



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

JAMES H. TROGDON, III  
SECRETARY

December 3, 2018

NC Dept. of Environmental Quality  
Division of Coastal Management  
400 Commerce Avenue  
Morehead City, NC 28557

ATTN: Mr. Stephen Lane  
NCDOT Coordinator

Subject: **Application for Coastal Area Management Act Major Development Permit** for the Proposed Replacement of Bridges 73 and 96 over The Straits on SR 1335 (Harkers Island Road) in Carteret County, North Carolina. TIP B-4863. Debit Permit Fees from WBS No. 40212.1.3

Dear Sir:

The North Carolina Department of Transportation (NCDOT) proposes to replace the existing bridges 73 and 96 over The Straits in Carteret County with a parallel bridge to the east. The purpose of this letter is to request approval for a Coastal Area Management Act (CAMA) Major Development Permit. In addition to this cover letter and CAMA MP 1, 2, and 5 Forms, this application package includes CAMA adjacent landowner notifications, Concurrence Point 4B and 4C minutes, mitigation plans, stormwater management plan, permit impact drawings (including utility relocation plans), and half size roadway plans. Construction of this project also requires the following approvals: Clean Water Act (CWA) Section 404 Nationwide Permit 14, Section 401 Water Quality General Certification 4135, U.S. Army Corps of Engineers (USACE) Section 408, Rivers and Harbors Act (RHA) Section 10, and the U.S. Coast Guard (USCG). An electronic Pre-Construction Notification (PCN) has been submitted to the USACE and the NC Division of Water Resources to request these approvals. In addition, NCDOT will submit a request for a USCG bridge permit concurrently with this application.

### 1.0 Purpose and Need

As identified in the October 2017 Categorical Exclusion (CE), the need for the proposed action is to replace structurally deficient, functionally obsolete bridges. The purpose of the proposed action is to improve bridge structural safety and functionality for vehicular traffic.

The 2014 bridge inspection report for Bridge No. 73 indicates that the bridge is in poor condition with a sufficiency rating of 15 out of 100 and a status of structurally deficient due to the condition of the superstructure and substructure (both having a FHWA structural rating of 4 out of 9). The 2015 bridge inspection report for Bridge No. 96 indicates that the bridge is in good condition with a sufficiency rating

of 47 out of 100 and has a status of functionally obsolete due to its horizontal width. The Division completed emergency repairs to replace the superstructure of Bridge No. 96 in 2013.

## **2.0 Project Description**

The NCDOT proposes to replace existing Bridge No. 73 (known as the Earl C. Davis Memorial Bridge) and existing Bridge No. 96 carrying SR 1332/1335 (Harkers Island Road) over The Straits in Carteret County. Together these bridges provide the only vehicular access to Harkers Island. Bridge 73 is a moveable swing span bridge, while Bridge 96 is a fixed span bridge. Replacement of Bridge No. 73 entails removal of the swing span bridge. Pending a municipal agreement between NCDOT and Carteret County for maintenance and operations, existing Bridge No. 96 may remain for non-vehicular access to the Straits Fishing Pier.

The proposed structure, east of the existing bridges, is approximately 3,200 feet in length, with a 32-foot wide roadway typical section, providing two 12-foot travel lanes and two 4-foot shoulders. The existing bridges provide two travel lanes and an approximate clear roadway width between 26 and 29 feet. The bridge height over the navigable portion of The Straits will be a minimum of 45 feet above mean high water, and provide a horizontal span of at least 125 feet for boat passage.

Several utilities are in conflict with the proposed project alignment and will require relocation, including underground telephone and cable and overhead electric power lines and poles. A separate application for a CAMA General Permit 1600 and Nationwide Permit (NWP) 12 and General Certification (GC) 4133 was submitted in August 2018 in order to allow overhead electric utility relocation to be completed prior to the proposed in-water work moratorium (April 1-September 30). Due to a landowner conflict, those impacts have been incorporated into this CAMA permit application. However, the NWP 12 did not require written approval from the USACE and the GC 4133 was issued, therefore utility impacts herein (Sites 5-8) are included for CAMA approval only and do not require additional USACE/DWR review due to prior authorization.

## **3.0 Summary of Impacts**

Proposed impacts to jurisdictional areas total 0.07 acre of permanent wetland impacts, 0.39 acre of temporary wetland impacts, 0.02 acre of permanent surface water impacts, and 2.79 acres of temporary surface water impacts. Direct impacts to submerged aquatic vegetation (SAV) areas total <0.01 acre (110 square feet) and potential shading effects total 0.44 acre.

See Section 7.4 for wetland and surface water impact summary tables.

## **4.0 Summary of Mitigation**

The proposed construction of B-4863 will permanently impact 0.07 acre of CAMA jurisdictional wetlands. Additionally, a total of <0.01 acre (110 square feet) of SAV will be directly impacted by bridge construction and require mitigation.

The unavoidable jurisdictional wetland impacts will be offset through on-site coastal marsh restoration on the eastern side of The Straits fishing island between existing bridges 73 and 96. Details of this proposal are included in the attached wetland mitigation plan. A minimum 1:1 ratio of wetland mitigation to impacts will be provided.

Due to the low level of direct impacts to SAV (up to 110 square feet), impacts will be compensated by monitoring the SAV within the construction area, including shading footprint of the bridge, for 5 years, and providing 1:1 mitigation for impacts over 110 square feet. Details of this proposal are included in the attached SAV mitigation plan.

## **5.0 Project Schedule**

B-4863 is scheduled to be let in July 2019. Mobilization will begin in August 2019 followed by upland staging and construction, and in-water construction will start in October 2019. Due to the in-water work moratorium of April 1-September 30, proposed completion of the new bridge is 2023 and demolition of existing Bridge 73 is 2024.

## **6.0 NEPA Document Status**

A Type III Categorical Exclusion was signed on October 3, 2017. NEPA/Section 404 Merger Concurrence meetings were held as follows:

Concurrence Point 1 (February 2016) – Definition of Purpose and Need and Study Area  
Concurrence Point 2 (June 2016) – Detailed Study Alternatives Carried Forward  
Concurrence Point 2A (June 2017) – Bridging Decisions and Alignment Review  
Concurrence Point 3 (June 2017) – Selection of Alternative 5 as the LEDPA / Preferred Alternative  
Concurrence Point 4A (February 2018) – Avoidance and Minimization  
Concurrence Point 4B (March 2018) – 30% Hydraulic Review  
Concurrence Point 4C (October 2018) – Permit Drawings Review

Copies of the CP 4B and 4C Meeting Minutes are attached.

## **7.0 Resource Status**

The project is located in the White Oak River Basin and lies within the USGS Hydrologic Unit 03020301. This is within the Carolinian Barrier Islands and Coastal Marshes eco-region. The project crosses The Straits (NCDEQ Index No. 21-35-1-12) which is classified as SA; HQW – tidal salt water for shellfishing for market purposes and high quality waters.

### **7.1 Wetland Delineations**

Wetland delineations were performed using the 1987 U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual and the USACE 2010 Regional Supplement for the Atlantic and Gulf Coastal Plain Region. Results of the wetland delineation were reported in the April 2011 Natural Resources Technical Report (NRTR). The wetland delineation was updated in 2017 and verified by the USACE and DCM (for coastal wetlands – site visit 1/16/18). This updated delineation was used to calculate the impacts presented in this application. The final design avoids and minimizes wetland impacts to the maximum extent practical.

## ***7.2 Stream/Open Water/SAV Delineations***

Due to the location and nature of the project, open water is the predominant jurisdictional feature. Open water, as sub-categorized by the Cowardin System, consists of aquatic bottom (open water, non-SAV) and SAV areas.

SAV surveys have been performed regularly since 2016, and will continue through and post-construction, as described in the attached SAV Mitigation Plan. Recent (Fall 2018) damage to SAVs within the project area was documented and discussed in the CP4C meeting. As recovery from this damage is unpredictable, the May 2018 survey data (pre-disturbance) was used in all calculations in this application as a conservative (high) estimate.

## ***7.3 Characterization of Jurisdictional Sites***

The project area bridges The Straits between the mainland to the north and Harkers Island to the south. Four wetlands were mapped within the project footprint, including riverine swamp forest (wetland WA) and salt/brackish marsh (wetlands WB, WC, & WD). The latter wetlands are subject to CAMA as well as CWA Section 404, while the former is only subject to 404 regulations.

Neither Water Supply (WS-I or WS-II) nor Outstanding Resource Waters (ORW) occur within 1.0 mile of the project study area. The waters of The Straits are classified as SA waters (Market Shellfishing tidal salt waters) with a supplemental classification of HQW (High Quality Waters). The Straits is not listed on the Final 2016 303(d) list of impaired waters for sediment or turbidity, but is listed as exceeding shellfish growing area criteria.

Per the above designations, NCDOT's Design Standards in Sensitive Watersheds will be implemented for the project.

## ***7.4 Impacts to Jurisdictional Resources***

Impacts to 404 and CAMA jurisdictional wetlands as well as surface waters for B-4863 are summarized below in Tables 1 and 2. Note that Sites 1 through 4 are related directly to bridge construction and demolition (as presented in the CP4C meeting) and Sites 5 through 8 are related to utility relocation (originally presented as sites 1 through 4 in the August 2018 CAMA GP/NWP application). Site 9 has been added since the CP4C meeting to include the on-site coastal wetland mitigation grading.



**Table 1: Wetland Impacts**

Permit Drawing Site Number	Wetland Biotic Communities (2011 NRTR)	Wetland Type	Permanent Impacts (ac.)	Temporary Impacts (ac.)
1	Salt/Brackish Marsh	404 and CAMA	0.07	0.11
2	Salt/Brackish Marsh	404 and CAMA	<0.01	0.04
3	Salt/Brackish Marsh	404 and CAMA	-	0.06
5	Salt/Brackish Marsh	404 and CAMA	-	<0.01
7	Salt/Brackish Marsh	404 and CAMA	<0.01	0.03
8	Riverine Swamp Forest	404	<0.01	0.09
9	Salt/Brackish Marsh	404 and CAMA	-	0.05
<b>CAMA Major Total:</b>			<b>0.07</b>	<b>0.39</b>
<b>NWP 14/GC 4135 Total:</b>			<b>0.07</b>	<b>0.26</b>

- 404 represents coastal and non-coastal wetlands; CAMA represents coastal wetlands
- Permanent Impacts represent permanent excavation and fill
- Temporary Impacts represent temporary fill (work platform access) and construction access (hand clearing)
- Totals represent the cumulative area of each site (not rounded per site) so differ slightly from individual site impacts
- NWP 14/GC4135 totals do not include sites 5-8, previously permitted under NWP 12 (see Section 2.0)

**Table 2: Surface Water Impacts**

Permit Drawing Site Number	Waterbody	Permanent (ac.)	Temporary (ac.)	Mitigation Required
2	The Straits	0.02	1.97	No
3	The Straits	<0.01	-	No
4	The Straits	-	0.72	No
6	The Straits	<0.01	0.09	No
<b>CAMA Major Total:</b>		<b>0.02</b>	<b>2.79</b>	
<b>NWP 12/GC 4135 Total:</b>		<b>0.02</b>	<b>2.70</b>	

- Totals represent the cumulative area of each site (not rounded per site) so differ slightly from individual site impacts
- NWP 14/GC4135 totals do not include sites 5-8, previously permitted under NWP 12 (see Section 2.0)

**Permanent Impacts:** Proposed permanent impacts include fill impacts to 0.07 acre of CAMA jurisdictional coastal wetlands at Sites 1, 2, and 7. Permanent fill impacts to 404 riparian wetlands consist of less than 0.01 acre for installation of utility poles and guy wires. No mechanized clearing is anticipated in wetlands. Proposed permanent impacts to surface waters are 0.02 acre, which includes the proposed bridge piles (Site 2) and several utility poles and wires (Site 6).

**Temporary Impacts:** There will be 0.39 acre of temporary wetland impacts (0.30 acre CAMA; 0.09 acre 404) due to stormwater outlet protection, work platform access, retaining wall construction, pile installation, driveway access, utility relocation, and re-grading for mitigation associated with Sites 1, 2, 3, 5, 7, 8 and 9. Impacts where construction access is required are depicted in the permit drawings as hand clearing. There will be 2.79 acres of temporary surface water impacts to The Straits due to the work platform, bridge construction, existing bridge demolition, and utility relocation associated with Sites 2, 3, 4, and 6.

**Utility Impacts:** There will be <0.01 acre of permanent wetland fill and <0.01 acre of permanent surface water fill associated with utility relocation (overhead power poles). Temporary utility relocation impacts include a total of 0.14 acre of wetlands (0.05 acre CAMA wetland construction access; 0.09 acre 404 wetland hand clearing and access), and 0.09 acre of surface water due to existing pole relocation. These utility impacts are included in the permanent and temporary impacts mentioned above.

Individual impact site descriptions are provided below:

*7.4.1 Site 1 (Permit Drawings 2-3)*

Site 1 is located on Harkers Island at the approach to the proposed bridge. The bridge approach will be constructed with a retaining wall to avoid encroachment into The Straits. A transition area from the existing roadway to the temporary work platform will require temporary fill placed on fabric to aid in removal after construction, when the area will be returned to pre-construction grades and vegetated.

*7.4.2 Site 2 (Permit Drawings 2-9)*

Site 2 is the construction of the new bridge over The Straits. An offset of 15 feet from the proposed piles has been used to estimate temporary construction impacts. This offset is based on contractor feedback as “worst practical case” to allow room for pile installation, pile cap construction, and sediment/turbidity control devices. Temporary surface water impacts are anticipated to result from work platform construction based on a 40 foot wide platform on 20-foot spans, 30 foot long work fingers associated with each bent, and six turnout/staging platforms. Several mooring points may also be required for barge access, but these will result in minimal area and unlikely to change the overall temporary impacts.

*7.4.3 Site 3 (Permit Drawings 8-9)*

Site 3 is located on the mainland at the northern bridge approach where a transition area from the existing roadway to the work platform is required. The temporary fill will be placed on fabric to aid in removal after construction, and the area will be returned to pre-construction grades and vegetated. On the existing roadway, construction of a driveway access to the adjacent boat ramp and a cut ditch outlet discharging to the existing rip rap slope will be required to retain access to the fishing pier.

*7.4.4 Site 4 (Permit Drawings 2-5)*

Site 4 consists of the demolition and removal of the existing Bridge 73 over The Straits. The existing 27 bents and swing span bridge section within The Straits will be completely removed (see demolition below). This includes a 10-foot offset from the footprint of the bridge to allow for construction equipment and control measures. No temporary work platform is proposed for demolition access, however several mooring points may be required to secure barges.

*7.4.5 Site 5 (Permit Drawings 2-3)*

Site 5 (originally submitted as Site 1 in the Nationwide 12 Application) is located on Harkers Island where overhead utility lines cross the roadway in direct conflict with the bridge approach. Access is required to remove poles and guy wires in order to relocate the overhead power to the west of the roadway.

*7.4.6 Site 6 (Permit Drawings 4-5)*

Site 6 (originally submitted as Site 2 in the Nationwide 12 Application) is located within The Straits, between the existing and proposed bridge locations (Sites 2 and 4). In order to accommodate the overhead power line relocation, two existing poles and their associated guy wires will be removed and replaced with two new poles to the west that do not require guy wires.

*7.4.7 Site 7 (Permit Drawings 6-7)*

Site 7 (originally submitted as Site 3 in the Nationwide 12 Application) is located on the fishing pier island between Bridges 96 and 73. Due to the relocation of the poles at Site 6, the existing pole on the island will require a new guy wire to adapt to the change in power line angle.

#### 7.4.8 Site 8 (Permit Drawings 8-9)

Site 8 (originally submitted as Site 4 in the Nationwide 12 Application) is located on the mainland where existing overhead power lines are in direct conflict with the bridge approach. New poles on the west side of the existing roadway will require additional utility easement cleared in the riverine swamp forest. This is the only Section 404 (non-CAMA) wetland impact associated with this project.

#### 7.4.9 Site 9 (Permit Drawings 6-7)

Site 9 is located on the fishing pier island and consists of an approximate 10-foot fringe of the existing coastal wetlands adjacent to the proposed coastal wetland mitigation area. The edge of the existing wetland slopes up to the adjacent uplands, and will require minor excavation (0.05 acre) to tie into the proposed wetland mitigation area grades.

### 7.5 Submerged Aquatic Vegetation

Direct impacts to SAV from bridge pile installation will total less than 0.01 acre (110 square feet). Potential shading from the proposed bridge could total 0.44 acre, and temporary construction areas (i.e. work platform) could affect an additional 0.61 acre. Monitoring of the shading and construction areas will be performed as described in the attached Mitigation Plan.

## 8.0 Protected Species

The United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) list 16 federally protected species for Carteret County as of the June 27, 2018 listing (Table 3).

**Table 3. Federally Protected Species in Carteret County**

Scientific Name	Common Name	Federal Status	Habitat	Biological Conclusion
<i>Alligator mississippiensis</i>	American alligator	T(S/A)	Yes	N/A
<i>Chelonia mydas</i>	Green sea turtle	T	Yes	MANLAA
<i>Eretmochelys imbricate</i>	Hawksbill sea turtle	E	Yes	No Effect
<i>Lepidochelys kempii</i>	Kemp's ridley sea turtle	E	Yes	MANLAA
<i>Dermochelys coriacea</i>	Leatherback sea turtle	E	Yes	No Effect
<i>Caretta Caretta</i>	Loggerhead sea turtle	T	Yes	MANLAA
<i>Myotis septentrionalis</i>	Northern long-eared bat	T	Yes	MALAA
<i>Charadrius melodus</i>	Piping plover	T	No	No Effect
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	No	No Effect
<i>Calidris canutus rufa</i>	Red knot	T	No	No Effect
<i>Sterna dougallii dougallii</i>	Roseate tern	E	No	No Effect
<i>Acipenser oxyrinchus</i>	Atlantic Sturgeon	E	Yes	MANLAA
<i>Acipenser brevirostrum</i>	Shortnose sturgeon	E	Yes	MANLAA
<i>Trichechus manatus</i>	West Indian manatee	E	Yes	MANLAA
<i>Lysimachia asperulaefolia</i>	Rough-leaved loosestrife	E	No	No Effect
<i>Amaranthus pumilus</i>	Seabeach amaranth	T	No	No Effect

E = Endangered, T = Threatened, T(S/A) = Threatened(Similarity of Appearance), T = Threatened, MANLAA= May Affect, Not Likely to Adversely Affect, MALAA = May Affect, Likely to Adversely Affect, N/A = Not Applicable.

Biological conclusions were presented in the CE and CP 2A/3 meeting documentation. The NMFS issued Section 7 concurrence for aquatic species in September 2018, and those biological conclusions are included in Table 3.

The USFWS has developed a programmatic biological opinion (PBO) in conjunction with the Federal Highway Administration, the US Army Corps of Engineers and NCDOT for the northern long-eared bat (NLEB) (*Myotis septentrionalis*) in eastern North Carolina. The PBO covers the entire NCDOT program in Divisions 1-8, including all NCDOT projects and activities. The programmatic determination for NLEB for the NCDOT program is “May Affect, Likely to Adversely Affect.” The PBO provides incidental take coverage for NLEB and will ensure compliance with Section 7 of the Endangered Species Act for five years for all NCDOT projects with a federal nexus in Divisions 1-8, which includes Carteret County.

Protected species moratoria required for the project are detailed below under “Moratoria” and “Avoidance and Minimization”.

### ***8.1 Bald and Golden Eagle Protection Act (BGPA)***

In the July 9, 2007 Federal Register (72:37346-37372), the bald eagle was declared recovered, and removed (de-listed) from the Federal List of Threatened and Endangered wildlife. This delisting took effect August 8, 2007. After delisting, the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668-668d) became the primary law protecting bald eagles.

The Straits is a water body of sufficient size to be considered potential feeding habitat. Also, there are a few trees near the project large enough to support the nesting of bald eagles. During initial field visits (February 15, and March 2, 3, and 8, 2011) surveys were conducted and no bald eagles or nests were observed within 660 feet of the study area. Additionally, a review of the NCNHP database (updated July 2018) revealed no known occurrences of this species within 1.0 mile of the study area. Due to the lack of known occurrences and minimal impact anticipated for this project, it has been determined that this project will not affect this species.

### ***8.2 Protection Measures***

Protection measures for several species have been recommended for B-4863. The Straits contain Essential Fish Habitat and are treated as Primary Nursery Habitat by the NC Division of Marine Fisheries. In order to minimize potential effects to these resources, NCDOT has committed to the following nondiscretionary measures for the construction of this project:

#### **In-Water Work Moratorium:**

An in-water work moratorium will be implemented during the construction of B-4863. Construction activity at or below the mean high water elevation within The Straits, including SAV habitat and open water, will not be allowed from April 1 to September 30. Work in upland areas, on the bridge superstructure, and within exclusion devices around individual bents (installed prior to the start of the moratorium) will be allowed to continue.

#### **Sea Turtles & Smalltooth Sawfish:**

All conditions outlined in the Sea Turtle and Smalltooth Sawfish construction conditions (NMFS, 2006) will be followed. In-water construction will cease if a protected species is sighted within 50 feet of construction. This moratorium prohibits pile installation and removal and any activity associated with bridge construction and demolition when listed species are present. However, this moratorium does not restrict terrestrial activity. Any collision with and/or injury to a sea turtle or smalltooth sawfish shall be reported to NMFS's Protected Resources Division (727-824-5312) and the Network for Endangered Sea Turtles (NEST) (252-41-8622).

West Indian Manatee:

All conditions outlined in Guidelines for Avoiding Impacts to the West Indian Manatee: Precautionary Measures for Construction Activities in North Carolina Waters (USFWS, 2003) will be adhered to.

## **9.0 Cultural Resources**

No sites eligible for the National Register of Historic Places are within the project area. One archaeological site, determined not eligible, will be preserved in place. NC State Historic Preservation Office concurrence is attached.

## **10.0 FEMA Compliance**

The project has been coordinated with appropriate state and local officials and the Federal Emergency Management Agency (FEMA) to assure compliance with FEMA, state, and local floodway regulations.

## **11.0 Mitigation Options**

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts.

### ***11.1 Avoidance & Minimization***

All jurisdictional features were delineated, field verified and surveyed within the corridor for B-4863 as described above. Using these surveyed features, preliminary designs were adjusted to avoid and/or minimize impacts to jurisdictional areas. NCDOT employs many strategies to avoid and minimize impacts to jurisdictional areas in all of its designs. Many of these strategies have been incorporated into BMP documents that have been reviewed and approved by the resource agencies and which will be followed throughout construction. All wetland areas and environmental sensitive areas (ESA) not affected by the project will be protected from unnecessary encroachment. Individual avoidance and minimization measures include the following:

#### ***11.1.1 Design Measures***

- Span lengths were maximized, especially through the navigation spans, thereby minimizing the overall footprint of the bridge's substructure and reducing surface water and SAV impacts.
- Pile caps near MHW have been minimized, required on only 10 of 27 bents (#3-12) over open water, and will be constructed three feet above MHW. No near-surface pile caps are over SAV areas.
- Retaining walls on both bridge approaches reduce wetland impacts and avoid surface water impacts.
- Stormwater will be collected on both bridge approaches: approximately 700 feet on the southern end (Sta 18+90 to Sta 26+00) and 600 feet on the northern end (Sta 44+65 to Sta 50+75).
- Bridge stormwater collection will be treated using roadside ditches meeting grass swale criteria.
- Deck drains will be installed, where feasible, throughout the remainder of the bridge, and will be located such that outlets will be at least 14' above mean high water.

#### ***11.1.2 General Construction Measures***

- Refer to Section 8.2 for protected species measures
- No staging of construction equipment or storage of construction supplies will be allowed in wetlands or AECs.

- A temporary work platform is proposed to access the new bridge alignment except for the navigation span, where barge access will be used.
- Sediment and erosion control measures shall adhere to the Design Standards in Sensitive Watersheds during construction of the project.
- Special Sediment Control Fence and Environmentally-Sensitive Area fencing will be used where applicable.
- No mechanized clearing in wetlands is proposed to reduce impact to wetlands.
- Bridge piles (24" pre-stressed concrete) will be driven, and no jetting will be used.
- Pile driving will be accomplished using pile cushions and will be ramped up to minimize the effects of in-water noise.
- Bridge pile installation within shallow water (SAV habitat) and wetlands will be contained with sediment control devices.
- No dredging is proposed.
- Turbidity curtains will be considered in areas of adequate shallow depth and lower velocity. Turbidity will be monitored during in-water work to ensure compliance with state water quality standards.
- To ensure that all borrow and waste activities occur on high ground, except as authorized by permit, the NCDOT shall require its contractors to identify all areas to be used to borrow material, or to dispose of dredged, fill or waste material. Documentation of the location and characteristics of all borrow and disposal sites associated with the project will be available on request.

#### *11.1.3 Demolition Measures*

- NCDOT will adhere to Best Management Practices for Construction and Maintenance Activities.
- Demolition of Bridge 73 will be accomplished through top-down and/or barge access. No work platform will be used for demolition access.
- Non-shattering methods will be implemented (no explosives) for bridge removal.
- No bridge deck or substructure components will be dropped in the water.
- Existing bridge piles in the navigation channel will be removed completely, unless not practicable.
- If a pile snaps off at a depth below scour and navigational clearance, and would require significant disturbance of substrate to remove, on-site agency consultation would be initiated by the Division prior to removing the lower portion of that pile.
- A demolition plan will be finalized by the selected contractor. The final demolition plan will also be approved by NCDOT and provided to permitting agencies for review prior to implementation.
- Once removed, bridge elements will be transported to a permitted disposal facility to be identified by the selected contractor and approved by NCDOT.

#### *11.1.4 Other Measures*

- Bridge 96 will be retained for County-maintained pedestrian access to the fishing pier on the island between the two current bridges.
- Access to the adjacent boat ramp will be provided via a driveway constructed of pervious pavement, and will not increase stormwater runoff on the existing boat ramp parcel.
- Existing causeway shoulders at the northern end of existing bridge 96 will be reinforced with pervious pavement and on-site parking (15 spaces) provided to address informal parking currently occurring.

## ***11.2 Compensation***

The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. Unavoidable jurisdictional wetland impacts will be offset by the on-site coastal wetland restoration as described in the attached Mitigation Plan. SAV impacts and mitigation will be determined in accordance with the attached Monitoring Plan for Determination of SAV Impact for Mitigation.

## **12.0 Indirect and Cumulative Effects**

The project is a replacement of existing infrastructure; therefore, additional development is not likely to occur as a result of the project. The replacement will neither influence nearby land use or stimulate growth as no new travel lanes are proposed.


## **13.0 Regulatory Approvals**

NCDOT requests that the proposed work be authorized under a Coastal Area Management Act Major Development Permit. The Certified Mail records for each adjacent riparian landowner are provided with this permit application. The return receipts will be forwarded once they have been received. Authorization to debit the \$475 Permit Application Fee from WBS 40212.1.3 is hereby given.

A copy of this permit application and its distribution list will be posted on the NCDOT website at: <http://xfer.services.ncdot.gov/pdea/PermApps/>.

If you have any questions regarding this information, please contact me at (252) 439-2827 or [hfyung@ncdot.gov](mailto:hfyung@ncdot.gov).

Sincerely,

DocuSigned by:  
  
7FF550D111C94DC...  
Hon Yeung, P.E.  
Division 2

cc: NCDOT Permit Application Standard Distribution List  
Tom Steffens, USACE  
Garcy Ward, NCDWR  
Jay Johnson, NCDOT Division 2  
Jennifer Farino, P.E., RS&H  
Phil May, Carolina Ecosystems, Inc.

Attachments:

- DCM MP-1 Form: Application for Major Development Permit
- DCM MP-2 Form: Excavation and Fill
- DCM MP-5 Form: Bridges and Culverts
- CAMA Landowner List & Notification Receipts
- CP4B Meeting Minutes
- CP4C Meeting Minutes
- SAV Mitigation & Monitoring Plan
- Coastal Wetland Mitigation Plan
- NMFS Concurrence
- NCSHPO Review Form
- Stormwater Management Plan
- Permit Impact Drawings
- Impact Summary Table
- Roadway Drawings



# APPLICATION for Major Development Permit

(last revised 12/27/06)



North Carolina DIVISION OF COASTAL MANAGEMENT

1. Primary Applicant/ Landowner Information				
Business Name N.C.D.O.T. Division 2		Project Name (if applicable) B-4863 Replace Bridges No. 73 & 96 over The Straits		
Applicant 1: First Name Hon	MI F	Last Name Yeung		
Applicant 2: First Name N/A	MI N/A	Last Name N/A		
<i>If additional applicants, please attach an additional page(s) with names listed.</i>				
Mailing Address 1037 W H Smith Blvd		PO Box 1587	City Greenville	State NC
ZIP 27835	Country USA	Phone No. 252 - 439 - 2827 ext.	FAX No. N/A - -	
Street Address (if different from above) N/A		City N/A	State N/A	ZIP N/A-
Email hfyung@ncdot.gov				

2. Agent/Contractor Information				
Business Name N/A				
Agent/ Contractor 1: First Name N/A	MI N/A	Last Name N/A		
Agent/ Contractor 2: First Name N/A	MI N/A	Last Name N/A		
Mailing Address N/A		PO Box N/A	City N/A	State N/A
ZIP N/A		Phone No. 1 N/A - - ext.	Phone No. 2 N/A - - ext.	
FAX No. N/A		Contractor # N/A		
Street Address (if different from above) N/A		City N/A	State N/A	ZIP N/A -
Email N/A				

&lt;Form continues on back&gt;

3. Project Location				
County (can be multiple) Carteret		Street Address Harkers Island Road		State Rd. # 1335
Subdivision Name NA		City Harkers Island	State NC	Zip 28504 -
Phone No. N/A - - ext.			Lot No.(s) (if many, attach additional page with list) N/A, , , ,	
a. In which NC river basin is the project located? White Oak			b. Name of body of water nearest to proposed project The Straits	
c. Is the water body identified in (b) above, natural or manmade? <input checked="" type="checkbox"/> Natural <input type="checkbox"/> Manmade <input type="checkbox"/> Unknown			d. Name the closest major water body to the proposed project site. The Straits	
e. Is proposed work within city limits or planning jurisdiction? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			f. If applicable, list the planning jurisdiction or city limit the proposed work falls within. N/A	

4. Site Description	
a. Total length of shoreline on the tract (ft.) 790	b. Size of entire tract (sq.ft.) 5.0 acres (217,800 sq ft)
c. Size of individual lot(s) N/A, (If many lot sizes, please attach additional page with a list)	d. Approximate elevation of tract above NHW (normal high water) or NWL (normal water level) 0-10 ft. <input type="checkbox"/> NHW or <input checked="" type="checkbox"/> NWL
e. Vegetation on tract Primarily maintained roadside grasses and herbs, mixed pine and oak forest, riverine swamp forest, and salt/brackish coastal marsh consisting of needlerush and cordgrass.	
f. Man-made features and uses now on tract Man-made features include existing bridges (including swing span bridge and house) and roadway, as well as multiple subsurface and aerial utility lines. Uses include transportation, residential, and recreational fishing and boating.	
g. Identify and describe the existing land uses <u>adjacent</u> to the proposed project site. Residential, undeveloped land, open water, and institutional (boat ramp, fishing pier, public beach access)	
h. How does local government zone the tract? Carteret County has not zoned this area.	i. Is the proposed project consistent with the applicable zoning? (Attach zoning compliance certificate, if applicable) <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> NA
j. Is the proposed activity part of an urban waterfront redevelopment proposal? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
k. Has a professional archaeological assessment been done for the tract? If yes, attach a copy. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA  If yes, by whom? NCDOT	
l. Is the proposed project located in a National Registered Historic District or does it involve a National Register listed or eligible property? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA	

&lt;Form continues on next page&gt;

m. (i) Are there wetlands on the site?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
(ii) Are there coastal wetlands on the site?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
(iii) If yes to either (i) or (ii) above, has a delineation been conducted? (Attach documentation, if available)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
n. Describe existing wastewater treatment facilities. N/A	
o. Describe existing drinking water supply source. Harkers Island Sanitary District (Carteret-Craven Electric Cooperative)	
p. Describe existing storm water management or treatment systems. Existing roadway stormwater either sheet flows to existing roadside ditches or drains directly from the bridges into The Straits.	

<b>5. Activities and Impacts</b>	
a. Will the project be for commercial, public, or private use?	<input type="checkbox"/> Commercial <input checked="" type="checkbox"/> Public/Government <input type="checkbox"/> Private/Community
b. Give a brief description of purpose, use, and daily operations of the project when complete. See cover letter	
c. Describe the proposed construction methodology, types of construction equipment to be used during construction, the number of each type of equipment and where it is to be stored. See cover letter	
d. List all development activities you propose. See cover letter	
e. Are the proposed activities maintenance of an existing project, new work, or both?	Both - construction of a replacement bridge on new location and existing roadway.
f. What is the approximate total disturbed land area resulting from the proposed project?	1.3 <input type="checkbox"/> Sq.Ft or <input checked="" type="checkbox"/> Acres
g. Will the proposed project encroach on any public easement, public accessway or other area that the public has established use of?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
h. Describe location and type of existing and proposed discharges to waters of the state. See cover letter and attached permit impact drawings.	
i. Will wastewater or stormwater be discharged into a wetland?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
If yes, will this discharged water be of the same salinity as the receiving water?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
j. Is there any mitigation proposed?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
If yes, attach a mitigation proposal.	

&lt;Form continues on back&gt;

**6. Additional Information**

In addition to this completed application form, (MP-1) the following items below, if applicable, must be submitted in order for the application package to be complete. Items (a) – (f) are always applicable to any major development application. Please consult the application instruction booklet on how to properly prepare the required items below.

- a. A project narrative.
- b. An accurate, dated work plat (including plan view and cross-sectional drawings) drawn to scale. Please give the present status of the proposed project. Is any portion already complete? If previously authorized work, clearly indicate on maps, plats, drawings to distinguish between work completed and proposed.
- c. A site or location map that is sufficiently detailed to guide agency personnel unfamiliar with the area to the site.
- d. A copy of the deed (with state application only) or other instrument under which the applicant claims title to the affected properties.
- e. The appropriate application fee. Check or money order made payable to DENR.
- f. A list of the names and complete addresses of the adjacent waterfront (riparian) landowners and signed return receipts as proof that such owners have received a copy of the application and plats by certified mail. Such landowners must be advised that they have 30 days in which to submit comments on the proposed project to the Division of Coastal Management.
- |                                  |           |
|----------------------------------|-----------|
| Name See attached landowner list | Phone No. |
| Address                          |           |
| Name                             | Phone No. |
| Address                          |           |
| Name                             | Phone No. |
| Address                          |           |
- g. A list of previous state or federal permits issued for work on the project tract. Include permit numbers, permittee, and issuing dates.
- |   |                                       |
|---|---------------------------------------|
| Nationwide 6 Permit for Geotechnical Investigations | GC 4133 Utility Relocation - 20181176 |
|   |                                       |
|   |                                       |
- h. Signed consultant or agent authorization form, if applicable.
- i. Wetland delineation, if necessary.
- j. A signed AEC hazard notice for projects in oceanfront and inlet areas. *(Must be signed by property owner)*
- k. A statement of compliance with the N.C. Environmental Policy Act (N.C.G.S. 113A 1-10), if necessary. If the project involves expenditure of public funds or use of public lands, attach a statement documenting compliance with the North Carolina Environmental Policy Act.

**7. Certification and Permission to Enter on Land**

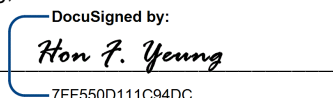
I understand that any permit issued in response to this application will allow only the development described in the application. The project will be subject to the conditions and restrictions contained in the permit.

I certify that I am authorized to grant, and do in fact grant permission to representatives of state and federal review agencies to enter on the aforementioned lands in connection with evaluating information related to this permit application and follow-up monitoring of the project.

I further certify that the information provided in this application is truthful to the best of my knowledge.

Date 12/03/2018

Print Name Hon Yeung, P.E.

Signature  7FF550D111C94DC...

Please indicate application attachments pertaining to your proposed project.

- ☒ DCM MP-2 Excavation and Fill Information      ☒ DCM MP-5 Bridges and Culverts
- ☐ DCM MP-3 Upland Development
- ☐ DCM MP-4 Structures Information

# EXCAVATION and FILL

**(Except for bridges and culverts)**

Attach this form to Joint Application for CAMA Major Permit, Form DCM MP-1. Be sure to complete all other sections of the Joint Application that relate to this proposed project. Please include all supplemental information.

Describe below the purpose of proposed excavation and/or fill activities. **All values should be given in feet.**

	Access Channel (NLW or NWL)	Canal	Boat Basin	Boat Ramp	Rock Groin	Rock Breakwater	Other (excluding shoreline stabilization)
Length							170
Width							80
Avg. Existing Depth					NA	NA	3.0
Final Project Depth					NA	NA	0.5

**1. EXCAVATION**☐ This section not applicable

- a. Amount of material to be excavated from below NHW or NWL in cubic yards.  
42 cubic yards
- b. Type of material to be excavated.  
Sand
- c. (i) Does the area to be excavated include coastal wetlands/marsh (CW), submerged aquatic vegetation (SAV), shell bottom (SB), or other wetlands (WL)? If any boxes are checked, provide the number of square feet affected.  
☒ CW 2,250   ☐ SAV \_\_\_\_\_   ☐ SB \_\_\_\_\_  
☐ WL \_\_\_\_\_   ☐ None
- d. High-ground excavation in cubic yards.  
1,170 cubic yards
- (ii) Describe the purpose of the excavation in these areas:  
An approximate 10 foot fringe of coastal wetlands adjacent to a proposed wetland mitigation area. Excavation is required to tie slopes into the proposed mitigation area grades.

**2. DISPOSAL OF EXCAVATED MATERIAL**☐ This section not applicable

- a. Location of disposal area.  
To be determined by contractor at an approved location.
- b. Dimensions of disposal area.  
Undetermined
- c. (i) Do you claim title to disposal area?  
☐ Yes   ☒ No   ☐ NA
- d. (i) Will a disposal area be available for future maintenance?  
☒ Yes   ☐ No   ☐ NA
- (ii) If no, attach a letter granting permission from the owner.  
Undetermined
- e. (i) Does the disposal area include any coastal wetlands/marsh (CW), submerged aquatic vegetation (SAV), shell bottom (SB), or other wetlands (WL)? If any boxes are checked, provide the number of square feet affected.  
☐ CW \_\_\_\_\_   ☐ SAV \_\_\_\_\_   ☐ SB \_\_\_\_\_  
☐ WL \_\_\_\_\_   ☒ None
- f. (i) Does the disposal include any area in the water?  
☐ Yes   ☒ No   ☐ NA
- (ii) Describe the purpose of disposal in these areas:  
Contractor will be required to dispose of material in upland areas only.
- (ii) If yes, how much water area is affected?

### 3. SHORELINE STABILIZATION

(If development is a wood groin, use MP-4 – Structures)

☐ This section not applicable

- a. Type of shoreline stabilization:  
☐ Bulkhead ☐ Riprap ☐ Breakwater/Sill ☒ Other: Wall
- b. Length: 166  
 Width: 26
- c. Average distance waterward of NHW or NWL: 18 feet
- d. Maximum distance waterward of NHW or NWL: 26 feet
- e. Type of stabilization material:  
Retaining wall
- f. (i) Has there been shoreline erosion during preceding 12 months?  
☐ Yes ☒ No ☐ NA  
 (ii) If yes, state amount of erosion and source of erosion amount information.
- g. Number of square feet of fill to be placed below water level.  
 Bulkhead backfill \_\_\_\_\_ Riprap \_\_\_\_\_  
 Breakwater/Sill \_\_\_\_\_ Other 2,790
- h. Type of fill material.  
Undetermined - clean fill will be required by NCDOT
- i. Source of fill material.  
Undetermined - contractor responsible for identifying fill material

### 4. OTHER FILL ACTIVITIES

(Excluding Shoreline Stabilization)

☒ This section not applicable

- a. (i) Will fill material be brought to the site? ☐ Yes ☐ No ☐ NA  
 If yes,  
 (ii) Amount of material to be placed in the water \_\_\_\_\_  
 (iii) Dimensions of fill area \_\_\_\_\_  
 (iv) Purpose of fill \_\_\_\_\_
- b. (i) Will fill material be placed in coastal wetlands/marsh (CW), submerged aquatic vegetation (SAV), shell bottom (SB), or other wetlands (WL)? If any boxes are checked, provide the number of square feet affected.  
☐ CW \_\_\_\_\_ ☐ SAV \_\_\_\_\_ ☐ SB \_\_\_\_\_  
☐ WL \_\_\_\_\_ ☐ None \_\_\_\_\_  
 (ii) Describe the purpose of the fill in these areas: \_\_\_\_\_

### 5. GENERAL

- a. How will excavated or fill material be kept on site and erosion controlled?  
Fill material will be contained behind the retaining wall.
- b. What type of construction equipment will be used (e.g., dragline, backhoe, or hydraulic dredge)?  
Standard construction equipment including excavator, backhoe, dump truck etc. No dredge or dragline proposed.
- c. (i) Will navigational aids be required as a result of the project?  
☐ Yes ☒ No ☐ NA  
 (ii) If yes, explain what type and how they will be implemented.  
Shoreline stabilization will not require navigational aids
- d. (i) Will wetlands be crossed in transporting equipment to project site? ☐ Yes ☒ No ☐ NA  
 (ii) If yes, explain steps that will be taken to avoid or minimize environmental impacts.  
Access to project will be via existing roadways

12/03/18

Date

B-4863 Harkers Island Bridge Replacements

Project Name

Hon F Yeung, P.E.

**Form DCM MP-2 (Excavation and Fill, Page 3 of 3)**

Applicant Name

DocuSigned by:

*Hon F. Young*

Applicant Signature

**BRIDGES and CULVERTS**

Attach this form to Joint Application for CAMA Major Permit, Form DCM MP-1. Be sure to complete all other sections of the Joint Application that relate to this proposed project. Please include all supplemental information.

**1. BRIDGES**☐ This section not applicable

- a. Is the proposed bridge:  
☐ Commercial ☒ Public/Government ☐ Private/Community
- b. Water body to be crossed by bridge:  
 The Straits
- c. Type of bridge (construction material):  
 Prestressed concrete
- d. Water depth at the proposed crossing at NLW or NWL:  
 0-17 ft depth across The Straits
- e. (i) Will proposed bridge replace an existing bridge? ☒ Yes ☐ No  
 If yes,  
 (ii) Length of existing bridge: 1,396' & 587'  
 (iii) Width of existing bridge: 30.3' & 30.0'  
 (iv) Navigation clearance underneath existing bridge: NA or 14' (when swing span is not open)  
 (v) Will all, or a part of, the existing bridge be removed?  
 (Explain) All of Bridge 73 will be removed. Bridge 96 will be retained for pedestrian access to fishing pier.
- f. (i) Will proposed bridge replace an existing culvert? ☐ Yes ☒ No  
 If yes,  
 (ii) Length of existing culvert: N/A  
 (iii) Width of existing culvert: N/A  
 (iv) Height of the top of the existing culvert above the NHW or NWL: N/A  
 (v) Will all, or a part of, the existing culvert be removed?  
 (Explain) N/A
- g. Length of proposed bridge: 3,200'
- h. Width of proposed bridge: 34.6'
- i. Will the proposed bridge affect existing water flow? ☐ Yes ☒ No  
 If yes, explain: N/A
- j. Will the proposed bridge affect navigation by reducing or increasing the existing navigable opening? ☒ Yes ☐ No  
 If yes, explain: The current swing span bridge opening will be replaced by a navigation span with horizontal and vertical clearance of 125' and 45'.
- k. Navigation clearance underneath proposed bridge: 45'
- l. Have you contacted the U.S. Coast Guard concerning their approval? ☒ Yes ☐ No  
 If yes, explain: A USCG Application will be submitted concurrently with this application.
- m. Will the proposed bridge cross wetlands containing no navigable waters? ☒ Yes ☐ No  
 If yes, explain: Wetlands at the southern end of the bridge are adjacent to navigable waters.
- n. Height of proposed bridge above wetlands: 12-18'

**2. CULVERTS**☒ This section not applicable

- a. Number of culverts proposed: \_\_\_\_\_
- b. Water body in which the culvert is to be placed: \_\_\_\_\_



< Form continues on back >

c. Type of culvert (construction material):

d. (i) Will proposed culvert replace an existing bridge?

☐ Yes ☐ No

If yes,

(ii) Length of existing bridge: \_\_\_\_\_

(iii) Width of existing bridge: \_\_\_\_\_

(iv) Navigation clearance underneath existing bridge: \_\_\_\_\_

(v) Will all, or a part of, the existing bridge be removed?  
(Explain)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

e. (i) Will proposed culvert replace an existing culvert?

☐ Yes ☐ No

If yes,

(ii) Length of existing culvert(s): \_\_\_\_\_

(iii) Width of existing culvert(s): \_\_\_\_\_

(iv) Height of the top of the existing culvert above the NHW or  
NWL: \_\_\_\_\_

(v) Will all, or a part of, the existing culvert be removed?  
(Explain)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

f. Length of proposed culvert: \_\_\_\_\_

g. Width of proposed culvert: \_\_\_\_\_

h. Height of the top of the proposed culvert above the NHW or NWL.

\_\_\_\_\_

i. Depth of culvert to be buried below existing bottom contour.

\_\_\_\_\_

j. Will the proposed culvert affect navigation by reducing or  
increasing the existing navigable opening? ☐ Yes ☐ No

If yes, explain:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

k. Will the proposed culvert affect existing water flow?

☐ Yes ☐ No

If yes, explain:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### 3. EXCAVATION and FILL

☐ This section not applicable

a. (i) Will the placement of the proposed bridge or culvert require any  
excavation below the NHW or NWL? ☒ Yes ☐ No

If yes,

(ii) Avg. length of area to be excavated: 225

(iii) Avg. width of area to be excavated: 10

(iv) Avg. depth of area to be excavated: 0.5

(v) Amount of material to be excavated in cubic yards: 42

b. (i) Will the placement of the proposed bridge or culvert require any  
excavation within coastal wetlands/marsh (CW), submerged  
aquatic vegetation (SAV), shell bottom (SB), or other wetlands  
(WL)? If any boxes are checked, provide the number of square  
feet affected.

☒ CW 2,250 ☐ SAV \_\_\_\_\_ ☐ SB \_\_\_\_\_  
☐ WL \_\_\_\_\_ ☐ None

(ii) Describe the purpose of the excavation in these areas:

Excavation in 10 ft fringe of coastal wetlands to tie in  
proposed mitigation grades.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Form DCM MP-5 (Bridges and Culverts, Page 3 of 4)**

- c. (i) Will the placement of the proposed bridge or culvert require any high-ground excavation? ☒ Yes ☐ No  
If yes,  
(ii) Avg. length of area to be excavated: Varies  
(iii) Avg. width of area to be excavated: Varies  
(iv) Avg. depth of area to be excavated: Varies  
(v) Amount of material to be excavated in cubic yards: 1,043
- d. If the placement of the bridge or culvert involves any excavation, please complete the following:  
(i) Location of the spoil disposal area: Spoil will be used as new roadway embankment or disposed at an approved location  
(ii) Dimensions of the spoil disposal area: Undetermined  
(iii) Do you claim title to the disposal area? ☐ Yes ☒ No (If no, attach a letter granting permission from the owner.)  
(iv) Will the disposal area be available for future maintenance? ☒ Yes ☐ No  
(v) Does the disposal area include any coastal wetlands/marsh (CW), submerged aquatic vegetation (SAVs), other wetlands (WL), or shell bottom (SB)?  
☐ CW ☐ SAV ☐ WL ☐ SB ☒ None  
If any boxes are checked, give dimensions if different from (ii) above.  
  
(vi) Does the disposal area include any area below the NHW or NWL? ☐ Yes ☒ No  
If yes, give dimensions if different from (ii) above.
- e. (i) Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item **d** above) to be placed below NHW or NWL? ☒ Yes ☐ No  
If yes,  
(ii) Avg. length of area to be filled: 166  
(iii) Avg. width of area to be filled: 26  
(iv) Purpose of fill: Construction of retaining wall at southern bridge approach to minimize impacts from fill slopes.
- f. (i) Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item **d** above) to be placed within coastal wetlands/marsh (CW), submerged aquatic vegetation (SAV), shell bottom (SB), or other wetlands (WL)? If any boxes are checked, provide the number of square feet affected.  
☒ CW 2,937 ☐ SAV      ☐ SB       
☐ WL      ☐ None  
(ii) Describe the purpose of the excavation in these areas:  
Retaining wall construction on southern approach
- g. (i) Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item **d** above) to be placed on high-ground? ☒ Yes ☐ No  
If yes,  
(ii) Avg. length of area to be filled: 750 ft  
(iii) Avg. width of area to be filled: 60 ft  
(iv) Purpose of fill: Roadway construction

**4. GENERAL**

- a. Will the proposed project require the relocation of any existing utility lines? ☒ Yes ☐ No  
If yes, explain: Overhead electric and subsurface cable and phone (see cover letter).
- b. Will the proposed project require the construction of any temporary detour structures? ☐ Yes ☒ No  
If yes, explain:

*If this portion of the proposed project has already received approval from local authorities, please attach a copy of the approval or certification.*

**< Form continues on back >**

- c. Will the proposed project require any work channels?

☐ Yes ☒ No

*If yes, complete Form DCM-MP-2.*

- d. How will excavated or fill material be kept on site and erosion controlled?

NCDOT standard practices (i.e. silt fence & check dams)

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- e. What type of construction equipment will be used (for example, dragline, backhoe, or hydraulic dredge)?

Standard construction equipment including cranes, pile drivers, backhoes, excavators, barges, boats, & dump trucks

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- f. Will wetlands be crossed in transporting equipment to project site?

☐ Yes ☒ No

If yes, explain steps that will be taken to avoid or minimize environmental impacts.

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- g. Will the placement of the proposed bridge or culvert require any shoreline stabilization?

☒ Yes ☐ No

*If yes, complete form MP-2, Section 3 for Shoreline Stabilization only.*

12/3/2018

Date

Project Name

Hon Yeung

Applicant Name

DocuSigned by:

Hon F. Yeung

Applicant Signature...



