

Avoidance and Minimization

Proposed Hampstead Bypass New Hanover and Pender Counties

State Project 40191.1.2
NCDOT TIP Project R-3300
Corps Action ID 2007 1386



July 12, 2017 at 8:30 a.m.

North Carolina Department of Transportation
Structures Conference Room, NCDOT Century Center Building A
1000 Birch Ridge Drive, Raleigh, NC 27610

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1.0 Introduction and Project Summary

1.1 Purpose of Today's Meeting

The purpose of today's meeting is to present additional design revisions that were developed in an effort to minimize stream and wetland impacts associated with Hampstead Bypass (R-3300). In addition to design refinements to reduce jurisdictional impacts, changes have been made to the design of the Preferred Alternative in consideration of public input regarding local access to the bypass. Formal concurrence on avoidance and minimization will be requested during this meeting.

1.2 Project Description

The North Carolina Department of Transportation (NCDOT) proposes to construct the Hampstead Bypass as a new location, multilane freeway. This project is included in the 2016-2025 State Transportation Improvement Program (STIP) as Project R-3300.

The length of the project is approximately 13.9 miles, extending from the US 17 Wilmington Bypass in New Hanover County to existing US 17 just north of Hampstead in Pender County. The project location is shown in Figure 1.

Project Schedule

Section	Right-of-Way Acquisition	Construction
Section A (US 17 Wilmington Bypass to NC 210)	Spring 2019 *	Fall 2020 *
Section B (NC 210 to US 17 North of Hampstead)	Spring 2019	Fall 2020

*Pending funding availability.

1.3 Purpose of the Proposed Action

The purpose of the project is to improve the traffic carrying capacity and safety of the US 17 and Market Street corridor in the study area.

1.4 NEPA/Section 404 Merger Coordination

Sept. 21, 2006	Concurrence Point 1(Purpose and Need, Study Area)
Aug. 23, 2007	Concurrence Point 2 (Detailed Study Alternatives) The NEPA/Section 404 Merger Team held three meetings between February and August 2007 to review project alternatives and reach concurrence on alternatives to be carried forward for detailed study.
May 27, 2010	Concurrence Point 2A (Bridging and Alignment Review)
Dec. 15, 2011	Informational meeting to review the project status, discuss comments on the DEIS and to identify any additional information needed prior to the selection of the LEDPA.
May 17, 2012	Alternative E-H selected as the Least Environmentally Damaging Practicable Alternative (LEDPA) at the NEPA/Section 404 Merger Team meeting on (Concurrence Point 3).
Jun. 13, 2013	The NEPA/Section 404 merger team concurred on Avoidance and Minimization (Concurrence Point 4A) for Hampstead Bypass.
Jan. 22, 2014	A NEPA/Section 404 merger informational meeting was held to discuss proposed service road locations for Hampstead Bypass and Military Cutoff Road Extension. The merger team also reviewed proposed Lendire Road intersection

	improvements. The merger team requested updated Avoidance and Minimization concurrence forms for Hampstead Bypass and Military Cutoff Road Extension to reflect the changes discussed at the meeting. The merger team also agreed upon avoidance and minimization measures for service road (SR) 6 for the Hampstead Bypass, but did not agree on the locations of all of the proposed service roads for the Bypass.
Jun. 16, 2016	The NEPA/Section 404 Merger Team met to reach agreement on potential design revisions developed in an effort to minimize wetland impacts associated with Hampstead Bypass (R-3300) SR 14. A revised concurrence form to supersede the June 13, 2013 form was signed.

1.5 Current Status

Final design is currently underway for the proposed bypass. Design refinements are currently being developed in an effort to further minimize wetland and stream impacts associated with the Hampstead Bypass (R-3300) project. In selecting its Preferred Alternative, NCDOT considered impacts calculated based on the proposed preliminary design available at that time. However, it is recognized the preliminary design is refined within the Preferred Alternative corridor through final design to address comments from environmental agencies and the public, and to avoid and minimize impacts. Changes in the project design since the last merger meeting are discussed in Sections 3.0 and 4.0.

1.6 Public Involvement

The last public meeting for this project was held on August 15, 2013 at Topsail High School in Hampstead. NCDOT will hold two public meetings in October 2017 to present the proposed design refinements and modifications.

2.0 Preferred Alternative

The Preferred Alternative (Alternative E-H), as detailed in the 2014 State Record of Decision (SROD), begins in New Hanover County at a proposed interchange with the US 17 Wilmington Bypass, approximately midway between I-40 and Market Street. The alternative extends northwest past Sidbury Road into Pender County. The Preferred Alternative turns to the northeast and continues to a proposed interchange with NC 210 east of Island Creek Road. From its interchange at NC 210, the Preferred Alternative extends northeast, crossing Hoover Road north of South Topsail Elementary School and continuing northeast to a proposed interchange with realigned US 17 approximately 0.7 mile west of Grandview Drive. The Preferred Alternative continues north behind the Topsail Schools complex and then turns east to tie into existing US 17, continuing north on existing US 17 to Sloop Point Loop Road. The length of the Preferred Alternative is approximately 13.9 miles, extending from the US 17 Wilmington Bypass in New Hanover County to existing US 17 just north of Hampstead in Pender County.

A new traffic forecast was prepared to update the original 2008 traffic forecast due primarily to its age and the need to have the best available traffic information for design decisions. Following significant data gathering and local input from the county, towns, Metropolitan Planning Organization, school system officials, and others, the forecast was completed in April 2017. This thoroughly reviewed traffic forecast indicates that a four-lane section can accommodate projected traffic volumes for the 2040 design year. As such, the project has been redesigned from six lanes to

four lanes. The associated traffic capacity analysis further indicates that moving the interchange west of Grandview Drive to Hoover Road would work and would not result in traffic concerns on existing US 17. This change in interchange locations would have less wetland impacts than the previous design. The proposed modifications to the Preferred Alternative are shown in Figures 3-3M.

3.0 Additional Avoidance and Minimization Measures Developed During Final Design

The changes and design refinements described in the following paragraphs contribute to a total reduction in wetland impacts of 31.65 acres and stream impacts of 542.99 feet.

Typical Section Modifications – The updated traffic forecast (April 2017) indicates that a four-lane section can accommodate projected traffic volumes for the 2040 design year. As such, the project was redesigned without a six-lane section. Four 12-foot lanes (two in each direction) with 12-foot outside shoulders (10-foot paved) are proposed for the entire length of the Hampstead Bypass. A 46-foot median is proposed for the length of the project. Typical sections as proposed at the 2013 merger meeting are shown in Figure 2A. The current proposed typical section is shown in Figure 2B.

The modified typical section would create less jurisdictional impacts along the project corridor between interchanges (mainline). Collectively, stream impacts along the project mainline are reduced by 687.2 feet and wetland impacts are reduced by 0.98-acre.

US 17 Interchange – The portion of the interchange south of the US 17 Wilmington Bypass is considered part of the Military Cutoff Road Extension (STIP Project U-4751), which connects to the southern terminus of the proposed Hampstead Bypass. The original design of the interchange has changed, necessitating a redesign of the ramp connections. As such, the southbound Wilmington Bypass ramp to northbound Hampstead Bypass will be one continuous flyover bridge instead of three separate bridges with fill in between. The refined design, shown in Figure 3A, reduces fill amounts and stream impacts by combining 3 separate bridges into a single 1,375-foot long bridge. Design modifications in the vicinity of the US 17 interchange at the southern terminus would reduce wetland impacts by 0.36-acre and stream impacts by approximately 96.03 feet. This refinement also creates potential opportunities to further minimize impacts to jurisdictional impacts within the interchange and will be investigated as final design progresses.

NC 210 Interchange – Based on the updated traffic forecast, the loop in the northeast quadrant is not required for design year 2040. Removal of the loop allows for an alternate ramp design in the northeast quadrant to minimize wetland impacts. The ramps in the northwest and southeast were slightly realigned to accommodate future loops while minimizing wetland and stream impacts. The NC 210 interchange is shown in Figure 3G.

Design refinements at the NC 210 interchange would reduce wetland impacts by 5.91 acres and stream impacts by approximately 298.68 feet, including 1.03 acres of impact to a high quality riparian wetland (LWB).

Interchange West of Grandview Drive – Based on the new forecast and the associated traffic capacity analysis along with public input, the proposed interchange to be constructed west of Grandview Drive was moved to Hoover Road. Public comments have questioned the lack of access to South Topsail Elementary School from the proposed bypass, and how the lack of direct access would require additional travel via a service road or existing US 17.

Several interchange designs were considered at Hoover Road including a half clover-leaf and a tight diamond. These configurations would either result in design occurring outside of the corridor limits or in substantial stream and wetland impacts, therefore a hybrid clover/diamond configuration was developed that would remove the need for a ramp in the northeast quadrant. The Hoover Road interchange currently proposed is shown in Figure 3I.

Moving the proposed interchange south of Topsail Schools from west of Grandview Drive to Hoover Road will also eliminate the need to construct a roadway on new location to connect existing US 17 with the proposed interchange. The former and current design in this area is shown in Figures 3I, 3J, and 3M. This change will create a net reduction in wetland impacts of 13.11 acres. Because there are no streams located in the area of the former interchange west of Grandview Drive, this change would create 21.68 feet of impact to perennial stream LSD and 393.35 feet of impact to intermittent stream LSDA. Stream impacts in this area are offset by a total stream impact reduction of 542.99 feet. It is also noted that LSDA has a DWR score of 24 as shown in Table 1.

Interchange North of Topsail Schools – This interchange was redesigned to improve traffic flow by reducing the number of phases at the traffic signal with existing US 17 while reducing the interchange footprint and providing enhanced connectivity to properties on the east side of existing US 17. It also helps reduce the speed of bypass traffic accessing the existing US 17 corridor. This change will reduce wetland impacts by 10.44 acres and stream impacts by 197.15 feet. The proposed new design for the interchange north of Topsail Schools is shown on Figure 3K.

Design Modifications at Northern Terminus – The design of the proposed project in the area between the interchange north of Topsail Schools and Sloop Point Loop Road has been refined in order to reduce wetland impacts. This change will reduce wetland impacts by 0.84 acres and stream impacts by 73.26 feet. The proposed new design in this area is shown on Figure 3L.

Hydraulic recommendations, as discussed in Section 4.2, result in further minimization to fill and linear stream impacts. As the hydraulic design is revised to accommodate a 4-lane section, further reductions in culvert lengths are anticipated, which will further decrease stream and potentially wetland impacts.

4.0 Other Project Updates

4.1 Other Design Changes

The refined 4-lane design allows the median shoulder and outside shoulder widths to be reduced. In addition, the shoulder to ditch width has been reduced from 18 feet to 15 feet. The proposed typical section with new dimensions can be seen in Figure 2B.

4.2 Current Hydraulic Recommendations

Hydraulic structure modifications from the February 2013 CP 4A meeting are recommended for three sites – Site Nos. 10, 15, and 16. The locations of hydraulic sites are displayed on Figures 3-3M. Site 10 previously recommended retaining the 72” rough corrugated pipe (RCP) pipes under the US 17 Wilmington Bypass and adding 72” RCP pipes at two interchange ramps. The refined design, shown in Figure 3A, reduces fill amounts, and allows the combination of three separate bridges into a single 1,375-foot long bridge. Dual 230-foot long bridges were recommended at Site 15 at the 2013 CP4A meeting. After design refinements, dual 229-foot long bridges are now recommended. Recommended hydraulic structures at Site 16 were dual 200-foot long bridges in 2013. The refined 2017 design now proposes dual 201-foot bridges. There are no proposed design modifications to the remainder of the hydraulic sites. Culvert lengths are to be re-evaluated during hydraulic design and will be adjusted based on the four-lane typical section. Current hydraulic recommendations meet or exceed the structure recommendations concurred on by the merger team at CP2A and CP 4A.

4.3 Federally-Protected Species

Since the publication of the State Record of Decision (SROD), two additional species have been added to the federally-protected species list for New Hanover and Pender Counties. These species include northern long-eared bat (NLEB) (*Myotis septentrionalis*), which is only listed for New Hanover County, and rufa red knot (*Calidris canutus rufa*), which is listed for both counties. NCDOT will coordinate with federal and state regulatory and resource agencies to ensure compliance with the Endangered Species Act (ESA) through the project’s permitting process.

4.4 Indirect and Cumulative Effects

An indirect and cumulative effects (ICE) screening was prepared in May 2017 as an addendum to the 2013 Land Use Scenario Assessment (LUSA) to evaluate potential ICEs within the Hampstead area should an interchange at Hoover Road be included in the proposed project. The ICE determined population growth and development in the area is expected regardless of the potential interchange at Hoover Road, however, the interchange may alter the rate and type of development along Hoover Road from residential to a mix of residential/commercial/mixed use development. The ICE also concluded the proposed Hampstead Bypass would contribute to cumulative effects on environmental resources, with or without the Hoover Road interchange. Hampstead is within planned or managed areas, and anticipated development would be planned and controlled by local plans and ordinances.

