



Appendix H

Essential Fish Habitat Technical Memorandum

June 2021

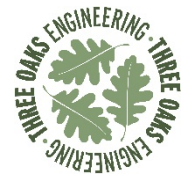


TECHNICAL MEMORANDUM: ESSENTIAL FISH HABITAT ASSESSMENT WITH ADDENDUM

Prepared for:



Prepared by:



Version 1: July 28, 2020

Version 2 - March 10, 2021

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1.0 INTRODUCTION

The proposed US 278 Corridor Improvements Project (project) will result in modifications to the human and natural environment. The Federal Highway Administration (FHWA) and the South Carolina Department of Transportation (SCDOT) are responsible for the Environmental Assessment (EA) according to the provisions of the National Environmental Policy Act (NEPA) and corresponding regulations and guidelines of the FHWA as the lead federal agency (23 Code of Federal Regulations [CFR] 771 and 40 CFR 1500–1508A). As required by the NEPA process, as well as the Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) of 1976 as amended (1996), potential effects to essential fish habitat (EFH) must be evaluated.

The purpose of this EFH Assessment is to identify the presence and types of EFH within the project area, as well as to document the potential effects of the project to EFH and federally managed species protected by the Magnuson-Stevens Act. SCDOT and FHWA are coordinating with the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) to ensure proper assessment of EFH and to communicate efforts to avoid, minimize, and mitigate impacts to those resources.

This revised EFH assessment was prepared to document project changes that have occurred since submittal of the initial assessment (dated July 2020). Specifically, this document addresses changes resulting from design modifications and refinements to the Recommended Preferred Alternative 4A, provides additional information about expected construction methods, and updates the potential project effects to EFH and managed fisheries species.

1.1 PROJECT DESCRIPTION

SCDOT, FHWA, and Beaufort County propose to make improvements to the US 278 corridor between Bluffton and Hilton Head Island in Beaufort County, South Carolina (Figure 1-1,). The project limits extend from Moss Creek Drive to Wild Horse/Spanish Wells Road for approximately 4.11 miles.



Figure 1-1: Project Overview and Location

The project includes replacement of the eastbound Mackay Creek bridge and replacement of the three other bridges located within the project corridor. The three additional bridges to be replaced include the westbound Mackay Creek, the eastbound Skull Creek, and the westbound Skull Creek bridge. Improved access to the Pinckney Island National Wildlife Refuge (PINWR) and the C.C. Haigh, Jr. boat ramp is also proposed as part of this project. Potential impacts to the environment will include construction of new bridges, the placement of clean fill material for construction and improvements to bridge approach, new roads, and/or realignment of existing roads for community access, and finally the demolition of the existing bridges.

2.0 AGENCY CONSULTATION HISTORY

A Letter of Intent (LOI) was distributed on September 4, 2018 by email to the resource and regulatory agencies to notify them of the initiation of the proposed project. In March 2019 FHWA sent an invitation to become a Participating Agency to NOAA Fisheries.

Following the LOI were a series of Agency Coordination Effort (ACE) meetings hosted by SCDOT and FHWA in February, June, and August 2019 and March and May 2020. These meetings were used as coordination points to discuss the Purpose and Need of the project, alternative evaluation criteria, alternatives evaluations, and the proposal of a Recommended Preferred Alternative. Representatives from NOAA Fisheries were present at multiple ACE Meetings.

The EFH technical report dated July 22, 2020, was submitted to NOAA Fisheries for review and comment following studies of the potential effects to EFH related to the project, specifically the effects of the Recommended Preferred Alternative. Concurrence with the findings in the initial EFH technical report was received from NOAA Fisheries on September 14, 2020. A copy of this letter is included in Appendix A.

This revised EFH Assessment was submitted to NOAA Fisheries to address refinements to the design of the roadway and bridge structures for the proposed US 278 Corridor Improvements. Copies of the letters and other consultation efforts as described above can be found in Appendix A. Table 2-1 provides a summary and timeline of EFH consultation with NOAA Fisheries.

Table 2-1: EFH Consultation Summary

Consultation	Submittal/Receipt Date	Response Date
LOI Submittal	9/4/18 from FHWA/SCDOT	NOAA Fisheries response 4/24/19
ACE Meeting	2/14/19	N/A
Participating Agency Letter	3/25/19 from FHWA	NOAA Fisheries response 4/24/19 – Participating Agency
ACE Meeting	6/13/19	N/A
ACE Meeting	8/8/19	N/A
ACE Meeting	3/12/20	N/A
ACE Meeting	5/14/20	N/A
EFH Assessment to NOAA Fisheries	7/22/20 from SCDOT	NOAA Fisheries response 9/14/20 – no additional recommendations
Revised EFH Assessment to NOAA Fisheries	3/10/21 from SCDOT	

important food source for snappers, groupers, sharks, skates, turtles, and octopuses. According to the EFH spatial data from NOAA, EFH for all life stages of Caribbean spiny lobster includes the tidal creeks and unconsolidated bottom. Habitat Areas of Particular Concern (HAPC) for Caribbean spiny lobster are coral reefs and live hard bottom habitats, which are not found within the project area.

3.1.3 Shrimp

Essential habitat for white shrimp (*Litopenaeus setiferus*) and brown shrimp (*Farfantepenaeus aztecus*) is present within the project area. These penaeid shrimp species are managed by the SAFMC because of their economic and ecological significance (SAFMC, 2020d). These shrimp species, like all penaeid shrimp, have an annual life cycle. Penaeid shrimp spawn year-round in deepwater habitats offshore, larval shrimp move to estuarine areas, and new adults return to offshore areas to spawn. White shrimp begin to migrate to estuarine waters in April and May, whereas brown shrimp migrate to estuarine waters from February to April (NOAA, 2020b). Juvenile shrimp forage and mature in tidally influenced nursery areas where the mud-silt substrate and salinity range provide a suitable feeding environment. Once maturity is reached, Brown shrimp egress to offshore areas between May and August (NOAA, 2020c). White shrimp egress from August to December (NOAA, 2020b). Some smaller adult individuals may remain in the estuary over the winter (SAFMC, 2016c). Inshore nursery areas include tidal freshwater (palustrine), estuarine, and marine emergent wetlands (e.g., intertidal marshes); tidal palustrine forested areas; mangroves; tidal freshwater, estuarine, and marine submerged aquatic vegetation (e.g., seagrass); and subtidal and intertidal non-vegetated flats (SAFMC, 1993). HAPC for these shrimp species is identified as all coastal inlets, which are not present within the project area (SAFMC, 2016c).



Shrimp (NOAA Fisheries)

3.1.4 Snapper-Grouper Complex

The snapper-grouper complex managed by the SAFMC is made up of 55 species across ten families: sea basses and groupers (*Serranidae*), wreckfish (*Polyprionidae*), snappers (*Lutjanidae*), porgies (*Sparidae*) grunts (*Haemulidae*), jacks (*Carangidae*), tilefishes (*Malacanthidae*), triggerfishes (*Balistidae*), wrasses, (*Labridae*), and spadefishes (*Eppiphidae*) (SAFMC, 2016d). Species in the complex spawn offshore in hard-bottom areas (SAFMC, 2016d). Snapper-grouper larvae are transported to estuarine areas by tides and currents where they grow to maturity. The nursery areas of estuarine waters and wetlands provide shelter from predation as well as



Red snapper (NOAA Fisheries)

an abundance of food. Snapper-grouper species are predatory, feeding on smaller fish and invertebrates. Adult snapper-groupers can be found feeding in estuarine environments (SAFMC, 2016c). Several species within the complex, such as the gray snapper (*Lutjanus griseus*), are known to use tidal freshwaters as well. According to the FMP for the snapper-grouper complex, For specific life stages of estuarine-dependent and near shore snapper grouper species, EFH includes areas inshore of the 30 meter (100-ft) contour, such as attached macroalgae; submerged rooted vascular plants (seagrasses); estuarine emergent vegetated wetlands (saltmarshes, brackish marsh); tidal creeks; estuarine scrub/shrub (mangrove fringe); oyster reefs and shell banks; unconsolidated bottom (soft sediments); artificial reefs;

and coral reefs and live/hard bottom habitats (SAFMC, 2016b). HAPC for the snapper-grouper complex is identified as all coastal inlets and oyster beds (SAFMC, 2016b). All oysters present within the project area are considered HAPC for the snapper-grouper complex.

3.1.5 Summer Flounder

Summer flounder (*Paralichthys dentatus*) is a fish species managed by the MAFMC as part of the Summer Flounder, Scup, and Black Seabass FMP. Summer flounder live up to 14 years, reaching maturity between 2-3 years of age. Spawning occurs several times during the fall and early winter in offshore waters of the continental shelf (NOAA, 2020a). Larval summer flounder are transported by tides and currents from offshore areas to estuarine areas where they grow to maturity. Summer flounder stay along the bottom of the water column where they hide against the substrate to hunt and ambush their prey. Larval summer flounder feed on zooplankton and small invertebrates while juveniles and adults feed on invertebrates and fish. Larvae, juvenile, and adult summer flounder are known to commonly occur in estuarine environments, venturing into offshore waters during spawning season. According to the FMP for summer flounder, intertidal non-vegetated flats, tidal creeks, and unconsolidated bottom are designated as EFH for the larval, juvenile, and adult life stages of summer flounder. HAPC for summer flounder includes submerged aquatic vegetation, which is not present within the project area (MAFMC, 1987).



Summer flounder (NOAA Fisheries)

3.1.6 Coastal Migratory Pelagics

Spatial data from the EFH mapper indicates the presence of EFH for coastal migratory pelagic species (CMP) within the project boundary (NOAA, 2019). CMP species managed by SAFMC include king mackerel, Spanish mackerel, and cobia. EFH for CMPs include coastal estuaries from the US/Mexico border to the boundary between the areas covered by the Gulf of Mexico Fisheries Management Council and the SAFMC from estuarine waters out to depths of 600 feet. EFH for CMP stocks includes sandy shoals of capes and offshore bars, high profile rocky bottom, and barrier island ocean-side waters, from the surf to the shelf break zone (SAFMC, 2018).

King mackerel (*Scomberomorus cavalla*)

King mackerel can be found throughout the Atlantic coast from the shore to depths of 2,000 feet. King mackerel have a streamlined body with tapered head, iridescent bluish green or iron-gray back, silvery sides and ventral surface, and pale to dusky fins. It is distinguished from Spanish mackerel by the lateral line, which dips sharply in Spanish mackerel. In addition, the anterior dorsal fin on a Spanish mackerel is gray in coloration (SAFMC, 2021). Adult King Mackerel are known to spawn in areas of low turbidity, with salinity and temperatures of approximately 30 parts per thousand (ppt) and 80°F, respectively. There are major spawning areas off Louisiana and Texas in the Gulf; and off the Carolinas, Cape Canaveral, and Miami in the western Atlantic. Spawning occurs generally from May through October with peak spawning in September (SAFMC, 2021). Juveniles are generally found closer to shore at inshore to mid-shelf depths (to < 29 feet) and occasionally in estuaries. King mackerel feed



King mackerel (SAFMC)

primarily on fishes. They prefer to feed on schooling fish, but also eat crustaceans and occasionally mollusks. (SAFMC, 2021).

Spanish mackerel (*Scomberomorus maculatus*)

Spanish mackerel are found throughout the Atlantic coast in areas from low-tide lines to the edge of the continental shelf. They inhabit estuarine areas, especially the higher salinity areas, during seasonal migrations (SAFMC, 2021). Spanish Mackerel are greenish dorsally with silver sides and belly. Yellow or olive oval spots traverse the body, which is covered with very tiny scales. The lateral line curves gently to base of tail, which distinguishes it from king mackerel. The Spanish Mackerel is much smaller than King Mackerel, averaging only 2 to 3 pounds in weight (SAFMC, 2021). Juveniles are most often found in coastal and estuarine habitats and at temperatures >77°F and salinities >10 ppt. Although they occur in waters of varying salinity, juveniles appear to prefer marine salinity levels and generally are not considered estuarine dependent (SAFMC, 2021).



Spanish mackerel (NOAA Fisheries)

Cobia (*Rachycentron canadum*)

Cobia is a large, fast growing pelagic species. The body is dark brown to silver, paler on the sides and grayish white to silvery below, with two narrow dark bands extending from the snout to base of caudal fin. Young cobia have pronounced dark lateral bands, which tend to become obscured in the adult fish. Most fins are deep brown, with gray markings on the anal and pelvic fins. The body is elongate and torpedo-shaped with a long, depressed head. The eyes are small, and the snout is broad. The lower jaw projects past the upper jaw. The skin looks smooth with very small, embedded scales (SAFMC, 2021). Cobia are often found in harbors, estuaries, nearshore around wrecks and reefs and offshore along the continental shelf. Cobia are opportunistic feeders, their diet includes crustaceans, cephalopods, and fish. They have been seen in shallow coastal waters in schools of up to 100 fish. Additionally, cobia are known to follow larger sharks, rays, and turtles, taking advantage of prey items lost during their feeding activity. Spawning occurs May through August in Atlantic waters off the southeastern US (SAFMC, 2021).



Cobia (SAFMC)

3.1.7 Other Fish

EFH within the PSA area also serves as nursery and forage habitat for other fish species, including Atlantic red drum (*Sciaenops ocellatus*). Atlantic red drum was previously managed by SAFMC. However, in 2008, management of Atlantic red drum was transferred from the Magnuson-Stevens Act to the Atlantic Coast Act, and with that transfer the EFH designations for red drum were no longer applicable; although NMFS may still use the Fish and Wildlife Coordination Act to comment on the effects of a project to Atlantic red drum (SAFMC, 2016). Estuarine environments within the project area provide habitat necessary for the development and survival of several life stages of Atlantic red drum.



Atlantic red drum (SCDNR)

3.2 HABITAT AREAS OF PARTICULAR CONCERN

Habitat areas of particular concern (HAPC) are discreet subsets of EFH that are considered high priority areas for conservation, management, or research. HAPCs receive such designation because they are rare, sensitive, stressed by development, or important to overall ecosystem function (SAFMC, 2020b). HAPC for a given fishery can include intertidal habitats, estuarine habitats, and deep-water habitats used for migration, spawning, and rearing of fish or other managed organisms. HAPCs present within the project area include all oysters.

3.2.1 Oysters

The Eastern oyster (*Crassostrea virginica*) is commonly found along the coast of South Carolina. Oysters primarily settle and develop in intertidal habitats creating beds, reefs, or banks. These reefs contain live oysters as well as remaining shells from previous generations (NOAA, 2020e). Oysters and other shellfish are monitored by SCDHEC and regulated by South Carolina Department of Natural Resources (SCDNR).



Eastern oysters (SCDNR)

4.0 EXISTING ENVIRONMENT

4.1 PROJECT STUDY AREA

The Project Study Area (PSA) (Figure 4-1) is approximately 438-acres and was evaluated and investigated for the presence of EFH. The PSA extends from Bluffton on the mainland across Mackay Creek, Pinckney Island, Skull Creek, Hog Island, and Jenkins Island to Hilton Head Island.

The PSA is in the Savannah River Basin and the Calibogue Sound watershed designated by the US Geological Survey as Hydrologic Unit Code (HUC) 03060110-03. The area is situated in the Sea Islands/Coastal Marsh Level IV ecoregion as defined by the US Environmental Protection Agency (EPA). *“The Sea Islands/Coastal Marsh region contains the lowest elevations in South Carolina and is a highly dynamic environment affected by ocean wave, wind, and river action... The island, marsh, and estuary systems form an interrelated ecological web, with processes and functions valuable to humans, but also sensitive to human alterations and pollution. The coastal marshes, tidal creeks, and estuaries are important nursery areas for fish, crabs, shrimp, and other marine species”* (Griffith et al. 2002). The project is within the Calibogue Sound watershed (Hydrologic Unit Code 10: 0306011003) and Savannah River basin (SCDHEC 2021).

A portion of the Pinckney Island National Wildlife Refuge (PINWR) falls within the PSA. PINWR is 4,053 acres of salt marshes, tidal creeks, forests, fields, and freshwater ponds owned and operated by the USFWS. The C.C. Haigh, Jr. Boat Landing is located on PINWR. This public boat landing includes a parking lot, two floating docks, and a kayak launch.



Figure 4-1: Project Study Area

4.2 IDENTIFIED ESSENTIAL FISH HABITAT

The PSA contains multiple waterbodies and wetlands that qualify as EFH. Using geographic information systems (GIS) and aerial imagery, GIS shapefiles were produced of all predicted habitat type boundaries within the EFH evaluation areas based on their photographic signatures. These shapefiles were uploaded to a Trimble Geo7x GPS unit and printed maps were generated to assist in ground truthing the predicted habitat boundaries in the field. Field assessments were conducted from December 9th to December 12th, 2019, during low tide to allow for all potential habitat types to be evaluated. During the ground truthing process, qualitative and quantitative data was collected at sample sites to either confirm predicted habitats or indicate a needed change of the predicted habitat in that area. Data collection included habitat type, vegetation composition, current tidal conditions, and salinity. The extent of the EFH habitat boundaries and data collection sites were recorded using the GPS unit. The shapefiles of the predicted habitat boundaries were then refined using the GPS locations and data collected in the field. Five different types of EFH were identified within the PSA: estuarine emergent wetlands, intertidal non-vegetated flats, tidal creeks, unconsolidated bottom, and oysters.

Table 4-1 provides a summary of all EFH found within the PSA, organized by habitat type and total area. Figures 4-2 through 4-5 provide an overview of existing EFH boundaries and locations within the PSA. Based on the lack of existing impairments to water quality, the classification of Shellfish Harvesting (SFH) by the South Carolina Department of Health and Environmental Control (SCDHEC), and results of field investigations, it has been determined that all EFH in the PSA is high quality and fully functional.

Table 4-1: Summary of Identified EFH in the Project Study Area

Habitat Type	Habitat Quality	Area (acres)	Percentage of Total EFH
Estuarine Emergent Wetland	High – Fully Functional	76.2	42%
Intertidal Non-Vegetated Flat	High – Fully Functional	24.3	13%
Tidal Creek	High – Fully Functional	2.1	1%
Unconsolidated Bottom	High – Fully Functional	72.8	40%
Oysters (HAPC)	High – Fully Functional	7.2	4%
TOTAL EFH	-	182.6	100%

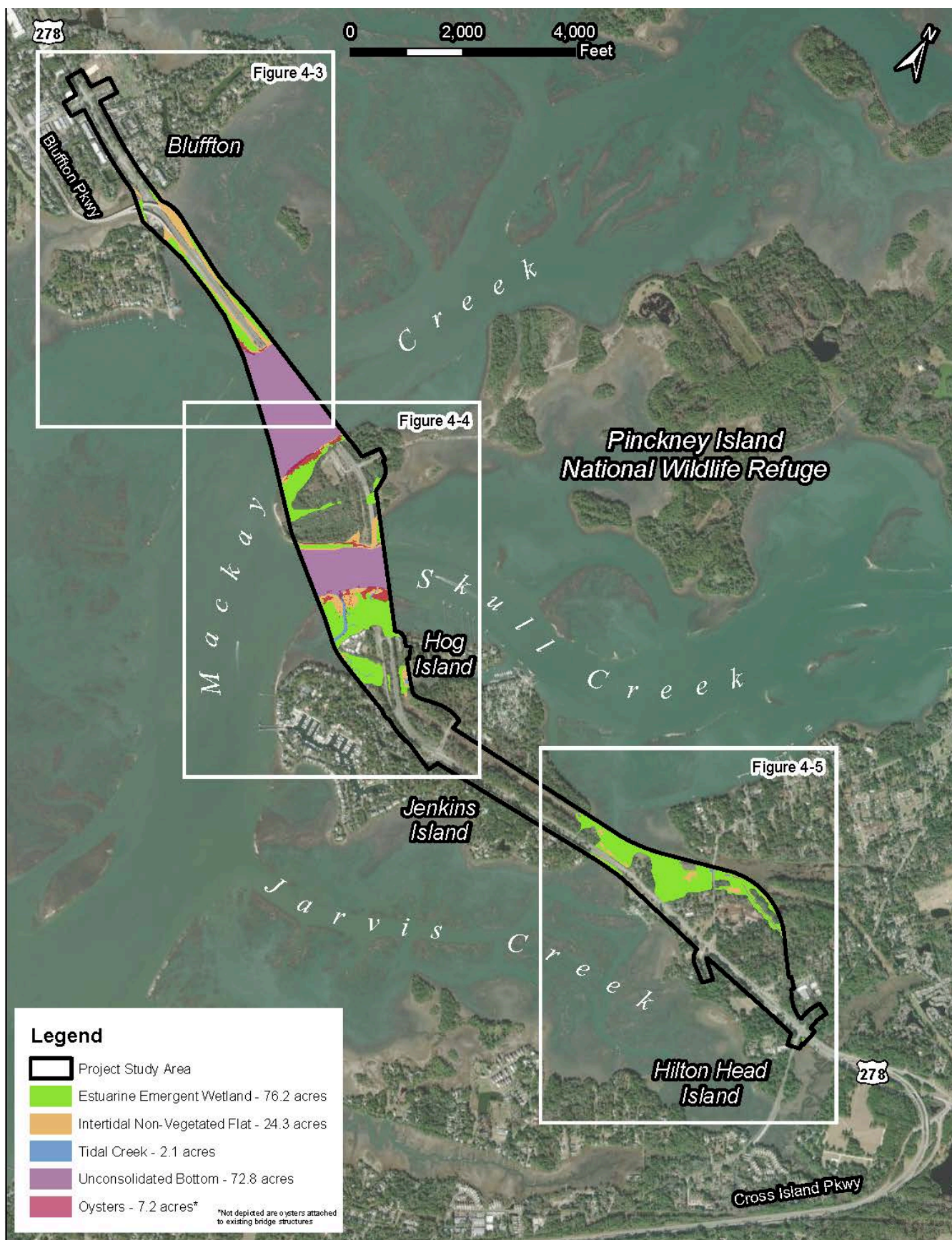


Figure 4-2: Essential Fish Habitat Overview

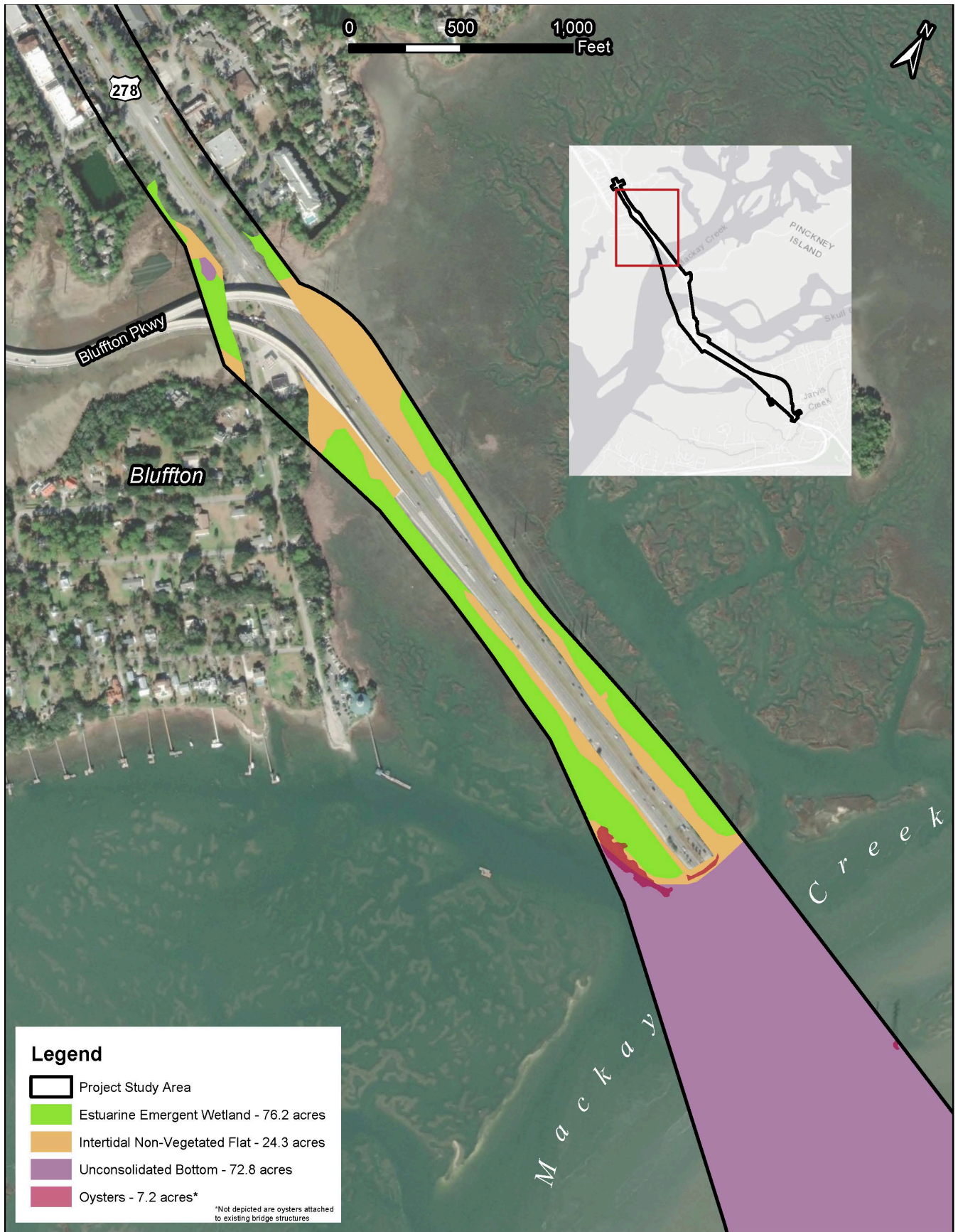


Figure 4-3: Essential Fish Habitat Overview – Bluffton and Mackay Creek

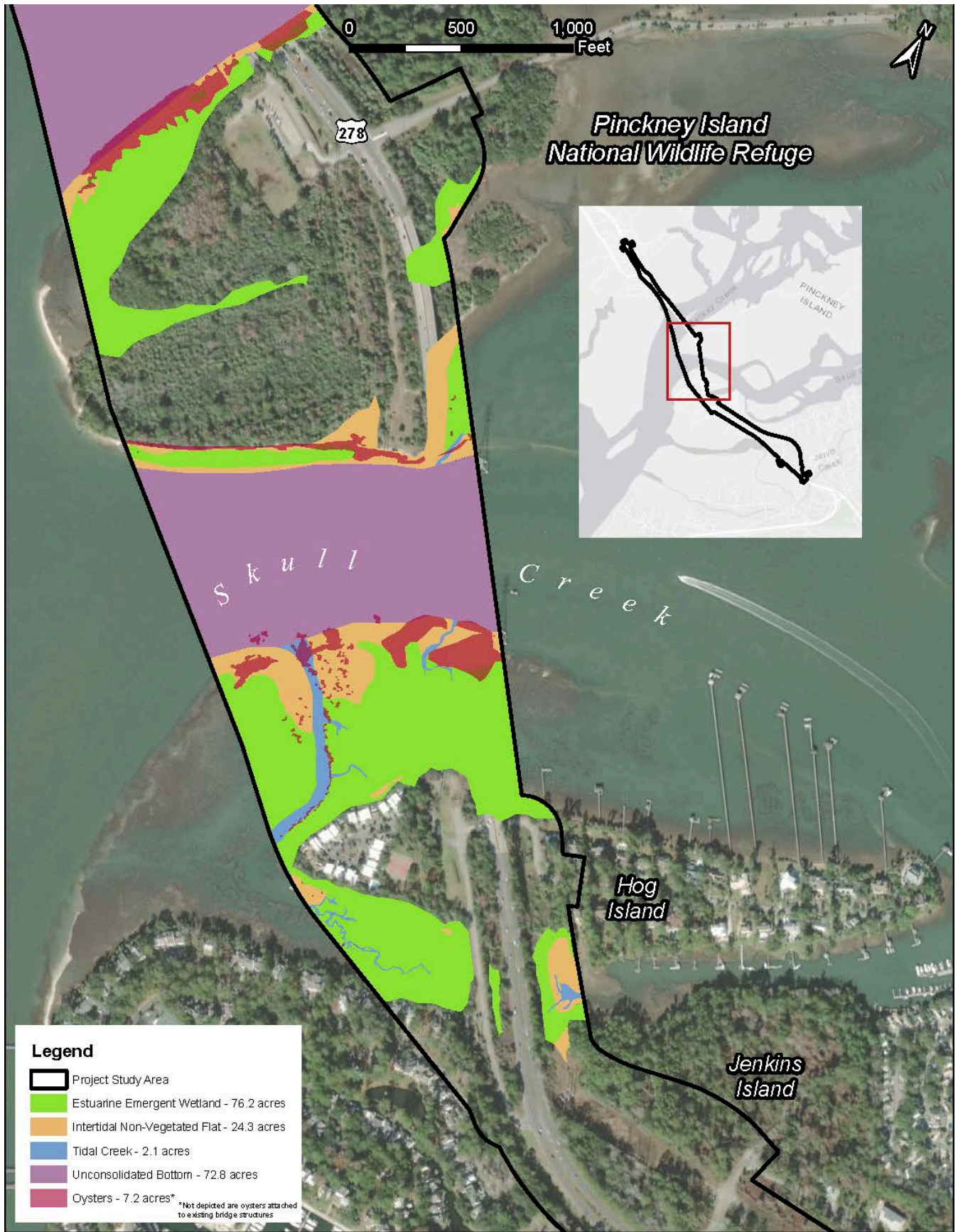


Figure 4-4: Essential Fish Habitat Overview – Pinckney Island, Skull Creek, Hog Island and Jenkins Island

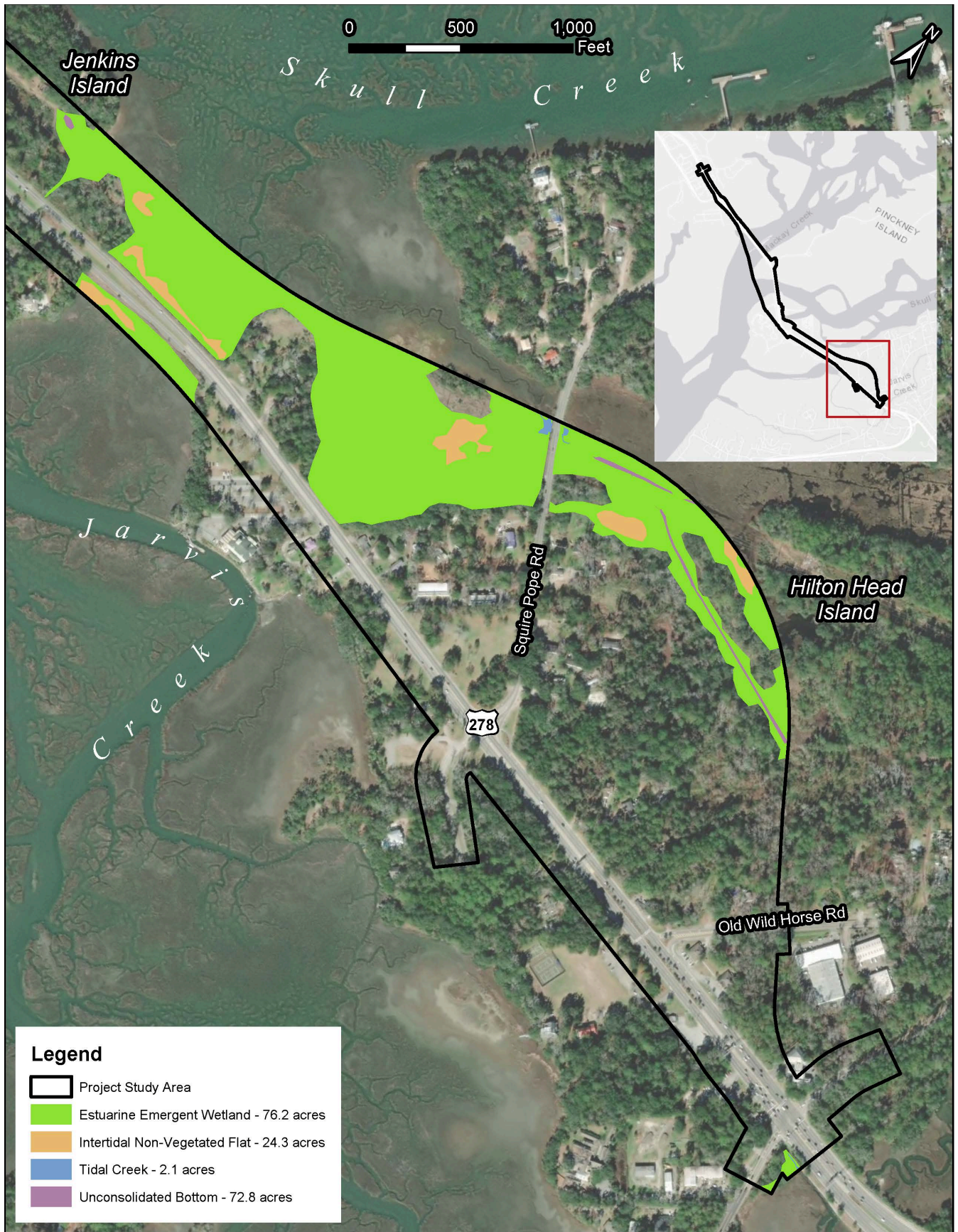


Figure 4-5: Essential Fish Habitat Overview – Jenkins Island, Hilton Head Island, Jarvis Creek & Skull Creek

4.2.1 Estuarine Emergent Wetland



Estuarine emergent wetland
(Photo by Three Oaks Engineering)

Estuarine emergent wetlands are salt or brackish marshlands that are intertidal, or regularly inundated by the tide cycle. The vegetation of these wetlands is typically dominated by one or two plant species that remain standing until the beginning of the next growing season (USFWS, 1979). This habitat serves as a nursery for many fish and other aquatic organisms. The high primary productivity of estuarine emergent wetlands provides abundant food stores for prey species and larval fish in the form of detritus. The shallow water column of these wetlands during high tides provides both a low-energy environment away from wave action and currents as well as a refuge for these organisms to avoid predation by larger predators. Other ecosystem services provided by estuarine emergent wetlands are the trapping of pollutants, storing of sediment, and the attenuation of floodwaters (SAFMC, 2016a).