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

JAMES H. TROGDON, III  
SECRETARY

December 3, 2018

Dear Landowner:

The North Carolina Department of Transportation is planning to replace bridges 73 and 96 on SR 1335 (Harkers Island Road) over The Straits. The proposed project will replace the aging existing structures over The Straits. The project will replace the two existing bridges with a single structure.

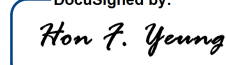
This project crosses an Area of Environmental Concern, as defined by the North Carolina Division of Coastal Management (DCM), and must be approved by the DCM under provisions of the Coastal Area Management Act (CAMA). One of the prerequisites to this approval is that adjacent riparian landowners be given an opportunity to comment on the proposal.

The attached form is submitted to ensure that you have an opportunity to comment on the proposal. If you have **no** objections to the proposal, please return the form with your response within 30 days to this office. If you **do** have objections to the project, please forward your comments to:

**Mr. Stephen Lane**  
**N.C. Division of Coastal Management**  
**400 Commerce Ave.**  
**Morehead City, NC 28557**

Thank you for your cooperation.

Sincerely,

DocuSigned by:  
  
7FF550D111C94DC...  
Hon Yeung, P.E.  
NCDOT Division 2

cc: Stephen Lane, NCDOT

**ADJACENT RIPARIAN LANDOWNER STATEMENT**  
(Carteret County: Replace Bridge Nos. 73 and 96 over The Straits)  
NCDOT TIP B-4863

General Statutes and Division of Coastal Management Major Permit approval procedures require that riparian landowners with property adjoining a proposed development in an Area of Environmental Concern (AEC) be given thirty (30) days in which to comment on the proposed development. This form allows the adjacent riparian landowner to express either: (1) that he/she objects to the project; or, (2) that he/she does not object and desires to waive his/her right to the 30-day period so that the processing of the application can progress more rapidly. Of course, the adjacent riparian landowner need not sign this form at all if he/she so chooses.

I, \_\_\_\_\_, am an adjacent riparian property owner and am aware of the North Carolina Department of Transportation's plans to replace bridges 73 and 96 over The Straits in Carteret County, North Carolina. I am further aware that this work will occur in one or more Areas of Environmental Concern and therefore will require authorization from the Division of Coastal Management in accordance with the Coastal Area Management Act (CAMA).

\_\_\_\_\_ I have no objection to the project as presently proposed and hereby waive that right of objection as provided in General Statute 113-229.

\_\_\_\_\_ I have objections to the project as presently proposed and my comments are attached.

\_\_\_\_\_  
Signature of Adjacent Riparian Landowner

\_\_\_\_\_  
Date

\_\_\_\_\_  
Phone Number with Area Code

Property ID	Contact Name	Contact Address	Copy ID
1	Hallis Batson et ux. (Stan Abrams – Attorney)	110 Captains Cove, Hampstead, NC 28443	1
2	Lawrence F. Baldwin et ux. (Stan Abrams – Attorney)	PO Box 278, Harkers Island, NC 28531	2
3	Harkers Point HOA (Stanley Richard – HOA Attorney)	113 Turner Street, Beaufort, NC 28516	3
4	Patricia Testa	105 Huntingtown Road, Newton, CT 06470	4
5	Hallis Batson et al. (Stan Abrams – Attorney)	110 Captains Cove, Hampstead, NC 28443	1
6	Carteret County (Tommy Burns)	302 Court House Square Suite 200, Beaufort, NC 28516	5
7	State of NC (Joe Creech – Special Acquisitions)	1546 Mail Service Center, Raleigh, NC 27699-1546	6
8	State of NC (Joe Creech – Special Acquisitions)	1546 Mail Service Center, Raleigh, NC 27699-1546	6
9	State of NC (Joe Creech – Special Acquisitions)	1546 Mail Service Center, Raleigh, NC 27699-1546	6
10	State of NC (Joe Creech – Special Acquisitions)	1546 Mail Service Center, Raleigh, NC 27699-1546	6
11	Jeffrey L. Chadwick et ux.	101 E. 3rd Avenue, Rome, GA 30161	7
12	Carteret County (Tommy Burns)	302 Court House Square Suite 200, Beaufort, NC 28516	5
13	Jeffrey L. Chadwick et ux.	101 E. 3rd Avenue, Rome, GA 30161	7
NA	Stan Abrams - Attorney (Prop IDs 1, 2, 5)	280 South Mangum Street Suite 400, Durham, NC 27701	8

# Meeting Summary Memorandum

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**Meeting Date:** March 14, 2018

**Subject:** Concurrence Point 4B Meeting  
B-4863 Harker's Island Bridge Replacements

**Location:** NCDOT Structure Design Conference Room C

**Attendees:**

Maria Rogerson, NCDOT Division 2	Travis Wilson, NCWRC
Bill Kincannon, NCDOT Division 2	Hal R. Pitts, USCG*
Jeff Cabaniss, NCDOT Division 2	Chris York, Down East RPO*
Hon Yeung, NCDOT Division 2	Gary Jordan, USFWS*
Jay Johnson, NCDOT Division 2	Jennifer Farino, RS&H
Preston Hunter, NCDOT Division 2*	Richard Bollinger, RS&H
Mike Sanderson, NCDOT BSG	Will Weathersbee, RS&H
Jason Dilday, NCDOT EAU	Drew Morrow, RS&H
Craig Freeman, NCDOT Hydraulics	Cole Benjamin, RS&H
Leilani Paugh, NCDOT	Meredith Van Duyn, RS&H
Ron Lucas, FHWA	Leigh Lane, Louis Berger
Cathy Brittingham, NCDOT	Robin Maycock, Louis Berger
Stephen Lane, NCDOT*	Douglas Parker, Louis Berger
Curt Weychert, NCDOT Fisheries*	Phil May, Carolina Ecosystems
Garcy Ward, NCDWR	Rob Crowther, Carolina Ecosystems
Fritz Rohde, NMFS*	<i>* joined via phone</i>

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## Meeting Summary:

The subsequent action items were established (to be completed before the CP4C Merger Meeting) following discussion about various topics such as stormwater treatment/design, the proposed parking area, SAV and Coastal Wetland mitigation, utility coordination, and construction methods:

1. Drainage Design- Swales will be utilized for stormwater treatment on both the mainland and the island side of the bridge. Also, a closed deck drain system will be used beyond the rollover point on the bridge, effectively creating the need for a closed deck drain system on both sides of the bridge. RS&H will analyze how many deck drains can be added to the closed system up to the treatment capacity of the swales.
2. Proposed Parking Area- NCDOT/RS&H/Louis Berger/Stephen Lane will coordinate to schedule a meeting with Linda Lewis (NCDEQ Wilmington Regional Office) to discuss stormwater impacts. Invitees include NCWRC (Sara Sherman and Travis Wilson), Garcy Ward, and County Staff.
3. SAV and Coastal Wetland Mitigation: RS&H will coordinate with NCDOT and Louis Berger to schedule a separate meeting to discuss SAV minimization/mitigation and coastal wetland mitigation. The Merger Team will be invited to a meeting once a mitigation plan has been further developed.

4. Utility Coordination: Coordination ongoing.
5. Construction Methods: Coordination of Constructability Meeting ongoing.

### **Detailed Meeting Minutes:**

Richard Bollinger opened the meeting, and attendees introduced themselves. The purpose of this meeting was to review the 30% conceptual drainage plans, which were provided prior to the meeting.

Richard discussed the drainage design, describing it in three areas. (See Figure 1)

#### ➤ **Drainage Design “Area 1” (Harker’s Island)**

- Area 1 is from Begin Project limits to the superelevation rollover point on the island side of the bridge (approx. -L- Sta. 22+00).
- Existing drainage was described in Area 1. Photos were shown of this area.
- Richard mentioned the new alignment is superelevated toward the right side of the road, taking a small amount of water away from the left side of the road (previous alignment was normal crown) and adding it to the right side of the road in the proposed condition.
- The first proposed drainage ditch on the right side of the road (between Maxwell Dr. and the unpaved resident driveway) will collect runoff and convey it south to the lagoon/marsh area. This ditch will also provide some treatment for this runoff.
- The second proposed drainage ditch between the resident driveway and Sparks Road collects runoff from the road and will convey it to the existing ditch along Sparks Road running east. This existing ditch will be converted into a proposed swale for treatment of this water as well as treatment of the runoff from the bridge via shoulder berm gutter and closed drainage system. The runoff from the bridge consists of all stormwater starting from the bypass from the last deck drain to the end of the bridge on Harker’s Island. The swale shown along Sparks Road is adequately sized for treatment per the NCDOT BMP manual, and has approximately three times the required length for treatment with a flat grade of  $\leq 0.4\%$ .

#### ➤ **Drainage Design “Area 2” (Main Span of Bridge)**

- Area 2 is from the superelevation rollover point on island side of bridge (approx. -L- Sta. 22+00) to the superelevation rollover point on mainland side of the bridge (approx. -L- Sta. 46+50). Richard pointed out the high point location which is above the existing navigation channel location (approx. -L- Sta. 27+45).
- Richard described the proposed drainage for Area 2. The proposed design discharges virtually all the water between the rollover points in Area 2 to the sound to keep the bypass at the rollover points less than 0.1 cfs to prevent vehicular hydroplaning. On the island side of the bridge high point, the lowest discharge height of a deck drain is approximately 26’ above MHW. On the mainland side of the bridge high point, the lowest discharge of a deck drain is 14’ above MHW. The deck drain discharging at 14’ above MHW is located at the superelevation rollover point.



- The importance of allowing water to flow off the bridge via deck drains prior to the superelevation rollover point is to minimize the amount of water sheet flowing across travel lanes from one side of the bridge to the other when the superelevation of the bridge reverses from sloping one direction to the opposite direction. The design minimizes this to <0.1 cubic feet per second (cfs). Everything from the rollover point toward the mainland will be collected in a closed deck drain system and treated. There is direct discharge over SAV areas near the Straits island and fishing pier, with the discharge heights ranging from 15.5' to 17.5' above MHW to allow the runoff to disperse before falling into the water below.

➤ **Drainage Design "Area 3" (Mainland)**

- Area 3 is from the superelevation rollover point on the mainland side of the bridge (approx. -L- Sta. 46+50) to End Project limits.
- Richard described the proposed drainage for Area 3. Bridge runoff will be captured from the rollover point into a closed deck drain system. A closed deck drainage system is proposed here since the deck drain discharge point falls below the 14' above MHW elevation. The closed deck drain system will convey runoff to a 6' base swale for treatment. The swale has approximately three times the required length for treatment and has a very flat grade of approximately 0.3 to 0.4%.

Once completed with the presentation, Richard asked the group if they had any questions or concerns regarding the drainage design.

➤ **Drainage Design Questions/Comments**

- Garcy questioned the length being shown from beginning of bridge to first deck drain. He mentioned it looks like approx. 150' on plans, however in a previous meeting in Greenville to discuss drainage, the lengths were closer to 300'-400'.
  - Craig responded, that the numbers that were discussed in the Greenville meeting were very preliminary, and they have been fine-tuned as the design has progressed.
- Garcy then asked if more detailed information could be provided regarding proposed treatment swales (length, slopes, areas, etc.).
  - Richard responded with general information regarding the swales. Longitudinal slopes are around 0.3-0.4%, island side swale is a V-shape with 3:1 side slopes, and the mainland side is a 6' base, trapezoidal-shape with 3:1 side slopes. Both swales are capable of treating the runoff from the bridge all the way to the roadway superelevation rollover point. The swale on the island side has a treatment length of approximately 112' and on the mainland side the swale has an approximate treatment length of 155'. Treatment lengths are approximately two to three times the required length for each swale. Drainage details will be added to the final redline plans with swale information.
- Garcy and Stephen asked if we could extend the closed deck drain system to collect more water for treatment since the treatment length of the swales are two to three times longer than required.
  - Richard mentioned extending the closed deck drain system was not proposed due to the cost and safety of maintenance associated with the height of the deck drains as well as the need for duplicate pipe on both sides of the bridge

due to the superelevation rollover occurring on the bridge. This requires a pipe to be placed on both sides of the bridge since the girders prevent the pipe crossing under the bridge.

- Travis provided some information regarding closed deck drain systems considered on other bridges that are in the Merger process. He expected to see a more extensive closed deck drain system on this bridge based on the shorter length of bridge in comparison to the other bridges he mentioned.
- Maria and Bill said the NCDOT is open to considering collecting more water in a closed system.
- Richard then mentioned he does not feel the swales, as currently designed, have the capacity to treat all the stormwater from the bridge if it were to be collected in a closed system.
- An Infiltration Basin on the island side was discussed; however due to location constraints and the possibility of the basin encroaching into the 75' AEC line and the 30' CAMA buffer, the basin was deemed not practical.
- Cathy said DCM would not allow exceptions for 30' CAMA Buffer encroachment for a proposed basin.
- Stephen asked to treat as much runoff from the bridge as possible, at least up to the capacity of the receiving treatment swale.
- Richard suggested an alternative option to collect water in a closed system over SAV areas (near middle of bridge) and discharge into deeper water via a pipe that runs down the bridge bent outside of the SAV areas.
  - Curt agreed from the NCDOT-Fisheries' perspective.
  - Garcy did not agree since from the NCDEQ-DWR perspective this would not benefit water quality.
- Richard and NCDOT agreed to run calculations to see how many additional deck drains can be added to the closed system to reach capacity on the treatment swales at each end of the proposed bridge. This additional interception of flow beyond the rollover points will require deck drain systems on both sides of the bridge.
- Bill mentioned that would be the best effort NCDOT can make for treating the bridge runoff due to the project constraints. He then asked if all invested parties agreed to this design methodology. **Everyone agreed this was the best way to proceed with the design.**

➤ **Parking Area Questions/Comments**

- Cathy requested a discussion of the proposed parking area, stormwater impacts, and proposed stormwater treatment in this area.
  - NCDOT is considering permeable pavers/gravel for proposed pavement areas. Designs have not been finalized yet.
  - The preliminary design is considering approximately 19 parking spaces.
  - There was discussion about who will maintain the parking area.

- Travis mentioned we should be coordinating with DEMLR/Stormwater staff and NCWRC staff regarding design.
- Jennifer referenced an internal discussion that has everything outside of the existing asphalt being some type of pervious material, and therefore there should be no net change to stormwater runoff.
- Travis stated that multiple stormwater variances have been issued for the WRC boat ramp property and his concern of additional parking adding impervious area not being allowed. He suggested a meeting to be scheduled with stormwater contact (Linda Lewis) to resolve. NCDOT/RS&H/Louis Berger will coordinate to schedule a meeting with Linda Lewis (NCDEQ Wilmington Regional Office) to discuss. Stephen Lane offered to help coordinate, and other invitees include NCWRC (Sara and Travis), Garcy Ward, and County Staff.

➤ **SAV and Coastal Wetland Mitigation Questions/Comments**

- Anticipated CP4C Meeting July 2018
- Coordination with St. Petersburg NMFS Protected Resource Division is ongoing.
- Cathy asked if the existing bridge abutments and rip rap will be removed.
  - Project team is evaluating this, but has not made final decision yet. Concerns were raised about grading the elevation too low since there are public and natural resources nearby that may be adversely affected.
  - Possibility of regrading existing causeway on Harker's Island to add additional beach access/recreational area was discussed.
  - Nothing proposed for the mainland side due to Bridge #96 remaining in place for pedestrian access to the fishing island.
- Stephen mentioned the possibility of using the island side of the center island as on-site wetland mitigation.
  - NCDOT will investigate if this is feasible.
  - Flow pattern and water depth concerns were discussed.
  - Stephen mentioned there is a variety of elevations we could grade down to.
  - Phil will coordinate with NCDOT.
- SAV mitigation option discussed included potentially:
  - Relocating SAV grasses that are directly affected by bent locations to another area on site.
  - Relocating SAV grasses to Oscar Shoals (offsite).
- Cathy asked if there was any coordination with Fritz or Curt.
  - Leilani said not at this time, but she will be following up with them.
  - Previous discussion with Ken Riley, but will now be with Fritz since he is taking over Ken's role on this project.
  - Discussion of SAV area inside proposed right-of-way and temporary construction area is 1.5 acres and SAV area under the dripline is 0.48 acres.

- Travis mentioned the Bonner Bridge SAV monitoring is on-going.
  - Curt agreed it wasn't fully completed. They would like to continue monitoring Harker's (before and after construction) and use Bonner as an example.
- Mike Sanderson stated that they will continue SAV habitat monitoring for this project twice a year, and will coordinate with Fritz and Curt to meet on-site.
- NCDOT would prefer to provide SAV mitigation as a part of this project for direct impacts from bents rather than in the future as this bridge is N-S and has limited shading potential.
- Travis asked about construction techniques and mentioned it would be good to have that information before the CP4C meeting. NCDOT plans to hold a constructability meeting to discuss construction methods prior to CP4C.
  - NCDOT plans to hold a constructability meeting to discuss construction methods prior to CP4C.
  - Discussions were held regarding low steel, shading effects, and configuration of temporary work platform.
  - Possibility of using grated deck for temporary work platform to reduce the shading effect on the SAV's. Pile removal effects also discussed.
  - Maria mentioned this is a Bid-Build, not Design-Build like other projects, so a contractor has not been selected yet. NCDOT does not want to dictate to the contractor how they must construct the bridge. Impacts will cover the worst case scenario.
  - Tom Steffens should be involved in these conversations.
- The length of the moratorium was discussed and how this will affect the overall construction schedule.
- **RS&H will coordinate with NCDOT and Louis Berger to schedule a separate meeting to discuss SAV minimization/mitigation and coastal wetland mitigation. The Merger Team will be invited to a meeting once a mitigation plan has been further developed.**

➤ **Utilities Questions/Comments**

- Cathy mentioned we should be thinking about utility impacts between now and CP4C meeting.
- Utility permits may be submitted sooner than project permits. Bore pits may be required within the 75' AEC, but not within the 30' CAMA buffer.
- Buffers clarified. 75' demarcation line from the MHW is the AEC. 30' demarcation line from the MHW is the Buffer.

➤ **Future Meetings and Schedule Questions/Comments**

- Stormwater Meeting
- SAV mitigation/Coastal Wetland mitigation Meeting
- Constructability Meeting
- CP4C Meeting

- DCM Pre-application Meeting (Phil to coordinate with Stephen Lane)
- Submit Permit
- Cathy mentioned CAMA permits will take approximately 3 months from submittal to approval.

➤ **General Discussion/Comments**

- Tom Steffens (USACE) was unable to attend. Per email correspondence received prior to CP4B meeting, Tom mentioned he does not have any comments or observations to add to the project at this point.
- **Items to be addressed at upcoming CP4C Meeting**
  - Parking and Stormwater
  - Revised Hydro Plans
  - Permit Drawings
  - Coastal Wetland Mitigation Plan
  - SAV Monitoring and/or Mitigation Plan
  - Protected Species Resolutions
  - Onsite Mitigation Opportunities
  - Utility Impacts/Coordination
  - Construction Methodology/Techniques
  - Section 408 applicability/permit
- **Meeting minutes will be circulated. RS&H to prepare meeting minutes.**
- Cathy mentioned to Jennifer, after the meeting was adjourned, that Curt would like to discuss the possibility of using part of the existing structure that is being removed as an artificial reef.
  - Item will be discussed further as project progresses.

- If any recipient of the meeting notes would like to add comments or feels a comment is erroneous or needs to be expanded, please feel free to contact Jennifer Farino at [jennifer.farino@rsandh.com](mailto:jennifer.farino@rsandh.com).

Attachments:

Figure 1

Copies to:

Merger Team

# Meeting Summary Memorandum

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**Meeting Date:** October 18, 2018

**Subject:** Concurrence Point 4C (Permit Drawings Review) Meeting  
B-4863 Harkers Island Bridge Replacements

**Location:** NCDOT Structure Design Conference Room

**Attendees:**

Maria Rogerson, NCDOT Division 2	Tom Steffens, USACE
Jeff Cabaniss, NCDOT Division 2*	Travis Wilson, NCWRC*
Hon Yeung, NCDOT Division 2	Hal R. Pitts, USCG*
Jay Johnson, NCDOT Division 2	Eric Howell, DERPO*
Cadmus Capehart, NCDOT Division 2	Jennifer Farino, RS&H
Brad McMannen, NCDOT Division 2	Richard Bollinger, RS&H
Kathy Herring, NCDOT EAU	Alex Vinson, RS&H
Tyler Stanton, NCDOT EAU	Drew Morrow, RS&H
Jason Dilday, NCDOT EAU	Meredith Van Duyn, RS&H
Byron Moore, NCDOT EAU	Leigh Lane, Louis Berger
Leilani Paugh, NCDOT EAU	Douglas Parker, Louis Berger
Matthew York, NCDOT Hydraulics	Phil May, Carolina Ecosystems
Trey Carroll, NCDOT Structures	Rob Crowther, Carolina Ecosystems
Colin Mellor, NCDOT EPU	
Cathy Brittingham, NCDOT	
Stephen Lane, NCDOT	
Curt Weychert, NMFS	
Garcy Ward, NCDWR	
Robert Patterson, NCDWR	
Fritz Rohde, NMFS*	
Twyla Cheat, NMFS*	

*\* joined via phone*

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Jennifer Farino and Maria Rogerson opened the meeting with introductions and reminded everyone that this meeting was rescheduled from September due to Hurricane Florence.

Richard Bollinger revisited the drainage design changes since the 4B meeting in March 2018.

- Based on agency input during the CP4B meeting, deck drain collection was extended on both ends of the bridge.
- On the island (south) side, deck drains are being collected from the navigation spans back to the island. The navigation span bridge flanges will not allow for deck drains, therefore those spans will discharge (at a height of up to 45 ft) horizontally.
- On the mainland (north) side, deck drain collection has been extended on both sides of the bridge to the maximum length that allows treatment on the mainland, picking up an additional 0.16 acres of bridge deck. The quantity of treatment is controlled by the size of the closed stormwater pipe system at the end of the bridge, which is at capacity. Any additional deck drains would require upsizing the pipe size which would place the top of the pipe in the road subgrade. Raising the road and increasing potential impacts, was not considered practical for the few additional deck drains this would permit due to the swale being at 95% capacity as currently designed.

- The remaining bridge length between the collection system and the navigation span will discharge via deck drains at a minimum of 14 feet above MHW.

Stephen Lane asked for the Stations where deck drains begin.

- See the attached permit drawings for deck drain spacing.

Richard then discussed the project impacts, and permit impact sheets. The impacts have been categorized into four sites – the approach on the island side and mainland side, the bridge construction over The Straits, and the demolition of the existing bridge over The Straits.

#### **Impact Site 1: Island Bridge Approach**

- The bridge approach includes permanent fill in wetland behind the retaining wall and hand clearing adjacent to the wall.
- Temporary fill in wetland is proposed for the transition from the existing road access down to the temporary work platform.
- A small amount of hand clearing is proposed to allow for installation of a riprap dissipater pad on the Y line at the end of the existing swale being improved.

Cathy Brittingham asked if this was where the adjacent riparian landowner had objected to the overhead power lines.

- Yes. The Baldwin property is the landowner objecting to the utility relocation.
- It was noted that adjacent landowner notification will also be required for the CAMA Major Permit application.

Tom Steffens asked if there was wetland fill associated with the splash pad on the Y line.

- No – only hand clearing is required there to construct the pad.

#### **Impact Site 2: Bridge Construction**

- This site consists of the permanent wetland and surface water impacts due to the bridge piers, temporary wetland and surface water impacts for the bridge pier installation, and temporary surface water impacts for the temporary work platform.
- The 27 bridge bents will be constructed from the work platform and barge (for the navigation span). Temporary disturbance around each bent location has been accounted for by a 15-foot offset from the piers. This is intended to be a “worst practical case” to account for various construction methods and allow room for construction, setting piles, and controlling sediment. The offset resulted from two constructability meetings with multiple potential contractors.
- The temporary work platform impacts account for a 40-foot wide platform with a row of piles spaced longitudinally along the platform every 20 feet. This was based on contractor feedback, and intended to again be the worst practical case. Surface water temporary impact calculations conservatively include a full line of 2.5 feet wide piles over the entire width of the platform, since transverse spacing cannot be determined at this time.

#### **Impact Site 3: Mainland Bridge Approach**

- Impacts on the mainland are limited to temporary fill associated with the transition from the existing roadway to the temporary work platform, and a small amount of hand clearing in wetlands adjacent to the boat landing to allow for construction of the driveway access.

#### **Impact Site 4: Bridge Demolition**

- Bridge demolition impacts are all temporary surface water and have been calculated by using a 10-foot offset from the footprint of the existing structure.

Garcy Ward asked if hollow piles would be used to support the temporary work platform. These piles often pull material out of the substrate and leave a hole.

- As this is not a design-build project, the type of pile for a temporary work platform cannot be specified at this time. The impacts over-account for square footage of impact as a worst-practical case.
- Kathy Herring stated that the effects of the temporary work platform removal would be monitored and included in the SAV mitigation plan.
- It was suggested that if hollow piles are allowed for the temporary platform a provision may need to be added to the contract to require backfilling of the holes created when the temporary piles are pulled.

Cathy Brittingham asked if top-down construction has been considered to avoid some of the temporary impacts.

- This has been discussed but the contractors did not indicate it would be practical. It would be very difficult to construct the project without a work platform.

Cathy asked about the horizontal clearance on the platform.

- The platform is 40 feet wide and includes six turnouts/staging points to allow contractors area to work. The turnout areas are 60' long by 45' wide and the bent fingers are 30 feet long by 42' wide.
- The amount of impact due to the temporary work platform is anticipated to be much less than proposed once a contractor is selected.

Cathy asked if the work platform segments would be leapfrogged.

- Due to the six-month moratorium on in-water work, DOT cannot commit to leapfrogging or removing any sections of the platform. The moratorium may result in multiple crews and types of work being performed so access from both sides may be required throughout construction. At this time, it is proposed to stay in place the entire length of construction.

Cathy stated that there would be conditions in the CAMA permit regarding temporary SAV impacts.

- This is understood. Temporary impacts will be minimized as much as possible as this is a worst practical case presented in the impact drawings and calculations.
- The SAV impacts would be monitored and include mortality from shading.

Phil May led the discussion of additional permitting and regulatory concerns.

#### **Construction Methods**

- Each bent will be constructed by driving 24" prestressed concrete piles.
- In open water areas, no control measures are proposed due to the difficulty of controlling sediment in fast flowing and deep water.
- In SAV areas and wetlands, sediment control devices will be required. The 15-foot offset allows for room to place control measures.

Cathy Brittingham asked if turbidity curtains would be used.



- Turbidity curtains might be used, but may be limited due to depth and velocity that would allow them to function. Other control devices such as exclusion boxes may be used in the SAV/wetland areas.
- DOT is committing to controlling sediment in the SAV/wetland areas, and not working in those areas during the moratorium period.

### **Utility Relocation**

- The utility relocation permit has been requested in advance of the bridge construction permit in order to allow the utility companies time to perform relocations prior to the moratorium in April. The overhead power poles directly conflict with both bridge approaches and must be out of the way before construction begins or it may push the work into another season.
- A request for a Nationwide Permit 12, corresponding 401 General Certification, and CAMA General Permit 1600 was submitted in August 2018. The 401 GC was issued and the Corps has determined that the activity is a non-reporting impact.
- The CAMA GP 1600 is on hold due to a landowner objection to the location of the overhead utility line.
- A separate GP 1600 request was submitted this week for the CenturyLink relocation. CenturyLink needs to repair damaged lines from Hurricane Florence and would prefer to do all the work at one time. This would also limit their activity within an Area of Environmental Concern to a single instance. No surface water or wetland impacts are associated with this work. Stephen Lane has the application and will begin processing it once the County signs the landowner notification.

Tom Steffens mentioned that although the utility relocation is non-reporting under Section 404, a Section 408 approval would still be required. He did not see an issue with this being issued.

- Understood. Previous correspondence with Jenny Owens supports this.

Maria Rogerson inquired about progress in discussions between DCM and the objecting landowner.

- Stephen Lane stated there may be some information in the next week.

### **Boat Landing**

- A meeting was held with Linda Lewis (NCDEQ Wilmington) in May 2018, and attended by several agencies. It was determined that the paperwork for a Minor Modification of the existing stormwater permit for the boat landing parcel would be submitted. Linda would then determine if a Minor Modification would actually be required. The consensus was that the effect on the parcel from the project would be minimal and should not be an issue.
- Pervious pavers will be used for the driveway and shoulder parking at the pedestrian access to the fishing island.
- The permit modification will be submitted soon.

The question was asked if the parking spaces were part of the minor modification.

- No, the parking spaces being provided are all within the existing ROW and do not drain to the boat landing. They are intended to help stabilize the existing shoulder which is currently being used for informal parking.

### **Other Issues**

Cathy Brittingham asked if the Impact Summary Sheet showed the breakdown between CAMA coastal wetlands and 404 wetlands.

- No. The impacts associated with the bridge construction are all CAMA coastal wetlands.

- This note will be added to the Impact Summary and also in the permit application.

Phil May asked if the utility relocation impacts should be shown in the upcoming permit application.

- No. A reference in the narrative to the prior application would suffice.

Cathy Brittingham asked when the permit application would be submitted.

- As soon as possible, but likely early November, based on comments received at this meeting.

Tom Steffens asked about the US Coast Guard Permit.

- The USCG application is being prepared at the same time as the Major CAMA and 404/401 permit applications. The USCG will not put the project on public notice until all other permits have been submitted.

Cathy Brittingham mentioned that the USCG permit can't be issued with an outstanding legal dispute. Tom Steffens also mentioned that the demolition method must be specified in the USCG application as well as the other permits. Hal Pitts clarified that the USCG will specify the "end state" of the bridge and demolition to ensure navigation but will not dictate the methods. They will follow the USACE lead on methods and bridge demolition requirements. Stephen Lane said to clearly state in the permit application what depth the existing bridge removal will be performed. Cathy Brittingham stated that the existing structure should be removed entirely.

- DOT standards require removing the entire structure. The only potential to leave anything in the substrate would be if a pier snaps off during removal at a depth where a lot of disturbance to the substrate would result to achieve removal.

Cathy Brittingham asked if the demolition would be performed from barges.

- Yes.

Cathy also asked if any of the material would be used for artificial reefs.

- At this time there are no plans to transport material to artificial reefs. Existing reefs are not located close to the project area. Usually DOT is approached closer to construction by the Division of Marine Fisheries about this and will consider it at that time.

Cathy stated that the temporary work platform pile locations would need to be filled with suitable material.

- This will be specified.

Garcy Ward stated that there have been issues with pile tips pinching and not being able to be removed. Consider using reinforced tips to prevent this.

- DOT will take this into consideration.

Phil May asked if mooring points, the locations of which cannot be accurately determined at this time, should be shown on the impact sheets in order to be included in the submittal, then modified later.

- It was determined that the best approach would be to include discussion of this in the narrative rather than in the plans, and include a note in the impact sheets. This would likely allow a minor adjustment to the permits, if needed, rather than a modification.

## Mitigation Plans

A conceptual mitigation plan meeting was held in August 2018. Comments on the plans from agencies was delayed due to the hurricanes. Comments have been received and will be incorporated into the plans.

Leilani Paugh discussed the Coastal Wetland Mitigation Plan

### *Coastal Wetland Mitigation*

- DOT is coordinating with the County on the amount of room required to maintain/replace the fishing pier, which would limit the coastal wetland mitigation area on the fishing island.
- DOT has acquired some elevations to use as biological benchmarks and will resurvey the area prior to construction.
- There would be some transition zone impacts associated with grading down the outer (landward) edge of the existing wetlands to a suitable elevation then continuing that through the mitigation area.

Tom Steffens asked if the projected acreage is the same.

- The projected area is still currently over 0.4 acres. All mitigation will be applied to this project.

Cathy Brittingham stated that due to the 0.07 acres of proposed impact, a minimum of 0.14 acres of mitigation, with success criteria, would be typical. However, CAMA would only require a 1:1 ratio. Tom Steffens stated 1:1 would satisfy the USACE as well.

Cathy asked if tide gauges would be used.

- Elevations seem to be adequate to design appropriate vegetation zones, and there is good growth out there. Gauges would not be necessary. Agencies agreed this would be a good approach.

Leilani Paugh stated that per agency comments on the conceptual plan the excavated material will be transported off-site and not placed on the roadway.

### *SAV Mitigation*

Kathy Herring reviewed the proposed SAV mitigation plan.

- DOT is proposing to relocate SAVs from the direct footprint of the bridge construction (i.e. pier locations).
- There has been disturbance to the SAV areas in 2018 related to recreational ATVs. Several aeriels were reviewed showing a significant loss of SAVs in September/October 2018, likely due to the change in flow patterns associated with these activities.
- DOT is proposing to monitor the SAV prior to relocation and if growth has returned, to relocate at that time.
- SAVs would be monitored and if shading and temporary work platform removal results in impacts, additional SAV mitigation would be provided.

Cathy Brittingham and Curt Weychert inquired about mitigation behind the existing riprap on the south end of the fishing island, as well as the suggestion from Travis Wilson at the conceptual mitigation meeting to evaluate reducing the footprint of the island-side causeway no longer needed for the bridge. There was discussion of these areas and a review of the flow patterns evident on aerial photography.

- It is DOT's opinion that this is not advisable due to existing scour and SAV/wetland locations at both the fishing island and Harkers Island. The areas are currently protected and stable, mostly

as a result of the protection provided by the existing causeways and riprap. Any alteration in this environment could cause altered flow patterns and unpredictable effects on existing SAV and wetland areas.

Cathy asked if DOT is planning to revise the mitigation plan based on their comments and provide that prior to the permit application.

- Yes, that is DOT's intention.

There was discussion related to the Rodanthe SAV mitigation and comparing it to the proposed plan for this project.

- The direct SAV impacts associated with this project are much smaller than Rodanthe. Currently, the estimate is 112 square feet of direct impact. Due to this and the significant change in SAVs this year from the recreational activity and storms, DOT is proposing to wait to see if the SAVs regrow and then monitor and move them. SAV relocation and monitoring (not for survival criteria) will be the proposed mitigation plan. It was determined that discussion between DMC and EAU would occur after the meeting.

#### **Miscellaneous Items:**

Cathy Brittingham asked about County parking

- DOT still intends to provide on-site parking at the pedestrian access point per the agreement with the County. This would still be beneficial since the shoulders would be used for parking anyway. The County is satisfied with the current number of parking spaces being provided.
- Stephen Lane agreed that informal parking is occurring and to classify that as an existing use.

Tom Steffens stated that the proposed impacts would likely be permitted under a Nationwide Permit 14, with a 45-day regulatory review period. Standard and some special conditions will be included.

Maria Rogerson reiterated the importance of moving the utilities ahead of the moratorium and the cost of remobilization.

Fritz & Twyla had no comments from NMFS at this time.

Update since CP4C Meeting:

- **Due to a landowner issue with the utility relocation, DCM has determined that the utility impacts need to be included in the Major Development Permit application with the bridge construction impacts. However, the Nationwide 14/General Certification 4135 e-PCN will only address bridge impact since a prior NWP 12/GC 4133 was issued for the utilities. This will be addressed/explained in the permit cover letter.**

If any recipient of the meeting notes would like to add comments or feels a comment is erroneous or needs to be expanded, please feel free to contact Jennifer Farino at [jennifer.farino@rsandh.com](mailto:jennifer.farino@rsandh.com).

Attachments:

Copies to: Merger Team

**North Carolina Department of Transportation  
STIP B-4863  
Harkers Island Bridge  
Submerged Aquatic Vegetation (SAV) Mitigation Plan  
Carteret County  
North Carolina**



**November 2018**



## **TABLE OF CONTENTS**

<b>1.0</b>	<b>PROJECT BACKGROUND AND DESCRIPTION</b>
<b>2.0</b>	<b>CURRENT STATUS OF SEAGRASS</b>
<b>3.0</b>	<b>BRIDGE CONSTRUCTION AND IMPACT SUMMARY</b>
	<b>3.1 IN WATER WORK MORATORIUM</b>
<b>4.0</b>	<b>PROPOSED MITIGATION</b>
	<b>4.1 SHADING MONITORING METHODOLOGY</b>
	<b>4.2 TEMPORARY IMPACT AREA MONITORING METHODOLOGY</b>
<b>5.0</b>	<b>PROPOSED MITIGATION OPTIONS FOR ANY SHADING IMPACTS POST MONITORING</b>
	<b>5.1 ON SITE ALTERNATIVES</b>
	<b>5.1.1 Modification of seagrass landscape on causeway island shoal</b>
	<b>5.1.2 Mitigation of anthropogenic activity scars on causeway island seagrass flat</b>
	<b>5.2 OFF SITE ALTERNATIVES</b>

## **TABLES**

**TABLE 1: SAV IN PREFERRED ALTERNATIVE**

**TABLE 2: IMPACT SUMMARY**

## **FIGURES**

**FIGURE 1: CHOSEN ALTERNATIVE**

**FIGURE 2: SEAGRASS COVER NORTH END**

**FIGURE 3: SEAGRASS COVER SOUTH END**

**FIGURE 4: ATV DAMAGE**

**FIGURE 5: EXCLUSION MESH**

**FIGURE 6: OSCAR SHOAL**

**FIGURE 7: OSCAR SHOAL HISTORIC SEAGRASS COVER**

## **1.0 PROJECT BACKGROUND AND DESCRIPTION**

The North Carolina Department of Transportation (NCDOT) proposes to replace Bridge No. 73 (known as the Earl C. Davis Memorial Bridge) and Bridge No. 96 carrying SR 1332/1335 (Harkers Island Road) over The Straits in Carteret County. Together these bridges provide the only vehicular access to Harkers Island. Replacement of Bridge No. 73 entails removal of the swing span bridge. Bridge No. 96 may remain in place for non-vehicular access to the Straits Fishing Pier.

After analysis and an extended period of public comment, NCDOT selected Alternative 5 as the preferred design, which involves a new fixed bridge to be located east of Bridges 73 and 96 (**Figure 1**). The proposed structure is approximately 3,200 feet (ft) in length, with a 32-foot wide roadway typical section, providing two 12-foot travel lanes and two 4-foot shoulders. The bridge height over the navigable portion of The Straits will be a minimum of 45 ft above mean high water and provide a horizontal span of at least 125 ft for boat passage.

## **2.0 CURRENT STATUS OF SEAGRASS**

A strong information base regarding seagrass resources in this area exists that can inform strategies for mitigating potential impacts to seagrass resources associated with the bridge replacement process. Seagrasses in the vicinity of Harkers Island Bridge (HIB) have been studied for several decades (Kenworthy et al. 1982, Fonseca et al. 1984, Irlandi and Peterson 1991, Bell et al. 1994, Irlandi et al. 1995, Murphey and Fonseca 1995, Fonseca and Bell 1998, Townsend and Fonseca 1998, Fonseca et al. 2002, Hovel et al. 2002, Hovel and Fonseca 2005, Fonseca 2006) and much is known not only about their function (see above) but also their status over time (Bell and Fonseca 1998; Fonseca et al. 2000; Uhrin and Turner, *in press* and recent unpublished survey data). These studies combine to provide a substantial foundation to inform mitigation opportunities associated with the HIB replacement.

The status of seagrass habitat over time surrounding the proposed HIB was also examined by review of satellite imagery available through Google Earth Pro. The area where the proposed bridge lands at the north end of the project area (mainland) has a seagrass bed forming a nearly continuous cover along the shoreline that is unusually well-studied (the seagrass bed at this site was utilized in the following studies: Bell et al. 1994, Murphey and Fonseca 1995, Fonseca and Bell 1998, Townsend and Fonseca 1998, Hovel et al. 2002., Mills and Fonseca 2003, Hovel and Fonseca 2005) (**Figure 2**). Proceeding south towards Harkers Island, the project alignment crosses a seagrass flat adjacent to a small island over which the existing highway and bridge alignment passes (causeway island; CI). There is a nearly continuous cover seagrass bed along the shoreline of CI. Where the HIB alignment passes to the east of CI (**Figure 2**) there are seagrass patches spread across an approximately 3- acre shoal. These patches are likely maintained in their patchy formation by biological disturbance (bioturbation; stingrays) and to some degree, wave energy (*sensu* Fonseca and Bell 1998, Townsend and Fonseca 1998). At the southern terminus of the HIB on Harkers Island (**Figure 3**), there are additional seagrass patches along the shoreline. In general, all seagrass beds within the project area have shown little fluctuation in cover over the past 20 years (**Figures 2 and 3**).



Figure 1. NCDOT Alternative 5; final selected plan for the Harkers Island Bridge replacement.





Figure 2. Mainland (north) end of the existing Harkers Island Bridge showing seagrass cover in the vicinity for 1994, 2009, 2011 and 2017 from Google Earth Pro imagery.

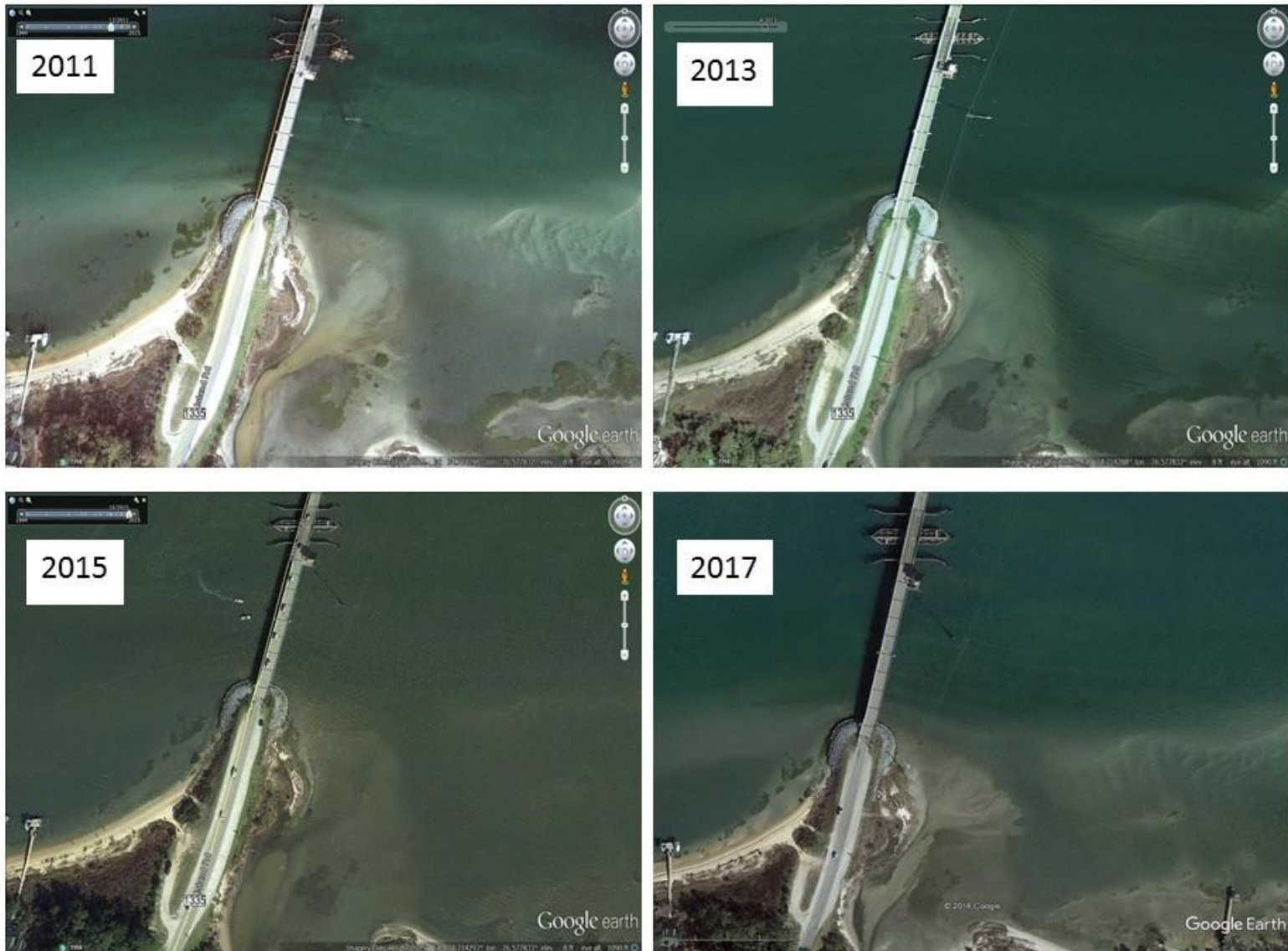


Figure 3. Harkers Island (south) end of the existing Harkers Island Bridge showing seagrass cover in the vicinity for 2011, 2013, 2015 and 2017 from Google Earth Pro imagery

During the Summer survey in 2018, it was discovered that SAV beds in the middle island area had been damaged by anthropogenic activities that resemble ATV tracks or propeller scars (**Figure 4**). These tracks have caused scars that consisted of depressed substrate and were void of SAV. In comparison with previous SAV assessments in the area, it is determined the damage was caused between August 2017 and May 2018. These damaged areas will be monitored using UAV collected photogrammetry during future assessments.

	2017 (Summer)	May 2018	September 2018	October 2018 Post Storm
Amount of SAV in ROW	1.54 ac	1.32 ac.	0.84 ac.	0.77 ac.
SAV in Construction Easement	0.33 a.	0.35 ac.	0.26 ac.	0.25 ac.
Total SAV in Study Area	1.87 ac.	1.67 ac.	1.1 ac.	1.02 ac.

Table 1. SAV in the Preferred Alternative Alignment





Figure 4. ATV or Propeller Damage

### **3.0 BRIDGE CONSTRUCTION AND IMPACT SUMMARY**

General construction methods are provided below; however, some details are dependent on the type of equipment used by the selected contractor after letting (projected for July 2019). Bridge construction will be accomplished by driving 24-inch pre-stressed piles to an estimated depth range of 35 to 60 ft. The bridge will be accessed primarily by a temporary work platform (with a minimum 20-foot span length) extending from both the mainland and island, with barge access through the navigable portion of The Straits. The Department has discussed the use of an open grate work platform and minimization efforts will continue throughout the design, contracting and construction process.

Within the 1 April to 30 September in-water moratorium requested by the NC Division of Coastal Management, work will be restricted to superstructure and areas above MHW, on the mainland and island, or within exclusion devices (dry boxes or caissons) within shallower portions of The Straits. Outside the moratorium, pile driving will occur in The Straits open water areas without jetting. Within shallow SAV habitat, pile driving will be contained within caissons or other temporary control structures to limit sedimentation. The permitting agencies will be included in a pre-construction meeting to discuss specifics regarding temporary sediment control measures once a contractor has been selected for the project.

Turbidity curtains will be considered in areas of adequate shallow depth and lower flow velocity. Staging areas will be identified by the individual contractors but will be restricted to upland areas outside Areas of Environmental Concern (AECs). Staging and turnaround access has been provided on the temporary work platform to reduce the amount of area needed on the mainland and island.

Demolition of Bridge 73 will be accomplished by barge and top-down methods, to be finalized in a demolition plan prepared by the selected contractor. No explosives will be used, and the material will be controlled and transported to an approved disposal facility. Structural components will be completely removed, if practical, or at minimum removed to below scour depth. Bridge 96 will be retained for County-maintained pedestrian access to the existing fishing pier on the island between the two bridges. NCDOT will provide to the contractors NC Division of Marine Fisheries contact information to allow for discussion of off-site disposal and use of demolition materials in the bidding process.

### **IMPACT SUMMARY**

Given the selected Alternative (**Figure 1**) the proposed bridge structure will permanently impact up to 110.46 sq ft of SAV within the piling footprint and potentially impact up to 1.87 ac of seagrass within the project area that could possibly require mitigation. There will be no SAV impact from footers or piers, based on SAV bed and SAV habitat location.

<b>Type of Impact</b>	<b>Acres</b>
Permanent Impact from Pilings	September 2018 SAV polygon - 71.64 sq ft May 2018 SAV polygon - 110.46 sq ft July 2017 SAV polygon - 108.69 sq ft July 2016 SAV polygon - 108.69 sq ft
Potential Shading from Bridge Footprint	0.44 ac.*
Temporary Work Platform	0.61 ac.*
Total SAV in Project Area	Up to 1.87 ac (Summer 2017)

Table 2. Impact Summary *\*These are part of the 1.67 total acres of seagrass. These numbers may change before going to final design.*

### **3.1 IN WATER WORK MORATORIUM**

The North Carolina Division of Coastal Management has determined that the project will have direct and indirect impacts to several different resource habitats. While the SAV within the B-4863 project study area are not designated by the North Carolina Division of Marine Fisheries as a primary nursery area (PNA), the NC Marine Fisheries Commission through rule 15A NCAC .31.0101(4)(f) defines nursery areas as “areas that for reasons such as food, cover, bottom type, salinity, temperature, and other factors, young finfish and crustaceans spend the major portion of their initial growing season.” The same rule further specifies that “primary nursery areas are those areas in the estuarine system where initial post-larval development takes place. These are areas where populations are uniformly early juveniles.” The DCM Fisheries Resource Specialist strongly recommends that any CAMA Permit that is issued for the project include a moratorium on in-water work from April 1 to September 30 to avoid significant adverse impacts on critical fish life history activities, to include spawning migrations and nursery functions.

#### **4.0 PROPOSED MITIGATION**

Due to the low level of direct impacts to SAV from this bridge project (up to only ~110ft<sup>2</sup>) the NCDOT proposes, as mitigation for the 110ft<sup>2</sup> of SAV permanently impacted by the bridge pilings, to monitor shading impacts for 5 years post construction and monitor the temporary impacts from the work bridge for 5 years post construction. If, at the conclusion of this monitoring period, it is determined that construction of the HIB has caused any permanent impact to seagrass above the ~110 sq ft., the NCDOT agrees to mitigate for that acreage of impact at a 1:1 ratio utilizing one of the methods proposed in Section 5.0 or another method proposed later based on the best available science.

#### **4.1 SHADING MONITORING METHODOLOGY**

The predicted area of shading would first be forecast by NCDOT's shading tool (currently under development; beta version March 2019) which uses a geometric model to delineate the distribution of the bridge's structure over time. The model will forecast the percent of time a given area of seafloor will be in shadow and the amount of light reduction experienced. The location of the forecast shading would be verified by periodic field observations. Twice annual seasonal monitoring will begin in 2019 and continuing for five years post construction (see details in section 4.2, below).

