

# **GUIDELINES FOR NCDOT PERMIT DRAWINGS**

August 31, 2009

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### Examples:

Property Owner Sheet

CAMA Counties

Profile Along Culverts

Typical Section of a Work Pad

# GUIDELINES FOR NCDOT PERMIT DRAWINGS

## **PERMIT DRAWING CADD FILE SETUP**

Using the Design File Generator, create the following files (if needed) and place in the “Hydraulics/PERMITS\_Environmental/Drawings” sub-directory;

- “TipNo\_Hyd\_prm\_wet.dgn” (where wetland and stream impact hatching will be drawn)
- “TipNo\_Hyd\_prm\_buf.dgn” (where buffer impact hatching will be drawn)

Open up the \*.wet or \*.buf.dgn file above and reference in, using live nesting, all roadway plan sheets that have impact areas. Hatch impact areas as needed noting site numbers at each impact location.

Next, create a plan sheet file for each plan sheet having impact areas. Reference in the “\*.wet.dgn” or “\*.buf.dgn” noted above. Each plan sheet should have a plan scale and a legend for each different impact type shown on the sheet. (A separate legend sheet is not required.) When it comes time to plot out multiple permit plan sheets, IPLOT Organizer can be very useful.

If wetland impacts are on the project, at least one representative cross section will need to be plotted, per site. Either the “xpl” or “xsc” files can be used for this purpose. Simply copy and rename the file “”TipNo\_Hyd\_prm\_xpl.dgn” or “TipNo\_Hyd\_prm\_xsc.dgn” and place in the “Hydraulics/PERMITS\_Environmental/Drawings” directory.

Use the Department’s current leveling terminology for Permit CADD work. Very helpful permit drawing tools can be found on the “Hydro V8 Tools” toolbar. In Microstation, go to “TOOLS>Tool Boxes>Hydro V8 Tools”. Click on the “Permenu” box to open up the “Hydraulics Permits Barmenu”.

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## **PERMIT DRAWING PACKAGE (for submittal to NEU)**

The submittal to NEU should contain the following;

- Stormwater Management Plan (see attached example)
  - Wetland & Stream Impact Package
  - Buffer Impact Package (Current basins & watersheds that require buffer permit drawings; Neuse River Basin, Tar-Pamlico River Basin, Catawba River (Main Stem and Main Stem Lakes), Randleman Lake Watershed)
  - CAMA Major Permit (MP) Application Forms (only if required) See attached listing of our 20 CAMA Counties
  - Roadway Plans
  - For Merger Projects, include 4B & 4C Merger meeting minutes
-

Wetland & Stream Impact Package Should Contain:

- PROJECT TITLE SHEET- Titled “Wetland & Stream Impacts”
- USGS QUAD MAP (For standard “B” projects, a quad map is not required.)
- PROPERTY OWNER SHEET
- WETLAND & STREAM IMPACT SUMMARY SHEET (Excel file)
- PLAN SHEETS WITH IMPACTS HATCHED -(one with and one without contours plotted)
- PERMIT PROFILE SHEETS
- WORK PADS, CAUSEWAYS AND ANY STORMWATER CONTROL DETAILS (if details are on separate sheets, include those sheets)
- ROADWAY CROSS SECTIONS (only for wetland impact areas)

Buffer Impact Package Should Contain:

- PROJECT TITLE SHEET- Titled “Buffer Impacts”.
- USGS QUAD MAP (For standard “B” projects, a quad map is not required.)
- BUFFER IMPACT SUMMARY SHEET
- PLAN SHEETS WITH IMPACTS HATCHED-(one with and one without contours plotted)
- STORMWATER CONTROL DETAILS (if details are on separate sheets, include those sheets)

For CAMA Permits:

- Indicate coastal wetlands separately from 404 wetlands
- CAMA Major Permit (MP) Application Forms as needed.

Roadway Plans (11”x17” plans obtained from Roadway Design)

Note: Only need to submit the title sheet, roadway typicals, storm water control details, stream design details and plan & profile sheets. Cross section sheets from Roadway are not required.