Estuarine emergent wetlands within the project area mostly dominated by Smooth cordgrass (*Sporobolus alterniflora*). Areas of slightly higher elevation that receive less saltwater during the tide cycle are dominated by Black needlerush (*Juncus roemerianus*). Some areas of estuarine emergent wetland receive shading impacts from the existing US 278 bridges. This results in a reduction of function provided by the estuarine emergent wetland but does not change the type of habitat. This habitat covers approximately 76 acres within the cumulative PSA.

4.2.2 Intertidal Non-Vegetated Flat

An intertidal area is a subsystem of an estuarine environment that lies between the high and low tide lines (USFWS, 1979). Intertidal non-vegetated flats are sediment deposits that occur across areas of gentle slope within the intertidal zone. These are dynamic habitats because of the drastic changes in salinity and temperature that occur each tide cycle (SAFMC, 2020c). Despite being called “non-vegetated”, these flats can have extensive communities of microalgae that benefit macroinvertebrates and other benthic feeders.



Along the South Atlantic coast, these flats typically have very fine sediments, which are inhabitable by benthic organisms such as nematodes, copepods, annelids, bivalves, etc. High tide brings food and predators onto the flat while low tide provides residents a temporal refuge from the mobile predators

(SAFMC, 2020c). Therefore, intertidal non-vegetated flats are important foraging habitat for managed species. Intertidal non-vegetated flats cover approximately 24.3 acres of the cumulative PSA. These intertidal non-vegetated flats are fully functional in that all ecosystem services essential to fisheries are present. Existing disturbances, such as the existing US 278 structures, have not significantly altered functions of this habitat. The intertidal flats located within the project area are functioning as high quality EFH.

4.2.3 Tidal Creek



Tidal creek
(Photo by Three Oaks Engineering)

Tidal creeks are sinuous drainage channels that are subject to the ebb and flow of each tide cycle. As the tide rises, tidal waters flow upstream filling the channel before spilling into the surrounding marshlands. The depths of tidal creeks vary depending on tide range, land use, and distance upstream from coastal inlet channels. Shallow depths of tidal creeks serve as nurseries for fish, crustaceans, and mollusks because they are inaccessible to larger predators (SAFMC, 2016a). Tidal creeks also have soft-bottom substrate that provides benefits like those provided by intertidal flats.

Tidal creek habitat within the cumulative PSA are tributaries associated with Skull Creek and Jarvis Creek. The depths of these tidal creeks were observed to be less than one foot at low tide. Tidal creeks account for approximately 2.2 acres within the cumulative PSA. The tidal creeks in the PSA are fully functional in that all ecosystem services essential to fisheries are present. Existing disturbances, such as the existing US 278 structures, have not significantly altered functions of this habitat.

4.2.4 Unconsolidated Bottom

Unconsolidated bottom includes all wetland and deep-water habitats with at least 25% cover of particles smaller than stones, less than 30% vegetative cover, and subtidal, permanently flooded, intermittently exposed, or semi-permanently flooded water regimes (USFWS, 1979). This designation was chosen to describe the group of habitats that are permanently to semi-permanently beneath tidal waters. There are two types of unconsolidated bottom habitat located within the cumulative PSA: the main channels of Mackay and Skull Creeks and man-made ponded features.



Unconsolidated bottom
(Photo by KCI Technologies)

Mackay Creek and Skull Creek flow between Port Royal Sound and Calibogue Sound. The channel of Mackay Creek within the PSA is up to 21 feet deep. The channel of Skull Creek within the PSA is up to 25 feet deep at low tide. The depth of the water level fluctuates with the range of the tide. These waterbodies have a soft-bottom substrate and a stable water column that provides spawning and foraging habitat for benthic and pelagic organisms.

Man-made unconsolidated bottom features found within the cumulative PSA are excavated pond features that do not have obvious surface connectivity to other unconsolidated bottom or tidal creek habitats. These features are surrounded by estuarine emergent wetlands and intertidal non-vegetated flats but are lacking in vegetative cover and maintain a stable depth of saline waters at low tide. Unconsolidated bottom habitat accounts for approximately 72.8 acres within the cumulative PSA. This habitat is fully functional in that all ecosystem services essential to fisheries are present. Existing disturbances, such as the existing US 278 structures, have not significantly altered functions of this habitat.



Unconsolidated bottom
(Photo by Three Oaks Engineering)

4.3 HABITAT AREAS OF PARTICULAR CONCERN

4.3.1 Oysters

The Eastern oyster (*Crassostrea virginica*) is commonly found along the coast of South Carolina. Oysters primarily settle and develop in intertidal habitats creating beds, reefs, or banks. These reefs contain live oysters as well as remaining shells from previous generations (NOAA, 2020e). Oysters and other shellfish are monitored by SCDHEC and regulated by South Carolina Department of Natural Resources (SCDNR).



Oysters on existing bridge structures in Skull Creek.
(Photo by Three Oaks Engineering)

Waters within the project area are within SCDHEC Shellfish Management Growing Area 20. Shellfish harvesting is prohibited within the waters around Hog Island and in Skull Creek north of US 278. Shellfish harvesting is restricted in the waters around Jenkins Island and Hilton Head Island south of US 278. All other waters within the PSA are approved for shellfish harvesting by SCDHEC.

SCDNR regulates designated State and Public Shellfish Grounds within the SCDHEC Shellfish Management Growing Areas. Waters within the PSA north of US 278 and east of Pinckney Island are within State Shellfish Ground S038. Waters within the PSA along the western shore of Pinckney Island are within Public

Shellfish Ground R037. All other waters within the PSA are within State Shellfish Ground S029 (SCDNR, 2019). Spatial data from 2015 of intertidal oyster reefs and shell deposits located by SCDNR was used to map oyster locations prior to conducting field assessments. During field assessments, oysters were found in several areas not included in the 2015 data. Clusters of oysters were found occupying most artificial hard surfaces (bridge piles, riprap, etc.). Several oyster beds were also found on natural surfaces. The locations of these oyster beds were collected by GPS. This data in combination with the 2015 data was overlaid onto the essential fish habitat types to display where they occurred within the PSA.

Oysters that were present along riprap, natural habitats, and other horizontal surfaces were captured with point data and logged on a GPS. Oysters occupying vertical, artificial surfaces are not displayed in the map figures, but this coverage was also estimated and included in the total acreage. The height of oysters on vertical surfaces was estimated in the field. These heights were dependent upon the water depth and tide cycle. Bridge columns nearest the banks of Mackay Creek and Skull Creek ranged in height from 1-3 feet, while the columns closer to the middle of the channels were estimated to be up to 6 feet. Approximately 6.4 acres of oysters exists on natural surfaces and 0.8 acres of oysters exists on bridge structures within the PSA. The total estimated coverage of oysters is 7.2 acres.



Oysters growing on natural mounds in estuary.
(Photo by KCI Technologies)

4.4 WATER QUALITY

The South Carolina Department of Health and Environmental Control (SCDHEC) develops a priority list of waterbodies that do not currently meet state water quality standards pursuant to Section 303(d) of the Clean Water Act (CWA) and 40 CFR § 130.7. It is commonly referred to as the 303(d) List of Impaired Waters. There are no 303(d) listed waters found within the PSA. SCDHEC also designates suitable Shellfish Harvesting Waters (SFH), determines water quality classifications and standards for the State. Mackay Creek and Skull Creek are both classified by SCDHEC as SFH.

SCDHEC monitors the water quality of Mackay Creek and Skull Creek with ambient water quality monitoring stations. These stations are used for “determining long-term water quality trends, assessing attainment of water quality standards, identifying locations in need of additional attention, and providing background data for planning and evaluating stream classifications and standards” (SCDHEC, 2018). There are two shellfish monitoring stations located within the PSA. Shellfish Harvest station 20-07 monitors Mackay Creek and is located near the existing US 278 bridge adjacent to Buckingham Landing. Station 20-10 monitors Skull Creek and is located near a small tidal creek near the Mariners Cove development. Neither of these stations are currently listed for water quality impairments. Figure 4-6 depicts the SFH water classifications and locations of these water quality monitoring stations.

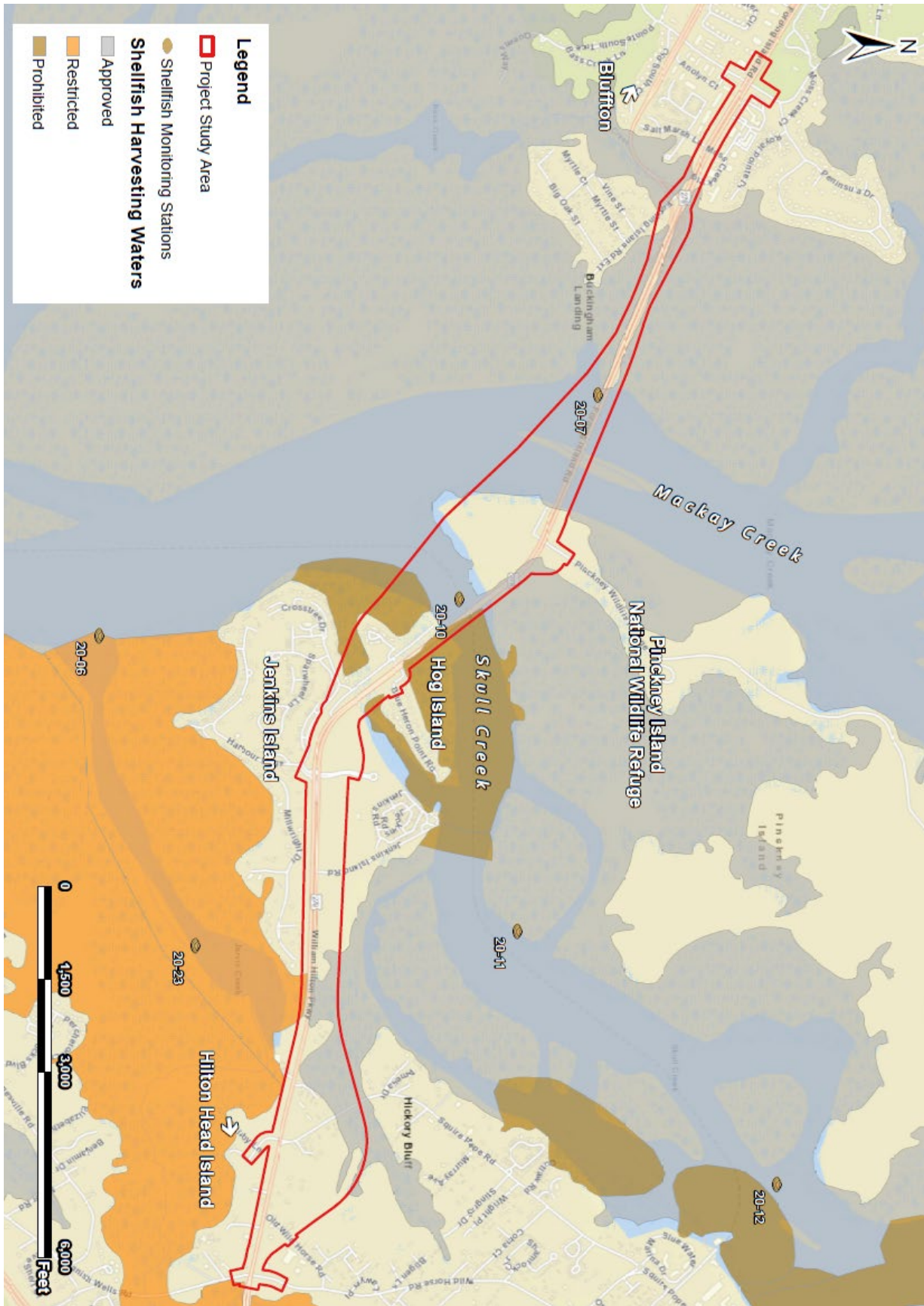


Figure 4-6: Shellfish Harvesting Waters

5.0 ALTERNATIVES ANALYSIS

The sections below briefly discuss the No-Build Alternative and the process that identified the Recommended Preferred Alternative. The analysis was conducted in coordination with federal and state regulatory agencies, project stakeholders, and public involvement. Chapter 3 of the Environmental Assessment provides a more detailed description of how alternatives were analyzed and evaluated for the project.

5.1 NO BUILD ALTERNATIVE

Under the No Build Alternative, EFH would remain as described in Section 4. The existing roadway and bridges would remain in place with no additional structures being placed in EFH. No long-term effects are expected from the No Build Alternative. However, the No Build Alternative does not meet the purpose and need of the project and was therefore only considered as a baseline for existing conditions during the alternative analysis and evaluation.

5.2 PRELIMINARY RANGE OF ALTERNATIVES

A wide range of alternatives were developed and analyzed to determine compatibility with the project's purpose and need to repair the structurally deficient bridge over Mackay Creek. Nineteen preliminary alternatives, assuming three lanes in each direction, were developed, including:

- No-Build
- Transportation System Management/Transportation Demand Management (TSM/TDM)
- Mass Transit
- Build Alternatives

Of these nineteen alternatives, six were carried forward for further analysis as Reasonable Alternatives. Figures and descriptions of each of the Preliminary Range of Alternatives, as well as the criteria used to assess each preliminary alternative can be found in Chapter 3 of the Environmental Assessment.

5.3 REASONABLE ALTERNATIVES

The six alternatives carried forward as Reasonable Alternatives were updated based on input from stakeholders, the public, and regulatory agencies as part of the continued alternatives analysis. Modifications resulted in three additional alternatives for consideration. A total of nine reasonable alternatives were ultimately analyzed to identify the Recommended Preferred Alternative 4A. Additional figures and descriptions of each of the Reasonable Alternatives, as well as the criteria used to assess each alternative can be found in Chapter 3 of the EA. Figure 5-1 depicts the nine reasonable alternatives evaluated. Additional figures and descriptions of each of the Reasonable Alternatives, as well as the criteria used to assess each alternative can be found in Chapter 3 of the Environmental Assessment.

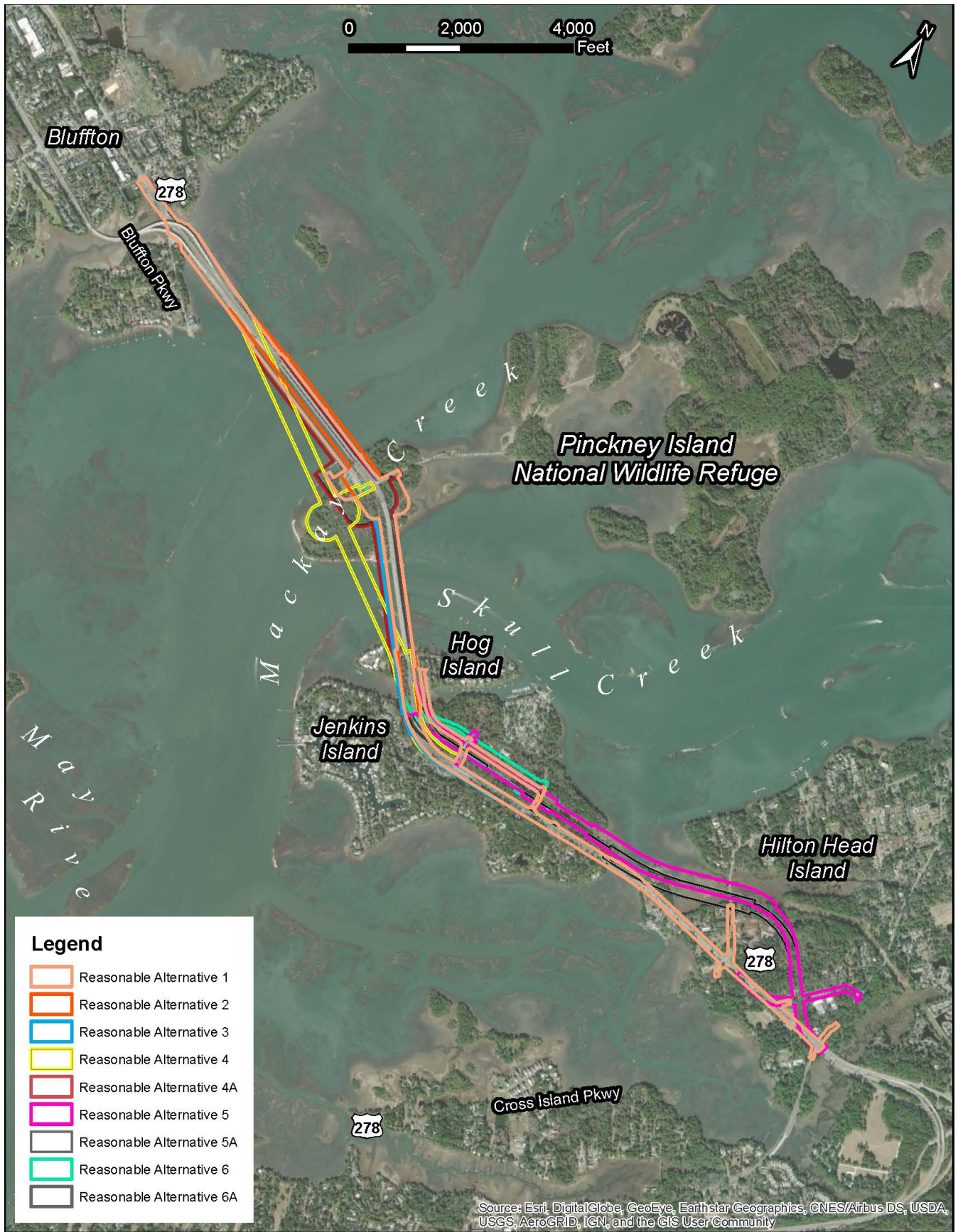


Figure 5-1: Reasonable Alternatives

5.4 RECOMMENDED PREFERRED ALTERNATIVE 4A

The Recommended Preferred Alternative 4A is approximately 4.11 miles long and includes widening the existing US 278 corridor to six lanes from Salt Marsh Drive to Mackay Creek bridge, building a new six-lane structure that bridges both Mackay Creek and Skull Creek south of the existing US 278 alignment and connecting back to the existing US 278 corridor at the end of the existing Skull Creek bridges. The existing Mackay Creek bridges and Skull Creek bridges will be removed once construction is complete. A new right-in/right-out interchange will be constructed at the PINWR and C.C. Haigh, Jr. Boat Landing closer to the existing interchange alignment allowing vehicles to pass underneath the existing bridges to access either side and provide full access to US 278. The existing at-grade intersection on PINWR will be decommissioned.

This alternative relocates the existing Blue Heron Point Drive to the existing US 278 roadbed and improves the intersection with Gateway Drive. This will also include a new bridge over the tidal area between Hog Island and Jenkins Island. The new bridge and roadway associated with Hog Island is needed to provide more efficient ingress/egress to properties on Hog Island. In addition, the revised Hog Island access allows for improved maintenance of traffic during construction. The Recommended Preferred Alternative 4A also widens the existing US 278 corridor to six-through lanes through Jenkins Island to Spanish Wells Road. The widening would primarily occur in the median on Jenkins Island and transitions to widen along the north side of US 278 from the eastern side of Jenkins Island to Spanish Wells Road.

The Recommended Preferred Alternative 4A consisted of the least amount of total wetland impacts and lowest impacts to tidal salt marsh/critical area wetlands when compared to the other Reasonable Alternatives. This alternative would also have minimum ROW and relocation impacts in comparison to the other Reasonable Alternatives.

The existing Mackay Creek and Skull Creek bridges do not meet current seismic design standards. The Recommended Preferred Alternative 4A would result in a new 6-lane facility with one new bridge over Mackay and Skull Creeks, as well as one new bridge on a new local connector road between Hog Island and Jenkins Island, that would meet current seismic design standards. These new structures would add longevity and increased safety to this singular link between Beaufort and Hilton Head.

Coordination with USFWS completed on January 30th, 2020 to discuss the reasonable alternatives revealed the Recommended Preferred Alternative was the most consistent with PINWR purposes. USFWS expressed that this alternative was the best alternative for their maintenance and regulatory needs. This alternative also results in fewer impacts on PINWR due to the proposed new facility being elevated.

5.4.1 Refinements to the Recommended Preferred Alternative 4A

Following the selection of the Recommended Preferred Alternative 4A, additional analysis was completed to review and determine potential effects to protected species based on the footprint of only the Recommended Preferred Alternative 4A. Since the previous versions of the BE, there have been refinements to the Recommended Preferred Alternative 4A footprint due to design modifications. These design modifications were required to meet SCDOT and FHWA design standards for the proposed bridge and roadway approaches as well as the intersection improvements within the project corridor.

The proposed new bridge over Mackay Creek and Skull Creek remains in its initial design alignment but was lengthened, as were the span lengths along the bridge. These modifications resulted in changes to

the size of proposed bridge support structures described and quantified in the previous version of the EFH assessment. The roadway design modifications predominantly affected the potential limits of clearing and earthen fill materials placement as quantified in the previous version of the EFH Assessment. Modifications to the proposed connector road and bridge between Hog and Jenkins Island were minimal.

The modifications to the Recommended Preferred Alternative 4A also resulted in changes to the refined evaluation area, which led to changes in the previously reported percent coverage of habitat types. Table 5-1 provides an updated total of the habitat types identified within the expanded Recommended Preferred Alternative 4A evaluation area.

Table 5-1: Identified EFH within Refined Recommended Preferred Alternative 4A

Habitat Type	Quality	Area (acres)	Percentage of Total EFH
Estuarine Emergent Wetland	High – Fully Functional	36.5	39%
Intertidal Non-Vegetated Flat	High – Fully Functional	17.2	18%
Tidal Creek	High – Fully Functional	0.6	1%
Unconsolidated Bottom	High – Fully Functional	34.9	37%
Oysters (HAPC)	High – Fully Functional	5	5%
TOTAL EFH	-	94.2	100%

