STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

October 31, 2006

N.C. Department of Environmental and Natural Resources
Division of Coastal Management
Wilmington District
127 Cardinal Drive Ext.
Wilmington, NC 28405-3845

ATTN: Mr. Jim Gregson
District Manager

Subject: **Application/Project Narrative for CAMA Major Development Permit** for the replacement of Bridge No. 198 on SR 1172 over the Atlantic Intracoastal Waterway at Sunset Beach, Brunswick County. Federal Aid No. BRS-1813 (1), State Project No. 8.2230101, Division 3, TIP Project No. B-0682. Debit $475.00 from WBS Element 32575.1.2.

Dear Mr. Gregson:

The North Carolina Department of Transportation (NCDOT) proposes to construct a new bridge on new location in Brunswick County, known as the Sunset Beach Bridge. Bridge No. 198 spans the Atlantic Intracoastal Waterway (AIWW) and connects the island and mainland portions of the town of Sunset Beach. NCDOT proposes to replace Bridge No. 198 over the AIWW at Sunset Beach and relocate a section of East Shoreline Drive to provide better alignment with the new bridge approach. The proposed structure is a high-level fixed span bridge that will be 2,563 feet in length with a width of 34 feet 7 inches to 38 feet 8inches and a navigational clearance of 65 feet vertical and 90 feet horizontal. The new bridge will be a total of 23 spans with 22 bents. Bent Nos. 1-10 and 15 will be post and beam on concrete columns on drilled shafts. Bent Nos. 11-14 will be hammerhead bents on footings on drilled shafts. Bents Nos. 16-22 will be post and beam on footings with piles. An onsite detour will be used. Roadway description information can be found on the attached stormwater management plan. The project length is approximately 1.1 miles.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
NATURAL ENVIRONMENT UNIT
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

TELEPHONE: 919-715-1334 or
919-715-1335

FAX: 919-715-5501

WEBSITE: WWW.NCDOT.ORG

LOCATION:
PARKER LINCOLN BUILDING
2728 CAPITAL BLVD. SUITE 240
RALEIGH NC 27604

PROJECT NARRATIVE

The purpose of this application is to submit this final design for approval and to request a Coastal Area Management Act (CAMA) Major Development Permit. Included in this application package are the following: (1) CAMA Major Development Permit Application forms, (2) a copy of the property owner certified mail delivery receipts, (3) permit drawings, (4) roadway plan sheets, (5) Stormwater Management Plan, (6) Merger '01 4B & 4C minutes and comments, (7) a copy of the U.S. Fish and Wildlife Service (USFWS) concurrence letters, (8) a copy of the National Marine Fisheries Service (NMFS) concurrence letters, (9) the wetland restoration plan, and (10) the Sea Trail Pond Draw Down Protocol.

Project Schedule

This project has a let date of April 17, 2007 with a review date of February 27, 2007.

Purpose and Need

The existing Sunset Beach Bridge is a single-lane floating steel-barge and swing-span drawbridge with fixed wooden approach spans, which is often referred to as a pontoon bridge. The bridge is 508 feet long and 14.8 feet wide. Since the bridge provides only a few feet of vertical clearance under the approach spans, virtually all waterway traffic is blocked when the bridge is closed to allow roadway traffic to cross. Replacement of the existing pontoon bridge with a new structure would provide a more reliable means of transportation between the island and the mainland and would offer a greater degree of public safety by improving emergency response time and emergency evacuation procedures. A new facility would enhance vehicular operation on Sunset Boulevard (SR 1172) and watercraft operations on the AIWW.

Summary of Impacts

Construction of the proposed project will necessitate impacts to jurisdictional waters. This project is located in the Lumber River Basin within Hydrologic Unit 03040207. There will be a total of 0.545 acre of permanent surface waters impacted, 0.438 acre of temporary surface waters impacted, 2.368 acres of permanent wetland impacted and 0.597 acre of temporary wetland impacted

Summary of Mitigation

Throughout the design and NEPA process this project has been designed to avoid and minimize impacts to jurisdictional areas. There will be 2.839 acres of onsite coastal marsh mitigation. Therefore, no offsite mitigation will be necessary. Specific strategies are detailed in the attached wetland restoration plan and the mitigation section of this document.

CAMA JURISDICTION

B-0682 is located in Brunswick County, one of the twenty coastal counties under the jurisdiction of the Coastal Area Management Act (CAMA). There are four areas that are located within an Area of Environmental Concern (AEC) within the project area, the estuarine and public trust waters, coastal wetlands, and the estuarine shoreline. The AIWW and the Slough Canal are classified as navigable "public trust" waterways under CAMA guidelines. A full description of the road improvements at the Slough Canal and the associated impacts is included on page 6 of this letter. A full description of the bridge over the AIWW and the proposed impacts is discussed on page 5.

The impacts to the public trust waters and associated buffers have been minimized to the greatest practical extent, as described in the avoidance and minimization section of this letter.

The AIWW and Slough Canal are located in the Lumber River Basin (USGS Hydrologic Unit 030340207, NCDWQ Subbasin 03-07-59). The best usage classification for the AIWW (NCDWQ Index No. 15-25) is Class SA HQW from Cape Fear River Basin at Buoy FI R ev. 4 sec 22 to North Carolina-South Carolina state line. Slough Canal has not been assigned a best usage classification, therefore it receives the same classification of the first assigned water body that it flows into, the AIWW (SA HQW).

NEPA DOCUMENT STATUS

A Final Environmental Impact Statement (FEIS) was prepared by the NCDOT and approved on October 30, 1997 and a Record of Decision was approved on August 27, 1999. The FEIS was provided to regulatory review agencies involved in the approval process after their approval. Additional copies will be provided upon request.

Net wetland permanent impacts have increased since the FEIS was completed by 1.734 acres. Wetland impacts have changed due to the following reasons: updating of the wetland delineation, erosion control devices, excavation of a portion of the causeway, slope protection, and a bridge bent. A breakdown of the change in impacts and rationale for the changes are included in Table 1 below.

Table 1- Difference in Wetland Impacts Between FEIS and Final Design (ac)				
Type of Impact	**FEIS Impact Total**	**Final Design Impacts**	**Impact Change**	**Reason For Impact Change**
Bridge Approach Left	0.524	0.443	-0.081	Decrease resulted from Redelineation/Reverification: wetland area (line) moved away from causeway.
Bridge Approach Right	0.11	0.916	0.806	Increase resulted from Redelineation/Reverification: new wetlands developed adjacent and closer to the causeway and erosion control devices will have to be placed in this new area.
Slough Canal slope protection	0	0.005	0.005	Increase resulted from Redelineation/Reverification
Bent #14	0	0.003	0.003	Increase resulted from Redelineation/Reverification
Excavation of Causeway	0	1.001	1.001	Results from excavation to reach the target CAMA wetland elevation for restoration.
Total	0.634	2.368	1.734	

Surface water impacts have decreased since the completion of the FEIS from 2.10 to 0.545 acre. The surface water impacts decrease is a result of the project length decreasing from 1.23 to 1.10 miles, bridge design length increasing from 2,372 to 2,563 feet, an alignment shift away from Big Narrows Canal, use of a detour bridge, use of a work bridge, and because dredging will not be necessary.

INDEPENDENT UTILITY

B-0682 is in compliance with 23 CFR Section 771.111(f) which lists the Federal Highway Administration (FHWA) characteristics of independent utility of a project:

(1) The project connects logical termini and is of sufficient length to address environmental matters on a broad scope;
(2) The project is usable and a reasonable expenditure, even if no additional transportation improvements are made in the area; and
(3) The project does not restrict consideration of alternatives for other reasonable foreseeable transportation improvements.

RESOURCE STATUS

Waters of the United States: The jurisdictional areas of concern associated with the replacement of the Sunset Beach Bridge and alignment of Sunset Beach Boulevard are: AIWW, the coastal marsh, the Slough Canal, and Sea Trail Pond.

Delineations
Wetland delineations were conducted in August 1996 using the criteria specified in the *1987 Corps of Engineers Wetland Delineation Manual* and verified by the U.S. Army

Corps of Engineers (USACE). Delineation updates were conducted in July 2005 with Bill Arrington, of the North Carolina Division of Coastal Management (DCM), and Dave Timpy, of the USACE. Mr. Timpy updated the verification on December 14, 2005. During the update of the wetland delineation, 1.73 acres of wetlands were added to the project impacts. These impacts are listed in Table 2.

Wetlands

B-0682 will have 2.368 acres of permanent impacts and 0.597 acre of temporary wetland impacts. Wetlands to be impacted are considered to be tidal and have a Cowardin Classification of E2EMIN (Estuarine, Intertidal, Emergent, Persistent Regularly Flooded). Table 2 is a list of permanent and temporary impacts to jurisdictional wetland resources. Permanent impacts to jurisdictional wetland resources include the approach fill for the new bridge, placement of erosion control devices adjacent to the causeway, the location of bridge bent #14 at the edge of the marsh, excavation of the marsh due to causeway removal, and slope protection around the replacement pipe at the toe of Slough Canal. The temporary impacts result from the detour approach fill, placement of a cofferdam around bridge bent #14, and work bridge bents. Erosion control devices located within wetland will be placed within the mechanized clearing areas. Riprap at the ends of the pipe for the Slough Canal has been calculated as permanent fill. Wetland impacts will require mitigation. Mitigation is to be provided onsite.

Table 2- B-0682 Wetland Impacts and Descriptions

Sheet	Structure / Type	Permanent Impacts (Acres)	Temporary Impacts (Acres)
4 - 6	Bridge	1.362	0.003
5A & 6A	Detour	0	0.587
4	Slope Protection	0.005	0
5 & 6	Excavation of Causeway	1.001	0
5B & 6B	Work bridge	0	0.008

Streams

B-0682 will have 0.545 acre of permanent surface water impacts and 0.438 acre of temporary impacts. Impacts to surface waters occur within HUC 030340207 of the Lumber River Basin. The North Carolina Department of Environmental and Natural Resources, Division of Marine Fisheries (DMF) also classifies the AIWW as a Primary Nursery Area (PNA). Table 3 lists proposed surface water impacts. Neither the AIWW nor the Slough Canal are designated as a North Carolina Natural or Scenic River, or as a National Wild and Scenic River, nor is it listed as a 303(d) stream. No designated Outstanding Resource Waters (ORW), Water Supply I (WS-I), or Water Supply II (WS-II) waters occur within 3.0 miles of the project study area.

Table 3 – B-0682 Surface Water Impacts							
Sheet	**Stream Name and Intermittent (I) or Perennial (P)**	**Structure/ Size Type**	**Permanent Impacts (ac)**	**Mitigation Required**	**Temporary Impacts (ac)**	**DWQ Index number**	**DWQ Class**
7	Slough Canal (P)	Bridge	0.004	No	0	15-25	SA HQW
6	AIWW (P)	Bridge	0.080	No	0.014	15-25	SA HQW
5B &6B	Work bridge	Bridge	0	No	0.007	15-25	SA HQW
7	Pond at Sea Trail (P)	42"Pipe	0.461	No	0.417		

WETLAND AND STREAM IMPACT DESCRIPTIONS

A description of wetland and stream impacts are included below.

Bridge

Stations 12+00 to 31+00 Lt. and 13+50 to 32+00 Rt. have 1.359 acres of fill in CAMA jurisdictional coastal marsh wetlands for the roadway approach fill. The 1.359 acres include the 0.410 acre for placement of erosion control devices in the 5-foot clearing area outside the slope stake line.

Station 49+73 has 0.003 acre of fill in CAMA jurisdictional coastal marsh wetlands and 0.002 acre of temporary impacts. Fill in wetlands occurs as a result of placement of Bridge Bent No.14.

Stations 33+00 to 44+00+/- Rt. & Lt. have 1.001 acres of (includes the 5 foot clearing area for erosion control devices) excavation of the marsh adjacent to the causeway. A portion of the causeway will be removed for onsite mitigation. Existing CAMA marsh is being graded to a lower elevation to match adjacent marsh elevation at the request of the agencies.

Stations 44+43 to 48+23 have 0.080 acre of impacts to the AIWW and 0.013 acre of temporary impacts for placement of Bridge Bents Nos.11, 12, and 13.

Stations 45+50 to 48+66 have <0.001 acre of temporary impacts to the AIWW for the placement of two temporary bridge bents for construction of bridge.

Detour

Stations 12+00 to 17+10 & 24+80 to 28+10 have 0.587 acre of temporary fill (includes the 5 foot area for erosion control devices) in CAMA jurisdictional coastal marsh wetlands for the onsite detour approach fill. The detour fill will also be placed on filter fabric for ease of removal. The detour will consist of the existing structure, an 800 foot temporary bridge (Stations 17+00 to 25+00) and temporary fill for approach. The type of bridge, pilings and number of pilings will be determined by contractor. Installation of pilings will either be done by pile driving or vibratory hammer.

Workbridge
Stations 32+70 to 50+00 have 0.008 acre of temporary fill in CAMA jurisdictional coastal marsh wetlands and 0.007 acre of temporary impacts to the AIWW for the bridge bent impacts associated with the work bridge.

Slough Canal, Pond, & Dam
Stations Y1- 17+30 to 17+70 Rt. have 0.005 acre of fill in CAMA jurisdictional coastal marsh wetlands and 0.004 acre of fill in Slough Canal for the placement of slope protection around the replacement pipe at the toe of Slough Canal.

Stations 62+00 to 63+50 Lt. have 0.461 acre of permanent fill and 0.417 acre of temporary fill to Sea Trail Pond for construction of roadway approach and dam.

BRIDGE DEMOLITION

Following construction of the bridge, all material used in the construction of the structure will be removed. The existing approach fill will be removed to natural grade and the area will be re-vegetated according to NCDOT guidelines. Pre-project elevations will be restored. The contractor will be required to submit a reclamation plan for the removal of and disposal of all materials off-site at an upland location. Approximately 105 feet of the old bridge will be left in place as requested by the Town of Sunset Beach. This section starts on the mainland side and continues waterward for 105 feet (Plan Sheet 10 of 28). The USACE Navigational setbacks, as agreed upon, will be adhered to and the section of bridge left standing will not cross the setback lines.

FEDERALLY PROTECTED SPECIES

Plants and animals with federal classification of Endangered (E) or Threatened (T) are protected under the provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of September 29, 2006 the USFWS lists fifteen federally protected species for Brunswick County (Table 4). Only one change to the county species list, the deletion of the peregrine falcon, has occurred since the original surveys were conducted.

Biological Conclusions of "No Effect" have been rendered for the eastern cougar, shortnose sturgeon, red-cockaded woodpecker, seabeach amaranth, rough-leaved loosestrife, and Cooley's meadowrue. The American alligator is listed due to similarity of appearance and thus not subject to Section 7 consultation. The USFWS has concurred with the biological conclusion of "May Affect, Not Likely to Adversely Affect" for the West Indian manatee, wood stork, bald eagle, loggerhead sea turtle, green sea turtle, leatherback sea turtle, Kemp's ridley sea turtle, and piping plover. NCDOT received concurrence from USFWS in the attached letters dated July 11, 1995 and October 10, 1996. The NMFS concurred with the biological conclusions of "May Affect, Not Likely to Adversely Affect" for the shortnose sturgeon and populations of endangered and threatened species under their purview in the attached letters dated November 5, 1996 and September 19, 2003. NCDOT has agreed to follow the "*Guidelines for Avoiding Impacts*

to the West Indian Manatee" in order to obtain concurrence from the USFWS. The biological conclusions for the fifteen species listed below remain valid.

Table 4 - Federally-Protected Species for Brunswick County

Scientific Name	Common Name	Status	Biological Conclusion
Alligator mississippiensis	American alligator	T (S/A)	Not Applicable
Acipenser brevirostrum	shortnose sturgeon	E	No Effect
Caretta caretta	loggerhead turtle	T	MANLAA
Charadrius melodus	piping plover	T	MANLAA
Chelonia mydas	green sea turtle	T	MANLAA
Dermochelys coriacea	leatherback sea turtle	E	MANLAA
Haliaeetus leucocephalus	bald eagle	T	MANLAA
Lepidochelys kempii	Kemp's ridley sea turtle	E	MANLAA
Mycteria americana	wood stork	E	MANLAA
Picoides borealis	red-cockaded woodpecker	E	No Effect
Felis concolor couguar	eastern cougar	E	No Effect
Trichechus manatus	West Indian manatee	E	MANLAA
Amaranthus pumilus	seabeach amaranth	T	No Effect
Lysimachia asperulaefolia	rough-leaved loosestrife	E	No Effect
Thalictrum cooleyi	Cooley's meadowrue	E	No Effect

E - Endangered; T – Threatened;
T (S/A)=Threatened due to similarity of appearance
MANLAA denotes May Affect, Not Likely to Adversely Affect

CULTURAL RESOURCES

Archaeology

The North Carolina State Historic Preservation Office (SHPO) concurred with an archaeological field survey recommendation that the project will not involve significant archaeological resources. The memorandum dated January 23, 1997 is included in Appendix F-III of the FEIS.

Historic Architecture

According to an August 28, 1995 letter from SHPO included in Appendix F-III of the FEIS, there are no historic properties within the project's area of potential effect (APE) that are listed on the National Register of Historic Places.

FEMA COMPLIANCE

This project crosses the 100-year floodplain of the AIWW. The bridge has been designed to completely span the 100-year floodplain of the AIWW.

ESSENTIAL FISH HABITAT

In accordance with the Magnuson-Stevens Act of 1996 (16 U.S.C 1801 et *seq.*) an Essential Fish Habitat (EFH) Assessment was prepared. Based upon the project design, the minimal short-term impacts associated with temporary bridges, installation of bridge structures, and the proposed mitigation, the NCDOT believes that the potential adverse impacts to EFH will not be substantial for the AIWW and the Slough Canal. Copies of the EFH Assessment will be furnished upon request.

UTILITY IMPACTS

The utility relocations on this project will not generate any additional impacts to Waters of the U.S. or CAMA AEC's.

INDIRECT AND CUMULATIVE IMPACTS

An Indirect and Cumulative Effects Assessment (ICE) study for this project was completed in August 2006. The project is not expected to cause substantial indirect and cumulative effects to the project area. The only adverse cumulative impacts are associated with noise and visual impacts. However, these are offset by the expected positive outcomes related to travel patterns and the local economy. The majority of recent environmental impacts on the island were determined to be associated with island build out, which is independent of, and not affected by the project. A copy of the ICE report was provided to NCDWQ on October 10, 2006. Additional copies of the ICE report will be furnished to the resource agencies upon request.

MITIGATION OPTIONS

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were implemented during the design phase.

Avoidance

Avoidance has been employed to the maximum extent practical. All wetland areas not affected by the project will be protected from unnecessary encroachment.

General avoidance measures incorporated into the project design:

- No staging of construction equipment or storage of construction supplies will be allowed in wetlands or near surface waters. Staging areas will be determined by the contractor after the project is let.

Specific avoidance measures:
- The bridge has been aligned to avoid and minimize impacts to Big Narrows Canal.

Minimization

Minimization has been employed in the project area to the maximum extent practical. Reduction of fill-slopes at surface water/wetland crossings and the selection of alternatives that minimized surface water/ wetland impacts were incorporated.

Project Wide Minimization Measures:
- Use of 3:1 side slopes in jurisdictional areas.
- For areas adjacent to HQW or Shellfish Areas (SA), Design Standards in Sensitive Watersheds will be implemented.
- Erosion control devices will be placed adjacent to the causeway for protection of wetlands.
- Clearing area has been minimized to five feet to reduce impacts to coastal marsh wetlands.
- NCDOT will adhere to a moratorium for no in-water work from April 1- August 30th during periods of inundation (waters actively connected to the AIWW) for the protection of the shortnose sturgeon and PNA (see attached emails dated July 27, 2006.
- NCDOT will use turbidity curtains and BMPs for in-water work.
- NCDOT will adhere to the *Guidelines for Avoiding Impacts to the West Indian Manatee.*

Site Specific Minimization Measures:
- Stations 25+00 to 29+05, A detour bridge will be used instead of a causeway.
- Stations 10+00 to 17+50, Soil stabilization fabric will be used for the onsite detour to aid in the placement and removal of temporary fill.
- Stations 33+00 to 46+00 & 48+00 to 50+00, Work bridges will be used for construction of the bridge over the AIWW rather then using work causeways.
- Dredging of Big Narrows Canal will not be necessary due to an alignment shift during design.
- Station 31+50 & 54+00, Runoff from impervious bridge deck surfaces will be treated by stormwater infiltration basins on the causeway and mainland side of bridge.
- Bridge design length was extended from 2,372 to 2,563 feet for stormwater management purposes.
- Station Y1- 17+50, NCDOT has agreed to monitor the outflow during the draining of a portion of Sea Trail Pond to protect water quality.
- Two stilling basins will be incorporated to protect water quality during draw down of Sea Trail Pond.

- Station Y1- 17+50, Energy dissipater pad will be placed at the pipe outfall into Slough Canal.

Compensation

The construction of B-0682 will result in 2.368 acres of CAMA jurisdictional wetlands that will require mitigation within the Lumber River Basin. The Department has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above. NCDOT will restore approximately 2.839 acres of coastal salt marsh wetland as onsite mitigation for B-0682. The onsite mitigation will result in approximately 0.471 acre of wetland restoration assets onsite. Therefore, no offsite mitigation will be necessary. The restoration plan is included with this application

In addition, impacts from erosion control devices account for 0.410 acre of the total impacts. Based on inspection and approval by USACE and the DCM after removal of the erosion control devices, these impacts may be called temporary. The 0.410 acre would be added back into the wetland assets onsite.

RESOURCE AGENCY COMMENTS FROM "4 C" MEETING

- The USFWS stated that the endangered species surveys are old and need to be updated. *NCDOT Response: Field surveys were conducted in August 2006. Habitat has not changed within the project area. Surveys were conducted for species federally-listed in Brunswick County where habitat exists. The biological conclusions listed in the Federally Protected Species Section are current and valid.*

- A request was made to include the rational for the proposed clearing zones and more details on the erosion and sedimentation control devices in the permit application. *NCDOT Response: The areas permitted for mechanized clearing in wetlands on this project will include zones for Temporary Fill in Wetlands for Erosion & Sediment Control Measures. The Erosion and Sediment Control Measures that are considered temporary fill include Special Sediment Control Fence and/or Temporary Rock Silt Check(s) Type A. These erosion control devices will serve as drainage outlets for the Temporary Silt Fence to ensure the fence does not become hydraulically overloaded.*
  Special Sediment Control Fence:
  Special Sediment Control Fence shall be placed as shown on the plans or as directed by the Engineer. The sections of Special Sediment Control Fence shall serve as drainage outlets for Silt Fence and shall not exceed 10 ft. in length and 2 ft. in width.

  Materials:
  (A) Posts:
  Steel posts shall be at least 5 ft. in length, approximately 1 3/8 inches wide measured parallel to the fence, and have a minimum weight of 1.25 LB/ft of length. The post shall be equipped with an anchor plate having a minimum area of 14.0 square inches and shall have a means of retaining wire in the desired position without displacement.

(B) 1/4 inch Hardware Cloth:
Hardware cloth shall have 1/4 inch openings constructed from #24 gauge wire. The hardware cloth shall be installed according to Standard Drawing No. 1606.01 with a minimum of 2 ft. of the cloth placed on the ground beneath the Sediment Control Stone.

(C) Sediment Control Stone:
Sediment control stone shall meet the requirements of Section 1005 of the 2002 Standard Specifications for Roads and Structures. Install stone according to Standard Drawing No. 1606.01.

Maintenance and Removal:
The Contractor shall maintain the special sediment control fence until the project is accepted or until the fence is removed. The Contractor shall remove and dispose of silt accumulations at the fence when so directed by the Engineer in accordance with Section 1630 of the 2002 Standard Specifications for Roads and Structures. The special sediment control fence shall be removed after the project has been completed and sufficient vegetation has been established.

Temporary Rock Silt Check Type A:
Temporary Rock Silt Checks Type A shall also be utilized to provide drainage outlets for Silt Fence in wetland areas. The Type A checks will be rock dams constructed of Class B Stone, with Sediment Control Stone placed on the flow side of the dam. The Temporary Rock Silt Checks Type A shall be constructed according to Roadway Standard Drawing No. 1633.01. In addition, Type 2 Filter Fabric shall be placed beneath the Type A check dams to allow for complete removal of the Class B and Sediment Control Stone at the completion of the project.

Maintenance and Removal:
The Contractor shall maintain the temporary rock silt checks Type A until the project is accepted or until the silt checks are removed. The Contractor shall remove and dispose of silt accumulations at the silt checks when so directed by the Engineer in accordance with Section 1630 of the 2002 Standard Specifications for Roads and Structures. The silt checks shall be removed after the project has been completed and sufficient vegetation has been established.

- Meeting participants discussed whether the elevation of the existing causeway should be removed to the elevation of the wetland limits or to an elevation that better matches the surrounding marsh elevation. The agencies stated that the causeway should be removed to the elevation of the surrounding marsh. They also requested that an explanation be included in the permit application detailing how the elevation was determined.
  NCDOT Response: See attached wetland restoration plan.

- Request was made to include a special condition for the correct handling and disposal of any existing utilities using asbestos pipe.
  NCDOT Response: Special Provision *will read: Remove all asbestos cement water pipe located between station 28+00 -L- and station 44+50 -L-. The pipe to be removed will be noted on the utility construction plans. All abandoned asbestos cement water pipe to be removed shall be disposed of according to Section 107 of the Standard Specifications or as directed by the Engineer.*

  The quantity of existing asbestos cement water pipe removed in accordance with the utility construction plans and provisions herein and accepted, will be measured and paid for at the contract unit price per linear foot for "Remove Existing Asbestos Cement Water Pipe". Such price and payments will be compensated in full for all labor and materials to include excavation, proper disposal, miscellaneous equipment and incidentals necessary to complete the work.

- A request made to include in the permit application details describing the temporary detour placement and removal. A suggestion was made to use filter fabric or some other means to separate the proposed detour fill from the existing ground. There was also concern that the natural ground may not rebound after the removal of the temporary detour and that the original natural ground elevation must be restored. It was also discussed that wetland material excavated during the existing causeway removal could be stockpile and used to accomplish this.
  NCDOT Response: *Soil stabilization fabric should be placed where the detour embankment overlies the existing SR 1172 embankment. The fabric shall be placed from existing toe of fill to the proposed toe of detour embankment. Do to the nature of the underlying soils at the detour location and the small fill height for the detour we anticipate the settlement to be small. Language will be included in the contract for the temporary detour removal including the fabric and restoring the area to the existing elevation with sandy material.*

- A request was made to describe the method of disposal of water drawn from the golf course pond (Sea Trail Pond) in application.
  NCDOT Response: This proposed protocol was initially discussed in a May 8, 2006 meeting with NMFS, DMF, DWQ, DCM, and NCDOT. The proposed representatives from DWQ, DCM, DMF, and NMFS developed a protocol. The protocol was sent to the Merger Team on August 7, 2006. The protocol will be a permit condition in the 401 and a copy is provided with this permit package.

SUMMARY

CAMA: Application is hereby made for a CAMA Major Development Permit as required for the above-described activities for the proposed TIP project B-0682. A copy of this permit application will be posted on the NCDOT Website at:
http://www.ncdot.org/doh/preconstruct/pe/neu/permit.html

Section 404 Permit: In a separate application NCDOT has applied for a Clean Water Act Section 404 Individual Permit.

Section 401 Permit: In a separate application NCDOT has applied for a 401 Water Quality Certification from DWQ.

U.S. Coast Guard: In a separate application, NCDOT requested approval from the U.S. Coast Guard for the construction of the bridge over the AIWW.

Thank you for you assistance with this project. If you have any questions or need any additional information about this project, please contact Deanna Riffey at (919) 715-1409.

Sincerely,

Gregory J. Thorpe, Ph.D., Environmental Management Director
Project Development and Environmental Analysis Branch

GT/drr

W/attachment
Mr. Steve Sollod, NCDCM

W/out attachment
Mr. John Hennessy, NCDWQ (2 Copies)
Mr. Dave Timpy, USACE
Mr. Travis Wilson, NCWRC
Ms. Kathy Matthews, USEPA
Mr. Ronald Mikulak, USEPA – Atlanta, GA
Mr. Clarence W. Coleman, P.E., FHWA
Mr. Gary Jordan, USFWS
Mr. Ron Sechler, NMFS
Mr. Michael Street, NCDMF
Dr. David Chang, P.E., Hydraulics
Mr. Mark Staley, Roadside Environmental
Mr. Greg Perfetti, P.E., Structure Design
Mr. H. Allen Pope, P.E., Division 3 Engineer
Mr. Mason Herndon, Division 3 Environmental Officer
Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Scott McLendon, USACE, Wilmington
Mr. Brian Yamamoto, P.E., Planning Engineer
Mr. Carl Goode, PE, Human Environment Unit Head

STORMWATER MANAGEMENT PLAN

B-0682, State Project 34407.1.2
Brunswick County
Hydraulics Project Manager: Max S. Price, PE

Date: May 11, 2005

PROJECT DESCRIPTION

The subject project is the replacement of Bridge # 198 on Secondary Road 1172 (SR-1172) in Sunset Beach, Brunswick County, North Carolina. Bridge # 198 spans the Atlantic Intracoastal Waterway (AIWW) and connects the island and mainland portions of the town of Sunset Beach.

The existing bridge is a single-lane, floating steel-barge, swing-span drawbridge, with fixed wooden approach spans, which is often referred to as a pontoon bridge.

The proposed structure is a high-level, fixed span bridge located approximately 170 feet west of the existing pontoon bridge. The proposed bridge will be 2563 feet in length. A minimum vertical clearance of 65 feet will be provided over the Intracoastal Waterway channel that is maintained by the USACE.

The roadway approach work on the south end (island end) of the proposed bridge will consist of widening the existing causeway from 18' +/- pavement with 5' +/- vegetated shoulders to 32' pavement (2 – 12' lanes, 2- 4' paved shoulders) with 4' vegetated shoulders (7' where guardrail is required) and 3:1 fill slopes. The elevation of the causeway will be raised to elevation 6.5' in order to prevent overtopping during spring tides. The approach work on the north end of the bridge (mainland end) will consist of new approach fill from the end of the bridge to NC 179 (Sunset Blvd.). The typical section of this new approach fill varies from 32' pavement (2-12' lanes, 2-4' paved shoulders) to 70' pavement with 4' vegetated shoulders (7' where guardrail is required). NC 179 (Sunset Blvd.) will be widened to provide new turn lanes. A section of East Shoreline Drive will be relocated to provide better alignment with the new bridge approach.

BEST MANAGEMENT PRACTICES AND MAJOR STORMWATER STRUCTURES

The Intracoastal Waterway along with all sloughs, sounds, inlets and connecting channels in the project area has a classification of SA; HQW from the North Carolina Department of Environmental and Natural Resources (NCDENR).

Best Management Practices (BMPs) and the major stormwater structures are used on the project to reduce the stormwater impacts to the Intracoastal Waterway, adjacent coastal wetlands, Slough Canal , and Long Creek Pond.

The use of grassed shoulders, embankment slopes and the flat longitudinal grade of the causeway from the beginning of the project to the new bridge will promote sheet flow runoff to the surrounding coastal wetlands. The elimination of the existing draw bridge, which caused traffic to queue up during the opening of the existing bridge for Intracoastal Waterway boat traffic will also be of benefit to water quality.

Bridge deck runoff from the crest to the south end of the bridge (island end) will be collected in a closed deck drainage system and directed to a stormwater management basin. The first one and a half-inch (first flush) of runoff will be directed to the basin and treated by infiltration. Flows greater than the first flush will bypass the basin and discharged into the coastal marsh at a non-erosive velocity.

Bridge deck runoff from the crest to a point just south of West Shore Line Drive (NC 179) will be collected in a closed deck drainage system and directed to a storm water management basin located under the bridge. The first inch and one-half of runoff will be directed to the basin and treated by infiltration. Flows greater than the first flush will bypass the basin and be conveyed to the Intracoastal Waterway through an existing vegetated swale along Canal Drive.

Bridge deck runoff from West Shore Line Drive (NC 179) to the north end of the bridge (mainland end) will be discharged to the upland area under the bridge through standard bridge deck drains. The deck runoff will collect and infiltrate in a natural depression in this area.

Runoff from the north end of the bridge to the end of the guardrail will be collected in a drainage system and receive stormwater treatment in a grass swale located at the toe of the embankment on the right side. Runoff from the remainder of the –L- line pavement will sheet flow across grassed shoulders and slopes before entering this same grassed swale.

Sheet flow across grassed shoulders and grassed swales will provide stormwater treatment for the pavement runoff of the widened section of NC 179 (Sunset Blvd.).

The relocated section of East Shoreline Drive will have grassed swales with false sumps. The false sumps will allow the runoff to collect in the swales until infiltration occurs.

A State Stormwater Management Permit will be required for this project. A pre-application consultation meeting was held on July 14, 2003 with Mr. Bradley Bennett, and Ms. Linda Lewis of DWQ. The above stormwater management measures and alternatives were discussed at this meeting and determined to be workable and permittable from a State Stormwater Permit perspective.