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**DETAILED DESCRIPTIVE NOTES**

STORMWATER MANAGEMENT PLAN-see attached example

PROJECT TITLE SHEET- 11”x17” Titled as either; “Wetland & Stream Impacts” or “Buffer Impacts”. Label site locations with numbers. (Note that “B” projects, unless very involved, do not need site numbers).

USGS QUAD MAP- For I’s, R’s and U projects, submit a quad map with the project alignment and site locations indicated. Can be either 8.5” by 11” or 11” by 17”.

PROPERTY OWNER SHEET- 8.5” by 11” sheet listing property owner names, addresses and parcel numbers. Property owner listings can be found under the Location & Surveys directory. Right click on the \* poc.mdb file and open in excel. See attached example sheet.

WETLAND & STREAM IMPACT SUMMARY SHEET-8.5” by 11”. (The latest “Wetland Permit Impact Summary” form can be found on the Hydraulics Unit Web Site under “Forms”: [Hydraulics Unit](#) . The accuracy of the impact calculations should be as follows: for wetlands, show site impacts to the nearest 0.01 acres. Individual site impacts <.01acres should be shown as “<.01” on the summary sheet. When totaling multiple wetland impact sites for the project, add them to the .001 acres but report the total to the nearest .01 acre. Surface water impacts should be shown to the nearest foot. Bank stabilization should be reported as a separate impact to the nearest foot. The Structure Design Unit will supply the Hydraulics Unit with permanent impact calculations for the proposed bents in the water. This data should be noted below the Wetland Permit Impact Summary Table.

BUFFER IMPACT SUMMARY SHEET-8.5” by 11”. (The latest “Buffer Impact Summary” form can be found on the Hydraulics Unit Web Site under “Forms”: [Hydraulics Unit](#) . Riparian buffer (Zone 1 and Zone 2) impacts are shown to the nearest square foot. Note that there is another worksheet in this file (see excel tab) where “wetlands in buffer” square footage needs to be reported. This is for NEU’s use so that impacts are not counted twice.

PLAN SHEETS WITH IMPACTS- 11”x17” (for only those sheets with impacts), showing hatched area impacts for Wetlands & Streams, Buffers and work bridges/work pads or causeways needed for demolition of the existing structure or construction of the proposed structure. (A plan sheet with contours should immediately follow the impact plan sheet without contours). A legend for the hatched area type and sheet scale should be placed on each sheet.

\*If necessary, due to sheet clutter, provide additional “blow up” views of impact areas.

Sheets Should Include:

- Show the existing and proposed bridge/interior bents and/or box culverts.
- Stormwater Treatment Data including; V10 partial flow velocity of all pipes or ditch outlets that drain directly into wetlands. Show Q10/V10 data. Must be non-erosive entering wetlands.
- Grass Swale Ditch Data (In Buffer areas, show Q2, V2 and Q10, V10 data. In other areas, show Q10, V10 data. -see data table cell under “Hydro V8 Tools”.
- Temporary Work Bridges and Rock Work Pads or Causeways should be drawn. (Coordination should take place with Structure Design to make sure that their work bridge or causeway drawings match what is shown in the permit drawings).

- Details for features affecting impact areas; Bank Stabilization, swale, structure inlet outlets, etc.
- Roadway centerline, stations with tick marks, sheet match lines, north arrow and parcel numbers & names.
- Buffer Permit Drawings should reflect the limits of both Zone 1 and Zone 2. They should also show any items pertaining to storm water controls indicated on the storm water control key.

PERMIT PROFILE SHEETS- 11"x17" (only needed for major crossings with structures greater than a 72" pipe)

For bridge sites, show the standard roadway centerline profile, existing and proposed bridges, bridge opening profile and piers on an 11" x 17" sheet. The bridge and bridge opening profile should match the bridge opening contained in the Bridge Survey Report. Any required excavation should also be shown on the profile sheets.

For culvert sites, show the culvert at its roadway centerline station and, if applicable, note any sills.

