

Pre-Construction Notification (PCN) Form

For Nationwide Permits and Regional General Permits

(along with corresponding Water Quality Certifications)

September 29, 2018 Ver 3

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Please note: fields marked with a red asterisk * below are required. You will not be able to submit the form until all mandatory questions are answered.

Also, if at any point you wish to print a copy of the E-PCN, all you need to do is right-click on the document and you can print a copy of the form.

Below is a link to the online help file.

https://edocs.deq.nc.gov/WaterResources/0/edoc/624704/PCN%20Help%20File%202018-1-30.pdf

A. Processing Information

County (or Counties) where the project is located:*

Lenoir

Is this project a public transportation project?*

⊙ Yes O No This is any publicly funded by municipal state or federal funds road, rail, airport transportation project.

Is this a NCDOT Project?*

• Yes • No

(NCDOT only) T.I.P. or state project number: B-5619

WBS #*

45574.1.1 (for NCDOT use only)

1a. Type(s) of approval sought from the Corps: *

Section 404 Permit (wetlands, streams and waters, Clean Water Act)

Section 10 Permit (navigable waters, tidal waters, Rivers and Harbors Act)

1b. What type(s) of permit(s) do you wish to seek authorization?*

Nationwide Permit (NWP)

Regional General Permit (RGP)

Standard (IP)

This form may be used to initiate the standard/individual permit process with the Corps. Please contact your Corps representative concerning submittals for standard permits. All required items that are not provided in the E-PCN can be added to the miscellaneous upload area located at the bottom of this form.

1c. Has the NWP or GP number been verified by the Corps?*

• Yes • No

Nationwide Permit (NWP) Number:	6 - Survey Activities	
NWP Numbers (for multiple NWPS):		
List all NW numbers you are applying for not on the drop dow	ın list.	
1d. Type(s) of approval sought from the DW check all that apply	/R:*	
401 Water Quality Certification - Regular		401 Water Quality Certification - Express
Non-404 Jurisdictional General Permit		Riparian Buffer Authorization
Individual Permit		
1e. Is this notification solely for the record	because written approval is not required?	
		*
For the record only for DWR 401 Certification	on:	© Yes C No
For the record only for Corps Permit:		C Yes 🖲 No
1f. Is this an after-the-fact permit applicatio	n?*	
O Yes	No N	

ed for mitigation of impacts?

1g. Is payment into a mitigatio	n bank or in-lieu fee program propose itioation bank or in-lieu fee program
C Yes	© No
Acceptance Letter Attachmen	t
Click the upload button or drag and drop f FILE TYPE MUST BE PDF	iles here to attach document
1h. Is the project located in ar	ny of NC's twenty coastal counties?*
C Yes	© No
1j. Is the project located in a c C Yes ⊙ No	lesignated trout watershed?*

Link to trout information: http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/Trout.aspx

B. Applicant Information

1a. Who is the Primary Contact?* NC Department of Transportation

1b. Primary Contact Email:*

ajames10@ncdot.gov

1d. Who is applying for the permit?*

Owner

(Check all that apply)

Applicant (other than owner)

1c. Primary Contact Phone:*

(xxx)xxx-xxxx

(919)707-6129

1e. Is there an Agent/Consultant for this project?*

4

⊙ Yes ⊙ No

2. Owner Information

2a. Name(s) on recorded deed: ^		
N/A		
2b. Deed book and page no.:		
2c. Responsible party:		
(for Corporations)		
2d. Address*		
Street Address		
1000 Birch Ridge Dr.		
Address Line 2		
City	State / Province / Region	
Raleigh	NC	
Postal / Zip Code	Country	
27610	USA	
2e. Telephone Number:*		
(xxx)xxx-xxxx		
(919)707-6123		
2f. Fax Number:		

(xxx)xxx-xxxx

2g. Email Address:*

pharris@ncdot.gov

C. Project Information and Prior Project History

1. Project Information

1a. Name of project:*

Geotechnical borings in the Neuse River and overflow channel (B-5619)

1b. Subdivision name:

(if appropriate)

1c. Nearest municipality / town:*

La Grange

2. Project Identification

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2d. Site coordinates in decimal degrees

Please collect site coordinates in decimal degrees. Use between 4-6 digits (unless you are using a survey-grade GPS device) after the decimal place as appropriate, based on how the location was determined. (For example, most mobile phones with GPS provide locational precision in decimal degrees to map coordinates to 5 or 6 digits after the decimal place.)

Latitude:*	Longitude:*
35.224716	-77.766817
ex: 34.208504	-77.7963/1

3. Surface Waters

3a. Name of the nearest body of water to proposed project:* Neuse River

3b. Water Resources Classification of nearest receiving water:*

Surface Water Lookup

3c. What river basin(s) is your project located in?*

Neuse

3d. Please provide the 12-digit HUC in which the project is located.*

030202020206

River Basin Lookup

4. Project Description and History

4a. Describe the existing conditions on the site and the general land use in the vicinity of the project at the time of this application:*

The immediate area surrounding the existing bridges is largely forested, with agricultural areas farther away from the river.

4b. Have Corps permits or DWR certifications been obtained for this project (including all prior phases) in the past?*

C Yes ⊙ No C Unknown

4d. Attach an 8 1/2 X 11 excerpt from the most recent version of the USGS topographic map indicating the location of the project site. (for DWR) Oick the upload button or drag and drop files here to attach document

File type must be pdf

4e. Attach an 8 1/2 X 11 excerpt from the most recent version of the published County NRCS Soil Survey map depicting the project site. (for DWR) Cick the upload button or drag and drop files here to attach document

File type must be pd

4f. List the total estimated acreage of all existing wetlands on the property:

12.43 acres

4g. List the total estimated linear feet of all existing streams on the property:

(intermittent and perennial)

1,901

4h. Explain the purpose of the proposed project:*

Geotechnical soil borings will be advanced in the streambed of the Neuse River (bridge no. 52), as well as its overflow channel/floodplain (bridge no. 152) to determine what bent type to use in the replacement structures. Impacts associated with replacing these bridges are not authorized or included in this permit application.

