STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

December 29, 2005

Stormwater Section
Division of Water Quality
127 Cardinal Drive Extension
Wilmington, NC 28405

ATTN: Linda Lewis

Dear Madam:

Subject: Stormwater Permit Application, Second Bridge to Oak Island from SR 1104 (Beach Drive) to NC 211, Brunswick County. TIP No. R-2245, State Project No. 8.2231201. $420.00 Debit work order 8.2231201, WBS Element 34407.1.1

The North Carolina Department of Transportation (NCDOT) proposes to construct a second bridge to Oak Island on new location from SR 1104 to NC 211 in Brunswick County. The NCDOT will be applying for a Section 404, 401, and CAMA permits in the near future.

Please find enclosed a stormwater permit application form, stormwater management narrative, infiltration supplements, and one copy of the project plans. Please review this project for authorization by your section of NCDWQ. If you have any questions regarding this project or need additional information, please contact Mr. Max Price of NCDOT Hydraulics Unit at (919) 250-4100, or Mr. Brett Feulner of NCDOT Project Development and Environmental Analysis Branch at (919) 715-1488.

Sincerely,

E. L. Fuse

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

W/out attachment
Dr. David Chang, Hydraulics
Mr. Dave Timpy, USACE, Washington
Mr. Brian Wrenn, NCDWQ
Mr. Steve Sollod, NCDCM
Mr. Bill Arrington, NCDCM
Mr. Joseph Qubain, PDEA
File

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

TELEPHONE: 919-715-1500
FAX: 919-715-1501

WEBSITE: WWW.DOH.DOT.STATE.NC.US

LOCATION:
2728 CAPITOL BOULEVARD
PARKER LINCOLN BUILDING, SUITE 168
RALEIGH NC 27699

STORMWATER MANAGEMENT PLAN

R-2245, State Project 34407.1 Date: 6 APR 05
Brunswick County
Hydraulics Project Manager: Max S. Price, PE

ROADWAY DESCRIPTION

The project constructs a new, second, route to Oak Island. It begins by widening the existing two lane Middleton Avenue on Oak Island and runs north, crossing the Atlantic Intracoastal Waterway with a new high rise bridge, continuing on a new route on the mainland. It terminates at the intersection of NC-211 and SR 1500, Midway Road. The overall length of the project is 4.52 miles with 0.92 miles on Oak Island and the remaining 3.60 miles on the mainland.

Starting near the ocean, the initial 1,700 feet of the project maintains two lanes, but widens the road from 20 feet to 22 feet and adds 4 foot wide paved shoulder to both sides. The road then begins a taper, widening to provide 5 lanes up to the southern end of the bridge over the Intracoastal Waterway. From this point to the northern terminus, the road provides two lanes in each direction with a raised median separating the traffic.

On the island, the roadway crosses Davis Canal. The project will cross the canal at the same location, but with a new bridge. The roadway will be closed during construction of the new bridge.

The majority of the roadway uses open shoulders. Gutters are used only on approaches to the two bridges.

On the mainland portion of the project, the 17.5 foot wide median is raised, with concrete curb and gutter bordering the mounded, grassy median. The typical section shows the pavement slopes away from the median, draining to the grass shoulders and fill slopes. All fill slopes are 3:1 or flatter except in wetland areas where they are held to 3:1.

A third major stream crossing occurs on NC-211, approximately 540 feet east of the intersection with SR 1500. There, an existing box culvert will be removed and replaced with a larger culvert.

ENVIRONMENTAL DESCRIPTION

Land Use

Beach homes dominate the project area on Oak Island while the corridor on the mainland remains undeveloped. Not far off the mainland corridor, development of the St. James community continues, pushing towards the project route. Along NC-211, at the northern

Topography and Water Resources

The project is located in the Lumber River Basin in the Coastal Plain Physiographic Province. Elevations in the project area range from a low of near seven feet to a high of

approximately 63 feet. The minimum elevation occurs on Oak Island near the ocean and the maximum elevation occurs between the two largest Carolina Bays in the central portion of the project area. North of the apex, the elevation drops to about 45 feet at the intersection of the –L- line with NC-211, creating a slope of about 2 percent. South of the apex, the elevation drops to sea level at the Atlantic Intracoastal Waterway, giving a slope of about 8 percent. Descending the scarp to the Quaternary-aged deposits largely accounts for the steeper slope. Soils in the southern portion of the project area are better drained than in the northern part.

The project –L- line crosses three jurisdictional surface waters: Davis Canal on Oak Island; the Atlantic Intracoastal Waterway which separates Oak Island from the mainland; and, a small, unnamed tributary on the mainland. NC-211 (-Y7-) crosses "River Swamp" with an existing box culvert. Both Davis Canal and the Intracoastal Waterway are SA waters. The unnamed tributary, an intermittent channel through a wetland, is not classified, but it drains to the Intracoastal waterway. This channel will be carried under the –L- line by two 60" diameter concrete pipes, both set one foot below natural ground level. Approximately 247 feet of this stream will be permanently impacted due to the crossing and about 0.009 acres of permanent surface water impacts will also result from the crossing. We estimate temporary surface water impacts at this site will measure 0.002 acres.

River Swamp has been classified as C and Sw water. Currently, water runs through a culvert of two different sizes; it appear to have been built with an initial size of 6'wide by 4' high, then extended on both ends with a size of 6' wide by 5' high. The extensions, each measuring about 7 feet in length, maintain the same top slab elevation, but use bottom slabs that drop one foot below the central, smaller portion. The project will replace this multi-sized culvert with one 10' wide by 8' high box culvert. The larger size will convey stormwater runoff expected from the developing area. Estimated impacts include: 0.010 acres surface water (permanent impact); 0.010 acres surface water (temporary impact); 40 feet of channel impact (permanent); and, 58 feet of channel impact (temporary.)

31 wetland sites will be crossed by the project with fill sections, impacting the wetlands with permanent roadway fill and mechanized clearing. One small wetland area, located in the southwest quadrant of the –L- line intersection with NC-211 will require a roadway ditch. There is an existing ditch, presently within the wetland, running along the south side of NC-211 and the project will require this ditch to be pushed out from 10 to 15 feet further into the wetland.

Total impacts to wetlands caused by permanent fill are estimated at 17.808 acres.

BEST MANAGEMENT PRACTICES AND MAJOR STRUCTURES

Best Management Practices (BMPs) and measures used on the project are an attempt to

primary BMP is the use of grassed shoulders, as opposed to a curb and gutter roadway drainage system. Rip rap lined ditches are used only near the stream under NC-211. There, the stream banks are lined with rip rap where the two roadside ditches flow down

the banks and into the channel. On the mainland, the outside shoulders and fill slopes are grass, requiring no stormwater collection system. Along the median in the curves, inlets intercept storm water and pipe it to the toe of slope. There, the stormwater will infiltrate into the existing soils. Rip rap pads are used at each outlet to aid in energy attenuation and flow dispersal. Most inlets are single inlets, collecting small areas of roadway runoff, and discharging the small flow to the adjacent land. The largest system on the mainland consists of three inlets and one outlet. This design was used to keep the outlet outside of a wetland area.

The one jurisdictional stream crossing on the mainland by the –L- line will be made by using two 60" concrete pipe culverts. These culverts will be placed one foot below natural ground level.

In the wetland areas, 48" concrete pipes are placed across the –L- line to promote equalization of water levels. Typical spacing is 200 feet and, as for the pipe culvert, these pipes will be placed one foot below natural ground level.

The new bridge crossing Davis Canal will carry stormwater in the shoulder area to inlets off of the bridge on the northern end. From there, the water will be conveyed to a "splitter box", dividing the first flush to "infiltration chambers." The first flush, consisting of the runoff from the first 1.5 inch of rainfall, will enter the buried chambers and infiltrate into the sandy soil. The bypass flow will be diverted away from the infiltration chambers and will flow through a grass swale to the Davis Canal. The swale length is greater than 170'.

The new bridge crossing the Intracoastal Waterway will carry stormwater in the shoulder area, just like the Davis Canal bridge. And as with the Davis Canal bridge, no deck drains will be allowed. Off the southern end of the bridge, storm water will be collected in a series of inlets and piped to a splitter box, similar to the one for the Davis Canal. Here, the runoff from the first 1.5 inch of rainfall will be directed to an infiltration basin. Bypass flows will be directed to an infiltration channel, located along both sides of the fill slopes for the southern approach to the bridge. Based on the topography and sandy soils, bridge deck storm water runoff will not enter SA waters except during large rainfall events, probably exceeded the 50 year event.

Stormwater from the northern end of the bridge collects in inlets off of the bridge deck and is piped to an outlet on the west side of the fill slope. At this location, the roadway is built atop of a sandy spoil pile created by construction and dredging of the Intracoastal Waterway. A soil boring and resultant testing show a high rate of infiltration will occur. Therefore, no additional devices, such as the "storm chambers" used on the Davis Canal or the infiltration basin used for the southern half of the Intracoastal Waterway bridge, are necessary. During large storm events, if the runoff does not infiltrate, it will sheet flow towards a non-jurisdictional pond within the spoil pile area, located approximately 350' west from the pipe outlet.

OFFICE USE ONLY		
Date Received	Fee Paid	Permit Number

State of North Carolina
Department of Environment and Natural Resources
Division of Water Quality

STORMWATER MANAGEMENT PERMIT APPLICATION FORM

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
LINEAR ROADWAY PROJECT
This form may be photocopied for use as an original.

DWQ Stormwater Management Plan Review:
A complete stormwater management plan submittal includes this application form, a supplement form for each BMP proposed (see Section V), design calculations, and plans and specifications showing all road and BMP details.

I. PROJECT INFORMATION

NCDOT Project Number: R-2245 County: BRUNSWICK

Project Name: NEW ROUTE FROM SR-1104 (OCEAN BEACH DRIVE) TO NC-211 SECOND BRIDGE TO OAK ISLAND

Project Location: FROM OAK ISLAND TO MIDWAY

Contact Person: RAY LOVINGGOOD Phone: 1.919.250.4100 Fax: 1.919.250.4108

Receiving Stream Name: INTRACOASTAL WATERWAY & DAVIS CANAL River Basin: LUMBER Class: SA

Proposed linear feet of project: 23,865

Proposed Structural BMP and Road Station *(attach a list of station and BMP type if more room is needed)*:
-L- STA 25+00 RT, STORM CHAMBER; -L- STA 48+00 LT & RT INFILTRATION BASIN

Type of proposed project: *(check all that apply)*:

☑ New ☑ Widening ☑ 2 lane* ☐ 4 lane* ☐ Curb and Gutter ☐ Bridge Replacement

☐ Other *(Describe)*

**2 lane and 4 lane imply that roadside ditches are used unless Curb and Gutter is also checked.*

II. REQUIRED ITEMS CHECKLIST

Initial in the space provided below to indicate the following design requirements have been met and supporting documentation is attached. Supporting documentation shall, at a minimum, consist of a brief narrative description including (1) the scope of the project, (2) how the items below are met, (3) how the proposed best management practices minimize water quality impacts, and (4) any significant constraints and/or justification for not meeting a, b, c and d to the maximum extent practicable.

Designer's Initials

RDL a. The amount of impervious surface has been minimized as much as possible.

RDL b. The runoff from the impervious areas has been diverted away from surface waters as much as possible.

RDL c. Best Management Practices are employed which minimize water quality impacts.

RDL d. Vegetated roadside ditches are 3:1 slope or flatter.

III. OPERATION AND MAINTENANCE AGREEMENT

I acknowledge and agree by my initials below that the North Carolina Department of Transportation is responsible for the implementation of the four maintenance items listed. I agree to notify DWQ of any operational problems with the BMP's that would impact water quality or prior to making any changes to the system or responsible party.

Maintenance Engineer's Initials

DT a. BMP's shall be inspected and maintained in good working order.

DT b. Eroded areas shall be repaired and reseeded as needed.

DT c. Stormwater collection systems, including piping, inlets, and outlets, shall be maintained to insure proper functioning.

Maintenance Engineer's Name: DAVID L. THOMAS, P.E.

Title: DIVISION MAINTENANCE ENGINEER

IV. APPLICATION CERTIFICATION

I, *(print or type name)* _____ of _____ Branch, certify that the information included on this permit application form is, to the best of my knowledge, correct and that the project will be constructed in conformance with the approved plans and that the proposed project complies with the requirements of 15A NCAC 2H .1000.

Title: _____

Address: _____

Signature: _____ Date: _____

V. SUPPLEMENT FORMS

The applicable state stormwater management permit supplement form(s) listed below must be submitted for each BMP specified for this project. Contact the Stormwater and General Permits Unit at (919) 733-5083 for the status and availability of these forms.

Form SWU-102	Wet Detention Basin Supplement
Form SWU-103	Infiltration Basin Supplement
Form SWU-104	Low Density Supplement
Form SWU-105	Curb Outlet System Supplement
Form SWU-106	Off-Site System Supplement
Form SWU-107	Underground Infiltration Trench Supplement
Form SWU-108	Neuse River Basin Supplement
Form SWU-109	Innovative Best Management Practice Supplement
Form SWU-110	Extended Dry Detention Basin Supplement

Permit No. _____
(to be provided by DWQ)

State of North Carolina
Department of Environment and Natural Resources
Division of Water Quality

STORMWATER MANAGEMENT PERMIT APPLICATION FORM

INFILTRATION BASIN SUPPLEMENT

This form may be photocopied for use as an original

DWQ Stormwater Management Plan Review:
A complete stormwater management plan submittal includes a stormwater management permit application, an infiltration basin supplement for each system, design calculations, soils report and plans and specifications showing all stormwater conveyances and system details.

I. PROJECT INFORMATION

SECOND BRIDGE TO OAK ISLAND

Project Name : NEW ROUTE FROM SR1104 (OCEAN BEACH DRIVE) TO NC 211

Contact Person: RAY LOVINGGOOD Phone Number: (919) 250.4100

This worksheet applies to: Basin No. INFILTRATION BASIN *(as identified on plans)* in Drainage Area INTRACOASTAL WATERWAY BRIDGE *(from Form SWU-101)*

II. DESIGN INFORMATION - Attach supporting calculations/documentation. The soils report must be based upon an actual field investigation and soil borings. County soil maps are not an acceptable source of soils information. All elevations shall be in feet mean sea level (fmsl).

Soils Report Summary

Soil Type WANDO VARIANT

Infiltration Rate 64.4 (in/hr) or cf/hr/sf *(circle appropriate units)*

SHWT Elevation < 20.5 fmsl *(Seasonal High Water Table elevation)*

Basin Design Parameters

Design Storm 1.5 inch *(1.5 inch event for SA waters, 1 inch event for others)*

Design Volume 7,600 c.f.

Drawdown Time 1 days

Basin Dimensions

Basin Size 100 ft. x 34 ft. = 3400 sq. ft. *(bottom dimensions)*

Basin Volume Provided 22,200 c.f.

Basin Elevations

Bottom Elevation 23.0 fmsl

Storage Elevation 23.6 fmsl

Top Elevation 26.0 fmsl

III. REQUIRED ITEMS CHECKLIST

The following checklist outlines design requirements per the Stormwater Best Management Practices Manual (N.C. Department of Environment, Health and Natural Resources, February 1999) and Administrative Code Section: 15 A NCAC 2H .1008.

Initial in the space provided to indicate that the following design requirements have been met and supporting documentation is attached. If the applicant has designated an agent in the Stormwater Management Permit Application Form, the agent may initial below. **Attach justification if a requirement has not been met.**

Applicants Initials

RDL a. System is located 50 feet from class SA waters and 30 feet from other surface waters.

RDL b. System is located at least 100 feet from water supply wells.

RDL c. Bottom of system is at least 2 feet above the seasonal high water table.

RDL d. Bottom of the system is 3 feet above any bedrock or impervious soil horizon.

RDL e. System is not sited on or in fill material or DWQ approval has been obtained.

RDL f. System is located in a recorded drainage easement for the purposes of operation and maintenance and has recorded access easements to the nearest public right-of-way.

RDL g. Drainage area for the device is less than 5 acres.

RDL h. Soils have a minimum hydraulic conductivity of 0.52 inches per hour and soils report is attached.

RDL i. System captures and infiltrates the runoff from the first 1.0 inch of rainfall (1.5 inch event for areas draining to SA waters). Design volume and infiltration calculations attached.

RDL j. System is sized to take into account the runoff at the ultimate built-out potential from all surfaces draining to the system, including any off-site drainage. Calculations attached.

RDL k. All side slopes stabilized with vegetated cover are no steeper than 3:1 (H:V).

_____ l. A pretreatment device such as a catch basin, grease trap, filter strip, grassed swale or sediment trap is provided.

RDL m. Bottom of the device is covered with a layer of clean sand to an average depth of 4 inches or dense vegetative cover is provided.

_____ n. Vegetated filter is provided for overflow and detail is shown on plans (Required minimum length is 50 feet for SA waters, 30 feet for other waters).

RDL o. Flow distribution mechanism within the basin is provided.

RDL p. A benchmark is provided to determine the sediment accumulation in the pretreatment device.

RDL q. Runoff in excess of the design volume bypasses off-line systems (bypass detail provided).

RDL r. System is designed to draw down the design storage volume to the proposed bottom elevation under seasonal high water conditions within five days. A soils report and all pertinent draw-down calculations are attached.

RDL s. Plans ensure that the installed system will meet design specifications (constructed or restored) upon initial operation once the project is complete and the entire drainage area is stabilized.