For CAMA Permits

- Indicate rip rap under bridges on profile (should match what is shown in the BSR)
- Show Mean High and Mean Low Tide (or show Normal Water Surface (NWS) if not tidally influenced)

JURISDICTIONAL STREAM PROFILE SHEETS- 8.5"x11" or 11"x17"

For Culverts Equal To And Greater Than 60" In Jurisdictional Streams: (See attached example)

- Show flow line profile of culvert and stream on an 11"x 17" sheet. (Can use Culvert Survey Report flow line profile)
- Indicate the NWS

WORK PADS & CAUSEWAY DETAILS- if work pads or causeways are required, submit a detail indicating the class of rip rap, work pad/causeway dimensions & material quantities desired. Also show the NWS. (See attached example)

ROADWAY CROSS SECTIONS- half sized with at least one cross section shown per each wetland impact area. Wetland boundaries and clearing limits should be marked with a thick vertical line marked "Wetlands" and "Clearing Limits".

**THE FOLLOWING ARE SOME OF THE ITEMS THAT SHOULD BE OMITTED IF POSSIBLE TO HELP DE-CLUTTER PLAN SHEETS**

DRN file:

- Structure numbers, ditch details (except swales or ditches in sensitive areas), rip rap and filter fabric quantities.
- Approach slab, embankment cut and pavement removal hatching since it can be confused with wetland or buffer impact hatching.

ROW file:

- Station and offsets for R/W, PDE, TDE, and E
- Right of Way marker symbols
- Property line bearings

DSN file:

- Super-elevations
- Pavement and shoulder widths
- Guardrail and Guardrail text
- Traffic flow arrows
- Begin and End Bridge Stations
- Begin and End Approach Slab Stations
- Approach Slab Single Hatch must be turned off
- Any other hatching that could be confused with impact hatching should be turned off as well.
- Curve Data Info, PT, PC, etc

BLN file:

- This file should be turned off

PRL file:

- Deed book reference and/or Map page
- Bearing and Distance for property lines
- Datum Description

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**WETLAND PERMIT IMPACT SUMMARY SHEET KEY**

1. Site No. - This is the site number referenced on the permit drawing plan view. Site numbers are not shown for standard "B" projects.
2. Station (From/To) - This is the project station where the impacts occur. Does not have to be from/to unless it is a very long linear impact. Will want to reference left or right of the centerline if applicable.
3. Structure Size/Type - Type of structure if applicable. Examples: culvert, bridge, 48"RCP, temporary work bridge, temporary rock causeway, bank stabilization, etc.
4. Permanent Fill in Wetlands, Temp. Fill in Wetlands, Excavation in Wetlands, Mechanized Clearing in Wetlands and Hand Clearing in Wetlands - Quantity in acres of wetlands. Does not include isolated wetlands. Report to nearest 0.01 ac.

5. Permanent SW Impacts - Quantity in acres of surface waters impacted permanently. Surface waters include streams, lakes and ponds (ponds that are connected to surface water streams or wetlands. Does not include isolated ponds). Examples: culverts in streams, permanently placed riprap in streams, bank stabilization, any part of the surface water of the stream that is permanently relocated, permanent roadway fill in the surface water, any part of the surface water that is permanently dewatered or drained, etc. Report to nearest 0.01 ac. (Note that bank stabilization should be noted separately, for each site in the impact table.)
6. Temp. SW Impacts - Quantity in acres of surface waters impacted temporarily. Surface waters include streams, lakes and ponds (ponds that are connected to surface water streams or wetlands). Does not include isolated ponds. Examples: temporary fills due to temporary rock causeways required for bridge construction or construction access, temporary detour fills in surface water, temporary dewatering impacts required for construction. Report to nearest 0.01 ac.
7. Existing Channel Impacts Permanent - Length of stream that is permanently impacted as noted in 5 above. Report to nearest foot.
8. Existing Channel Impacts Temp. Length of stream that is temporarily impacted as noted in 6 above. This is generally 10 feet for pipe crossings. Report to nearest foot.
9. Natural Stream Design - Length of stream that is relocated (due to project impacting it) using natural stream design techniques. Report to nearest foot.