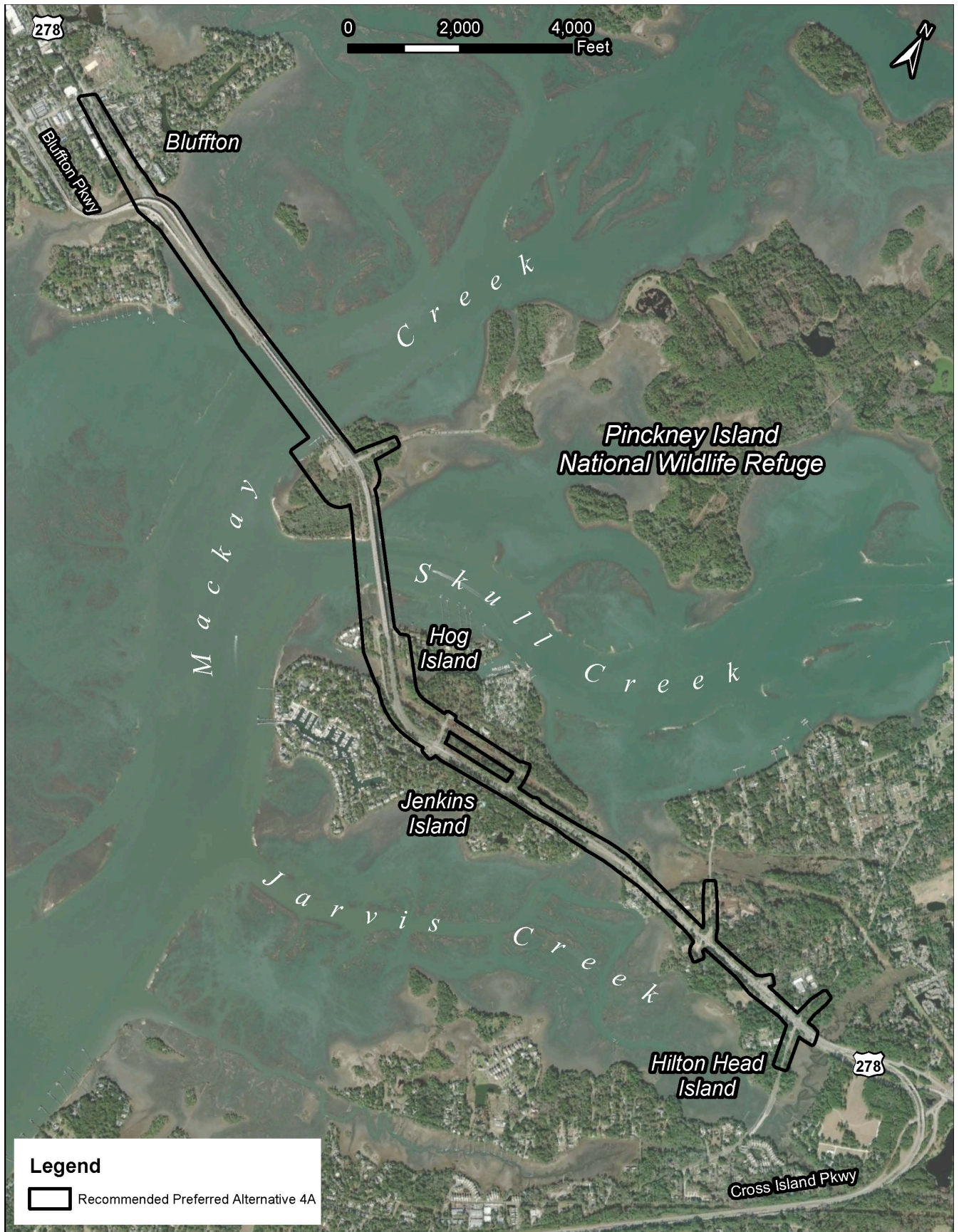


Figure 5-2: Recommended Preferred Alternative 4A

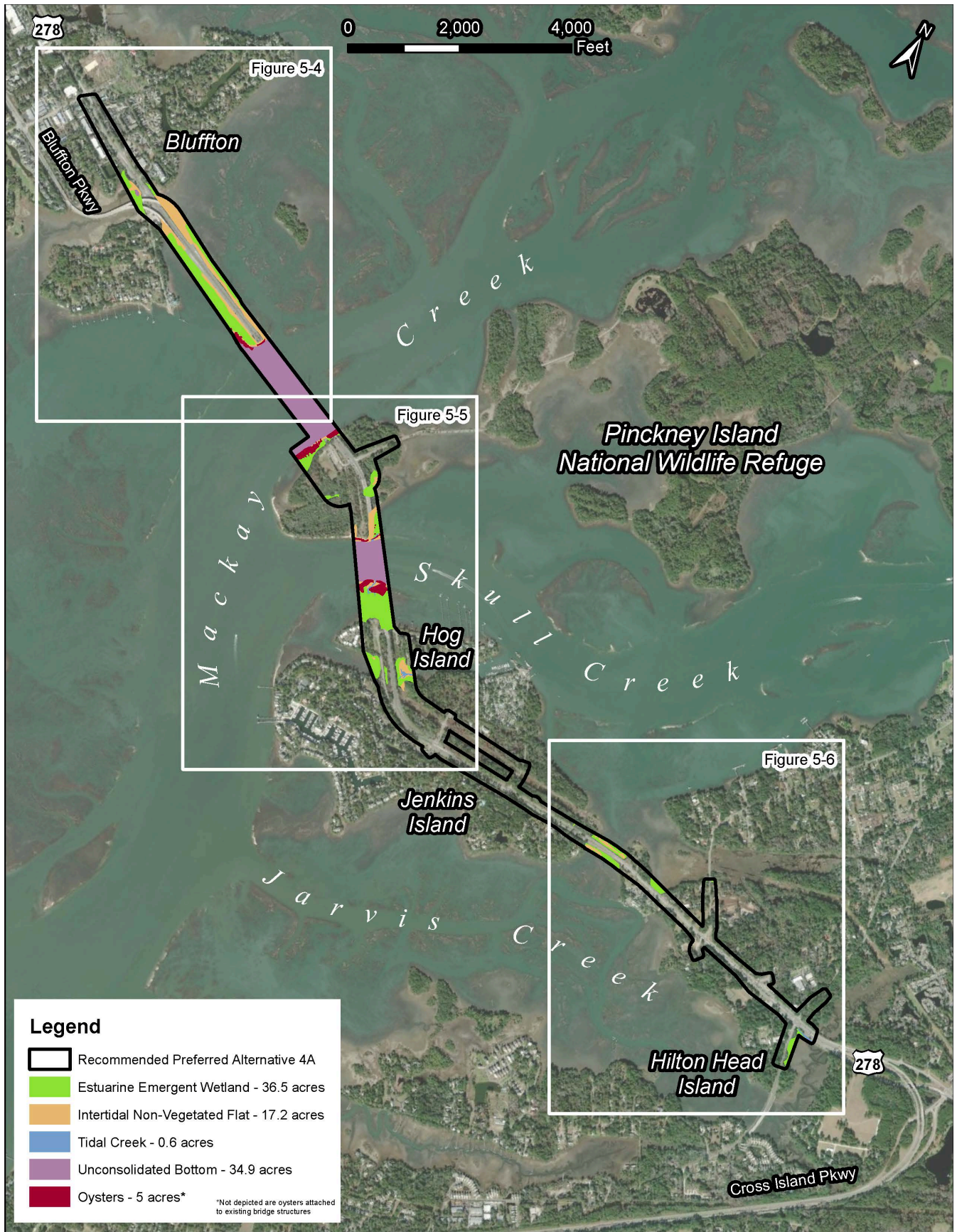


Figure 5-3: EFH within the Recommended Preferred Alternative

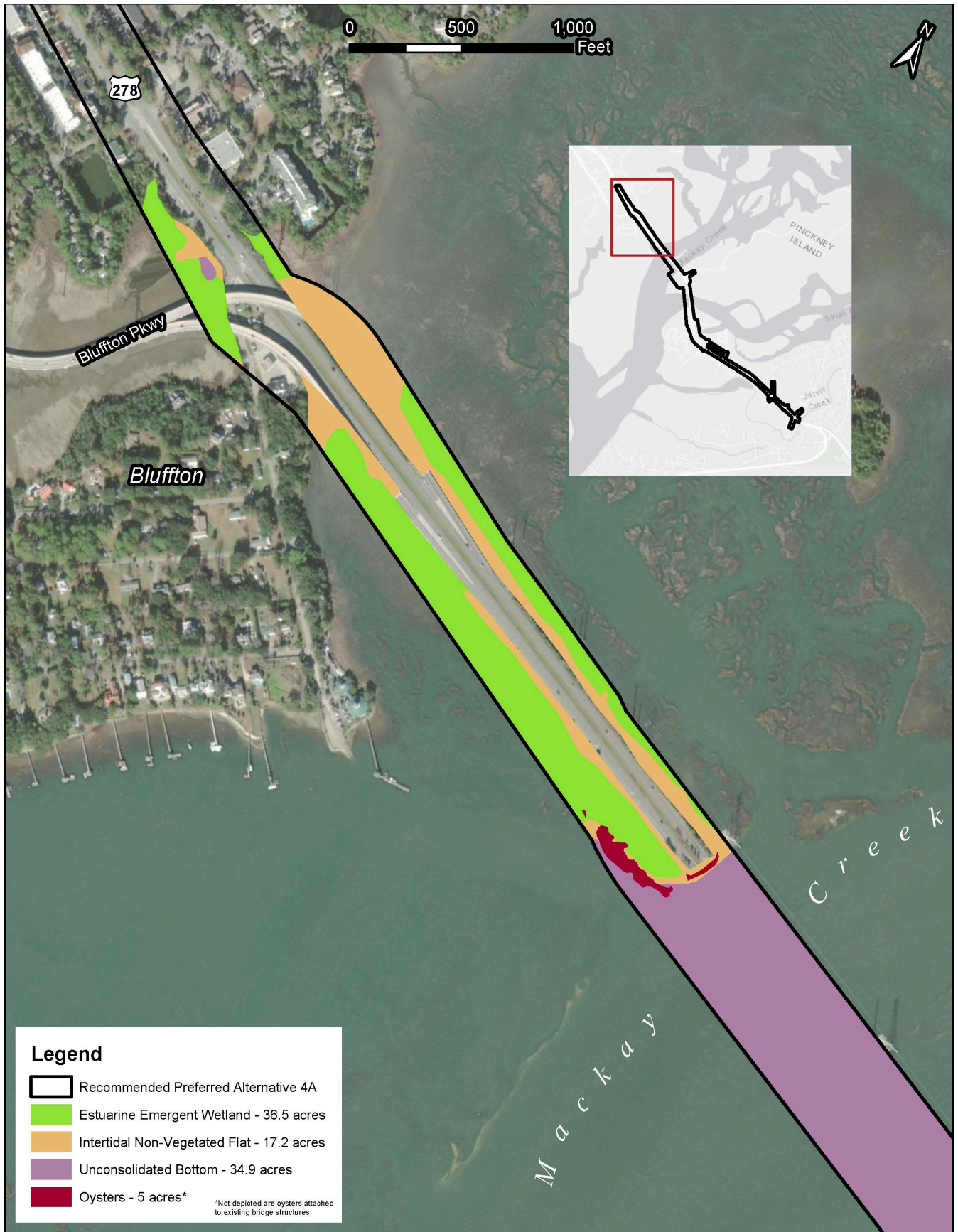


Figure 5-4: Recommended Preferred Alternative EFH – Near Bluffton and Mackay Creek

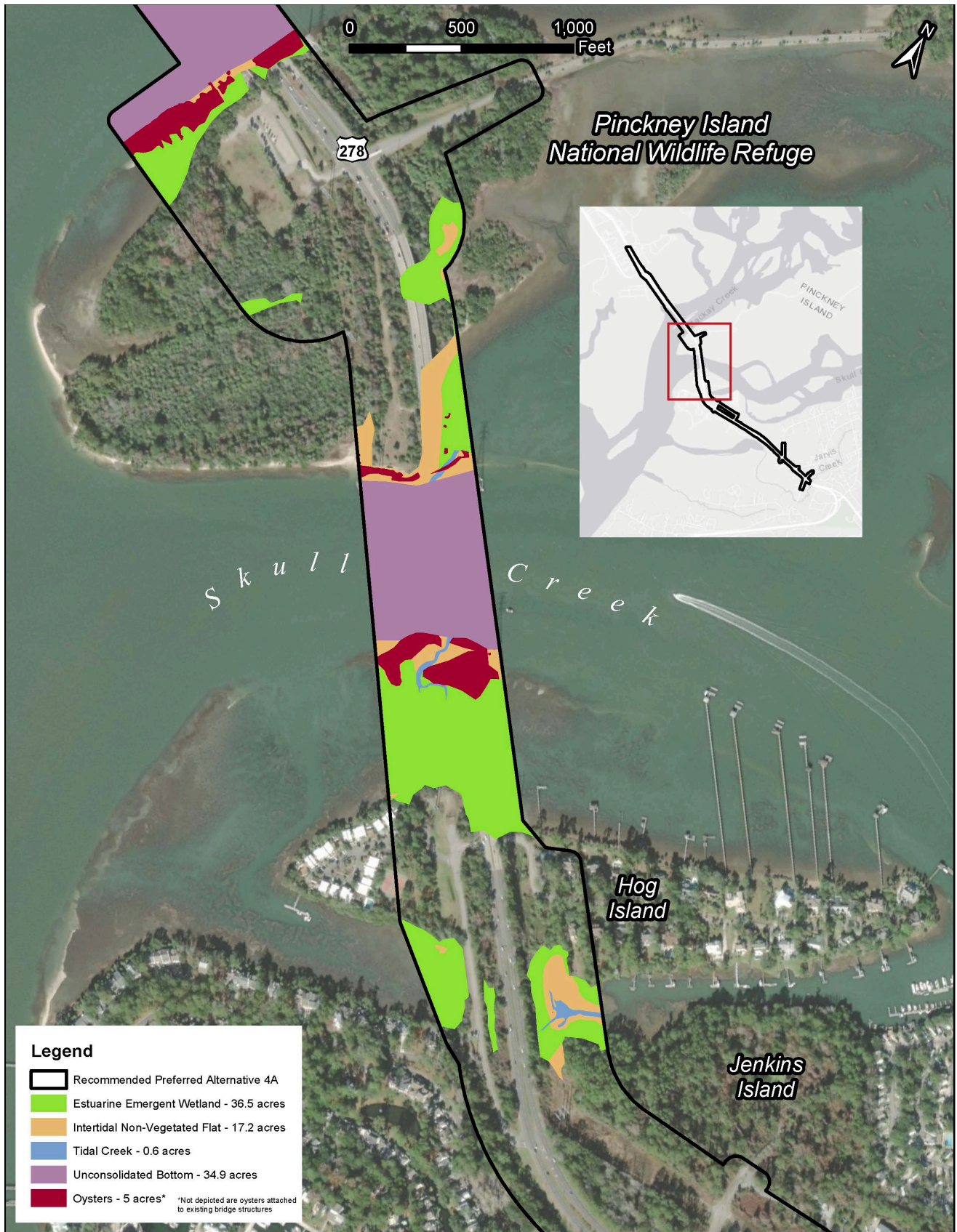


Figure 5-5: Recommended Preferred Alternative 4A EFH - Pinckney Island, Skull Creek, Hog Island and the western portion of Jenkins Island

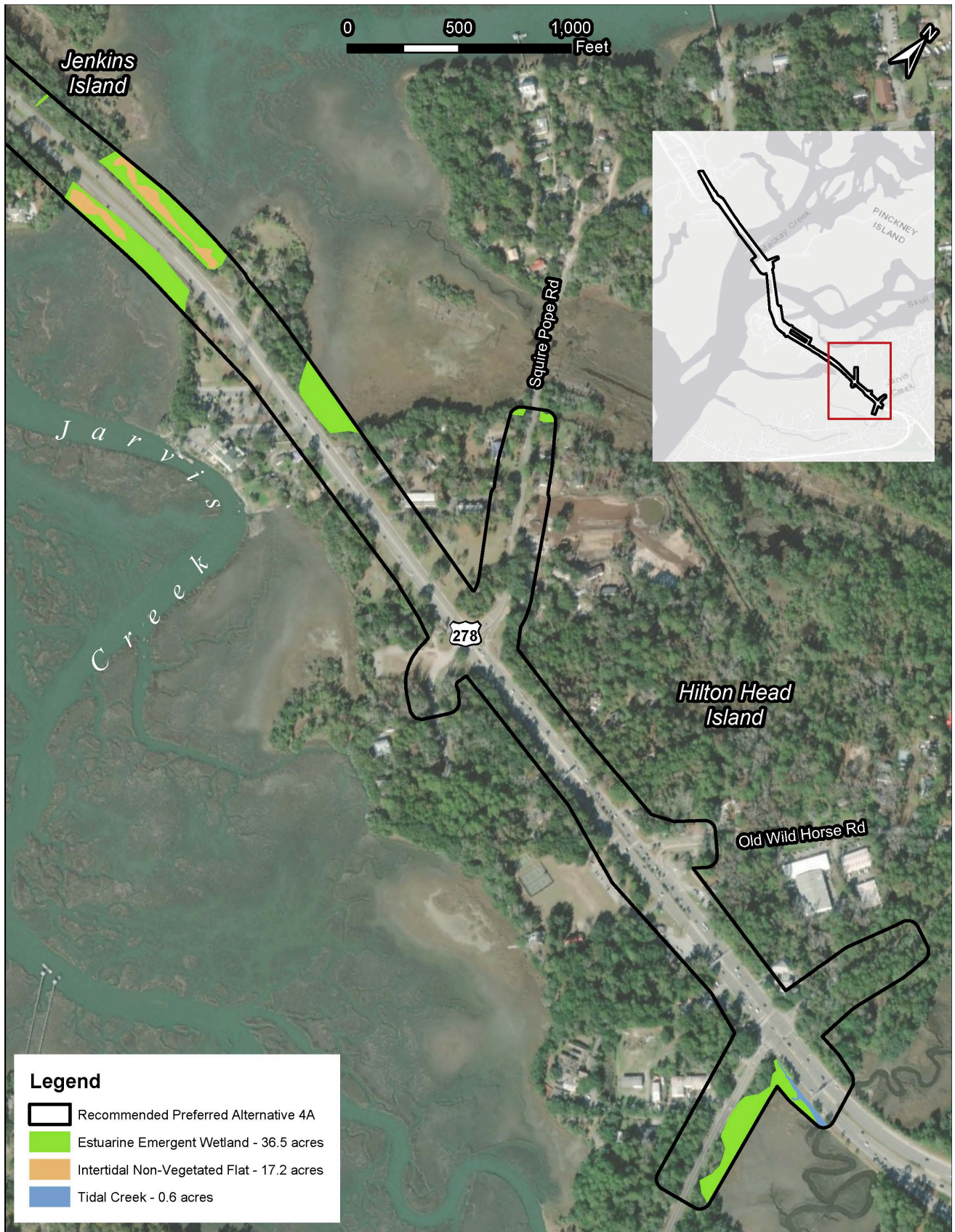


Figure 5-6: Recommended Preferred Alternative EFH – Eastern portion of Jenkins Island, part of Hilton Head Island, Jarvis Creek and Skull Creek

6.0 PROPOSED ACTION

The purpose of the project is to address structural deficiencies at the existing eastbound Mackay Creek bridge and reduce congestion within the project study area (PSA). While the original purpose of this project was to replace the structurally deficient eastbound Mackay Creek Bridge, the project has grown to include improvements throughout the corridor between Moss Creek Drive and Wild Horse/Spanish Wells Road. The eastbound Mackay Creek bridge (traveling to Hilton Head Island), which crosses the Intracoastal Waterway, would be replaced as part of SCDOT's bridge replacement program. The other three bridges in the PSA—the westbound bridge over Mackay Creek and the eastbound and westbound bridges over Skull Creek—have also been identified for potential improvements. In addition, the access to Pinckney Island National Wildlife Refuge (PINWR) and the C.C. Haigh, Jr. boat landing have also been considered for possible improvements.

The proposed action would result in impacts to EFH due to the construction of new bridge approaches and structures and the demolition/removal of existing bridge approaches and structures over Mackay Creek, Skull Creek, and associated wetlands. Construction is expected to occur between 2023 and 2026. The following is a discussion of the proposed construction activities associated with the US 278 Corridor Improvement project. Some of the proposed activities may have permanent effects to EFH; while others will be temporary in nature and may vary in magnitude during construction. The proposed construction activities described below are based on conceptual plans and “worst-case” scenarios for fill limits, bridge supports, and temporary construction access techniques. All potential fill impacts to EFH within the project area are based on the conceptual construction limit plus an additional 50-foot buffer to represent a “worst-case” scenario.

Estimated impacts to other environmental factors are addressed in more detail in Chapter 4 of the EA. Impacts to wetlands will be addressed in more detail in the Section 404/401 permit application.

6.1 CONSTRUCTION ACTIVITIES

6.1.1 Site Preparation

SCDOT and/or the contractor will develop a Stormwater Pollution Prevention Plan (SWPPP) and obtain both a land disturbance permit and a National Pollutant Discharge Elimination System (NPDES) permit from the SCDHEC before construction can commence. SCDOT will require the contractor to properly install the required erosion, turbidity, and sediment control devices prior to all other construction activities. The contractor will be required to install these measures around the perimeter of the active construction site, including any off-site staging areas. After the installation of erosion, turbidity and sediment control measures, the contract will begin the project staging area preparation and general site preparation.

To prepare the general project area for construction and establish staging areas, the contractor may need to clear vegetation and remove stumps, roots, and/or debris. Clearing may occur in uplands, estuarine emergent, palustrine emergent, and forested wetlands in the project area. The contractor may also grade portions of the project area to establish a suitable work environment. Staging areas will be selected by

the contractor to establish a construction site office and will also include construction material, equipment, and fuel storage. Staging areas are expected to be predominantly located in uplands.

6.1.2 Roadway Construction

Once the project area has been prepared, the contractor will begin construction of the proposed bridge approaches, roadway widening and associated intersection improvements. Bridge approach, roadway widening, and intersection improvement construction will consist of placing clean fill materials throughout the project area. The fill will then be compacted and formed into the roadway prism and shoulder slopes.

6.1.3 Bridge Construction Access

Temporary access for the construction of the bridge supports and superstructure will be required. Bridge construction access may be required throughout the life of the project (approximately three years). There are many ways the contractor could establish temporary access such as the use of temporary causeways made of fill, floating barges, or temporary work trestles. It is possible the contractor may elect to use a different method for bridge construction access, but any method selected will be required to comply with all applicable permits and/or environmental commitments for the project.

To evaluate a “worst-case” scenario for potential impacts to protected species, SCDOT is assuming the contractor will utilize temporary trestles to the maximum extent practicable in shallow waters. The contractor will be responsible for the design of the trestle, so all numbers provided are estimates based on a conceptual design. This assessment assumes the contractor would install a 40-foot-wide temporary work trestle in shallow estuarine emergent wetlands. The trestle would parallel the proposed new bridge location and include shorter 30-foot-wide sections (fingers) between the bents to allow full construction access along this portion of the project. It is assumed the trestle could be constructed using a top-down method with minimal need for additional construction access for the installation of the trestle.

Channel depths at mean low tide range from approximately 14 to 20 feet deep in Mackay Creek and approximately 20 to 25 feet deep in Skull Creek (NOAA 2021e). Survey data and as-built plans of the existing bridges collected during the preliminary engineering indicates Skull Creek depths are approximately 30 to 40 feet deep at the center of the channel. For bridge construction access in these deeper waters of Mackay Creek and Skull Creek, the contractor will likely use work barges anchored in place by spuds set in the substrate. The total number of required barges would be at the discretion of the contractor and is unknown at this time.

For the secondary connector bridge between Hog Island and Jenkins Island, it is anticipated that construction access would be achieved through adjacent upland habitat, bridge approach fills, and top-down methods as the bridge is built.

6.1.4 Bridge Construction

The proposed project will require construction of two new permanent bridges: one mainline US 278 bridge that will span both Mackay Creek and Skull Creek and one bridge that will connect Hog Island and Jenkins Island as part of a new local connector road.

New US 278 Bridge over Mackay Creek and Skull Creek

The new mainline US 278 bridge will be a singular structure that will carry six lanes of traffic and a multi-use path from the mainland to Jenkins Island (see the bridge typical section provided in Appendix B). This new bridge will be 132-foot-wide bridge and approximately 6,750 feet long and will span the entire bank to bank channel width of Mackay Creek (2,107 feet) and Skull Creek (763 feet). The new structure will be constructed parallel to and approximately 55 feet southwest of the existing bridge structures. The existing bridges will remain open to traffic until such time traffic can be shifted onto the new structure prior to demolition.

The bridge design has undergone revisions since the analysis completed in July 2020. These revisions include a lengthening of bridge spans from 100 feet to 175 feet long, thereby reducing the number of bents and piles required to support the replacement bridge. Additionally, the bridge has been lengthened on either end which will reduce the earthen fill previously designated in estuarine habitats.

The refined conceptual design for the main bridge over Mackay Creek and Skull Creek proposes three different sized drilled shafts, measuring approximately 72 inches, 96 inches, and 120 inches in diameter, for the permanent bridge support structures. The construction of drilled shaft bridge columns will require the contractor to install a permanent steel casing to ensure the drilled shaft remains open and does not collapse prior to the pouring of concrete. Drilled shafts are expected to be installed by the following process:

1. Install the casing using a vibratory hammer until refusal
2. Repeat process to install all required casings for the respective bridge bent
3. Drill/auger inside casing to set final depth (if necessary) and to prepare for rebar cage installation
4. Install rebar cage
5. Pour concrete inside the casing
6. Repeat steps above until the respective bent is complete

Connector Bridge between Hog Island and Jenkins Island

The second bridge is proposed as part of a new connector road between Hog Island to Jenkins Island. This second bridge will be approximately 36 feet wide, 300 feet long, and will span the small tidal creek and most of the adjacent estuarine emergent wetlands. The bank to bank width of the cove is 388 feet. The clearance of the connector bridge will be approximately 5 feet at high tide, approximately 9 feet at mean tide, and approximately 10 feet at low tide. The new connector road bridge will be supported by 24-inch pre-stressed concrete piles. The 24-inch prestressed concrete would be installed by the following process:

1. Install piles and hammer them until they reach the required depths
2. Repeat process to install all required casings for the respective bridge bent

6.1.5 Bridge Demolition

There are currently four bridges in the US 278 corridor: two bridges over Mackay Creek and two bridges over Skull Creek. The existing bridges have separate structures for eastbound and westbound traffic over the respective waterbodies. The existing bridges over Mackay Creek were originally constructed in 1956 (eastbound) and 1983 (westbound). Both are approximately 2,200 feet long and approximately 25 feet above mean high tide. The existing bridges over Skull Creek were constructed in 1982 and 1983 and are both approximately 2,800 feet long. These bridges are approximately 65 feet above mean high tide. All four of the existing bridges are approximately 36 feet wide. A copy of bridge plan profile sheets for the

existing bridges are included in Appendix C. These existing bridges, along with old approach fills, will be removed in their entirety once construction of the new bridge is completed.

All four bridge decks and superstructures are comprised of mostly concrete. The Mackay Creek bridges are supported by 18-inch and 20-inch prestressed concrete piles. The Skull Creek bridges are supported by a combination of 18-inch and 20-inch prestressed concrete piles and steel H-piles. A summary of the in-water bridge support structures to be removed for each of the four bridges is presented in Table 6-1.

Table 6-1: Existing In-Water Bridge Support Structures to Be Removed

Location	Type	Quantity	Bents
Westbound Mackay Creek	18-inch Prestressed Concrete Pile	372	51
Eastbound Mackay Creek	18-inch Prestressed Concrete Pile	276	51
Westbound Skull Creek	18-inch Prestressed Concrete Pile	300	12
	20-inch Prestressed Concrete Pile	190	6
	10-inch H-Pile	248	4
Eastbound Skull Creek	18-inch Prestressed Concrete Pile	300	12
	20-inch Prestressed Concrete Pile	190	6
	10-inch H-Pile	248	4
TOTAL		2,124	95

It is expected the contractor will implement standard bridge demolition techniques such as the use of concrete saws and jack hammers to dismantle the bridge decks. The demolition of substructure and bridge supports may be removed by direct pull, vibratory hammer, or cutting piles with saws, torches, or other cutting tools. Non-hazardous demolition debris will be hauled off site and disposed of in accordance SCDOT policy and SCDHEC regulations.

Final demolition plans are the responsibility of the contractor and therefore are not currently available. SCDOT will require the contractor to submit a bridge demolition plan, prepared by professional engineers, for review and approval prior to beginning structure removal. Because Mackay Creek and Skull Creek are navigable waters, the demolition plan will require additional coordination with the US Coast Guard (USCG). If explosives are required for demolition the contractor, SCDOT, and FHWA will initiate additional coordination and consultation with the USFWS and NOAA Fisheries.

6.2 BRIDGE FENDER SYSTEM

The new bridge will include a fender system to protect the bridge from damage by watercraft. The new fender system will be designed to accommodate all required uses of the waterway. The proposed fender system will be designed for both recreational watercrafts, as well as larger vessels such as commercial fishing boats and tugboats. The fender elements would likely consist of rubber fenders, with a steel panel and polyethylene facing. Additional prestressed concrete piles will be required to support the new fender systems.

6.3 STORMWATER RUNOFF

The existing bridges over Mackay Creek and Skull Creek currently utilize scuppers that discharge bridge deck runoff directly into the waterbodies below. Mackay Creek and Skull Creek are both classified by SCDHEC as SFH. There are also oyster beds found throughout the estuarine habitats within the PSA. The SCDOT Stormwater Quality Design Manual (2014) requires the treatment of stormwater runoff to avoid or minimize potential impacts to maintain the high water quality levels required for Shellfish Harvesting Waters. A NPDES permit that includes a Stormwater Pollution Prevention Plan (SWPPP) will be required prior to the start of construction.

7.0 IMPACTS TO ESSENTIAL FISH HABITAT

The analysis of impacts to EFH is based on the Recommended Preferred Alternative 4A and the proposed actions described in Section 6. The proposed impacts discussed in subsequent sub-sections are the best attempt to quantify potential impacts to EFH based on the current level of design. The potential impact to managed species will vary based on life stage, habitat use, distribution, and abundance.

Most of the EFH within the project area is proposed to be spanned by the new bridge structure. To quantify impacts to EFH it is assumed the contractor will utilize temporary trestles in combination with floatable barges and timber mats during construction. Additional assumptions include conservative bridge span lengths and arrangements, conservative construction limits for bridge approaches, and a conservative combination of pile driving techniques to install bridge support structures including temporary trestle to be used during construction and drilled shaft casings for bridge support structures. The impact totals will be refined as the final design is completed. Table 7-1 summarizes possible temporary and permanent impacts to EFH in the project area related to construction of the new bridge.

Table 7-1: Potential Impacts to EFH

Habitat Type	Sources of Permanent Impacts	Sources of Temporary Impacts
Estuarine Emergent Wetlands	Fill, Bridge Pilings, Shading	Temporary Trestle Pilings*, Barges*, Shading, Turbidity
Tidal Creek	Fill, Bridge Pilings	Temporary Trestle Pilings*, Barges, Turbidity
Intertidal Non-Vegetated Flats	Fill, Bridge Pilings	Temporary Trestle Pilings*, Barges*, Turbidity
Unconsolidated Bottom	Fill, Bridge Pilings	Temporary Trestle Pilings*, Turbidity
Oysters (HAPC)	Fill, Bridge Pilings, Temporary Trestle Pilings *, Barges*, Demolition*	Turbidity

** Impacts are estimated based on a preliminary design. The final design, location, and use of temporary trestle piles, barges, or timber mats will be determined by the contractor.*

7.1 PERMANENT IMPACTS

Permanent impacts to EFH will result from the placement of permanent fill for bridge approaches and bridge support structures, such as pre-stressed concrete bridge pilings or drilled shafts. Final construction limits and bridge span arrangements are not finalized at the current level of design. Therefore, the following potential impacts represent an estimation of the worst-case scenario for the placement of new fill for bridge approaches and bridge support structures. Table 7-2 summarizes the potential permanent impacts to EFH within the PSA.

Table 7-2: Estimated Permanent Impacts to EFH

Impact Type	EFH Type					Total
	Estuarine Emergent Wetlands	Intertidal Non-Vegetated Flats	Tidal Creek	Unconsolidated Bottom	Oyster (HAPC)	
Bridge Pilings	< 0.1 acre	< 0.1 acre	< 0.1 acre	< 0.1 acres	< 0.1 acre	< 0.5 acre
Bridge Demolition	0 acres	0 acres	0 acres	0 acres	0.4 acre	0.4 acre
Fill	12.7 acres	6.2 acres	≤0.1 acres	0.1 acre	< 0.1 acre	19.2 acres
Shading	2.6 acres	N/A	N/A	N/A	N/A	2.6 acres
Temporary Trestle Pilings/ Barges	0 acres	0 acres	0 acres	0 acres	0.4 acres	0.4 acres
Total	15.4 acres	6.3 acres	0.2 acres	0.2 acres	1 acre	23.1 acres

7.1.1 Roadway Fill Impacts

New bridge approaches to the west of Mackay Creek and to the east of Skull Creek are required for the new bridge alignment. Bridge approaches will require widening and fill to tie into existing US 278 alignments to the west and east of the proposed project. Bridge piles and drilled shafts will impact EFH as permanent fill. Clean fill material will be placed in estuarine emergent wetlands to realign the bridge approach from the mainland and Jenkins Island; on the east side of Hog Island and west side of Jenkins Island to create a new connector road and bridge which will tie into Gateway Drive; and on either side of the US 278 causeway between Jenkins Island and Hilton Head Island. Fill will also be associated with construction of the new bridge approaches and improved access to PINWR.

All EFH types identified within the project study boundary may be impacted with the placement of permanent fill in some form during construction of the project. To calculate these potential impacts, the proposed construction limits were buffered an additional 50 feet and the locations of proposed bridge support structures within the most-recent roadway plants were analyzed. These permanent impacts to EFH will impact estuarine emergent wetlands, intertidal non-vegetated flats, oysters, and unconsolidated bottom habitats. Table 7-3 summarizes the potential permanent impacts to EFH within the PSA.

