US Army Corps
Of Engineers
Wilmington District

PUBLIC NOTICE

Issue Date: September 19, 2014
Comment Deadline: October 17, 2014
Corps Action ID Number: SAW-2010-01219

The Wilmington District, Corps of Engineers (Corps) received an application from the North Carolina Department of Transportation (NCDOT), in consultation with the Federal Highway Administration (FHWA), seeking Department of the Army (DA) authorization to permanently impact 2.9 acres of riparian riverine wetlands and 567 feet of warm water stream associated with safety improvements to the existing US 70 corridor including construction of new grade separated interchanges with associated approachs in place of existing at-grade interchanges in Johnson County, North Carolina. (NCDOT TIP No.W-5107)

Specific plans and location information are described below and shown on the attached plans. This Public Notice and all attached plans are also available on the Wilmington District Web Site at:

http://www.saw.usace.army.mil/Missions/RegulatoryPermitProgram.aspx

Applicant: **North Carolina Department of Transportation (NCDOT)**
Attn: Mr. Tim M. Little P.E.
NCDOT / Division 4
Post Office Box 3165
Wilson, North Carolina 27895

Authority

The Corps evaluates this application and decides whether to issue, conditionally issue, or deny the proposed work pursuant to applicable procedures of the following Statutory Authorities:

☒ Section 404 of the Clean Water Act (33 U.S.C. 1344)

☐ Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403)

☐ Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413)

Location

Directions to Site: The site location is within the US 70 corridor east of I-95, from Firetower Road (SR 2305) to east of Davis Mill - Stevens Chapel Road (SR 2310) near the Town of Smithfield, Johnston County, North Carolina (Figure1).

Project Area (acres): 2.7 miles Nearest Town: Smithfield
Nearest Waterway: Neuse River River Basin: Neuse River
Latitude and Longitude: Approximate center at 35.57389 N, -78.58389 W

Figure 1

Existing Site Conditions

The study area lies in the coastal plain physiographic region of North Carolina. Topography in the project vicinity is comprised of gently rolling hills with narrow, level floodplains and moderately steep slopes along streams. Elevations in the study area range from 140 to 165 feet above mean sea level. Land use in the project vicinity consists of primarily residential, commercial, and agricultural uses along roadways and in uplands and forested lands occupying stream corridors and other undeveloped areas.

Water resources in the study area are part of the Neuse River Basin (United States Geological Survey [USGS] Hydrologic Unit Code (HUC) 03020201). Three jurisdictional streams were identified in the study area; Bawdy Creek, Quincosin Swamp and an unnamed tributary of Quincosin Swamp. There are no trout waters, designated anadromous fish spawning areas or Primary Nursery Areas present in the study area.

Based on the North Carolina 2006 Final 303(d) list of impaired waters, there are no impaired waters located within one mile of the study area. No High Quality Waters (HQW), Outstanding Resource Waters (ORW), or WS-I or WS-II waters occur within one mile of the study area.

Five terrestrial communities were identified in the study area: maintained/disturbed areas, mesic mixed hardwood forest (coastal plain subtype), mesic pine flatwoods, coastal plain small stream swamp (blackwater subtype), and coastal plain bottomland hardwoods (blackwater subtype).

A wetland identification and preliminary assessment analysis for the study area was performed and wetlands were delineated based on the 1987 U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual. Wetland delineations were completed in May 2009.The wetlands located in the western portion of the study area are part of the coastal plain bottomland hardwoods community, while wetlands in the eastern portion of the study area are comprised of coastal plain small stream swamp community.

Applicant's Stated Purpose

The purpose of the project is to improve the mobility of vehicular travel along US 70. The proposed improvements are needed to safely accommodate future traffic volumes along this section of the Strategic Highway Corridor. The proposed project would implement safe access management measures within the freeway concept consistent with the US 70 Access Management Study (NCDOT July 2005) and the US 70 Master Plan map for Johnston County (US 70 Corridor Commission July 2009). Secondary benefits from the proposed project include a reduction in the number of potential vehicular conflicts inherent with at-grade intersections.

Project Description

The applicant proposes to construct grade-separated interchanges at the intersection of US 70 with US 70 Business-Peedin Street Extension (SR 2308) and with Stevens Chapel Road-Davis Mill Road (SR 2310) and to close median openings at the intersections of US 70 with Firetower Road (SR 2305), Creech's Mill Road-Peedin Road (SR 2309), Pine Street-Pine Valley Road, Linden Street, and a private driveway east of Stevens Chapel Road-Davis Mill Road. Project construction includes several culvert extensions as well as several new location culverts. The length of the project is approximately 2.7 miles.

Avoidance and Minimization

The applicant provided the following information in support of efforts to avoid and/or minimize impacts to the aquatic environment: All jurisdictional features were delineated and surveyed within the corridor for W-5107. Using these surveyed features, preliminary designs were adjusted to avoid and/or minimize impacts to jurisdictional areas. NCDOT employs many strategies to avoid and minimize impacts to jurisdictional areas in all of its designs. Many of these strategies have been incorporated into BMP documents that have

been reviewed and approved by the resource agencies and which will be followed throughout construction. All wetland areas not affected by the project will be protected from unnecessary encroachment. Individual avoidance and minimization items are as follows:

- No staging of construction equipment or storage of construction supplies will be allowed in wetlands or near surface waters.
- The project was designed to avoid or minimize disturbance to aquatic life movements.
- NCDOT and its contractors will not excavate, fill, or perform land clearing activities within Waters of the U.S. or any areas under the jurisdiction of the USACE, except as authorized by the USACE. To ensure that all borrow and waste activities occur on high ground, except as authorized by permit, the NCDOT shall require its contractors to identify all areas to be used to borrow material, or to dispose of dredged, fill or waste material. Documentation of the location and characteristics of all borrow and disposal sites associated with the project will be available to the USACE on request.
- Storm water will be treated using grass swales
- Sediment and erosion control measures shall adhere to the Design Standards in Sensitive Watersheds during construction of the project.
- The use of hand clearing rather than mechanized clearing where possible.

Compensatory Mitigation

The applicant offered the following compensatory mitigation plan to offset unavoidable functional loss to the aquatic environment: The proposed impacts to jurisdictional areas within the project limits will require compensatory mitigation. Impacts to 567 linear feet of stream and 2.9 acres of wetlands will be mitigated through the in-lieu fee program administered by the North Carolina Ecosystem Enhancement Program (NCEEP)..

Essential Fish Habitat

Pursuant to the Magnuson-Stevens Fishery Conservation and Management Act, this Public Notice initiates the Essential Fish Habitat (EFH) consultation requirements. The Corps' determination is that the proposed project will not affect EFH or associated fisheries managed by the South Atlantic or Mid Atlantic Fishery Management Councils or the National Marine Fisheries Service.

Cultural Resources

Pursuant to Section 106 of the National Historic Preservation Act of 1966, Appendix C of 33 CFR Part 325, and the 2005 Revised Interim Guidance for Implementing Appendix C, the District Engineer consulted district files and records and the latest published version of the National Register of Historic Places and initially determines that:

☐ Should historic properties, or properties eligible for inclusion in the National Register, be present within the Corps' permit area; the proposed activity requiring

the DA permit (the undertaking) is a type of activity that will have no potential to cause an effect to an historic properties.

☒ No historic properties, nor properties eligible for inclusion in the National Register, are present within the Corps' permit area; therefore, there will be no historic properties affected. The Corps and NCDOT coordinated with the NC Department of Cultural Resources and it was determined that no historic resources would be affected by the proposed project, and has received written concurrence from SHPO.

☐ Properties ineligible for inclusion in the National Register are present within the Corps' permit area; there will be no historic properties affected by the proposed work. The Corps subsequently requests concurrence from the SHPO (or THPO).