4i. Describe the overall project in detail, including indirect impacts and the type of equipment to be used: *

Borings will be advanced from the bridge deck in the approximate red line locations shown on the attached bridge plans (proposed bent locations):

Neuse River overflow channel (bridge no. 152): 3 borings in the channel ,which may or may not be in standing water; and Neuse River (bridge no. 52): 3 borings in the channel

Borings will be advanced using the mud rotary method; this method involves setting a piece of 4" to 6" diameter casing between the drill rig and the river bed/floodplain to contain the drilling fluid and cutting returns. All soil samples, drilling fluid, and cutting returns are disposed of off-site.

4j. Please upload project drawings for the proposed project.

Click the uplead button or drag and drop files here to attach document	
530052_2019_B5619_NEUSERIVER_SR1389_HSR.pdf	3.79MB
530152_2019_B5619_NEUSERIVEROVERFLOW_SR1389_HSR.pdf	3.8MB
File type must be pdf	

5. Jurisdictional Determinations

5a. Have the wetlands or streams been de	lineated on the property or proposed impact a	ireas?*
© Yes	C No	C Unknown
Comments:		
5b. If the Corps made a jurisdictional dete	rmination, what type of determination was mad	ie?*
⊙ Preliminary ○ Approved ○ Not Verified ○	Unknown C N/A	
Corps AID Number: Example: SAW-2017-99999		
5c. If 5a is yes, who delineated the jurisdic	ctional areas?	
Name (if known):		
Agency/Consultant Company:	Mead and Hunt	
Other:		
5d. List the dates of the Corp jurisdiction of A field JD visit was made with the Corps and No	determination or State determination if a deter CDWR on March 25, 2019.	mination was made by the Corps or DWR.
5d1. Jurisdictional determination upload Olick the upload button or drag and drop files here to attach File type must be PDF) document	
6. Future Project Plans		
6a. Is this a phased project? *		
C Yes	© No	
Are any other NM/P(a) regional general no	vrmit(a) or individual parmita(a) used or inten	ded to be used, to outborize any part of the proposed project or related activity? This

Are any other NWP(s), regional general permit(s), or individual permits(s) used, or intended to be used, to authorize any part of the proposed project or related activity? This includes other separate and distant crossing for linear projects that require Department of the Army authorization but don't require pre-construction notification. Permitting for impacts associated with replacing the existing structures will be permitted separately. A GP 31 will likely be required, though final discretion as to what permit will be required lies with the Corps.

D. Proposed Impacts Inventory	٢
1. Impacts Summary	
1a. Where are the impacts associated with your project? (check all that apply):	

Buffers

1a. Where are the	impacts associated	with your	project?	(check all that apply):
Wetlands				Streams-tributaries

Open Waters	Pond Construction

4. Open Water Impacts

If there are proposed impacts to lakes, ponds, estuaries, tributaries, sounds, the Atlantic Ocean, or any other open water of the U.S. then individually list all open water impacts below.

4a. Site #* (?)	4a1. Impact Reason	4b. Impact type * (?)	4c. Name of waterbody (?)	4d. Activity type *	4e. Waterbody type *	4f. Impact area [*]
1	Soil borings	Т	Neuse River	Other	Other	0.00 (acres)
2	Soil borings	Т	Neuse River overflow channel	Other	Other	0.00 (acres)

4g. Total temporary open water Impacts:

0.00

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4g. Total permanent open water impacts:
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0.00

4g. Total open water impacts:

0.00

4h. Comments:

Actual impact is 0.52 square feet or 0.00001 acre for six borings, assuming that each boring has a diameter of 4 inches.

E. Impact Justification and Mitigation

1a. Specifically describe measures taken to avoid or minimize the proposed impacts in designing the project:* The drill will be encased and all soil, drill fluid, and cutting returns will be disposed of off-site.

1b. Specifically describe measures taken to avoid or minimize the proposed impacts through construction techniques:* N/A

2. Compensatory Mitigation for Impacts to Waters of the U.S. or Waters of the State

2a. Does the project require Compensatory Mitigation for impacts to Waters of the U.S. or Waters of the State?

C Yes

2b. If this project DOES NOT require Compensatory Mitigation, explain why:

No permanent impacts to jurisdictional resources are anticipated for activities authorized by this permit.

O No

• No

NC Stream Temperature Classification Maps can be found under the Mitigation Concepts tab on the Wilmington District's RIBITS website.

F. Stormwater Management and Diffuse Flow Plan (required by DWR)

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*** Recent changes to the stormwater rules have required updates to this section .***

1. Diffuse Flow Plan

1a. Does the project include or is it adjacent to protected riparian buffers identified within one of the NC Riparian Buffer Protection Rules?

• Yes

1b. All buffer impacts and high ground impacts require diffuse flow or other form of stormwater treatment. If the project is subject to a state implemented riparian buffer protection program, include a plan that fully documents how diffuse flow will be maintained.

All Stormwater Control Measures (SCM)s must be designed in accordance with the NC Stormwater Design Manual. Associated supplement forms and other documentation shall be provided.

What type of SCM are you providing?

Level Spreader

Vegetated Conveyance (lower SHWT)

Wetland Swale (higher SHWT)

C Other SCM that removes minimum 30% nitrogen

Proposed project will not create concentrated stormwater flow through the buffer

(check all that apply)

For a list of options to meet the diffuse flow requirements, click here.

Diffuse Flow Documentation

Click the upload button or drag and drop files here to attach document File type must be PDF

2. Stormwater Management Plan

2a. Is this a NCDOT project subject to compliance with NCDOT's Individual NPDES permit NCS000250?*

O Yes ⊙ No

2b. Does this project meet the requirements for low density projects as defined in 15A NCAC 02H .1003(2)?*

⊙ Yes ◯ No

To look up low density requirement click here 15A NCAC 02H .1003(2).

Comments:

G. Supplementary Information

1. Environmental Documentation

1a. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land?*

© Yes C No

1b. If you answered "yes" to the above, does the project require preparation of an environmental document pursuant to the requirements of the National or State (North Carolina) Environmental Policy Act (NEPA/SEPA)?*

• Yes

 1c. If you answered "yes" to the above, has the document review been finalized by the State Clearing House? (If so, attach a copy of the NEPA or SEPA final approval letter.)*

 O Yes
 © No

Comments:*

These activities are occurring in advance of the NEPA environmental document, which is scheduled for completion in July 2019.