Sunset Beach Wetland Restoration Plan
At Bridge No. 198 over the Intracoastal Waterway
on SR1172
Brunswick County

TIP B-0682
Federal Aid Project No. BRSTP-1813(1)
WBS No. 32575.1.1

July 6, 2006

The North Carolina Department of Transportation (NCDOT) will perform on-site mitigation for coastal marsh wetland impacts at the SR 1172 overpass of the Intercoastal Waterway. This mitigation site occurs within Transportation Improvement Program (TIP) B-0682. The project begins approximately 3200 feet south of Bridge No. 198 and continues to approximately 1500 to the north of the bridge. NCDOT will restore approximately 2.839 acres of coastal salt marsh wetland as onsite mitigation for B-0682. The roadway project will impact 2.368 acres of unavoidable wetlands, leaving approximately 0.471 acres of wetland restoration assets on-site.

Impacts from erosion control devises accounts for 0.410 acres of the total impacts. Based on inspection and approval by USACE and DCM after removal of the erosion control devises, these impacts may be called temporary. The 0.410 acres would be added back into the wetland assets onsite.

EXISTING CONDITIONS

The project is located in Brunswick County north of Sunset Beach near the intersection of NC 179 and SR 1172. The project study area land use is mainly salt marsh or forested wetlands with residential use of uplands.

The Natural Systems Technical Memorandum for TIP B-0682, dated April 1995, provides further details concerning existing roadway and project study area conditions.

The existing causeway for the southern approach to Bridge No. 198 is located in the intertidal area between the barrier island of the Sunset Beach community and the mainland. This wetland area slopes from the upland edge of the island towards the Intercoastal Waterway and the Big Narrows. The wetland consists entirely of a coastal salt marsh community dominated by herbaceous species of smooth cordgrass (*Spartina alterniflora*). The transition zone where the coastal marsh wetland grades into the existing causeway slope is dominated by silverling (*Baccharis halimifolia*).

PROPOSED CONDITIONS
DESIGN

The proposed wetland mitigation will consist of restoring 2.839 acres of coastal salt marsh wetland. Restoration will involve removing causeway fill and transition area along the southern approach to Bridge No. 198 to match the adjacent coastal marsh wetland elevation. Fill from the temporary detour will also be removed and graded to match the adjacent wetland elevation. Five cross sections taken along the causeway from Station 33+00 to Station 44+00 (approximately every 200 feet) to provide target wetland elevations. Excavated areas will be ripped and disked prior to planting of the site if neccessary.

The Natural Environment Unit shall be contacted to provide construction oversight to ensure that the wetland mitigation area is constructed appropriately.

VEGETATION PLANTING

The restoration site will be planted following the successful completion of the site grading. The site will be planted with smooth cordgrass on 3 foot centers.

MONITORING:

Upon successful completion of construction, the following monitoring strategy is proposed for the mitigation site. NCDOT will document monitoring activities on the site in an annual report distributed to the regulatory agencies.

HYDROLOGIC MONITORING

No specific hydrological monitoring is proposed for this restoration site. The target elevation will be based on the adjacent wetland and verified during construction. Constructing the site at the adjacent wetland elevation will ensure the hydrology in the restored area is similar to the hydrology in the reference area.

VEGETATION SUCCESS CRITERIA

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

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9721 Executive Center Dr. N.
St. Petersburg, FL 33702
(727) 570-5312, FAX 570-5517
http://caldera.sero.nmfs.gov

SEP 19 2003

F/SER3:SKB

Mr. Phillip S. Harris, III
Manager, PDEA Office of the Natural Environment
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, NC 27699-1548

Dear Mr. Harris:

This is in response to your June 23, 2003, letter regarding reconsultation on TIP Project B-0682. The reconsultation request is due to a proposed change in construction methodology for the proposed bridge over the Intracoastal Waterway on SR 1172, Sunset Beach, Brunswick County, North Carolina. We have reviewed the material submitted by the state of North Carolina's Department of Transportation (NCDOT) with respect to possible effects on the species listed under the Endangered Species Act (ESA) under the purview of the National Marine Fisheries Service (NOAA Fisheries). This consultation is being conducted with the NCDOT as designated by the Federal Highways Administration, North Carolina Division (letter dated April 8, 2003) pursuant to 50 CFR 402.08.

Sunset Beach bridge spans the Intracoastal Waterway just north of the North Carolina/South Carolina border. The endangered shortnose sturgeon (*Acipenser brevirostrum*) has been documented north of the project area in the Cape Fear River (N.C.) and to the south in the Winyah Bay system (S.C.). NOAA Fisheries is not aware of any records of shortnose sturgeon nearby the project area.

Initial consultation (November 5, 1996; enclosed) determined that the proposed Sunset Beach bridge replacement project was not likely to adversely affect shortnose sturgeon if specific mitigation measures were followed. One of those measures restricted in-water construction from April through August. A subsequent consultation (January 15, 1997; enclosed) eliminated the in-water moratorium for pile driving but required the use of turbidity curtains on all drilled shaft construction during the months of March through August. NCDOT is now requesting written concurrence to include the use of a vibratory pile-driving hammer under the restrictions imposed for drilled shaft installation. While the initial consultation specifically mentioned in-water drilled shaft construction, there was no mention of pile installation by vibratory hammer.

At a regulatory agency field demonstration held March 5, 2001 (for the NCDOT Wilmington ByPass project), pilings were sunk by vibration into the nearby wetlands to investigate air noise generated by vibrating shaft construction (50 - 60 db) and pile driving (120 db). Partly as a result of that demonstration, NOAA Fisheries included vibratory shaft as an authorized construction methodology during the in-water moratorium for a project that had previously been consulted upon (I/SER/2002/00136).

NOAA Fisheries concludes that the proposed project, including the use of vibratory hammer for shaft installation, is not likely to adversely affect shortnose sturgeon when the other project restrictions initially agreed upon (January 15, 1997 consultation: the use of turbidity curtains between March and August, implementation of high quality erosion control standards, no removal of in-water piles between and inclusive of March through August, and dredging by bucket/clams shell dredge only) are adhered to.

This concludes the NCDOT's consultation responsibilities under section 7 of the ESA for the TIP Project B-0682. Be advised that a new consultation must be initiated if a take occurs or new information reveals effects of the action not previously considered, or the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat in a manner or to an extent not previously considered, or if a new species is listed or critical habitat designated that may be affected by the identified action.

We look forward to continued cooperation with NCDOT in conserving our endangered and threatened resources. If you have any questions, please contact Dr. Stephania Bolden, fishery biologist, at (727) 570 - 5312, or by e-mail at stephania.bolden@noaa.gov.

Sincerely yours,

Roy E. Crabtree, Ph.D.
Regional Administrator

Enclosures

cc: M. Frazer (NCDOT)
o:\section7\informal\Sunset Beach NC
Ref: I\SER\2003\
File: 1514-22.1.2 (NC)

FILE # 1514-222.1.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9721 Executive Center Drive N.
St. Petersburg, FL 33702

NOV 5 1996

F/SEO13:JEB

H. Franklin Vick
Manager, Planning and Environmental Branch
Division of Highways
North Carolina Department of Transportation
P.O. Box 25201
Raleigh, NC 27611-5201

Dear Mr. Vick:

This responds to your October 4, 1996, request for consultation on the replacement of bridge No. 198 on SR 1172 over the Intracoastal Waterway in Sunset Beach, Brunswick County, North Carolina. You are coordinating this consultation on behalf of the U.S. Department of Transportation, Federal Highway Administration (FHWA). The Federal Aid Project number is BRS-1813(1). A biological assessment (BA) was transmitted pursuant to Section 7 of the Endangered Species Act of 1973 (ESA).

We have reviewed the BA and concur with your determination that populations of endangered or threatened species under our purview would not be adversely affected by the proposed project. This determination is based upon the protective measures the FHWA will require, as described in the BA.

This concludes consultation responsibilities under Section 7 of the ESA. However, consultation should be reinitiated if new information reveals impacts of the identified activity that may affect listed species or their critical habitat, a new species is listed, the identified activity is subsequently modified, or critical habitat is determined that may be affected by the proposed activity.

If you have any questions please contact Jeffrey Brown, Fishery Biologist, at (813) 570-5312.

Sincerely,

Andrew J. Kemmerer
Regional Administrator

cc: F/PR8
F/SEO2

cc: Hunkins 10-18-96

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

October 10, 1996

H. Franklin Vick, P. E., Manager
Planning and Environmental Branch
North Carolina Department of Transportation
PO Box 25201
Raleigh, NC 27611-5201

RE: Replacement of Bridge No. 198 on SR 1172 over ICW in Sunset Beach, Brunswick County, Federal Aid Project BRS-1813(1), State Project No 8.2230101, TIP No. B-682

Dear Mr. Vick:

The U.S. Fish and Wildlife Service (Service) has reviewed the above-referenced project in Brunswick County, North Carolina. Our comments are provided in accordance with Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543).

Based on the information provided in your letter, the Service concurs that this project is not likely to adversely affect the West Indian manatee or any other Federally-listed endangered or threatened species, their formally designated critical habitat, or species currently proposed for Federal listing under the Endangered Species Act, as amended.

We believe that the requirements of Section 7 of the Act have been satisfied. We remind you that obligations under Section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner that was not considered in this review; (3) a new species is listed or critical habitat determined that may be affected by the identified action.

Thank you for your continued cooperation with our agency.

Sincerely,

Ken Graham

Ken Graham
Acting Supervisor

FWS/R4:CMartino:cm:10-10-96:919/856-4520:WP51\NCDOT\Sunset-Brdg.NE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

July 11, 1995

Mr. H. Franklin Vick
North Carolina Department of Transportation
Division of Highways
P.O. Box 25201
Raleigh, North Carolina 27611-5201

Dear Mr. Vick:

B-0682

This is in response to your June 8, 1995 letter requesting U.S. Fish and Wildlife Service (Service) comments regarding the endangered species section of the Preliminary Draft Environmental Impact Statement (PDEIS) for the proposed replacement of Bridge No. 198 on SR 1172 over the Intracoastal Waterway in Sunset Beach, Brunswick County, North Carolina. These comments are provided in accordance with the provisions of the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667d) and Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act) and supplement the Service comments of November 9, 1992.

Based on the information provided in the PDEIS, the Service concurs that the proposed bridge replacement is not likely to adversely impact the following Federally-listed species: seabeach amaranth (Amaranthus pumilus); bald eagle (Haliaeetus leucocephalus); peregrine falcon (Falco peregrinus tundrius); and, wood stork (Mycteria americana).

Additionally, the Service concurs that the proposed project is not likely to cause secondary adverse impacts to the following Federally-listed sea turtle species: leatherback sea turtle (Dermocheys coriacea); Kemp's ridley sea turtle (Lepidochelys kempii); loggerhead sea turtle (Caretta caretta); and, the green sea turtle (Chelonia mydas). However, in water bridge construction activities have the potential to directly impact sea turtles. Sea turtles, while in the water, and the Federally-listed endangered shortnose sturgeon (Acipenser brevirostrum) are under the jurisdiction of the National Marine Fisheries Service (NMFS). To meet the requirements of Section 7 for sea turtles and the shortnose sturgeon, we recommend that you contact the National Marine Fisheries Service, Protected Species Management Branch, Southeast Regional Office, 9450 Koger Boulevard, St. Petersburg, Florida 33702. (813) 893-3366.

In water construction activities associated with this project have the potential to adversely effect the Federally-listed endangered manatee (Trichechus manatus). We believe that any risk to the manatee could be eliminated by scheduling construction during the winter months when the manatee is not present in the work area. In order to avoid any potential harm to the manatee, the Service recommends that construction be limited to the period from October through May of any year. If work must occur during the period from June through September, personnel should be designated as manatee observers with the authority to take immediate precautionary measures if manatees are observed in the construction zone. To concur with the not likely to adversely effect determination, we recommend that such measures be considered and incorporated into the Draft Environmental Impact Statement.

We appreciate the opportunity to provide comments on the proposed project, and we look forward to reviewing the Draft Environmental Impact Statement. If our office can supply any additional information or clarification, please contact Kate Looney, the biologist reviewing this project, at 919-856-4520 (ext. 16).

Sincerely,

Tom Augspurger
Acting Supervisor

Subject: Re: B-0682 Sunset Beach - Moratorium
From: "Deanna R. Riffey" <driffey@dot.state.nc.us>
Date: Thu, 27 Jul 2006 15:34:22 -0400
To: Fritz Rohde <Fritz.Rohde@ncmail.net>, Ron Sechler <ron.sechler@noaa.gov>
CC: Mason Herndon <mherndon@dot.state.nc.us>

Okay,

Here is my latest revision to include the correspondence today:

NCDOT will adhere to a moratorium for no in-water work from April 1- August 30th during periods of inundation (waters actively connected to the AIWW). This allows work to be done in the PNA when it is not inundated in the area adjacent to the existing causeway. This area is normally inundated briefly during high tide (especially during new and full moon tide cycles).

thanks you so much for your time,

Deanna

Fritz Rohde wrote:

> I spoke with Mason and got clarification on this issue. As long as it applies to the area he and I discussed (adjacent to the exisiting road and possibly wet for an hour during high lunar tides), we have no problem with the wording.
>
> Fritz
>
> Deanna R. Riffey wrote:
>
> > Good afternoon,
> >
> > I know we have discussed along the many years this project has been in existence (approx 20yr) what to do or not do for the moratorium for this project. To avoid anymore confusion from the paperwork trail, NCDOT would like to propose a moratorium and guidelines that would best suit the intent of everyone. I have spoken with our Division 3 folks to also get there input. The following is the proposal for Sunset Beach:
> >
> > 1) NCDOT will adhere to a moratorium for no in-water work from April 1 - August 30th during periods of inundation. This allows work to be done in the PNA when it is not inundated.
> >
> > 2) NCDOT will use turbidity curtains and BMPs for in-water work.
> >
> > Please let us know if you have any questions or concerns. Thank-you for your time and attention.
> >
> > Deanna

--
Deanna R. Riffey, Environmental Supervisor
Project Management Group
PDEA Natural Environment Unit
N.C. Department of Transportation (919) 715-1409 or (919) 715-5501 (fax)

Subject: [Fwd: Re: B-0682 Sunset Beach - Moratorium]
From: Ron Sechler <ron.sechler@noaa.gov>
Date: Thu, 27 Jul 2006 08:13:49 -0400
To: "Deanna R. Riffey" <driffey@dot.state.nc.us>
CC: Fritz Rohde <Fritz.Rohde@ncmail.net>

Deanna,
I agree with Fritz's position regarding the PNA in water work moratorium. So long as the plan is consistent with his determination, I have no objection to your proposal.

Ron Sechler
National Marine Fisheries Service
Habitat Conservation Division
101 Pivers Island Road
Beaufort, North Carolina 28516
Phone: 252-728-5090
Fax: 252-728-8728
Email: ron.sechler@noaa.gov

Subject: Re: B-0682 Sunset Beach - Moratorium
From: Fritz Rohde <Fritz.Rohde@ncmail.net>
Date: Wed, 26 Jul 2006 16:13:49 -0400
To: "Deanna R. Riffey" <driffey@dot.state.nc.us>
CC: Ron Sechler <ron.sechler@noaa.gov>

I spoke with Mason and got clarification on this issue. As long as it applies to the area he and I discussed (adjacent to the exisiting road and possibly wet for an hour during high lunar tides), we have no problem with the wording.

Fritz

Deanna R. Riffey wrote:

> Good afternoon,
>
> I know we have discussed along the many years this project has been in existence (approx 20yr) what to do or not do for the moratorium for this project. To avoid anymore confusion from the paperwork trail, NCDOT would like to propose a moratorium and guidelines that would best suit the intent of everyone. I have spoken with our Division 3 folks to also get there input. The following is the proposal for Sunset Beach:
>
> 1) NCDOT will adhere to a moratorium for no in-water work from April 1 - August 30th during periods of inundation. This allows work to be done in the PNA when it is not inundated.
>
> 2) NCDOT will use turbidity curtains and BMPs for in-water work.
>
> Please let us know if you have any questions or concerns. Thank-you for your time and attention.
>
> Deanna

Re: B-0682 Sunset Beach - Moratorium	**Content-Type:** message/rfc822

Minutes of the Interagency Hydraulic Design Review "4B" Meeting October 17, 2002

B-682

State Project 8.2230101
Bridge #198 over Intracoastal Waterway on SR 1172 at Sunset Beach, Brunswick County

Team Members:
David Timpy, USACE (present)
John Hennessy, NCDENR (present)
David Cox, NCWRC (present)
Gary Jordan, USFWS (not present)
Chris Militscher-EPA (not present)
Cathy Brittingham, DCM (present)
Bill Arrington, DCM (not present)
Heather Montague, NCDOT PD&EA (present)

Participants:
David Chang, NCDOT Hydraulics
Amy Helms, NCDOT Hydraulics
Max Price, NCDOT Hydraulics
Jennifer Harris, NCDOT PD&EA
John Frye, NCDOT Structures
Scott Hidden, NCDOT Soils & Foundations

Note: *Italics address comments that were received after submittal of the draft minute (see attachments)*

A Hydraulic Design Review Meeting was held on Thursday, October 17, 2002 in the Location and Surveys conference room at the NCDOT Century Center Complex, Raleigh. The meeting began with Max Price giving a brief overview of the project. It was explained that this meeting was a thirty-percent plan review to discuss the conceptual hydraulic design. Max Price proceeded to review each redline plan sheet.

1. Existing Roadway Width vs. Proposed Roadway Width. Sunset Beach Blvd. will be widened from 18ft. to 24ft. on the causeway side.

2. Elevating Causeway. Since causeway will be overtopped during spring tide and hurricane surges, raising the causeway elevation was discussed. The causeway is currently proposed to be raised +/- 1.5 feet. The causeway cannot be raised enough to prevent overtopping during storm surge.
   The causeway elevation would have to be raised to above elevation 11.7 in order to not be overtopped by the FEMA 100 yr. storm surge. This would require a considerable (+/- 2000') increase in the proposed bridge length in order to avoid excessive wetland impacts.

3. Tidal Elevations Mr. Timpy stated that the tidal elevations obtained from the NOAA website seem to be low. Mr. Price agreed to further investigate them and consult with Mr. Timpy. *The MHW elevation of 1.91 ft and the MLW elevation of –2.85 ft were based on the Sunset Beach Tidal Station adjusted to the project datum (NAVD 88). The Yaupon Beach Station relative to NAVD 88 would result in a MHW elevation of 1.64 feet and a MLW*

elevation of –3.12 ft. The final tidal elevations used in the design were taken from the Little River Neck Station and are MHW elevation of 2.0 ft and MLW elevation of –2.7 ft.

4. Proposed Infiltration Basin left of station 32+00. A water quality infiltration basin to treat the bridge deck runoff from the beginning of the bridge to the bridge crest was discussed. The basin as currently proposed is to be located on an area of existing fill between the existing causeway and Big Narrows Canal. Mr. Hennessy expressed concerns that the existing fill area may not be suitable for infiltration There is currently no subsurface and groundwater data to determine if the soil will allow an infiltration basin. Mr. Timpy and Mr. Hennessy expressed concerns with the current location of the infiltration basin because of its close proximity to SA waters. Mr. Timpy expressed concerns that the MHHW and or the storm surge would inundate the elevation of the fill area where the basin would be constructed. Mr. Price explained that in order to move the basin to the island the grade of the causeway would have to be raised to provide positive drainage to the basin.
   Ms. Brittingham suggested that the bridge could be lengthened to reduce the wetland impacts associated with raising the causeway. Mr. Timpy suggested that the area of fill left of station 32+00 could be removed for additional on site mitigation credit if it were not used for the basin site. Mr. Price stated that he had discussed the basin during a State Stormwater Permit pre-application consultation meeting with Ms. Linda Lewis, DWQ Wilmington Regional Office. Mr. Hennessy commented that he would contact Ms. Lewis to discuss the matter further. *See attached email comments and follow up discussions in Old Business "4B" Meeting Minutes April 24, 2003 and August 21, 2003.*

5. Temporary Detour Tie-Ins. Mr. Hennessy discussed extending the detour bridge length to try to eliminate the amount of detour fill. Mr. Price and Mr. Frye explained that the fill was required to eliminate a sharp horizontal curve on the detour bridge and that the permanent causeway fill slope could not be constructed under the detour bridge.

6. Temporary Impacts. Temporary detour impacts (fill) will be considered permanent until it can be proven through monitoring that the area affected has been restored with vegetation and appropriate species. All staging areas (Haul Rd.) will not be allowed in coastal wetlands. The impact to coastal wetlands due to the temporary detour anticipated to be +/- 0.85 acres. The work bridge impacts are anticipated to be +/- 1.55 acres. *See attached emails comments. The +/- 1.55 acres of work bridge impacts were the shading area, the anticipated impacts due to bridge bents for the work bridge is < 0.001 acres.*

7. Pile Driving. Ms. Brittingham of DCM considered vibrating in permanent casings for construction of drilled shafts to be pile driving. There is a moratorium on pile driving between April and August. DOT, however, is allowed to eliminate the moratorium if turbidity curtains are used. A letter was found in the FEIS (10/27/97) stating that no consultation was required. DCM, however, suggested DOT request an informal consultation with Mr. Ron Sechler of National Marine Fishery Service. *See email comments*

8. Test Piers. Two drilled shafts, not part of the bridge, will be used as a test for the other drilled shafts. The exact location of the two additional shafts is not known yet. These shafts will be a permanent impact. Location should however be inside the current area of impacts. Permit application shall contain a footnote stating that location of test piers will be finalized during construction. *See email comments.*

9. Boat Ramp. Mr. Cox asked about the DOT commitment to construct a new boat access ramp. A new boat ramp has been constructed at Ocean Isle.

10. Fill in Pond. Mr. Price discussed the fill in the pond on the Sea Trail Property and stated that bridging the pond instead of fill was being considered.

11. Proposed Infiltration Basin right of station 63+00 A water quality infiltration basin to treat the bridge deck and new pavement runoff on the mainland end of the project was discussed by Mr. Price. Subsurface and ground water data information will be obtain to determine this sites suitability for infiltration.

Subject: RE: B-0682 Brunswick Interagency Hydraulic Design Review
Date: Fri, 25 Oct 2002 09:57:28 -0500
From: David.L.Timpy@saw02.usace.army.mil
To: mprice@dot.state.nc.us, John.Hennessy@ncmail.net,
coxdr@mail.wildlife.state.nc.us, gary_jordan@fws.gov,
cmilitscher@dot.state.nc.us, hwmontague@dot.state.nc.us,
lenhill@dot.state.nc.us, dbarbour@dot.state.nc.us,
bgilmore@dot.state.nc.us, bill.arrington@ncmail.net,
david.l.timpy@usace.army.mil, cathy.brittingham@ncmail.net
CC: dhenderson@dot.state.nc.us, dchang@dot.state.nc.us,
jfrye@dot.state.nc.us, shidden@dot.state.nc.us,
jgoodnight@dot.state.nc.us

Max,

Below are my comments on the draft minutes for the 10/17/02 project team meeting.

Item 2. The statement that "The causeway cannot raised enough to prevent overtopping during storm surge" should be clarified. What we were told was the proposed bridge design will not allow the causeway to be elevated from the currently proposed design. Elevating the causeway would require raising the bridge above the proposed design. It was understood that this was a major change in the current design for the bridge.

Item 3. Based on NOS's website (http://co-ops.nos.noaa.gov/bench.html, the tidal datums at the Bridge are as follows:

HIGHEST OBSERVED WATER LEVEL (11/12/1974)	=	7.31
MEAN HIGHER HIGH WATER (MHHW)	=	5.32
MEAN HIGH WATER (MHW)	=	4.94
MEAN TIDE LEVEL (MTL)	=	2.56
(NGVD)-1929	=	2.25
MEAN LOW WATER (MLW)	=	0.18
MEAN LOWER LOW WATER (MLLW)	=	0.00
LOWEST OBSERVED WATER LEVEL (01/01/1976)	=	-1.58

Relative to NDVD 29 at the Yaupon Station (ie 2.25 ft):

HIGHEST OBSERVED WATER LEVEL (11/12/1974)	=	5.06
MEAN HIGHER HIGH WATER (MHHW)	=	3.07
MEAN HIGH WATER (MHW)	=	2.69
MEAN TIDE LEVEL (MTL)	=	0.31
(NGVD)-1929	=	0.00
MEAN LOW WATER (MLW)	=	-2.07
MEAN LOWER LOW WATER (MLLW)	=	-2.25
LOWEST OBSERVED WATER LEVEL (01/01/1976)	=	-3.83

PLEASE CHECK ME ON THESE.

At the meeting, you had indicated the MHW elevation to be 1.91 ft and MLW -2.85 ft. Please review the above and let's discuss if necessary. It is also worth noting the highest observed water level and MHHW levels. The highest observed would overtop the proposed causeway, estimated at 5.0 ft ngvd. Also, note that water levels do not include superimposed wave heights. I would really like to know where your tidal datum info came from.

Item 4. It would be more correct to indicate that NCDWQ expressed concerns over the basin location due to soils and storm events. My comments were in support of NCDWQ comments. Also, the minutes should reflect that this proposal has been reviewed and approved by Linda Lewis, NCLQ and that DCM stated the basin must be a minumum of 50 ft from MHW. With regards to

the comments on positive drainage, my notes indicate that this needs further evaluation in view of the state agency restrictions of directly discharging storm water into these waters, depending on the waters classification, and the currently proposed elevation of the bridge and causeway. We had also discussed the possibility of raising the bridge and causeway to provide positive drainage and decrease the overtopping frequency of the causeway. I do not recall exactly what the NCDOT response was to this. The minutes should capture this response and indicate that the project team did not reach a decision on this.

Item 6. Impacts due to temporary causeway will be considered permanent. The minutes should reflect this agreement. In addition, the minutes should state the estimated wetland impacts are currently estimated at:

Bridge Causeway	0.93 ac
Temporary Detour	0.85 ac
Total	1.78 ac

Restoration by removal of the EXISTING causeway is 1.51 ac.

Net impacts considering the onsite wetland restoration (1:1) is 0.27 ac.

DCM also indicated that permanent impacts to cama wetlands are 0.63 ac. I am not sure about the source of this estimate but it should be clarified in the minutes. DCM also stated that based on a previous meeting, wetland impacts due to a staging area are 1.27 ac and total impacts are 4.45 ac. These estimates must be clarified. DCM also advised NCDOT that preservation of coastal wetlands is not acceptable for mitigation. The minutes must reflect this comment also.

Hope this helps. I will be till around 3:15, should you have any questions.

Dave
910-251-4634

-----Original Message-----
From: Max S. Price, P.E. [mailto:mprice@dot.state.nc.us]
Sent: Friday, October 25, 2002 3:32 AM
To: John.Hennessy; David Cox; Gary Jordan; Chris Militscher; Heather Montague; Len Hill, PE; Deborah M. Barbour PE; Bill Gilmore; Bill Arrington; Dave Timpy; cathy.brittingham@ncmail.net
Cc: D. R. Henderson; David S. Chang; John Frye; Scott Hidden, PE; James S. Goodnight
Subject: B-0682 Brunswick Interagency Hydraulic Design Review

Attached are the Draft Minutes of the Interagency Hydraulic Design Review for B-0682 Brunswick.

If addittional information is required, please advise

Max Price
Hydraulics

Subject: Re: B-0682 Brunswick Interagency Hydraulic Design Review
Date: Fri, 25 Oct 2002 16:53:24 -0400
From: Cathy Brittingham <Cathy.Brittingham@ncmail.net>
Organization: NC DENR DCM
To: David.L.Timpy@saw02.usace.army.mil, mprice@dot.state.nc.us
CC: John.Hennessy@ncmail.net, coxdr@mail.wildlife.state.nc.us,
gary_jordan@fws.gov, cmilitscher@dot.state.nc.us,
hwmontague@dot.state.nc.us, bill.arrington@ncmail.net,
jfrye@dot.state.nc.us, shidden@dot.state.nc.us,
jgoodnight@dot.state.nc.us, Linda Lewis <Linda.Lewis@ncmail.net>,
Ron Sechler <RON.SECHLER@noaa.gov>

Max and Dave,

Thanks for doing a great job summarizing the B-682 Sunset Beach Hydraulic Review meeting. I have a few additional comments. Please add the information underlined below to the revised meeting minutes and remove the information with strikethrough:

* Correction to Dave's e-mail: Item 4 currently states. "Also, the minutes should reflect that this proposal has been reviewed and approved by Linda Lewis, NCLQ and that DCM stated the basin must be a minimum of 50 ft from MHW." This is how I remember the discussion: "Mr. Price stated that he had discussed the proposed infiltration basin during a State Stormwater Permit pre-application consultation meeting with Ms. Linda Lewis, DWQ -Stormwater Management Section, Wilmington Regional Office. Additional coordination with the DWQ-Stormwater Management Section will be needed after the hydraulic design is revised, therefore no decisions or approvals were made during the meeting with Linda Lewis. DWQ rules (15A NCAC 02H .1000) require that all infiltration basins be a minumum of 50 feet from MHW. Cathy Brittingham stated that DCM rules (15A NCAC 07H .0209 (g)(1)(A) require that there shall be no stormwater collection systems within 575 feet of Outstanding Resource Waters. No one at the meeting knew if the project is located within Outstanding Resource Waters. DOT will investigate further."
* Addition to the meeting minutes, Item 4: "DOT will investigate methods for getting the stormwater to the mainland so that the proposed infiltration basin left of station 32+00 is not needed."
* Correction to Dave's e-mail: "DCM also indicated that permanent impacts to cama wetlands are 0.63 ac. I am not sure about the source of this estimate but it should be clarified in the minutes. DCM also stated that based on a previous meeting, wetland impacts due to a staging area are 1.27 ac and total impacts are 4.45 ac. These estimates must be clarified. DCM also advised NCDOT that preservation of coastal wetlands is not acceptable for mitigation. The minutes must reflect this comment also." This is how I remember the discussion: "Ms. Brittingham asked DOT to summarize the current estimate of temporary and permanent impacts to coastal wetlands. According to informational materials received by Ms. Brittingham prior to an interagency meeting for B-682 on 10/18/01, DOT stated that the total temporary impacts to coastal wetlands would be 4.45 acres (1.27 acres due to the staging area/haul road; 1.63 acres due to the temporary detour; and 1.55 acres due to the work bridge). DOT responded at the 10/17/02 meeting that the estimate of 1.27 acres of impacts due to the staging area/haul road has been eliminated; and the estimate of 1.63 acres due to the temporary detour has been reduced to 0.85 acres. DOT stated that the current estimate of permanent impacts to coastal wetlands is 0.93 acres. This is based on 3:1 side slopes with 10' outside of the fill slope included as additional impacts. The length of the fill causeway is 2000'. Therefore, the current estimate of temporary and permanent impacts to coastal wetlands is 1.78 acres. Restoration by removal of the existing causeway is estimated to be 1.51

acres. Therefore, DOT will need to locate 0.27 acres of suitable mitigation for impacts to coastal wetlands. DOT stated that they have begun searching for potential mitigation sites. Ms. Brittingham reminded DOT that preservation of coastal wetlands is not an acceptable form of mitigation for impacts to coastal wetlands."

* Question for Max, Item 6: Your notes state that the work bridge impacts are anticipated to be +/- 1.55 acres. I do not have that figure in my meeting notes. If that is shading impacts, then I do not believe that mitigation will be required. If that is impacts due to fill or excavation, then I believe mitigation may be required. Could you please add more detail about this discussion in the revised meeting minutes?
* Correction to meeting minutes, Item 7: "Ms. Brittingham of DCM consideredstated that vibrating in permanent casings for construction of drilled shafts is considered by DCM to be pile driving, unless DOT can provide data that shows otherwise. There is a moratorium on pile driving between April and August. DOT, however, is allowed to eliminate the moratorium if turbidity curtains are used. A letter was found in the FEIS (10/27/97) stating that no consultation was required. DCM, however, suggested DOT request an informal consultation with Mr. Ron Sechler of National Marine Fishery Service. According to a letter from NMFS to DOT dated 1/15/97 contained within the FEIS: 'On October 4, 1996, you transmitted a biological assessment (BA) pursuant to Section 7 of the Endangered Species Act of 1973 (ESA). That BA included a moratorium on in-water pile construction between the months of April and August in order to protect shortnose sturgeons. Your December 9, 1996, letter proposes, among other things, to eliminate the moratorium on in-water pile construction but proposes to employ turbidity curtains on all drilled shaft construction and during the months of March through August for in-water pile construction. We have reviewed the BA and the new protective measures included in your December 9 letter and have determined that populations of endangered or threatened species under our purview would not be adversely affected by the proposed project. This determination agrees with our November 5, 1996, consultation on this project and is based upon the protective measures the FHWA has agreed to. This concludes consultation responsibilities under Section 7 of the ESA. However, consultation should be reinitiated if new information reveals impacts of the identified activity that may affect listed species or their critical habitat, a new species is listed, the identifed activity is subsequently modified, or critical habitat is determined that may be affected by the proposed activity.' Ms. Brittingham suggested that DOT request an informal consultation with Mr. Ron Sechler of the National Marine Fisheries Service to ensure that the need to vibrate casings was anticipated during the Section 7 consultation. DOT stated that it might be possible to screw the casings if necessary."
* Addition to the meeting minutes, Item 8: "DOT stated that the test piers will be installed from the temporary work bridge and will not need special access, therefore the test piers will not result in any additional temporary wetland impacts."