☐ Historic properties, or properties eligible for inclusion in the National Register, are present within the Corps' permit area; however, the undertaking will have no adverse effect on these historic properties. The Corps subsequently requests concurrence from the SHPO (or THPO).

☐ Historic properties, or properties eligible for inclusion in the National Register, are present within the Corps' permit area; moreover, the undertaking may have an adverse effect on these historic properties. The Corps subsequently initiates consultation with the SHPO (or THPO).

☐ The proposed work takes place in an area known to have the potential for the presence of prehistoric and historic cultural resources; however, the area has not been formally surveyed for the presence of cultural resources. No sites eligible for inclusion in the National Register of Historic Places are known to be present in the vicinity of the proposed work. Additional work may be necessary to identify and assess any historic or prehistoric resources that may be present.

The District Engineer's final eligibility and effect determination has been based upon coordination with the SHPO and/or THPO, as appropriate and required, and with full consideration given to the proposed undertaking's potential direct and indirect effects on historic properties within the Corps-indentified permit area.

Endangered Species

Pursuant to the Endangered Species Act of 1973, the Corps reviewed the project area, examined all information provided by the applicant and consulted the latest North Carolina Natural Heritage Database. Based on available information:

☒ The Corps determines that the proposed project would not affect federally listed endangered or threatened species or their formally designated critical habitat.

☐ The Corps determines that the proposed project may affect federally listed endangered or threatened species or their formally designated critical habitat.

The Corps initiates consultation under Section 7 of the ESA and will not make a permit decision until the consultation process is complete.

☐ The Corps is not aware of the presence of species listed as threatened or endangered or their critical habitat formally designated pursuant to the Endangered Species Act of 1973 (ESA) within the project area. The Corps will make a final determination on the effects of the proposed project upon additional review of the project and completion of any necessary biological assessment and/or consultation with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service.

Other Required Authorizations

The Corps forwards this notice and all applicable application materials to the appropriate State agencies for review.

North Carolina Division of Water Resources (NCDWR): The Corps will generally not make a final permit decision until the NCDWR issues, denies, or waives the state Certification as required by Section 401 of the Clean Water Act (PL 92-500). The receipt of the application and this public notice, combined with the appropriate application fee, at the NCDWR Central Office in Raleigh constitutes initial receipt of an application for a 401 Certification. A waiver will be deemed to occur if the NCDWR fails to act on this request for certification within sixty days of receipt of a complete application. Additional information regarding the 401 Certification may be reviewed at the NCDWR Central Office, Transportation Permitting Unit, 512 North Salisbury Street, Raleigh, North Carolina 27604-2260. All persons desiring to make comments regarding the application for a 401 Certification should do so, in writing, by October 17, 2104 to:

NCDWR Central Office
Attention: Ms. Amy Chapman, Transportation Permitting Unit
(USPS mailing address): 1617 Mail Service Center, Raleigh, NC 27699-1617

Or,

(physical address): 512 North Salisbury Street, Raleigh, North Carolina 27604

North Carolina Division of Coastal Management (NCDCM):

☐ The application did not include a certification that the proposed work complies with and would be conducted in a manner that is consistent with the approved North Carolina Coastal Zone Management Program. Pursuant to 33 CFR 325.2 (b)(2) the Corps cannot issue a Department of Army (DA) permit for the proposed work until the applicant submits such a certification to the Corps and the NCDCM, and the NCDCM notifies the Corps that it concurs with the

applicant's consistency certification. As the application did not include the consistency certification, the Corps will request, upon receipt,, concurrence or objection from the NCDCM.

☒ Based upon all available information, the Corps determines that this application for a Department of Army (DA) permit does not involve an activity which would affect the coastal zone, which is defined by the Coastal Zone Management (CZM) Act (16 U.S.C. § 1453).

Evaluation

The decision whether to issue a permit will be based on an evaluation of the probable impacts including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, flood plain values (in accordance with Executive Order 11988), land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people. For activities involving the discharge of dredged or fill materials in waters of the United States, the evaluation of the impact of the activity on the public interest will include application of the Environmental Protection Agency's 404(b)(1) guidelines.

Commenting Information

The Corps of Engineers is soliciting comments from the public; Federal, State and local agencies and officials, including any consolidated State Viewpoint or written position of the Governor; Indian Tribes and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment (EA) and/or an Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA). Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

Any person may request, in writing, within the comment period specified in this notice, that a public hearing be held to consider the application. Requests for public hearings shall state, with particularity, the reasons for holding a public hearing. Requests for a public hearing shall be granted, unless the District Engineer determines that the issues raised are insubstantial or there is otherwise no valid interest to be served by a hearing.

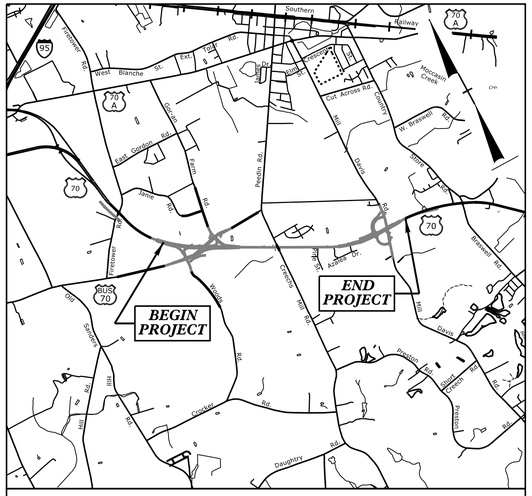
The Corps of Engineers, Wilmington District will receive written comments pertinent to the proposed work, as outlined above, until 5pm, October 17, 2014. Comments should be submitted to Mr. Thomas Steffens, Washington Regulatory Field Office,
2407 West Fifth Street , Washington, North Carolina 27889, at (910) 251-4615.

09/08/99

TIP PROJECT: W-5107

CONTRACT:

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

JOHNSTON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5107	1	19

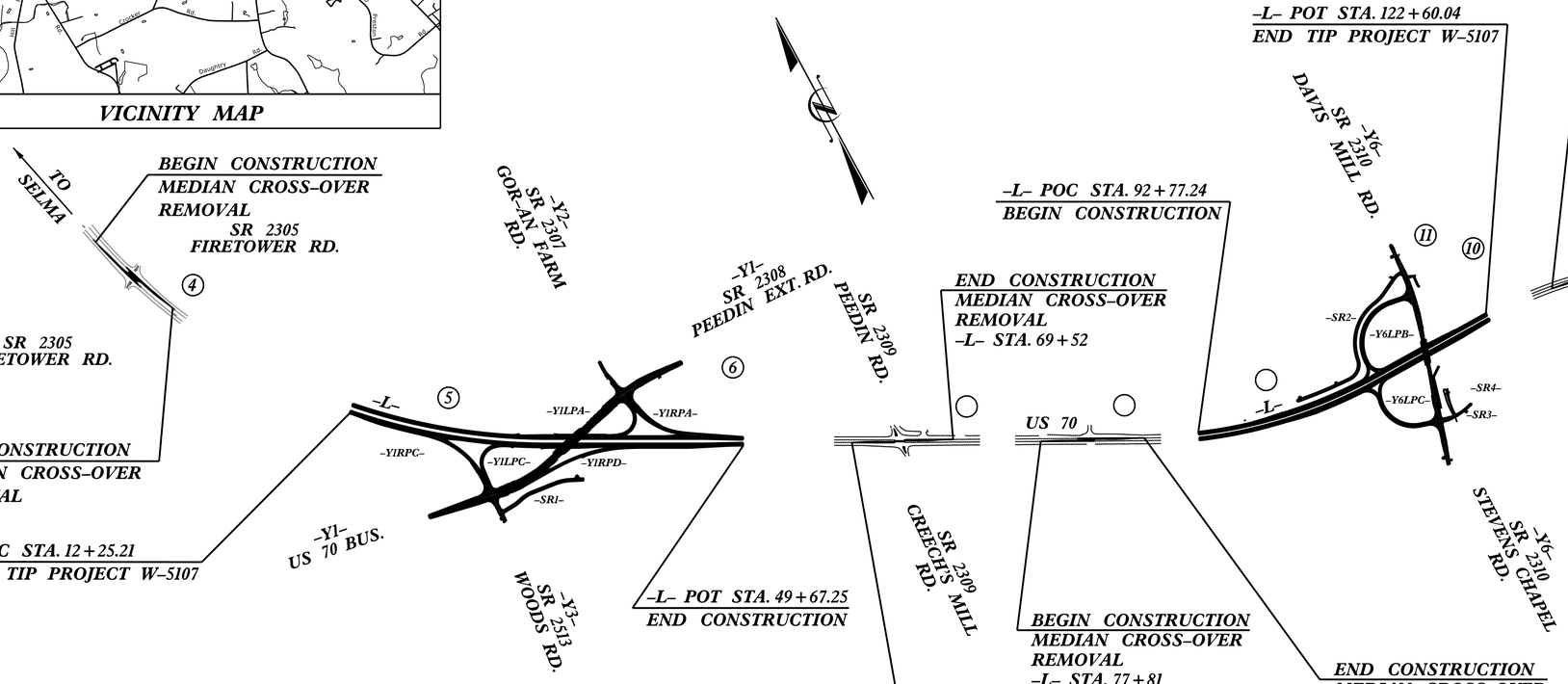
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
WBS-41871.1.1	STPNHS-0070(117)	P.E.
WBS-41871.2.1	STPNHS-0070(117)	R/W, UTIL.