O No

2. Violations (DWR Requirement)

2a. Is the site in violation of DWR Water Quality Certification Rules (15A NCAC 2H .0500), Isolated Wetland Rules (15A NCAC 2H .1300), or DWR Surface Water or Wetland Standards or Riparian Buffer Rules (15A NCAC 2B .0200)?*

O Yes

3. Cumulative Impacts (DWR Requirement)

No

3a. Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? *

3b. If you answered "no," provide a short narrative description. This application is for geotechnical borings only.

4. Sewage Disposal (DWR Requirement)

4a. Is sewage disposal required by DWR for this project?*

○ Yes ○ No ⊙ N/A

5. Endangered Species and Designated Critical Habitat (Corps Requirement)

5a. Will this project occur in or	near an area with federally protected species or habitat?*	
© Yes	○ No	
5b. Have you checked with the	USFWS concerning Endangered Species Act impacts?*	
© Yes	© No	
5d. Is another Federal agency in	nvolved?*	
Yes	C No	O Unknown
What Federal Agency is involve NOAA National Marine Fisheries Se	d? arvice	
5e. Is this a DOT project located ⊙ Yes ◯ No	within Division's 1-8?*	
5j. What data sources did you us NC Natural Heritage Program data;	se to determine whether your site would impact Endangered rule in federal register (50 CFR 226) promulgating Atlantic sturger	d Species or Designated Critical Habitat?* on critical habitat, published on 9/18/2017.
Consultation Documentation Up	load	
Click the upload button or drag and drop files	s here to attach document	
File type must be PDF		
6. Essential Fish Habi	tat (Corps Requirement)	

C Yes C No

6a. Will this project occur in or near an area designated as an Essential Fish Habitat?*

6b. What data sources did you use to determine whether your site would impact an Essential Fish Habitat?* NMFS EFH viewer

7. Historic or Prehistoric Cultural Resources (Corps Requirement)

Link to the State Historic Preservation Office Historic Properties Map (does not include archaeological data: http://gis.ncdcr.gov/hpoweb/

7a. Will this project occur in or near an area that the state, federal or tribal governments have designated as having historic or cultural preservation status (e.g., National Historic Trust designation or properties significant in North Carolina history and archaeology)?*

7b. What data sources did you use to determine whether your site would impact historic or archeological resources?*

NCSHPO HPOWeb Mapping; a complete review of potential historic and archeological resources on B-5619 will be conducted for inclusion in the environmental document, which is anticipated to be a Categorical Exclusion. The document is scheduled for completion in July 2019.

7c. Historic or Prehistoric Information Upload Oick the upload button or drag and drop files here to attach document File must be FDF

8. Flood Zone Designation (Corps Requirement)

Link to the FEMA Floodplain Maps: https://msc.fema.gov/portal/search

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8a. Will this project occur in a FEMA-designated 100-year floodplain?*
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O No

Yes

8b. If yes, explain how project meets FEMA requirements:

NCDOT Hydraulics Unit coordination with FEMA. The activities authorized by this permit will take place in open water and/or will not effect base flood elevations.

8c. What source(s) did you use to make the floodplain determination?*

FEMA mapping (Map number 3720356400J, effective 7/2/2004)

Miscellaneous	\odot
Comments	

168.6KB

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The Neuse River at this location is designated as a primary nursery area, and as such carries an in-water work moratorium between February 15 and September 30. Per the Wildlife Resources Commission, the activities authorized by this permit are allowed to be conducted during the in-water work moratorium (see attached email response).

Miscellaneous attachments not previously requested.

Click the upload button or drag and drop files here to attach document

B-5619 WRC.pdf

File must be PDF or $\ensuremath{\mathsf{KWZ}}$

Signature

*

☑ By checking the box and signing below, I certify that:

- I have given true, accurate, and complete information on this form;
- I agree that submission of this PCN form is a "transaction" subject to Chapter 66, Article 40 of the NC General Statutes (the "Uniform Electronic Transactions Act");

• I agree to conduct this transaction by electronic means pursuant to Chapter 66, Article 40 of the NC General Statutes (the "Uniform Electronic Transactions Act");

- I understand that an electronic signature has the same legal effect and can be enforced in the same way as a written signature; AND
- I intend to electronically sign and submit the PCN form.

Full Name:*

Mack Christopher Rivenbark III

Signature

Hack C Rivenbank III

Date 5/20/2019

Rivenbark, Chris

From:	Wilson, Travis W.
Sent:	Friday, May 17, 2019 9:58 AM
То:	Rivenbark, Chris
Cc:	Riffey, Deanna; thomas.a.steffens@usace.army.mil
Subject:	RE: B-5619 Neuse River and overflow geotechnical borings

WRC is ok with the proposed Geotech work.

From: Rivenbark, Chris
Sent: Wednesday, May 15, 2019 9:39 AM
To: Wilson, Travis W. <travis.wilson@ncwildlife.org>
Cc: Riffey, Deanna <driffey@ncdot.gov>; thomas.a.steffens@usace.army.mil
Subject: B-5619 Neuse River and overflow geotechnical borings

Travis,

We are planning to perform geotechnical borings in the Neuse River and it's overflow on Hardy Bridge Rd (SR 1389) in Lenoir County. This project is subject to the Inland PNA moratoria.

We plan to conduct the following borings:

- Neuse River overflow (bridge no. 152): 3 borings in the flood plain which may or may not be in standing water.
- Neuse River (bridge no. 52): 3 borings in the channel, 1 in the flood plain which may or may not be in standing water.

I know you've approved borings during moratoria for other projects but I still like to confirm.