Based on current surveys of seagrass distribution and observation of Google Earth Pro imagery, there would be three areas where the structure has the potential to intersect seagrass and where sampling for shading impacts would occur; 1) on the north end of the project area where the HIB reaches the mainland, 2) on the shoal to the east of the causeway island and 3) at the southern end of the project area where the HIB reaches Harkers Island. Equally-spaced monitoring transects will be placed centered on and running perpendicular to the bridge, extending across two strata; 1) the shading area and 2) areas outside the shading area (reference area). Transects will be replicated on both sides of the bridge, to correlate the forecast (and field-validated) duration of shading to changes in seagrass cover (if any), all normalized to the status of the seagrass in the reference areas (unshaded).

At this project area where the bridge structure is short (as compared to other bridge projects such as the B-2500 Phase I- Bonner Bridge and Phase II- Rodanthe Bridge projects which are approximately 2 miles long) transects would be established at a frequency of one transect per 10-50 m of bridge structure (to be determined in coordination with DMF) for portions of the structure that are forecast to shade seagrass<sup>1</sup>. Given an estimated 440 m of bridge structure length running across seagrass-populated shoals, approximately 8-9 transects may be established (final transect number to be determined based on the verified forecast of shading extent). Braun-Blanquet (BBL) quadrats will be sampled at ~5 m increments along the length of each transect (again, final transect length and hence, number of quadrats to be determined based on the verified forecast of shading extent but no less than one quadrat per strata per transect on a given side of the bridge); BBL values will be converted to percent cover by

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<sup>1</sup> Transect spacing will vary depending on project size in order to produce a useful number of replicate transects

regression<sup>2</sup>. To remove any effects of local shifts in seagrass cover from that of the shading impact, seagrass cover in the shaded areas will be corrected for any change in reference area percent cover. Areas exhibiting a post-correction reduction to 33% <sup>3</sup>of reference bed seagrass cover (BBL scale) will trigger a planning assessment by NCDOT in preparation for potential seagrass bed mitigation.

In addition to the fine-scale transect surveys (above), low-level drone-based imagery will be collected of the seagrass resources on both sides of the bridge to the distance of the survey transects. These overflights would be conducted concurrently, based on water clarity and prevailing conditions, with the twice annual monitoring. All seagrass and seagrass bed boundaries delineated at the lowest practicable spatial resolution (~ 10 cm), rectified in a GIS and evaluated for accuracy by ground-truthing points and margins of seagrass beds as directed by initial interpretation of each imagery collection. Change analysis for seagrass cover will be performed among successive imagery collections as well as the initial collection each time imagery is flown.

#### **4.2 TEMPORARY IMPACT MONITORING METHODOLOGY**

Bridge construction is estimated at three to four years. Thus, the proposed monitoring plan will be conducted in two phases. Phase 1 – Will occur during bridge construction for monitoring of temporary impacts. Phase 2 – will occur post-construction and will monitor the entire study area that includes temporary impacted areas for five years. The study area is defined as the construction ROW. In addition to the monitoring phases as described above, SAV reference plots will be GPS located and will also be monitored for the entire monitoring period.

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<sup>2</sup> Average B-B scores will be converted to percent cover for each area to allow interpolation of averaged B-B scores that fall between B-B scale values (conversion will be conducted by regressing the mid-point of percent cover associated within the range covered by each B-B scale value, on the associated B-B scale value: Percent Cover =  $2.8108 * [B-B]^{2.2325}$ ).

<sup>3</sup> Reduction to 33% of abundance of reference values is a documented level at which shifts in fauna begin (Fonseca et al. 1996) NCDOT is recommending a 33% reduction in overall cover within the shading area as derived from the Braun-Blanquet survey at which to trigger an assessment. The assessment response would entail a survey to determine acceptable nearby, off-site locations at which to conduct compensatory mitigation for losses of services below 33% reduction in seagrass-specific cover and losses of acreage, both adjusted proportionally to any changes in reference conditions (baseline), accompanied by a supporting mitigation plan.



The following SAV species occur within the ROW and will be assessed:

- 1 – Eelgrass (*Zostera marina*)
- 2 – Shoal grass (*Halodule wrightii*)
- 3 – Widgeon grass (*Ruppia maritima*)

To determine temporary SAV impact locations, NCDOT proposes to assess each new temporary impact site as the work bridge is constructed until project completion. This assessment will be compared with pre-construction data to determine temporary SAV impact locations and impact areas.

Data collection for temporary impact areas will include the following metrics:

- Location of each temporary impact site
- Photography of each temporary impact site
- Temporary impact type (ie: cause of temporary impact, sedimentation, boring, etc.)
- SAV presence or absence, percent cover, and species composition and distribution

Post construction monitoring will occur throughout the entire study area, including the area covered by the temporary work bridge, and consists of the following metrics:

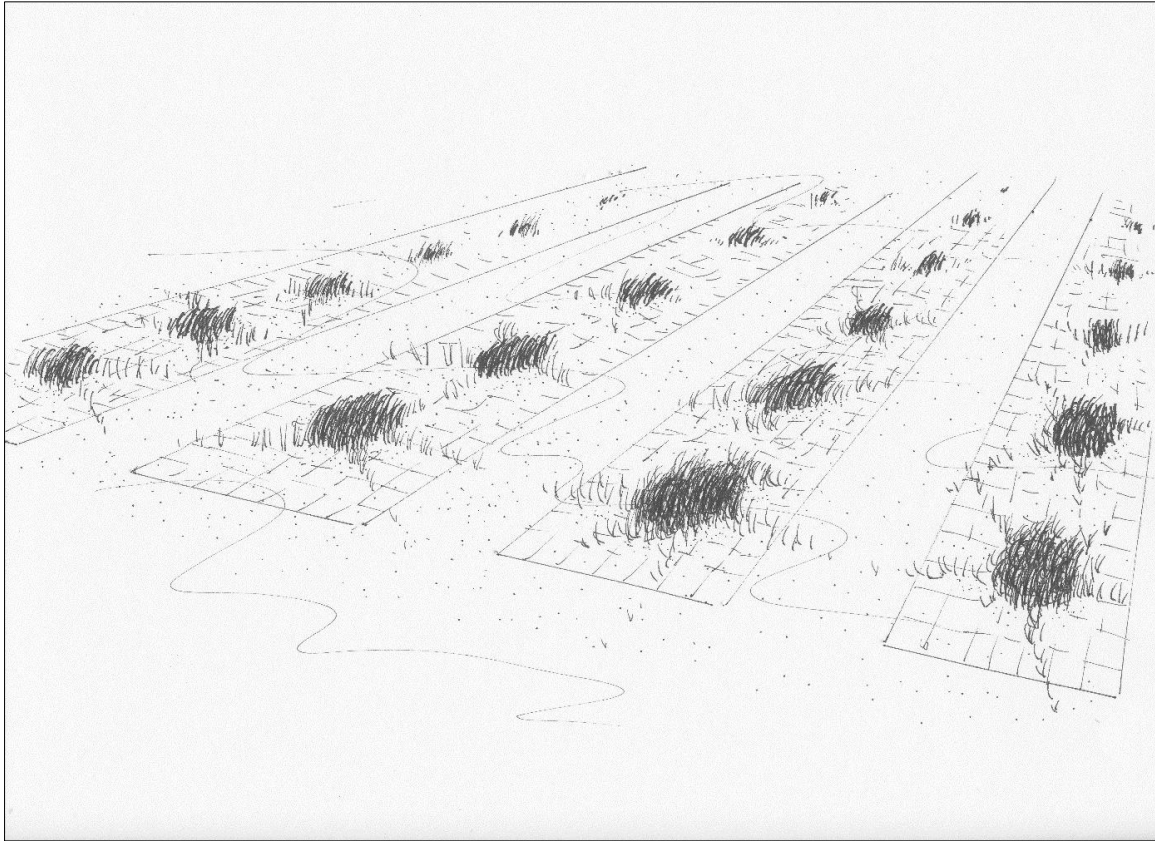
- GIS analysis of aerial photography to delineate changes to SAV beds as compared to pre-construction baseline
- Ground-truth of GIS assessment. This will include a GPS located delineation of changes to the aerial GIS-based assessment and exclude areas discovered to be detritus
- Species percent cover and composition/distribution via random quadrat analysis
- Comparison of pre and post construction data sets
- Analysis of temporary impact areas

Existing patches of SAV will be identified as reference monitoring plots. Preconstruction monitoring assessments yielded variable SAV coverage both seasonally and yearly. The purpose of the SAV monitoring plots will be used in determining changes in SAV beds from various unforeseen factors such as environmental/habitat condition change (eg: storms). SAV Plots will be installed and monitored according to the following metrics:

- Ten permanent plots will be established via GPS location in coordination with NC DMF staff. Plot sizes will be 10x10 or 5x20 meters (100 sq. meters targeted)
- SAV area within each plot will be calculated via SUB-Meter GPS
- SAV density (percent cover) and species distribution will be assessed
- Photography

## **5.0 PROPOSED MITIGATION OPTIONS FOR ANY SHADING IMPACTS or TEMPORARY WORK BRIDGE IMPACTS POST MONITORING**

Exclusion of sting rays (the primary source of bioturbation that may keep seagrass beds in a patchy, colonizing state) with exclusion mesh has been successfully tested elsewhere. Similar stingray exclusion methods have been highly successful in Tampa Bay, where planting survival was increased from 0 to over 60% (Fonseca et al. 1994; R. Dennis, Port Manatee Project; pers. com.). Additionally, this approach has been permitted by the State of Florida Department of Environmental Protection (Permittee: Hunter Walker, Santa Rosa County Administrator Permit No: 57-0203765-006-EI). Following the aforementioned FDEP permit NCDOT proposes the installation of a temporary exclusion system (a type of concrete wire reinforcing mesh or its equivalent) that is stabilized loosely on the seafloor that will keep the stingrays from disturbing the sediment, allowing the margins of existing seagrass patches on the shoal to the east of the bridge alignment adjacent to the causeway island to expand and colonize new seafloor, resulting in additional seagrass acreage. After edge expansion has occurred and existing patches joined, the exclusion devices will be removed and disposed of in accordance with local construction debris requirements. The wire mesh will be carefully removed so as to minimally damage any of the newly colonized seagrass.



Figure

5. Artist's rendition of mesh deployment over planted clusters of seagrass, showing their initial process of patch expansion.

## 5.1 ON-SITE ALTERNATIVES

### 5.1.1 Option 1: Modification of seagrass landscape on causeway island shoal

**Description:** The subtidal shoal on the east side of the causeway island has supported seagrass for decades (at least as far back as 1994 which is the earliest Google Earth imagery for this area). During that time there have been two consistent features of this seagrass habitat; one, a wide band of continuous seagrass cover along the shoreline and further offshore, a 'leopard-skin' (den Hartog 1971) pattern of discrete seagrass patches (**Figure 2**). Consistent with the approach used at the Bonner Bridge wavebreak project, here it is proposed to alter the sources of disturbance that are maintaining the leopard-skin seagrass pattern and cause a shift to more extensive, permanent cover.

The sources of disturbance maintaining seagrasses in this form of patchy cover in eastern North Carolina are a combination of waves, currents and biological disturbance, particularly from sting rays (Fonseca and Bell 1998, Townsend and Fonseca 1998). Tidal currents at this site remain to be evaluated but an examination of the seagrass patch pattern suggests weak effects of unidirectional flow (Mark Fonseca, pers. obs.). Wave energy at this site also remains to be

evaluated but the long fetch to the east through the waterbody known locally as “the straits” although constrained does provide opportunity for periodic northeasterly wind events to affect the site (as seen recently during Hurricane Florence with the substantial erosion of marsh on the causeway island and destruction of the fishing pier). Biological disturbance from stingrays is also very likely as the effect of ray burrowing on local seagrass pattern maintenance, if not formation, was demonstrated as being highly likely in nearby Back Sound where similar seagrass bed patterns were observed (Townsend and Fonseca 1998). Reduction in wave energy and exclusion of sting ray disturbance are used for this option as a means to shift the seagrass landscape pattern to a more continuous and extensive coverage pattern, thereby providing new, permanent seagrass acreage.

**Methodology:** Modification of wave energy would include use of already tested, low technology, oyster bags as wave breaks arranged in a semicircle. Oyster shell-filled bags would be placed offshore (east) of the causeway island and on unvegetated seafloor to create a living shoreline wavebreak. Bags would be stacked high enough to provide wind wave (and vessel wake) reduction based on the tidal frame at the site. The length of the shell wavebreak would be approximately 75 to 100 ft in length to provide shelter for the planted seagrass area. In addition to removing the potential for periodic acute disturbance by waves, NCDOT proposes installation of a temporary exclusion system (a type of concrete wire reinforcing mesh or its equivalent) that is stabilized loosely on the seafloor that will keep the stingrays from disturbing the sediment, allowing the margins of existing seagrass patches to expand and colonize new seafloor, resulting in additional seagrass acreage (**Figure 5**). After edge expansion has occurred and existing patches joined, the exclusion devices will be removed and disposed of in accordance with local construction debris requirements. The wire mesh will be carefully removed so as to minimally damage any of the newly colonized seagrass.

#### **5.1.2 Option 2: Mitigation of anthropogenic activity scars on causeway island seagrass flat**

**Description:** At some time between August 2017 and May 2018 a vehicle or boat was driven onto the wide band of continuous seagrass bed on the east side of the causeway island. This activity left extensive tracks in the seagrass bed (**Figure 4**), apparently having been run at a high speed such that the seagrass within the tracks was destroyed.

Unlike one of the dominant seagrasses in the southern U.S. (*Thalassia testudinum*; turtle grass), the seagrass species which initiate meadow formation in North Carolina (*Halodule wrightii* and *Zostera marina*) appear to have the capacity to vegetatively expand back into scarred areas comparatively quickly given their vegetative extension rates and ability to cope somewhat with verticality of terrain. However, scars through seagrasses with exposure to high wave energy may become initiation points for further disruption of the seagrass through erosion of the newly exposed bed margin to wave action as has been seen in North Carolina seagrass beds under storm conditions (Fonseca et al. 2000). Additionally, openings in the seagrass cover from such scars may become initiation points for biological disturbance (*sensu* Valentine et al. 1994) that could prevent their natural recolonization. The balance among the ability of local North Carolina seagrasses to recolonize scars and their vulnerability to storms and biological disturbance as it influences their subsequent expansion or recovery remains relatively

unstudied. Therefore, encouraging seagrass regrowth into these scars is proposed to prevent progressive impact to the existing beds through erosion of the scarred area.

**Methodology:** NCDOT proposes installation of a temporary exclusion system (a type of concrete wire reinforcing mesh or its equivalent) that is stabilized loosely on the seafloor that will keep the stingrays from disturbing the sediment, allowing the margins of existing seagrass patches to expand into the damaged area and re-covering the scarred seafloor. After expansion has occurred and coverage joined across the scars, the exclusion devices will be removed and disposed of in accordance with local construction debris requirements. The wire mesh will be carefully removed so as to minimally damage any of the newly colonized seagrass. Given these seagrass beds were already largely continuous, no wave energy reduction to facilitate bed expansion is proposed.

## 5.2 OFF-SITE ALTERNATIVE

**Description:** Only one off-site alternative is proposed. Within ~1 mile south and west of the HIB, there is a large shoal (Oscar Shoal; OS) covering ~80 to 100 acres that lies between Harker's Island and Middle Marsh (**Figure 6**). There is a navigation channel traversing the southern end of OS, close to Middle Marsh, allowing connectivity between North River and Back Sound. No part of OS is within the North Carolina Estuarine Research Reserve that encompasses Middle Marsh. Oscar Shoal has historically had high amounts of seagrass cover (**Figure 7**) and like the seagrass bed at the mainland terminus of the HIB alignment, this area has figured in numerous studies over time (Kenworthy et al. 1982, Fonseca et al. 1984, Irlandi and Peterson 1991, Ambrose and Irlandi 1992, Bell et al. 1994, Irlandi et al. 1995, Murphey and Fonseca 1995, Fonseca and Bell 1998, Townsend and Fonseca 1998, Fonseca et al. 2002, Hovel et al. 2002, Hovel and Fonseca 2005).

However, by approximately 1994, seagrass cover on the shoal had begun to collapse, ostensibly from intense scallop dredging activity (author's personal observation; also see Fonseca and Foltz 1984). Seagrass can apparently still persist on the site based on observations of remnant seagrass cover on OS and on adjacent, long-studied seagrass beds at similar depths (Fonseca and Bell 1998; MMN site). Oscar Shoal today is largely devoid of seagrass (**Figure 6**) having apparently reached a new stable state (*sensu* van Katwijk et al. 2009, Fonseca 2011, McGlathery et al. 2013) and natural recolonization of OS is likely limited by ongoing bioturbation (*sensu* Townsend and Fonseca 1998; Fonseca 2011). However, because the ostensible cause of the change in seagrass cover may be the result of anthropogenic disturbance pushing the seagrass cover below a tipping point, there may be an opportunity to shift the seagrass bed back to its previous stable state of being largely vegetated. Further, restoration of seagrass cover on portions of OS can provide a positive benefit for shellfish and shellfish leasing through increased seafloor stability and the ability of seagrass to utilize and recycle pseudofecal deposits associated with shellfish leasing if properly constructed and vice versa (Smith et al. 2009) (but see Dumbauld and McCoy 2015).

Verification of the suitability of the site to sustain seagrass requires environmental checks which would frequently include an assessment of water quality and elevation. However, water quality should not receive special study because seagrass still exists on the site and in adjacent

beds, suggesting that the strong flushing of the site by tides moving through Beaufort Inlet is adequate to maintain suitable optical water quality properties. However, in the long (years) absence of seagrass on the site and the effect of flushing by Beaufort Inlet, the elevation of the shoal should be compared to the elevation range of seagrasses in the immediate vicinity. This would determine whether any sediment accumulation (or loss, although this appears unlikely; personal observation) has occurred that would render the site too shallow or deep for successful colonization.

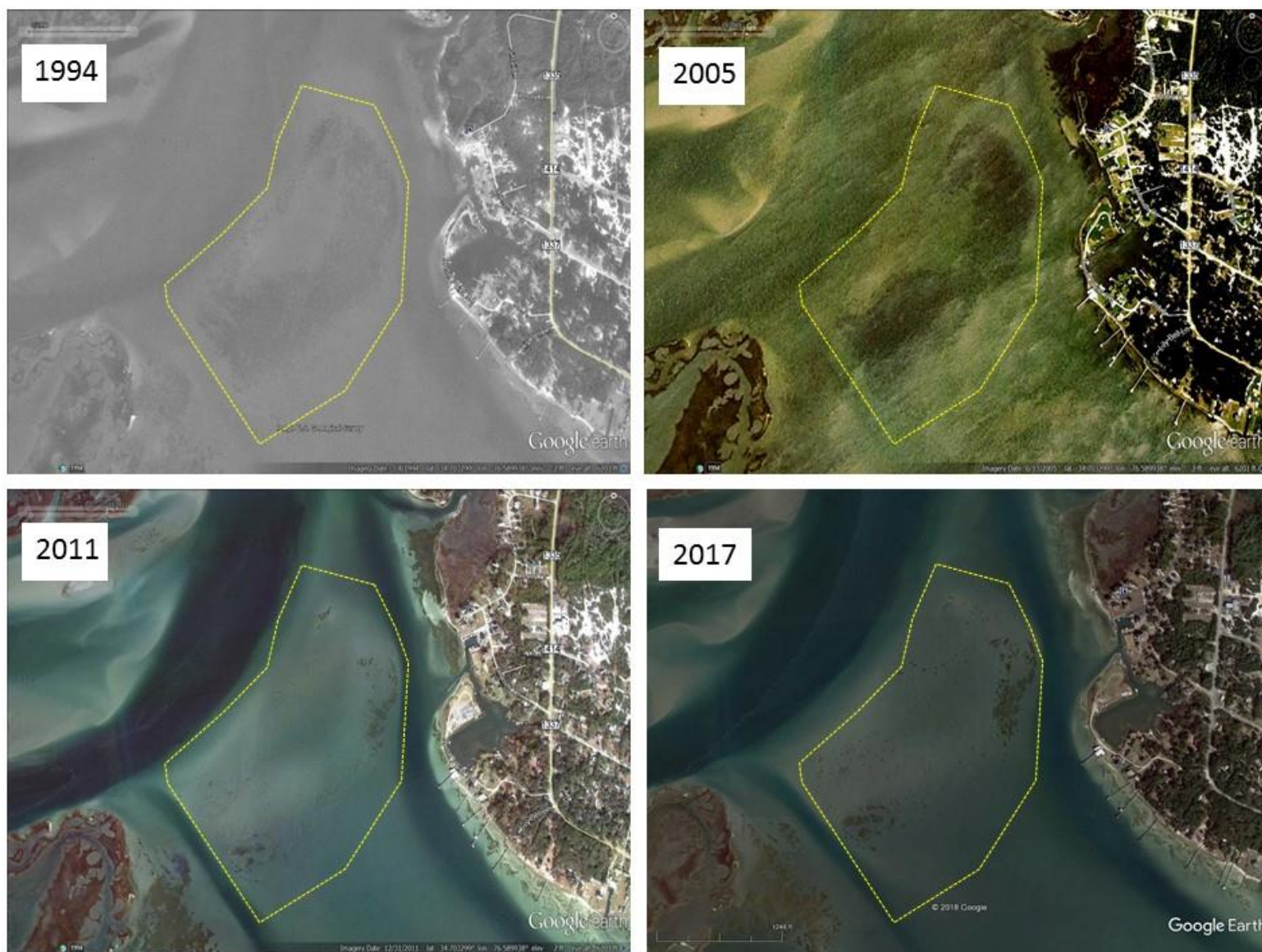


Figure 6. Oscar Shoal (yellow dashed line outline), located between Middle Marsh to the south and Harkers Island to the north showing seagrass cover in the vicinity for 1994, 2005, 2011 and 2017 from Google Earth Pro imagery.



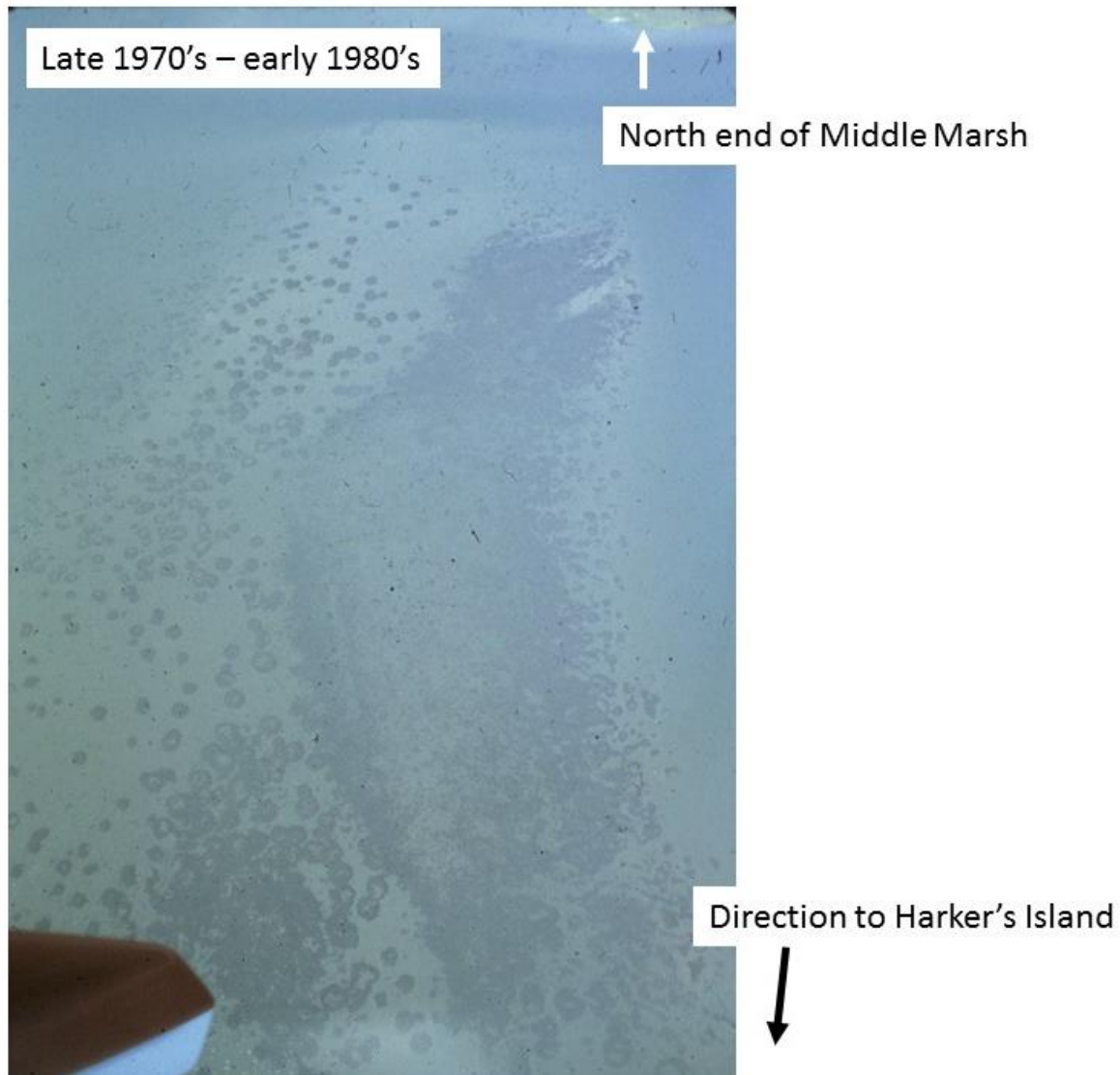


Figure 7. Oblique aerial photograph of Oscar Shoal looking to the south, taken sometime between the late 1970's and early 1980's showing extensive seagrass cover.

**Methodology:** Coalescence of seagrass would be facilitated by use of already tested, low technology, oyster bags as wave breaks arranged in a semicircle around patchy seagrass areas. Oyster shell-filled bags would be placed east and west of the grass areas and on unvegetated seafloor to create living shoreline wavebreaks. Bags would be stacked high enough to provide wind wave (and vessel wake) reduction based on the tidal frame at the site. The length of each shell wavebreak would be approximately 75 to 100 ft in length in order to provide shelter for the patchy seagrass areas as delineated on the shoal by the up-to-date imagery. NCDOT proposes installation of a temporary exclusion system (a type of concrete wire reinforcing mesh or its equivalent) in the lee of the wave break that is stabilized loosely on the seafloor and will keep the stingrays from disturbing the sediment, allowing the margins of existing seagrass patches to expand and colonize new seafloor, resulting in additional seagrass acreage.



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**(Figure 5).** After edge expansion has occurred and existing patches joined, the exclusion devices will be removed and disposed of in accordance with local construction debris requirements. The wire mesh will be carefully removed so as to minimally damage any of the newly colonized seagrass.

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**Onsite Wetland Mitigation Plan**  
**Replacement of Bridge No. 73 and 96 and SR1335 (Harker's Island Road)**  
**Carteret County**  
**TIP B-4863**  
**WBS No. 40212.1.1**  
**November 19, 2018**

The North Carolina Department of Transportation (NCDOT) proposes to replace bridge numbers 73 and 96 on SR.1335 (Harker's Island Road) over the Straits (TIP B-4863) in Carteret County.

This project will take place within the White Oak River basin, Hydrologic Unit 03020106, in the coastal plain physiographic region of North Carolina. The topography within the project vicinity is flat to very gently sloping, with level floodplains along streams. Elevations within the study area range from 0ft to 10ft above sea level. Land use in the project vicinity consists primarily of residential development and access to the water for recreational and commercial uses.

Within the study area of this project, there is only one jurisdictional stream and two types of jurisdictional wetlands that were identified. The chosen alternative for this project will permanently impact 0.07 acres of brackish marsh wetlands. There will be temporary fill impacts consisting of 0.14 acres of brackish marsh due to the transition from the roadway to the work platform for the new bridge.

### **Existing Conditions**

B-4863 was reviewed for potential onsite mitigation along The Straits fishing pier island. There are brackish marsh wetlands along the east and west side of the island. The brackish marsh areas are regularly inundated by tidal flooding at The Straits and are dominated by black needlerush, smooth cord grass and salt meadow cord grass. The existing brackish marsh adjacent to the parking area on the east side of the island ranged from 0.45 to 0.73 feet above mean sea level at the time of the survey. The adjacent parking area ranged from 2.17 feet to 3.02 feet above mean sea level. The County will retain the northern part of the parking area to facilitate recreational activities for the adjacent fishing pier.

### **Proposed Conditions**

The goal of this project is to remove a portion of the existing parking area on the Straits Fishing Pier Island to restore brackish marsh wetland. Only pedestrian access will be allowed to the area after construction is completed.

There will be approximately 1,170 cubic yards of fill material graded down to match the elevation of the adjacent marsh. The area will be replanted with appropriate mix of wetland herbaceous species. This will allow NCDOT to restore 15,246 sq. ft. (0.35 acres) of brackish marsh wetland. All excavated material will be wasted offsite.

NCDOT proposes that this brackish marsh mitigation site offset all permanent wetland impacts associated with B-4863.

The 0.14 acres of temporary fill will be removed once construction has taken place. Once completed, these areas will be restored by grading back to the existing elevation and by replanting the existing species.

An as-built report will be submitted within 60 days of completion of the project.

### **Success Criteria**

The vegetation component of the wetland site will be deemed successful if the target wetland herbaceous species survives and has an average of 75 percent vegetative cover, not including any invasive species.

Hydrologic success will be based on achieving the target elevations based on the adjacent marsh elevations as documented in the as-built plans.

### **Monitoring**

NCDOT shall monitor the mitigation site by visual observation and photo points for survival and aerial cover of vegetation. NCDOT shall monitor the site for a minimum of three years or until the site is deemed successful. Monitoring will be initiated upon completion of the site planting.

An annual monitoring report will be provided to the agencies for comment at the annual monitoring review meeting.



Excavation Area  
0.35 acres

Elevation  
2.17 ft

## Temporary Impacts

Elevation  
1.04 ft

STATE OF NORTH CAROLINA  
NDR  
INNERDUCT

Elevation  
1.07 ft

Elevation  
0.54 ft

Elevation  $\nearrow$   
0.42 ft

SR 1335 HARKERS ISLAND RD. 20' BST



**UNITED STATES DEPARTMENT OF COMMERCE**

National Oceanic and Atmospheric Administration

**NATIONAL MARINE FISHERIES SERVICE**

Southeast Regional Office

263 13th Avenue South

St. Petersburg, Florida 33701-5505

<http://sero.nmfs.noaa.gov>

F/SER31:FI

SER-2018-19276

Preston Hunter, P.E.  
Environmental Analysis Unit  
North Carolina Department of Transportation  
8521 Six Forks Road, Suite 400  
Raleigh, North Carolina 27615

**SEP 21 2018**

Dear Mr. Hunter:

This letter responds to your request for consultation with us, the National Marine Fisheries Service (NMFS), pursuant to Section 7 of the Endangered Species Act (ESA) for the following action.

SER Number	Project Type
SER-2018-19276	Replacement of bridges

**Consultation History**

We received your letter requesting consultation dated April 19, 2018, on April 20, 2018. We requested additional information on May 29, 2018, and July 2, 2018. We received a final response on June 13, 2018, and July 17, 2018, respectively, and initiated consultation on July 17, 2018.

**Project Location**

Address	Latitude/Longitude	Water body
Bridge Number 73 (Earl C Davis Memorial Bridge) and Bridge Number 96 (Harkers Island Road) over the Straits in Carteret County, North Carolina	34.719082°N, 76.576584°W (North American Datum 1983)	"The Straits" between Harkers Island and Straits, North Carolina, 6.5 miles from the Atlantic Ocean





**Image of the project location and surrounding area (©2018 Google)**

#### *Existing Site Conditions*

Currently two bridges, Bridge Number 96 (north) and Bridge Number 73 (south), cross the Straits waterbody and are connected in the middle by a small island with parking and an existing fishing pier. A boat ramp is also located at the north end of the north bridge. Benthic conditions are described as sand with non-ESA listed seagrasses (eelgrass, shoal grass, and widgeon grass). The navigational channels are 10 feet (ft) deep. The width of the river at the bridge is approximately 3,500 ft.

#### **Project Description**

The applicant proposes to replace the two existing bridges with a single bridge structure. Work will be performed from barges and a temporary work platform and includes the removal of the south bridge and installation of up to 212 new 24-inch (in) concrete piles. The temporary work platform will run the entire length of the proposed bridge except at the navigational channel location. The work platform is anticipated to be 40 ft wide with a minimum 20-ft span length, and includes the installation of 1,260 36-in metal piles. Pile installation methods have yet to be determined so we are assuming the worst-case scenario of impact hammer installation. The applicant has agreed to ramp up procedures and the use of a pile cushioning block to minimize the effects of in-water noise from pile installation.

The applicant has stated that more than one pile may be installed at a time and construction may be performed using a 24-hour construction window for up to 3 years; however, in-water work will be prohibited from April 1 to September 30, when Atlantic sturgeon (adult, larval, and small juvenile stages) are at most risk of injury due to their spring and fall spawning runs that occur in the proposed action area. Approximately 0.1 acre of seagrasses are expected to be covered by bridge materials.

### Pile Installation

Pile Types	Number of Piles	Installation Method	Confined Space or Open Water
Concrete (24-in)	212	Various and undetermined (assumed impact hammer)	Open
Metal (36-in)	1,260	Various and undetermined (assumed impact hammer)	Open

### Construction Conditions

The contractor will comply with North Carolina Department of Transportation's Best Management Practices (BMPs) for Bridge Demolition and Removal including:

- Existing bridge piles in the navigation channel will be removed completely, unless not practicable, and piles located in seagrasses and wetland areas will be cut off at the mudline to minimize overall disturbance.
- The use of turbidity curtains will be evaluated for areas with sufficient depth, but lower velocity. Turbidity will be monitored during in-water work to ensure compliance with state water quality standards.
- Non-shattering methods will be implemented (no explosives) for bridge removal. No bridge deck or substructure components will be dropped in the water.
- Loose debris and road surface materials will be removed prior to demolition to minimize the potential for turbidity and contaminant discharge.

The applicant has also agreed to adhere to NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions*<sup>1</sup> and to stop work if a sturgeon is spotted within 50 ft of operations.

### Effects Determination(s) for Species the Action Agency or NMFS Believes May Be Affected by the Proposed Action

Species	ESA Listing Status	Action Agency Effect Determination	NMFS Effect Determination
<b>Sea Turtles</b>			
Green (North Atlantic [NA] distinct population segment [DPS])	T	NLAA	NLAA
Green (South Atlantic [SA] DPS)	T	NLAA	NLAA
Kemp's ridley	E	NLAA	NLAA
Leatherback	E	NLAA	NE
Loggerhead (Northwest Atlantic [NWA] DPS)	T	NLAA	NLAA
Hawksbill	E	NLAA	NE
<b>Fish</b>			
Shortnose sturgeon	E	NE	NLAA

<sup>1</sup> NMFS. 2006. Sea Turtle and Smalltooth Sawfish Construction Conditions revised March 23, 2006. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Regional Office, Protected Resources Division, Saint Petersburg, Florida.  
[http://sero.nmfs.noaa.gov/protected\\_resources/section\\_7/guidance\\_docs/documents/sea\\_turtle\\_and\\_smalltooth\\_sawfish\\_construction\\_conditions\\_3-23-06.pdf](http://sero.nmfs.noaa.gov/protected_resources/section_7/guidance_docs/documents/sea_turtle_and_smalltooth_sawfish_construction_conditions_3-23-06.pdf).



Species	ESA Listing Status	Action Agency Effect Determination	NMFS Effect Determination
Atlantic sturgeon (Carolina DPS)	E	NLAA	NLAA
E = endangered; T = threatened; NLAA = may affect, not likely to adversely affect; NE = no effect			

We believe the project will have no effect on hawksbill and leatherback sea turtles, due to the species' very specific life history strategies, which are not supported at the project site. Leatherback sea turtles have pelagic, deepwater life history, where they forage primarily on jellyfish. Hawksbill sea turtles typically inhabit inshore reef and hard bottom areas where they forage primarily on encrusting sponges.

### **Critical Habitat**

The project is not located in designated critical habitat, and there are no potential routes of effect to any designated critical habitat.

### **Analysis of Potential Routes of Effects to Species**

Sea turtles and sturgeon may be injured if struck with the equipment and construction materials. However, we believe this effect is discountable because these species are likely to move away during construction. The applicant's implementation of NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions* will further reduce the risk by requiring all construction workers watch for protected species. Operation of any mechanical construction equipment will cease immediately if a sea turtle or sturgeon is seen within a 50-ft radius of the equipment. Activities will not resume until the protected species has departed the project area of its own volition.

Use of turbidity curtains, the construction activities, and related construction noise may prevent or deter sea turtles and Gulf sturgeon from entering the project area. We believe the effects to these species from temporary exclusion from the project area due to construction activities, including related noise and presence of turbidity curtains, will be insignificant. The open water environment of this long spanned bridge has numerous suitable alternative habitat sites in the area that these mobile species can use for foraging or refuge. Additionally, any exclusion effects will be temporary as only relatively small areas will be excluded at any point in time.

In-water construction activities will result in temporary increases in turbidity that could affect water quality. However, we anticipate any effects on sea turtles and sturgeon due to elevated turbidity will be insignificant, given the availability and abundance of habitat with naturally occurring water quality conditions (i.e., unaffected by construction activities) in the surrounding area, outside of the action area.

Effects to sea turtles and sturgeon as a result of noise created by the construction activities can physically injure animals in the affected areas or change animal behavior in the affected areas. Injurious effects can occur in 2 ways. First, immediate adverse effects can occur to listed species if a single noise event exceeds the threshold for direct physical injury. Second, effects can result from prolonged exposure to noise levels that exceed the daily cumulative exposure threshold for

the animals, and these can constitute adverse effects if animals are exposed to the noise levels for sufficient periods. Behavioral effects can be adverse if such effects interfere with animals migrating, feeding, resting, or reproducing, for example. Our evaluation of effects to sea turtles and sturgeon as a result of noise created by construction activities is based on the analysis prepared in support of the Opinion for SAJ-82.<sup>2</sup> The noise analysis in this consultation evaluates effects to sturgeon and sea turtles identified by NMFS as potentially affected in the table above.

Based on our noise calculations, the installation of 24-in concrete piles and 36-in metal piles using an impact hammer with a pile cushioning block may cause peak-pressure injury to sea turtles or sturgeon within 21 ft (6 m) of the pile driving. Additionally, the daily cumulative sound exposure level of multiple pile strikes over the course of a day may cause injury to sturgeon and sea turtles at a radius of up to 152 ft (46 m) away from the pile. Because more than one pile may be installed at a time, and construction may be performed using a 24-hour construction window for up to 3 years, the use of the ramp-up technique prior to full-force driving will be utilized to further minimize the effects of in-water noise from pile installation. The use of the ramp-up technique prior to full-force driving will provide sea turtles and sturgeon ample opportunity to leave the project area as noise levels increase and before the peak-pressure injury threshold is reached. Due to the mobility of sea turtles and sturgeon, and because the project occurs in open water, we expect them to move away from noise disturbances. Because we anticipate that sea turtles and sturgeon will move away from the project area during the ramp-up period, we believe that an animal's suffering physical injury from peak-pressure noise exposure is extremely unlikely to occur. Additionally, construction personnel will cease construction activities if an animal is sighted in the 50-ft radius per NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions*. Thus, we believe the likelihood of any injurious effects occurring is discountable. An animal's movement away from the injurious impact zone is a behavioral response, with the same effects discussed below.

Based on our noise calculations, the installation of 24-in concrete piles and 36-in metal piles using an impact hammer with a pile cushioning block could also result in behavioral effects at a radii of up to 328 ft (100 m) for sea turtles and 1,523 ft (464 m) for sturgeon. Due to the mobility of sea turtles and sturgeon, we expect them to move away from noise disturbances in this open-water environment. Because there is similar habitat nearby, we believe behavioral effects will be insignificant. If an individual chooses to remain within the behavioral response zone, it could be exposed to behavioral noise impacts during pile installation. Additionally, in-water work will be prohibited from April 1 to September 30, when Atlantic sturgeon are at most risk of injury due to their spring and fall spawning runs that occur in the proposed action area. Therefore, we anticipate any behavioral effects will be insignificant.

## **Conclusion**

Because all potential project effects to listed species were found to be discountable, insignificant, or beneficial, we conclude that the proposed action is not likely to adversely affect listed species under NMFS's purview. This concludes your consultation responsibilities under the ESA for species under NMFS's purview. Consultation must be reinitiated if a take occurs or new information reveals effects of the action not previously considered, or if the identified action is

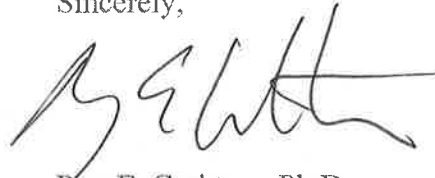
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<sup>2</sup> NMFS. Biological Opinion on Regional General Permit SAJ-82 (SAJ-2007-01590), Florida Keys, Monroe County, Florida. June 10, 2014.

subsequently modified in a manner that causes an effect to the listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action. NMFS's findings on the project's potential effects are based on the project description in this response. Any changes to the proposed action may negate the findings of this consultation and may require reinitiation of consultation with NMFS.

We look forward to further cooperation with you on other projects to ensure the conservation of our threatened and endangered marine species and designated critical habitat. If you have any questions on this consultation, please contact Francesca Innocenti, Consultation Biologist, at (727) 824-5336, or by email at [francesca.innocenti@noaa.gov](mailto:francesca.innocenti@noaa.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "R. Crabtree", with a long horizontal flourish extending to the right.

Roy E. Crabtree, Ph.D.  
Regional Administrator

File: 1514-22.L.1



STATE OF NORTH CAROLINA  
DEPARTMENT OF ADMINISTRATION

ROY COOPER  
GOVERNOR

MACHELLE SANDERS  
SECRETARY

January 29, 2018

Ms. Maria Rogerson  
North Carolina Department of Transportation  
Project Development and Environmental Analysis  
1548 Mail Service Center  
Raleigh, North Carolina 27699-1548

**Re: SCH File # 18-E-4220-0160; Proposed project for the replacement of the Earl C. Davis Memorial Bridge (Bridge No. 73) and Bridge No. 96 carrying SR 1332/1335 (Harkers Island Road/Island Road) over The Straits waterway in Carteret County. STIP B-4863**

Dear Ms. Rogerson:

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. According to G.S. 113A-10, when a state agency is required to prepare an environmental document under the provisions of federal law, the environmental document meets the provisions of the State Environmental Policy Act. Attached to this letter are additional comments made by the agencies in the review of this document.

If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

Should you have any questions, please do not hesitate to call.

Sincerely,

A handwritten signature in blue ink that reads "Crystal Best".

Crystal Best  
State Environmental Review Clearinghouse

Attachments  
cc: Region P

**NORTH CAROLINA STATE CLEARINGHOUSE  
DEPARTMENT OF ADMINISTRATION  
INTERGOVERNMENTAL REVIEW**

**COUNTY:** CARTERET

**F02:** HIGHWAYS AND ROADS

**STATE NUMBER:** 18-E-4220-0160

**DATE RECEIVED:** 12/13/2017

**AGENCY RESPONSE:** 01/08/2018

**REVIEW CLOSED:** 01/12/2018

MS RENEE GLEDHILL-EARLEY  
CLEARINGHOUSE COORDINATOR  
DEPT OF NATURAL & CULTURAL RESOURCE  
STATE HISTORIC PRESERVATION OFFICE  
MSC 4617 - ARCHIVES BUILDING  
RALEIGH NC

**Received: 12/29/17**  
**State Historic Preservation Office**

**ER 09-0745**

**REVIEW DISTRIBUTION**

DEPT OF AGRICULTURE  
DEPT OF ENVIR. QUALITY - COASTAL MG  
DEPT OF ENVIRONMENTAL QUALITY  
DEPT OF NATURAL & CULTURAL RESOURCE  
DEPT OF TRANSPORTATION  
DNCR - NATURAL HERITAGE PROGRAM  
DPS - DIV OF EMERGENCY MANAGEMENT  
EASTERN CAROLINA COUNCIL

Due -- 1/9/18

A- (Ne) JCS  
1/16/18

**PROJECT INFORMATION**

APPLICANT: NCDOT  
TYPE: National Environmental Policy Act  
Environmental Review

DESC: Proposed project for the replacement of the Earl C. Davis Memorial Bridge (Bridge No. 73) and Bridge No. 96 carrying SR 1332/1335 (Harkers Island Road/Island Road) over The Straits waterway in Carteret County. STIP B-4863

The attached project has been submitted to the N. C. State Clearinghouse for intergovernmental review. Please review and submit your response by the above indicated date to 1301 Mail Service Center, Raleigh NC 27699-1301.

If additional review time is needed, please contact this office at (919)807-2425.

AS A RESULT OF THIS REVIEW THE FOLLOWING IS SUBMITTED: ☒ NO COMMENT ☐ COMMENTS ATTACHED

SIGNED BY:

*Renee Gledhill-Earley*

DATE:

*1-19-18*

**JAN 02 2018**



North Carolina Department of Transportation  
Highway Stormwater Program  
STORMWATER MANAGEMENT PLAN  
FOR NCDOT PROJECTS



(Version 2.06; Released June 2016)

WBS Element: 40212.1.3 TIP No.: B-4863 County(ies): Carteret Page 1 of 1

General Project Information

WBS Element:	40212.1.3	TIP Number:	B-4863	Project Type:	Bridge Replacement	Date:	8/30/2018
NCDOT Contact:	Hon Yeung, PE			Contractor / Designer:	Will Weathersbee, PE		
Address:	1037 W.H. Smith Blvd Greenville, NC 27835			Address:	1520 South Blvd, Suite 200 Charlotte, NC 28203		
	Phone: 252-439-2827				Phone: 704-940-4715		
	Email: hfyeung@ncdot.gov				Email: will.weathersbee@rsandh.com		
City/Town:	Harkers Island			County(ies):	Carteret		
River Basin(s):	N/A			CAMA County?	Yes		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	0.853 MI.	Surrounding Land Use:	Coastal Marsh, Open Water (Sound), Woods, Residential, Recreational					
	Proposed Project		Existing Site					
Project Built-Up Area (ac.)	5.0	ac.	3.7	ac.				
Typical Cross Section Description:	A 40-foot wide typical section will be used, providing two 12-foot travel lanes and two 8-foot shoulder, 4-feet of the shoulder is paved.		The existing 20-foot wide typical section features two 10-foot travel lanes					
Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	4200	Year:	2040	Existing:	3300	Year:	2019
General Project Narrative: (Description of Minimization of Water Quality Impacts)	B-4863 involves the replacement of Bridge 73 and 96 in Carteret County. Bridge 73 is an existing moveable swing span bridge along SR 1335 Harkers Island Road spanning The Straits. Bridge 96 is an existing fixed span bridge also spanning The Straits. Together these bridges provide the only vehicular access across The Straits waterway to Harkers Island. Both bridges are proposed to be replaced by a single fixed span bridge. A closed deck drainage system will be used to capture stormwater from a portion of the bridge. The captured stormwater will be directed to two separate swales, one on the mainland side and one on the island side, for treatment and controlled release. The proposed swales treat all the possible bridge runoff on the island side, and all the bridge runoff that the storm system can handle on the mainland side. The remaining stormwater will be released into The Straits through deck drains which are located a minimum of 14' above the MHW elevation. Specific natural environment avoidance and minimization measures include the use of retaining walls, on both sides of the bridge, to minimize fill in wetlands and surface water.							