PERMIT DRAWING
SHEET 1 OF 19

LOCATION: US 70 EAST OF I-95 FROM SR 2305 (FIRETOWER RD.)
TO EAST OF SR 2310 (DAVIS MILL RD. – STEVENS CHAPEL RD.)

TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURES AND SIGNING

WETLAND AND SURFACE WATER IMPACTS PERMIT



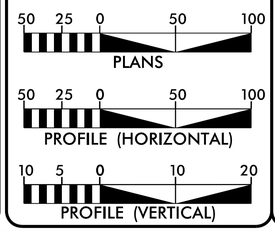
THIS IS A FULL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS SHOWN ON THE PLANS.

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES



DESIGN DATA

ADT 2015 = 29,538
ADT 2035 = 45,000
DHV = 9 %
D = 60 %
T = 10 % *
V = 60 MPH
FUNCTIONAL CLASS =
RURAL PRINCIPAL ARTERIAL
STATEWIDE TIER DESIGN
*TTST = 6% DUALS = 4%

PROJECT LENGTH

LENGTH ROADWAY PROJECT = 1.27 MILES
TOTAL LENGTH STATE PROJECT = 1.27 MILES

Prepared In the Office of:

WSP
Transportation & Infrastructure
15401 Weston Parkway Suite 100
Cary, NC 27513 - 919.678.0035
www.wspsellls.com
LICENSE NO. F-0891

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Tel: 919/854-1282 Fax: 919/854-5448 NC License No. C-1869

for the North Carolina Department of Transportation

2012 STANDARD SPECIFICATIONS	*ARCADIS CONTACT*
RIGHT OF WAY DATE: MARCH , 2013	STEVE SMALLWOOD, P.E. *PROJECT ENGINEER*
LETTING DATE: FEBRUARY 17, 2015	*NCDOT CONTACT* JERRY PAGE, P.E. *PROJECT ENGINEER*

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

6/17/2014
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5/14/99

E E DENOTES EXCAVATION IN WETLAND

F F DENOTES FILL IN WETLAND

HC HC DENOTES HAND CLEARING

DENOTES STREAM RELOCATION/IMPROVEMENTS

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES STREAM BANK STABILIZATION

DENOTES MECHANIZED CLEARING

DENOTES EXCAVATION FOR UTILITY INTALLATION

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
W-5107	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REF. ROADWAY SHEET 6

PERMIT DRAWING SHEET 2 OF 19

SITE 1

SITE 2

SITE 3

SITE 4

MATCHLINE STA 23+00 SEE SHEET 5

MATCHLINE STA 16+00 SEE SHEET 5

MEDIAN GRASSED SWALE STA. 19+00 TO STA. 23+53 -L- M

MEDIAN GRASSED SWALE STA. 23+53 TO STA. 28+60 -L- M

MEDIAN GRASSED SWALE STA. 28+60 TO STA. 30+04 -L- M

MEDIAN GRASSED SWALE STA. 30+04 TO STA. 31+75 -L- M

TOE PROTECTION STA. 29+00 TO 31+00 -L- LINE W/CLASS B SEE DETAIL AM, SH. 2E

TIE TO EAST GAB

CABLE GUIDERAIL ANCHOR

RETAIN

RETAIN EXISTING 2-10'X8' RCBC

REMOVE

TEMPORARY CHANNEL

FOR DITCHES RPC 1 - 6 SEE CHART ABOVE

RPC-1 RPC-2 RPC-3 RPC-4 RPC-5 RPC-6

FOR DITCHES LPC 1 - 9 SEE CHART BELOW

LPC-1 LPC-2 LPC-3 LPC-4 LPC-5

PROPOSED CHANNEL CHANGE

SPECIAL CUT GRASSED SWALE STA. 15+05 TO STA. 20+40 -Y1RPC- RT SEE DETAIL AV, SH. 2E

SPECIAL CUT BASE DITCH STA. 19+00 -Y1- LT TO STA. 20+40 -Y1RPC- RT LINE W/PSRM SEE DETAIL Q, SH. 2C

SPECIAL CUT GRASSED SWALE STA. 18+00 TO STA. 19+00 -Y1- LT SEE DETAIL B, SH. 2C

SPECIAL CUT DITCH STA. 14+50 TO STA. 15+50 -Y3- RT LINE W/PSRM

LATERAL GRASSED SWALE STA. 11+50 TO STA. 12+61 -SR1- LT

SPECIAL CUT GRASSED SWALE STA. 16+52 TO STA. 17+76 -SR1- LT SEE DETAIL B, SH. 2C

TOE PROTECTION STA. 19+00 -Y1RPD- TO STA. 27+50 -Y1- RT LINE W/CLASS B RIP RAP SEE DETAIL AM, SH. 2E

TOE PROTECTION STA. 12+67 TO 16+32 -SR1- LT LINE W/PSRM SEE DETAIL AK, SH. 2C

TOE PROTECTION STA. 14+97 TO 17+36 -SR1- RT LINE W/CLASS B SEE DETAIL AM, SH. 2E

TOE PROTECTION STA. 10+54 TO 14+25 -SR1- RT LINE W/CLASS B SEE DETAIL AM, SH. 2E

STANDARD "V" DITCH STA. 21+50 -Y- RT TO STA. 21+50 -SR1- LT SEE DETAIL AB, SH. 2C

TEMPORARY CHANNEL

REMOVE EXISTING 3-7'X5' RCBC

GRASS SWALE DATA
DA = 41.69 AC
SLOPE = 0.22%
L REQ. = 0 FT
L PRO. = 55 FT
Q2 = 23.14 CFS
V2 = 1.85 FPS
D2 = 1.27 FT
Q10 = 33.94 CFS
V10** = 2.06 FPS
D10 = 1.55 FT
*BASED UPON UNTREATED HIGHWAY IMPERVIOUS DA