IV. INFILTRATION BASIN OPERATION AND MAINTENANCE AGREEMENT

1. After every runoff producing rainfall event and at least monthly inspect the infiltration system for erosion, trash accumulation, vegetative cover, and general condition.
2. Repair eroded areas immediately, re-seed as necessary to maintain adequate vegetative cover, mow vegetated cover to maintain a maximum height of six inches, and remove trash as needed.
3. After every runoff producing rainfall event and at least monthly inspect the bypass, inflow and overflow structures for blockage and deterioration. Remove any blockage and repair the structure to approved design specifications.
4. Remove accumulated sediment from the pretreatment system and infiltration basin annually or when depth in the pretreatment unit is reduced to 75% of the original design depth. The system shall be restored to the original design depth without over-excavating. Over-excavating may cause the required water table separation to be reduced and may compromise the ability of the system to perform as designed. Removed sediment shall be disposed of in an appropriate manner and shall not be handled in a manner that will adversely impact water quality (i.e. stockpiling near a stormwater treatment device or stream, etc.).

   A benchmark shall be established in the pretreatment unit. The benchmark will document the original design depth so that accurate sediment accumulation readings can be taken. The measuring device used to determine the depth at the benchmark shall be such that it will give an accurate depth reading and not readily penetrate into accumulated sediments.

   When the design depth reads 0.3 feet in the pretreatment unit, the sediment shall be removed from both the pretreatment unit and the infiltration basin.

5. If the Division determines that the system is failing, the system will immediately be repaired to original design specifications. If the system cannot be repaired to perform its design function, other stormwater control devices as allowed by NCAC 2H .1000 must be designed, approved and constructed.

I acknowledge and agree by my signature below that ~~I~~ THE NCDOT am responsible for the performance of the five maintenance procedures listed above. I agree to notify DWQ of any problems with the system or prior to any changes to the system or responsible party.

Print Name and Title: DAVID L. THOMAS, P.E DIVISION MAINTENANCE ENGR.

Address: 124 DIVISION DRIVE WILMINGTON NC 28401

Phone: 910 251-5724 Date: 12/1/05

Signature: [signature]

Note: *The legally responsible party should not be a homeowners association unless more than 50% of the lots have been sold and a resident of the subdivision has been named the president.*

I, _____, a Notary Public for the State of _____, County of _____, do hereby certify that _____ personally appeared before me this ____ day of _____, _____, and acknowledge the due execution of the forgoing infiltration basin maintenance requirements.

Witness my hand and official seal,

SEAL My commission expires_____

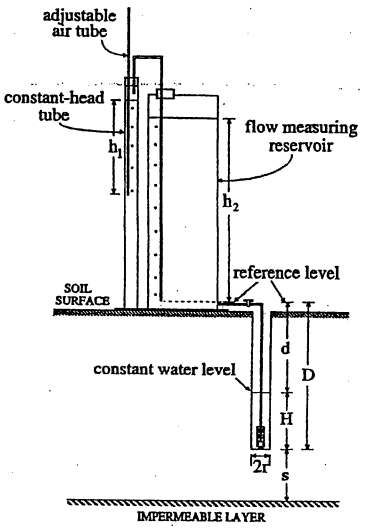
S&ME
"IN-SITU" CONSTANT HEAD PERMEAMETER

Date: 9/16/2004
Location: Ksat 6
Horizon: C
Client: NCDOT
Project Name: Oak Island NCDOT Project
Project #: 1051-04-188

Hole Depth:	1.83	Feet
Hole Radius (r):	0.08	Feet
Bubble Tube to Surface:	0.25	Feet
Reference Tube to Hole Bottom (D):	2.08	Feet
Water Depth in Hole (H):	0.16	Feet
CHT Tube(s) Setting (h_1):	1.92	Feet

Chamber Used: 0.11 Ft^2

Initial Water in Hole:	0.16	Feet
Final Water in Hole:	0.16	Feet



$Ksat = CQ/(2\pi iH^2)$

$C = \sinh^{-1}(H/r) - [(r/H)^2 + 1]^{1/2} + r/H$

$\sinh^{-1}$ = inverse hyperbolic sin of a number
H = Height of water in hole (cm)
r = radius of hole (cm)
Q = Constant Flow Rate (Gal/day)
= Cross Sectional Area of Resevior x Length of Drop in Water Column over Time

r = **0.08** ft
H = **0.16** ft

C = **0.83**
Q = **187.49** Gallons/Day

Time	Drop in Water Column (ft)
0-5 min.	0.492
5 - 10 min.	0.705
12 - 17 min.	0.837
17 - 22 min.	0.754
23 - 28 min.	0.902
28 - 33 min.	**0.722**
34 - 39 min.	**0.840**
39 - 43 min.	**0.748**
Avg.	**0.770**

Time (min) = 5

Cross Sectional Area = **0.11** ft^2
Length of Drop in Water Column = **221.76** ft/day

K_{sat} = 962.85 Gallons/Day/ft^2

Inches/Hour = **64.36**

Note: Ksat calculations are based on average drop in Water Column (ft) after equilibrium is reached.

ICWW SITE

Prepared by: S&ME, Inc.
Martin Mabe

S&ME, INC.
SOIL PROFILE DESCRIPTIONS

ICWW SITE

Client:	North Carolina DOT	Date:	9-16-04
Project Name:	Oak Island	Project No.	1051-04-188
County:	Brunswick	State	NC
Location:	Oak Island, NC	Site/Field No.	Ksat-6
Soil Series:	Wando Variant		
Apparent Water Table:	>72 Inches	Seasonal High Water Table:	>72 Inches
Vegetation:	Pines & Oaks	Slope:	0-1 %
Boring Terminated at	72 Inches		

Horizon	Depth	Matrix	Mottles	Texture	Structure	Consistence	Boundary
O	2-0	-	-	sl	-	-	cs
A	0-5	10YR 7/1	-	s	sg	ml	gw
C1	5-8	10YR 7/4	-	s	sg	ml	gw
C2	8-17	2.5Y 7/6	-	s	sg	ml	gw
C3	17-25	2.5Y 6/6	-	s	sg	ml	gw
C4	25-46	2.5Y 7/3	-	s	sg	ml	gw
C5	46-72+	2.5Y 8/2	-	s	sg	ml	-

COMMENTS:

LEGEND: Attached at the end of logs

DESCRIBED BY: Rob Willcox DATE 9-16-04

Permit No. _____
(to be provided by DWQ)

State of North Carolina
Department of Environment and Natural Resources
Division of Water Quality

STORMWATER MANAGEMENT PERMIT APPLICATION FORM

UNDERGROUND INFILTRATION TRENCH SUPPLEMENT

This form may be photocopied for use as an original

DWQ Stormwater Management Plan Review:
A complete stormwater management plan submittal includes a stormwater management permit application, an underground infiltration trench supplement for each system, design calculations, and plans and specifications showing all stormwater conveyances and system details.

I. PROJECT INFORMATION

SECOND BRIDGE TO OAK ISLAND

Project Name : NEW ROUTE FROM SR-1104 (OCEAN BEACH DRIVE) TO NC-211

Contact Person: RAY LOVINGGOOD Phone Number: (919) 250. 4100

For projects with multiple infiltration systems, a supplement form must be completed for each system. This worksheet applies to: Trench STORM CHAMBER *(from plans)* in Drainage Area DAVIS CANAL BRIDGE *(from Form SWU-101)*

II. DESIGN INFORMATION (attach supporting calculations/documentation):

Soils Report Summary *(based upon an actual field investigation and soil borings)*

Soil Type: FILL

Infiltration Rate: 23.3 (in/hr) or cf/hr/sf (*circle appropriate units*)

SHWT Elevation: < 11 fmsl (*Seasonal High Water Table elevation*)

Trench Design Parameters

Design Volume: 1,765 c.f.

Design Storm: 1.5 inch event (*1.5 inch event for SA waters, 1 inch event for others*)

Drawdown Time: _____ days

Perforated Pipe Size: 51"w x 30"h inch ~~diameter~~ storm chamber

Perforated Pipe Length: 170 ft.

No. Observation Wells: _____ *(may be required on a case-by-case basis)*

Stone Type (if used): WASHED # 57

Stone Void Ratio: 40%

Trench Elevations *(in feet mean sea level)*

Bottom Elevation: 11.75' BOTTOM fmsl OF STORM CHAMBER

Storage/Overflow Elevation: 14.25' fmsl

Trench Dimensions

Height	2.5 ft.	Length	170 ft.
Width	4.25 ft.	Volume Provided	1,800 cu.ft.

III. REQUIRED ITEMS CHECKLIST

The following checklist outlines design requirements per the Stormwater Best Management Practices manual (N.C. Department of Environment, Health and Natural Resources, November 1995) and Administrative Code Section: 15 A NCAC 2H .1008.

Initial in the space provided to indicate that the following design requirements have been met and supporting documentation is attached. If the applicant has designated an agent in the Stormwater Management Permit Application Form, the agent may initial below. Attach justification if a requirement has not been met.

Applicants Initials

RDL	a. System is located 50 feet from class SA waters and 30 feet from other surface waters.
RDL	b. System is located at least 100 feet from water supply wells.
RDL	c. Bottom of system is at least 2 feet above the seasonal high water table.
RDL	d. Bottom of the system is 3 feet above any bedrock or impervious soil horizon.
RDL	e. Off-line system, runoff in excess of the design volume bypasses the system (bypass detail provided).
RDL	f. System is designed to draw down the design storage volume to the proposed bottom elevation under seasonal high water conditions within five days based upon infiltration through the bottom only (a hydrogeologic evaluation may be required).
RDL	g. Soils have a minimum hydraulic conductivity of 0.52 inches per hour.
	h. System is not sited on or in fill material or DWQ approval has been obtained.
RDL	i. Plans ensure that the installed system will meet design specifications (constructed or restored) upon initial operation once the project is complete and the entire drainage area is stabilized.
RDL	j. System is sized to take into account the runoff at the ultimate built-out potential from all surfaces draining to the system, including any off-site drainage.
RDL	k. System is located in a recorded drainage easement for the purposes of operation and maintenance and has recorded access easements to the nearest public right-of-way.
RDL	l. System captures and infiltrates the runoff from the first 1.0 inch of rainfall (1.5 inch event for areas draining to SA waters).
RDL	m. Drainage area for the device is less than 5 acres.
	n. A pretreatment device (filter strip, grassed swale, sediment trap, etc.) is provided.
	o. Trench bottom is covered with a layer of clean sand to an average depth of 4 inches.
RDL	p. Sides of the infiltration trench are lined with geotextile fabric.
	q. Rock used is free of fines (washed stone) and has a large void ratio.
	r. Side to bottom area ratio is less than 4:1.

_____ s. Observation well(s) are provided (case-by-case basis).

KDL t. Vegetated filter is provided for overflow (50 feet for SA waters, 30 feet for other waters) and detail is shown on plans.

KDL u. A benchmark for checking sediment accumulation is provided.

IV. UNDERGROUND INFILTRATION TRENCH OPERATION AND MAINTENANCE AGREEMENT

1. After every runoff producing rainfall event and at least monthly inspect the bypass/overflow structure for blockage and deterioration and the infiltration system for erosion, trash accumulation, grass cover, and general condition.

2. Repair eroded areas immediately, re-seed as necessary to maintain adequate vegetative cover, mow vegetative cover to maintain a maximum height of six inches, and remove trash and blockages as needed to maintain system performance.

3. Remove accumulated sediment annually or when depth is reduced to 75% of the original design depth. Restore depth to original design depth without over-excavating. Over-excavating may cause the required water table separation to be reduced and may compromise the ability of the system to perform as designed.

4. The water level in any monitoring wells will be recorded after a 1 inch rainfall event and at least once a month. Chronic high water table elevations (within 1 foot of the bottom of the system for a period of three months) shall be reported to DWQ immediately.

5. If DWQ determines that the system is failing, the system will immediately be repaired or replaced to original design specifications. If the system cannot be repaired to perform its design function, other stormwater control devices as allowed by NCAC 2H .1000 must be designed, approved and constructed.

6. Remove accumulated sediment from the infiltration system annually or when depth in the unit is reduced to 75% of the original design depth. The system shall be restored to the original design depth without over-excavating. Over-excavating may cause the required water table separation to be reduced and may compromise the ability of the system to perform as designed. Removed sediment shall be disposed of in an appropriate manner and shall not be handled in a manner that will adversely impact water quality (i.e. stockpiling near a stormwater treatment device or stream, etc.).

   A benchmark shall be established in the infiltration system. The benchmark will document the original design depth so that accurate sediment accumulation readings can be taken. The measuring device used to determine the depth at the benchmark shall be such that it will give an accurate depth reading and not readily penetrate into accumulated sediments.

   When the depth at the benchmark reads 0.5', the accumulated sediment shall be removed from the system.

I acknowledge and agree by my signature below that ~~I~~ AN NCDOT am responsible for maintaining the stormwater collection system in accordance with the six maintenance procedures listed above. I agree to notify DWQ of any problems with the system or prior to any changes to the system or responsible party.

Print Name and Title: DAVID L. THOMAS, P.E. DIVISION MAINTENANCE ENGR

Address: 124 DIVISION ~~MAINT.~~ DRIVE

Phone: (910) 251-5724 Date: 12/1/05

Signature:

Note: *The legally responsible party should not be a homeowners association unless more than 50% of the lots have been sold and a resident of the subdivision has been named the president.*

I, _____, a Notary Public for the State of _____, County of _____, do hereby certify that _____ personally appeared before me this __ day of _____, _____, and acknowledge the due execution of the forgoing infiltration basin maintenance requirements. Witness my hand and official seal,

SEAL My commission expires_____

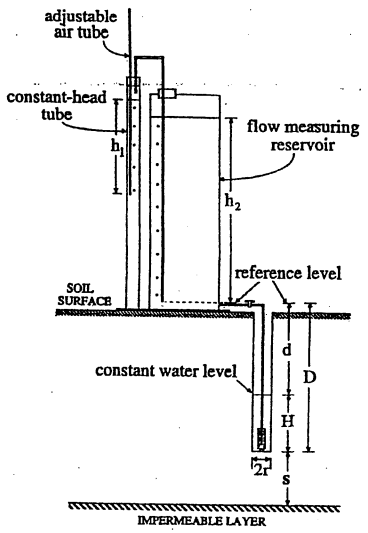
S&ME
"IN-SITU" CONSTANT HEAD PERMEAMETER

Date: 9/17/2004
Location: Ksat 3
Horizon: C
Client: NCDOT
Project Name: Oak Island NCDOT Project
Project #: 1051-04-188

Hole Depth:	2.08	Feet
Hole Radius (r):	0.08	Feet
Bubble Tube to Surface:	0.25	Feet
Reference Tube to Hole Bottom (D):	2.33	Feet
Water Depth in Hole (H):	0.16	Feet
CHT Tube(s) Setting (h_1):	2.17	Feet

Chamber Used:	0.11 ▼	Ft^2

Initial Water in Hole:	0.16	Feet
Final Water in Hole:	0.16	Feet



$$Ksat = CQ/(2PiH^2)$$

$$C = \sinh^{-1}(H/r) - [(r/H)^2 + 1]^{1/2} + r/H$$

$\sinh^{-1}$ = inverse hyperbolic sin of a number
H = Height of water in hole (cm)
r = radius of hole (cm)
Q = Constant Flow Rate (Gal/day)
= Cross Sectional Area of Resevior x Length of Drop in Water Column over Time

r = **0.08** ft
H = **0.16** ft

C = **0.83**
Q = **67.77** Gallons/Day

Time	Drop in Water Column (ft)
0-5 min.	0.269
5 - 10 min.	0.259
10 - 15 min.	**0.311**
15 - 20 min.	**0.262**
20 - 25 min.	**0.262**
Avg.	**0.278**

Time (min) = 5

Cross Sectional Area = **0.11** ft^2
Length of Drop in Water Column = **80.16** ft/day

K_{sat} = 348.04 Gallons/Day/ft^2

Inches/Hour = **23.26**

Note: Ksat calculations are based on average drop in Water Column (ft) after equilibrium is reached.

Prepared by: S&ME, Inc.
Martin Mabe

DAVIS CANAL SITE

S&ME, INC.
SOIL PROFILE DESCRIPTIONS

DAVIS CANAL SITE

Client:	North Carolina DOT	Date:	9-17-04
Project Name:	Oak Island	Project No.	1051-04-188
County:	Brunswick	State	NC
Location:	Oak Island, NC	Site/Field No.	Ksat-3
Soil Series:	Fill		
Apparent Water Table:	>72 Inches	Seasonal High Water Table:	>72 Inches
Vegetation:	R/W	Slope:	1-2 %
Boring Terminated at	72 Inches		

Horizon	Depth	Matrix	Mottles	Texture	Structure	Consistence	Boundary
Fill	0-10	10YR 6/3	-	s	sg	ml	cw
Fill	10-21	10YR 5/6	-	s	sg	ml	gw
Fill	21-27	10YR 3/3	-	s	sg	ml	gw
C1	27-35	2.5Y 6/6	-	s	sg	ml	gw
C2	35-43	2.5Y 6/4	-	s	sg	ml	gw
C3	43-72+	2.5Y 6/6	-	s	sg	ml	-

COMMENTS:

LEGEND: Attached at the end of logs

DESCRIBED BY: Rob Willcox DATE 9-17-04

JUSTIFICATION FOR CERTAIN REQUIREMENTS ON REQUIRED ITEM CHECKLIST NOT BEING MET

R-2245, State Project 34407.1 Date: 14 NOV 05
Brunswick County
Hydraulics Project Manager: Max S. Price, PE

DAVIS CANAL BRIDGE

Item h. System is not sited on or in fill material or DWQ approval has been obtained.

The location for the infiltration chambers was discussed with regional DWQ staff.

Item n. A pretreatment device (filter strip, grassed swale, sediment trap, etc.) is provided.

