



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY PERDUE
GOVERNOR

EUGENE CONTI
SECRETARY

April 27, 2011

MEMORANDUM TO: Mr. Jerry Jennings, PE
Division 1 Engineer

FROM: Philip S. Harris, III, P.E., Unit Head
Natural Environment Unit
Project Development and Environmental Analysis Branch

SUBJECT: Pasquotank and Camden Counties, Improvements to US 158 (East Elizabeth Street) from US 17 Business (Road Street) to the east side of the Pasquotank River; WBS No. 35742.1.1. TIP No.U-4438

E. L. Fueck

Attached is the US Coast Guard Permit for the above-referenced project. This permit, combined with the previously distributed Section 404, 401, and CAMA permits, comprises all of the environmental permits for the construction of this project.

A copy of this permit package will be posted on the NCDOT website at:
<http://www.ncdot.gov/doh/preconstruct/pe/neu/permit.html>

Cc W/o attachment (see website for attachments):

Mr. Randy Garris, P.E. State Contract Officer
Mr. Clay Willis, Division 1 Environmental Officer
Mr. Majed Alghandour, P. E., Program and TIP
Mr. Jay Bennett, P.E., Roadway Design
Dr. David Chang, P.E., Hydraulics
Mr. Art McMillan, P.E., Highway Design
Mr. Tom Koch, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. Clarence Coleman, FHWA
Mr. Ron Hancock, P.E., State Roadway Construction Engineer
Mr. Mike Robinson, P.E., State Bridge Construction Engineer
Mr. Ted Devens, P.E., PDEA Project Planning Engineer
Mr. Rob Hanson, P.E., PDEA Eastern Region

U.S. Department of
Homeland Security

United States
Coast Guard



Commander
United States Coast Guard
Fifth Coast Guard District

431 Crawford Street
Portsmouth, Va. 23704-5004
Staff Symbol: (dpb)
Phone: 757-398-6629
Fax: 757-398-6334
Email: Lindsey.R.Middleton@uscg.mil

16591 E
20 APR 10

Mr. Gregory Thorpe
Environmental Management Director
North Carolina Department of Transportation
Natural Environment Unit
1598 Mail Service Center
Raleigh, NC 27699-1598

Dear Mr. Thorpe:

We have received your letter dated April 13, 2011, requesting approval of the navigational lighting plan for the US 158 replacement bridge across Pasquotank River, mile 50.7, at Elizabeth City, Pasquotank and Camden Counties, NC. The lighting plan dated April 13, 2011, was reviewed and meets the lighting requirements set forth in the Code of Federal Regulations, Section 118.65.

The navigational lighting plan is approved and a copy is enclosed for your files. No deviation from the approved plans may be made unless the modifications are submitted to and approved by this office. If you have any questions please contact Lindsey Middleton at the above listed telephone number or email address.

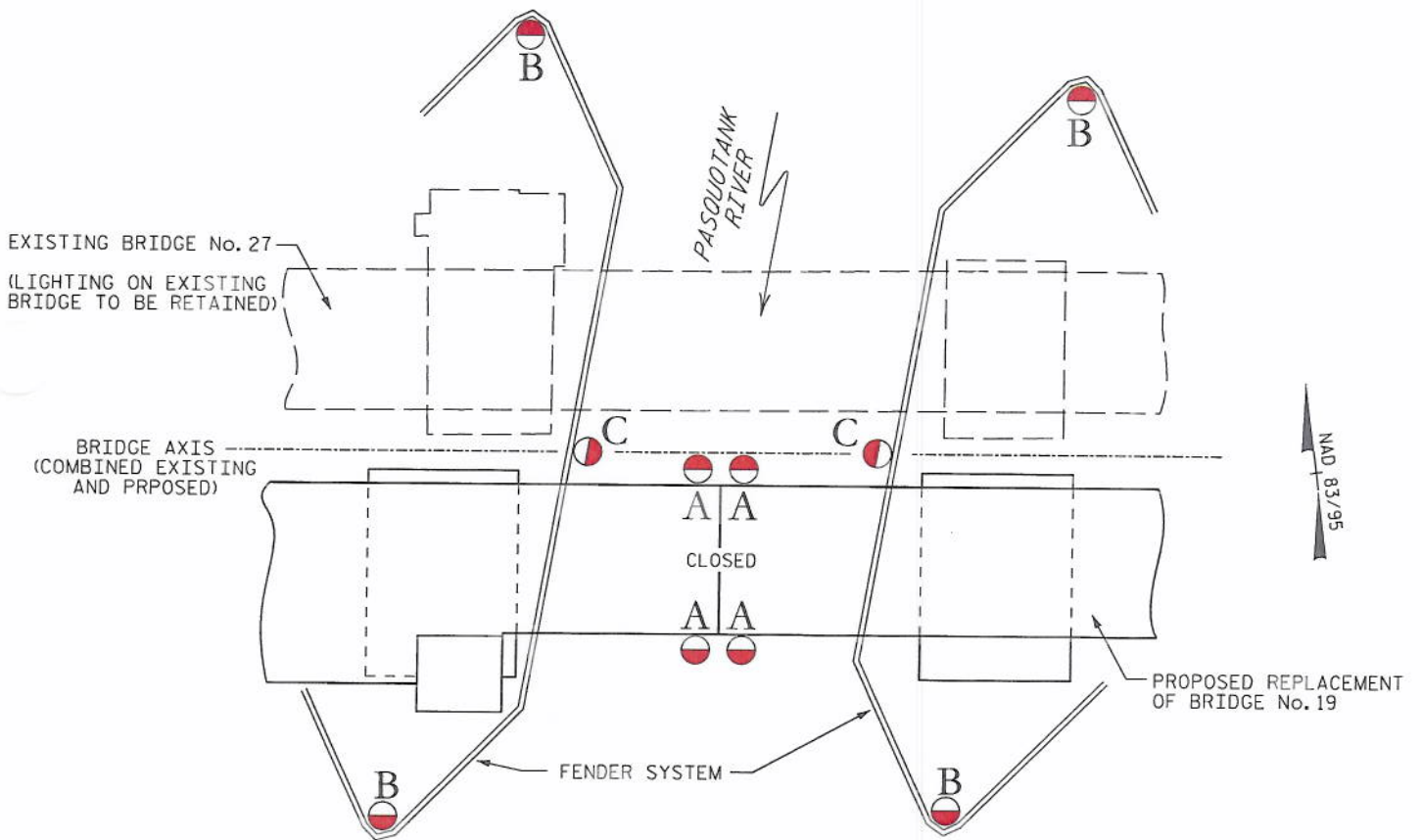
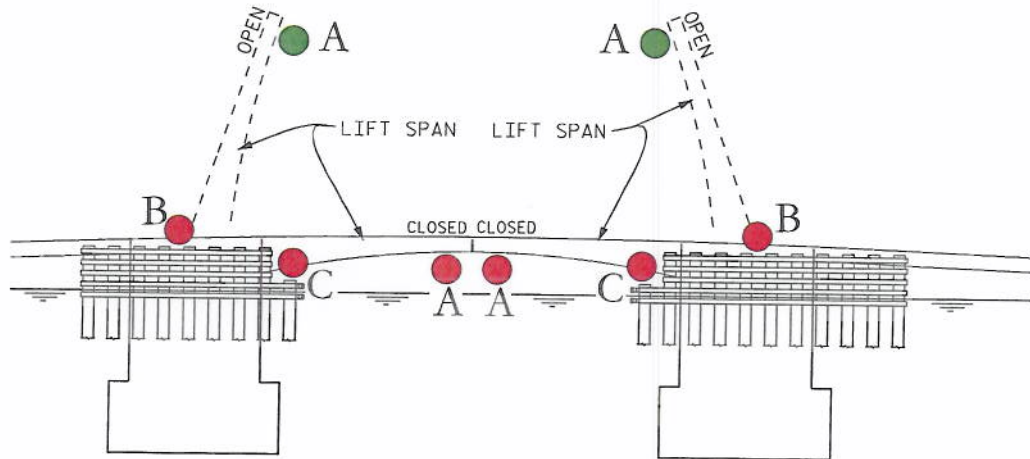
Sincerely,

A handwritten signature in blue ink that reads "Waverly W. Gregory, Jr." with a stylized flourish at the end.