STA. 23+00 -Y1- LT

DITCH CHART

LPC

LPC-1	TRAPEZOIDAL GRASSED SWALE w/ROCK CHECK DAM STA. 20+87 TO STA. 22+00 -Y1- LT SEE DETAIL AG, SH. 2D
LPC-2	TRAPEZOIDAL GRASSED SWALE w/ROCK CHECK DAM STA. 17+60 -Y1LPC- LT TO STA. 20+87 -Y1- LT SEE DETAIL AG, SH. 2D
LPC-3	LATERAL BASE DITCH STA. 22+00 TO STA. 23+00 -Y1- LT LINE w/PSRM SEE DETAIL AC, SH. 2D
LPC-4	STANDARD BASE GRASSED SWALE STA. 23+00 -Y1- LT SEE DETAIL AZ, SH. 2C
LPC-5	'V' GRASSED SWALE w/ROCK CHECK DAM STA. 14+00 TO STA. 15+00 -Y1LPC- LT SEE DETAIL AJ, SH. 2D

DITCH CHART

LPC

LPC-6	TOE PROTECTION STA. 12+98 TO 14+00 -Y1LPC- LT LINE wCLASS B RIP RAP SEE DETAIL AM, SH. 2E
LPC-7	TOE PROTECTION STA. 27+44 TO 29+67 -L- RT LINE wCLASS B RIP RAP SEE DETAIL AM, SH.2E
LPC-8	TOE PROTECTION STA. 23+90 TO 24+04 -Y1- LT LINE wCLASS B RIP RAP SEE DETAIL AM, SH. 2E
LPC-9	TOE PROTECTION STA. 24+91 TO 26+21 -Y1- LT LINE wCLASS B RIP RAP SEE DETAIL AM, SH. 2E
LPC-10	STANDARD BASE DITCH STA. 23+54 -Y1- LT SEE DETAIL A, SH. 2C

GRAPHIC SCALE
25 12.5 0 25 50
PLANS

6/17/2014
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PROJECT REFERENCE NO.	SHEET NO.
W-5107	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REF. ROADWAY SHEET 6

PERMIT DRAWING SHEET 4 OF 19

E E DENOTES EXCAVATION IN WETLAND

F F DENOTES FILL IN WETLAND

HC HC DENOTES HAND CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

DENOTES STREAM BANK STABILIZATION

DENOTES STREAM RELOCATION/IMPROVEMENTS

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SITE 2

SITE 1

SITE 3

SEE DETAIL AM, SH. 2E

MEDIAN GRASSED SWALE
STA. 23+53 TO
STA. 28+60 –L– M

RETAIN EXISTING
2–10'X8' RCBC

2–10'X8' RCBC

CABLE GUIDERAIL ANCHOR

REMOVE

MEDIAN GRASSED SWALE
STA. 28+60 TO
STA. 30+04 –L– M

MEDIAN
STA. 30
STA. 31

TEMPORARY CHANNEL

EXTEND EXISTING
2–10'X8' RCBC

BEGIN SBG +00 RT

END SBG +50 RT

PROPOSED CHANNEL CHANGE

PROPOSED 3–10'X9' RCBC

RPC–5

LPC–6

LPC–5

LPC–4

LPC–3

LPC–7

LPC–9

LPC–8

–Y1LPC–

–Y1RPD–

–Y1–

–L–

CAT –1

GRAU–350

BAWDY SWAMP

WOODS

MTL

FOR DITCHES LPC 1 – 9 SEE CHART BELOW

GRASS SWALE DATA
DA= 41.69 AC
SLOPE= 0.22%
L REQ.= 0 FT
L PRO.= 55 FT
Q2= 23.14 CFS
V2= 1.85 FPS
D2= 1.27 FT
Q10= 33.94 CFS
V10**= 2.06 FPS
D10= 1.55 FT
*BASED UPON UNTREATED HIGHWAY IMPERVIOUS DA

STA. 23+00 –Y1– LT

DITCH CHART

LPC

LPC–1	TRAPEZOIDAL GRASSED SWALE w/ROCK CHECK DAM STA. 20+87 TO STA. 22+00 –Y1– LT SEE DETAIL AG, SH. 2D
LPC–2	TRAPEZOIDAL GRASSED SWALE w/ROCK CHECK DAM STA. 17+60 –Y1LPC– LT TO STA. 20+87 –Y1– LT SEE DETAIL AG, SH. 2D
LPC–3	LATERAL BASE DITCH STA. 22+00 TO STA. 23+00 –Y1– LT LINE w/PSRM SEE DETAIL AC, SH. 2D
LPC–4	STANDARD BASE GRASSED SWALE STA. 23+00 –Y1– LT SEE DETAIL AZ, SH. 2C
LPC–5	'V' GRASSED SWALE w/ROCK CHECK DAM STA. 14+00 TO STA. 15+00 –Y1LPC– LT SEE DETAIL AJ, SH. 2D

DITCH CHART

LPC

LPC–6	TOE PROTECTION STA. 12+98 TO 14+00 –Y1LPC– LT LINE w/CLASS B RIP RAP SEE DETAIL AM, SH. 2E
LPC–7	TOE PROTECTION STA. 27+44 TO 29+67 –L– RT LINE w/CLASS B RIP RAP SEE DETAIL AM, SH.2E
LPC–8	TOE PROTECTION STA. 23+00 TO 24+04 –Y1– LT LINE w/CLASS B RIP RAP SEE DETAIL AM, SH. 2E
LPC–9	TOE PROTECTION STA. 24+91 TO 26+21 –Y1– LT LINE w/CLASS B RIP RAP SEE DETAIL AM, SH. 2E
LPC–10	STANDARD BASE DITCH STA. 23+54 –Y1– LT SEE DETAIL A, SH. 2C

GRAPHIC SCALE
12.5 0 12.5 25
PLANS

6/17/2014
usym01388
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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
W-5107	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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E E DENOTES EXCAVATION IN WETLAND

F F DENOTES FILL IN WETLAND

HC HC DENOTES HAND CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

DENOTES MECHANIZED CLEARING

DENOTES STREAM BANK STABILIZATION

DENOTES STREAM RELOCATION/IMPROVEMENTS

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES EXCAVATION FOR UTILITY INTALLATION

REF. ROADWAY SHEET 6

PERMIT DRAWING SHEET 5 OF 19

LPC–1

CAT–1

WOODS

–Y1–

–Y1RPD–

20

BEGIN SBG +50 LT

BEGIN SBG +50 LT

REMOVE EXISTING 3–7'X7'RCBC

JOHNSTON CO.

STANDARD 'V' DITCH
STA. 21+50 –Y1– RT TO
STA. 11+50 –SR1– LT
SEE DETAIL AB, SH. 2D

GRAU–350

CULTIVATED

–SR1–

SOIL

SITE 4

SPECIAL CUT GRASSED SWALE
STA. 16+52 TO
STA. 17+76 –SR1– LT
SEE DETAIL B, SH. 2C

TOE PROTECTION
STA. 12+61 TO
16+52 –SR1– LT
LINE W/PSRM
SEE DETAIL AK, SH. 2D

GRAU–350

TOE PROTECTION
STA. 14+97 TO
17+36 –SR1– RT
LINE W/CLASS B
SEE DETAIL AM, SH. 2E

TEMPORARY CHANNEL

TOE PROTECTION
STA. 10+54 TO
14+25 –SR1– RT
LINE W/CLASS B
SEE DETAIL AM, SH. 2E

LATERAL GRASSED SWALE
STA. 11+50 TO
STA. 12+61 –SR1– LT
SEE DETAIL K, SH. 2C

WLB

GRASS SWALE DATA	
DA=	41.69 AC
SLOPE=	0.22%
L REQ.=	0 FT
L PRO.=	55 FT
Q2=	23.14 CFS
V2=	1.85 FPS
D2=	1.27 FT
Q10=	33.94 CFS
V10**=	2.06 FPS
D10=	1.55 FT

