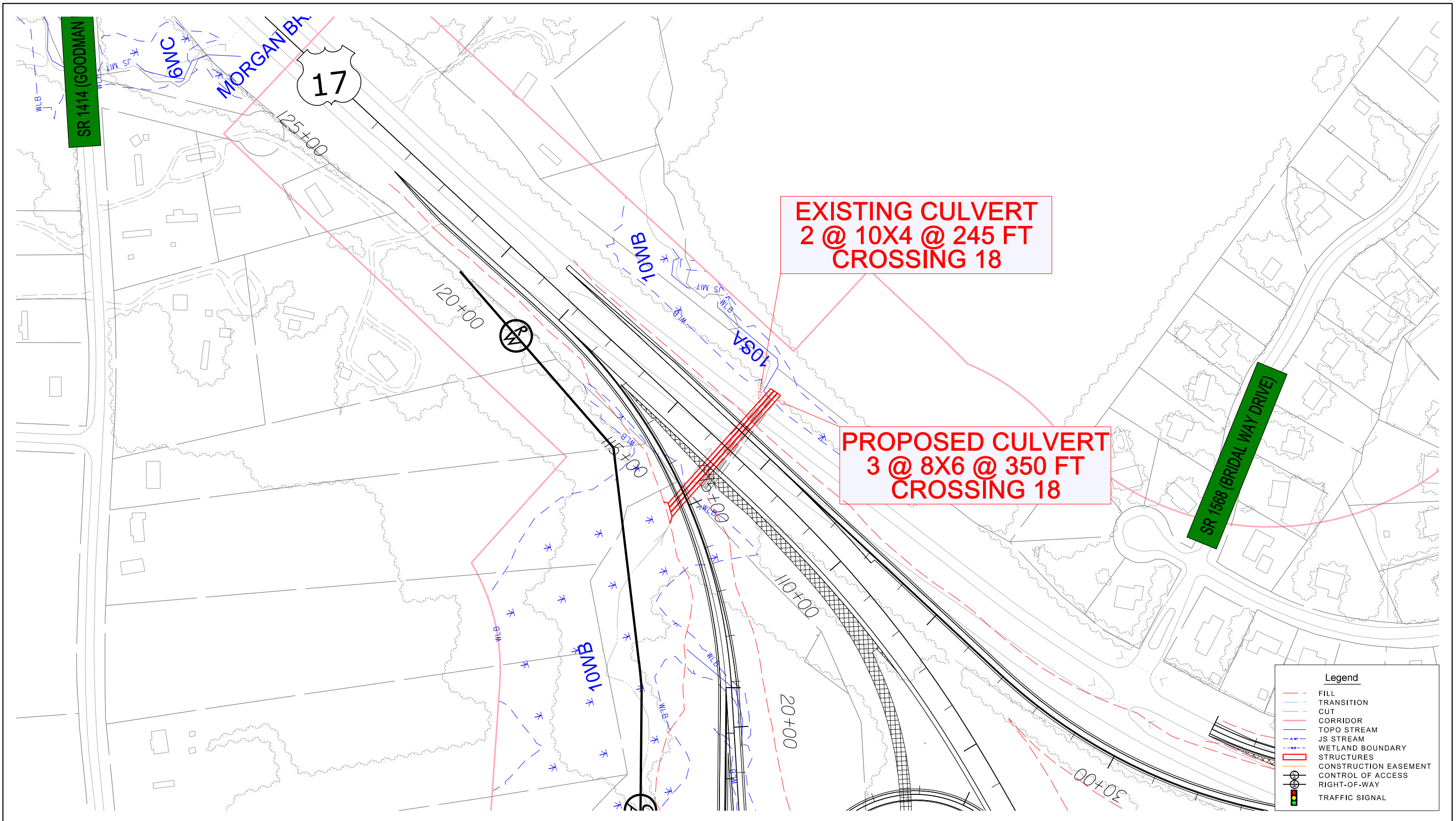


HYDRAULIC CROSSING NO. 18 & 19



HYDRAULIC CROSSINGS

Date: May 2017  
U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties  
ALT-P, Q, T, VA



**EXISTING CULVERT  
2 @ 10X4 @ 245 FT  
CROSSING 18**

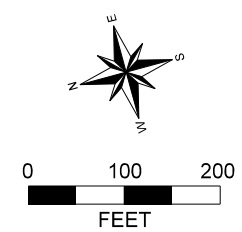
**PROPOSED CULVERT  
3 @ 8X6 @ 350 FT  
CROSSING 18**

Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 18

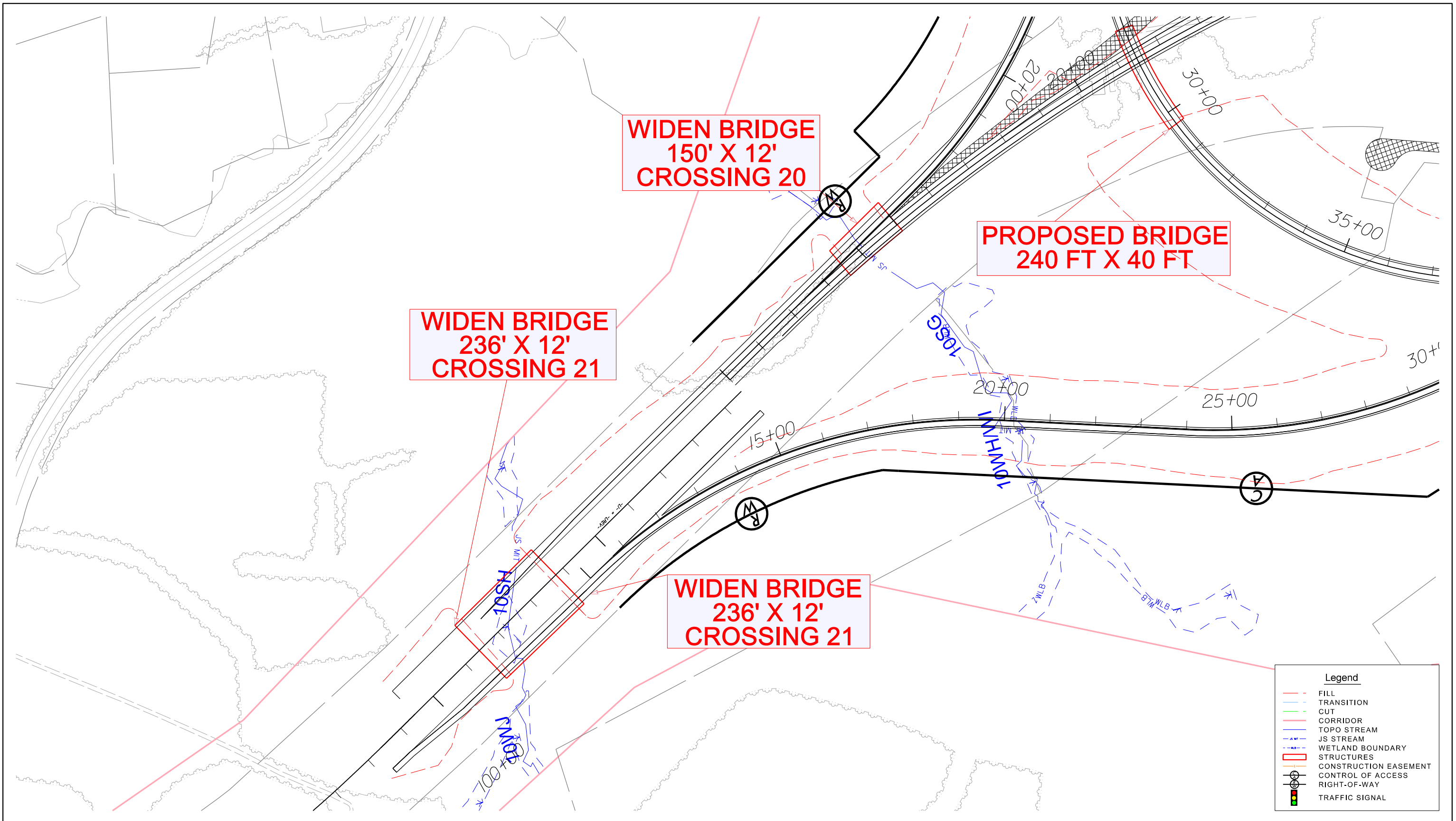


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-MA, NA



**WIDEN BRIDGE**  
**150' X 12'**  
**CROSSING 20**

**PROPOSED BRIDGE**  
**240 FT X 40 FT**

**WIDEN BRIDGE**  
**236' X 12'**  
**CROSSING 21**

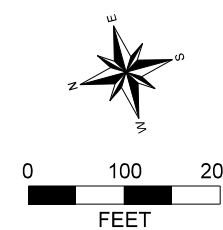
**WIDEN BRIDGE**  
**236' X 12'**  
**CROSSING 21**

Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
 Department of Transportation



HYDRAULIC CROSSING NO. 20 & 21

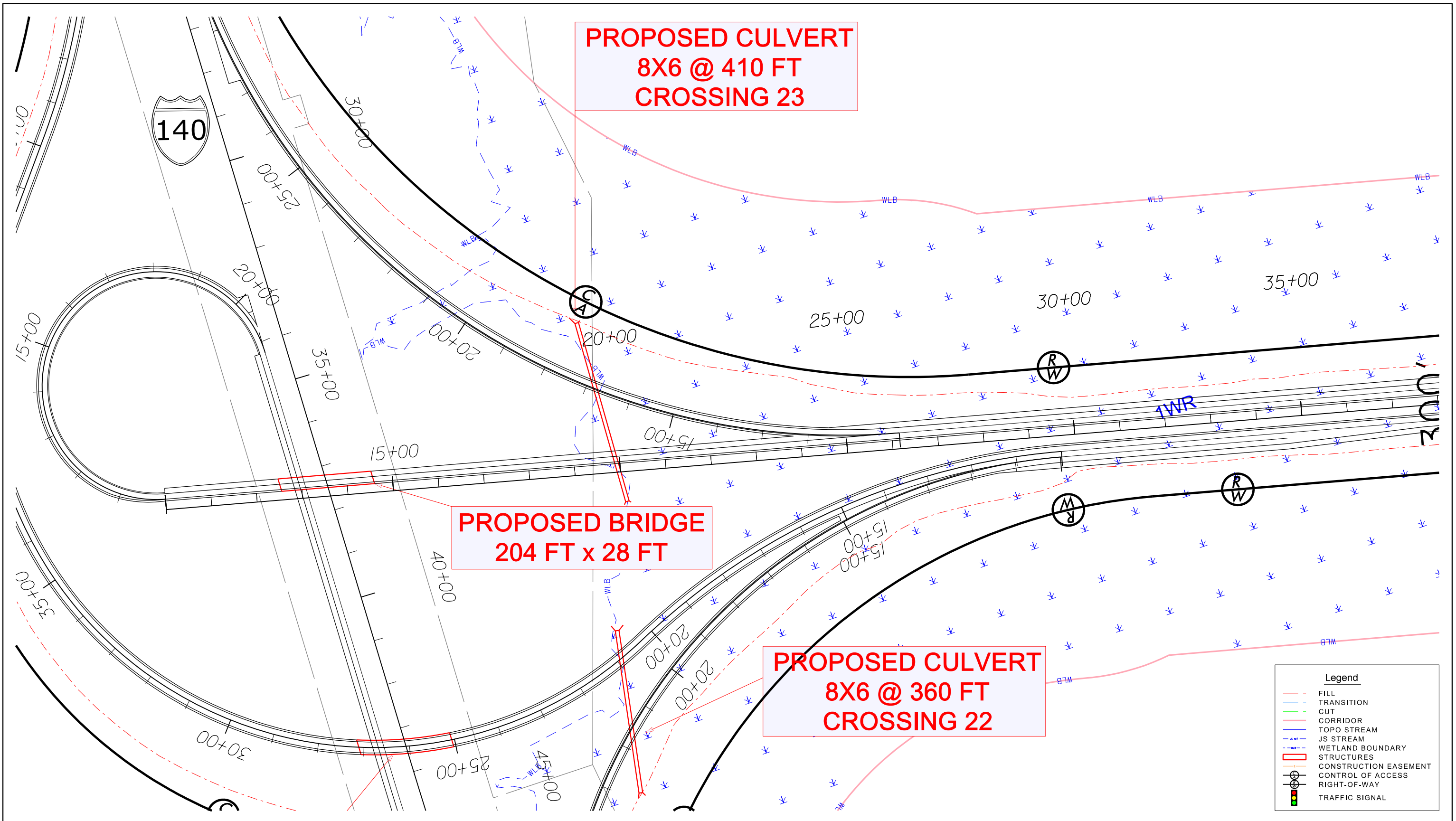


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
 Brunswick and New Hanover Counties

ALT-MA, NA



**PROPOSED CULVERT  
8X6 @ 410 FT  
CROSSING 23**

**PROPOSED BRIDGE  
204 FT x 28 FT**

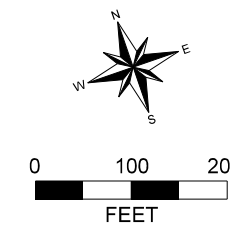
**PROPOSED CULVERT  
8X6 @ 360 FT  
CROSSING 22**

Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 22 & 23

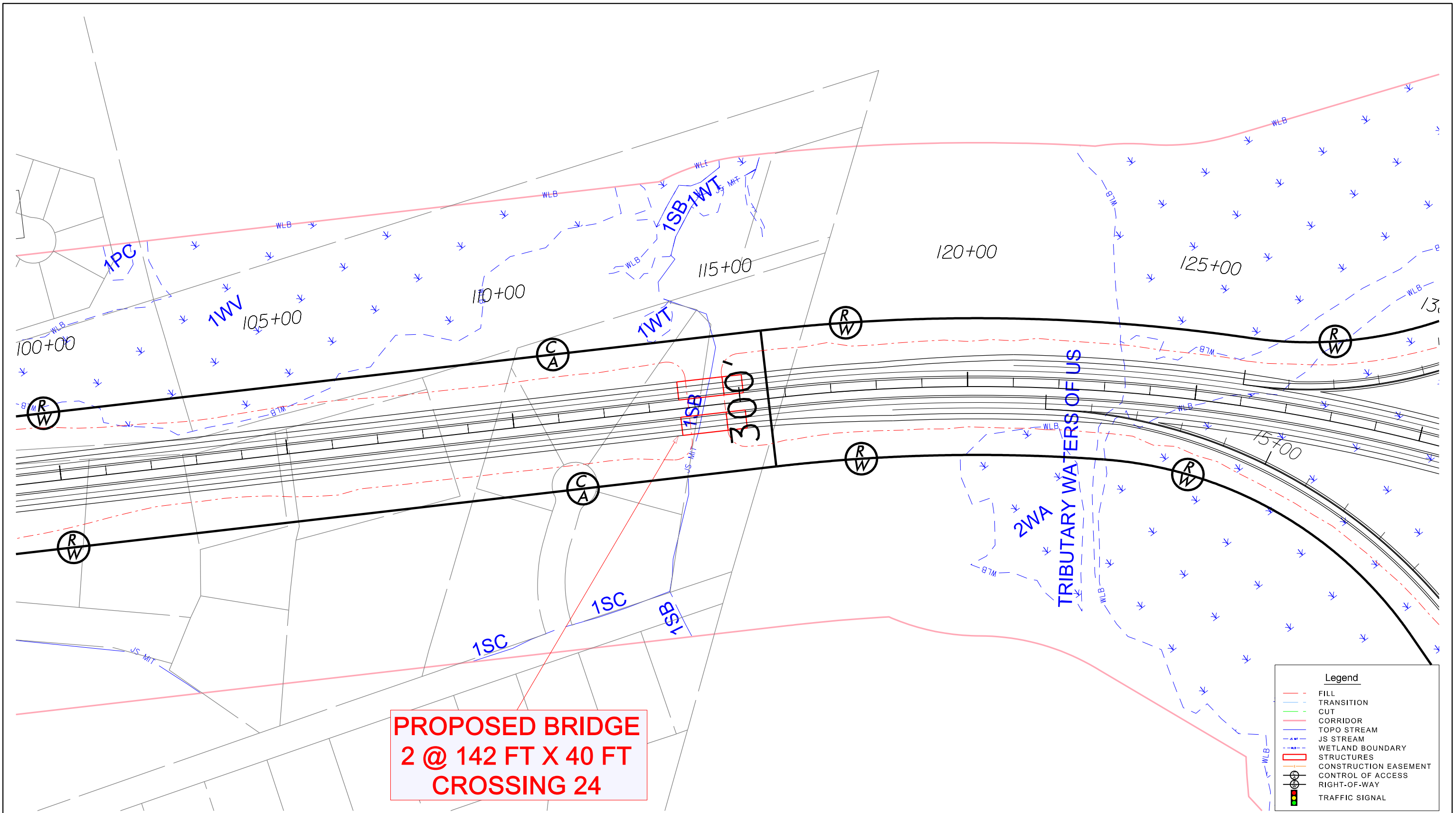


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-B, C



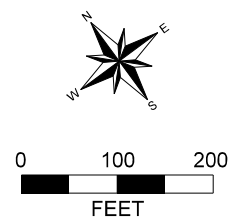
**PROPOSED BRIDGE  
2 @ 142 FT X 40 FT  
CROSSING 24**

Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 24

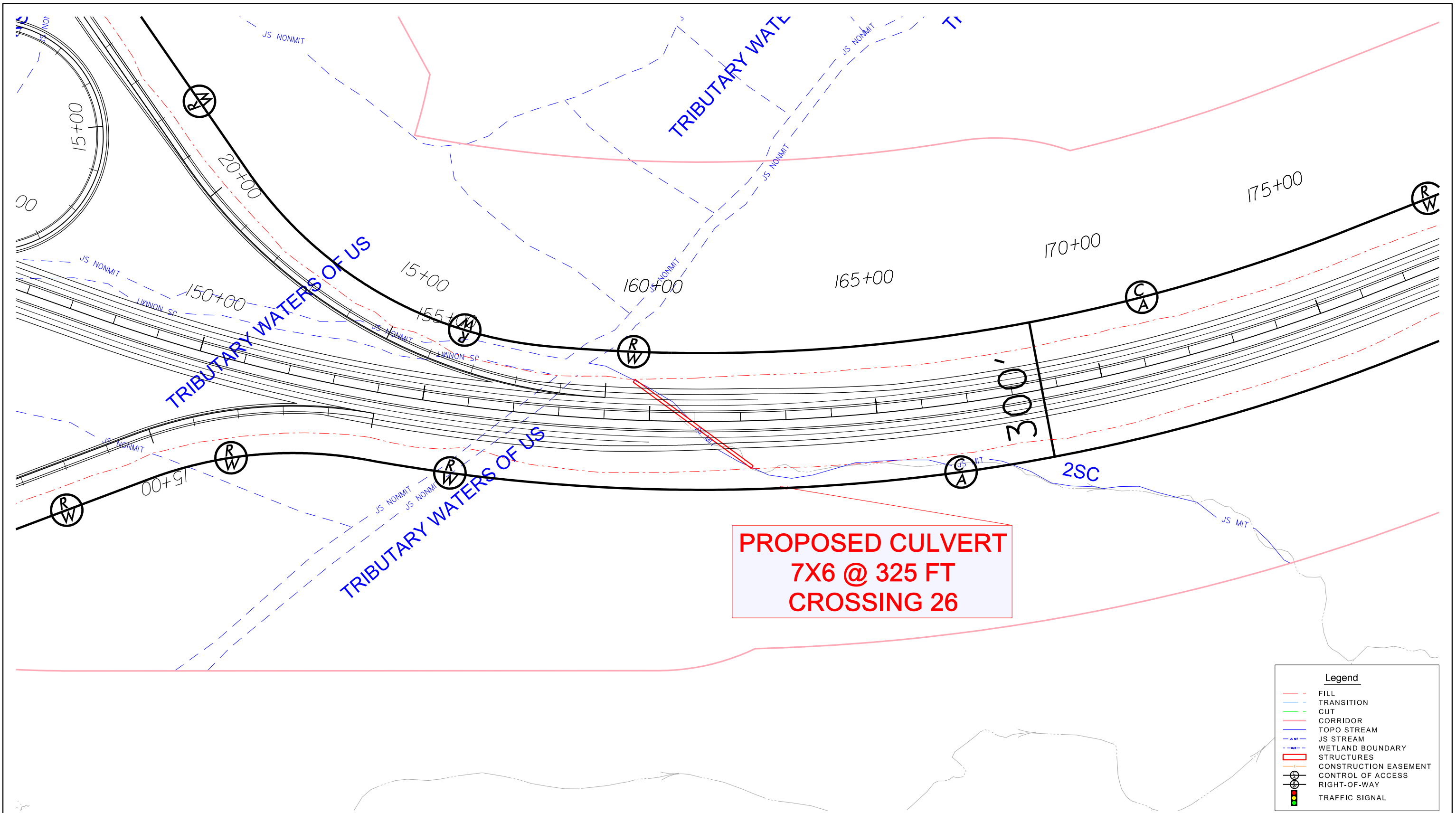


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-B, C



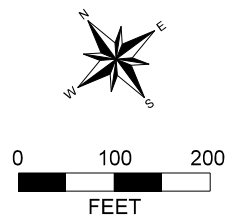
**PROPOSED CULVERT  
7X6 @ 325 FT  
CROSSING 26**

Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation



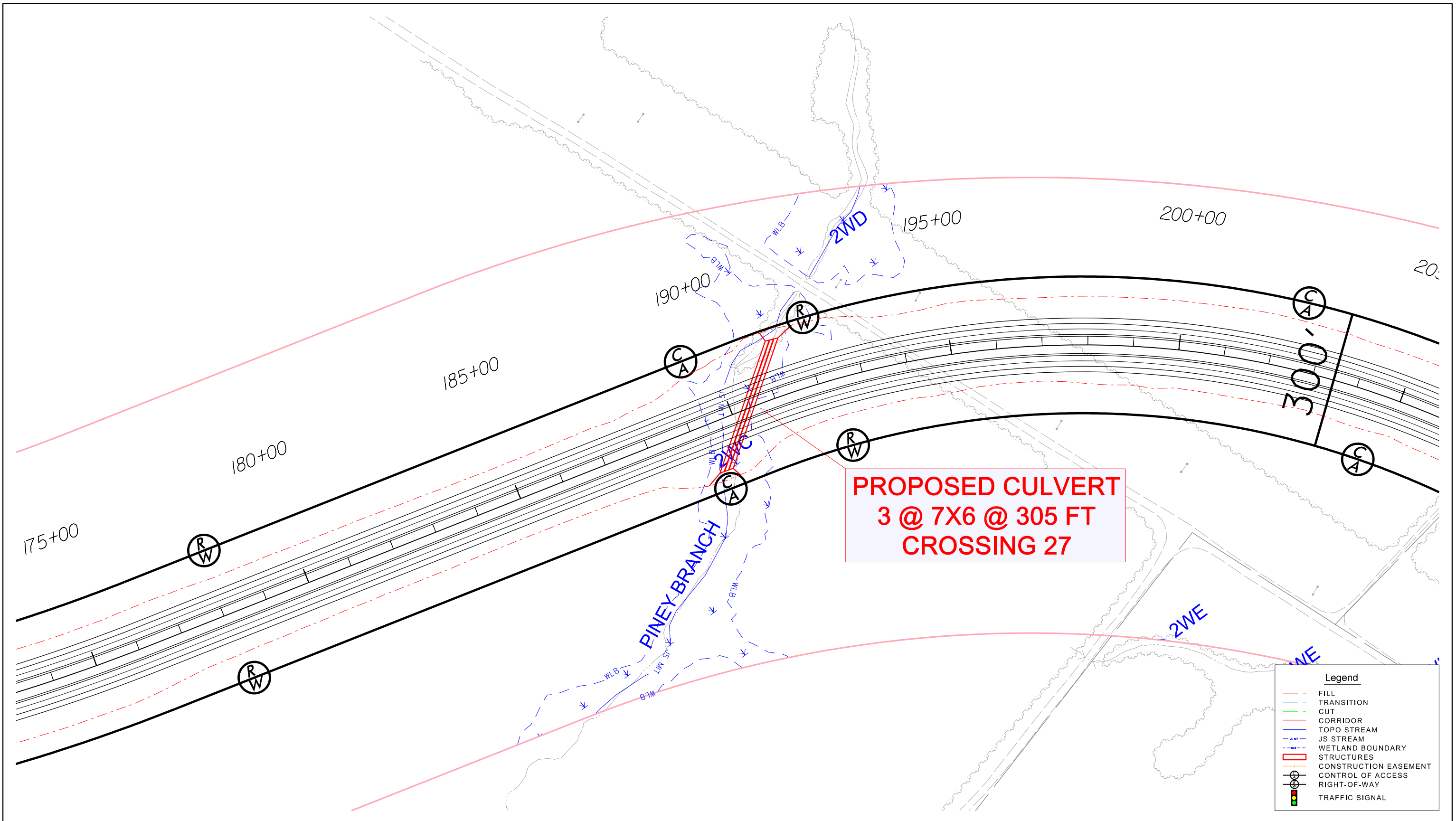
HYDRAULIC CROSSING NO. 26



HYDRAULIC CROSSINGS

Date: May 2017  
U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

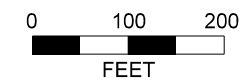
ALT-B, C



North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 27

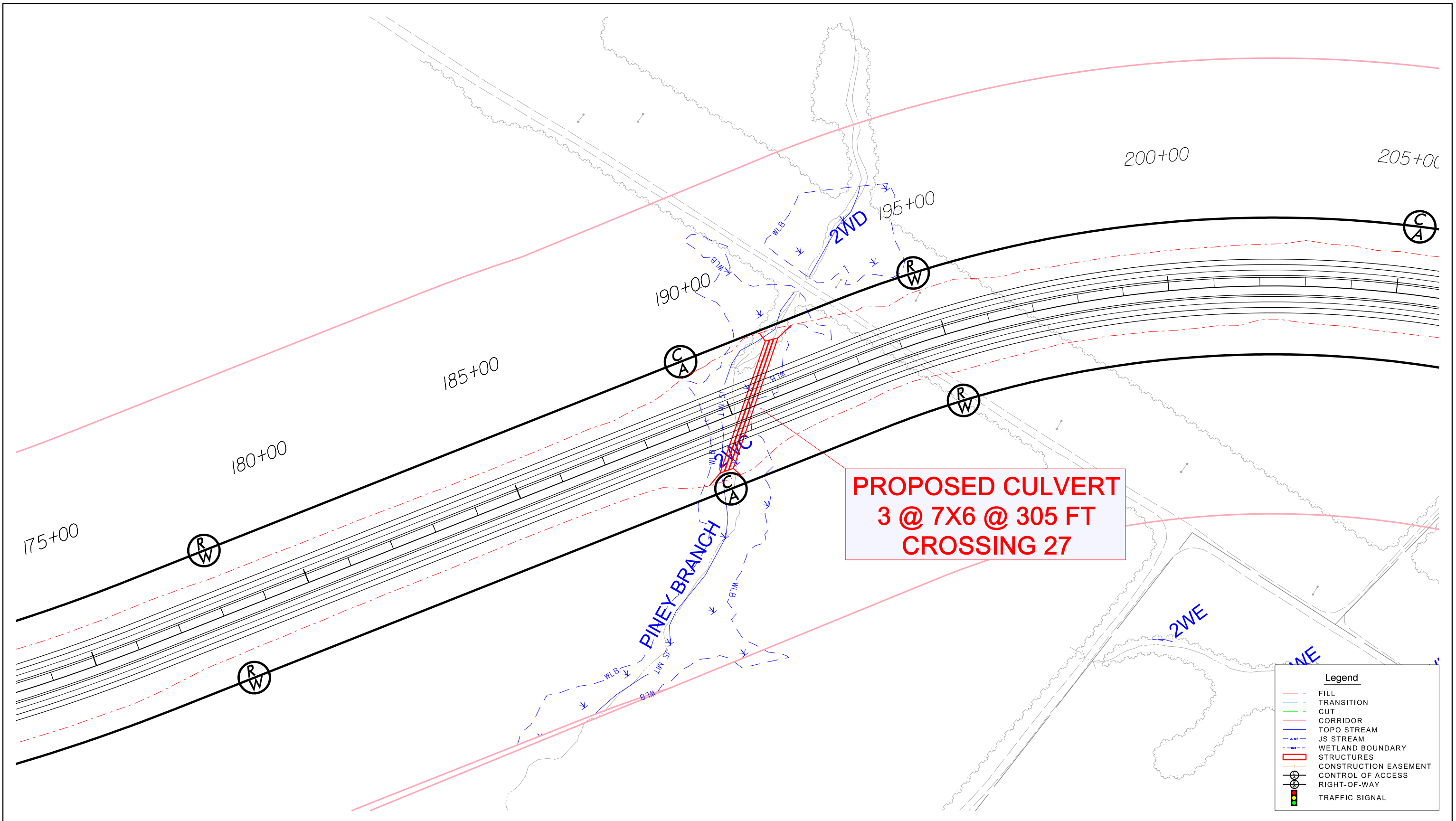


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

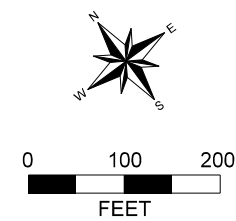
ALT-B, G, Q



North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 27

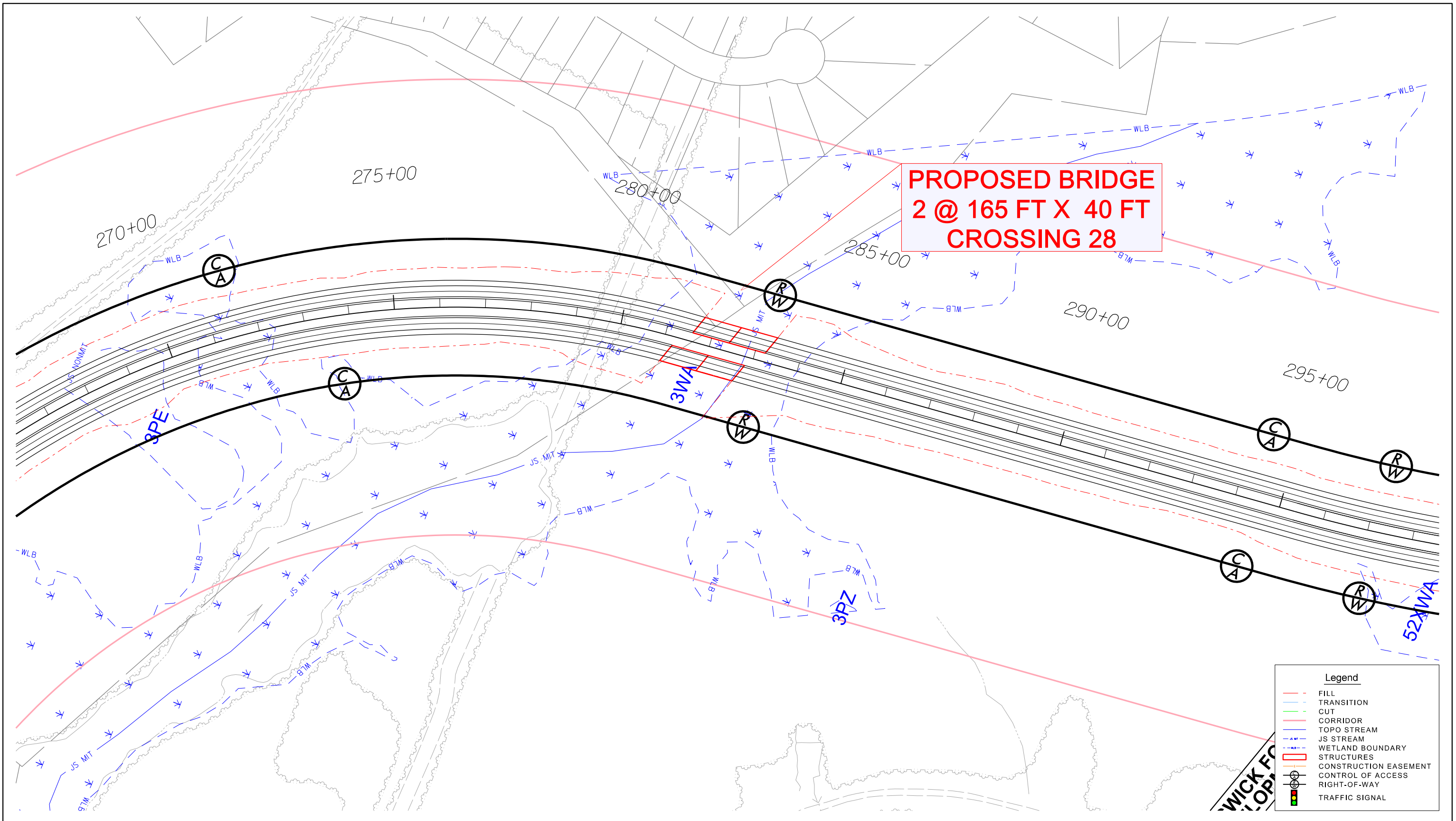


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-C, J, T



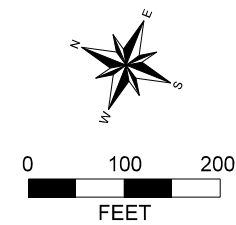
**PROPOSED BRIDGE  
2 @ 165 FT X 40 FT  
CROSSING 28**

Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 28

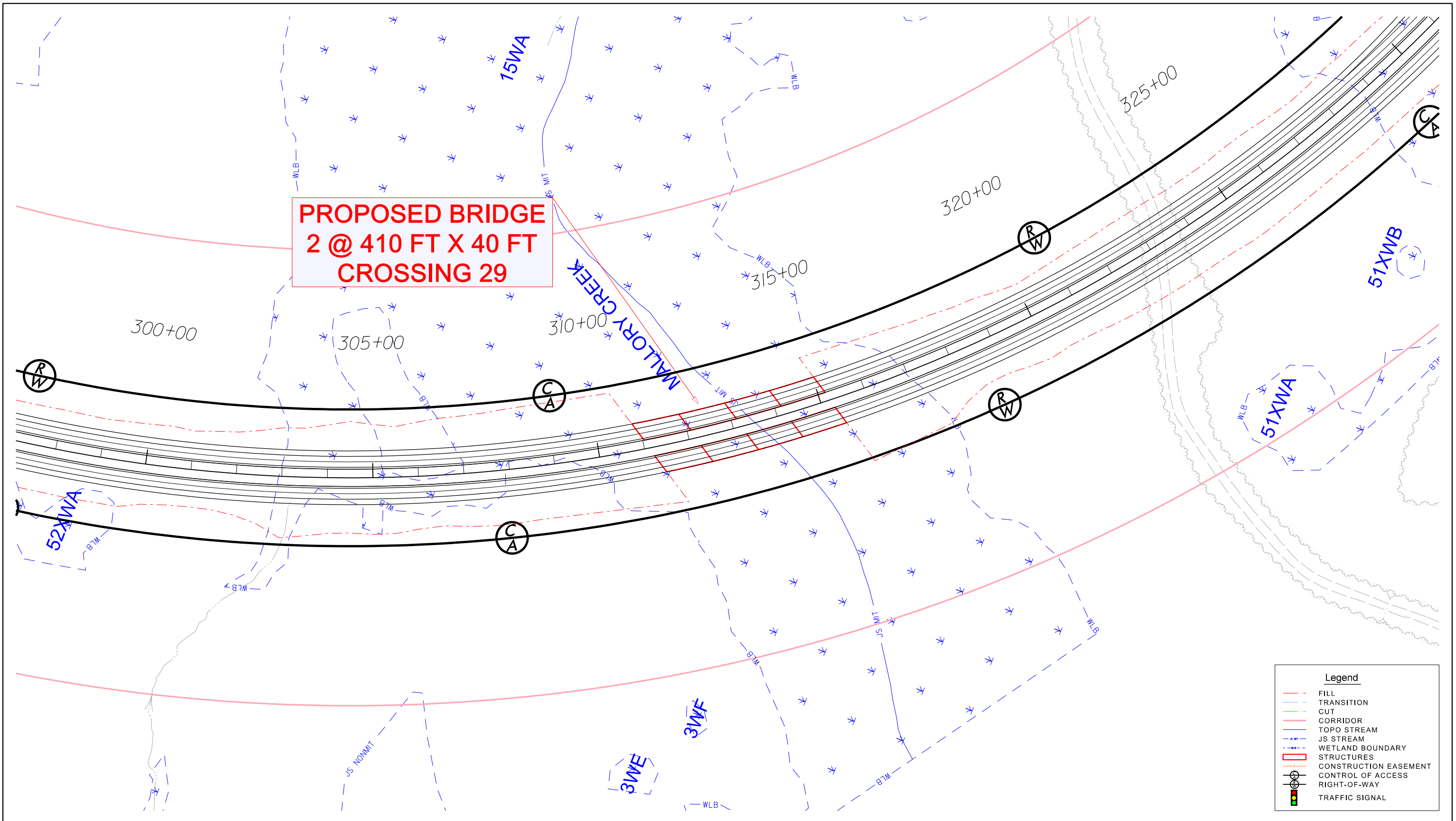


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-B, G, Q



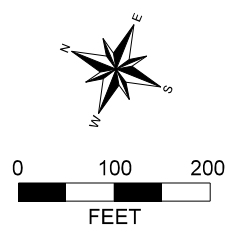
**PROPOSED BRIDGE  
2 @ 410 FT X 40 FT  
CROSSING 29**

Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation

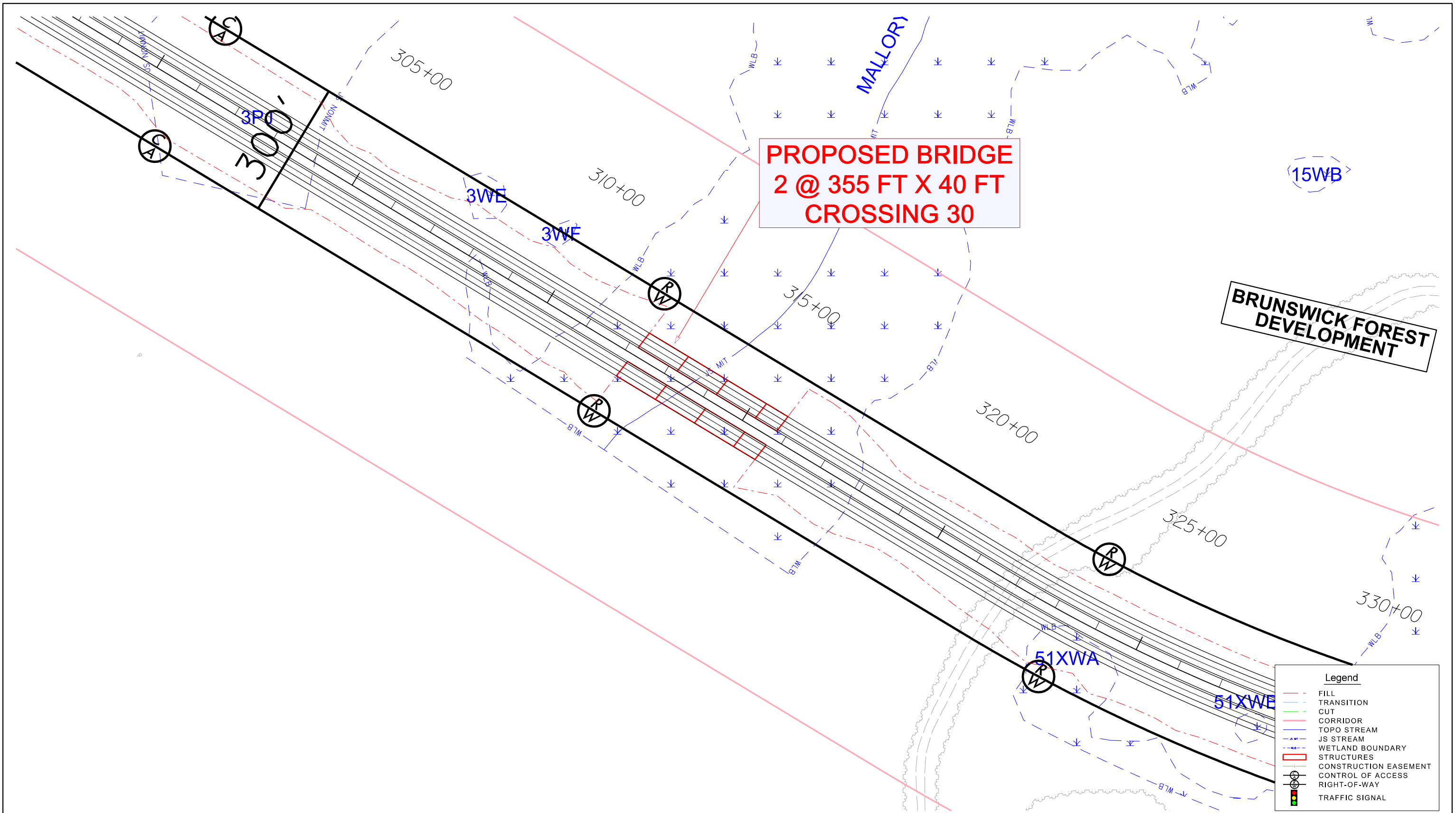


HYDRAULIC CROSSING NO. 29



HYDRAULIC CROSSINGS

Date: May 2017  
U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties  
ALT-B, G, Q



**PROPOSED BRIDGE  
2 @ 355 FT X 40 FT  
CROSSING 30**

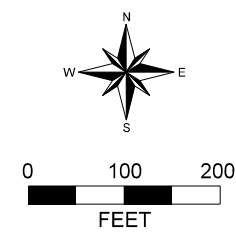
**BRUNSWICK FOREST  
DEVELOPMENT**

Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 30

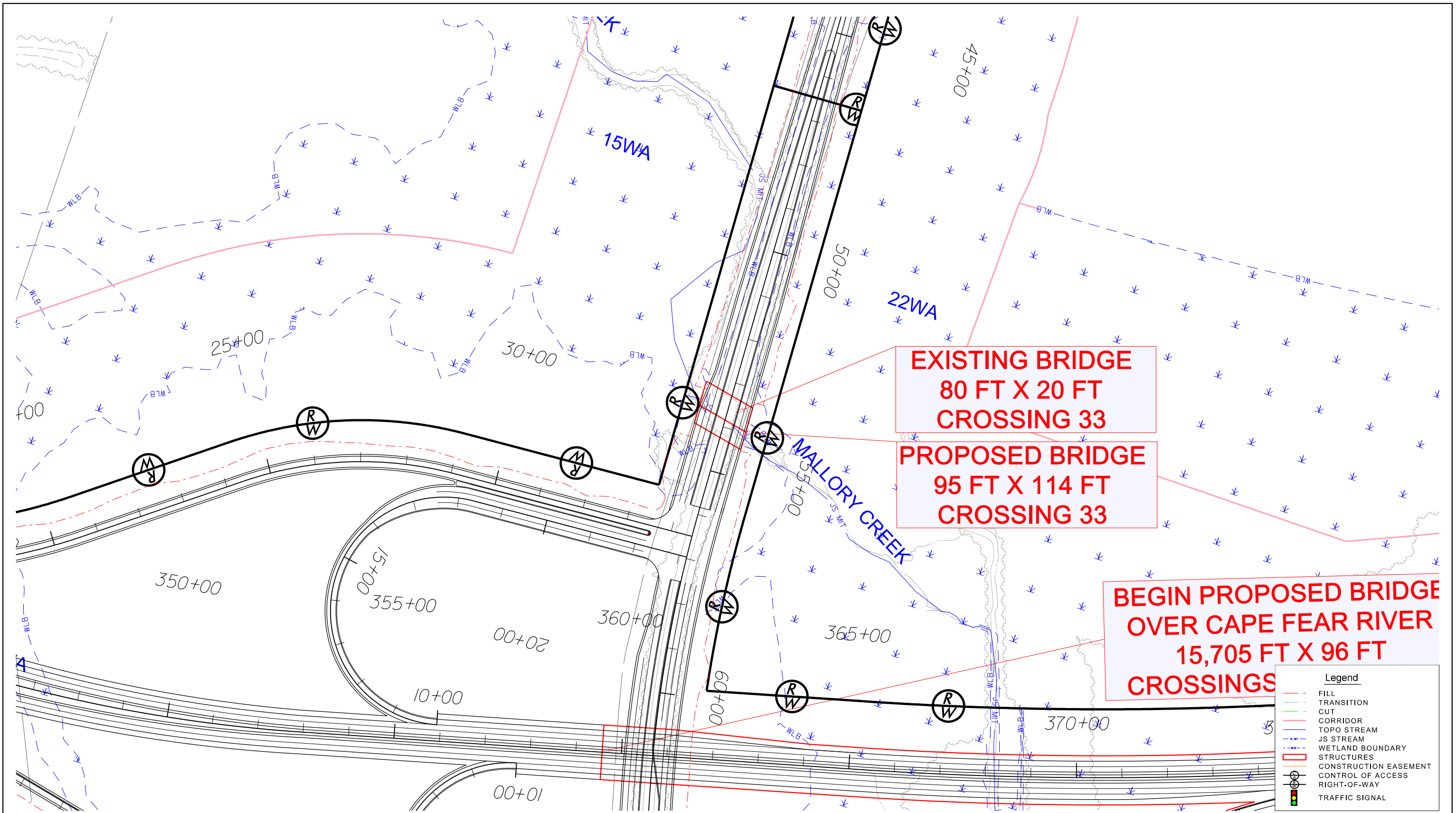


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

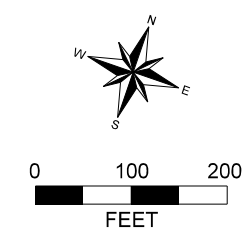
ALT-C, J, T



North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 33

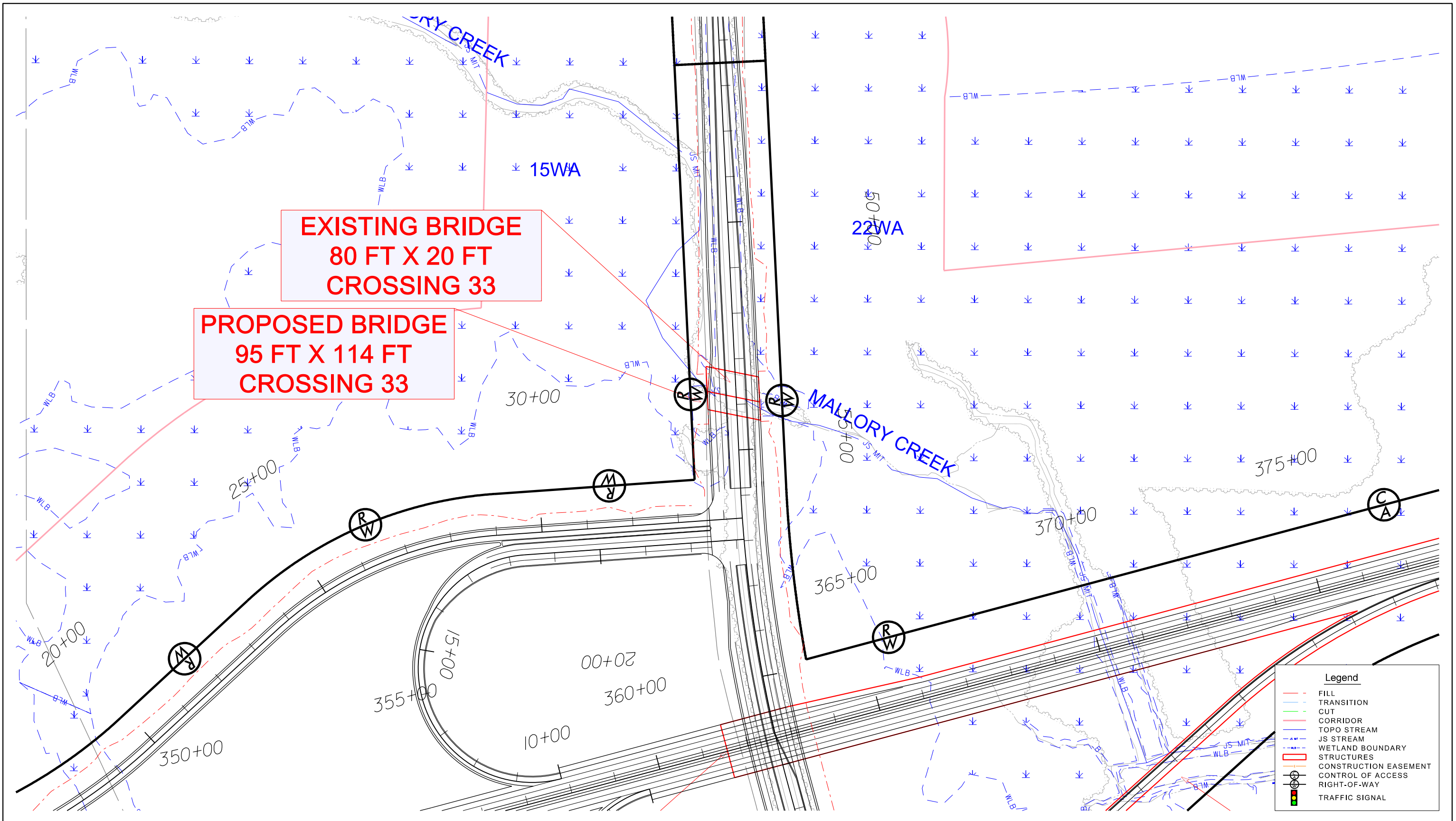


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

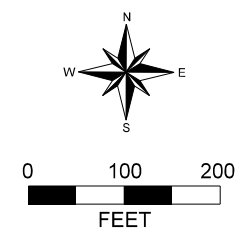
ALT-B, G, Q



North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 33

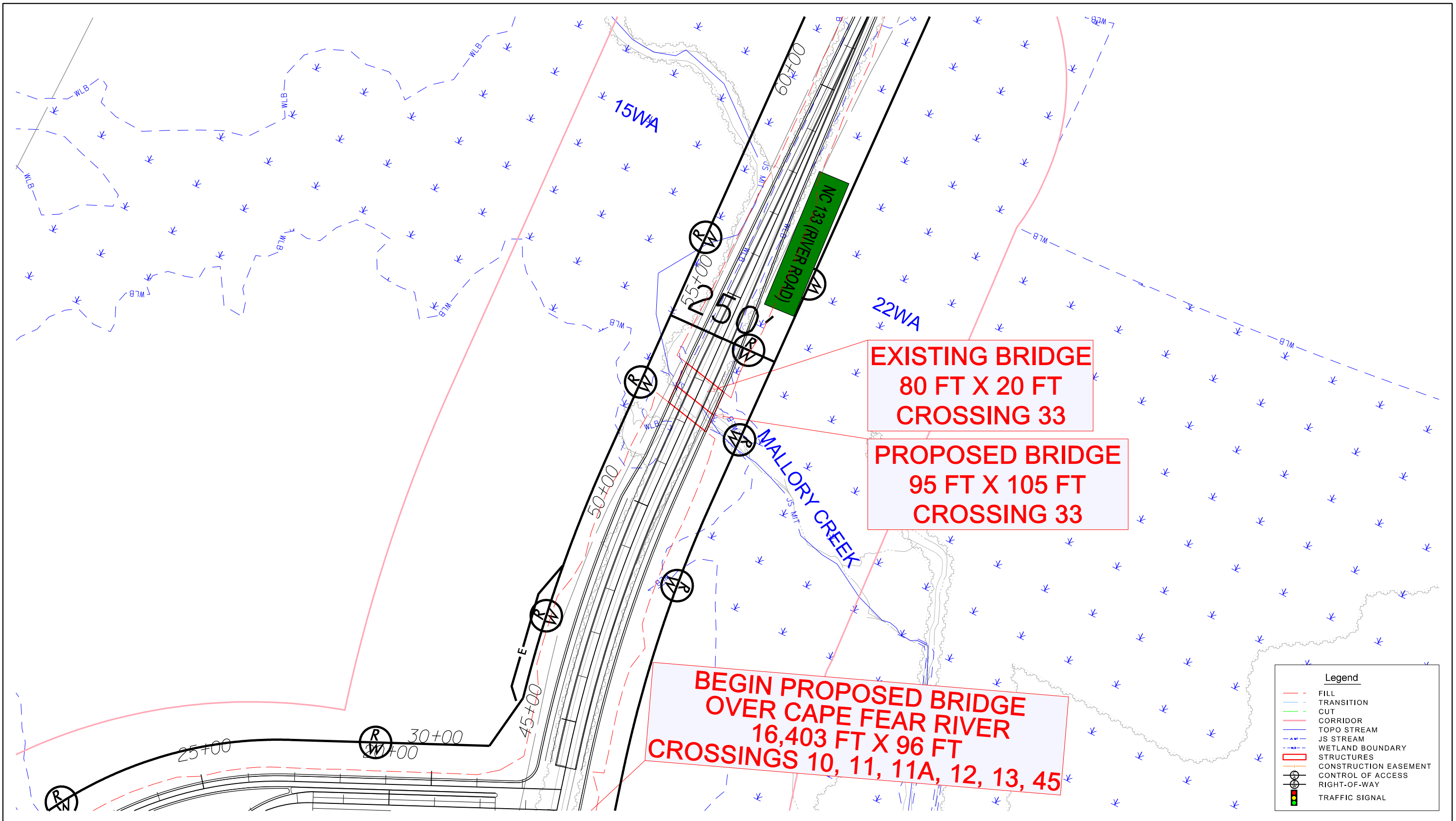


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-C, J, T

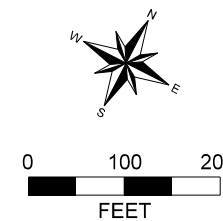


Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
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HYDRAULIC CROSSING NO. 33

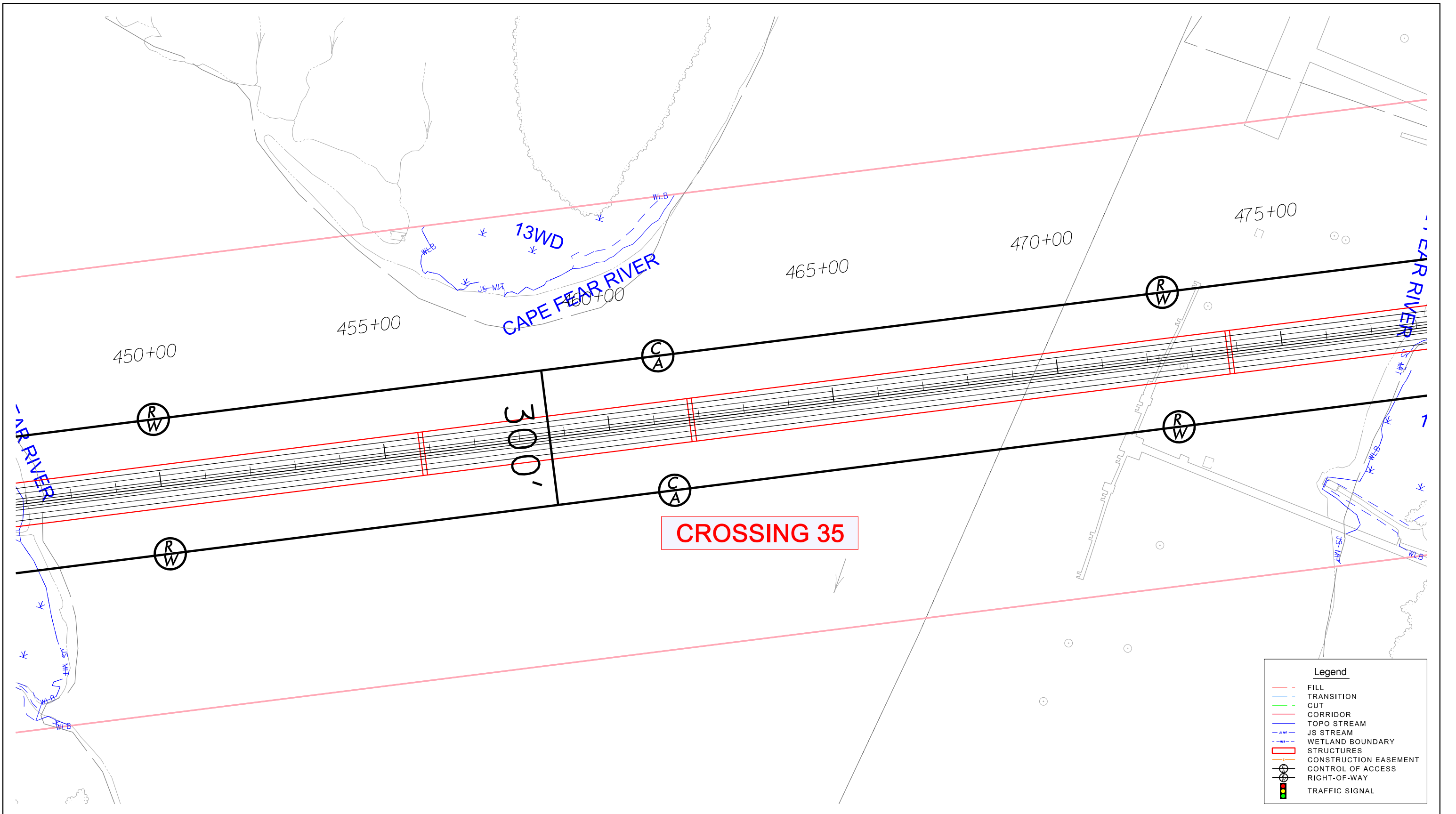


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

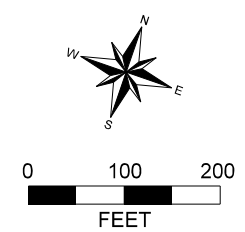
ALT-MA, NA



North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 35

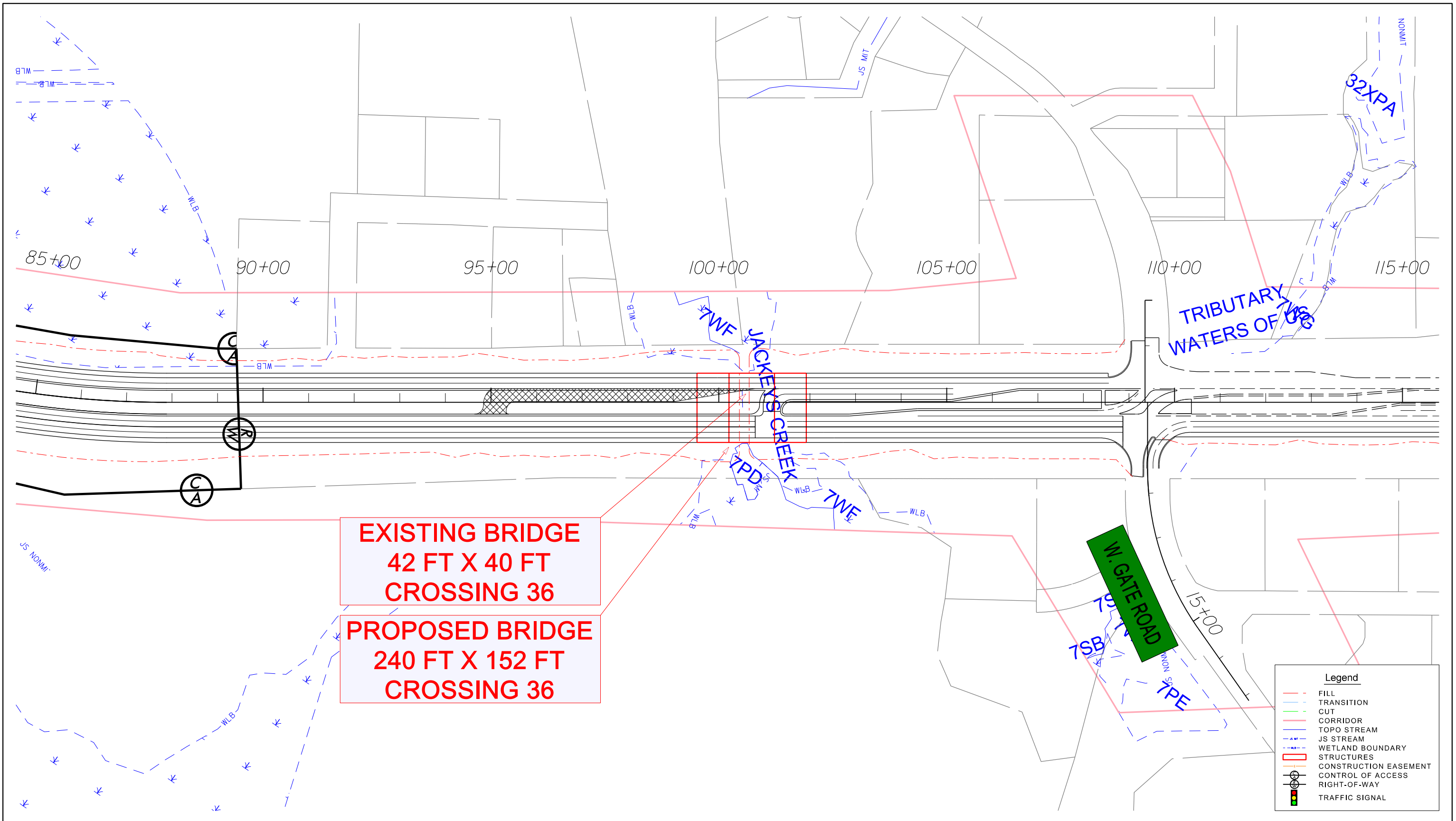


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

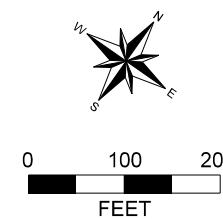
ALT-B, J, T, N



North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 36



HYDRAULIC CROSSINGS

Date: May 2017

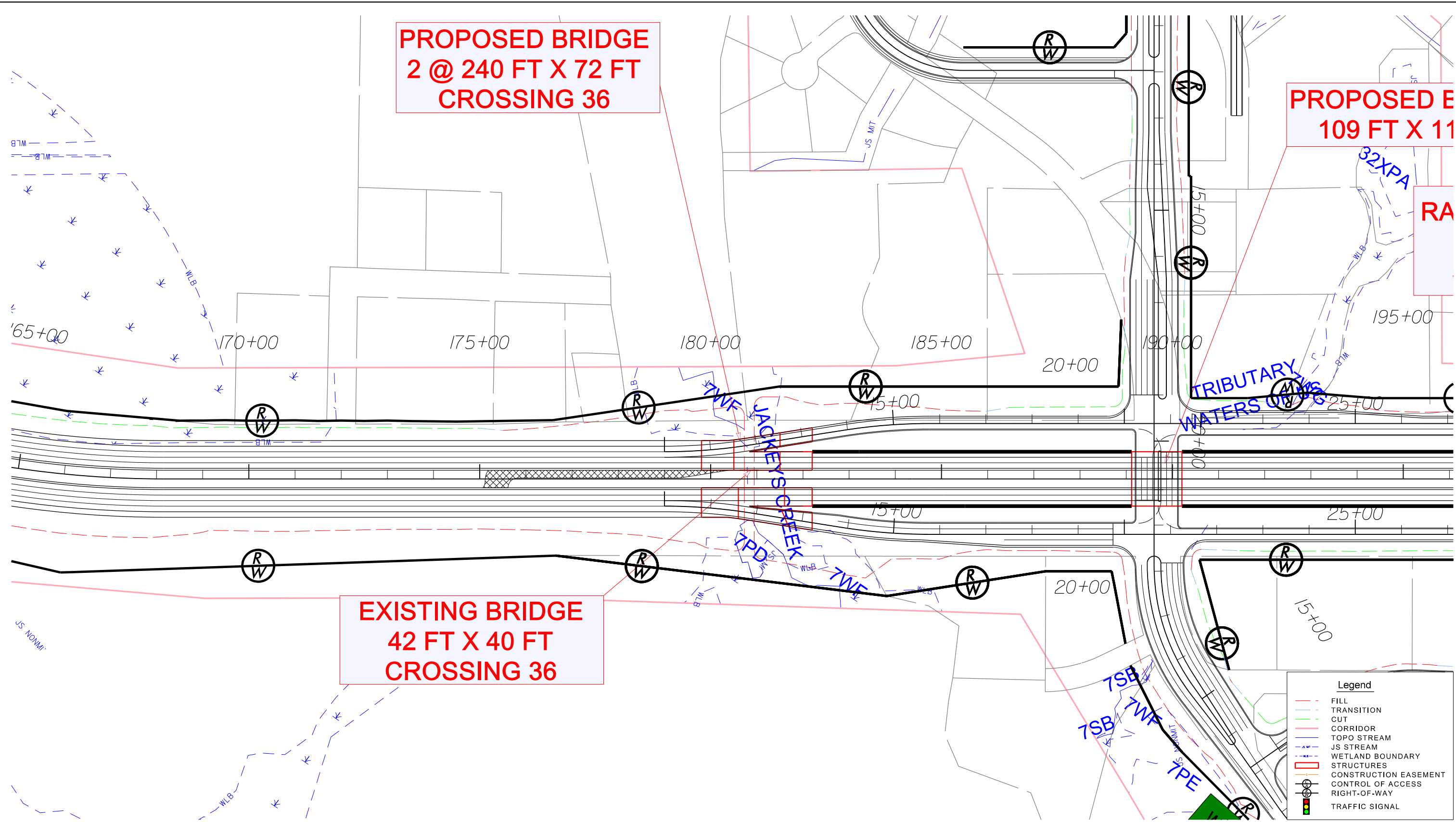
U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-B, C

**PROPOSED BRIDGE  
2 @ 240 FT X 72 FT  
CROSSING 36**

**PROPOSED E  
109 FT X 11**

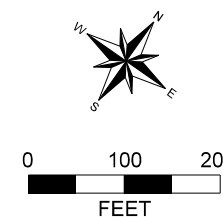
**EXISTING BRIDGE  
42 FT X 40 FT  
CROSSING 36**