Chris Rivenbark Environmental Analysis Unit North Carolina Department of Transportation

919 707 6152 office crivenbark@ncdot.gov

1598 Mail Service Center Raleigh, NC 27699-1598

1000 Birch Ridge Drive Raleigh, NC 27610



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Designed by: <u>C.R. SHARPLESS, PE</u> Project Engineer : <u>R.S. WEADON, PE</u>

<u>0052</u> [.D

<u>B-5619</u>

P

	(a) River Station 362832
. Ĥ	Flood Study 100yr. Discharge <u>40,500 د.</u> ۴.۶. WS Elev.: Floodway <u>51.9 ۴۰</u> ۰ Floodway Without ۲۰۰۰ Flood Study 100yr. Discharge دروی د.۴.۶. WS Elev.: Floodway
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	Manning's n: Left O.B. 0.18Channel .0.054 Right O.B. 0.18 Source FLOOD STUDY
.Ĥ	Channel Slope0.00038 _ftft Source _USGS_Quad_Map Normal Water Surface Elev.
	Historical Scour Info. : General NONE ft. Contraction NONE ft. Local NONE ft.
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\ rs.	Date Elev
\rs.	Date 09.2038. Elev 50.3 ft. Est. Freq. ^{300.±√-} -yr. Source Jesse .′Ja ^v . Grapy. NCD01 Bridge50.3
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	Max, Discharae V/A Frequency V/A Branency V/A
yrs.	Gage Station No. N/A Period of Records WA
	Design Control Elev. © RIVER 3767101 360374 (MAINTAIN OR REDUCE FEMA CORR EFF 100 YR WSEL)
	0900€5# ¥230090
Ğ	1@45.1;1@39.8;1@48.9, #530045, OAL=350', DOWNSTREAM: US_70_EBL & US_258_SL, 1@45'5.5;7@45'5'.
	Data on Structures Up and Down Stream UPSTREAM: NC 903, RC DECK, 1@40.8;2@40.3;1@40.1;1@54.9;
.†.2 .†.2	Debris Potential: Low ModerateHighX Waterway Opening Below 100yr. WS EL8359 Debris Potential: Low ModerateHighX
	Data on Existing Structure 1@50'3, 7@50', 1@50'3, OAL=451, RC DECK'I BEAMS, STEEL PILES
	Stream Classification (Such as Trout, High Quality Water, etc.)
	kiver basin Neuse Character
	ATAD TIR

DESIGN DATA

	Materway Openin	Provided	V npizəC:wolə8	. Elev. 8086	.s.f.,100yr W.S. Elev.	1.2. <u>9728</u> lotoT,1.2. <u>9728</u>	,.¹.2_
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Waterway Opening Provided Below:Design W.S. Elev. <u>8086</u> .s.f., 100yr W.S. Elev. <u>8576</u> .s.f., Total <u>8576</u> .s.f., Average Channel Velocity (Design) <u>2.8</u> ...f.p.s. Average Overbank Velocity (Design) ...<u>9.5</u>f.p.s. Computed Scour : General <u>NA</u> ...f. Contraction <u>9.0 (100 YR.)</u> .ft. Local <u>9.0 (100 YR.)</u> .ft. Is a Floodway Revision Required? MOA TYPE 1 (MAX DECREASE 0.01' @ RS 360446)

:pniqqothevO	Discharge	30'200	l .ɛ.¹.ɔ₋	····· Kouənbə.	λλ	.yr. Ele	Elev	<u>5.84</u>	.Ĥ.
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ZNOITATUAMOD GUA NOITAMAOANI JANOITIGUA

	SILT	BED WATERIAL: MOSTLY
Ø200=26'500	Ø200=26'193	
Q100=44,000	Ø100=43'956	Ø200=28'500
Ø20=38 [,] 100	Ø20=38'065	0100 = 40,500
G25=32,400	Ø52=35 [,] 393	Ø20=38 [,] 100
N2E 010=52'900	Ø10=32 [,] 580	Ø52=34 [,] 700
GED ESTIMATE BASED ON NEARBY GAUGE 02089500	Арлиятер имса	Ø10=22,600
M: 5006-2128' KECION J-22'2%' KECION 4-45'2%	NING NZEZ EC	EMA FLOOD STUDY DISCHARGES

$\lambda^{3} = 51.1 [17678/20376] [361.2/256.1]$	$\lambda^{3} = \lambda^{1} \left[\mathbf{O}^{3} \setminus \mathbf{O}^{1} \right] \left[\mathbf{M}^{1} \setminus \mathbf{M}^{3} \right]$
	<u>соиткастіон scour: (от)</u>
ZION OUTPUT TABLE IN HEC-RAS USED FOR SCOUR CALCULATIONS	*NOTE: CHANNEL TOP WIDTHS FROM CROSS-SEC
acdot design, ncdot 100 yr. Used for scour calculations	*NOTE: NCDOT 25 YR. DISCHARGE USED FOR 1