Note that other impacts the permitting agencies require that are not listed in the table may be reported at the bottom of the page. Examples would be impacts to isolated wetlands, impacts due to bridge piers (get from Structure Design) in the wetlands (temp. and perm.), bridge impacts to wetlands due to bridging of wetlands (this is to be shown as area of the bridge over the wetland as required by DWQ), etc.

**BUFFER PERMIT IMPACT SUMMARY SHEET KEY (For Items Not Explained Above)**

1. \* TYPE: Type of impact; Road Crossing, Bridge or Parallel Impact - Place an “x” in the appropriate column
2. Allowable Impact; zone 1, zone 2 and totals (zone 1 plus zone 2)- Report to nearest square foot.
3. Mitigable Impact; zone 1, zone 2 and totals- Report to nearest square foot.
4. Buffer Replacement; zone 1, zone 2- buffer replacement in zone 1. Report to nearest square foot.
5. WETLANDS IN BUFFERS (see tab at bottom of spreadsheet); so impacts are not counted in both wetlands and buffers, report the wetlands in buffers in square feet for NEU’s use.

\*Note: There are other types of impacts other than road crossing, bridge or parallel impact (example: temporary road). These are the three most common types. If you have another type of impact other than these, you may replace one of the columns with that impact if that column is not being used or you may need to add another column.

# **STORMWATER MANAGEMENT PLAN**

Project: 33701.1.1  
TIP No. B-4435  
County: Bertie  
Date: 3/07/09

Hydraulics Project Manager: PEF, P.E. (FIRM),  
Marshal Clawson, P.E. (NCDOT Hydraulics Unit)

## **ROADWAY DESCRIPTION**

The project B-4435 consists of constructing a new bridge 140 feet long to replace the existing bridge #44 in Bertie County on SR-1100 over Roquist Creek. The total project length is 0.077 miles. The project creates impacts to Roquist Creek, which is located in the Roanoke River Basin. The project drainage systems consist of grated inlets with associated pipe systems, and preformed scour holes at the pipe outlets.

Jurisdiction Stream: Roquist Creek

## **ENVIRONMENTAL DESCRIPTION**

The project is located within the Roanoke River Basin in Bertie County, which is also a CAMA county. There is a wetland site surrounding the bridge that will be impacted by the proposed project. Impacts have been minimized by and using preformed scour holes at the pipe outlets and reducing the roadway approach work to minimize fill slopes encroachment into the wetlands.

## **BEST MANAGEMENT PRACTICES AND MAJOR STRUCTURES**

The primary goal of Best Management Practices (BMP's) is to prevent degradation of the states surface waters by the location, construction and operation of the highway system. The BMPs are activities, practices and procedures taken to prevent or reduce stormwater pollution. The BMP measures used on this project to reduce stormwater impacts are:

- Rip rap preformed scour hole at pipe outlets.