WAVERLY W. GREGORY, JR.
Chief, Bridge Administration Branch
By direction of the Commander
Fifth Coast Guard District

Encl.: (1) Copy of approved navigational lighting plan

Copy: CG Sector North Carolina, Waterways Management



LIGHT COLORS AND HORIZONTAL ARCS OF VISIBILITY

- LIFT SPAN:**
 180° GREEN WHEN LIFT SPAN IS FULLY OPEN FOR NAVIGATION
 180° RED FOR ALL OTHER POSITIONS OF LIFT SPAN
- A**  180° GREEN WHEN LIFT SPAN IS FULLY OPEN FOR NAVIGATION
 180° RED FOR ALL OTHER POSITIONS OF LIFT SPAN
- B**  PIER 180° RED LIGHT
- C**  AXIS 180° RED LIGHT

Office, Commander, Fifth Coast Guard District
 431 Crawford Street
 Portsmouth, VA 23709

Horizontal Signs and other signals
 specified as above.

Karenly P. Byrd 4/25/11
 Chief, Bridge Administrator Date

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH, NC	
PASQUOTANK & CAMDEN COUNTIES	
ELIZABETH CITY, NC	
PROPOSED BRIDGE ON US 158 (CAMDEN CAUSEWAY) BETWEEN US 17 AND NC 343 OVER PASQUOTANK RIVER @ MILE POINT 50.7 (INTRACOASTAL WATERWAY - ALTERNATE ROUTE)	
REPLACEMENT OF BRIDGE No. 19	
STATE PROJECT NO.: U-4438	SHEET 3 OF 3

DRAWN BY : P. Ervin DATE : Apr 11, 2011
 CHECKED BY : T. Payne DATE : Apr 11, 2011



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

April 13, 2011

Commander, Fifth Coast Guard District (obr)
LANTAREA
Bridge Administration
Federal Building
431 Crawford Street
Portsmouth, VA 23704-5004

ATTN: Mr. Waverly Gregory
Chief, Bridge Administration

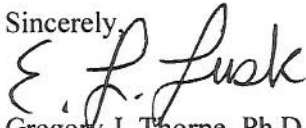
Dear Sir:

Subject: **US Coast Guard Lighting Permit Application** for the replacement of Bridge No. 19 on eastbound US 158 over the Pasquotank River in Pasquotank and Camden Counties. Federal Aid Project No. STP-0158(31) TIP No. U-4438, WBS Element 35742.1.1.

Application is hereby made by the North Carolina Department of Transportation (NCDOT) for lighting approval by the Commandant, U.S. Coast Guard, of the replacement of Bridge No. 19 on eastbound US 158 over the Pasquotank River near Elizabeth City in Pasquotank and Camden Counties. Please find attached bridge drawings with proposed lighting.

Please initiate review of the proposed project for authorization under a U.S. Coast Guard Lighting Permit. It is requested that any correspondence from your office regarding this project include the NCDOT TIP Number (U-4438). Should you have any questions regarding this information, please contact Mr. Chris Rivenbark at (919) 707-6152.

Sincerely,

for 

Gregory J. Thorpe, Ph.D.
Environmental Management Director, PDEA

Enclosure

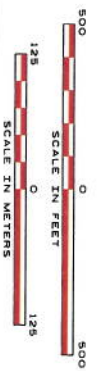
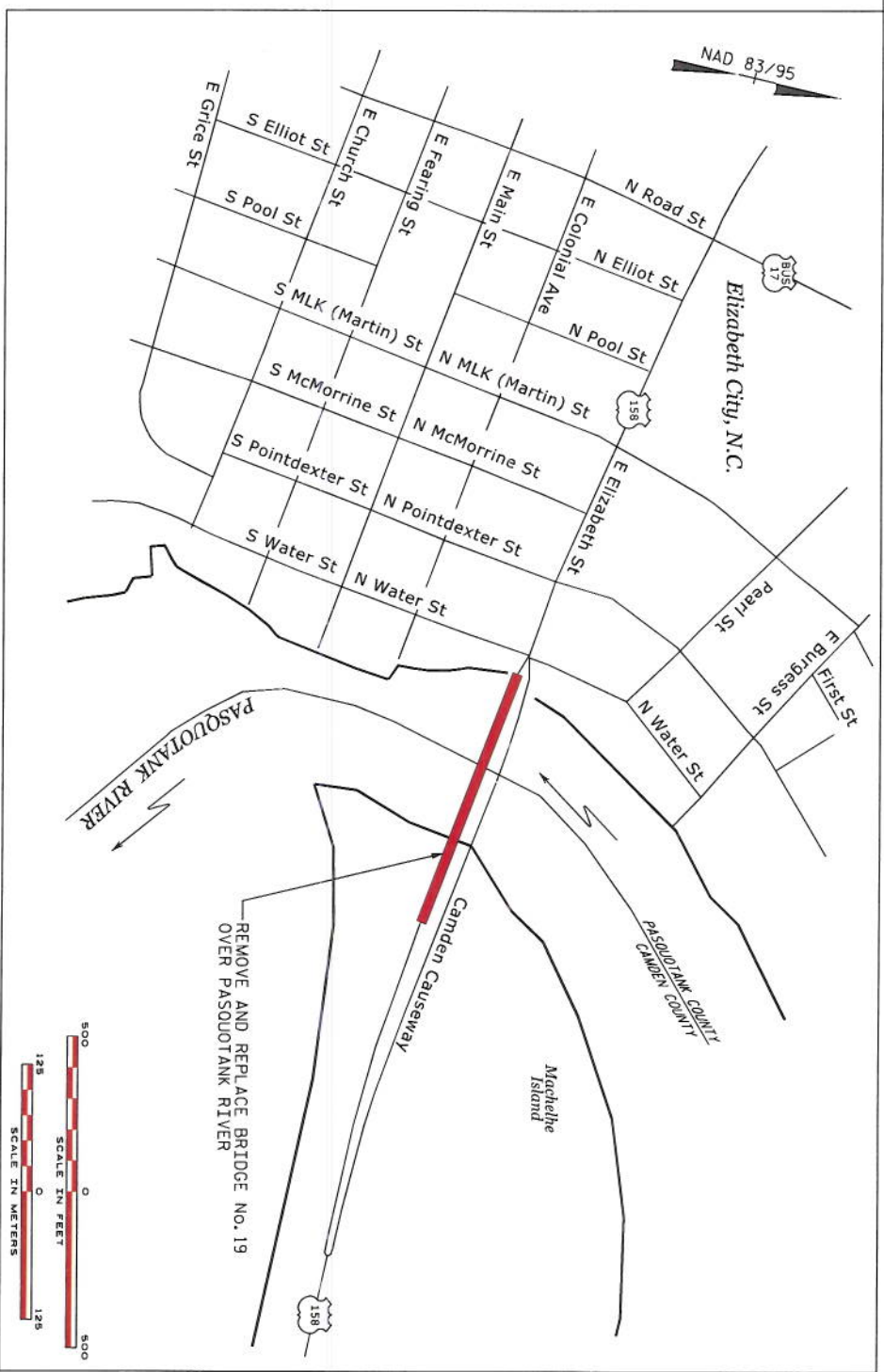
(Electronic format): (1) A copy of a vicinity map and drawings of the bridge.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PRECONSTRUCTION
NATURAL ENVIRONMENT UNIT
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