The proposed drainage area is comprised entirely of bridge deck and paved shoulder. Sedimentation should not be a problem, and large debris will be prevented from entering the system by the bridge deck drain size and grated inlets.

Item o. Trench bottom is covered with a layer of clean sand to an average depth of 4 inches.

The storm chambers will be bedded on a minimum of six inches of washed no. 57 stone.

Item r. Side to bottom ratio is less than 4:1.

The storm chambers are buried in a trench that will have vertical walls and backfilled with native, sandy material. There will not be an open trench or swale providing infiltration with this installation.

INTRACOASTAL WATERWAY BRIDGE

Item l. A pretreatment device such as a catch basin, grease trap, filter strip, grassed swale or sediment trap is provided.

The proposed drainage area is comprised entirely of bridge deck and paved shoulder. Sedimentation should not be a problem, and large debris will be prevented from entering the system by the bridge deck drain size and grated inlets.

Item n. Vegetated filter is provided for overflow and detail is shown on plans (Requred minimum length is 50 feet for SA waters, 30 feet for other waters).

The proposed design provides for infiltration of the overflow and does not convey the overflow to any receiving channel or body of water. The overflow "swales" are similar to the main infiltration basin, but uses side slopes of 4:1 rather than the 6:1 in the main basin. The steeper sides were required to fit the swales in the available space.

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
HIGHWAY BUILDING
P. O. BOX 25201
RALEIGH, NORTH CAROLINA 27611

SUBJECT STORM CHAMBER PROJECT R-2245
COUNTY
PREPARED BY RDL DATE 22 NOV 05 STATION
CHECKED BY MSP DATE STR NO SHEET OF

DETERMINE DRAW DOWN

$Q = (0.00023) \times K \times A \times \Delta H/\Delta L$

$Q = (0.00023) \times (25\% \times 23.26\ in/hr) \times (4' \times 170') \times 1$

$Q = 0.9095\ cfs$

DECK RUNOFF = $1,765\ ft^3$

TIME FOR DRAWDOWN = $1,765\ ft^3 / 0.9095\ ft^3/sec = 1,940\ sec$

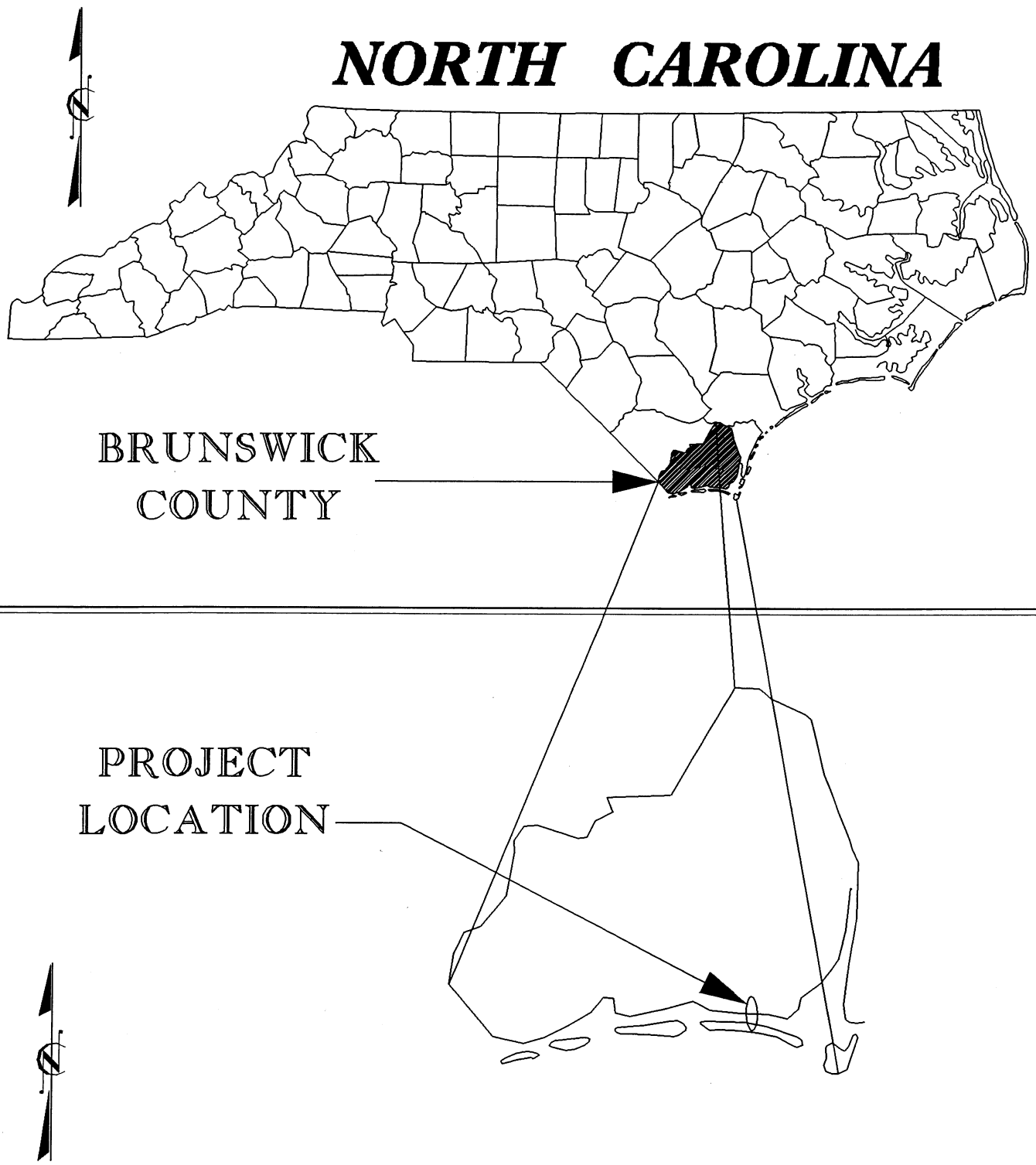
$= 32\ min$

SD-01

Hydrograph for Pond 2P: Infiltration Basin, South

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)	Primary (cfs)	Secondary (cfs)
0.00	0.00	0	23.00	0.00	0.00	**0.00**
1.00	0.00	0	23.00	0.00	0.00	0.00
2.00	0.00	0	23.00	0.00	0.00	0.00
3.00	0.00	2	23.00	0.00	0.00	0.00
4.00	0.01	17	23.00	0.00	0.00	0.00
5.00	0.01	40	23.01	0.01	0.01	0.00
6.00	0.02	70	23.01	0.01	0.01	0.00
7.00	0.03	110	23.02	0.02	0.02	0.00
8.00	0.04	168	23.04	0.02	0.02	0.00
9.00	0.07	256	23.05	0.04	0.04	0.00
10.00	0.10	388	23.08	0.06	0.06	0.00
11.00	0.16	588	23.12	0.09	0.09	0.00
12.00	**1.64**	**1,689**	**23.35**	**0.25**	**0.25**	0.00
13.00	**0.20**	**2,898**	**23.59**	**0.42**	**0.42**	0.00
14.00	0.13	2,136	23.45	0.32	0.32	0.00
15.00	0.10	1,556	23.33	0.23	0.23	0.00
16.00	0.07	1,136	23.24	0.17	0.17	0.00
17.00	0.05	831	23.17	0.12	0.12	0.00
18.00	0.04	618	23.13	0.09	0.09	0.00
19.00	0.04	469	23.10	0.07	0.07	0.00
20.00	0.03	371	23.08	0.05	0.05	0.00
21.00	0.03	304	23.06	0.05	0.05	0.00
22.00	0.03	258	23.05	0.04	0.04	0.00
23.00	0.02	222	23.05	0.03	0.03	0.00
24.00	0.02	194	23.04	0.03	0.03	0.00
25.00	0.00	117	23.02	0.02	0.02	0.00
26.00	0.00	69	23.01	0.01	0.01	0.00
27.00	0.00	40	23.01	0.01	0.01	0.00
→ 28.00	0.00	24	23.00	0.00	0.00	0.00
29.00	0.00	14	23.00	0.00	0.00	0.00
30.00	0.00	8	23.00	0.00	0.00	0.00
31.00	0.00	5	23.00	0.00	0.00	0.00
32.00	0.00	3	23.00	0.00	0.00	0.00
33.00	0.00	2	23.00	0.00	0.00	0.00
34.00	0.00	1	23.00	0.00	0.00	0.00
35.00	0.00	1	23.00	0.00	0.00	0.00
36.00	0.00	0	23.00	0.00	0.00	0.00
37.00	0.00	0	23.00	0.00	0.00	0.00
38.00	0.00	0	23.00	0.00	0.00	0.00
39.00	0.00	0	23.00	0.00	0.00	0.00
40.00	0.00	0	23.00	0.00	0.00	0.00
41.00	0.00	0	23.00	0.00	0.00	0.00
42.00	0.00	0	23.00	0.00	0.00	0.00
43.00	0.00	0	23.00	0.00	0.00	0.00
44.00	0.00	0	23.00	0.00	0.00	0.00
45.00	0.00	0	23.00	0.00	0.00	0.00
46.00	0.00	0	23.00	0.00	0.00	0.00
47.00	0.00	0	23.00	0.00	0.00	0.00
48.00	0.00	0	23.00	0.00	0.00	0.00

DRAW DOWN TIME



LOCATION MAP

NCDOT

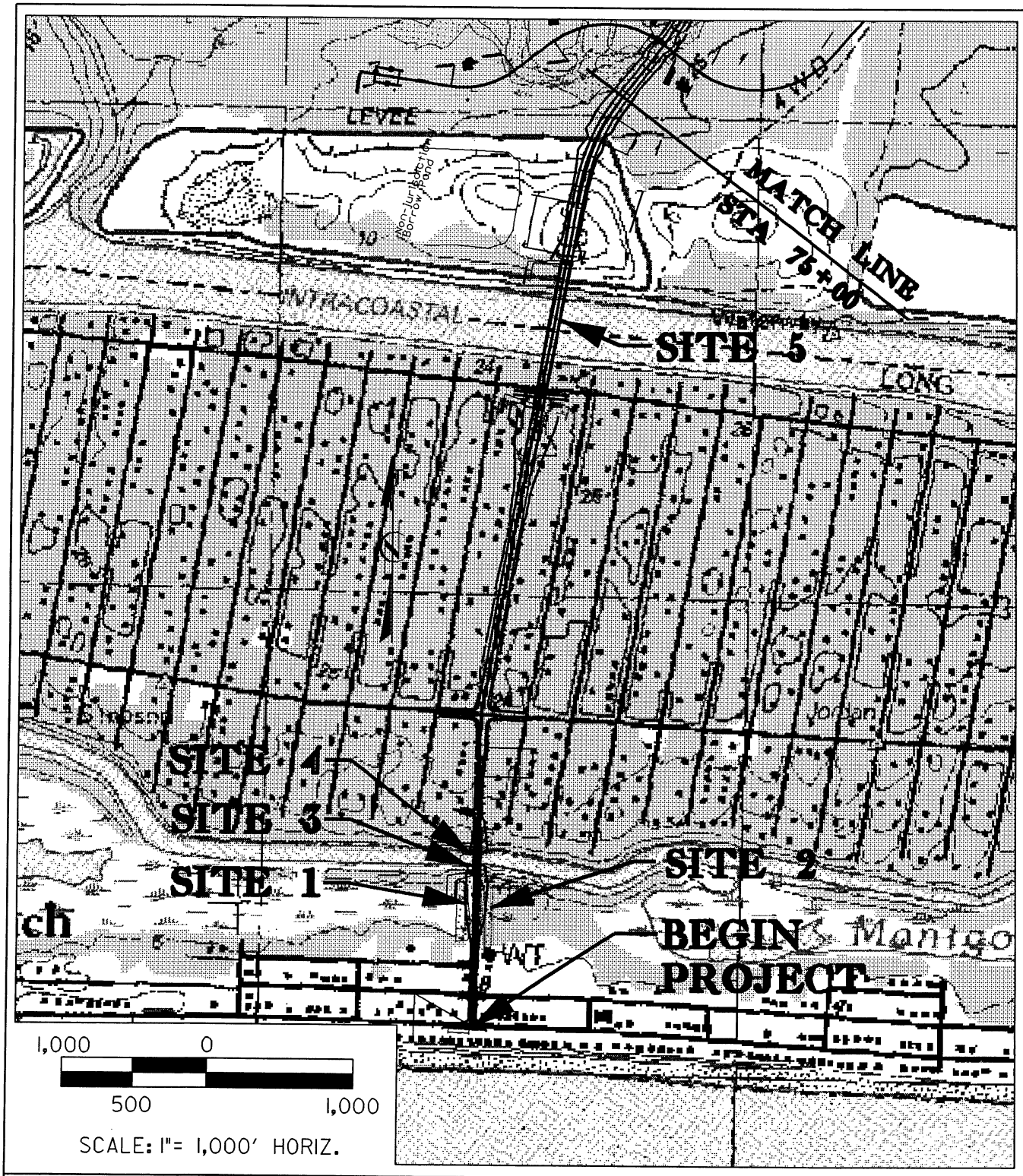
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY

PROJECT 34407.1.1 (R-2245)

SECOND BRIDGE TO OAK ISLAND

SHEET OF

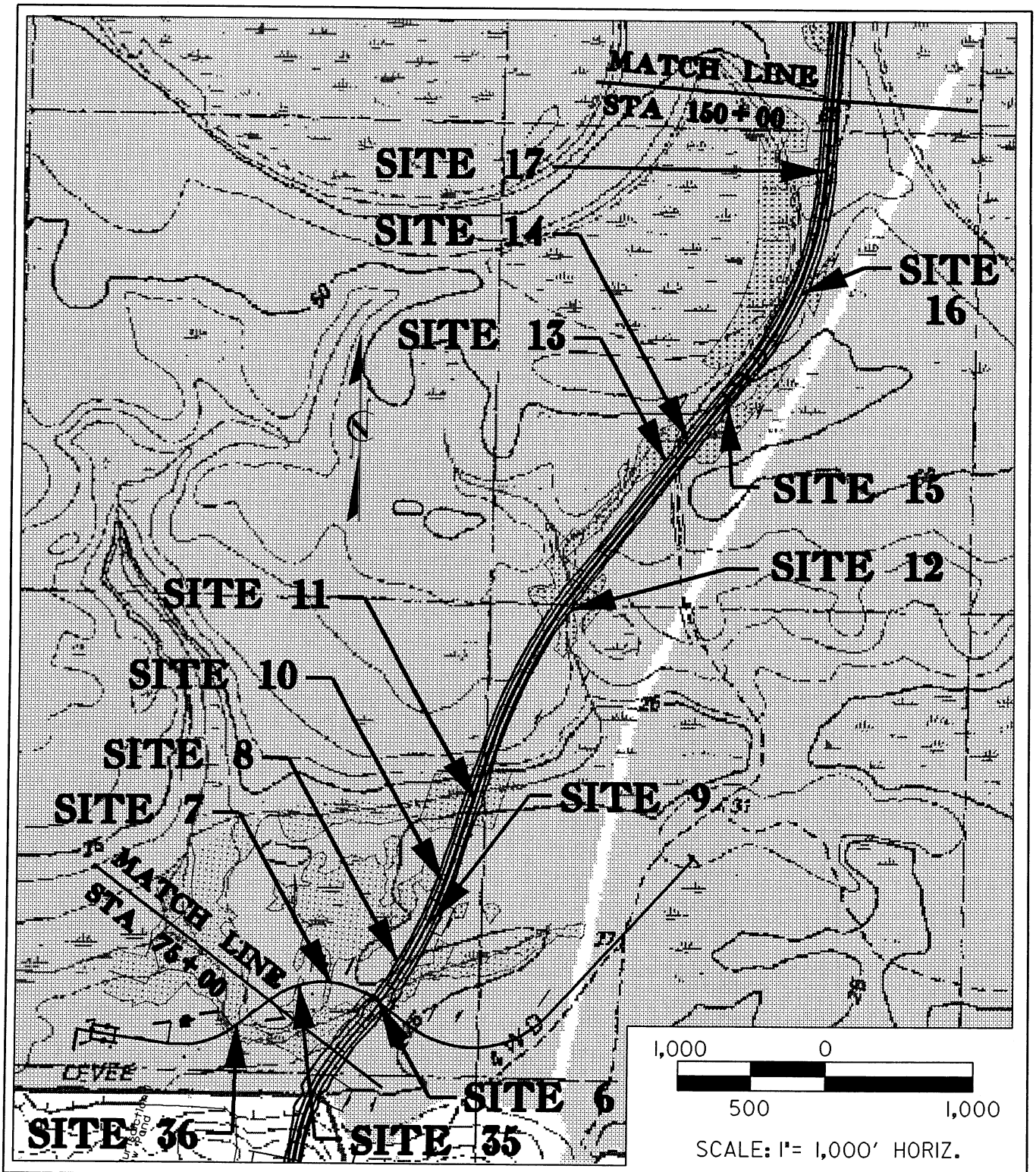


SITE MAP 1 of 4

NCDOT

DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT 34407.1.1 (R-2245)
NEW ROUTE FROM SR 1104
(BEACH DR) TO NC 211
(SECOND BRIDGE TO OAK ISLAND)