North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 36

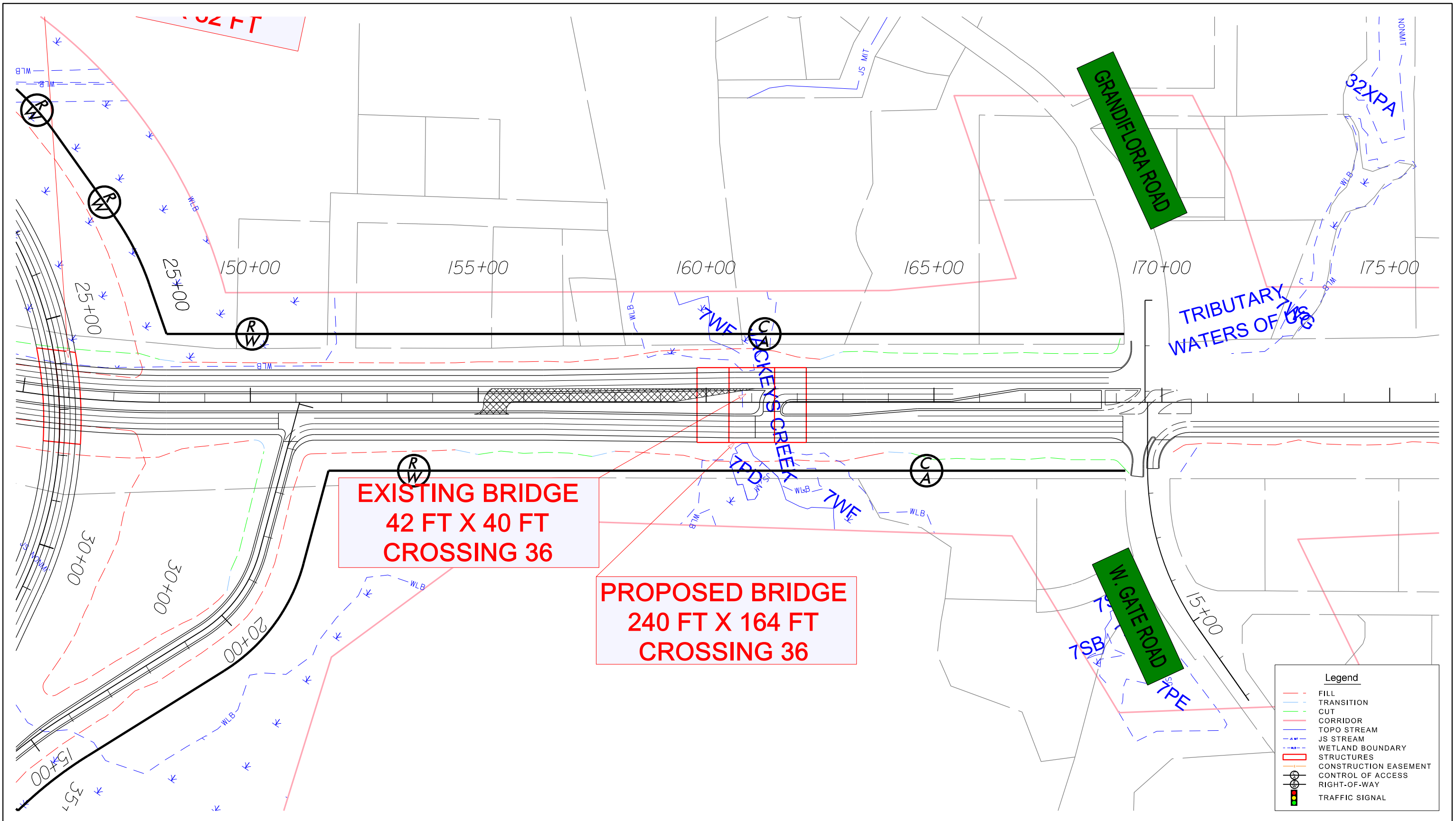


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

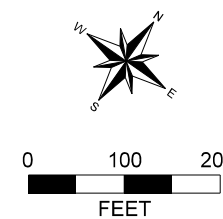
ALT-F, VF



North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 36

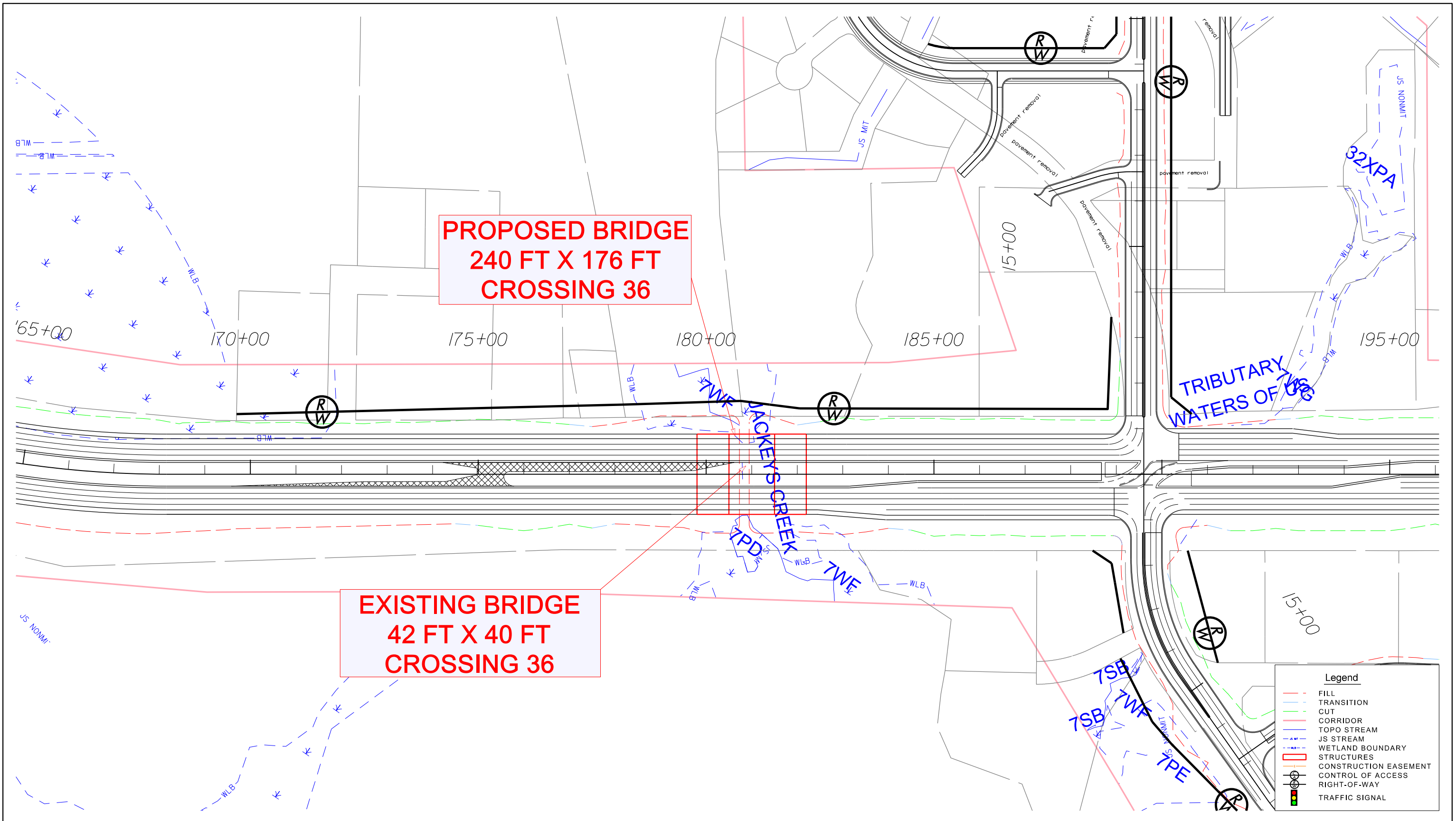


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-G, Q, J, T

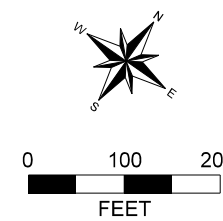


Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 36



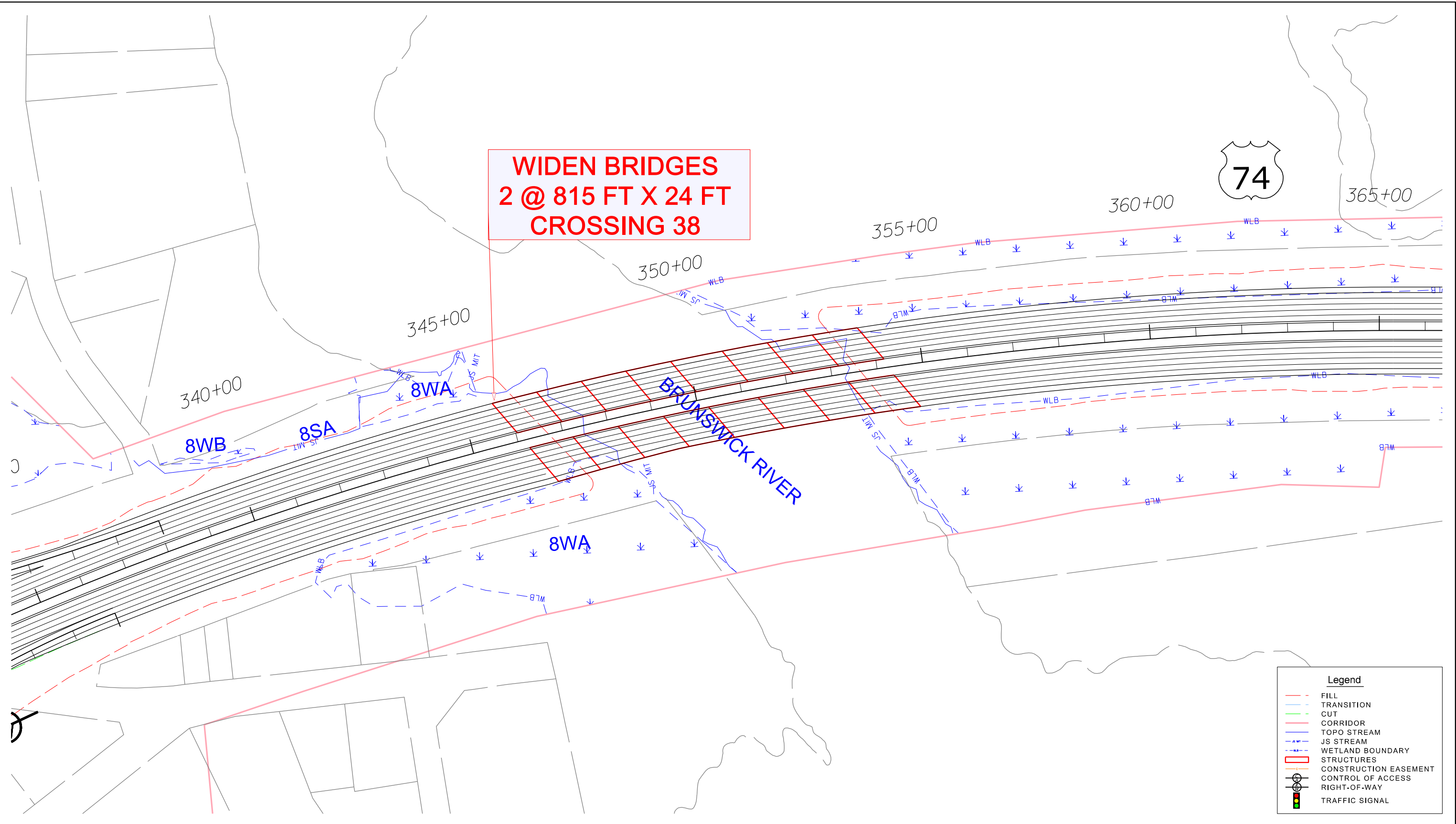
HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-P, VA

**WIDEN BRIDGES  
2 @ 815 FT X 24 FT  
CROSSING 38**

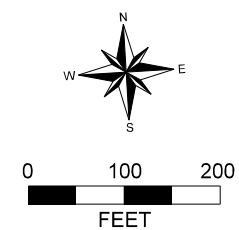


Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 38



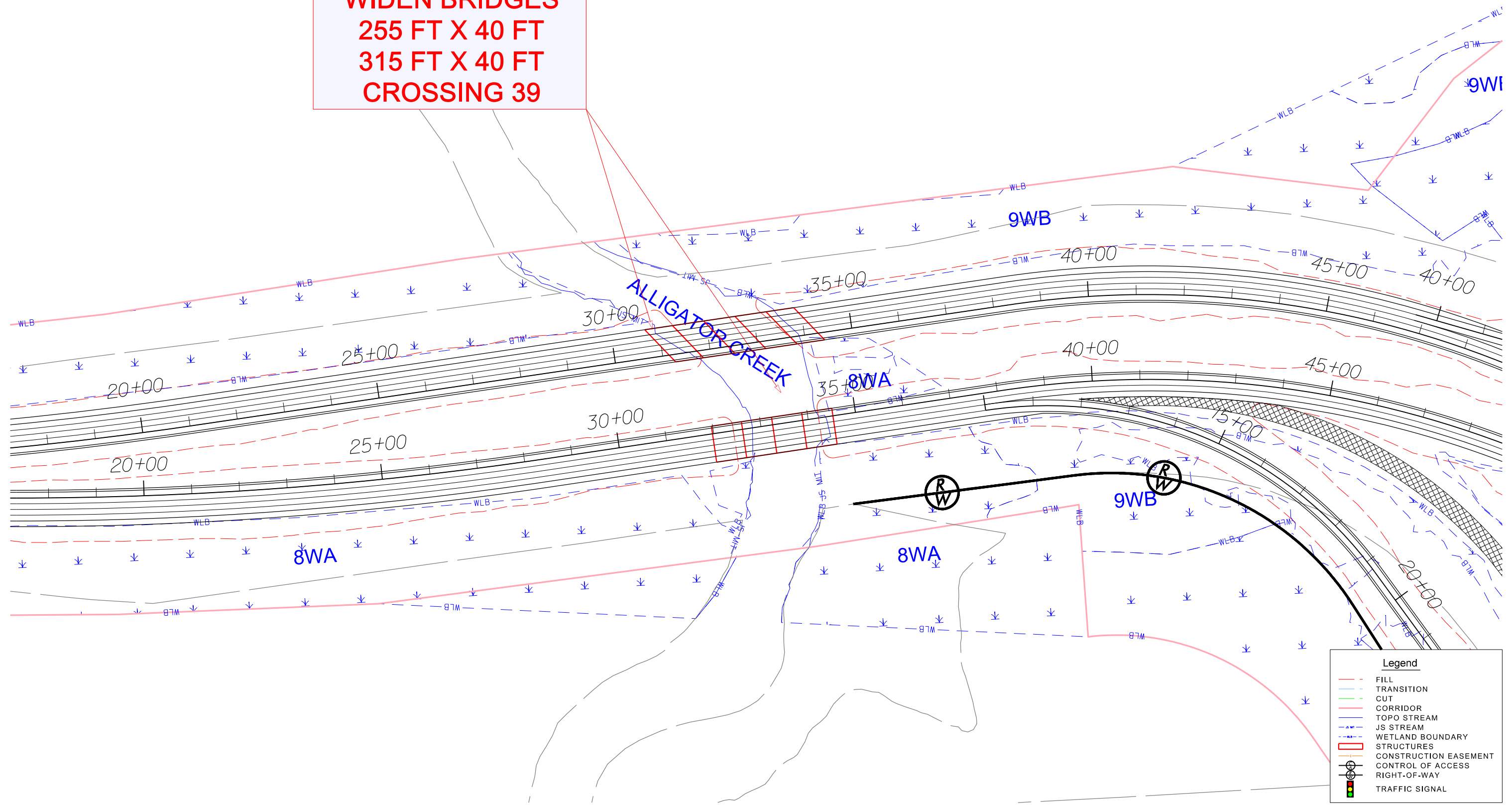
HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-F, P, VF, VA

**WIDEN BRIDGES  
255 FT X 40 FT  
315 FT X 40 FT  
CROSSING 39**

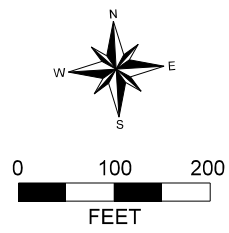


Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 39



HYDRAULIC CROSSINGS

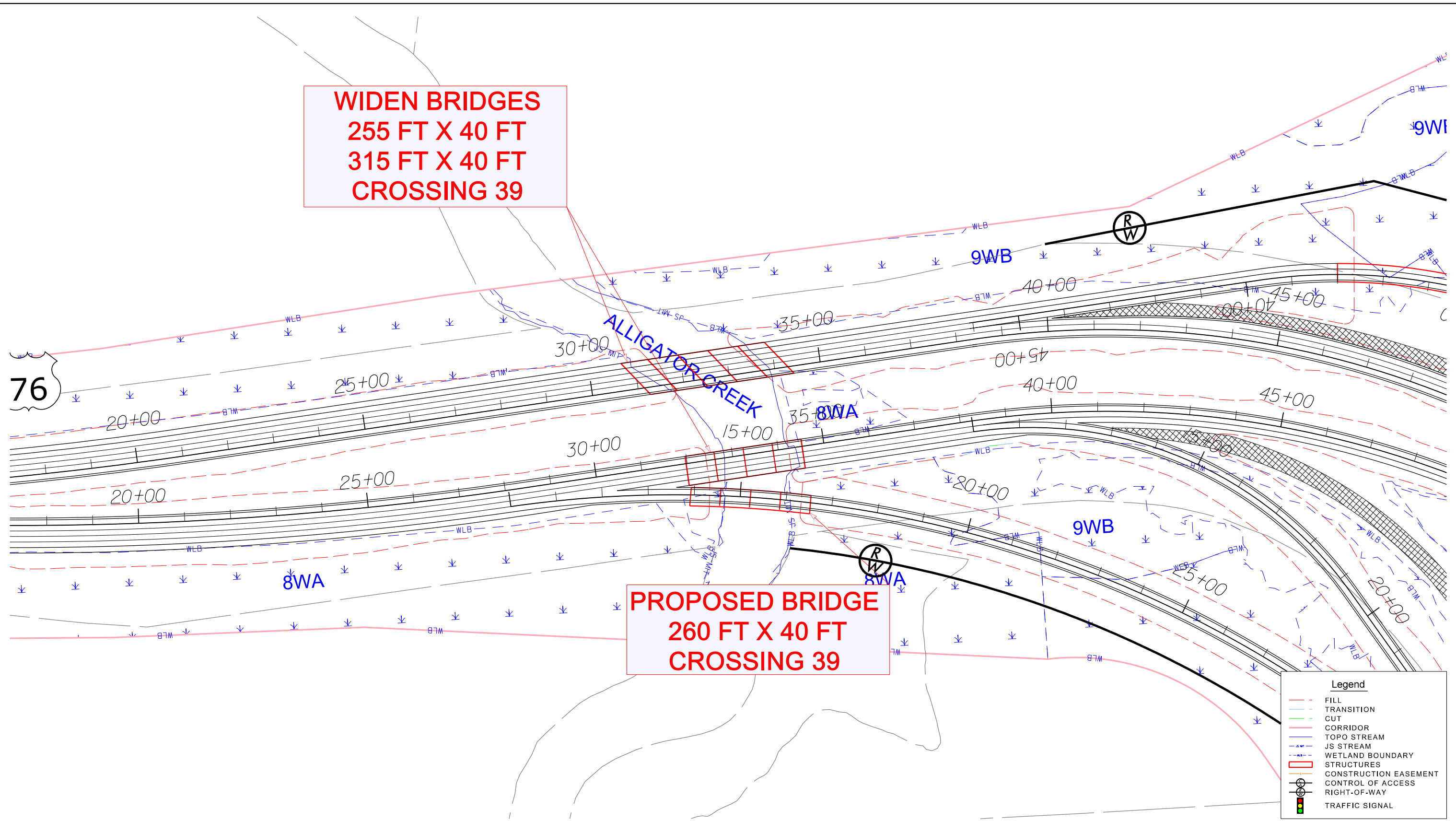
Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

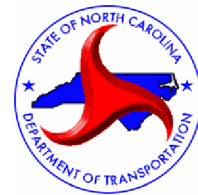
ALT-F, P

**WIDEN BRIDGES**  
**255 FT X 40 FT**  
**315 FT X 40 FT**  
**CROSSING 39**

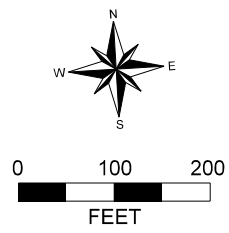
**PROPOSED BRIDGE**  
**260 FT X 40 FT**  
**CROSSING 39**



North Carolina  
 Department of Transportation

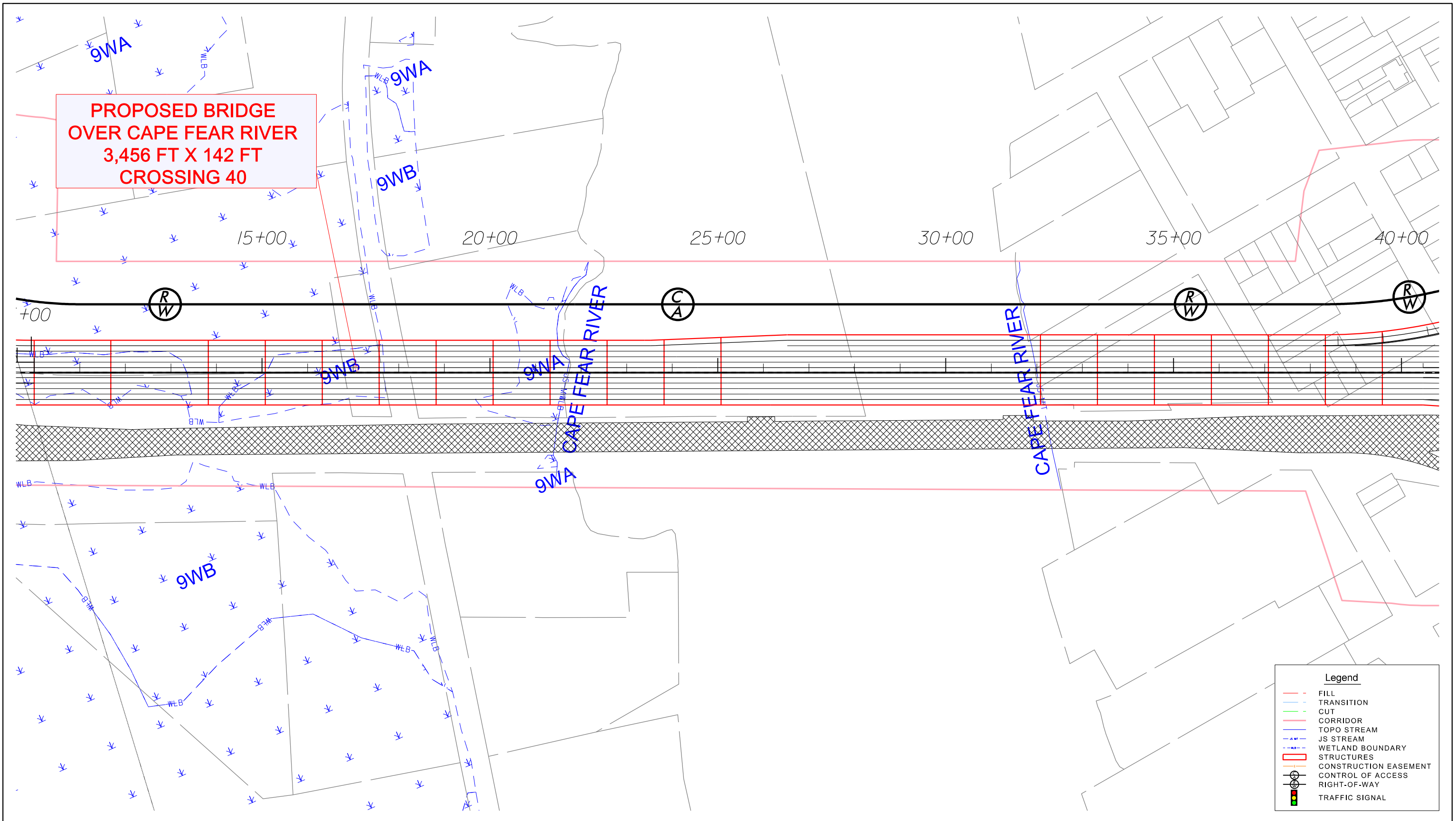


HYDRAULIC CROSSING NO. 39



HYDRAULIC CROSSINGS

Date: May 2017  
 U-4738 Cape Fear Crossing  
 Brunswick and New Hanover Counties  
 ALT-VF, VA

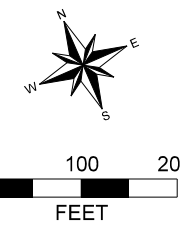


Legend	
	FILL
	TRANSITION
	CUT
	CORRIDOR
	TOPO STREAM
	JS STREAM
	WETLAND BOUNDARY
	STRUCTURES
	CONSTRUCTION EASEMENT
	CONTROL OF ACCESS
	RIGHT-OF-WAY
	TRAFFIC SIGNAL

North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 40

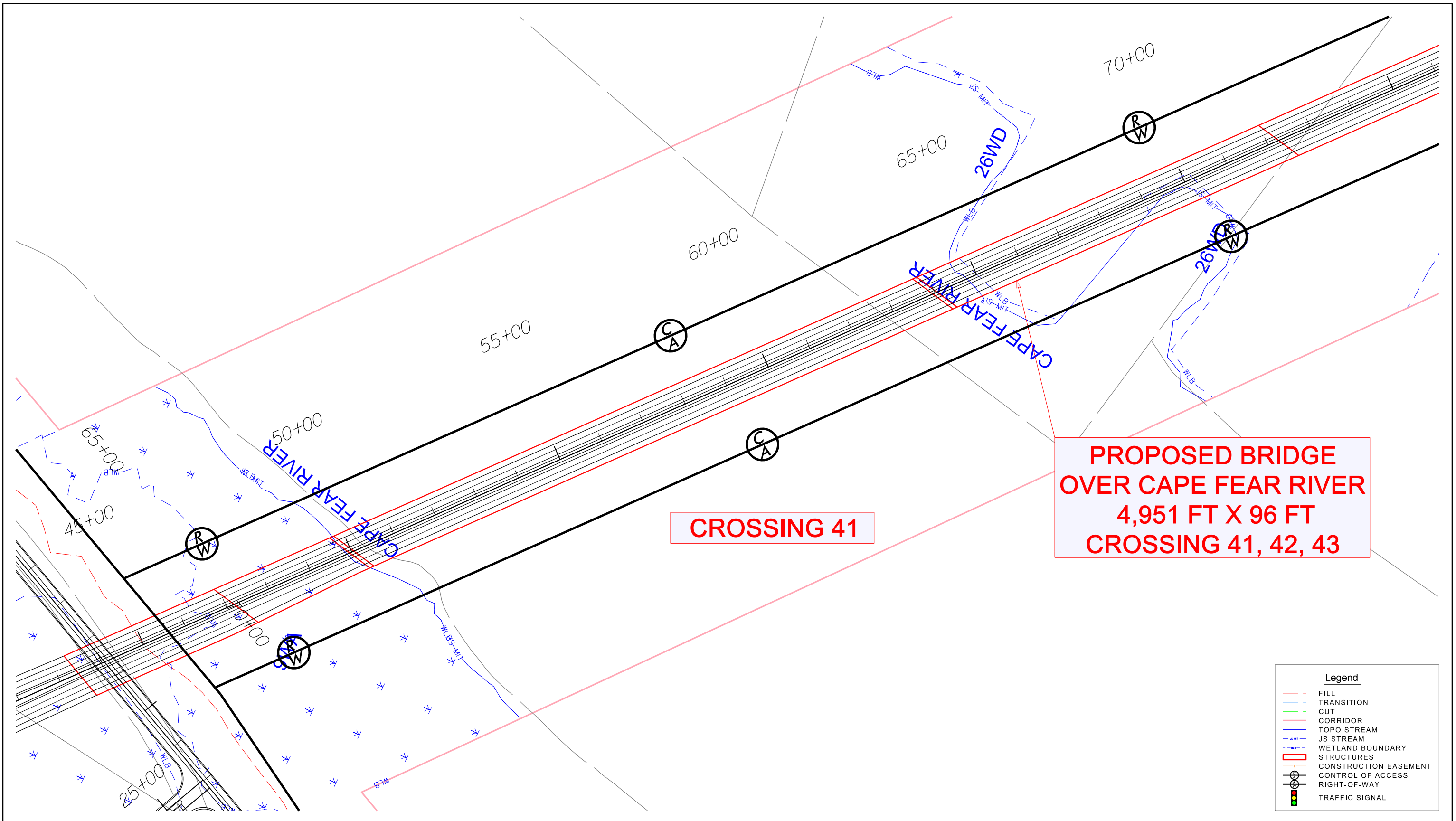


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

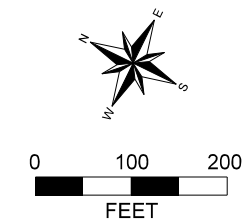
ALT-F, P



North Carolina  
Department of Transportation



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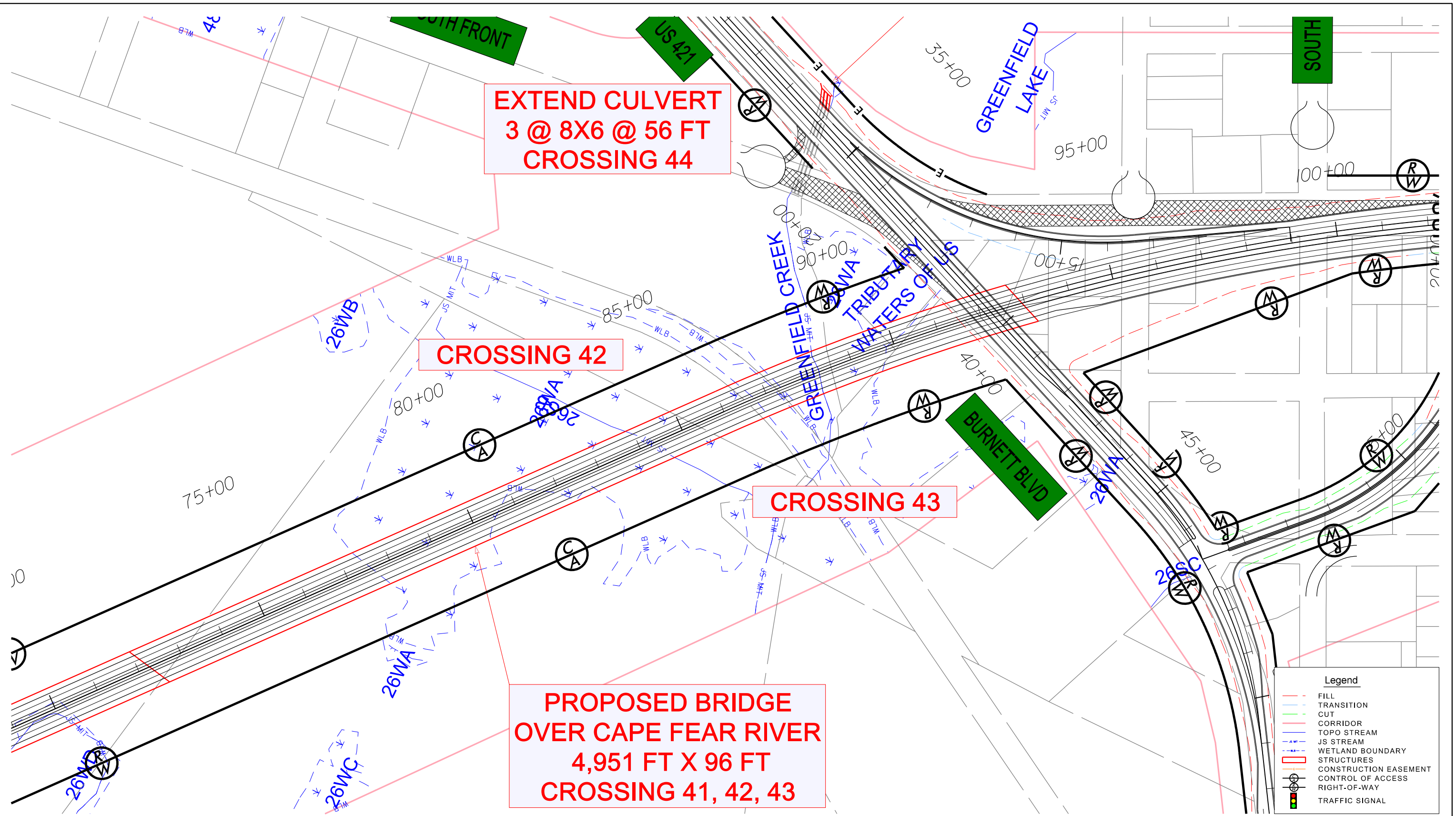


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

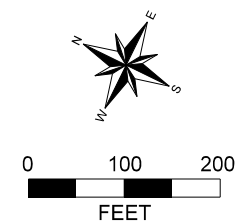
ALT-VF, VA



North Carolina  
Department of Transportation



HYDRAULIC CROSSING NO. 42, 43, & 44

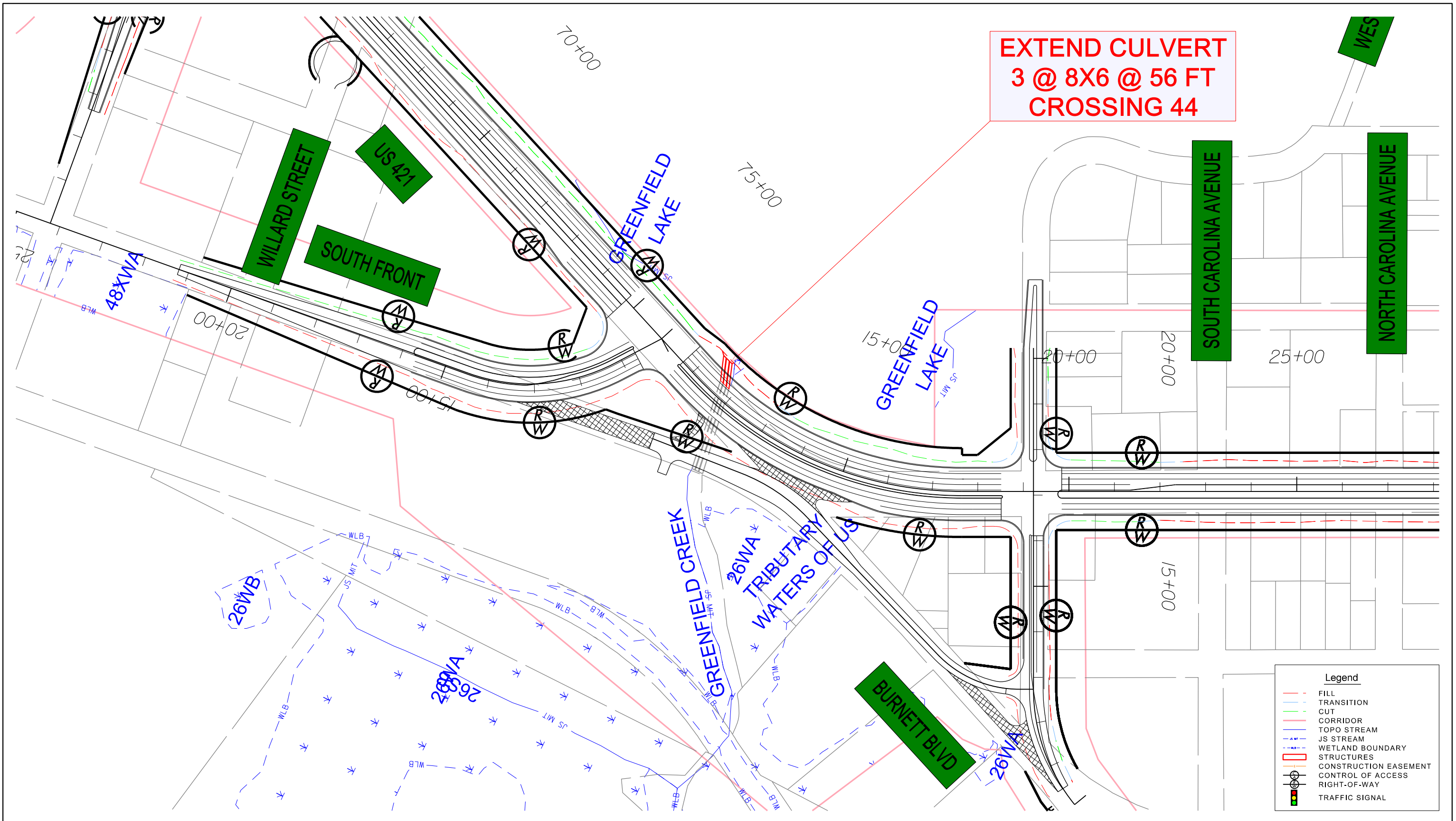


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

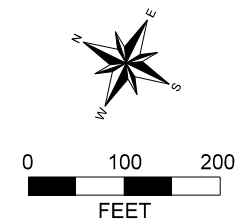
ALT-VF, VA



North Carolina  
Department of Transportation



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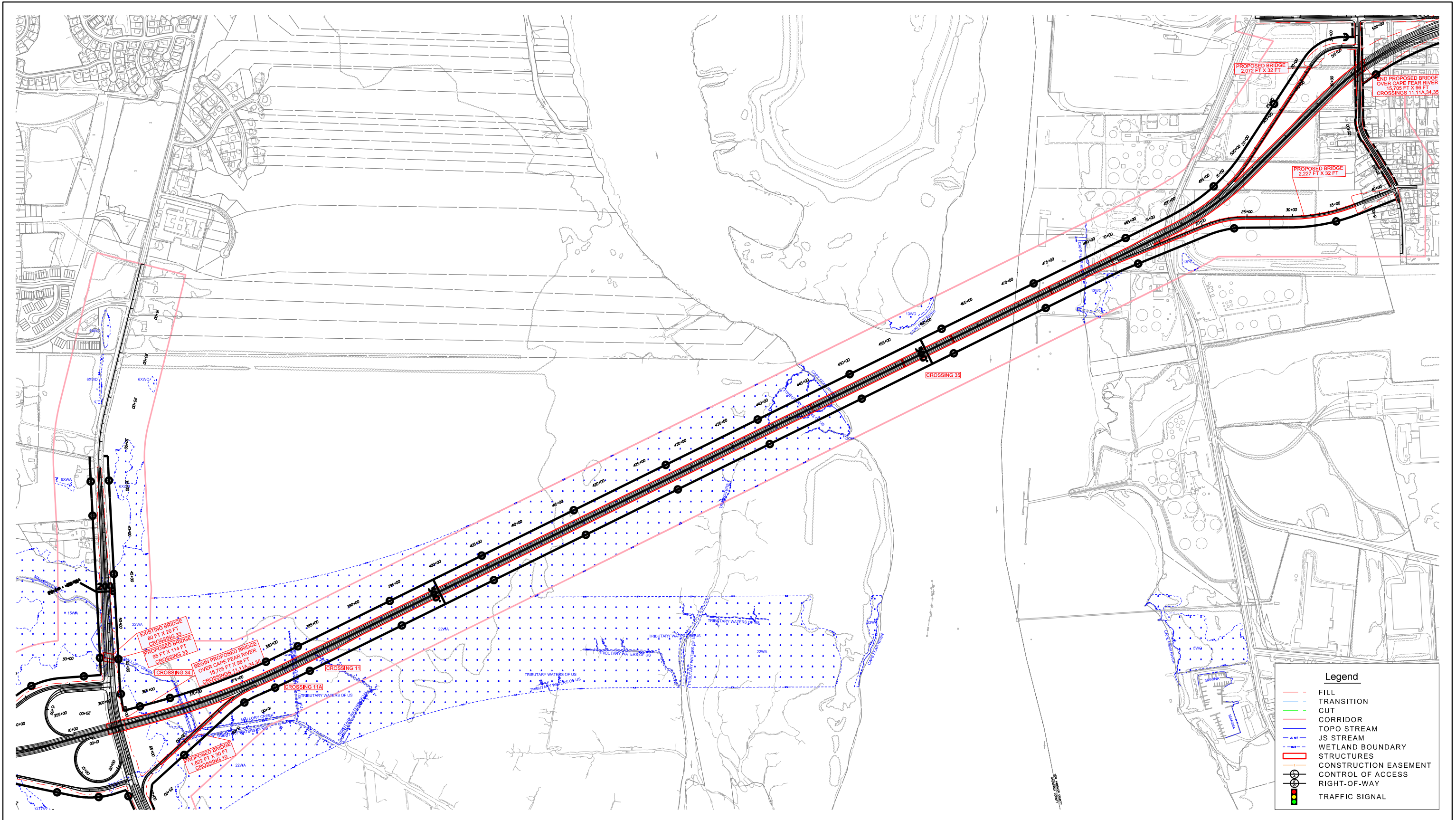