*BASED UPON UNTREATED HIGHWAY IMPERVIOUS DA

STA. 23+00 –Y1– LT

DITCH CHART

LPC

LPC–1	TRAPEZOIDAL GRASSED SWALE w/ROCK CHECK DAM STA. 20+87 TO STA. 22+00 –Y1– LT SEE DETAIL AG, SH. 2D
LPC–2	TRAPEZOIDAL GRASSED SWALE w/ROCK CHECK DAM STA. 17+60 –Y1LPC– LT TO STA. 20+87 –Y1– LT SEE DETAIL AG, SH. 2D
LPC–3	LATERAL BASE DITCH STA. 22+00 TO STA. 23+00 –Y1– LT LINE w/PSRM SEE DETAIL AC, SH. 2D
LPC–4	STANDARD BASE GRASSED SWALE STA. 23+00 –Y1– LT SEE DETAIL AZ, SH. 2C
LPC–5	'V' GRASSED SWALE w/ROCK CHECK DAM STA. 14+00 TO STA. 15+00 –Y1LPC– LT SEE DETAIL AJ, SH. 2D

DITCH CHART

LPC

LPC–6	TOE PROTECTION STA. 12+98 TO 14+00 –Y1LPC– LT LINE w/CLASS B RIP RAP SEE DETAIL AM, SH. 2E
LPC–7	TOE PROTECTION STA. 27+44 TO 29+67 –L– RT LINE w/CLASS B RIP RAP SEE DETAIL AM, SH.2E
LPC–8	TOE PROTECTION STA. 23+00 TO 24+04 –Y1– LT LINE w/CLASS B RIP RAP SEE DETAIL AM, SH. 2E
LPC–9	TOE PROTECTION STA. 24+91 TO 26+21 –Y1– LT LINE w/CLASS B RIP RAP SEE DETAIL AM, SH. 2E
LPC–10	STANDARD BASE DITCH STA. 23+54 –Y1– LT SEE DETAIL A, SH. 2C

GRAPHIC SCALE
12.5 0 12.5 25
PLANS

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GRAPHIC SCALE
25 12.5 0 25 50
PLANS