Table 1
Individual Stream Impacts

Stream ID	Stream Name ¹	Figure No.	DWR Score	USACE Score	Compensatory Mitigation	Stream Determination	Stream Impacts (linear feet)		
							@ CP4A Jun. 2016	2017 Update ³	Change
FSA	UT to Island Creek	3A	36.75	45	Yes	Perennial	2131.70	2035.67	-96.03
FSE	UT to Island Creek	3B	28.75 ²	50	Yes	Perennial	331.14	340.93	9.79
FSH	UT to Island Creek	3B	27.5	44	Yes	Intermittent	135.4	130.17	5.23
FSI	UT to Island Creek	3B	37.75	45	Yes	Perennial	273.54	295.8	22.26
FSJ	UT to Island Creek	3A	22.5	32	Yes	Intermittent	858.61	858.61	0.00
HBSAA	UT to Island Creek	3C	24.5	69	Yes	Intermittent	141.44	232.36	90.92
HBSC	UT to Island Creek	3D	--- ²	53	Yes	Perennial	350.19	353.92	3.73
HBSD(1)	UT to Island Creek	3D	32.75	42	Yes	Perennial	116.54	117.45	0.91
			26	42	Yes	Intermittent	161.22	157.72	-3.50
HBSH	UT to Island Creek	3C	26	40	Yes	Intermittent	319.9	334.25	14.35
HSC	UT to Harrison Cr.	3E/F	20.5 ²	54	Yes	Perennial	407.74	553.49	145.75
HSX	UT to Harrison Cr.	3F	30.5	67	Yes	Perennial	309.65	268.13	-41.52
HSB		3F					0	0	0.00
LSB	UT to Harrison Cr.	3G	37.5	66	Yes	Perennial	1,397.92	1099.24	-298.68
LSC	Harrison Creek	3H	41.5	64	Yes	Perennial	861.25	647.23	-214.02
LSCA	UT to Harrison Cr.	3H	--- ²	58	Yes	Intermittent	335.91	332.09	-3.82
			30	58	Yes	Perennial	107.15	126.91	19.76
LSCAA	UT to Harrison Cr.	3H	20.5 ²	39	Yes	Perennial	206.03	229.79	23.76
LSCB	UT to Harrison Cr.	3H	26 ²	44	Yes	Perennial	298.17	289.22	-8.95
LSCC	UT to Harrison Cr.	3H	28 ²	52	Yes	Perennial	272.97	232.26	-40.71
LSCF	UT to Harrison Cr.	3H	27	39	Yes	Intermittent	120.32	53.38	-66.94
LSD	Godfrey Creek	3I	45	48	Yes	Perennial	277.95	299.63	21.68
LSDA	UT to Godfrey Cr.	3I	22.75	24	Yes	Intermittent	194.97	588.32	393.35
NSA	UT to Nixons Cr.	3L	--- ²	31	Yes	Perennial	110.32	44.14	-66.18
			16	31	Yes	Intermittent	344.21	337.13	-7.08
NSF	UT to Old Topsail Cr.	3K	--- ²	29	Yes	Perennial	290.02	970.55	680.53
			22.25	29	Yes	Intermittent	483.38	0	-483.38
ZSK	UT to Prince George Cr.	---	18.5 ²	35	Yes	Perennial	593.51	0	-593.51
ZSL	UT to Prince George Cr.	---	30.5	35	Yes	Perennial	40.23	0	-40.23
							11,471.38	10,928.39	-542.99

NOTES: 1 Island Creek, Harrison Creek, Godfrey Creek, and Prince George Creek are classified C; Sw. Nixons Creek and Old Topsail Creek are classified SA; HQW. Stream HBSF (Island Creek) is bridged at Site 15, eliminating impacts to this stream.
2 Initial stream determination was revised based on conditions at the time of the regulatory agency field review.
3 Stream HSB was added after jurisdictional review, therefore not included in the 2013 CP4A calculations.

Table 2
Individual Surface Water Impacts

Feature ID	Figure No.	Appearance or Name	Connection or Compensatory Mitigation Requirement	Impacts (acres/square feet)			Additional Information
				@ CP4A Feb. 2013	2017 Update	Change	
IPE	3G	Stormwater Pond	No Connection	0.27	0.26	-0.01	No permit found
JPD	3M	Cypress/Gum Depression	KWG	1.71	0	-1.71	
KPB	3M	Cypress/Gum Depression	KWA/KWG	0.34	0	-0.34	
LPB	3H	Manmade/Maintained	LWF	0.38	0.38	0	
LPD	3G	Manmade/Maintained	LWA	0.02	0.004	-0.02	
LPE	3H	Manmade/Maintained	No Connection	0.36	0.38	0.02	
NPA	3K	Small Borrow Pond	No Connection	0.01	0.02	0.01	
NPC	3K	Stormwater Pond	No Connection	0.06	0	-0.06	Permit No. SW8 040431, Coastal Mini Storage & Caisson Yachts, High Density Project, Valid: 7/20/04-7/20/14
NPE	3K	Water Treatment Pond	No Connection	0.70	0.67	-0.03	
FSH	3B	UT to Island Creek ¹	Compensatory Mitigation Not Required ²	2,327.58 sq. ft.	2,060.56 sq. ft.	-267.02 sq. ft.	OHWL ⁴ , USACE Score 44
FSH	3B	UT to Island Creek ¹	Compensatory Mitigation Not Required ³	905.67 sq. ft.	805.04 sq. ft.	-100.63 sq. ft.	OHWL ⁴ , USACE Score 44
NDITCH1 ⁵	3K	UT to Old Topsail Creek ¹	Compensatory Mitigation Not Required ^{2,3}	1,558.08 sq. ft.	0 sq. ft.	-1,558.08 sq. ft.	OHWL ⁴
ZTRIB1 ⁵	STIP U-5732	UT to Old Topsail Creek ¹	Compensatory Mitigation Not Required ³	181.2 sq. ft.	214.2 ⁶	33	OHWL ⁴

- NOTES: 1 Island Creek is classified C; Sw. Old Topsail Creek is classified SA; HQW.
2 Tributary feature does not require stream mitigation but may require mitigation by the USACE as a "Water of the US" dependent upon the type of impact proposed at the time of permit application.
3 Tributary feature exists within the boundaries of an adjacent wetland and therefore does not require mitigation independent of the wetland.
4 Tributary waters determined to be jurisdictional based on the presence of an ordinary high water mark (OHWM). These waters are classified as 'Waters of the US' (impacts calculated in sq. ft.) and will not require compensatory mitigation.
5 ZTRIB1 and NDITCH1 were added during Jurisdictional review based on current site conditions.
6 Updated impacts to surface waters along the US 17 corridor south of the northern terminus are not shown in this table. This area is outside the project limits for R-3300 at the time of the public hearing. Figure 3K shows the northern terminus of the preferred alternative at the time of the public hearing design as well as the current project limits.

Table 3
Individual Wetland Impacts

Wetland ID	Figure No.	Cowardin Classification ¹	Hydrologic Classification	DWR Wetland Rating	Wetland Impacts (acres)		
					@ CP4A Jun. 2016	2017 Update ⁵	Change
FWB	3A	PFO	Riparian	20	5.01	4.71	-0.30
FWC ²	3B	PFO	Riparian	48	1.45	1.52	0.07
FWF	3C	PFO	Non-riparian	37	5.81	5.58	-0.23
			Riparian	37	1.08	1.05	-0.03
FWHB	3C	PFO	Non-riparian	24	0.04	0.01	-0.03
FWI	3C	PFO	Non-riparian	17	0.38	0.37	-0.01
FWL	3C	PFO	Non-riparian	19	0.03	0.00	-0.03
FWY	3A	PFO	Non-riparian	20	0.18	0.12	-0.06
HBAA3	3C	PSS/PFO	Riparian	32	0.06	0.35	0.29
HBAB	3C	PSS/PFO	Non-riparian	27	1.09	1.02	-0.07
HBWD ⁴	3D	PSS/PFO	Riparian	83	1.19	1.93	0.74
HBWF	3D	PEM/PSS	Riparian	32	0.78	0.79	0.01
HBWK5	3D	PFO/PSS	Riparian	83	1.47	1.75	0.28
HBWT	3D	PSS	Non-riparian	14	0.39	0.39	0.00
HWAA ⁶	3E	PFO	Riparian	40	1.64	1.58	-0.06
			Non-riparian	40	8.52	8.51	-0.01
HWB	3F	PFO	Riparian	50	2.31	2.06	-0.25
HWD	3F	PFO	Non-riparian	21	0.35	0.34	-0.01
HWG ⁷	3F	PFO/PSS	Riparian	15	0.87	0.97	0.10
HWH	3F	PFO	Non-riparian	26	0.15	0.15	0.00
HWH1	3F	PFO	Non-riparian	26	0.08	0.08	0.00
HWH2	3F	PFO	Non-riparian	26	0.03	0.03	0.00
HWH3	3F	PFO	Non-riparian	26	0.07	0.07	0.00
HWH4	3F	PFO	Non-riparian	26	0.02	0.00	-0.02
HWH5	3F	PFO	Non-riparian	26	0.23	0.23	0.00
HWHH	3D	PFO	Non-riparian	34	0.9	0.88	-0.02
HWMX	3F	PFO	Non-riparian	40	0.05	0.05	0.00
HWY	3F	PFO	Non-riparian	26	0.17	0.18	0.01
HWZ	3F	PFO	Non-riparian	21	0.01	0.06	0.05
IWA	3G	PFO	Riparian	80	0.03	0.00	-0.03
IWB	3G	PFO	Riparian	25	0.15	0.03	-0.13

Table 3
Individual Wetland Impacts

Wetland ID	Figure No.	Cowardin Classification ¹	Hydrologic Classification	DWR Wetland Rating	Wetland Impacts (acres)		
					@ CP4A Jun. 2016	2017 Update ⁵	Change
IWC	3G	PFO	Riparian	20	0.22	0.30	0.08
IWD	3G	PFO	Non-riparian	31	17.72	13.69	-4.03
			Riparian	31	0.39	0.06	-0.33
IWE	3G	PFO	Non-riparian	13	0.16	0.16	0.00
KWG	3M	PFO1/2G	Non-riparian	43	0.71	0.00	-0.71
LWA	3G	PFO	Riparian	70	0.13	0.00	-0.13
LWB	3G	PFO	Riparian	72	7.81	6.78	-1.03
LWD	3H	PFO	Riparian	83	5.84	4.97	-0.87
LWD1	3H	PFO	Riparian	48	0.08	0.08	0.00
LWE	3H	PFO	Non-riparian	29	0.49	0.61	0.12
LWF	3H	PFO	Non-riparian	11	0.1	0.09	-0.01
LWG	3H	PFO	Non-riparian	46	0.01	0.03	0.02
LWH	3H/I	PFO	Non-riparian	23	0.01	0.03	0.02
LWI	3H/I	PFO	Riparian	80	2.5	2.63	0.13
LWJ	3I/M	PFO	Non-riparian	40	5.51	8.29	2.78
LWK	3I	PFO	Riparian	78	0.36	0.39	0.03
LWL	3I	PFO	Riparian	76	0.28	0.31	0.03
MWA	3K	PSS/PFO	Non-Riparian	36	0	0.00	0.00
MWM(2)	3G	PFO	Riparian	68	0.09	0.11	0.02
			Non-riparian	68	2.61	2.28	-0.33
NWA	3L	PFO	Non-riparian	12	0.01	0.00	-0.01
NWB	3L	PEM/PFO	Non-riparian	13	0.04	0.00	-0.04
NWE	3L	PEM/PFO	Non-riparian	12	0.03	0.02	-0.01
NWF	3L	PEM/PSS	Non-riparian	12	0.05	0.00	-0.05
NWJ	3K	PSS/PFO	Non-riparian	12	0.1	0.00	-0.10
NWK	3K	PSS	Non-riparian	12	0.04	0.00	-0.04
NWM	3K	PFO	Non-Riparian	22	1.01	0.47	-0.54
NWO	3I	PFO4	Non-riparian	17	3.69	1.15	-2.54
NWP	3I/J	PSS	Non-riparian	17	32.31	19.61	-12.70
PD-09	3J/K	PFO/PSS	Non-riparian	N/A	0	0.47	0.47
PD-11	3J/K	PFO/PSS	Non-riparian	N/A	0.04	0.16	0.12