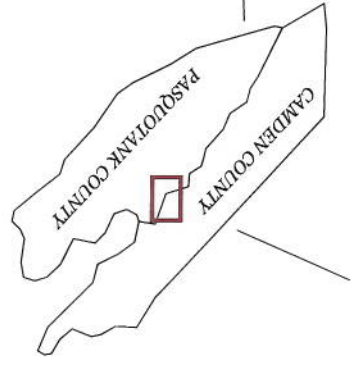
TELEPHONE: 919-707-6100
FAX: 919-212-5785

WEBSITE: WWW.NCDOT.ORG

LOCATION:
1020 BIRCH RIDGE ROAD
RALEIGH NC 27610-4328

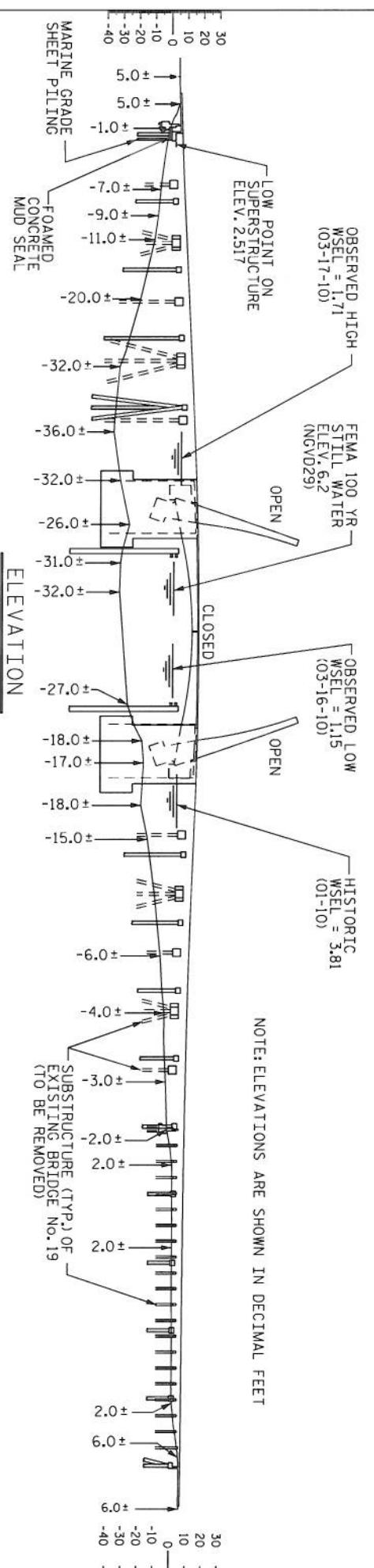


REMOVE AND REPLACE BRIDGE NO. 19
OVER PASQUOTANK RIVER

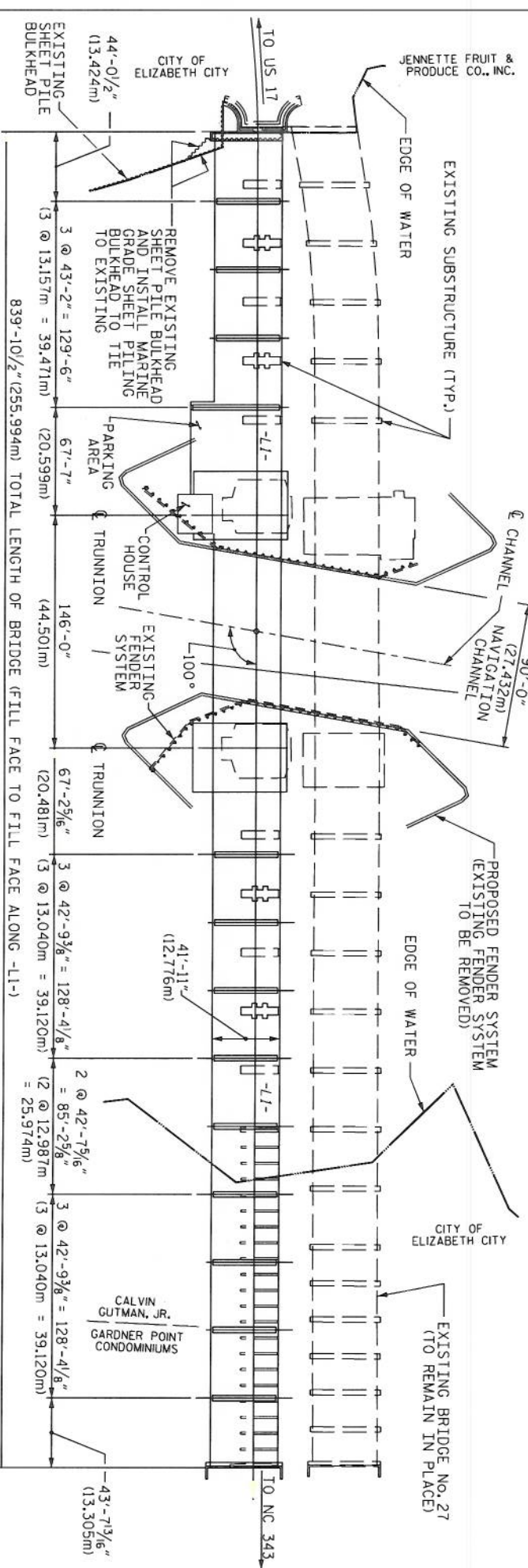


DRAWN BY : P
CHECKED BY :
DATE : Apr-11-2011
DATE : Apr-11-2011

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH, NC
PASQUOTANK & CAMDEN COUNTIES
ELIZABETH CITY, NC
PROPOSED BRIDGE ON US 158 (CAMDEN CAUSEWAY) BETWEEN US 17 AND NC 343 OVER _____
PASQUOTANK RIVER @ MILE POINT 50.7 (INTRACOASTAL WATERWAY - ALTERNATE ROUTE)
REPLACEMENT OF BRIDGE NO. 19
STATE PROJECT NO. : U-
SHEET 1 OF 3



NOTE: ELEVATIONS ARE SHOWN IN DECIMAL FEET



839'-10"/2" (255.994m) TOTAL LENGTH OF BRIDGE (FILL FACE TO FILL FACE ALONG -L1-)



PASQUOTANK RIVER
PASQUOTANK COUNTY
CAMDEN COUNTY

DRAWN BY: P. J. ...
CHECKED BY: ...
DATE: Apr/11/2011

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH, NC
PASQUOTANK & CAMDEN COUNTIES
ELIZABETH CITY, NC
PROPOSED BRIDGE ON US 158 (CAMDEN CAUSEWAY)
BETWEEN US 17 AND NC 343
OVER PASQUOTANK RIVER @ MILE POINT 50.7
(INTRACOASTAL WATERWAY - ALTERNATE ROUTE)
REPLACEMENT OF BRIDGE No. 19
STATE PROJECT NO.: U-
SHEET 2 OF 3