Υs= 9.21'	Fr ₁ = 0.11	$Fr_{1} = V_{1} \setminus (gy_{1})$ $Fr_{1} = 3.3 \setminus (32.2*28.0)$
$\begin{array}{llllllllllllllllllllllllllllllllllll$	17 001)(NO	۲ <u>۵۵۵ ۲۵COUR: (CSU EQUATI</u> ۲۶= 2.0(۲٫)(۲٫)(۲٫)(۲٫) (۲٫) ۲۶= 2.0(۲٫)(۲٫)
		100–У.R. Contraction Scour=9.0
36.7–28=8.71 SAY 9.0'	= sY	oY− _s Y =sY
53`\ [5\6 46\55155] [391`5\529'] <i>9</i>	ג [™] = ארא	$\begin{array}{l} \begin{array}{l} & \begin{array}{l} & \begin{array}{l} & \begin{array}{l} & \end{array}\\ \end{array} \end{array} \end{array} \\ \begin{array}{l} & \begin{array}{l} & \begin{array}{l} & \end{array}\\ \end{array} \end{array} \\ \begin{array}{l} & \begin{array}{l} & \end{array} \end{array} \\ \begin{array}{l} & \end{array} \end{array} \\ \begin{array}{l} & \begin{array}{l} & \end{array} \end{array} \\ \begin{array}{l} & \begin{array}{l} & \end{array} \end{array} \\ \begin{array}{l} & \end{array} \end{array} \\ \begin{array}{l} & \end{array} \end{array} \\ \begin{array}{l} & \begin{array}{l} & \end{array} \end{array} \\ \begin{array}{l} & \end{array} \end{array} \\ \begin{array}{l} & \begin{array}{l} & \end{array} \end{array} \\ \begin{array}{l} & \end{array} \end{array} \\ \begin{array}{l} & \end{array} \end{array} \\ \begin{array}{l} & \begin{array}{l} & \end{array} \end{array} \\ \end{array} \end{array} \\ \begin{array}{l} & \end{array} \end{array} \\ \end{array} \\ \begin{array}{l} & \end{array} \end{array} \\ \end{array} \end{array} \\ \end{array} \end{array} \\ \end{array} \\ \\ \\ \end{array} \\ \\ \\ \\ \end{array} \\ \\ \end{array} \\ \\ \end{array} \\ \\ \end{array} \\ \\ \\ \end{array} \\ \\ \end{array} \\ \\ \\ \end{array} \\ \\ \\ \end{array} \\ \\ \\ \\ \end{array} \\ \\ \\ \end{array} \\ \\ \\ \end{array} \\ \\ \end{array} \\ \\ \\ \\ \\ \end{array} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \end{array} \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \end{array} \\$
		OT Local Scour= Ys=8.0'
γ86.7 = zY	80.0= _r 17	$Fr_{1} = V_{1} (gy_{1})$ $Fr_{1} = 2.2/(32.2*26.3)$
$\begin{array}{rcl} \varepsilon_{P,0} & \varepsilon_{C,0} & \varepsilon_{A,0} \\ (80.0) & (\varepsilon_{A,2}) & (0.\varepsilon)(\Gamma,\Gamma)(\partial,\Gamma)(\Gamma,\Gamma)0.\Delta & = zY \\ \end{array}$		$\lambda_{s} = 2.0(k^{1})(k^{2})(k^{3})(a) (\lambda^{1}) (E_{1})$
		OT Contraction Scour=6.0'
23.7-17.9=5.8 SAY 6.0'	= sY	¢۲−۲ = ۶۶
۲۱٫۵۲8٫۲۵3۲6] [361٫2٫256٫1] ۵٫۰۰۰ [3678٫20376] [361٫2٫256٫1]	= ^z Y	$\lambda^{3} = \lambda^{1} \left[\sigma^{3} \setminus \sigma^{1} \right] \left[M^{1} \setminus M^{3} \right]$

100-ХВ. Local Scour = Ys = 9.0'