Table 3
Individual Wetland Impacts

Wetland ID	Figure No.	Cowardin Classification ¹	Hydrologic Classification	DWR Wetland Rating	Wetland Impacts (acres)		
					@ CP4A Jun. 2016	2017 Update ⁵	Change
PD-15	3J/K	PFO/PSS	Non-riparian	N/A	0.53	0.26	-0.27
PD-16	3J/K	PFO/PSS	Non-riparian	N/A	0.63	0.73	0.10
PD-29	3J/K	PFO/PSS	Non-riparian	N/A	10.40	10.13	-0.27
PD-31	3J/K	PFO/PSS	Non-riparian	N/A	2.02	1.62	-0.40
PD-32	3K	PFO/PSS	Non-riparian	N/A	2.44	0.73	-1.71
			Riparian	N/A	0.92	0.09	-0.83
PD-33	3K	PFO/PSS	Non-riparian	N/A	7.79	4.64	-3.15
			Riparian	N/A	0.67	1.98	1.31
PD-34	3K	PFO/PSS	Non-riparian	N/A	2.3	0.00	-2.30
PD-35	3K	PFO/PSS	Non-riparian	N/A	7.24	3.48	-3.76
ZWCC	3L	PFO	Riparian	28	0.06	0.01	-0.05
ZWDD	Outside design limits	PFO	Non-riparian	26	0.92	0.00	-0.92
					152.80	121.15	-31.65

- NOTES: 1 Cowardin classifications are based on characteristics of each wetland at the specific time and location of observation. Wetlands having 'No ID' were not characterized due to impacted appearance at the time of observation.
2 Includes wetland FEW
3 Includes wetland HBAC.
4 Bridging at Site 16 reduces wetland impacts to HBWD from 1.71 acres to 1.19 acres.
5 Updated wetland impacts include an additional 5.48 acres of wetland impacts associated with Service Roads 5, 11, 13, 14, and 17, which were not in the design at the time of the 2013 CP4A Meeting.
6 Includes wetlands HWBB, HWII, HWLL
7 Includes wetlands HWM, HWN, HWO

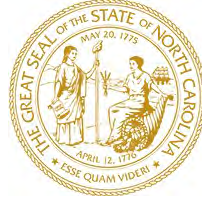
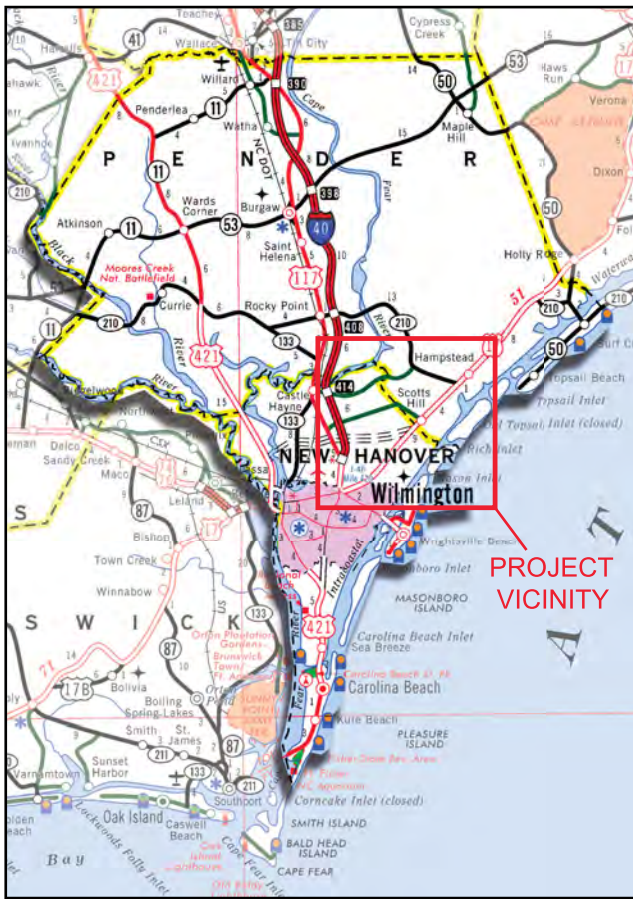
Table 4
Impact Summary Table

Feature	@ CP4A Jun. 2016	2017 Update	Change
Length (miles)	13.9	13.9	---
Delineated Wetland Impacts (acres)	152.80 ¹	121.15	-31.65
Delineated Stream Impacts (linear feet)	11,471 ²	10,928	-543
Feature	@ CP4A Feb. 2013	2017 Update	Change
Delineated Surface Water Impacts			
Stormwater ponds with a connection to tributary waters (acres)	2.45	0.38	-2.07
Stormwater ponds with no connection to tributary waters (acres)	1.4	1.33	-0.07
Jurisdictional tributaries based on the presence of an Ordinary High Water Mark (OHWM) (square feet/acres)	4,972.53/0.11	3,080/0.07	-1,892.53/-0.04
Displacements ³			
Residential	40	44	4
Business	12	11	-1
Non-profit	2	2	---
Red-cockaded Woodpecker Foraging Habitat Impact (acres)⁴	13.36	6.24	-7.12
Other Federally-Protected Species Impacts	No	No ⁵	---
Natural Heritage Areas, Managed Areas, Wetland Mitigations Sites (acres) ⁶	0.04	---	---
Prime Farmlands/Farmlands of Statewide Importance (acres) ⁷	68	83.39	15.39
Forest (acres) ⁷	410	444.03	34.03
100 Year Floodplain and Floodway Impacts (acres) ⁸	28.69	28.91	0.22
Historic Properties (no.)	0	0	---
Noise Receptor Impacts ⁹	110	TBD	TBD
Recorded Archaeological Sites (no.)	0	0	---
Wildlife Refuge/Game Lands (acres)	0	0	---
Recreational Areas/Parks (no.)	0	0	---
High Quality Waters Watershed (HQW, ORW, WS Protected or Critical Areas) (acres)	17.06	17.06	---
Cemeteries (no.)	1	1	---
Potential UST / Hazmat Sites (no.)	1	1	---
Total Cost (in millions)	\$213	TBD	TBD

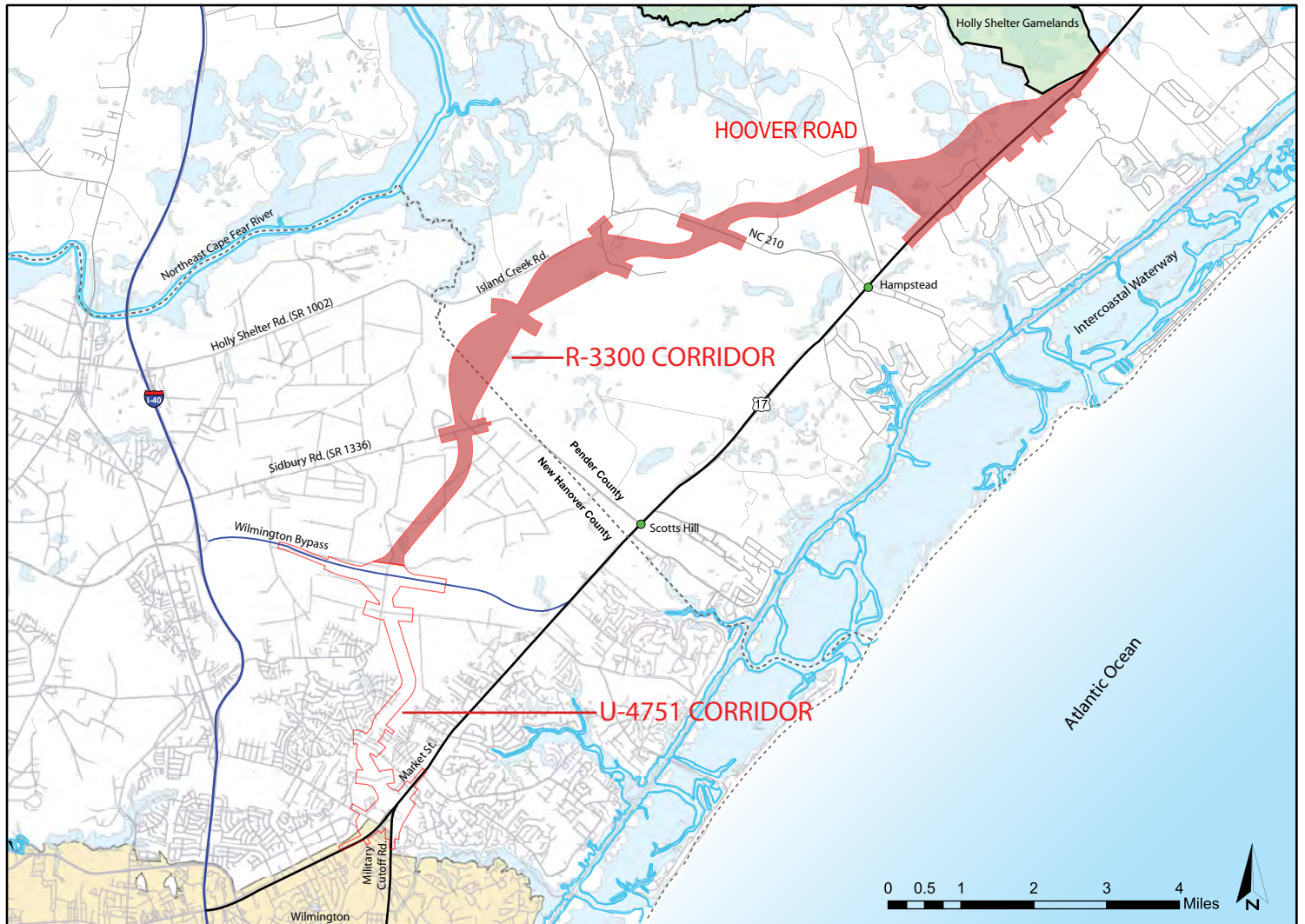
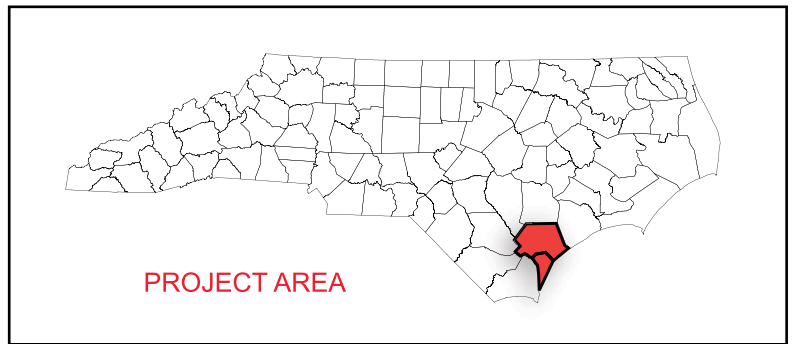
- NOTES: 1 The initial impact quantity reflects total wetland impact quantities based on the last CP4A meeting in June 2016.
2 There were no stream impacts associated with the service road decisions made at the CP4A meeting in June 2016. The initial impact quantity reflects total stream impact quantities as of June 2016.
3 2017 updates reflect an increase of 8 residential relocations associated with service roads. Moving the interchange to Hoover Road created 1 additional residential relocation in the Hoover Road area but eliminated 5 residential relocations within the former interchange west of Grandview Drive. One business relocation would be avoided by moving the interchange to Hoover Road.
4 RCW habitat was surveyed in 2008, and a foraging habitat analysis was conducted in 2009 (updated 2011-2012). RCW habitat was confirmed via aerial imagery in 2017.
5 New listed species have been added for Pender and New Hanover Counties since the approval of the biological opinion. NCDOT will continue coordination with USFWS to ensure ESA compliance.
6 The 0.04-acre impact identified in the 2013 CP4A impact summary table reflects impacts to the Corbett Tract Mitigation Site on the south side of the US 17 Wilmington Bypass. The Wilmington Bypass splits the Military Cutoff Road Extension project (STIP No. U-4751) and the Hampstead Bypass; therefore, there are no impacts to mitigation sites associated with the Hampstead Bypass project.
7 Updated impacts reflect the addition of forested land and farmland within the right-of-way for service roads and the Hoover Road interchange, which were not in the design in 2013.
8 Updated impacts reflect the addition of floodplain areas within the construction limits for service roads and the Hoover Road interchange, which were not in the design in 2013.
9 Impacted noise receptors will be updated in a Design Noise Report and recommended noise barrier locations will be reviewed.