U.S. Department of
Homeland Security

United States
Coast Guard



Commander
United States Coast Guard
Fifth Coast Guard District

431 Crawford Street
Portsmouth, Va. 23704-5004
Staff Symbol: (dpb)
Phone: (757) 398-6629
Fax: (757) 398-6334
Email: Lindsey.R.Middleton@uscg.mil

16591 B
11 APR 11

Mr. Gregory Thorpe
Environmental Management Director
North Carolina Department of Transportation
Natural Environment Unit
1598 Mail Service Center
Raleigh, NC 27699-1598

Dear Mr. Thorpe:

Enclosed is the Coast Guard Bridge Permit 1-11-5 dated April 7, 2011, approving the location and plans of a replacement bridge across Pasquotank River, mile 50.7, at Elizabeth City, Pasquotank and Camden Counties, NC. The following stipulations shall be adhered to:

a. The Contractor shall submit his plan and schedule of operation for approval at least 45 days prior to commencement of work in the waterway. On copy of such information shall be submitted concurrently to both the Resident Engineer, the United States Coast Guard Commander (dpb); Federal Building, 4th Floor, 431 Crawford Street; Portsmouth, VA 23704-5004, and the U. S. Coast Guard Sector North Carolina at 2301 East Fort Macon Road, Atlantic Beach, NC 28512-5633. The information shall include a sketch of the waterway; the bridge; the location of any restrictions that will be placed in the waterway such as barges, anchors, and anchor lines; the location and height above mean high water and detailed description of any scaffolding, or netting; detailed description indicating the placement, type and dimension of any cofferdams if used. The schedule should also include the hours of operation and whether or not the equipment will be removed at night. The contractor shall comply with all provisions of the Navigation Rules International - Inland, available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. The Contractor shall submit to the Resident Engineer a copy of all correspondence between the Coast Guard and himself or herself. No deviation from the approved plan and schedule of operation may be made unless the modification has previously been submitted and approved by the Coast Guard.

b. All bridge closures for the existing-to-be-replaced bridge shall be requested in writing to be received at this office at least 15 days in advance. If any closures will exceed three consecutive days, we must be advised at least 30 days in advance so that we may make the appropriate marine notifications. Time restrictions for the navigational traffic shutdown shall be strictly adhered to. Any request for an extension of the closure dates stated above shall be forwarded at least 30 days in advance to the Coast Guard for approval. At no time during the work will the waterway be closed to navigation without prior approval from the Coast Guard. You are required to maintain close and regular contact with Coast Guard Sector North Carolina to keep them informed to activities in waterway at (252) 247-4570.

c. Barges that are used in the waterway during the project must be marked in accordance with Title 33 Code of Federal Regulations, Section 118.95 that outlines temporary marking and lighting requirements. Enclosure (2) outlines temporary marking and lighting requirements for barges and structures not part of the bridge that will be used during construction. If barge or

float anchor lines are used, they must be marked by anchor buoys, which should be lighted. If you should have any questions, regarding lights on the barges or work floats, please contact Mr. John Walters, Chief, Planning and Waterways Management Section, at (757) 398-6230. Floating equipment shall have a radiotelephone capable of operation from its main control station in accordance with Part 26 of Title 33, Code of Federal Regulations and shall be monitored during all periods the floating equipment is on station.

d. During the progress of work, while the channel is in operation, should any material, machinery or equipment be lost, dumped, thrown overboard, sunk or misplaced which may be dangerous to or obstruct navigation, immediate notice shall be given to the Coast Guard and the object removed with the utmost dispatch. Until removal can be effected, the objects shall be properly marked in order to protect navigation. Notice to the Coast Guard shall give a description and location of any such object and the action taken or being taken to protect navigation.

e. Upon completion of the proposed project, an inspection of the waterway bottom shall be performed to insure that all construction waste materials have been completely removed. Certification will be required in writing by a licensed engineer or licensed surveyor that the waterway has not been impaired and all construction related debris has been cleared from it. The certification shall include the actual method used to conduct the inspection. The Contractor shall remove any bridge related debris, resulting from the current or prior work or occurrences, discovered during this survey.

f. Upon completion of the bridgework, a responsible official of the North Carolina Department of Transportation shall verify as-built clearances and a statement attesting to the correctness of the clearances shall be forwarded to this office for record purpose. In lieu of verification by the above listed official, certification by a licensed surveyor or registered professional engineer registered in the State of North Carolina will be accepted.

g. Except as shown on the plans, no dredging, excavation, filling, rip-rap, or other work affecting the bottom, shall be done in conjunction with this work.

h. If during the periods of construction, permanent lighting cannot be maintained operable, the fenders of each pier shall be marked with a battery or power operated quick flashing white light of not less than 60 flashes per minute and visible for a range of 2,000 yards on 90% of the nights of the year. Generally, a lamp of 20-candle power will meet these requirements. If necessary to obtain coverage required, a light or lights on the upstream and downstream sides shall be installed. The piers shall be so marked until the construction has been completed and permanent navigational lighting has been reinstalled and determined to be operating satisfactorily. Written approval from the Coast Guard of temporary lighting during periods of construction is required. No existing bridge navigation lights shall be impaired or blocked during darkness or periods of reduced visibility.

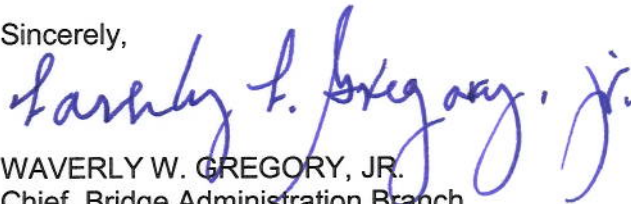
i. Compliance with the requirements stated herein does not relieve the contractor of the obligation or responsibility for compliance with the provisions of any other law or regulation as may be under the jurisdiction of the State of North Carolina, or any other federal, state or local authority having cognizance of any aspect of the location, construction or maintenance of said bridge. It is advised that the Coast Guard can levy monetary civil penalties for violations of bridge regulations and statutes.

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j. In accordance with Title 33 Code of Federal Regulations Part 118.25 – Application procedure, approval of lights and other signals required shall be obtained prior to construction. Application shall be by letter accompanied by duplicate sets of drawings showing (1) the plan and elevation of the structure showing lights and signals proposed, and (2) a small scale vicinity chart showing proposed bridge and all other bridges within 1,000 feet above or below the proposed bridge.

The office of the Bridge Administrator, Fifth Coast Guard District, shall be notified immediately upon completion of the project. If you should have any questions regarding this matter, please call Ms. Lindsey Middleton at (757) 398-6629.

Sincerely,



WAVERLY W. GREGORY, JR.
Chief, Bridge Administration Branch
By direction of the Commander
Fifth Coast Guard District

Encl: (1) Bridge Permit 1-11-5 dated April 7, 2011
(2) USCG Temporary Marking & Lighting

Copy: John Walters, (dpw) w/encl
USCG Sector North Carolina, Waterways Management w/encl

***LIGHTING REQUIREMENTS FOR BARGES AND STRUCTURES NOT PART OF A
BRIDGE OR APPROACH STRUCTURE***

88.13 Lights on barges at bank or dock.

- (a) The following barges shall display at night and, if practicable, in periods of restricted visibility the lights described in paragraph (b) of this section -
 - (1) Every barge projecting into a buoyed or restricted channel.
 - (2) Every barge so moored that it reduces the available navigable width of any channel to less than 80 meters.
 - (3) Barges moored in groups more than two barges wide or to a maximum width of over 25 meters.
 - (4) Every barge not moored parallel to the bank or dock.
- (b) Barges described in paragraph (a) shall carry two unobstructed white lights of an intensity to be visible for a least one mile on a clear dark night and arranged as follows:
 - (1) On a single moored barge, lights shall be placed on the two corners farthest from the bank or dock.
 - (2) On barges moored in group formation, a light shall be placed on each of the upstream and downstream ends of the group, on the corners farthest from the bank or dock.
 - (3) Any barge in a group, projecting from the main body of the group toward the channel, shall be lighted as a single barge.
- (c) Barges moored in any slip or slough, which is used primarily for mooring purposes, are exempt from the lighting requirements of this section.