PROJECT REFERENCE NO.	SHEET NO.
W-5107	6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REF. ROADWAY SHEET 10

PERMIT DRAWING SHEET 6 OF 19

SITE 5

LATERAL GRASSED SWALE
STA. 14+51 TO STA. 16+11 –SR2– RT
SEE DETAIL D, SH. 2C

LATERAL GRASSED SWALE
STA. 12+60 TO STA. 14+37 –SR2– RT
SEE DETAIL E, SH. 2C

TEMPORARY CHANNEL

SPECIAL CUT DITCH
STA. 12+20 TO –SR2– RT
STA. 12+60 –SR2– RT
LINE w/PSRM
SEE DETAIL J, SH. 2C

SPECIAL CUT DITCH
STA. 32+00 –Y6– LT TO
STA. 12+20 –SR2– RT
SEE DETAIL U, SH. 2C

SPECIAL CUT GRASSED SWALE
STA. 30+00 TO
STA. 33+00 –Y6– RT
SEE DETAIL B, SH. 2C

SPECIAL CUT DITCH
STA. 18+59 TO STA. 19+00 –Y6LPB– LT
LINE w/PSRM
SEE DETAIL J, SH. 2C

SPECIAL CUT GRASSED SWALE
STA. 10+49 TO
STA. 12+75 –SR2– LT
SEE DETAIL B, SH. 2C

SPECIAL CUT GRASSED SWALE
STA. 19+00 TO
STA. 20+50 –Y6LPB– LT
SEE DETAIL B, SH. 2C

LATERAL GRASSED SWALE
16+11 TO STA. 18+45 –SR2– RT
SEE DETAIL G, SH. 2C

LATERAL GRASSED SWALE
STA. 29+50 TO
STA. 30+00 –Y6– RT
SEE DETAIL K, SH. 2C

SPECIAL CUT GRASSED SWALE
STA. 31+08 –Y6– LT TO
STA. 20+50 –Y6LPB– LT
SEE DETAILS B, SH. 2C

TEMPORARY CHANNEL

LATERAL V DITCH
STA. 19+00 TO
STA. 19+50 –Y6LPB– RT
LINE w/PSRM
SEE DETAIL X, SH. 2C

LATERAL GRASSED SWALE
STA. 16+50 TO
STA. 17+26 –Y6LPB– RT
SEE DETAIL D, SH. 2C

LATERAL V DITCH
STA. 19+50 TO
STA. 20+00 –Y6LPB– RT
SEE DETAIL H, SH. 2C

LATERAL BASE DITCH
STA. 17+41 TO
STA. 19+00 –Y6LPB– RT
SEE DETAIL C, SH. 2C

LATERAL GRASSED SWALE
STA. 20+00 –Y6LPB– RT TO STA. 27+50 –Y6– LT
SEE DETAIL K, SH. 2C

LATERAL GRASSED SWALE
STA. 26+74 TO
STA. 27+50 –Y6– LT
SEE DETAIL D, SH. 2C

SPECIAL CUT GRASSED SWALE
STA. 12+50 TO STA. 16+50 –Y6LPB– RT
SEE DETAIL N, SH. 2C

SITE 6

SPECIAL CUT DITCH
STA. 11+30 TO
STA. 12+00 –Y6LPBA– LT
SEE DETAIL U, SH. 2C

SPECIAL CUT BASE DITCH
STA. 12+00 TO
STA. 12+50 –Y6LPB– RT
SEE DETAIL O, SH. 2C

LATERAL GRASSED SWALE
STA. 24+89 TO STA. 26+35 –Y6– LT
SEE DETAIL K, SH. 2C

LATERAL 'V' DITCH
STA. 24+70 TO STA. 24+89 –Y6– LT
LINE w/PSRM
SEE DETAIL X, SH. 2C

STANDARD V DITCH
STA. 115+00 –L– LT TO STA. 24+70 –Y6– LT
LINE w/PSRM
SEE DETAIL V, SH. 2C

SPECIAL CUT DITCH
STA. 11+00 TO
STA. 12+00 –Y6LPB– RT
SEE DETAIL U, SH. 2C

SPECIAL CUT DITCH
STA. 10+25 TO STA. 11+00 –Y6LPB– RT
LINE w/CLASS B RIP RAP SEE DETAIL Y, SH. 2C

MEDIAN GRASSED SWALE
STA. 108+28 TO
STA. 113+00 –L– M

MEDIAN GRASSED SWALE
STA. 113+00 TO
STA. 115+00 –L– M

SPECIAL CUT GRASSED SWALE
STA. 111+50 TO STA. 114+18 –L– RT
SEE DETAIL N, SH. 2C

SPECIAL CUT BASE DITCH
STA. 114+18 –L– RT TO
STA .22+00 –Y6– LT
SEE DETAIL O, SH. 2C

LATERAL BASE DITCH
STA. 21+70 TO
STA. 22+00 –Y6– LT
SEE DETAIL L, SH. 2C

SPECIAL CUT DITCH
STA. 10+00 TO STA. 11+75 –Y6LPC– LT
SEE DETAIL U, SH. 2C

SITE 7

TOE PROTECTION
STA. 25+00 TO STA. 25+74 –Y6– RT
LINE w/CLASS B RIP RAP
SEE DETAIL AM, SH. 2E

MEDIAN DITCH
STA. 120+59 TO
STA. 134+36 –L– M
SEE DETAIL AT, SH. 2E

MEDIAN GRASSED SWALE
STA. 116+50 TO
STA. 120+60 –L– M

2–6'X6' RCBC

SPECIAL CUT BASE DITCH
STA. 116+72 TO STA. 117+00 –L– RT
LINE w/PSRM
SEE DETAIL Q, SH. 2C

TRAPEZOIDAL GRASSED SWALE
w/ROCK CHECK DAM
STA. 117+00 TO STA. 119+00 –L– RT
SEE DETAIL AG, SH. 2D

LATERAL BASE DITCH
STA. 22+50 –Y6– RT TO

LATERAL GRASSED SWALE
STA. 119+00 TO
STA. 119+75 –L– RT
SEE DETAIL M, SH. 2C

LATERAL GRASSED SWALE
STA. 119+96 TO
STA. 121+00 –L– RT
SEE DETAIL D, SH. 2C

LATERAL BASE DITCH
STA. 121+00 TO
STA. 121+50 –L– RT
SEE DETAIL C, SH. 2C

LATERAL GRASSED SWALE
STA. 26+00 TO
STA. 29+50 –Y6– RT
SEE DETAIL S, SH. 2C

TEMPORARY CHANNEL

GRASS SWALE DATA

DA= 1.89 AC	DA= 4.29 AC	DA= 4.00 AC	DA= 0.69 AC	DA= 1.15 AC	DA= 1.11 AC
SLOPE= 0.96%	SLOPE= 0.57%	SLOPE= 0.38%	SLOPE= 2.30%	SLOPE= 0.37%	SLOPE= 1.24%
L REQ.*= 27 FT	L REQ.= 78 FT	L REQ.*= 0 FT	L REQ.= 25 FT	L REQ.*= 34 FT	L REQ.= 47 FT
L PRO.= 177 FT	L PRO.= 117 FT	L PRO.= 6 FT	L PRO.= 75 FT	L PRO.= 111 FT	L PRO.= 330 FT
Q2= 4.37 CFS	Q2= 8.68 CFS	Q2= 11.57 CFS	Q2= 1.96 CFS	Q2= 3.33 CFS	Q2= 2.25 CFS
V2= 1.99 FPS	V2= 1.93 FPS	V2= 1.83 FPS	V2= 1.84 FPS	V2= 1.44 FPS	V2= 1.96 FPS
D2= 0.42 FT	D2= 0.58 FT	D2= 0.76 FT	D2= 0.16 FT	D2= 0.88 FT	D2= 0.37 FT
Q10= 5.62 CFS	Q10= 11.17 CFS	Q10= 14.88 CFS	Q10= 2.52 CFS	Q10= 4.28 CFS	Q10= 2.89 CFS
V10= 2.15 FPS	V10= 2.09 FPS	V10= 1.98 FPS	V10= 2.01 FPS	V10= 1.54 FPS	V10= 2.10 FPS
D10= 0.48 FT	D10= 0.67 FT	D10= 0.87 FT	D10= 0.19 FT	D10= 0.96 FT	D10= 0.42 FT
*UNTREATED IMPERVIOUS DA, OUTFALL SR2006		*ALL IMPERVIOUS AREA HAS BEEN TREATED		*BASED UPON UNTREATED HIGHWAY IMPERVIOUS DA	*BASED UPON UNTREATED HIGHWAY IMPERVIOUS DA
STA. 12+60 TO STA. 14+37 –SR2– RT	STA. 14+51 TO STA. 16+11 –SR2– RT	STA. 16+50 TO STA. 17+26 –Y6LPB– RT	STA. 26+74 TO STA. 27+50 –Y6– LT	STA. 24+89 TO STA. 26+35 –Y6– LT	STA. 26+00 TO STA. 30+00 –Y6– RT

GRASS SWALE DATA	GRASS SWALE DATA
DA= 17.85 AC	DA= 3.49 AC
SLOPE= 0.19%	SLOPE= 0.67%
L REQ.*= 10 FT	L REQ.*= 10 FT
L PRO.= 25 FT	L PRO.= 35 FT
Q2= 36.14 CFS	Q2= 7.91 CFS
V2= 1.98 FPS	V2= 1.98 FPS
D2= 1.66 FT	D2= 0.53 FT
Q10= 46.48 CFS	Q10= 10.17 CFS
V10= 2.12 FPS	V10= 2.14 FPS
D10= 1.88 FT	D10= 0.61 FT
*BASED UPON UNTREATED HIGHWAY IMPERVIOUS DA	*BASED UPON UNTREATED HIGHWAY IMPERVIOUS DA
STA. 119+00 TO STA. 119+75 –L– RT	STA. 119+96 TO STA. 121+00 –L– RT

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

HC HC DENOTES HAND CLEARING

DENOTES STREAM BANK STABILIZATION

DENOTES STREAM RELOCATION/IMPROVEMENTS

DENOTES EXCAVATION FOR UTILITY INTALLATION

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Locations

X-Section Locations

E E DENOTES EXCAVATION IN WETLAND

F F DENOTES FILL IN WETLAND

HC HC DENOTES HAND CLEARING

DENOTES STREAM RELOCATION/IMPROVEMENTS

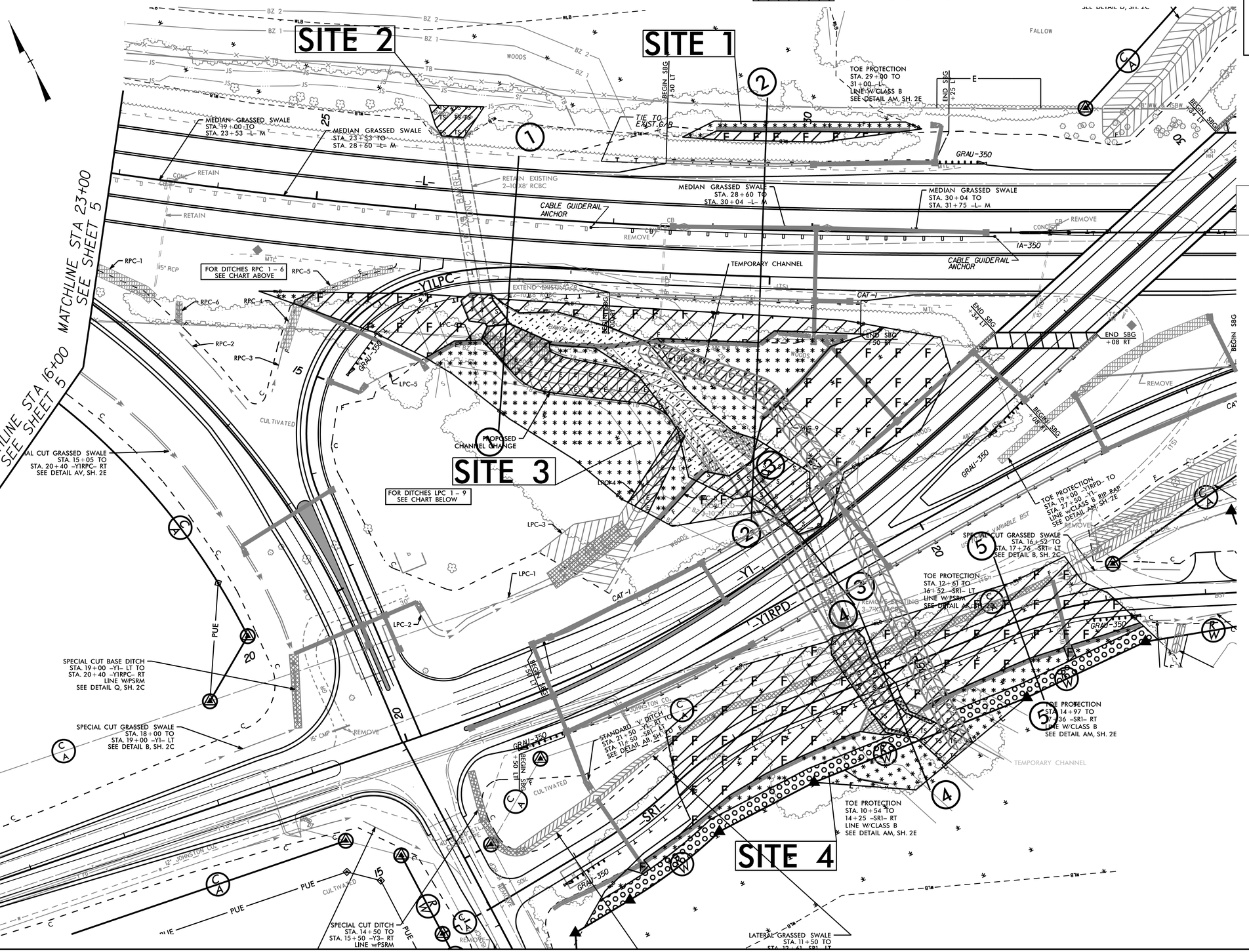
S S DENOTES IMPACTS IN SURFACE WATER

DENOTES STREAM BANK STABILIZATION

DENOTES MECHANIZED CLEARING

DENOTES EXCAVATION FOR UTILITY INTALLATION

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER



PROJECT REFERENCE NO.	SHEET NO.
W-5107	2
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