**PROPERTY OWNERS**  
**NAMES AND ADDRESSES**

**PARCEL NO.**

**NAMES**

**ADDRESSES**

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**NCDOT**

**DIVISION OF HIGHWAYS**

**CABARRUS COUNTY**

**PROJECT: 8.2661601 (R-2246C)**

**CONCORD-KANNAPOLIS**

**WESTSIDE BYP EXT FROM**

**SR 1431 TO SR 1555**



# CAMA Counties

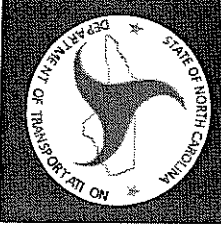
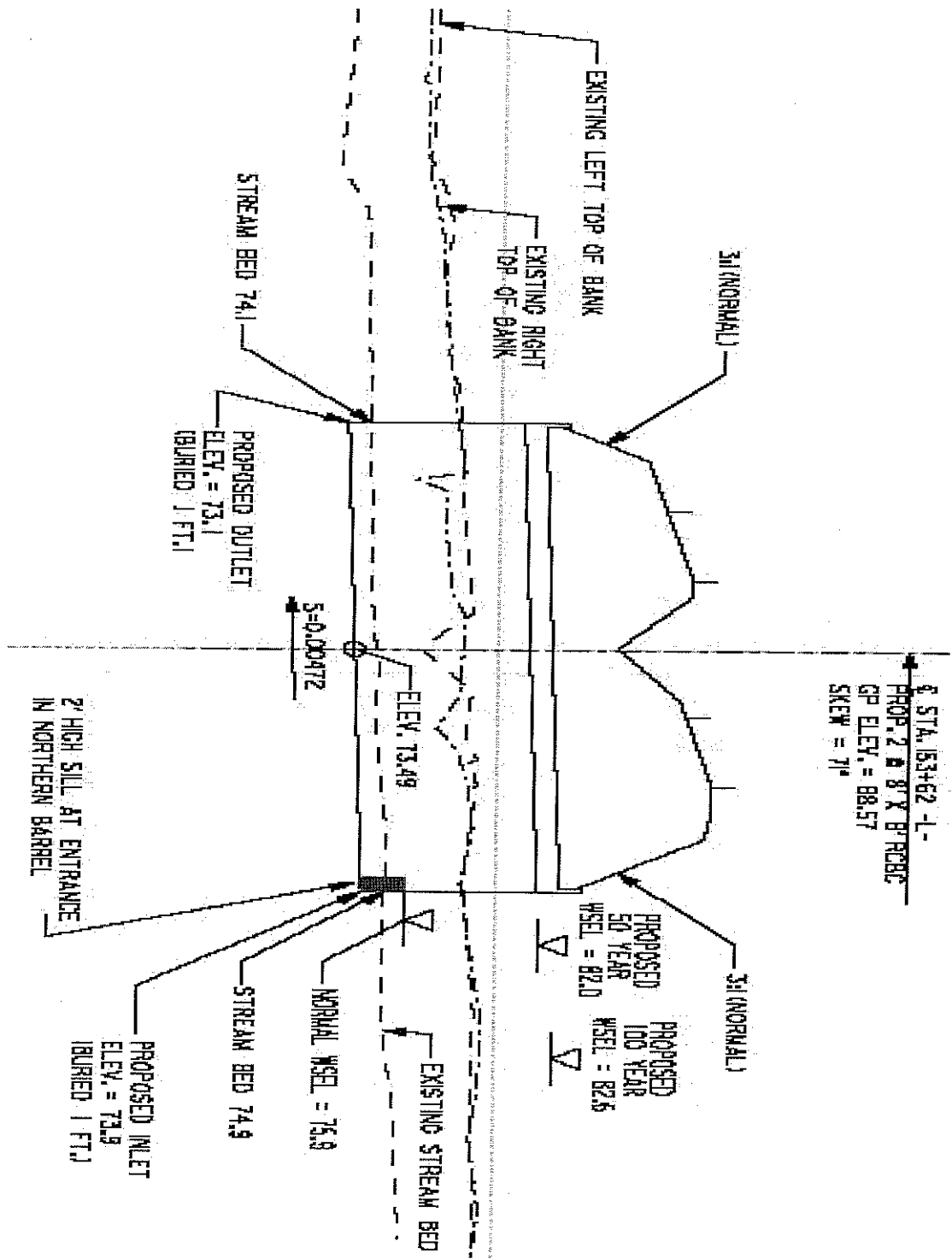
## Coastal Permitting

If your project is in one of the 20 coastal counties listed below, a coastal permit may be required. Click below to see coastal permits.