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

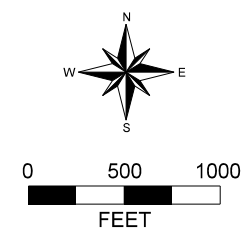
ALT-F, P



North Carolina  
Department of Transportation



ALTERNATIVE B BRIDGE  
CROSSINGS 10, 11, 11A, 34, 35

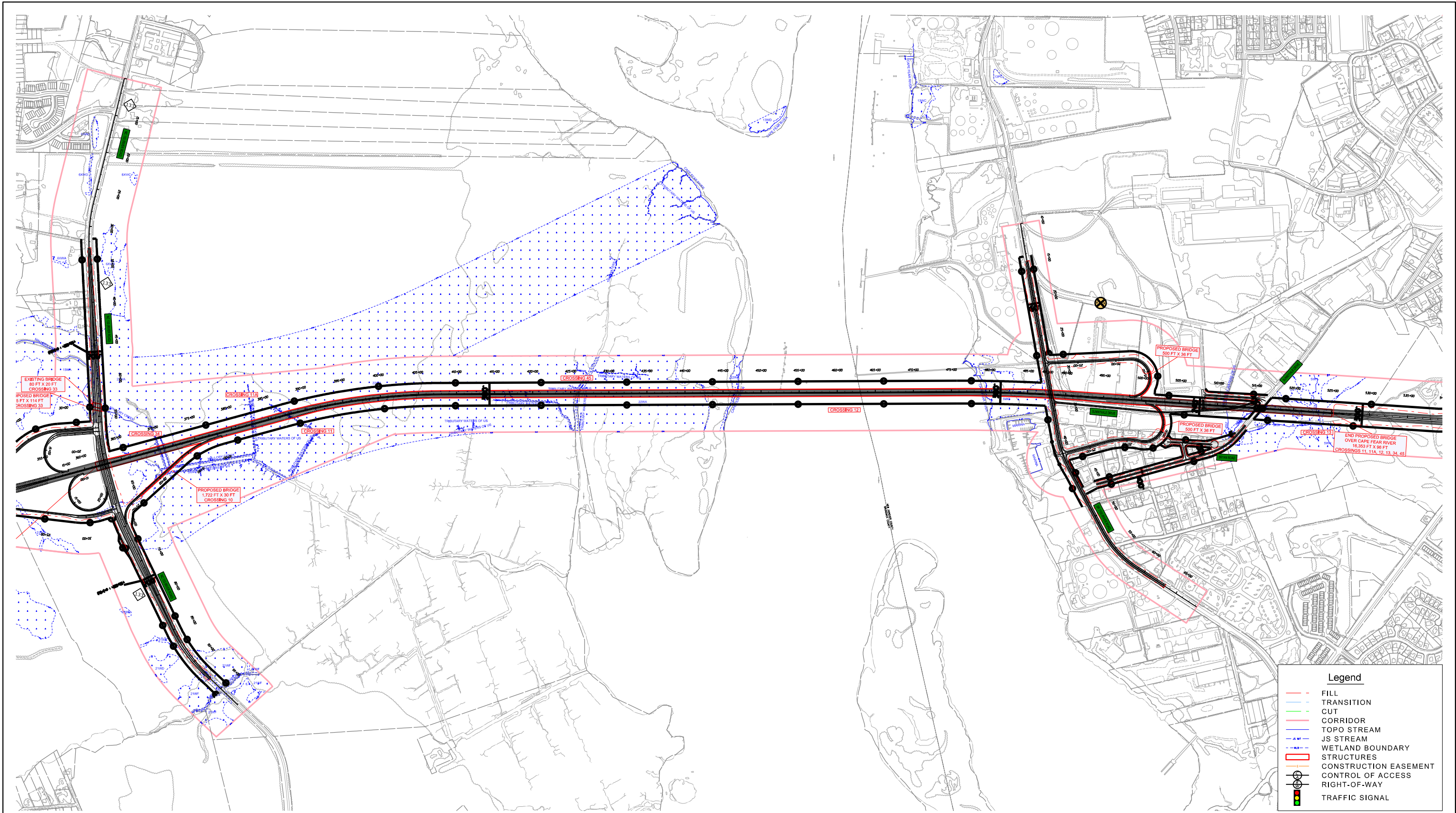


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

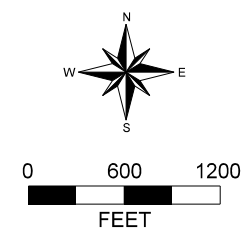
ALT-B



North Carolina  
Department of Transportation



ALTERNATIVE C BRIDGE  
CROSSINGS 10, 11, 11A, 12, 13, 34, 45

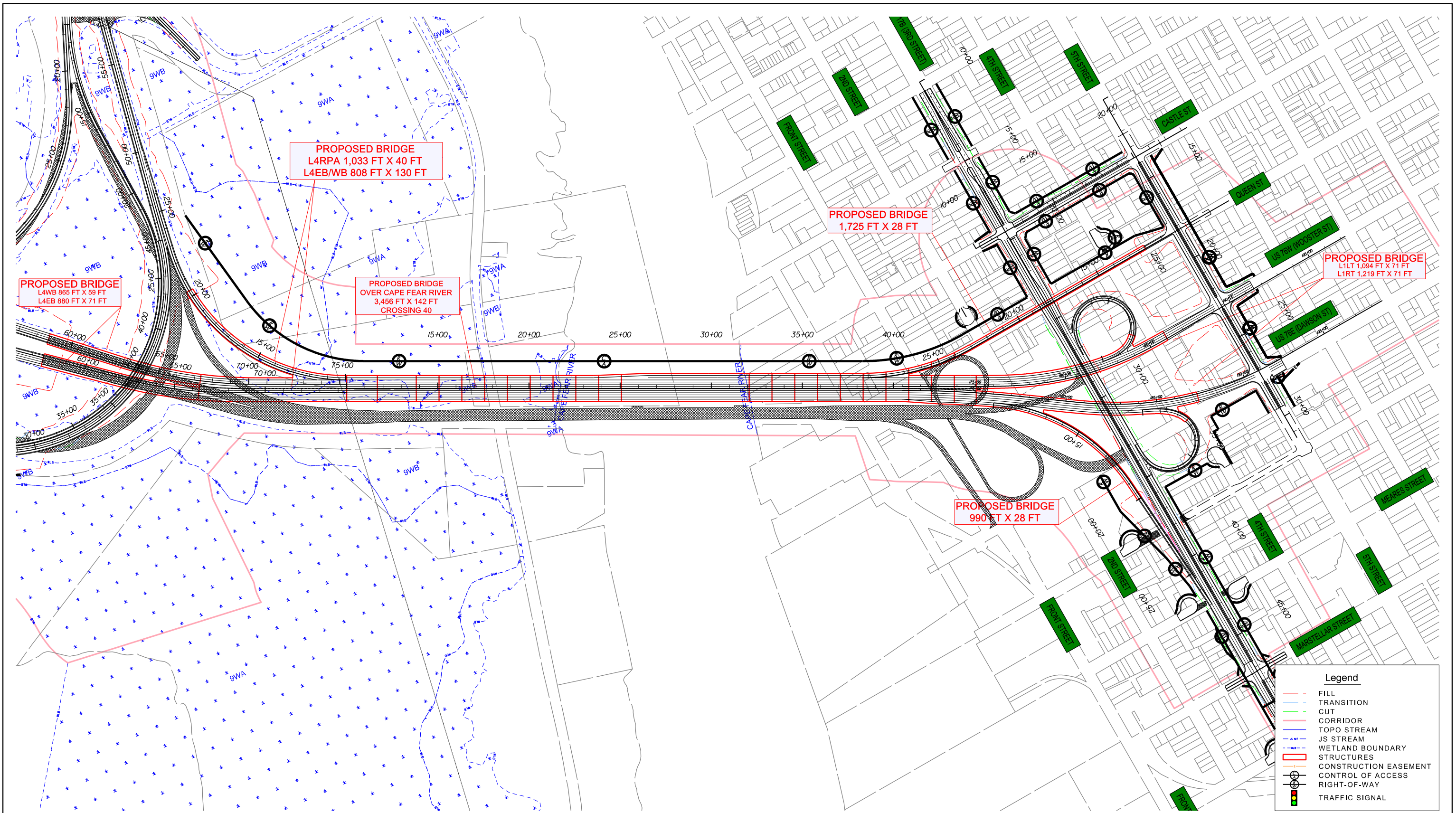


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

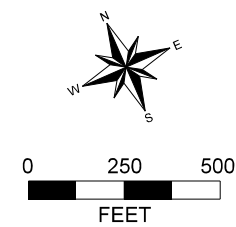
ALT-C



North Carolina  
Department of Transportation



ALTERNATIVE F AND P BRIDGE  
CROSSING 40

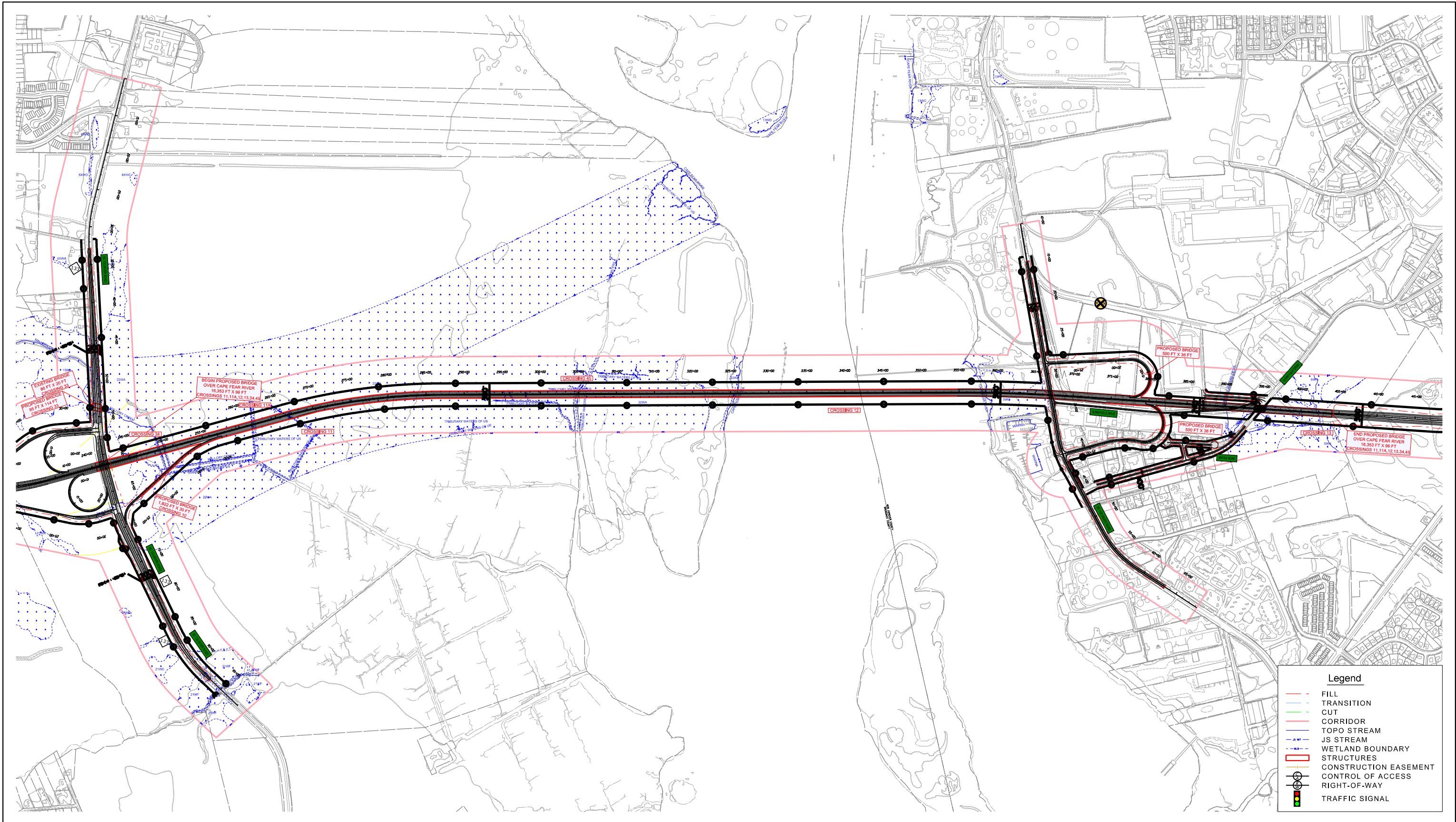


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

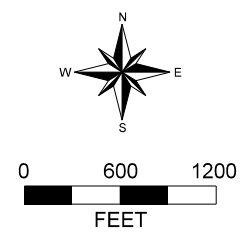
ALT-F, P



North Carolina  
Department of Transportation



ALTERNATIVE G AND Q BRIDGE  
CROSSINGS 10, 11, 11A, 12, 13, 34, 45

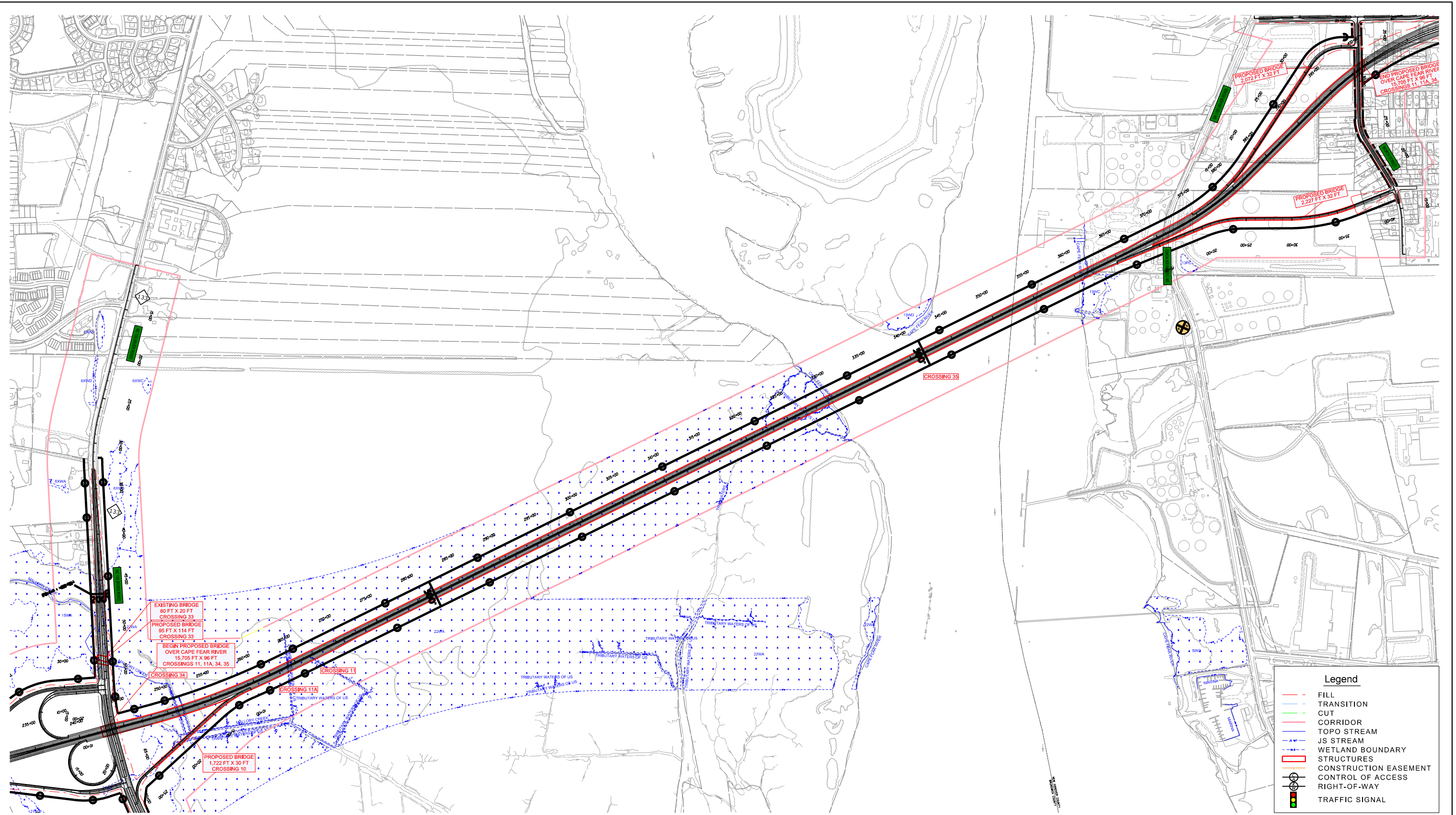


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

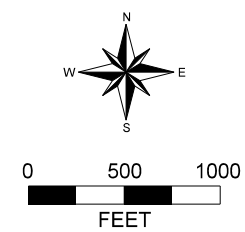
ALT-G, Q



North Carolina  
Department of Transportation



ALTERNATIVE J AND T BRIDGE  
CROSSINGS 10, 11, 11A, 34, 35

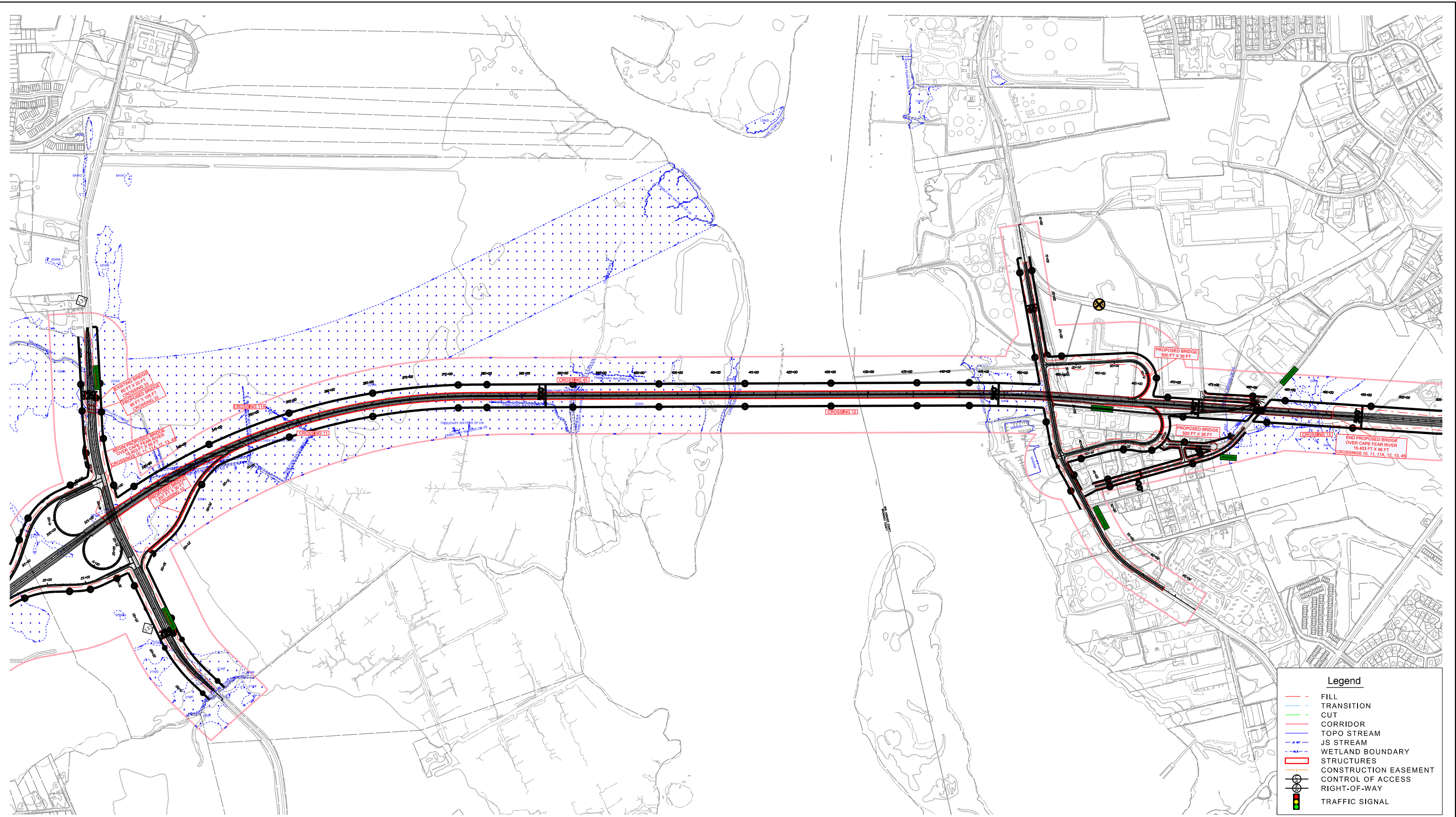


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

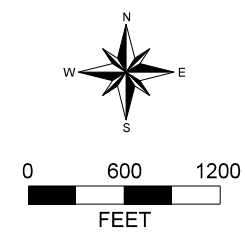
ALT-J, T



North Carolina  
Department of Transportation



ALTERNATIVE MA BRIDGE  
CROSSINGS 10, 11, 11A, 12, 13, 45

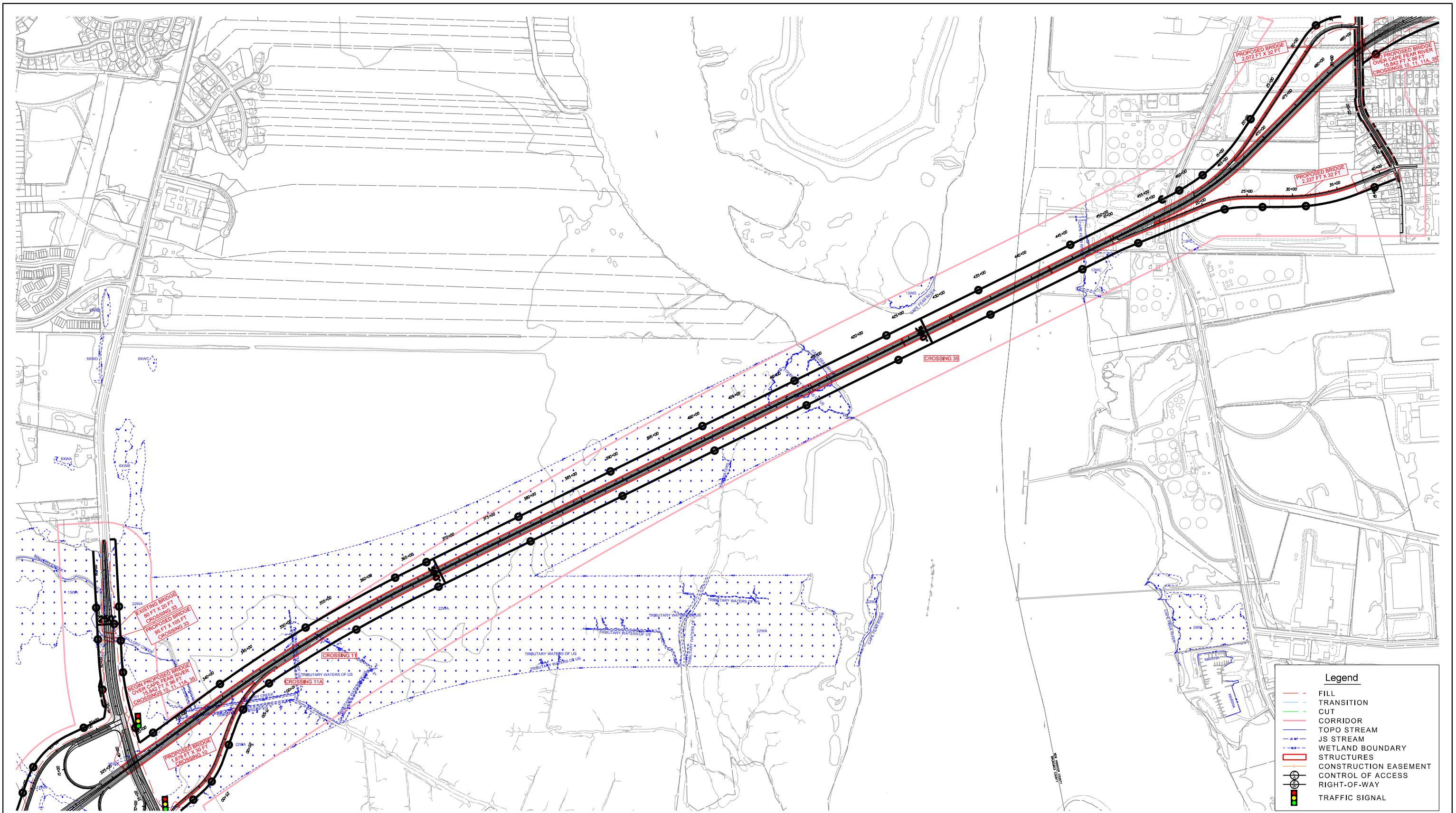


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

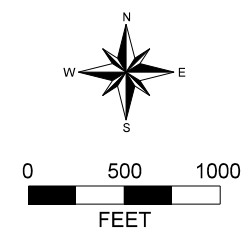
ALT-MA



North Carolina  
Department of Transportation



ALTERNATIVE NA BRIDGE  
CROSSINGS 10, 11, 11A, 35

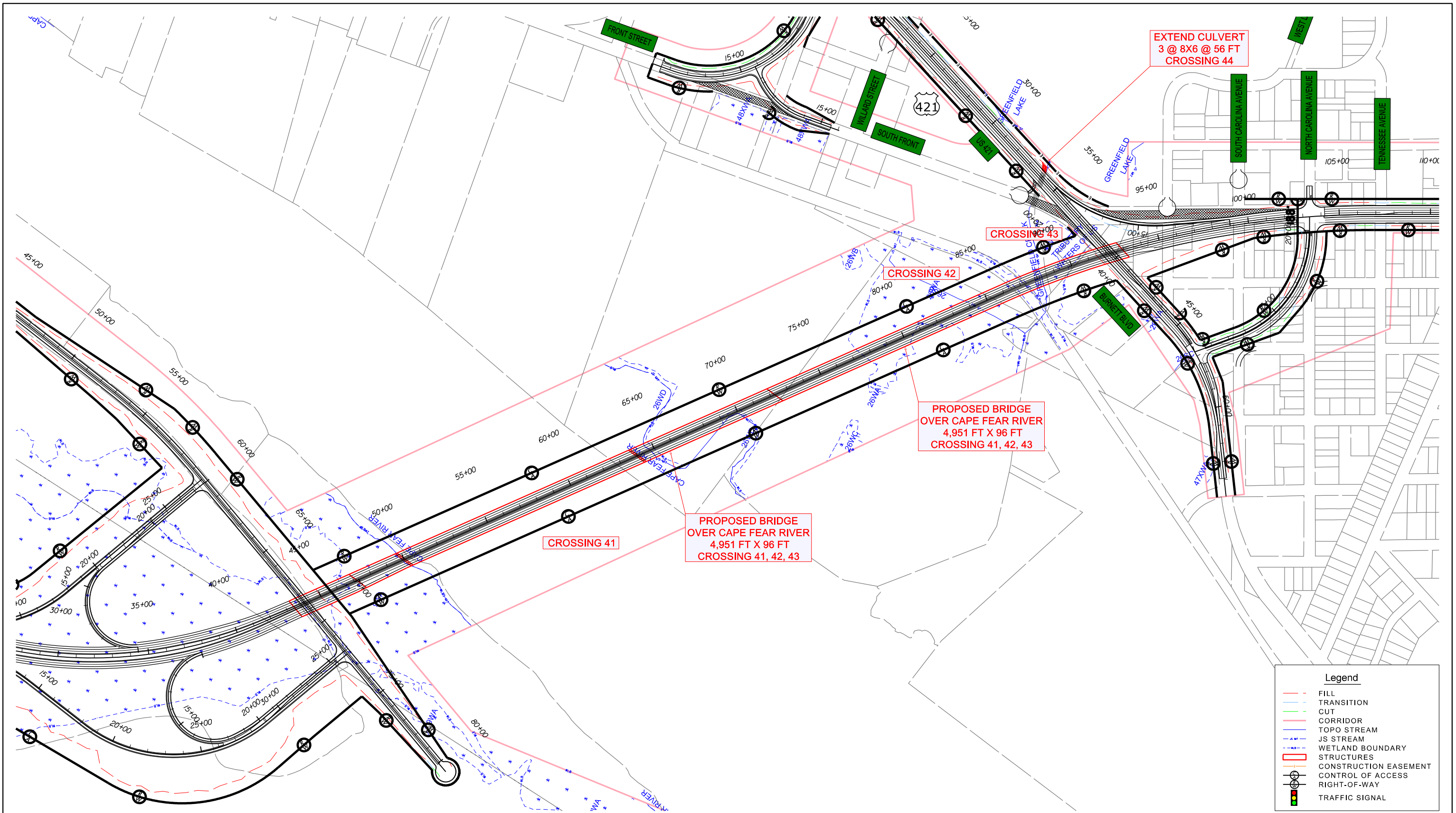


HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

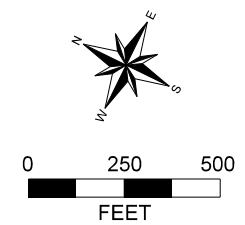
ALT-NA



North Carolina  
Department of Transportation



ALTERNATIVE VF AND VA BRIDGE  
CROSSINGS 41, 42, 43



HYDRAULIC CROSSINGS

Date: May 2017

U-4738 Cape Fear Crossing  
Brunswick and New Hanover Counties

ALT-VF, VA

## **Appendix B**

Project Alternative Maps

# CAPE FEAR CROSSING

State Transportation Improvement Program  
Project No. U-4738

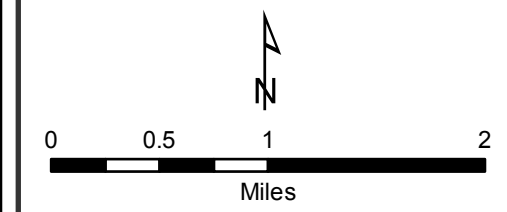
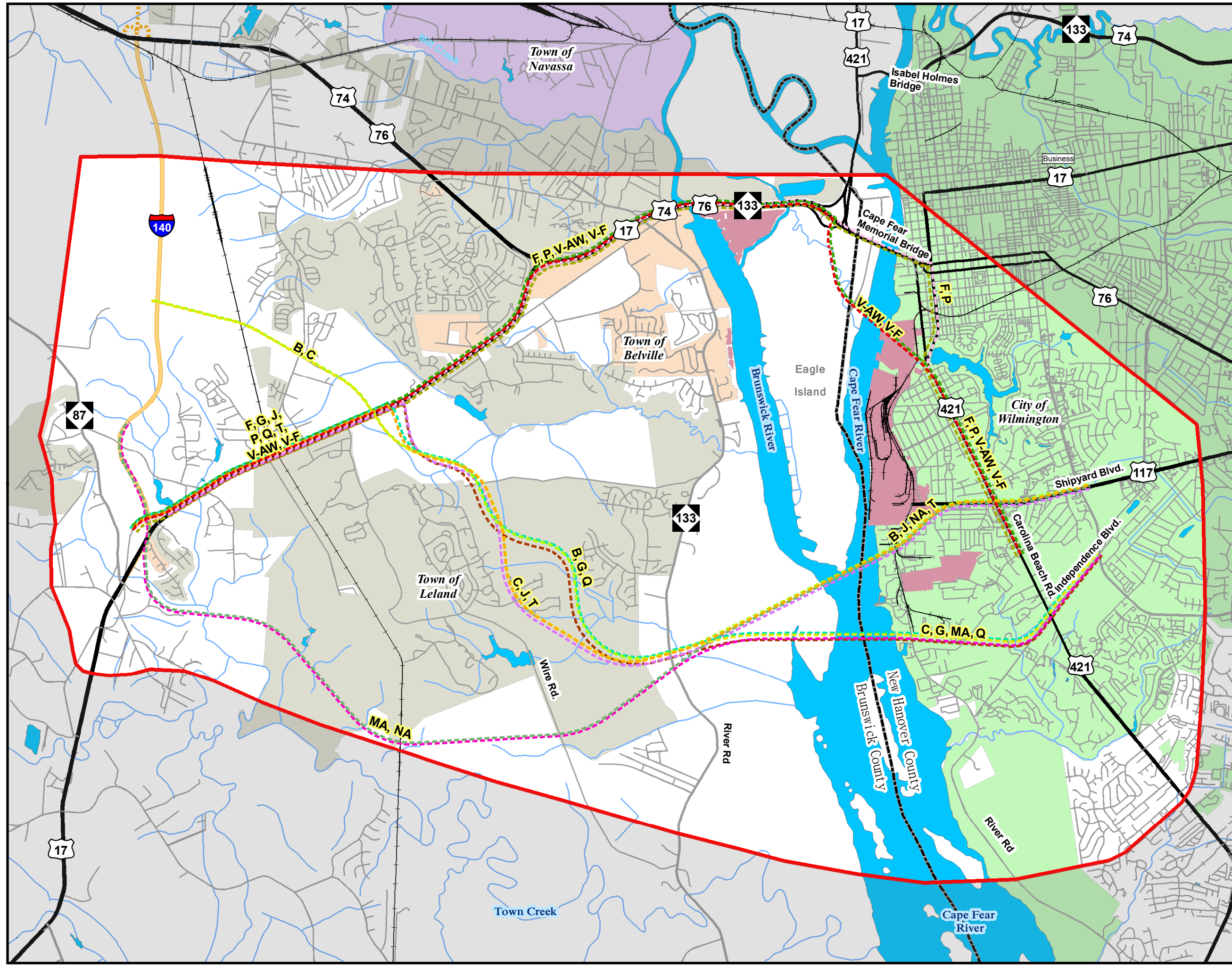
Concurrence Point 2A



Figure 1: Project Study Area

**Legend**

Project Study Area	Alternative B
Interstate	Alternative C
US Highway	Alternative F
NC Highway	Alternative G
Local Road	Alternative J
Railroad	Alternative MA
Future Wilmington Bypass (I-140)	Alternative NA
Water	Alternative P
Belville	Alternative Q
Leland	Alternative T
Navassa	Alternative V-AW
Wilmington	Alternative V-F
County Boundary	
Port of Wilmington	



Date: May 2017  
This map is for reference only.  
Sources: ESRI, CGIA, NCDOT, and AECOM.