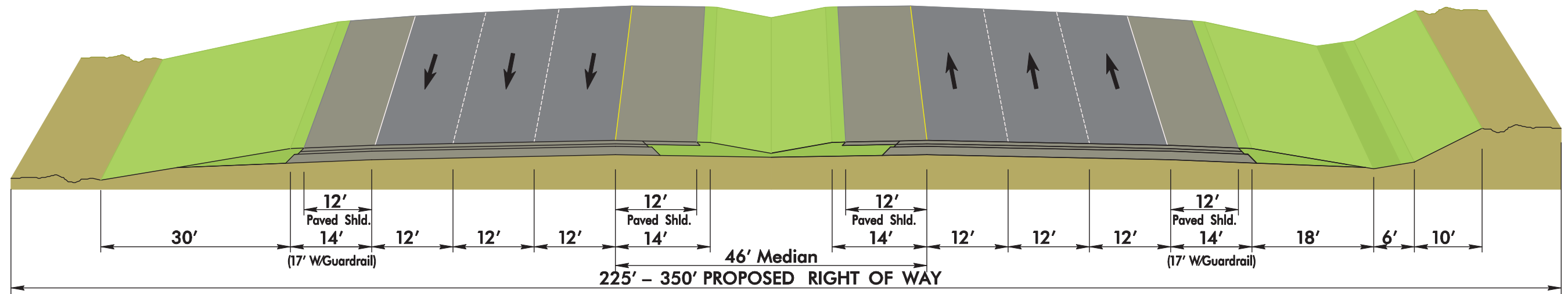
Figure 1

PROJECT VICINITY
US 17 Corridor Study
NCDOT TIP Nos. U-4751 and R-3300
New Hanover and Pender Counties

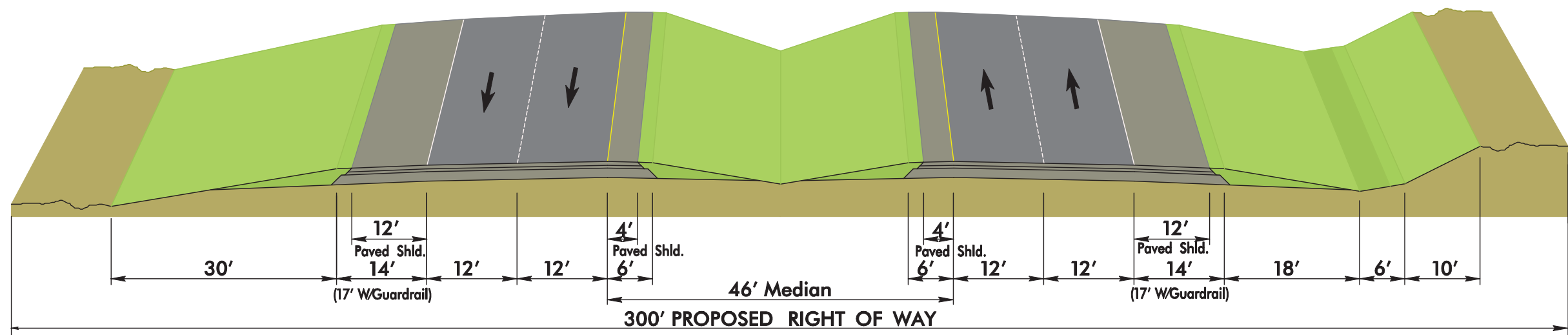


North Carolina
Department of Transportation

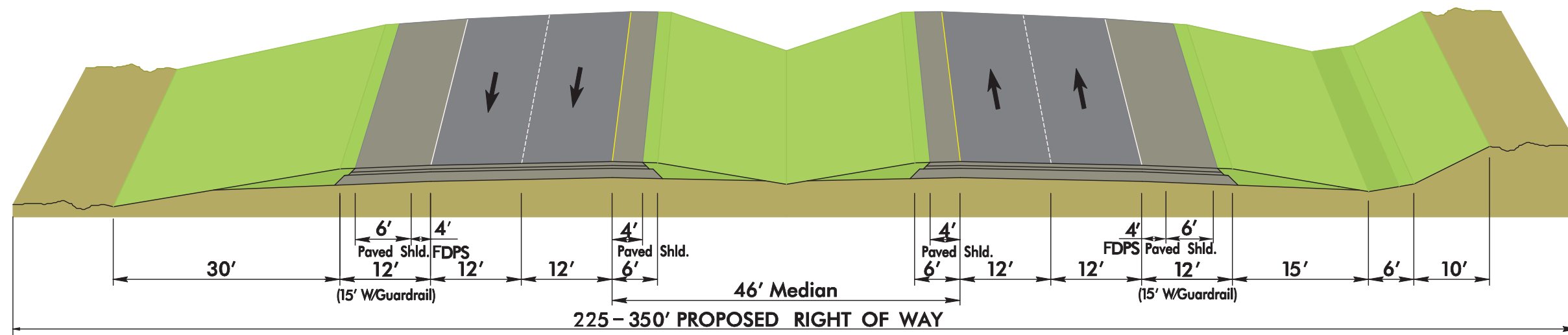





Alternative EH - From Proposed Hampstead Bypass Interchange at US 17 Wilmington Bypass to Proposed Hampstead Bypass Interchange at NC 210 and From Proposed Hampstead Bypass Interchange with Realigned US 17 Approximately 0.7 Mile West of Grandview Drive to Sloop Point Loop Road



Alternative EH - From Proposed Hampstead Bypass Interchange at NC 210 to Proposed Hampstead Bypass Interchange with Realigned US 17 Approximately 0.7 Mile West of Grandview Drive



Prepared by: 

Prepared for: 



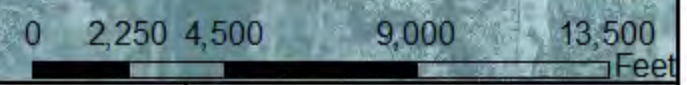
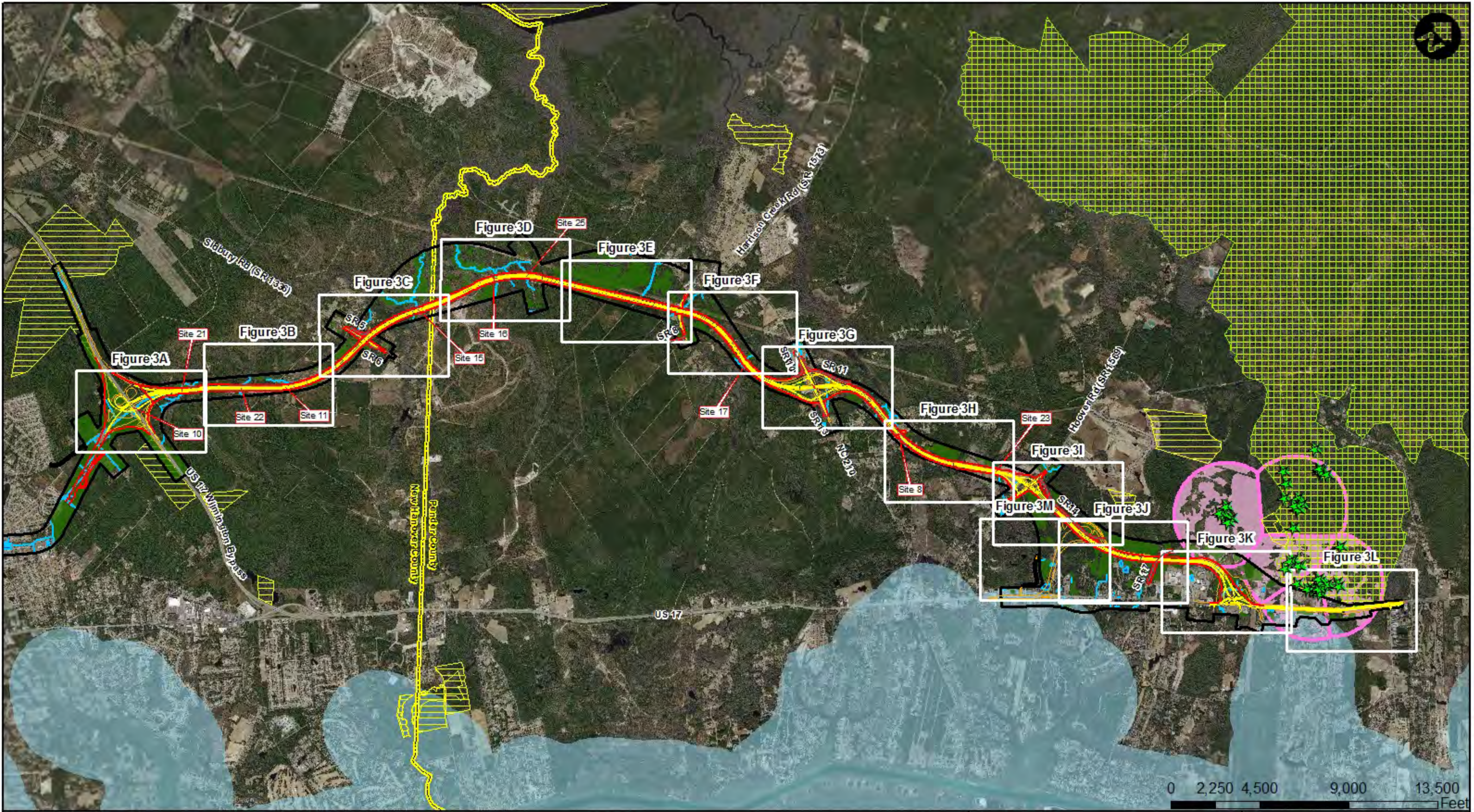
Hampstead Bypass 2017 CP4A Typical Section
 US 17 Corridor Study
 NCDOT TIP Project Number R-3300
 New Hanover & Pender Counties, NC

Not to Scale

Figure Prepared 1/15/2013. Modified 6/28/2017.

Figure No.

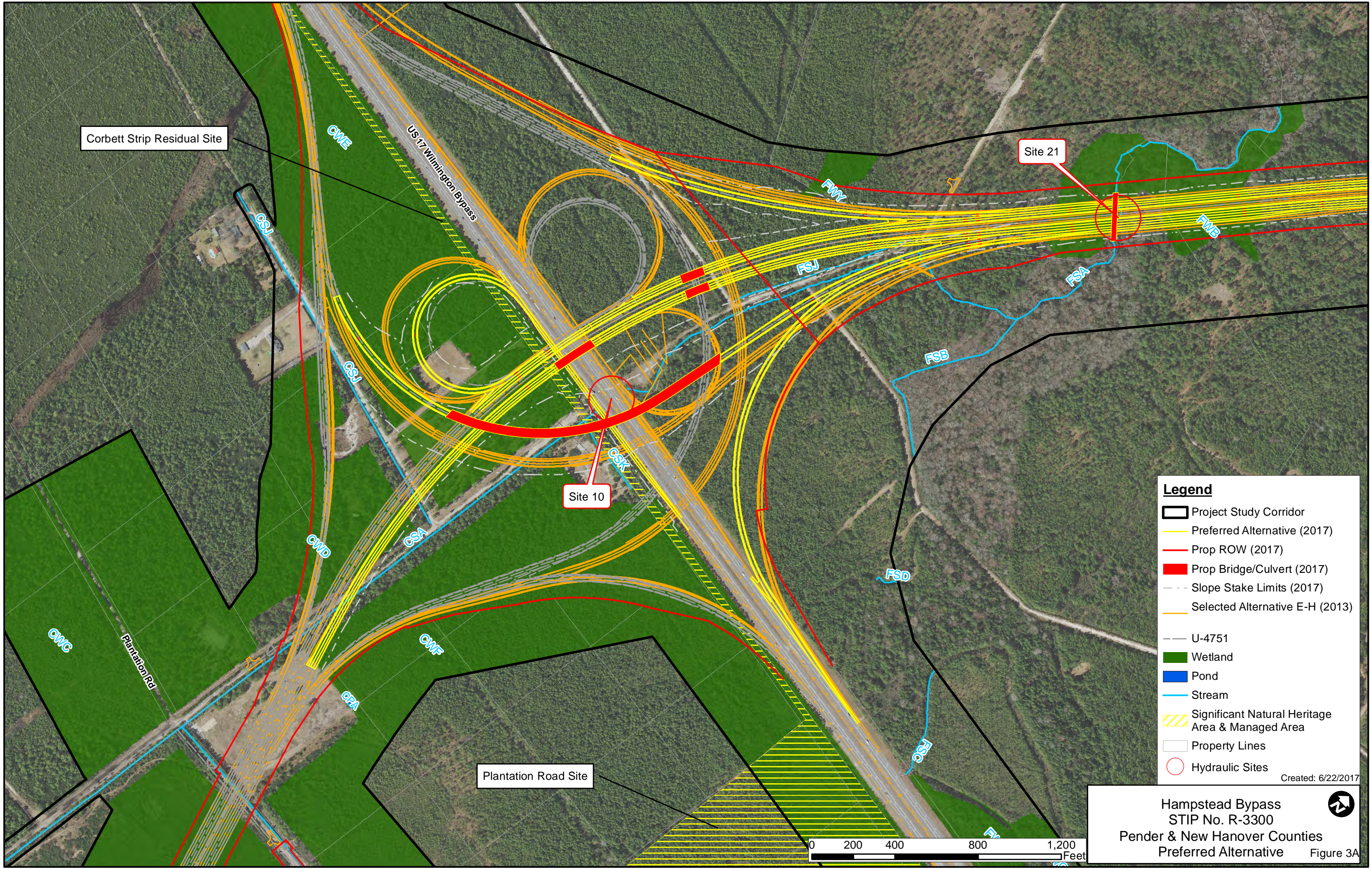
2B



Legend			
Project Study Corridor	R-3300 (2013)	Holly Shelter Game Land	RCW Cavity Tree
R-3300 (2017)	Wetland	Significant Natural Heritage Area & Managed Area	RCW Partitions
Prop ROW	Pond	County Boundary	RCW Suitable & Potentially Suitable Habitat (2012)
Prop Bridge/Culvert	Stream	HQW/ORW	