SHEET OF

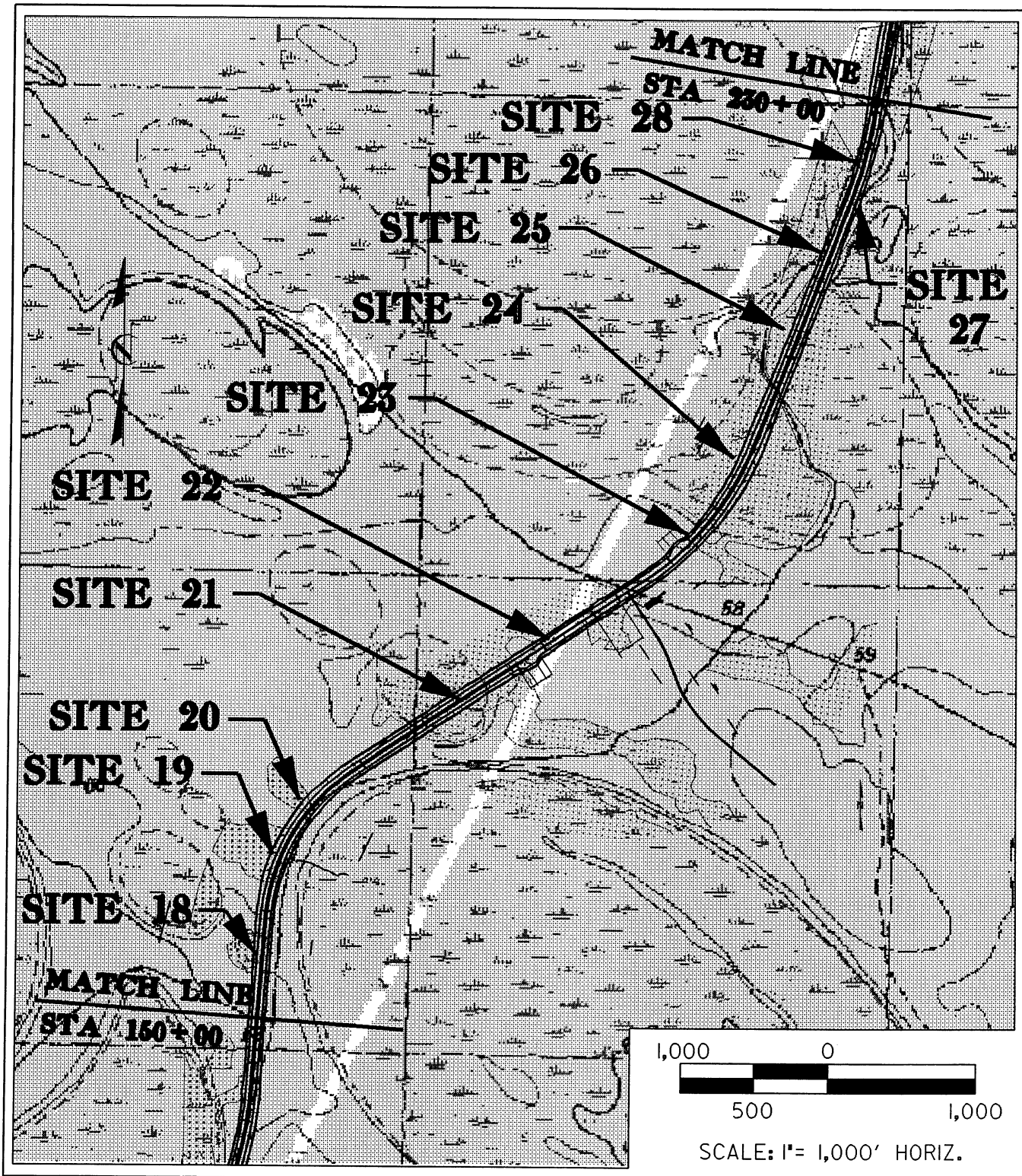


SITE MAP 2 of 4

NCDOT

DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT 34407.1.1 (R-2245)
NEW ROUTE FROM SR 1104
(BEACH DR) TO NC 211
(SECOND BRIDGE TO OAK ISLAND)

SHEET OF

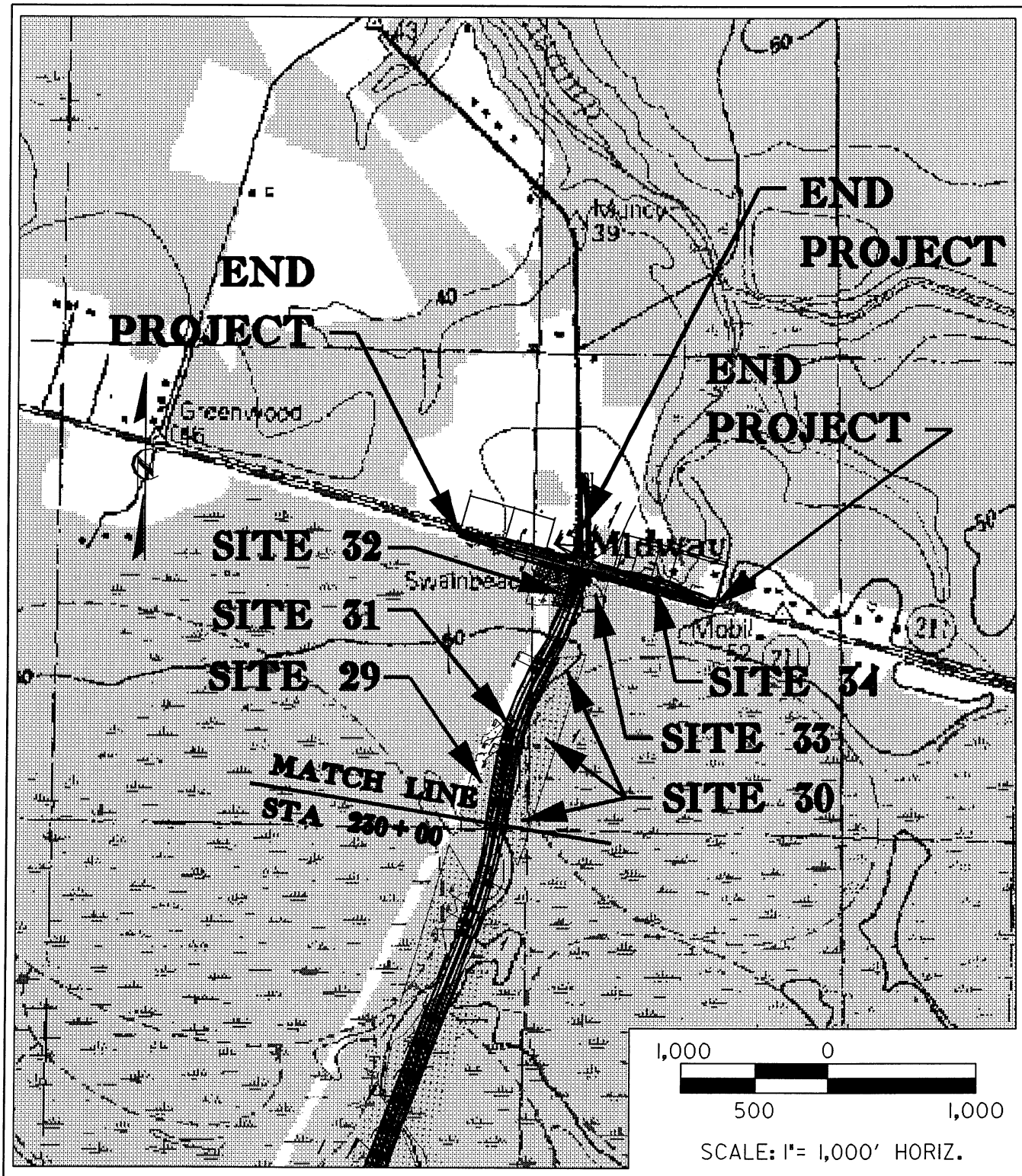


SITE MAP 3 of 4

NCDOT

DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT 34407.1.1 (R-2245)
NEW ROUTE FROM SR 1104
(BEACH DR) TO NC 211
(SECOND BRIDGE TO OAK ISLAND)

SHEET OF



SITE MAP 4 of 4

NCDOT

DIVISION OF HIGHWAYS
BRUNSWICK COUNTY
PROJECT 34407.1.1 (R-2245)
NEW ROUTE FROM SR 1104
(BEACH DR) TO NC 211
(SECOND BRIDGE TO OAK ISLAND)

SHEET OF

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
5	BOBBY A. LONDON	129 HELEN AVE.
		BESSEMER CITY, NC 28013
7	OAK ISLAND	EAST DOLPHIN DRIVE
	ELKS LODGE #2769	OAK ISLAND, NC 28465
8	JAMES A. FERRELL	(no address)
9	HOBOKE, INC.	P.O. BOX 433
		OAK ISLAND, NC 28465
11	ROBERT ROBBINS	119 SE 1st STREET
		OAK ISLAND, NC 28465
104	MAS PROPERTIES	131 OCEAN BLVD. WEST
	LLC	HOLDEN BEACH, NC 28462
106	LADANE WILLIAMSON	130 N. FRONT STREET, STE 201
		WILMINGTON, NC 28401

NCDOT

DIVISION OF HIGHWAYS

BRUNSWICK COUNTY

PROJECT 34407.1.1 (R-2245)

SECOND BRIDGE TO

OAK ISLAND

SHEET OF

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
(not	BRUNSWICK ELEC	P.O. BOX 826
numbered)	MEMBERSHIP	SHALLOTTE, NC 28459
107	CBS LLC	36 RICHMOND PLAZA HWY 74
		ROCKINGHAM, NC 28379
109	YOUNGS GAS	P.O. BOX 14
	& GROCERY OF	WINNABOW, NC 28479
	WINNABOW INC.	

NCDOT

DIVISION OF HIGHWAYS

BRUNSWICK COUNTY

PROJECT 34407.1.1 (R-2245)

SECOND BRIDGE TO

OAK ISLAND

SHEET OF

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
7	ACCESS ROAD 2	CLEARING FOR					0.009					
	13+65 to 14+05 +/-	FENCE										
8	82+10 -L- +/- to	ROADWAY FILL	0.046			0.020	0.014					
	83+00 -L- +/- LT											
9	85+95 -L- +/- to	ROADWAY FILL	0.099			0.007						
	86+65 -L- +/- RT											
10	88+05 -L- +/- to	ROADWAY FILL	0.108			0.029	0.035					
	89+75 -L- +/- LT											
11	92+65 -L- +/- to	ROADWAY FILL	1.203			0.204	0.151	0.010	0.002	207	52	
	97+50 -L- +/-											
12	108+20 -L- +/- to	ROADWAY FILL	1.013			0.159	0.055					
	112+65 -L- +/-											
13	120+85 -L- +/- to	ROADWAY FILL	0.029			0.041	0.015					
	123+05 -L- +/- LT											
14	122+85 -L- +/- to	ROADWAY FILL	0.669			0.081	0.023					
	126+55 -L- +/-											
TOTALS, This Sheet:			3.167			0.541	0.302	0.010	0.002	207	52	

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY
PROJECT: 34407.1.1 (R-2245)

SHEET OF

ATN Revised 3/31/05

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
15	127+23 -L- +/- to	ROADWAY FILL	0.003			0.007	0.014					
	127+85 -L- +/- RT											
16	136+35 -L- +/- to	ROADWAY FILL	0.231			0.045						
	138+30 -L- +/- RT											
17	144+25 -L- +/- to	ROADWAY FILL	0.325			0.040	0.030					
	146+10 -L- +/- LT											
18	153+40 -L- +/- to	ROADWAY FILL	0.105			0.042	0.035					
	155+25 -L- +/- LT											
19	159+25 -L- +/- to	ROADWAY FILL	1.070			0.091						
	163+65 -L- +/-											
20	164+55 -L- +/- to	ROADWAY FILL	0.142			0.026						
	165+70 -L- +/- LT											
21	173+70 -L- +/- to	ROADWAY FILL	2.388			0.385	0.125					
	182+40 -L- +/-											
TOTALS, This Sheet:			4.264			0.636	0.204					

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY
PROJECT: 34407.1.1 (R-2245)

SHEET OF

ATN Revised 3/31/05

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
22	184+50 -L- +/- to	ROADWAY FILL	1.313			0.243	0.222					
	191+85 -L- +/-											
23	197+05 -L- +/- to	ROADWAY FILL	0.161			0.021	0.008					
	197+70 -L- +/-											
24	198+55 -L- +/- to	ROADWAY FILL	2.889			0.456	0.089					
	209+30 -L- +/-											
25	208+60 -L- +/- to	ROADWAY FILL	2.497			0.411	0.167					
	219+90 -L- +/-											
26	218+65 -L- +/- to	ROADWAY FILL					0.013					
	220+45 -L- +/- LT											
27	222+25 -L- +/- to	ROADWAY FILL	0.004			0.021	0.007					
	223+65 -L- +/- RT											
28	225+20 -L- +/- to	ROADWAY FILL					0.002					
	225+65 -L- +/- LT											
29	229+50 -L- +/- to	ROADWAY FILL	0.682			0.123	0.019					
	235+30 -L- +/-											
TOTALS, This Sheet:			7.546			1.275	0.527					

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY
PROJECT: 34407.1.1 (R-2245)

SHEET OF

ATN Revised 3/31/05

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
30	229+15 -L- +/- to	ROADWAY FILL	0.687			0.297	0.091					
	242+45 -L- +/-											
31	236+55 -L- +/- to	ROADWAY FILL	0.073			0.015						
	237+60 -L- +/- LT											
*32	SOUTH WEST	ROADWAY FILL	0.514		0.166							
	CORNER OF -L-											
	and NC-211											
		*Drawdown Effect	0.671									
33	SOUTH EAST	ROADWAY FILL	0.047				0.050					
	CORNER OF -L-											
	and NC-211											
34	24+00 -Y7-	10' w x 8' h RCBC						0.009	0.011	34	61	
	(NC-211)											
35	ACCESS ROAD 2	HAND CLEARING					0.006					
	15+65 +/- to	FOR										
	16+45 +/-	RIGHT OF WAY FENCE										
TOTALS, This Sheet:			1.992		0.166	0.312	0.147	0.009	0.011	34	61	

* NOTE: Area of drawdown as a result of moving existing roadway ditch: 0.671 Acres

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY
PROJECT: 34407.1.1 (R-2245)

SHEET OF

ATN Revised 3/31/05

WETLAND PERMIT IMPACT SUMMARY

Site No.	Station (From/To)	Structure Size / Type	WETLAND IMPACTS: Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	SURFACE WATER IMPACTS: Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
*1	16+00-L- +/- to	ROADWAY FILL	0.099				0.039					
	19+80 -L- +/- LT											
*2	15+40 -L- +/- to	ROADWAY FILL	0.162				0.047					
	19+80 -L- +/- RT											
3	20+70 -L- +/- to	CLASS II RIP RAP FILL						0.044	0.001			
	21+20 -L- +/-	SLOPE PROTECTION										
		& TEMP. WORK BRIDGE										
*4	21+75 -L- +/- to	CLASS II RIP RAP FILL	0.018					0.005	0.001			
	22+35 -L- +/-	SLOPE PROTECTION										
		& MECH. CLEARING										
5	56+40 -L- +/- to	BRIDGE OVER										
	60+70 -L- +/-	INTRACOASTAL							0.013			
		WATERWAY										
6	75+40 -L- +/- to	ROADWAY FILL	1.395			0.142	0.075					
	83+00 -L- +/-											
TOTALS, This Sheet:			1.674			0.142	0.161	0.049	0.015			

* NOTE: Wetlands at Sites 1, 2, and 4 are Coastal Wetlands

Total impacts to Coastal Wetlands:

Permanent Fill in Coastal Wetlands: 0.279 acres
Hand Clearing in Coastal Wetlands: 0.086 acres

SPECIAL EROSION CONTROL FENCE (TEMPORARY FILL) WILL BE PLACED IN SOME AREAS OF MECH. CLEARING.

ATN Revised 3/31/05

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY
PROJECT: 34407.1.1 (R-2245)

SHEET OF

WETLAND PERMIT IMPACT SUMMARY

Site 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)
36	ACCESS ROAD 2	HAND CLEARING					0.040					
	20+55 +/- to	FOR										
	21+95 +/-	RIGHT OF WAY FENCE										
TOTALS, This Sheet:							0.040					
PROJECT TOTALS:			18.643		0.166	2.906	1.381	0.068	0.028	241	113	

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BRUNSWICK COUNTY
PROJECT: 34407.1.1 (R-2245)

SHEET OF

ATN Revised 3/31/05

PROJECT REFERENCE NO.	SHEET NO.
R-2245	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

SITE 1
FILL IN COASTAL WETLANDS
&
HAND CLEARING

SITE 2
FILL IN COASTAL WETLANDS
&
HAND CLEARING

HAND CLEARING WILL BE REQUIRED IN AREAS DESIGNATED BY THE PERMITS AND AS DIRECTED BY THE ENGINEER.

SITE 3
FILL IN
SURFACE WATERS
&
WORK BRIDGE

HAND CLEARING WILL BE REQUIRED IN AREAS DESIGNATED BY THE PERMITS AND AS DIRECTED BY THE ENGINEER.

SITE 4
FILL IN COASTAL WETLANDS
&
FILL IN SURFACE WATERS
&
WORK BRIDGE

BEGIN CONSTRUCTION
-Y1- STA.10+00.00

-Y1- POT Sta. 14+00.00

END CONSTRUCTION
-Y1- STA.13+00.00

-Y2- POT Sta. 10+00.00

BEGIN CONSTRUCTION
-Y2- STA.11+00.00

END CONSTRUCTION
-Y2- STA.12+80.00

-Y2- POT Sta. 14+07.11

-Y3- POT Sta. 10+00.00

BEGIN CONSTRUCTION
-Y3- STA.11+00.00

-L- STA. 23+20.00

MATCH LINE SEE SHEET 5

(1) NO DEED

(2) JACK S KEPLEY & STEPHEN C. HARRIS

(3) GERALD C. GOUGER
MAINTAIN DRAINAGE FROM EAST SIDE OF GARAGE TO NORTH SIDE

(4) MICHAEL H. OXFORD
MAINTAIN SURFACE DRAINAGE

(5) BOBBY A. LONDON

(6) TOWN OF LONG BEACH

(7) OAK ISLAND ELKS LODGE #2769

(8) JAMES A. FERRELL, ESTATE

(9) HOBOKE, INC.