# CAPE FEAR CROSSING

State Transportation Improvement Program  
Project No. U-4738

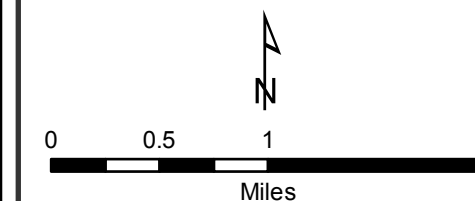
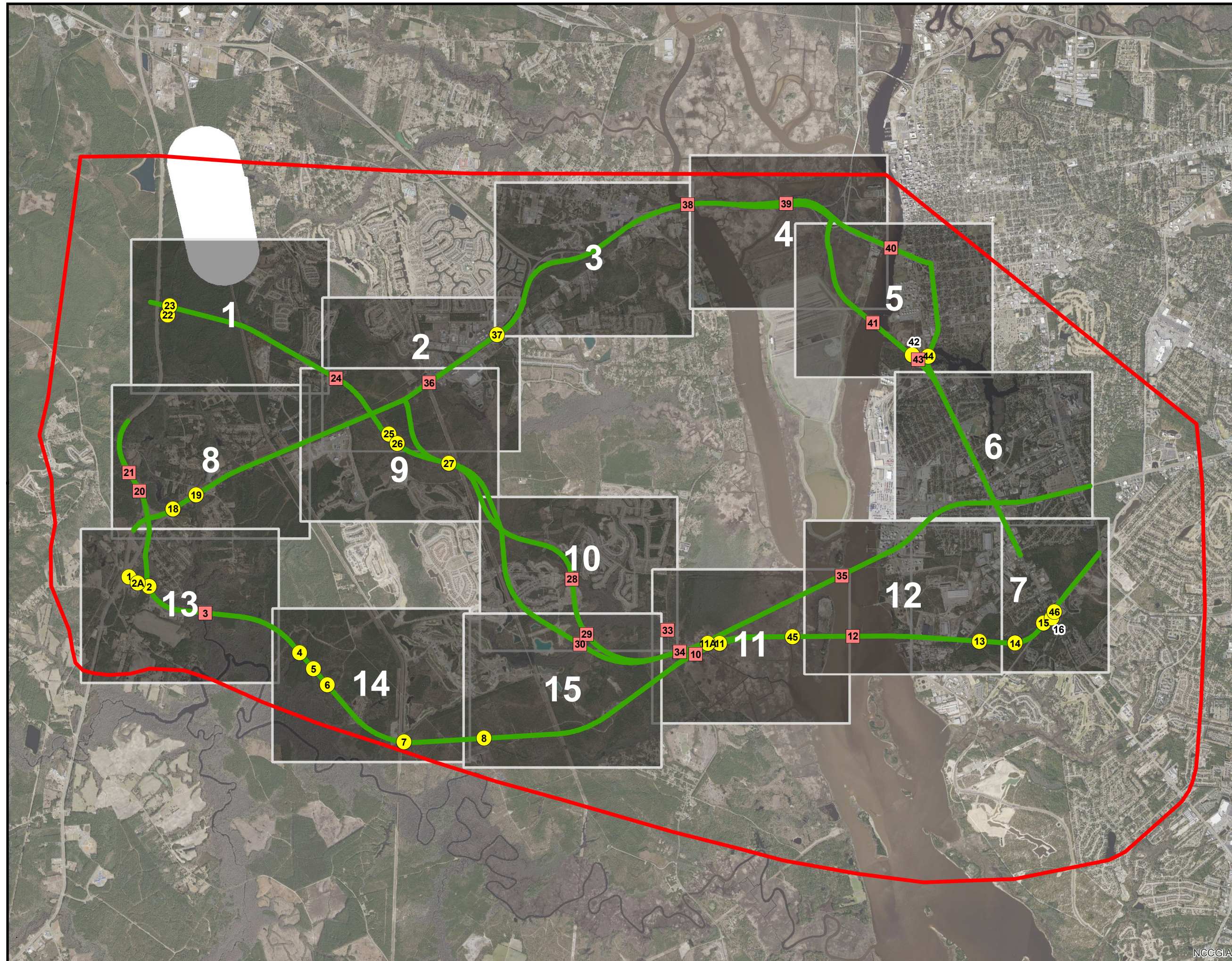
Concurrence Point 2A



**Figure 2: Environmental Constraints Index Map**  
Freeway Alternatives  
(Alternatives B, C, F, G, J, MA, NA, and V-F)

### Legend

- Project Study Area
- Functional Centerlines
- Bridge Crossing
- Culvert Crossing



Date: May 2017  
This map is for reference only.  
Sources: ESRI, CGIA, NCDOT, and AECOM.

NCCGIA

# CAPE FEAR CROSSING

State Transportation Improvement Program

Project No. U-4738

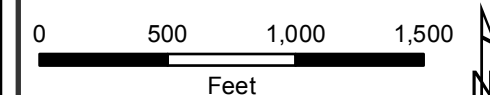
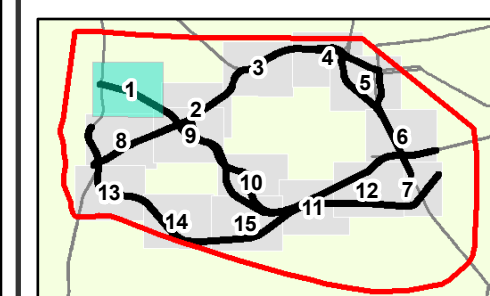
Concurrence Point 2A



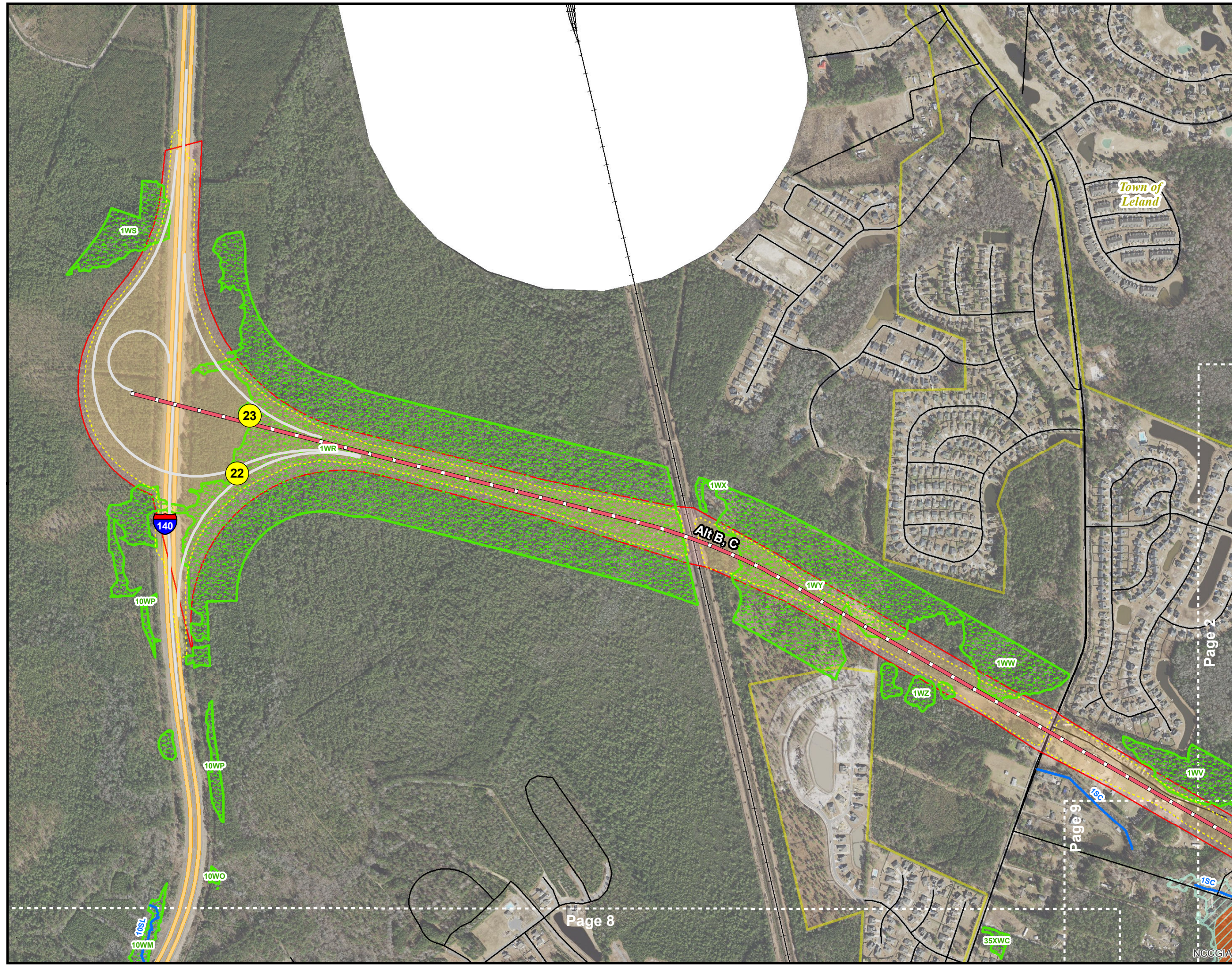
**Figure 2: Environmental Constraints**  
 Freeway Alternatives  
 (Alternatives B, C, F, G, J, MA, NA, and V-F)  
 Page 1 of 15

## Legend

- |                               |                              |
|-------------------------------|------------------------------|
| Project Study Area            | Day Care Facility            |
| ROW Limits                    | Nursing Homes                |
| SS Limits                     | Cemetery                     |
| Proposed Centerlines          | Church                       |
| Bridge Crossing               | School                       |
| Culvert Crossing              | College/University           |
| Interstate                    | Beach Access Site            |
| US Highway                    | Boat Access                  |
| NC Highway                    | Golf Course                  |
| Local Road                    | Airport                      |
| Railroad                      | Fire Station                 |
| Delineated Wetlands           | EMS                          |
| Delineated Stream Lines       | Historic Resource            |
| Delineated Ponds              | Historic Resource / District |
| 303(d) Impaired Stream        | Port of Wilmington           |
| Primary Nursery Area          | Park                         |
| Floodway                      | Municipal Boundaries         |
| 100-year Floodplain           | County Boundary              |
| <b>Functional Centerlines</b> |                              |
| B, C                          |                              |



Date: May 2017  
 This map is for reference only.  
 Sources: ESRI, CGIA, NCDOT, and AECOM.



# CAPE FEAR CROSSING

State Transportation Improvement Program  
Project No. U-4738  
Concurrence Point 2A



**Figure 2: Environmental Constraints**  
Freeway Alternatives  
(Alternatives B, C, F, G, J, MA, NA, and V-F)  
Page 2 of 15

## Legend

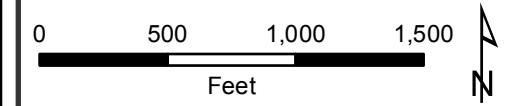
- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
| SS Limits               | Cemetery                     |
| Proposed Centerlines    | Church                       |
| Bridge Crossing         | School                       |
| Culvert Crossing        | College/University           |
| Interstate              | Beach Access Site            |
| US Highway              | Boat Access                  |
| NC Highway              | Golf Course                  |
| Local Road              | Airport                      |
| Railroad                | Fire Station                 |
| Delineated Wetlands     | EMS                          |
| Delineated Stream Lines | Historic Resource            |
| Delineated Ponds        | Historic Resource / District |
| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |

## Floodplains

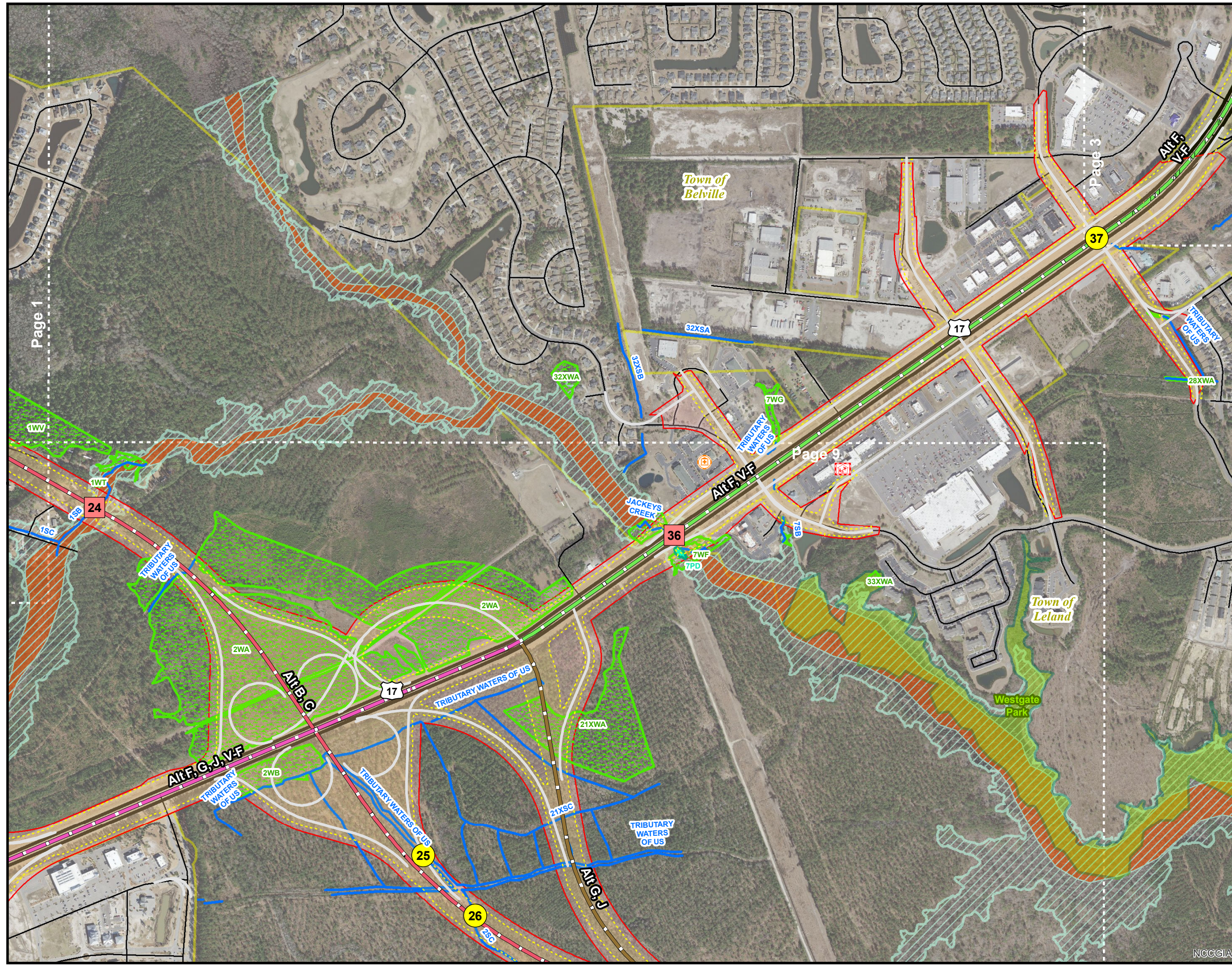
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|----------------------|--------------------|
| Floodway             | Port of Wilmington |
| 100-year Floodplain  | Park               |
| Municipal Boundaries | County Boundary    |

## Functional Centerlines

- |              |     |
|--------------|-----|
| B, C         | V-F |
| F, G, J, V-F |     |
| F, V-F       |     |
| G, J         |     |



Date: May 2017  
This map is for reference only.  
Sources: ESRI, CGIA, NCDOT, and AECOM.



NCCGIA



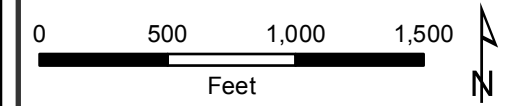
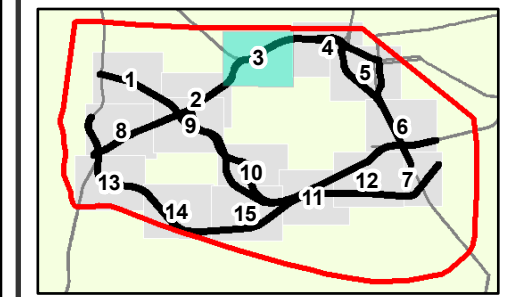
# CAPE FEAR CROSSING

State Transportation Improvement Program  
Project No. U-4738  
Concurrence Point 2A



**Figure 2: Environmental Constraints**  
Freeway Alternatives  
(Alternatives B, C, F, G, J, MA, NA, and V-F)  
Page 3 of 15

- Legend**
- |                               |                              |
|-------------------------------|------------------------------|
| Project Study Area            | Day Care Facility            |
| ROW Limits                    | Nursing Homes                |
| SS Limits                     | Cemetery                     |
| Proposed Centerlines          | Church                       |
| Bridge Crossing               | School                       |
| Culvert Crossing              | College/University           |
| Interstate                    | Beach Access Site            |
| US Highway                    | Boat Access                  |
| NC Highway                    | Golf Course                  |
| Local Road                    | Airport                      |
| Railroad                      | Fire Station                 |
| Delineated Wetlands           | EMS                          |
| Delineated Stream Lines       | Historic Resource            |
| Delineated Ponds              | Historic Resource / District |
| 303(d) Impaired Stream        | Port of Wilmington           |
| Primary Nursery Area          | Park                         |
| Floodway                      | Municipal Boundaries         |
| 100-year Floodplain           | County Boundary              |
| Functional Centerlines F, V-F |                              |
| Functional Centerlines V-F    |                              |

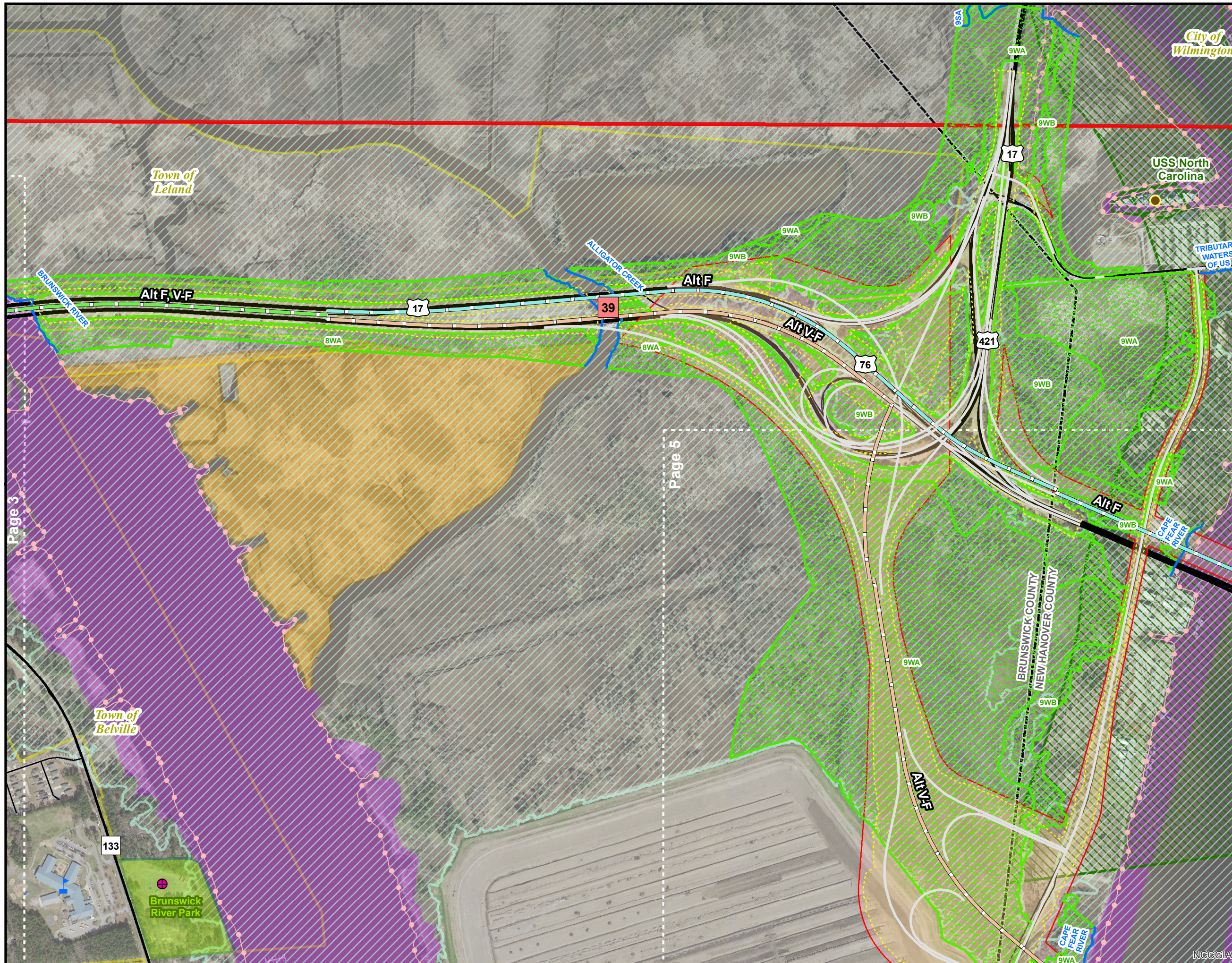


Date: May 2017  
This map is for reference only.  
Sources: ESRI, CGIA, NCDOT, and AECOM.

Page 2

Page 4

NCCGIA



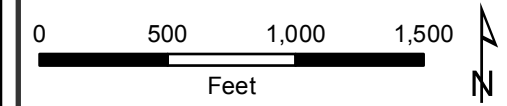
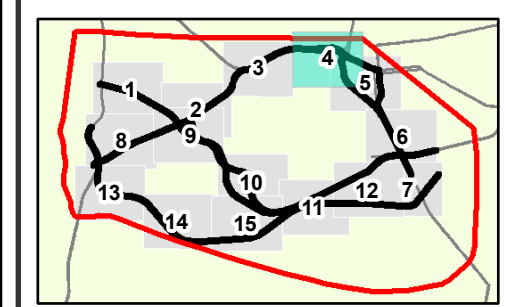
# CAPE FEAR CROSSING

State Transportation Improvement Program  
Project No. U-4738  
Concurrence Point 2A

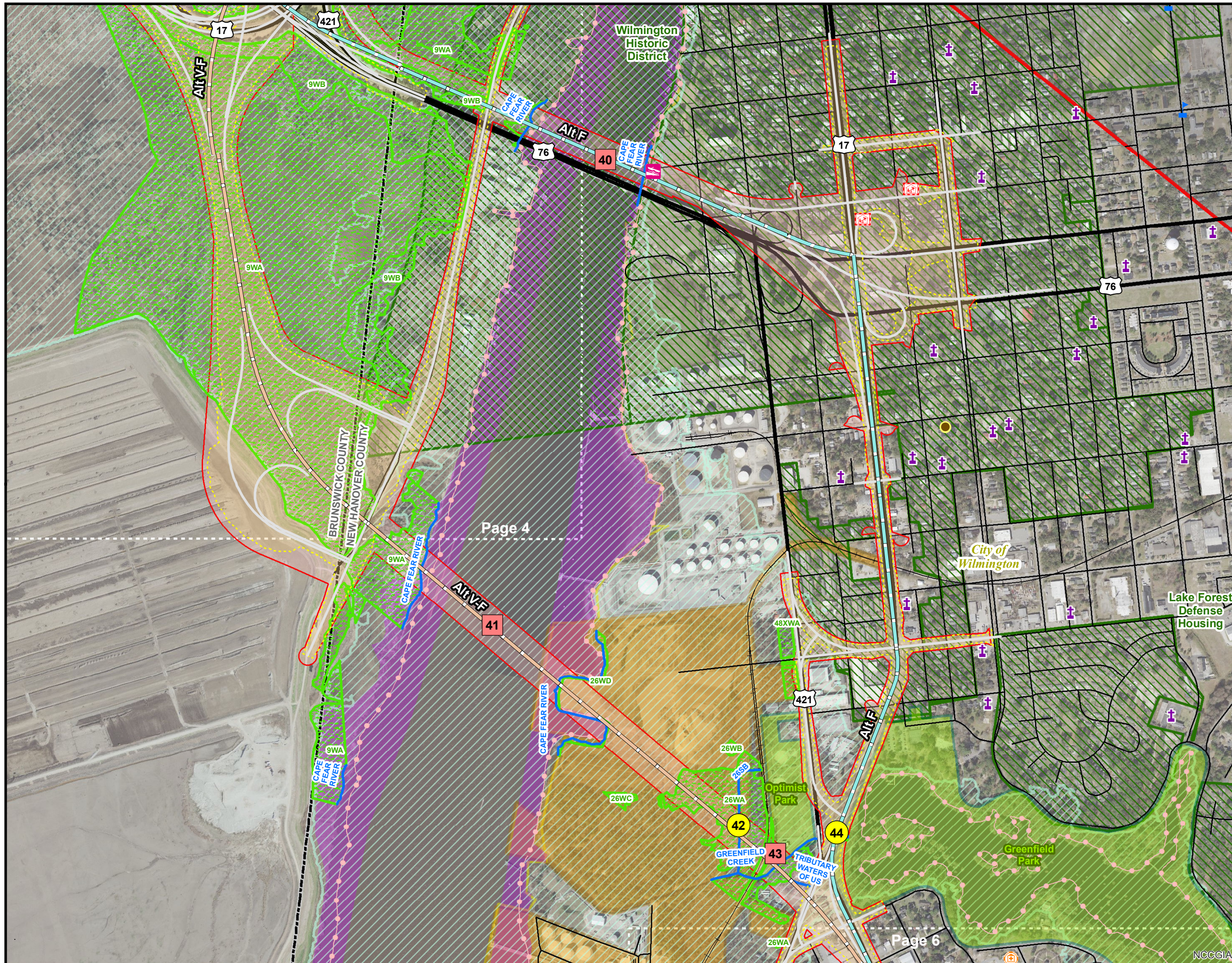


**Figure 2: Environmental Constraints**  
Freeway Alternatives  
(Alternatives B, C, F, G, J, MA, NA, and V-F)  
Page 4 of 15

- Legend**
- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
| SS Limits               | Cemetery                     |
| Proposed Centerlines    | Church                       |
| Bridge Crossing         | School                       |
| Culvert Crossing        | College/University           |
| Interstate              | Beach Access Site            |
| US Highway              | Boat Access                  |
| NC Highway              | Golf Course                  |
| Local Road              | Airport                      |
| Railroad                | Fire Station                 |
| Delineated Wetlands     | EMS                          |
| Delineated Stream Lines | Historic Resource            |
| Delineated Ponds        | Historic Resource / District |
| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |
- Functional Centerlines**
- F
  - F, V-F
  - V-F



Date: May 2017  
This map is for reference only.  
Sources: ESRI, CGIA, NCDOT, and AECOM.



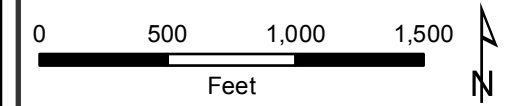
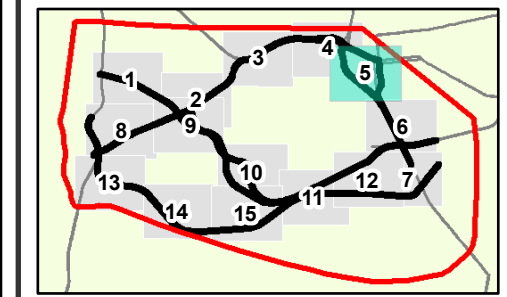
# CAPE FEAR CROSSING

State Transportation Improvement Program  
 Project No. U-4738  
 Concurrence Point 2A

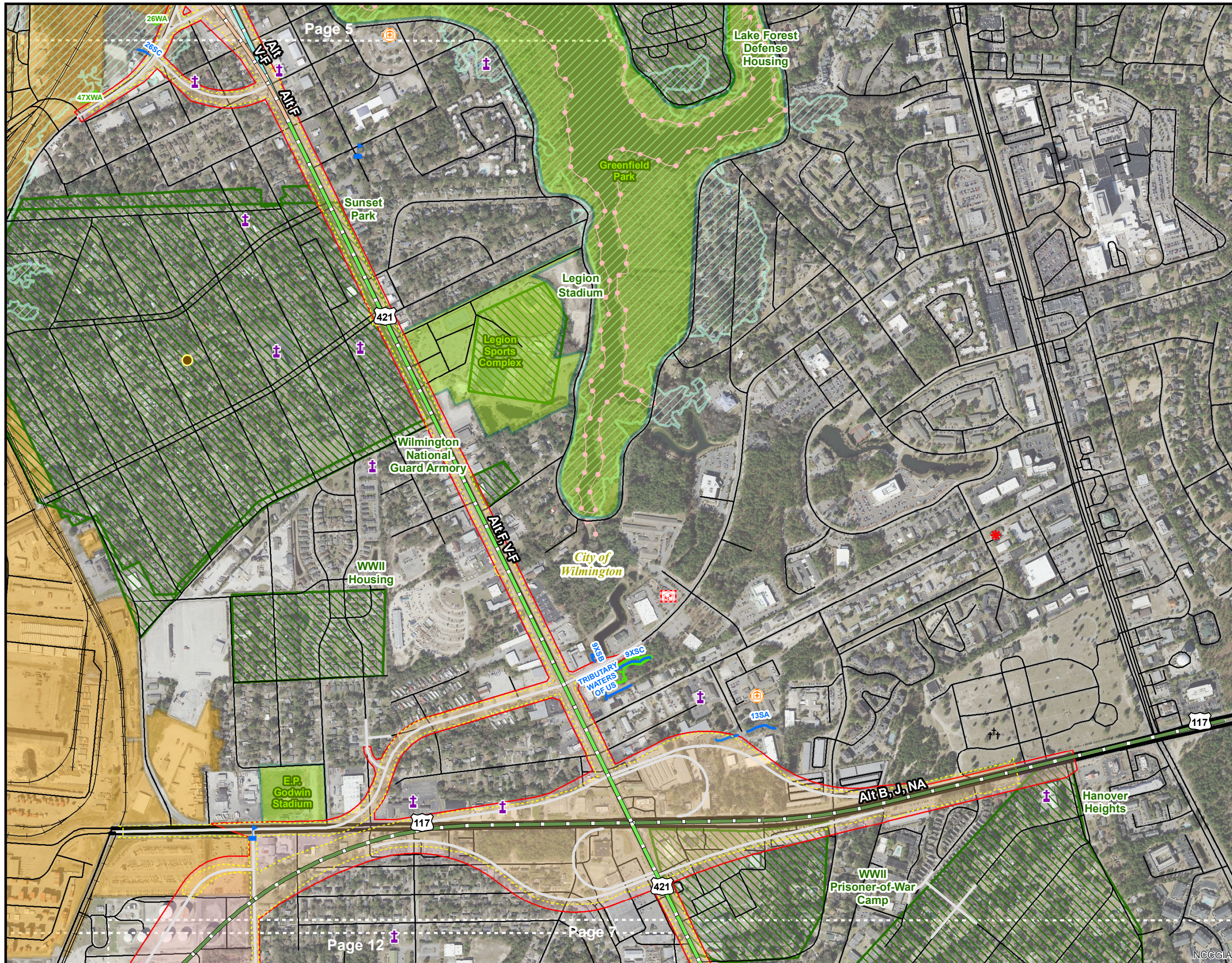


**Figure 2: Environmental Constraints**  
 Freeway Alternatives  
 (Alternatives B, C, F, G, J, MA, NA, and V-F)  
 Page 5 of 15

- Legend**
- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
| SS Limits               | Cemetery                     |
| Proposed Centerlines    | Church                       |
| Bridge Crossing         | School                       |
| Culvert Crossing        | College/University           |
| Interstate              | Beach Access Site            |
| US Highway              | Boat Access                  |
| NC Highway              | Golf Course                  |
| Local Road              | Airport                      |
| Railroad                | Fire Station                 |
| Delineated Wetlands     | EMS                          |
| Delineated Stream Lines | Historic Resource            |
| Delineated Ponds        | Historic Resource / District |
| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |
| Functional Centerlines  |                              |
| F                       |                              |
| V-F                     |                              |



Date: May 2017  
 This map is for reference only.  
 Sources: ESRI, CGIA, NCDOT, and AECOM.