26+00	27+00	28+00	29+00	30+00	31+00	32 + 00	33+00) 34+	00 35+00	



	/: BIGEL : <u>R.S. WEADON, PE</u>	roject Eng قول به Reviewed by	۲۵۱٬ @ ۶۶ 360446 ۲۱) ۴۰ Γοcal ۲۰۰ (OI) ۴۰	<u>VA</u> ft. Contraction <u>4.0 ((</u>	a Floodway Revision Required?	sا Cc
ZEVI OLESSION X	, ,: С.к. SHARPLESS, PE	الله الله الله الله الله الله الله الله	0.1		aterway Opening Provided Below. 	۵۵.0) (20.0) (۲.۵۲) کې
		<u>RFLOW)</u> St	0.1 2.3	2.12 000'74'	001 100(FEMA)	
		ruc. Inv	0'3 <u>3'2</u>	35,400 48.9	03.74 03.74	
	MOH	Z о А	يدلاسمئود Bridge Opening Velocity (۴.) 0.4 م. ۲.9	کی 55,580 £1ev. Bd (c.f.s) (ff.) ک5,580 £1ev. Bd	loods Evaluated: Freq. _(yr.) 2r Station <u>10</u>	جا (@ لاَبَهُو
		01 <u>52</u> I.C		HEC RAS 5.0.3	yaranlic Design Method	⁽ Н
		Z o	7.5%, REGION 4-42.5%	DISES EQN: 2009-2128' RECION 1-22	Using botted insingled	H (60'0) (07'7L)
			iver Station 362832	<u>0 - د.</u> ۴.s. WS Elev.: Floodway @ R	ood Study 100yr. Discharge <u>4050</u>	
		9 Pro	- Floodway Established?YES		ood Study /Status <u>DETAILED FLC</u>	PIJ
			ıter Surface Elev. <u>36.2</u> 100D STUDY	e <u>USGS Quad Map</u> Normal Wa annel <u>0.054</u> Right O.B. <u>0.18</u>	۵،۲۰۰۲ میں اور میں 1941 م.۲. <u>م. 18</u> . مەلتەر مەرمەر 1966 مە: Left O.B. <u>م. 18</u> . مەلتەر	AD SCOUR CALCULATIONS AC
5 Elev38.64ft. Datum:	Crossing Crossing	yrs. Vorthing	۲ocal NONE H.	ONE II. Contraction NONE II.	istorical Scour Info. : General <u>VC</u>	H SNOITAJUDIS
	Set □ 100 Set 0.5	Aus 10 Aus 10 Digence War	۲enoa or ۲enoa of Period of ۲enowledge	γr.Source γr	ate Elevft. Est. Freg.	20 20 20
Longipude	tude <u>35.22243</u>	لما ۲۰۵۲ - الما ۱۹۳۲ - ۲۹۹۹ - ۲۹۹۹ - ۲۹۹۹	Period of BRIDGE MAINTENANCE Knowledge Poriod of	. <u>.</u>]00- -/yr. Source jesse "jay".grady. ucdot	ate <u>09/2018</u> Elev. <u>50 J. 1</u> t. Est. Freq.	200 DY
from Existing Crossing.	łed Location is (Up,(A) Down) Stream	ອ ອ ຜູ່ຮູບບາມພອບດ	Ανίστος	AV Date	ax. Discharge <u>Information</u> .	H 000 W 00
CLEAR ROADWAY Skew	ed Width of Roadway	-yrs. 50 24 00 25 20 26		360374 Period of Records	age Station No.	00 ·····
260', 2@50', 24" CORED SLAB, W/4.0' CAPS	led Structure	nemmosex ფ აი გ			AL=405', #530062	
1302 (МИЕ ВПЯН КD') аид 28 1300 (DAVIS-HARDY RD.)		owdgiH nO ≍	/@ 4 2, ^י ،ا@42.508,			2%' KECION 4-45.5%
<u>V4.1.1</u> <u>NEUSE RIVER (OVERFLOW)</u> Bridge Inv. No. 0152	<u>8–5619</u> Project No <u>4557</u> <u>LENOJR</u> Bridge Over	V. G.I. O. No	2FAB. 1@21:2@20.3:1@21:	ate	ebris Potential: Low Moder	a
		VERFLO	باهامهدار ۲۰۱۰ مع وامس کی 185 اور کی 285 میں			
JE HIGHWAYS JE HIGHWAYS DF HIGHWAYS		- SR1389	MS-IV, NSW, CA	ut, High Quality Water, etc.)	itream Classification (Such as Trou	او۷. <u>۲۲۵ (۵۶ ۴</u> . S
OF TRANSPORTATION	BRIDGE SURVEY & HYE	HSR.PDF		Character	iver Basin <u>VEUSE</u>	. П
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	20+00) 21+00	0 22 + 00	23+00	24+00	25+00 26+00
	20 + 00 Right Floodway Bound Right Floodplain Bou	21 + 00 Jary- 950' from Sta. 20 + 00 Indary- 1,870 from Sta. 20 + 00	0 22+00	23+00 <i>c</i> sta-4-23+ <i>r</i> o50'.1060'.20	24 + 00	25+00 Left Floodway Boundary- 1,800 from Sta. 2 Left Floodplain Boundary- 7,200 from Sta.
	20 + 00 Right Floodway Bound Right Floodplain Bound 60) 21 + 00 Jary- 950' from Sta. 20 + 00 Indary- 1,870 from Sta. 20 + 00		23+00 1 © STA+L-23+ 1 @STA+L-23+ 1 @STA+L-23+ 24 " CORED S 1 W/ 4 CAPS - SKEW 90 °	24+00 2 07 050' LAB BRIDGE	25+00 Left Floodway Boundary- 1,800 from Sta. 2 Left Floodplain Boundary- 7,200 from Sta.
	20 + 00 Right Floodway Bound Right Floodplain Bound 60 OVERTOPPING ELEV.	21 + 00 Jary- 950' from Sta. 20 + 00 Indary- 1,870 from Sta. 20 + 00	D 22 + 00 ERTICAL CURVE INFORMATION PI=21+10 EL=50.06' VC=120'	23 + 00 1 & STA-L- 23+ ; 7@50',1@60',20 ; 24 " CORED S ; W/ 4' CAPS ; SKEW 90 ° ; SKEW 90 °	24 + 00 2 07 050' LAB BRIDGE 100 YR. WS ELEV. 51.2	25+00 Left Floodway Boundary- 1,800 from Sta. 2 Left Floodplain Boundary- 7,200 from Sta.
	20 + 00 Right Floodway Bound Right Floodplain Bound 60 OVERTOPPING ELEV. EX =L= STA. 16 + 00 50	21 + 00 dary- 950' from Sta. 20 + 00 ndary- 1,870 from Sta. 20 + 00 - 48.5	$\begin{array}{c c} 22 + 00 \\ \hline $	23 + 00 1 & STA-L- 23+ 1 7@50'.1@60'.20 24 " CORED S 1 W/ 4' CAPS - SKEW 90 ° - G.P.ELEV.50.81	24 + 00 2 07 050 LAB BRIDGE 1 100 YR. WS ELEV. 51.2 25 YR. WS ELEV. 48.9	25+00 Left Floodway Boundary- 1,800 from Sta. 2 Left Floodplain Boundary- 7,200 from Sta.
	20 + 00 Right Floodway Bound Right Floodplain Bound 60 OVERTOPPING ELEV. EX =L= STA. 16 + 00 50 — — — — — — — — — BEGIN GRAI	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	22+00 ERTICAL CURVE INFORMATION PI=21+10 EL=50.06' VC=120' K=363 (+)0.3796%	23+00 1 © STA-L-23+ 1 7@50'.1@60'.20 24 ' CORED S 1 W/ 4 CAPS - SKEW 90° 1 C.P.ELEV.50.81	24 + 00 2 07 050' LAB BRIDGE 100 YR. WS ELEV. 51.2 25 YR. WS ELEV. 48.9	25 + 00 Left Floodway Boundary- 1,800 from Sta. 2 Left Floodplain Boundary- 7,200 from Sta.
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	20 + 00 Right Floodway Bound Right Floodplain Bound 60 OVERTOPPING ELEV. EX =L- STA. 16 + 00 50 EX =L- STA. 16 + 00 BEGIN GRAI -L- STA. 20 + EL = 49.63 40	21 + 00	D 22 + 00 ERTICAL CURVE INFORMATION PI=21+10 EL=50.06' VC=120' K=363	23 + 00 1 ¢ \$TA -L- 23+ 1 7050'.1'060'.20 24 ' CORED S 1 W/ 4 CAPS 5 SKEW 90° 1 G.P.ELEV.50.81 0 0 1 G.P.ELEV.50.81 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	24 + 00 2 07 050 LAB BRIDGE 100 YR. WS ELEV. 51.2 25 YR. WS ELEV. 48.9 100 100 100 100 100 100 100 10	25+00 Left Floodway Boundary- 1,800 from Sta. 2 Left Floodplain Boundary- 7,200 from Sta. $ \begin{array}{ccccccccccccccccccccccccccccccccccc$