(10) CARY V. PETERSON

(11) ROBERT ROBBINS

(88) BRUCE E. LEE

(90) EMMETT C. GUNNERSON

OCEAN WEST BEACH DR. 20' BST

WEST DOLPHIN DR.

WEST PELICAN DR. 24' BST

SOUTH MIDDLETON AVE. 20' BST

OCEAN EAST BEACH DR.

EAST DOLPHIN DR. 25' BST

DAVIS CANAL

MEAN HIGH TIDE

CLASS II RIP RAP (NOT SHOWN TO IMPROVE CLARITY)

EXTEND RIP RAP INTO BULKHEAD

EBB & FLOW

EXISTING BRIDGE
LENGTH = 160.75'
LOW CHORD = 17.36'

SCALE
50' 0 100'

LEGEND
- FILL IN COASTAL WETLANDS
- FILL IN SURFACE WATERS
- HAND CLEARING
- TEMPORARY WORK BRIDGE

REVISIONS 8/17/99

18-NOV-2005 16:56
I:\Highways\Permits\2245 permit psh 04.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2245	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

SITE 5
TWO WORK BRIDGES

NAD 83

INTRACOASTAL RIGHT-OF-WAY OF PERPETUAL EASEMENT

ATLANTIC INTRACOASTAL WATERWAY CENTERLINE (PROVIDED BY THE U.S. ARMY CORPS OF ENGINEERS WILMINGTON DISTRICT)

TOWN OF OAK ISLAND

MEAN HIGH TIDE

BEGIN PROPOSED BULKHEAD

REMOVE EXISTING BULKHEAD

END PROPOSED BULKHEAD

MEAN HIGH TIDE

CORP. OF ENGR. T4-29

CORP. OF ENGR. CONC MON T4-27

INTRACOASTAL RIGHT-OF-WAY OF PERPETUAL EASEMENT

GEORGE L. FISHER, ETUX (71)

BENNY E. PRINCE (903)

HENRY C. HARRIS (904)

RANDY W. GOODNIGHT (906)

CHARLOTTE M. HAWTHORNE (101)

BENNY E. PRINCE (78)

RALPH DICKSON, III (80)

CARL F. MICKEY, JR (81)

JAMES W. WRIGHT (103)

DONALD W. BATCHELOR (907)

PHILLIP M. LEWIS (75)

J. D. MEARS (905)

THOMAS R. STANLEY (77)

BARBARA S. BRUNSON (902)

MATCH LINE SEE SHEET 6 -L- STA. 50+20.00

MATCH LINE SEE SHEET 8 -L- STA. 64+05.00

SCALE
50' 0 100'

TEMPORARY WORK BRIDGE

REVISIONS

8/17/99

18-NOV-2005 14:24
r:\Hydraulics\Permits\r-2245 permit psh 07.dgn
lowingwood at WX21536

PROJECT REFERENCE NO.	SHEET NO.
R-2245	8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

REVISIONS 8/17/99

21-NOV-2005 11:22
r:\Hydraulics\Permits\r-2245 permit psh 08.dgn
$userprofile (d) HYDRAULICS

NAD 83

MATCH LINE SEE SHEET 7 -L- STA. 64+05.00

MATCH LINE SEE SHEET 9 -L- STA. 77+20.00

104 MAS PROPERTIES,LLC

106 LaDANE WILLIAMSON

105 STATE OF NORTH CAROLINA

105 PDE STATE OF NORTH CAROLINA

END SBG
-L- 65+95

PERMANENT SOIL REINFORCEMENT MAT 8.5' x 45'

CL B RIPRAP

CHORD

15" DI

18" DI

24" F

48" WW FENCE

BURIAL OF THIS PIPE IS NOT REQUIRED

CONC MOD COPP. OF EXIST. CM T4-16

JB W/MH

15" HDPE ELBOWS

HDWL

PDE

CL I RIPRAP

WOODS

WLB

INTRACOASTAL RIGHT-OF-WAY OF PERPETUAL EASEMENT

INTERCOASTAL WATERWAY EXISTING R/W

LATERAL BASE DITCH

D.A.=46.7 Ac
Q2 = 2.4 cfs
Y2 = 1.0 ft/sec
Q10 = 3.7 cfs
V10 = 1.1 ft/sec

SITE 6

FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

SCALE

50' 0 100'

LEGEND

FILL IN WETLANDS — F F F F F F

MECHANIZED CLEARING

HAND CLEARING — HC HC HC HC

PROJECT REFERENCE NO.	SHEET NO.
R-2245	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/17/99

MATCHLINE SEE SHEET 24 -ACC2- STA.15+20.00

NAD 83

SITE 7
HAND CLEARING

SITE 6
FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

SITE 8
FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

SITE 9
FILL IN WETLANDS
&
MECHANIZED CLEARING

SITE 10
FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

MATCH LINE SEE SHEET 8 -L- STA. 77+20.00

MATCH LINE SEE SHEET 10 -L- STA. 90+95.00

-ACC2-

-ACC1-

-L-

LaDANE WILLIAMSON (106)

STATE OF NORTH CAROLINA (105)

48" WW FENCE

CL B RIPRAP

BURY CROSS PIPES 1.0'

LATERAL BASE DITCH

JB w/MH

HDWL

WLB

WOODS

MATCHLINE SEE SHEET 25 -ACC1- STA.13+80.00

SCALE
50' 0 100'

LEGEND

FILL IN WETLANDS

MECHANIZED CLEARING

HAND CLEARING

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

18-NOV-2005 14:42
r:\Hydraulics\Permits\r2245 permit psh 09.dgn
Environment 01.11.22.06

PROJECT REFERENCE NO.	SHEET NO.
R-2245	10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

NAD 83

REVISIONS 8/17/99

SITE 11

FILL IN WETLANDS, MECHANIZED & HAND CLEARING
&
PERMANENT SURFACE WATER IMPACTS, PERMANENT CHANNEL IMPACTS

106 LaDANE WILLIAMSON

D.A.=187.7 Ac
Q2=57.5 cfs
V2=0.9 ft/sec
Q10=90.2 cfs
V10=1.1 ft/sec

BURY CROSS PIPES 1.0'

BURY EQUALIZER PIPE 1.0'

WOODS

PROP.48" WW FENCE

DI

18"

15"

CL B RIPRAP

2@60"

HDWL

WLB

MATCH LINE SEE SHEET 9 -L- STA. 90+95.00

MATCH LINE SEE SHEET 11 -L- STA. 104+25.00

UNNAMED JURISDICTIONAL TRIBUTARY TO INTRACOASTAL WATERWAY

106 LaDANE WILLIAMSON

SCALE

50' 0 100'

LEGEND

FILL IN WETLANDS — F F F F F F

MECHANIZED CLEARING

HAND CLEARING — HC HC HC HC

21-NOV-2005 11:24
F:\Hydraulics\Permits\r-2245 permit psh 10.dgn
plowagood at HYDRAULICS

PROJECT REFERENCE NO.	SHEET NO.
R-2245	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 12

FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

NAD 83

105

110

115

WOODS

WLB

BURY CROSS PIPE 1.0'

HDWL

BURY EQUALIZER PIPE 1.0'

DI

CL B RIPRAP

PROP. 48" WW FENCE

106 LoDANE WILLIAMSON

D.A.=3.52 Ac
Q2=13.3 cfs
V2=1.3 ft/sec
Q10=21 cfs
V10=1.5 ft/sec

MATCH LINE SEE SHEET 10 -L- STA. 104+25.00

MATCH LINE SEE SHEET 12 -L- STA. 118+35.00

SCALE
50' 0 100'

LEGEND

FILL IN WETLANDS

MECHANIZED CLEARING

HAND CLEARING

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

REVISIONS

8/17/99

05-DEC-2005 14:18
J:\Highway Projects\Permits\r-2245 permit psh 11.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2245	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS
8/17/99

NAD 83

(106) LoDANE WILLIAMSON

SITE 13
FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

SITE 14
FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

SITE 15
FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

MATCH LINE SEE SHEET 11 -L- STA. 118+35.00

MATCH LINE SEE SHEET 13 -L- STA. 132+45.00

WOODS

BURY CROSS PIPE 1.0'

CL I RIPRAP

PDE

CL B RIPRAP

PROP. 48" WW FENCE

WE 480

24" CMP ± 30" CMP

WE 494

NCDOT GPS MON R2245-13

WLB

SCALE
50' 0 100'

LEGEND
FILL IN WETLANDS — F F F F F F
MECHANIZED CLEARING
HAND CLEARING — HC HC HC HC

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

05-DEC-2005 14:22
K:\Projects\Permits\r-2245 permit psh 12.dgn
jlundgren
07.11.22.1536

PROJECT REFERENCE NO.	SHEET NO.
R-2245	13
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/17/99

NAD 83

(106) LoDANE WILLIAMSON

MATCH LINE SEE SHEET 12 -L- STA. 132+45.00

MATCH LINE SEE SHEET 14 -L- STA. 146+15.00

SITE 17

FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

SITE 16

FILL IN WETLANDS
&
MECHANIZED CLEARING

BURY EQUALIZER PIPE 1.0'

CL B RIPRAP

48" WW FENCE

SOIL

WLB

SCALE

50' 0 100'

LEGEND

FILL IN WETLANDS

MECHANIZED CLEARING

HAND CLEARING

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

05-DEC-2005 14:25
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rjohnson

PROJECT REFERENCE NO.	SHEET NO.
R-2245	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

SITE 18

FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

SITE 19

FILL IN WETLANDS
&
MECHANIZED CLEARING

106 LaDANE WILLIAMSON

WLB

150

155

MATCH LINE SEE SHEET -L- STA. 146+15.00

MATCH LINE SEE SHEET 15 -L- STA. 159+50.00

48" WW FENCE

CHORD

2GI

DI

CL B RIPRAP

SOIL

5 @ 60" x 46" CORR. ALUM. PIPE-ARCH
FOR ANIMAL PASSAGE
WITH CONTINUOUS ALUMINUM HEADWALLS
ON BOTH ENDS

BURY PIPES 1.0' AND BACKFILL
ENTIRE LENGTH OF EACH PIPE
WITH 1.0' OF SOIL

106 LaDANE WILLIAMSON

SCALE

50' 0 100'

LEGEND

FILL IN WETLANDS — F F F F F F

MECHANIZED CLEARING

HAND CLEARING — HC HC HC HC

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

REVISIONS 8/17/99

18-NOV-2005 14:53
r:\Hydraulics\Permits\r2245 permit psh 14.dgn
laurenwood at 112221535

PROJECT REFERENCE NO.	SHEET NO.
R-2245	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

REVISIONS

8/17/99

SITE 19
FILL IN WETLANDS
&
MECHANIZED CLEARING

SITE 20
FILL IN WETLANDS
&
MECHANIZED CLEARING

SITE 21
FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

BURY SMALL ANIMAL PASSAGE PIPE 1.0' AND BACKFILL ENTIRE LENGTH OF PIPE WITH 1.0' OF SOIL

LoDANE WILLIAMSON (106)

MATCH LINE SEE SHEET 14 -L- STA. 159+50.00

MATCH LINE SEE SHEET 16 -L- STA. 173+90.00

CL B RIPRAP

RETAIN

30" CMP

24" CMP

REMOVE

45° WW FENCE

SCALE

50' 0 100'

LEGEND

FILL IN WETLANDS — F F F F F F

MECHANIZED CLEARING

HAND CLEARING — HC HC HC HC

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

18-NOV-2005 15:08
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bl 11x17.tcl

PROJECT REFERENCE NO.	SHEET NO.
R-2245	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/17/99

SITE 21

FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

SITE 22

FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

NAD 83

175 180 185

BURY EQUALIZER PIPE 1.0'

BURY EQUALIZER PIPE 1.0'

48" WW FENCE

WLB

106 LoDANE WILLIAMSON

107 RESERVE DEVELOPMENT CO., LLC

BRUNSWICK ELECTRIC MEMBERSHIP CORP. EASEMENT BOOK 08 PG 901

MATCH LINE SEE SHEET 15 -L- STA. 173.+90.00

MATCH LINE SEE SHEET 17 -L- STA. 187+50.00

SCALE

50' 0 100'

LEGEND

FILL IN WETLANDS — F F F F F F

MECHANIZED CLEARING

HAND CLEARING — HC HC HC HC

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

18-NOV-2005 15:18
r:\hydraulics\permits\r2245 permit psh 16.dgn
jmarrawood
d1 ll22x36

PROJECT REFERENCE NO.	SHEET NO.
R-2245	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

REVISIONS 8/17/99

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tillmanmark

LODANE WILLIAMSON (106)

BRUNSWICK ELECTRIC MEMBERSHIP CORP. EASEMENT 2007 DB 820 PG 1

S 85°18'01"W 126.30'

CIP

NAD 83

YOUNG'S GAS & GROCERY OF WINNABOW, INC (109)

SITE 22
FILL IN WETLAND, MECHANIZED & HAND CLEARING

SITE 23
FILL IN WETLAND, MECHANIZED & HAND CLEARING

SITE 24
FILL IN WETLAND, MECHANIZED & HAND CLEARING

RESERVE DEVELOPMENT CO., LLC CBS, LLC (107)

BURY EQUALIZER PIPE 1.0'

BURY 42" EQUALIZER PIPE 1.5'

48" WW FENCE

CL B RIPRAP

15"

DI

EQUALIZER

WLB

-ACC3-

MATCH LINE SEE SHEET 16 -L- STA. 187+50.00

MATCH LINE SEE SHEET 18 -L- STA. 201+20.00

MATCH LINE SEE SHEET 26 -ACC3- STA. 13+40.00

SCALE
50' 0 100'

LEGEND
- FILL IN WETLANDS
- MECHANIZED CLEARING
- HAND CLEARING

PROJECT REFERENCE NO.	SHEET NO.
R-2245	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ENGLISH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

REVISIONS

8/17/99

SITE 24

FILL IN WETLAND,
MECHANIZED AND HAND CLEARING

SITE 25

FILL IN WETLAND,
MECHANIZED AND HAND CLEARING

205

210

109 YOUNG'S GAS & GROCERY OF WINNABOW, INC

107 RESERVE DEVELOPMENT CO., LLC

BURY SMALL ANIMAL PIPE 1.0' AND BACKFILL ENTIRE LENGTH OF PIPE WITH 1.0' OF SOIL

BURY EQUALIZER PIPES 1.0'

BURY EQUALIZER PIPE 1.0'

48" WW FENCE

WLB

SOIL

WE 536

S 21°44'45" E 149.84'

S 21°44'45" E 50.00'

S 30°28'43" E 155.01'

MATCH LINE SEE SHEET 17 -L- STA. 201+20.00

MATCH LINE SEE SHEET 19 -L- STA. 215+00.00

SCALE

50' 0 100'

LEGEND

FILL IN WETLANDS — F F F / F F F

MECHANIZED CLEARING

HAND CLEARING — HC HC / HC HC

18-NOV-2005 15:47
r:\hydraulics\Permits\r-2245 permit psh 18.dgn
dlevinpond AT HYDRAULICS

PROJECT REFERENCE NO.	SHEET NO.
R-2245	19
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS 8/17/99

HAND CLEARING WILL BE REQUIRED IN AREAS DESIGNATED BY THE PERMITS AND AS DIRECTED BY THE ENGINEER.