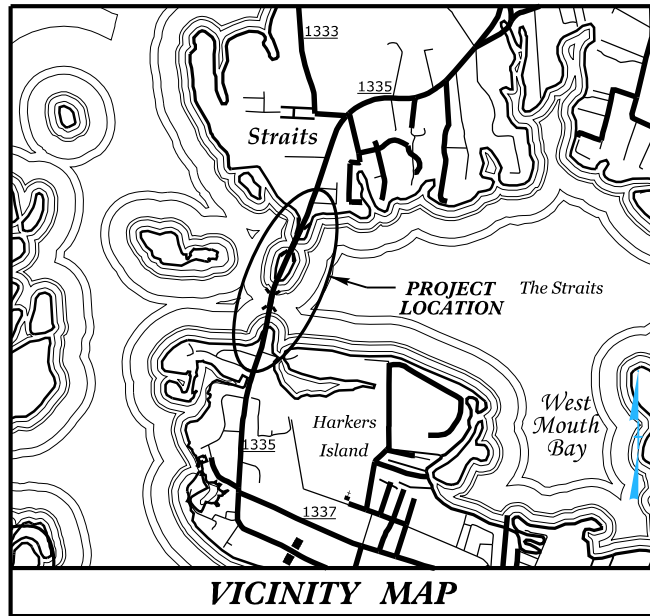
Waterbody Information

Surface Water Body (1):	The Straits		NCDWR Stream Index No.:	21-35-1-12	
NCDWR Surface Water Classification for Water Body	Primary Classification:		Class SA		
	Supplemental Classification:		High Quality Waters (HQW)		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	Yes	Comments: American Alligator, Green Sea Turtle, Hawksbill Sea Turtle, Kemp's Ridley Sea Turtle, Leatherback Sea Turtle, Loggerhead Sea Turtle, Shortnose Sturgeon, West Indian Manatee and Atlantic Sturgeon.			
NRTR Stream ID:	The Straits		Buffer Rules in Effect:	N/A	
Project Includes Bridge Spanning Water Body?	Yes	Deck Drains Discharge Over Buffer?	No	Dissipator Pads Provided in Buffer?	No
Deck Drains Discharge Over Water Body?	Yes	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

09/08/99  
15-NOV-2018 10:56  
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TIP PROJECT: B-4863

CONTRACT:



VICINITY MAP

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

NWS PERMIT DRAWING PLANS  
CARTERET COUNTY

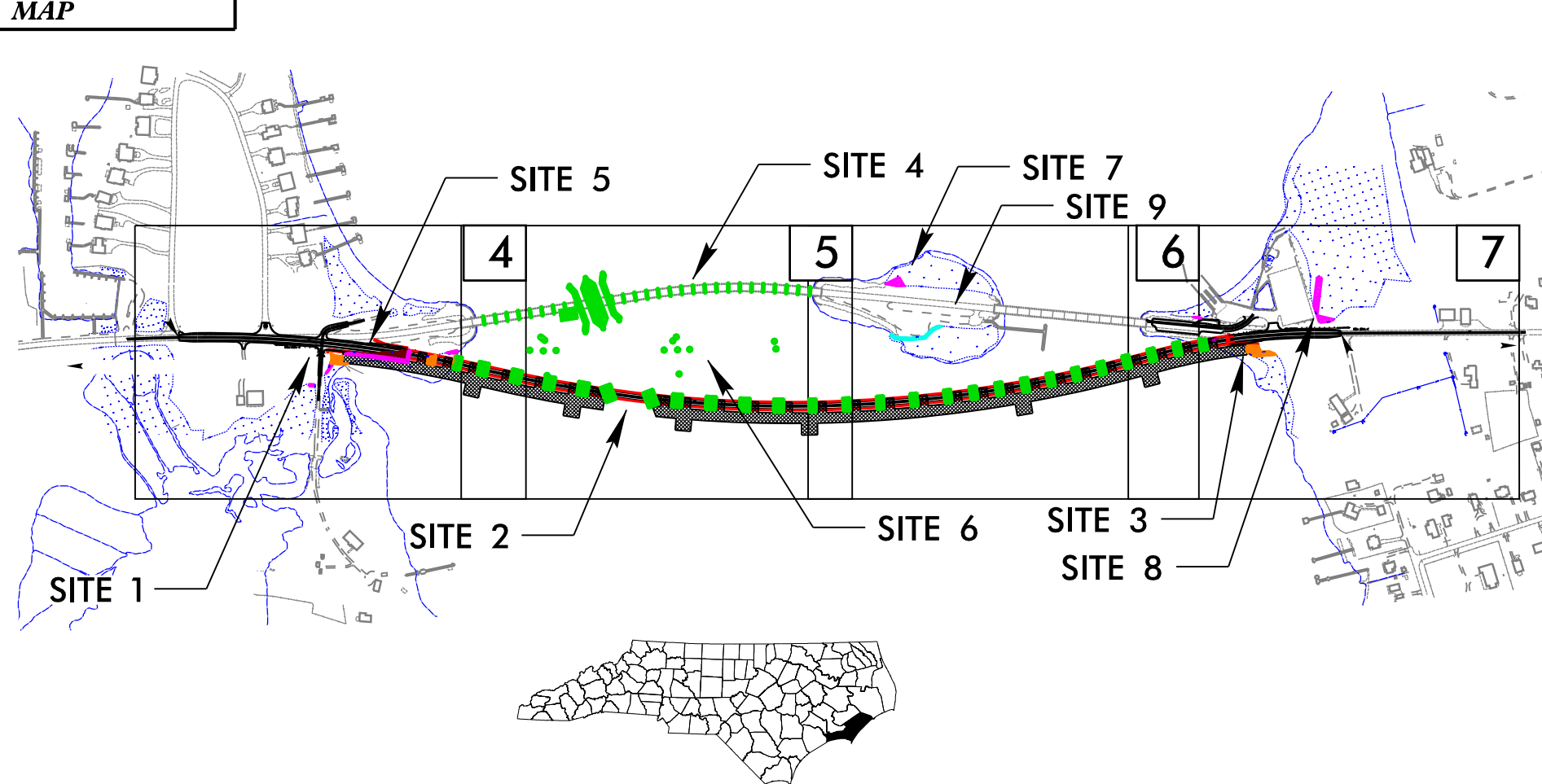
LOCATION: REPLACEMENT OF BRIDGE NOS. 73 AND 96 CARRYING  
SR 1335 (HARKERS ISLAND RD) OVER THE STRAITS

TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

WETLAND AND SURFACE WATER IMPACTS PERMIT

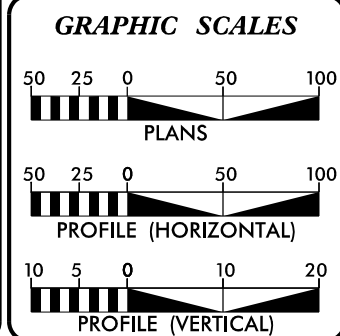
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4863	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
40212.1.3	N/A	PE, RW, UTL	

PERMIT DRAWING  
SHEET 1 OF 17



NAD 83/  
NA 2011

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION  
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

ADT 2019 = 3,300  
ADT 2040 = 4,200  
K = 10 %  
D = 60 %  
T = 4 % \*  
V = 50 MPH  
\*(TTST=2% + DUAL=2%)  
FUNC CLASS = MAJOR  
COLLECTOR

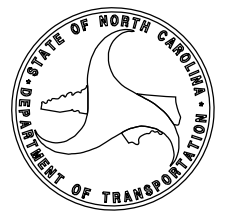
PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4863 = 0.247 MILE +/-  
LENGTH STRUCTURE TIP PROJECT B-4863 = 0.606 MILE +/-  
TOTAL LENGTH TIP PROJECT B-4863 = 0.853 MILE +/-

PLANS PREPARED BY:  
**RS&H**  
1520 SOUTH BLVD, SUITE 200  
CHARLOTTE, NC 28203  
704-752-0610  
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
2018 STANDARD SPECIFICATIONS  
RIGHT OF WAY DATE:  
JULY 10, 2018  
LETTING DATE:  
OCTOBER 15, 2019

JENNIFER FARINO, PE  
PROJECT ENGINEER  
DREW MORROW, PE  
PROJECT DESIGN ENGINEER  
MARIA ROGERSON, PE  
NCDOT CONTACT

HYDRAULICS ENGINEER  
SIGNATURE: \_\_\_\_\_ P.E.  
ROADWAY DESIGN ENGINEER  
SIGNATURE: \_\_\_\_\_ P.E.





PERMIT DRAWING  
SHEET 2 OF 17

## SITE 4

## SITE 5

**RIGHT SIDE APPROACH:**

**PLACE 6" DECK DRAINS AS FOLLOWS:**

- STA. 21+31 RT TO — STA. 21+67 RT @ 12' CTS. AND
- STA. 21+71 RT TO — STA. 21+83 RT @ 12' CTS. AND
- STA. 21+87 RT TO — STA. 21+99 RT @ 4' CTS.

**NOTE: ALL DECK DRAINS ON THE BRIDGE APPROACH SIDE ARE PART OF A CLOSED DECK DRAINAGE SYSTEM. EXCEPT FOR THE TWO HORIZONTAL DECK DRAINS @ STA. 26+03 AND 26+15**

**BEGIN PROJECT**  
**B-4863 -L- Sta. 10+00.00**

## SITE 1

## SITE 2

DENOTES TEMPORARY  
IMPACTS IN SURFACE WATER

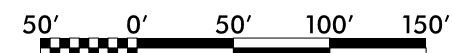
DENOTES FILL IN WETLAND

DENOTES TEMPORARY  
FILL IN WETLAND

TEMPORARY WORK  
PLATFORM

EXISTING POWER  
LINE

**★ DENOTES HAND CLEARING**



MATCH TO SHEET 5 -L- STA. 22+00  
 1" = 10'

—EXIST. SUBAQUATIC VEGETATION (SAV) BOUNDARY  
(AS SURVEYED ON JULY 27, 2017)

## REVISIONS

8/17/99

15-NOV-2018 10:56  
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 \$\$\$\$SYSENAME\$\$\$\$  
 Permit.t.UB0 and Standard\Drawings\B4863\_hyd.prm.02\_psh\_04.dgn



PERMIT DRAWING  
SHEET 3 OF 17

## SITE 4

**RIGHT SIDE APPROACH:**

**PLACE 6" DECK DRAINS AS FOLLOWS:**

- ~~STA. 21+31 RT TO STA. 21+67 RT @ 12' CTS. AND~~
- ~~STA. 21+71 RT TO STA. 21+83 RT @ 12' CTS. AND~~
- ~~STA. 21+87 RT TO STA. 21+99 RT @ 4' CTS.~~

**NOTE: ALL DECK DRAINS ON THE BRIDGE APPROACH SIDE ARE PART OF A CLOSED DECK DRAINAGE SYSTEM EXCEPT FOR THE TWO HORIZONTAL DECK DRAINS @ STA. 26+03 AND 26+15**

## SITE 5

**BEGIN PROJECT**  
**B-4863 -L- Sta. 10+00.00**

## SITE 1

## SITE 2

DENOTES TEMPORARY  
IMPACTS IN SURFACE WATER

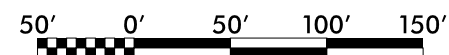
**DENOTES FILL IN WETLAND**

DENOTES TEMPORARY  
FILL IN WETLAND

TEMPORARY WORK  
PLATFORM

EXISTING POWER  
LINE

**■** DENOTES HAND CLEARING



MATCH TO SHEET 5 -L- STA. 22+00

EXIST. SUBAQUATIC VEGETATION (SAV) BOUNDARY  
(AS SURVEYED ON JULY 27, 2017)

## REVISIONS

8/17/99

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8/17/99

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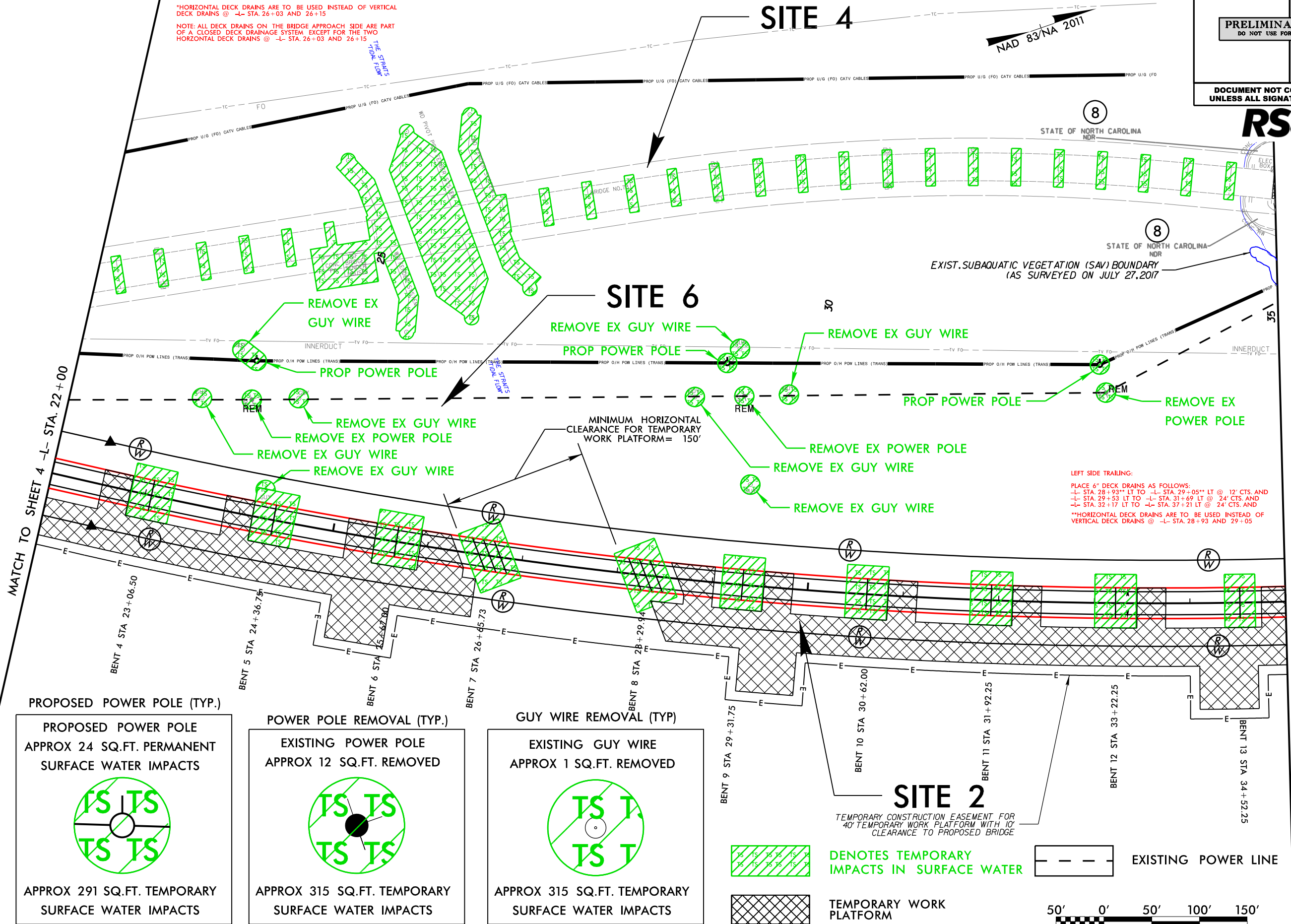
REVISIONS

LEFT SIDE APPROACH:  
PLACE 6" DECK DRAINS AS FOLLOWS:  
-L- STA. 22+07 LT TO -L- STA. 22+23 LT @ 4' CTS. AND  
-L- STA. 22+31 LT TO -L- STA. 22+55 LT @ 8' CTS. AND  
-L- STA. 22+67 LT TO -L- STA. 24+23 LT @ 8' CTS. AND  
-L- STA. 24+47 LT TO -L- STA. 25+55 LT @ 12' CTS. AND  
-L- STA. 26+03 LT TO -L- STA. 26+15 LT @ 12' CTS.  
  
\*HORIZONTAL DECK DRAINS ARE TO BE USED INSTEAD OF VERTICAL DECK DRAINS @ -L- STA. 26+03 AND 26+15  
  
NOTE: ALL DECK DRAINS ON THE BRIDGE APPROACH SIDE ARE PART OF A CLOSED DECK DRAINAGE SYSTEM EXCEPT FOR THE TWO HORIZONTAL DECK DRAINS @ -L- STA. 26+03 AND 26+15

PERMIT DRAWING  
SHEET 4 OF 17

PROJECT REFERENCE NO. <i>B-4863</i>		SHEET NO. <i>5</i>
RW SHEET NO.		
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
<div>PRELIMINARY PLANS</div> <div>DO NOT USE FOR CONSTRUCTION</div>		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

RS&H



MATCH TO SHEET 6 -L- STA. 35+00



# SITE 4

NAD 83/NA 2011

**NOTE: ALL DECK DRAINS ON THE BRIDGE APPROACH SIDE ARE PART OF A CLOSED DECK DRAINAGE SYSTEM EXCEPT FOR THE TWO HORIZONTAL DECK DRAINS @ -L- STA. 26+03 AND 26+15**

# SITE 6

- REMOVE EX  
POWER POLE

**\*\*HORIZONTAL DECK DRAINS ARE TO BE USED INSTEAD OF VERTICAL DECK DRAINS @ -L- STA. 28+93 AND 29+05**

## SITE 2



--	--	--	--

50' 0' 50' 100' 150'

MATCH TO SHEET 6 -L- STA. 35+00

## REVISIONS

8/17/99

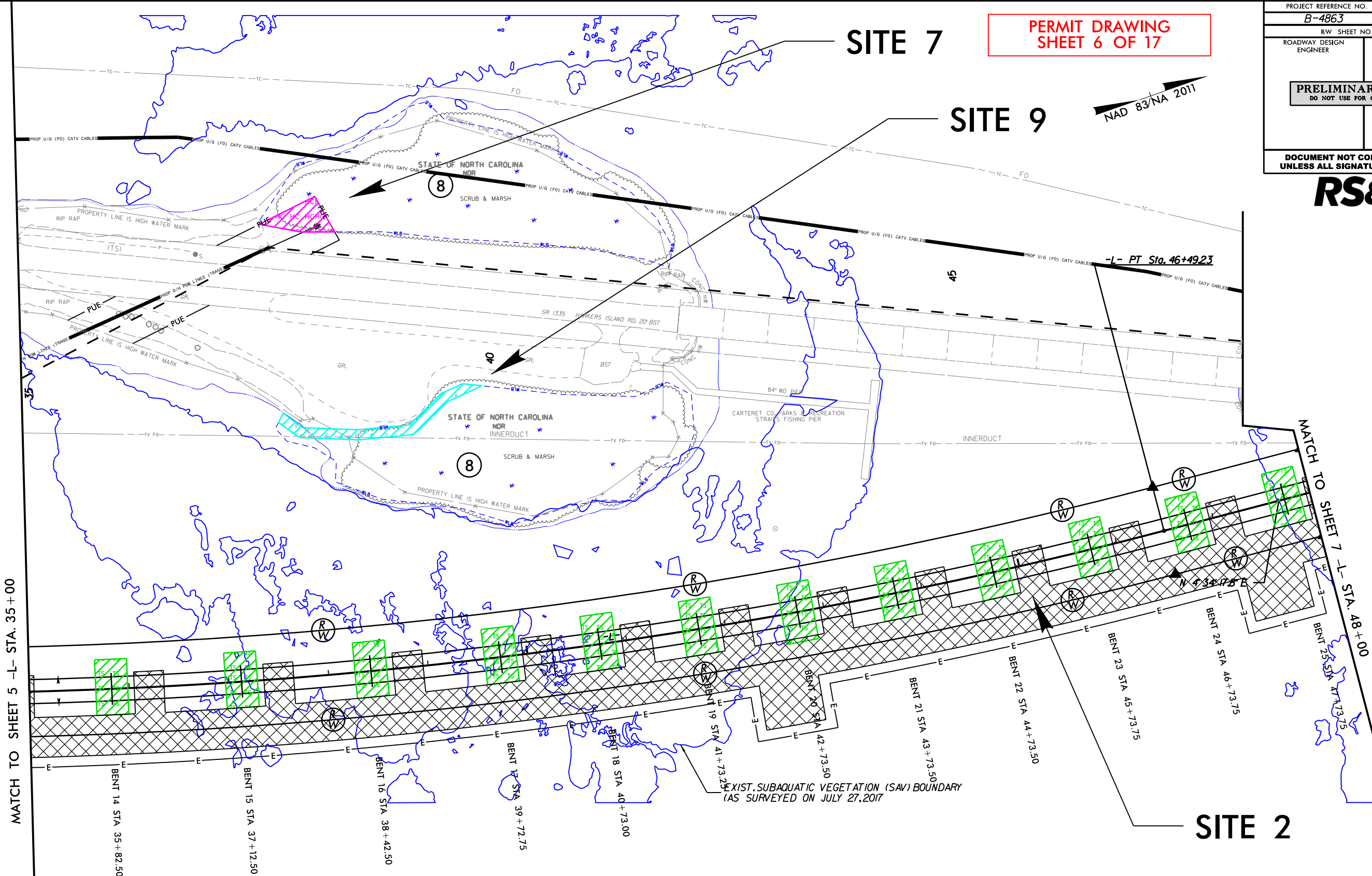
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8/17/99

15-NOV-2018 10:57 R:\Hydro\Projects\PERMITS\_Environmental\Combined\Permit\_UB0 and Standard Drawings\B4863\_hyd\_prm\_06\_pst\_06.dgn

REVISIONS

MATCH TO SHEET 5 -L- STA. 35+00



LEFT SIDE TRAILING:  
PLACE 6" DECK DRAINS AS FOLLOWS:  
+L- STA. 32+17 LT TO +L- STA. 37+21 LT @ 24' CTS. AND  
+L- STA. 37+33 LT TO +L- STA. 38+29 LT @ 12' CTS. AND  
+L- STA. 38+33 LT TO +L- STA. 39+61 LT @ 12' CTS. AND  
+L- STA. 39+85 LT TO +L- STA. 42+61 LT @ 12' CTS. AND  
+L- STA. 42+85 LT TO +L- STA. 44+65 LT @ 12' CTS. AND  
+L- STA. 44+89 LT TO +L- STA. 45+61 LT @ 12' CTS. AND  
+L- STA. 45+81 LT TO +L- STA. 46+29 LT @ 8' CTS. AND  
+L- STA. 46+33 LT TO +L- STA. 46+61 LT @ 4' CTS.

RIGHT SIDE TRAILING:  
PLACE 6" DECK DRAINS AS FOLLOWS:  
+L- STA. 46+65 RT TO +L- STA. 46+69 RT @ 4' CTS. AND  
+L- STA. 46+77 RT TO +L- STA. 47+01 RT @ 4' CTS. AND  
+L- STA. 47+13 RT TO +L- STA. 49+05 RT @ 24' CTS.

NOTES: DECK DRAINS FROM +L- STA. 44+65 LT TO 46+61 LT ARE PART OF A CLOSED DECK DRAINAGE SYSTEM.

DECK DRAINS FROM +L- STA. 46+65 RT TO 49+05 RT ARE PART OF A CLOSED DECK DRAINAGE SYSTEM.

SITE 7

SITE 9

SITE 2

PERMIT DRAWING  
SHEET 6 OF 17

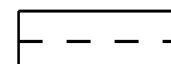
NAD 83/NA 2011

PROJECT REFERENCE NO. <i>B-4863</i>		SHEET NO. <i>6</i>	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<div>PRELIMINARY PLANS</div> <div>DO NOT USE FOR CONSTRUCTION</div>			
<div>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</div>			

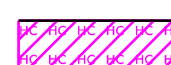
RS&H



TEMPORARY WORK  
PLATFORM



EXISTING POWER  
LINE



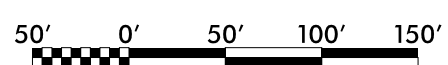
DENOTES HAND  
CLEARING



DENOTES EXCAVATION  
IN WETLAND



DENOTES TEMPORARY  
IMPACTS IN SURFACE WATER





PERMIT DRAWING  
SHEET 7 OF 17

NAD 83/NA 2011

## SITE 2

**LEFT SIDE TRAILING:**  
**PLACE 6" DECK DRAINS AS FOLLOWS:**

— STA. 32+17 LT TO	— STA. 37+21 LT @	24' CTS. AND
— STA. 37+33 LT TO	— STA. 38+29 LT @	12' CTS. AND
— STA. 38+53 LT TO	— STA. 39+61 LT @	12' CTS. AND
— STA. 39+81 LT TO	— STA. 40+47 LT @	12' CTS. AND
— STA. 42+85 LT TO	— STA. 44+65 LT @	12' CTS. AND
— STA. 44+89 LT TO	— STA. 45+61 LT @	12' CTS. AND
— STA. 45+81 LT TO	— STA. 46+29 LT @	8' CTS. AND
— STA. 46+33 LT TO	— STA. 46+61 LT @	4' CTS.

**RIGHT SIDE TRAILING:**

**PLACE 6" DECK DRAINS AS FOLLOWS:**


-L- STA. 46+65 RT TO	-L- STA. 46+69 RT @	4' CTS. AND
-L- STA. 46+77 RT TO	-L- STA. 47+01 RT @	4' CTS. AND
-L- STA. 47+13 RT TO	-L- STA. 49+05 RT @	24' CTS.

NOTES: DECK DRAINS FROM -L- STA. 44+65 LT TO 46+61 LT ARE PART OF A CLOSED DECK DRAINAGE SYSTEM.

DECK DRAINS FROM -L- STA. 46+65 RT TO 49+05 RT ARE PART OF A CLOSED DECK DRAINAGE SYSTEM.



TEMPORARY WORK  
PLATFORM

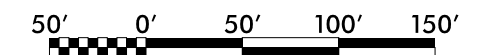
 EXISTING POWER LINE



DENOTES HAND CLEARING

 DENOTES EXCAVATION  
IN WETLAND

 DENOTES TEMPORARY  
IMPACTS IN SURFACE WATER



## REVISIONS

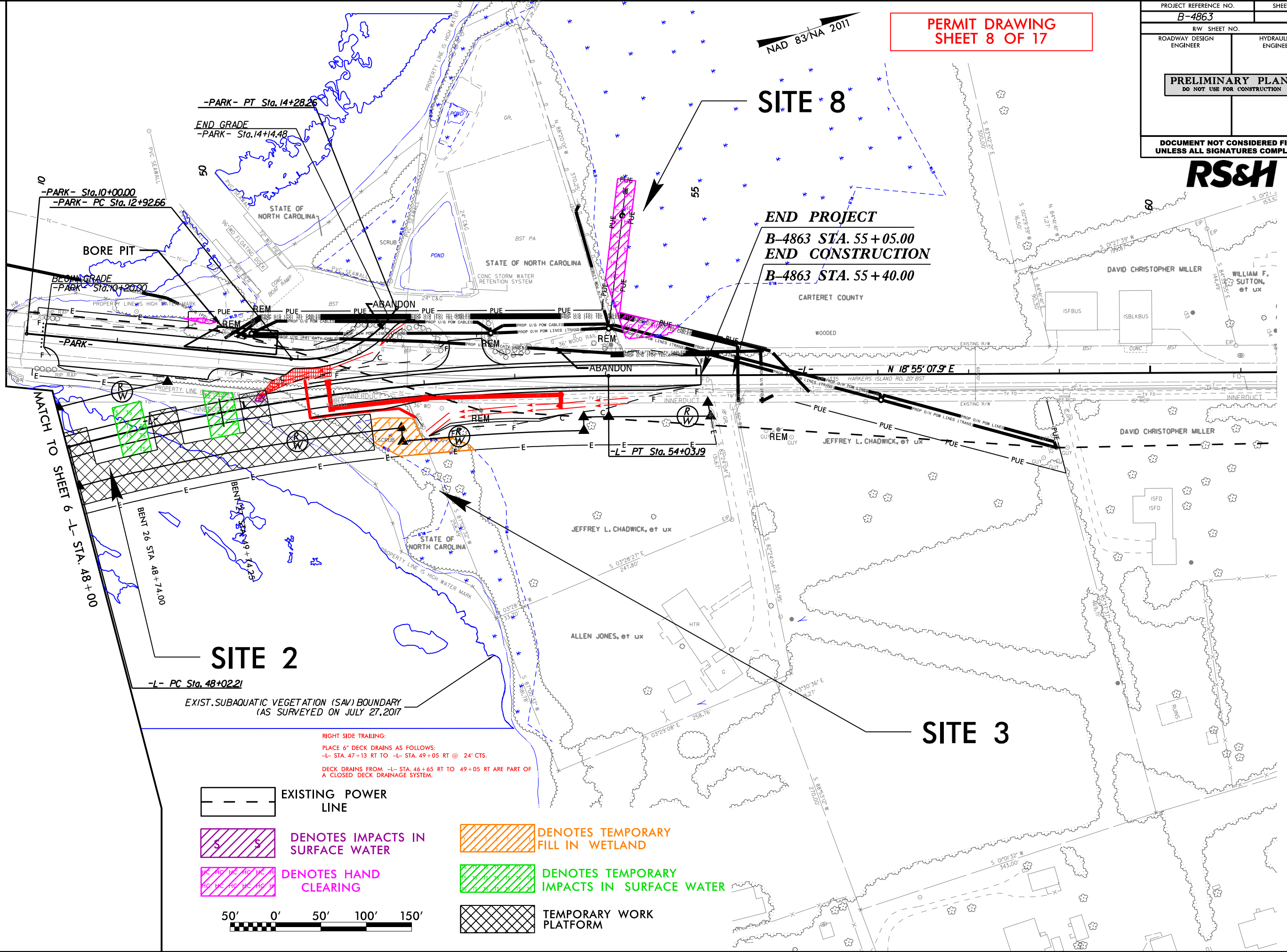
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 \$\$\$\$\$\$HYDRA\$\$\$\$\$\$

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4863	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

RS&H



PERMIT DRAWING  
SHEET 8 OF 17

SITE 8

END PROJECT  
B-4863 STA. 55+05.00  
END CONSTRUCTION  
B-4863 STA. 55+40.00

SITE 2

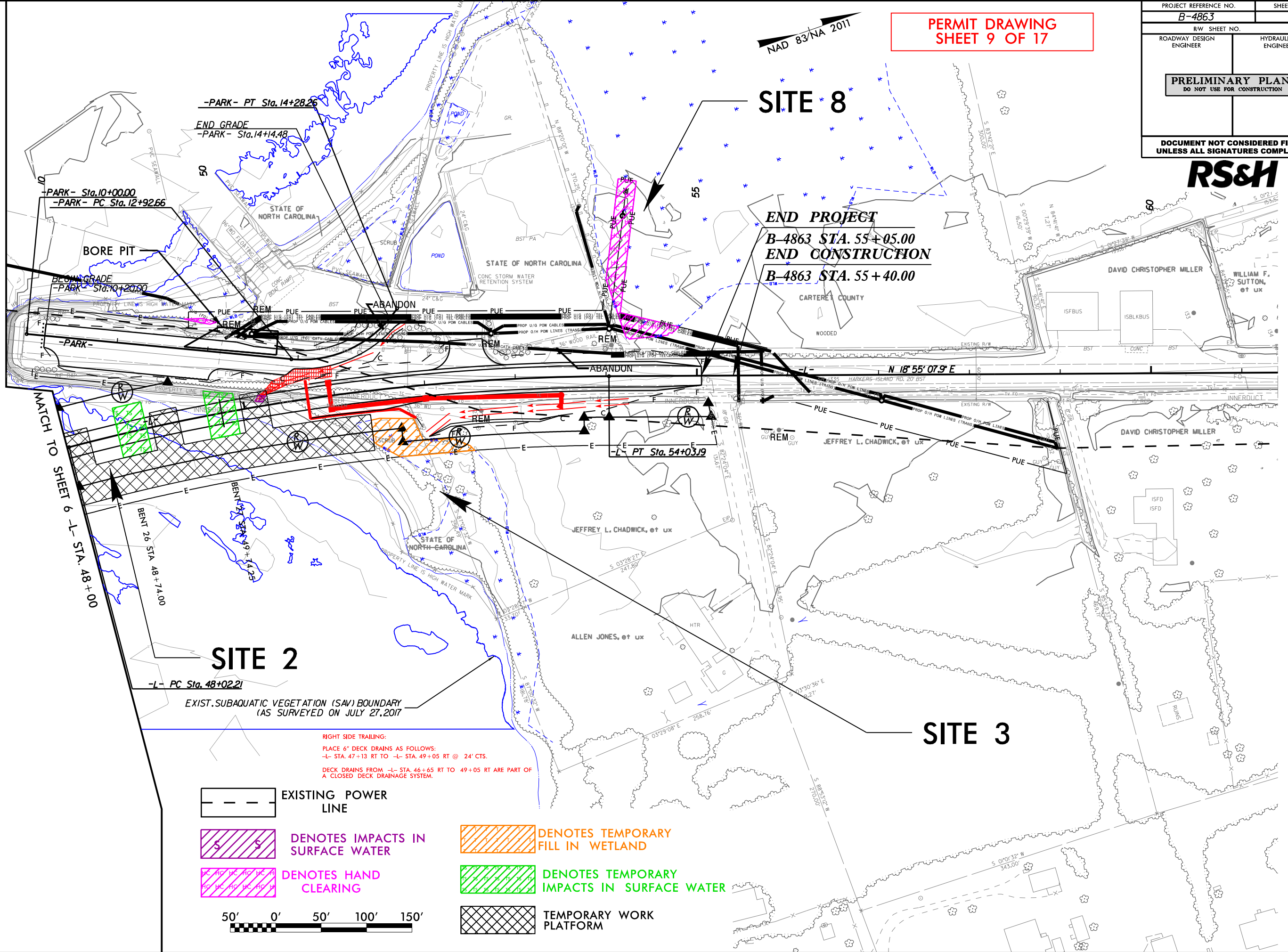
SITE 3



REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-4863	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

RS&H



PERMIT DRAWING  
SHEET 9 OF 17

SITE 8

SITE 2

SITE 3

**RIGHT SIDE APPROACH:**  
**PLACE 6" DECK DRAINS AS FOLLOWS:**  
 -L- STA. 21+31 RT TO -L- STA. 21+67 RT @ 12' CTS. AND  
 -L- STA. 21+71 RT TO -L- STA. 21+83 RT @ 12' CTS. AND  
 -L- STA. 21+87 RT TO -L- STA. 21+99 RT @ 4' CTS.  
**NOTE: ALL DECK DRAINS ON THE BRIDGE APPROACH SIDE ARE PART**  
**OF A CLOSED DECK DRAINAGE SYSTEM EXCEPT FOR THE TWO**  
**HORIZONTAL DECK DRAINS @ -L- STA. 26+03 AND 26+15**

PROPC  
GRADE

**BEGIN BRIDGE**  
**-L- STA. 18+75.00**  
**ELEV. = 18.60'**

$$\begin{aligned} PI &= 17+05.00 \\ EL &= 7.93' \\ VC &= 530' \\ K &= 96 \end{aligned}$$

MHW ELEV. = 1.60'

EXISTING GROUND  
TEMPORARY WALL  
PLATFORM

**BEGIN GRADE**  
**-L- STA. 10+00.00**  
**ELEV. = 4.44'**

-L- STA.15+50.00 =  
-Y- STA.10+00.00 =  
-DRIVE- STA.10+00.00  
ELEV. = 7.79'

**BORE PI**  
**STA. 15+00**

FOR -L- ALIGNMENT, SEE SHEET NO. 4

05-NOV-2018 09:03  
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5/14/99

RS&H Hydraulics Environmental\Permit\_UBO and Standard Drawings\B4863\_hyd.prm.11.pfl.09.dgn

-L-

PERMIT DRAWING  
SHEET 11 OF 17

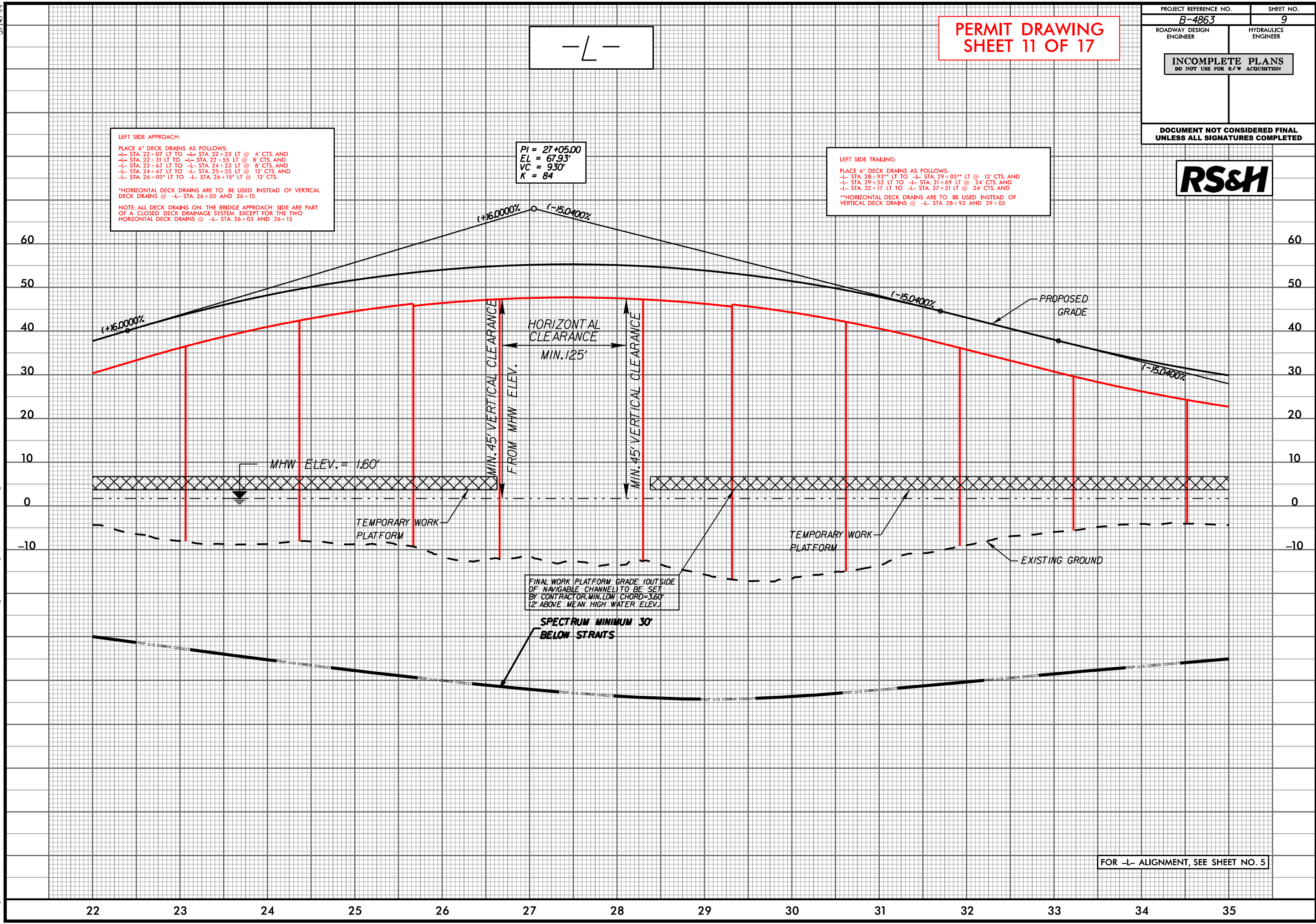
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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
<div><b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION</div>		
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>		



LEFT SIDE APPROACH:  
PLACE 6" DECK DRAINS AS FOLLOWS:  
-L- STA. 22+07 LT TO -L- STA. 22+23 LT @ 4' CTS. AND  
-L- STA. 22+31 LT TO -L- STA. 22+55 LT @ 8' CTS. AND  
-L- STA. 22+67 LT TO -L- STA. 24+23 LT @ 8' CTS. AND  
-L- STA. 24+47 LT TO -L- STA. 25+55 LT @ 12' CTS. AND  
-L- STA. 26+03\* LT TO -L- STA. 26+15\* LT @ 12' CTS.  
  
\*HORIZONTAL DECK DRAINS ARE TO BE USED INSTEAD OF VERTICAL  
DECK DRAINS @ -L- STA. 26+03 AND 26+15  
  
NOTE: ALL DECK DRAINS ON THE BRIDGE APPROACH SIDE ARE PART  
OF A CLOSED DECK DRAINAGE SYSTEM, EXCEPT FOR THE TWO  
HORIZONTAL DECK DRAINS @ -L- STA. 26+03 AND 26+15

PI = 27+05.00  
EL = 67.93'  
VC = 930'  
K = 84

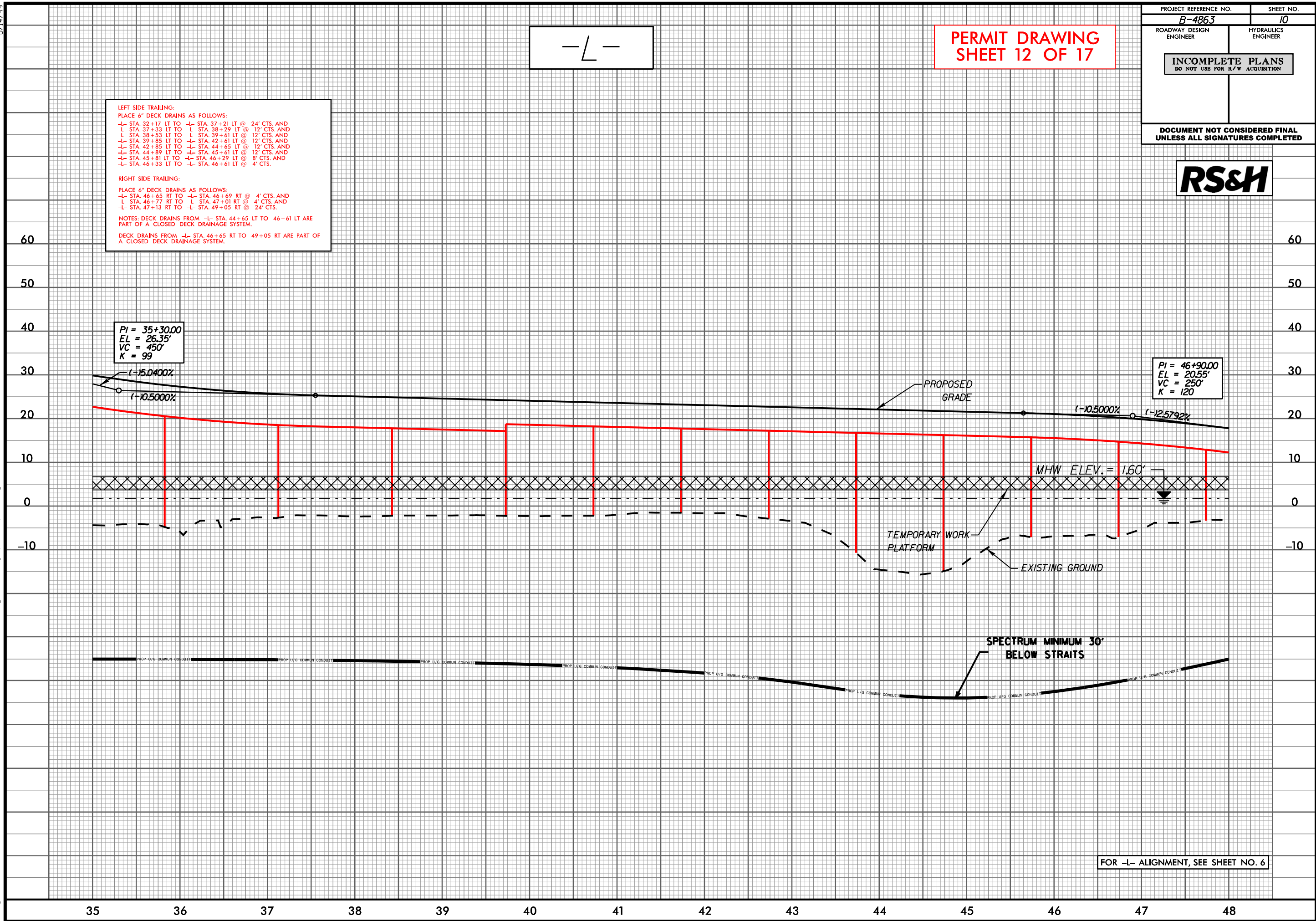
LEFT SIDE TRAILING:  
PLACE 6" DECK DRAINS AS FOLLOWS:  
-L- STA. 28+93\*\* LT TO -L- STA. 29+05\*\* LT @ 12' CTS. AND  
-L- STA. 29+53 LT TO -L- STA. 31+69 LT @ 24' CTS. AND  
-L- STA. 32+17 LT TO -L- STA. 37+21 LT @ 24' CTS. AND  
  
\*\*HORIZONTAL DECK DRAINS ARE TO BE USED INSTEAD OF  
VERTICAL DECK DRAINS @ -L- STA. 28+93 AND 29+05



5/14/99

RS-Hydraulics\ENR\Permits\Environmental\Combined Permit\_UBO and Standard\Drawings\B4863-hyd-prm-12.pfl\_10.dgn

05-NOV-2018 09:00



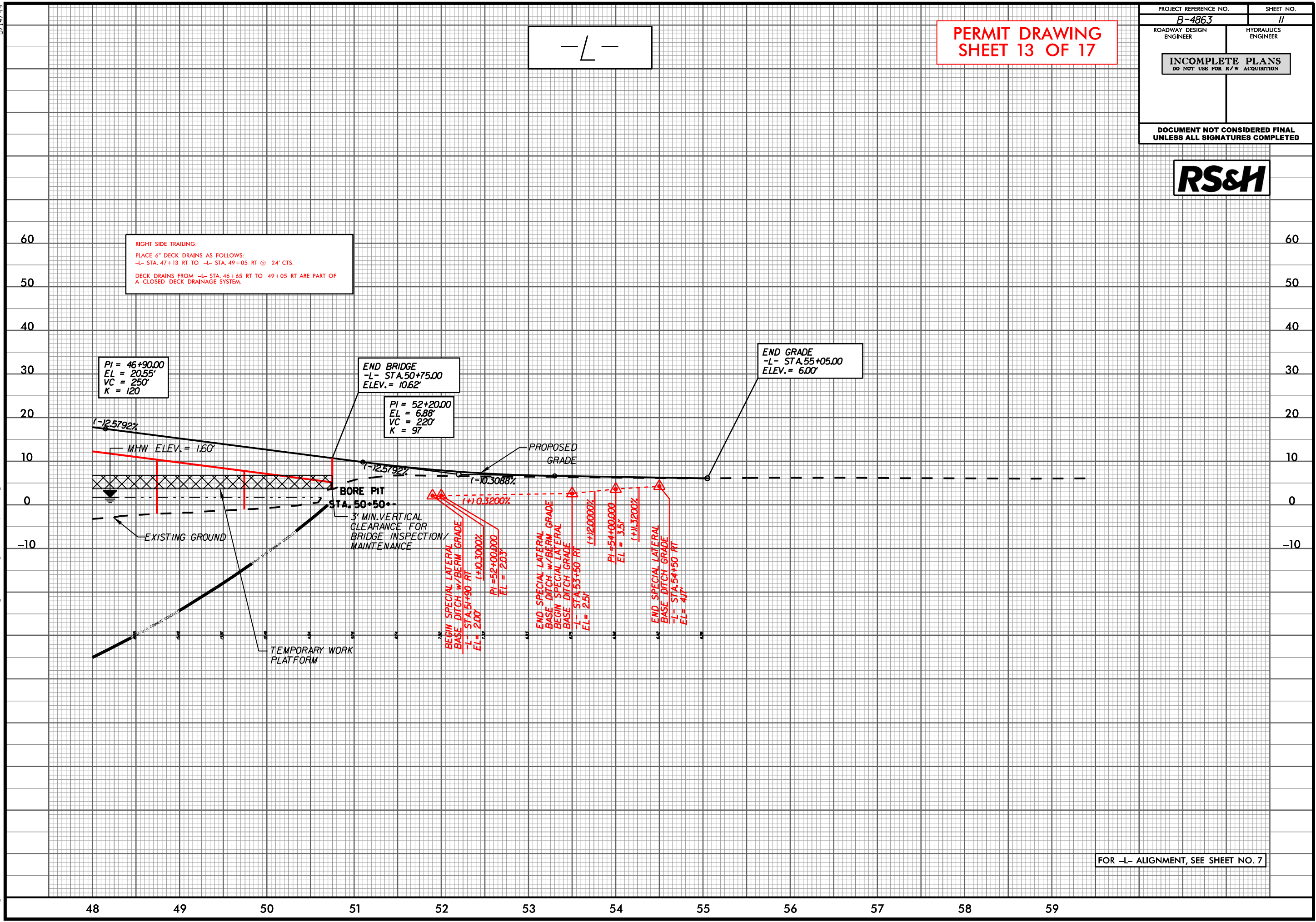
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-L-

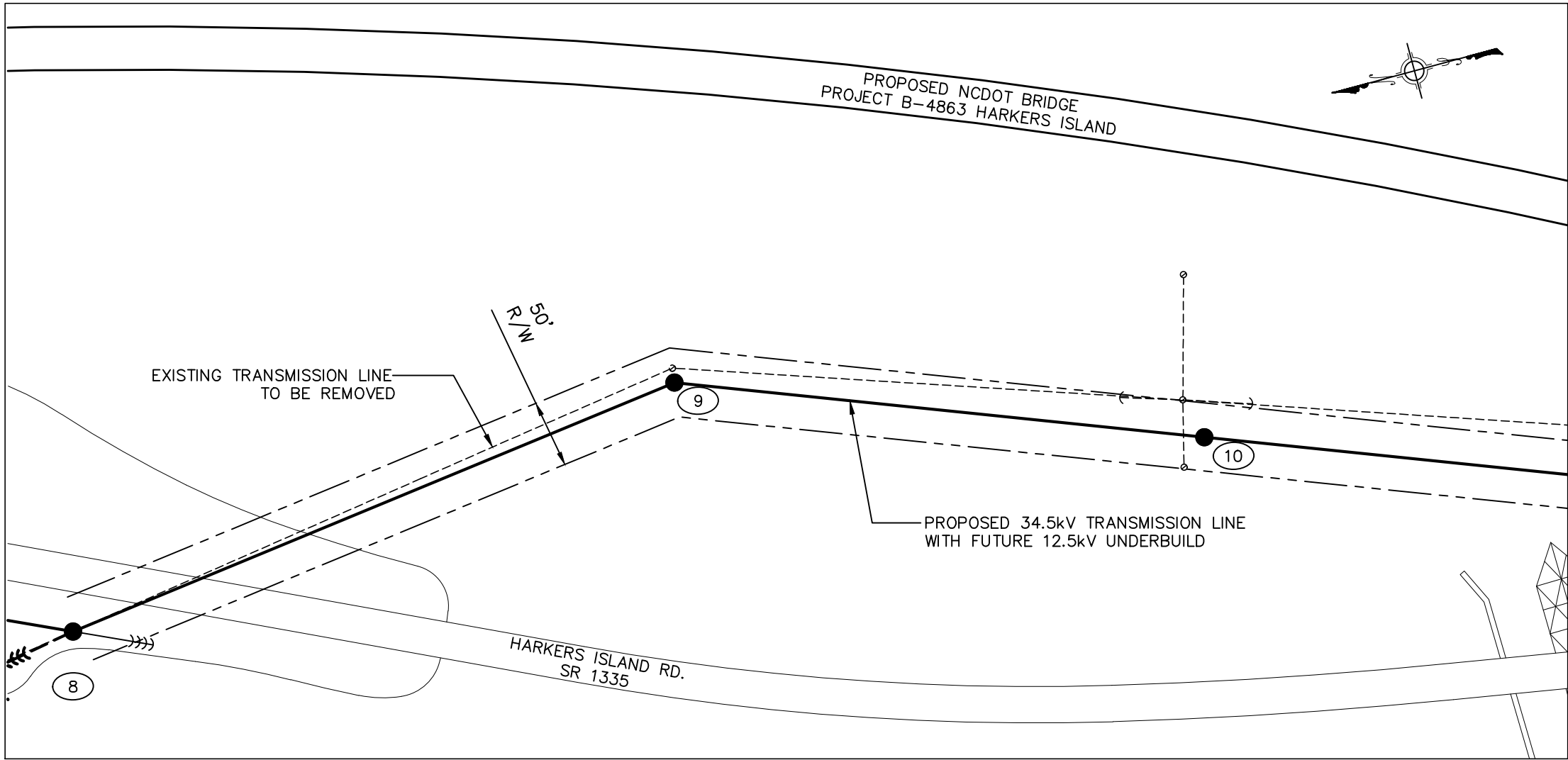
PERMIT DRAWING  
SHEET 13 OF 17

PROJECT REFERENCE NO.	SHEET NO.
B-4863	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

RS&H



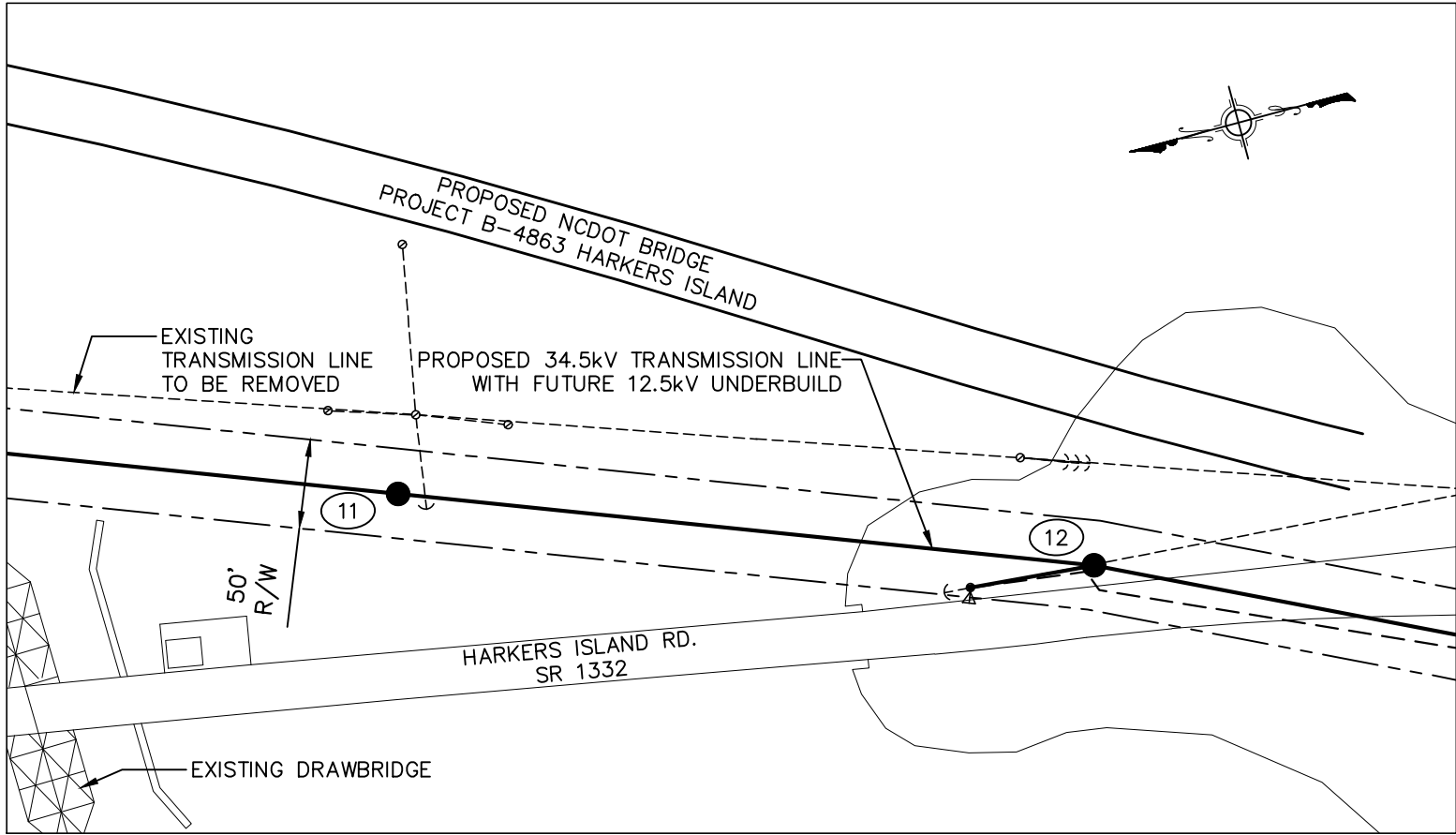
FOR -L- ALIGNMENT, SEE SHEET NO. 7



MATCH LINE - SEE BELOW FOR CONTINUATION



VICINITY MAP  
N.T.S.