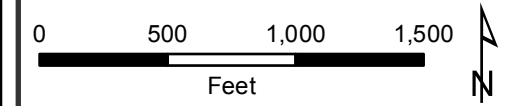
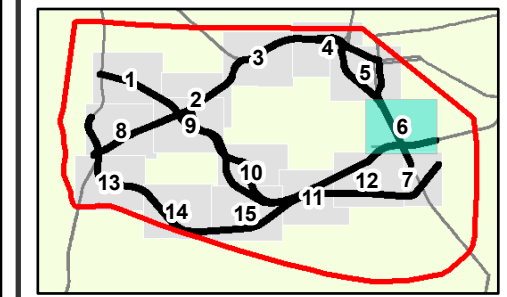


**CAPE FEAR CROSSING**  
 State Transportation Improvement Program  
 Project No. U-4738  
 Concurrence Point 2A

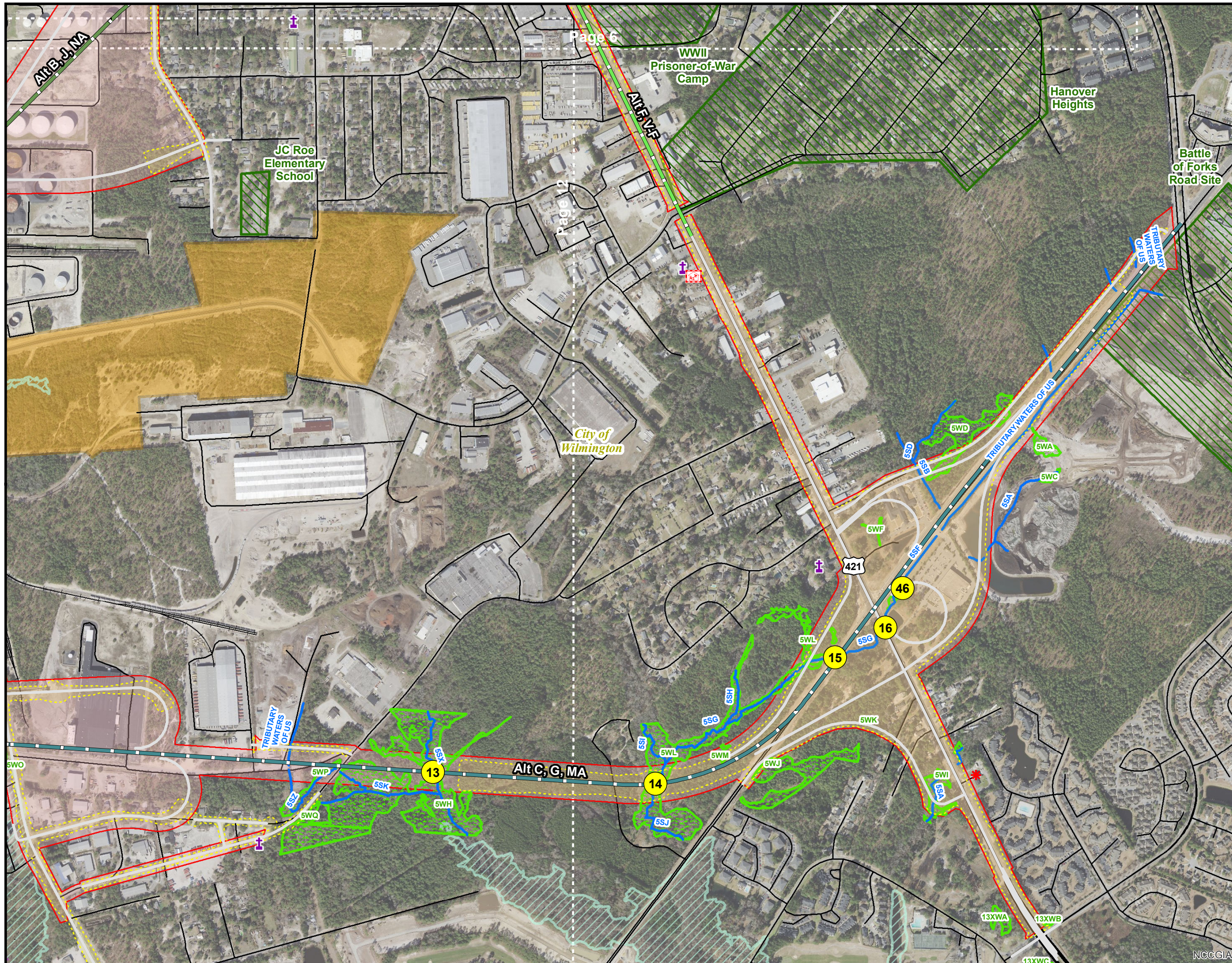


**Figure 2: Environmental Constraints**  
 Freeway Alternatives  
 (Alternatives B, C, F, G, J, MA, NA, and V-F)  
 Page 6 of 15

- Legend**
- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
| SS Limits               | Cemetery                     |
| Proposed Centerlines    | Church                       |
| Bridge Crossing         | School                       |
| Culvert Crossing        | College/University           |
| Interstate              | Beach Access Site            |
| US Highway              | Boat Access                  |
| NC Highway              | Golf Course                  |
| Local Road              | Airport                      |
| Railroad                | Fire Station                 |
| Delineated Wetlands     | EMS                          |
| Delineated Stream Lines | Historic Resource            |
| Delineated Ponds        | Historic Resource / District |
| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |
- Functional Centerlines**
- B, J, NA
  - F
  - F, V-F
  - V-F



Date: May 2017  
 This map is for reference only.  
 Sources: ESRI, CGIA, NCDOT, and AECOM.



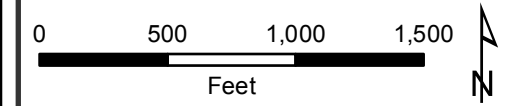
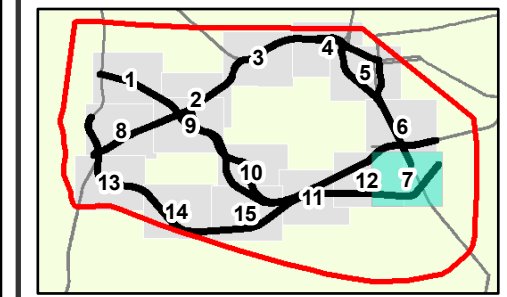
# CAPE FEAR CROSSING

State Transportation Improvement Program  
 Project No. U-4738  
 Concurrence Point 2A

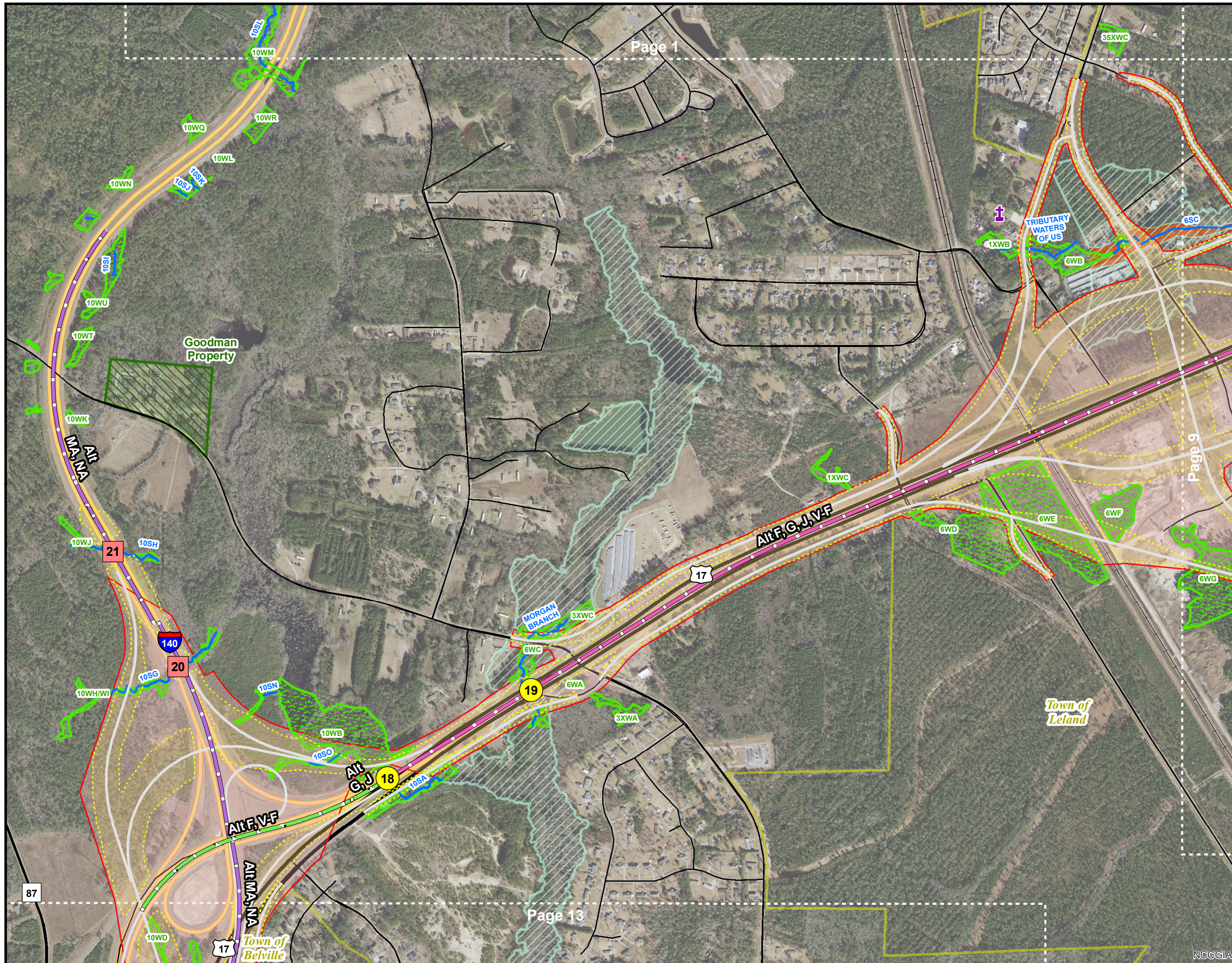


**Figure 2: Environmental Constraints**  
 Freeway Alternatives  
 (Alternatives B, C, F, G, J, MA, NA, and V-F)  
 Page 7 of 15

- Legend**
- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
| SS Limits               | Cemetery                     |
| Proposed Centerlines    | Church                       |
| Bridge Crossing         | School                       |
| Culvert Crossing        | College/University           |
| Interstate              | Beach Access Site            |
| US Highway              | Boat Access                  |
| NC Highway              | Golf Course                  |
| Local Road              | Airport                      |
| Railroad                | Fire Station                 |
| Delineated Wetlands     | EMS                          |
| Delineated Stream Lines | Historic Resource            |
| Delineated Ponds        | Historic Resource / District |
| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |
- Functional Centerlines**
- B, J, NA
  - C, G, MA
  - F, V-F



Date: May 2017  
 This map is for reference only.  
 Sources: ESRI, CGIA, NCDOT, and AECOM.



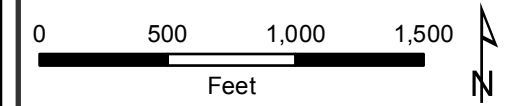
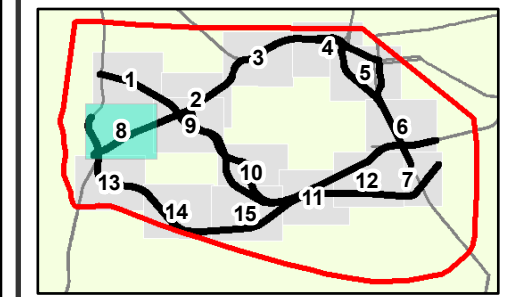
# CAPE FEAR CROSSING

State Transportation Improvement Program  
 Project No. U-4738  
 Concurrence Point 2A



**Figure 2: Environmental Constraints**  
 Freeway Alternatives  
 (Alternatives B, C, F, G, J, MA, NA, and V-F)  
 Page 8 of 15

- Legend**
- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
| SS Limits               | Cemetery                     |
| Proposed Centerlines    | Church                       |
| Bridge Crossing         | School                       |
| Culvert Crossing        | College/University           |
| Interstate              | Beach Access Site            |
| US Highway              | Boat Access                  |
| NC Highway              | Golf Course                  |
| Local Road              | Airport                      |
| Railroad                | Fire Station                 |
| Delineated Wetlands     | EMS                          |
| Delineated Stream Lines | Historic Resource            |
| Delineated Ponds        | Historic Resource / District |
| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |
- Functional Centerlines**
- |              |           |
|--------------|-----------|
| F            | G, J, V-F |
| F, G, J, V-F | MA        |
| F, V-F       | MA, NA    |
| G, J         | V-F       |



Date: May 2017  
 This map is for reference only.  
 Sources: ESRI, CGIA, NCDOT, and AECOM.



# CAPE FEAR CROSSING

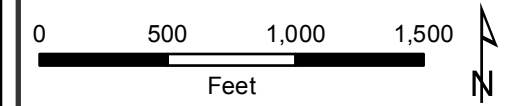
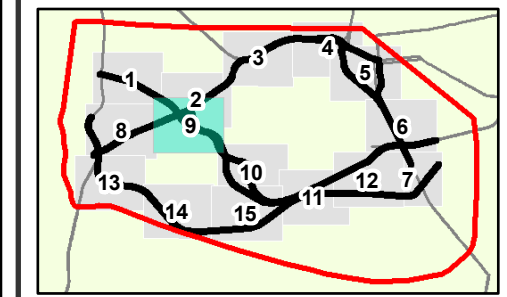
State Transportation Improvement Program  
 Project No. U-4738  
 Concurrency Point 2A



**Figure 2: Environmental Constraints**  
 Freeway Alternatives  
 (Alternatives B, C, F, G, J, MA, NA, and V-F)  
 Page 9 of 15

- Legend**
- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
| SS Limits               | Cemetery                     |
| Proposed Centerlines    | Church                       |
| Bridge Crossing         | School                       |
| Culvert Crossing        | College/University           |
| Interstate              | Beach Access Site            |
| US Highway              | Boat Access                  |
| NC Highway              | Golf Course                  |
| Local Road              | Airport                      |
| Railroad                | Fire Station                 |
| Delineated Wetlands     | EMS                          |
| Delineated Stream Lines | Historic Resource            |
| Delineated Ponds        | Historic Resource / District |
| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |

- Functional Centerlines**
- |            |              |
|------------|--------------|
| B, C       | F, G, J, V-F |
| B, C, G, J | F, V-F       |
| B, G       | G, J         |
| C, J       |              |



Date: May 2017  
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 Sources: ESRI, CGIA, NCDOT, and AECOM.

# CAPE FEAR CROSSING

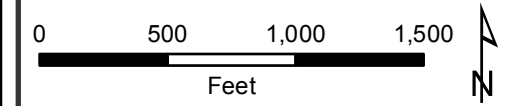
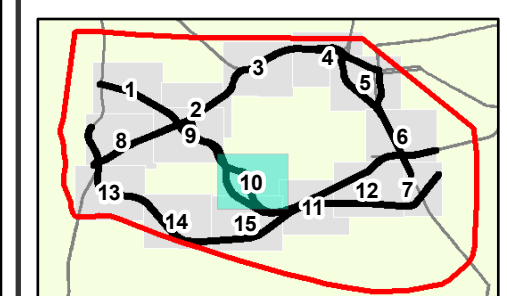
State Transportation Improvement Program  
 Project No. U-4738  
 Concurrency Point 2A



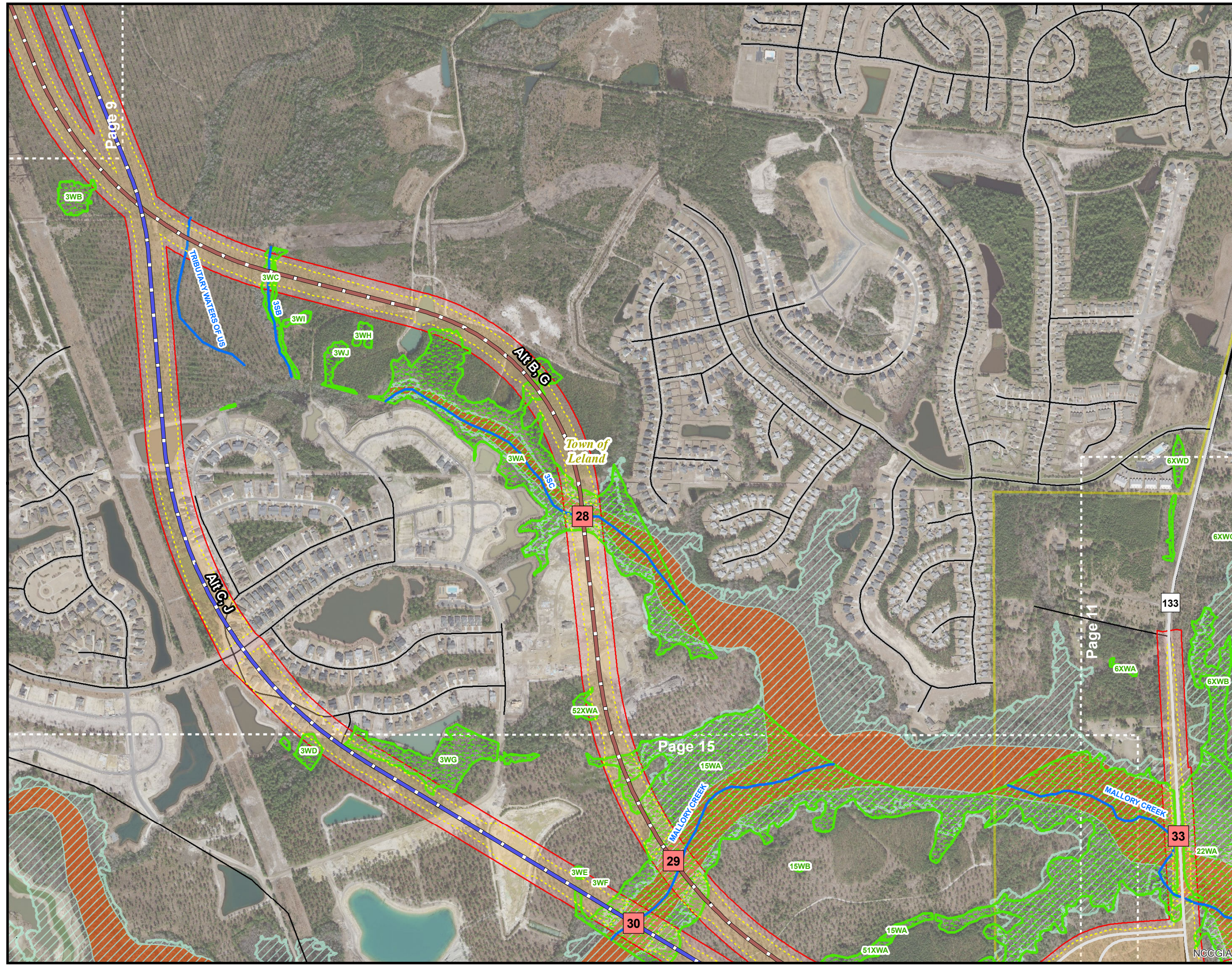
**Figure 2: Environmental Constraints**  
 Freeway Alternatives  
 (Alternatives B, C, F, G, J, MA, NA, and V-F)  
 Page 10 of 15

### Legend

- |                               |                              |
|-------------------------------|------------------------------|
| Project Study Area            | Day Care Facility            |
| ROW Limits                    | Nursing Homes                |
| SS Limits                     | Cemetery                     |
| Proposed Centerlines          | Church                       |
| Bridge Crossing               | School                       |
| Culvert Crossing              | College/University           |
| Interstate                    | Beach Access Site            |
| US Highway                    | Boat Access                  |
| NC Highway                    | Golf Course                  |
| Local Road                    | Airport                      |
| Railroad                      | Fire Station                 |
| Delineated Wetlands           | EMS                          |
| Delineated Stream Lines       | Historic Resource            |
| Delineated Ponds              | Historic Resource / District |
| 303(d) Impaired Stream        | Port of Wilmington           |
| Primary Nursery Area          | Park                         |
| Floodway                      | Municipal Boundaries         |
| 100-year Floodplain           | County Boundary              |
| <b>Functional Centerlines</b> |                              |
| B, G                          |                              |
| C, J                          |                              |



Date: May 2017  
 This map is for reference only.  
 Sources: ESRI, CGIA, NCDOT, and AECOM.



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Town of Leland

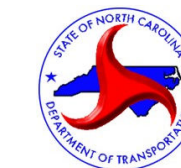
Page 15

Page 11

NCCGIA

# CAPE FEAR CROSSING

State Transportation Improvement Program  
 Project No. U-4738  
 Concurrency Point 2A

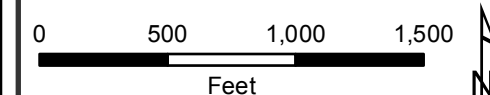
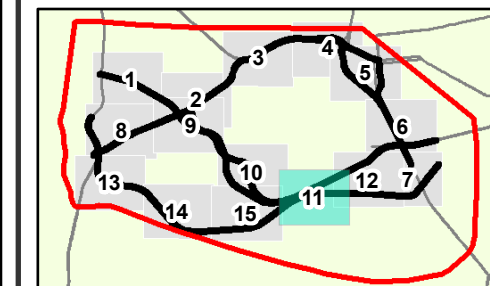


**Figure 2: Environmental Constraints**  
 Freeway Alternatives  
 (Alternatives B, C, F, G, J, MA, NA, and V-F)  
 Page 11 of 15

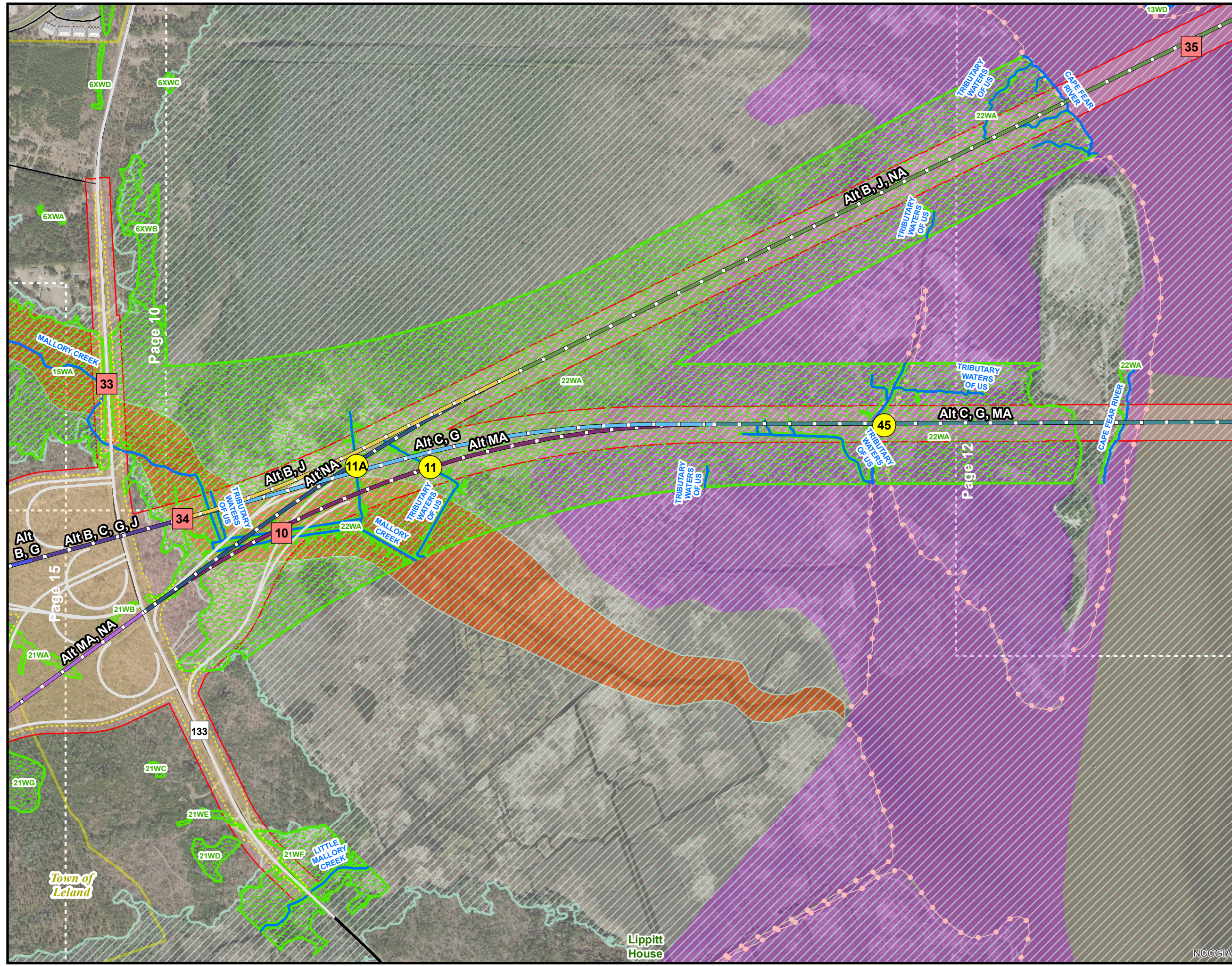
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- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
| SS Limits               | Cemetery                     |
| Proposed Centerlines    | Church                       |
| Bridge Crossing         | School                       |
| Culvert Crossing        | College/University           |
| Interstate              | Beach Access Site            |
| US Highway              | Boat Access                  |
| NC Highway              | Golf Course                  |
| Local Road              | Airport                      |
| Railroad                | Fire Station                 |
| Delineated Wetlands     | EMS                          |
| Delineated Stream Lines | Historic Resource            |
| Delineated Ponds        | Historic Resource / District |
| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |

- ### Functional Centerlines
- |            |          |        |
|------------|----------|--------|
| B, C, G, J | C, G     | MA, NA |
| B, G       | C, G, MA | NA     |
| B, J       | C, J     |        |
| B, J, NA   | MA       |        |



Date: May 2017  
 This map is for reference only.  
 Sources: ESRI, CGIA, NCDOT, and AECOM.



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# CAPE FEAR CROSSING

State Transportation Improvement Program  
 Project No. U-4738  
 Concurrence Point 2A



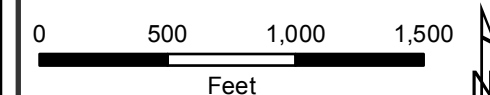
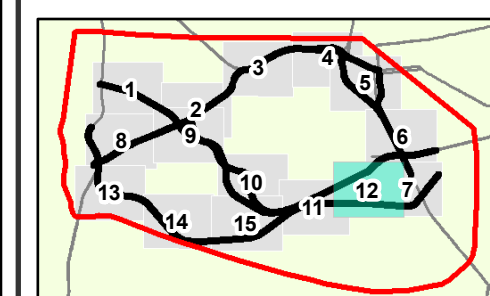
**Figure 2: Environmental Constraints**  
 Freeway Alternatives  
 (Alternatives B, C, F, G, J, MA, NA, and V-F)  
 Page 12 of 15

### Legend

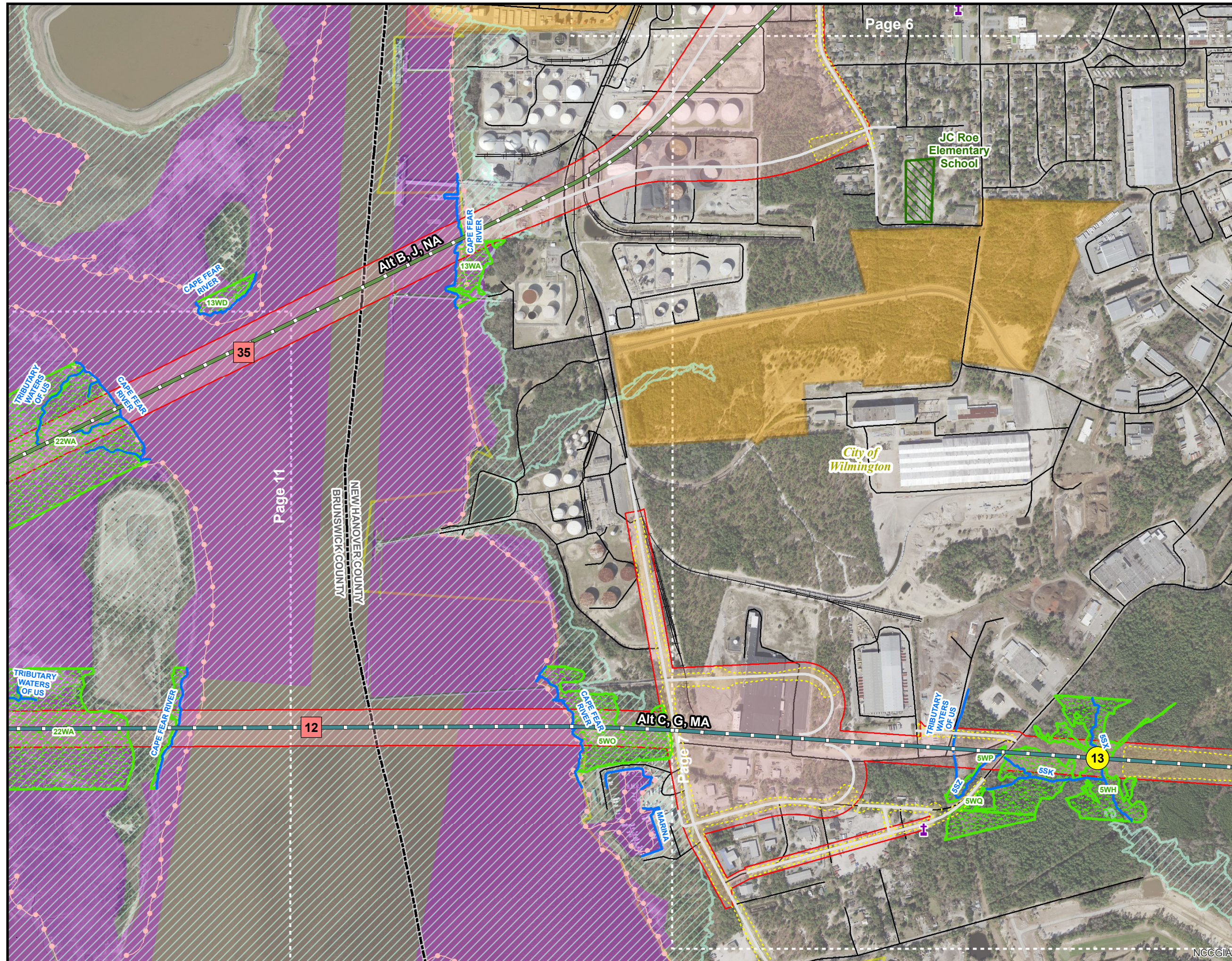
- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
| SS Limits               | Cemetery                     |
| Proposed Centerlines    | Church                       |
| Bridge Crossing         | School                       |
| Culvert Crossing        | College/University           |
| Interstate              | Beach Access Site            |
| US Highway              | Boat Access                  |
| NC Highway              | Golf Course                  |
| Local Road              | Airport                      |
| Railroad                | Fire Station                 |
| Delineated Wetlands     | EMS                          |
| Delineated Stream Lines | Historic Resource            |
| Delineated Ponds        | Historic Resource / District |
| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |

### Functional Centerlines

- B, J, NA
- C, G, MA



Date: May 2017  
 This map is for reference only.  
 Sources: ESRI, CGIA, NCDOT, and AECOM.