Table 7-3: Estimated Permanent Fill Impacts in EFH

Habitat Type	Estimated Fill Impacts (acres)
Estuarine Emergent Wetland	12.7 acres
Intertidal Non-vegetated Flats	6.2 acres
Tidal Creek	< 0.1 acre
Unconsolidated Bottom	0.1 acre
Oysters (HAPC)	< 0.1 acre
TOTAL	19.2 acres

All potential fill impacts to EFH within the project area are based on the conceptual construction limit plus an additional 50-foot buffer to represent a “worst-case” scenario. The placement of fill in wetlands, including EFH, will require authorization from the USACE and SCDHEC. The limits of any clearing, grading, or fill in wetlands will be delineated and shown on approved permitted plans by the USACE and SCDHEC. SCDOT and the contractor will comply with all applicable permits and permit conditions for the placement of fill in wetlands.

7.1.2 Bridge Construction

It is estimated that 24 72-inch diameter drilled shafts, 112 96-inch diameter drilled shafts, and 16 120-inch diameter drilled shafts would be needed for the new US 278 bridge and 30 24-inch prestressed concrete piles would be required for the connector bridge between Hog Island and Jenkins Island. A total count for each type of proposed bridge support structure the proposed new bridges are provided in Table 7-4. Support structures located within the potential fill limits are not included in the provided totals since the predominant impact in that area is fill.

Table 7-4: Bridge Support Structures to be Placed in EFH

Support Type (Location)	Number of Supports
24-inch Pre-Stressed Concrete Pile (Connector Bridge)	30
72-inch Drilled Shaft (Mackay Creek)	24
96-inch Drilled Shaft (Mackay and Skull Creeks)	112
120-inch Drilled Shaft (Skull Creek)	16
TOTAL	182

The placement of these drilled shafts would result in permanent impacts to less than 0.1 acres to estuarine emergent wetlands, intertidal non-vegetated flats, tidal creeks, and unconsolidated bottom, respectively. A summary of potential permanent impacts to wetland habitats associated with the construction of the new bridges is presented in Table 7-5. Bridge support structures located within the potential fill limits are not included in the provided totals since the predominant impact in that area is fill.

Table 7-5: Estimated Permanent Impacts to EFH from New Bridge Support Structures

EFH Type	Concrete Piles	Drilled Shafts	Estimated Impact Surface Area (acres)
Estuarine emergent wetland	7	29	< 0.1 acre
Estuarine tidal creek	10	1	< 0.1 acre
Estuarine sub-tidal unconsolidated bottom	0	89	< 0.1 acre
Intertidal non-vegetated flats	13	14	< 0.1 acre
Oysters (HAPC)	0	19	< 0.1 acre
TOTAL	30	152	< 0.5 acres

7.1.3 Permanent Impacts to Oysters

Existing US 278 Bridges Removal

Once the proposed US 278 bridge over Mackay Creek and Skull Creek is completed, the old bridge structures would be demolished and removed. Removal of the existing bridge columns would also remove oysters that are occupying the structures. Oysters were observed occupying 3-to-6-feet in height on the surfaces of the existing bridge structures. Approximately 0.8 acres of surface area comprised of oysters would be impacted by the demolition of the existing bridge.

New US 278 Bridge over Mackay Creek and Skull Creek

The proposed bridge would have drilled shafts placed in areas where oysters have the potential to colonize the hard surfaces. Based on the surface area of the proposed pilings and the observed average height of oysters (4.5 feet) on the existing bridges, the new structure should provide approximately 0.4 acres of surface area suitable for oyster habitat.

While the new bridge structure may provide suitable habitat for oysters to colonize and grow, there is no way to be certain that oysters will be able to colonize and reestablish structures. Also, any changes to the bridge design such as increasing span lengths or reducing the number of piles or shafts may reduce the replacement of oyster habitat. Furthermore, it may take beyond ten years of oyster regeneration and growth to reestablish populations like those on the existing bridge structure. Under the 2008 Mitigation Rule, temporal loss of more than ten years qualifies as a permanent loss. Therefore, it is assumed that there will be a permanent net loss of approximately 0.4 acres of oyster habitat from the placement of the new bridge and demolition of the old bridges.

Construction Access

Oysters may also be impacted by temporary trestle piles and barges serving as construction access for the proposed bridge. The temporary piles may be driven through existing oyster beds thereby impacting the oysters and EFH. Barges may also crush oysters as equipment and materials are mobilized or stored. Temporary piles would impact oysters to a lesser extent than barges since the trestle is elevated and the only impact to oysters would be the location of the pile. A worst-case scenario would involve the contractor utilizing all barges and those barges would crush oysters beneath them.

Using the same logic as with the new bridge structure, there is no way to be certain that oysters will be able to re-colonize in areas where they are impacted. Additionally, assuming it takes more than ten years

for oysters to regenerate to match the existing condition, it is estimated that up to 0.4 acres of oysters may be impacted permanently from the placement of temporary trestle piles or barges. Table 7-6 presents the net change of oyster habitat resulting from the proposed project.

Table 7-6: Net Change of Oyster Habitat from Bridge Construction

Construction Activity	Approximate Change in Oyster Habitat (acres)
Demolition of existing bridges	- 0.8 acres
New bridge	+ 0.4 acres
Construction access	- 0.4 acres
Net Total: - 0.4 acres	

7.1.4 Permanent Shading Impacts

Permanent impacts to EFH include the possible loss of vegetation from shading. The proposed project would impact EFH by shading salt marsh grasses and freshwater wetland vegetation underneath the proposed bridges. The shading effects could potentially result in areas of sparse vegetation or the existing vegetation dying off. The extent of shading is dependent on several factors, including the proposed bridge orientation and height to width ratio. Impacts to salt marsh vegetation generally occur when the bridge height to bridge width ratio is less than 0.7 (Broome et al, 2005). No permanent loss of EFH is anticipated, but rather an anticipated loss of functions associated with vegetated EFH. These impacts were estimated under the assumption that only estuarine emergent wetlands would be impacted by shading. Table 7-7 provides a summary of the permanent shading impacts from the project. The estimated net total for permanent shading impacts to estuarine emergent wetlands is approximately 1 acre.

Table 7-7: Net Total Permanent Shading Impacts to EFH

Habitat Type	New Permanent Shading (acres)	Removed Shading (acres)	Net Total Shading Impact (acres)
Estuarine emergent wetland	+ 2.6 acres	- 1.6 acres	+ 1 acre

New US 278 Bridge over Mackay Creek and Skull Creek

The proposed bridge structure is approximately 6,750 feet long and 132 feet wide, covering approximately 2.5 acres of estuarine emergent wetland habitat. Based on the 0.7 bridge height to bridge width ratio (Broome et al, 2005), impacts related to shading of vegetated salt marsh may occur in areas where the bridge height is approximately 91 feet or lower. The preliminary plans depict the maximum bridge height as 85 feet above existing ground elevations, thereby staying below this 91-foot threshold for the entire length of the bridge over estuarine emergent wetlands. Therefore, it is assumed the entire footprint of the new bridge over estuarine emergent wetlands (2.5 acres) will have permanent impacts from shading.

Connector Bridge between Hog Island and Jenkins Island

The proposed bridge structure associated with the improved access to Hog Island is approximately 300 feet long and 40 feet wide, covering approximately 0.1 acre of estuarine emergent wetland habitat. Based on the 0.7 bridge height to bridge width ratio (Broome et al, 2005), impacts related to shading of vegetated salt marsh may occur in areas where the bridge height is approximately 28 feet or less. The preliminary plans show the maximum bridge height below 28 feet for the entire length of the proposed bridge. Therefore, the entire footprint of the new bridge over estuarine emergent wetland will result in permanent impacts from shading. This area totals approximately 0.1 acre.

Existing US 278 Bridges Removal

Permanent impacts from the removal of the existing bridges may include the restoration of wetland habitats. The removal of the old bridge substructure may allow for the previously impacted wetland habitat areas to return to a more natural condition. The removal the existing bridge decks may allow up to 1.6 acres of estuarine emergent wetlands to revegetate under natural processes.

7.2 TEMPORARY IMPACTS

Temporary impacts to EFH will result from the placement of temporary fill for construction access for the project. Bridge construction access would be in upland areas to the maximum extent practicable. However, to construct the new bridge a combination of temporary trestle and barges will be required. Deeper water and the main channels of Mackay Creek and Skull Creek will likely be accessed via barges for construction. Barges may be delivered and moved via water and transport vessels or via land on flatbed trucks with cranes and other heavy equipment. The piles required to construct the temporary trestle would constitute temporary fill to EFH. Table 7-8 provides a summary of temporary impacts to EFH within the PSA.

Table 7-8: Estimated Temporary Impacts to EFH

Impact Type	EFH Type					Total
	Estuarine Emergent Wetlands	Intertidal Non-Vegetated Flats	Tidal Creek	Unconsolidated Bottom	Oyster	
Temporary Trestle Piles	< 0.1 acres	< 0.1 acres	< 0.1 acres	< 0.1 acres	N/A	0.4 acres
Temporary Shading	0.7 acres	N/A	N/A	N/A	N/A	0.7 acres
Total	0.8 acres	< 0.1 acres	< 0.1 acres	< 0.1 acres	-	1.1 acres

7.2.1 Turbidity

The construction of the temporary trestle for construction access may cause a temporary increase in turbidity in Mackay Creek and Skull Creek as mud and silt is disturbed during installation and removal of the trestle support piles. Turbidity is expected to be localized and will dissipate quickly. Fish and other aquatic species are likely to swim through the turbid water with no detectable effects. To minimize the potential effects of turbidity, the contractor will be required to utilize all appropriate SCDOT BMPs for soil and erosion control during construction to minimize the potential impacts and effects of turbidity.

7.2.2 Temporary Fill

The temporary trestle piles are expected to act as temporary fill since they will displace EFH while in place. The temporary trestle would be approximately 30 feet wide and would be supported by steel pipe piles. The steel piles would be approximately 24-inches in diameter and would be installed using a piledriver. It is estimated that approximately 400 24-inch diameter steel pipe piles would be needed for the temporary work trestle. The use of temporary trestles would result in temporary fill impacts to less than 0.1 acres of estuarine emergent wetlands, intertidal non-vegetated flats, tidal creek, unconsolidated bottom, and oysters respectively.

7.2.3 Temporary Shading Impacts

Additional temporary impacts may include the loss of vegetation due to smothering or shading. The total dimensions of the mainline and extensions of the temporary trestle would be approximately 30 feet wide and 5,600 feet in length. Based on the 0.7 bridge height to bridge width ratio (Broome et al, 2005), temporary shading impacts may occur in areas where the bridge height is 29 feet or lower. Because the height of the temporary work trestle is not currently known, shading is assumed to impact all estuarine emergent wetlands beneath the trestle. The proposed temporary trestle would result in the temporary shading impacts to approximately 0.7 acres of estuarine emergent wetlands.

Floatable barges or timber mats used for construction access may cause temporary impacts to vegetation during construction. Vegetation will likely die while covered by mats or barges. These areas are expected to regenerate vegetation once construction is completed, but there may be a lag due to compaction of the marsh from the weight of construction equipment. The proposed project would impact EFH by shading salt marsh grasses and freshwater wetland vegetation underneath the proposed temporary trestles. Due to the preliminary design, it is difficult to quantify an area of EFH that may be impacted by temporary placement of timber mats and barges.

7.3 EFH IMPACTS SUMMARY

EFH resources including estuarine emergent wetlands, intertidal non-vegetated flats, unconsolidated bottom, and oysters will incur some permanent impacts resulting from construction. These impacts are associated with the placement of permanent fill for widening of roadway, bridge approaches or bridge structures and sub-structures, such as concrete bridge pilings or shafts. Permanent impacts to oysters also include the removal of existing bridge columns that have oyster coverage; however, the new columns are expected to be recolonized by oysters, lessening the overall net loss. Additional permanent impacts to estuarine emergent wetlands include loss of vegetation from shading. Permanent shading impacts are expected to occur to estuarine emergent wetlands directly beneath the proposed bridge structures.

Temporary impacts to EFH will result from the placement of temporary fill for construction access for the project. The piles required to construct the temporary trestle would act as temporary fill to EFH. The use of temporary trestles would impact estuarine emergent wetlands, intertidal non-vegetated flats, tidal creeks, unconsolidated bottom, and oysters. Additional temporary impacts to EFH may occur during construction activities and demolition of the existing bridge structures. These impacts would include turbidity and shading. The proposed temporary trestle and use of any timber mats or barges within estuarine emergent wetlands would result in a reduction of habitat function by decreasing vegetative cover. Table 7-9 summarizes all impacts to EFH within the PSA.

Table 7-9: Summary of Estimated Impacts to EFH

Impact Type	EFH Type					Total
	Estuarine Emergent Wetlands	Intertidal Non-Vegetated Flats	Tidal Creek	Unconsolidated Bottom	Oysters	
Permanent Impacts	15.4 acres	6.3 acres	0.2 acres	0.2 acres	1 acre	23.1 acres
Temporary Impacts	0.8 acres	< 0.1 acres	< 0.1 acres	< 0.1 acres	< 0.1 acres	1.2 acres
Total	16.2 acres	6.4 acres	0.3 acres	0.3 acres	1.5 acres	24.3 acres

8.0 CONSERVATION MEASURES

Impacts to EFH will be minimized to the maximum extent practicable. As the project design progresses, the actual construction limits will be refined, and further avoidance and minimization measures taken to reduce the amount of impact to EFH. Additionally, through coordination with resource and regulatory agencies, “Environmental Commitments” will be developed and become part of the NEPA record. SCDOT and the contractor will be required to honor/implement SCDOT all “Environmental Commitments” and all project specific commitments developed through agency coordination and the permitting process.

8.1 EROSION, SEDIMENT, AND TURBIDITY CONTROL

SCDOT and/or the contractor will develop a Stormwater Pollution Prevention Plan (SWPPP) and obtain both a land disturbance permit and a National Pollutant Discharge Elimination System (NPDES) permit from the SCDHEC before construction can commence. Temporary silt/turbidity curtains will be installed prior to commencement of in-water work, where practicable. The contractor will be required to utilize SCDOT Best Management Practices for soil and erosion control during construction.

Additionally, the limits of clearing, grading, or placement of fill in wetlands will be delineated and shown on approved permitted plans by the USACE and the SCDHEC. SCDOT and the contractor will comply with all applicable permits and permit conditions for the placement of fill in wetlands.

8.2 POST CONSTRUCTION STORMWATER TREATMENT

SCDOT proposes to pre-treat future stormwater runoff from the proposed bridge deck prior to discharge into waters below the new US 278 bridge. Stormwater discharged within 1,000 feet of a shellfish bed will be pre-treated per the SCDOT Stormwater Quality Design Manual. The final project design will incorporate the conditions of SCDOT’s General MS4 permit and Stormwater Quality Design Manual that includes pretreatment of post-construction stormwater runoff prior to discharge into receiving waters classified as SFH.

8.3 BRIDGE SPAN LENGTH

The concepts for bridges over both estuarine and riverine tidal creeks have been designed to span the entire creek channels and avoid any roadway fill impacts to the channels where practicable. In addition, maximizing the length of spans and the distance between bents and columns where practicable will minimize the amount of fill being placed in EFH.

The US 278 bridge design has undergone revisions since the analysis completed in July 2020. These revisions include a lengthening of bridge spans from 100 feet to 175 feet long, thereby reducing the number of bents and piles required to support the replacement bridge.

8.4 PERMITTING REQUIREMENTS

The contractor will be required to adhere to all special conditions associated with all federal, state, and local permits required to construct the project. The expected permits and other authorizations required prior to beginning construction include an Individual USACE Section 404 permit, an Individual SCDHEC Section 401 Water Quality Certification, an Individual SCDHEC-OCRM Critical Area permit, and a USCG bridge permit.

8.5 EFH SPECIFIC BEST MANAGEMENT PRACTICES

Through coordination efforts with NOAA Fisheries, SCDOT has developed an EFH-specific list of general best BMPs to minimize construction-related impacts to EFH and water quality within the project watershed (Appendix D). SCDOT and the contractor will implement all practicable EFH-specific BMPs during construction.

8.6 SUMMARY OF CONSERVATION MEASURES

Table 8-1 summarizes the EFH effects minimization commitments listed in the previous sections of the document. The contractor, SCDOT, and FHWA will be required to stay in compliance with all approved environmental conditions established in the EA as well as any special conditions established in the required permit authorizations.

Table 8-1: Recommended Conservation and Effect Minimization Environmental Commitments

Recommended Environmental Commitment
<ul style="list-style-type: none"> SCDOT and/or the contractor will develop a Stormwater Pollution Prevention Plan (SWPPP) and obtain both a land disturbance permit and a National Pollutant Discharge Elimination System (NPDES) permit from the SCDHEC before construction can commence.
<ul style="list-style-type: none"> The contractor will adhere to all SCDOT construction and erosion and sediment control BMPs.
<ul style="list-style-type: none"> The limits of any clearing, grading, or fill in wetlands will be delineated and shown on approved permitted plans by the USACE and SCDHEC. SCDOT and the contractor will comply with all applicable permits and permit conditions for the placement of fill in wetlands.
<ul style="list-style-type: none"> The contractor will be required to maintain navigability during construction and will not be allowed to block the respective channels of Mackay or Skull Creeks.
<ul style="list-style-type: none"> These existing US 278 bridges will be removed in their entirety once construction of the new bridge is completed.
<ul style="list-style-type: none"> Non-hazardous demolition debris will be hauled off site and disposed of in accordance SCDOT policy and SCDHEC regulations.

<ul style="list-style-type: none"> If explosives are required for demolition, the contractor, SCDOT, and FHWA will initiate additional coordination and consultation with the USFWS and NOAA Fisheries.
<ul style="list-style-type: none"> SCDOT proposes to pre-treat future stormwater runoff from the proposed bridge deck prior to discharge into waters below the new US 278 bridge. Stormwater discharged within 1,000 feet of a shellfish bed will be pre-treated per the SCDOT Stormwater Quality Design Manual.
<ul style="list-style-type: none"> SCDOT and the contractor will implement all practicable EFH-specific BMPs during construction.
<ul style="list-style-type: none"> The contractor, SCDOT, and FHWA will be required to stay in compliance with all approved environmental conditions established in the EA as well as any special conditions established in the required permit authorizations.
<ul style="list-style-type: none"> SCDOT will continue to coordinate with NOAA Fisheries during the permitting process to ensure there is adequate mitigation for impacts to EFH

9.0 MITIGATION

The project will result in unavoidable impacts to EFH. The placement of fill for the bridge approaches and new bridge structure and sub-structure and the shading associated with permanent bridge structures will result in the permanent impacts to EFH. Temporary impacts associated with construction access will result in temporary loss of area and function of EFH. The permanent loss of EFH and the temporal lag for restoration to existing conditions from temporary impacts may take months or years. Therefore, mitigation to offset these unavoidable impacts will be required.

A final mitigation plan will be developed for the 404/401 permit and will include consideration for impacts to EFH as part of that plan. This mitigation plan will be established as part of the Section 404 permitting phase of the project. The EFH Mitigation Plan may include mitigation measures such purchasing mitigation credits from an approved mitigation bank or Permittee Responsible Mitigation (PRM) method such as causeway removal, living shorelines, oyster bed restoration, and/or other methods of mitigating for EFH impacts. SCDOT and FHWA will develop the mitigation plan in coordination with the appropriate resource agencies.

10.0 CONCLUSIONS

After completing a literature search, a field survey, and a habitat assessment, it was determined that EFH is present in the project area and will be impacted by the project. EFH resources including estuarine emergent wetlands, intertidal non-vegetated flats, and unconsolidated bottom will sustain permanent impacts resulting from construction of the US 278 Corridor Improvements. Oyster beds and reefs are considered EFH HAPC. Permanent impacts to oysters are expected from the placement of permanent bridge pilings, as well as the temporary placement of temporary trestles and/or barges for construction access. Temporary impacts to EFH will result from the placement of temporary fill for construction access for the project.

Impacts to EFH will be minimized to the maximum extent practicable. As the project design progresses, the actual construction limits will be refined, and further avoidance and minimization measures taken to reduce the amount of impact to EFH. However, it appears that impacts to EFH will be unavoidable.

Although impacts to EFH will be unavoidable, there are opportunities to mitigate losses to EFH and offset the proposed impacts. A mitigation plan for unavoidable impacts to wetlands, including EFH, will be developed during the Section 404/401 permitting process. SCDOT will continue to coordinate with NOAA Fisheries during the permitting process to ensure there is adequate mitigation for impacts to EFH.

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APPENDIX A

AGENCY CONSULTATION HISTORY



U.S. Department
of Transportation
**Federal Highway
Administration**

South Carolina

March 25, 2019

1835 Assembly Street, Suite 1270
Columbia, South Carolina 29201
803-765-5411
803-253-3989

In Reply Refer To:
HDA-SC

Dr. Roy E. Crabtree
Regional Administrator SE Regional Office
NOAA Fisheries
Attn: Kelly Shotts
263 13th Avenue South
St. Petersburg, FL 33701

Subject: Invitation to Become a Participating Agency for the Preparation of an
Environmental Assessment (EA) for the Proposed US 278 Corridor
Improvements Project in Beaufort County, South Carolina;
Federal Project Number P030450

Dear Dr. Crabtree:

The Federal Highway Administration (FHWA), in cooperation with the South Carolina Department of Transportation (SCDOT), is preparing an Environmental Assessment (EA) for the US 278 Corridor Improvements Project. The proposed project would make improvements to the US 278 corridor between Bluffton and Hilton Head Islands. The purpose of the proposed project is to increase capacity and reduce congestion along the U.S. 278 corridor from Moss Creek Drive to Squire Pope Road. The eastbound Mackay Creek Bridge, which crosses the Intracoastal Waterway, is structurally deficient and is scheduled to be replaced. Access to Pinckney Island National Wildlife Refuge and the C.C. Haigh, Jr. boat ramp would be improved as well (see attached study area map). A website for the project has been established and can be viewed at <https://www.scdot278corridor.com>.

Pursuant to Section 6002 of SAFETEA-LU, as amended by Section 1304 of the Fixing America's Surface Transportation (FAST) Act, participating agencies are responsible for identifying, as early as possible, any issues of concern regarding the project's potential environmental, social, or economic impacts. Section 6002 is intended to assure that agencies are fully engaged in the scoping of the project and the decisions regarding alternatives to be evaluated in detail in the NEPA analysis. In accordance with the SAFETEA-LU Section 6002, FHWA is in the process of identifying local, state, and federal agencies that may have an interest in the project.

The FHWA and SCDOT would like to take this opportunity to formally invite your agency to become a participating agency in the development of the EA. Areas of concern to be emphasized in the EA will include potential environmental impacts upon existing ecological resources, wetlands, water resources, historic and archaeological resources, parks and recreation facilities, noise and air, social and community character, hazardous/contaminated materials, cumulative and

indirect impacts, and potential impacts due to project construction. **Along with requesting your agency's participation as a Participating Agency, FHWA is also asking for any comments you may have on the Draft Purpose and Need statement, which is to "Improve Capacity and Reduce Congestion Along the U.S. 278 Corridor" and Draft Agency Coordination Plan (enclosure).**

Your agency's involvement in the proposed project would entail those areas under its jurisdiction. No direct writing or analysis by your agency will be necessary for this document unless you request to do so. We suggest that your agency's role in the development of the above project should include the following as they relate to your area of expertise:

1. Participate in coordination meetings as appropriate.
2. Consultation on any relevant technical studies that may be required for the project.
3. Timely review and comment on the environment document to reflect the views and concerns of your agency on the adequacy of the document, alternatives considered, and the anticipated impacts and mitigation.

To become a Participating Agency with the FHWA, please respond to this office in writing with an acceptance or denial of the invitation within 30 days. If you accept, please identify the appropriate contact person within your organization for coordination. If your agency declines, please provide a written response that states your reason for declining the invitation, such as:

- Has no jurisdiction or authority with respect to the project;
- Has no expertise or information relevant to the project;
- Does not intend to submit comments on the project.

If you have any questions or would like to discuss in more detail the project or each agency's respective roles and responsibilities during the preparation of the EA, please contact Mr. J. Shane Belcher at 803-253-3187 or by e-mail at jeffrey.belcher@dot.gov.

Sincerely,



Emily O. Lawton
Division Administrator

Enclosures

ec: Ms. Kelly Shotts, NOAA Fisheries
Mr. Chad Long, SCDOT Environmental Division Manager
Mr. David Kelly, SCDOT RPG 1 NEPA Coordinator
Mr. Craig Winn, SCDOT Program Manager



U.S. Department
of Transportation
Federal Highway
Administration

South Carolina

March 25, 2019

1835 Assembly Street, Suite 1270
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In Reply Refer To:
HDA-SC

Mr. Pace Wilber
South Atlantic Branch Supervisor
NOAA Fisheries
331 Fort Johnson Road
Charleston, SC 29412

Subject: Invitation to Become a Participating Agency for the Preparation of an Environmental Assessment (EA) for the Proposed US 278 Corridor Improvements Project in Beaufort County, South Carolina; Federal Project Number P030450

Dear Mr. Wilber:

The Federal Highway Administration (FHWA), in cooperation with the South Carolina Department of Transportation (SCDOT), is preparing an Environmental Assessment (EA) for the US 278 Corridor Improvements Project. The proposed project would make improvements to the US 278 corridor between Bluffton and Hilton Head Islands. The purpose of the proposed project is to increase capacity and reduce congestion along the U.S. 278 corridor from Moss Creek Drive to Squire Pope Road. The eastbound Mackay Creek Bridge, which crosses the Intracoastal Waterway, is structurally deficient and is scheduled to be replaced. Access to Pinckney Island National Wildlife Refuge and the C.C. Haigh, Jr. boat ramp would be improved as well (see attached study area map). A website for the project has been established and can be viewed at <https://www.scdot278corridor.com>.

Pursuant to Section 6002 of SAFETEA-LU, as amended by Section 1304 of the Fixing America's Surface Transportation (FAST) Act, participating agencies are responsible for identifying, as early as possible, any issues of concern regarding the project's potential environmental, social, or economic impacts. Section 6002 is intended to assure that agencies are fully engaged in the scoping of the project and the decisions regarding alternatives to be evaluated in detail in the NEPA analysis. In accordance with the SAFETEA-LU Section 6002, FHWA is in the process of identifying local, state, and federal agencies that may have an interest in the project.

The FHWA and SCDOT would like to take this opportunity to formally invite your agency to become a participating agency in the development of the EA. Areas of concern to be emphasized in the EA will include potential environmental impacts upon existing ecological resources, wetlands, water resources, historic and archaeological resources, parks and recreation facilities, noise and air, social and community character, hazardous/contaminated materials, cumulative and indirect impacts, and potential impacts due to project construction. **Along with requesting your**

agency's participation as a Participating Agency, FHWA is also asking for any comments you may have on the Draft Purpose and Need statement, which is to "Improve Capacity and Reduce Congestion Along the U.S. 278 Corridor" and Draft Agency Coordination Plan (enclosure).

Your agency's involvement in the proposed project would entail those areas under its jurisdiction. No direct writing or analysis by your agency will be necessary for this document unless you request to do so. We suggest that your agency's role in the development of the above project should include the following as they relate to your area of expertise:

1. Participate in coordination meetings as appropriate.
2. Consultation on any relevant technical studies that may be required for the project.
3. Timely review and comment on the environment document to reflect the views and concerns of your agency on the adequacy of the document, alternatives considered, and the anticipated impacts and mitigation.

To become a Participating Agency with the FHWA, please respond to this office in writing with an acceptance or denial of the invitation within 30 days. If you accept, please identify the appropriate contact person within your organization for coordination. If your agency declines, please provide a written response that states your reason for declining the invitation, such as:

- Has no jurisdiction or authority with respect to the project;
- Has no expertise or information relevant to the project;
- Does not intend to submit comments on the project.

If you have any questions or would like to discuss in more detail the project or each agency's respective roles and responsibilities during the preparation of the EA, please contact Mr. J. Shane Belcher at 803-253-3187 or by e-mail at jeffrey.belcher@dot.gov.

Sincerely,



Emily O. Lawton
Division Administrator

Enclosures

ec: Ms. Cynthia Cooksey, NOAA Fisheries
Mr. Chad Long, SCDOT Environmental Division Manager
Mr. David Kelly, SCDOT RPG 1 NEPA Coordinator
Mr. Craig Winn, SCDOT Program Manager



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:SER/NS

Emily O. Lawton
Division Administrator
U.S. Department of Transportation
Federal Highway Administration
1835 Assembly Street, Suite 1270
Columbia, South Carolina 29201

Attention: Shane Belcher

Dear Ms. Lawton:

NOAA's National Marine Fisheries Service (NMFS) has received your letter dated March 25, 2019, requesting our participation as a participating agency on the US 278 Corridor Improvements Project, pursuant to section 6002 of the Fixing America's Surface Transportation Act. Given our special expertise and jurisdiction by law under the Endangered Species Act, Marine Mammal Protection Act, and Magnuson Stevens Act, NMFS agrees to serve as a participating agency for this project. Due to staffing and travel constraints, our participation may be limited to our review and comment on draft National Environmental Policy Act documents, teleconferences, and occasional travel to meetings.

We appreciate your invitation to serve as a participating agency for the US 278 Corridor Improvements Project. Please direct project correspondence related to habitat impacts and/or Essential Fish Habitat consultation to Cynthia Cooksey at 219 Fort Johnson Rd., Charleston, SC 29412; by telephone (843) 460-9922, or by e-mail at cynthia.cooksey@noaa.gov. Please direct project correspondence related to sturgeon and/or Endangered Species Act coordination to Andy Herndon, at the letterhead address; by telephone (727) 824-5312, or by email at Andrew.herndon@noaa.gov. Please direct project correspondence related to dolphins and/or the Marine Mammal Protection Act to Jaclyn Daly, 1315 East-West Hwy, Silver Spring, MD 20910; by telephone at (301) 427-8438, or by email at Jaclyn.daly@noaa.gov.