Please let me know if you have any questions or concerns.

Sincerely,

Cathy Brittingham

David.L.Timpy@saw02.usace.army.mil wrote:

>

Minutes of the Interagency Hydraulic Design Review Old Business "4B" Meeting April 24, 2003

B-0682

State Project 8.2230101
Bridge #198 over Intracoastal Waterway on SR 1172 at Sunset Beach, Brunswick County

Team Members:
David Timpy, USACE (present)
John Hennessy, NCDENR (present)
Travis Wilson, NCWRC (present)
Gary Jordan, USFWS (not present)
Chris Militscher-EPA (present)
Cathy Brittingham, DCM (present)
Bill Arrington, DCM (not present)
Heather Montague, NCDOT ONE (present)

Participants:
David Chang, NCDOT Hydraulics
Bill Zerman, NCDOT Hydraulics
Max Price, NCDOT Hydraulics
Elizabeth Lusk, NCDOT ONE
John Frye, NCDOT Structures
Theo Beach, NCDOT Structures
David Harris, NCDOT Roadside Environmental
Bradley Bennett, NCDENR DWQ
Linda Lewis, DWQ Wilmington
Laurie Munn, DWQ Wilmington

A Hydraulic Design 4B "Old Business" Meeting was held on Thursday, April 24, 2003 in the Location and Surveys conference room at the NCDOT Century Center Complex, Raleigh. The meeting began with Max Price explaining that the primary purpose of the meeting was to discuss stormwater management issues. Max explained that since the original 4B meeting on 10/17/02 geotechnical information for the proposed stormwater basins had been received.

Topics Discussed:

1. Proposed stormwater basin left of station 32+00 –L-. A water quality basin to treat the bridge deck runoff from the beginning of the bridge to the bridge crest was discussed. The basin, as currently proposed, is to be located on an area of existing fill between the existing causeway and Big Narrows Canal. It should be noted that this basin location would not be located a minimum of 50 feet from SA waters and that the runoff in excess of the design volume would not flow through a vegetative filter with a minimum length of 50 feet (measured from mean highwater of SA waters). The subsurface information for this site indicates that the seasonal high ground water would +/- 3 feet below the bottom of the basin with some fluctuation as a result of tidal influence.

2. Possibility of moving the above basin to the island (left of station 10+00 –L-)
As discussed in the 10/17/02 4B meeting, an investigation as to what would be the effect

of moving the basin to the island was performed. As a result of the existing causeway being on a 0.0% grade a new causeway and bridge grade would be required to provide positive system drainage to this basin location. A minimum 0.3% causeway grade would be required to provide self-cleaning velocities in the pipe system. This increase in grade would create a wider causeway footprint resulting in additional wetland impacts. These impacts could be mitigated for on site by lengthening the proposed bridge and removing existing causeway fill. The proposed detour bridge would also require lengthening. The possibility of stage construction of the causeway fill was discussed, however the existing causeway width and amount of grade change required would make this impracticable.

The following is a summary of the wetland impacts, additional bridge lengths required for on site mitigation, and cost required if the bridge and causeway grade is raised.

3:1 Causeway Fill Slopes	**2:1 Causeway Fill Slopes**
Wetland Impacts 2.77 acres	Wetland Impacts 2.33 acres
Onsite Mitigation 2.85 acres	Onsite Mitigation 2.53 acres
6@ 113' additional bridge length	4@ 113' additional bridge length
678' X 32' @ $80/sf = $1.74 million	452' X 32' @ $80/sf= $1.16 million

Additional Temporary Detour Bridge 2000' X 28' @ $70/sf = $3.92 million

- Note: the above wetland impacts reflect 10' impacts outside the slope stakes.
- New numbers will be calculated with 5' impacts outside the slope stake, as discussed
- Cost do not include embankment fill costs
- Pumping of stormwater was discussed but was not considered a valid option due to long term maintenance cost and problems inherent with pumping.
- Utilizing a larger basin to increase storage volume was discussed, however, it was pointed out that this would require addition fill in coastal wetlands.

3. Proposed stormwater basin right of station 63+00 –L- A water quality basin to treat the bridge deck and new pavement runoff on the mainland end of the project was discussed. Geotechnical information received since the last October 17, 2002 meeting indicates that the seasonal highwater table is to high (10 -14 inches +/- below the ground elevation) for this site to be suitable.

   - Bradley Bennett suggested looking at the possibility of using several smaller basins instead of one large one as proposed.
   - Max stated that geotechnical information would need to be collected at other possible basin locations.

4. It was decided that after other possible stormwater basin locations were looked at that a separate meeting with Bradley Bennett , Linda Lewis, and the Hydraulics Unit would be held in order to discuss the stormwater management plan and the State Stormwater Permit Application.

4. Other items discussed.

- Building a bridge over the pond at Sea Trail property instead of filling the pond. This avoids the roadway intersection serving as the emergency spillway for the pond.

- The lack of a bike path on the bridge and the towns request for a bike path were discussed. John Frye stated that he thought that the FEIS addressed the lack of a bike path in the design.

- Chris Militscher stated that the current design alternatives being discussed deviated from what the public had been shown, and that the FEIS should be reevaluated if the alternates were to be pursued.

- NCDOT needs to conduct an informal consultation with Mr. Ron Sechler of the National Marine Fisheries Service to insure that the need to vibrate casings for drilled shafts was anticipated during the Section 7 consultation.

- An information package should be sent out for review two weeks prior to the next meeting (including impacts of alternate designs, cost estimates, etc.).

Minutes of the Interagency Hydraulic Design Review Old Business "4B" Meeting August 21, 2003

B-0682

State Project 8.2230101
Bridge #198 over Intracoastal Waterway on SR 1172 at Sunset Beach, Brunswick County

Team Members:
David Timpy, USACE (present)
John Hennessy, NCDENR (present)
Travis Wilson, NCWRC (present)
Gary Jordan, USFWS (not present)
Chris Militscher-EPA (present)
Cathy Brittingham, DCM (present)
Bill Arrington, DCM (present)
Heather Montague, NCDOT ONE (present)

Participants:
Max Price, NCDOT Hydraulics
Bill Elam , NCDOT Hydraulics
Elizabeth Lusk, NCDOT ONE
John Frye, NCDOT Structures
Lonnie Brooks, NCDOT Structures
Jennifer Seaboch, NCDOT Roadside Environmental
DeWayne Sykes, NCDOT Roadway Design
Steve Kendall, NCDOT Roadway Design
Mason Herndon NCDOT Division 3

A second Hydraulic Design 4B "Old Business" Meeting was held on Thursday, August 21, 2003 in the Location and Surveys conference room at the NCDOT Century Center Complex, Raleigh. The meeting began with Max handing out information sheets showing approximate wetland impacts, alternate bridge lengths and cost. An explanation of the information contained in these sheets was given later in the meeting. It was decided that the information calculated for the 10-foot impact area outside the toe of fill (top of pg. 1 and all of pg. 2) could be ignored.

Topics Discussed:

1. Proposed stormwater basin left of station 32+00 –L-.

   - Ground water control sheeting will be required to construct the basin instead of an earthen berm. The sheeting will be used to obtain the volume required for one and one half inches of runoff, in the limited space available. An example of a HDPE Vertical Barrier product was shown.
   - In the current proposed design, approximately 0.65 acres of detour fill right of –L- station 26+50 to station 33+00 was being left in place. This area was to be utilized to construct a level spreader outlet device to ensure non erosive velocities for the bypass outlet pipe from the basin. It was also being left in to provide maintenance access to the basin.

- Cathy Brittingham and Bill Arrington stated that DCM did not consider the basin, outlet device, or the maintenance device as being a water dependent structure. Therefore the detour fill in coastal wetlands would not be allowed to remain in place.
- Maintenance access down the fill slope to the basin was discussed. This would require the removal of a section of guardrail, and traffic control during maintenance operations.
- Bill Arrington suggested that the level spreader device could possibly be constructed within the foot print of the –L- fill (3:1 slope)
- The Hydraulics Unit agreed to investigate the possibility of constructing a velocity reduction device within the –L- foot print and will confer with Division on the possible issues (safety, accessibility, etc.) associated with maintenance access from the roadway. Additional consultation with Division of Coastal Management may be required.

2. Possibility of moving the above basin to the island (left of station 10+00 –L-)
A general consensus was reached that the options to raise the causeway grade and lengthen the proposed bridge (impacts shown on pg. 3 of 3 in handout) would not be considered further at this time.

3. Stormwater issues for remainder of project (mainland side)
A meeting with Bradley Bennett, Linda Lewis and Hydraulics was held on July 14, 2003 to discusses stormwater management issues and design. The outcome of this meeting was that the stormwater management measures and alternatives discussed were workable and permittable from a State Stormwater Permit perspective.

- The design was discussed in this meeting and Division of Coastal Management questioned why the outfall to Slough Canal would not be considered a direct discharge to SA waters.
- John Hennessy stated that he would discuss this with Bradley Bennett and reply back to DCM.

4. Other items discussed

- The information contained in the FEIS concerning the proposed design not including a bike path was discussed.
- Cathy Brittingham asked about the current let date. Roadway Design stated that it was currently July 2005.
- Dave Timpy asked had the use of a pontoon bridge been ruled out. John Frye replied that the current design was the chosen alternate.
- Dave Timpy and Mason Herndon requested a copy of the plans that were provided to DWQ in the July 14, 2003 meeting that show current stormwater management design and computations. This will be done ASAP.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

September 26, 2005

Final Minutes of the Interagency Permit Drawings Review
"4C" Meeting August 17, 2005

B-0682 (Bridge No. 198 over Intracoastal Waterway on SR 1172 at Sunset Beach
State Project 32575.1.2
Brunswick County

Team Members:
David Timpy, USACE (present)
Gary Jordan, USFWS (present)
Travis Wilson, NCWRC (not present)
Brian Wrenn, NCDWQ (present)
Chris Militscher, USEPA (present)
Donnie Brew, FHWA (present)
Bill Arrington, NCDCM (present)
Steve Sollod, NCDCM (present)
Ron Sechler, NMFS (conference call)
Colista Freeman, PDEA (present)
Deanna Riffey, NEU (present)
Joe Blair, Division 3 (present)
Steve Kendall, Roadway Design (present)
Lonnie Brooks, Structures (present)
Mark Staley, Roadside Environmental (present)

Participants: (See attached list)

General Comments:

NOTE *Comments in Italics were received after submittal of the draft meeting minutes*

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
HYDRAULICS UNIT
1590 MAIL SERVICE CENTER
RALEIGH NC 27699-1590

TELEPHONE: 919-250-4100
FAX: 919-250-4108
WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
CENTURY CENTER COMPLEX
BUILDING B
1020 BIRCH RIDGE DRIVE
RALEIGH NC

- Max Price explained that the wetland impacts had changed since they were last discussed in the previous 4B meetings. As a result of not knowing the source or verification of the previous wetland file, the wetlands limits were redelineated and verified in July 2005. The new wetland limits differed from the previous wetland limits, with the greatest difference being on the east side of the existing causeway.

- The permanent impacts changed from 0.932 acres to 1.335 acres.
- The temporary impacts from the proposed detour changed from 0.851 acres to 0.602 acres.
- The area of on-site mitigation created by removal of the existing causeway and boat ramp fill changed from 1.51 acres to 1.42 acres

The USFWS stated that the endangered species surveys are old and need to be updated.

- Erosion Control devices in wetland areas should be described in the permit documentation. Special Sediment Control Fence is proposed to be placed within the mechanized cleared areas that are already delineated on the permit drawings. The impact from the devices is not to be calculated nor tabulated since the impacts have already been accounted for by the mechanized clearing. A note will be placed on the summary sheet addressing the erosion control in mechanized clearing area.
- The agencies requested NCDOT attempt to find an alternate choice for the Special Sediment Control Fence (std. 1606.01) that is currently being used at the toe of fill in coastal wetlands. They are concerned that the contractor will be unable to remove all of the sediment control stone and that the remaining stone will prevent the reestablishment of wetland vegetation. The possible use of sections of perforated HDPE pipe, encased in a filter fabric sleeve, using stone for ballast was discussed as an option. It was also discussed that if this or some other alternative could be found and proven to work that the area of impact might be considered temporary on future projects.
  A request was made by the agencies for the rational for the proposed mechanized clearing limits in the tidal marsh. NCDOT responded that the clearing zone was required for erosion and sedimentation control devices. The rational for the proposed clearing zones and more details on the erosion and sedimentation control devices should be included in the permit application.

- Meeting participants discussed whether the elevation the existing causeway should be removed to the elevation of the wetland limits or to an elevation that better matches the surrounding marsh elevation. The agencies stated that the causeway should be removed to the elevation of the surrounding marsh. They also requested that an explanation be included in the permit application detailing how the elevation was determined.
- Bill Arrington and Dave Timpy stated that the USACE and DCM would verify and approve the final elevation.
- Joe Blair requested a comment be included in the contract concerning the excavation elevation for the contractor.
- The area of excavation in wetlands should be included in the permit.

- Chris Militscher requested that a special condition be included for the correct handling and disposal of any existing utilities using asbestos pipe.

- Dave Timpy requested that details describing the temporary detour placement and removal should be included in the permit.
  The temporary impacts of the detour will be included in the permit application.

- Dave Timpy requested that the Intracoastal Waterway centerline, as supplied by the Corps of Engineers, appear on the both the plans and permit drawings.

Plan Sheet 4: No Comments

Plan Sheet 5:
The bridge will begin at –L- Station 32+00. The permanent and or temporary impacts may change slightly when the bridge end bent design is finalized. Bill Arrington inquired as to why the stormwater basin could not be more centered on the upland area that it is to be constructed on. It was explained that the basin would be cleaned out from the westbound shoulder, and that the basin needed to be off-center to facilitate clean out.
A discussion was had as to how the runoff was directed to the basin and that other issues with the basin have been coordinated and would be permitted with Regional DWQ Stormwater personnel.
DCM asked about the depth of the proposed stormwater basin. It was explained that the basin was to be constructed at grade by using groundwater type sheeting. A cross section of the stormwater basin should be included in the permit drawings.

Plan Sheet 5A: (Shows only Temporary Detour Impacts)
Dave Timpy emphasized the importance of removing the entire detour fill. He suggested using filter fabric or some other means to separate the proposed detour fill from existing natural ground. He also emphasized that the natural ground may not "rebound" after the removal of the temporary detour and that the original natural ground elevation must be restored. It was also discussed that wetland material excavated during the existing causeway removal could be stockpiled and used to accomplish this.

Plan Sheet 5B: (Shows only Bridge Construction)
The proposed temporary work bridge should be in place for approximately one year.
The location of the temporary bridge bents required for construction of the navigational span should be shown on the final permit impact sheets. The elevations of the footers and caps should be set at an elevation that can be constructed from the work bridge and that will not require excavation of wetlands for the form work. The agencies strongly emphasized that *the approved work bridge be designed to provide adequate access for all construction related activities and that request for permit modifications for other construction access that results in additional wetland impacts may not be approved unless the need is fully justified. The permit drawings*

should include cross sections of the work bridge to insure that the structure can provide adequate construction access.

Plan Sheet 6: No Comments

Plan Sheet 6A: No Comments

Plan Sheet 6B: No Comments

Plan Sheet 7:
Max Price discussed the pond and dam at the golf course that will require relocation. NCDOT currently proposes to build a new dam and turn it over to the property owners. A question was raised asking how the water would be drawn down and what would the water quality impacts be? Max Price stated that a consultant was under contract to provide construction plans for the dam and that those issues were currently being worked out. Another question asked whether or not an additional 4C meeting would be required to discuss these issues. Dave Timpy stated that the pond was determined to be non-jurisdictional and that he did not intend to call it jurisdictional. Max Price stated that the Hydraulics Unit could coordinate with DCM, DWQ and any others with concerns about the pond dam construction but he did not want to hold another 4C meeting if possible.
The USACE expressed concerns over the water quality concerns raised by the EPA and DWQ and that they may need to reconsider their determination based on those concerns. An inspection of the pond site by the USACE and DWQ was conducted on 8-25-05. Based on that meeting, the determination that the pond is not jurisdictional was confirmed.

All responding agencies expressed concerns and the need for coordination on the appropriate measures that must be implemented to ensure that water discharged into Slough Canal and or the ICW is discharged such that suspended sediments are not increased in the receiving waters. Aquatic resources must be protected and water quality standards must not be contravened. DCM stated that they defer to DWQ and DMF as to the approval of the method of disposal of water drawn from the golf course pond. NCDOT will coordinate with these agencies as soon as more detailed construction methods are worked out. Details of the agreed upon method should be forwarded via email to the merger team members, and the method should be described, with documentation of resource agency approval, in the permit application.

HYDRAULIC DESIGN (4B) / PERMIT DRAWINGS (4C) REVIEW

Location: Location & Survey Conference Room, DOT Century Center

TIP NO: B-0682 **DATE:** Aug 17, 2005

COUNTY: BRUNSWICK **ROUTE:** NC 179 SR-1172

NAME	AGENCY/ UNIT	PHONE
MAX PRICE	NCDOT HYDRAULICS	250-4100
Brian Wrenn	DWQ	733-5715
Gary Jordan	USFWS	919-856-4520 x.32
CHRIS MILITSCHER	USEPA	919-856-4206
Donnie Brew	FHWA	919-715-2231
Steve Kendall	NCDOT Roadway	250-4016
LONNIE L. BROOKS	NCDOT - STRUCTURE DESIGN	256-4049
GREG PERFETTI	NCDOT - STRUCTURE DESIGN	250-4037
Deanna Riffey	DOT - NEU	715-1409
Mason Herndon	NCDOT - DIV 3	910-251-5724
Joe Bialek	NCDOT-DIV 3	910-251-5724
Colista Freeman	NCDOT - PDEA	733-3141
Bill Arrington	DCM	252-528-0019
Jeff Walston	Roadside Env.	733-2920

(CONTINUED) **TIP NO:** B-0682

NAME	AGENCY/ UNIT	PHONE NO
Mark Staley	Roadside Environmental	733-2920
Mike Robinson	Const Unit	5224337
Nilesh Surti	Geotechnical	250-4088
Allen Raynor	Structure Design	250-4037
Bill Elam	Hydro	250-4160
Dave Timmerman	USACE	251-4634 (90)
Steve Sollod	DCM	919-733-2293x230

Monitoring Protocol for Pond Draw-down to Slough Canal Associated with TIP Project No. B-0682

On May 8, 2006, representatives from NC Department of Transportation (DOT), NC Division of Water Quality (DWQ), NC Division of Coastal Management (DCM), NC Division of Marine Fisheries (DMF), and US National Marine Fisheries (NMF) met to discuss a proposed pond draw-down for the B-0682 project in Brunswick County. Due to the large amount of water being drained from the pond and the sensitivity of the waters receiving the drainage, it was determined that a monitoring protocol should be developed to ensure that the pond draw-down does not impact the water quality and biological resources of Slough Canal.

Pond Draw-down Procedures

DOT proposes to drain the pond by gradually draining the upper three feet of water (approximately 2.1 million gallons) directly to Slough Canal (SA; HQW). Efforts should be taken to reduce the volume discharged to Slough Canal by pumping to pond #6 or by additional irrigation on the golf course if possible. The top three feet of water are expected to have very little sediment and relatively high dissolved oxygen concentrations. However, care should be taken to minimize sediment transport to Slough Canal. Velocity control measures within piping used to discharge to Slough Canal should ensure non-erosive velocities. In addition, a small energy dissipator pad will be constructed at the outlet into Slough Canal to maintain the discharge throughout the entire process at non-erosive velocities. This energy dissipator will consist of a temporary rip-rap pad lined with filter fabric.

Once the upper three feet are drained, a cofferdam will be built laterally across the pond and the lower end of the pond will be drained (approximately 1.8 million gallons). This portion of the pond is expected to have high suspended sediment concentrations and low dissolved oxygen concentrations. DOT will route this portion of the pond through two stilling basins prior to discharging to Slough Canal to settle out sediment and raise dissolved oxygen concentrations.

DMF and NMF will require that the draw down not take place from March 1st to July 31st due to primary nursery area work moratoriums. This is an abbreviated moratorium that is applicable only to the pond draw-down. The normal moratoriums are applicable to the rest of the project. DOT has indicated that it plans to conduct the draw-down from August to February. The NC Division of Environmental Health (DEH), Shellfish Sanitation and Recreational Water Quality Section, prefers that the draining of the golf course pond not occur during the recreational swimming season between April 1st and October 31st. If the draining must occur during this period, DEH (Mr. J.D. Potts, 252-726-6827) is to be notified one week prior to discharge in order to provide an opportunity for DEH to visit the site and determine if posting a swimming advisory sign in the area is necessary.

Monitoring Protocol

Water Quality monitoring will be conducted every other day at two monitoring locations. The monitoring locations will need to be field located, but in general, one location will be at the furthest upstream location in Slough Canal where water is present during low tide and the other location will be in Slough Canal approximately 100 yards upstream of where Slough Canal enters the Atlantic Intracoastal Water Way. Monitoring will be conducted twice per sampling day, once at high tide and once at low tide. Parameters to be monitored include the following:

Dissolved Oxygen (DO) (mg/l)
Salinity
Temperature
Conductivity
Fecal Coliform*

*Fecal coliform shall be monitored once a week. Fecal coliform was added due to concerns from Division of Environmental Health. A public swimming area is located east of the existing bridge at Jink's Creek.

Prior to discharge of the pond water, a one-time monitoring of the pond sediment will be required for herbicide and pesticide concentrations. Based on scientific literature regarding herbicide and pesticide fate in ponds, concentrations of concern are not expected. However, if high concentrations are found in the pond sediments, additional monitoring and treatment may be necessary.

Results of all monitoring are to be promptly provided to DWQ and DEH. The monitoring results for DO, salinity, temperature, and conductivity shall be submitted within 24 hours of sampling. The fecal coliform results shall be submitted with 24 hours of receipt from a certified laboratory. The one-time herbicide/pesticide monitoring results shall be submitted one week prior to start of construction. If DO concentrations of <4 mg/l [based on water quality standards for swamp waters, lake coves, or backwaters in 15A NCAC 02B .0211(3)(b)] are measured or if a fish kill occurs as a result of the pond draw-down, work shall be stopped immediately. Additional retention time in the settling basins may be required to prevent further problems. Representatives from DWQ, DCM, DMF, and NMF should be contacted if these conditions occur.

Form DCM-MP-1

APPLICATION

(To be completed by all applicants)

1. APPLICANT

a. Landowner:

Name **N. C. Department of Transportation**

Address 1598 Mail Service Center

City Raleigh State **N.C.**

Zip 27699-1598 Day Phone 919-715-3141

Fax 919-715-5501

b. Authorized Agent:

Name _____

Address _____

City _____ State _____

Zip _____ Day Phone _____

Fax _____

c. Project name (if any) **(B-0682) Bridge #198**

NOTE: Permit will be issued in name of landowner(s), and/or project name.

2. LOCATION OF PROPOSED PROJECT

a. County **Brunswick**

b. City, town, community or landmark **Sunset Beach**

c. Street address or secondary road number **SR-1172**

d. Is proposed work within city limits or planning jurisdiction? X Yes _____ No

e. Name of body of water nearest project (e.g. river, creek, sound, bay) **Intracoastal Waterway**

3. DESCRIPTION AND PLANNED USE OF PROPOSED PROJECT

a. List all development activities you propose (e.g. building a home, motel, marina, bulkhead, pier, and excavation and/or filling activities.
Raise existing causeway +/- 1.5 feet
Construct new bridge over the Intracoastal Waterway and a temporary detour bridge
Add turn lanes to NC179 (Sunset Blvd)

b. Is the proposed activity maintenance of an existing project, new work, or both? **Both**

c. Will the project be for public, private or commercial use? **Public transportation**

d. Give a brief description of purpose, use, methods of construction and daily operations of proposed project. If more space is needed, please attach additional pages. **Replacement of existing bridge #198 to provide more efficient hurricane evacuation route. Standard roadway and bridge construction methods, temporary work bridge addition of turn lanes to NC179 (Sunset Blvd) Daily Operation- 6800 Avg Daily Traffic in 2025**

4. LAND AND WATER CHARACTERISTICS

a. Size of entire tract +/-**32 acres in R/W**

b. Size of individual lot(s) **N/A**

c. Approximate elevation of tract above MHW or NWL **Varies -2.0 ft to +22 ft**

d. Soil type(s) and texture(s) of tract: Leon, Bohicket, Kureb, Newhan, Pactolus, and Wando

e. Vegetation on tract: Coastal Fringe Evergreen Forest, Salt Shrub, and Salt Marsh

f. Man-made features now on tract: Existing bridge and roadway to Sunset Beach

g. What is the CAMA Land Use Plan land classification of the site? *(Consult the local land use plan.)*

____ Conservation	____ Transitional
__X__ Developed	__X__ Community
____ Rural	____ Other

h. How is the tract zoned by local government? Commercial & Residential

i. Is the proposed project consistent with the applicable zoning? __X__ Yes ____ No
(Attach zoning compliance certificate, if applicable)

j. Has a professional archaeological assessment been done for the tract? __X__ Yes ____ No
If yes, by whom? NCDOT staff

k. Is the project located in a National Registered Historic District or does it involve a National Register listed or eligible property?
____ Yes __X__ No

l. Are there wetlands on the site? __x__ Yes ___ No
Coastal (marsh) __x__ Other ____
If yes, has a delineation been conducted? Yes
(Attach documentation, if available)

m. Describe existing wastewater treatment facilities.
N/A

n. Describe location and type of discharges to waters of the state. (For example, surface runoff, sanitary wastewater, industrial/commercial effluent, "wash down" and residential discharges.)
See Stormwater management Plan

o. Describe existing drinking water supply source.
Town of Sunset Beach provides water to Barrier Island

5. ADDITIONAL INFORMATION

In addition to the completed application form, the following items must be submitted:

- **A copy of the deed** (with state application only) or other instrument under which the applicant claims title to the affected properties. If the applicant is not claiming to be the owner of said property, then forward a copy of the deed or other instrument under which the owner claims title, plus written permission from the owner to carry out the project.

- **An accurate, dated work plat** (including plan view and cross-sectional drawings) drawn to scale in black ink on an 8 1/2" by 11" white paper. (Refer to Coastal Resources Commission Rule 7J.0203 for a detailed description.)

  Please note that original drawings are preferred and only high quality copies will be accepted. Blue-line prints or other larger plats are acceptable only if an adequate number of quality copies are provided by applicant. (Contact the U.S. Army Corps of Engineers regarding that agency's use of larger drawings.) A site or location map is a part of plat requirements and it must be sufficiently detailed to guide agency personnel unfamiliar with the area to the site.

  Include highway or secondary road (SR) numbers, landmarks, and the like.

- **A Stormwater Certification**, if one is necessary.

- A list of the **names and complete addresses of the adjacent waterfront (riparian) landowners and signed return receipts as proof that such owners have received a copy of the application and plats**

by certified mail. Such landowners must be advised that they have 30 days in which to submit comments on the proposed project to the Division of Coastal Management. Upon signing this form, the applicant further certifies that such notice has been provided.

Name See addresses in permit drawings & green
Address cards.
Phone _____

Name _____
Address _____
Phone _____

Name _____
Address _____
Phone _____

- **A list of previous state or federal permits** issued for work on the project tract. Include permit numbers, permittee, and issuing dates.

_____

- **A check for $250** made payable to the Department of Environment, Health, and Natural Resources (DEHNR) to cover the costs of processing the application.

- **A signed AEC hazard notice** for projects in oceanfront and inlet areas.

- **A statement of compliance with the N.C. Environmental Policy Act (N.C.G.S. 113A - 1 to 10)** If the project involves the expenditure of public funds or use of public lands, attach a statement documenting compliance with the North Carolina Environmental Policy Act.

6. CERTIFICATION AND PERMISSION TO ENTER ON LAND

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

I certify that to the best of my knowledge, the proposed activity complies with the State of North Carolina's approved Coastal Management Program and will be conducted in a manner consistent with such program.

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

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

This is the 1 day of November, ~~19~~ 2006.

Print Name Philip S. Hamis III

Signature _____
Landowner or Authorized Agent

Please indicate attachments pertaining to your proposed project.

x DCM MP-2 Excavation and Fill Information
x DCM MP-3 Upland Development
___ DCM MP-4 Structures Information
x DCM MP-5 Bridges and Culverts
___ DCM MP-6 Marina Development

NOTE: Please sign and date each attachment in the space provided at the bottom of each form.

Form DCM-MP-2

EXCAVATION AND FILL

(Except bridges and culverts)

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

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

	Length	Width	Average Existing Depth	Final Project Depth
Access channel (MLW) or (NWL)				
Canal				
Boat basin				
Boat ramp				
Rock groin				
Rock breakwater				
Other (Excluding shoreline stabilization)	SEE ATTACHED SHEET			

1. EXCAVATION

a. Amount of material to be excavated from below MHW or NWL in cubic yards 2700 cy

b. Type of material to be excavated Existing Causeway fill & proposed roadway ditches and coastal marsh

c. Does the area to be excavated include coastal wetlands (marsh), submerged aquatic vegetation (SAVs) or other wetlands? x Yes ___ No

d. High ground excavation in cubic yards 15,500 cy

2. DISPOSAL OF EXCAVATED MATERIAL

a. Location of disposal area Upland site to be acquired by contractor

b. Dimensions of disposal area To be determined by contractor

c. Do you claim title to disposal area?
___ Yes x No
If no, attach a letter granting permission from the owner.

d. Will a disposal area be available for future maintenance? ___ Yes x No
If yes, where? ___

e. Does the disposal area include any coastal wetlands (marsh), SAVs or other wetlands?
____ Yes __x__ No

f. Does the disposal include any area in the water?
____ Yes __x__ No

3. SHORELINE STABILIZATION

a. Type of shoreline stabilization
____ Bulkhead ____ Riprap N/A

b. Length N/A

c. Average distance waterward of MHW or NWL
N/A

d. Maximum distance waterward of MHW or NWL
N/A

e. Shoreline erosion during preceding 12 months
N/A
(Source of information) _____

f. Type of bulkhead or riprap material N/A

g. Amount of fill in cubic yards to be placed below water level
(1) Riprap N/A
(2) Bulkhead backfill N/A

h. Type of fill material N/A

i. Source of fill material N/A

4. OTHER FILL ACTIVITIES

(Excluding Shoreline Stabilization)

a. Will fill material be brought to site?
__X__ Yes ____ No

If yes,
(1) Amount of material to be placed in the water
5000 cy below NWS
(2) Dimensions of fill area See Attached Sheets
(3) Purpose of fill Roadway Roadway approach fill & Pond Dam

b. Will fill material be placed in coastal wetlands (marsh), SAVs or other wetlands?
__x__ Yes ____ No
If yes,
(1) Dimensions of fill area See attached sheet
(2) Purpose of fill Roadway Approach Embankment

5. GENERAL

a. How will excavated or fill material be kept on site and erosion controlled? Standard erosion controll Methods: Basins, silt fence, silt ditches, special Silt fence with filter fabric for stone removal in Coastal wetland area

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

c. Will wetlands be crossed in transporting equipment to project site? ____ Yes __X__ No
If yes, explain steps that will be taken to lessen environmental impacts. _____

NCDOT
Applicant or Project Name

Signature

11/1/06
Date

Form: MP 2

Roadway Approach Fill (Sheet # 4 & 5)

Location of Fill:	-L- Sta 20+25 to 31+00 Lt.
Length of Fill	1075 ft
Width of Fill	10.1 ft (avg.)

Location of Fill:	-L- Sta 13+75 to 32+00 RT
Length of Fill	1825 ft
Width of Fill	16.4 ft (avg.)

Temporary Detour Approach Fill (including 5' clearing) **(Sheet # 5A & 6A)**

Location of Fill:	-DET- Sta 12+00 to 17+10
Length of Fill	510 ft
Width of Fill	27.8 ft (avg.)

Location of Fill:	DET- Sta 24+80 to 28+10
Length of Fill	330 ft
Width of Fill	35.1 ft (avg.)

Roadway Approach & Dam Fill in Pond (Sheet # 7)

Location of Fill:	'-L- Sta 62+00 to 63+50
Length of Fill:	130 ft
Width of Fill:	155 ft (avg)

Rip Rap Slope Protection (Sheet #7)

Location of Fill:	'-Y1- Sta 17+30 to 17+70
Length of Fill:	40 ft
Width of Fill:	5 ft (avg.)