X-Sections

PERMIT DRAWING SHEET 1 OF 6

GRASS SWALE DATA
DA = 41.69 AC
SLOPE = 0.22%
L REQ. = 0 FT
L PRO. = 55 FT
Q2 = 23.14 CFS
V2 = 1.85 FPS
D2 = 1.27 FT
Q10 = 33.94 CFS
V10** = 2.06 FPS
D10 = 1.55 FT
*BASED UPON UNTREATED HIGHWAY IMPERVIOUS DA

STA. 23+00 -Y1- LT

DITCH CHART

LPC

LPC-1	TRAPEZOIDAL GRASSED SWALE w/ROCK CHECK DAM STA. 20+87 TO STA. 22+00 -Y1- LT SEE DETAIL AG, SH. 2D
LPC-2	TRAPEZOIDAL GRASSED SWALE w/ROCK CHECK DAM STA. 17+60 -Y1LPC- LT TO STA. 20+87 -Y1- LT SEE DETAIL AG, SH. 2D
LPC-3	LATERAL BASE DITCH STA. 22+00 TO STA. 23+00 -Y1- LT LINE w/PSRM SEE DETAIL AC, SH. 2D
LPC-4	STANDARD BASE GRASSED SWALE STA. 23+00 -Y1- LT SEE DETAIL AZ, SH. 2C
LPC-5	'V' GRASSED SWALE w/ROCK CHECK DAM STA. 14+00 TO STA. 15+00 -Y1LPC- LT SEE DETAIL AJ, SH. 2D

DITCH CHART

LPC

LPC-6	TOE PROTECTION STA. 12+98 TO 14+00 -Y1LPC- LT LINE wCLASS B RIP RAP SEE DETAIL AM, SH. 2E
LPC-7	TOE PROTECTION STA. 27+44 TO 29+67 -L- RT LINE wCLASS B RIP RAP SEE DETAIL AM, SH.2E
LPC-8	TOE PROTECTION STA. 23+00 TO 24+04 -Y1- LT LINE wCLASS B RIP RAP SEE DETAIL AM, SH. 2E
LPC-9	TOE PROTECTION STA. 24+91 TO 26+21 -Y1- LT LINE wCLASS B RIP RAP SEE DETAIL AM, SH. 2E
LPC-10	STANDARD BASE DITCH STA. 23+54 -Y1- LT SEE DETAIL A, SH. 2C

GRAPHIC SCALE
2.5 12.5 0 25 50
PLANS

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X-Section Locations

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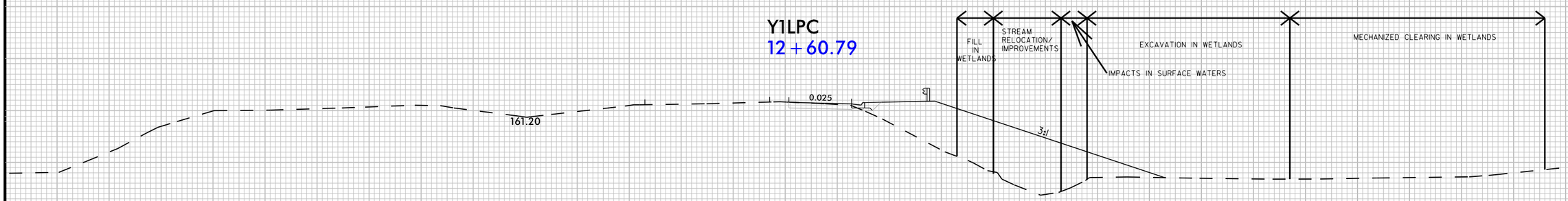
X-Section

0	PROJ. REFERENCE NO.	SHEET NO.

PERMIT DRAWING
SHEET 3 OF 6

L STA 27+00

SECTION 1



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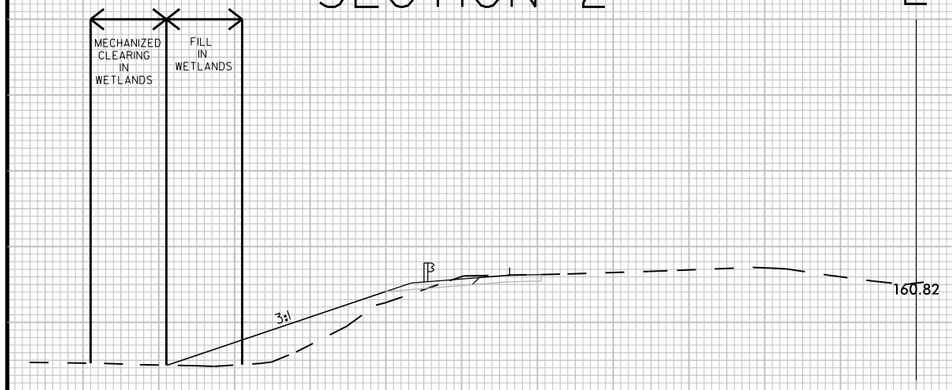
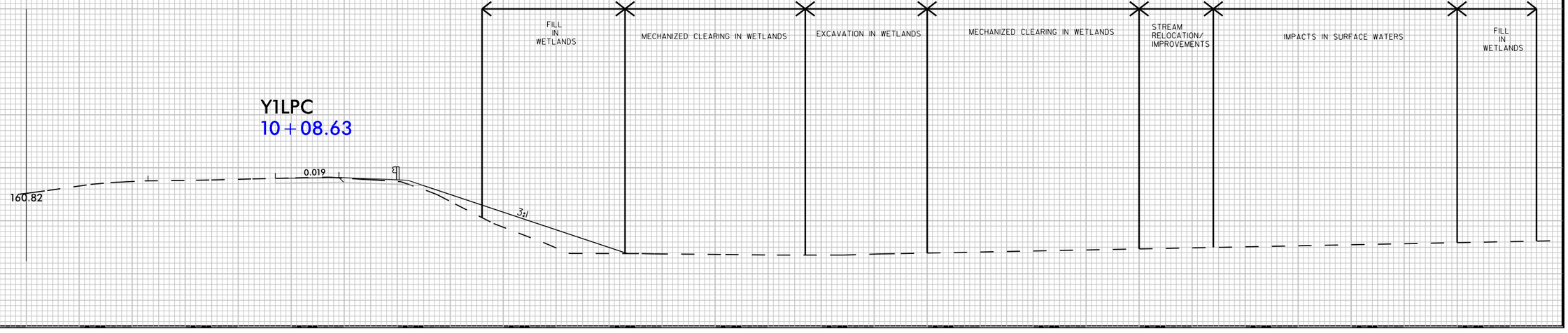