Sincerely,

Roy E. Crabtree, Ph.D.
Regional Administrator





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>

cc:

GCERC, Renshaw, Lipsy

F/SER, Strelcheck, Blough, Silverman,

F/SER3, Bernhart,

F/SER4, Fay, Dale, Engleby

F/SER45, Wilber, Cooksey

OPR PR1, Daly

Files





ACE Meeting Notes – June 13, 2019

Attendees:

FHWA	Shane Belcher
NOAA	Cindy Cooksey (on phone)
USACE	Laura Boos Steve Brumagin Ivan Fannin
USEPA	
USFWS	Mark Caldwell (on phone) Russ Webb (on phone)
SCDAH	Elizabeth Johnson (on phone)
SCDHEC	Chuck Hightower
SCDHEC-OCRM	Josh Hoke (on phone) Chris Stout (on phone)
SCDNR	Tom Daniel Susan Davis (on phone) Greg Mixon
SCDOT	Chris Beckham Sean Connolly Siobhan Gordon Henry Phillips (on phone) Craig Winn
KCI	Phil Leazer
Three Oaks Engineering	Russell Chandler Heather Robbins Geni Theriot

Purpose of the Meeting:

Purpose was to present and discuss the alternative evaluation criteria, range of alternatives, and provide a coordination point for agencies as required by the 6002 EA process.

Change in project termini, has now extended from Squire Pope Road to Spanish Wells Road.

The intersection at Spanish Wells Road has already been improved which will allow for more logical tie-in to occur without additional intersection improvements. Traffic studies already extended to Spanish Wells Road. The change in termini was determined through coordination with SCDOT and FHWA.



Preliminary Alternative Evaluation Criteria:

The alternative evaluation criteria and the range of Alternatives is a coordination point for agencies. Preliminary range of alternatives was developed based on public comments from the September 2018 Public Meeting and additional stakeholder input. Some of the alternatives do not tie in at Spanish Wells Road but at other termini.

Purpose and Need is to address deficiency at Mackay Creek as well as increase capacity and reduce congestion.

TSM/TDM and Mass Transit will be considered as standalone but can be incorporated into the alternatives if they cannot move forward on their own.

First level of evaluation criteria:

- Wetlands – GIS layer – NWI, soils, topo, DEM, existing JD on Jenkins Island
- Protected lands – USGS PADUS, National Conservation Easement Database
- ROW – number of impacted parcels/properties, total acres outside existing R/W
- Neighborhoods – how the individual parcels are grouped together and “self-identify” as groups

Analyze alternatives based on the above criteria. For August ACE meeting the team will be able to explain which alternatives will be kept and which ones will be eliminated based on the criteria. The team plans to



present Reasonable Alternatives to the public in the Fall of 2019 following agency coordination. Currently there are seventeen (17) preliminary alternatives.

Reasonable Alternative Evaluation Criteria:

NOAA-NMFS requested to add habitat areas of particular concern (oyster and shellfish habitat) to the second level of evaluation criteria. NOAA also asked about utility impacts. Project Team explained that exact impacts are currently unknown. There are overhead power lines on both sides of the existing bridges over Mackay Creek, a large water line that feeds all of Hilton Head Island, and other known utilities. Discussions and coordination with utility companies have been started. Utility impacts will be further evaluated under the reasonable range of alternatives.

USACE recommended including a discussion of the practicability of alternatives. Document all decisions thoroughly. Project is an EA but follows the SAFETEA-LU 6002 Process and could easily be elevated to EIS if required. As portions of the document are available, they will be shared with cooperating and participating agencies. USACE asked if the route was a hurricane evacuation route. Project Team explained that SCDOT will require four lanes of traffic be open at all times during construction.

USFWS requested to include compatibility with the Pinckney Island National Wildlife Refuge (NWR) as an evaluation criterion. Pinckney Island National Wildlife Refuge prefers any new alignments considered stay south of existing roadway. This would be compatible with their future plans for additional access and parking. USFWS stated that there are no records of T&E on Pinckney Island NWR. Compatibility with NWR plans will be added to reasonable criteria or preliminary criteria.

SCDAH had no comments or concerns at this time.

SCDOT asked why the P&N was not in preliminary evaluation criteria. It was assumed that all preliminary alternatives meet P&N. Traffic studies will be completed on reasonable alternatives and is component of P&N. Use driving environmental factors as first level of evaluation criteria such as wetlands, National Wildlife Refuge and Environmental Justice communities. The USFWS' archaeologist has been contacted, but the team has not received a reply. The team is aware that the Pinckney Island NWR archaeologist needs to be involved in discussions. Will bring this up during meeting scheduled with NWR staff on June 25th.

SCDHEC & SCDHEC-OCRM requested the team include restrictive covenants on properties as an evaluation criterion. Inclusion of shellfish harvesting waters. OCRM areas of concern include archaeology, geographic area of particular concern (GAPC), EJ, and critical area. Shellfish harvesting leaseholders need to be informed. OCRM and SCDNR typically handle this as part of the Public Notice process for Critical Area permits.



SCDNR asked about the proposed corridor width. Project Team explained that it is currently four lanes, but the preliminary traffic numbers show that it needs to be six lanes. Different typical sections will be reviewed to avoid and minimize impacts in the reasonable/preferred alternative selections. SCDNR asked if Only the alternatives with new alignments would extend to Cross Island Parkway. Any work on Cross Island Parkway would be limited to tie-ins for those alternatives. Cross Island Parkway does not provide access on or off the island and traffic diverges at the expressway.

Next Steps:

- The following items will be added to the 2nd Evaluation Criteria:
 - Habitat Areas of Particular Concern
 - Compatibility with USFWS Refuge
 - Restrictive Covenants
- Alternative Matrix to explain alternatives eliminated from proposed reasonable alternatives to proposed preferred alternatives. Plan to present at August 2019 ACE meeting.
- Mitigation needs assessment to be conducted once reasonable alternatives identified and agency concurrence point completed.



Draft Schedule:

Milestones	Date
2019	
<i>Agency Project Kickoff and Scoping Meeting</i>	<i>February 14, 2019</i>
Send Letters Inviting Cooperating and Participating Agencies	March 25, 2019
Agencies review draft Purpose and Need Statement & Agency Coordination Plan	April-May2019
Coordination Point for Agency Coordination Plan and Purpose and Need Statement	May 2019
<i>Agency Meeting to discuss the alternative evaluation criteria, alternatives analysis process, and Preliminary Range of Alternatives</i>	<i>June 13, 2019</i>
Agencies Review the Preliminary Range of Alternatives for Coordination	June/July 2019
Coordination Point for Preliminary Range of Alternatives/Alternatives Carried Forward by Agencies	Summer 2019
Public Information Meeting	Fall 2019
Continued Coordination with Agencies on specific resources (i.e. Permitting, EFH, Section 106, Section 7, etc.)	Fall-Winter 2019
2020	
<i>Agency Meeting to discuss Reasonable Alternatives and Preferred Alternative</i>	<i>Spring 2020</i>
Agency Meeting and Coordination Point for Preferred Alternative by Agencies	Spring 2020
Submit Preliminary Jurisdictional Determination to USACE & Critical Area to SCDHEC-OCRM	Summer 2020
Pre-Application Meeting with USACE and SCDHEC	Summer/Fall 2020
Draft EA issued; Joint USACE Individual Permit and USCG Public Notices	Fall 2020
Public Hearing	Fall/Winter 2020
2021	
Prepare Final NEPA Decision	Early 2021
FHWA Issues Final NEPA Decision	Early 2021
USACE and USCG Issue Permit Decisions	Early 2021



ACE Meeting Notes – August 8, 2019

Attendees:

FHWA	Shane Belcher
NOAA	Cindy Cooksey (on phone)
USACE	Christopher Mims Ivan Fannin
USEPA	
USFWS	Megan Cook (on phone)
SCDAH	Joe Wilkinson
SCDHEC	Logan Ress (on phone) Chuck Hightower (on phone)
SCDHEC-OCRM	
SCDNR	Tom Daniels (on phone)
SLCOG	Kyle Kelly (on phone) Jake Whitmire
SCDOT	Sean Connolly Siobhan Gordon Micky Queen Vince McCarron Megan Groves David Kelly
KCI	Phil Leazer Eric Burgess
Three Oaks Engineering	Russell Chandler Heather Robbins Geni Theriot

Purpose of the Meeting:

Purpose was to present and discuss the full range of preliminary alternatives, the evaluation criteria and present the proposed reasonable alternatives. The evaluation criteria used to get from preliminary to reasonable alternatives was reviewed. These criteria include:

- Purpose & Need
 - Structural Deficiency



- GIS Wetlands
- Right-of-Way
- Neighborhoods
- Protected Lands
- Consistent with Pinckney Island National Wildlife Refuge (PINWR) purposes

The meeting continued with a brief explanation of the materials sent to the agencies and printed for those in attendance which included the alternatives matrix, the alternatives development flowchart, the project handout as well as a alternatives matrix summary developed and provided to those in the room. The matrix summary will be provided to those on the call with the meeting summary. Please note on the matrix summary document, the alternatives that are proposed to be eliminated are in grey.

Preliminary Range of Alternatives to Proposed Reasonable Alternatives

The Preliminary Range of Alternatives were discussed by using a KML (Google Earth) file for a visual representation of each alternative. Each alternative was outlined by the Preliminary Range of Alternatives Summary Sheet (attached) and any additional notes are recorded below.

Alternative 1:

- Reminder that the original purpose of the project was to replace the structurally deficient eastbound Mackay Creek bridge. The project has grown to include the full corridor between Moss Creek and Spanish Wells.
- If funding falls through, the eastbound Mackay Creek bridge will still be replaced.
- FHWA (Shane) noted one of the reasons access improvements at Pinckney Island are because SCDOT is trying to incorporate improvements for the access/egress issues on Pinckney Island. The County has a plan to apply for a grant to improve access to Pinckney Island and this is an opportunity to tie the two projects together and incorporate the long-range plans of the refuge.
- Beaufort County plans to submit for a FLAP grant to improve access to Pinckney Island.
- SCDOT (Sean) asked if the justification provided was enough to eliminate according to USACE and the other agencies in attendance.
- USACE (Chris) did indicate the provided justification was adequate.

Alternative 2:

- A reminder that USFWS has indicated they prefer the alternatives that remain close to existing alignment.
- No comments received during the discussion of this alternative.

Alternative 3a: No comments received during the discussion of this alternative.



Alternative 3b:

- This alternative was eliminated because it had a bigger footprint and the potential impacts were greater than 3a.
- SCDOT (Sean) states he thinks the elimination justification is pretty self-explanatory and asked if it was enough for eliminating for permit application?
- USACE (Chris) responded that it was hard to get too specific on each alternative right now because the level of review is still so broad.
- FHWA (Shane) Some of the bigger issues on the Spanish Wells end is the Environmental Justice impacts are bigger.
- SCDOT (Sean) asked if at this time if anyone saw any red flags in terms of process.
- USACE (Chris) agrees that based on what he sees now he does not see any red flags.
- SCDOT (Sean) stated he just wants to make sure everyone is comfortable with the justification for removing the ones we think are not practical.
- Three Oaks (Heather) reviewed the evaluation criteria again and pointed out the additional criteria that was added after the June ACE Meeting.
 - Consistency with PINWR Purposes was added to the Preliminary Alternatives Evaluation Criteria.
 - Shellfish Harvesting Waters and Essential Fish Habitat have been added to the Evaluation Criteria for the Reasonable Alternatives.
- SCDOT (Sean) asks that if there are things you were good with in June but you aren't anymore let us know.
- Three Oaks (Russell) asks USACE if they would like to see the Alternatives Matrix as a separate appendix to the permit document. The NEPA document is a standard appendix but the matrix could be a standalone appendix for ease of reference.
- USACE (Chris) responded that the NEPA document will discuss the elimination in detail and if they had questions, they could reference the matrix.
- SCDOT (Sean) asked USACE to make sure the chart had everything they need in it if they plan to use it for reference.

Three Oaks (Heather) specified we want everyone to agree on what is being carried forward, so we do want feedback.

Alternative 4a:

- Pinckney Island access is a little different in this alternative.
- It was also noted that there is a slightly different configuration by Windmill Harbor.
- No comments received during the discussion of this alternative.

Alternative 4b:

- This alternative tried to keep the existing boat ramp on Pinckney Island



- It was noted that USFWS expressed concern with getting farther away from existing alignment.
- No comments received during the discussion of this alternative.

Alternative 4c:

- USFWS concerns regarding future infrastructure maintenance and safety with this alternative being too far south.
- No comments received during the discussion of this alternative.

Alternative 4d:

- SCDOT (Sean) asks for clarification on the USFWS concerns in regards to infrastructure and financial responsibility.
- Three Oaks (Heather) explains that everything at grade will be the responsibility of USFWS to maintain in the future.
- SCDOT (Sean) asked if we had documentation of USFWS concerns for justification of elimination of these alternatives.
- Three Oaks (Heather) stated we had the concerns documented in the summaries from these meetings. The federal land transfer process was briefly discussed. USFWS also advised it would be easier to get a compatibility determination for the NEPA document the closer to existing alignment the project stays.

Alternative 4e: No comments received during the discussion of this alternative.

Alternative 4f:

- This alternative avoids Pinckney Island but eliminated because 4d improves Pinckney Island access.
- No comments received during the discussion of this alternative.

Alternative 5a:

- This alignment goes the farthest north of all alternatives.
- USFWS does not want Pinckney Island bisected to the north
- This alternative also has impacts to SCDNR's Victoria Bluff Heritage Preserve
- No comments received during the discussion of this alternative.

Alternative 5b:

- FHWA (Shane) pointed out that the reason we are looking at these off the wall alternatives is because SCDOT and the consultants were charged with looking at alternatives to address the county/town concerns.

Alternative 6a: No comments received during the discussion of this alternative.



Alternative 6b:

- The public wanted tie into the Bluffton Parkway
- No comments received during the discussion of this alternative.

Alternative 6c:

- The only change between 6b and 6c is that the curves were buttoned up a little more with this alternative.
- No comments received during the discussion of this alternative.

Alternative 6d: No comments received during the discussion of this alternative.

Alternative 6e: No comments received during the discussion of this alternative.

Alternative 7:

- This alternative is similar to Alternative 4a until it reaches Jenkins Island. The town wanted us to look at using the existing transmission line easement at the Jenkins Island tie in.
- Three Oaks (Heather) points out that if we move it there it avoids some of the Environmental Justice impacts and could tie into the proposed Jenkins Island improvements.
- NOAA (Cindy) asks where the transmission lines would go?
- Three Oaks (Heather) explains we need farther evaluation to determine if it will be eliminated or carried forward. Utilities are included in the next level of evaluation criteria and a detailed utilities and cost analysis will occur.

Alternative 8:

- This alternative still uses the transmission line but connects to the alignment of Alternative 4d.
- SCDOT (Sean) points out that 7 & 8 take from 4a & 4d until transmission lines. He asks if there is any way to tie back down before the hump?
- KCI (Eric) and Three Oaks (Heather) respond that this would cause greater impacts to the EJ communities.
- USACE (Ivan) asked if the owners of the marsh land have commented on this yet?
- Three Oaks (Heather) answered that they will see it at the PIM. Ivan explained that there was history here where these property owners have been told they couldn't touch this land because it is marsh and points out they may have an issue with being told a highway is now going to be built there.

General Discussion

- Three Oaks (Heather):
 - If we have agreement on reasonable we propose to rename them for the PIM so they are sequential (RA1-RA6).



- We will use the new names moving forward in all discussions.
- At the PIM we will show the spaghetti map and the 6 reasonable alternatives.
- We will plan to return in the spring of 2020 to walk through the detailed analysis and propose a preferred alternative.
- In the Spring of 2020, we will have more details on when PJD will be submitted to USACE.
- Draft EA is anticipated to be submitted in Fall of 2020.
- SCDOT (Sean) asks if USFWS expressed anything about purchasing additional land?
- Three Oaks (Heather) responded that this had not been mentioned in our discussions with them. They had mentioned future improvements such as a visitor's center and additional parking.
- FHWA (Shane) also confirmed no discussion of expansion had occurred.
- Sean asked USFWS (Megan) to confirm and she did through email.
- FHWA (Shane) states that USFWS is a cooperating agency. The compatibility determination for the NEPA document is needed for the Federal Land access program. The goal is to write the NEPA document to meet the needs of USFWS, USACE and USCG.
- USFWS (Megan) expressed some confusion on the final determination on if they were a participating or cooperating agency.
- FHWA (Shane) stated USFWS was confirmed as a cooperating agency by Holly. Megan will let Shane know if she needs any additional documentation.
- SCDOT (Sean) asked USACE if the update for the SOP for mitigation was complete?
- USACE (Chris) stated it was still going through QA/QC.
- SCDOT (Sean) asked if we anticipated impacts to be fill, shading or clearing?
- Three Oaks (Russell) answered that the impacts have not been quantified to that level at this time.
- SCDOT (Sean) asked USACE if they still had to wait on OCRM to bless the PJD before they could approve it?
- USACE (Chris) stated the process has been modified to allow the PJD to move forward without OCRM approval.
- Three Oaks (Russell) noted the plan was to submit the PJD with maps, then to a site visit followed by the generation of the plat.
- SCDNR will consider any impacts to SCDNR properties.
- SCDNR is checking to see if they have any properties they are interested in acquiring within the area
- SHPO will wait to see the report to determine what is present.



ACE Meeting Notes – March 12, 2020

Attendees:

FHWA	Shane Belcher
NOAA	Cindy Cooksey (on phone)
USACE	Christopher Mims (on phone) Steve Brumagin (on phone)
USEPA	Alya Singh-White (on phone)
USFWS	Mark Caldwell (on phone)
SCDAH	Joe Wilkinson
SCDHEC	
SCDHEC-OCRM (CZC)	Chris Stout (on phone)
SCDNR	Susan Davis
SCDOT	Craig Winn Chris Beckham David Kelly Ed Frierson Jackie Galloway
KCI	Phil Leazer
Three Oaks Engineering	Russell Chandler Heather Robbins Geni Theriot

Purpose of the Meeting:

Purpose was to present a project update, discuss the reasonable alternatives and revisions since the last agency meeting, discuss preliminary EFH assessment and future mitigation planning.

Old Business

Agencies were asked if they had any questions/concerns with Carolina Crossroad 404 (b) 1 responses progressing

USACE stated once final mitigation plan is received a 15-day review will occur.

No other questions/concerns were voiced.



US 278 Corridor Improvements

Alternatives Analysis

- Project recap/update was provided
- Agencies were provided the presentation seen today prior to the meeting
- In August we showed the reasonable alternatives, the project team is currently evaluating these alternatives and plan to have analysis complete by summer.
- 17 preliminary alternatives were developed originally and were narrowed down to 6 reasonable alternatives
- Public input led to revisions to the alternatives resulting in 9 reasonable alternatives
 - RA 4 modified to 4a with closer interchange to existing Pickney based on previous coordination with USFWS and coordination call with Waccamaw
 - RA 5 & 6 modified to pull off utility easement to minimize potential high costs of impacting utilities resulting in 5a and 6a
 - Hog Island Connector was added to all alternatives to facilitate more efficient ingress/egress during construction
- Preliminary impact calculations show RA 2, RA 3 and RA 4a are rising to the top. Impacts are still being evaluated so all 9 reasonable alternatives are still under analysis.
- NOAA-NMFS and USFWS expressed concern with the impacts expected from adding the Hog Island connector and expansion of project outside of existing right-of-way in this area.
- USFWS and NOAA-NMFS expressed concern with portions of the loop on Pinckney Island with proposed impacts to saltmarsh. NOAA needs justification for any proposed new causeway.
- Agencies asked if this loop over the saltmarsh could be a flyover but it was explained that due to elevations this was not constructible
- USFWS asked if existing US 278 could be used instead of the proposed loop concept was not constructible due to elevation constraints.

Essential Fish Habitat

NOAA-NMFS has no comments/questions and offers a site visit

Mitigation Needs Assessment

- Looking at existing landscape
- The range of credit needs was developed based on lowest level of impacts and highest level of impacts for all 9 reasonable alternatives
 - 23-62 freshwater credits
 - 203-396 tidal credits
- The agencies were asked if they knew of any on-site mitigation opportunities.
 - SCDNR does not have any on-site mitigation opportunities
 - SCDNR & USFWS expressed concern with the number of tidal credits



- SCDNR, NMFS, USFWS and USACE like onsite restoration
- USACE reminds to avoid & minimize and does not consider removal of causeway as mitigation without including a restoration component
- SCDOT is not sure they would propose onsite mitigation for all of mitigation
- The mitigation needs assessment is a snapshot of where we are in the design concept, efforts to avoid an minimize will be incorporated into the preferred alternatives. At this stage, the #'s are representative of all 9 reasonable alternatives and include both permanent and temporary impacts.
 - Credit range is conservative and may get smaller as alternatives are refined.
- USACE states they see a benefit of PRM for this project versus wiping out the available credits
- During the May ACE meeting, we plan to provide the full matrix of impacts for review

Action Items

- Provide justification to NMFS and USFWS for the following
 - Hog Island Connector and why it isn't shifting south of utility easement vs the northern alignment the project team is currently proposing
 - Why the Hog Island Connector is part of the US 278 project
- Continue refining alternatives analysis matrix to define preferred alternative
- Begin investigation of potential mitigation opportunities within the project watershed

Russell Chandler

From: Riddle, Nicole L. <RiddleNL@scdot.org>
Sent: Tuesday, July 28, 2020 10:52 AM
To: 'cynthia.cooksey@noaa.gov'
Cc: Pace Wilber; Belcher, Jeffery - FHWA; Kelly, David P.
Subject: EFH Submittal for US 278 Corridor Improvements in Beaufort County 30450
Attachments: Final EFH Submittal US 278 Beaufort 30450.pdf

The South Carolina Department of Transportation (SCDOT) on behalf of the Federal Highway Administration (FHWA), is requesting consultation with NOAA-NMFS as prescribed by the Magnuson-Stevens Act for the Proposed US 278 Corridor Improvement Project in Beaufort County, SC. Included you should find the EFH Assessment describing habitats, species, relevant construction activities with estimated impacts to EFH calculated based upon the described activities.

Please let me know if you need any additional information or any clarifications.

Nicole Levinson Riddle

Public Involvement Coordinator/Biologist

Environmental Services Office

South Carolina Department of Transportation

955 Park Street

Columbia, SC 29201

O: [803-737-0841](tel:803-737-0841)





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
<https://www.fisheries.noaa.gov/region/southeast>

September 14, 2020

F/SER47:CC/pw

(Sent via Electronic Mail)

Nicole Riddle
South Carolina Department of Transportation
Environmental Services Office
955 Park Street
Columbia, SC 29201

Dear Ms. Riddle:

NOAA's National Marine Fisheries Service (NMFS) reviewed the *US 278 Corridor Improvements Technical Memorandum: Essential Fish Habitat Assessment* dated July 2020, prepared on behalf of the Federal Highway Administration (FHWA) and sent to NMFS by letter dated July 28, 2020. The South Carolina Department of Transportation (SCDOT) and FHWA propose improvements to the US 278 corridor between Bluffton and Hilton Head Island in Beaufort County. The FHWA and SCDOT have determined the proposed action will adversely affect essential fish habitat (EFH) and, therefore, have included measures to avoid and minimize effects on EFH and will establish a plan to mitigate for unavoidable impacts to EFH. By letter dated April 24, 2019, the NMFS is serving as a participating agency in development of the Environmental Assessment. As the nation's federal trustee for the conservation and management of marine, estuarine, and anadromous fishery resources, the NMFS provides the following comments and recommendations pursuant to authorities of the Fish and Wildlife Coordination Act and the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act).

The EFH Assessment describes the proposed action, documents existing EFH conditions within the project area, and provides an analysis of the potential impacts to EFH from the proposed action. The proposed action involves 4.11 miles of improvements along US 278 from Moss Creek Drive to Wild Horse/Spanish Wells Road, inclusive of the Pinckney Island National Wildlife Refuge (PINWR) access roads. The project area includes portions of Mackay Creek and Skull Creek, and their associated wetlands and tributaries. The EFH Assessment outlines environmental protection provisions and best management plans for avoiding and minimizing adverse impacts to natural resources, including maximizing length of bridge spans and the distance between bents and columns; noise reduction techniques; and pollution and erosion control measures. The Recommended Preferred Alternative consists of the alternative with the least amount of total wetland impacts and lowest impacts to EFH.

The EFH Assessment was comprehensive and complete. In addition to reviewing the document, NMFS participated in several interagency coordination team meetings. While the proposed action will result in adverse impacts to EFH, the FHWA and SCDOT have chosen the least damaging alternative with regards to EFH while implementing strategies to avoid and minimize

remaining impacts and to increase the likelihood of recovery at locations not expected to have permanent impacts. These strategies include using bridging across EFH, rather than lengthy causeways that remove EFH and alter the flows of tidal waters and other Best Management Practices. Of the 182.6 total acres of EFH found within the 438.2 acre project area, potentially up to 6.4 acres of EFH will be permanently impacted by fill, 2.6 acres of EFH will permanently impacted via shading, and 1.2 acres of EFH may be temporarily impacted. The FHWA and SCDOT have committed to working with the NMFS and other resource agencies to develop a mitigation plan to ensure appropriate mitigation for all unavoidable EFH impacts. The EFH mitigation plan may include purchasing mitigation credits from an approved mitigation bank or Permittee Responsible Mitigation (PRM), and the NMFS believes both options are viable for scope and scale of this project's impacts. The NMFS looks forward to continued participation in development of the mitigation plan. Therefore, based on the information provided and commitment to develop appropriate compensatory mitigation, the NMFS has no EFH conservation recommendations at this time for the proposed improvements to the US 278 Corridor.

The NMFS appreciates the opportunity to provide these comments and thanks the FHWA and SCDOT for their efforts in incorporating avoidance and minimization strategies and early engagement on the project. Please direct related correspondence to the attention of Cindy Cooksey at our Charleston Area Office. She may be reached at (843) 460-9922 or by e-mail at Cynthia.Cooksey@noaa.gov.

Sincerely,

WILBER.THOMAS.P
AYSON.136582018
6

Digitally signed by
WILBER.THOMAS.PAYSON.136582
0186
Date: 2020.09.14 14:34:29 -04'00'

/for

Virginia M. Fay
Assistant Regional Administrator
Habitat Conservation Division

cc: SCDOT, RiddleNL@scdot.org
FHWA, Jeffrey.Belcher@dot.gov
F/SER47, Cynthia.Cooksey@noaa.gov

From: Beckham, Chris <BeckhamJC@scdot.org>
Sent: Thursday, March 18, 2021 8:07 AM
To: cynthia.cooksey@noaa.gov
Cc: Belcher, Jeffery - FHWA; Kelly, David P.; Winn, Craig L.; Heather Robbins; Russell Chandler
Subject: US 278 Corridor Improvements EFH
Attachments: US 278_EFH_TechnicalReport_w_Addendum_final_03-18-21.pdf

Cindy,

The South Carolina Department of Transportation on behalf of the Federal Highway Administration is requesting consultation with NOAA-NMFS for the proposed US 278 Corridor Improvement Project. We originally submitted a consultation request for this project in July 2020, and received comments on this project from your office on September 14, 2020. Since receiving the comment letter, the project has been modified resulting in changes that required additional analysis of the potential EFH impacts. Please find the attached Updated EFH Consultation Request Package for the US 278 Corridor Improvements Project. Let me know if you have any questions or need any additional information to process this request.

Thanks,

Chris Beckham
SCDOT
Environmental Services Office
Office: (803) 737-1332
Mobile: (803) 609-9464

From: [Heather Robbins](#)
To: [Amanda Chandler](#)
Subject: FW: US 278 Corridor EFH Addendum
Date: Tuesday, June 8, 2021 11:14:46 AM
Attachments: [image001.png](#)

Heather M. Robbins, AICP

NEPA Practice Leader
m: 803.600.3787

From: Kelly, David P. <KellyDP@scdot.org>
Sent: Thursday, June 3, 2021 9:56 AM
To: Heather Robbins <Heather.Robbins@kci.com>; Matthew DeWitt <Matthew.Dewitt@kci.com>
Subject: FW: US 278 Corridor EFH Addendum

Timeframe from NOAA below.

David

From: Belcher, Jeffrey (FHWA) <Jeffrey.Belcher@dot.gov>
Sent: Thursday, June 3, 2021 9:46 AM
To: Beckham, Chris <BeckhamJC@scdot.org>; Kelly, David P. <KellyDP@scdot.org>
Subject: FW: US 278 Corridor EFH Addendum

*** This is an EXTERNAL email. Please do not click on a link or open any attachments unless you are confident it is from a trusted source. ***

FYI.

J. Shane Belcher
Lead Environmental Specialist
Federal Highway Administration
1835 Assembly Street, Suite 1270
Columbia, SC 29201
Phone: 803-253-3187

The content of this email is confidential and intended for the recipient specified in message only.

From: Cynthia Cooksey - NOAA Federal <cynthia.cooksey@noaa.gov>
Sent: Thursday, June 03, 2021 9:42 AM
To: Belcher, Jeffrey (FHWA) <Jeffrey.Belcher@dot.gov>
Subject: Re: US 278 Corridor EFH Addendum

CAUTION: This email originated from outside of the Department of Transportation (DOT). Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Yes, although I'm hoping to have it complete by no later than 30 days.

Cindy

Cynthia Cooksey
Fishery Biologist

NOAA
National Marine Fisheries Service
Southeast Regional Office - Habitat Conservation Division
331 Fort Johnson Road
Charleston, SC 29412
PH: (843) 460-9922
E-Mail: cynthia.cooksey@noaa.gov

On Wed, Jun 2, 2021 at 10:31 AM Belcher, Jeffrey (FHWA) <Jeffrey.Belcher@dot.gov> wrote:

Cindy,

Just to clarify, since it is an addendum report would your review still be 60 days? Sorry, meant to ask that when I sent it. If there is anything that we can do to maybe help streamline the review on the addendum, please let me know. Apologies again, we all thought the report went through back in March.

Much thanks,

J. Shane Belcher

*Lead Environmental Specialist
Federal Highway Administration
1835 Assembly Street, Suite 1270
Columbia, SC 29201
Phone: 803-253-3187*

The content of this email is confidential and intended for the recipient specified in message only.