Hampstead Bypass
STIP No. R-3300
Pender & New Hanover Counties

Figure 3
Preferred Alternative Map



Corbett Strip Residual Site

Site 21

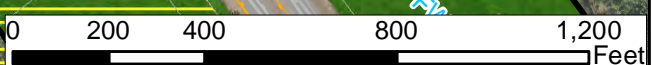
Site 10

Plantation Road Site

Legend

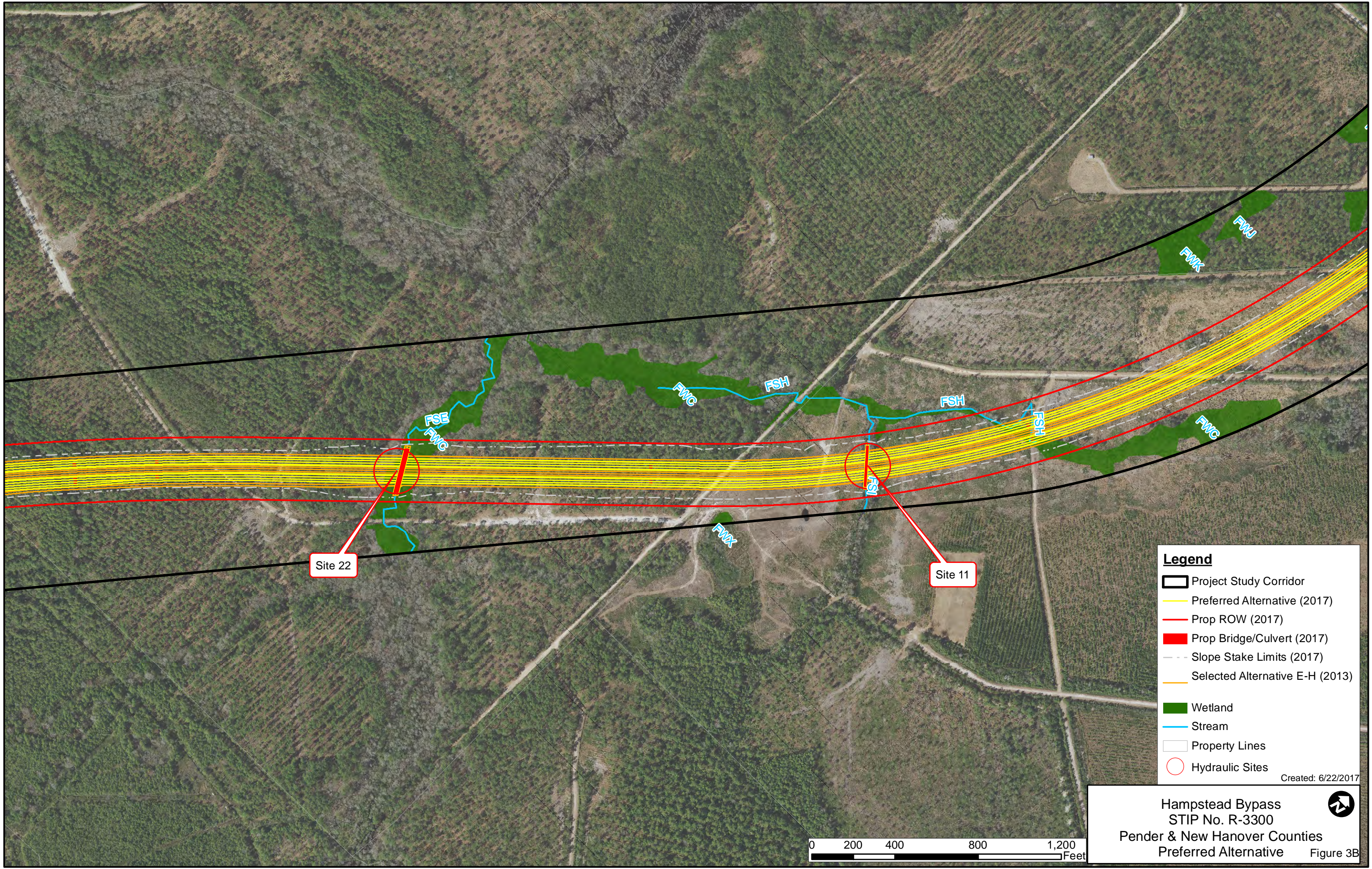
- Project Study Corridor
- Preferred Alternative (2017)
- Prop ROW (2017)
- Prop Bridge/Culvert (2017)
- Slope Stake Limits (2017)
- Selected Alternative E-H (2013)
- U-4751
- Wetland
- Pond
- Stream
- Significant Natural Heritage Area & Managed Area
- Property Lines
- Hydraulic Sites

Created: 6/22/2017



Hampstead Bypass
 STIP No. R-3300
 Pender & New Hanover Counties
 Preferred Alternative

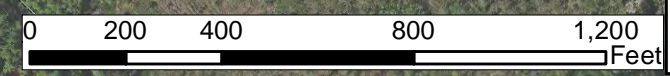
Figure 3A



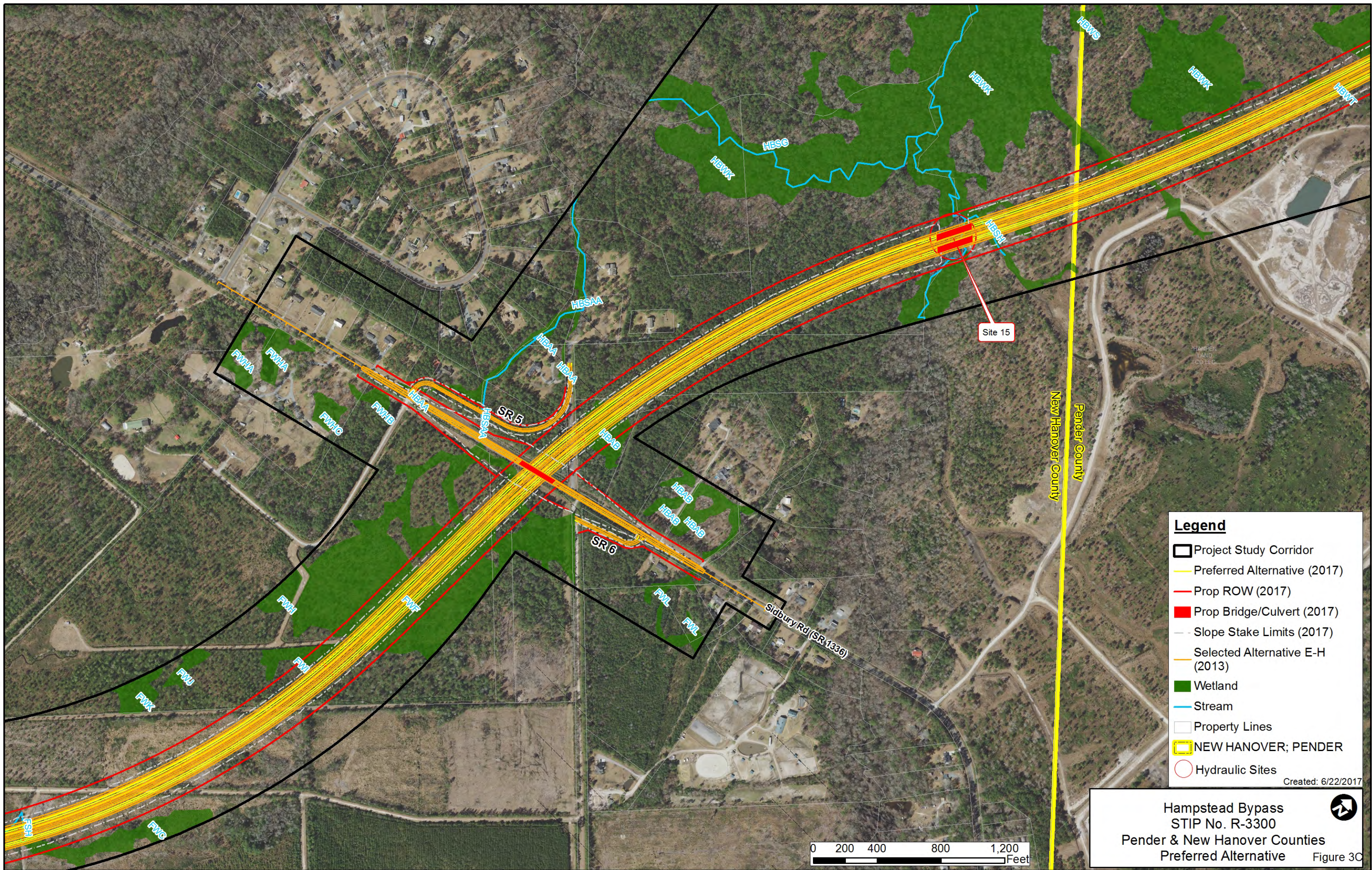
Legend

- Project Study Corridor
- Preferred Alternative (2017)
- Prop ROW (2017)
- Prop Bridge/Culvert (2017)
- Slope Stake Limits (2017)
- Selected Alternative E-H (2013)
- Wetland
- Stream
- Property Lines
- Hydraulic Sites

Created: 6/22/2017



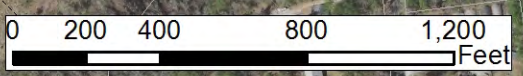
Hampstead Bypass
 STIP No. R-3300
 Pender & New Hanover Counties
 Preferred Alternative Figure 3B

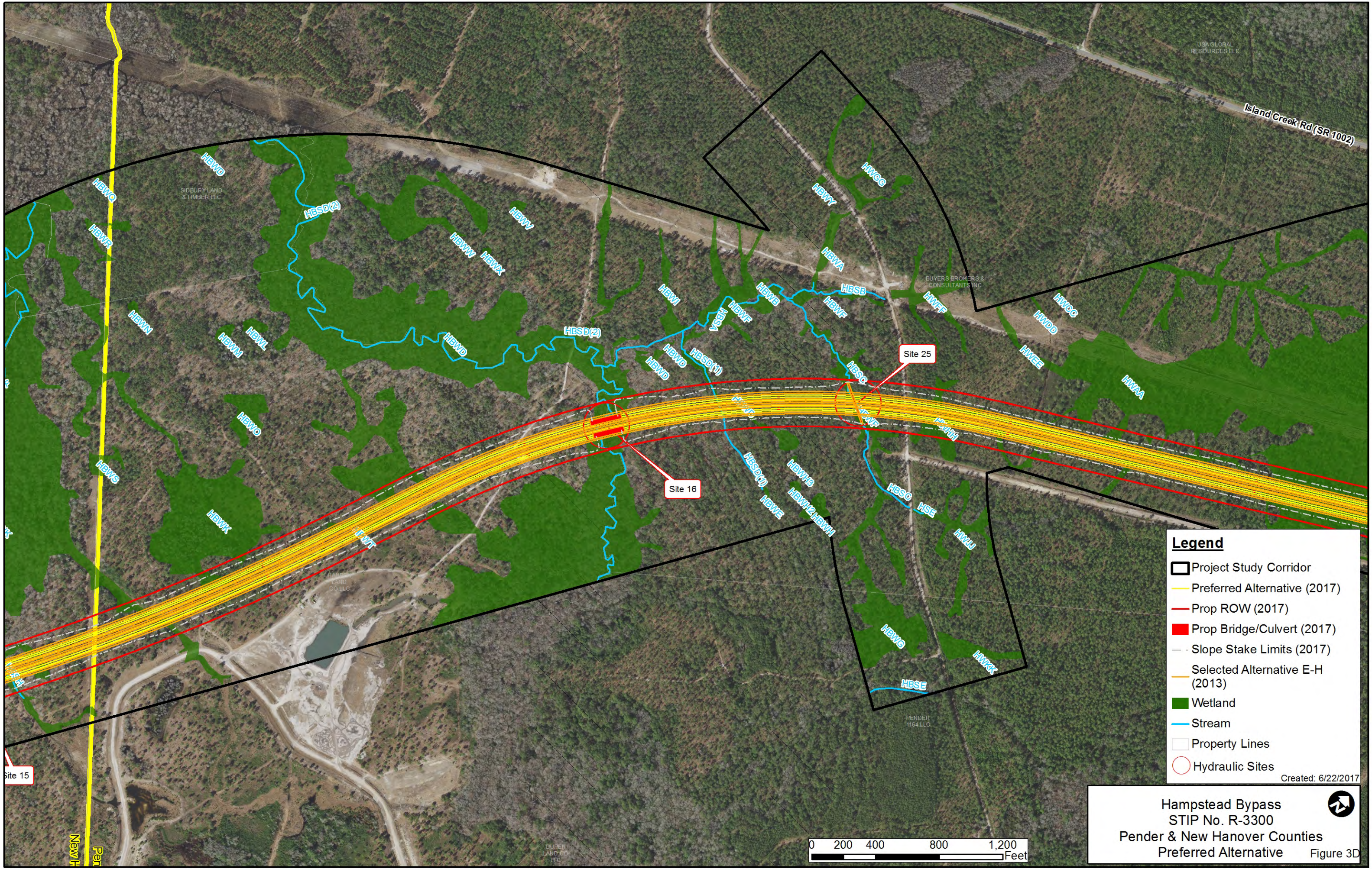


- Legend**
- Project Study Corridor
 - Preferred Alternative (2017)
 - Prop ROW (2017)
 - Prop Bridge/Culvert (2017)
 - Slope Stake Limits (2017)
 - Selected Alternative E-H (2013)
 - Wetland
 - Stream
 - Property Lines
 - NEW HANOVER; PENDER
 - Hydraulic Sites