Excavation/Restored Wetlands (including 5' clearing) **(Sheet # 5 & 6)**

Location of Excavation:	'-L- Sta 33+00 to 44+00 +/-
Length of Excavation:	1150 ft
Width of Excavation:	38 ft (avg.)

Form DCM-MP-3

UPLAND DEVELOPMENT

(Construction and/or land disturbing activities)

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

a. Type and number of buildings, facilities, units or structures proposed **bridge**

b. Number of lots or parcels **N/A**

c. Density (give the number of residential units and the units per acre) **N/A**

d. Size of area to be graded, filled or disturbed including roads, ditches, etc. **12.8 ac disturbed**

e. If the proposed project will disturb more than one acre of land, the Division of Land Resources must receive an erosion and sedimentation control plan at least 30 days before land disturbing activity begins. If applicable, has a sedimentation and erosion control plan been submitted to the Division of Land Resources? ____ Yes **X** No
If yes, date submitted ____

f. List the materials (such as marl, paver stone, asphalt, or concrete) to be used for paved surfaces.
Asphalt and concrete

g. Give the percentage of the tract within 75 feet of MHW or NWL, or within 575 feet in the case of an Outstanding Resource Water, to be covered by impervious and/or built-upon surfaces, such as pavement, buildings, rooftops, or to be used for vehicular driveways or parking. 9.5 %

h. Projects that require a CAMA Major Development Permit may also require a Stormwater Certification. Has a site development plan been submitted to the Division of Environmental Management for review?
X Yes ____ No
If yes, date submitted ____

i. Describe proposed method of sewage disposal.
N/A

j. Have the facilities described in Item i. above received state or local approval? **N/A**
(Attach appropriate documentation)

k. Describe location and type of proposed discharges to waters of the state (for example, surface runoff, sanitary wastewater, industrial/commercial effluent, "wash down" and residential discharges).
See Stormwater Management Plan

l. Describe proposed drinking water supply source (e.g. well, community, public system, etc.)
N/A

m. Will water be impounded? **X** Yes ____ No
If yes, how many acres? **1.6 ac (remaining surface area of pond after construction is complete)**

n. If the project is a oceanfront development, when was the lot(s) platted and recorded? **N/A**

NCDOT
Applicant or Project Name

Signature

11/1/06
Date

Form DCM-MP-5

BRIDGES AND CULVERTS

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

1. BRIDGES

a. Public __X__ Private _____

b. Type of bridge (construction material)
Concrete

c. Water body to be crossed by bridge
Intracoastal Waterway

d. Water depth at the proposed crossing at MLW or NWL **20 ft Channel Depth at MLW**

e. Will proposed bridge replace an existing bridge?
__X__ Yes _____ No
If yes,
(1) Length of existing bridge **508 ft**
(2) Width of existing bridge **14.8 ft**
(3) Navigation clearance underneath existing bridge **None**
(4) Will all, or a part of, the existing bridge be removed? (Explain) **Yes all will be removed**

f. Will proposed bridge replace an existing culvert(s)?
_____ Yes __X__ No
If yes,
(1) Length of existing culvert **N/A**
(2) Width of existing culvert **N/A**
(3) Height of the top of the existing culvert above the MHW or NWL **N/A**
(4) Will all, or a part of, the existing culvert be removed? (Explain) **N/A**

g. Length of proposed bridge **2563 ft**

h. Width of proposed bridge **34.7 - 38.7 ft**

i. Height of proposed bridge above wetlands
Varies 10 ft - 50 ft

j. Will the proposed bridge affect existing water flow?
_____ Yes __X__ No
If yes, explain _____

k. Navigation clearance underneath proposed bridge
65 ft above MHW

l. Will the proposed bridge affect navigation by reducing or increasing the existing navigable opening? __X__ Yes _____ No
If yes, explain **Boat and vehicular traffic will no longer have to wait for swing span operation**

m. Will the proposed bridge cross wetlands containing no navigable waters? __X__ Yes _____ No
If yes, explain **Bridge will cross wetlands created/ Restored by removal of existing causeway**

n. Have you contacted the U.S. Coast Guard concerning their approval?
__X__ Yes _____ No
If yes, please provide record of their action: Pending Approval

2. CULVERTS

a. Water body in which culvert is to be placed
N/A

b. Number of culverts proposed **N/A**

c. Type of culvert (construction material, style)
N/A

d. Will proposed culvert replace an existing bridge?
_____ Yes _____ No **N/A**
If yes,
(1) Length of existing bridge _____
(2) Width of existing bridge _____

(3) Navigation clearance underneath existing bridge N/A

(4) Will all, or a part of, the existing bridge be removed? (Explain) N/A

e. Will proposed culvert replace an existing culvert?
____ Yes ____ No N/A
If yes,
(1) Length of existing culvert N/A
(2) Width of existing culvert N/A
(3) Height of the top of the existing culvert above the MHW or NWL N/A
(4) Will all, or a part of, the existing culvert be removed? (Explain) N/A

f. Length of proposed culvert N/A

g. Width of proposed culvert N/A

h. Height of the top of the proposed culvert above the MHW or NWL N/A

i. Will the proposed culvert affect existing water flow?
____ Yes ____ No N/A
If yes, explain _____

j. Will the proposed culvert affect existing navigation potential? ____ Yes ____ No N/A
If yes, explain _____

3. EXCAVATION AND FILL

a. Will the placement of the proposed bridge or culvert require any excavation below the MHW or NWL?
X Yes ____ No
If yes, **Bridge Bent #14 Sta 49+73**
(1) Length of area to be excavated 30 ft
(2) Width of area to be excavated 45 ft
(3) Depth of area to be excavated 2 ft avg
(4) Amount of material to be excavated in cubic yards 100 cy

b. Will the placement of the proposed bridge or culvert require any excavation within:
X Coastal Wetlands ____ SAVs ____ Other Wetlands
If yes, **Bridge Bent #14 Sta 49+73**
(1) Length of area to be excavated 5'
(2) Width of area to be excavated 45 ft
(3) Amount of material to be excavated in cubic yards 25 cy

c. Will the placement of the proposed bridge or culvert require any highground excavation?
____ Yes X No
If yes,
(1) Length of area to be excavated ____
(2) Width of area to be excavated ____
(3) Amount of material to be excavated in cubic yards ____

d. If the placement of the bridge or culvert involves any excavation, please complete the following:
(1) Location of the spoil disposal area
To be acquired by contractor
(2) Dimensions of spoil disposal area
To be determined by contractor
(3) Do you claim title to the disposal area?
____ Yes X No
If no, attach a letter granting permission from the owner.
(4) Will the disposal area be available for future maintenance? ____ Yes X No
(5) Does the disposal area include any coastal wetlands (marsh), SAVs, or other wetlands?
____ Yes X No
If yes, give dimensions if different from (2) above. ____
(6) Does the disposal area include any area below the MHW or NWL? ____ Yes X No
If yes, give dimension if different from No. 2 above. ____

e. Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item d. above) to be placed below MHW or NWL? X Yes ____ No
If yes,
(1) Length of area to be filled: See Attached Sheets
(2) Width of area to be filled ____
(3) Purpose of fill ____

f. Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item d. above) to be placed within:
X Coastal Wetlands ____ SAVs ____ Other Wetlands If yes,
(1) Length of area to be filled See Attached Sheets
(2) Width of area to be filled ____
(3) Purpose of fill ____

g. Will the placement of the proposed bridge or culvert result in any fill (other than excavated material described in Item d. above) to be placed on highground? ___Yes __X__ No
If yes,
(1) Length of area to be filled _____
(2) Width of area to be filled _____
(3) Purpose of fill _____
_____

4. GENERAL

a. Will the proposed project involve any mitigation?
__X__ Yes _____ No
If yes, explain in detail: See permit application
_____

b. Will the proposed project require the relocation of any existing utility lines? __**X**__ Yes _____ No
If yes, explain in detail: See permit application
_____

c. Will the proposed project require the construction of any temporary detour structures?
__**X**__ Yes _____ No
If yes, explain in detail **A temporary detour bridge**
Temporary fill for tying to existing causeway

d. Will the proposed project require any work channels? _____ Yes __**X**__ No
If yes, complete Form DCM-MP-2

e. How will excavated or fill material be kept on site and erosion controlled? **Standard erosion control methods**
_____

f. What type of construction equipment will be used (for example, dragline, backhoe or hydraulic dredge)? **Standard Bridge Construction Equipment**
_____

g. Will wetlands be crossed in transporting equipment to project site? _____ Yes __**X**__ No
If yes, explain steps that will be taken to lessen environmental impacts. _____
_____
_____

h. Will the placement of the proposed bridge or culvert require any shoreline stabilization?
_____ Yes __X__ No
If yes, explain in detail _____
_____

NCDOT
Applicant or Project Name

Signature

11/1/06
Date

Form: MP 5

Bridge Bents # 11, 12, & 13 (Sheet # 6)

Location of surface water impact: '-L- Sta 44+43 to 48+23
Length of impact: 3 @ 30 ft
Width of impact: 3 @ 45 ft

Bridge Bent #14 (Sheet# 6)

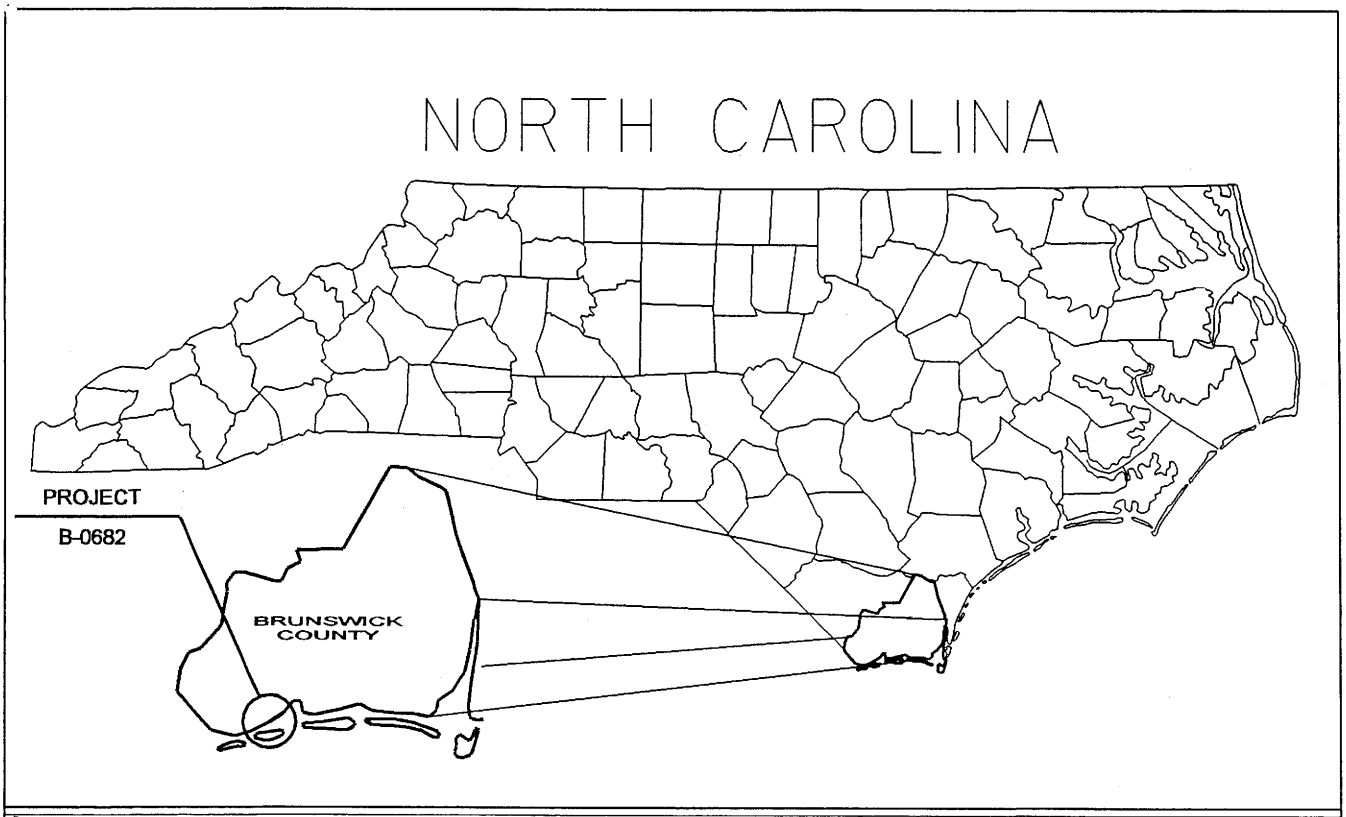
Location of Fill: -L- Sta 49+73
Length of Fill: 5 ft
Width of Fill: 45 ft

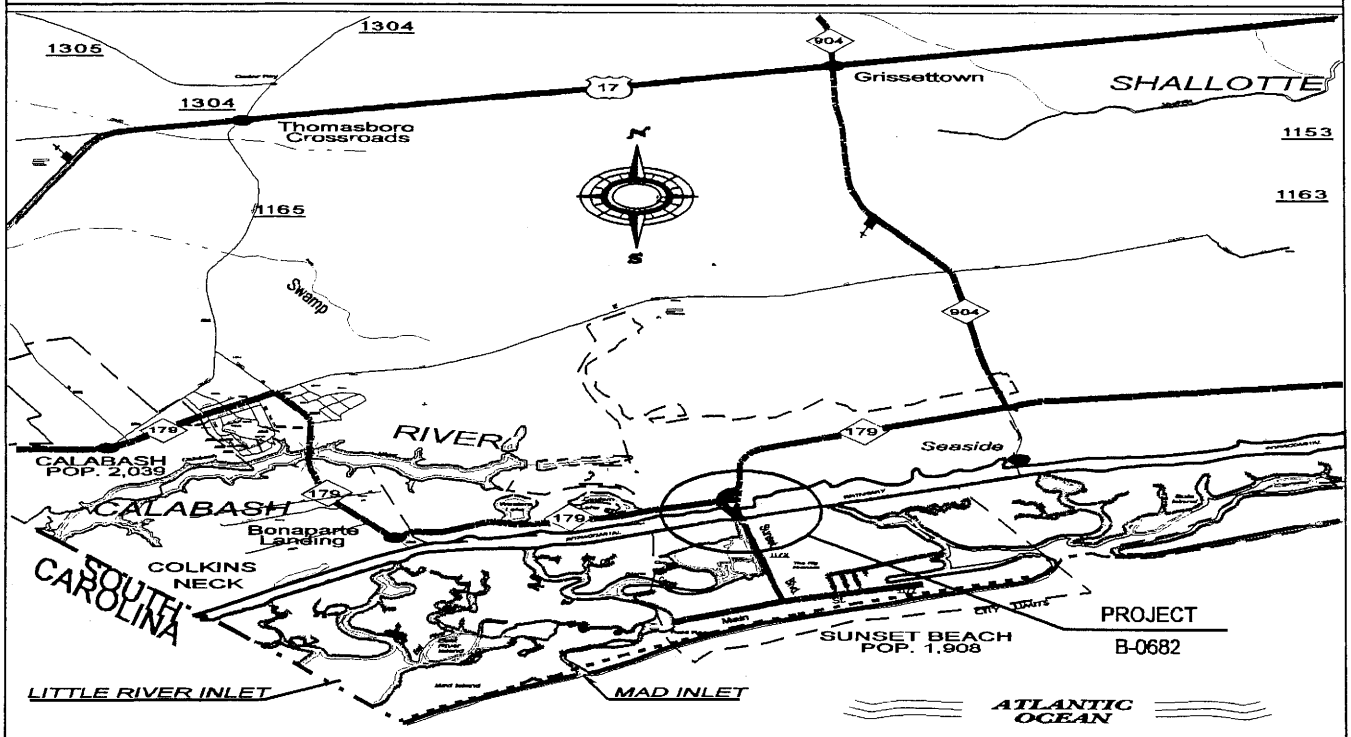
Temporary Work Bridge Bent Impacts (Sheets 5B & 6B)

Location of impacts: -L- Sta 32+70 to 50+00
Assuming: 103- 24 inch dia. piles in wetlands
90- 24 inch dia. piles in surface waters

Temporary Bridge Bents for Construction (Sheet 6)

Location of impacts: -L- 45+50 & 48+66
Assuming steel H piles





VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 32575.1.2 (B-0682)
BRIDGE #198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR1172 AT SUNSET BEACH

SHEET 1 OF 28 **6/06**

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
	Edward Gore	435 West Shoreline Dr. Sunset Beach, NC 28468
	Ronald Holden	3852 Holden Rd. SW Shallotte, NC 28459
	Sunset Beach Partners LLC c/o Mr. Jason Stegall	410 N. Boylan Ave., Suite 138 Raleigh, NC 27603
	Sunset Beach & Twin Lakes, Inc. c/o Mr. Edward Gore	435 West Shoreline Dr. Sunset Beach, NC 28468
	The Pouge Mahone Corp. c/o Mr. Mark O'Brien, President	P.O. Box 1733 Rd. Shallotte, NC 28459
	NC Dept. of Transportation	P. O. Box 25201 Raleigh, NC 27611
	Joe L. Peed	310 Sunset Blvd. Sunset Beach, NC 28468
	Sea Trail Inc. c/o Ms. Dana Copeland, President	279 Clubhouse Rd. Sunset Beach, NC 28468
	Carolina Dreams Golf, LLC c/o Mr. Eric Frankovitch	337 Penco Rd. Wierton, WV 26062
	Town of Sunset Beach	700 Sunset Blvd. N Sunset Beach, NC 28468

NCDOT

DIVISION OF HIGHWAYS

BRUNSWICK COUNTY

PROJECT: 32575.1.2 (B-0682)

BRIDGE #198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR1172 AT SUNSET BEACH

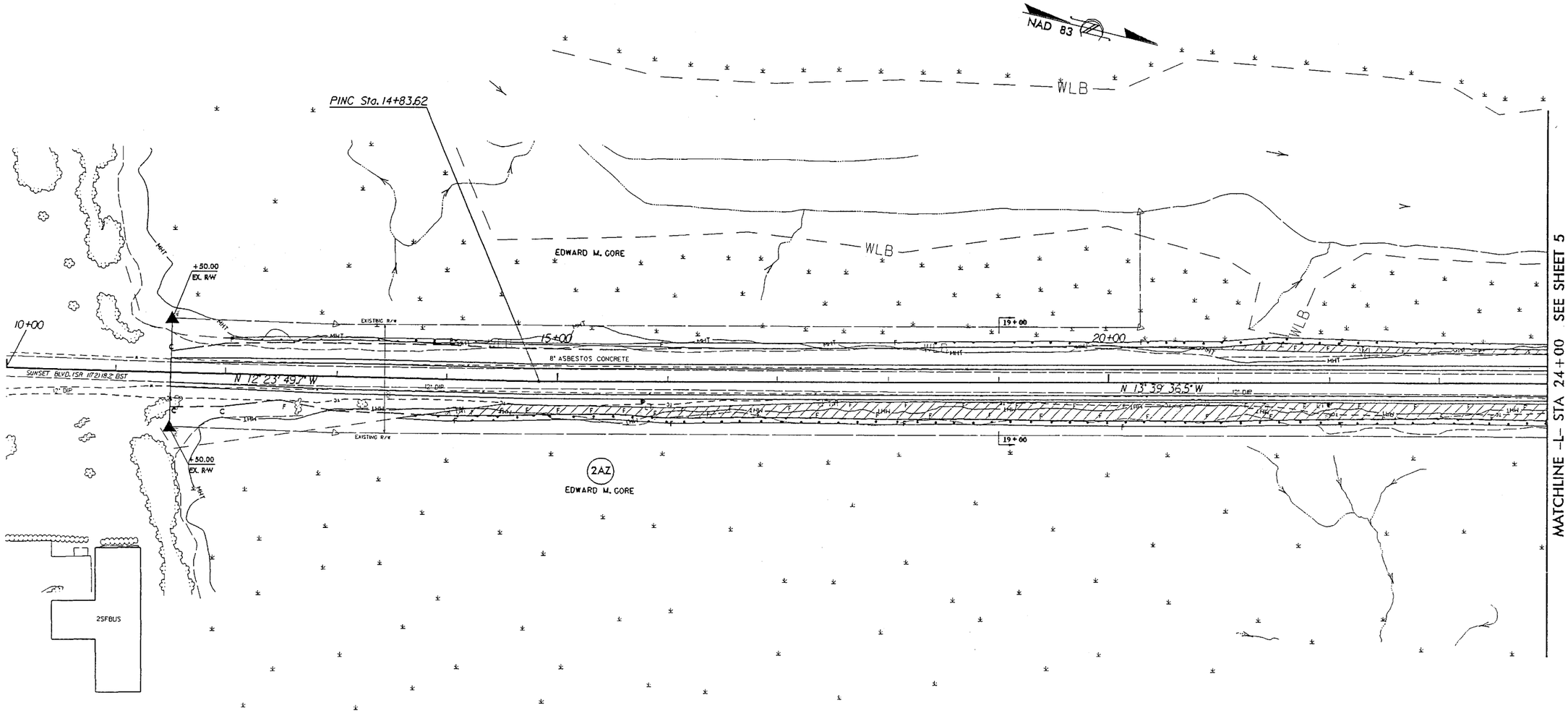
PROJECT REFERENCE NO.	SHEET NO.
B-0682	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/23/2006



DENOTES FILL FROM EROSION CONTROL DEVICES (5' FROM TOE)

DENOTES FILL IN WETLAND

100' 0' 100' 200' 300'

SCALE: 1" = 100'

28-AUG-2006 17:08
R:\Highways\b0682\PERMIT\b0682_rdy_psh-4.dgn
mlash AT HYDRES7

NCDOT
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 32575.1.2 (B-0682)
BRIDGE #198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR1172 AT SUNSET BEACH

SHEET 3 OF 28 6/06

PROJECT REFERENCE NO.	SHEET NO.
B-0682	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

NAD 83

PINC Sta. 14+83.62

WLB

EDWARD M. GORE

+50.00 EX. R/W

10+00

15+00

20+00

19+00

EXISTING R/W

8" ASBESTOS CONCRETE

SUNSET BLVD. (SR 1172) 78.2' BST

12" DIP

N 12° 23' 49.7" W

N 13° 39' 36.5" W

-50.00 EX. R/W

2AZ

EDWARD M. GORE

25FBUS

MATCHLINE -L- STA 24+00 SEE SHEET 5

DENOTES FILL FROM EROSION CONTROL DEVICES (5' FROM TOE)

DENOTES FILL IN WETLAND

100' 0' 100' 200' 300'

SCALE: 1"= 100'

NCDOT
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 32575.1.2 (B-0682)
BRIDGE #198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR1172 AT SUNSET BEACH
SHEET 4 OF 28 6/06

13-OCT-2006 10:40
R:\Hydraulics\B0682\PERMIT\b0682_rdy_psh4.dgn
mlelli

PROJECT REFERENCE NO.	SHEET NO.
B-0682	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/21/06

-L-
PI Sta 40+10.40
Δ = 14° 00' 31.7" (LT)
D = 2° 30' 00.0"
L = 560.35'
T = 281.58'
R = 2,291.83'
SE = 03

NAD 83

WLB

EXISTING TEMPORARY CONSTRUCTION EASEMENT

PCSta. 37+28.82

THE BIG NARROWS

PINC Sta. 26+54.85

BEGIN RETAINING WALL STA. -L- 30+00 SEE STRUCTURE DESIGN PLANS

STORMWATER BMP BASIN SEE DETAIL H SHEET 2-C

CONC FOUNDATION

SPLITTER BOX SEE DETAIL I SHEET 2-F

GRASSED SWALE SEE DETAIL J

16" PVC DECK DRAIN SYSTEM

CAT-1

TB DI

JB w/HH Cover SOIL TYPE-III

25+00

30+00

35+00

30+50

34+00

8" ASBESTOS CONCRETE

N 13° 39' 20.7" W

GRAD 850

GRAD 350

TYPE-III

EXISTING TEMPORARY CONSTRUCTION EASEMENT

EXISTING R/W

+40.00 -DET- EX. R/W

+57.00 -DET- 43'

+00.00 -DET- 45'

EDWARD M. GORE

2AZ

MATCHLINE -L- STA 24+00 SEE SHEET 4

MATCHLINE -L- STA 38+00 SEE SHEET 6

DENOTES EXCAVATION/RESTORED WETLANDS

DENOTES FILL IN WETLAND

DENOTES FILL FROM EROSION CONTROL DEVICES (5' FROM TOE)

DENOTES RESTORED WETLANDS

100' 0' 100' 200' 300'

SCALE= 1": 100'

28-AUG-2006 13:08
R:\Highway\Projects\B-0682\PERMIT\b0682_rdy_psh5.dgn
mlaw

NCDOT

DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 32575.1.2 (B-0682)
BRIDGE #198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR1172 AT SUNSET BEACH

SHEET 5 OF 28 6/06

PROJECT REFERENCE NO.	SHEET NO.
B-0682	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

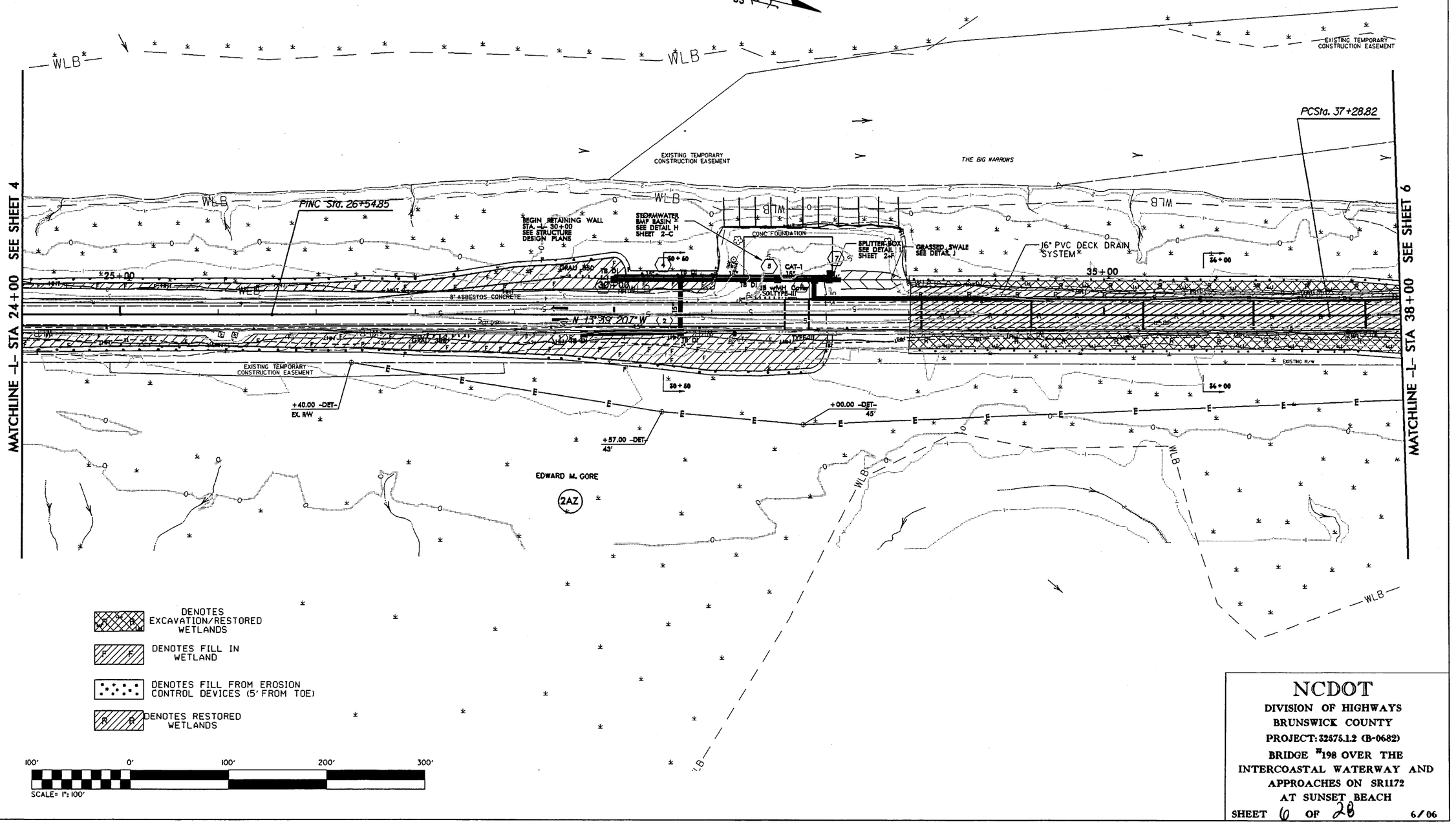
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

-L-
PI Sta 40+10.40
Δ = 14° 00' 31.7" (LT)
D = 2° 30' 00.0"
L = 560.35'
T = 281.58'
R = 2,291.83'
SE = 03

NAD 83



DENOTES EXCAVATION/RESTORED WETLANDS

DENOTES FILL IN WETLAND

DENOTES FILL FROM EROSION CONTROL DEVICES (5' FROM TOE)

DENOTES RESTORED WETLANDS

100' 0' 100' 200' 300'

SCALE: 1": 100'

NCDOT

DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 32575.1.2 (B-0682)
BRIDGE #198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR1172 AT SUNSET BEACH
SHEET 6 OF 28 6/06

13-OCT-2006 10:42
R:\Hydraulics\B0682\PERMIT\b0682_rdy_psh5.dgn
mkeith AT HY221537

PROJECT REFERENCE NO.	SHEET NO.
B-0682	5A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

NAD 83

MATCHLINE -L- STA 24+00 SEE SHEET 4

MATCHLINE -L- STA 38+00 SEE SHEET 6A

WLB

MHT

EXISTING TEMPORARY CONSTRUCTION EASEMENT

THE BIG NARROWS

CONC FOUNDATION

8" ASBESTOS CONCRETE

SOIL

EXISTING R/W

GRAU 350

GRAU 380

TYPE-M

PCSta. 10+00.00 BEGIN -DET-
-L- STA 25+00.00

+40.00 -DET-
EX. R/W

PRCSta. 14+01.19 -DET-

+57.00 -DET-
43'

+00.00 -DET-
45'

PTSta. 18+02.20 -DET-

N 13° 39' 20.7" W

PCSta. 21+05.76 -DET-

EDWARD M. CORE

2AZ

DENOTES FILL FROM EROSION CONTROL DEVICES (5' FROM TOE)

DENOTES TEMPORARY FILL IN WETLAND

100' 0' 100' 200' 300'

SCALE: 1"=100'

28-AUG-2006 15:08
R:\HighwayData\roadway\PERMIT\b0682_rdy_psh5a_dgn.dgn
mlew

NCDOT
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 32575.1.2 (B-0682)
BRIDGE #198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR1172 AT SUNSET BEACH

SHEET 7 OF 28 6/06

PROJECT REFERENCE NO.	SHEET NO.
B-0682	5A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

NAD 83

MATCHLINE -L- STA 24+00 SEE SHEET 4

MATCHLINE -L- STA 38+00 SEE SHEET 6A

EXISTING TEMPORARY CONSTRUCTION EASEMENT

THE BIG NARROWS

WLB

MHT

8" ASBESTOS CONCRETE

CONC FOUNDATION

SOIL

12" RCP

GRAU 350

TYPE-III

EXISTING R/W

PCSta. 10+00.00 BEGIN -DET-
-L- STA 25+00.00

+40.00 -DET-
EX. R/W

PRCSta. 14+01.19 -DET-

+57.00 -DET-

PTSta. 18+02.20 -DET-

+00.00 -DET-

PCSta. 21+05.76 -DET-

N 13° 39' 20" W

EDWARD M. GORE

2AZ

DENOTES FILL FROM EROSION CONTROL DEVICES (5' FROM TOE)

DENOTES TEMPORARY FILL IN WETLAND

100' 0' 100' 200' 300'

SCALE: 1" = 100'

NCDOT
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 32575.1.2 (B-0682)
BRIDGE #198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR1172 AT SUNSET BEACH

SHEET 8 OF 28 6/06

13-OCT-2006 10:43
R:\hydro\projects\B0682\PERMIT\b0682_rdy_psh5a_dgn_t.dgn
mkelly AT H1P21537

PROJECT REFERENCE NO.	SHEET NO.
B-0682	5B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/17/

-L-
PI Sta 40+10.40
Δ = 14° 00' 31.7" (LT)
D = 2° 30' 00.0"
L = 560.35'
T = 281.58'
R = 2,291.83'
SE = 03

NAD 83

MATCHLINE -L- STA 24+00 SEE SHEET 4

MATCHLINE -L- STA 38+00 SEE SHEET 6B

WLB

PINC Sta. 26+54.85

PCSta. 37+28.82

EXISTING TEMPORARY CONSTRUCTION EASEMENT

THE BIG NARROWS

CONC FOUNDATION

TEMPORARY WORK BRIDGE

25+00

30+00

35+00

GRAU 350

8" ASBESTOS CONCRETE

SOIL TYPE-III

N 13° 39' 20.7" W

12" DIP

TYPE III

EXISTING R/W

+40.00 -DET- EX. R/W

+57.00 -DET- 43'

+00.00 -DET- 45'

EDWARD M. GORE

2AZ

TEMPORARY WORK BRIDGE

100' 0' 100' 200' 300'

SCALE= 1": 100'

NCDOT
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 32575.1.2 (B-0682)
BRIDGE #198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR1172 AT SUNSET BEACH

SHEET 9 OF 28 6/06

28-AUG-2006 13:07
R:\Hydraulics\B0682\PERMIT\b0682_rdy_psht5b_work bridge.dgn
mlehr AT HYDRAULICS

PROJECT REFERENCE NO.	SHEET NO.
B-0682	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Sheet 10 of 28

REVISIONS

8/12/98

-L-
PI Sta 40+10.40
Δ = 14° 00' 31.7" (LT)
D = 2° 30' 00.0"
L = 560.35'
T = 281.58'
R = 2,291.83'
SE = 03

-DET-
PI Sta 23+05.19
Δ = 9° 56' 46.1" (LT)
D = 2° 30' 00.0"
L = 397.85'
T = 199.42'
R = 2,291.83'
SE = 02

PI Sta 27+04.83
Δ = 10° 02' 06.8" (RT)
D = 2° 30' 00.0"
L = 401.41'
T = 201.22'
R = 2,291.83'
SE = 02

NAD 83

MATCHLINE -L- STA 38+00 SEE SHEET 5

MATCHLINE -L- STA 52+00 SEE SHEET 7

EDWARD M. GORE 2AZ

SUNSET BEACH AND TWIN LAKES, INC

SUNSET BRIDGE PARTNERS, LLC. 11Z

N.C. DEPT. OF TRANSPORTATION

PT Sta. 42+89.17

16" PVC DECK DRAIN SYSTEM

45+00

50+00

N 27° 39' 52.5" W

TEMPORARY EX. R/W 50' BENT

TEMPORARY BENT

BRIDGE 198

THE BIG NARROWS

INTRACOASTAL WATERWAY EASEMENT

TEMPORARY EASEMENT

EXISTING R/W

EXISTING TEMPORARY CONSTRUCTION EASEMENT

CHANNEL

ISSAQUE SETBACK

RETAIN 10.5' OF EXISTING STRUCTURE

SUNSET BLVD. (SR 1172)

12' PLASTIC

6" ASPH. CURB & GUTTER

GRAVEL PARKING

SOIL & GRAVEL PARKING

RONALD C. HOLDEN

SUNSET 8

4" WOOD PIER

SCATTERED TREES

WOODS

+95.00 -DET- 42'

+65.00 -DET- EX. R/W

+80.63 50'

DENOTES FILL IN SURFACE WATER

DENOTES FILL FROM EROSION CONTROL DEVICES (5' FROM TOE)

DENOTES EXCAVATION/RESTORED WETLANDS

100' 0' 100' 200' 300'

SCALE= 1"= 100'

NCDOT
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 8.2576.1.3 (B-0682)
BRIDGE #198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR1172 AT SUNSET BEACH
SHEET 10 OF 28 6/06

24-OCT-2006 11:46
F:\hydr_auto\permit\b0682_rdy_psh6.dgn
mkelly at 172.21.2.37

PROJECT REFERENCE NO.	SHEET NO.
B-0682	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Sheet 11 of 28

-L-
PI Sta 40+10.40
Δ = 14° 00' 31.7" (LT)
D = 2° 30' 00.0"
L = 560.35'
T = 281.58'
R = 2,291.83'
SE = 03

-DET-
PI Sta 23+05.19
Δ = 9° 56' 46.1" (LT)
D = 2° 30' 00.0"
L = 397.85'
T = 199.42'
R = 2,291.83'
SE = 02

PI Sta 27+04.83
Δ = 10° 02' 06.8" (RT)
D = 2° 30' 00.0"
L = 401.41'
T = 201.22'
R = 2,291.83'
SE = 02

NAD 83

MATCHLINE -L- STA 38+00 SEE SHEET 5

MATCHLINE -L- STA 52+00 SEE SHEET 7

PT Sta. 42+89.17

16" PVC DECK DRAIN SYSTEM

45+00

50+00

N 27° 39' 52.5" W

EX. TEMPORARY 30' BENT

TEMPORARY BENT

BRIDGE 198

EDWARD M. GORE

SUNSET BEACH AND TWIN LAKES, INC.