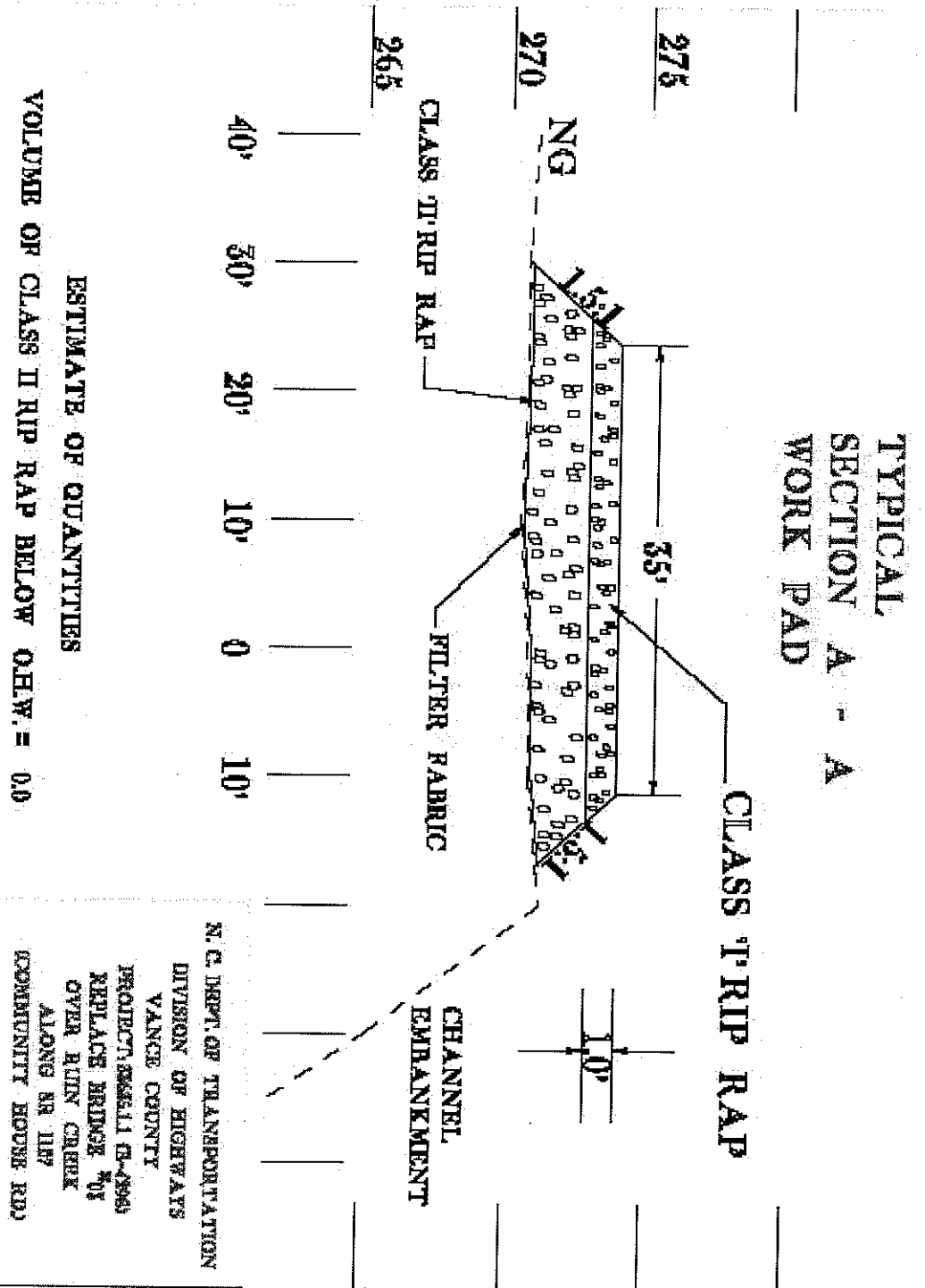
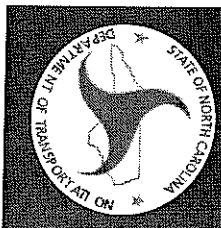
- Beaufort
- Bertie
- Brunswick
- Camden
- Carteret
- Chowan
- Craven
- Currituck
- Dare
- Gates
- Hertford
- Hyde
- New Hanover
- Onslow
- Pamlico
- Pasquotank
- Pender
- Perquimans
- Tyrrell
- Washington



# Profile along the Structure (Inset)



# Typical Section for a Rip Rap Work Pad (8.5 x 11)



N. C. DEPT. OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 VANCE COUNTY  
 PROJECT # 98011 (I-95)  
 REPLACE BRIDGE # 01  
 OVER RAIN CREEK  
 ALONG RR 1187  
 COMMUNITY HOOR RD

SECRET OF