NAD 83

SITE 25
FILL IN WETLAND,
MECHANIZED & HAND CLEARING

SITE 26
HAND CLEARING

SITE 28
HAND CLEARING

SITE 27
FILL IN WETLAND,
MECHANIZED & HAND CLEARING

MATCH LINE SEE SHEET 18 -L- STA. 215+00.00

MATCH LINE SEE SHEET 20 -L- 228+75.00

(109) YOUNG'S GAS & GROCERY OF WINNABOW, INC

(107) RESERVE DEVELOPMENT CO., LLC

BURY EQUALIZER PIPE 1.0'

48" WW FENCE

CL B RIPRAP

SCALE
50' 0 100'

LEGEND
FILL IN WETLANDS
MECHANIZED CLEARING
HAND CLEARING

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

05-DEC-2005 14:32
c:\hydraulics\permits\2245 permit psh 19.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2245	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

REVISIONS
8/17/99

18-NOV-2005 16:30
I:\hydraulics\Permits\r-2245 permit psh 20.dgn
dlivengood
ATLIVZ1536

SITE 29

FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

SITE 31

FILL IN WETLANDS
&
MECHANIZED CLEARING

SITE 30

FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

(109) YOUNG'S GAS & GROCERY OF WINNABOW, INC

(107) RESERVE DEVELOPMENT CO., LLC

BRUNSWICK ELECTRIC MEMBERSHIP CORP. EASEMENT 1005

BURY EQUALIZER PIPE 1.0'

CL B RIPRAP

48" WW FENCE

WLB

MATCH LINE SEE SHEET 19 -L- STA. 228+75.00

MATCH LINE SEE SHEET 21 -L- STA. 242+75.00

SCALE

50' 0 100'

LEGEND

FILL IN WETLANDS — F F F F F F

MECHANIZED CLEARING

HAND CLEARING — HC HC HC HC

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

PROJECT REFERENCE NO.	SHEET NO.
R-2245	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

MATCH LINE SEE SHEET 22 -Y7- STA. 13+15.00

NAD 83

SITE 32

FILL and EXCAVATION IN WETLANDS
&
MECHANICAL CLEARING
&
WETLAND IMPACTS FROM DITCH DRAWDOWN

MATCH LINE SEE SHEET 20 -L- STA. 242+75.00

END CONSTRUCTION -Y8- POT STA. 16+50.00

END TIP PROJECT R-2245 -L- POT STA. 248+66.02

SITE 33

FILL IN WETLANDS
&
HAND CLEARING

MATCH LINE SEE SHEET 23 -Y7- STA. 22+55.00

SCALE
50' 0 100'

LEGEND

- FILL IN WETLANDS
- EXCAVATION IN WETLANDS
- MECHANIZED CLEARING
- DITCH DRAWDOWN
- HAND CLEARING

PROJECT REFERENCE NO.	SHEET NO.
R-2245	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS
8/17/99

SITE 34

TEMPORARY AND PERMANENT
SURFACE WATER IMPACTS
&
TEMPORARY AND PERMANENT
CHANNEL IMPACTS

NAD 83

MATCH LINE SEE SHEET 21 -Y7- STA. 22+55.00

(113) WILLIAM J. BATUYIOS
(114) JAMES E. McCRACKEN
(115) GENE ALAN BARRETT
(116) J. H. LIGON
(109) YOUNG'S GAS & GROCERY OF WINNABOW, INC

RIP RAP AT EMBANKMENT SEE DETAIL
TDE
SPECIAL CUT DITCH
PROP. 48" WW FENCE
HTR
18" CONC
NC 211 SOUTHPORT - SUPPLY ROAD
NC 211 SOUTHPORT SUPPLY RD
RIPLEY DRIVE
EXISTING R/W
CONC MON
EIP
4" BST
28" BST
20" BST
3" BST
10' X 8' RCBC
+35.00 -Y7- EXIST. R/W (RT.)
END PROP. 48" WW FENCE
END CONSTRUCTION -Y7- POT STA. 28+00.00

SITE 34

SCALE
50' 0 100'

LEGEND
PERMANENT FILL IN SURFACE WATERS
TEMPORARY FILL IN SURFACE WATERS

18-NOV-2005 16:33
r:\Hydraulics\Permits\r2245 permit psh 23.dgn
Intergraph XM 8.9.2.1546

PROJECT REFERENCE NO.	SHEET NO.
R-2245	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/17/99

-ACC2- POT Sta. 32+43.33

BEG. 48" WW FENCE +12.02 -ACC2- 50' (RT)

END 48" WW FENCE +12.02 -ACC2- 50' (LT)

MATCH LINE SHEET 24 -ACC2- STA. 29+50.00

30

NAD 83

SITE 35
HAND CLEARING

MATCHLINE SEE SHEET 9 -ACC2- STA. 15+20.00

106 LaDANE WILLIAMSON

SITE 36
HAND CLEARING

MATCH LINE SHEET 24 -ACC2- STA. 29+50.00

104 MAS PROPERTIES, LLC

PROP. 48" WW FENCE

-ACC2-

PROP. 48" WW FENCE

25

104 MAS PROPERTIES, LLC

106 LaDANE WILLIAMSON

SCALE
50' 0 100'

LEGEND
HAND CLEARING — HC HC / HC HC

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

NOTE:
1) ACCESS ROAD TO BE CONSTRUCTED BY OTHERS.

18-NOV-2005 16:13
r:\Hydraulics\Permits\r-2245 permit psh 24.dgn
environment

PROJECT REFERENCE NO.	SHEET NO.
R-2245	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ENGLISH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

SITE 1
FILL IN COASTAL WETLANDS
&
HAND CLEARING

SITE 2
FILL IN COASTAL WETLANDS
&
HAND CLEARING

SITE 3
FILL IN
SURFACE WATERS
&
WORK BRIDGE

SITE 4
FILL IN COASTAL WETLANDS
&
FILL IN SURFACE WATERS
&
WORK BRIDGE

HAND CLEARING WILL BE REQUIRED IN AREAS DESIGNATED BY THE PERMITS AND AS DIRECTED BY THE ENGINEER.

BEGIN CONSTRUCTION
-Y1- STA.10+00.00

END CONSTRUCTION
-Y1- STA.13+00.00

-Y1- POT Sta. 14+00.00

BEGIN CONSTRUCTION
-Y2- STA.11+00.00

-Y2- POT Sta. 10+00.00

END CONSTRUCTION
-Y2- STA.12+80.00

-Y2- POT Sta. 14+07.11

BEGIN CONSTRUCTION
-Y3- STA.11+00.00

-Y3- POT Sta. 10+00.00

MAINTAIN DRAINAGE FROM EAST SIDE OF GARAGE TO NORTH SIDE

MAINTAIN SURFACE DRAINAGE

EXTEND RIP RAP TO BULKHEAD

CLASS II RIP RAP (NOT SHOWN TO IMPROVE CLARITY)

MEAN HIGH TIDE

EXISTING BRIDGE
LENGTH = 160.75'
LOW CHORD = 17.36'

1 NO DEED
2 JACK S KEPLEY & STEPHEN C. HARRIS
3 GERALD C. GOUGER
4 MICHAEL H. OXFORD
5 BOBBY A. LONDON
6 TOWN OF LONG BEACH
7 OAK ISLAND ELKS LODGE #2769
8 JAMES A. FERRELL, ESTATE
9 HOBOKE, INC.
10 GARY L. PETERSON
11 ROBERT ROBBINS
88 BRUCE E. LEE
90 EMMETT C. GUNNERSON

OCEAN WEST BEACH DR. 26.5' BST
OCEAN EAST BEACH DR.
WEST DOLPHIN DR.
WEST PELICAN DR. 24' BST
EAST DOLPHIN DR. 25' BST
SOUTH MIDDLETON AVE. 30' BST
DAVIS CANAL

WLB — WOODS — HC — F — E — PDE — RW — TB 81

SCALE
50' 0 100'

MATCH LINE SEE SHEET 5 -L- STA. 23+20.00

LEGEND
- FILL IN COASTAL WETLANDS
- FILL IN SURFACE WATERS
- HAND CLEARING
- TEMPORARY WORK BRIDGE

REVISIONS

8/17/99

05-DEC-2005 11:29
R:\Hydraulics\Permits\r2245 permit psh 04.dgn
Timmerman
$USERNAME

PROJECT REFERENCE NO.	SHEET NO.
R-2245	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

REVISIONS

8/17/99

SITE 5
TWO WORK BRIDGES

NAD 83

INTRACOASTAL RIGHT-OF-WAY OF PERPETUAL EASEMENT

ATLANTIC INTRACOASTAL WATERWAY CENTERLINE (PROVIDED BY THE U.S. ARMY CORPS OF ENGINEERS WILMINGTON DISTRICT)

MEAN HIGH TIDE

TOWN OF OAK ISLAND

BEGIN PROPOSED BULKHEAD

END PROPOSED BULKHEAD

REMOVE EXISTING BULKHEAD

MATCH LINE SEE SHEET 6 -L- STA. 50+20.00

MATCH LINE SEE SHEET 8 -L- STA. 64+65.00

GEORGE L. FISHER, ETUX (71)

CHARLOTTE M. HAWTHORNE (101)

BENNY E. PRINCE (903)

BENNY E. PRINCE (78)

HENRY G. HARRIS (904)

RANDY W. GOODNIGHT (906)

RALPH DICKSON, W. (80)

CARL F. MICKEY, JR (81)

JAMES W. WRIGHT (103)

DONALD W. BATCHELOR (907)

PHILLIP M. LEWIS (75)

J. D. MEARS (905)

THOMAS R. STANLEY (77)

BARBARA S. BRUNSON (902)

SCALE
50' 0 40 100'

TEMPORARY WORK BRIDGE

05-DEC-2005 11:33
r:\hydraulics\permits\2245 permit psh 07.dgn
r:\roadwaypgl\r2245.tab

PROJECT REFERENCE NO.	SHEET NO.
R-2245	8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

8/17/99

REVISIONS

NAD 83

MATCH LINE SEE SHEET 7 -L- STA. 64+05.00

MATCH LINE SEE SHEET 9 -L- STA. 77+20.00

CHORD

CL B RIPRAP

END SBC -L- 65+95

PERMANENT SOIL REINFORCEMENT MAT 8.5' x 45'

15" DI

BURIAL OF THIS PIPE IS NOT REQUIRED

48" WW FENCE

WOODS

INTRACOASTAL RIGHT-OF-WAY OF PERPETUAL EASEMENT

INTRACOASTAL WATERWAY EXISTING R/W

WLB

LODANE WILLIAMSON (106)

MAS PROPERTIES,LLC (104)

STATE OF NORTH CAROLINA (105)

PDE

CL I RIPRAP

D.A.=46.7 Ac.
Q2=24 cfs
V2=1.0 fr/sec
Q10=87 cfs
V10=1.1 fr/sec

JB W/MH

HDWL

LATERAL BASE DITCH

(105) STATE OF NORTH CAROLINA

SCALE
50' 0 100'

SITE 6

FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

LEGEND

FILL IN WETLANDS — F F F F F F

MECHANIZED CLEARING

HAND CLEARING — HC HC HC HC

05-DEC-2005 11:34
C:\Projects\2245\Roadway\Sheets\Sheet 08.dgn

ENGLISH

PROJECT REFERENCE NO.	SHEET NO.
R-2245	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

MATCHLINE SEE SHEET 24
-ACC2- STA.13+20.00

NAD 83

SITE 7
HAND CLEARING

SITE 6
FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

SITE 8
FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

SITE 9
FILL IN WETLANDS
&
MECHANIZED CLEARING

SITE 10
FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

MATCH LINE SEE SHEET 8 -L- STA. 77+20.00

MATCH LINE SEE SHEET 10 -L- STA. 90+95.00

-ACC2-

-ACC1-

-L-

LODANE WILLIAMSON (106)

D.A. = 46.7 Ac
Q2 = 24 cfs
V2 = 1.0 ft/sec
Q10 = 37 cfs
V10 = 1.1 ft/sec

BURY CROSS PIPES 1.0'

48" WW FENCE

WLB

WOODS

CL B RIPRAP

DI

RW

CA

PDE

LATERAL BASE DITCH

2@42" CMP

STATE OF NORTH CAROLINA (105)

MATCHLINE SEE SHEET 25
-ACC1- STA.13+80.00

SCALE
50' 0 100'

LEGEND
FILL IN WETLANDS
MECHANIZED CLEARING
HAND CLEARING

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

05-DEC-2005 11:35
C:\Projects\permits\r-2245 permit psh 09.dgn
User: gmgood
PW: dgn_HY221536

ENGLISH	PROJECT REFERENCE NO.	SHEET NO.
	R-2245	10
	R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

NAD 83

REVISIONS

8/17/99

SITE 11

FILL IN WETLANDS,
MECHANIZED & HAND CLEARING
&
PERMANENT SURFACE WATER IMPACTS,
PERMANENT CHANNEL IMPACTS

(106) LoDANE WILLIAMSON

D.A. = 187.7 Ac
Q2 = 87.5 cfs
V2 = 0.9 ft/sec
Q10 = 90.2 cfs
V10 = 1.1 ft/sec

BURY EQUALIZER PIPE 1.0'

BURY CROSS PIPES 1.0'

PROP. 48" WW FENCE

WOODS

DI

CL B RIPRAP

HDWL

WLB

MATCH LINE SEE SHEET 9 -L- STA. 90+95.00

MATCH LINE SEE SHEET 11 -L- STA. 104+25.00

UNNAMED JURISDICTIONAL TRIBUTARY TO INTRACOASTAL WATERWAY

(106) LoDANE WILLIAMSON

SCALE

50' 0 50' 100'

LEGEND

FILL IN WETLANDS — F F F / F F F

MECHANIZED CLEARING

HAND CLEARING — HC HC / HC HC

05-DEC-2005 11:36
c:\projects\permits\r2245 permit psh 10.dgn
clowrance AT HYDRALICS

PROJECT REFERENCE NO.	SHEET NO.
R-2245	11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

SITE 12

FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

REVISIONS
8/17/99

MATCH LINE SEE SHEET 10 -L- STA. 104+25.00

MATCH LINE SEE SHEET 12 -L- STA. 118+35.00

BURY CROSS PIPE 1.0'

BURY EQUALIZER PIPE 1.0'

HDWL

TBE

CL B RIPRAP

D.A.=332 Ac
Q2=13.3 cfs
V2=1.3 ft/sec
Q10=21 cfs
V10=1.5 ft/sec

PROP. 48" WW FENCE

(106) LoDANE WILLIAMSON

WOODS

WLB

SCALE
50' 0 100'

LEGEND
FILL IN WETLANDS
MECHANIZED CLEARING
HAND CLEARING

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

05-DEC-2005 14:19
File: n:\roadway\projects\r-2245 permit psh 11.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2245	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

REVISIONS

MATCH LINE SEE SHEET 11 -L- STA. 118+35.00

MATCH LINE SEE SHEET 13 -L- STA. 132+45.00

(106) LODANE WILLIAMSON

SITE 13
FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

SITE 14
FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

SITE 15
FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

BURY CROSS PIPE 1.0'

CL B RIPRAP

PROP. 48" WW FENCE

NCDOT GPS MON
R2245-13

WOODS

WLB

BTM

SCALE
50' 0 100'

LEGEND
FILL IN WETLANDS
MECHANIZED CLEARING
HAND CLEARING

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

05-DEC-2005 14:22
F:\Hydraulics\Permits\r-2245 permit psh 12.dgn
Landgrogod

PROJECT REFERENCE NO.	SHEET NO.
R-2245	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

REVISIONS 8/17/99

106 LoDANE WILLIAMSON

MATCH LINE SEE SHEET 12 – STA 132+45.00

MATCH LINE SEE SHEET 14 – STA 149+15.00

SITE 17
FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

SITE 16
FILL IN WETLANDS
&
MECHANIZED CLEARING

BUCKY EQUALIZER PIPE 1.0'

48" WW FENCE

CL B RIPRAP

SCALE
50' 0 100'

LEGEND
- FILL IN WETLANDS
- MECHANIZED CLEARING
- HAND CLEARING

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

05-DEC-2005 14:25
C:\Projects\Permits\r-2245 permit psh_13.dgn
jlwagood at hy22f636

PROJECT REFERENCE NO.	SHEET NO.
R-2245	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ENGLISH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS 8/17/99

NAD 83

SITE 18

FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

SITE 19

FILL IN WETLANDS
&
MECHANIZED CLEARING

106 LoDANE WILLIAMSON

106 LoDANE WILLIAMSON

MATCH LINE SEE SHEET 1– STA. 146+15.00

MATCH LINE SEE SHEET 15 –L– STA. 159+50.00

48" WW FENCE

CHORD

CL & RIPRAP

5 @ 60" x 46" CORR. ALUM. PIPE-ARCH
FOR ANIMAL PASSAGE
WITH CONTINUOUS ALUMINUM HEADWALLS
ON BOTH ENDS

BURY PIPES 1.0' AND BACKFILL
ENTIRE LENGTH OF EACH PIPE
WITH 1.0' OF SOIL

SCALE

50' 0 100'

LEGEND

FILL IN WETLANDS

MECHANIZED CLEARING

HAND CLEARING

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

05-DEC-2005 11:40
c:\projects\2245_pmits\r2245 permit psh 14.dgn
user:mgood
$I(R2245)

PROJECT REFERENCE NO.	SHEET NO.
R-2245	15
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

SITE 19
FILL IN WETLANDS
&
MECHANIZED CLEARING

SITE 20
FILL IN WETLANDS
&
MECHANIZED CLEARING

SITE 21
FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

BURY SMALL ANIMAL PASSAGE PIPE 1.0' AND BACKFILL ENTIRE LENGTH OF PIPE WITH 1.0' OF SOIL

LODANE WILLIAMSON (106)

BURY SMALL ANIMAL PASSAGE PIPE 1.0' AND BACKFILL ENTIRE LENGTH OF PIPE WITH 1.0' OF SOIL

LODANE WILLIAMSON (106)

MATCH LINE SEE SHEET 14 -L- STA. 159+50.00

MATCH LINE SEE SHEET 16-L- STA. 173+90.00

CL B RIPRAP

CL B RIPRAP

CL B RIPRAP

SMALL ANIMAL PASSAGE PIPE

WIRE FENCE

WIRE FENCE

WIRE REMOVE

SOIL

SOIL

RETAIN

24" CMP

24" CMP

DI

DI

DI

SCALE

50' 0 100'

LEGEND

FILL IN WETLANDS — F F F F F F

MECHANIZED CLEARING

HAND CLEARING — HC HC HC HC

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

REVISIONS 8/17/99

05-DEC-2005 11:41
c:\hydro\projects\permits\r-2245 permit psh 15.dgn
dlevengood AT HYDRO36

PROJECT REFERENCE NO.	SHEET NO.
R-2245	16
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

8/17/99

SITE 21

FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

SITE 22

FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

NAD 83

BURY EQUALIZER PIPE 1.0'

BURY EQUALIZER PIPE 1.0'

48" WW FENCE

48" WW FENCE

WLB

WLB

WLB

WLB

EQUALIZER

EQUALIZER

EQUALIZER

175

180

185

106 LODANE WILLIAMSON

106 LODANE WILLIAMSON

BRUNSWICK ELECTRIC MEMBERSHIP CORP.
EASEMENT BOOK 08 PG 907

107 RESERVE DEVELOPMENT CO., LLC

MATCH LINE SEE SHEET 15 -L- STA. 183+90.00

MATCH LINE SEE SHEET 17 -L- STA. 187+50.00

SCALE

50' 0 100'

LEGEND

FILL IN WETLANDS — F F F / F F F

MECHANIZED CLEARING

HAND CLEARING — HC HC / HC HC

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

05-DEC-2005 11:42
C:\Documents and Settings\jmatis\Desktop\projects\r-2245 permit psh 16.dgn
Underground Plant Permitted By: LW221536