From: Cynthia Cooksey - NOAA Federal <cynthia.cooksey@noaa.gov>
Sent: Tuesday, June 01, 2021 1:37 PM
To: Belcher, Jeffrey (FHWA) <Jeffrey.Belcher@dot.gov>
Cc: Beckham, Chris <BeckhamJC@dot.state.sc.us>
Subject: Re: US 278 Corridor EFH Addendum

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Got it.
Cindy

Cynthia Cooksey
Fishery Biologist

NOAA
National Marine Fisheries Service
Southeast Regional Office - Habitat Conservation Division
331 Fort Johnson Road
Charleston, SC 29412
PH: (843) 460-9922
E-Mail: cynthia.cooksey@noaa.gov

On Thu, May 27, 2021 at 12:22 PM Belcher, Jeffrey (FHWA) <Jeffrey.Belcher@dot.gov> wrote:

No problem here it is, but if you click on the attachment in the PDF it is the 103 page report.

Much thanks,

*J. Shane Belcher
Lead Environmental Specialist
Federal Highway Administration
1835 Assembly Street, Suite 1270
Columbia, SC 29201
Phone: 803-253-3187*

The content of this email is confidential and intended for the recipient specified in message only.

From: Cynthia Cooksey - NOAA Federal <cynthia.cooksey@noaa.gov>
Sent: Thursday, May 27, 2021 12:06 PM
To: Belcher, Jeffrey (FHWA) <Jeffrey.Belcher@dot.gov>
Subject: Re: US 278 Corridor EFH Addendum

CAUTION: This email originated from outside of the Department of Transportation (DOT). Do not click on links or open attachments unless you recognize the sender and know the content is safe.

What I received from you was 1 page - just the cover letter, didn't have the EFH addendum. Can you try to send just the addendum.
Cindy

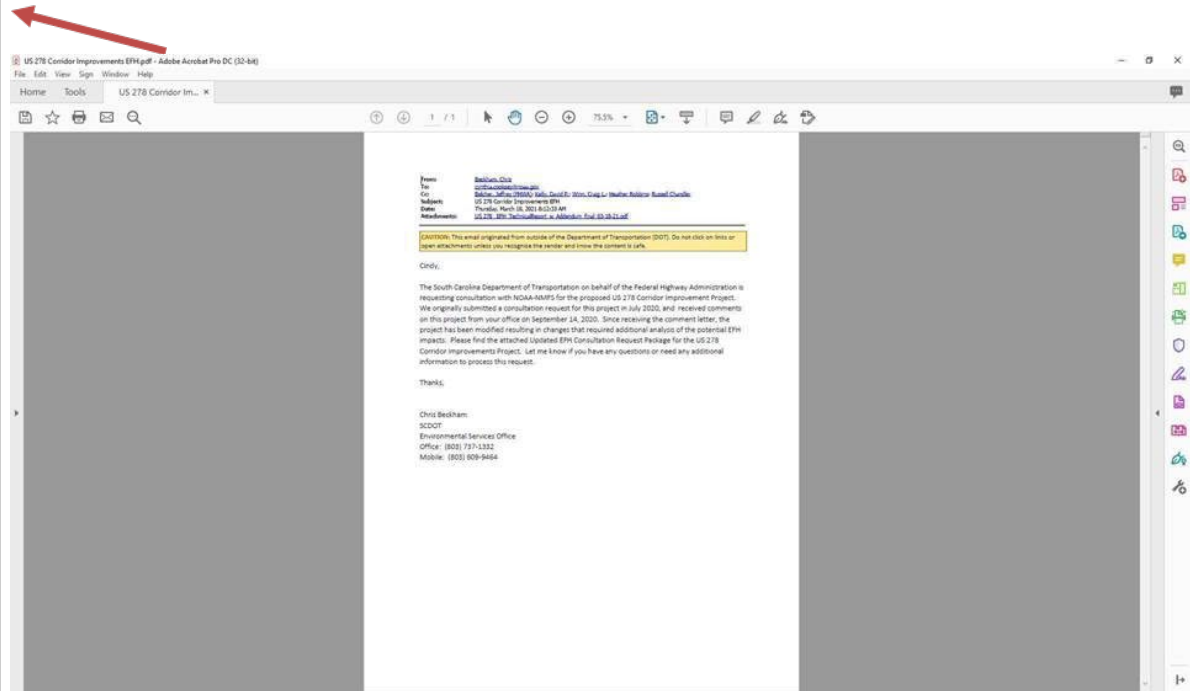
Cynthia Cooksey
Fishery Biologist

NOAA
National Marine Fisheries Service
Southeast Regional Office - Habitat Conservation Division
331 Fort Johnson Road
Charleston, SC 29412
PH: (843) 460-9922
E-Mail: cynthia.cooksey@noaa.gov

On Thu, May 27, 2021 at 12:00 PM Belcher, Jeffrey (FHWA) <Jeffrey.Belcher@dot.gov> wrote:

Thanks Cindy. I looked and the revised/addendum assessment is ~14 MB. What size attachments are you able to receive? I'll resend via e-mail if the file size

is small enough. Since you received my e-mail, you should also be able to get the revised document from the PDF attachment of Chris's e-mail that I attached. Let me know.



J. Shane Belcher
Lead Environmental Specialist
Federal Highway Administration
1835 Assembly Street, Suite 1270
Columbia, SC 29201
Phone: 803-253-3187

The content of this email is confidential and intended for the recipient specified in message only.

From: Cynthia Cooksey - NOAA Federal <cynthia.cooksey@noaa.gov>
Sent: Thursday, May 27, 2021 11:43 AM
To: Belcher, Jeffrey (FHWA) <Jeffrey.Belcher@dot.gov>
Cc: Pace Wilber - NOAA Federal <pace.wilber@noaa.gov>; Beckham, Chris <BeckhamJC@dot.state.sc.us>
Subject: Re: US 278 Corridor EFH Addendum

CAUTION: This email originated from outside of the Department of Transportation (DOT). Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Hi Shane,
I just searched all of my email files for Chris' email and could not locate it. It's possible it was bounced by my system if the file attachment size was too large. Could you please resend?
Cindy

Cynthia Cooksey
Fishery Biologist

NOAA
National Marine Fisheries Service
Southeast Regional Office - Habitat Conservation Division
331 Fort Johnson Road
Charleston, SC 29412
PH: (843) 460-9922
E-Mail: cynthia.cooksey@noaa.gov

On Wed, May 26, 2021 at 10:34 AM Belcher, Jeffrey (FHWA) <Jeffrey.Belcher@dot.gov> wrote:

Cindy,

Hope all is well. Just wanted to do a quick follow-up to see if you had any comments on the addendum report that Chris sent in March (see attached)? We are hoping to be able to include any revised conservation measures if applicable into the upcoming EA. Your previous response on the EFH did not

recommend any, so just wanted to make sure if the addendum report would change that and if you would be providing an updated response?

Much thanks,

J. Shane Belcher

*Lead Environmental Specialist
Federal Highway Administration
1835 Assembly Street, Suite 1270
Columbia, SC 29201
Phone: 803-253-3187*

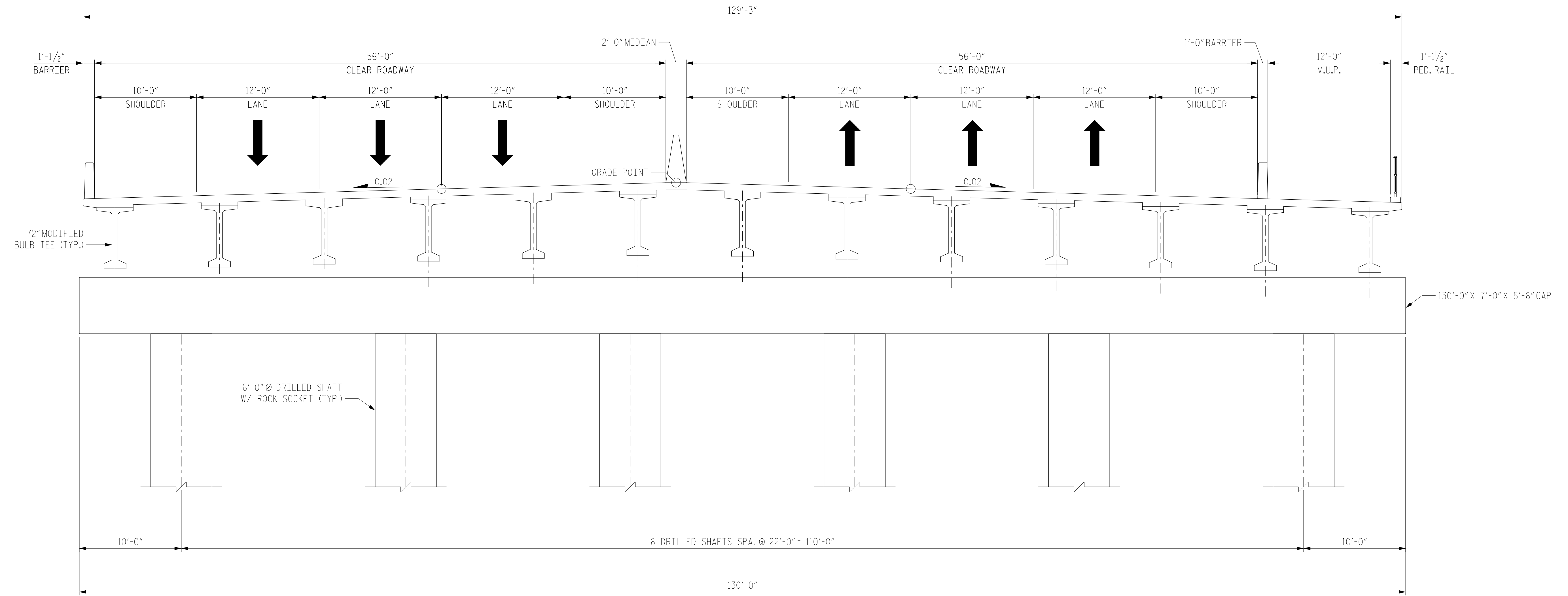
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APPENDIX B

PROPOSED US 278 BRIDGE TYPICAL SECTIONS


BRIDGE PLANS ID	SHEET NO.
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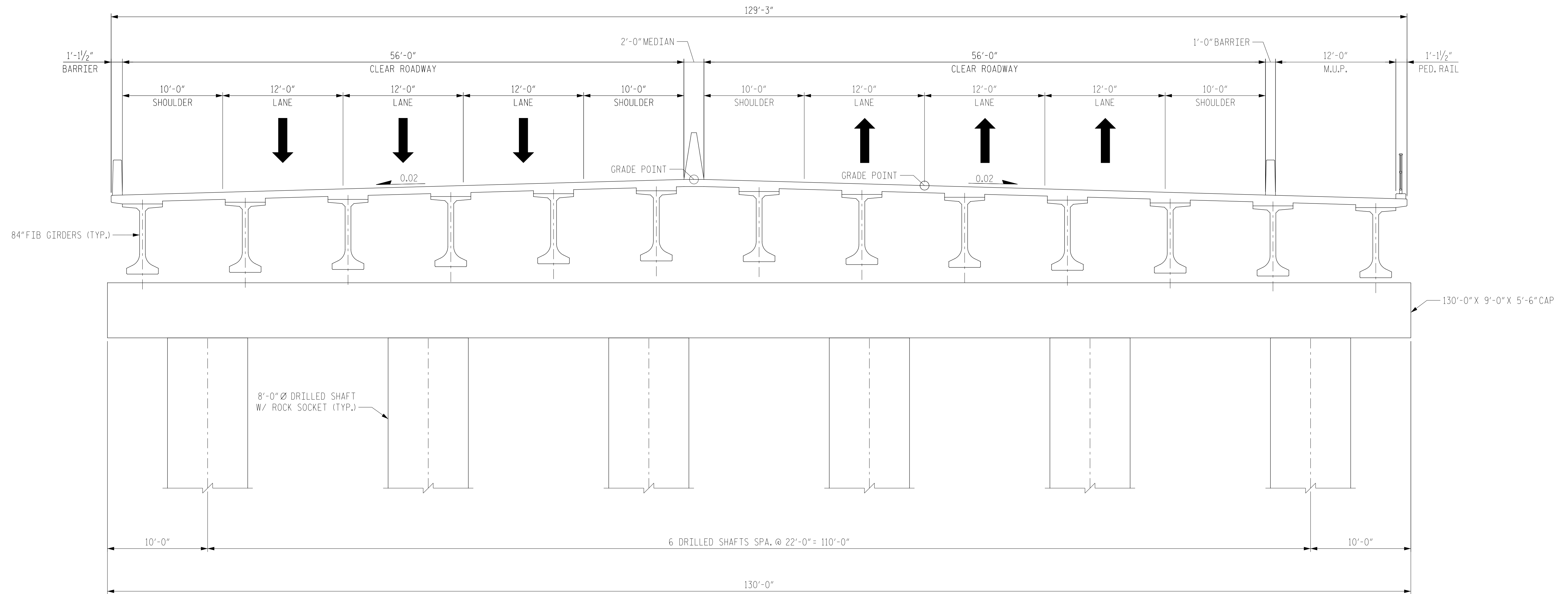

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 DEPARTMENT OF TRANSPORTATION

ELEVATION
(BENTS 1-7 & 44-46)
 US 278 CORRIDOR IMPROVEMENT
 OVER INTERCOASTAL WATERWAY

COUNTY: BEAUFORT ROUTE: US 278

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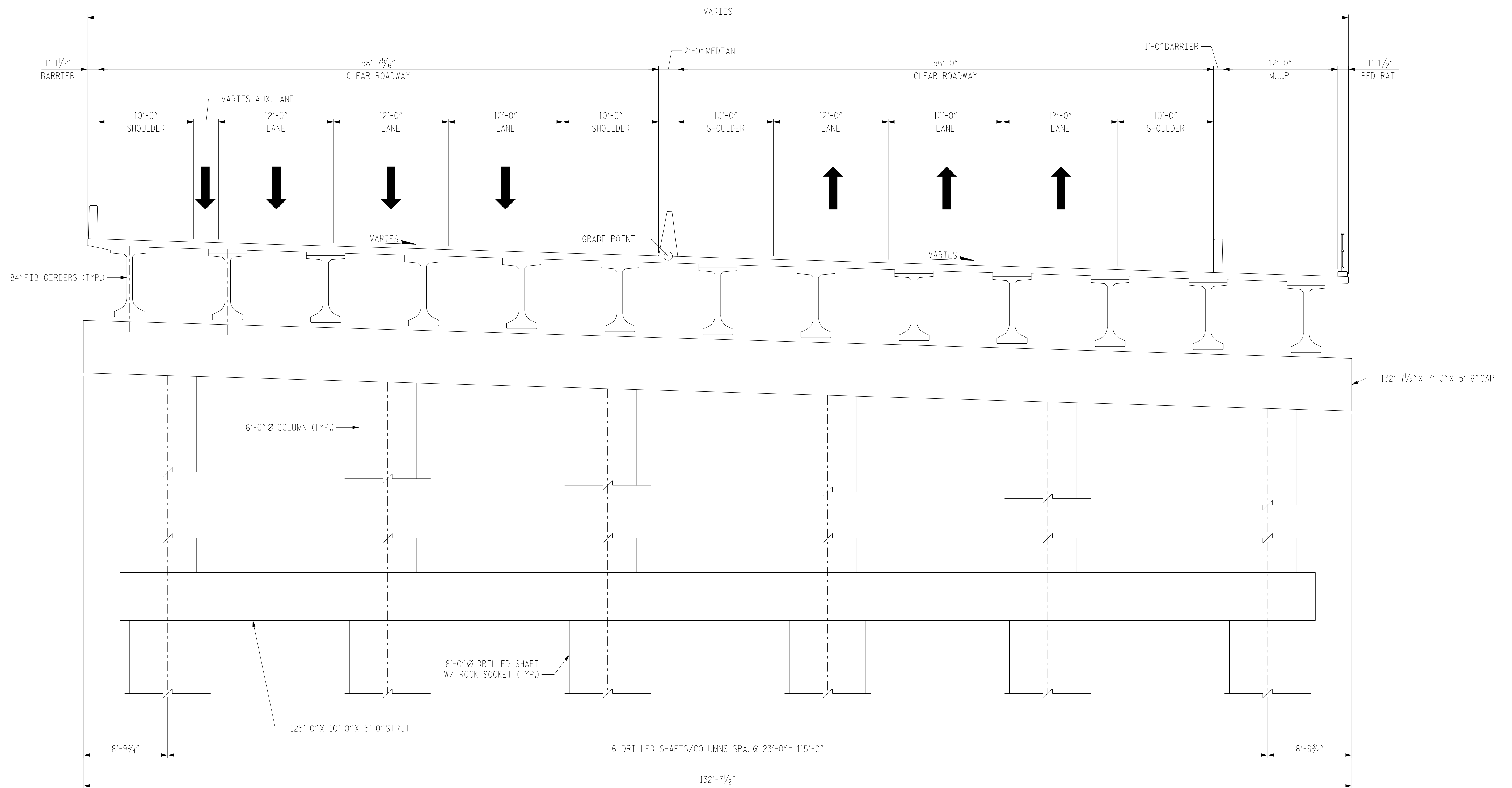
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DEPARTMENT OF TRANSPORTATION

ELEVATION (BENTS 8-13)

US 278 CORRIDOR IMPROVEMENT
OVER INTERCOASTAL WATERWAY

COUNTY: BEAUFORT ROUTE: US 278


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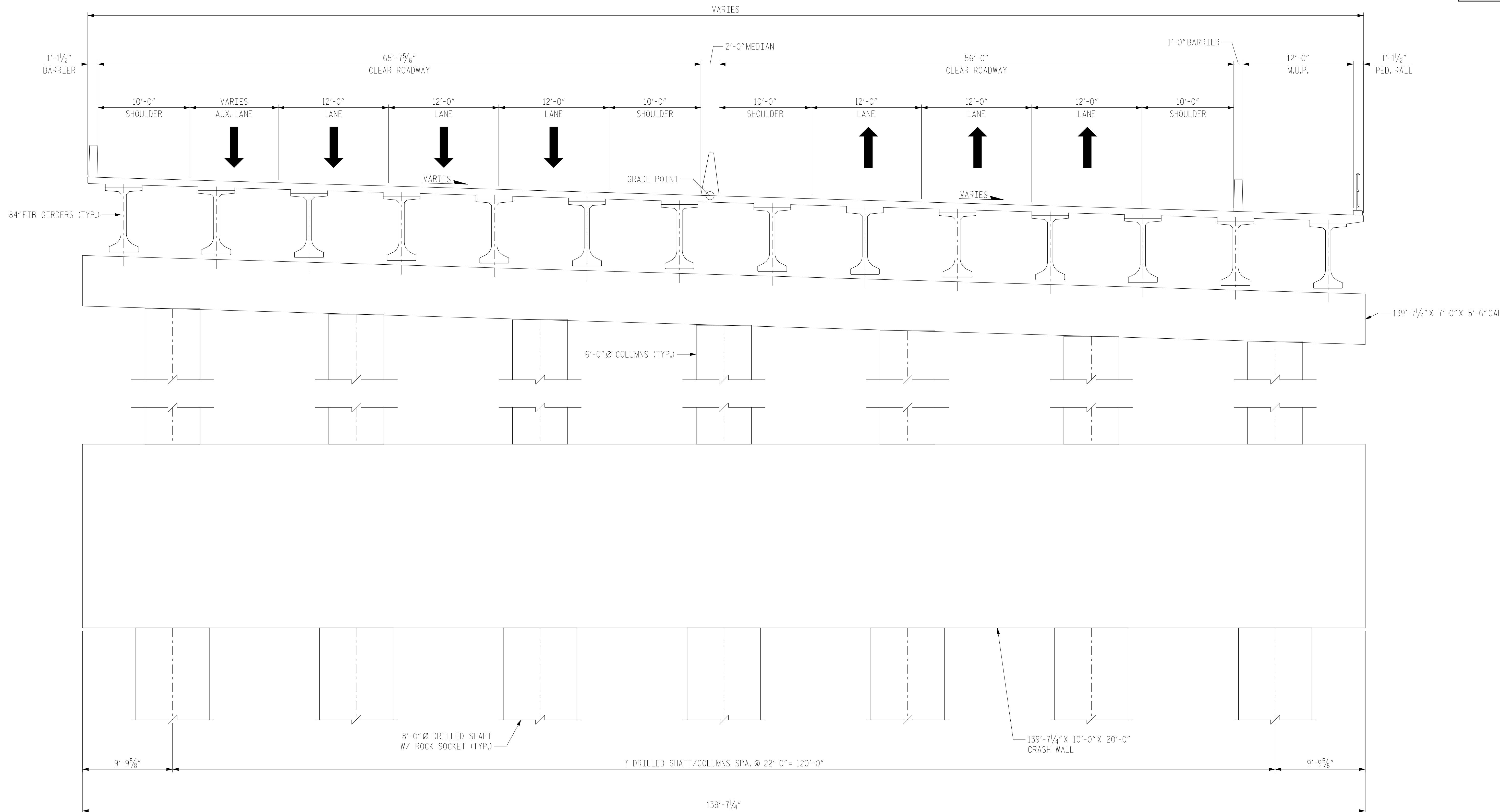

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ELEVATION (BENT 14)
 US 278 CORRIDOR IMPROVEMENT
 OVER INTERCOASTAL WATERWAY

COUNTY BEAUFORT	ROUTE US 278
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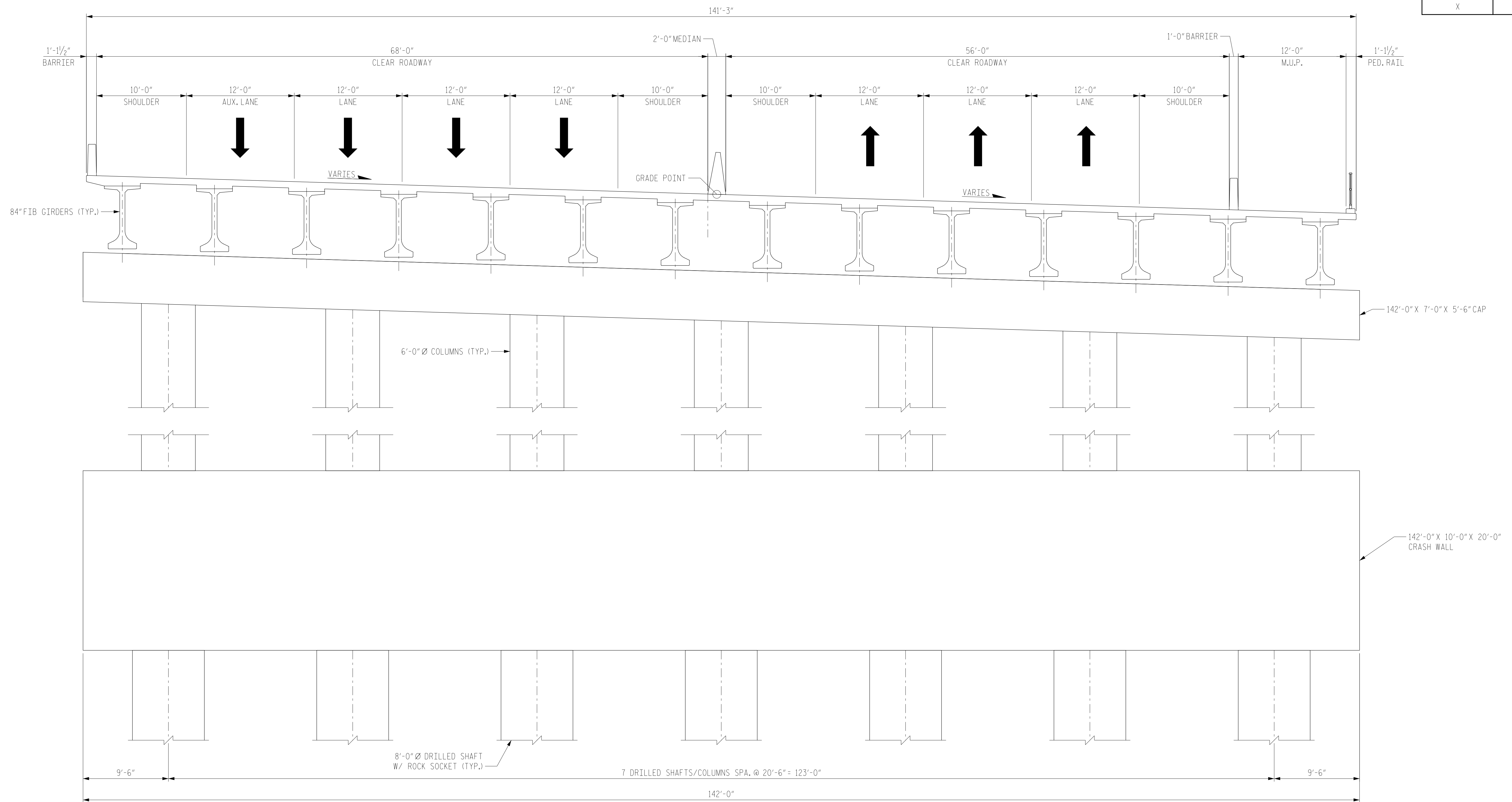

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ELEVATION (BENT 15)
 US 278 CORRIDOR IMPROVEMENT
 OVER INTERCOASTAL WATERWAY

COUNTY	ROUTE
BEAUFORT	US 278

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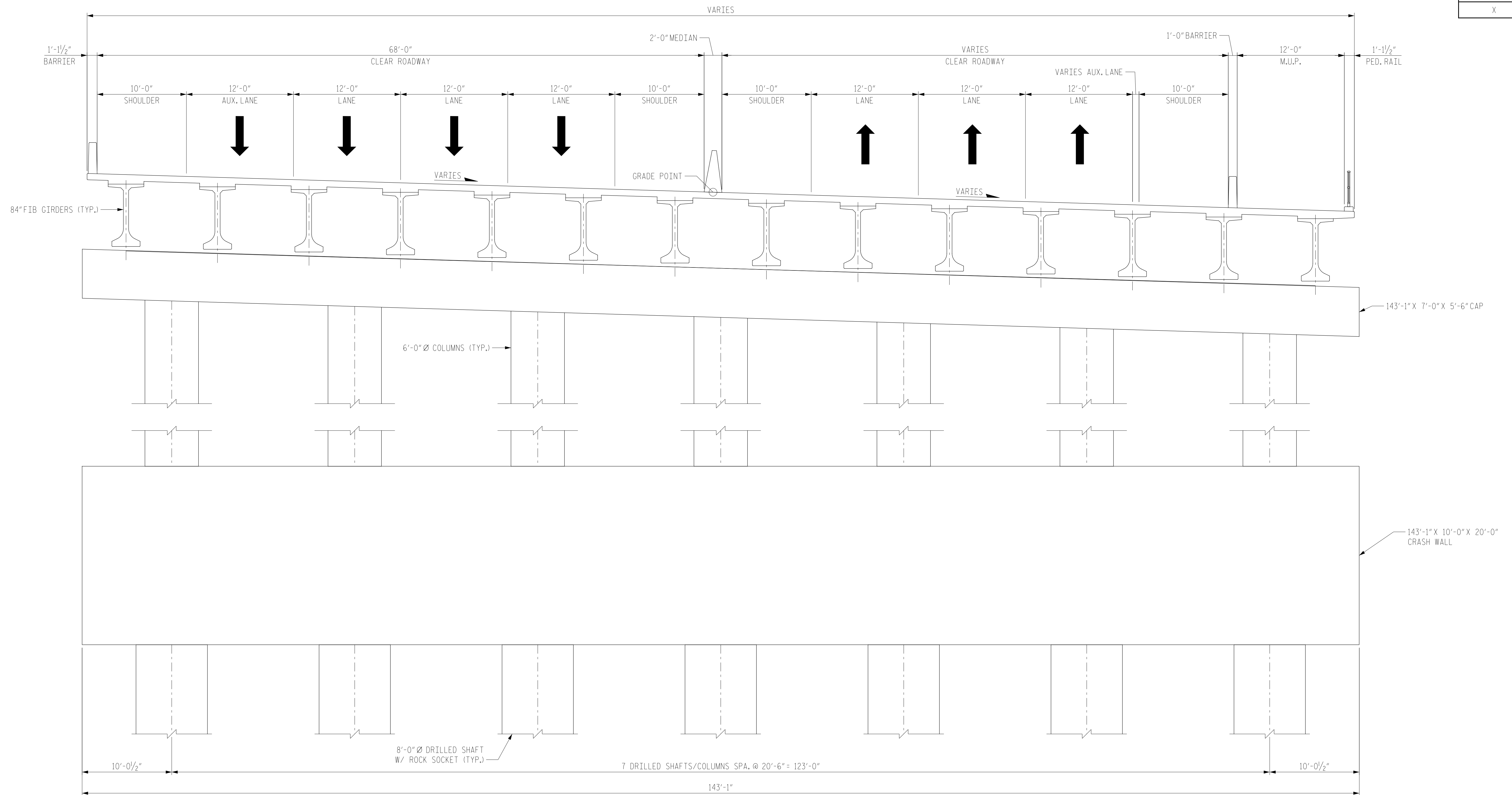
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ELEVATION
(BENTS 16 & 17)
 US 278 CORRIDOR IMPROVEMENT
 OVER INTERCOASTAL WATERWAY