SUNSET BRIDGE PARTNERS, LLC.

N.C. DEPT. OF TRANSPORTATION

RONALD C. HOLDEN

EXISTING TEMPORARY CONSTRUCTION EASEMENT

RETAIN 100' OF EXISTING STRUCTURE

TEMPORARY EASEMENT

INTRACOASTAL WATERWAY EASEMENT

THE BIG NARROWS

CHANNEL

EBB

FLOOD

WLB

WOODS

SCATTERED TREES

4' WOOD PIER

25FD

SOIL & GRAVEL PARKING

SUNSET BLVD (SR 1172)

6" ASPH CURB & GUTTER

12' PLANTING STRIP

5' CONC SIDEWALK

2SFBUS

DENOTES FILL IN SURFACE WATER

DENOTES FILL FROM EROSION CONTROL DEVICES (5' FROM TOE)

DENOTES EXCAVATION/RESTORED WETLANDS

100' 0' 100' 200' 300'

SCALE: 1" = 100'

REVISIONS

24-OCT-2006 11:02
F:\hydraulics\b0682\permit\b0682_rdy_psh6.dgn
mbellu
AT HYDRAULICS

NCDOT
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 2507113 (B-4682)
BRIDGE #198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR1172 AT SUNSET BEACH

SHEET 11 OF 28 6/06

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
B-0682	6A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

sheet 12 of 28

NAD 83

MATCHLINE -L- STA 38+00 SEE SHEET 5A

MATCHLINE -L- STA 52+00 SEE SHEET 7

TEMPORARY EASEMENT

WLB

EXISTING R/W

100'

THE BIG NARROWS

TIDE

EBB

SUNSET BEACH AND TWIN LAKES, INC

2Z

45+00

CHANNEL

45'

ISSUE SETBACK

EXISTING TEMPORARY CONSTRUCTION EASEMENT

4' WOOD PIER

2SFD

S 72° 37' 02" E 13.25'

N 16° 08' 25" W 11.46'

N 16° 08' 24"

WOODS

N 75° 17' 19" E 29.30'

S 72° 37' 02" E 51.15'

N 55° 51' 46" E 30.46'

N.C. DEPT. OF TRANSPORTATION

SCATTERED TREES

98.38'

102.37'

HHT

12" DIP

DET

B5

TYPE III

GRAU 350

PRCSta. 25+03.61 -DET-

+95.00 -DET-

42'

+65.00 -DET-

EX. R/W

25'

19' SST

12" PLASTIC

43+00

GRAVEL

8" ASBESTOS CONCRETE

SUNSET BLVD.(SR 1172) 18.2' DST.

EX. R/W -L-

50'

RIPRAP

LT

RT

END -DET-

PTSta. 29+05.82 -DET-

EDWARD M. CORE

2AZ

WLB

INTRACOASTAL WATERWAY EASEMENT

BRIDGE 198

RETAIN 105' OF EXISTING STRUCTURE

80'

11Z

51+80.63

50' -L-

SUNSET BRIDGE PARTNERS, LLC.

SCATTERED TREES

CMALOE 18" SCP

SUNSET B

SOIL & GRAVEL PARKING

6" ASPH. CURB

ASPHALT

GRAVEL PARKING

2SFBUS

RONALD C. HOLDEN

N 65° 18' 01" E 48.04'

N 3° 08' 59" W 3.00'

N 51° 51' 59" E 97.00'

S 43° 22' 00" E 87.70'

S 51° 51' 59" W 96.96'

WOODS

DENOTES TEMPORARY FILL IN WETLAND

DENOTES FILL FROM EROSION CONTROL DEVICES (5' FROM TOE)

100' 0' 100' 200' 300'

SCALE= 1": 100'

NCDOT
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 33571.1.2 (B-0682)
BRIDGE #198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR1172 AT SUNSET BEACH
SHEET 12 OF 28 6/06

24-OCT-2006 14:17
n:\hydraulics\b0682\permit\b0682_rdy_psh6a_def.dgn
mleah

PROJECT REFERENCE NO.	SHEET NO.
B-0682	6A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

sheet 13 of 28

REVISIONS

8/17/99

MATCHLINE -L- STA 38+00 SEE SHEET 5A

MATCHLINE -L- STA 52+00 SEE SHEET 7

NAD 83

EDWARD M. GORE

SUNSET BEACH AND TWIN LAKES, INC

THE BIG NARROWS

SUNSET BLVD. (SR 1172)

SUNSET BRIDGE PARTNERS, LLC.

N.C. DEPT. OF TRANSPORTATION

RONALD C. HOLDEN

BRIDGE 198

EXISTING TEMPORARY CONSTRUCTION EASEMENT

INTRACOASTAL WATERWAY EASEMENT

PRCSta. 25+03.61 -DET-

END -DET-

PTSta. 29+05.82 -DET-

EX. R/W

51+80.63

DENOTES TEMPORARY FILL IN WETLAND

DENOTES FILL FROM EROSION CONTROL DEVICES (5' FROM TOE)

100' 0' 100' 200' 300'

SCALE: 1"=100'

NCDOT
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 2557A.1.2 (B-0682)
BRIDGE #198 OVER THE INTRACOASTAL WATERWAT AND APPROACHES ON SR1172 AT SUNSET BEACH
SHEET 13 OF 28 6/06

23-OCT-2006 16:10
R:\Hydraulics\B0682\PERMIT\b0682_rdy_psh6a_dgt.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-0682	6B
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Sheet 14 of 28

-L-
PI Sta 40+10.40
Δ = 14° 00' 31.7" (LT)
D = 2° 30' 00.0"
L = 560.35'
T = 281.58'
R = 2,291.83'
SE = 03

-DET-	
PI Sta 23+05.19	PI Sta 27+04.83
Δ = 9° 56' 46.1" (LT)	Δ = 10° 02' 06.8" (RT)
D = 2° 30' 00.0"	D = 2° 30' 00.0"
L = 397.85'	L = 401.41'
T = 199.42'	T = 201.22'
R = 2,291.83'	R = 2,291.83'
SE = 02	SE = 02

NAD 83

MATCHLINE -L- STA 38+00 SEE SHEET 5B

MATCHLINE -L- STA 52+00 SEE SHEET 7

TEMPORARY EASEMENT

WLB

EXISTING R/W

THE BIG NARROWS

TIDE

EBB

PT Sta. 42+89.17

SUNSET BEACH AND TWIN LAKES, INC

TEMPORARY WORK BRIDGE

40+00

45+00

50+00

-L-

N 27° 39' 52.5" W

EX. R/W -L- 50'

8" ASBESTOS CONCRETE

SUNSET BLVD. (SR 1172) 18.2' BST

12" PLASTIC

½" PLASTIC

EDWARD M. GORE

2AZ

+95.00 -DET- 42'

+65.00 -DET- EX. R/W

WLB

INTRACOASTAL WATERWAY EASEMENT

BRIDGE 198

USACE SETBACK

80.00'

CHANNEL

EXISTING TEMPORARY CONSTRUCTION EASEMENT

4' WOOD PIER

2SFD

S 72° 37' 02" E 13.25'

N 16° 08' 25" W 71.46'

N 16° 08' 24

S 72° 37' 02" E 28.50'

N 55° 51' 46" E 30.48'

N.C. DEPT. OF TRANSPORTATION

SCATTERED TREES

11Z

51+80.63 50' -L-

SUNSET BRIDGE PARTNERS, LLC.

SUNSET B

REMAIN 105' OF EXISTING STRUCTURE

SOIL & GRAVEL PARKING

12" PLASTIC

SUNSET BLVD. (SR 1172)

6" ASPH CURB

ASPHALT

GRAVEL PARKING

2SFBUS

RONALD C. HOLDEN

N 65° (B. OF E.) 18.0'

N 15° 15' 59" E 3,600.59'

S 43° 22' 02" E 87.70'

WOODS

CANAL DIR. OF FLOW

TEMPORARY WORK BRIDGE

SCALE= 1": 100'

100' 0' 100' 200' 300'

NCDOT
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 33571.1.2 (B-0682)
BRIDGE #198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR1172 AT SUNSET BEACH
SHEET 14 OF 28 6/06

REVISIONS

23-OCT-2006 16:10
R:\Hydraulics\B0682\PERMIT\b0682_rdy_psh6b_work-brg.dgn
mesliw
11 H22157

PROJECT REFERENCE NO.	SHEET NO.
B-0682	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

POT Sta. 10+00.00

S 15° 55' 46" E 196.3'

-L-
PI Sta 62+17.02
Δ = 110° 47' 44.3" (RT)
D = 10° 00' 00.0"
L = 1,107.96'
T = 830.48'
R = 572.96'
SE = 06

NAD 83

SEA TRAIL CORP.

A. O. KING

PC Sta. 53+86.54

SPLITTER BOX SEE DETAIL F SHEET 2-C

"V" GRASSED SWALE SEE DETAIL G

18" RCP

8" ASBESTOS CONCRETE

55+00

MATCHLINE -L- STA 52+00 SEE SHEET 6

N 74° 08' 00" E

-Y-

RONALD C. HOLDEN

STORMWATER BMP BASIN SEE DETAIL E SHEET 2-C

GRAVEL PARKING

TOWN OF SUNSET BEACH

ASPHALT PARKING

2' BASE SPECIAL LATERAL GRASSED SWALE SEE DETAIL C SHEET 2-C

EXISTING TEMPORARY CONSTRUCTION EASEMENT

PROPOSED CART PATH

60+00

CLASS B RIP-RAP

GRAU 350

TB D1

TDE

PAVED CARTWAY

48" RISER

PT Sta. 64+94.49

PINC Sta. 65+23.61 -L-
STA. 20+11.44 -Y1-

20' WIDE EMERGENCY SPILLWAY @ ELEV. 12.0' SEE DETAIL "B" SHEET 2-C

CONTROL ACCESS

CL I RIPRAP 20 TONS FF=39 SY

CL II RIPRAP 8 TONS FF=21 SY

CL I RIPRAP 101 TONS FF=22 SY

RETAIN

REMOVE

6" ASPH CURB

6" ASPH CURB +/-34 TONS CLASS I RIP-RAP w/+/- 48sq. yds. FILTER FABRIC

12" PLASTIC

200' TAPER

2' BASE/SPECIAL CUT GRASSED SWALE SEE DETAIL A SHEET 2-C

THE POUCE MAHONE CORP

H&D PROPERTIES, LLC

EACH, INC.

THE SUNSET BEACH BEVERAGE CONTROL BOARD

SCATTERED TREES

26" OAK

14" OAK

WD BRIDGE

WD BENCH

SHALLOW POINT

CONC WATERWAYS

POT Sta. 17+41.01 -Y- = -Y1- STA 14+00

BEGIN CONST. -Y1- 13+50

EDWARD M. GORE

ALLEY

PI Sta 68+45.20
Δ = 16° 00' 00.0" (LT)
D = 4° 00' 00.0"
L = 400.00'
T = 201.31'
R = 1,432.39'
SE = 0.04

EDWARD M. GORE

EXISTING TEMPORARY CONSTRUCTION EASEMENT -L-

2 TONS CLASS B STONE

ELIMINATE DITCH STA 16+80 TO 19+50

JOE L. PEED

ELIMINATE DITCH STA. 65+50 TO 69+00 RT.

SEE DETAIL "B" SHEET 2-C

PC Sta. 66+43.89

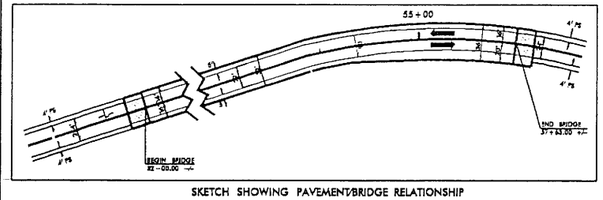
MATCHLINE -L- STA 67+00 SEE SHEET 8

MATCHLINE -Y1- STA 22+00 SEE SHEET 8

DENOTES FILL IN SURFACE WATER (POND)

100' 0' 100' 200' 300'

SCALE= 1": 100'



SKETCH SHOWING PAVEMENT/BRIDGE RELATIONSHIP

NCDOT
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 33175.1.2 (B-0682)
BRIDGE #198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR1172 AT SUNSET BEACH

SHEET 15 OF 28 6/06

28-AUG-2006 13:24
R:\Hydraulics\B-0682\PERMIT\B0682_dgn.pdf

PROJECT REFERENCE NO.	SHEET NO.
B-0682	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/22/2006

POT Sta. 10+00.00

-L-
PI Sta 62+17.02
Δ = 110°47' 44.3" (RT)
D = 10°00' 00.0"
L = 1,107.96'
T = 830.48'
R = 572.96'
SE = 06

NAD 83

MATCHLINE -L- STA 52+00 SEE SHEET 6

PCSta. 53+86.54

A. O. KING

SEA TRAIL CORP.

SPLITTER BOX SEE DETAIL F SHEET 2-C

'V' GRASSED SWALE SEE DETAIL G

8" ASBESTOS CONCRETE

18"

STORMWATER BMP BASIN SEE DETAIL E SHEET 2-C

RONALD C. HOLDEN

TOWN OF SUNSET BEACH

2' BASE SPECIAL LATERAL GRASSED SWALE SEE DETAIL C SHEET 2-C

CLASS B RIP-RAP

80'-00"

PROPOSED CART PATH

EXISTING TEMPORARY CONSTRUCTION EASEMENT -L-

EXISTING TEMPORARY CONSTRUCTION EASEMENT

PT Sta. 64+94.49

PINC Sta. 65+23.61 -L-
STA. 20+11.44 -Y1-

20' WIDE EMERGENCY SPILLWAY @ ELEV. 12.0' SEE DETAIL "B" SHEET 2-C

H&D PROPERTIES, LLC

THE POUGE MAHONE CORP

THE SUNSET BEACH BEVERAGE CONTROL BOARD

POT Sta. 17+41.01 -Y- = -Y1- STA 14+00

CONC WATERWAYS

RETAIN

REMOVE

CL I RIPRAP 20 TONS FF=39.3Y

CL I RIPRAP 8 TONS FF=22.5Y

CL I RIPRAP 8 TONS FF=21.5Y

N 83°07'51.8"E

6' ASPH CURB

12" PLASTIC

BEGIN CONST. -Y1-
13+50

EDWARD M. GORE

+/- 2 TONS CLASS B STONE

+/- 34 TONS CLASS I RIP-RAP
W/ +/- 48sq. yds. FILTER FABRIC

PI Sta 68+45.20
Δ = 16°00' 00.0" (LT)
D = 4°00' 00.0"
L = 400.00'
T = 201.31'
R = 1,432.39'
SE = 0.04

ELIMINATE DITCH STA. 16+80 TO 17+50

ELIMINATE DITCH STA. 65+50 TO 69+00 RT.

JOE L. PEED

PCSta. 66+43.89

SEE DETAIL "B" SHEET 2-C

MATCHLINE -Y1- STA 22+00 SEE SHEET 8

MATCHLINE -L- STA 67+00 SEE SHEET 8

DENOTES FILL IN SURFACE WATER (POND)

100' 0' 100' 200' 300'
SCALE= 1"= 100'

SKETCH SHOWING PAVEMENT/BRIDGE RELATIONSHIP

NCDOT
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 33576.1.2 (B-0682)
BRIDGE #198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR1172 AT SUNSET BEACH

SHEET 16 OF 29 6/06

13-OCT-2006 10:43
mk:\highway\projects\0682\PERMIT\b0682_r_dy_psh7.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-0682	7-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOTE: THIS SHEET TO BE USED FOR CONSTRUCTION OF PROPOSED DAM ONLY
(SEE SHEETS D-1 THRU D- FOR DAM PLANS)

REVISIONS

8/17/06

MATCHLINE -L- STA 57+00

-CARTWAY- POT Sta. 10+00.00

-CARTWAY- PINC Sta. 11+28.50

-CARTWAY- PC Sta. 12+77.77

-CARTWAY-
PI Sta 13+72.84
Δ = 57° 01' 44.2" (LT)
D = 32° 44' 25.6"
L = 174.18'
T = 95.07'
R = 175.00'

-CARTWAY- PT Sta. 14+51.95

THE POUGE MAHONE CORP.

SEA TRAIL CORP.

JOE L. PEED

CAROLINA DREAM GO

20' WIDE EMERGENCY SPILLWAY @ ELEV. 12.0'

CONTROL ACCESS

END ACCESS

EXISTING TEMPORARY CONSTRUCTION EASEMENT

EXISTING TEMPORARY CONSTRUCTION EASEMENT

EXISTING TEMPORARY CONSTRUCTION EASEMENT

PUTT PUTT GOLF COURSE WITH CONC WALKS & CONC GOLF HOLES & CONC WATERWAYS WITH MULTIPLE GROUND LIGHTS AROUND COURSE AREA

THE SUNSET BEACH ALCOHOLIC BEVERAGE CONTROL BOARD

CONC WATERWAYS

WD BRIDGE

WD BENCH

SHALLOW POND

ASPHALT PARKING

CONC

ASPHALT

ESTOS CONCRETE

ET BEACH

CLASS B RIP-RAP

FIBER CARPET

GRAU 350

6' ASPH CURB

SOIL

+/-34 TONS CLASS I RIP-RAP
+/- 48sq. yds. FILTER FABRIC

3' ASBESTOS CONCRETE

12" PLASTIC

NC 179 28 BST

P P DENOTES FILL IN SURFACE WATER (POND)

TS TS DENOTES TEMPORARY FILL IN SURFACE WATER

NCDOT
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 52575.1.2 (B-0682)
BRIDGE #198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR1172 AT SUNSET BEACH

SHEET 17 OF 28 6/06

28-AUG-2006 15:56
R:\Hydro\Projects\B0682\Permit\B0682_Aug.dgn
mkelly

PROJECT REFERENCE NO.	SHEET NO.
B-0682	7-A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NOTE: THIS SHEET TO BE USED FOR CONSTRUCTION OF PROPOSED DAM ONLY
(SEE SHEETS D-1 THRU D- FOR DAM PLANS)

REVISIONS

8/17/2006

-CARTWAY- POT Sta. 10+00.00

-CARTWAY- PINC Sta. 11+28.60

-CARTWAY- PC Sta. 12+77.77

-CARTWAY-
PI Sta 13+72.84
Δ = 57° 01' 44.2" (LT)
D = 32° 44' 25.6"
L = 174.18'
T = 95.07'
R = 175.00'

-CARTWAY- PT Sta. 14+51.95

MATCHLINE -L- STA 57+00

P P DENOTES FILL IN SURFACE WATER (POND)

TS TS DENOTES TEMPORARY FILL IN SURFACE WATER

NCDOT
DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT: 33576.1.2 (B-0682)
BRIDGE #198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR1172 AT SUNSET BEACH

SHEET 18 OF 26 6/06

13-OCT-2006 10:50
r:\hydraulics\b0682\permit\b0682_hyd_psh7a.dgn
mkelly AT H122137

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	1

0.0200 0.0200

CAUSEWAY REMOVAL FOR RESTORATION

WLEB

4.79

WLEB

DET
21+04.09
6.14

0.0200 0.02

36+00.00

RETAINING WALL

WLEB

0.0200 0.0200

WLEB

DET
15+53.60
6.03

3:1

3:1

0.0199 0.0199

5.03

30+50.00

WLEB

3:1

0.0200 0.0200

WLEB

3:1

5.06

19+00.00

—L—

8/23/

22-AUG-2006 12:42
R:\Hydraulics\B0682\PERMIT\b0682_hyd_xpl_pmtsections.dgn
mkelly
AT H221637

Sheet 19 of 22

8/23/

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	2

FILL IN SURFACE WATER (POND)

NORMAL POOL ELEV.= 0.0'

0.0600

0.0600

7.00

1.40

62+50.00

0.0300

0.0300

EXISTING CAUSEWAY REMOVAL

DET 27+16.92

TEMPORARY FILL IN WETLANDS

SM. MECHANIZED CLEARING

0.81

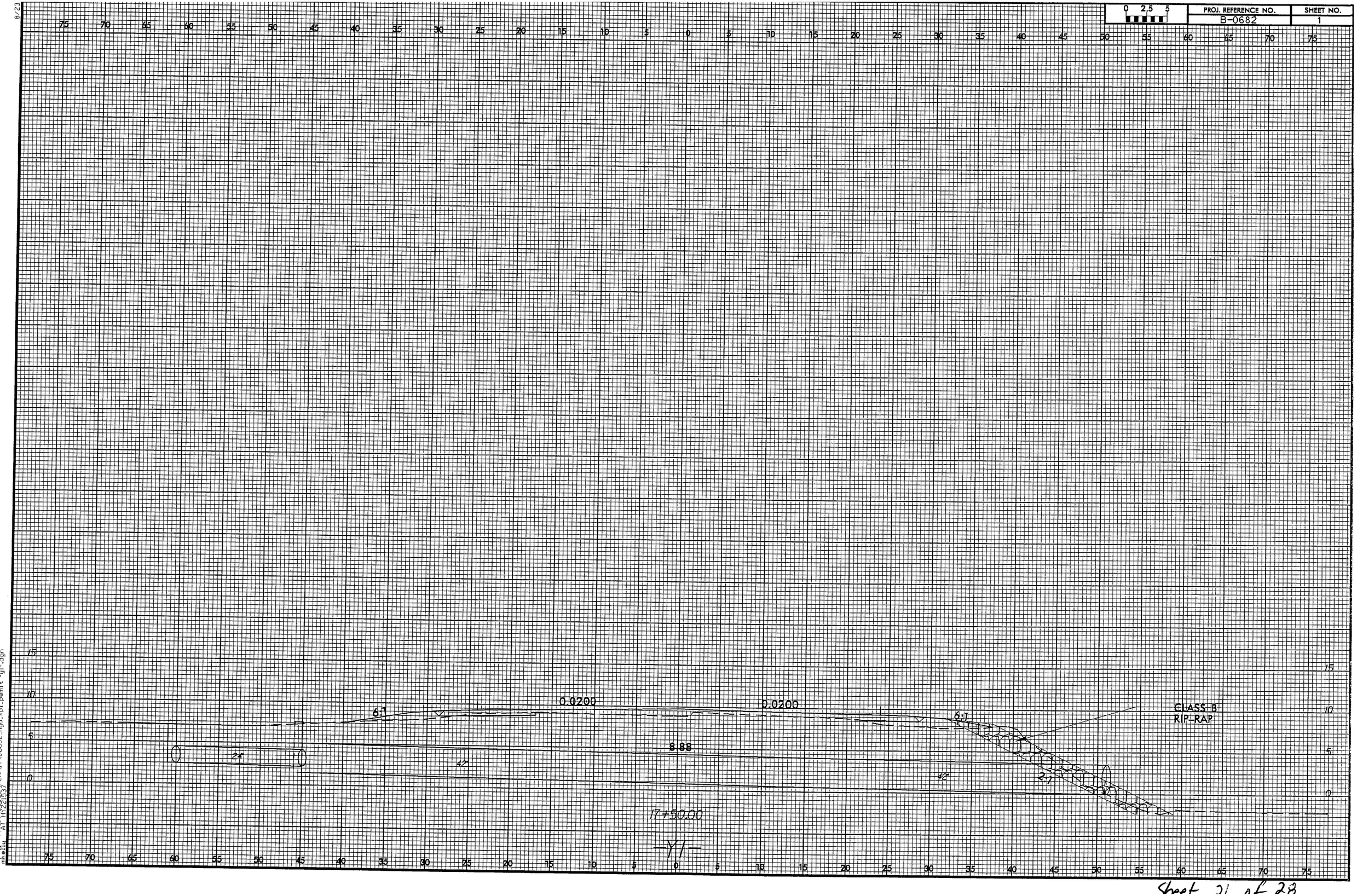
42+00.00

42+00.00

22-AUG-2006 14:49
r:\hydraulics\b0682\permit\b0682_hyd_xpl_permit_1.dgn
mkelly
MT M2253

8/23

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	1



22-AUG-2006 14:46
N:\Hydraulics\B0682\PERMIT\B0682_hyd_xpl_permit -yl-.dgn
mslu
Active (2153)

Sheet 21 of 23

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	1

EXISTING CAUSEWAY REMOVAL

36+00.00

DET. 4.7.04.09 5.1.4

0.0200 0.0200

5FT. MECHANIZED CLEARING

FILL IN WETLANDS

RETAINING WALL

0.0200 0.0200

FILL IN WETLANDS

5FT. MECHANIZED CLEARING

DET. 14.23.50 6.05

0.0199 0.0199

TEMPORARY FILL IN WETLANDS

5FT. MECHANIZED CLEARING

30+50.00

5FT. MECHANIZED CLEARING

0.0200 0.0200

5FT. MECHANIZED CLEARING

19+00.00

22-AUG-2006 14:48
r:\hydraulics\b0682\permit\b0682_hyd_xpl_permit.dgn
mkelly
ALT H/V 2:1

Sheet 22 of 28

PROJECT REFERENCE NO.	SHEET NO.
B-0682	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

5/28/

-L-

BEGIN GRADE -L- STA 11+50
EL = 6.50'

6.50

(±)0.00%

25
15
5
-5
-15
-25

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

-L-

BEGIN BRIDGE
STA. 32+00 +/-

PI = 29+80.00
EL = 6.50'
VC = 450'
K = 90.0

47.50

6.50

+0.0000% (±)5.0000%

BEGIN -L- STA. 33+00
CAUSEWAY REMOVAL FOR RESTORATION
SEE XSC'S FOR HORIZONTAL
AND VERTICAL LIMITS

65
55
45
35
25
15
5
-5
-15
-25

24 25 26 27 28 29 30 31 32 33 34 35 36 37 38

28-AUG-2006 13:16
R:\Hydraulics\B0682\PERMIT\b0682_hyd_pf1_psmt.dgn
mkelly
Hydraulics

Sheet 23 of 28

PROJECT REFERENCE NO.	SHEET NO.
B-0682	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

PI = 47+10.00
EL = 93.00'
VC = 1,420'
K = 142.0

+15.0000%

-15.0000%

11 @ 113'; 1 @ 150'; 1 @ 230'; 1 @ 150';
4 @ 95'; 2 @ 85'; 3 @ 80'
Prestressed Girder

47.50

66.80

FEMA 100 yr. Storm Surge w/Wave Set-up EL. = 14.2

MTL EL. = -0.4'

MHW EL. = 2.0'

MLW EL. = -2.7'

FEMA 100 yr. Storm Surge EL. = 11.7'

MHHW EL. = 2.3'

MLLW EL. = -2.8'

END -L- STA. 44+00
CAUSEWAY REMOVAL FOR RESTORATION
SEE XSC'S FOR HORIZONTAL
AND VERTICAL LIMITS

115 105 95 85 75 65 55 45 35 25 15 5 -5 -15 -25

38 39 40 41 42 43 44 45 46 47 48 49 50 51 52

28-AUG-2006 15:15
R:\Hydraulics\B0682\PERMIT\b0682_hyd.prf Layout: Layout1
mkeith AT HIGHWAY

PROJECT REFERENCE NO.	SHEET NO.
B-0682	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

5\28\2006 08:18

PI = 47+10.00
EL = 93.00'
VC = 1,420'
K = 142.0

-L-

END BRIDGE
STA. 32+00 +/-

PI = 63+97.50
EL = 8.63'
VC = 200'
K = 28.6

END GRADE -L- STA 64+99.36 =
EL 10.66'
-Y1- RT EOP STA 20+07.96
EL 10.66'

BEGIN SWALE LT
STA 59+50
EL = 20.00

PI = 60+50.000
EL = 7.50

PI = 61+50.000
EL = 11.50

BEGIN SWALE LT
STA 62+40.000
EL = 8.8

PI = 63+75.000
EL = 5.50

PI = 63+50.000
EL = 7.40

PI = 64+00.000
EL = 8.70

END SWALE LT
STA 64+50.000
EL = 6.0

END SWALE RT
STA 64+50.000
EL = 4.00

PI = 63+50.000
EL = 5.00

PI = 63+00.000
EL = 9.00

(+)2.0%

(-)6.0000%

(-)2.0000%

(+)4.2000%

(-)1.0000%

(-)2.8696%

(-)3.4355%

SWALE LEFT

SWALE RIGHT

-L-

BEGIN GRADE -L- STA 65+47.51 =
EL 10.70
-Y1- RT EOP STA 20+11.55
EL 10.70'

BEGIN SWALE LT
STA 65+75.00
EL = 7.90

END SWALE LT
STA 65+75.00
EL = 8.5

PI = 69+30.00
EL = 12.71'
VC = 270'
K = 114

BEGIN DITCH LT
STA 70+00.00
EL = 6.30

PI = 70+50.000
EL = 7.30

PI = 71+20.00
EL = 9.20'
VC = 80'
K = 77

END DITCH LT
STA 71+50.00
EL = 6.3

END GRADE -L- STA 71+60.56
EL = 8.87'