PROJECT REFERENCE NO.	SHEET NO.
R-2245	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

REVISIONS 8/17/99

NAD 83

LODANE WILLIAMSON (106)

BRUNSWICK ELECTRIC MEMBERSHIP CORP. EASEMENT 1007/ DB 601 PG 1

S 85°48'01"W 126.30'

EIP

YOUNG'S GAS & GROCERY OF WINNABOW, INC (109)

RESERVE DEVELOPMENT CO., LLC CBS, LLC (107)

SITE 22
FILL IN WETLAND, MECHANIZED & HAND CLEARING

SITE 23
FILL IN WETLAND, MECHANIZED & HAND CLEARING

SITE 24
FILL IN WETLAND, MECHANIZED & HAND CLEARING

BURY 42" EQUALIZER PIPE 1.0'

BURY EQUALIZER PIPE 1.0'

42" EQUALIZER

CL B RIPRAP

48" WW FENCE

WLB

MLB

MLTM

-ACC3-

MATCH LINE SEE SHEET 16 -L- STA. 187+50.00

MATCH LINE SEE SHEET 18 -L- STA. 201+20.00

MATCH LINE SEE SHEET 26 -ACC3- STA. 13+40.00

LEGEND

FILL IN WETLANDS — F F F F F F

MECHANIZED CLEARING — M M M

HAND CLEARING — HC HC HC HC

SCALE
50' 0 100'

05-DEC-2005 11:43
p:\hydraulics\permits\r-2245 permit psh 17.dgn
plotscale = 1.0 '/in.
plotted on HYDRAULICS

PROJECT REFERENCE NO.	SHEET NO.
R-2245	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

ENGLISH

NAD 83

SITE 24

FILL IN WETLAND,
MECHANIZED AND HAND CLEARING

SITE 25

FILL IN WETLAND,
MECHANIZED AND HAND CLEARING

MATCH LINE SEE SHEET 17 -L- STA. 201+20.00

MATCH LINE SEE SHEET 19 -L- STA. 215+00.00

109 YOUNG'S GAS & GROCERY OF WINNABOW, INC

107 RESERVE DEVELOPMENT CO., LLC

BURY SMALL ANIMAL PIPE 1.0' AND BACKFILL ENTIRE LENGTH OF PIPE WITH 1.0' OF SOIL

BURY EQUALIZER PIPES 1.0'

BURY EQUALIZER PIPE 1.0'

48" WW FENCE

WLB

S 2°44'43" E 449.86'

S 90°49'40" E 80.91'

SCALE

50' 0 100'

LEGEND

FILL IN WETLANDS

MECHANIZED CLEARING

HAND CLEARING

REVISIONS

8/17/99

05-DEC-2005 11:44
c:\projects\r-2245\permits\r-2245 permit psh 18.dgn
User: Default
Plotted at 1:2000

PROJECT REFERENCE NO.	SHEET NO.
R-2245	19
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

HAND CLEARING WILL BE REQUIRED IN AREAS DESIGNATED BY THE PERMITS AND AS DIRECTED BY THE ENGINEER.

NAD 83

SITE 25
FILL IN WETLAND,
MECHANIZED & HAND CLEARING

SITE 26
HAND CLEARING

SITE 28
HAND CLEARING

(109) YOUNG'S GAS & GROCERY OF WINNABOW, INC

MATCH LINE SEE SHEET 18 -L- STA. 215+00.00

MATCH LINE SEE SHEET 20 -L- 228+75.00

BURY EQUALIZER PIPE 1.0'

48" WW FENCE

CL B RIPRAP

DI

SOIL

WLB

HC

F

(107) RESERVE DEVELOPMENT CO., LLC

SITE 27
FILL IN WETLAND,
MECHANIZED & HAND CLEARING

SCALE
50' 0 100'

LEGEND
FILL IN WETLANDS
MECHANIZED CLEARING
HAND CLEARING

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

05-DEC-2005 (431)
f:\projects\roadway\permits\r-2245 permit psh 19.dgn
User: HV221536

PROJECT REFERENCE NO.	SHEET NO.
R-2245	20
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83

REVISIONS
8/17/99

SITE 29

FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

SITE 31

FILL IN WETLANDS
&
MECHANIZED CLEARING

SITE 30

FILL IN WETLANDS,
MECHANIZED & HAND CLEARING

(109) YOUNG'S GAS & GROCERY OF WINNABOW, INC

(107) RESERVE DEVELOPMENT CO., LLC

BRUNSWICK ELECTRIC MEMBERSHIP CORP. EASEMENT 1007

BURY EQUALIZER PIPE 1.0'

CL B RIPRAP

48" WW FENCE

WLB

230 235 240

MATCH LINE SEE SHEET 19 -L- STA. 228+75.00

MATCH LINE SEE SHEET 21 -L- STA. 242+75.00

SCALE
50' 0 100'

LEGEND

FILL IN WETLANDS — F F F F F F

MECHANIZED CLEARING — • • • • • •

HAND CLEARING — HC HC HC HC HC HC

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

05-DEC-2005 11:45
c:\projects\permits\r2245 permit psh 20.dgn
flowerspod PAT HY2/R36

PROJECT REFERENCE NO.	SHEET NO.
R-2245	21
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

ENGLISH

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

REVISIONS 8/17/99

NAD 83

MATCH LINE SEE SHEET 22 -Y7- STA. 13+15.00

MATCH LINE SEE SHEET 20 -L- STA. 242+75.00

MATCH LINE SEE SHEET 23 -Y7- STA. 22+55.00

SITE 32

FILL and EXCAVATION IN WETLANDS
&
MECHANICAL CLEARING
&
WETLAND IMPACTS FROM DITCH DRAWDOWN

SITE 33

FILL IN WETLANDS
&
HAND CLEARING

(109) YOUNG'S GAS & GROCERY OF WINNABOW, INC

(110) JOSEPH M. EDWARDS, SR.

(111) MIDWAY MEDICAL MALL, P.A.

(112) MICHAEL D. RICHARDS

(113) WILLIAM J. BATUYIOS

(117) BRUNSWICK ELECTRIC MEM. CORP. NO DEED FOUND

(118) ATLANTIC TELEPHONE MEMBERSHIP CORP.

BRUNSWICK ELECTRIC MEMBERSHIP CORP. EASEMENT DOC. BK. 1000 PG. 0240

PROP. 48" WW FENCE

LATERAL BASE DITCH

REMOVE

TDE

SPECIAL CUT DITCH

DO NOT BURY THIS CROSS PIPE

CL B RIPRAP

POWER SUB-STATION

SR 1500 MIDWAY ROAD

CONC. ISL.

FOR CONTINUATION OF WETLANDS, SEE SHEET 20

END CONSTRUCTION -Y8- POT STA. 16+50.00

END TIP PROJECT R-2245 -L- POT STA. 248+66.02

SCALE
50' 0 100'

LEGEND

- FILL IN WETLANDS
- EXCAVATION IN WETLANDS
- MECHANIZED CLEARING
- DITCH DRAWDOWN
- HAND CLEARING

05-DEC-2005 11:46
C:\Documents and Settings\jwalker\Desktop\permits\R-2245 permit psh 21.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-2245	23
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

SITE 34

TEMPORARY AND PERMANENT
SURFACE WATER IMPACTS
&
TEMPORARY AND PERMANENT
CHANNEL IMPACTS

NAD 83

REVISIONS

MATCH LINE SEE SHEET 21 -Y7- STA. 22+55.00

(113) WILLIAM J. BATUYIOS

(114) JAMES E. McCRACKEN

(115) GENE ALAN BARRETT

RIP RAP AT EMBANKMENT SEE DETAIL

TDE

SPECIAL CUT DITCH

PROP. 48" WW FENCE

HTR

18" CONC

EXISTING R/W

NC 211 SOUTHPORT - SUPPLY ROAD

NC 211 SOUTHPORT SUPPLY RD 20' BST

RIPLEY LANE

10' X 8' RCBC

+3500 -Y7- EXIST. R/W (RT) END PROP. 48" WW FENCE

CONC MON

EIP

END CONSTRUCTION -Y7- POT STA. 28+00.00

(116) J. H. LIGON

(109) YOUNG'S GAS & GROCERY OF WINNABOW, INC

SITE 34

SCALE

50' 0 100'

LEGEND

PERMANENT FILL IN SURFACE WATERS

TEMPORARY FILL IN SURFACE WATERS

05-DEC-2005 11:47
J:\hydraulics\permits\r-2245_permit_psh_23.dgn
Environmental AT HYDRAULICS

PROJECT REFERENCE NO.	SHEET NO.
R-2245	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

8/17/99

REVISIONS

-ACC2- POT Sta. 32+43.33

BEG 48" WW FENCE -RIGHT- -ACC2- 50' (RT)

END 48" WW FENCE -RIGHT- -ACC2- 50' (LT)

30

MATCH LINE SHEET 24 -ACC2- STA. 29+50.00

NAD 83

WLB

106 LoDANE WILLIAMSON

SITE 35
HAND CLEARING

MATCHLINE SEE SHEET 9 -ACC2- STA. 15+20.00

SITE 36
HAND CLEARING

MATCH LINE SHEET 24 -ACC2- STA. 29+50.00

104 MAS PROPERTIES, LLC

PROP. 48" WW FENCE

-ACC2-

PROP. 48" WW FENCE

104 MAS PROPERTIES, LLC

106 LoDANE WILLIAMSON

SCALE
50' 0 100'

LEGEND
HAND CLEARING — HC / HC / HC / HC

NO REVISIONS CAN BE MADE TO THE CONTROL OF ACCESS WITHOUT APPROVAL OF NCDOT, DENR AND USACE.

NOTE:
1) ACCESS ROAD TO BE CONSTRUCTED BY OTHERS.

05-DEC-2005 13:58
r:\hydraulics\permits\2245 permit psh 24.dgn
environmental\mitigation\2245

PROJECT REFERENCE NO.	SHEET NO.
rlovinggood AT HY221826	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

5/28/99

BM #200 BOLT IN LEFT FRONT LEG OF WATER TOWER
62.10' RT. OF -L- STA 15+14.91
ELEV. = 7.95' N 6147208 E 2254632.21

STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	=	N/A CFS
DESIGN FREQUENCY	=	10 YRS
DESIGN HW ELEVATION	=	6.9 FT
BASE DISCHARGE	=	N/A CFS
BASE FREQUENCY	=	100 YRS
BASE HW ELEVATION	=	12.3 FT
OVERTOPPING DISCHARGE	=	N/A CFS
OVERTOPPING FREQUENCY	=	10 YRS
OVERTOPPING ELEVATION	=	7.3 FT

℄ EL = 19.78'
℄ STATION 21+60.00 -L-
3 SPAN BRIDGE w/ 21" CORED SLABS
TOTAL LENGTH = 165'
SPAN 1 = 55'
SPAN 2 = 55'
SPAN 3 = 55'

-L- STA 12+10.64
-Y1- STA 11+97.69

-L- STA 14+22.68
-Y5- STA 23+10.37

BEGIN GRADE -L- STA 10+12.45
-Y1- STA 11+99.81
EL = 8.35'
16.02 LT.

PI = 13+10.00
EL = 7.23'
VC = 120'
K = 178

PI = 14+50.00
EL = 7.65'
VC = 150'
K = 143

PI = 18+60.00
EL = 10.48'
VC = 160'
K = 46

PI = 18+70.00
EL = 20.62'
VC = 255'
K = 49

(-)0.3748%
(+)1.3455%
(+)0.3000%
(+)0.8292%
(-)0.3000%

BEGIN BRIDGE -L- STA 20+68.50

END BRIDGE -L- STA 23+13.50

WORK BRIDGES

9.5'

MHW ELEVATION 2.7'
MTL ELEVATION 0.4'
MLW ELEVATION -1.5'

FOR -L- PLAN VIEW SEE SHEET 4

PVI DITCH GRADE RT
-L- STA 22+28
EL=5.00

(+)4.38%

(+)5.70%

BEGIN DITCH GRADE RT
-L- STA 22+07
EL=3.50

6.5'

-L-

-Y4- STA 24+59.03
-Y5- STA 24+75.90

PI = 25+70.00
EL = 18.52'
K = 127
VC = 150'

-L- STA 31+43.86
-Y5- STA 31+63.09

PI = 32+20.00
EL = 24.74'
K = 274
VC = 180'

(+)0.3000%
(+)0.9567%
(+)0.3000%

45.81'

8.5'

BEGIN DITCH GRADE RT
-L- STA 32+00
EL=22.10

END DITCH GRADE RT
-L- STA 33+43
EL=22.10

END DITCH GRADE RT
-L- STA 24+04
EL=12.70

(+)4.38%

FOR -L- PLAN VIEW SEE SHEETS 4 & 5

SEE SHEET 5 FOR SPECIAL CUT DITCH DETAILS

18-NOV-2005 16:29
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rlovinggood

11/9/05 - TLW- DESIGN REVISION: MODIFIED THE GRADE FROM -L- STA 42+80&I TO -L- STA 70+60.00 TO PROVIDE A SYMMETRICAL GRADE ON THE INTRACOASTAL WATERWAY BRIDGE.

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-2245	28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-L-

PI = 48+50.61
EL = 28.03'
K = 151
VC = 740'

(+)5.2000%

(+)0.3000%

25.81

44.77

BM = 202 RRS SET IN 12" OAK
212.74 LT OF -L- STA 544+37.88
ELEV. = 22.35' N 65397.51 E 2254798.82

BM = 204 RRS SET IN 12" OAK
936.94' AT OF -L- STA 611+80.20
ELEV. = 29.92' N 6596470 E 2255723.93

-L-

BEGIN BRIDGE
-L- STA 537+00.00

(+)5.2000%

(-)5.2000%

END BRIDGE
-L- STA 602+60.00

44.77

60.20

PI = 58+00.00
EL = 69.80'
VC = 800'
K = 77

WORK BRIDGES

MHW
MTL
MLW

℄ EL = 76.40'
℄ STATION 58+00.00 -L-
5 SPAN BRIDGE w/ 70' FLORIDA TYPE
POST TENSIONED BULB TEE's
TOTAL LENGTH = 980'
SPAN 1 = 125'
SPAN 2 = 225'
SPAN 3 = 280'
SPAN 4 = 225'
SPAN 5 = 125'

MHW ELEVATION 2.7'
MTL ELEVATION 0.6'
MLW ELEVATION -1.5'

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PROJECT REFERENCE NO.	SHEET NO.
R-2245	38