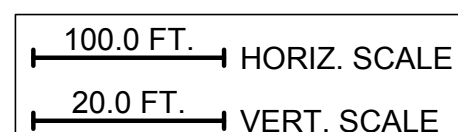
MATCH LINE - SEE ABOVE

LEGEND

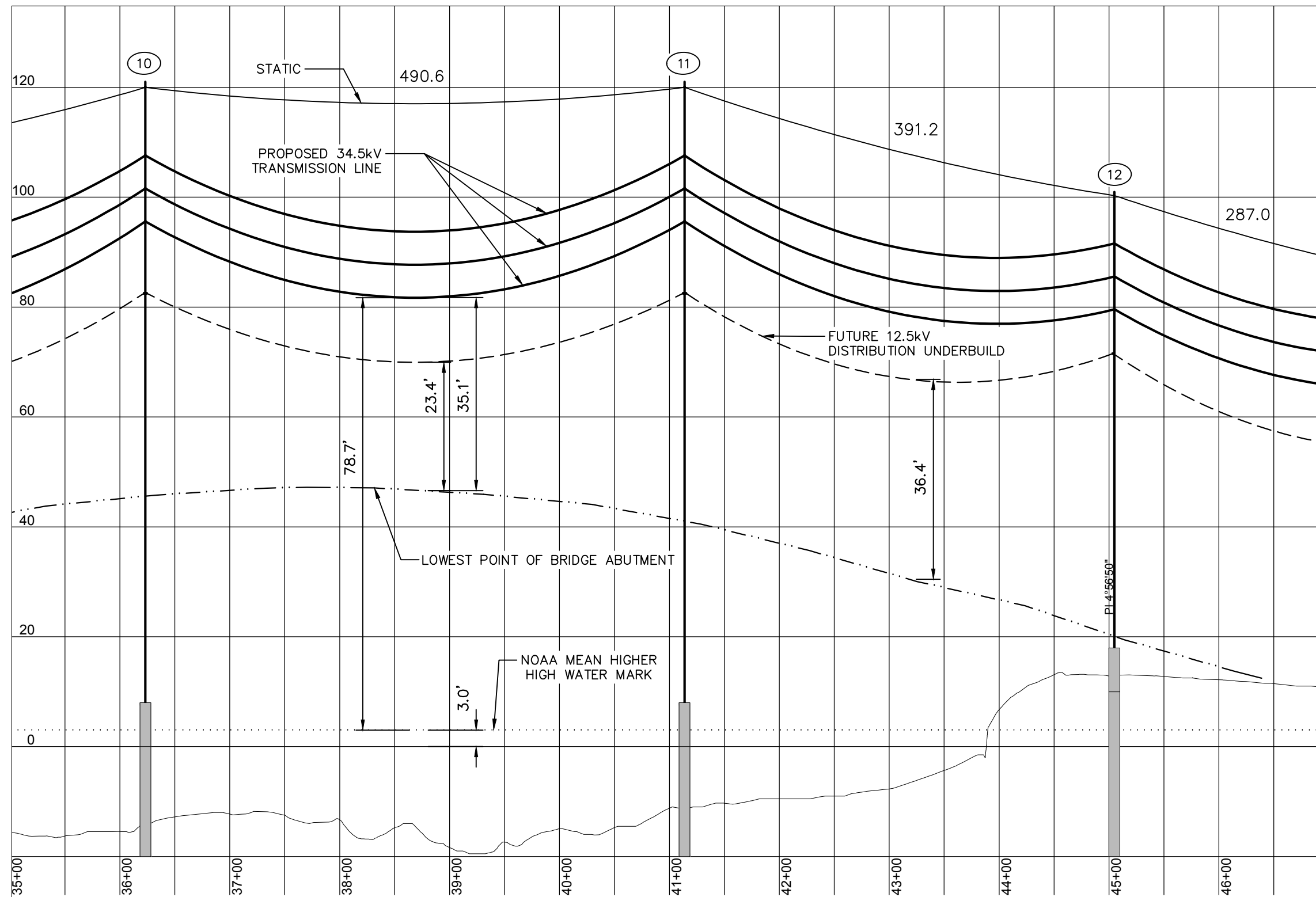
- NEW POLE
- REMOVE POLE

UTILITY PERMIT DRAWING  
SHEET 14 OF 17

NO.			REVISIONS	DATE	CARTERET-CRAVEN ELECTRIC COOPERATIVE MOREHEAD CITY, NORTH CAROLINA  NCDOT BRIDGE PROJECT B-4863 HARKERS ISLAND 34.5kV TRANSMISSION LINE PLAN VIEW  Booth & Associates, LLC <small>5811 Glenwood Avenue   Raleigh, NC 27612   CONSULTING ENGINEERS NC F-0221</small>
					DWN. AAI
					CKD. TKB
					DATE 7/5/18
					APPD. GSB
					SCALE: 1" = 100'
					© 07/18
					DWG. NO. 8708-ACOE 1 OF 3



NO.	REVISIONS	DATE	CARTERET-CRAVEN ELECTRIC COOPERATIVE MOREHEAD CITY, NORTH CAROLINA		
			NCDOT BRIDGE PROJECT B-4863 HARKERS ISLAND 34.5kV TRANSMISSION LINE PROFILE VIEW		
			<div style="text-align: center;"> <u>Booth &amp; Associates, LLC</u>  <small>3811 Glenwood Avenue • Raleigh, NC 27612 CONSULTING ENGINEERS NC F-0221</small> </div>		
			DWN. AAI CKD. TKB SCALE: 1" = 100'	DATE 7/5/18 APPD. GSB © 07/18	DWG. NO. 8708-ACOE 2 OF 3



UTILITY PERMIT DRAWING  
SHEET 16 OF 17

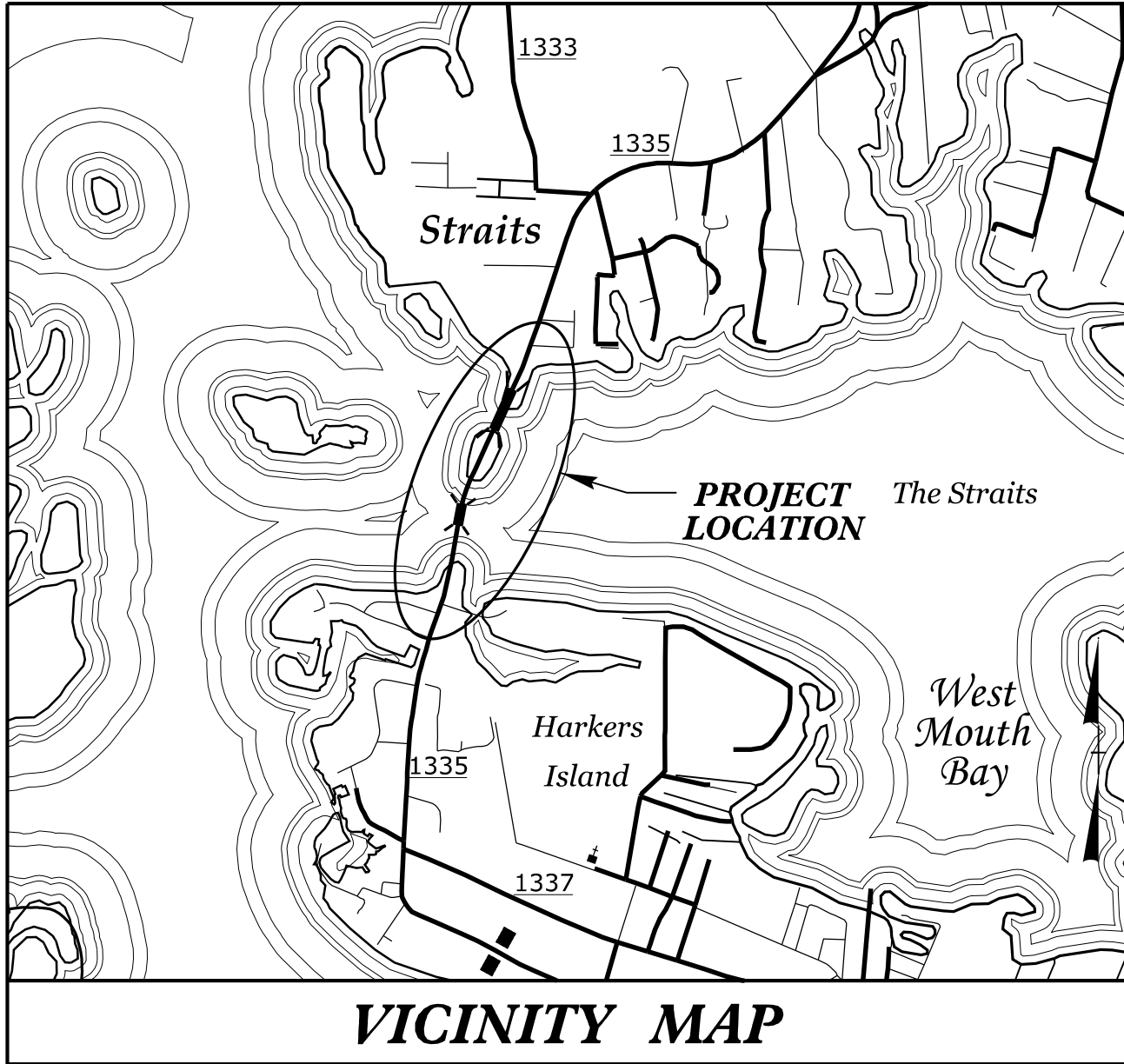
NO.	REVISIONS	DATE	CARTERET-CRAVEN ELECTRIC COOPERATIVE MOREHEAD CITY, NORTH CAROLINA	
			NCDOT BRIDGE PROJECT B-4863 HARKERS ISLAND 34.5kV TRANSMISSION LINE PROFILE VIEW	
			<u>Booth &amp; Associates, LLC</u> <small>3811 Glenwood Avenue 1 Raleigh, NC 27612 CONSULTING ENGINEERS NC E-0221</small>	
			DWN. AAI	DATE 7/5/18
			CKD. TKB	APPD. GSB
			SCALE: 1" = 100'	© 07/18
			DWG. NO. 8708-ACOE 3 OF 3	





09/08/19

See Sheet 1A For Index of Sheets  
See Sheet 1B For Conventional Symbols



75% PLANS

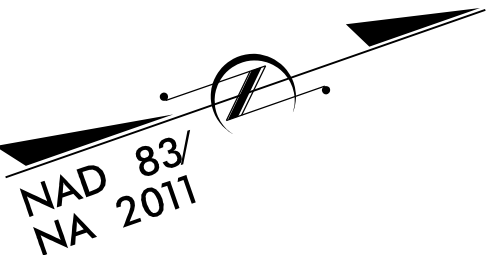
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

CARTERET COUNTY

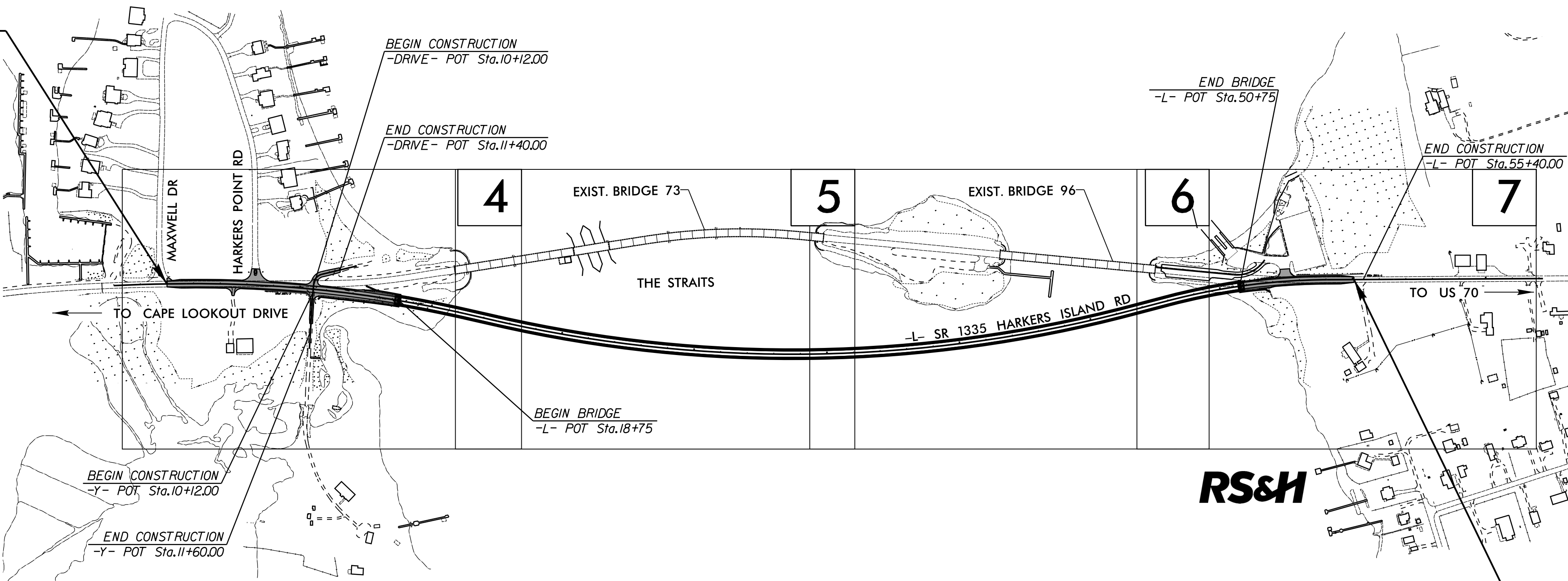
LOCATION: REPLACEMENT OF BRIDGE NOS. 73 AND 96 CARRYING  
SR 1335 (HARKERS ISLAND RD) OVER THE STRAITS

TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4863	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
40212.1.3	N/A	PE, RW, UTL	

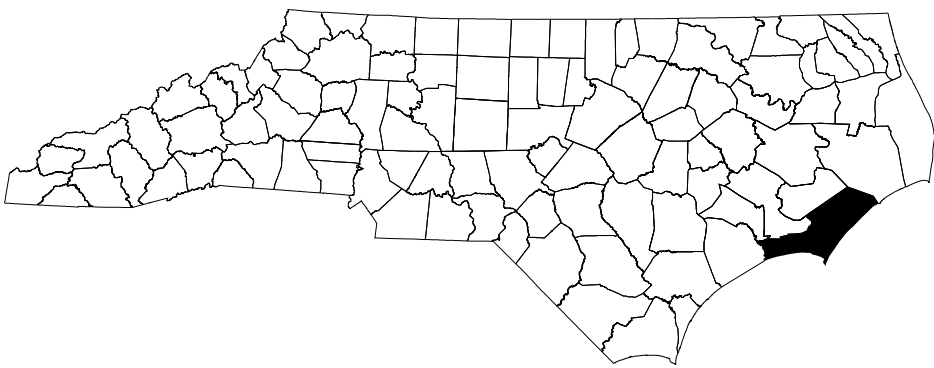


BEGIN TIP PROJECT B-4863  
-L- POC Sta.10+00.00

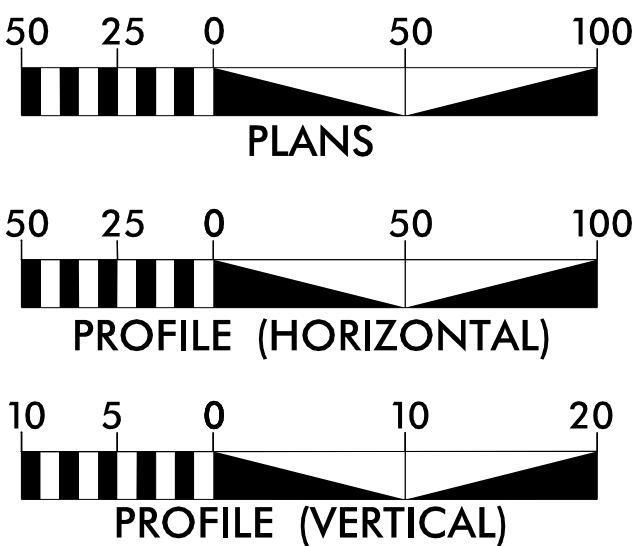


END TIP PROJECT B-4863  
-L- POT Sta.55+05.00

THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.  
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.  
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III.



GRAPHIC SCALES



DESIGN DATA

ADT 2019 = 3,300  
ADT 2040 = 4,200  
K = 10 %  
D = 60 %  
T = 4 % \*  
V = 50 MPH  
\*(TTST=2% + DUAL=2%)  
FUNC CLASS = MAJOR  
COLLECTOR

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4863 = 0.247 MILE +/-  
LENGTH STRUCTURE TIP PROJECT B-4863 = 0.606 MILE +/-  
TOTAL LENGTH TIP PROJECT B-4863 = 0.853 MILE +/-

PLANS PREPARED BY:

RS&H

1520 SOUTH BLVD, SUITE 200  
CHARLOTTE, NC 28203  
704-752-0610

FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
JULY 10, 2018

LETTING DATE:  
OCTOBER 15, 2019

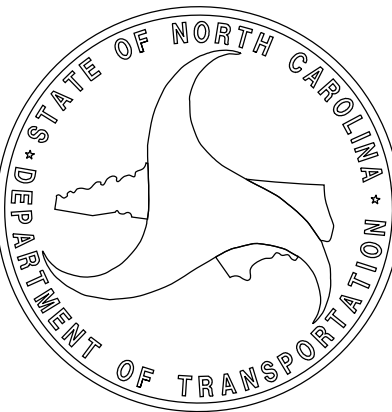
JENNIFER FARINO, PE  
PROJECT ENGINEER  
DREW MORROW, PE  
PROJECT DESIGN ENGINEER  
MARIA ROGERSON, PE  
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN  
ENGINEER

SIGNATURE: P.E.



TIP PROJECT: B-4863

CONTRACT:

10-JUL-2018 15:33  
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8/17/99

10 JUL 2018 15:24  
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\$\$\$\$\$SYTIME\$\$\$\$

PROJECT REFERENCE NO.	SHEET NO.
B-4863	1A
	ROADWAY DESIGN ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

## INDEX OF SHEETS

SHEET NUMBER	SHEET
1	TITLE SHEET
1A	INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS
1B	CONVENTIONAL SYMBOLS
2A-1 THRU 2A-3	TYPICAL SECTIONS
2B-1	SHEAR POINT DIAGRAM
2B-2	-DETOUR- DETAIL SHEET
2B-3	-PARK- DETAIL SHEET
3B-1	ROADWAY SUMMARIES
3P-1	PARCEL INDEX SHEET
4 THRU 12	PLAN AND PROFILE SHEETS
TMP-4 THRU TMP-11	PRELIMINARY TRAFFIC CONTROL SHEETS
UO-1 THRU UO-5	UTILITY BY OTHERS SHEETS
X-1A	CROSS SECTION TITLE SHEET
X-1 THRU X-40	CROSS-SECTIONS

## GENERAL NOTES

GENERAL NOTES AND STANDARD DRAWINGS TO BE ADDED AFTER DIVISION APPROVAL.

## STANDARD DRAWINGS

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS  
CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

State Line	
County Line	
Township Line	
City Line	
Reservation Line	
Property Line	
Existing Iron Pin	
Computed Property Corner	
Property Monument	
Parcel/Sequence Number	
Existing Fence Line	
Proposed Woven Wire Fence	
Proposed Chain Link Fence	
Proposed Barbed Wire Fence	
Existing Wetland Boundary	
Proposed Wetland Boundary	
Existing Endangered Animal Boundary	
Existing Endangered Plant Boundary	
Existing Historic Property Boundary	
Known Contamination Area: Soil	
Potential Contamination Area: Soil	
Known Contamination Area: Water	
Potential Contamination Area: Water	
Contaminated Site: Known or Potential	

BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	
Sign	
Well	
Small Mine	
Foundation	
Area Outline	
Cemetery	
Building	
School	
Church	
Dam	

HYDROLOGY:

Stream or Body of Water	
Hydro, Pool or Reservoir	
Jurisdictional Stream	
Buffer Zone 1	
Buffer Zone 2	
Flow Arrow	
Disappearing Stream	
Spring	
Wetland	
Proposed Lateral, Tail, Head Ditch	
False Sump	

RAILROADS:

Standard Gauge	
RR Signal Milepost	
Switch	
RR Abandoned	
RR Dismantled	

RIGHT OF WAY & PROJECT CONTROL:

Secondary Horiz and Vert Control Point	
Primary Horiz Control Point	
Primary Horiz and Vert Control Point	
Exist Permanent Easment Pin and Cap	
New Permanent Easement Pin and Cap	
Vertical Benchmark	
Existing Right of Way Marker	
Existing Right of Way Line	
New Right of Way Line	
New Right of Way Line with Pin and Cap	
New Right of Way Line with Concrete or Granite R/W Marker	
New Control of Access Line with Concrete C/A Marker	
Existing Control of Access	
New Control of Access	
Existing Easement Line	
New Temporary Construction Easement	
New Temporary Drainage Easement	
New Permanent Drainage Easement	
New Permanent Drainage /Utility Easement	
New Permanent Utility Easement	
New Temporary Utility Easement	
New Aerial Utility Easement	

ROADS AND RELATED FEATURES:

Existing Edge of Pavement	
Existing Curb	
Proposed Slope Stakes Cut	
Proposed Slope Stakes Fill	
Proposed Curb Ramp	
Existing Metal Guardrail	
Proposed Guardrail	
Existing Cable Guiderail	
Proposed Cable Guiderail	
Equality Symbol	
Pavement Removal	

VEGETATION:

Single Tree	
Single Shrub	

\*S.U.E. = Subsurface Utility Engineering

Hedge	
Woods Line	
Orchard	
Vineyard	

EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	
Bridge Wing Wall, Head Wall and End Wall	
MINOR:	
Head and End Wall	
Pipe Culvert	
Footbridge	
Drainage Box: Catch Basin, DI or JB	
Paved Ditch Gutter	
Storm Sewer Manhole	
Storm Sewer	

UTILITIES:

POWER:	
Existing Power Pole	
Proposed Power Pole	
Existing Joint Use Pole	
Proposed Joint Use Pole	
Power Manhole	
Power Line Tower	
Power Transformer	
U/G Power Cable Hand Hole	
H-Frame Pole	
U/G Power Line LOS B (S.U.E.*)	
U/G Power Line LOS C (S.U.E.*)	
U/G Power Line LOS D (S.U.E.*)	

TELEPHONE:

Existing Telephone Pole	
Proposed Telephone Pole	
Telephone Manhole	
Telephone Pedestal	
Telephone Cell Tower	
U/G Telephone Cable Hand Hole	
U/G Telephone Cable LOS B (S.U.E.*)	
U/G Telephone Cable LOS C (S.U.E.*)	
U/G Telephone Cable LOS D (S.U.E.*)	
U/G Telephone Conduit LOS B (S.U.E.*)	
U/G Telephone Conduit LOS C (S.U.E.*)	
U/G Telephone Conduit LOS D (S.U.E.*)	
U/G Fiber Optics Cable LOS B (S.U.E.*)	
U/G Fiber Optics Cable LOS C (S.U.E.*)	
U/G Fiber Optics Cable LOS D (S.U.E.*)	

WATER:

Water Manhole	
Water Meter	
Water Valve	
Water Hydrant	
U/G Water Line LOS B (S.U.E.*)	
U/G Water Line LOS C (S.U.E.*)	
U/G Water Line LOS D (S.U.E.*)	
Above Ground Water Line	

TV:

TV Pedestal	
TV Tower	
U/G TV Cable Hand Hole	
U/G TV Cable LOS B (S.U.E.*)	
U/G TV Cable LOS C (S.U.E.*)	
U/G TV Cable LOS D (S.U.E.*)	
U/G Fiber Optic Cable LOS B (S.U.E.*)	
U/G Fiber Optic Cable LOS C (S.U.E.*)	
U/G Fiber Optic Cable LOS D (S.U.E.*)	

GAS:

Gas Valve	
Gas Meter	
U/G Gas Line LOS B (S.U.E.*)	
U/G Gas Line LOS C (S.U.E.*)	
U/G Gas Line LOS D (S.U.E.*)	
Above Ground Gas Line	

SANITARY SEWER:

Sanitary Sewer Manhole	
Sanitary Sewer Cleanout	
U/G Sanitary Sewer Line	
Above Ground Sanitary Sewer	
SS Forced Main Line LOS B (S.U.E.*)	
SS Forced Main Line LOS C (S.U.E.*)	
SS Forced Main Line LOS D (S.U.E.*)	

MISCELLANEOUS:

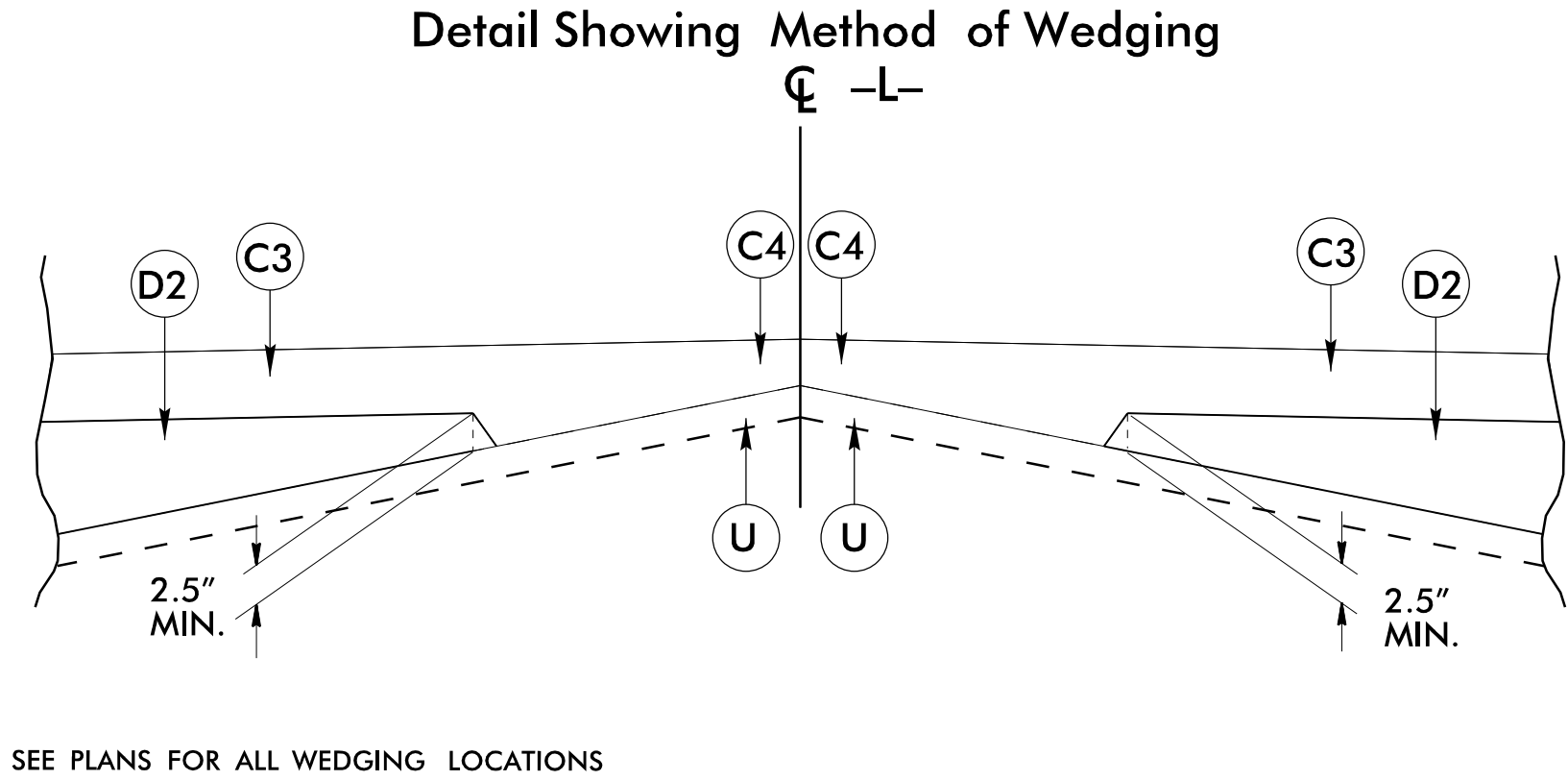
Utility Pole	
Utility Pole with Base	
Utility Located Object	
Utility Traffic Signal Box	
Utility Unknown U/G Line LOS B (S.U.E.*)	
U/G Tank; Water, Gas, Oil	
Underground Storage Tank, Approx. Loc.	
A/G Tank; Water, Gas, Oil	
Geoenvironmental Boring	
U/G Test Hole LOS A (S.U.E.*)	
Abandoned According to Utility Records	
End of Information	



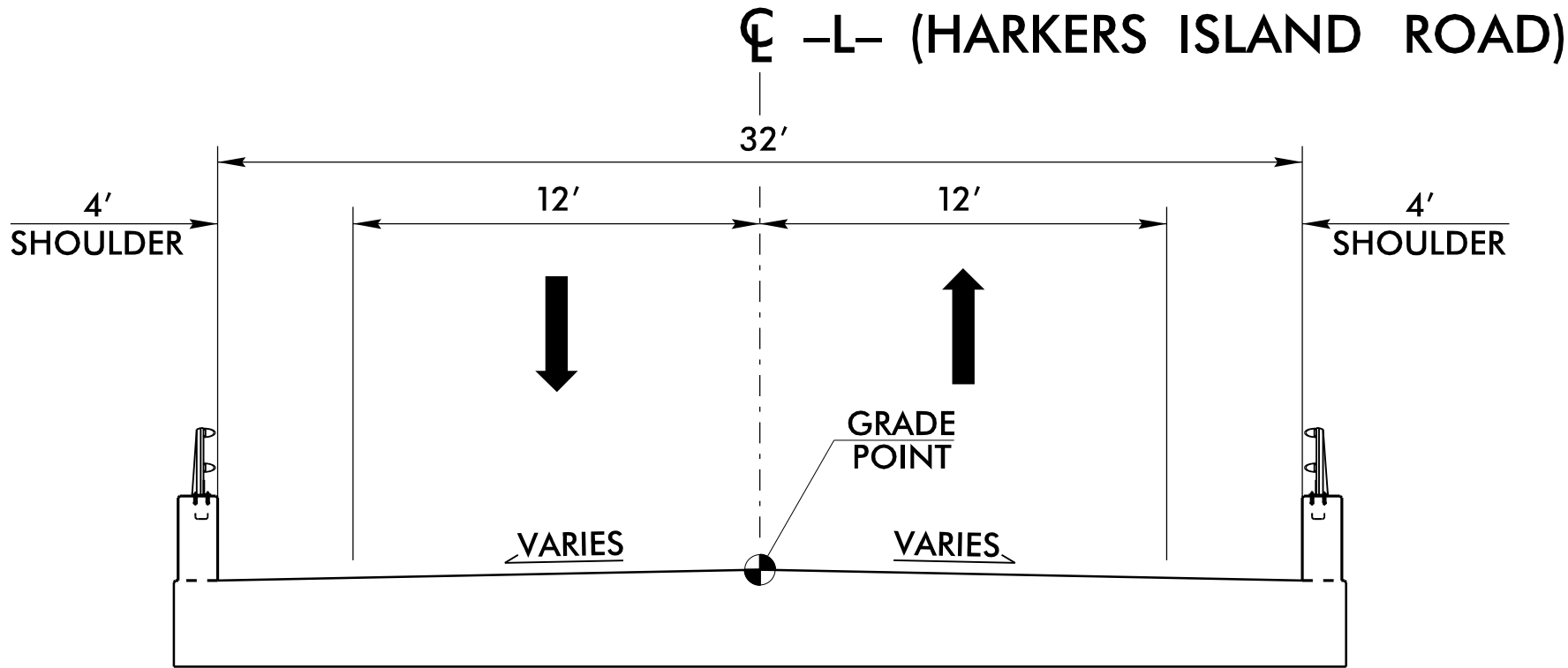
6/2/99

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.
C3	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C4	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH.
D1	PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH TO BE PLACED IN LAYERS NOT LESS THAN 2½" IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
J1	8" AGGREGATE BASE COURSE.
J2	VARIABLE DEPTH AGGREGATE BASE COURSE.
P	PRIME COAT.
R1	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V1	4" PERMEABLE PAVERS.
V2	4" NO. 57 STONE.
W	VARIABLE DEPTH ASPAHLT PAVEMENT (SEE WEDGING DETAIL).

NOTE: ALL PAVEMENT SLOPES AND TRENCH SLOPES 1:1 UNLESS NOTED OTHERWISE

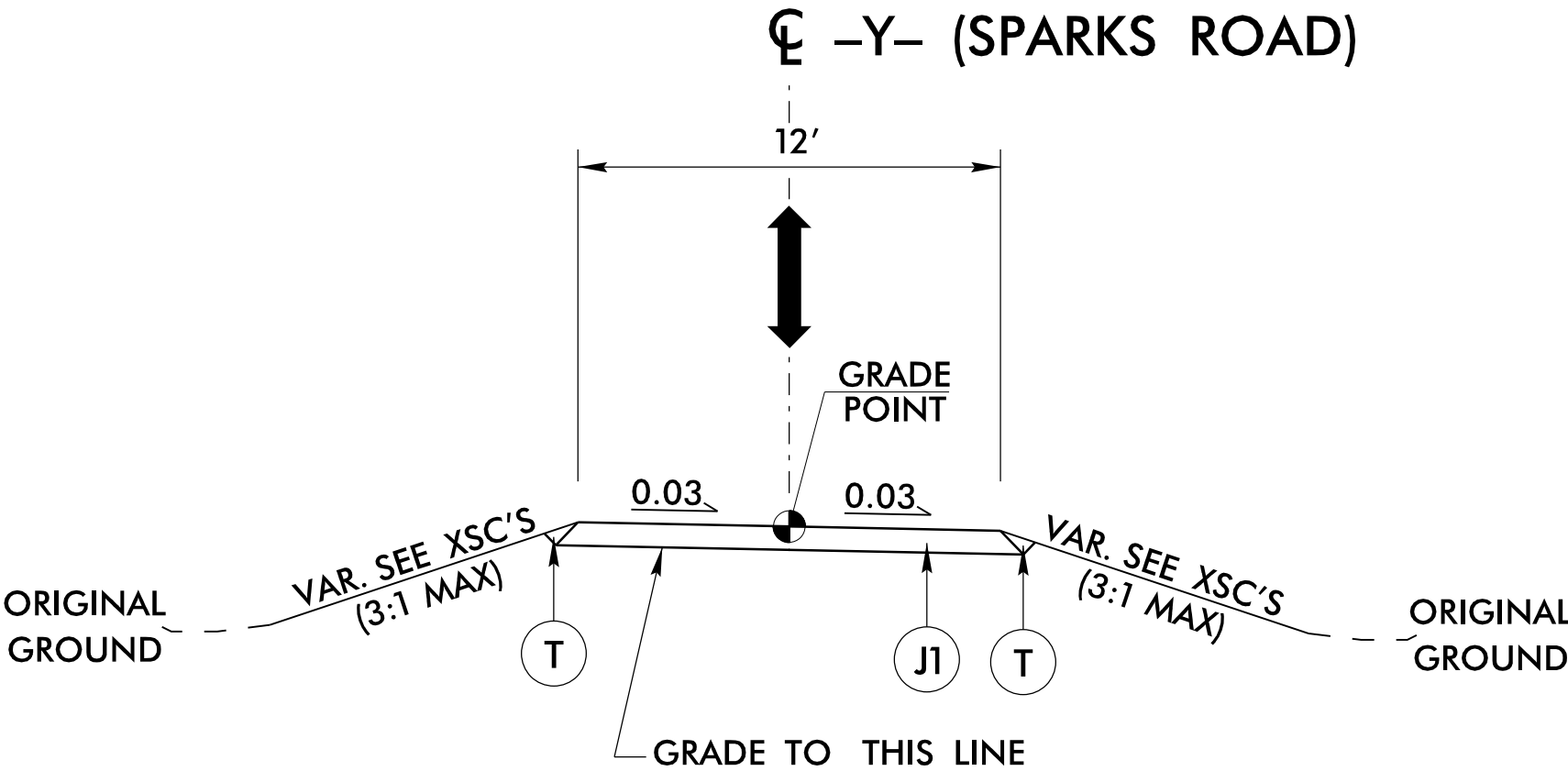


SEE PLANS FOR ALL WEDGING LOCATIONS



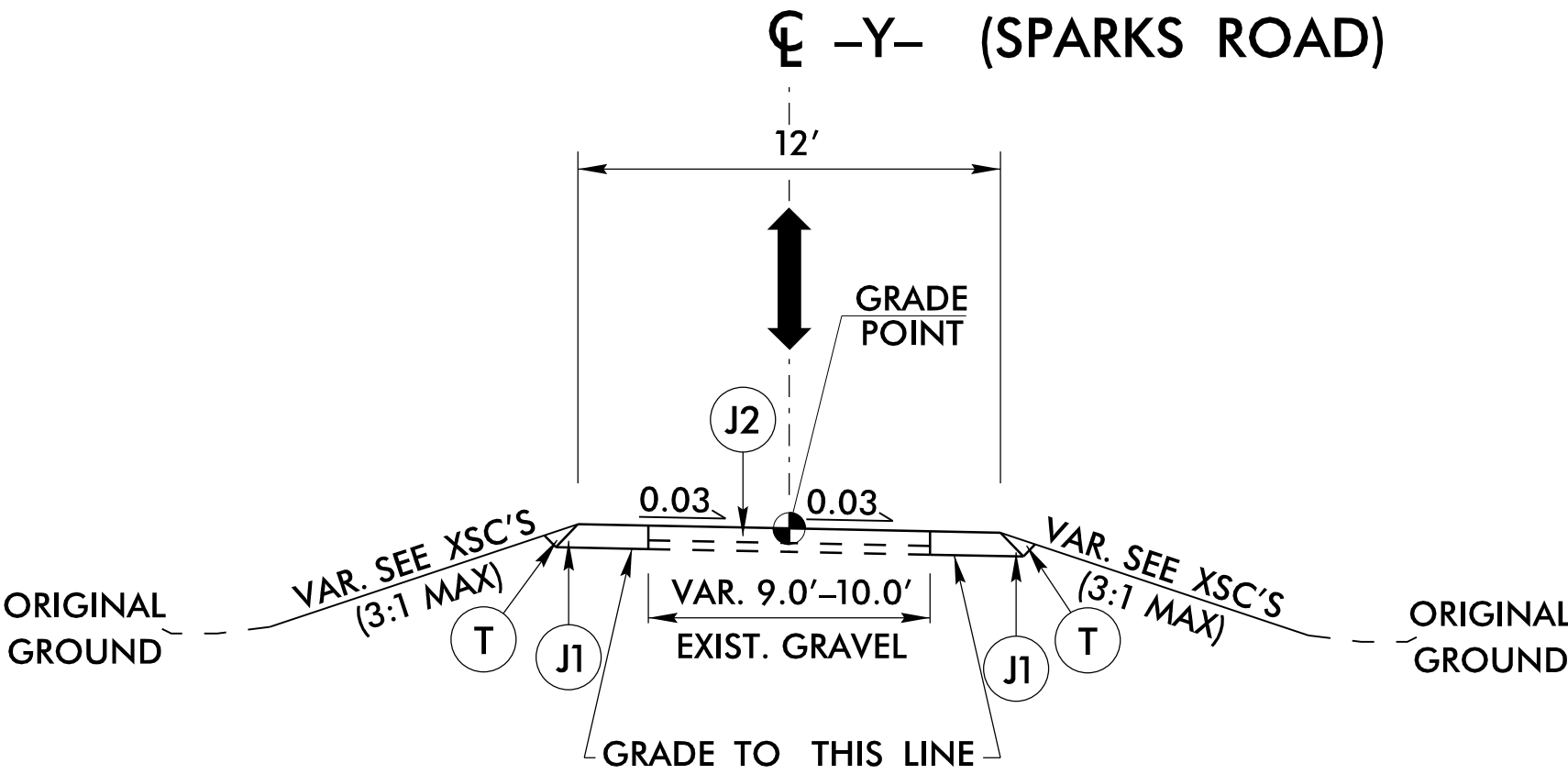
TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5  
-L- STA. 18 + 75.00 TO -L- STA. 50 + 75.00



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6  
-Y- STA. 10 + 12.00 TO -Y- STA. 10 + 78.00



TYPICAL SECTION NO. 7

USE TYPICAL SECTION NO. 7  
-Y- STA. 10 + 78.00 TO -Y- STA. 11 + 30.00

PROJECT REFERENCE NO.		SHEET NO.	
B-4863		2A-2	
ROADWAY DESIGN ENGINEER		PAVEMENT DESIGN ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

RS&H

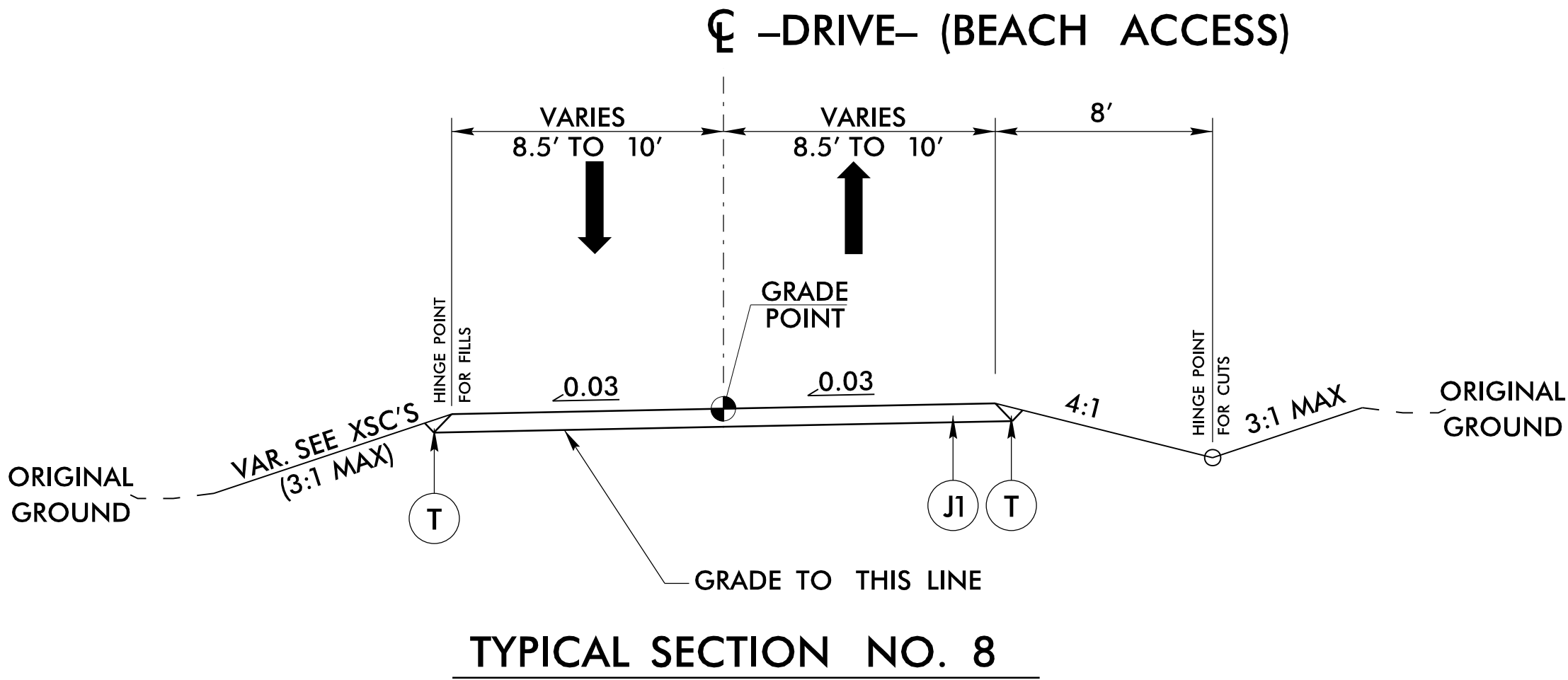
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\$\$\$\$\$PERNAME\$\$\$\$\$

6/2/99

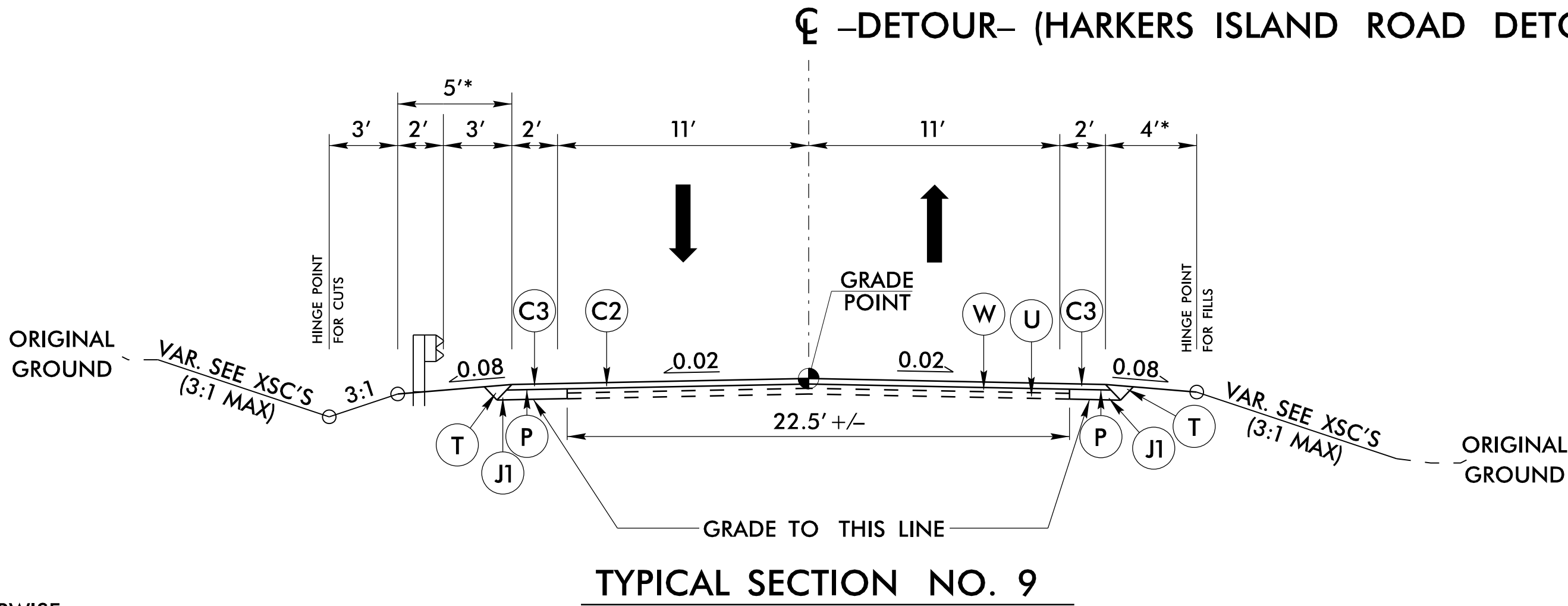
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\$\$\$\$\$PERNAME\$\$\$\$\$

PAVEMENT SCHEDULE (FINAL PAVEMENT DESIGN)	
C1	PROP. APPROX. 2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
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R1	SHOULDER BERM GUTTER.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
V1	4" PERMEABLE PAVERS.
V2	4" NO. 57 STONE.
W	VARIABLE DEPTH ASPAHLT PAVEMENT (SEE WEDGING DETAIL).