(+)10.5252%

(-)1.1200%

(+)10.5252%

(-)11.8484%

(-)1.2000%

(-)11.8484%

(-)1.0000%

(-)10.8111%

28-AUG-2006 13:16
R:\Hydraulics\B0682\PERMIT\B0682_hyd-pf1.prn
mellis
11"x17"

Sheet 25 of 28

PROJECT REFERENCE NO.	SHEET NO.
B-0682	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-Y1-

BEGIN GRADE -Y1- STA 16+21.00
EL = 11.007

PI = 17+41.00
EL = 9.10'
VC = 240'
K = 103.5

BEGIN SWALE 4LT
STA 18+50.00
EL = 30

END SWALE 4LT
STA 19+20.00
EL = 40

PI = 20+19.00
EL = 11.13'
VC = 160'
K = 255.6

BEGIN SWALE 5LT
STA 20+50.00
EL = 60'

PI = 20+70.000
EL = 2.00

END SWALE 5LT
STA 22+00.00
EL = 10.50

PI = 23+79.00
EL = 16.01'
VC = 120'
K = 5905

16.29

(-)1.5896%

(+)0.7302%

1.4286%

(-)0.5000%

9.0000%

2.9951%

5.4615%

(+)1.3561%

(+)1.3358%

BENCHMARK
NGS MON "SB NO. 4 1975"
COPPER-CLAD STEEL ROD ENCASED IN A PVC
PIPE SET IN CONCRETE
-BY1- STATION 5+74.36 55.23' RT
EL = 20.02'

BENCHMARK
NGS MON "SB NO. 1 1975"
COPPER-CLAD STEEL ROD ENCASED IN A PVC
PIPE SET IN CONCRETE
-BY2- STATION 20+78.42 62.05' RIGHT
EL 13.848'

BEGIN SWALE 6RT
STA 20+50.00
EL = 7.7

PI = 20+70.000
EL = 7.00

END SWALE 6RT
STA 22+00.00
EL = 10.8

BENCHMARK
NGS MON "SB NO. 5 1975"
COPPER-CLAD STEEL ROD ENCASED IN A PVC
PIPE SET IN CONCRETE
-BY2- STATION 16+42.66' RIGHT
EL 9.73'

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

35 25 15 5 -5 -15 -25

SWALE LEFT
SWALE RIGHT

-Y1-

PI = 25+69.00
EL = 18.55'
VC = 120'
K = 458.1

BEGIN SWALE 7LT
STA 26+50.00
EL = 17.7

PI = 27+45.00
EL = 21.36'
VC = 120'
K = 281.5

END SWALE 7LT
STA 26+50.00
EL = 17.7

END GRADE -Y1- STA 28+53.55
EL = 22.59

16.29

(+)1.3358%

(+)1.5977%

0.4000%

(+)1.1714%

22.59

BENCHMARK
-BY2- STATION 9+73.24 63.54'' LEFT
R/R SPIKE SET IN 12' OAK
EL 13.848'

24 25 26 27 28 29 30

35 25 15 5 -5 -15 -25

28-AUG-2006 17:46
R:\Highways\B0682\PERMIT\b0682_hyd-pf1.prmt.dgn
mellis at H2O-E37

Sheet 26 of 28

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-0682	13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-DET-

BEGIN BRIDGE
STA. 17+00 +/-

BEG. GRADE -DET-
STA. 12+71.04 EL = 5.97'

(+)0.0201%

6.20

15
5
-5
-15
-25

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

-DET-

END BRIDGE
STA. 25+00 +/-

END GRADE -DET- STA. 27+11.27
EL = 6.25'

(+)0.0201%

6.20

-CARTWAY-

BEGIN GRADE -CARTWAY- STA. 10+00.00
EL = 14.83

END GRADE -CARTWAY- STA. 14+31.25
EL = 12.51

14.83

EL = 12.00'
EL = 12.00'

PVI = 13+00.00
PVI = 13+40.00

(-)0.94% (-)0.94%

12.51

Proposed 20' Emergency Spillway @ Elev. 12.0'

15 5 -5 -15 -25

24 25 26 27 28 29 10 11 12 13 14

28-AUG-2006 13:16
R:\Hydraulics\B0682_PERMIT\b0682_hyd_pf1_plan1.dgn
mkelly on HYDRAULICS

Sheet 27 of 28

WETLAND PERMIT IMPACT SUMMARY

Sheet No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	WETLAND IMPACTS: Temp. Fill In Wetlands (ac)	WETLAND IMPACTS: Excavation in Wetlands (ac)	WETLAND IMPACTS: Mechanized Clearing in Wetlands (ac)	WETLAND IMPACTS: Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	SURFACE WATER IMPACTS: Temp. SW impacts (ac)	SURFACE WATER IMPACTS: Existing Channel Impacts Permanent (ft)	SURFACE WATER IMPACTS: Existing Channel Impacts Temp. (ft)	SURFACE WATER IMPACTS: Natural Stream Design (ft)
4 & 5	-L- Sta. 12+00 to Sta. 31+00 Lt.	Roadway Approach Fill	0.443									
4 & 5	-L- Sta. 13+50 to Sta. 32+00 Rt.	Roadway Approach Fill	0.916									
5A	-DET- Sta 12+00 to Sta. 17+10	Temp. Detour Approach Fill (includes 5' clearing)		0.321								
6A	-DET- Sta 24+80 to Sta. 28+10	Temp. Detour Approach Fill (includes 5' clearing)		0.266								
7	-L- Sta. 62+00 to Sta. 63+50 Lt.	Roadway Approach & Dam Fill (Pond)						0.461	0.417			
7	-Y1- Sta. 17+30 to Sta. 17+70 Rt.	Rip Rap Slope Protection	0.005					0.004				
5 & 6	-L- Sta. 33+00 to Sta.44+00+/- Rt.& Lt.	Excavation/Restored Wetlands (Includes 5' of Clearing)			1.001							
6	-L- Sta. 49+73	Bridge Bent # 14	0.003	0.002								
TOTALS:			1.367	0.589	1.001	0.000	0.000	0.465	0.417	0	0	0

STATION 12+00 -DET- TO 17+10 -DET. = 0.321ac. OF RESTORED WETLANDS (after detour removal)

STATION 24+80 -DET- TO 28+10 -DET. = 0.086ac. OF RESTORED WETLANDS (after detour removal)

STATION 33+00 -L- TO 44+00 -L- +/- LT.& RT. = 1.001ac. OF EXCAVATION/RESTORED WETLANDS

STATION 33+00 -L- TO 44+00 -L- +/- = 1.427ac. OF RESTORED WETLANDS (existing causeway removal)

Total Restored Wetlands= 2.839ac

-L- Sta. 44+43 to Sta. 48+23 Bridge Bents # 11, 12, & 13 0.080 ac Permanent surface water impacts
0.013 ac. Temporary surface water impacts

-L- Sta. 32+70 to Sta. 50+00 Temporary work bridge bent impacts 0.008 ac Temporary wetland impacts
0.007 ac. Temporary surface water impacts

-L- Sta. 45+50 to Sta. 48+66 Temporary bridge bent for construction impacts <0.001 ac Temporary surface water impacts

-L- Sta. 12+00 to 31+00 Lt. 0.194ac. Fill From Erosion Control Devices

-L- Sta. 12+00 to 32+00 Rt. 0.216ac. Fill From Erosion Control Devices

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY

WBS - 32575.1.2 (B-0682)

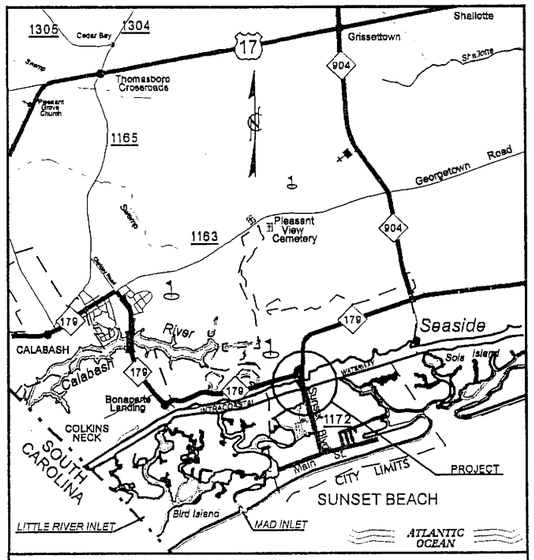
SHEET 28 of 28 8/22/2006

ATN Revised 3/31/05

TIP PROJECT: B-0682

CONTRACT: 32575.1.2

See Sheet 1-A For Index of Sheets



VICINITY MAP

BEGIN STATE PROJECT B-0682
-L- Sta. 11+50.00

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY

LOCATION: BRIDIGE No. 198 OVER THE INTERCOASTAL WATERWAY AND APPROACHES ON SR 1172 AT SUNSET BEACH

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-0682	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
32575.1.2	BRS-1813(1)	P.E.	
32575		R/W & UTILITIES	

Sheet 1 of 64

END STATE PROJECT B-0682
-L- Sta. 72+10.56

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD III

THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS

THIS PROJECT IS WITHIN THE LIMITS OF SUNSET BEACH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2005 = 4,300
ADT 2025 = 6,800
DHV = 12 %
D = 60 %
T = 3 % *
V = 40 MPH

* TTST 1% DUAL 2%

PROJECT LENGTH

LENGTH ROADWAY F.A. PROJECT BRS-1813(1) = 0.663 Mi.

LENGTH STRUCTURE F.A. PROJECT BRS-1813(1) = 0.485 Mi.

TOTAL LENGTH STATE PROJECT B-0682 = 1.148 Mi.

Prepared In the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 18, 2005

LETTING DATE: DECEMBER 19, 2006

J. S. GOODNIGHT
PROJECT ENGINEER

S. D. KENDALL
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

29-AUG-2006 13:27
R:\Roadway Proj\bpss_rdy_tsh.dgn
mkelly AT HIGHWAY

04-08-04

PROJECT REFERENCE NO.	SHEET NO.
B-0682	1-B

Sheet 2 of 64

Note: Not to Scale

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing High Quality Wetland Boundary — HQ WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB

BUILDINGS AND OTHER CULTURE:

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

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- River Basin Buffer — RBB
- Flow Arrow
- Disappearing Stream
- Spring
- Swamp Marsh
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Guage — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY:

- Baseline Control Point
- Existing Right of Way Marker
- Existing Right of Way Line
- Proposed Right of Way Line — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite Marker — RW
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Utility Easement — PUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Wheel Chair Ramp — WCR
- Curb Cut for Future Wheel Chair Ramp — CCFR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equaility Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole — HH
- H-Frame Pole
- Recorded U/G Power Line — P
- Designated U/G Power Line (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Booth
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- Recorded U/G Telephone Cable — T
- Designated U/G Telephone Cable (S.U.E.*) — T
- Recorded U/G Telephone Conduit — TC
- Designated U/G Telephone Conduit (S.U.E.*) — TC
- Recorded U/G Fiber Optics Cable — T FO
- Designated U/G Fiber Optics Cable (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- Recorded U/G Water Line — W
- Designated U/G Water Line (S.U.E.*) — W
- Above Ground Water Line — A/G Water

TV:

- TV Satellite Dish
- TV Pedestal — T
- TV Tower
- U/G TV Cable Hand Hole — HH
- Recorded U/G TV Cable — TV
- Designated U/G TV Cable (S.U.E.*) — TV
- Recorded U/G Fiber Optic Cable — TV FO
- Designated U/G Fiber Optic Cable (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter — G
- Recorded U/G Gas Line — G
- Designated U/G Gas Line (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- Recorded SS Forced Main Line — FSS
- Designated SS Forced Main Line (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — TS
- Utility Unknown U/G Line — ?UTL
- U/G Tank; Water, Gas, Oil — FSS
- A/G Tank; Water, Gas, Oil
- U/G Test Hole (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

6/2/99

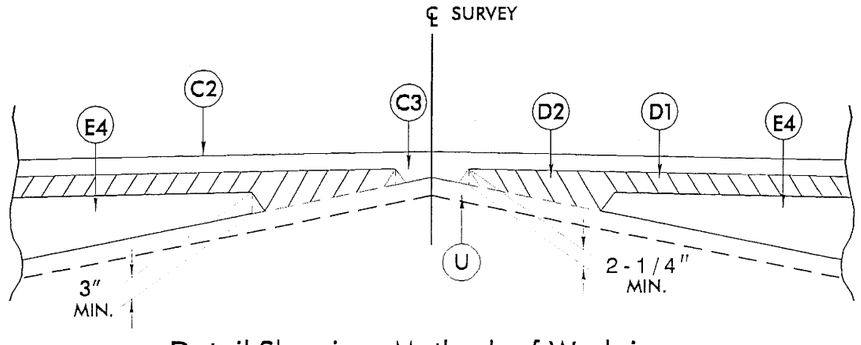
PROJECT REFERENCE NO.	SHEET NO.
B-0682	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Sheet 3 of 64

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1-1/4 " ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 140 LBS. PER SQ. YD.
C2	PROP. APPROX. 2-1/2 "ASPHALT CONCRETE SURFACE COURSE TYPE S9.5B, AT AN AVERAGE RATE OF 140 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C3	PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NO LESS THAN 1-1/4" OR GREATER THAN 1-1/2"IN DEPTH.
D1	PROP. APPROX. 2-1/2 " ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
D2	PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2-1/4 " IN DEPTH OR GREATER THAN 4" IN DEPTH.
E1	PROP. APPROX. 3" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD.
E2	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
E3	PROP. APPROX. 5 " ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.
E4	PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5-1/2 " IN DEPTH.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.
W	VARIABLE DEPTH ASPHALT PAVEMENT, (SEE DETAILS)



Detail Showing Method of Wedging

6/2/99

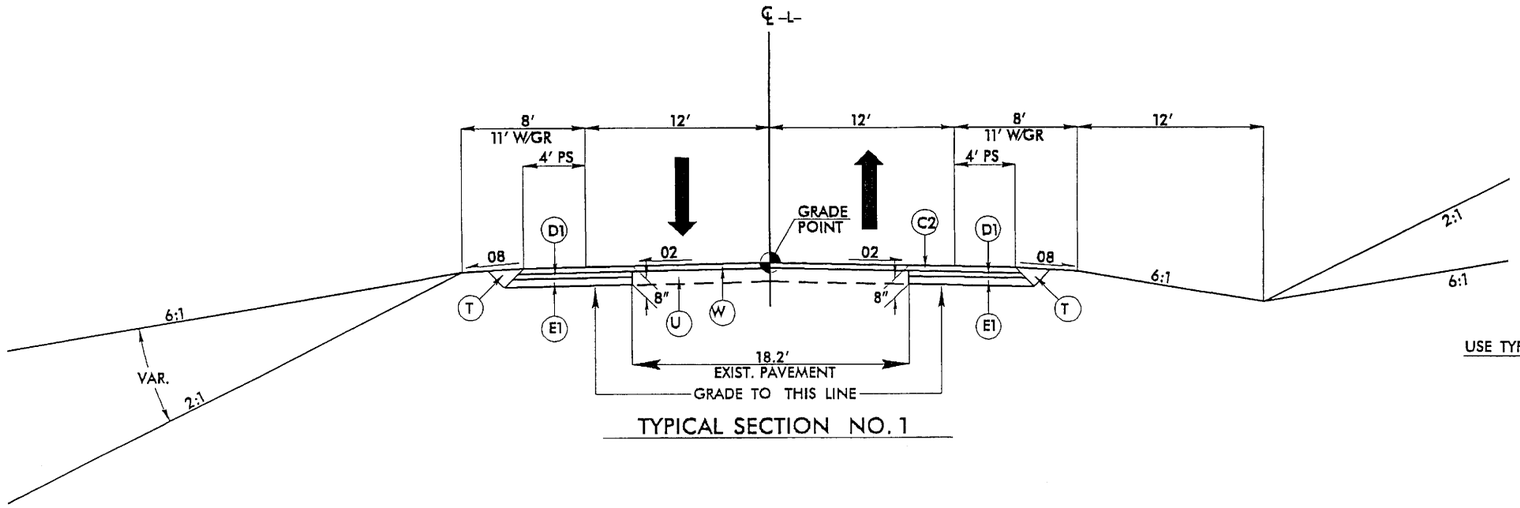
PROJECT REFERENCE NO.	SHEET NO.
B-0682	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Sheet 4 of 64

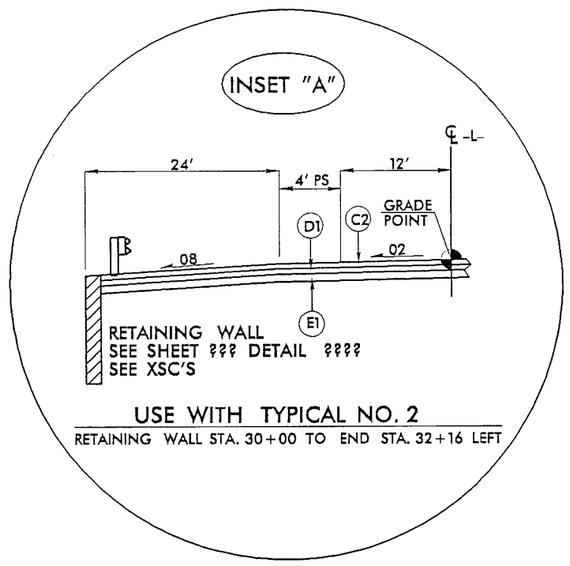
PAVEMENT SCHEDULE

C2	2½" S9.5B
D1	2½" I19.0B
E1	3" B25.0B
T	EARTH MATERIAL
U	EXISTING PAVEMENT
W	WEDGING

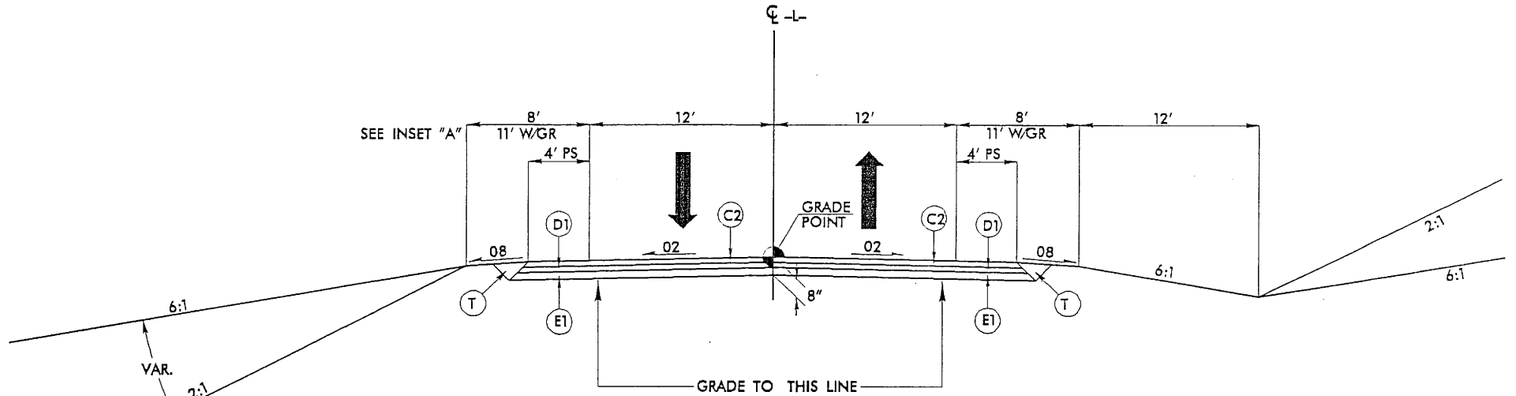


TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 AS FOLLOWS:
STA. 11+50 TO 28+50+/-

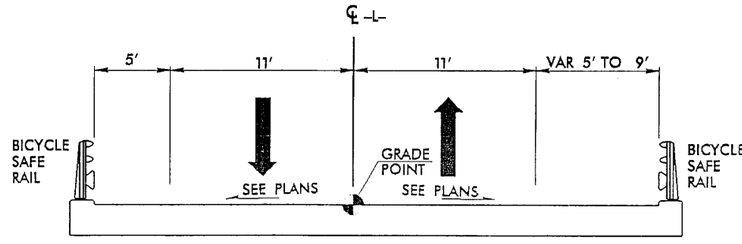


USE WITH TYPICAL NO. 2
RETAINING WALL STA. 30+00 TO END STA. 32+16 LEFT



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2 AS FOLLOWS:
STA. 28+50+/- TO BEGIN BRIDGE STA. 32+00+/-
END BRIDGE STA. 57+63+/- TO STA. 64+00+/-



TYPICAL SECTION NO. 3

USE TYPICAL SECTION NO. 3 AS FOLLOWS:
BEGIN BRIDGE STA. 32+00+/- TO END BRIDGE STA 57+63+/-

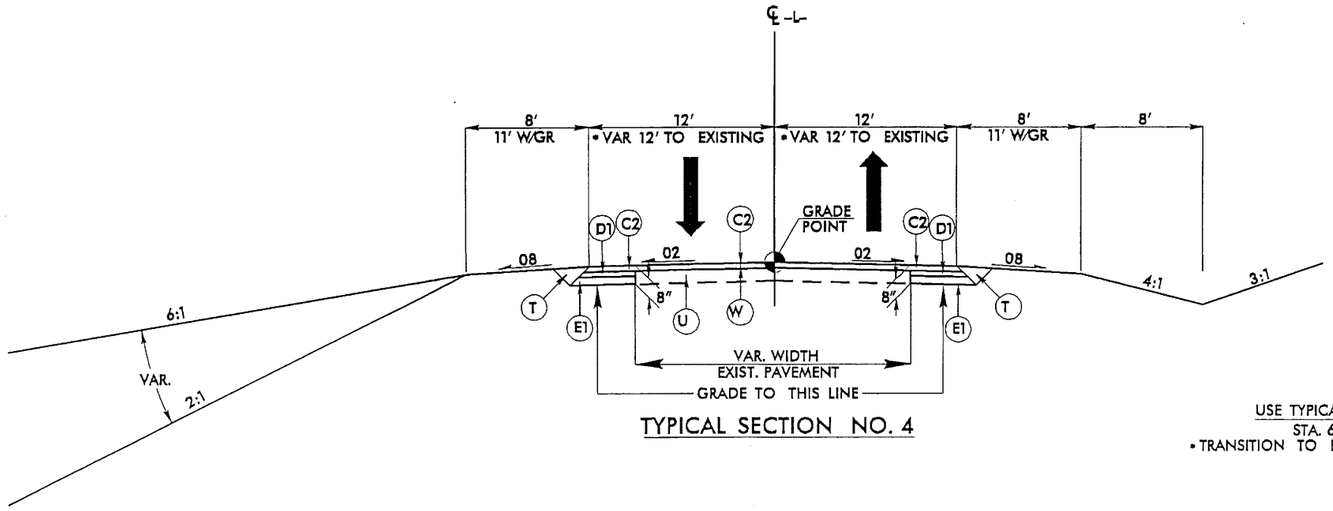
28-AUG-2006 13:32
J:\roadway\proj\b0682_rdy_typ.dgn
mreilly

6/2/99

PROJECT REFERENCE NO.	SHEET NO.
B-0682	2-B
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

Sheet 5 OF 64

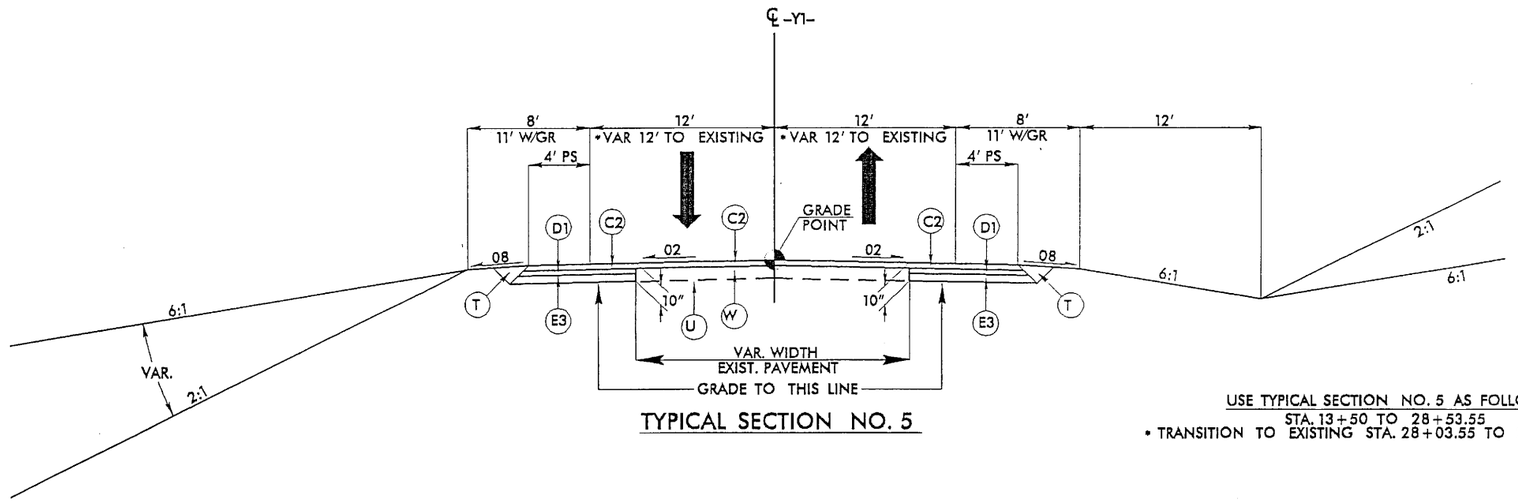


TYPICAL SECTION NO. 4

USE TYPICAL SECTION NO. 4 AS FOLLOWS:
STA. 64+00 +/- TO 71+60.56
• TRANSITION TO EXISTING STA. 71+60.56 TO 72+10.56

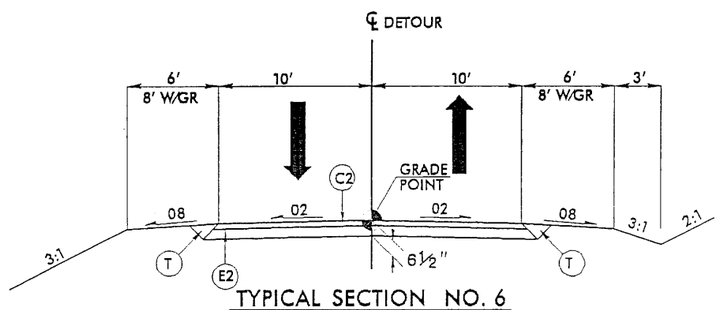
PAVEMENT SCHEDULE

C2	2½" S9.5B
D1	2½" I19.0B
E1	3" B25.0B
E2	4" B25.0B
E3	5" B25.0B
U	EXISTING PAVEMENT
W	WEDGING



TYPICAL SECTION NO. 5

USE TYPICAL SECTION NO. 5 AS FOLLOWS:
STA. 13+50 TO 28+53.55
• TRANSITION TO EXISTING STA. 28+03.55 TO 28+53.55



TYPICAL SECTION NO. 6

USE TYPICAL SECTION NO. 6 AS FOLLOWS:
TEMPORARY DETOUR

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-0682	2-C

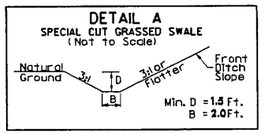
Sheet 60 of 64

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

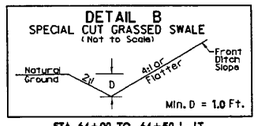
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DETAIL A
SPECIAL CUT GRASSED SWALE
(Not To Scale)



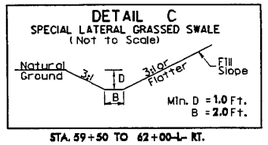
STA. 62+50 TO 64+50-L- RT.
STA. 18+50 TO 19+20-Y1- LT.

DETAIL B
SPECIAL CUT GRASSED SWALE
(Not To Scale)



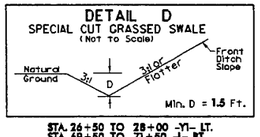
STA. 64+00 TO 64+50-L- LT.
STA. 20+50 TO 22+00-Y1- LT.
STA. 20+50 TO 22+00-Y1- RT.
STA. 65+75 TO 67+00-L- LT.

DETAIL C
SPECIAL LATERAL GRASSED SWALE
(Not To Scale)



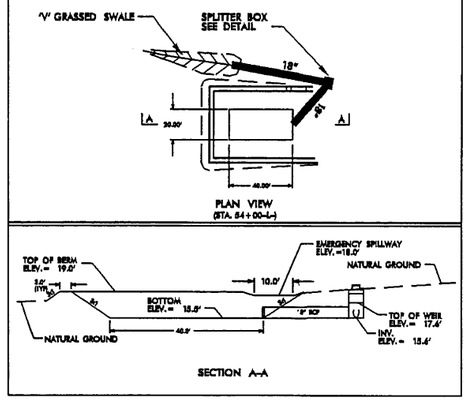
STA. 59+50 TO 62+00-L- RT.

DETAIL D
SPECIAL CUT GRASSED SWALE
(Not To Scale)

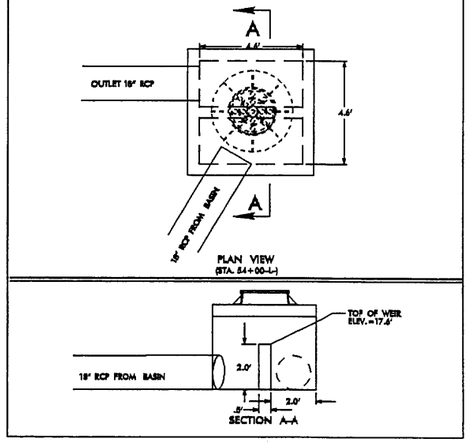


STA. 26+50 TO 28+00 -Y1- LT.
STA. 69+50 TO 71+50 -L- RT.
STA. 70+00 TO 71+50-L- LT.

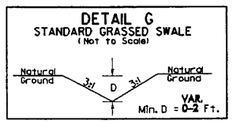
STORMWATER BMP BASIN DETAIL E



SPLITTER BOX DETAIL F

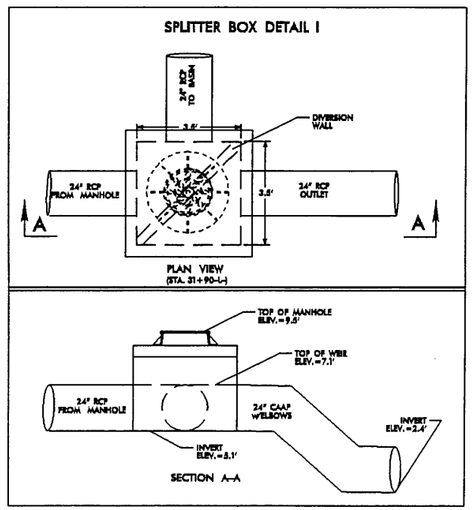


DETAIL G
STANDARD GRASSED SWALE
(Not To Scale)



STA. 54+00 -L- LT.
DDE = ######

SPLITTER BOX DETAIL I



8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-0682	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Sheet 7 of 69

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

-L- STATION 11+50
BEGIN STATE PROJECT B-0682
BEGIN CONSTRUCTION

PINC Sta. 14+83.62

-BL-12 PINC 12+57.27=
-L- STA 12+72.18 (11.61' LT)

-BL- 13 PINC 15+57.58=
-L- STA 15+72.80 (13.99' LT)

-BL- 14 PINC 18+57.57=
-L- STA 18+72.78 (13.97' LT)

-BL- 15 PINC 21+58.30=
-L- STA 21+73.52 (13.02' LT)

EDWARD M. GORE
DB 264 PG 24

+50.00
EX. R/W

150' UNIFORM TAPER

EXISTING R/W

10+00
N 11° 38' 04.8" W

15+00
N 13° 13' 35.7" W

8" ASBESTOS CONCRETE

20+00
N 13° 39' 19.0" W

N 13° 28' 50.4" W

N 13° 26' 10.8" W

SUNSET BLVD. (SR 1172) 18.2 BSL

N 12° 23' 49.7" W

N 13° 39' 36.5" W

12" DIP

12' P5

4' P5

12'

12'

EXISTING R/W

+50.00
EX. R/W

2AZ
EDWARD M. GORE
DB 264 PG 24

2SFBUS

MATCHLINE -L- STA 24+00 SEE SHEET 5

SEE SHEET 9 FOR -L- PROFILE

24-AUG-2006 12:05
R:\Roadway\Proj\b0682_rdy_psh4.dgn
$$$$USERNAME$$$$

8/17/18

PROJECT REFERENCE NO.	SHEET NO.
B-0682	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

sheet 8 of 64

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-
PI Sta 40+10.40
Δ = 14° 00' 31.7" (LT)
D = 2° 30' 00.0"
L = 560.35'
T = 281.58'
R = 2,291.83'
SE = 03

NAD 83

MATCHLINE -L- STA 24+00 SEE SHEET 4

MATCHLINE -L- STA 38+00 SEE SHEET 6

EXISTING TEMPORARY CONSTRUCTION EASEMENT

-BL- 17 PINC 27+58.54=
-L- STA 27+74.01 (13.57' LT)

PINC Sta. 26+54.85

-BL- 16 PINC 24+57.86=
-L- STA 24+73.07 (12.03' LT)

-BL- 18 PINC 30+58.36=
-L- STA 30+73.52 (15.09' LT)

-BL- 19 PINC 33+57.31=
-L- STA 33+72.51 (15.02' LT)

THE BIG NARROWS

-BL- 20 PINC 36+57.34=
-L- STA 36+72.52 (14.59' LT)

PCSta. 37+28.82

BEGIN RETAINING WALL STA. -L- 30+00 SEE STRUCTURE DESIGN PLANS

STORMWATER SWM BASIN # SEE DETAIL H SHEET 2-C

CONC FOUNDATION

END RETAINING WALL STA. -L- 32+23

SPLITTER BOX SEE DETAIL SHEET 2-F

GRASSED SWALE SEE DETAIL J

16" PVC DECK DRAIN SYSTEM

25+00

30+00

35+00

N 13° 50' 35.9" W

N 83° 47' 07.6" W

N 13° 39' 20.7" W

N 13° 27' 51.8" W

N 83° 54' 50.2" W

8" ASBESTOS CONCRETE

12" DIP

GRAU 350

GRAU 350-T13

TB DI wMH Comb SOUTH-III

VERTICAL ABUTMENT

TYPE-III

EXISTING R/W

-DET-
N 13° 39' 20.7" W

PCSta. 10+00.00 BEGIN -DET-
-L- STA 25+00.00

+40.00 -DET-
EX. R/W

PRCSta. 14+01.19 -DET-

CLASS II RIP-RAP (RIP-RAP TO SHLD.)