***33 CODE OF FEDERAL REGULATIONS, SECTION 118.95
LIGHTS ON STRUCTURES NOT PART OF A BRIDGE OR APPROACH STRUCTURE***

Lights on sheer booms, isolated piers, obstructions, and other structures not part of a bridge or approach structure must meet the requirements for aids to navigation in Subpart 66.01 of Part 66 of this chapter

33 CODE OF FEDERAL REGULATIONS, SECTION 66.01-10

- (a) The characteristics of a private aid to navigation shall conform to the United States Aids to Navigation System described in Subpart B of Part 62 of this subchapter, except that only tungsten-incandescent light sources will be approved for electric lights.

Therefore in accordance with 33 CFR 66.01-10(a), the above lights shall be marked with slow flashing yellow lights visible for two miles on a clear dark night. Lights similar to the Tideland ML-120 Barge Light may be used. Only tungsten-incandescent light sources will be approved for electric lights.



BRIDGE PERMIT

(1-11-5)

APR 07 2011

WHEREAS by Title V of an act of Congress approved August 2, 1946, entitled "General Bridge Act of 1946," as amended (33 U.S.C. 525-533), the consent of Congress was granted for the construction, maintenance and operation of bridges and approaches thereto over the navigable waters of the United States;

AND WHEREAS the Secretary of Homeland Security has delegated the authority of Section 502(b) of that act to the Commandant, U. S. Coast Guard by Department of Homeland Security Delegation Number: 0170.1;

AND WHEREAS before construction is commenced, the Commandant must approve the location and plans of any such bridge and may impose any specific conditions relating to the construction, maintenance and operation of the structure deemed necessary in the interest of public navigation, such conditions to have the force of law;

AND WHEREAS the - STATE OF NORTH CAROLINA - has submitted for approval the location and plans of a bridge to be constructed across the Pasquotank River at Elizabeth City, North Carolina;

NOW THEREFORE, This is to certify that the location and plans dated 28 January 2011 are hereby approved by the Commandant, subject to the following conditions:

1. No deviation from the approved plans may be made either before or after completion of the structure unless the modification of said plans has previously been submitted to and received the approval of the Commandant.

2. The construction of falsework, cofferdams or other obstructions, if required, shall be in accordance with plans submitted to and approved by the Commander, Fifth Coast Guard District, prior to construction of the bridge. All work shall be so conducted that the free navigation of the waterway is not unreasonably interfered with and the present navigable depths are not impaired. Timely notice of any and all events that may affect navigation shall be given to the District Commander during construction of the bridge. The channel or channels through the structure shall be promptly cleared of all obstructions placed therein or caused by the construction of the bridge to the satisfaction of the District Commander, when in the judgment of the District Commander the construction work has reached a point where such action should be taken, but in no case later than 90 days after the bridge has been opened to traffic.

**Replacement bridge across the Pasquotank River
at Elizabeth City, North Carolina****(1-11-5)**

3. Issuance of this permit does not relieve the permittee of the obligation or responsibility for compliance with the provisions of any other law or regulation as may be under the jurisdiction of the State of North Carolina, Division of Coastal Management, or any other federal, state or local authority having cognizance of any aspect of the location, construction or maintenance of said bridge.

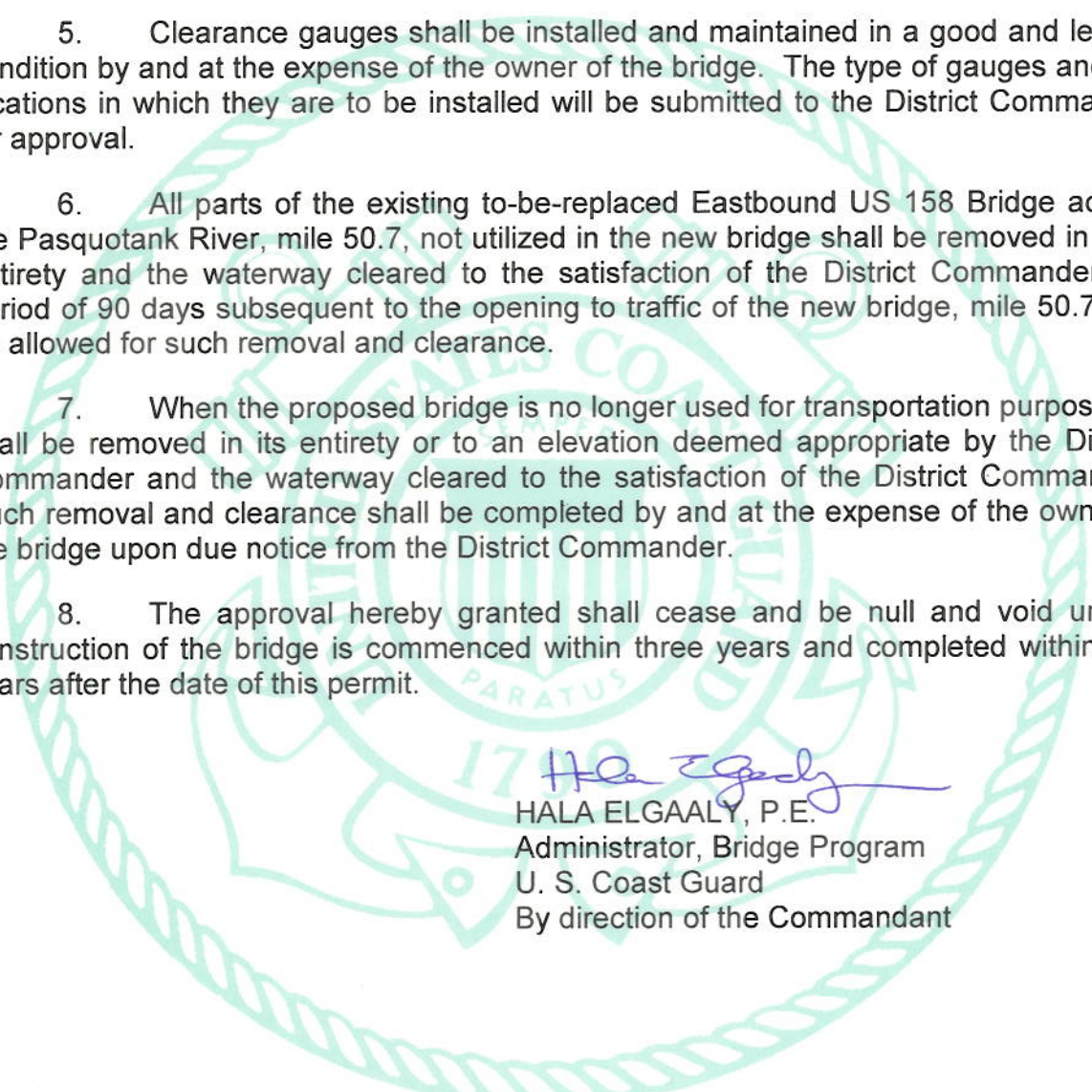
4. The location of, and materials to be used in construction of, the pier protection fender system as shown on the approved plan sheets 2, 3 and 4 (of 4) dated 28 January 2011 shall be submitted to the District Commander for approval prior to commencing construction of such system. The entire pier protection fender system shall be maintained as a continuous system between the new eastbound bridge and the existing westbound bridge.