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	20 + 00 Right Floodway Bound Right Floodplain Bound 60 OVERTOPPING ELEV. EX =L= STA. 16 + 00 50 BEGIN GRAI -L= STA. 20 + EL = 49.63 40 30	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	D 22 + 00 ERTICAL CURVE INFORMATION PI=21+10 EL=50.06' VC=120' K=363 (+)0.3796% OBSERV ASS II RIP-RAP ATE TO ELEY 37.1 ARADE TO DRAIN OLU YD	23 + 00 1 ¢ \$TA -L- 23+ 1 050', 1060', 20 24 ' CORED 5 1 W/ 4 CAPS 5 \$KEW 90° 1 G.P.ELEV.5081 1 022/2018 1 022/2018 1 022/2018	24 + 00 07 0507 LAB BRIDGE 100 YR. WS ELEV. 51.2 25 YR. WS ELEV. 48.9 100 YR. WS ELEV. 48.9 100 YR. WS ELEV. 48.9 CLASS II.1 CLASS II.1 EXCAVAT AND GR EST. 157 (REMOVE	25 + 00 Left Floodway Boundary- 1,800 from Sta. 2 Left Floodplain Boundary- 7,200 from Sta. VERTICAL CURVE INFORMA: RT. Pl=26+50 EL=52.11 VC=240' K=461 RIP-RAP E TO ELEV 37.5 ADE TO DRAIN CU. YD. EXISTING FB)
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	$\begin{array}{c} 20 + 00 \\ \hline \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ $) 21 + 00 dary- 950' from Sta. 20 + 00 ndary- 1,870 from Sta. 20 + 00 - 48.5 - 48.5 	D 22 + 00 ERTICAL CURVE INFORMATION PI=21+10 EL=50.06' VC=120' K=363 (+)0.3796% OBSERV STADE TO DRAIN OCU.YD VE EXISTING EB)	23 + 00	24+00	25 + 00 Left Floodway Boundary- 1,800 from Sta. 2 Left Floodplain Boundary- 7,200 from Sta.
	20 + 00 Right Floodway Bound Right Floodplain Bound 60 OVERTOPPING ELEV. EX -L- STA: 16 + 00 50 EL = 49.63 40 30 30 40 50 50 50 50 50 50 50 50 50 5) 21 + 00 iary- 950' from Sta. 20 + 00 idary- 1,870 from Sta. 20 + 00 48.5 - 48.5 0 	D 22 + 00 ERTICAL CURVE INFORMATION PI = 21 + 10 EL = 50.06' VC = 120' K = 363 (+)0.3796% OBSERV ASS II RIP-RAP ATE TO ELEY 37.1 BRADE TO DRAIN O CU. YD YE EXISTING EB)	23 + 00	24 + 00	25 + 00 Left Floodway Boundary- 1,800 from Sta. 2 Left Floodplain Boundary- 7,200 from Sta. VERTICAL CURVE INFORMAN PI=26+50 EL=52.11 VC = 240' K=461 RIP-RAP TE TO ELEV 37.5 WADE TO DRAIN CU. YD. EXISTING EB) ORETICAL SCOUR ICAL SCOUR WOODS
-L -L - - - - - - - - - - - -	20 + 00 Right Floodway Bound Right Floodway Bound Right Floodplain Bound 60 OVERTOPPING ELEV. EX =L= STA: 16 + 00 50 EL = 49.63 40 30 40 30 40 COOOCO K 30 K 40 COOOCO K 40 COOOCO K 40 COOOCO K 40 COOCO COOCO K 40 K 40 COOCO COOCO K 40 K 40 C 40 K 40 C 40 K 40 C 40	$ \begin{array}{c} 21 + 00 \\ 1 ary - 950' from Sta. 20 + 00 \\ 1 ary - 1,870 from Sta. 20 + 00 \\ - 48.5 \\$	D 22 + 00 ERTICAL CURVE INFORMATION PI=21+10 EL=50.06' VC=120' K=363 (+)0.3796% OBSERV ASS II RIP-RAP ATE TO ELEV 37.1 PRADE TO DRAIN O CU. YD YE EXISTING EB)	23 + 00	24 + 00	25+00 Left Floodway Boundary- 1,800 from Sta. 2 Left Floodplain Boundary- 7,200 from Sta. Left Floodplain Boundary- 7,200 from Sta. VERTICAL CURVE INFORMA VERTICAL CURVE INFORMA RT. VERTICAL CURVE INFORMA RT. PI=26+50 EL=52.11 YC=240' K=461 RIP-RAP E TO ELEV 37.5 ADE TO DRAIN CU. YD. EXISTING EB) ORETICAL SCOUR ICAL SCOUR WOODS
-L -L - - - - - - - - - - - -	20 + 00 Right Floodplain Bour Sight Floodplain Bour 60 0VERTOPPING ELEV. EX =L= STA. 16 + 00 50 BEGIN GRAT 	21+00 dary= 950' from Sta. 20+00 hdary= 1,870 from Sta. 20+00 - 48.5 - 48.5 - 48.5 - 48.5 - 50.00 / NG RT. - CL - CL	D 22 + 00 ERTICAL CURVE INFORMATION PI=21+10 EL=50.06' VC=120' K=363 (+)0.3796% OBSERV ASS II RIP-RAP ATE TO ELEV 37.1 FRADE TO DRAIN OCU: YD VE EXISTING EB) PDE PDE COX PROF. PDE COX PROF. PDE COX PROF.	23 + 00	24 + 00 07 06 100 YR. WS ELEV. 100 YR. WS ELEV. 100 YR. WS ELEV. 48.9 100 YR. WS ELEV. 100 YR. WS ELEV. 1	25+00 Left Floodway Boundary-1,800 from Sta. 2 Left Floodplain Boundary-7,200 from Sta. 2 Left Floodplain Boundary-7,200 from Sta. 2 (+)0.3796 VERTICAL CURVE INFORMA PI=26+50 E TO ELEV 37.5 ADE TO DRAIN CU YD. E XISTING EB) ORETICAL SCOUR GAL SCOUR CAL SCOUR WOODS
-L- -L- L- 	20 + 00 Right Floodway Bound Right Floodplain Bound Right Floodplain Bound 60 OVERTOPPING ELEV. EX -L- STA: 16 + 00 50 BEGIN GRAI STA: 20 STA: 20	21 + 00 dary= 950' from Sta. 20 + 00 ndary= 1,870 from Sta. 20 + 00 - 48.5 - 48.5 	22 + 00 ERTICAL CURVE INFORMATION PI = 21 + 10 EL = 50.06' VC = 120' K = 363 (+)0.3796% OBSERV	23 + 00	24 + 00 07 07 07 07 07 07 07 07 07	25+00 Left Floodway Boundary- 1,800 from Sta. 2 Left Floodplain Boundary- 7,200 from Sta. 2 Left Floodplain Boundary- 7,200 from Sta. 4 $ \begin{array}{c} $
-L- -L- -L- -L- -L- -L- -L- -L-	20 + 00 Right Floodway Bound Right Floodplain Bound Right Floodplain Bound Right Floodplain Bound COVERTOPPING ELEV. EX -L- STA: 16 + 00 50 6 3" - 1 - 3" 6 3" - 1 - 3" 7 0 8 0 8 0 8 0 8 0 8 0 8 0 8 0 8	21 + 00 iary- 950' from Sta. 20 + 00 idary- 1,870 from Sta. 20 + 00 - 48.5 	22 + 00 ERTICAL CURVE INFORMATION PI = 21 + 10 EL = 50.06' VC = 120' K = 363 (+)0.3796% OBSERV OBSERV OBSERV OBSERV OBSERV OBSERV COSC PDC PDC PDC PDC PDC PDC PDC PD	23 + 00	24 + 00	25 + 00 Left Floodway Boundary- 1,800 from Sta. 2 Left Floodplain Boundary- 7,200 from Sta. 2 Left Floodplain Boundary- 7,200 from Sta. 2 Left Floodplain Boundary- 7,200 from Sta. 2 PI=26+50 EL=52.11 VC = 240' K = 461 RIP-RAP TE TO ELEY 37.5 CADE TO DRAIN CU. YD E XISTING EB) ORETICAL SCOUR ICAL SCOUR
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ν∋I∃ (. ¹¹⁾ γ.Υλ	52 [,] 580 ^(c.f.s) Q	: Freq. _(۷۲.) ا0	Bloods Evaluated Biver Station	0
НЕС		bodtəM	Hydraulic Design	
		6011		