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# CAPE FEAR CROSSING

State Transportation Improvement Program  
Project No. U-4738  
Concurrence Point 2A



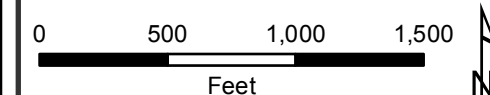
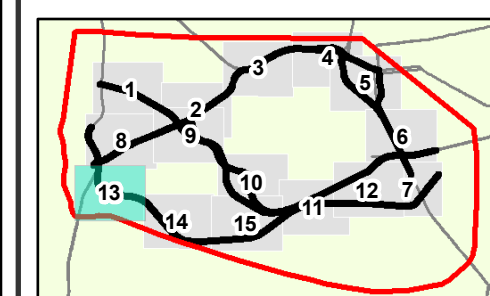
### Figure 2: Environmental Constraints

Freeway Alternatives  
(Alternatives B, C, F, G, J, MA, NA, and V-F)  
Page 13 of 15

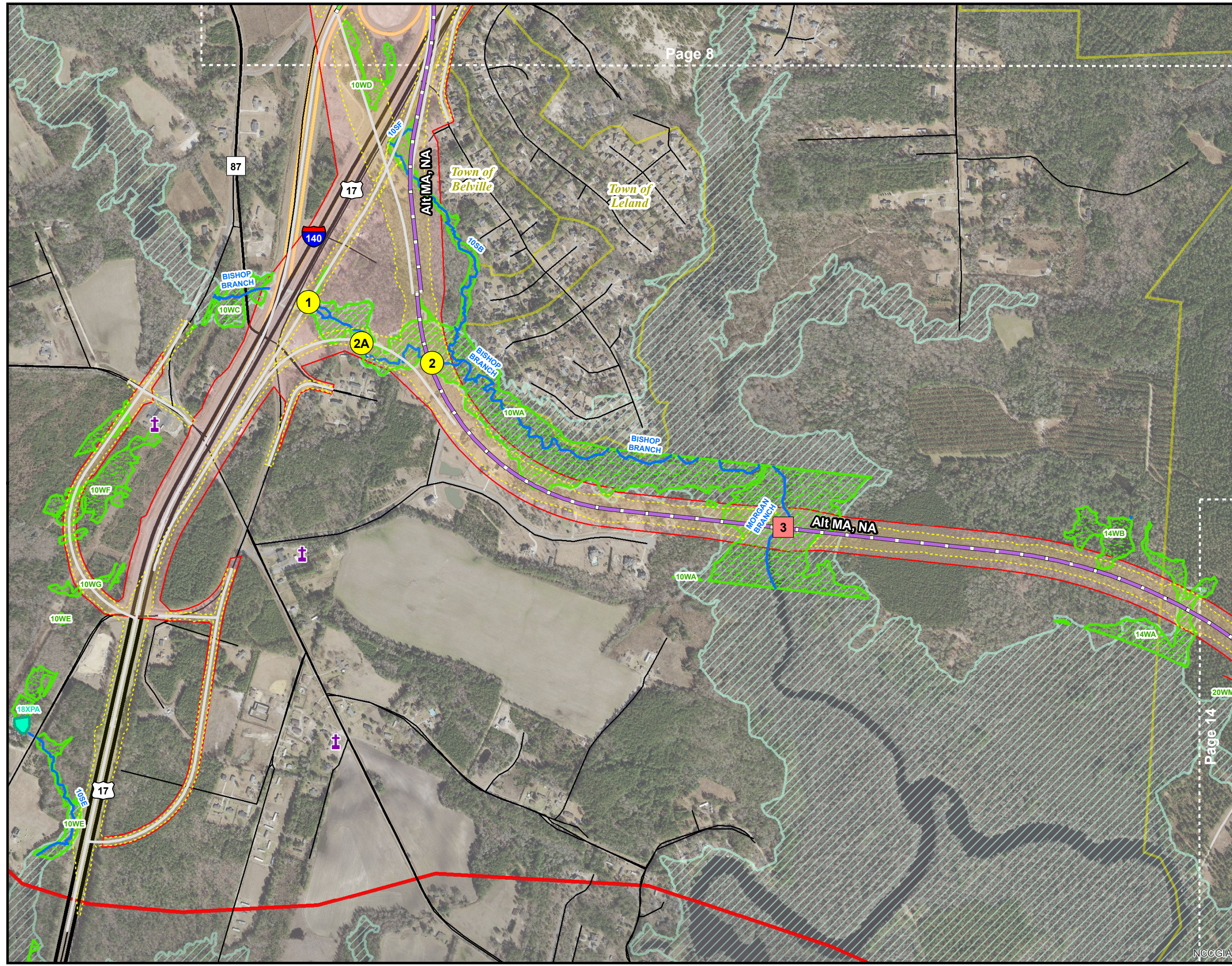
#### Legend

- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
| SS Limits               | Cemetery                     |
| Proposed Centerlines    | Church                       |
| Bridge Crossing         | School                       |
| Culvert Crossing        | College/University           |
| Interstate              | Beach Access Site            |
| US Highway              | Boat Access                  |
| NC Highway              | Golf Course                  |
| Local Road              | Airport                      |
| Railroad                | Fire Station                 |
| Delineated Wetlands     | EMS                          |
| Delineated Stream Lines | Historic Resource            |
| Delineated Ponds        | Historic Resource / District |
| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |

- #### Floodplains
- Floodway
  - 100-year Floodplain
- #### Functional Centerlines
- F, V-F
  - MA, NA



Date: May 2017  
This map is for reference only.  
Sources: ESRI, CGIA, NCDOT, and AECOM.

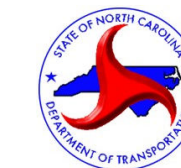


# CAPE FEAR CROSSING

State Transportation Improvement Program

Project No. U-4738

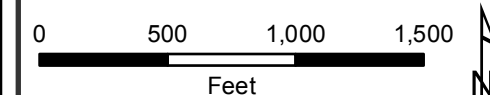
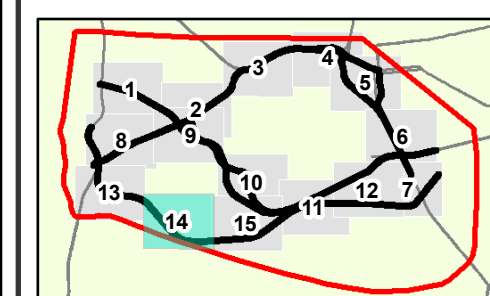
Concurrence Point 2A



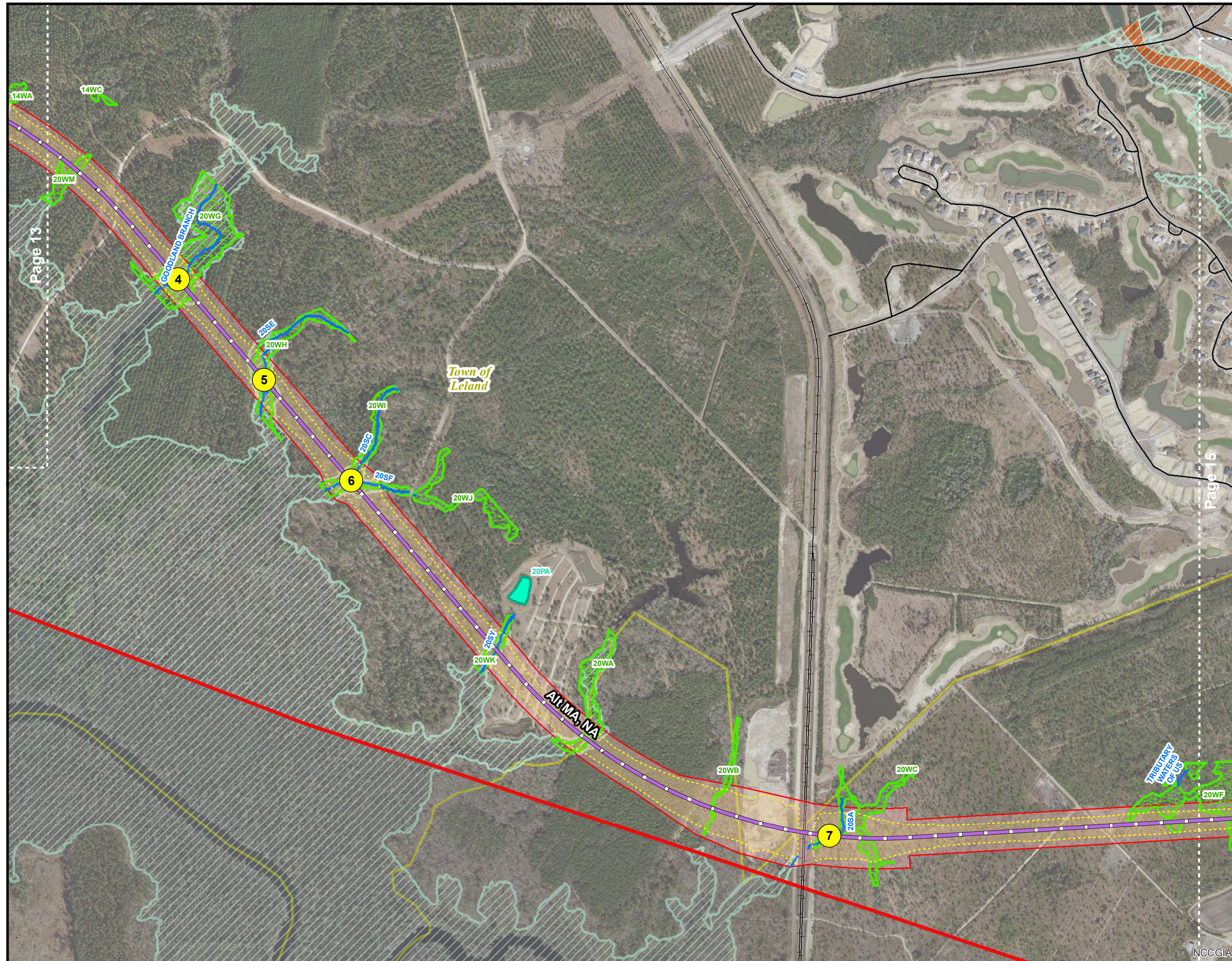
**Figure 2: Environmental Constraints**  
 Freeway Alternatives  
 (Alternatives B, C, F, G, J, MA, NA, and V-F)  
 Page 14 of 15

## Legend

- |                               |                              |
|-------------------------------|------------------------------|
| Project Study Area            | Day Care Facility            |
| ROW Limits                    | Nursing Homes                |
| SS Limits                     | Cemetery                     |
| Proposed Centerlines          | Church                       |
| Bridge Crossing               | School                       |
| Culvert Crossing              | College/University           |
| Interstate                    | Beach Access Site            |
| US Highway                    | Boat Access                  |
| NC Highway                    | Golf Course                  |
| Local Road                    | Airport                      |
| Railroad                      | Fire Station                 |
| Delineated Wetlands           | EMS                          |
| Delineated Stream Lines       | Historic Resource            |
| Delineated Ponds              | Historic Resource / District |
| 303(d) Impaired Stream        | Port of Wilmington           |
| Primary Nursery Area          | Park                         |
| Floodway                      | Municipal Boundaries         |
| 100-year Floodplain           | County Boundary              |
| <b>Functional Centerlines</b> |                              |
| MA, NA                        |                              |



Date: May 2017  
 This map is for reference only.  
 Sources: ESRI, CGIA, NCDOT, and AECOM.



# CAPE FEAR CROSSING

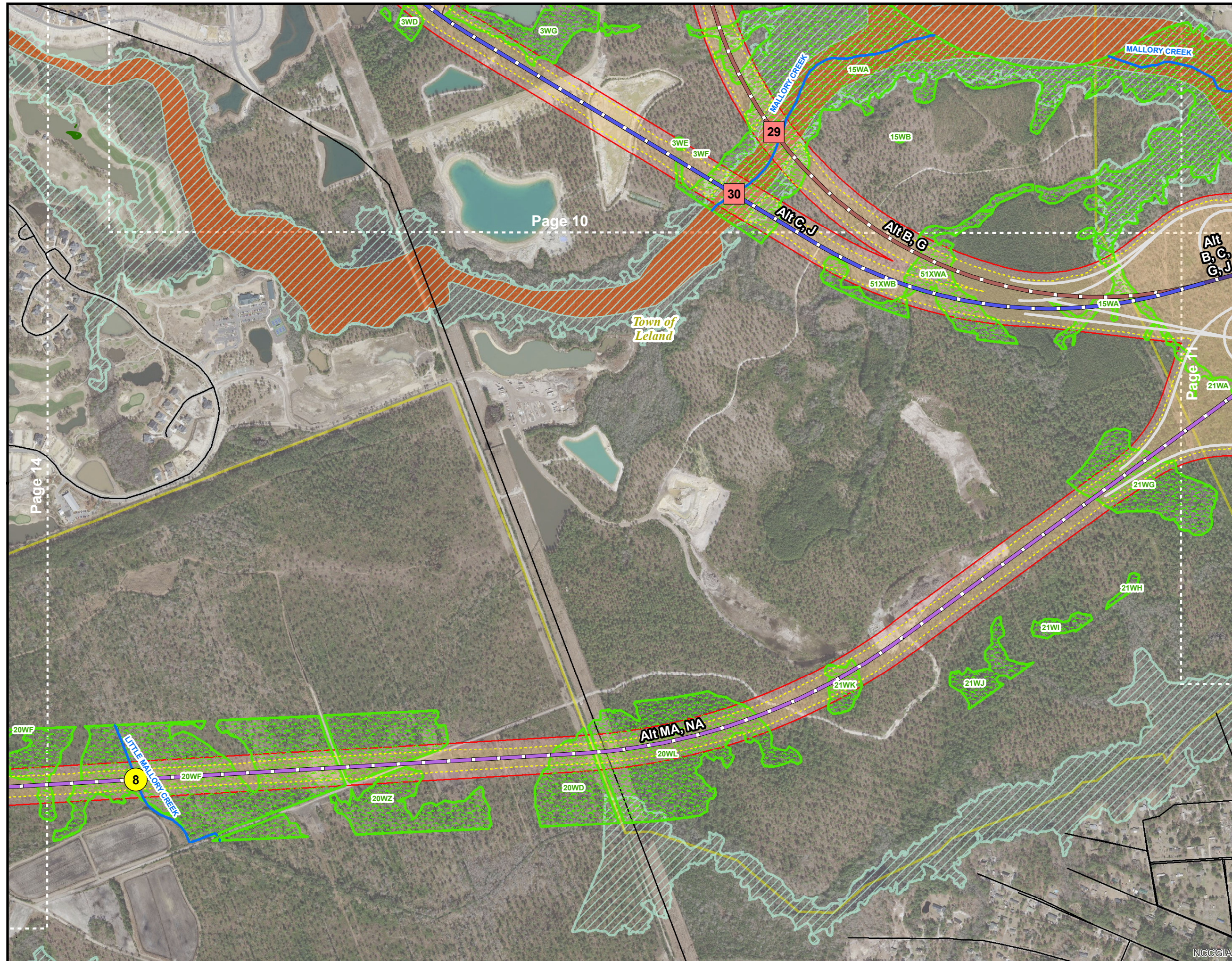
State Transportation Improvement Program

Project No. U-4738

Concurrence Point 2A



**Figure 2: Environmental Constraints**  
 Freeway Alternatives  
 (Alternatives B, C, F, G, J, MA, NA, and V-F)  
 Page 15 of 15

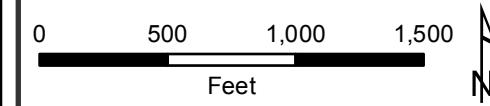
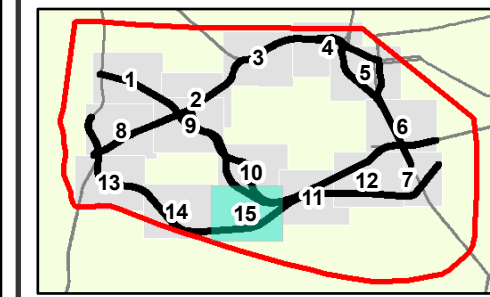


## Legend

- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
| SS Limits               | Cemetery                     |
| Proposed Centerlines    | Church                       |
| Bridge Crossing         | School                       |
| Culvert Crossing        | College/University           |
| Interstate              | Beach Access Site            |
| US Highway              | Boat Access                  |
| NC Highway              | Golf Course                  |
| Local Road              | Airport                      |
| Railroad                | Fire Station                 |
| Delineated Wetlands     | EMS                          |
| Delineated Stream Lines | Historic Resource            |
| Delineated Ponds        | Historic Resource / District |
| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |

## Functional Centerlines

- B, C, G, J
- B, G
- C, J
- MA, NA



Date: May 2017  
 This map is for reference only.  
 Sources: ESRI, CGIA, NCDOT, and AECOM.

# CAPE FEAR CROSSING

State Transportation Improvement Program  
Project No. U-4738

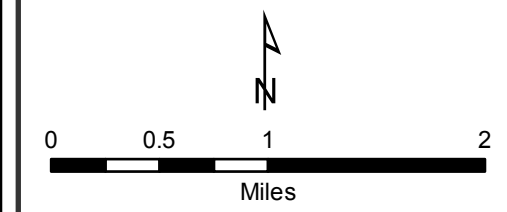
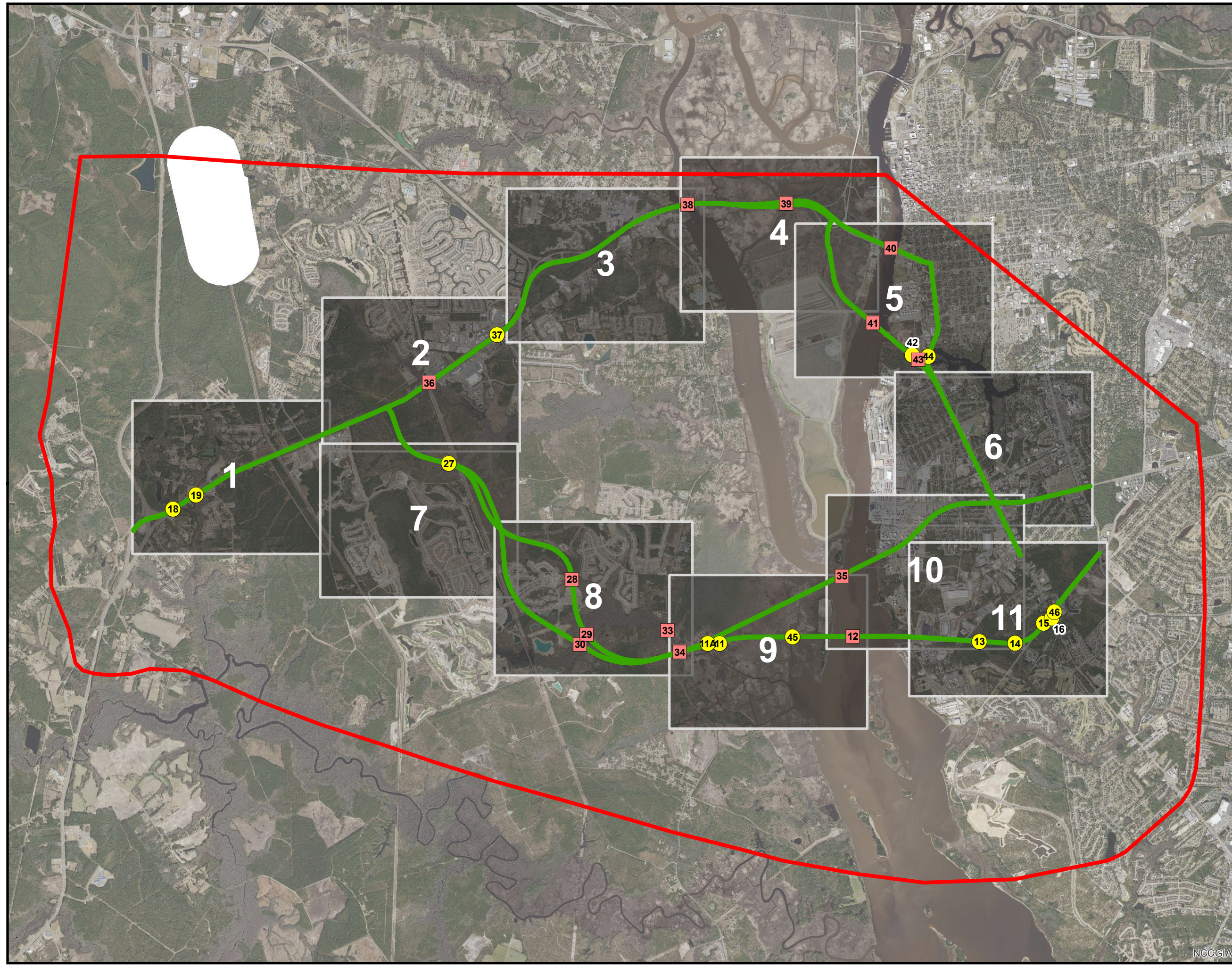
Concurrence Point 2A



**Figure 3: Environmental Constraints Index Map**  
Widening Alternatives  
(Alternatives P, Q, T, and V-AW)

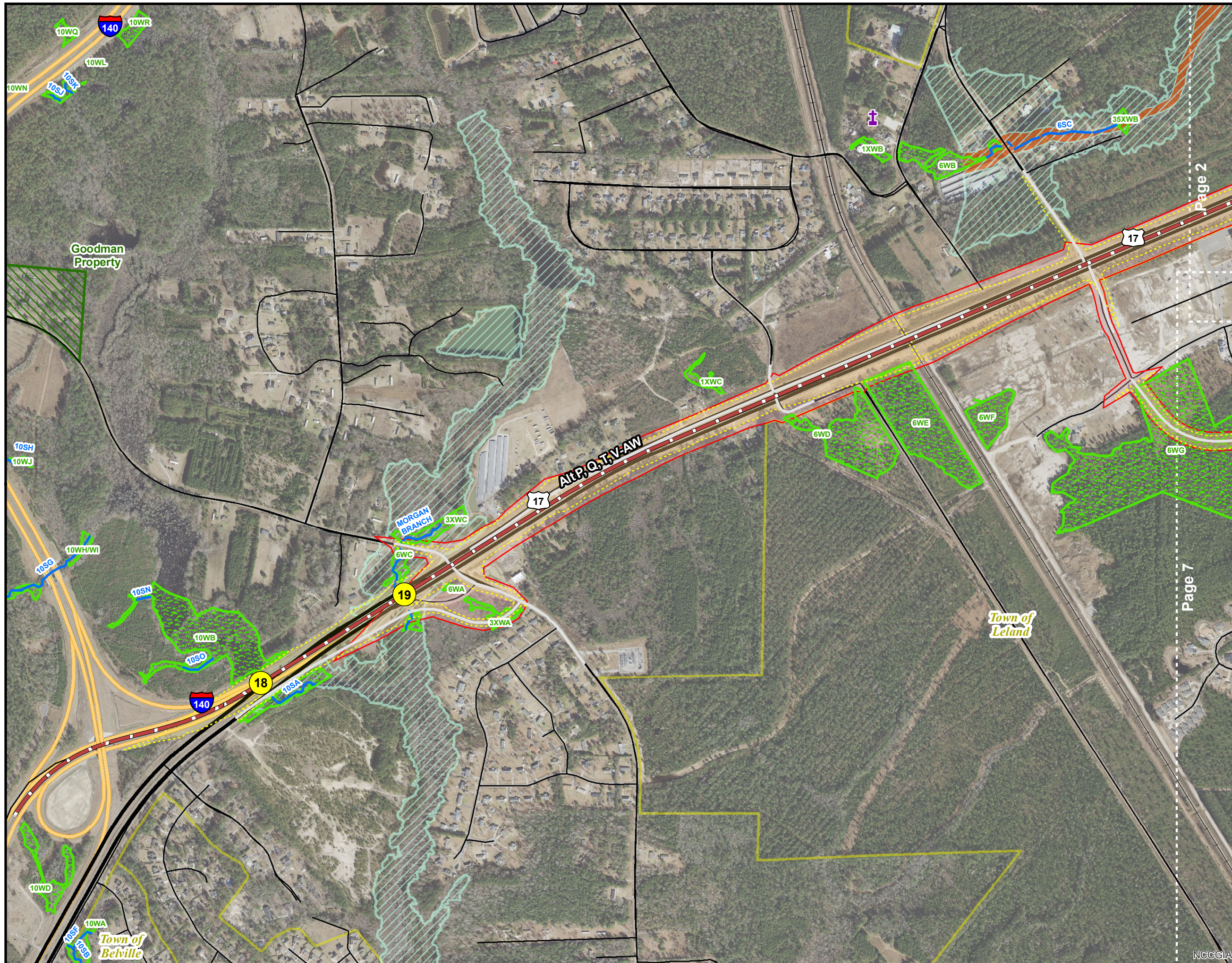
### Legend

- Project Study Area
- Functional Centerlines
- Bridge Crossing
- Culvert Crossing



Date: May 2017  
This map is for reference only.  
Sources: ESRI, CGIA, NCDOT, and AECOM.

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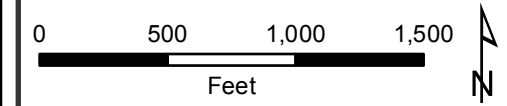
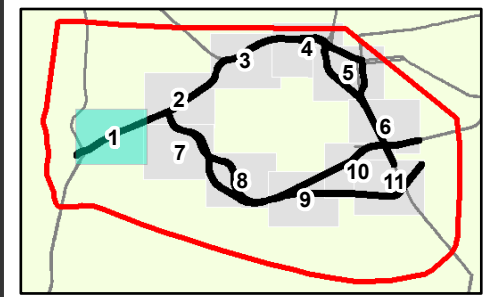


**CAPE FEAR CROSSING**  
 State Transportation Improvement Program  
 Project No. U-4738  
 Concurrency Point 2A



**Figure 3: Environmental Constraints**  
 Widening Alternatives  
 (Alternatives P, Q, T, and V-AW)  
 Page 1 of 11

- Legend**
- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
| SS Limits               | Cemetery                     |
| Proposed Centerlines    | Church                       |
| Bridge Crossing         | School                       |
| Culvert Crossing        | College/University           |
| Interstate              | Beach Access Site            |
| US Highway              | Boat Access                  |
| NC Highway              | Golf Course                  |
| Local Road              | Airport                      |
| Railroad                | Fire Station                 |
| Delineated Wetlands     | EMS                          |
| Delineated Stream Lines | Historic Resource            |
| Delineated Ponds        | Historic Resource / District |
| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |
- Floodplains**
- Functional Centerlines**
- P
  - P, Q, T, V-AW
  - T

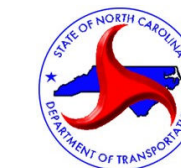


Date: May 2017  
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 Sources: ESRI, CGIA, NCDOT, and AECOM.

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# CAPE FEAR CROSSING

State Transportation Improvement Program  
 Project No. U-4738  
 Concurrence Point 2A

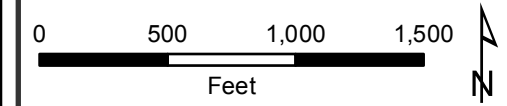
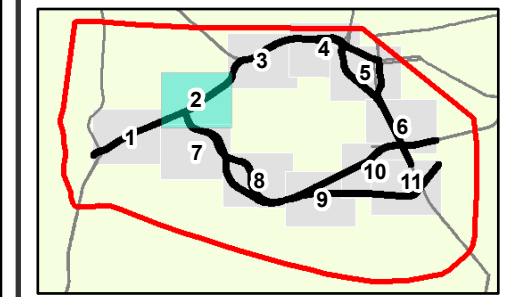


**Figure 3: Environmental Constraints**  
 Widening Alternatives  
 (Alternatives P, Q, T, and V-AW)  
 Page 2 of 11



## Legend

- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
| SS Limits               | Cemetery                     |
| Proposed Centerlines    | Church                       |
| Bridge Crossing         | School                       |
| Culvert Crossing        | College/University           |
| Interstate              | Beach Access Site            |
| US Highway              | Boat Access                  |
| NC Highway              | Golf Course                  |
| Local Road              | Airport                      |
| Railroad                | Fire Station                 |
| Delineated Wetlands     | EMS                          |
| Delineated Stream Lines | Historic Resource            |
| Delineated Ponds        | Historic Resource / District |
| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |
- 
- ### Functional Centerlines
- |               |      |
|---------------|------|
| P             | Q    |
| P, Q, T, V-AW | T    |
| P, T, V-AW    | V-AW |
| P, V-AW       |      |



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Page 3

Page 7

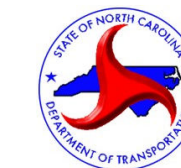
NCCGIA

# CAPE FEAR CROSSING

State Transportation Improvement Program

Project No. U-4738

Concurrence Point 2A

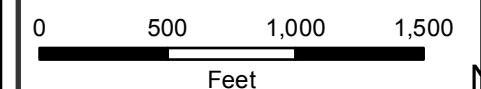
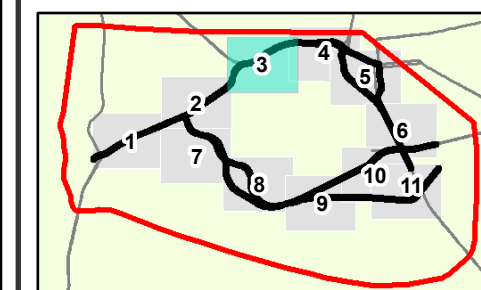


## Figure 3: Environmental Constraints

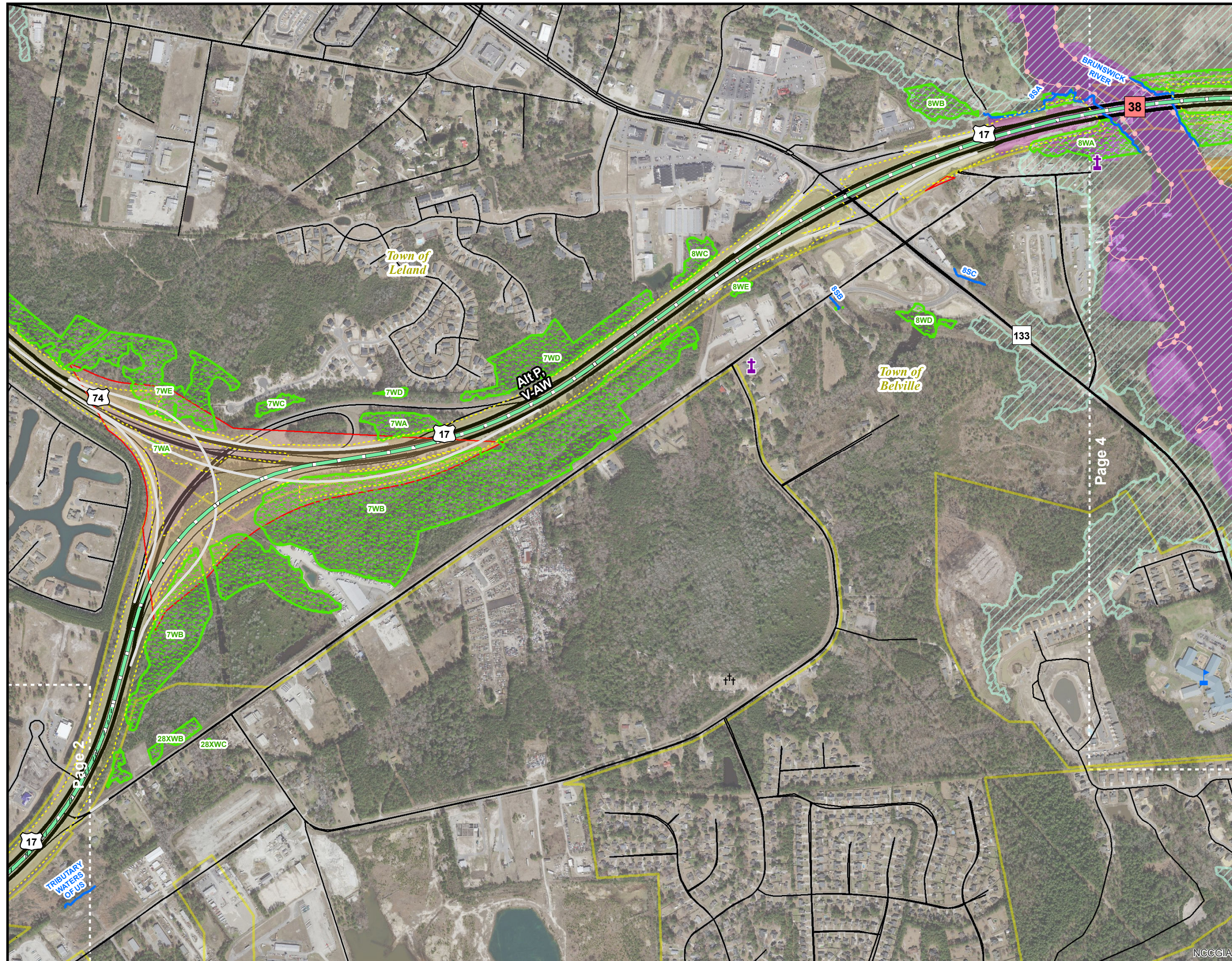
Widening Alternatives  
(Alternatives P, Q, T, and V-AW)  
Page 3 of 11

### Legend

- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
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| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |
- 
- ### Floodplains
- |  |                     |
|--|---------------------|
|  | Floodway            |
|  | 100-year Floodplain |
- 
- ### Functional Centerlines
- |  |         |
|--|---------|
|  | P       |
|  | P, V-AW |
|  | V-AW    |



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# CAPE FEAR CROSSING

State Transportation Improvement Program

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## Figure 3: Environmental Constraints

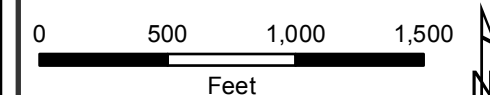
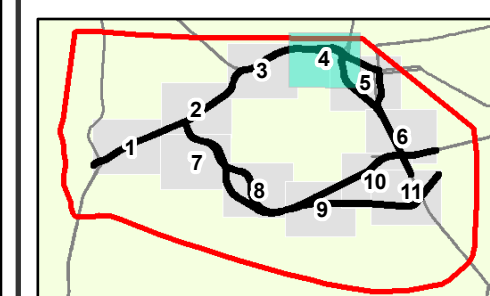
Widening Alternatives  
(Alternatives P, Q, T, and V-AW)  
Page 4 of 11