Created: 6/22/2017

Hampstead Bypass
 STIP No. R-3300
 Pender & New Hanover Counties
 Preferred Alternative Figure 3C



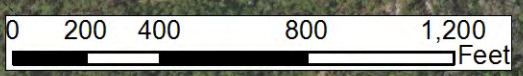


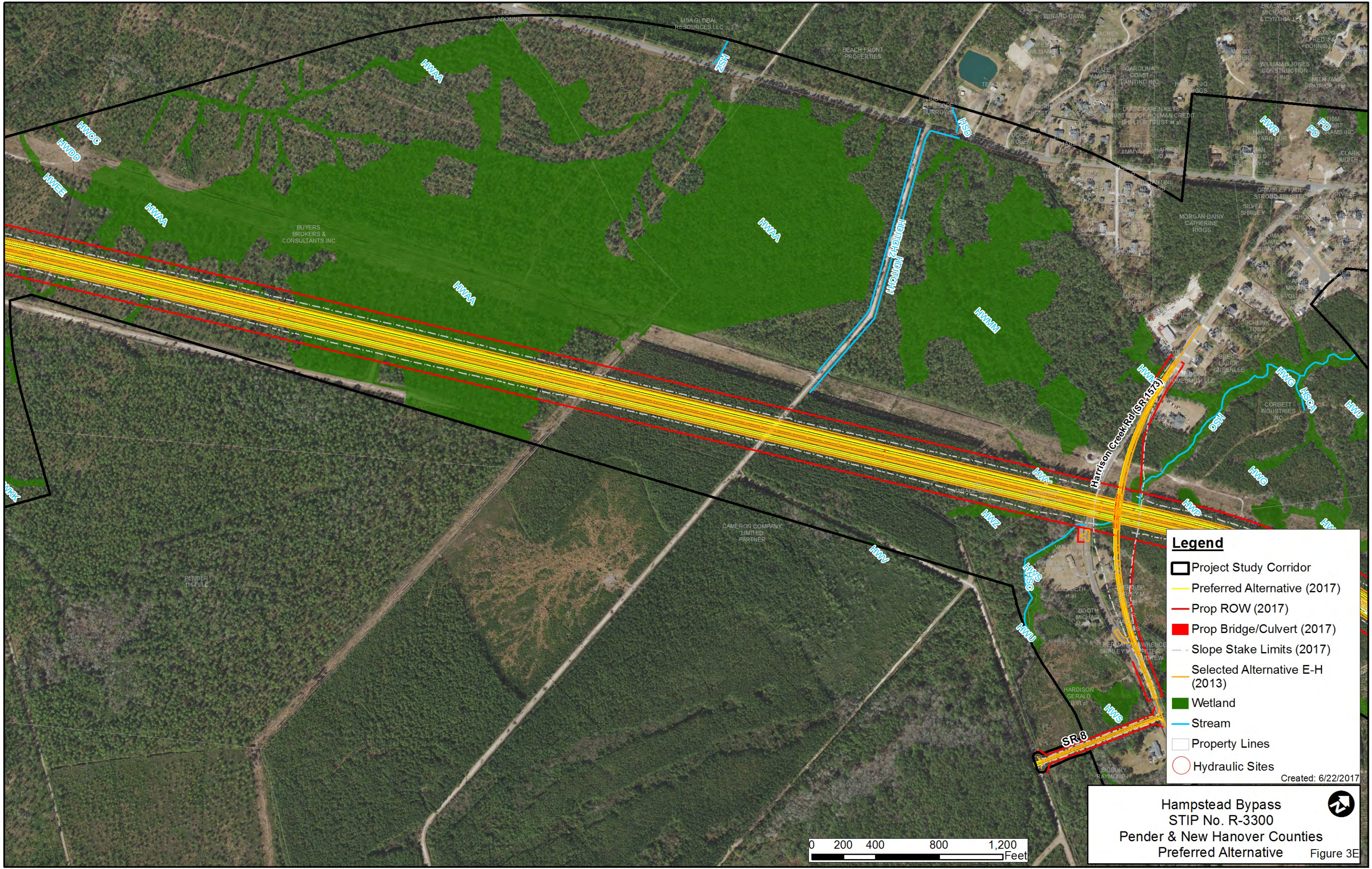
Legend

- Project Study Corridor
- Preferred Alternative (2017)
- Prop ROW (2017)
- Prop Bridge/Culvert (2017)
- Slope Stake Limits (2017)
- Selected Alternative E-H (2013)
- Wetland
- Stream
- Property Lines
- Hydraulic Sites

Created: 6/22/2017

Hampstead Bypass
 STIP No. R-3300
 Pender & New Hanover Counties
 Preferred Alternative Figure 3D

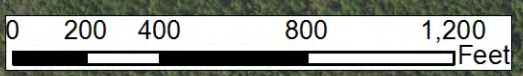




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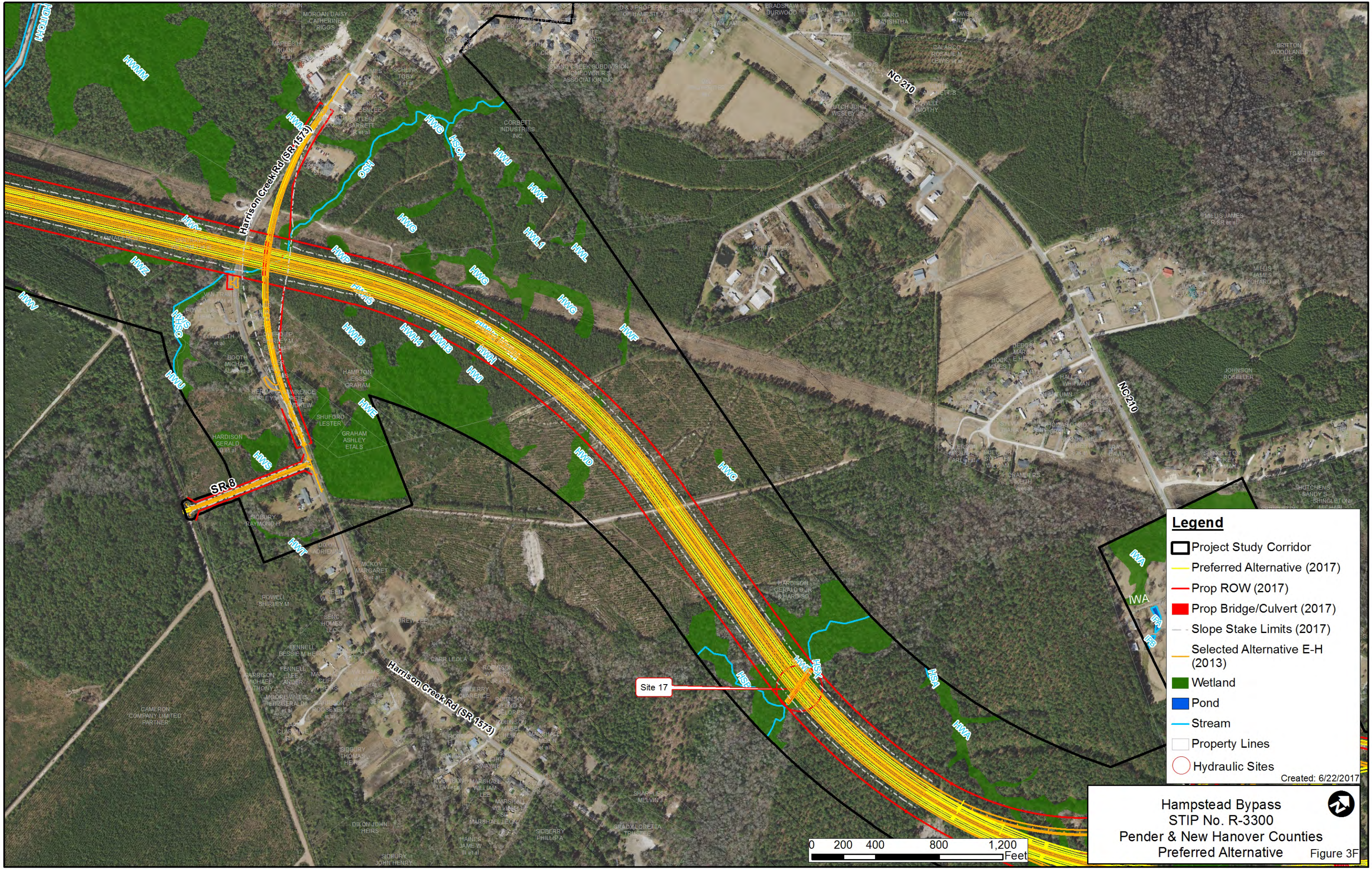
- Project Study Corridor
- Preferred Alternative (2017)
- Prop ROW (2017)
- Prop Bridge/Culvert (2017)
- Slope Stake Limits (2017)
- Selected Alternative E-H (2013)
- Wetland
- Stream
- Property Lines
- Hydraulic Sites

Created: 6/22/2017



Hampstead Bypass
STIP No. R-3300
Pender & New Hanover Counties
Preferred Alternative

Figure 3E



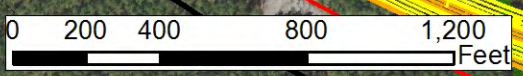
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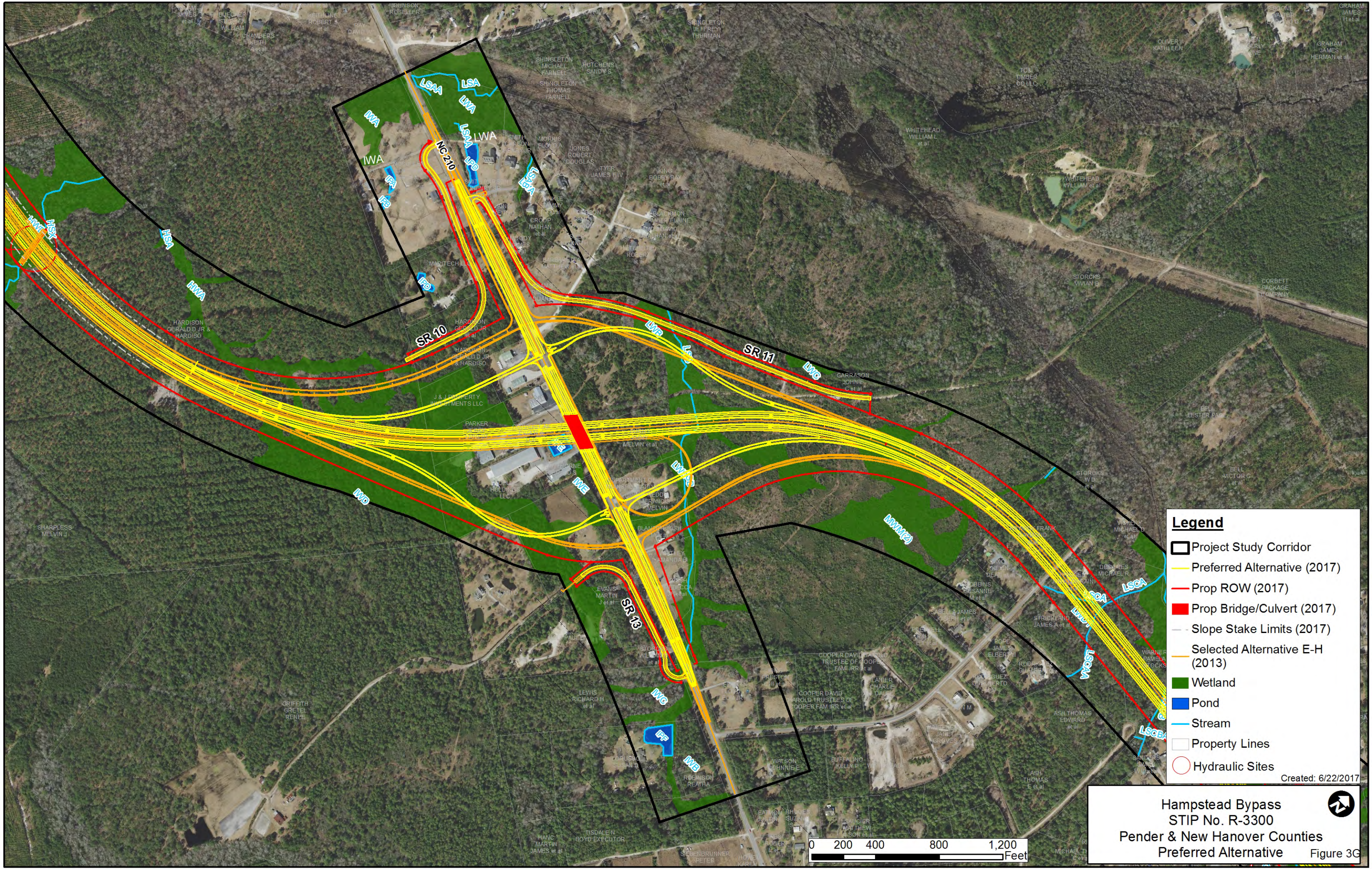
- Project Study Corridor
- Preferred Alternative (2017)
- Prop ROW (2017)
- Prop Bridge/Culvert (2017)
- Slope Stake Limits (2017)
- Selected Alternative E-H (2013)
- Wetland
- Pond
- Stream
- Property Lines
- Hydraulic Sites