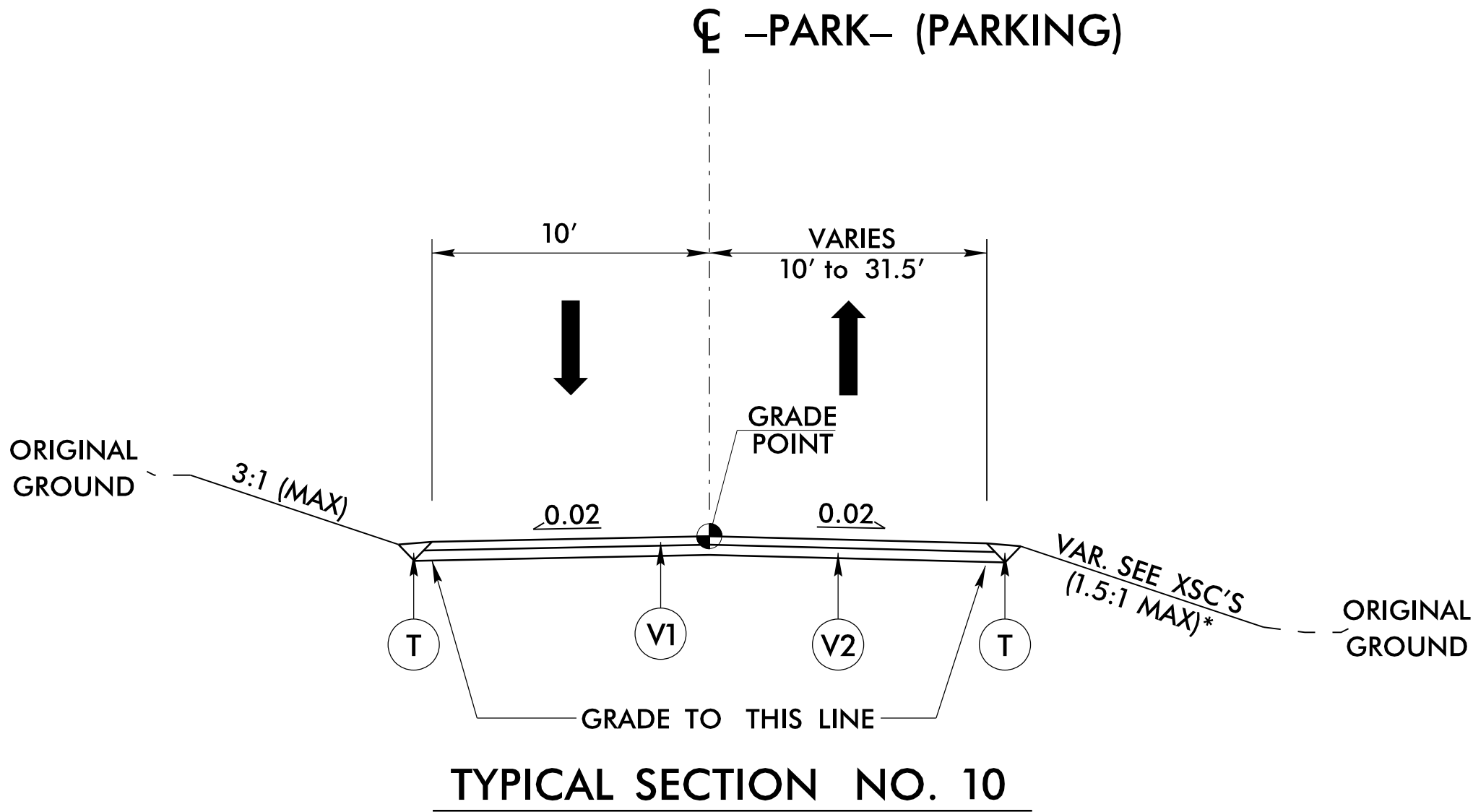
NOTE: ALL PAVEMENT SLOPES AND TRENCH SLOPES 1:1 UNLESS NOTED OTHERWISE



USE TYPICAL SECTION NO. 8  
–DRIVE– STA. 10+12.00 TO –DRIVE– STA. 11+40.00



USE TYPICAL SECTION NO. 9  
–DETOUR– STA. 10+03.00 TO –DETOUR– STA. 16+68.48  
\* 4' TURF SHOULDER WIDTH WITHOUT GUARDRAIL



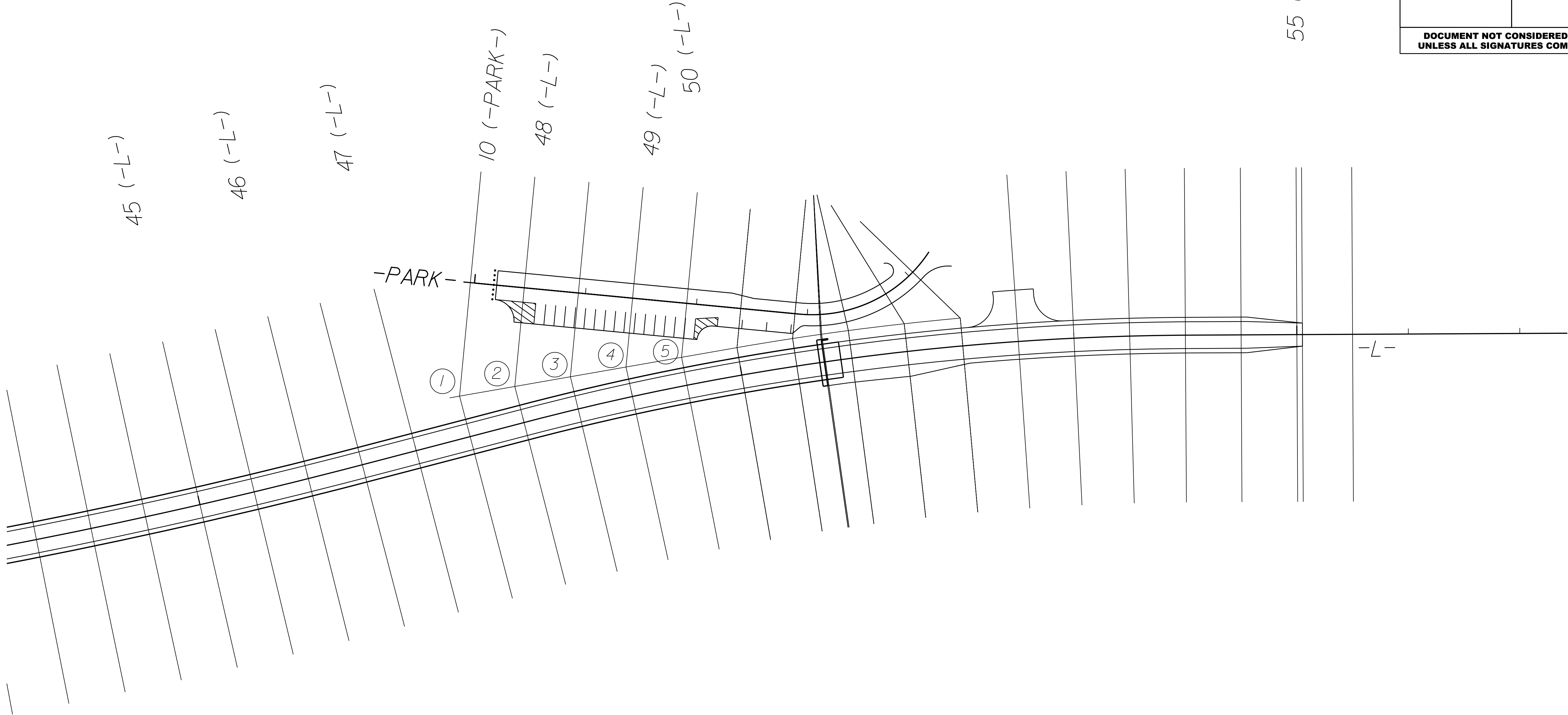
USE TYPICAL SECTION NO. 10  
–PARK– STA. 10+20.00 TO –PARK– STA. 14+14.48  
\*SLOPES STEEPER THAN 3:1 WILL REQUIRE SLOPE PROTECTION

PROJECT REFERENCE NO.		SHEET NO.	
B-4863		2A-3	
ROADWAY DESIGN ENGINEER		PAVEMENT DESIGN ENGINEER	
<div>PRELIMINARY PLANS</div> <div>DO NOT USE FOR CONSTRUCTION</div>			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

RS&H

REVISIONS

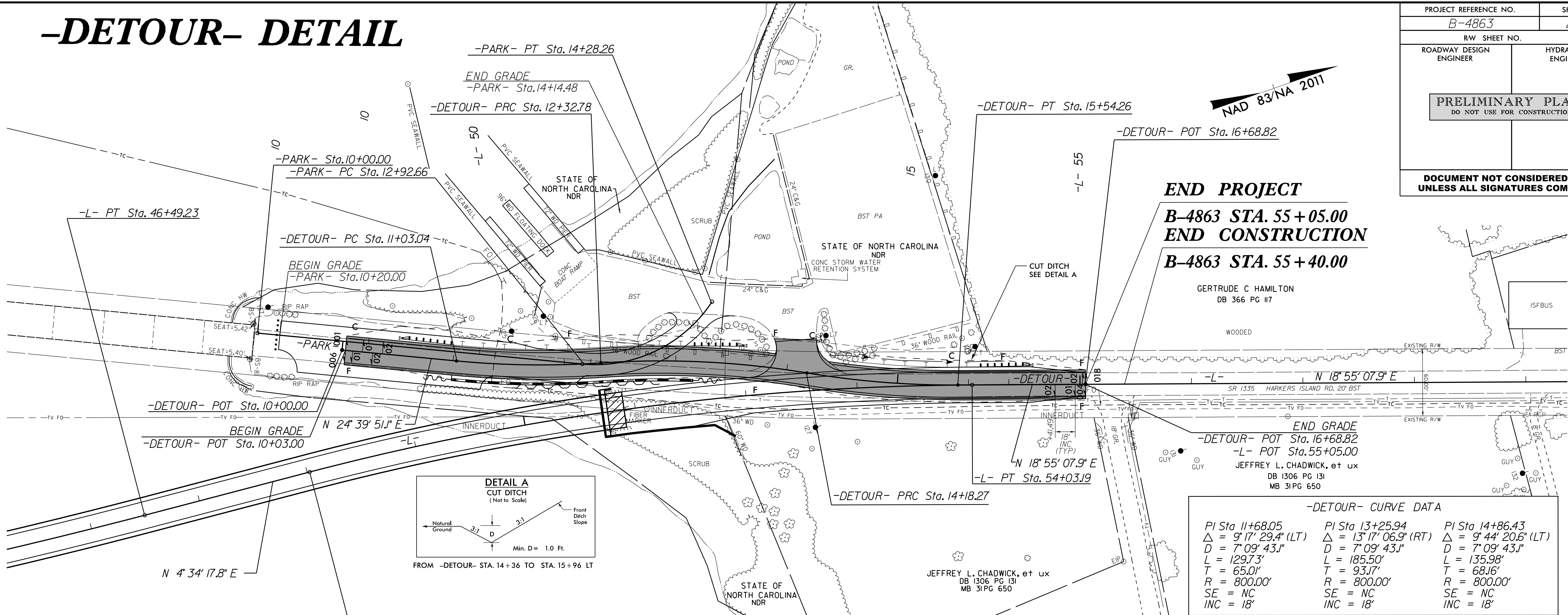
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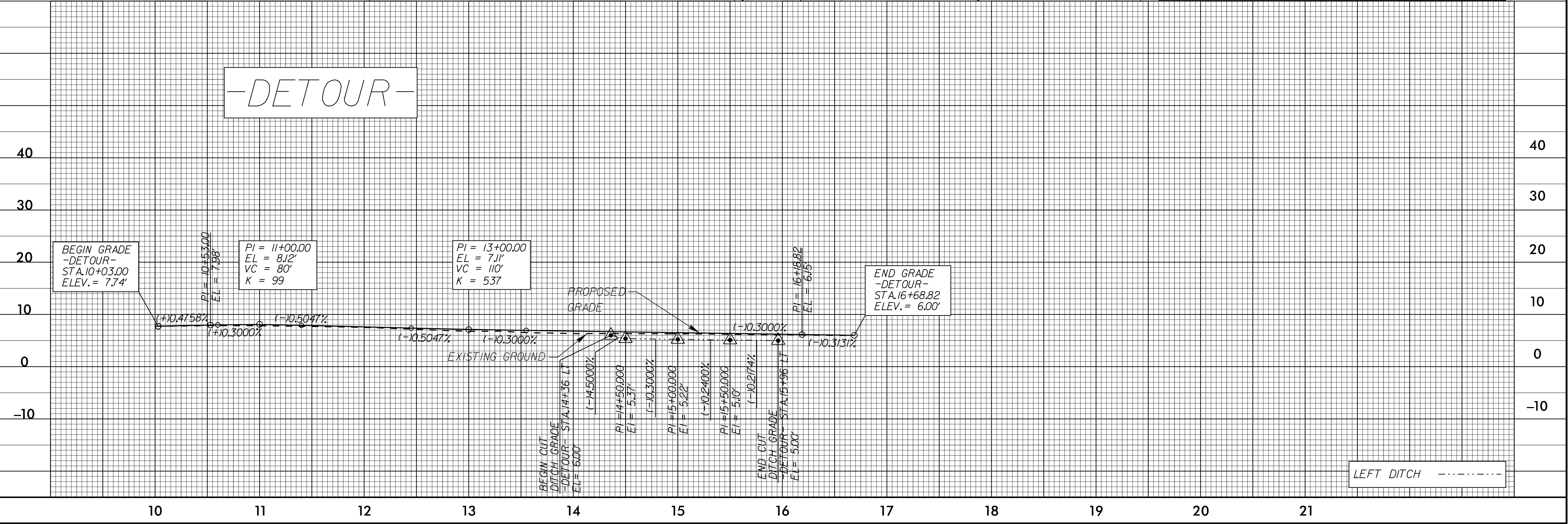
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B-4863	2B-1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



-DETOUR- DETAIL



-DETOUR-

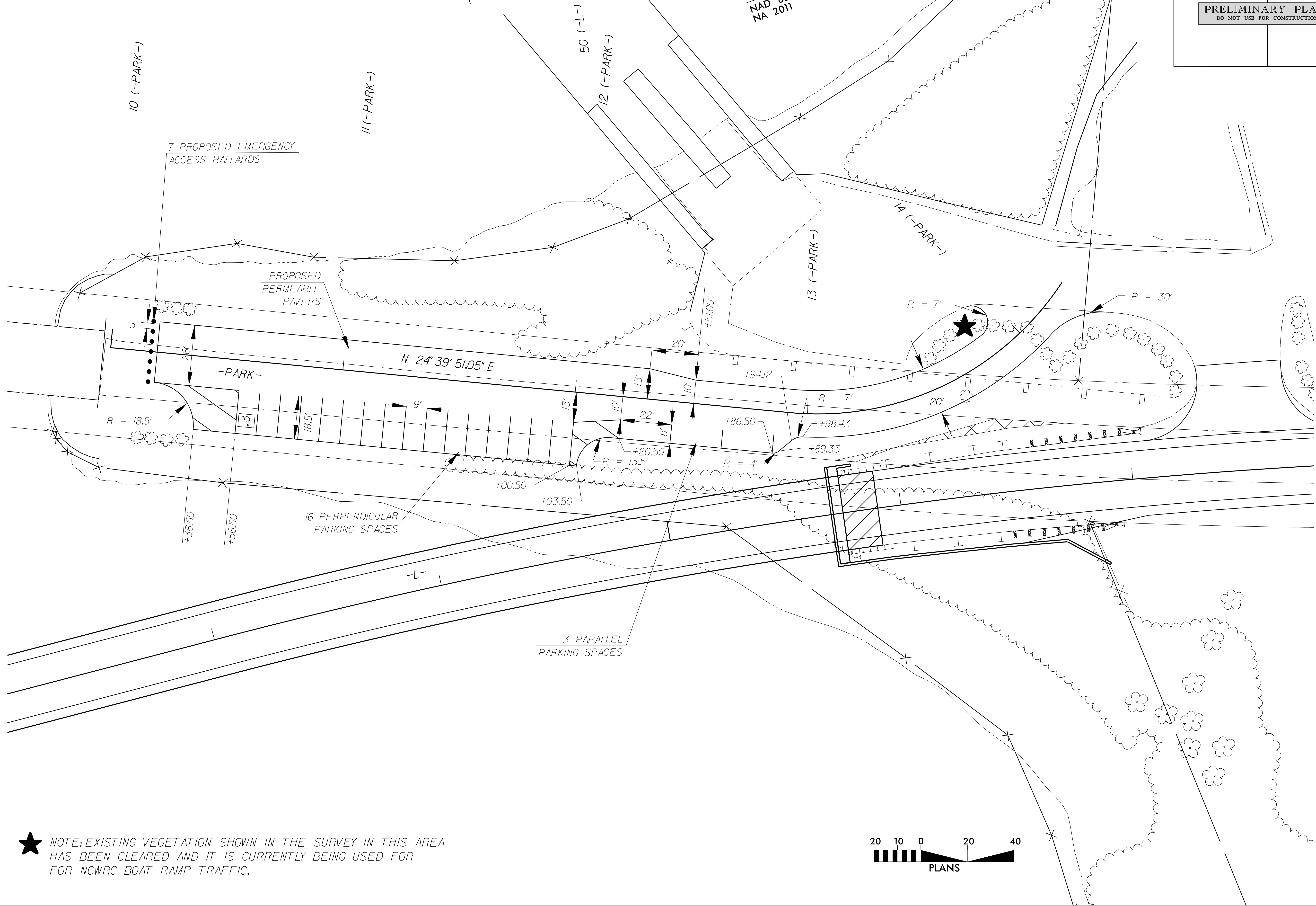
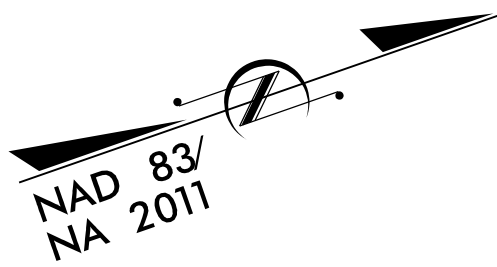


LEFT DITCH

8/17/99

# -PARK- DETAIL

PROJECT REFERENCE NO.	SHEET NO.
B-4863	2B-3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



REVISIONS

10 JUL 2018 15:47  
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B4863.DWG



SUMMARY OF EARTHWORK

STATION	STATION	UNCL EXCAV.	EMBANK. + %	BORROW	WASTE
-L- 10+00.00	-L- 18+74.00 (BR)	287	4,817	4,530	
-L- 50+00.00 (PARK)	-L- 50+75.00 (BR)	46	4		42
-L- 50+75.00 (BR)	-L- 55+05.00	388	1,037	649	
SUBTOTALS:		721	5,858	5,179	42
-Y- 10+12.00	-Y- 11+60.00	80	105	25	
-DRIVE- 10+12.00	-DRIVE- 11+40.00	94	29		65
SUBTOTALS:		174	134	25	65
-PARK- 10+20.00	-PARK- 12+39.96	148	104		44
SUBTOTALS:		148	104		44
TOTALS:		1,043	6,096	5,204	151
MATERIAL FOR SHOULDER CONSTRUCTION			182	182	
LOSS DUE TO CLEARING & GRUBBING		-500		500	
WASTE IN LIEU OF BORROW				-151	-151
PROJECT TOTALS:		543	6,278	5,735	0
EST. 5% TO REPLACE SOIL IN BORROW PIT				287	
PROJECT TOTALS:		543	6,278	6,022	0
SAY:		580		6,330	

Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

ROW AREA DATA SUMMARY

PARCEL NO.	PROPERTY OWNERS NAMES	PROP. ROW	PERM. UTILITY EASE.	PERM. DRAIN EASE.	PERM. DRAINAGE UTILITY EASE.	CONST. EASE.
1	HALLIS L. BATSON, et ux	0.07 AC				
2	LAWRENCE F. BALDWIN, et ux	0.18 AC	0.15 AC	0.05 AC		
3	HARKERS POINT OWNERS ASSOC INC	0.01 AC				0.05 AC
4	PATRICIA TESTA	0.05 AC				0.14 AC
5	HALLIS L. BATSON, et al	0.18 AC		0.03 AC		0.19 AC
6	CARTERET COUNTY		0.10 AC			0.04 AC
7	STATE OF NORTH CAROLINA	0.51 AC	0.15 AC			0.04 AC
8	STATE OF NORTH CAROLINA		0.16 AC			
9	STATE OF NORTH CAROLINA	0.18 AC	0.17 AC			0.12 AC
10	STATE OF NORTH CAROLINA		0.22 AC			
11	JEFFREY L. CHADWICK, et ux	0.19 AC				0.17 AC
12	FORMERLY KNOWN AS THE GERTRUDE C. HAMILTON PROPERTY		0.14 AC			
13	JEFFREY L. CHADWICK, et ux		0.25 AC			

PAVEMENT REMOVAL SUMMARY

SURVEY LINE	STATION	STATION	LOCATION LT/RT/CL	YD <sup>2</sup>
-EL-	25+37	32+01	CL	1,700.02
-EL-	45+97	51+20	CL	1,363.63
-EL-	58+49	63+53	CL	1,263.76
-L-	52+66	52+85	LT	5.90
-DETOUR-	10+03	13+88	LT	389.69
-DETOUR-	10+03	12+08	RT	61.31
-DETOUR-	14+36	14+97	LT	21.27
			TOTAL:	4,805.59
			SAY:	4,810

SHOULDER BERM GUTTER SUMMARY

SURVEY LINE	STATION	STATION	LENGTH
-L-	15+75.00	18+60.00	285.00
-L-	50+90.00	52+00.00	110.00
		TOTAL:	395.00
		SAY:	395

"N" = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.  
TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.  
FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.  
W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.  
G = GATING IMPACT ATTENUATOR TYPE 350  
NG = NON-GATING IMPACT ATTENUATOR TYPE 350

TEMPORARY GUARDRAIL SUMMARY

SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS												IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL-3	GRAU TYPE III	AT-1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																

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NG = NON-GATING IMPACT ATTENUATOR TYPE 350

GUARDRAIL SUMMARY

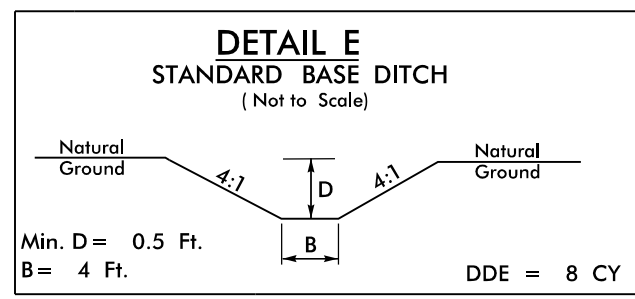
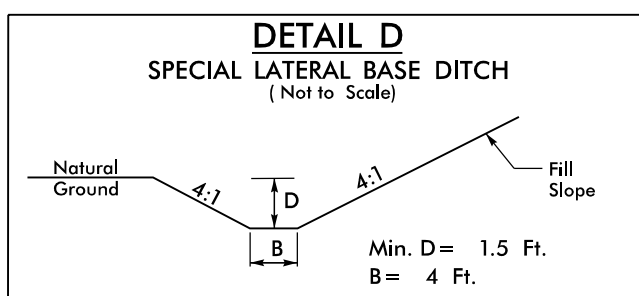
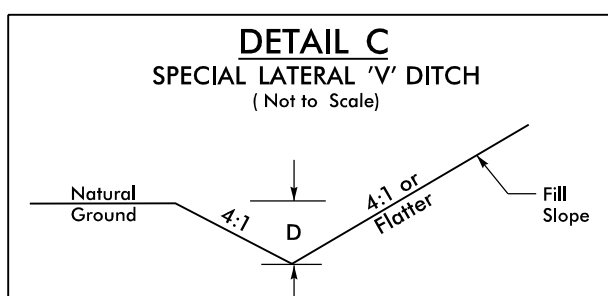
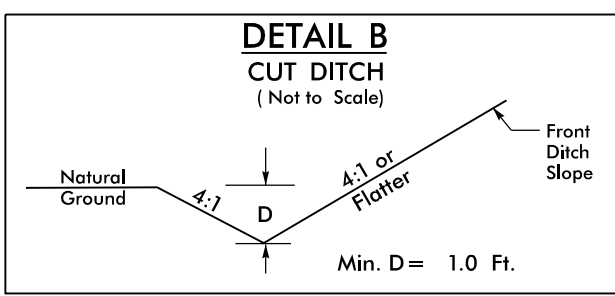
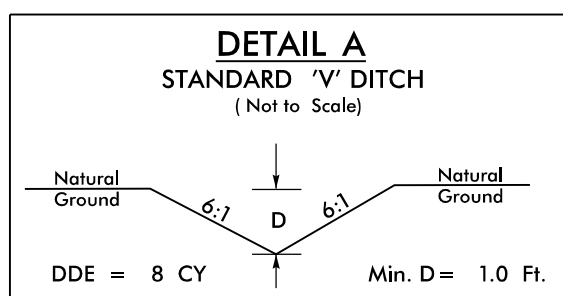
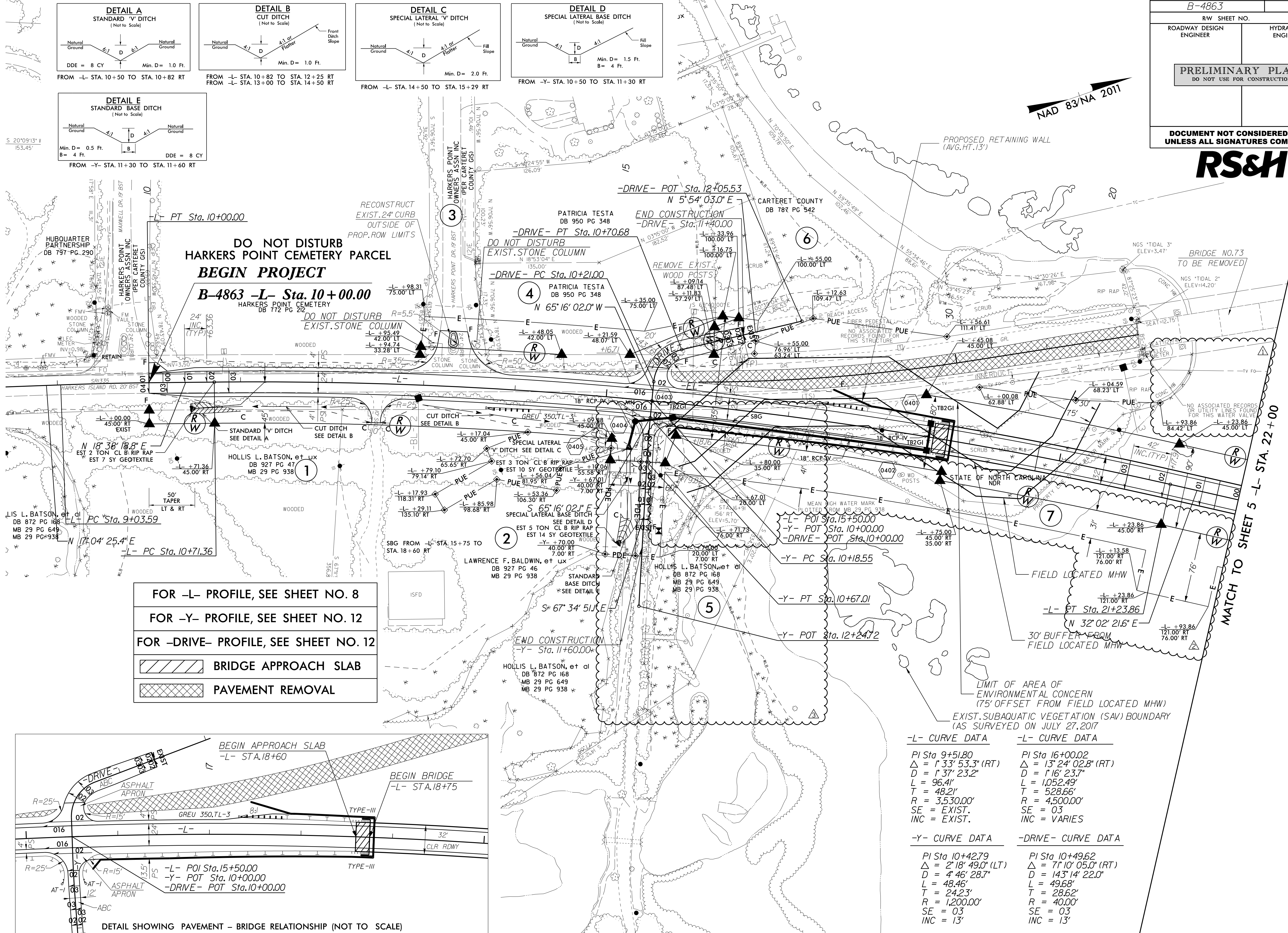
SURVEY LINE	BEG. STA.	END STA.	LOCATION	LENGTH			WARRANT POINT		"N" DIST. FROM E.O.L.	TOTAL SHOUL. WIDTH	FLARE LENGTH		W		ANCHORS										IMPACT ATTENUATOR TYPE 350			SINGLE FACED GUARDRAIL	REMOVE EXISTING GUARDRAIL	REMOVE AND STOCKPILE EXISTING GUARDRAIL	REMARKS
				STRAIGHT	SHOP CURVED	DOUBLE FACED	APPROACH END	TRAILING END			APPROACH END	TRAILING END	APPROACH END	TRAILING END	GREU TL-3	GRAU TYPE III	AT-1									EA	G				
-L/-Y-	13 + 69.27	10 + 51.19	RT	156.25	37.50		18 + 75.00 (BR)		8'-0"	11'-0"					1		1														
-Y/-L-	10 + 52.23	18 + 75.00 (BR)	RT	300.00	37.50		18 + 75.00 (BR)		4'-0"	11'-0"	200.00		4.00			1	1	1													
-L-	17 + 31.81	18 + 75.00 (BR)	LT	143.75				18 + 75.00 (BR)	4'-0"	11'-0"		62.50		1.25	1	1															
-L-	50 + 75.00 (BR)	52 + 05.26	LT	131.25			50 + 75.00 (BR)		4'-0"	11'-0"	50.00		2.00		1	1															
-L-	50 + 75.00 (BR)	51 + 94.57	RT	118.75				50 + 75.00 (BR)	4'-0"	11'-0"		50.00		1.00	1	1															
-L-	52 + 90.94	55 + 40.00	LT	250.00				53 + 30.00	8'-0"	11'-0"					2																
			SUBTOTALS	1100.00																											
			ANCHOR DEDUCTION	387.50																											
			TOTAL	712.50	75.00																										
			SAY	725.00	87.50																										

12/06/07

01-NOV-2018 07:26  
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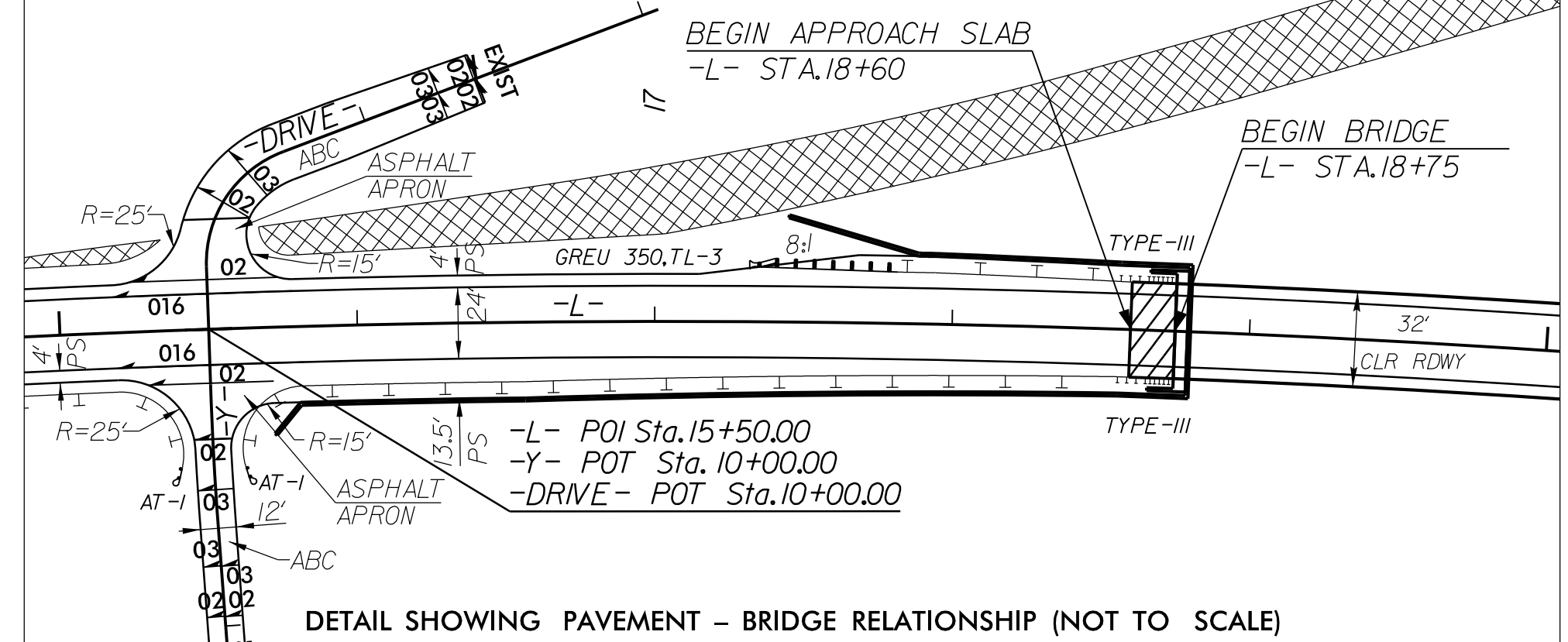
RS&H



**DO NOT DISTURB**  
**HARKERS POINT CEMETERY PARCEL**  
**BEGIN PROJECT**  
**B-4863 -L- Sta. 10+00.00**  
HARKERS POINT CEMETERY  
DB 172 PG 212

**FOR -L- PROFILE, SEE SHEET NO. 8**  
**FOR -Y- PROFILE, SEE SHEET NO. 12**  
**FOR -DRIVE- PROFILE, SEE SHEET NO. 12**

**BRIDGE APPROACH SLAB**  
 **PAVEMENT REMOVAL**



-L- CURVE DATA	-L- CURVE DATA
PI Sta 9+51.80	PI Sta 16+00.02
$\Delta = 1^\circ 33' 53.3''$ (RT)	$\Delta = 13^\circ 24' 02.8''$ (RT)
D = 1' 37' 23.2"	D = 1' 16' 23.7"
L = 96.41'	L = 1052.49'
T = 48.21'	T = 528.66'
R = 3,530.00'	R = 4,500.00'
SE = EXIST.	SE = 03
INC = EXIST.	INC = VARIES

-Y- CURVE DATA	-DRIVE- CURVE DATA
PI Sta 10+42.79	PI Sta 10+49.62
$\Delta = 2^\circ 18' 49.0''$ (LT)	$\Delta = 7^\circ 10' 05.0''$ (RT)
D = 4' 46' 28.7"	D = 143' 14' 22.0"
L = 48.46'	L = 49.68'
T = 24.23'	T = 28.62'
R = 1,200.00'	R = 40.00'
SE = 03	SE = 03
INC = 13'	INC = 13'

REMOVED THE PUE FOR PROP. OVERHEAD UTILITIES SHOWN OVER WATER. ANK 8/15/2018.  
PROPOSED TEMPORARY CONSTRUCTION EASEMENT REVISED FOR TEMPORARY WORK PLATFORM. ANK 8/15/2018.  
SURVEY REVISED BY NCDOT TO SHOW A PARCEL TIE FOR THE TWO PARCELS SHOWN AS PARCEL #5. ANK 8/27/2018.

27-AUG-2018 13:37  
R:\4863\B4863.Rdw\_psh\_04.dgn  
B4863.DWG



8/17/99

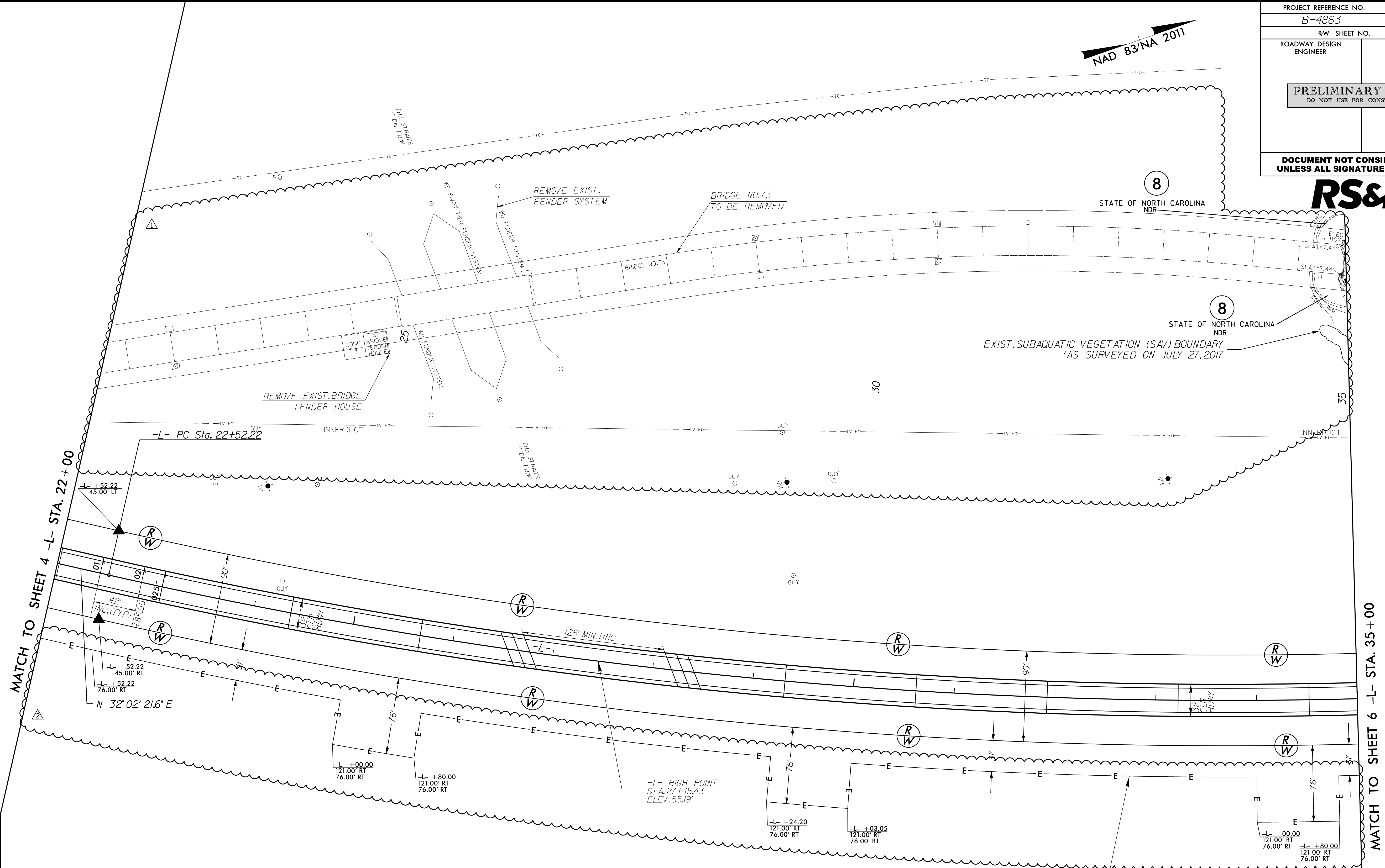
REVISIONS

- △ REMOVED THE PUE FOR PROP.OVERHEAD UTILITIES AND TCE FOR EXIST.FENDER SYSTEM SHOWN OVER WATER. ANK 8/15/2018.  
△ PROPOSED TEMPORARY CONSTRUCTION EASEMENT REVISED FOR TEMPORARY WORK PLATFORM. ANK 8/15/2018.

14-AUG-2018 15:35  
R:\Projects\B4863.Rdy\_psh\_05.dgn  
\$\$\$\$\$SYSTRAME\$\$\$\$\$

PROJECT REFERENCE NO.		SHEET NO.
B-4863		5
RW SHEET NO.		
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

RS&H



TEMPORARY CONSTRUCTION EASEMENT FOR  
40' TEMPORARY WORK PLATFORM WITH 10'  
CLEARANCE TO PROPOSED BRIDGE

-L- CURVE DATA  
PI Sta 34+74.21  
Δ = 27° 28' 03.8" (LT)  
D = 1° 08' 45.3"  
L = 2,397.01'  
T = 1,222.00'  
R = 5,000.00'  
SE = 025  
INC = VARIES

FOR -L- PROFILE, SEE SHEET NO. 9

8/17/99

REVISIONS

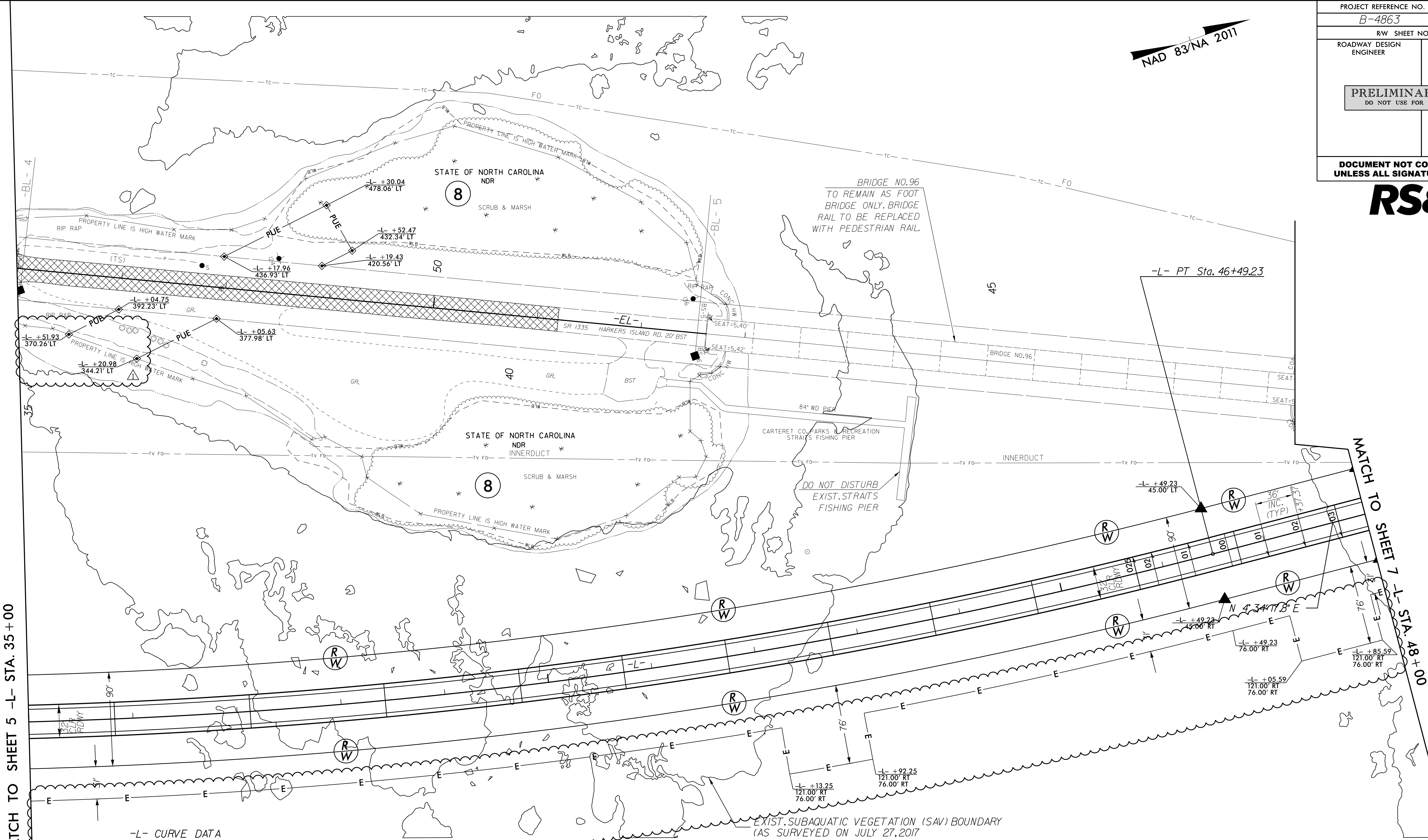
- △ REMOVED THE PUE FOR PROP.OVERHEAD UTILITIES SHOWN OVER WATER. ANK 8/15/2018.  
△ PROPOSED TEMPORARY CONSTRUCTION EASEMENT REVISED FOR TEMPORARY WORK PLATFORM. ANK 8/15/2018.

14-AUG-2018 15:39  
R:\Projects\B4863.Rdw\_psh\_06.dgn  
\$\$\$\$\$ISTRAME\$\$\$\$\$

MATCH TO SHEET 5 -L- STA. 35+00

-L- CURVE DATA

PI Sta 34+74.21  
 $\Delta = 27^\circ 28' 03.8" (LT)$   
 $D = 1' 08" 45.3"$   
 $L = 2,397.0'$   
 $T = 1,222.00'$   
 $R = 5,000.00'$   
 $SE = 025$   
 $INC = VARIES$



FOR -L- PROFILE, SEE SHEET NO. 10

PAVEMENT REMOVAL

PROJECT REFERENCE NO.		SHEET NO.	
B-4863		6	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<div>PRELIMINARY PLANS</div> <div>DO NOT USE FOR CONSTRUCTION</div>			
<div>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</div>			

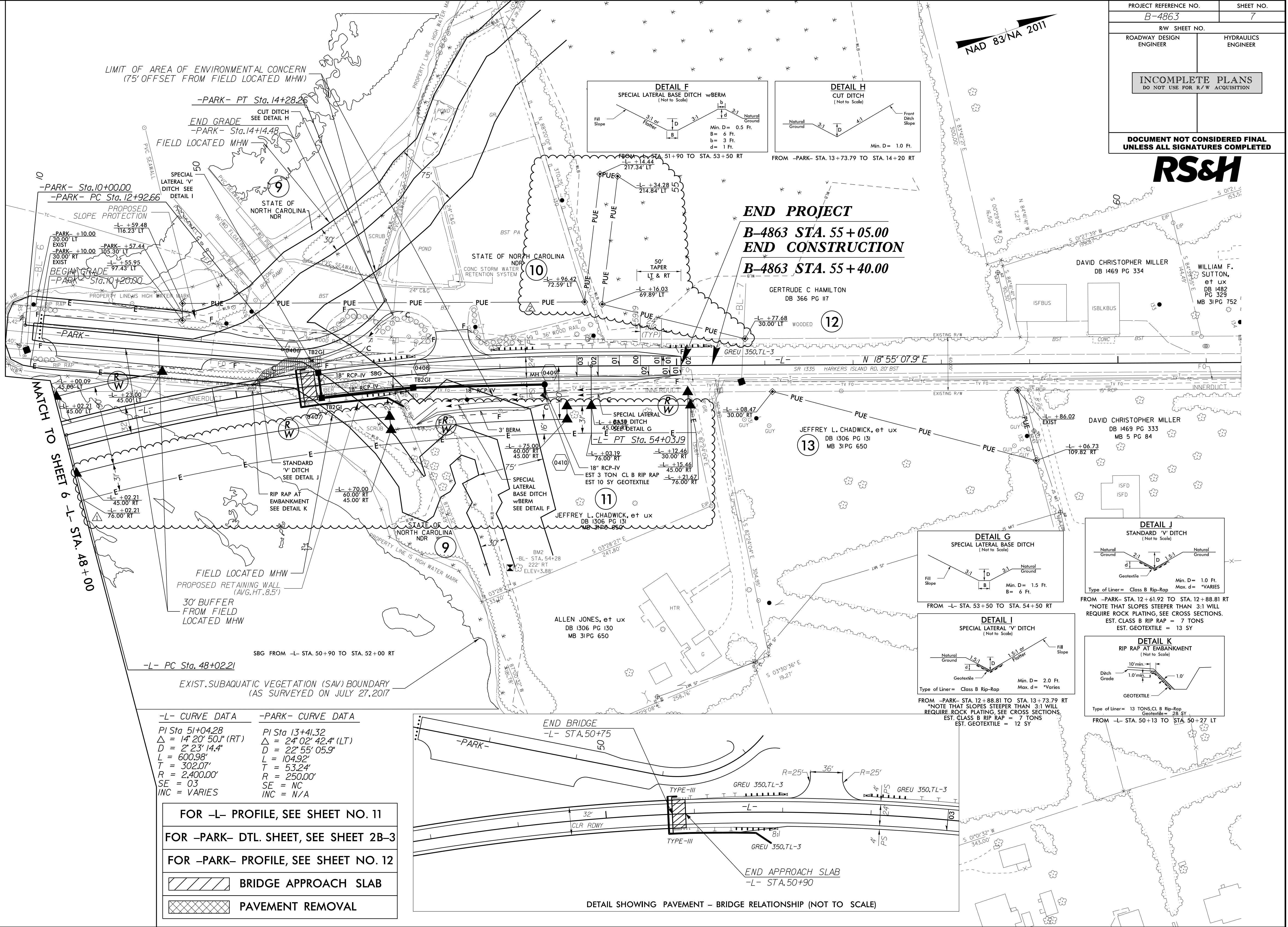
RS&H

8/17/99

REVISIONS

PROPOSED TEMPORARY CONSTRUCTION EASEMENT REVISED FOR TEMPORARY WORK PLATFORM ANK 8/15/2018.  
PROPOSED PERMANENT UTILITY EASEMENT REVISED FOR NEW POLE AND GUY LOCATION ON PARCELS 10 & 12. ANK 11/1/2018.