+57.00 -DET-
43'

+00.00 -DET-
45'

PTSta. 18+02.20 -DET-

PCSta. 21+05.76 -DET-

EDWARD M. GORE
DB 264 PG 24
2AZ

-DET-

PI Sta 12+01.11	PI Sta 16+02.21	PI Sta 23+05.19
Δ = 10° 01' 46.9" (RT)	Δ = 10° 01' 31.1" (LT)	Δ = 9° 56' 46.1" (LT)
D = 2° 30' 00.0"	D = 2° 30' 00.0"	D = 2° 30' 00.0"
L = 401.19'	L = 401.01'	L = 397.85'
T = 201.11'	T = 201.02'	T = 199.42'
R = 2,291.83'	R = 2,291.83'	R = 2,291.83'
SE = 0.02	SE = 0.02	SE = 0.02

SEE SHEET 9 FOR -L- PROFILE
SEE SHEET 13 FOR -DET- PROFILE

24-AUG-2006 12:05
R:\Roadway\Proj\b0682_rdy_psh5.dgn
$$$$USERNAME$$$$

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-0682	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Sheet 9	of 64

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-	-DET-	-DET-
PI Sta 40+10.40	PI Sta 23+05.19	PI Sta 27+04.83
Δ = 14° 00' 31.7" (LT)	Δ = 9° 56' 46.1" (LT)	Δ = 10° 02' 06.8" (RT)
D = 2° 30' 00.0"	D = 2° 30' 00.0"	D = 2° 30' 00.0"
L = 560.35'	L = 397.85'	L = 401.41'
T = 281.58'	T = 199.42'	T = 201.22'
R = 2,291.83'	R = 2,291.83'	R = 2,291.83'
SE = 03	SE = 02	SE = 02

NAD 83

MATCHLINE -L- STA 38+00 SEE SHEET 5

MATCHLINE -L- STA 52+00 SEE SHEET 7

40+00

45+00

50+00

25+00

-BL-21 PINC 39+56.20=
-L- STA 39+72.12 (2.49' LT)

-L- PT Sta. 42+89.17

-BL- 22 PINC 43+82.51=
-L- STA 43+86.66 (80.62' RT)

-BL- 23 PINC 50+07.57=
-L- STA 50+04.29 (15.44' LT)
-TI- 23 POT 5+00.00
ELEV= 9.24'

-BL-24 PINC 52+03.46=
-L- STA 52+00.18 (14.34' LT)

-DET- PRC Sta. 25+03.61

END DETOUR
-DET- PT Sta. 29+05.02

-BY2- 36 POT 23+41.43
-TI- 36 POT 8+02.64
ELEV= 13.485'

-Y1- POT Sta. 10+00.00

N 27° 39' 52.5" W

N 22° 29' E

BRIDGE 198

THE BIG NARROWS

INTRACOASTAL WATERWAY EASEMENT

USACE SETBACK

EXISTING TEMPORARY CONSTRUCTION EASEMENT

2Z SUNSET BEACH AND TWIN LAKES, INC DB 264 PG 30

2AZ EDWARD M. GORE DB 264 PG 24

11Z SUNSET BRIDGE PARTNERS, LLC. DB. 2233 PG. 702 MAP 33 PG 202

RONALD C. HOLDEN DB 258 PG 936

N.C. DEPT. OF TRANSPORTATION DB. 717 PG 82

EDWARD DB 34[illegible]

16" PVC DECK DRAIN SYSTEM

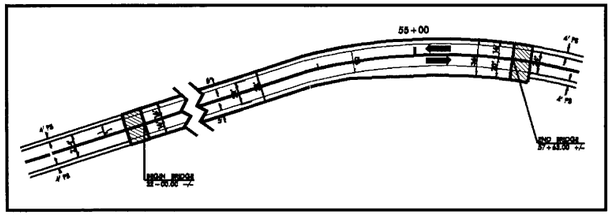
REMOVE EXISTING CAUSEWAY (SEE X-SECTIONS X- THUR X-)

PROPOSED GUARDRAIL

RETAIN 108' OF EXISTING STRUCTURE

SUNSET BLVD. (SR 1172)

SKETCH SHOWING PAVEMENT / BRIDGE RELATIONSHIP



SEE SHEET 10 FOR -L- PROFILE
SEE SHEET 12 FOR -Y1- PROFILE
SEE SHEET 13 FOR -DET- PROFILE

24-OCT-2006 10:54
r:\roadway\proj\b0682_rdy_psh6.dgn

PROJECT REFERENCE NO.	SHEET NO.
B-0682	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Sheet 10 of 64

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

-L-

PI Sta 62+17.02	PI Sta 68+45.20
Δ = 110° 41' 44.3" (RT)	Δ = 16° 00' 00.0" (LT)
D = 10° 00' 00.0"	D = 4° 00' 00.0"
L = 1,107.96'	L = 400.00'
T = 830.48'	T = 201.31'
R = 572.96'	R = 1,432.39'
SE = 06	SE = 0.04

NAD 83

POT Sta. 10+00.00

NGS MON. "S.B. NO. 4 1975"
BYI- STA. 5+74.36 55.23' RT.
ELEV. 20.02'

PCSta. 53+86.54

MATCHLINE -L- STA 52+00 SEE SHEET 6

MATCHLINE -L- STA 67+00 SEE SHEET 8

MATCHLINE -Y1- STA 22+00 SEE SHEET 8

BEGIN CONST. -Y1- 13+50

NCDOT GPS MON. "B0682-4"

NGS MON. "S.B. NO.1 1975"
BY2- STA. 20+78.42 62.05' RT.
ELEV. 13.848

-BL- 26 PINC 58+52.46=
-L- STA 58+33.39 (55.20' LT)

-BL- 25 PINC 55+18.60=
-BY1- 25 PINC 8+01.27=
-L- STA 55+14.96 (0.94' LT)

-BY1- 32 PINC 10+50.56=
-Y- STA 14+79.27 (26.27' LT)

-BL- 27 PINC 62+42.57=
-L- STA 61+47.17 (175.97' LT)

-BL- 28 PINC 13+01.81=
-BY2- 28 PINC 67+17.74=
-L- STA 65+40.70 (48.42 RT)

-BY2- 35 PINC 18+33.72=
-BY1- 35 POT 13+53.87=
-Y1- STA 14+31.44 (33.70' RT)

POT Sta. 17+41.01 -Y- =
-Y1- STA 14+00

PTSta. 64+94.49

PINC Sta. 65+23.61 -L-
STA 20+11.44 -Y1-

PCSta. 66+43.89

SEA TRAIL CORP.
DB 366 PG 862
DB 381 PG 298
DB 364 PG 413

A. O. KING
DB. 999 PG. 280
MAP 5 PG 64

RONALD C. HOLDEN
DB 778 PG 897
DB 314 PG 169
MAP 5 PG 64

TOWN OF SUNSET BEACH
DB 1157 PG 870
DB 703 PG 130
DB 319 PG 153

EDWARD M. GORE
DB 345 PG 796

H&D PROPERTIES, LLC
DB 2026 PG 1087

THE POUGE MAHONE CORP
DB 1553 PG 1368

JOE L. PEED
DB 760 PG 709

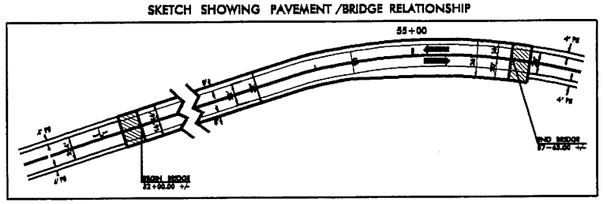
TRAFFIC DIAGRAM

2005 ADT 7800	4500		
2025 ADT 16700	6800		
100 / 200	7700 / 16500	1000 / 2000	2200 / 3600
NC 179 DRIVE / SHORELINE DRIVE	SUNSET BOULEVARD		9300 / 19800
SUNSET BOULEVARD			
100 / 200	SHORELINE DRIVE	500 / 1700	
	1700 / 3100		

PAINT STRIPING

MONOLITHIC ISLAND

SKETCH SHOWING PAVEMENT /BRIDGE RELATIONSHIP



SEE SHEET 11 FOR -L- PROFILE
SEE SHEET 12 FOR -Y1- PROFILE

24-AUG-2006 12:06
\\Ncdot.org\dfs\Projects\Projects\Hydraulics\Div13\b0682_rdy_psh7.dgn
$$$$USERNAME$$$$

8/17/99

NOTE: SHEET 7A TO BE USED FOR CONSTRUCTION OF PROPOSED DAM ONLY
(SEE SHEETS D-1 THRU D- FOR DAM PLANS)

PROJECT REFERENCE NO.	SHEET NO.
B-0682	7A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Sheet 11 of 64

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

-L-

PI Sta 62+17.02
Δ = 110° 47' 44.3" (RT)
D = 10° 00' 00.0"
L = 1,107.96'
T = 830.48'
R = 572.96'
SE = 06

PI Sta 68+45.20
Δ = 16° 00' 00.0" (LT)
D = 4° 00' 00.0"
L = 400.00'
T = 201.31'
R = 1,432.39'
SE = 0.04

-CARTWAY- POT Sta. 10+00.00

-BL-26 PINC 58+52.46=
-L- STA 58+33.39 (55.20' LT)

-BL- 27 PINC 62+42.57=
-L- STA 61+47.17 (175.97' LT)

-CARTWAY- PINC Sta. 11+28.60

-CARTWAY- PC Sta. 12+77.77

-CARTWAY-
PI Sta 13+72.84
Δ = 57° 01' 44.2" (LT)
D = 32° 44' 25.6"
L = 174.18'
T = 95.07'
R = 175.00'

-CARTWAY- PT Sta. 14+51.95

PT Sta. 64+94.49

PINC Sta. 65+23.61 -L-
STA. 20+11.44 -Y1-

PCSta. 66+43.89

-BL- 28 PINC 13+01.81=
-BY2- 28 PINC 67+17.74=
-L- STA 65+40.70 (48.42 RT)

-BY2- 34 PINC 9+01.32=
-Y1- STA 23+63.59 (16.30' RT)

SEE SHEET 11 FOR -L- PROFILE
SEE SHEET 12 FOR -Y1- PROFILE

SEA TRAIL CORP.
DB 366 PG 862
DB 381 PG 298
DB 364 PG 413

THE POUGE MAHONE CORP.
DB 1553 PG 1368

JOE L. PEED
DB 760 PG 709

NCDOT GPS
MON "B0682-5"

BM= 6
-BY2- STA 9+73.24
63.54' LEFT
ELEV= 16.15'

24-AUG-2006 12:06
R:\Roadway\Prj\b0682_rdy_psh7a.dgn
$$$$USERNAME$$$$

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-0682	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Sheet 12 of 64

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

MATCHLINE -Y1- STA 22+00 SEE SHEET 7

MATCHLINE -L- STA 67+00 SEE SHEET 7

SEA TRAIL CORP.
DB 366 PG 862
DB 381 PG 298
DB 364 PG 413

6Z

6Y

CAROLINA DREAM GOLF, LLC.
DB 1532 PG 1379

NCDOT GPS
MON "B0682-5"

EXISTING TEMPORARY CONSTRUCTION EASEMENT

SCATTERED TREES

PAVED CARTWAY

SAND TRAP

TDE

+02 -Y1-
74'

+69 -Y1-
PROP. R/W
END ACCESS

+00 -Y1-
65'

+00 -Y1-
52'

SEE SPECIAL CUT
GRASSED SWALE
SEE DETAIL D
SHEET 2-C

+53.55 -Y1-
EX. R/W

END CONST -Y1-
STA 28+53.55

250' TAPER

200' TAPER

385' TAPER

500' TAPER

4' PS

25

30

N 1° 22' 29.9" E

NC 179 PR RDT

8" ASBESTOS CONCRETE

12" PLASTIC

18" CMP

R = 30'

+50 -Y1-
57'

+50 -Y1-
62'

INT. EX. R/W
50' PROP R/W

-69 -Y1-
PI

-BY2- 34 PINC 9+01.32=
-Y1- STA 23+63.59 (16.30' RT)

BM# 6
-BY2- STA 9+73.24
63.54' LEFT
ELEV= 16.15'

-BY2- 33 POT 5+00.00=
-Y1- STA 27+64.89 (20.15' RT)

POT Sta. 30+76.03

WOODS

ASPHALT PARKING

2' CURB

2SBLKBUS

RAMP 2

EXISTING R/W

HICKORY ST.

-BL-29 PINC 70+27.40=
-L- STA 68+45.12 (28.73' RT)

480' TAPER

+30 -L-
50'

PT Sta. 70+43.89

+43.89 -L-
50'

SEE SPECIAL CUT
GRASSED SWALE
SEE DETAIL D
SHEET 2-C

-L- STA 72+10.56
END STATE PROJECT B-0682
END CONSTRUCTION

+50 -L-
50'

LONG CREEK POND

72+10.56
EX. R/W

POT Sta. 72+51.26

-BL-30 POT 74+30.95=
-L- STA 72+45.32 (17.91' RT)

N 71° 50' 08" E
1432.39'

N 17° 33' 36" W
96.20'

N 41° 18' 34" E
30.00'

N 28° 33' 8" W
144.02'

N 72° 29' 59" E
159.79'

N 15° 56' 56" W
330.22'

-L-
PI Sta 68+45.20
Δ = 16° 00' 00.0" (LT)
D = 4° 00' 00.0"
L = 400.00'
T = 201.31'
R = 1,432.39'
SE = 0.04

PAINT STRIPING

SEE SHEET 11 FOR -L- PROFILE
SEE SHEET 13 FOR -Y1- PROFILE

4-AUG-2006 12:06
\\Roadway\PROJECTS\b0682_rdy_psh8.dgn
$$$$USERNAME$$$$

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-0682	9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Sheet 13 of 64	

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-L-

BEGIN GRADE -L- STA. 11+50
EL=6.50'

6.50

+10.00%

6.50

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

25 15 5 -5 -15 -25

-L-

FOR ROADWAY VERTICAL ALIGNMENT ONLY
SEE STRUCTURE PLANS FOR BRIDGE DESIGN

47.50

BEGIN BRIDGE
STA. 32+00 +/-

PI = 29+80.00
EL = 6.50'
VC = 450'
K = 90.0

VERTICAL ABUTMENT

+10.0000%

-5.0000%

6.50

BEGIN -L- STA. 33+00
CAUSEWAY REMOVAL FOR RESTORATION
SEE XSC'S FOR HORIZONTAL
AND VERTICAL LIMITS

24 25 26 27 28 29 30 31 32 33 34 35 36 37 38

65 55 45 35 25 15 5 -5 -15 -25

03-MAY-2006 10:11
r:\roadway\proj\b0682_rdy_pf1.dgn
mprice
AT HY206430

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-0682	10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Sheet 14 of 64	

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

PI = 47+10.00
EL = 93.00'
VC = 1,420'
K = 142.0

+5.0000%

-5.0000%

11 @ 113'; 1 @ 150'; 1 @ 230'; 1 @ 150';
4 @ 95'; 2 @ 85'; 3 @ 80'
Prestressed Girder

47.50

66.80

FOR ROADWAY VERTICAL ALIGNMENT ONLY
SEE STRUCTURE PLANS FOR BRIDGE DESIGN

FEMA 100 yr. Storm Surge w/Wave Set-up EL = 14.2'

MHW EL = 2.0'

MTL EL = -0.4'

MLW EL = -2.7'

FEMA 100 yr. Storm Surge EL = 11.7'

MHHW EL = 2.3'

MLLW EL = -2.8'

END -L- STA. 44+00
CAUSEWAY REMOVAL FOR RESTORATION
SEE XSC'S FOR HORIZONTAL
AND VERTICAL LIMITS

115 105 95 85 75 65 55 45 35 25 15 5 -5 -15 -25

38 39 40 41 42 43 44 45 46 47 48 49 50 51 52

25-APR-2006 15:55
r:\roadway\proj\b0682_rdy_pfl.dgn
mariss
NYZ36430

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-0682	11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Sheet 15 of 64	

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PI = 47+10.00
EL = 93.00'
VC = 1,420'
K = 142.0

FOR ROADWAY VERTICAL ALIGNMENT ONLY
SEE STRUCTURE PLANS FOR BRIDGE DESIGN

-L-

END BRIDGE
STA. 37+00 +/-

PI = 63+97.50
EL = 8.63'
VC = 200'
K = 28.6

END GRADE -L- STA 64+99.36 =
EL 10.66'
-Y1- RT EOP STA 20+07.96
EL 10.66'

BEGIN SWALE LT
STA 624+00.00
EL = 8.8

END SWALE LT
STA 64+50.00
EL = 6.0

BEGIN SWALE RT
STA 59+50.00
EL = 20.00

PI = 60+50.000
EL = 7.50

PI = 61+50.000
EL = 11.50

PI = 62+50.000
EL = 6.0

PI = 63+50.000
EL = 5.50

PI = 64+00.000
EL = 6.0

PI = 63+50.000
EL = 5.00

END SWALE RT
STA 64+50.00
EL = 4.66

(+)2.33333%
(-)2.00000%
(-)1.75000%
(-)1.00000%
(+)2.00000%
(+)5.00%
(+)12.0%

52 53 54 55 56 57 58 59 60 61 62 63 64 65 66

25 15 5 -5 -15 -25

-L-

SWALE LEFT
SWALE RIGHT

BEGIN GRADE -L- STA 65+47.51 =
EL 10.70
-Y1- RT EOP STA 20+11.55
EL 10.70'

BEGIN SWALE LT
STA 65+75.00
EL = 7.40

END SWALE LT
STA 66+75.00
EL = 8.5

PI = 69+30.00
EL = 12.71
VC = 270'
K = 114

BEGIN DITCH LT
STA 70+10.00
EL = 6.50

PI = 70+50.000
EL = 7.30

END DITCH LT
STA 71+50.00
EL = 6.3

PI = 71+20.00
EL = 9.20'
VC = 80'
K = 77

END GRADE -L- STA 71+60.56
EL = 8.87'

(+)0.5252%
(+)0.5252%
(-)1.8484%
(-)2.2000%
(-)1.0000%
(-)0.8111%
11.200%

65 66 67 68 69 70 71 72

25 15 5 -5 -15 -25

27-MAR-2006 14:04
r:\roadway\prof\b0682_rdy_prfl.dgn
sowedking
AT R0223234

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-0682	12
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
Sheet 16	of 64

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-Y1-

BEGIN GRADE -Y1- STA 16+21.00
EL = 11.007

PI = 17+41.00
EL = 9.10'
VC = 240'
K = 103.5

BEGIN SWALE LT
STA 16+50.00
EL = 30

END SWALE LT
STA 19+20.00
EL = 40

BEGIN SWALE LT
STA 22+50.00
EL = 50

PI = 20+70.00
EL = 60.00

END SWALE LT
STA 23+30.00
EL = 70.00

PI = 23+79.00
EL = 16.01'
VC = 120'
K = 5905

PI = 20+19.00
EL = 11.13'
VC = 160'
K = 255.6

16.29

(-)1.5896%

(+)0.7902%

(-)0.2296%

(-)0.5000%

0.0000%

2.92%
3.46%

(+)1.2641%

(-)1.3358%

BENCHMARK
NGS MON "SB NO. 4 1975"
COPPER-CLAD STEEL ROD ENCASED IN A PVC PIPE SET IN CONCRETE
-BY1- STATION 5+74.36 55.23' RT
EL = 20.02'

BENCHMARK
NGS MON "SB NO. 1 1975"
COPPER-CLAD STEEL ROD ENCASED IN A PVC PIPE SET IN CONCRETE
-BY2- STATION 20+78.42 62.05' RIGHT
EL 13.848'

BENCHMARK
NGS MON "SB NO. 5 1975"
COPPER-CLAD STEEL ROD ENCASED IN A PVC PIPE SET IN CONCRETE
-BY2- STATION 16+42.66' RIGHT
EL 9.73'

BEGIN SWALE RT
STA 20+50.00
EL = 7.1

PI = 20+70.00
EL = 7.00

END SWALE RT
STA 23+10.00
EL = 10.5

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

35 25 15 5 –5 –15 –25

-Y1-

SWALE LEFT
SWALE RIGHT

PI = 25+69.00
EL = 18.55'
VC = 120'
K = 458.1

BEGIN SWALE LT
STA 26+50.00
EL = 17.1

PI = 27+45.00
EL = 21.36'
VC = 120'
K = 281.5

END SWALE LT
STA 28+50.00
EL = 17.7

END GRADE -Y1- STA 28+53.55
EL = 22.59

16.29

22.59

(+)1.3358%

(+)1.5977%

(+)1.1714%

0.4000%

BENCHMARK
-BY2- STATION 9+73.24 63.54' LEFT
R/R SPIKE SET IN 12" OAK
EL 13.848'

24 25 26 27 28 29 30

35 25 15 5 –5 –15 –25

27-MAR-2006 14:04
R:\roadway\proj\b0682_rdy_pf1.dgn
User:rdy
Level:1,2,3,4

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
B-0682	13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
sheet 17	of 44

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

-DET-

BEGIN BRIDGE
STA. 17+00 +/-

BEG. GRADE -DET-
STA. 12+71.04 EL=5.97'

(+)0.0201%

6.20

15
5
-5
-15
-25

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

-DET-

END BRIDGE
STA. 25+00 +/-

END GRADE -DET- STA. 27+11.27
EL = 9.28

(+)0.0201%

6.20

-CARTWAY-

BEGIN GRADE -CARTWAY- STA. 10+00.00
EL = 14.89

END GRADE -CARTWAY- STA. 14+51.95
EL = 12.4

PI = 13+30.00
D = 13°-30'-00"

(-)0.0568%

(+)0.0965%

Proposed 10' Emergency
Spillway @ Elev. 11.4'

15
5
-5
-15
-25

24 25 26 27 28 29 10 11 12 13 14

27-MAR-2006 14:04
F:\roadway\proj\b0682\rdy_pfl.dgn
wseaking
$1 RD22x34

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-2

Sheet 18 of 44

14+00.000

13+50.000

13+00.000

12+50.000

12+00.000

11+50.000

11+00.000

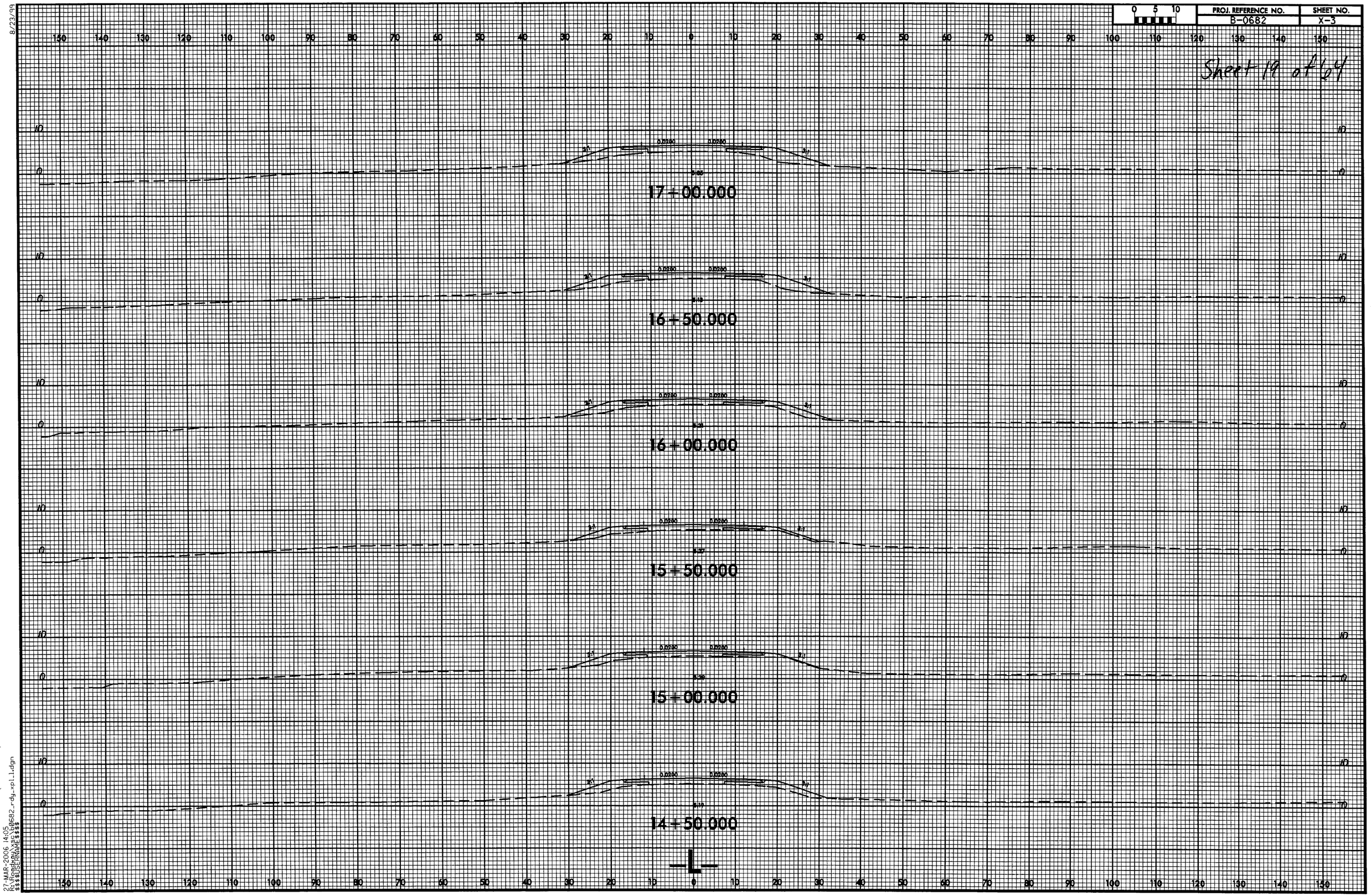
10+50.000

10+00.000

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-3

Sheet 19 of 104

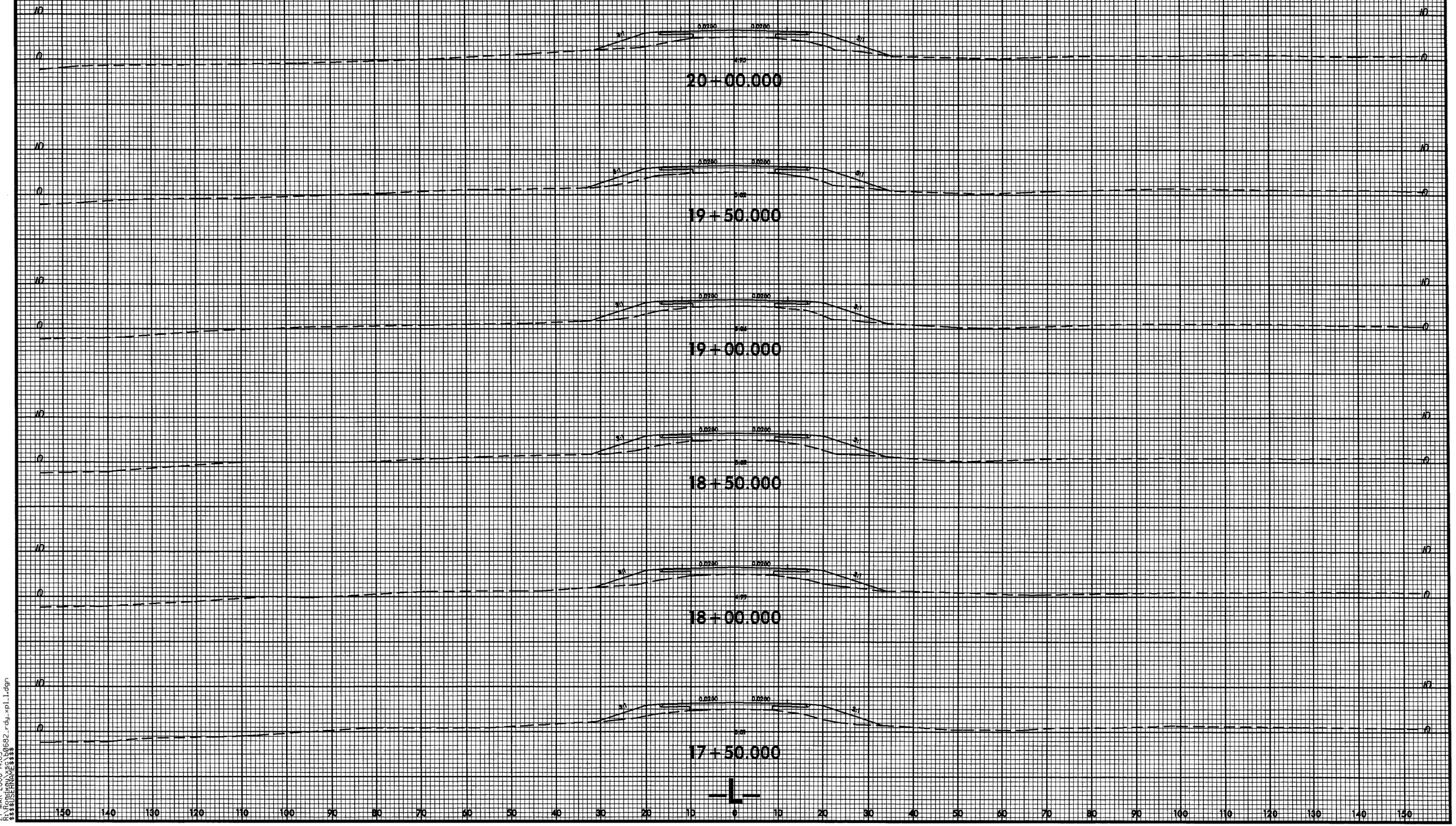


27-MAR-2006 14:05
$$$$USERNAME$$$$
R:\roadway\x_files\b0682_rdy_xpl_1.dgn

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-4

Sheet 20 of 64



27-MAR-2006 14:05
R:\R4\projects\B0682\rdy_xpl1.dgn
$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-5

Sheet 21 of 44

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

10 0

0.0200 0.0200 -6.0% -2.0% 4.40

23+00.000

0.0200 0.0200 -6.0% -2.0% 4.45

22+50.000

0.0200 0.0200 -6.0% -2.0% 4.52

22+00.000

0.0200 0.0200 -6.0% -2.0% 4.63

21+50.000

0.0200 0.0200 -6.0% -2.0% 4.75

21+00.000

0.0200 0.0200 -6.0% -2.0% 4.88

20+50.000

—L—

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

27-MAR-2006 14:05
R:\Projects\b0682_rdy_xpl1.dgn
$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-6