### Legend

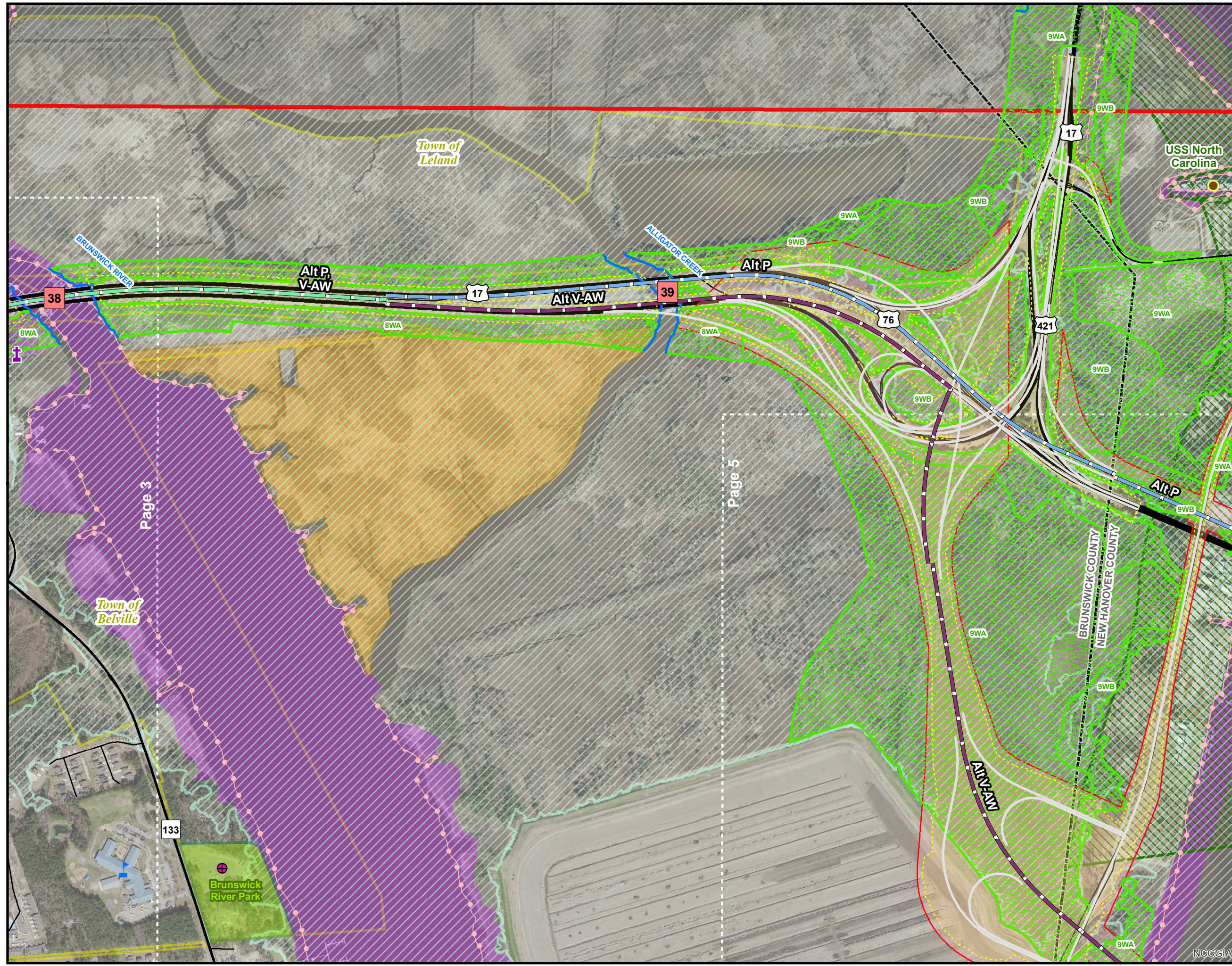
- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
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| Proposed Centerlines    | Church                       |
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| Interstate              | Beach Access Site            |
| US Highway              | Boat Access                  |
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| Railroad                | Fire Station                 |
| Delineated Wetlands     | EMS                          |
| Delineated Stream Lines | Historic Resource            |
| Delineated Ponds        | Historic Resource / District |
| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |

### Functional Centerlines

- |         |
|---------|
| P       |
| P, V-AW |
| V-AW    |



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# CAPE FEAR CROSSING

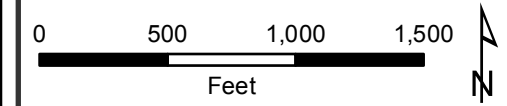
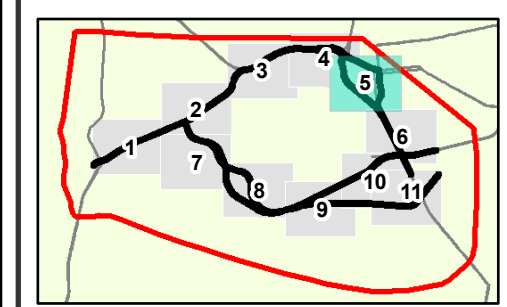
State Transportation Improvement Program  
 Project No. U-4738  
 Concurrence Point 2A



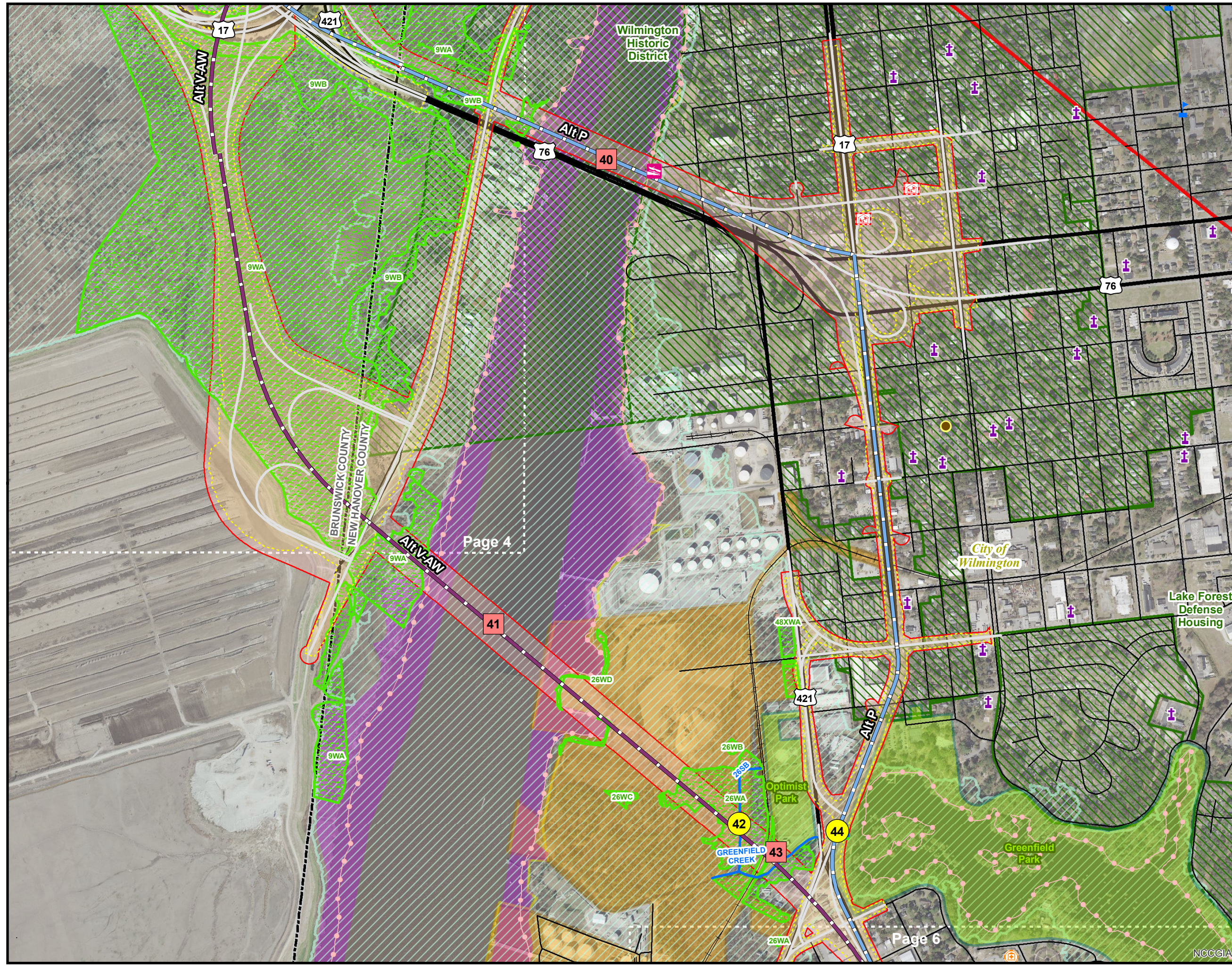
**Figure 3: Environmental Constraints**  
 Widening Alternatives  
 (Alternatives P, Q, T, and V-AW)  
 Page 5 of 11

## Legend

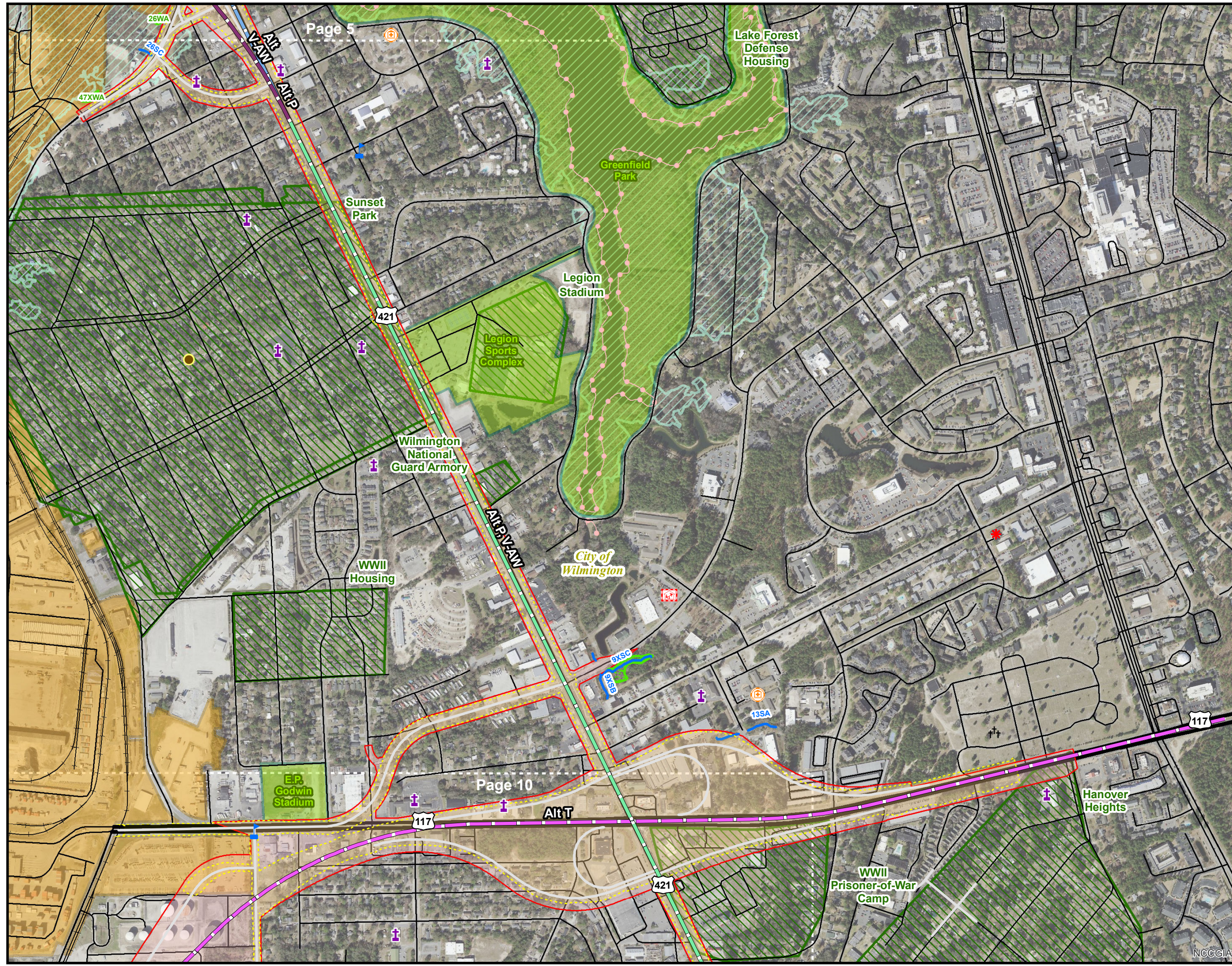
- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
| SS Limits               | Cemetery                     |
| Proposed Centerlines    | Church                       |
| Bridge Crossing         | School                       |
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| Interstate              | Beach Access Site            |
| US Highway              | Boat Access                  |
| NC Highway              | Golf Course                  |
| Local Road              | Airport                      |
| Railroad                | Fire Station                 |
| Delineated Wetlands     | EMS                          |
| Delineated Stream Lines | Historic Resource            |
| Delineated Ponds        | Historic Resource / District |
| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |
- 
- ### Floodplains
- |  |                     |
|--|---------------------|
|  | Floodway            |
|  | 100-year Floodplain |
- 
- ### Functional Centerlines
- |  |      |
|--|------|
|  | P    |
|  | V-AW |



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 State Transportation Improvement Program  
 Project No. U-4738  
 Concurrence Point 2A



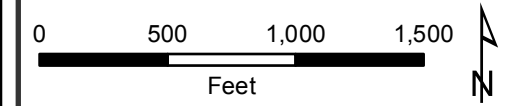
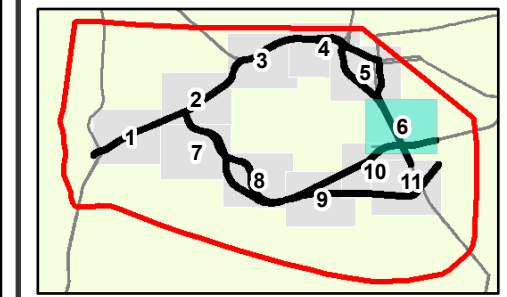
**Figure 3: Environmental Constraints**  
 Widening Alternatives  
 (Alternatives P, Q, T, and V-AW)  
 Page 6 of 11

**Legend**

- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
| SS Limits               | Cemetery                     |
| Proposed Centerlines    | Church                       |
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| NC Highway              | Golf Course                  |
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| Delineated Stream Lines | Historic Resource            |
| Delineated Ponds        | Historic Resource / District |
| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |

**Functional Centerlines**

- P
- P, V-AW
- T
- V-AW



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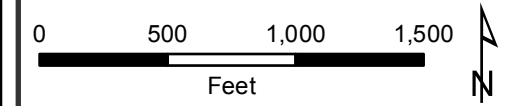
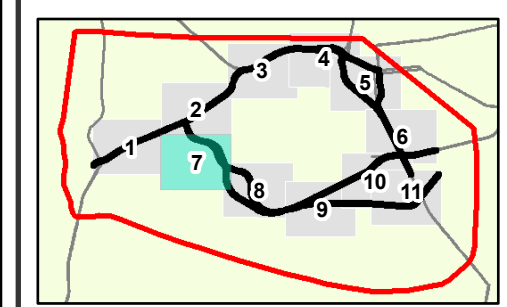
**CAPE FEAR CROSSING**  
 State Transportation Improvement Program  
 Project No. U-4738  
 Concurrence Point 2A



**Figure 3: Environmental Constraints**  
 Widening Alternatives  
 (Alternatives P, Q, T, and V-AW)  
 Page 7 of 11

**Legend**

- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
| SS Limits               | Cemetery                     |
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| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |
- Functional Centerlines**
- Q
  - Q, T
  - T



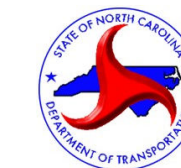
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# CAPE FEAR CROSSING

State Transportation Improvement Program

Project No. U-4738

Concurrence Point 2A



## Figure 3: Environmental Constraints

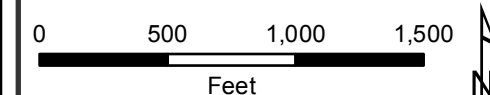
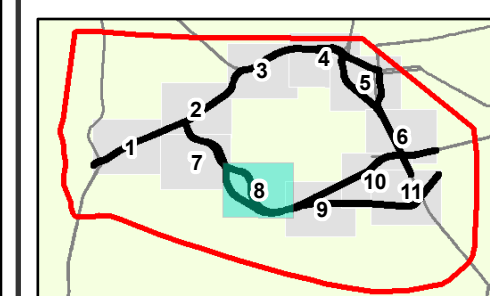
Widening Alternatives  
(Alternatives P, Q, T, and V-AW)  
Page 8 of 11

### Legend

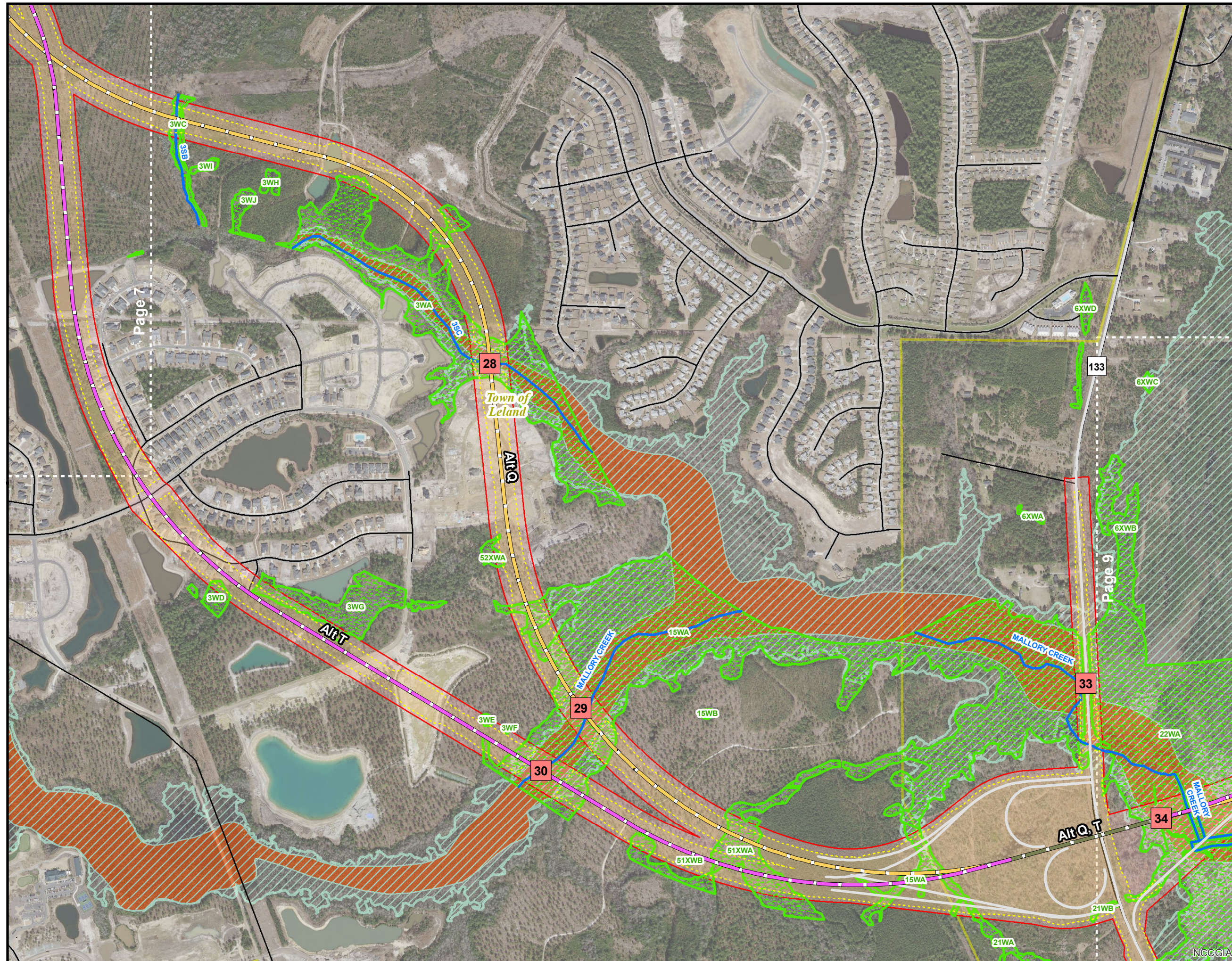
- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
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| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |

### Functional Centerlines

- |      |
|------|
| Q    |
| Q, T |
| T    |



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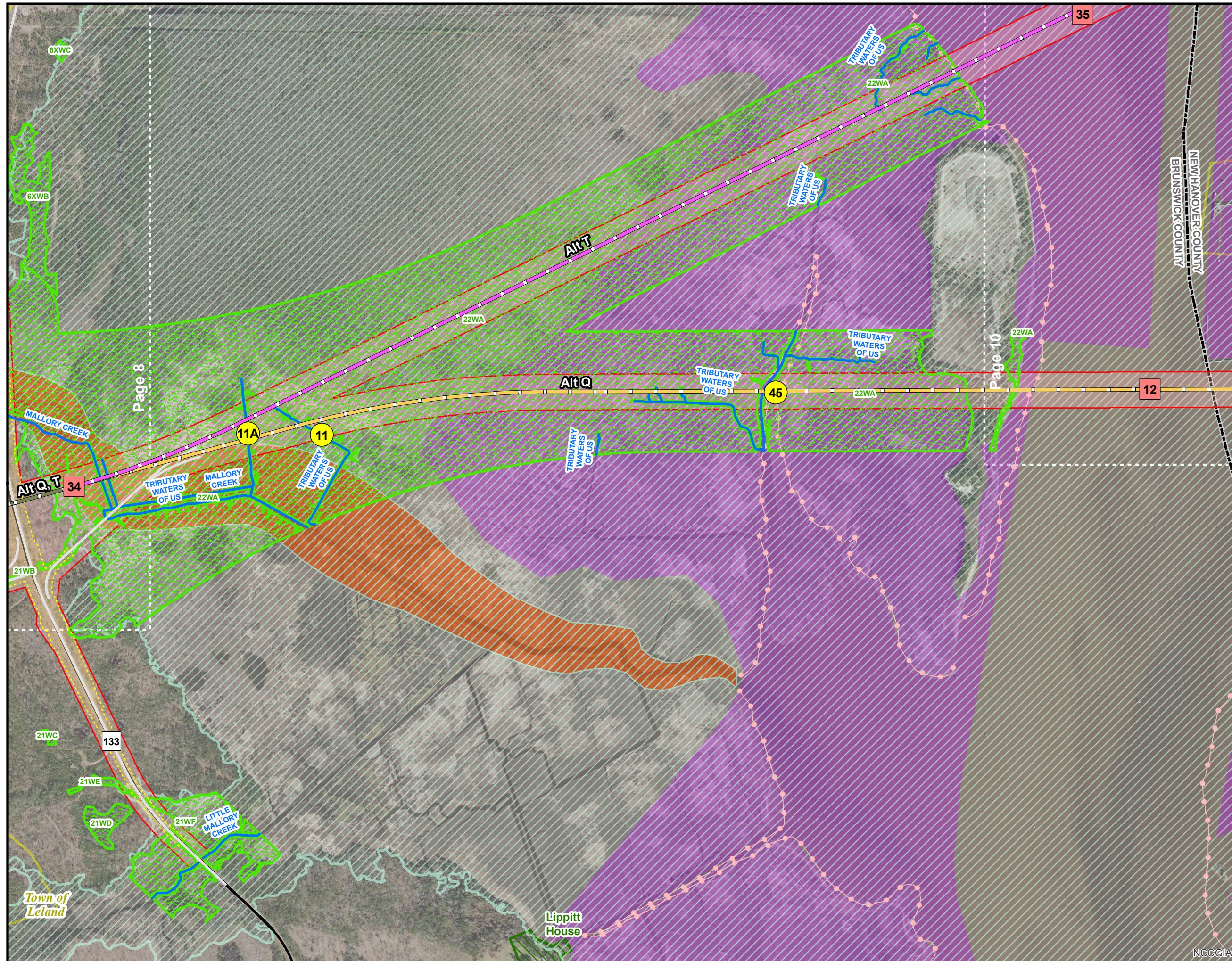


# CAPE FEAR CROSSING

State Transportation Improvement Program  
 Project No. U-4738  
 Concurrence Point 2A



**Figure 3: Environmental Constraints**  
 Widening Alternatives  
 (Alternatives P, Q, T, and V-AW)  
 Page 9 of 11

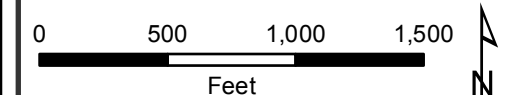
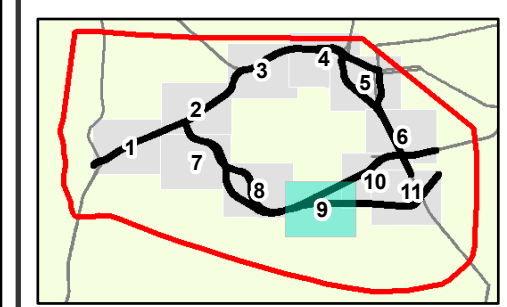


### Legend

- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
| ROW Limits              | Nursing Homes                |
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| Interstate              | Beach Access Site            |
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| NC Highway              | Golf Course                  |
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| Railroad                | Fire Station                 |
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| 303(d) Impaired Stream  | Port of Wilmington           |
| Primary Nursery Area    | Park                         |
| Floodway                | Municipal Boundaries         |
| 100-year Floodplain     | County Boundary              |

### Functional Centerlines

- Q
- Q, T
- T



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# CAPE FEAR CROSSING

State Transportation Improvement Program  
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 Concurrence Point 2A



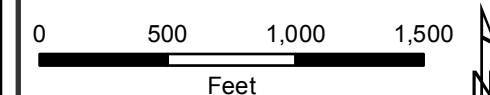
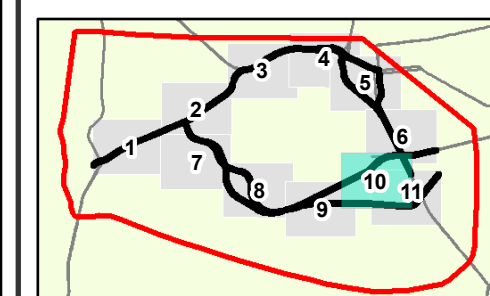
**Figure 3: Environmental Constraints**  
 Widening Alternatives  
 (Alternatives P, Q, T, and V-AW)  
 Page 10 of 11

## Legend

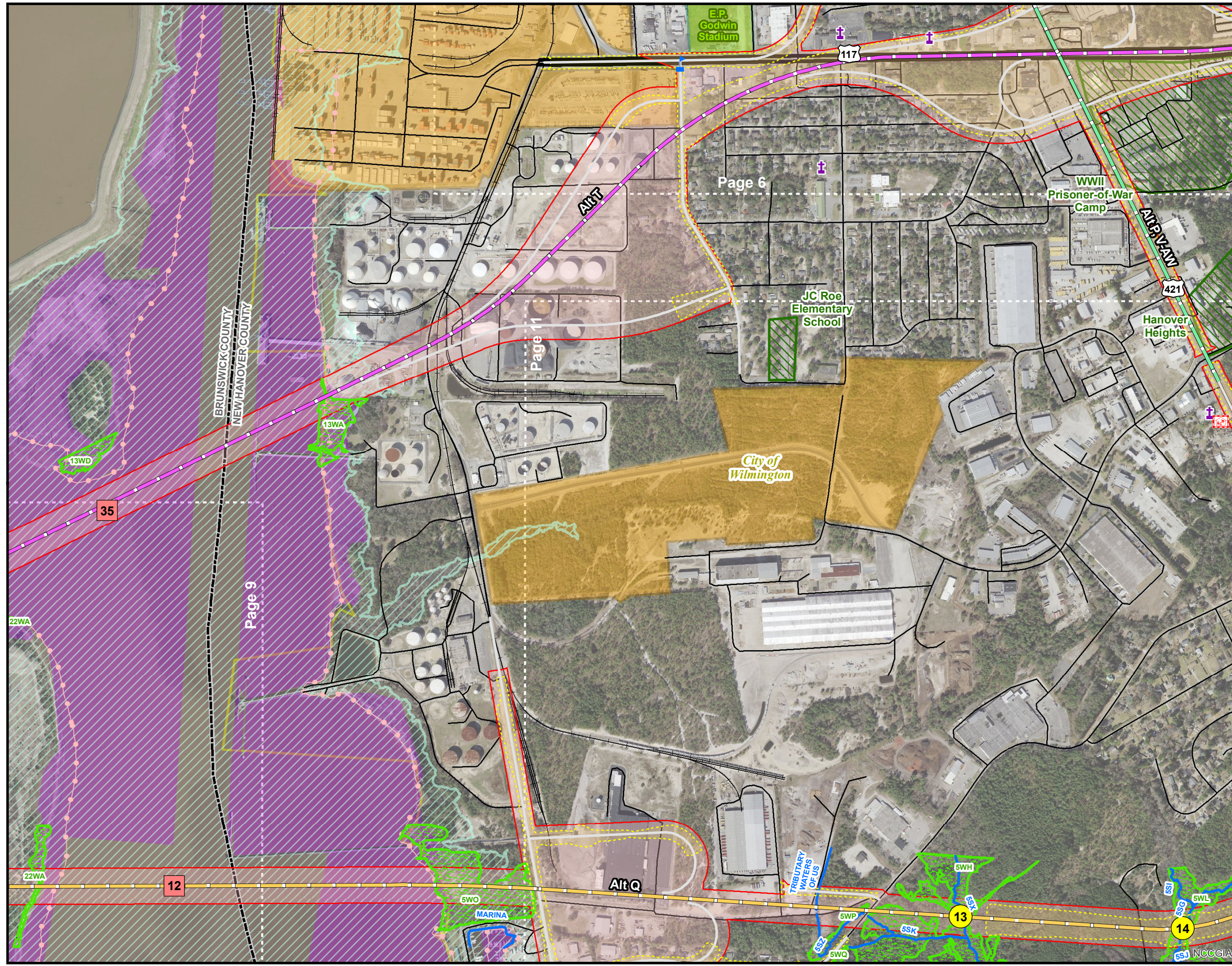
- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
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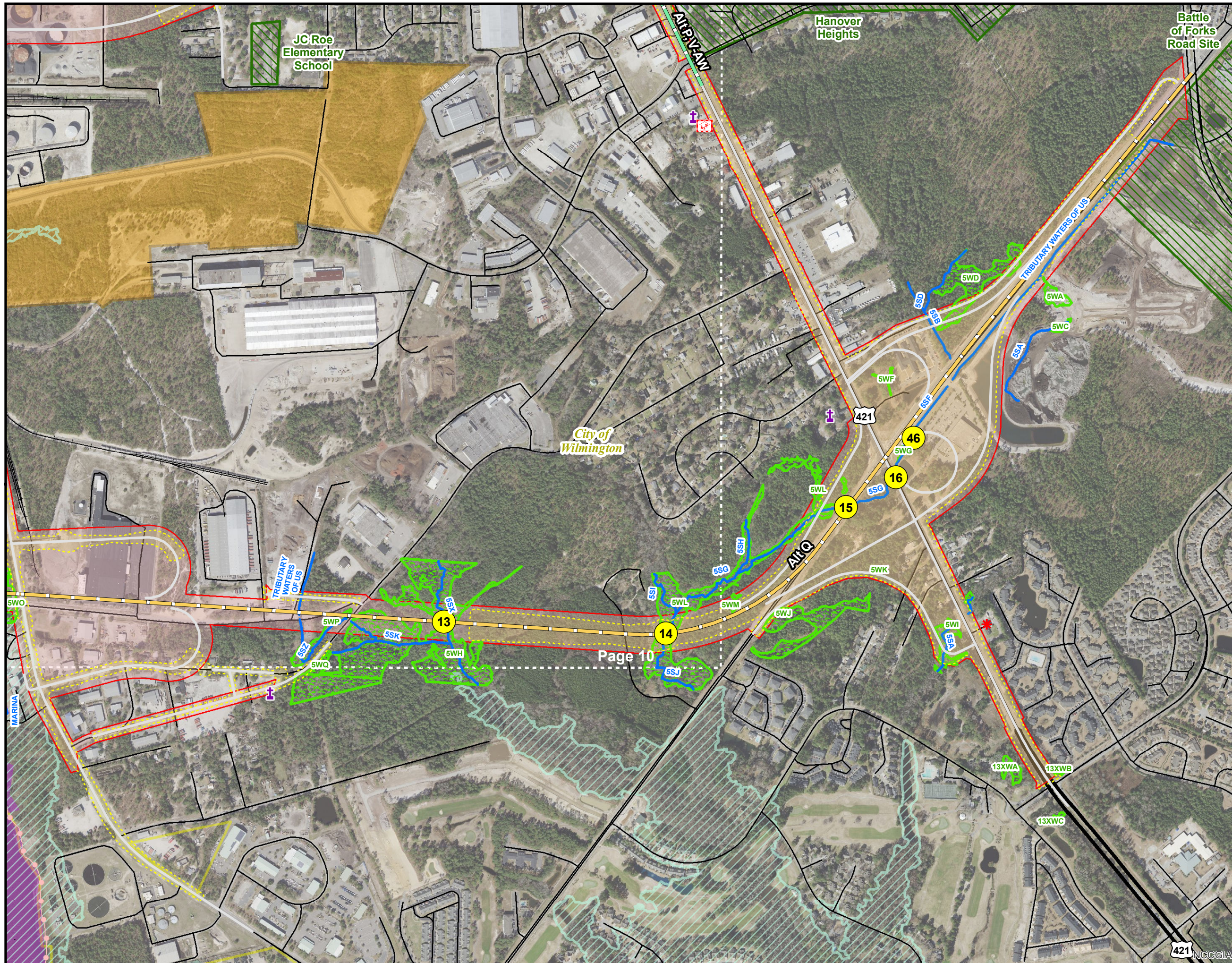
## Floodplains

- |         |
|---------|
| P, V-AW |
| Q       |
| T       |



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**CAPE FEAR CROSSING**  
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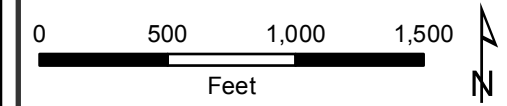
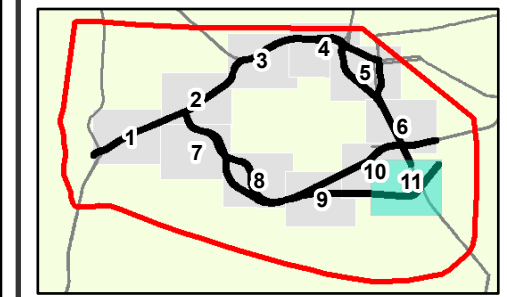
**Figure 3: Environmental Constraints**  
 Widening Alternatives  
 (Alternatives P, Q, T, and V-AW)  
 Page 11 of 11

**Legend**

- |                         |                              |
|-------------------------|------------------------------|
| Project Study Area      | Day Care Facility            |
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**Functional Centerlines**

- P, V-AW
- Q



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