01-NOV-2018 07:27  
R:\Projects\B4863.Rdw\_psh\_07.dgn  
B4863.DWG



PROJECT REFERENCE NO.	SHEET NO.
B-4863	7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

RS&H

NAD 83/NA 2011



5/14/99

10 JUL 2018 15:56  
R:\Roadway\Projects\B4863.Rdy\_pfl\_08.dgn

BM #1  
RAILROAD SPIKE SET IN BASE OF 18" PINE TREE  
-BL- STA 16+91.156' RIGHT  
-L- STA 15+71.65 140.58' RIGHT  
ELEV.= 5.70'

-L-

PROJECT REFERENCE NO. B-4863		SHEET NO. 8
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

RS&H

BEGIN GRADE  
-L- STA.10+00.00  
ELEV.= 4.44'

-L- STA.15+50.00 =  
-Y- STA.10+00.00 =  
-DRIVE- STA.10+00.00  
ELEV.= 7.79'

BEGIN BRIDGE  
-L- STA.18+75.00  
ELEV.= 18.60'

PI = 17+05.00  
EL = 7.93'  
VC = 530'  
K = 96

PROPOSED  
GRADE

MHW ELEV.= 1.60'

EXISTING GROUND

BEGIN STANDARD  
1/2' DITCH GRADE  
-L- STA.10+50 RT  
EL= 2.75'  
END STANDARD  
1/2' DITCH GRADE  
-L- STA.10+82 RT  
EL= 2.89'

PI=12+00.000  
EL = 3.50'  
END CUT  
DITCH GRADE  
-L- STA.12+25 RT  
EL= 4.92'

BEGIN CUT  
DITCH GRADE  
-L- STA.13+00 RT  
EL= 4.77'

PI=13+50.000  
EL = 3.90'

END CUT  
DITCH GRADE  
BEGIN SPECIAL LATERAL  
1/2' DITCH GRADE  
-L- STA.14+50 RT  
EL= 3.30'

PI=15+00.000  
EL = 3.00'

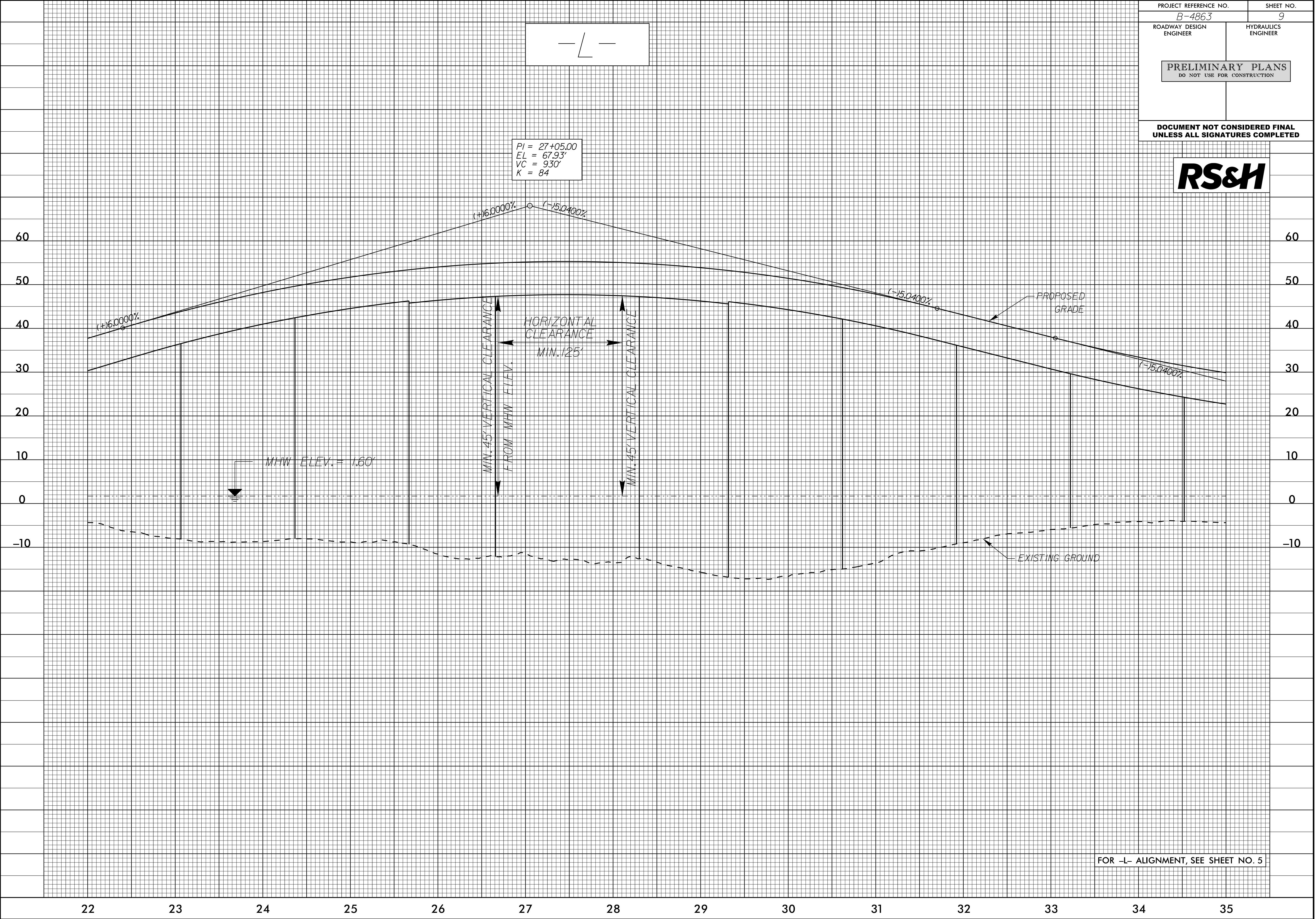
END SPECIAL LATERAL  
1/2' DITCH GRADE  
-L- STA.15+29 RT  
EL= 2.80'

FOR -L- ALIGNMENT, SEE SHEET NO. 4

RIGHT DITCH

5/14/99

10 JUL 2018 15:57  
P:\Roadway\Projects\B4863.Rdy.pfl\_09.dgn

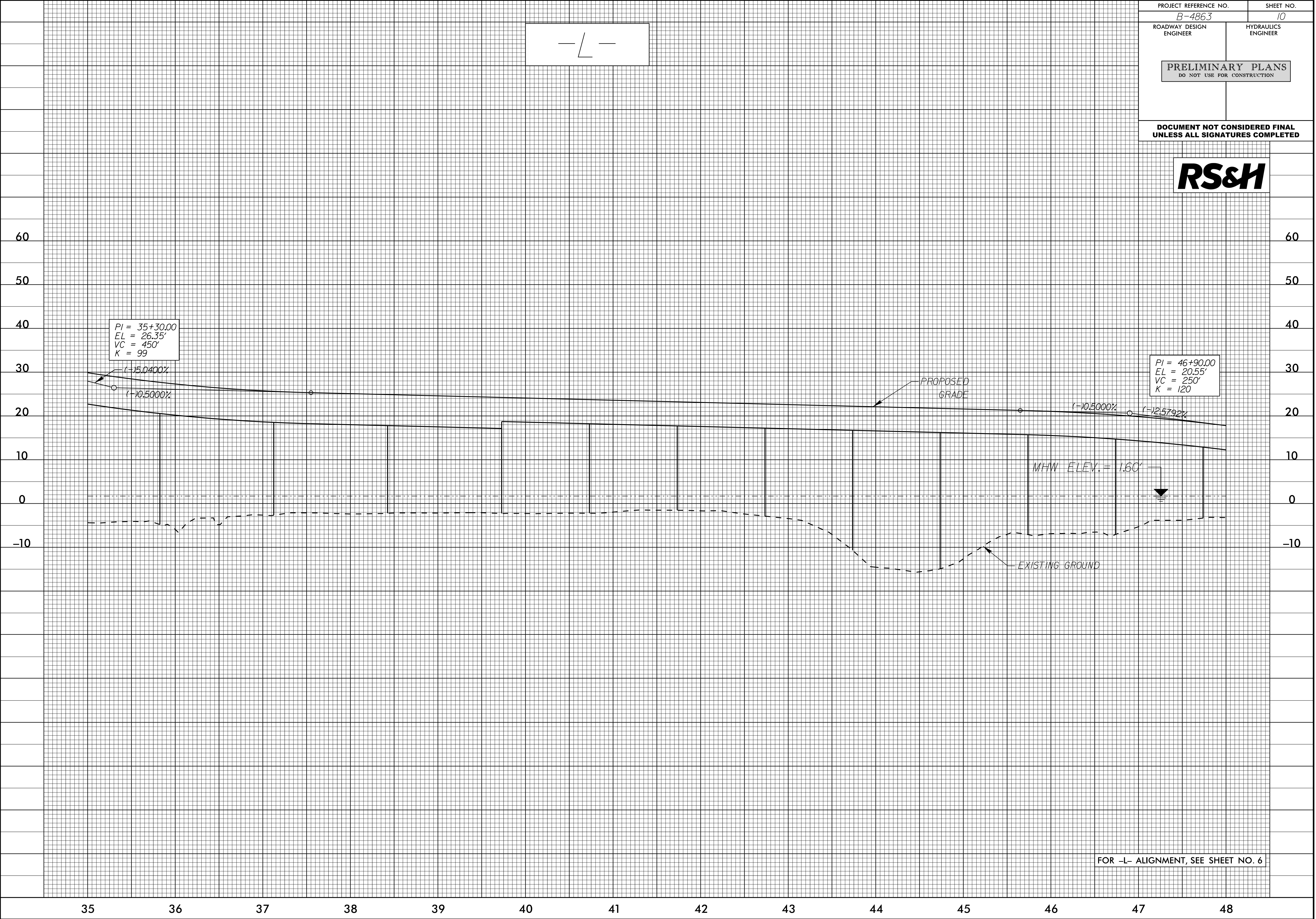


FOR -L- ALIGNMENT, SEE SHEET NO. 5



5/14/99

10 JUL 2018 15:58  
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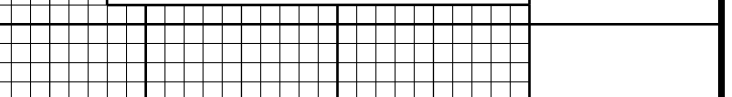
—L—

PROJECT REFERENCE NO.	SHEET NO.
B-4863	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

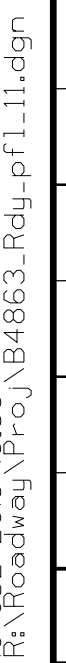
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

RS&H

FOR —L— ALIGNMENT, SEE SHEET NO. 6

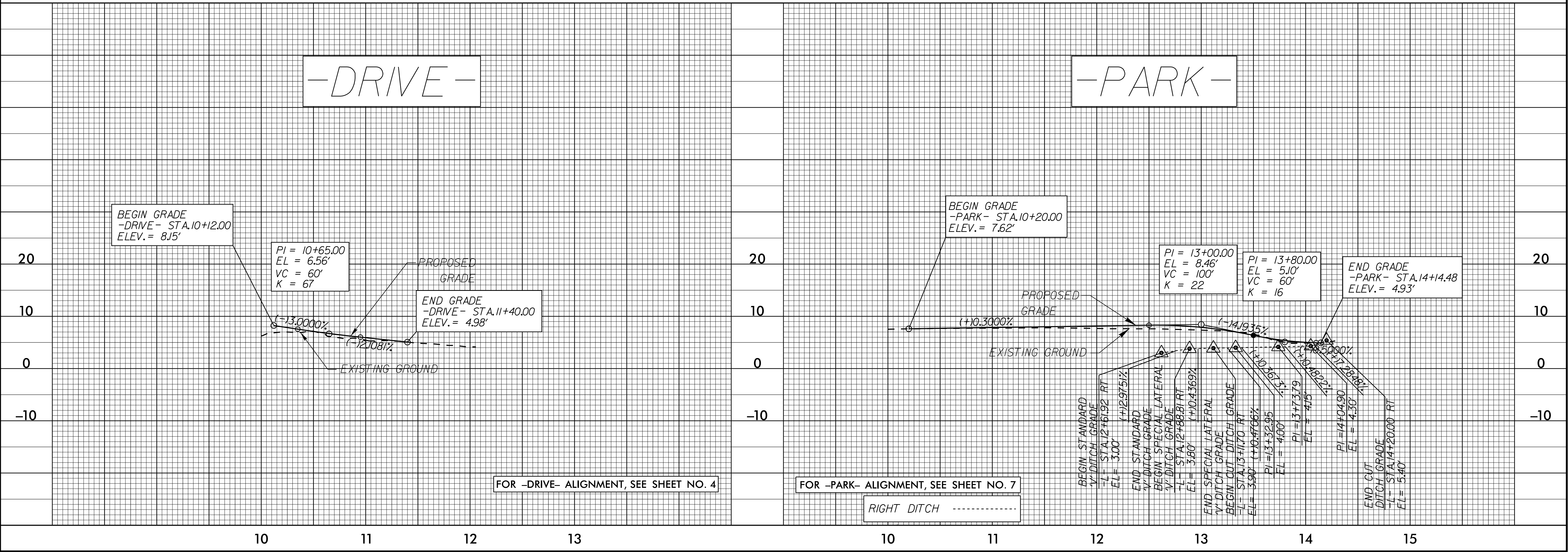
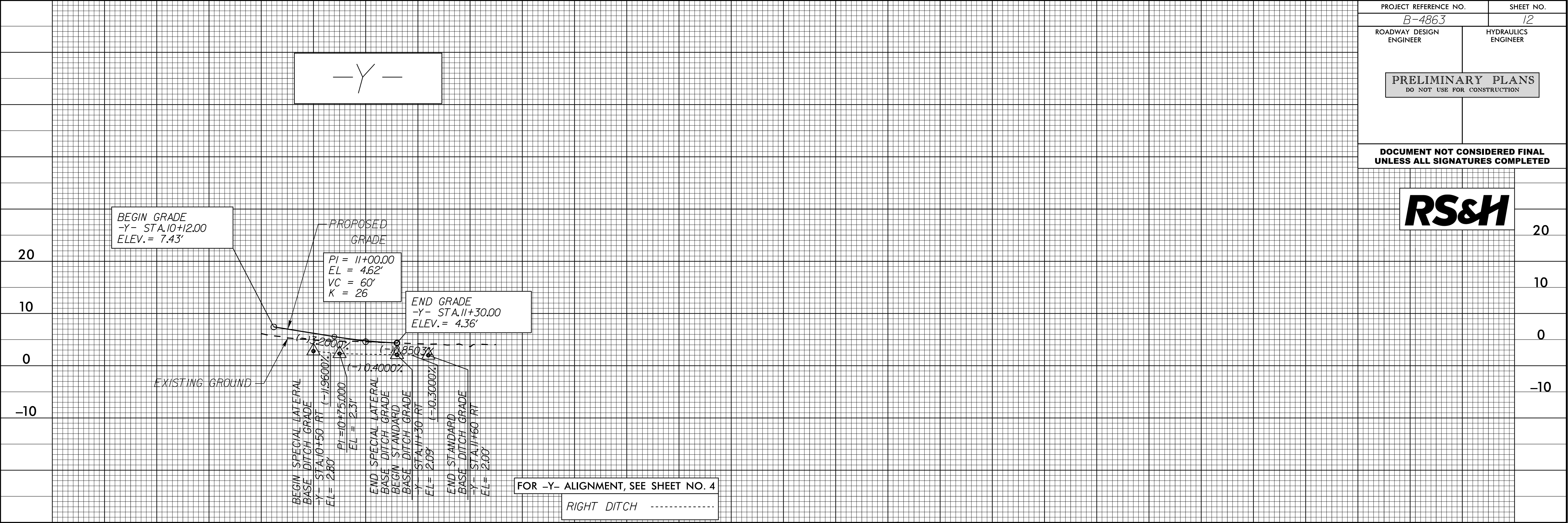


RIGHT DITCH -----



5/14/99

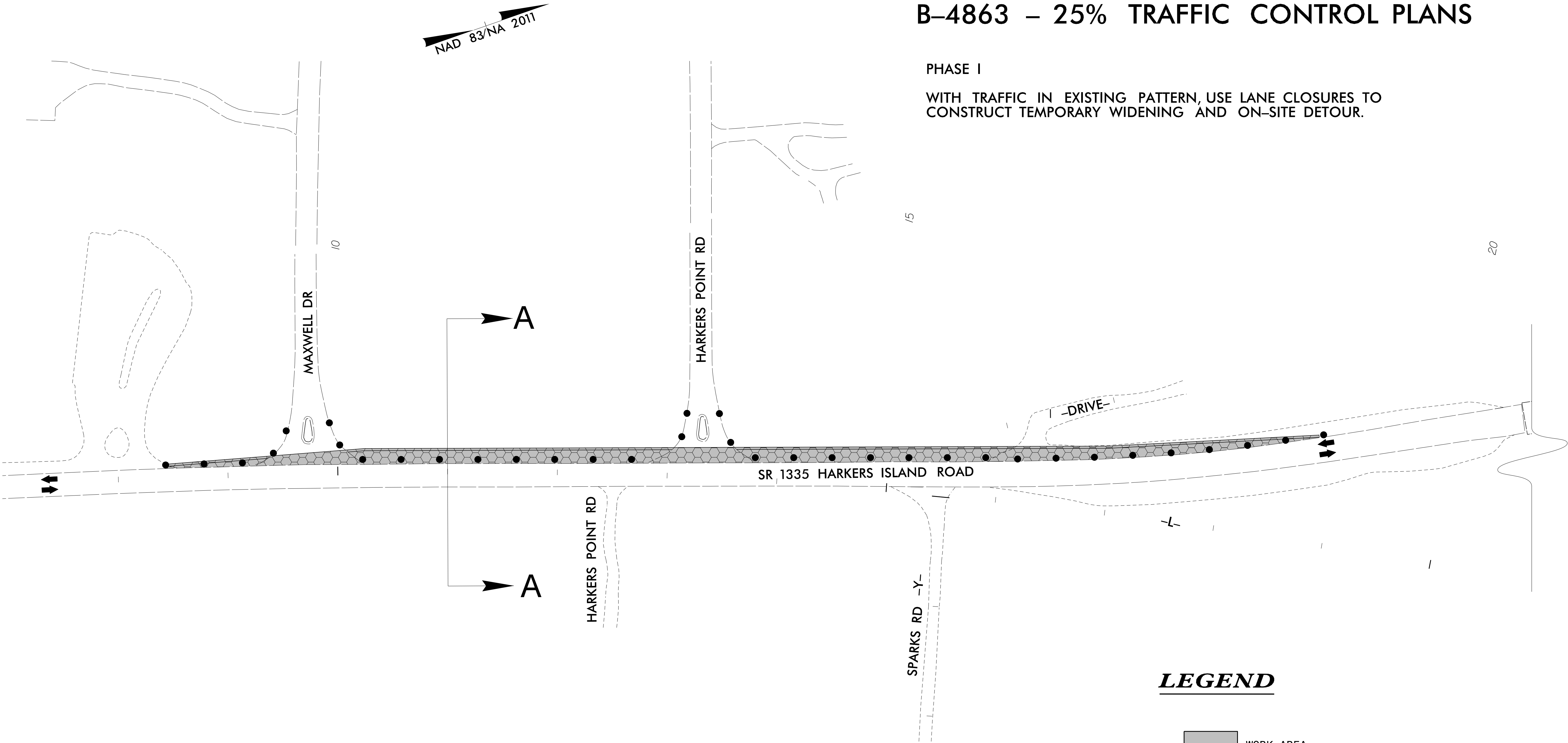
PROJECT REFERENCE NO. B-4863		SHEET NO. 12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		



10-JUL-2018 16:00  
R:\Roadway\B4863.Rdw\_pfl\_12.dgn

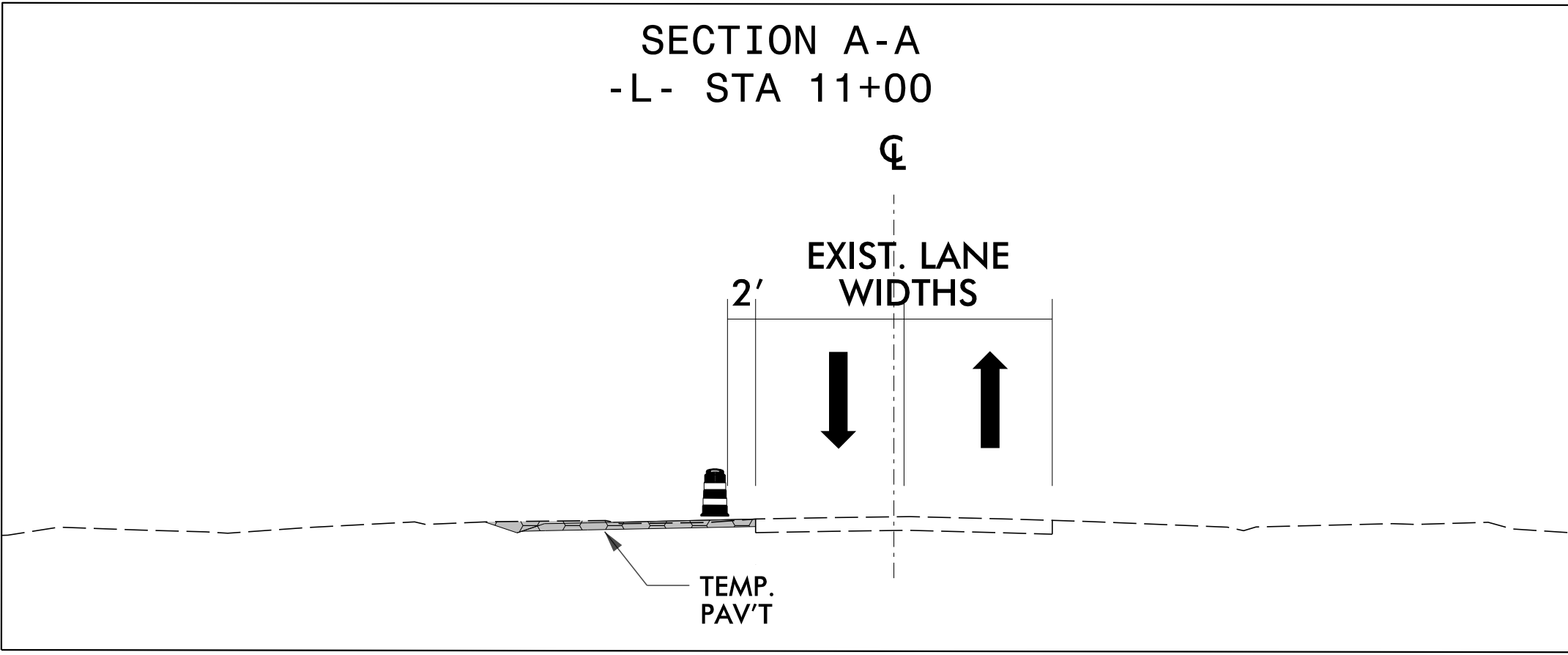
B-4863 – 25% TRAFFIC CONTROL PLANS

PHASE I  
WITH TRAFFIC IN EXISTING PATTERN, USE LANE CLOSURES TO  
CONSTRUCT TEMPORARY WIDENING AND ON-SITE DETOUR.



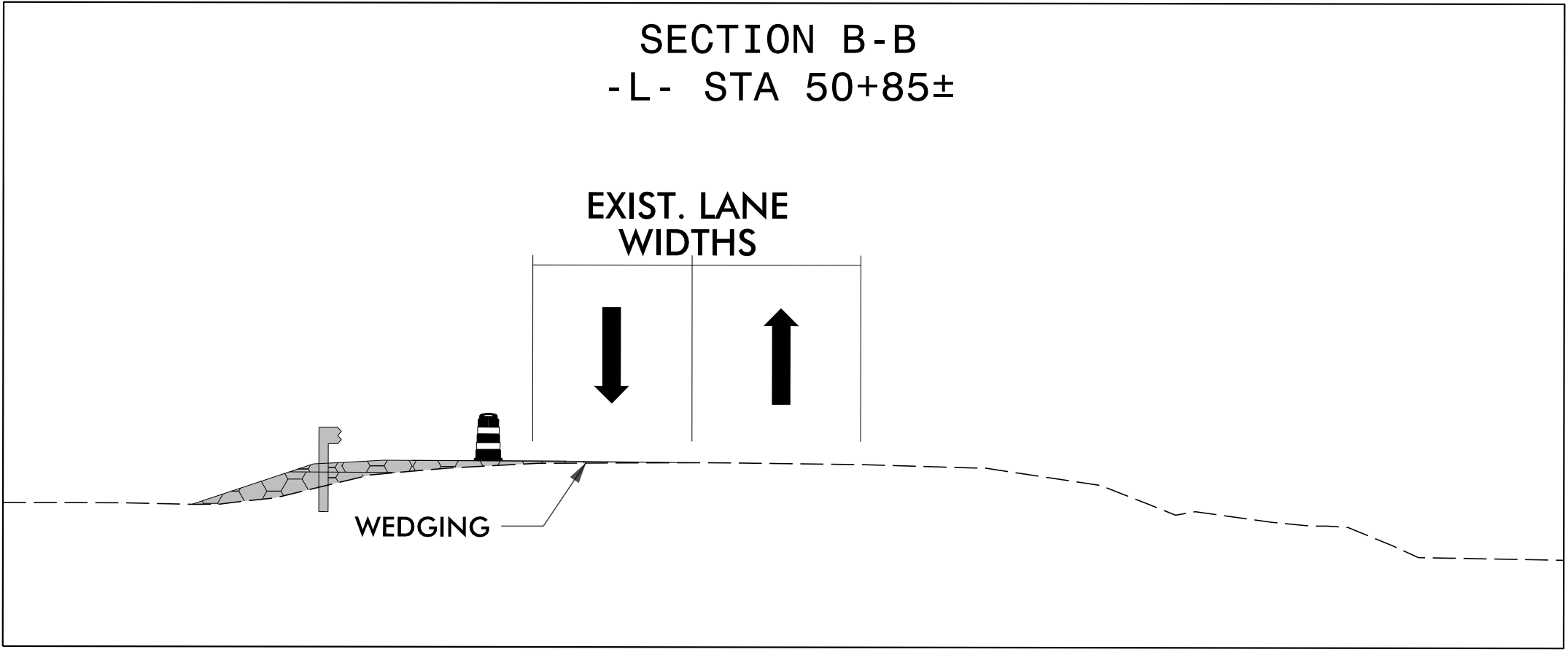
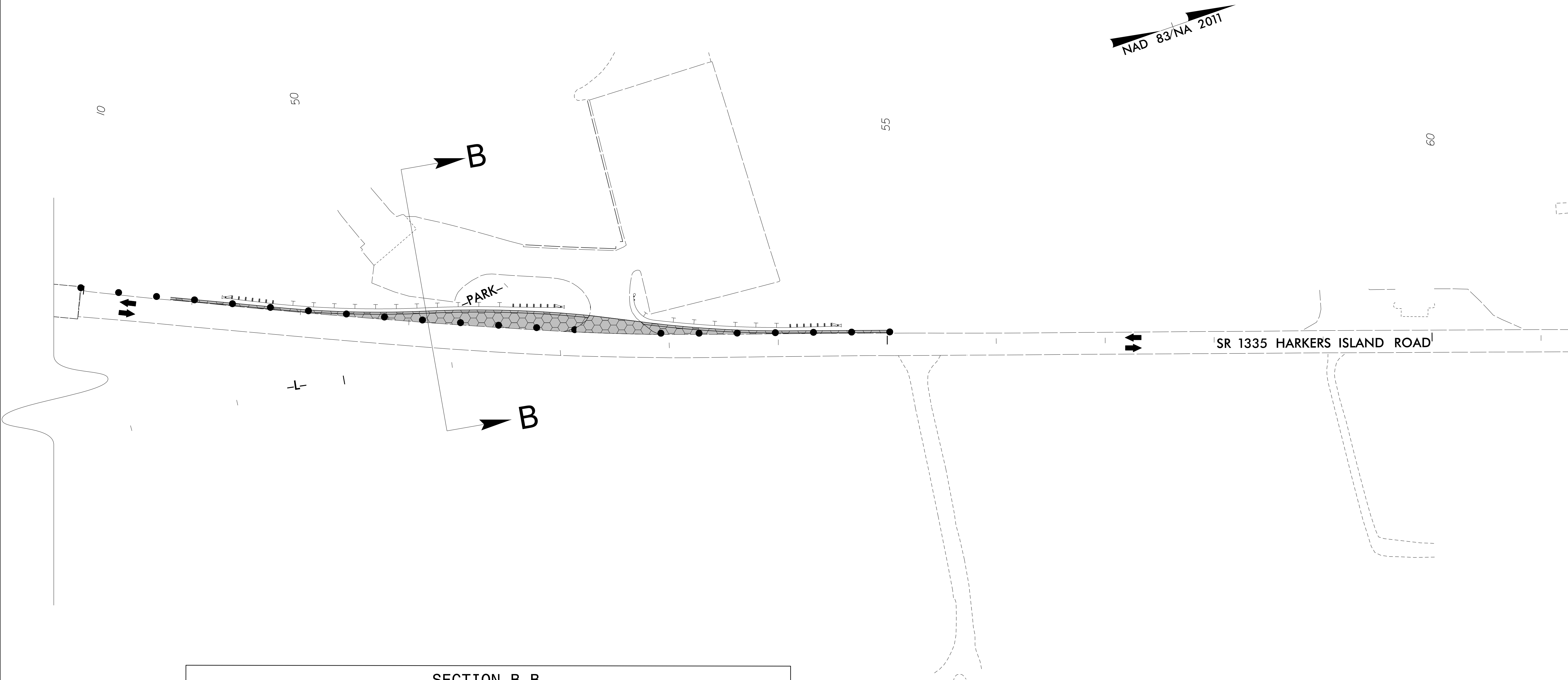
LEGEND

- WORK AREA
- REMOVAL
- TEMPORARY PAVEMENT

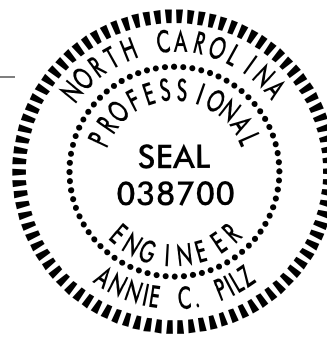


RS&H

APPROVED: _____ DATE: _____			PHASE I DETAIL
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



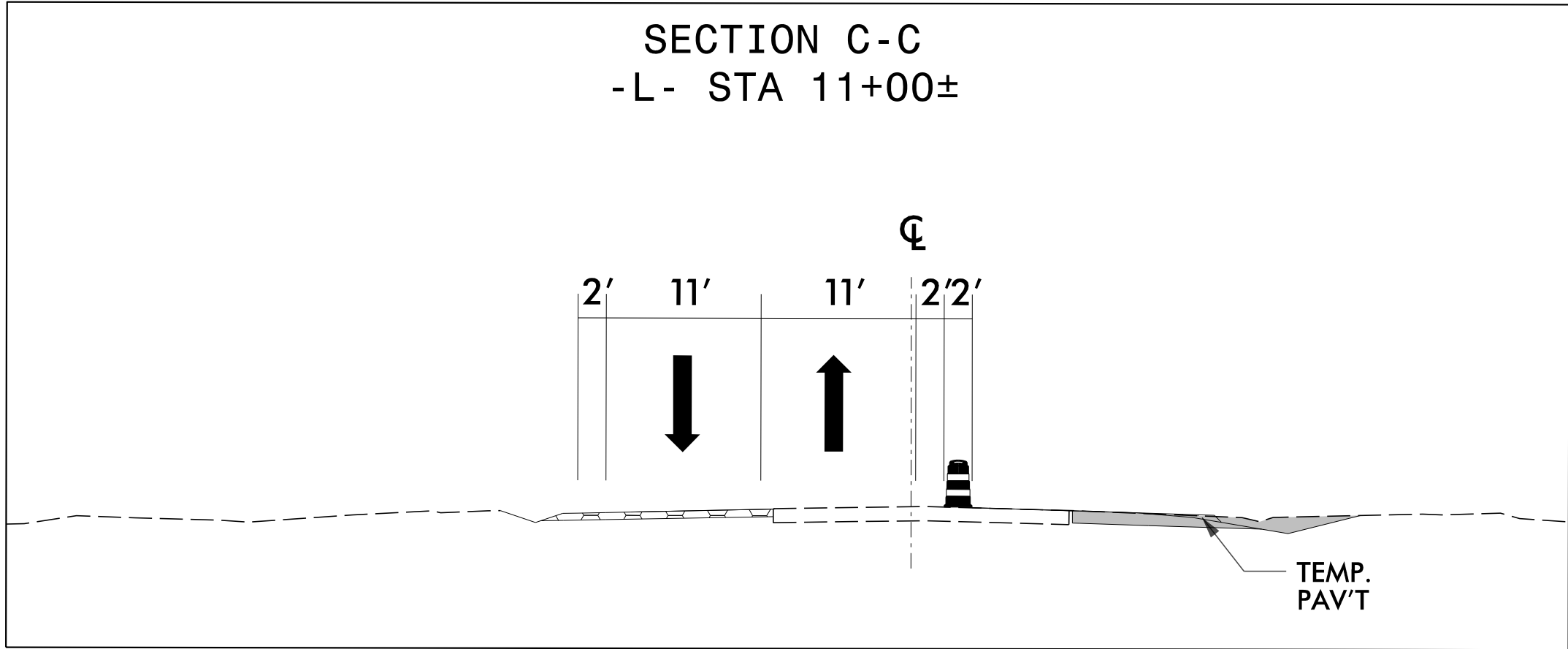
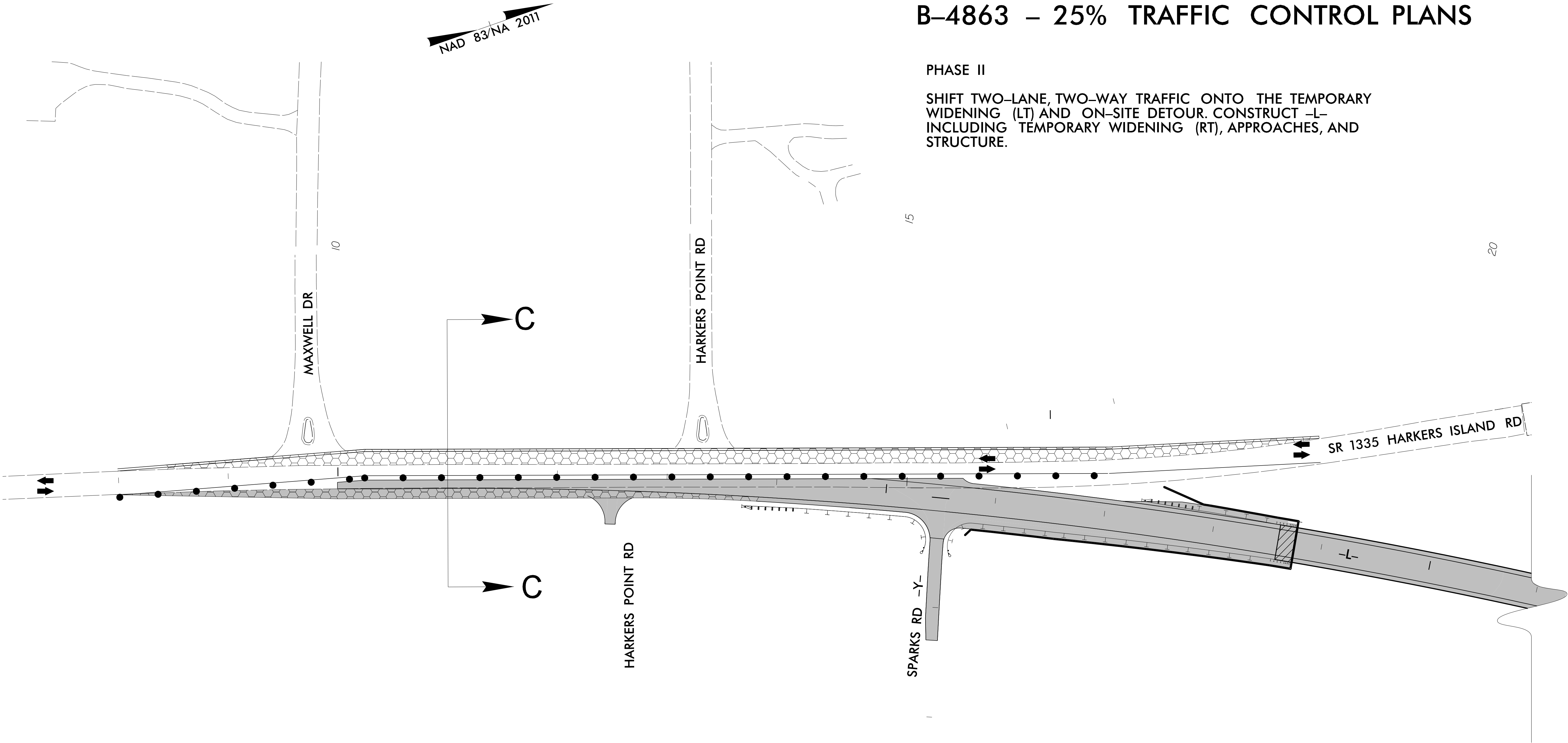
**RS&H**

APPROVED: _____ DATE: _____			PHASE I DETAIL
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

B-4863 – 25% TRAFFIC CONTROL PLANS

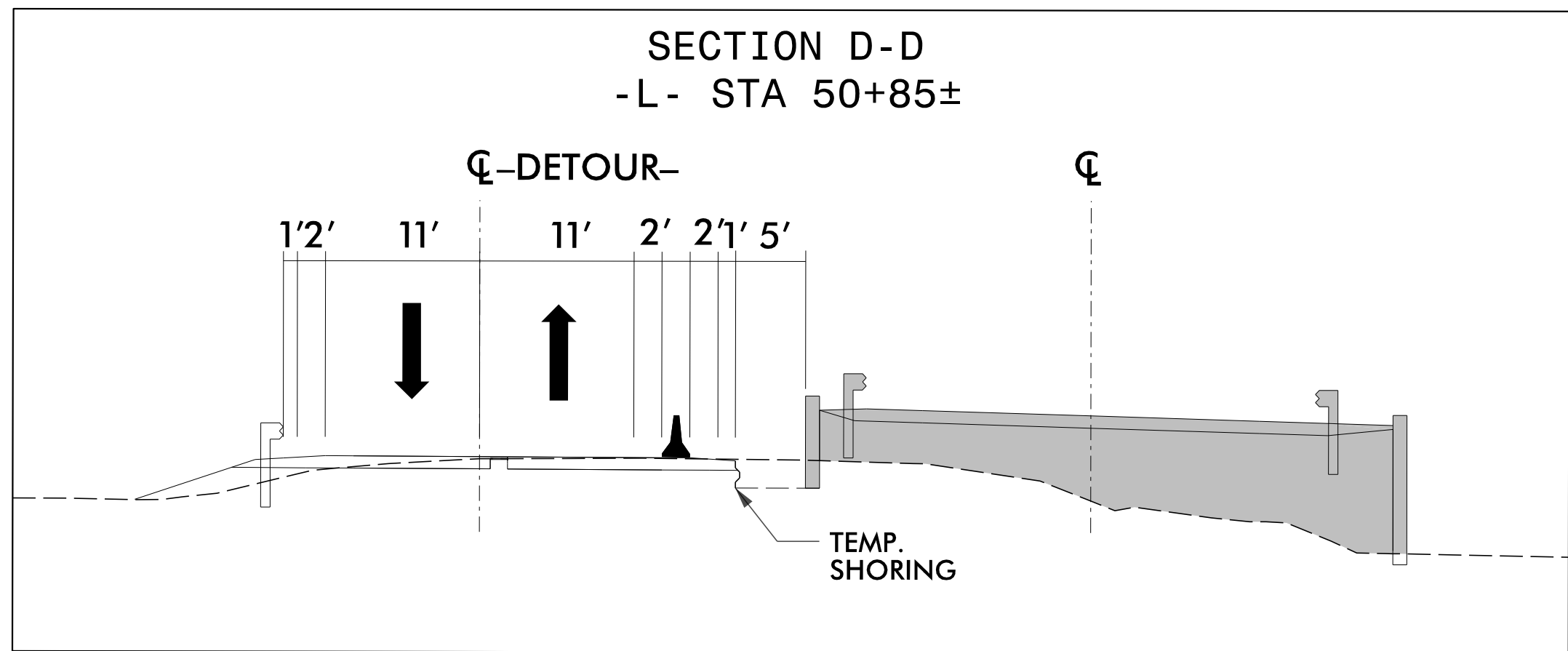
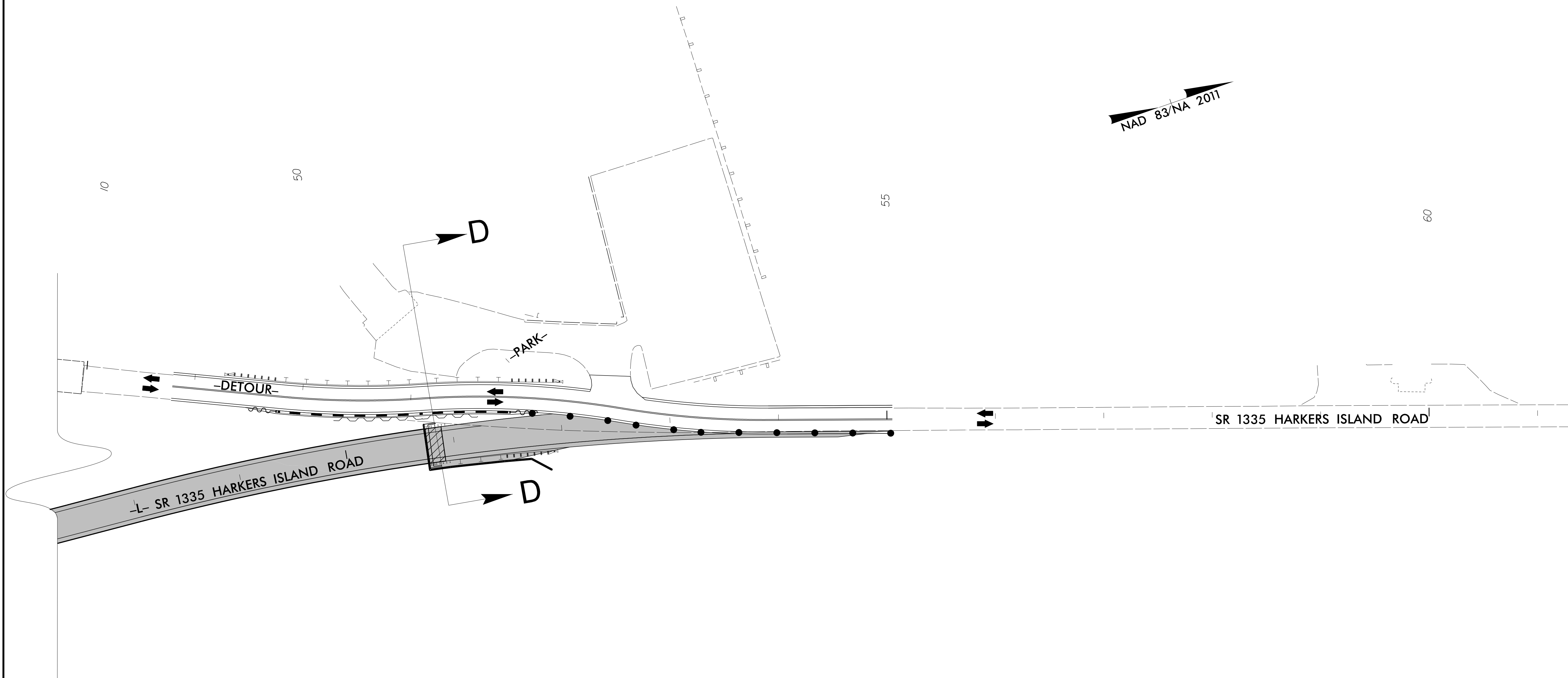
PHASE II

SHIFT TWO-LANE, TWO-WAY TRAFFIC ONTO THE TEMPORARY WIDENING (LT) AND ON-SITE DETOUR. CONSTRUCT -L- INCLUDING TEMPORARY WIDENING (RT), APPROACHES, AND STRUCTURE.