Sheet 22 of 64

26+00.000

25+50.000

25+00.000

24+50.000

24+00.000

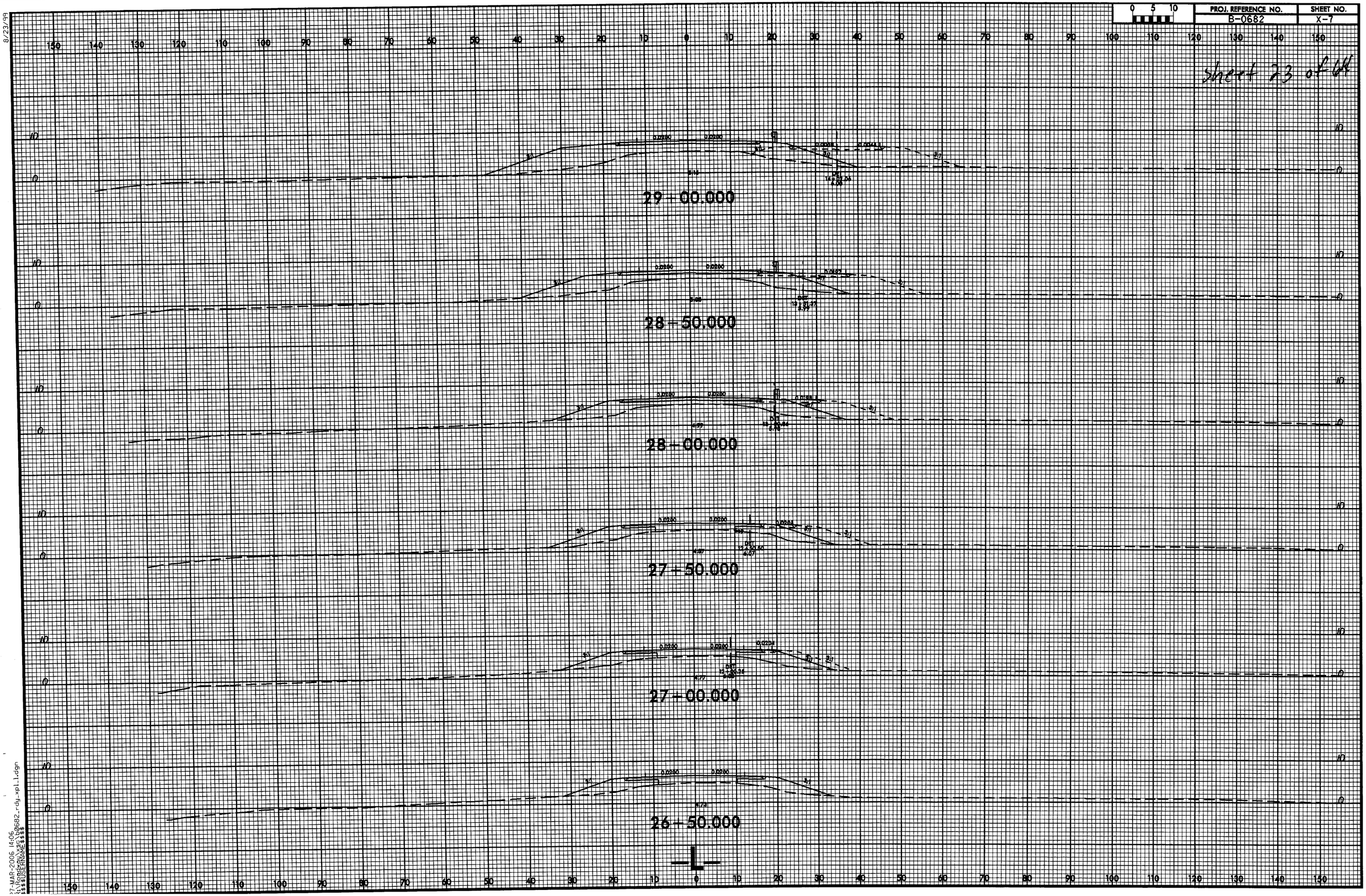
23+50.000

27-MAR-2006 14:05
R:\Roadway\xsg\b0682_rdy_xpl1.dgn
$$$$USERNAME$$$$

8/23/99

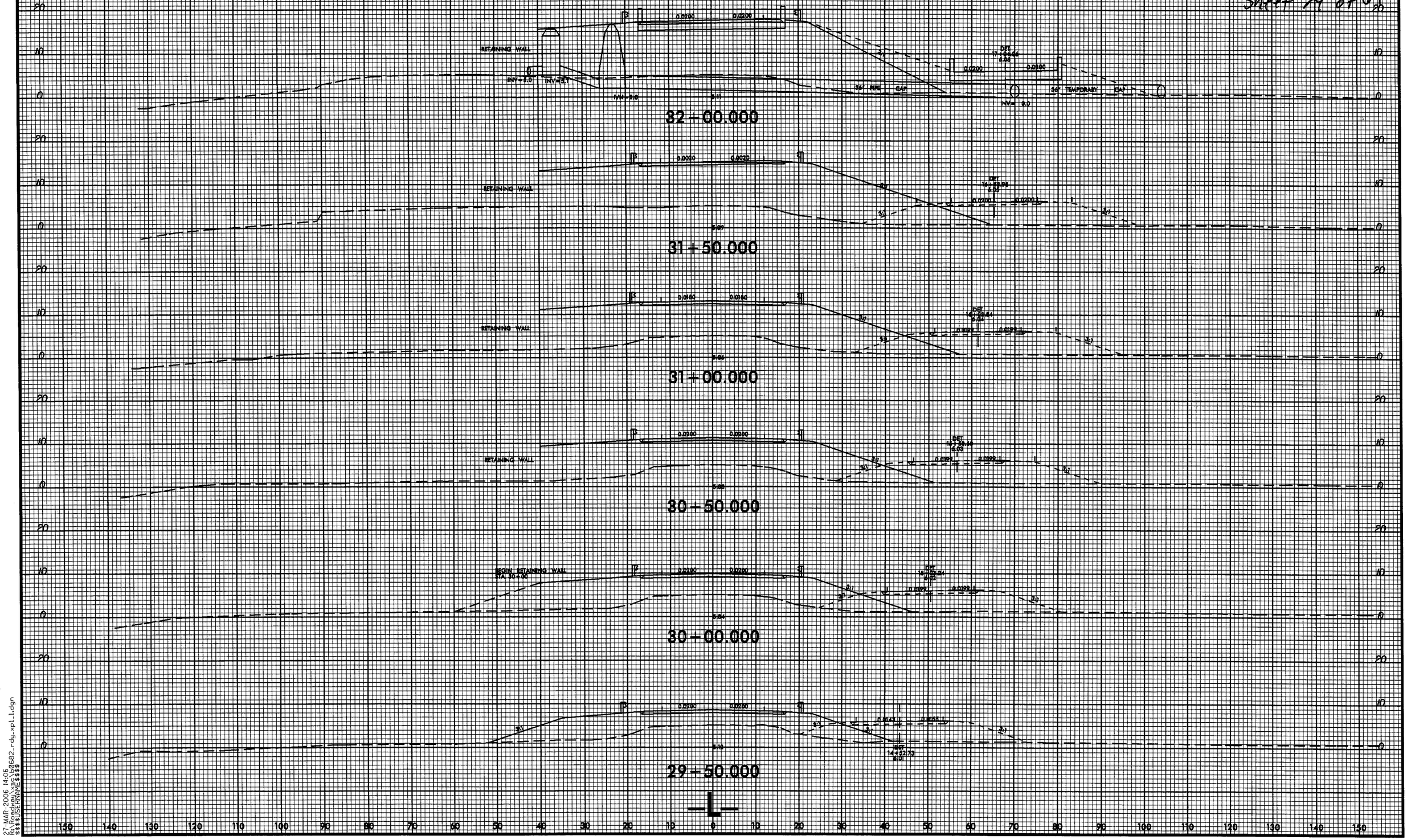
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-7

Sheet 23 of 64



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-8

Sheet 24 of 64



8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-9

Sheet 25 of 64

34+00.000

33+50.000

33+00.000

32+50.000

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-10

Sheet 26 of 64

35+50.000

35+00.000

34+50.000

—L—

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-11

Sheet 27 of 64

37+00.000

36+50.000

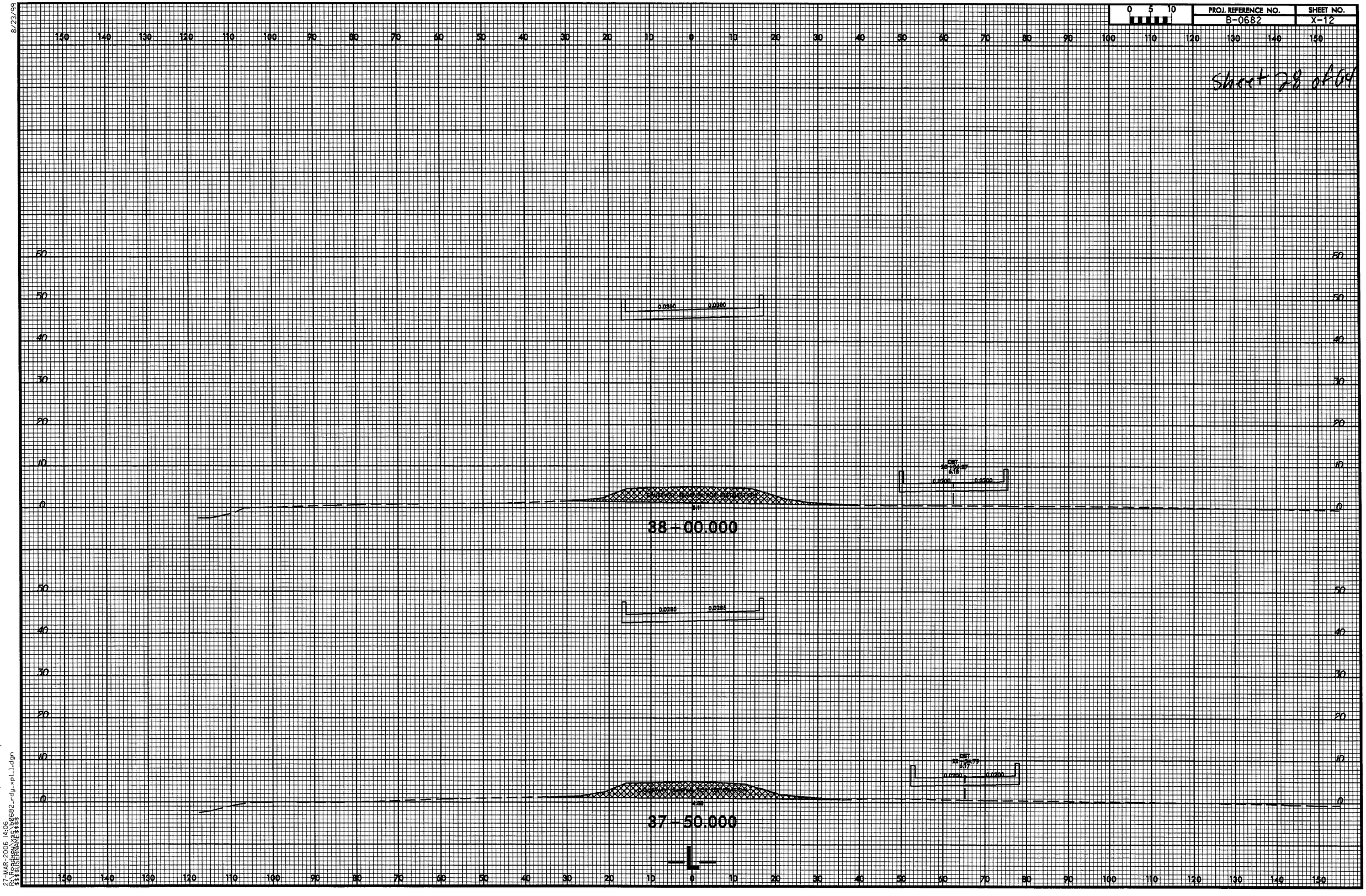
36+00.000

-L-

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-12

Sheet 28 of 64



8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-13

Sheet 29 of 64

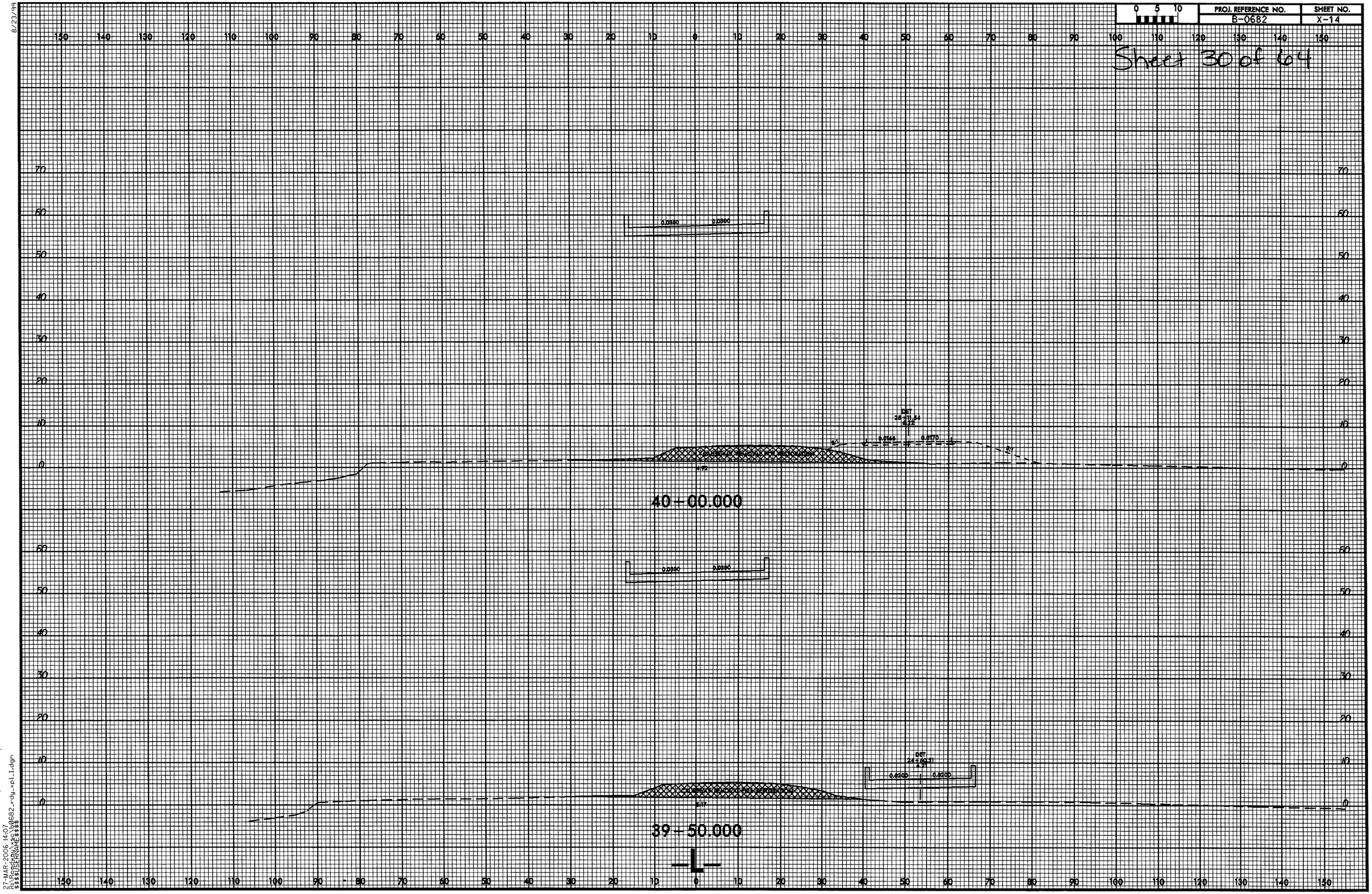
39+00.000

38+50.000

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-14

Sheet 30 of 64

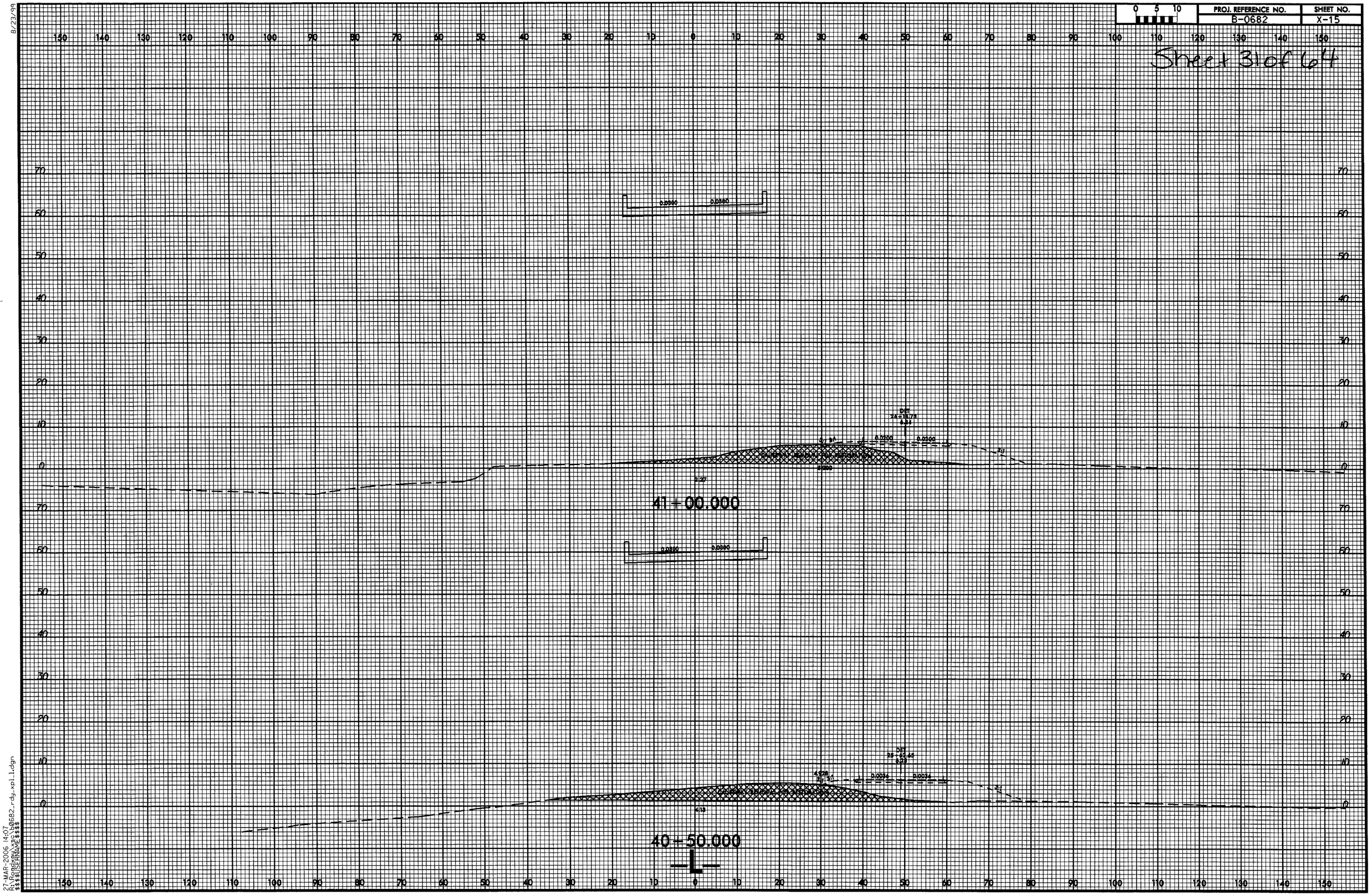


27-MAR-2006 14:07
n:\roadway\x_sects\b0682_rdy_xpl_1.dgn

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-15

Sheet 31 of 64



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-16

Sheet 32 of 64

0.0000

0.0000

42+00.000

0.0000

0.0000

41+50.000

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-17

Sheet 33 of 64

43+00.000

42+50.000

27-MAR-2006 14:07
R:\roadway\projects\b0682_rdy_xpl_1.dgn
$USERNAME$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-18

Sheet 34 of 64

44+00.000

43+50.000

27-MAR-2006 14:07
R:\roads\RDWG\b0682_rdy_xpl1.dgn
$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-19

Sheet 35 of 64

0.0200 0.0200

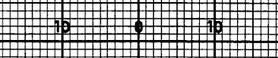
44+50.000

27-MAR-2006 14:08
R:\roadway\xsl\b0682_rdy_xpl_1.dgn
$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-20

Sheet 36 of 64



45+00.000

27-MAR-2006 14:08
R:\roadway\xs\b0682_rdy.xpl1.dgn
$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-21

Sheet 37 of 64

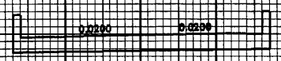
45+50.000
-L-

27-MAR-2006 14:08
$\Roadway\xs\b0682_rdy_xpl1.dgn
$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-22

Sheet 38 of 64



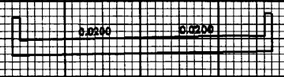
46+00.000

27-MAR-2006 14:08
C:\projects\b0682\rdy\b0682_rdy_xpl1.dgn
$$USER_NAME$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-23

Sheet 30 of 64



46+50.000

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-24

Sheet 40 of 64

47+00.000

27-MAR-2006 14:09
R:\Projects\B0682_rdy_xpl.dgn
$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-25

Sheet 41 of 64

0.0200 0.0270

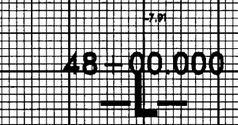
47+50.000
-L-

27-MAR-2006 14:09
R:\Projects\xsec\b0682_rdy_xpll.dgn
$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-26

Sheet 42 of 64



27-MAR-2006 14:09
n:\roadway\proj\b0682_rdy_xpl1.dgn
$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-27

Sheet 43 of 64

48+50.000

27-MAR-2006 14:09
\\ncdot\Projects\B0682\Design\B0682_rdy_xpl_1.dgn
$$$$MICHAEL$$$$

8/27/3/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-28

Sheet 44 of 64

0.0240 0.0200

49+50.000

0.0200 0.0230

49+00.000

27-MAR-2006 14:09
C:\Projects\B0682_rdy_xpl1.dgn
$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-29

Sheet 45 of 64

0.0200 0.0200

10.31'

50+50.000

0.0200 0.0200

10.00'

50+00.000

—L—

27-MAR-2006 14:09
R:\roadway\xsl\b0682_rdy_xpl_1.dgn
$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-30

Sheet 46 of 64

12.74

51+50.000

0.0200 0.0200

11.24

51+00.000

—L—

27-MAR-2006 14:10
R:\Roadway\xsc\b0682_rdy_xpl1.dgn
$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-31

Sheet 47 of 64

14.67
52+50.000

14.04
52+00.000

—L—

27-MAR-2006 14:10
R:\Projects\0682\Design\Roadway\0682_rdy_xpl1.dgn
RSTEUSTRAND

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-32

Sheet 48 of 64

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

70 60 50 40 30 20 10

0.0234 0.0234

17.68

53+50.000

0.0054 0.0200

16.74

53+00.000

—L—

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

70 60 50 40 30 20 10

27-MAR-2006 14:10
R:\roadway\c13b0682_rdy_xpl1.dgn
$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-33

Sheet 44 of 64

55+00.000

54+50.000

54+00.000

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-34

Sheet 50 of 64

0.0400

0.0400

20.73

56 - 50.000

0.0400

0.0400

20.80

56 - 00.000

0.0400

0.0400

20.34

55 - 50.000

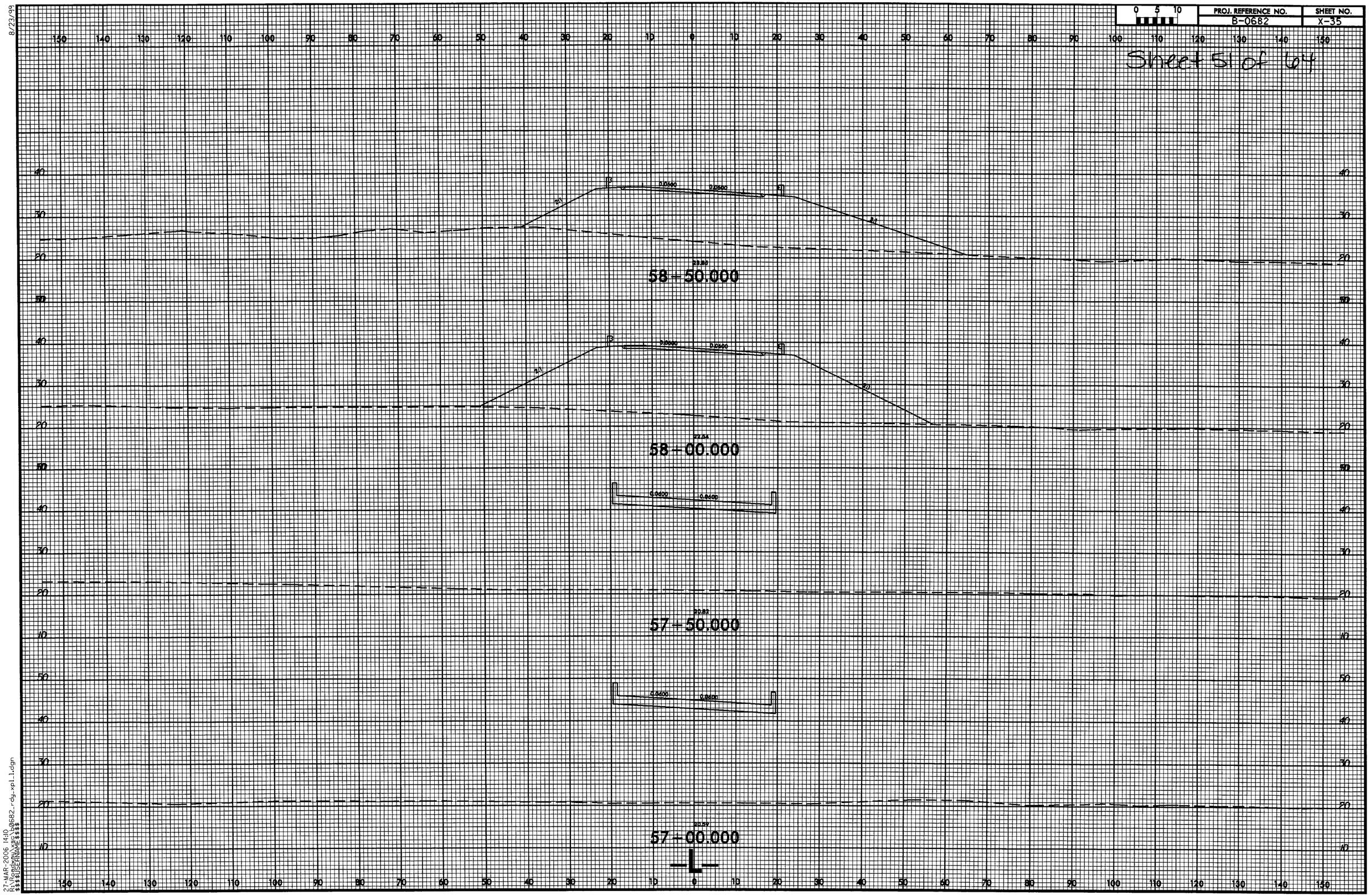
-L-

27-MAR-2006 14:10
R:\...\b0682_rdy_xpl1.dgn
$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-35

Sheet 5 of 6



8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-36

Sheet 52 of 64

61+50.000

61+00.000

60+50.000

60+00.000

59+50.000

59+00.000

—L—

27-MAR-2006 14:11
R:\Roadway\xsec_b0682_rdy_xpl1.dgn
USERNAME=$$$$$$$$$$$$$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-37

Sheet 53 of 64

64+50.000

64+00.000

63+50.000

63+00.000

62+50.000

62+00.000

—L—

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-38

Sheet 54 of 64

69+00.000

68+50.000

68+00.000

67+50.000

67+00.000

66+50.000

66+00.000

65+50.000

65+00.000

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-39

Sheet 56 of 64

72+50.000

72+00.000

71+50.000

71+00.000

70+50.000

70+00.000

69+50.000

27-MAR-2006 14:11
\\rivfsdom\DATA\projects\b0682_rdy_xpl_1.dgn
$$$$USERNAME$$$$

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
B-0682	X-40	

Sheet 56 of 64

14+00.00

13+50.00

13+00.00

12+50.00

12+00.00

11+50.00

11+00.00

10+50.00

10+00.00

-Y1-

02/03/98

21-MAR-2006 14:1
$$$$USERNAME$$$$
$$$$USERNAME$$$$
B0682_rdy_xpl_y1.dgn

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
B-0682	X-41	

Sheet 57 of 64

17+50.00

17+00.00

16+50.00

16+00.00

15+50.00

15+00.00

14+50.00

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
B-0682	X-42	

Sheet 58 of 61

22+00.00

21+50.00

21+00.00

20+50.00

20+00.00

19+50.00

19+00.00

18+50.00

18+00.00

-Y1-

02/03/98

27-MAR-2006 14:11
R:\roadway\xsec\b0682_rdy_xpl-gl.dgn
$$$$USERNAME$$$$

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
B-0682	X-43	

Sheet 59 of 64

26+00.00

25+50.00

25+00.00

24+50.00

24+00.00

23+50.00

23+00.00

22+50.00

-Y1-

02/03/98

21-MAR-2006 14:11
$$$USERNAME$$$
$$$JOBNAME$$$ b0682_rdy_xpl_gl.dgn

PROJ. REFERENCE NO.	SHEET NO.	TOTAL SHEETS
B-0682	X-44	

Sheet 60 of 64

30+50.00 (2487)

30+00.00 (2431)

29+50.00 (2372)

29+00.00 (2365)

28+50.00 (2236)

28+00.00 (2170)

27+50.00 (2101)

27+00.00 (2026)

26+50.00 (1952)

-Y1-

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-45

Sheet 61 of 64

11+25.000

11+00.000

10+75.000

10+50.000

10+25.000

10+00.000

-CARTWAY-

27-MAR-2006 14:32
R:\...\$$$$USERNAME$$$$\...twy_xpl.dgn
$$$$USERNAME$$$$

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-46

Sheet 62 of 64

12+50.000

12+25.000

12+00.000

11+75.000

11+50.000

-CARTWAY-

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-47

Sheet 6 of 64

14+25.000

14+00.000

13+75.000

13+50.000

13+35.000

13+25.000

13+00.000

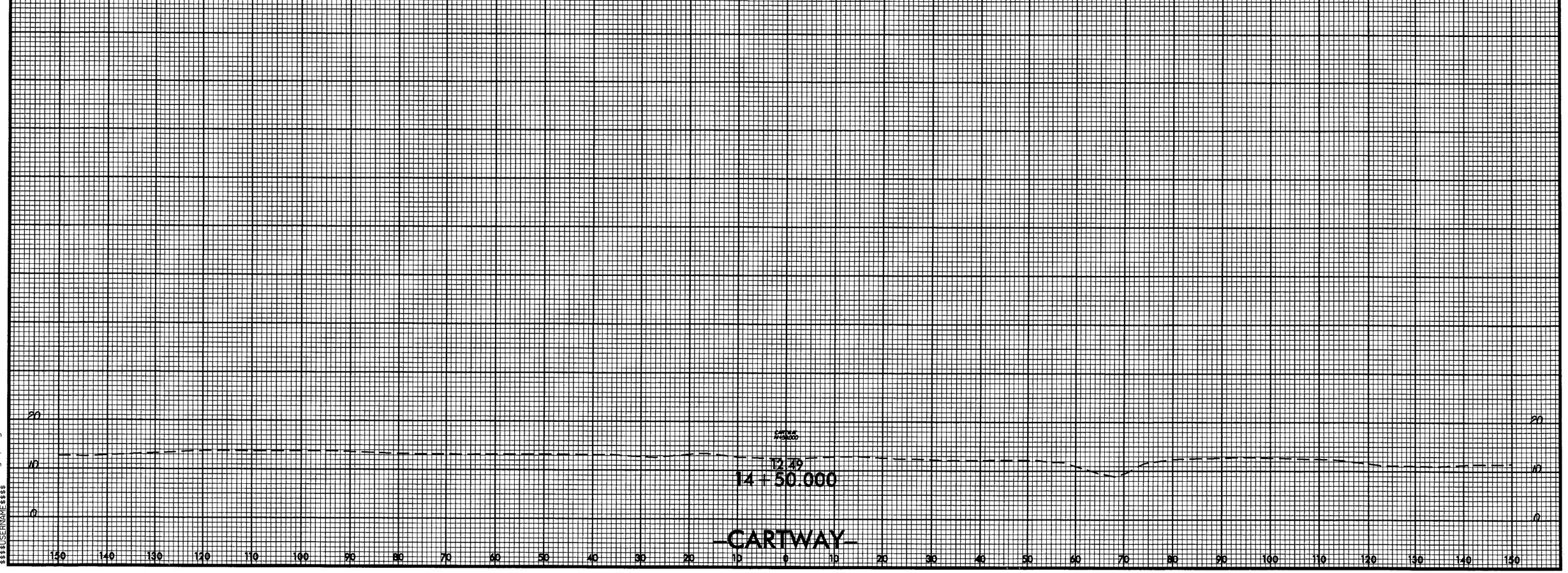
12+75.000

-CARTWAY-

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-0682	X-48

Sheet 64 of 64



27-MAR-2006 14:32
R:\Roadway\xsc\cartway_xpl.dgn
$$$$USERNAME$$$$