L STA 29+50

SECTION 2. CONT'D

L STA 29+50



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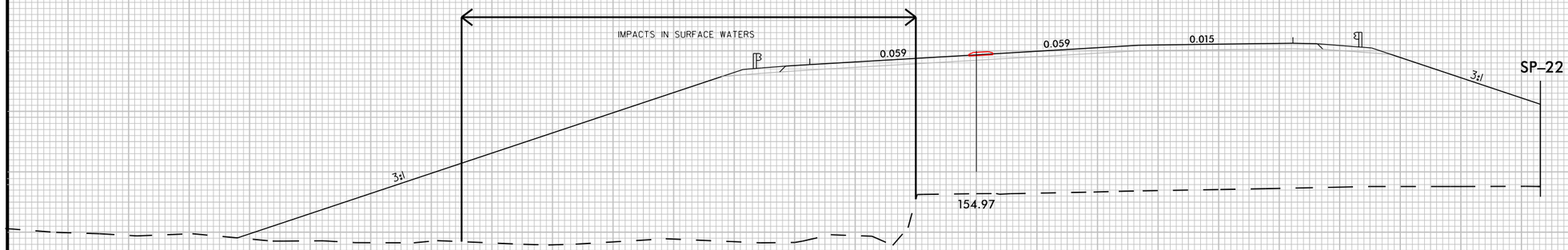
X-Section

0	PROJ. REFERENCE NO.	SHEET NO.

PERMIT DRAWING
SHEET 4 OF 6

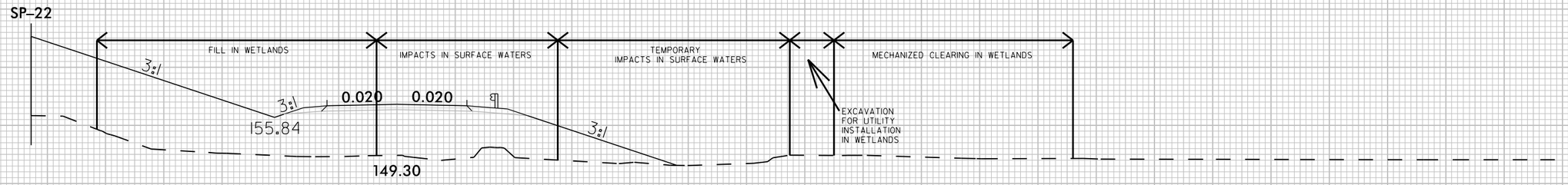
Y1 STA 24+50

Y1RPD
21+04.45



SECTION 3

SR1 STA 14+63.41



SECTION 4

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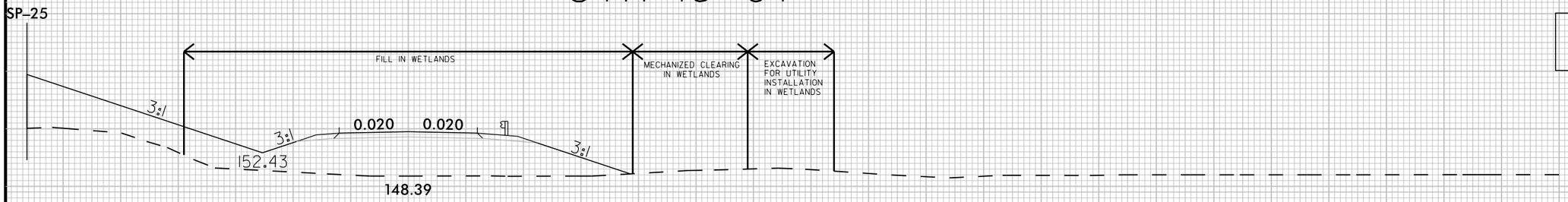
0	PROJ. REFERENCE NO.	SHEET NO.

PERMIT DRAWING
SHEET 5 OF 6

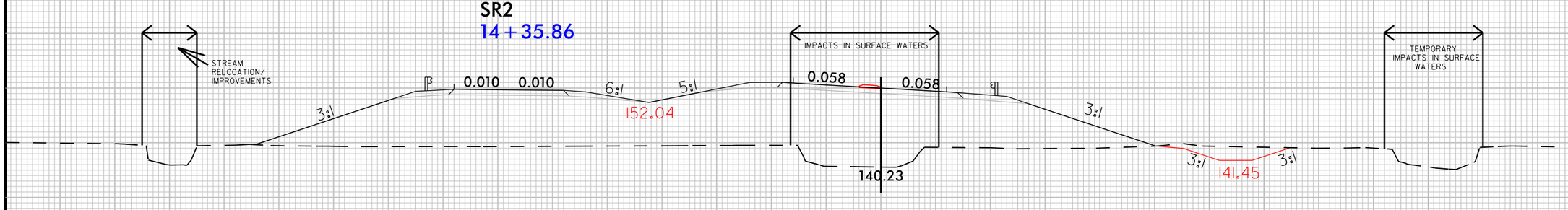
X-Section

SR1 STA 16+07



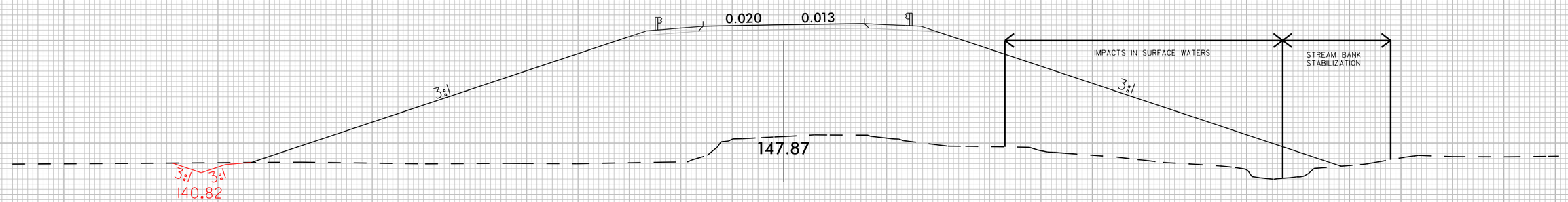
SECTION 5

Y6LPB STA 17+50



SECTION 6

Y6 STA 26+00



SECTION 7

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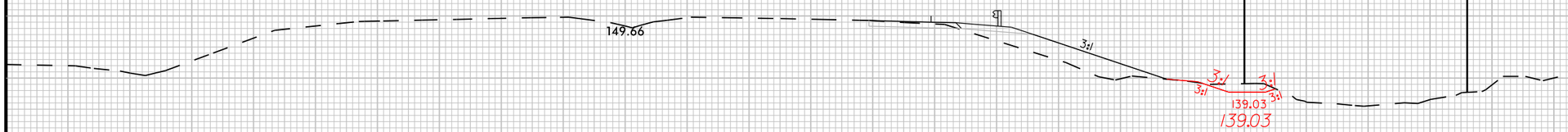
X-Section

0	PROJ. REFERENCE NO.	SHEET NO.

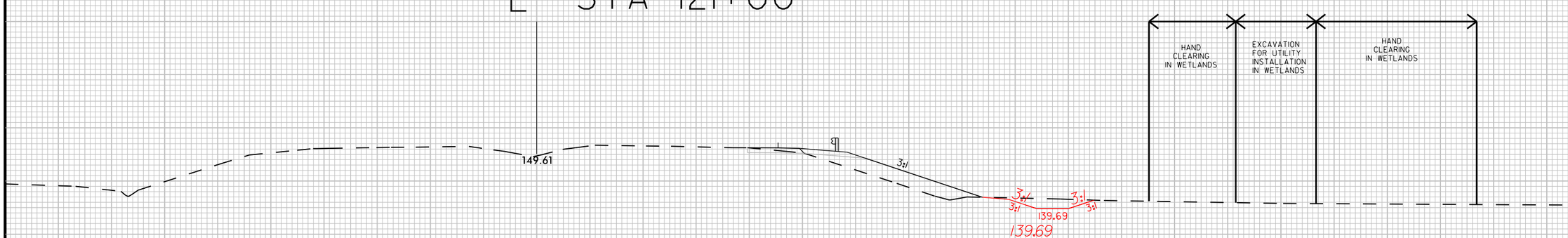
PERMIT DRAWING
SHEET 6 OF 6

L STA 120+00



SECTION 8

L STA 121+00



SECTION 9

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