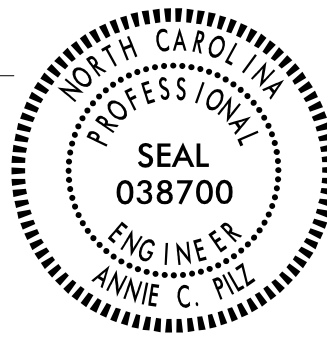


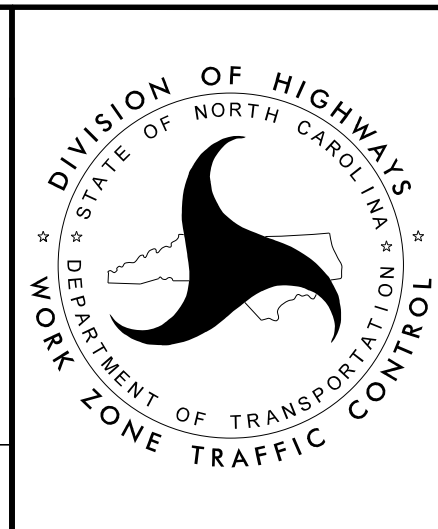
APPROVED: _____ DATE: _____		 PHASE II DETAIL
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		





**RS&H**

APPROVED: _____	
DATE: _____	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	

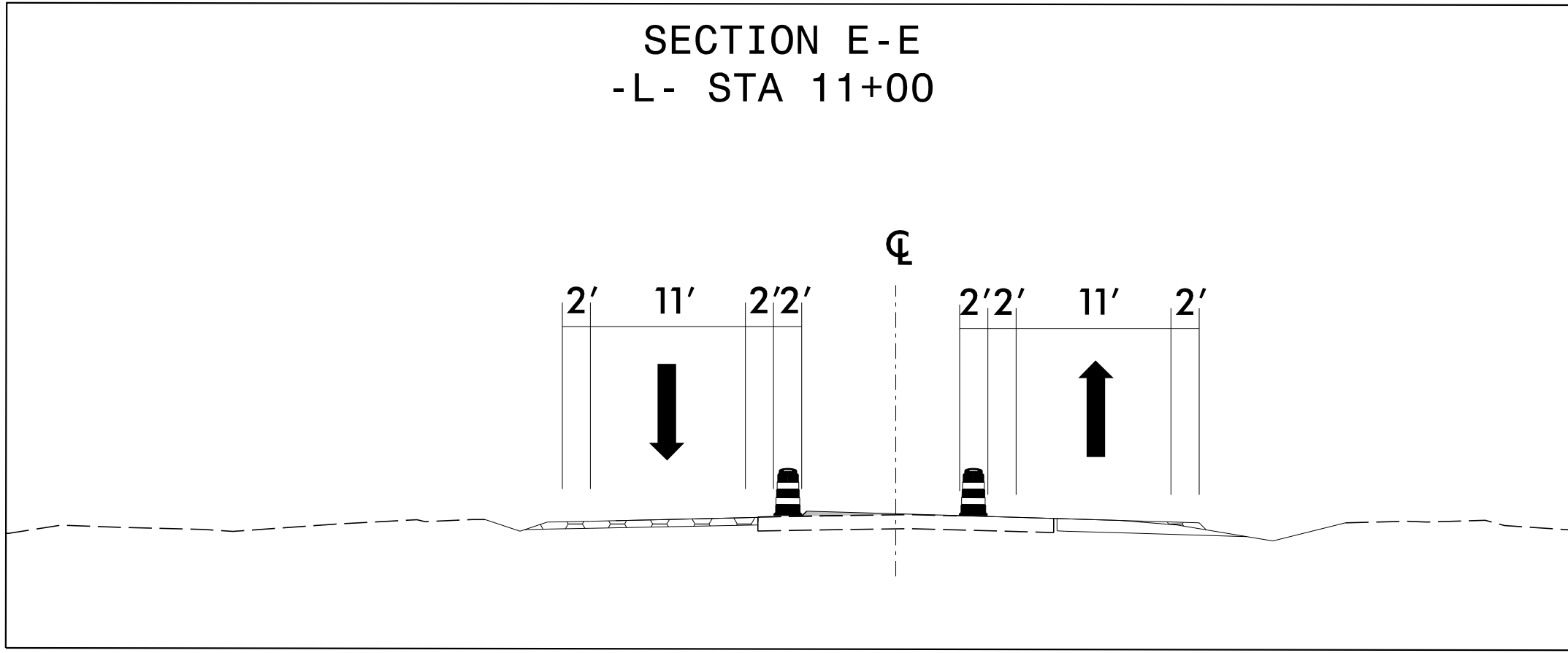
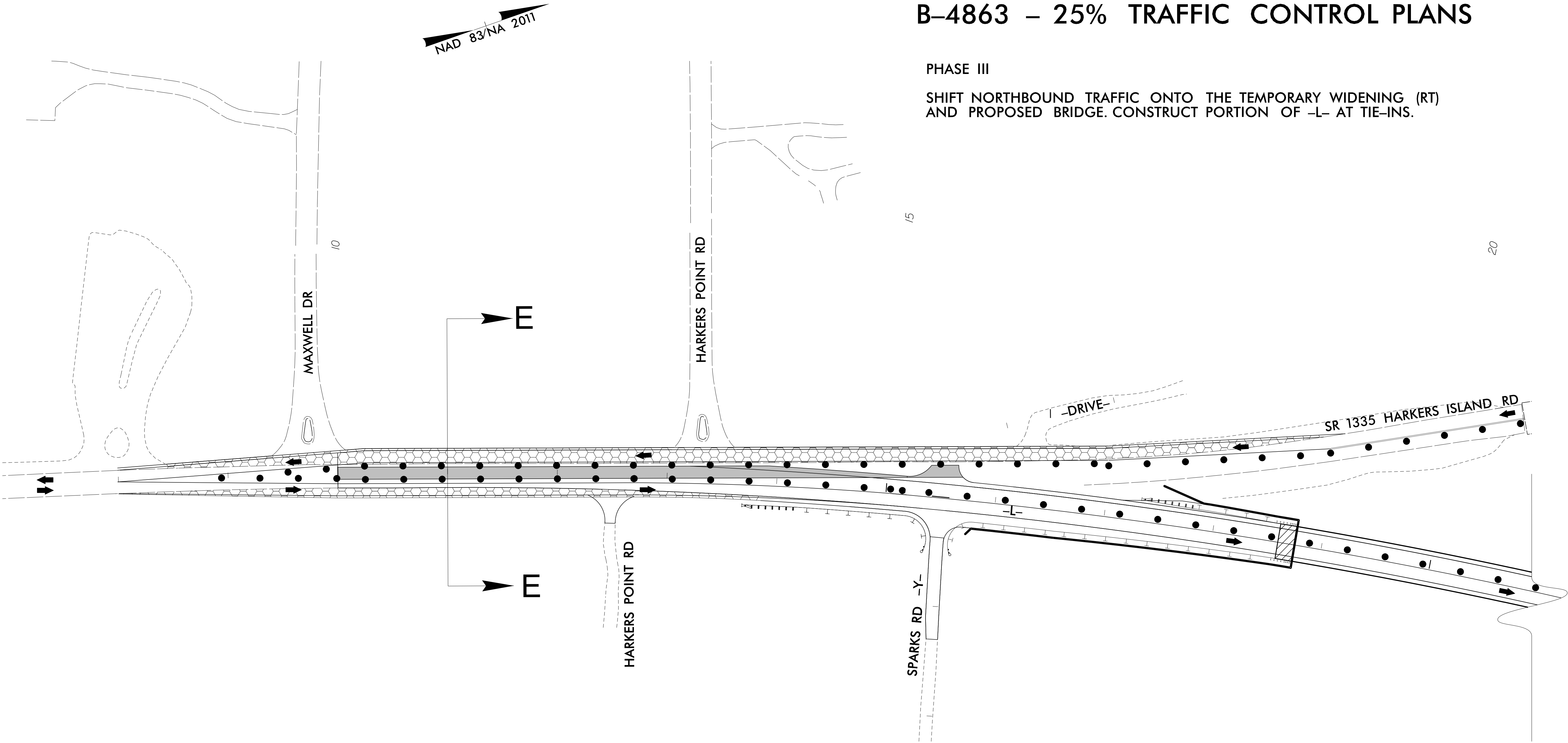


PHASE II DETAIL


B-4863 – 25% TRAFFIC CONTROL PLANS

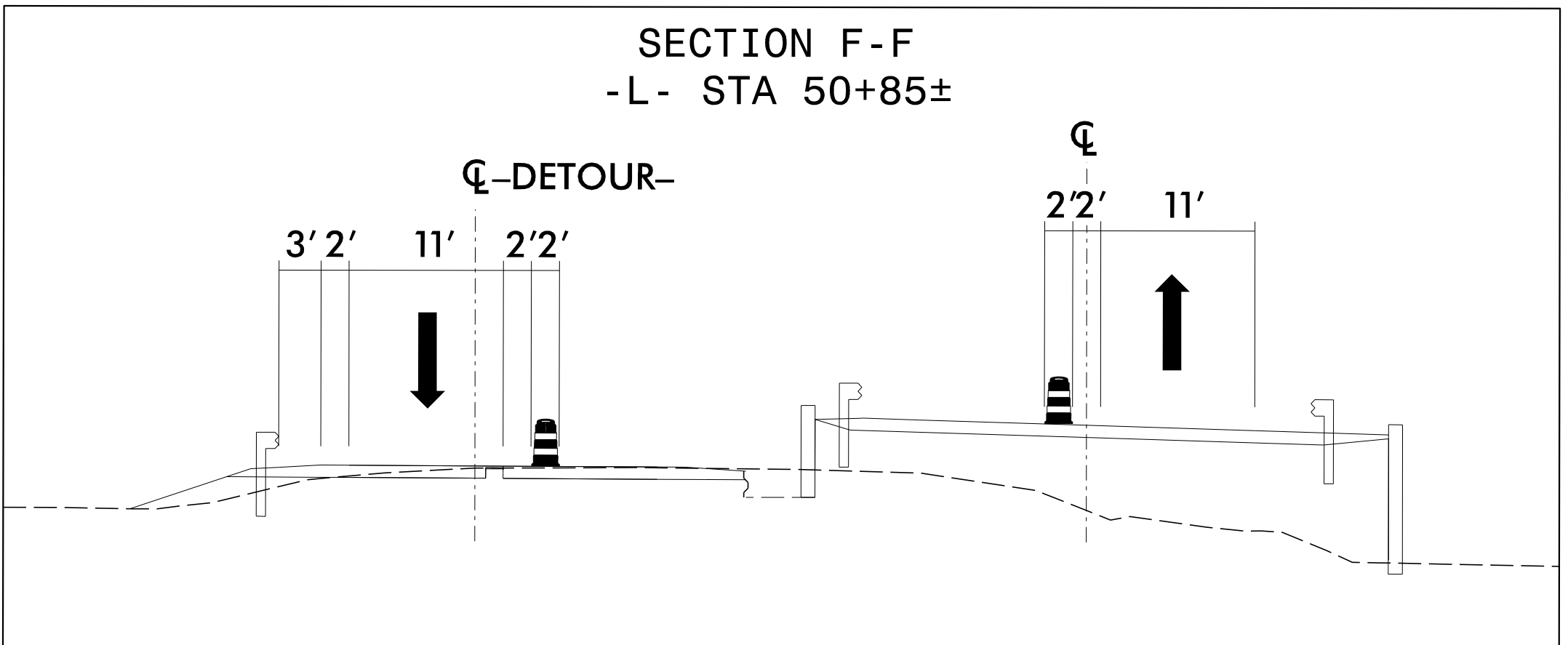
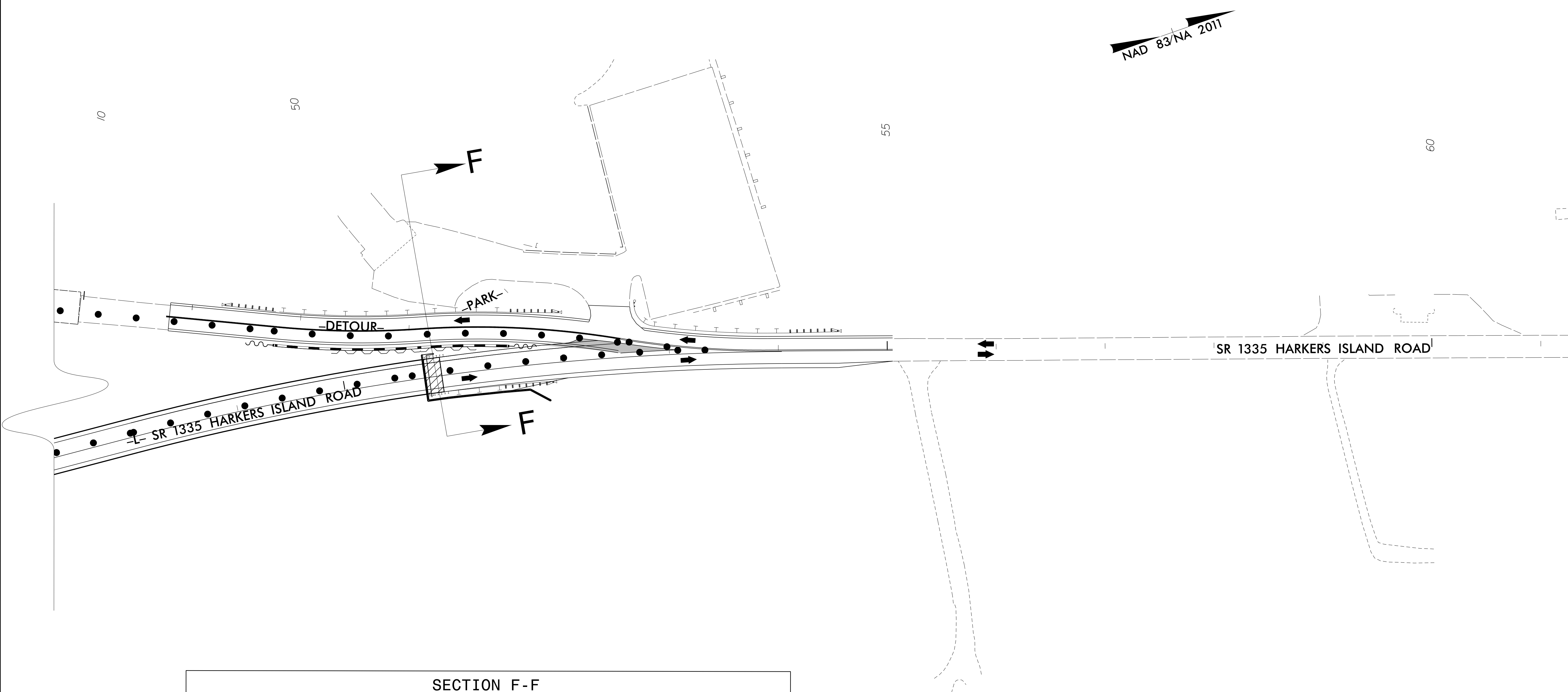
PHASE III

SHIFT NORTHBOUND TRAFFIC ONTO THE TEMPORARY WIDENING (RT) AND PROPOSED BRIDGE. CONSTRUCT PORTION OF -L- AT TIE-INS.



**RS&H**

APPROVED: _____ DATE: _____			<b>PHASE III DETAIL</b>
<p><b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b></p>			



APPROVED: \_\_\_\_\_  
DATE: \_\_\_\_\_

SEAL  
038700  
ENGINEER  
ANNIE C. PILZ

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



PHASE III DETAIL

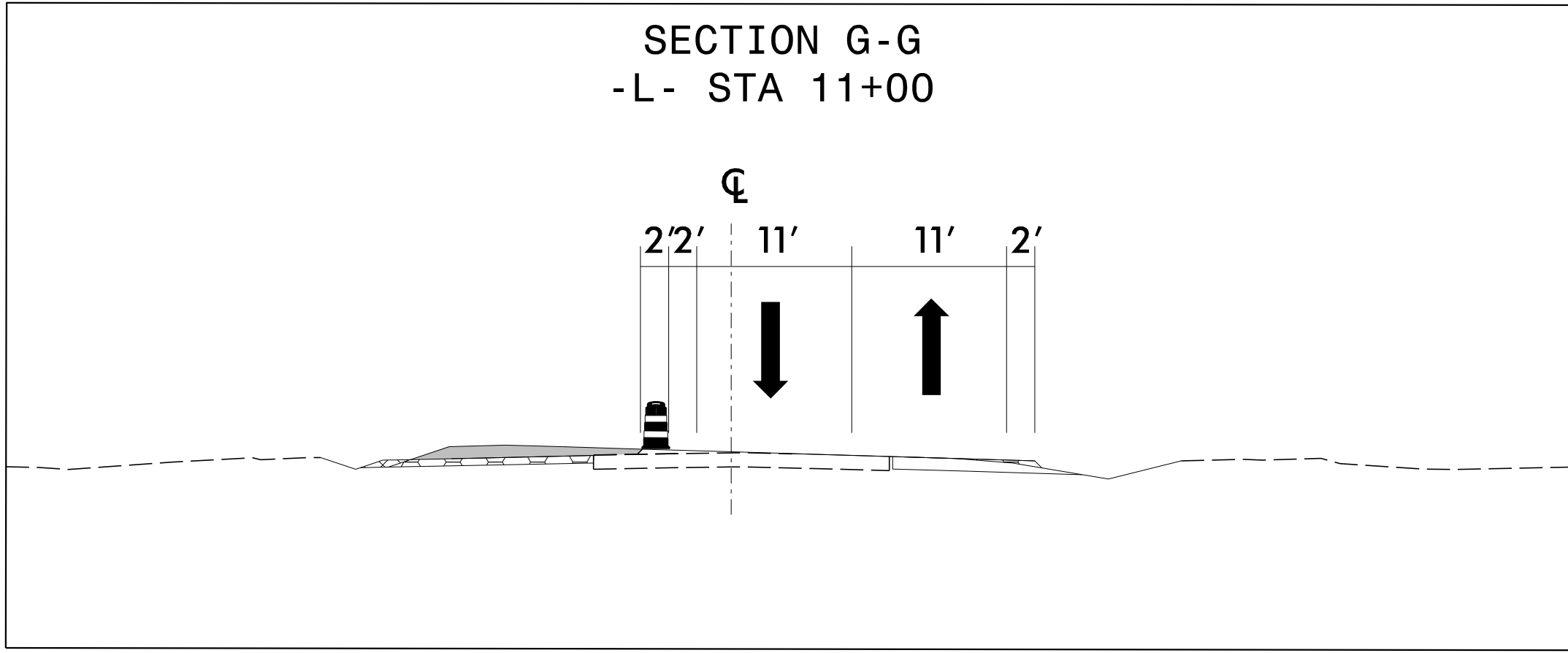
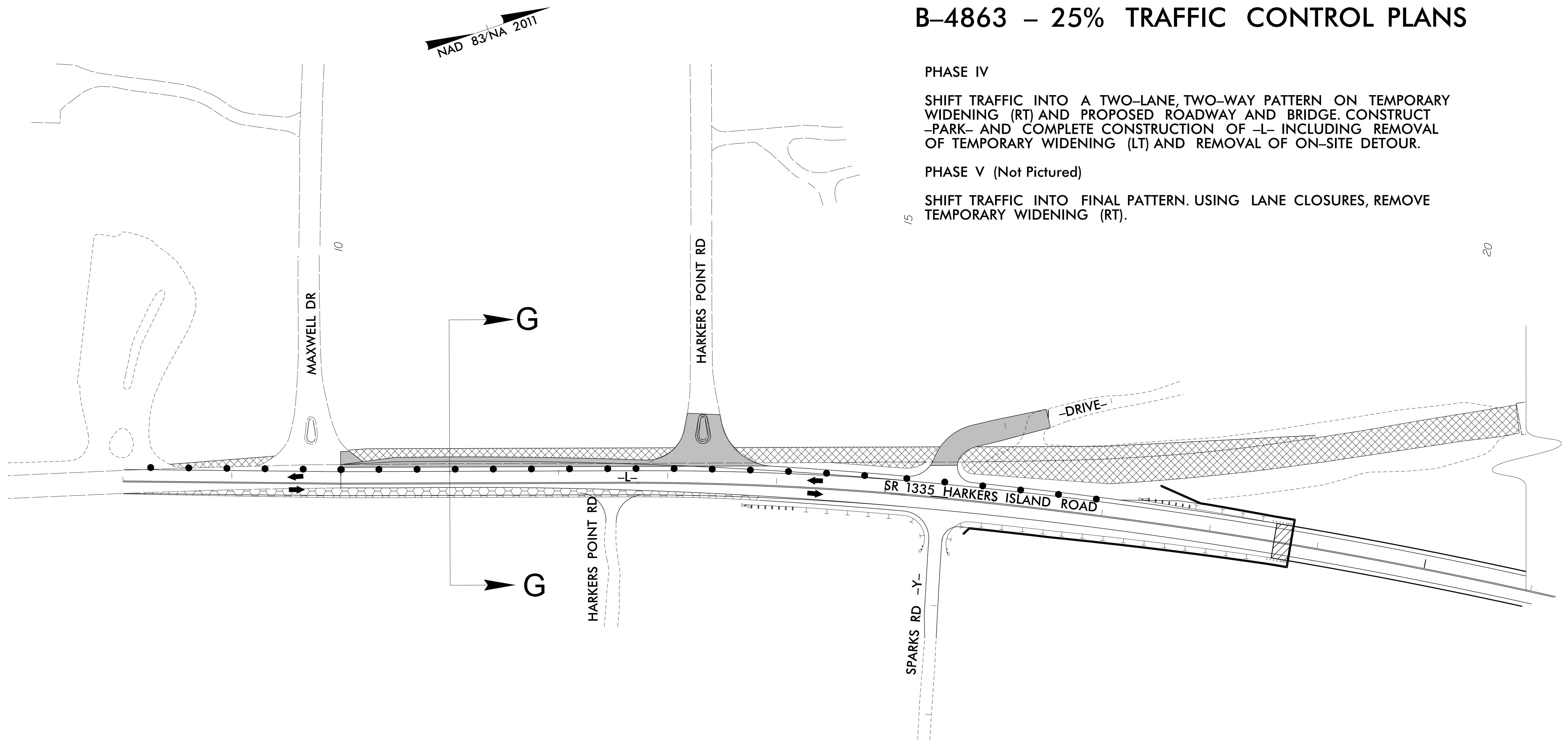
B-4863 – 25% TRAFFIC CONTROL PLANS

PHASE IV

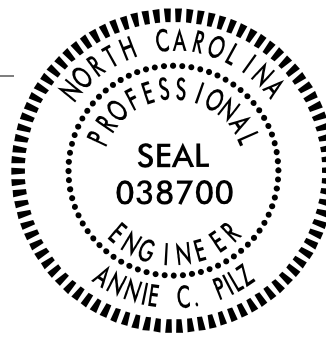
SHIFT TRAFFIC INTO A TWO-LANE, TWO-WAY PATTERN ON TEMPORARY WIDENING (RT) AND PROPOSED ROADWAY AND BRIDGE. CONSTRUCT -PARK- AND COMPLETE CONSTRUCTION OF -L- INCLUDING REMOVAL OF TEMPORARY WIDENING (LT) AND REMOVAL OF ON-SITE DETOUR.

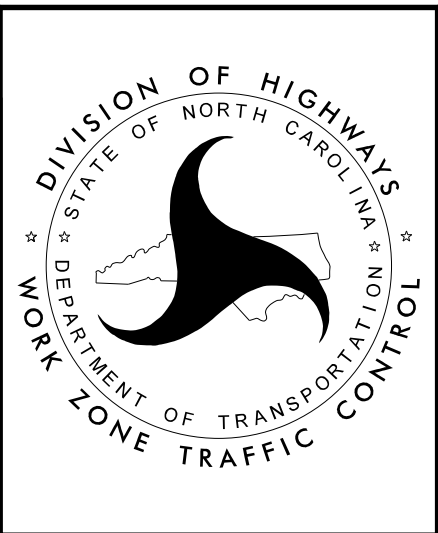
PHASE V (Not Pictured)

SHIFT TRAFFIC INTO FINAL PATTERN. USING LANE CLOSURES, REMOVE TEMPORARY WIDENING (RT).

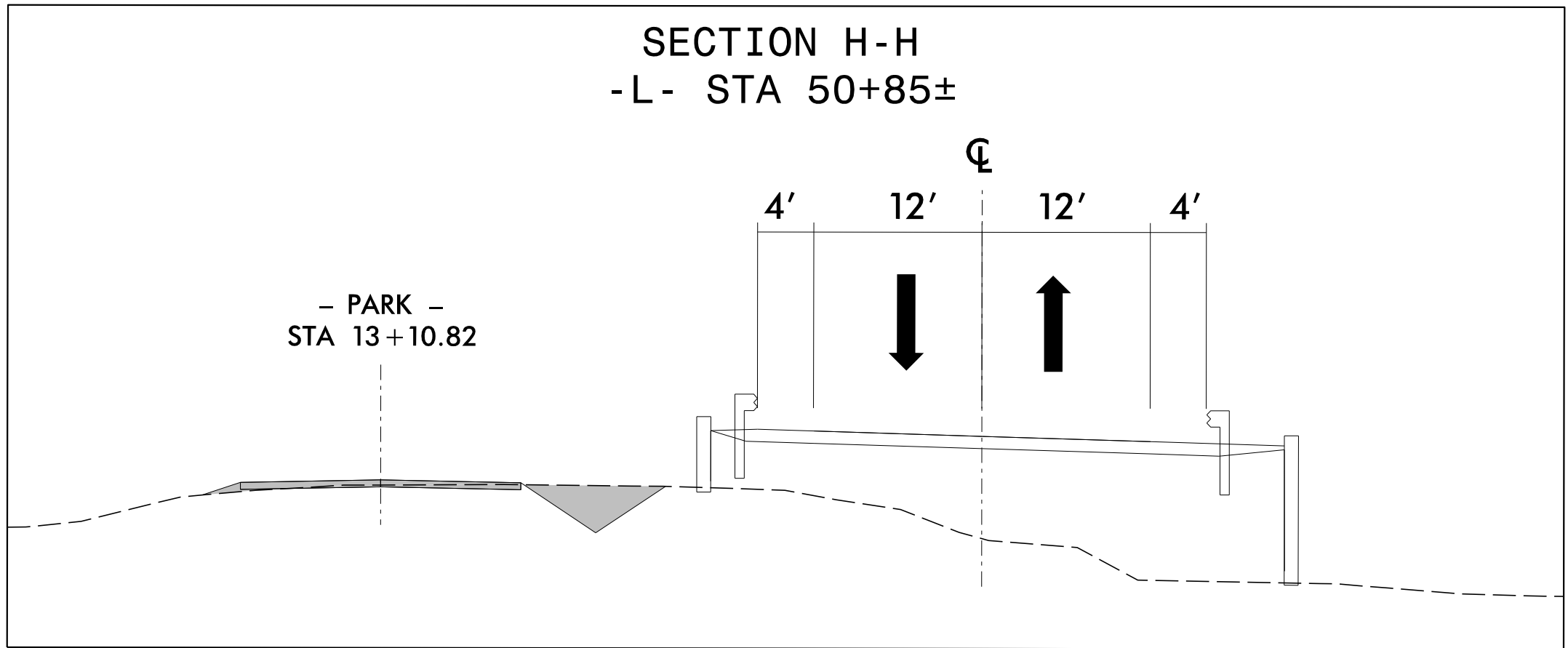
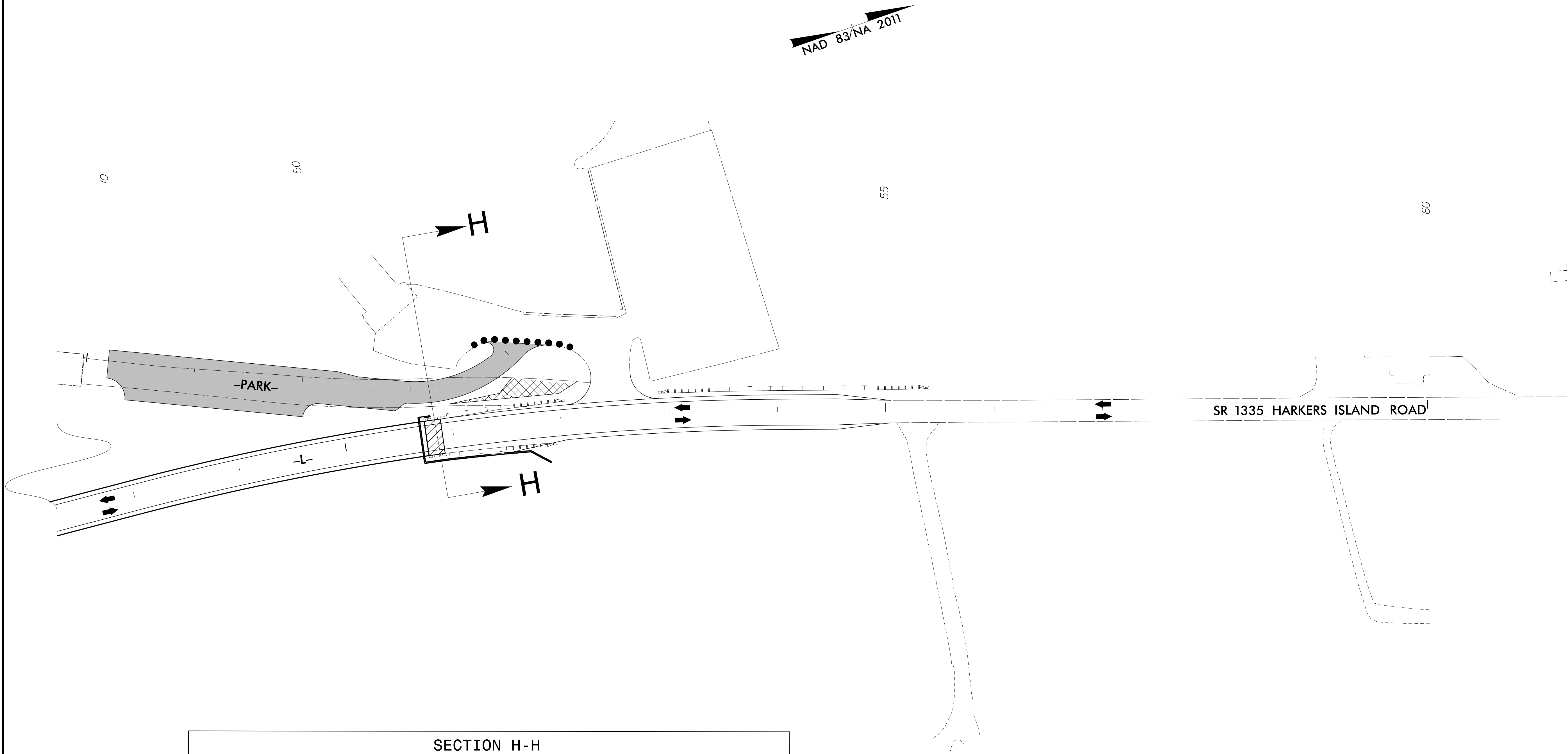


**RS&H**


APPROVED: _____
DATE: _____

<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>

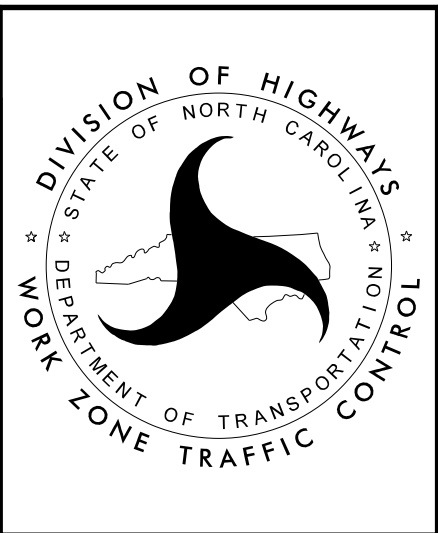


PHASE IV DETAIL



**RS&H**

APPROVED: _____
DATE: _____

<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>

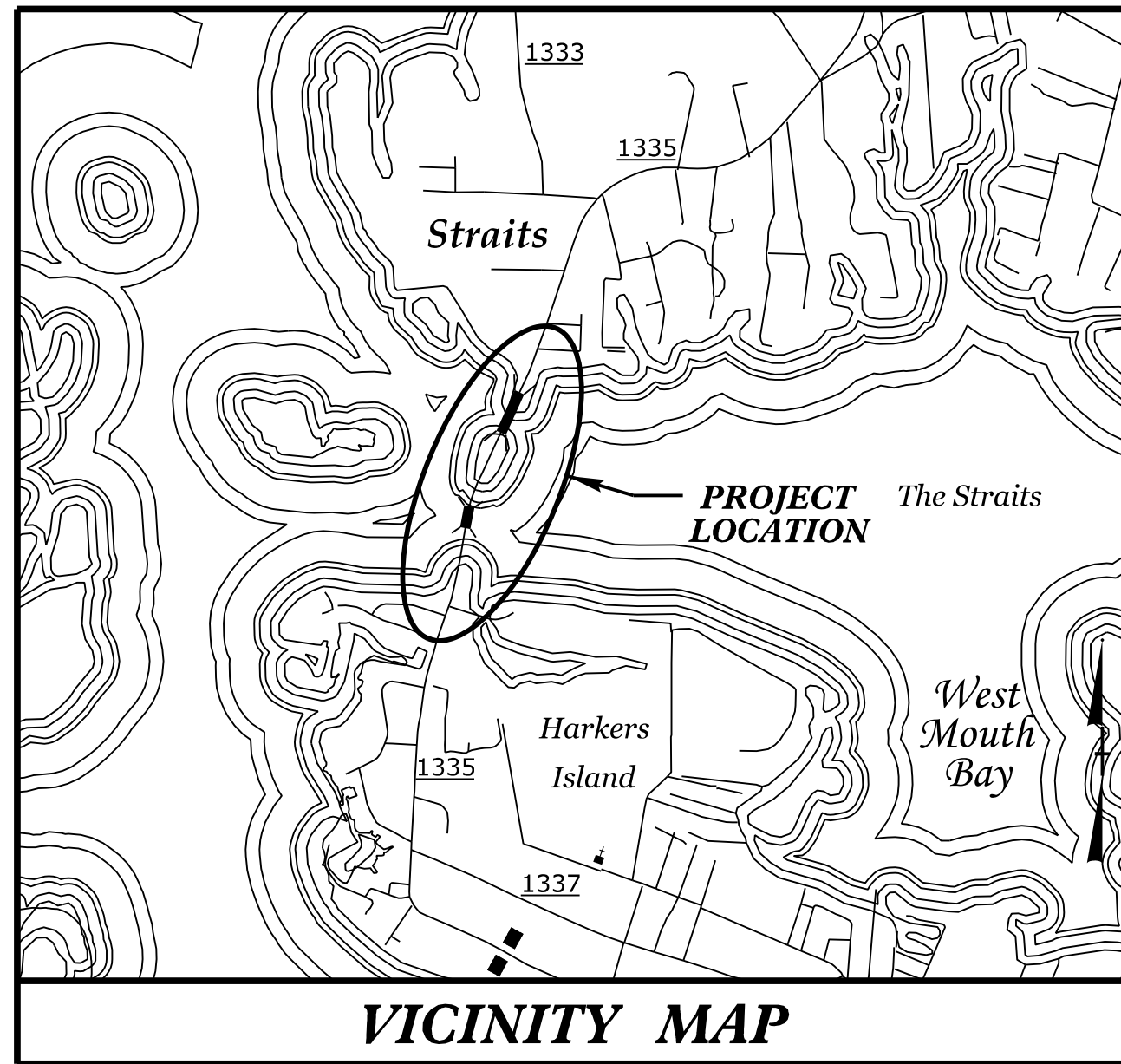


PHASE IV DETAIL

09/08/99

TIP PROJECT: B-4863

\$\$\$\$SYTIME\$\$\$\$  
\$\$\$\$\$DGN\$\$\$\$\$  
\$\$\$\$\$USERNAME\$\$\$\$\$



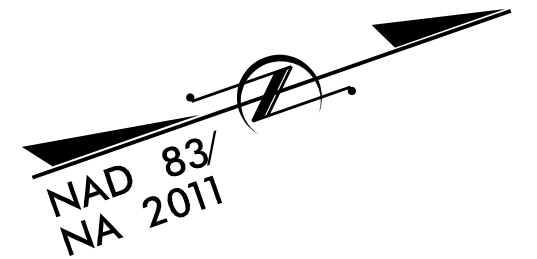
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**UTILITIES BY OTHERS PLANS  
CARTERET COUNTY**

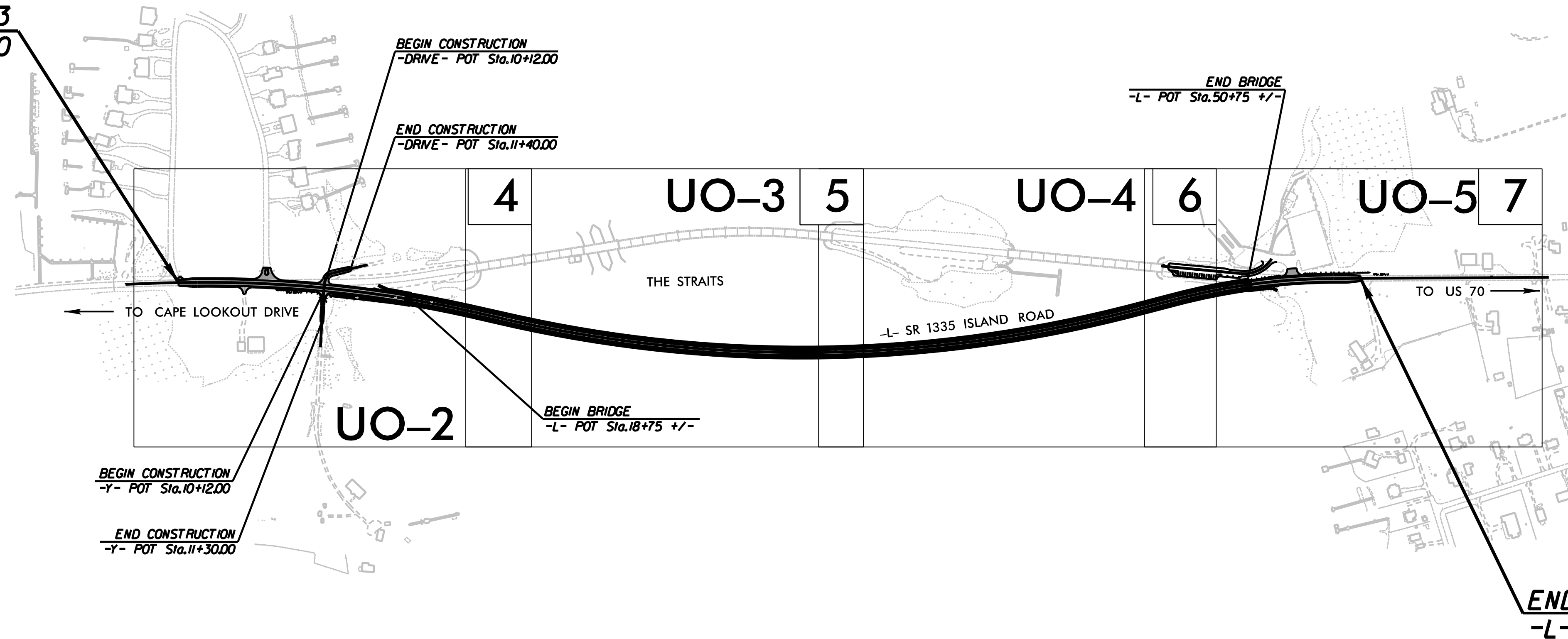
**LOCATION: REPLACEMENT OF BRIDGE NOS. 73 AND 96 CARRYING  
SR 1335 (HARKERS ISLAND RD) OVER THE STRAITS**

**TYPE OF WORK: POWER (TRANSMISSION) AND COMMUNICATIONS**

NOTE:  
ALL UTILITY WORK SHOWN ON THIS  
SHEET WILL BE DONE BY OTHERS.  
NO PAYMENT WILL BE MADE TO  
THE CONTRACTOR FOR UTILITY WORK  
SHOWN ON THIS SHEET.

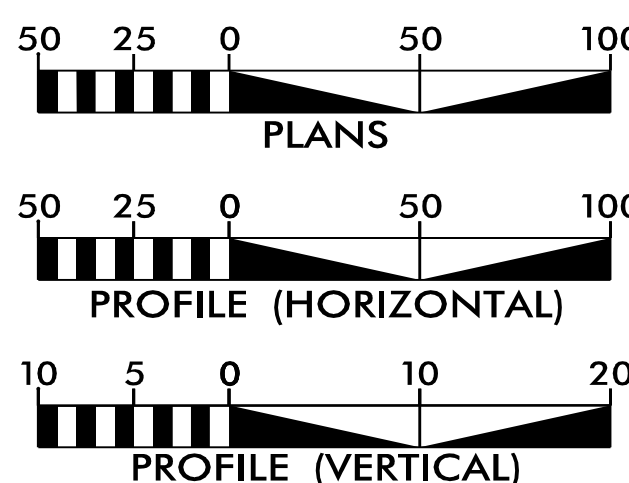


**BEGIN TIP PROJECT B-4863**  
**-L- POC Sta.10+00.00**



**END TIP PROJECT B-4863**  
**-L- POT Sta.55+05.00**

**GRAPHIC SCALES**



**INDEX OF SHEETS**

<u>SHEET NO.:</u>	<u>DESCRIPTION:</u>
UO-1	TITLE SHEET
UO-2 THRU UO-5	UBO PLAN SHEETS

**UTILITY OWNERS WITH CONFLICTS**

- (A) POWER - CCEMC
- (B) COMMUNICATIONS - CENTURYLINK
- (C) COMMUNICATIONS - SPECTRUM
- (D) COMMUNICATIONS - CONTERRA BROADBAND

PREPARED IN THE OFFICE OF:

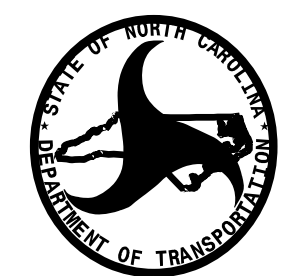
**SO-DEEP | SAM NC**

SO-DEEP | SAM NC, Inc.

A SAM COMPANY

2800-154 Summer Boulevard, Raleigh, NC 27616 Tel 919-878-7466

Keith Garry UTILITY PROJECT MANAGER  
Freddie Bunn PROJECT UTILITY COORDINATOR

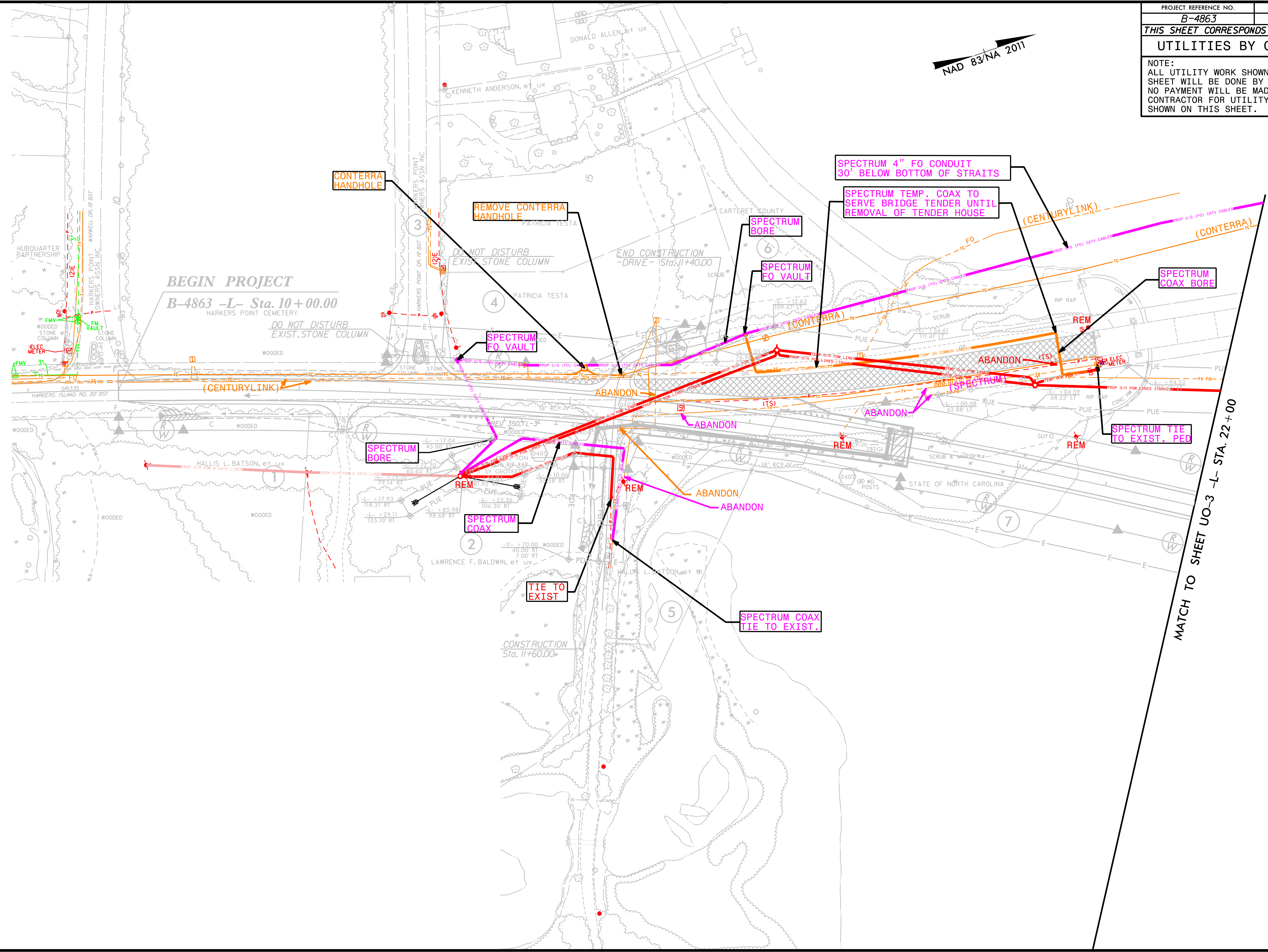


**DIVISION OF HIGHWAYS  
DIVISION 02**

DIV ADDRESS  
105 PACTOLUS HWY (NC 33)  
PO BOX 1587  
GREENVILLE, NC 27835

MARIA ROGERSON, PE	DIVISION CONTACT #1
XXXX	DIVISION CONTACT #2
XXXX	DIVISION CONTACT #3
XXXX	DIVISION CONTACT #4





## REVISIONS

MATCH TO SHEET UO-3 -L- STA. 22+00

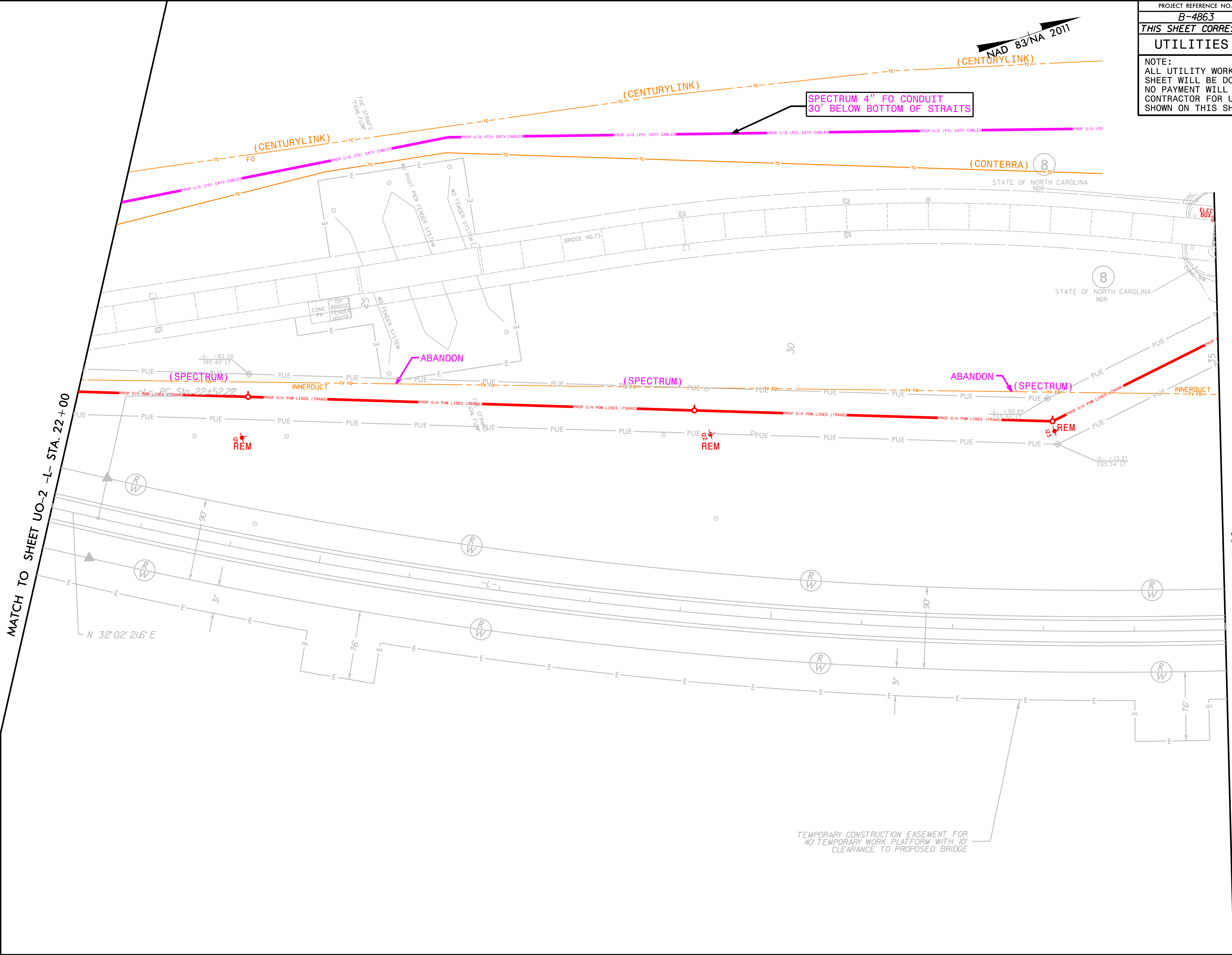


8/17/99

REVISIONS

CONSTRUCTION EASEMENT

MATCH TO SHEET UO-2 -L- STA. 22+00



PROJECT REFERENCE NO.	SHEET NO.
B-4863	UO-3
THIS SHEET CORRESPONDS TO RDT-5	
UTILITIES BY OTHERS	
NOTE: ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.	

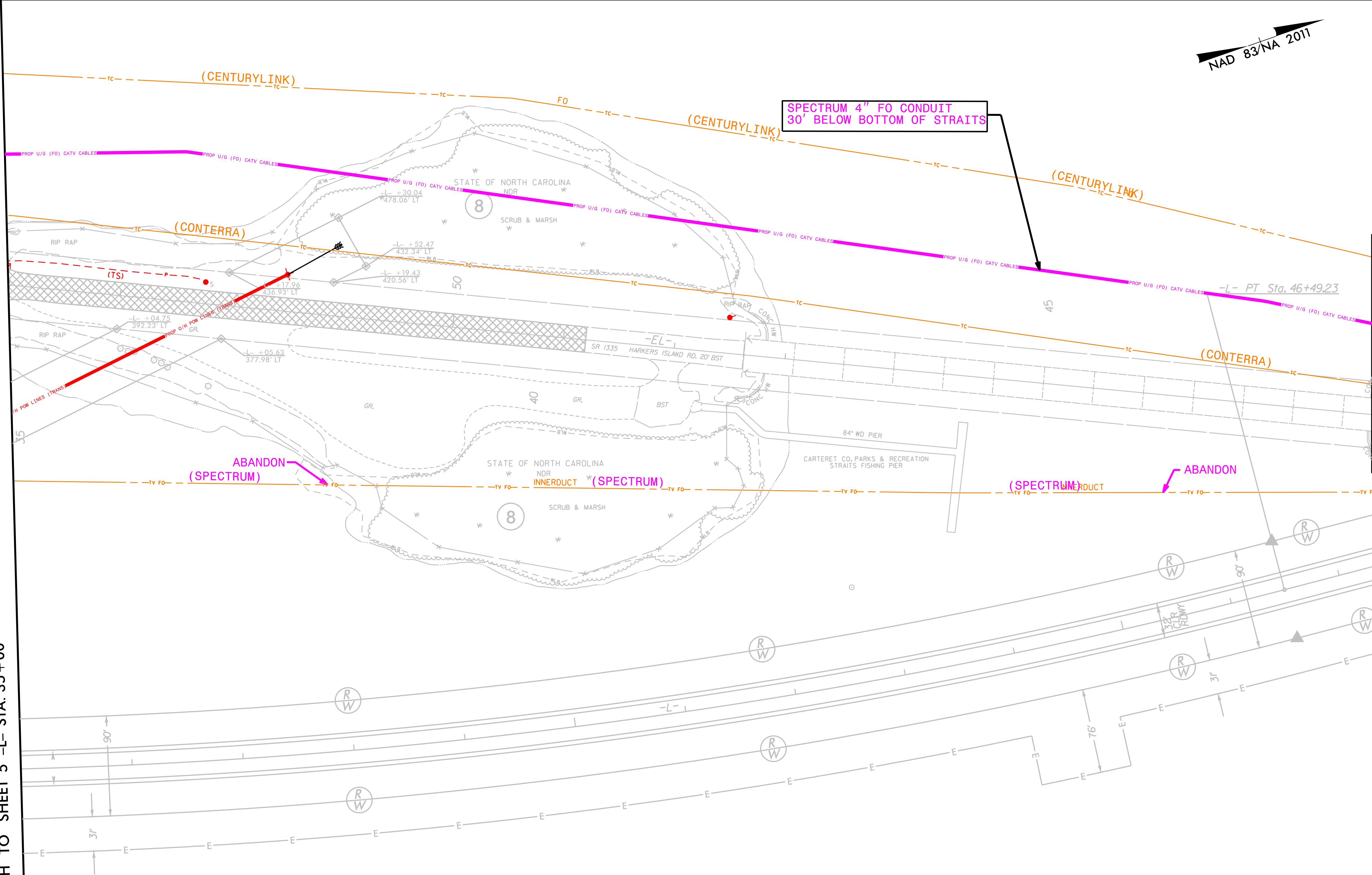
MATCH TO SHEET UO-4 -L- STA. 35+00

8/17/99

REVISIONS

UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.

MATCH TO SHEET 5 -L- STA. 35+00



NAD 83/NA 2011

PROJECT REFERENCE NO.	SHEET NO.
B-4863	U0-4
THIS SHEET CORRESPONDS TO RDT-6	
UTILITIES BY OTHERS	
NOTE: ALL UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.	

MATCH TO SHEET 7 -L- STA. 48+00





# CROSS SECTION INDEX

ALIGNMENT

SHEET NUMBERS

-L-  
-PARK-  
-Y-  
-DRIVE-  
-EL-

X-1 THRU X-28  
X-29  
X-30 THRU X-31  
X-32 THRU X-33  
X-34 THRU X-40