5. Clearance gauges shall be installed and maintained in a good and legible condition by and at the expense of the owner of the bridge. The type of gauges and the locations in which they are to be installed will be submitted to the District Commander for approval.

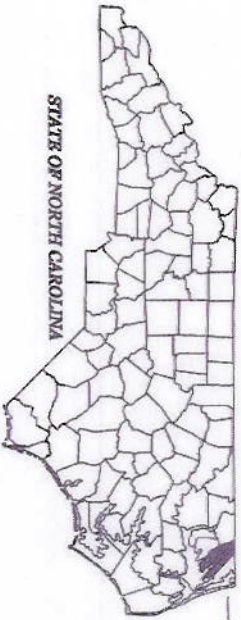
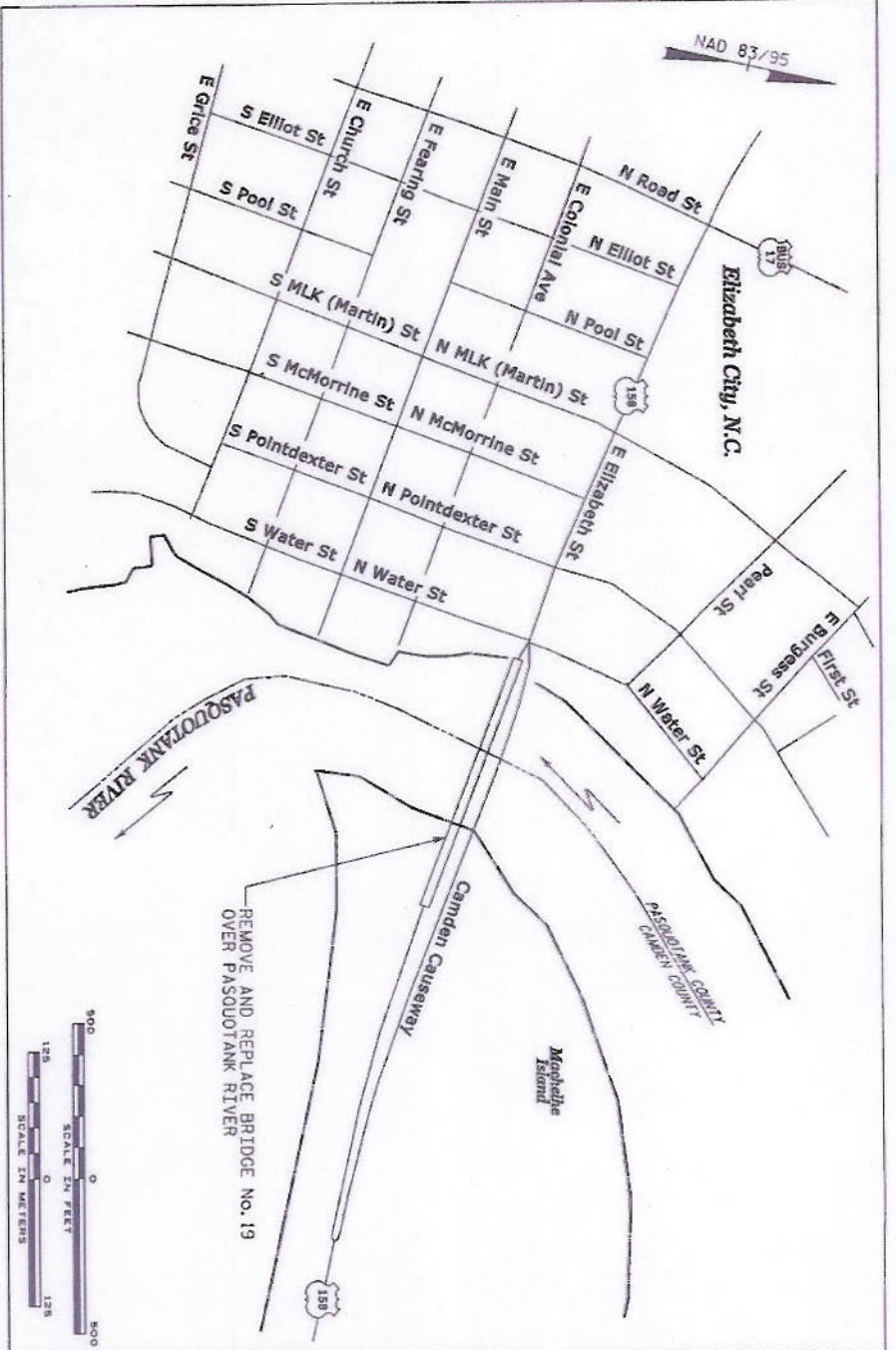
6. All parts of the existing to-be-replaced Eastbound US 158 Bridge across the Pasquotank River, mile 50.7, not utilized in the new bridge shall be removed in their entirety and the waterway cleared to the satisfaction of the District Commander. A period of 90 days subsequent to the opening to traffic of the new bridge, mile 50.7, will be allowed for such removal and clearance.

7. When the proposed bridge is no longer used for transportation purposes, it shall be removed in its entirety or to an elevation deemed appropriate by the District Commander and the waterway cleared to the satisfaction of the District Commander. Such removal and clearance shall be completed by and at the expense of the owner of the bridge upon due notice from the District Commander.

8. The approval hereby granted shall cease and be null and void unless construction of the bridge is commenced within three years and completed within five years after the date of this permit.



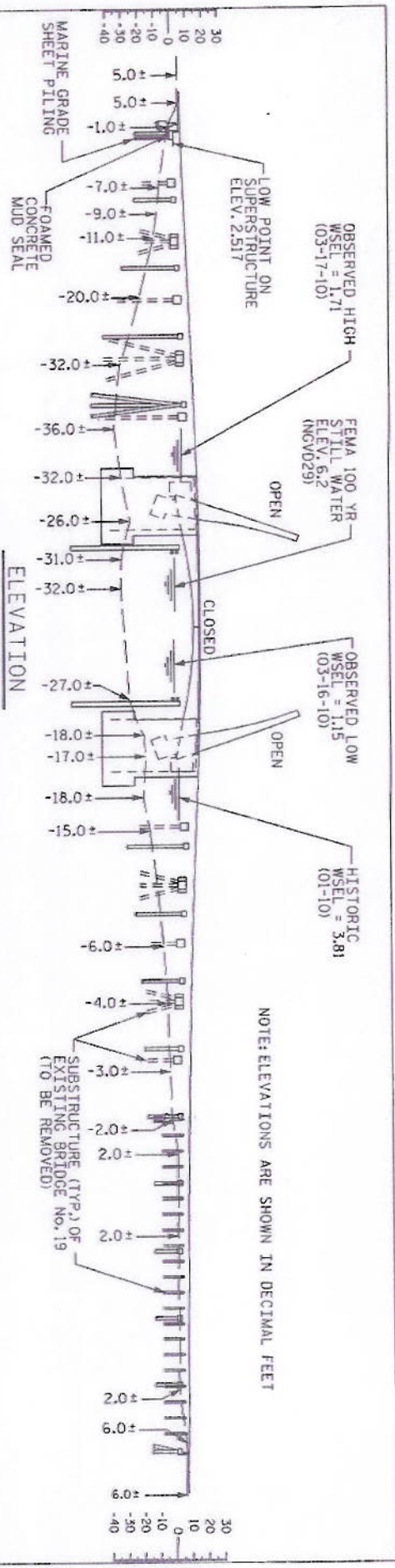
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HALA ELGAALY, P.E.
Administrator, Bridge Program
U. S. Coast Guard
By direction of the Commandant