Created: 6/22/2017

Hampstead Bypass
 STIP No. R-3300
 Pender & New Hanover Counties
 Preferred Alternative

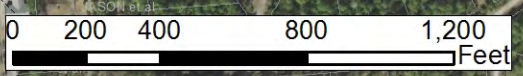
Figure 3F





- Legend**
- Project Study Corridor
 - Preferred Alternative (2017)
 - Prop ROW (2017)
 - Prop Bridge/Culvert (2017)
 - Slope Stake Limits (2017)
 - Selected Alternative E-H (2013)
 - Wetland
 - Pond
 - Stream
 - Property Lines
 - Hydraulic Sites

Created: 6/22/2017



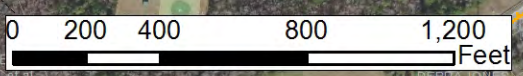
Hampstead Bypass
STIP No. R-3300
Pender & New Hanover Counties
Preferred Alternative

Figure 3C



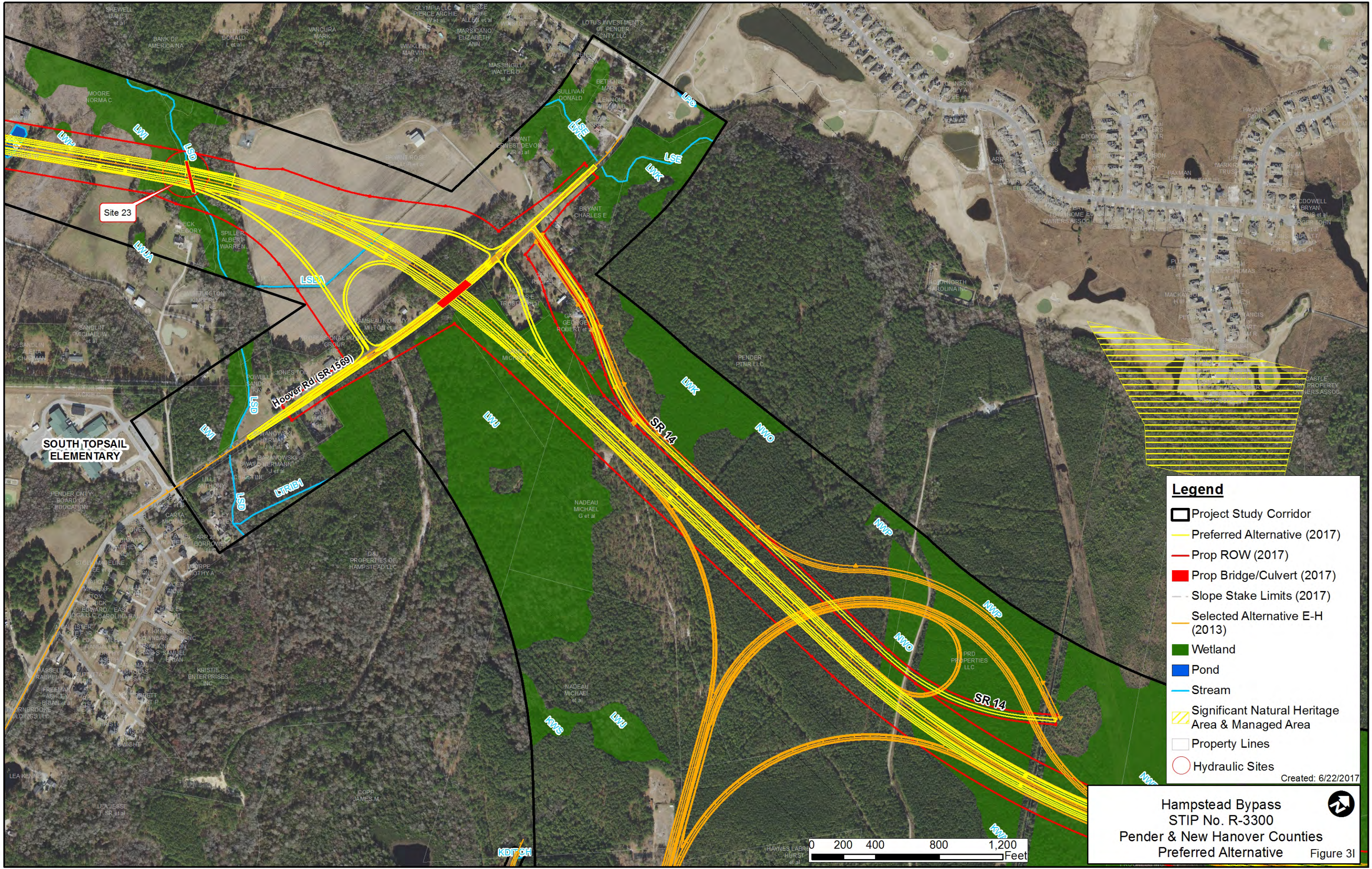
- Legend**
- Project Study Corridor
 - Preferred Alternative (2017)
 - Prop ROW (2017)
 - Prop Bridge/Culvert (2017)
 - Slope Stake Limits (2017)
 - Selected Alternative E-H (2013)
 - Wetland
 - Pond
 - Stream
 - Property Lines
 - Hydraulic Sites

Created: 6/22/2017



Hampstead Bypass
 STIP No. R-3300
 Pender & New Hanover Counties
 Preferred Alternative Figure 3H

**SOUTH TOPSAIL
 ELEMENTARY**



Site 23

SOUTH TOPSAIL
ELEMENTARY

Hoover Rd (SR 1569)

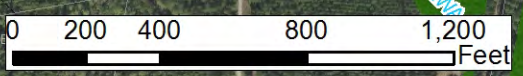
SR 14

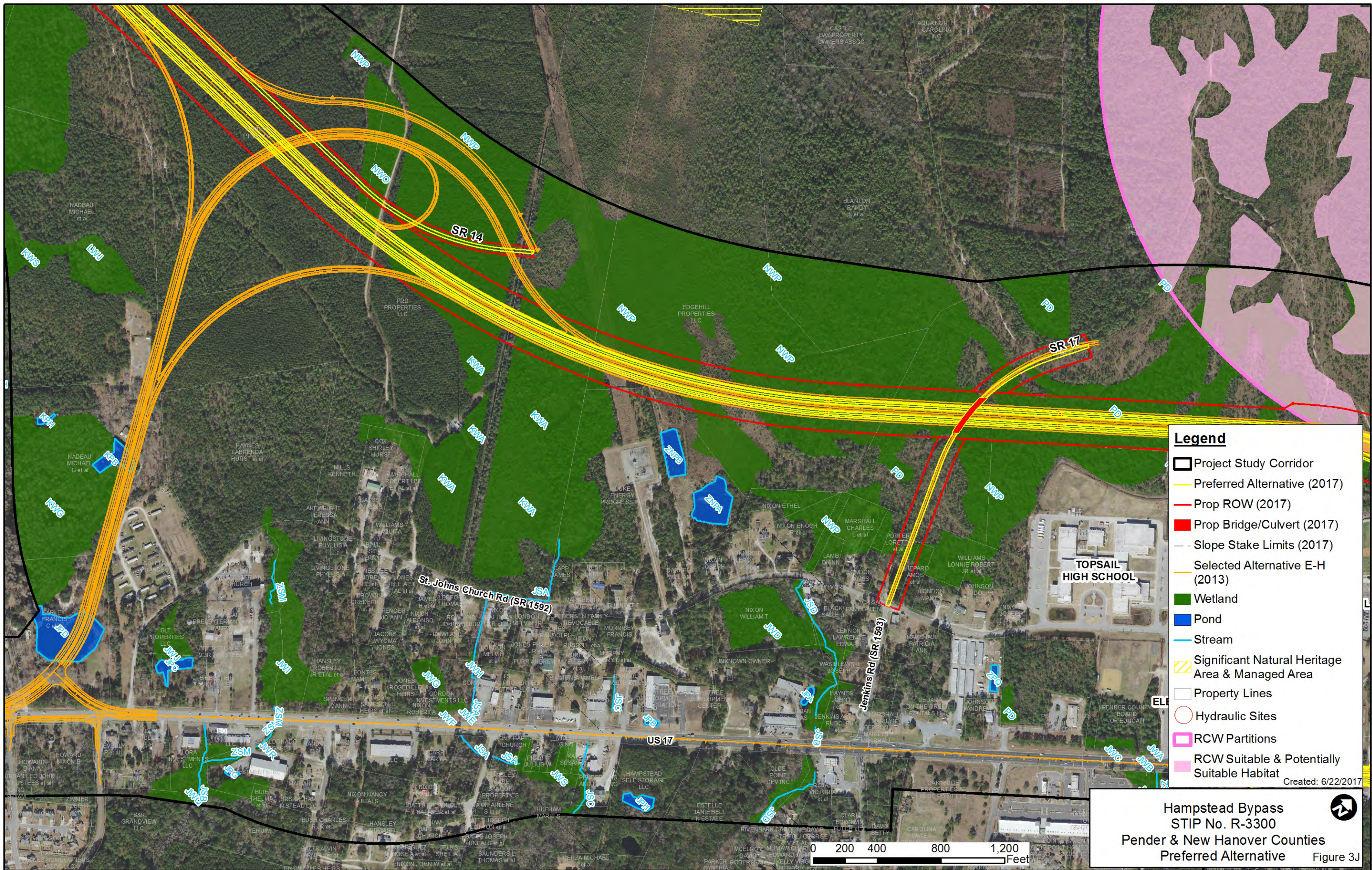
SR 14

- Legend**
- Project Study Corridor
 - Preferred Alternative (2017)
 - Prop ROW (2017)
 - Prop Bridge/Culvert (2017)
 - Slope Stake Limits (2017)
 - Selected Alternative E-H (2013)
 - Wetland
 - Pond
 - Stream
 - Significant Natural Heritage Area & Managed Area
 - Property Lines
 - Hydraulic Sites

Created: 6/22/2017

Hampstead Bypass
STIP No. R-3300
Pender & New Hanover Counties
Preferred Alternative Figure 31