COUNTY: BEAUFORT ROUTE: US 278


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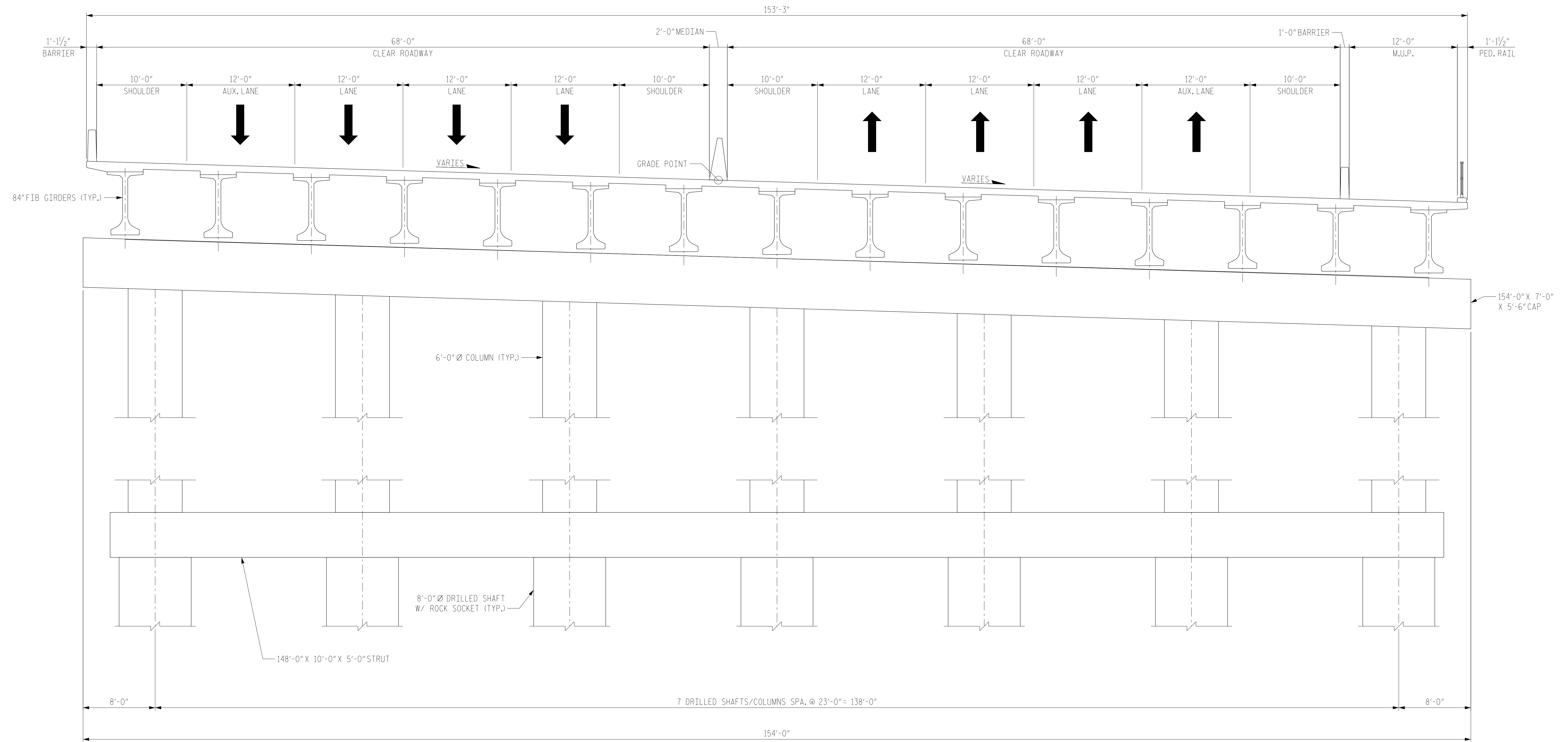

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ELEVATION (BENT 18)
 US 278 CORRIDOR IMPROVEMENT
 OVER INTERCOASTAL WATERWAY

COUNTY BEAUFORT ROUTE US 278


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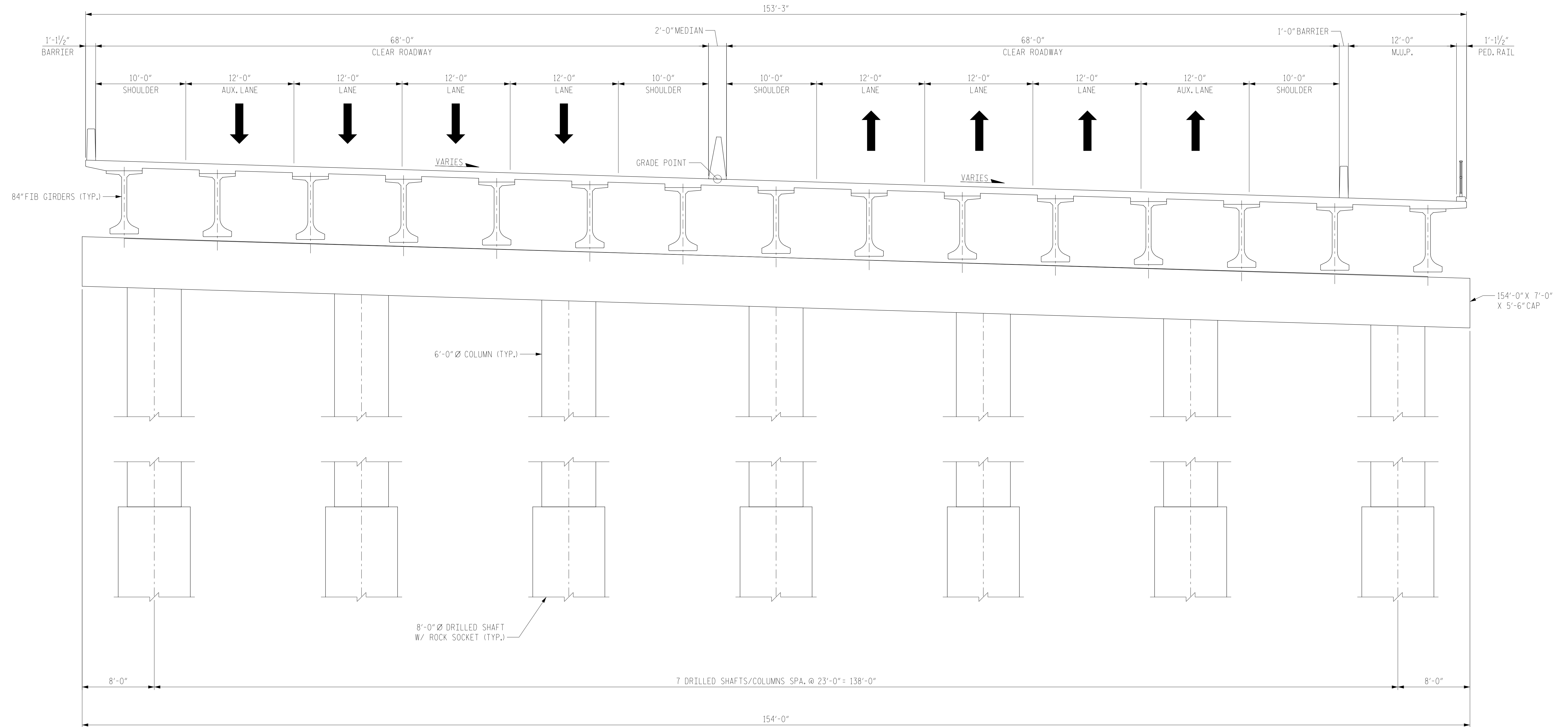

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ELEVATION (BENT 19)
 US 278 CORRIDOR IMPROVEMENT
 OVER INTERCOASTAL WATERWAY

COUNTY: BEAUFORT ROUTE: US 278


BRIDGE PLANS ID	SHEET NO.
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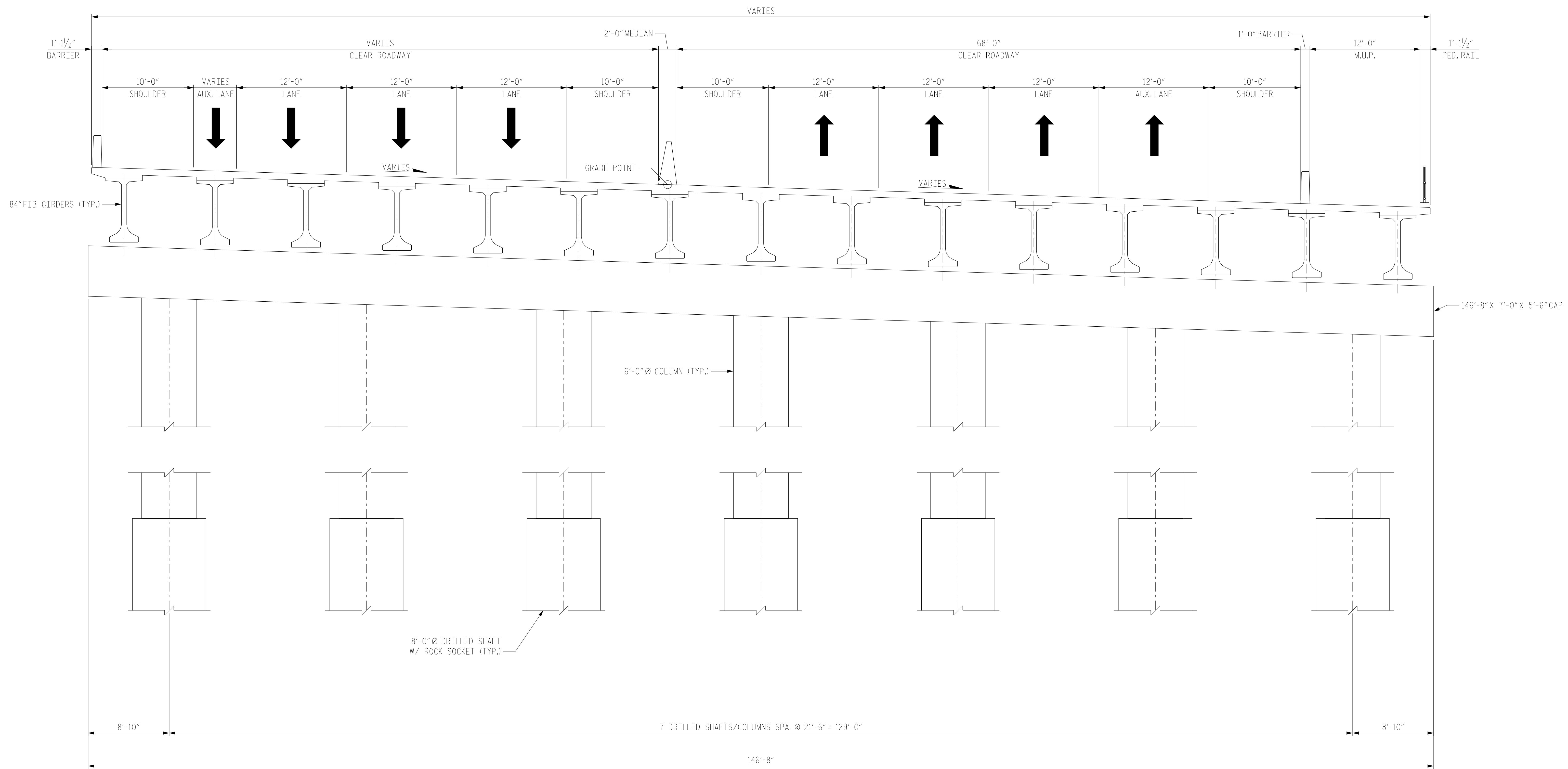

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ELEVATION (BENTS 20-26)
 US 278 CORRIDOR IMPROVEMENT
 OVER INTERCOASTAL WATERWAY

COUNTY: BEAUFORT ROUTE: US 278

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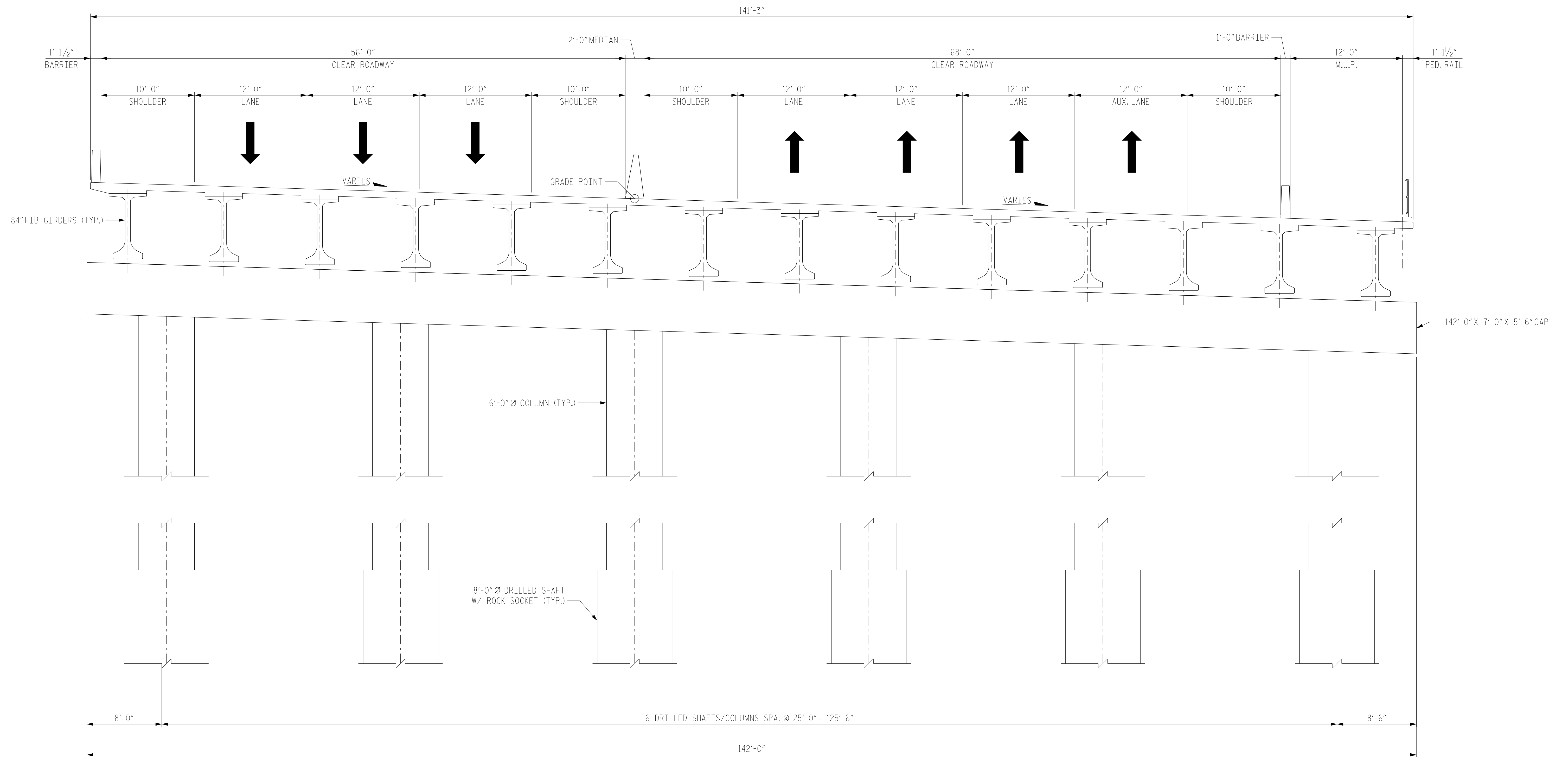
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 DEPARTMENT OF TRANSPORTATION

ELEVATION (BENT 27)
 US 278 CORRIDOR IMPROVEMENT
 OVER INTERCOASTAL WATERWAY

COUNTY: BEAUFORT ROUTE: US 278

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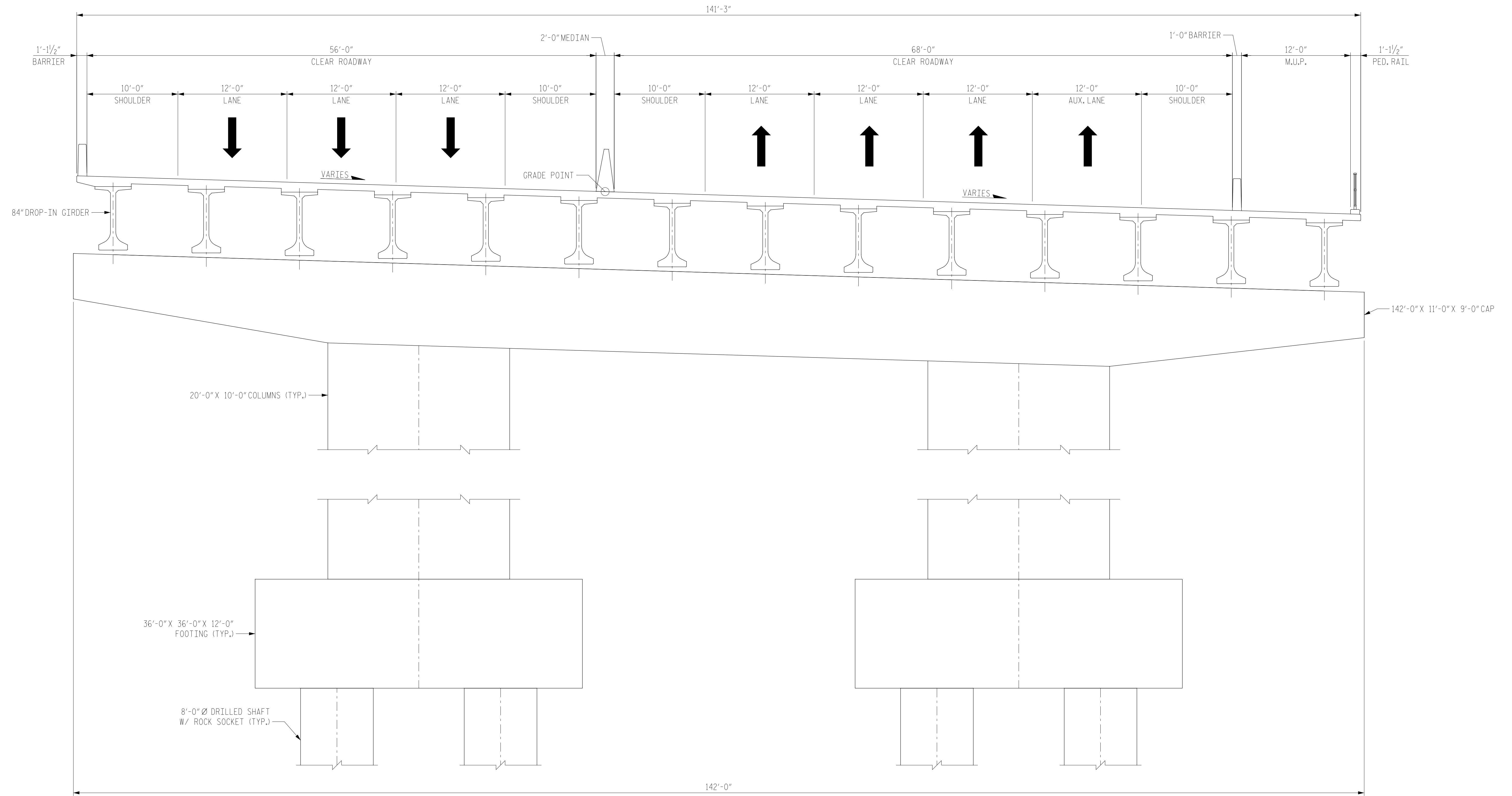
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 DEPARTMENT OF TRANSPORTATION

ELEVATION
(BENTS 28-31)
 US 278 CORRIDOR IMPROVEMENT
 OVER INTERCOASTAL WATERWAY

COUNTY: BEAUFORT ROUTE: US 278


BRIDGE PLANS ID	SHEET NO.
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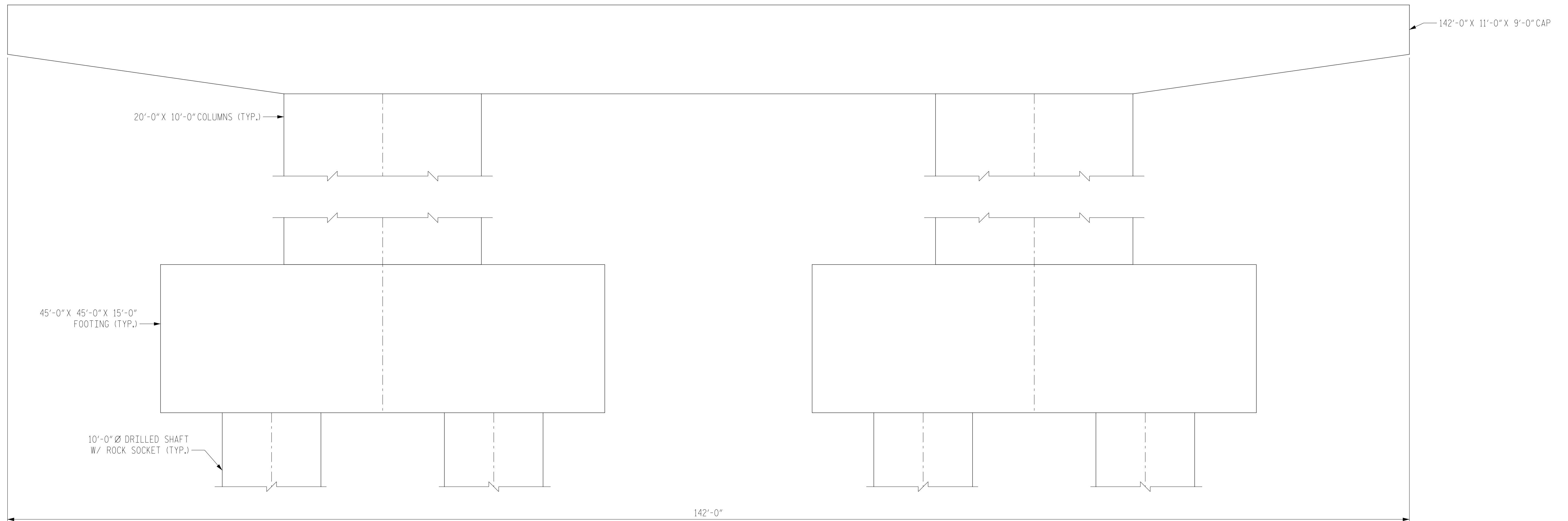
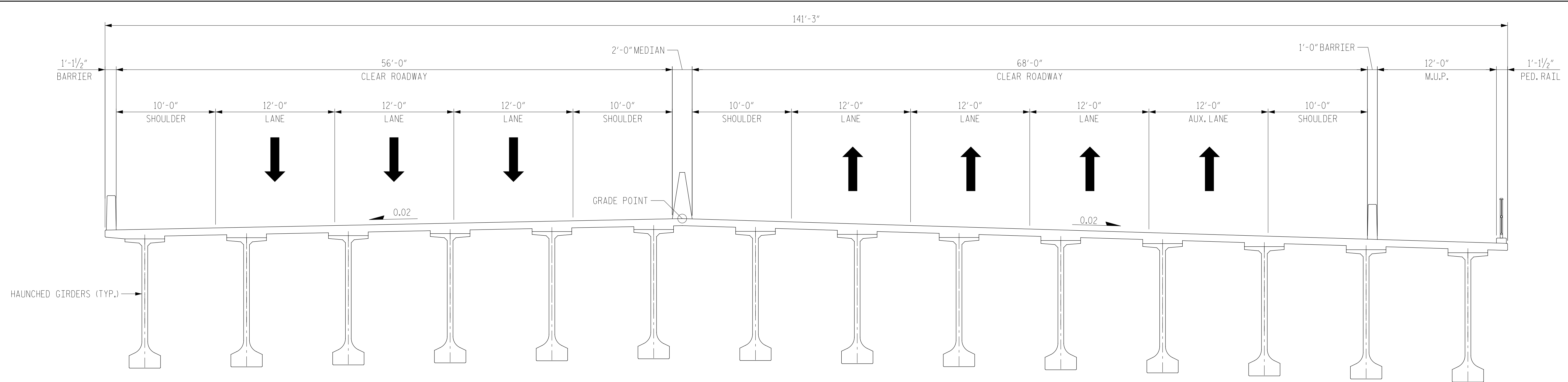

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 DEPARTMENT OF TRANSPORTATION

ELEVATION (BENT 32)
 US 278 CORRIDOR IMPROVEMENT
 OVER INTERCOASTAL WATERWAY

COUNTY BEAUFORT ROUTE US 278


BRIDGE PLANS ID	SHEET NO.
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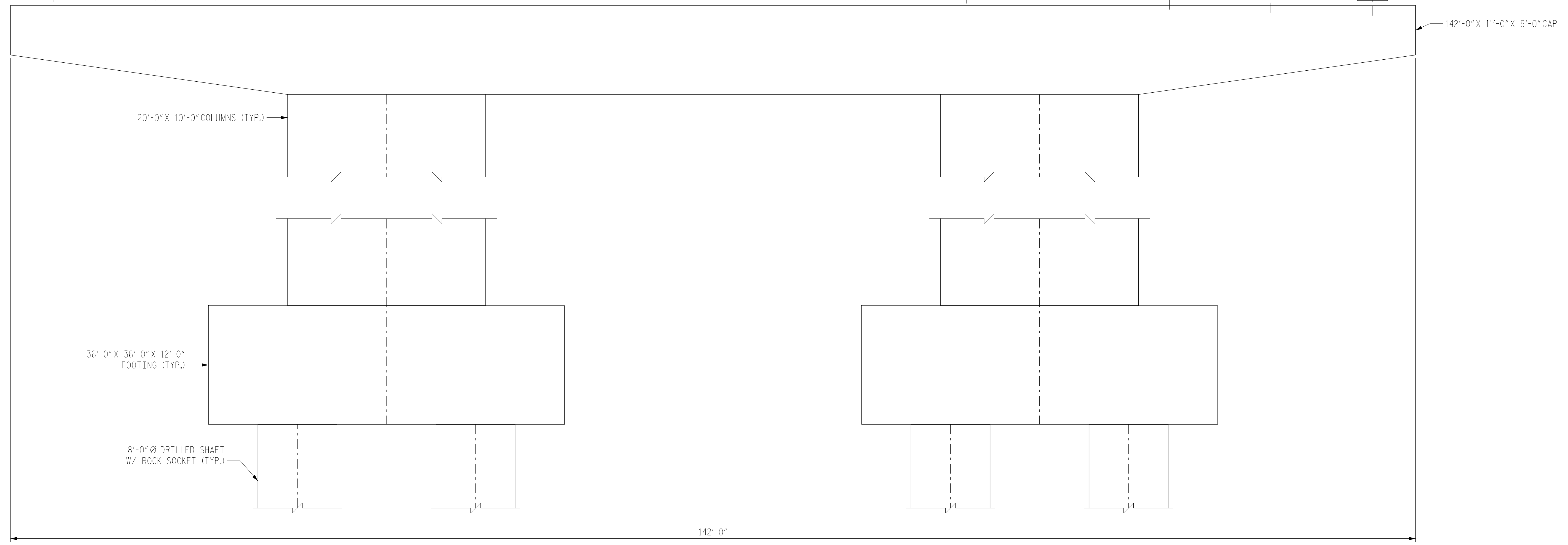
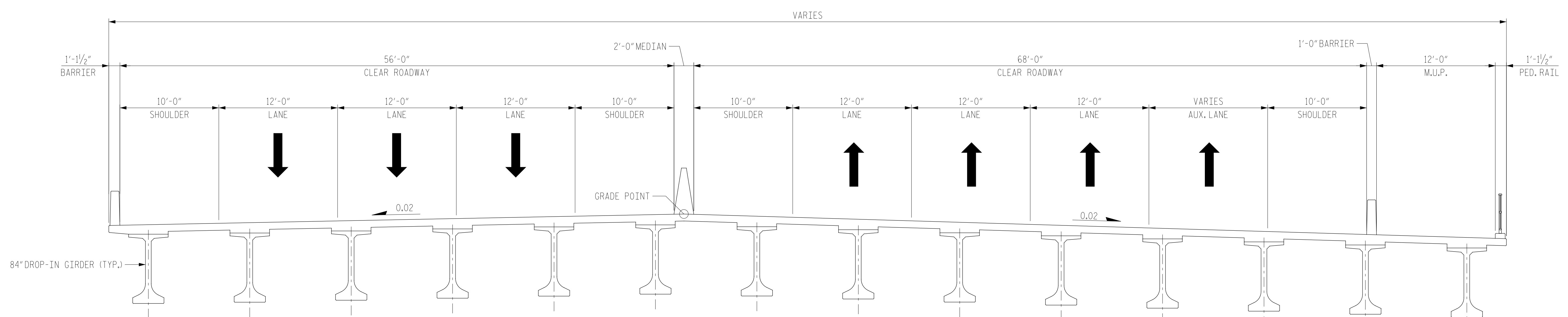
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SOUTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
ELEVATION
(BENTS 33 & 34)
 US 278 CORRIDOR IMPROVEMENT
 OVER INTERCOASTAL WATERWAY

COUNTY: BEAUFORT ROUTE: US 278

BRIDGE PLANS ID	SHEET NO.
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 KCI ENGINEERS | PLANNERS | SCIENTISTS | CONSTRUCTION MANAGERS