INFORMATION TO BE SHOWN ON PLANS

WS EL. Taken @ River Station 360374 Jesign: Discharge <u>30,500</u> c.f.s. Frequency <u>25</u> yr. Elev. <u>48.5</u> <u>f.</u> . معو Flood: Discharge <u>30,500</u> c.f.s. Frequency <u>25</u> yr. Elev. <u>48.5</u> <u>f.</u> .					· · · · · · · · · · · · · · · · · · ·			
esign: Discharge <u>30,500</u> c.f.s. Frequency <u>25</u> yr. Elev. <u>48.5</u> f.f. ase Flood: Discharge <u>30,500</u> c.f.s. Frequency <u>100</u> yr. Elev. <u>51.2</u> f.f. كvertopping: Discharge <u>30,500</u> c.f.s. Frequency <u>25</u> yr. Elev. <u>48.5</u> f.			¢75032	ğ Kiver Station	EL. Taken @	SM		
ase Flood: Discharge <u>عمر500</u> د.f.s. Frequency <u>25</u> yr. Elev. <u>51.2</u> f .	.н. <u>6.8</u> 4	Elev.	.25yr.	Frequency	l .s.f.ɔ		Discharge	: ngisə D
ر،ertopping: Discharge <u>30,</u> 500 c.f.s. Frequency <u>ک5–</u> ر.r. Elev. Elev <u>48.5</u> f.	. ĥ <u>5.1</u> 2	Elev.	<u>100</u>	Frequency	l .s.f.ɔ	44,000	Discharge	Base Flood:
	. f) <u>2.84</u>	Elev.	55yr.	Frequency	. s. ł. ɔ	30,500	Discharge	:pniqqotiəvO

ZNOITATUAMOD ANA NOITAMAOANI JANOITIDA

			scour=5.0'	100 - ХК. Local 3
· · · · · · · · · · · · · · · · · · ·	94.č = sY	Fr ₁ = 0.05	$Fr_{1} = 1.20/(32.2*15.2)$	$Fr_{1} = V_{1} / (g Y_{1})$
(20.0) (2.21) (0.5)(1.1)(2.1)(1.	r)0.2 = ₈ Y		$(K_2)(K_3)(\alpha)$ (Y_1) (Fr_1)	Ys= 2.0(K
<u>57'0 59'0 59'0</u>	(7	LION)(100 XB	COUR: (CSU EQUAL	TOCAL SC
			sction Scour=4.0'	100–YR. Contro
0.4 YA،0'	S 74.4=8.2-70.7	<u>,</u> = ۲		¢۲− _۲ ۲ = ۶۲
[269.6/158.7] [269.6/158.7]	2.8 [2899/11354]	$L = {}^{z} A$	(0 ¹] [M ¹ /M ³]	$\lambda^{3} = \lambda^{1} [\sigma^{3}]$
	2) XB)		CONTRAC
			,0`∠=	OT Local Scour
	′₄9.ð =₂Y	01.0 = _r 17	$F_{r_{1}} = 2.0/(32.2^{*}14.40)$	$EL^{1} = A^{1} \setminus (a \lambda^{1})$
(90.0) (04.41) (0.E)(I.I)(Z.I)(I.	r)0.2 = eY		(K ³)(K ³)(a) (J ¹) (Fr ¹)	$Y_s = 2.0(K_1)$
<u> </u>		<u>10)(NOI</u>	<u>ະວຸດຮະ (ດູຮູນ, ຮູດບຸລ</u> ັ	
			. Scour=4.0'	OT Contraction
0.4 YAs, 0.4	\$\$	sr = sY		oY− _s Y = sY
[7.821/9.92]	[9275/3864] 4.0	$\lambda^{z} = 1$	oʻl [M ¹ \M ⁵]	$\lambda^{2} = \lambda^{1} [O^{2}]$
	29			CONTRAC
IEC-RAS USED FOR SCOUR CALCULATION	H NI 318AT TU9T	OO NOILDES-SS	тор міртня ғком ско	*NOTE: CHANNEL
DT USED FOR SCOUR CALCULATIONS	ESIGN. NCDOT (ЕОК ИСDOT D	25 YR. DISCHARGE USED	NOTE: NCDOT 3
			LI: MOSTLY SILT	AIATAM DAB
Ø200=26'500	۶۹	0200=26	1	
Q100=44,000	99	0100=43'6		0200=29,200
Ø20=38'100	۔ ۲۵	60′82=38'08	-	009'07=00IO
Ø32=33 ⁴ 00	3	Ø72=37 [,] 39	-	001/85=050
2E ØJ0=52'900	n 0	Ø10=52 [°] 28		G25=34'700
TE BASED ON NEARBY CAUCE 020895	AGAGED ESTIMA	IN DATZULDA		Ø10=22,600
8' KECION 1-27.5%' KECION 4-47.5%		EEMA FLOOD		