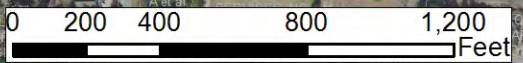


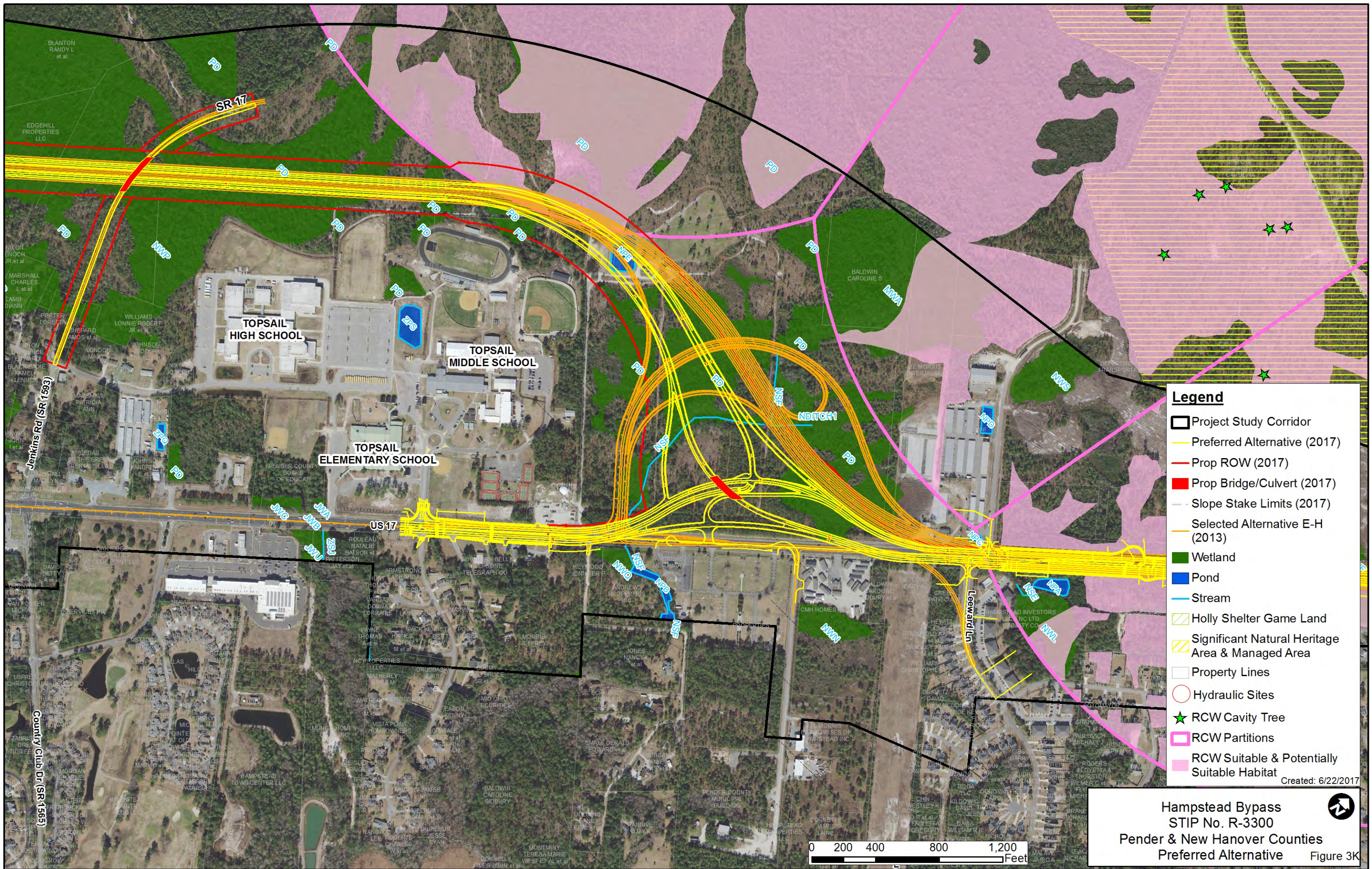
- Legend**
- Project Study Corridor
 - Preferred Alternative (2017)
 - Prop ROW (2017)
 - Prop Bridge/Culvert (2017)
 - Slope Stake Limits (2017)
 - Selected Alternative E-H (2013)
 - Wetland
 - Pond
 - Stream
 - Significant Natural Heritage Area & Managed Area
 - Property Lines
 - Hydraulic Sites
 - RCW Partitions
 - RCW Suitable & Potentially Suitable Habitat

Created: 6/22/2017

Hampstead Bypass
STIP No. R-3300
Pender & New Hanover Counties
Preferred Alternative

Figure 3J





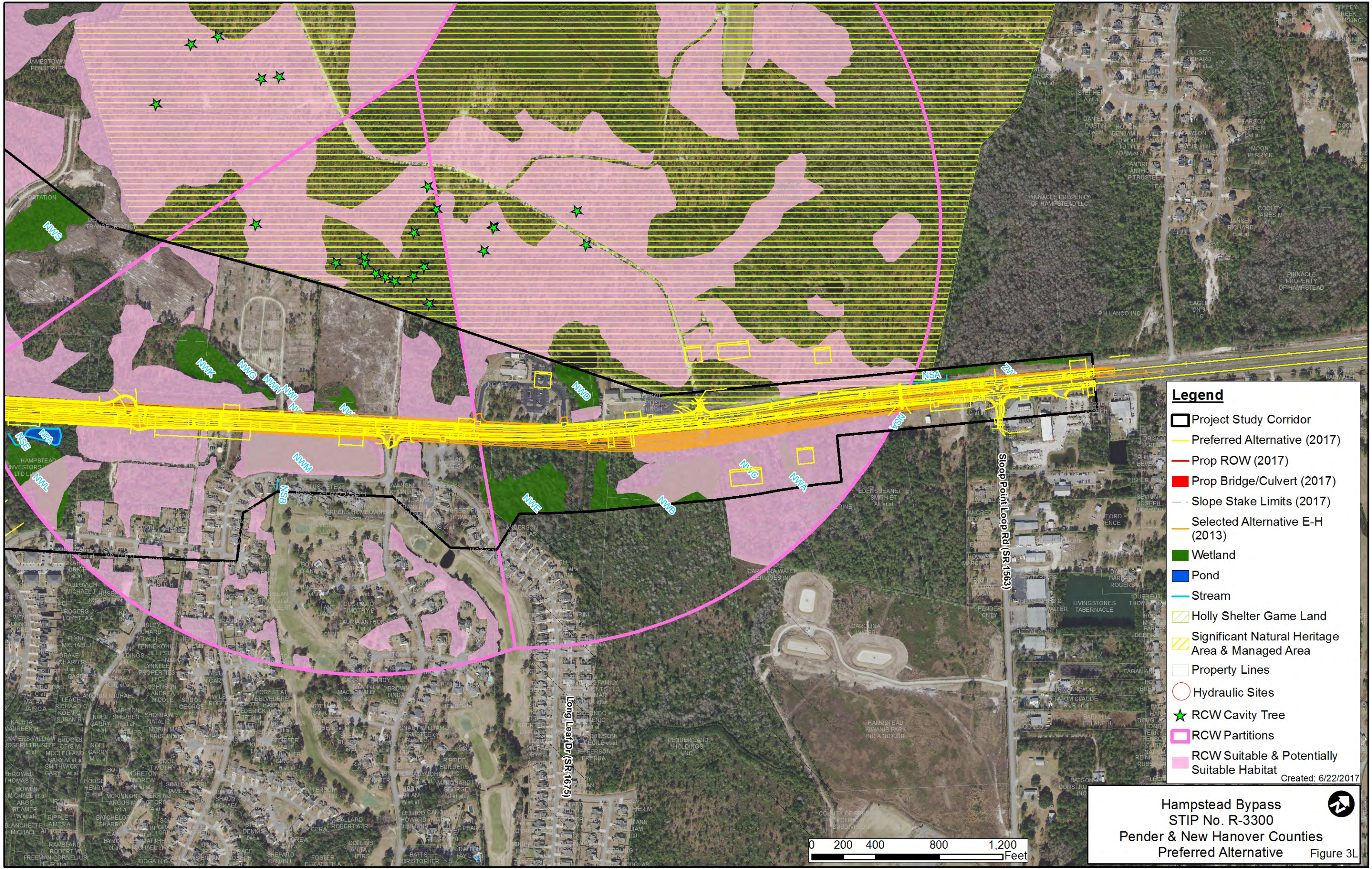
- Legend**
- Project Study Corridor
 - Preferred Alternative (2017)
 - Prop ROW (2017)
 - Prop Bridge/Culvert (2017)
 - Slope Stake Limits (2017)
 - Selected Alternative E-H (2013)
 - Wetland
 - Pond
 - Stream
 - Holly Shelter Game Land
 - Significant Natural Heritage Area & Managed Area
 - Property Lines
 - Hydraulic Sites
 - ★ RCW Cavity Tree
 - RCW Partitions
 - RCW Suitable & Potentially Suitable Habitat

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Hampstead Bypass
STIP No. R-3300
Pender & New Hanover Counties
Preferred Alternative

Figure 3K



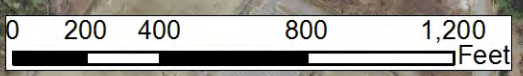
Legend

- Project Study Corridor
- Preferred Alternative (2017)
- Prop ROW (2017)
- Prop Bridge/Culvert (2017)
- Slope Stake Limits (2017)
- Selected Alternative E-H (2013)
- Wetland
- Pond
- Stream
- Holly Shelter Game Land
- Significant Natural Heritage Area & Managed Area
- Property Lines
- Hydraulic Sites
- ★ RCW Cavity Tree
- RCW Partitions
- RCW Suitable & Potentially Suitable Habitat

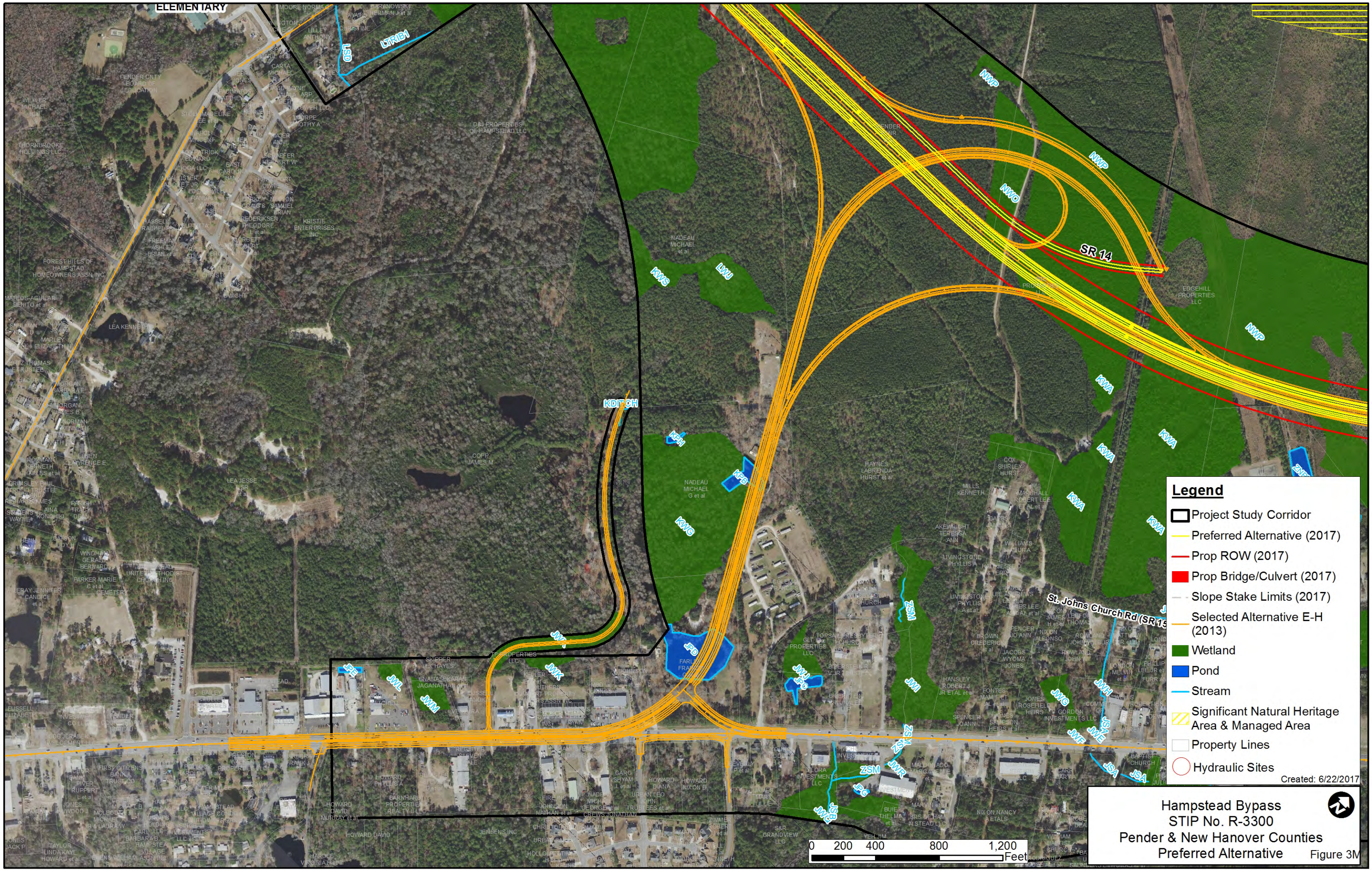
Created: 6/22/2017

Hampstead Bypass
STIP No. R-3300
Pender & New Hanover Counties
Preferred Alternative

Figure 3L



ELEMENTARY



Legend

- Project Study Corridor
- Preferred Alternative (2017)
- Prop ROW (2017)
- Prop Bridge/Culvert (2017)
- Slope Stake Limits (2017)
- Selected Alternative E-H (2013)
- Wetland
- Pond
- Stream
- Significant Natural Heritage Area & Managed Area
- Property Lines
- Hydraulic Sites

Created: 6/22/2017



Hampstead Bypass
STIP No. R-3300
Pender & New Hanover Counties
Preferred Alternative Figure 3M