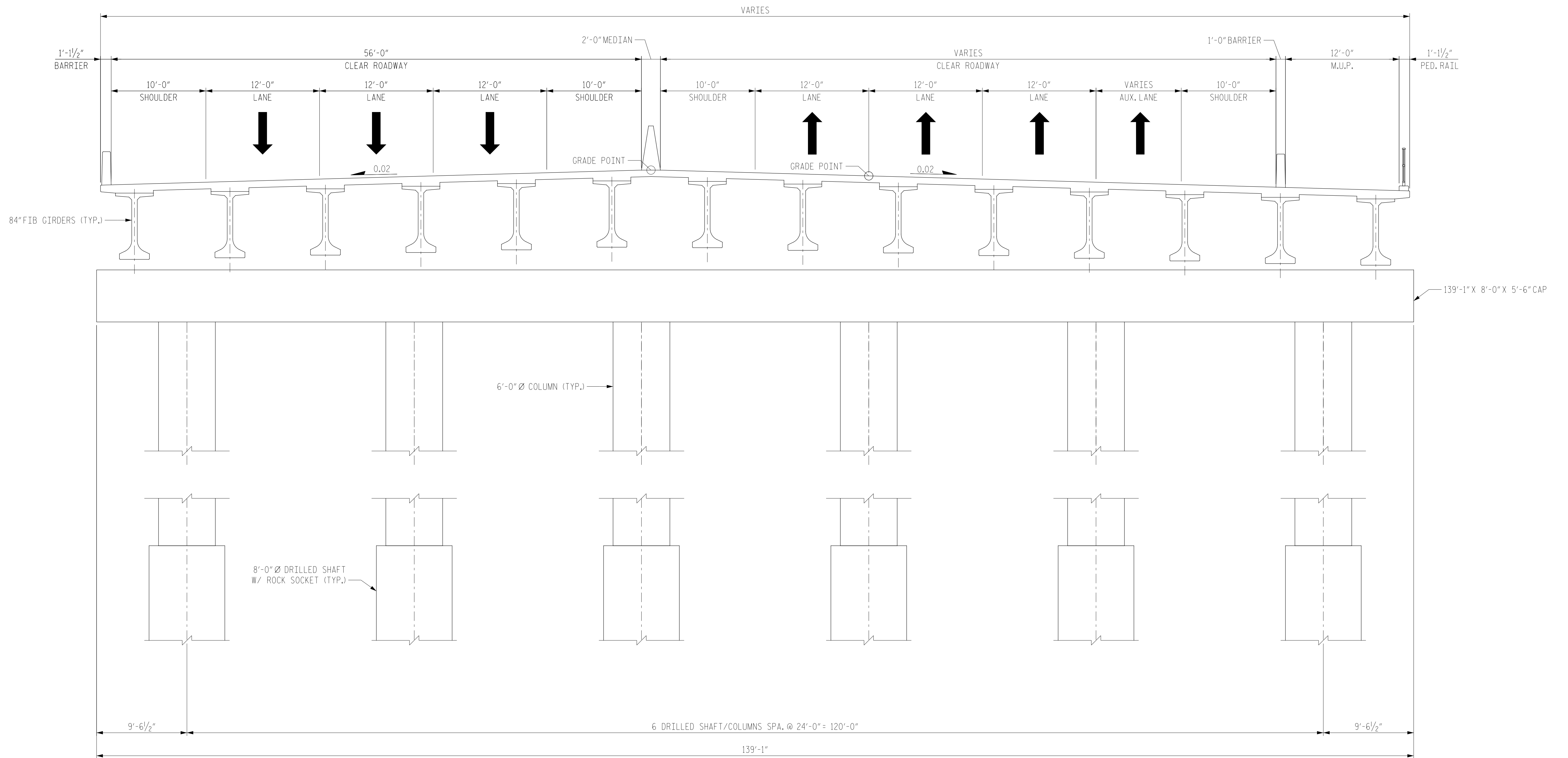
SOUTH CAROLINA
 DEPARTMENT OF TRANSPORTATION

ELEVATION (BENT 35)

US 278 CORRIDOR IMPROVEMENT
 OVER INTERCOASTAL WATERWAY

COUNTY: BEAUFORT ROUTE: US 278


BRIDGE PLANS ID	SHEET NO.
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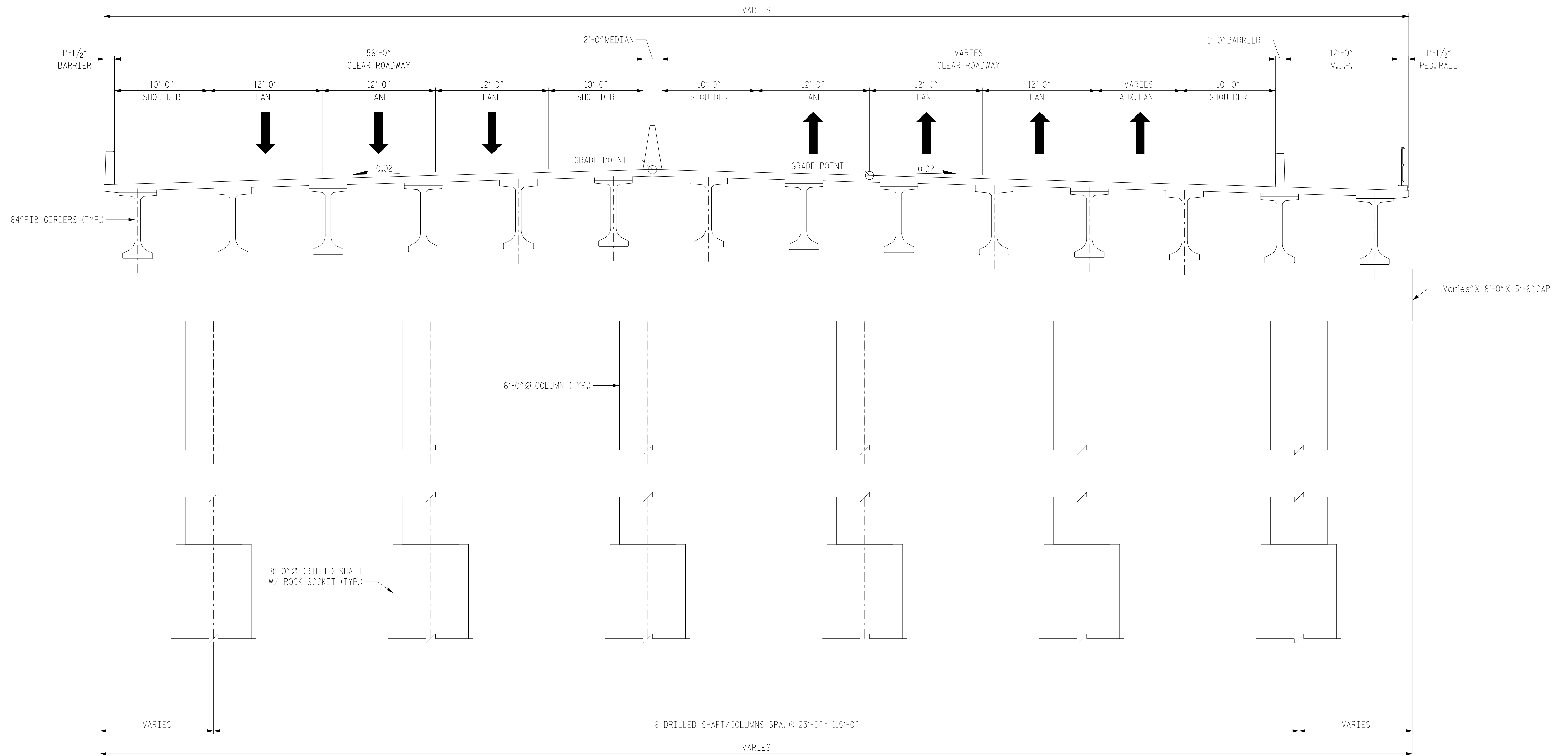

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SOUTH CAROLINA
 DEPARTMENT OF TRANSPORTATION

ELEVATION (BENT 36)
 US 278 CORRIDOR IMPROVEMENT
 OVER INTERCOASTAL WATERWAY

COUNTY: BEAUFORT ROUTE: US 278


BRIDGE PLANS ID	SHEET NO.
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CONCEPTUAL
PLANS

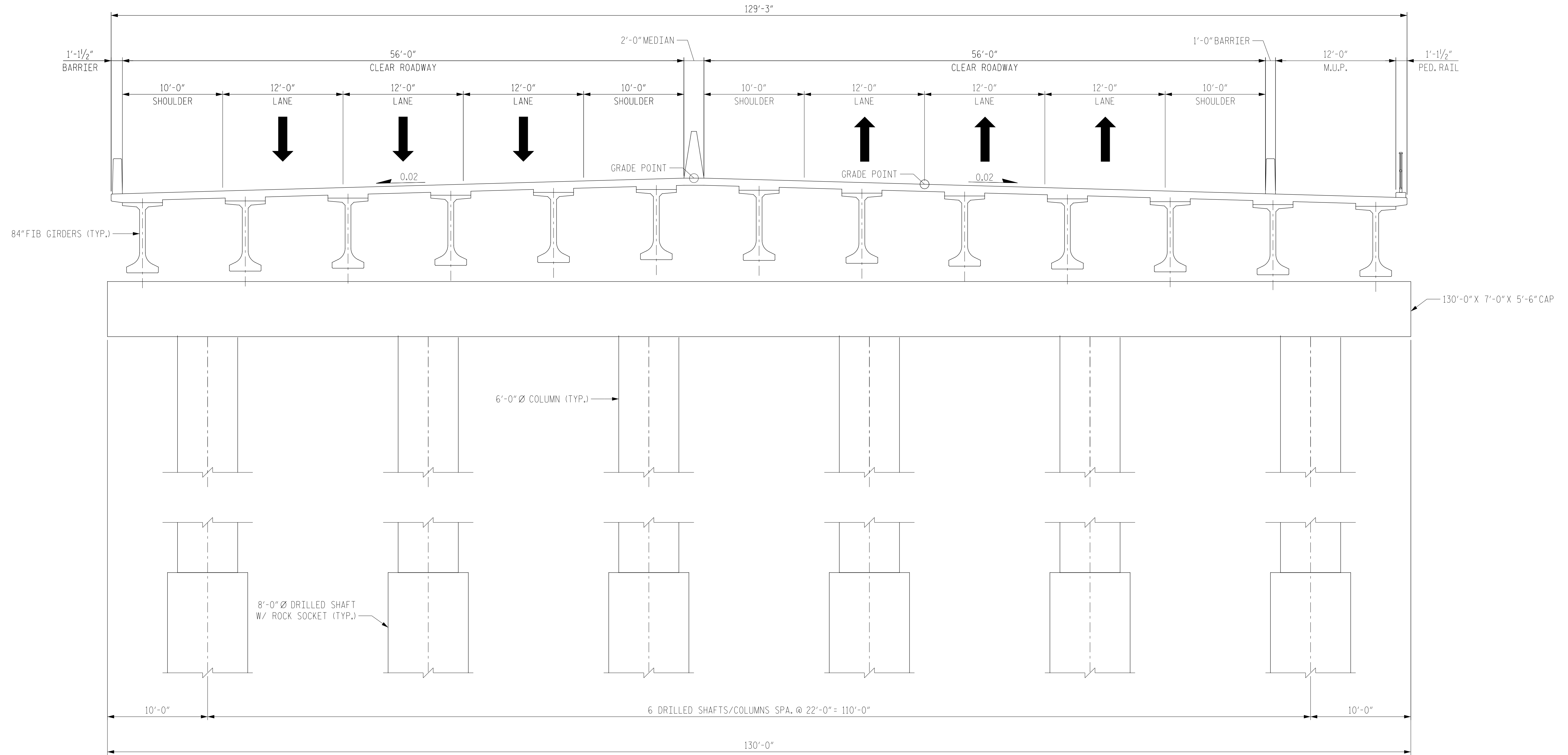
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KCI TECHNOLOGIES
 ENGINEERS | PLANNERS | SCIENTISTS | CONSTRUCTION MANAGERS

SOUTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
ELEVATION
(BENT 37 & 38)
 US 278 CORRIDOR IMPROVEMENT
 OVER INTERCOASTAL WATERWAY

COUNTY BEAUFORT ROUTE US 278


BRIDGE PLANS ID	SHEET NO.
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BY	CHK.	DATE	

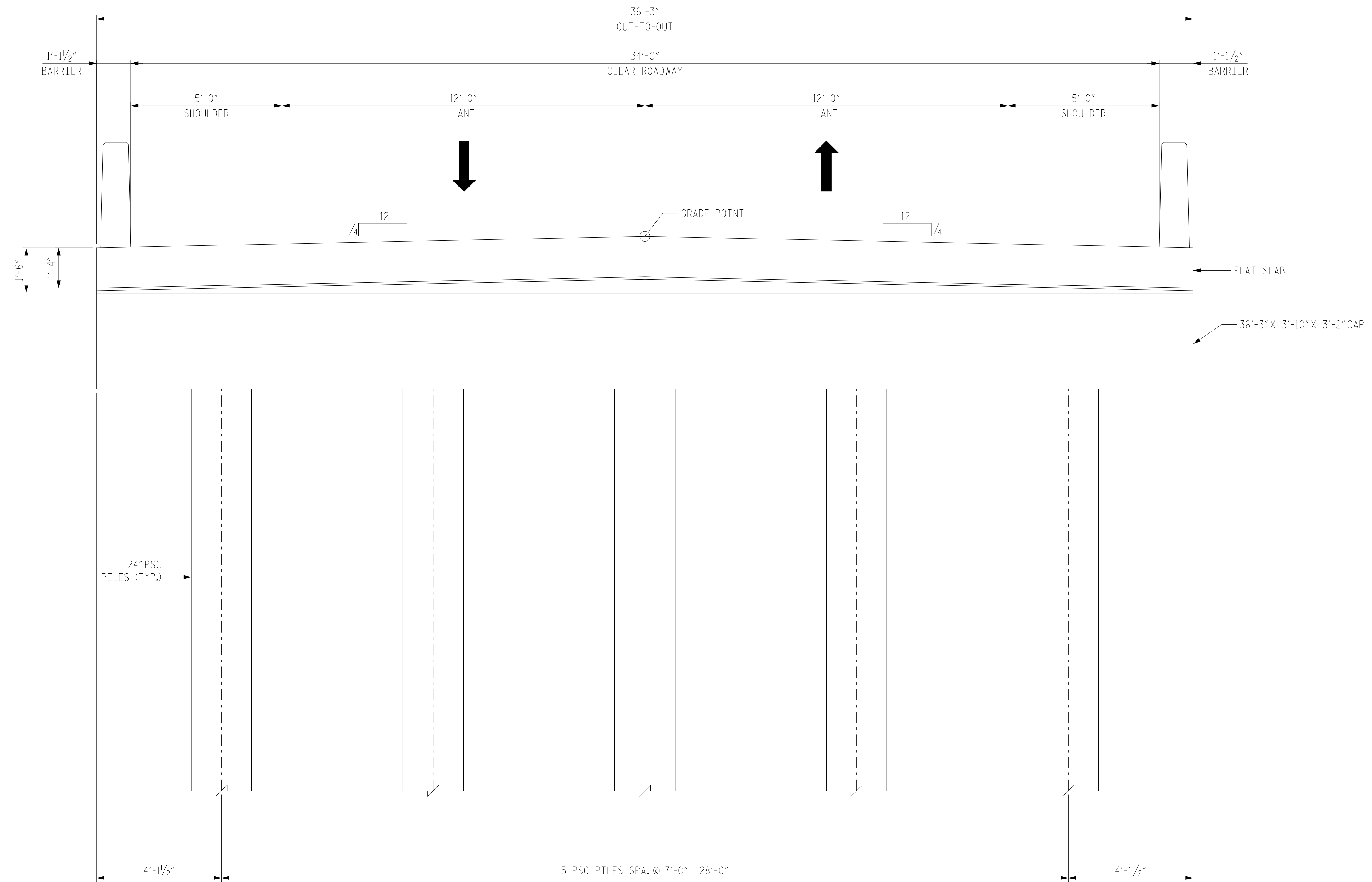

KCI TECHNOLOGIES
 ENGINEERS | PLANNERS | SCIENTISTS | CONSTRUCTION MANAGERS

SOUTH CAROLINA
 DEPARTMENT OF TRANSPORTATION

ELEVATION (BENTS 39-43)
 US 278 CORRIDOR IMPROVEMENT
 OVER INTERCOASTAL WATERWAY

COUNTY BEAUFORT ROUTE US 278


BRIDGE PLANS ID	SHEET NO.
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CONCEPTUAL
PLANS

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KCI TECHNOLOGIES
 ENGINEERS | PLANNERS | SCIENTISTS | CONSTRUCTION MANAGERS

SOUTH CAROLINA
 DEPARTMENT OF TRANSPORTATION

BENT ELEVATION
 S-7-772 (BLUE HERON POINT RD EXT)
 OVER INTERCOASTAL WATERWAY

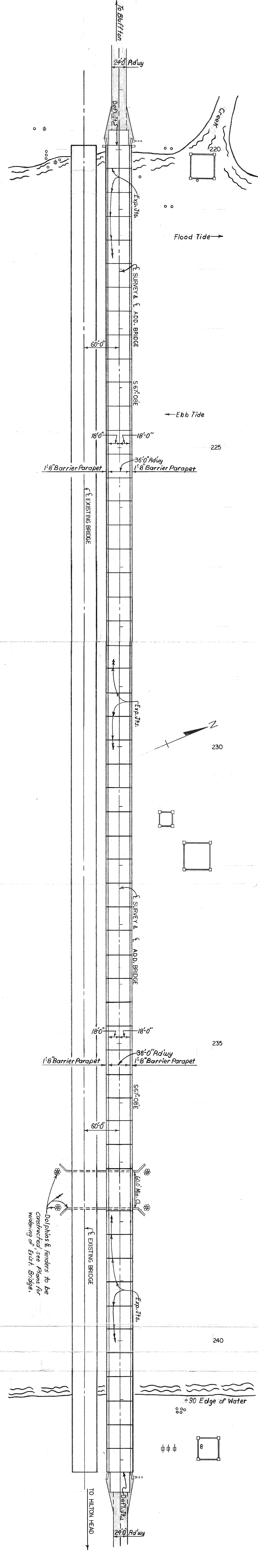
COUNTY BEAUFORT ROUTE S-7-772



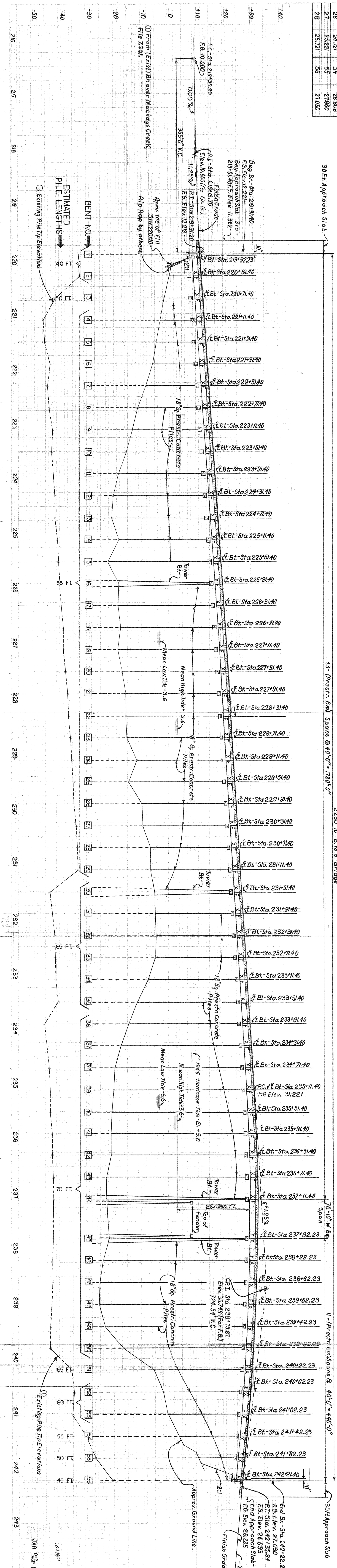
APPENDIX C

EXISTING US 278 BRIDGES OVER MACKAY CREEK AND SKULL CREEK PROFILES

BENT NO.	ELEV.	BENT NO.	ELEV.
1	12.232	29	28.221
2	12.721	30	28.721
3	13.221	31	27.221
4	13.721	32	27.721
5	14.221	33	28.221
6	14.721	34	28.721
7	15.221	35	29.221
8	15.721	36	29.721
9	16.221	37	30.221
10	16.721	38	30.721
11	17.221	39	31.221
12	17.721	40	31.721
13	18.221	41	32.221
14	18.721	42	32.721
15	19.221	43	33.221
16	19.721	44	33.721
17	20.221	45	34.221
18	20.721	46	34.721
19	21.221	47	35.221
20	21.721	48	35.721
21	22.221	49	36.221
22	22.721	50	36.721
23	23.221	51	37.221
24	23.721	52	37.721
25	24.221	53	38.221
26	24.721	54	38.721
27	25.221	55	39.221
28	25.721	56	39.721



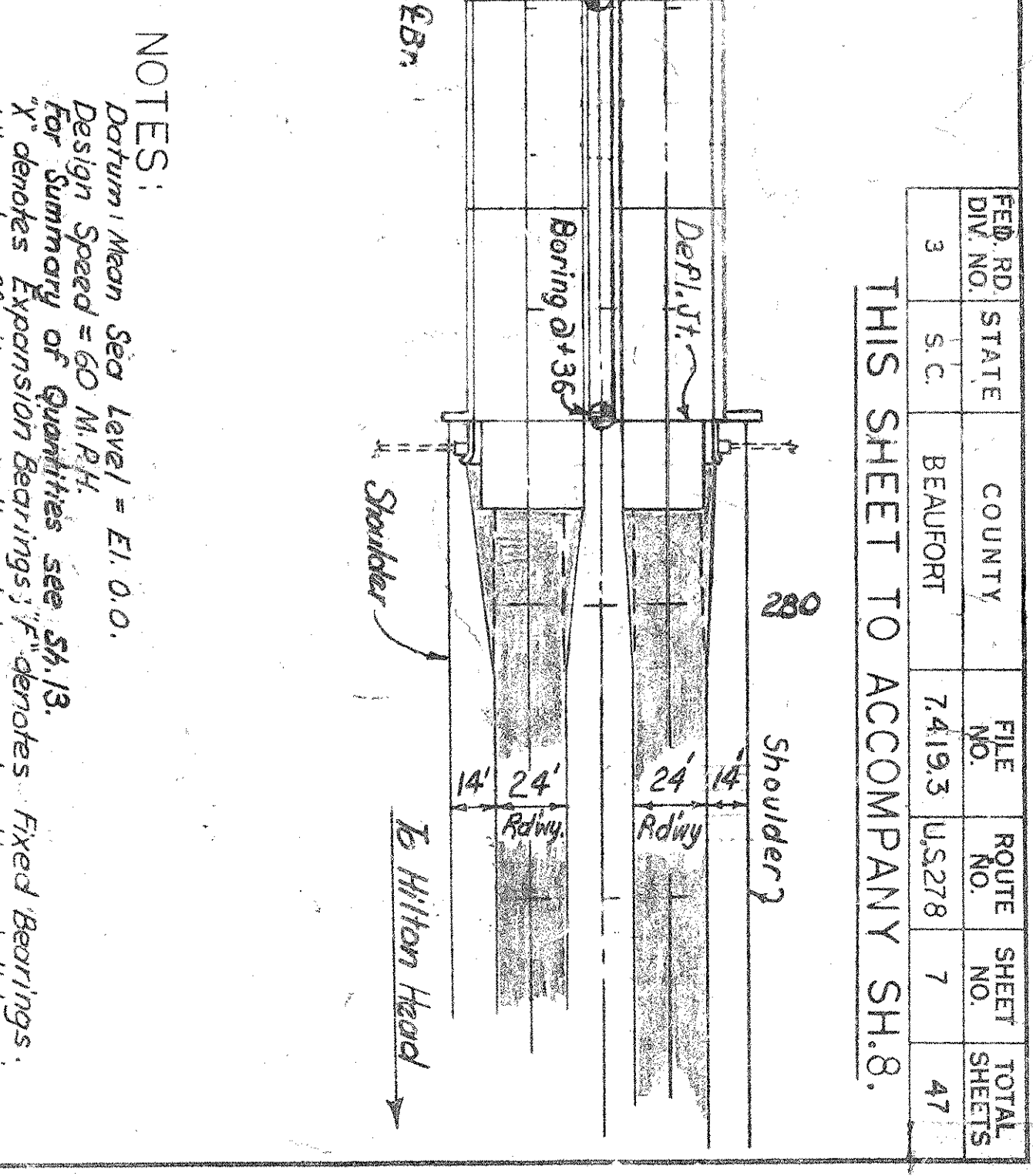
BENT NO.	ELEV.	BENT NO.	ELEV.
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5	14.221	33	28.221
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7	15.221	35	29.221
8	15.721	36	29.721
9	16.221	37	30.221
10	16.721	38	30.721
11	17.221	39	31.221
12	17.721	40	31.721
13	18.221	41	32.221
14	18.721	42	32.721
15	19.221	43	33.221
16	19.721	44	33.721
17	20.221	45	34.221
18	20.721	46	34.721
19	21.221	47	35.221
20	21.721	48	35.721
21	22.221	49	36.221
22	22.721	50	36.721
23	23.221	51	37.221
24	23.721	52	37.721
25	24.221	53	38.221
26	24.721	54	38.721
27	25.221	55	39.221
28	25.721	56	39.721



PLAN AND PROFILE FOR ADD. BRIDGE OVER MACKLAYS CREEK
 SCALE: 1"=50'(HORIZ) 1"=20'(VERT)
 JAR 11-79
 7-418
 BEAUFORT U.S. 278 1-80

PROJECT NO.	STATE	COUNTY	FILE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	BEAUFORT	7419.3	7	47

THIS SHEET TO ACCOMPANY SH. 8.



EXIST. NAVIGATION LIGHTS
 Light 1 - 360° Green Omnidirectional Light
 Light 2 - 180° Red Axial Light

NOTES:
 Datum Mean Sea Level = EL. 0.0.
 For quantity of quantities see SH. 8.
 * Shows expansion bearings; * denotes fixed bearings.
 All work affecting navigation during construction shall be in accordance with the requirements of the U.S. Dept. of the Army and the U.S. Coast Guard.
 For SH. 8 Notes & Details see SH. 11-18.
 The existing bridge is to be replaced with a new bridge with a clear span of 270'-0" and a total length of 270'-0".
 The existing bridge is to be replaced with a new bridge with a clear span of 270'-0" and a total length of 270'-0".
 is to be replaced with a new bridge with a clear span of 270'-0" and a total length of 270'-0".

PLAN

ALONG E.B.R. & W.B.L. ALONG CURVE DATA
 P.L. Sta. 250+00.00
 D = 3'-18" = 36"
 L = 472.8'
 E = 823.9'
 F = 61.7'

NOTE: Stationing shown on this sheet is along E.B.R. & W.B.L. unless otherwise indicated.

NOTE: This light to be removed from the side of the existing bridge and installed as shown. See Special Provisions.

30 FT. Approach Slab
 70 FT. Prest. Br. Spans (2 x 3 x 7)
 11 Spans @ 70'-0" = 770'-0"
 70 FT. Prest. Br. Spans (2 x 3 x 7)
 11 Spans @ 70'-0" = 770'-0"
 W. Br. Span
 81'-3"
 110'-0"
 360 Ft. Continuous Welded Girder Span
 140'-0"
 110'-0"
 470 Ft. Continuous Girder Span
 145'-0"
 180'-0"
 145'-0"
 110'-0"
 360 Ft. Continuous Welded Girder Span
 140'-0"
 110'-0"
 70 Ft. Prest. Br. Spans (2 x 3 x 7)
 10 Spans @ 70'-0" = 700'-0"
 30 Ft. Approach Slab

SECTION ALONG W.B.R. (UNLESS OTHERWISE INDICATED)

30 FT. Approach Slab
 70 FT. Prest. Br. Spans (2 x 3 x 7)
 11 Spans @ 70'-0" = 770'-0"
 70 FT. Prest. Br. Spans (2 x 3 x 7)
 11 Spans @ 70'-0" = 770'-0"
 W. Br. Span
 81'-3"
 110'-0"
 360 Ft. Continuous Welded Girder Span
 140'-0"
 110'-0"
 470 Ft. Continuous Girder Span
 145'-0"
 180'-0"
 145'-0"
 110'-0"
 360 Ft. Continuous Welded Girder Span
 140'-0"
 110'-0"
 70 Ft. Prest. Br. Spans (2 x 3 x 7)
 10 Spans @ 70'-0" = 700'-0"
 30 Ft. Approach Slab

PLAN AND PROFILE FOR SKULL CREEK

SCALE: HORIZONTAL = 1" = 20' (VERT. = 1" = 40')

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APPENDIX D

SCDOT ESSENTIAL FISH HABITAT CONSTRUCTION BEST MANAGEMENT PRACTICES

Essential Fish Habitat-List of Best Management Practices

- - During the course of construction or post-construction, the impairment of the hydrologic flow of any creek system will be minimized to the maximum extent practicable.
- - Construction BMPs must include measures to reduce temporary impacts including turbidity and sedimentation. For example, temporary sediment and runoff control fences (e.g., a silt fence consisting of geotextile fabric installed between supporting posts) should be installed along approaches adjacent to EFH; floating turbidity barriers should be used when activities could result in increased turbidity downstream of work site.
- -To the maximum extent practicable, construction activities impacting EFH should be conducted during low biological use periods (winter months, Nov1- Feb 28).
- - To the maximum extent practicable, plan the stages of development so that only the areas that are actively being developed are exposed. All other areas should have a good cover of either temporary or permanent vegetation.
- -SCDOT must not conduct work in a manner that results in permanent bank erosion or decreased stabilization. Sediment entering the waterway due to equipment presence and operation must be avoided to the maximum extent practicable.
- -Grading should be completed as soon as possible after it has begun.
- -Keep runoff velocities low and retain runoff on the site using sediment and erosion control BMPs to the maximum extent practicable.
- -Any excavated material must not be disposed of in the adjacent waterway or sidecast into adjacent marsh.
- -To the maximum extent practicable, project areas that are excavated adjacent to the marsh must be graded down to adjacent marsh levels.
- -Where necessary, banks should be stabilized with bioengineering material (e.g, biologs, fiber matting, etc.).
- -Raw or live concrete (which is toxic to aquatic life) may not come in contact with the wetlands or open water until the concrete has cured.
- -At the end of the workday, remove debris that may enter EFH by wind, tides, etc.
- -Temporary impacts from work mats should be avoided to the maximum extent practicable. Temporary work trestles or use of existing infrastructure is preferred.
- - Riprap should be minimized to the least amount practicable. Riprap placed within tidal wetlands should consist of clean rock or masonry clean of pollutants and debris.
- -Material (e.g., riprap, pilings) may not be placed in waterways such that it impairs the hydrologic flow at mean low tide unless the rip rap is needed to support the integrity of the bridge abutment or roadway that is susceptible to scour.
- -Any impact pile driving shall be conducted out-of-water or at low tide where practicable.

- -Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.
- -All steps necessary must be taken to prevent oil, tar, trash, debris and other pollutants from entering adjacent wetlands and/or waterways.
- -Once initiated, projects must be carried to completion in an expeditious manner in order to minimize the period of disturbance and upon completion, all disturbed areas must be permanently stabilized with vegetative cover and/or rip-rap, as appropriate. Native vegetation and/or native seed mixtures should be utilized.
- -Construction access areas must be clearly identified in the permit application or construction access must consist of minimal clearing for installation of elevated working platform(s), timber mat(s) or barge(s). Impacts will be temporary and minor in nature. There will be no mechanized equipment allowed to operate within jurisdictional areas unless it has been clearly identified and authorized in the approved plans. All impacts for construction access count towards the thresholds allowed under this General Permit.