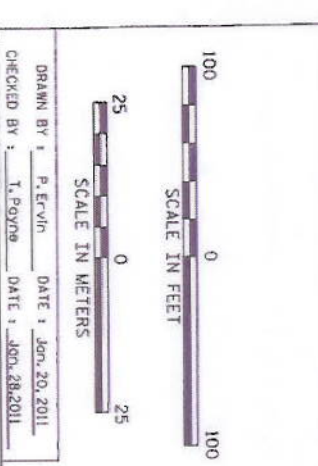
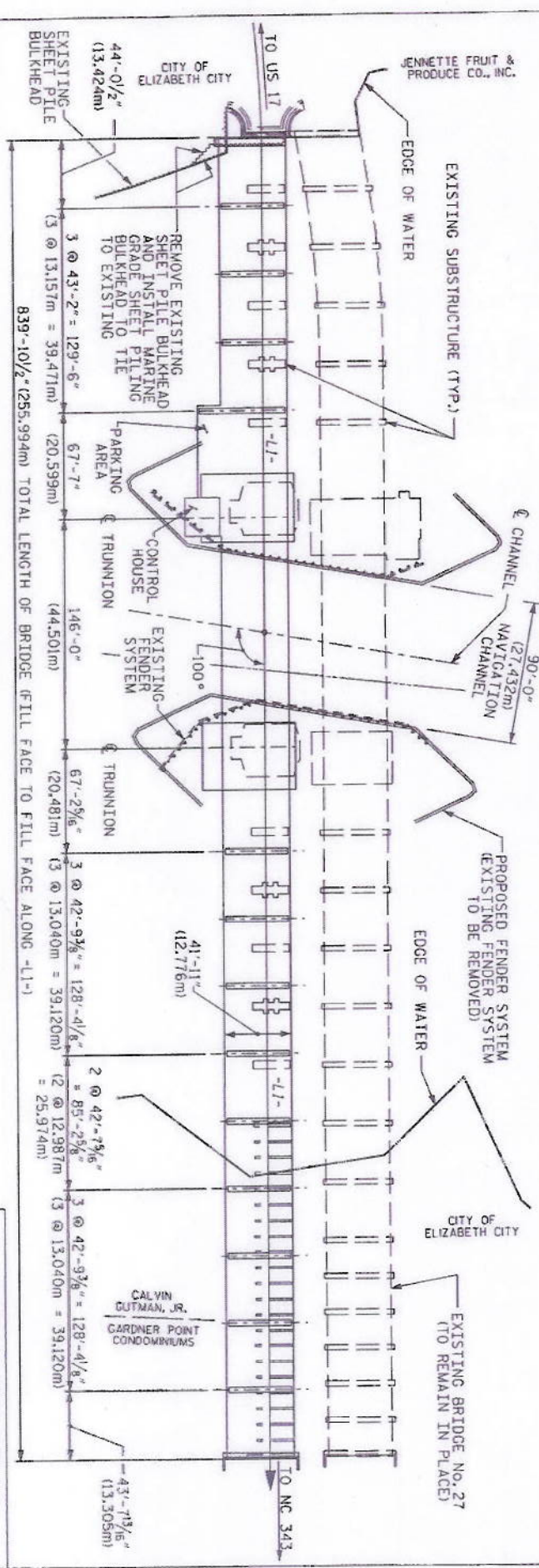
DRAWN BY : P. Ervin DATE : Jan. 20, 2011
 CHECKED BY : T. Payne DATE : Jan. 28, 2011

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH, NC	
PASQUOTANK & CAMDEN COUNTIES ELIZABETH CITY, NC	
PROPOSED BRIDGE ON US 158 (CAMDEN CAUSEWAY) BETWEEN US 17 AND NC 343	
PASQUOTANK RIVER @ MILE POINT 50.7 (INTRACOASTAL WATERWAY - ALTERNATE ROUTE)	
REPLACEMENT OF BRIDGE No. 19	
STATE PROJECT NO. : U-4438	SHEET 1 OF 4

Ervin



NOTE: ELEVATIONS ARE SHOWN IN DECIMAL FEET



PASQUOTANK RIVER
PASQUOTANK COUNTY
CAMDEN COUNTY
PLAN



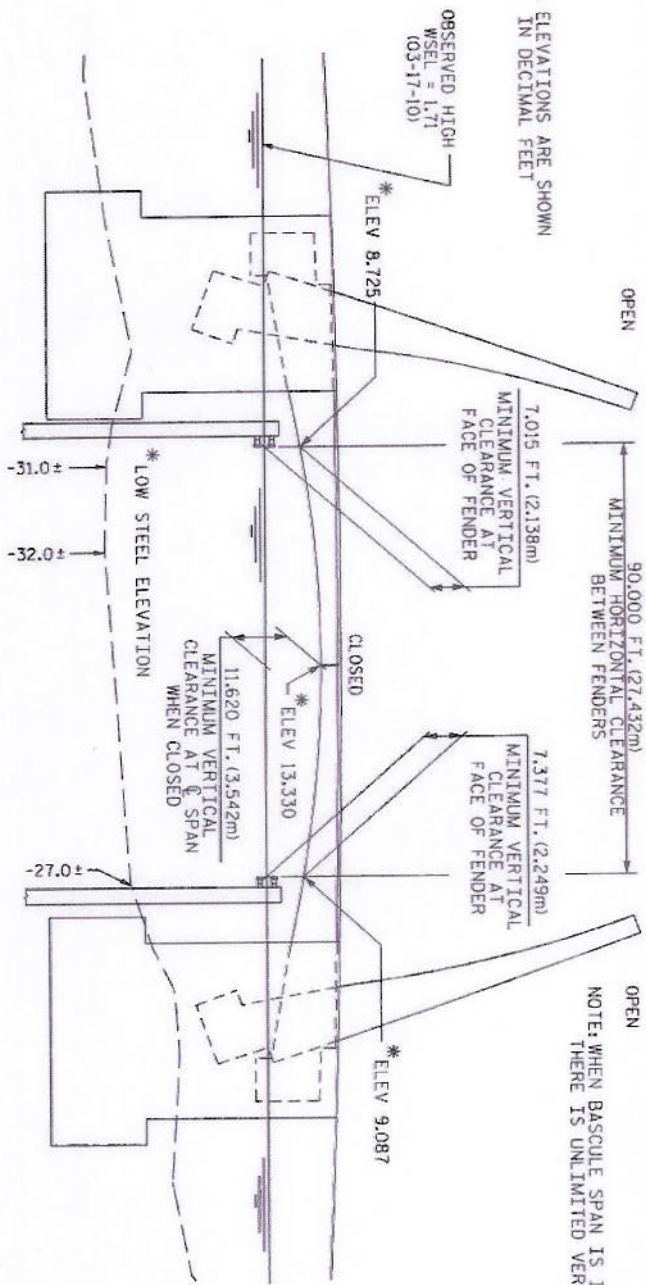
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH, NC
PASQUOTANK & CAMDEN COUNTIES
ELIZABETH CITY, NC

PROPOSED BRIDGE ON US 158 (CAMDEN CAUSEWAY)
BETWEEN US 17 AND NC 343
OVER
PASQUOTANK RIVER @ MILE POINT 50.7
(INTRACOSTAL WATERWAY - ALTERNATE ROUTE)
REPLACEMENT OF BRIDGE No. 19