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

5/28/99

BM # 213 RRS SET IN 12" PINE
93.09' RT. OF -Y7- STA. 15+24.28
ELEV.= 44.33' N 81975.41 E 2263298.32

-Y7-

BEGIN GRADE
-Y7- STA 10+00.00
EL = 46.57

PI = 14+50.00
EL = 47.92
VC = 200'
K = 266

PI = 18+80.00
EL = 46.88
VC = 200'
K = 250

-Y7- STA 18+96.98
-L- STA 240+66.02

PI = 21+30.00
EL = 48.45
VC = 200'
K = 308

(+)0.3000% (-)0.453% (+)0.453% (+)0.3500% (+)0.1500% (-)0.3000% (-)0.90%

0.00% (+)0.10% (+)0.63%

41.94

42.79

BEGIN DITCH GRADE LT
-Y7- STA 12+75
EL=41.90

BEGIN DITCH GRADE RT
-Y7- STA 13+00
EL=41.60

END DITCH GRADE LT
-Y7- STA 16+00
EL=41.90

PI=17.96 RT
=-L- STA 240+21 LT
EL=42.10

PI=19+14 LT
=-L- STA 10+57 RT
EL=42.85

PI=21+38 LT
EL=44.25

FOR -Y7- PLAN VIEW
SEE SHEETS 21, 22 & 23

-Y7-

PI = 25+10.00
EL = 47.31
VC = 400'
K = 308

END GRADE
-Y7- STA 28+05.00
EL = 50.24

42.79

(-)0.90% (+)0.3000% (+)1.0086% (+)0.20% (+)2.40% (+)3.60%

END DITCH GRADE LT
-Y7- STA 23+88
EL=42.00

BEGIN DITCH GRADE LT
-Y7- STA 24+05
EL=42.00

PROPOSED
10'w x 8'h RCBC

P.I.=27+00
EL=42.30

P.I.=27+50
EL=43.30

END DITCH GRADE LT
-Y7- STA 27+75
EL=44.70

FOR -Y7- PLAN VIEW
SEE SHEET 23

-Y8-

PI = 10+65.00
EL = 46.21
VC = 60'
K = 33

PI = 13+25.00
EL = 45.88
VC = 100
K = 446

PI = 16+00.00
EL = 45.73
VC = 100
K = 897

BEGIN GRADE -Y8- STA 10+39.20
30' LT
-Y7- STA 18+56.48
EL = 46.34

END GRADE
-Y8- STA 16+50.00
EL = 45.80

-2.0000% (-)0.2058% (+)0.0185% (+)0.0500%

(-)0.07%

END DITCH GRADE LT
-Y8- STA 12+77
EL=42.70

BEGIN DITCH GRADE LT
-Y8- STA 12+05
EL=42.70

END DITCH GRADE RT
-Y8- STA 16+50
EL=42.40

P.I.=10+57 RT
=-Y7- STA 19+14 LT
EL=42.85

FOR -Y8- PLAN VIEW
SEE SHEET 21

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dlovegrove
HYDRAULICS

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2245	X-5

20+50.00

0.0200 0.0200

3:1 3:1

S.S. 3263 S.S. 16.519

20+00.00

0.0200 0.0200

3:1 3:1

S.S. 4767 S.S. 2584

19+50.00

0.0200 0.0200

3:1 3:1

S.S. 3165 S.S. 3126

WETLANDS

19+00.00

0.0200 0.0200

3:1 3:1

S.S. 2990 S.S. 2670

WETLANDS

—L—

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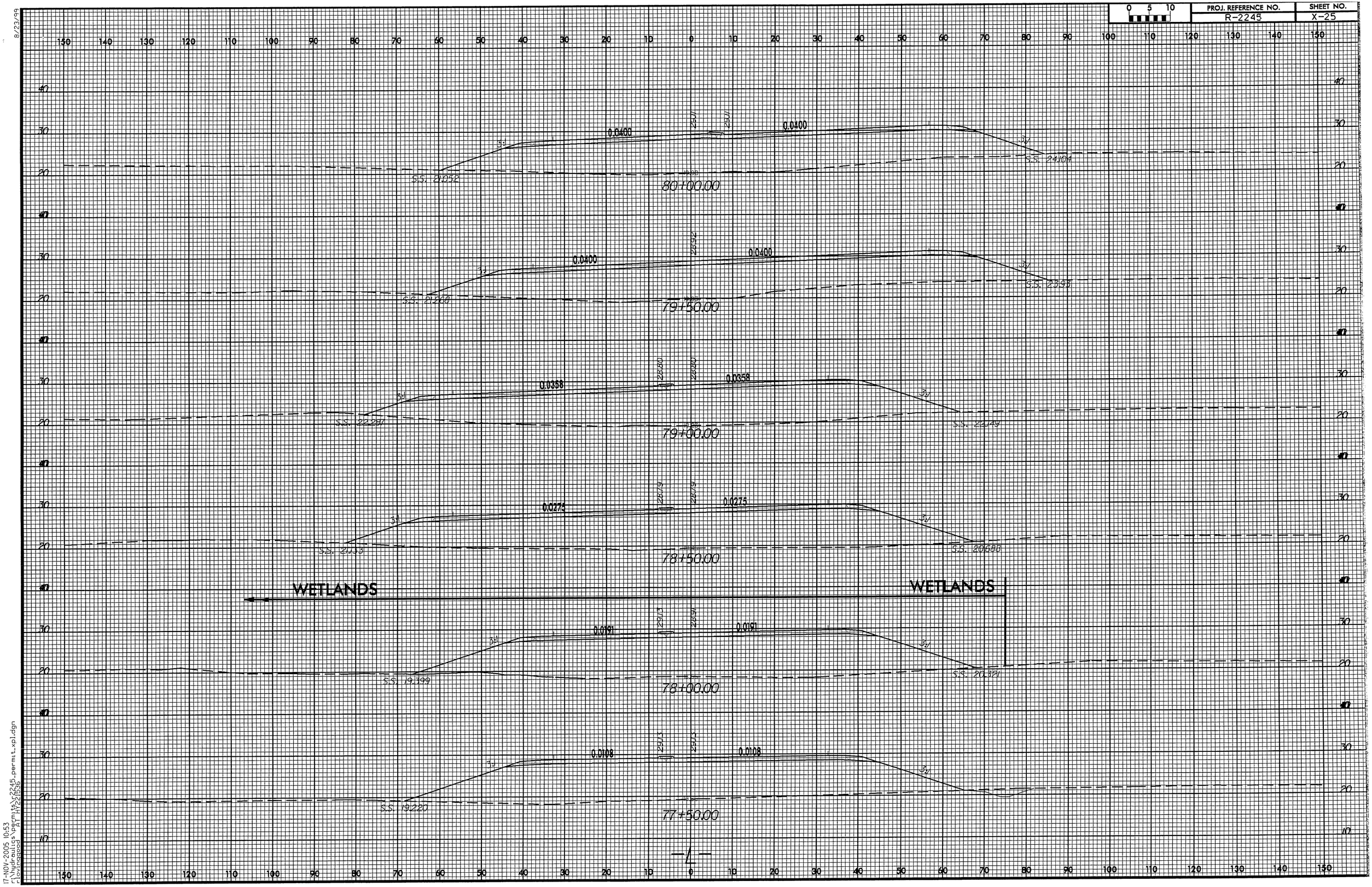
rlovingood
AT HY22636

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2245	X-25

8/23/99



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rlovingood AT HY225536

WETLANDS

WETLANDS

95+00.00

S.S. 29.078

S.S. 27.386

94+50.00

S.S. 28641

S.S. 27.546

94+00.00

S.S. 28071

S.S. 28.309

93+50.00

S.S. 27.814

S.S. 28140

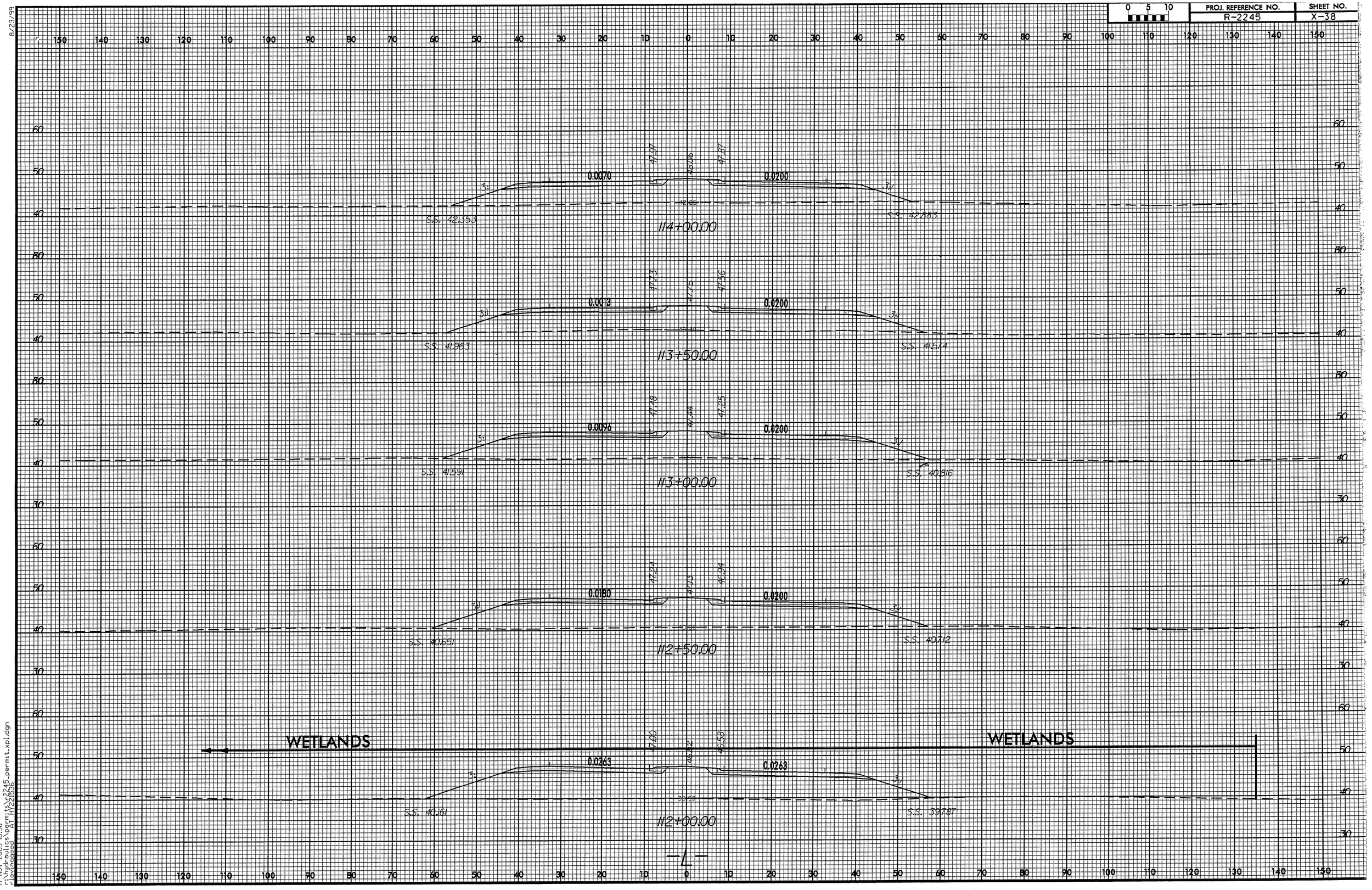
93+00.00

S.S. 27.927

S.S. 29.266

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2245	X-38



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rlovingood AT HY22536

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2245	X-42

WETLANDS

WETLANDS

WETLANDS

0.0200

0.0200

5%

5%

5346

5307

S.S. 47.185

S.S. 45.674

124+00.00

0.0200

0.0200

5%

5%

5326

5316

5326

S.S. 47.639

S.S. 45.091

123+50.00

0.0200

0.0200

5%

5%

5345

5334

5345

S.S. 46.004

S.S. 48.070

123+00.00

0.0200

0.0200

5%

5%

5314

5305

5314

S.S. 46.118

S.S. 47.020

122+50.00

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clovingood ATT1 HY2215.36

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2245	X-51

WETLANDS

WETLANDS

S.S. 60245

145+00.00

S.S. 60902

S.S. 60311

144+50.00

S.S. 60279

S.S. 60387

144+00.00

S.S. 59786

S.S. 60151

143+50.00

S.S. 59934

S.S. 59771

143+00.00

S.S. 58841

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plotting
AT H221536

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2245	X-58

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

80 70 60 50 40

0.0600 0.0600 3:1 3:1

64.68 64.23 63.70

S.S. 56.264

163+00.00

S.S. 55.654

64.53 64.08 63.55

S.S. 56.536

162+50.00

S.S. 55.494

WETLANDS WETLANDS

64.38 63.98 63.40

0.0600 0.0600 3:1 3:1

S.S. 56.509

162+00.00

S.S. 55.750

64.23 63.78 63.25

0.0600 0.0600 3:1 3:1

S.S. 55.766

161+50.00

S.S. 53.446

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bcarnegie
Default

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8/23/99

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
R-2245	X-66

182+00.00

S.S. 59.170

S.S. 59.327

181+50.00

S.S. 59.427

S.S. 59.260

181+00.00

S.S. 59.332

S.S. 59.306

180+50.00

S.S. 59.186

S.S. 59.440

WETLANDS

WETLANDS

180+00.00

S.S. 59.425

S.S. 59.734

-L-

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dowdesign

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2245	X-69

WETLANDS

WETLANDS

190+00.00

S.S. 58.999

S.S. 59.235

0.0200

3:1

3:1

189+50.00

S.S. 59.159

S.S. 59.069

0.0200

3:1

3:1

189+00.00

S.S. 59.251

S.S. 59.137

0.0200

3:1

3:1

188+50.00

S.S. 59.197

S.S. 59.557

0.0200

0.0200

3:1

3:1

188+00.00

S.S. 59.588

S.S. 59.890

0.0200

0.0200

3:1

3:1

187+50.00

S.S. 59.279

S.S. 59.596

0.0200

0.0200

3:1

3:1

—L—

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c:\highroads\permits\r-2245_permit_xpl.dgn
Approved

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2245	X-75

WETLANDS

WETLANDS

0.0310

0.0310

6314

5342

6364

3:1

3:1

5%

S.S. 54215

205+00.00

S.S. 53977

0.0393

0.0393

6335

5341

6389

3:1

3:1

5%

S.S. 54068

204+50.00

S.S. 54025

0.0477

0.0477

6338

5340

6365

3:1

3:1

5%

S.S. 54164

204+00.00

S.S. 54117

0.0500

0.0500

6356

5337

6348

3:1

3:1

5%

S.S. 54103

203+50.00

S.S. 54239

—4—

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rlovingood AT H221536

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2245	X-79

8/23/99

214+50.00

S.S. 52558

S.S. 52257

214+00.00

S.S. 52645

S.S. 52572

213+50.00

S.S. 52951

S.S. 53177

WETLANDS

WETLANDS

213+00.00

S.S. 53131

S.S. 52905

212+50.00

S.S. 53173

S.S. 53117

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levi.ragsdale
Active Pid: 8122536

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2245	X-86

WETLANDS

WETLANDS

0.0040

0.0200

3:1

3:1

S.S. 51720

59.40

59.40

59.21

232+00.00

S.S. 51370

0.0044

0.0165

3:1

3:1

S.S. 51690

59.48

59.55

59.32

231+50.00

S.S. 50526

0.0127

0.0081

3:1

3:1

S.S. 51514

59.56

59.70

59.69

231+00.00

S.S. 50848

0.0200

0.0002

3:1

3:1

S.S. 51716

59.66

59.96

59.82

230+50.00

S.S. 50790

0.0200

0.0085

3:1

3:1

S.S. 51996

59.81

60.00

60.04

230+00.00

S.S. 50696

—L—

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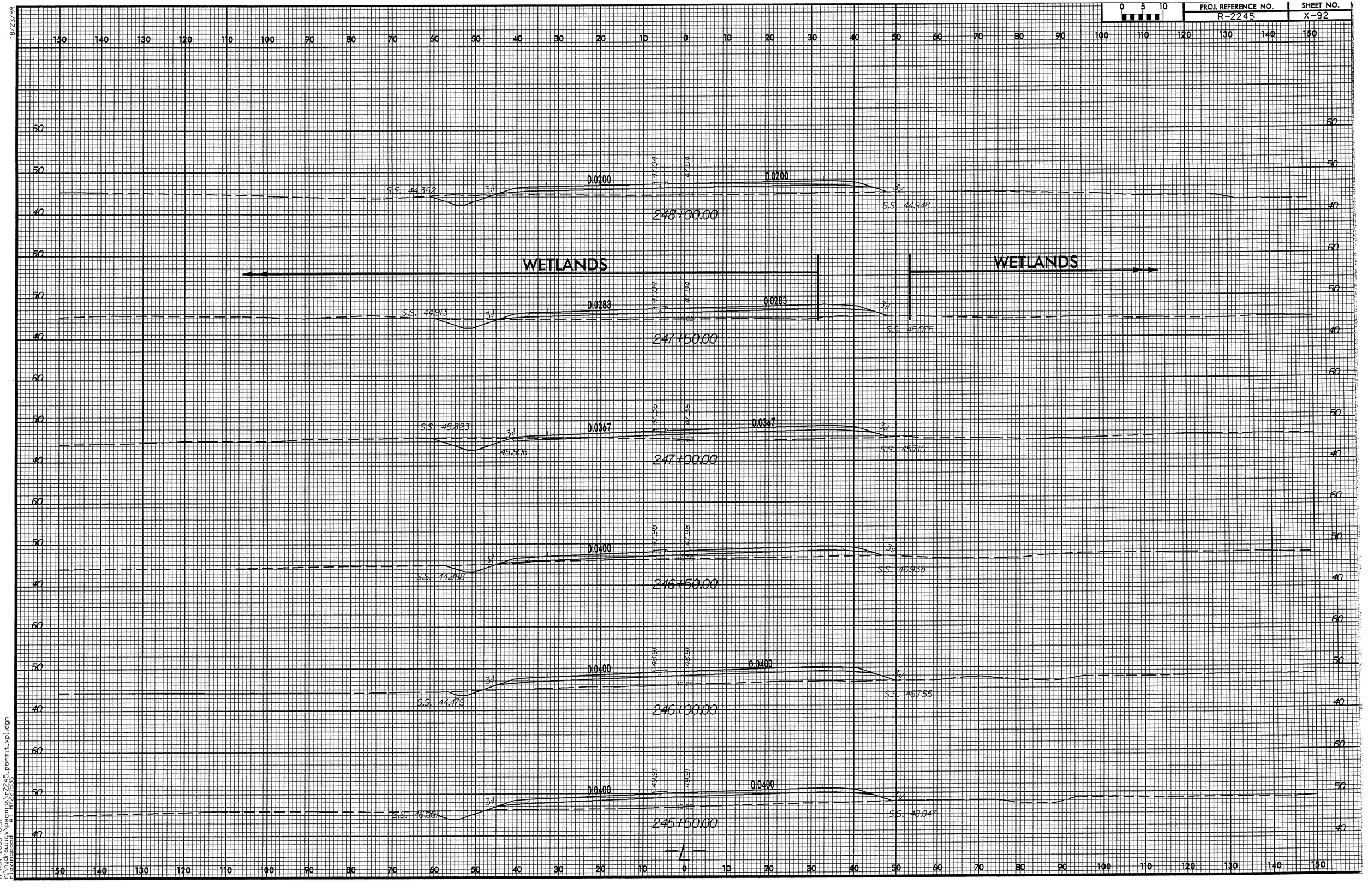
plowingood AT H221536



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0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	R-2245	X-102

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

60 50 40

-L- TIE

18+50.00

0.0200 0.0200 0.0200

SS 43892

18+00.00

0.0200 0.0200

SS 44143

17+50.00

WETLANDS

0.0200 0.0200

SS 44361

17+00.00

SS 44875

0.0200 0.0200

SS 44842

16+50.00

SS 44771

0.0200 0.0200

SS 44744

16+00.00

-Y7-

8/23/95

PROJ. REFERENCE NO.	SHEET NO.
R-2245	X-104

0 10 20

24+50.00

0.0200 0.0200

47.82

SS. 4408

SS. 4401

24+00.00

0.0200 0.0200

47.79

SS. 39593

SS. 42079

23+50.00

0.0200 0.0200

47.82

SS. 4450

SS. 4450

23+00.00

0.0200 0.0200

47.94

47.90

SS. 4621

SS. 44.41

22+50.00

0.0200 0.0200

47.88

47.38

SS. 4607

SS. 4424

22+00.00

0.0200 0.0200

47.23

47.45

SS. 4644

SS. 4465

-Y17-

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plivingood
A1_H22x36