STATE PROJECT NO.: U-4438 SHEET 2 OF 4

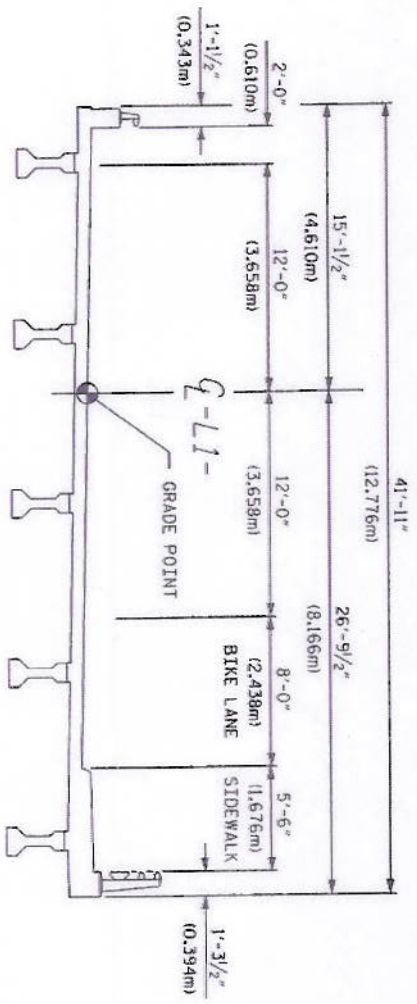
DRAWN BY: P. Ervin DATE: Jan. 20, 2011
CHECKED BY: T. Poyne DATE: Jan. 28, 2011

NOTE: ELEVATIONS ARE SHOWN IN DECIMAL FEET



NOTE: WHEN BASCULE SPAN IS IN THE OPEN POSITION THERE IS UNLIMITED VERTICAL CLEARANCE

ELEVATION AT BASCULE SPAN SHOWING NAVIGATIONAL CLEARANCES



TYPICAL SECTION APPROACH SPANS TO BASCULE SPAN



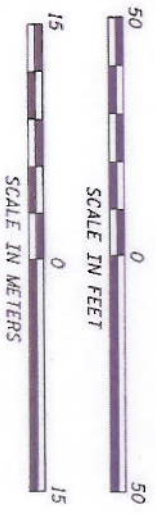
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH, NC
PASQUOTANK & CAMDEN COUNTIES
ELIZABETH CITY, NC

PROPOSED BRIDGE ON US 158 (CAMDEN CAUSEWAY)
BETWEEN US 17 AND NC 345
OVER PASQUOTANK RIVER @ MILE POINT 50.7
(INTRACOASTAL WATERWAY - ALTERNATE ROUTE)
REPLACEMENT OF BRIDGE No. 19

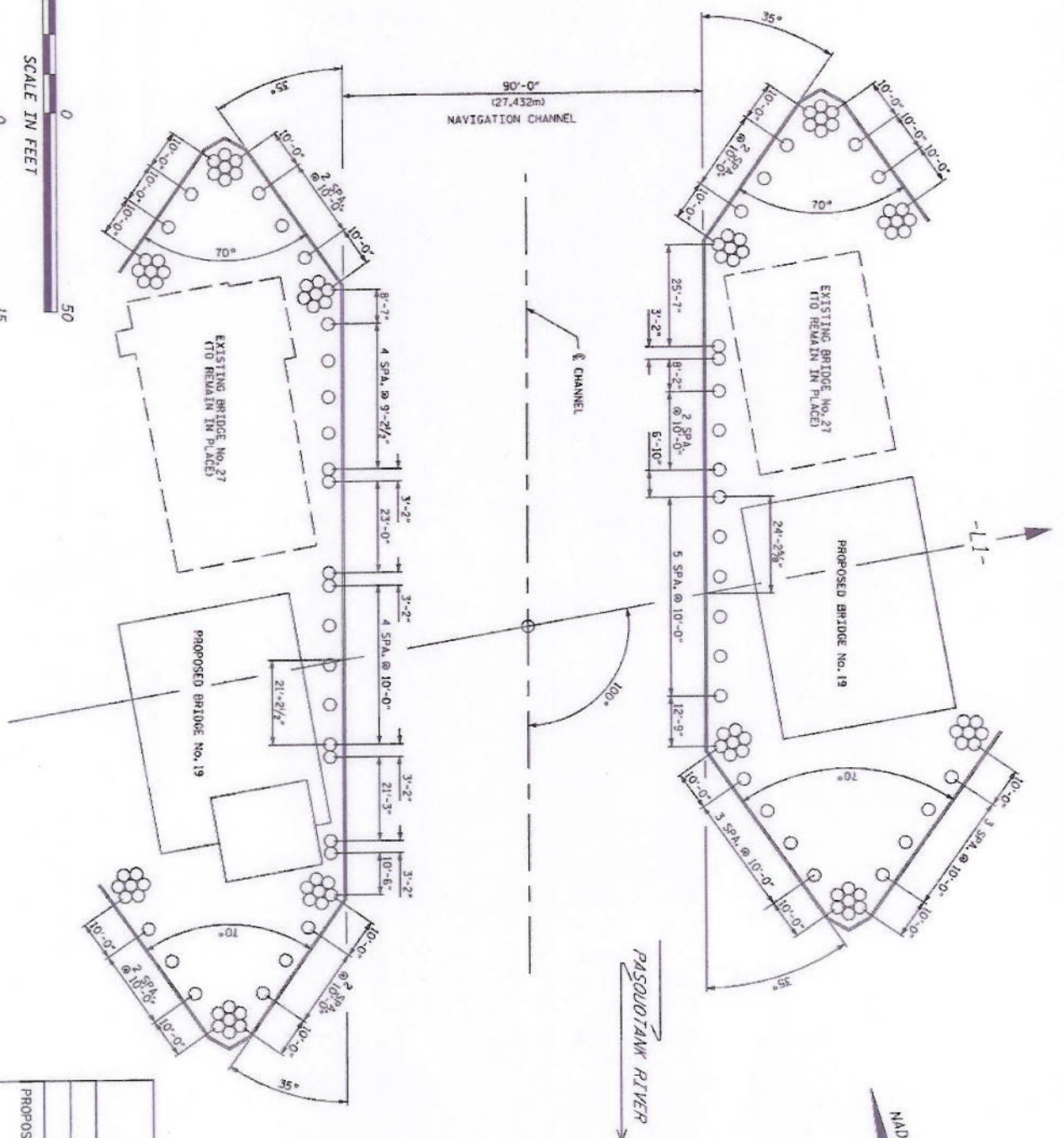
DRAWN BY : P. Ervin DATE : Jan. 20, 2011
CHECKED BY : T. Payne DATE : Jan. 28, 2011

STATE PROJECT NO. : U-4438 SHEET 3 OF 4

DRAWN BY : P. E. VIN DATE : JUN. 28, 2011
 CHECKED BY : I. P. VANDER DATE : JUN. 28, 2011



FENDER SYSTEM LAYOUT



PASQUOTANK RIVER



STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH, NC
PASQUOTANK & CAMDEN COUNTIES ELIZABETH CITY, NC
PROPOSED BRIDGE ON US 158 (CAMDEN CAUSEWAY) BETWEEN US 17 AND NC 343 PASQUOTANK RIVER @ MILE POINT 50.7 (INTRACOASTAL WATERWAY - ALTERNATE ROUTE) REPLACEMENT OF BRIDGE No. 19
STATE PROJECT NO.: U-4438
SHEET 4 OF 4