



Managing Stormwater Runoff
*NPDES Stormwater Program
Compliance*

Andy McDaniel, P.E.





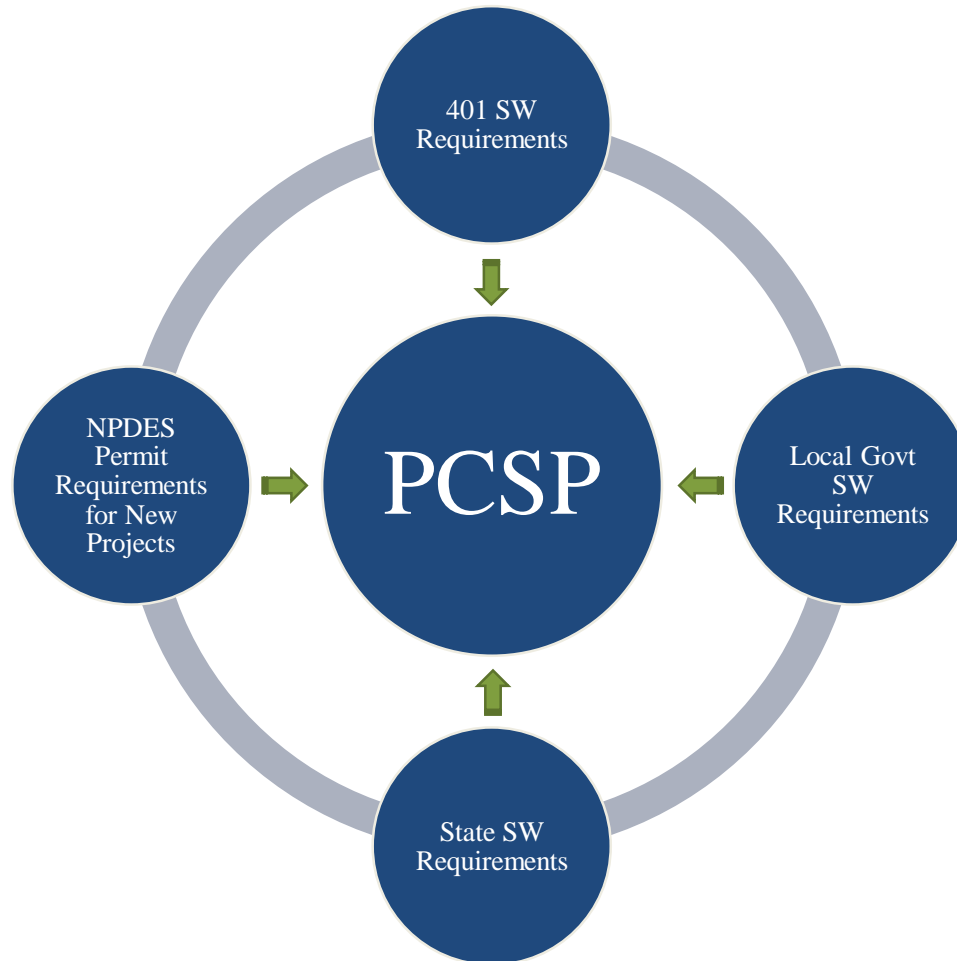
*If you remember only one thing
from this presentation...*

Compliance with NCDOT's
Post-Construction Stormwater Program (PCSP) =
Compliance with Stormwater Regulations





Post-Construction Stormwater Program is a One Stop Compliance Shop



*Clean Water Act, Section 402:
National Pollutant Discharge Elimination System
Permitting Program*



NCDOT's NPDES Stormwater Permit

- First issued in 1998
- Permit renewed every 5 years
- Current permit 2015 - 2020

STATE OF NORTH CAROLINA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF ENERGY, MINERAL AND LAND RESOURCES
PERMIT NO. NCS000250

TO DISCHARGE STORMWATER AND BORROW PIT WASTEWATER UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of North Carolina General Statute 143-215.1, other lawful standards and regulations promulgated and adopted by the North Carolina Environmental Management Commission, and the Federal Water Pollution Control Act, as amended,


North Carolina Department of Transportation

is hereby authorized to discharge borrow pit wastewater and stormwater from construction activities and the North Carolina Department of Transportation (NCDOT) Transportation Separate Storm Sewer System (TS4) located statewide in accordance with the discharge limitations, monitoring requirements, and other conditions set forth in Parts I, II, III, IV, V, VI, VII and VIII hereof.

This permit shall become effective October 1, 2015.

This permit and the authorization to discharge shall expire at midnight on September 30, 2020.

Signed this day September 11, 2015.


for Tracy Davis, Director
Division of Energy, Mineral and Land Resources
By the Authority of the Environmental Management Commission



NPDES Permit Authorizes Stormwater Discharges From...



NCDOT's NPDES Statewide Programs

- Post-Construction Stormwater Program (PCSP)
- BMP Toolbox Program
- BMP Inspection & Maintenance Program
- BMP Retrofit Program
- Construction/Borrow Pit and Waste Pile Program
- Public Education and Involvement Program
- Internal Education Program
- Illicit Discharge Detection and Elimination Program
- Industrial Activities Program
- Research Program
- Stormwater Outfall Inventory Program
- Total Maximum Daily Load Program
- Vegetation Management Program



Focus of Today's Presentation

- PCSP
- BMP Toolbox
- Stormwater Management Plans



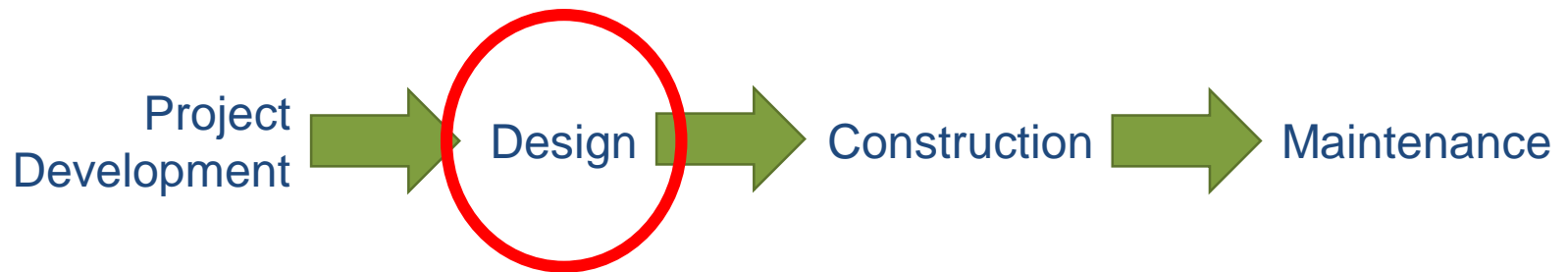
Simplified Project Workflow

Q: What does Post-Construction mean ?



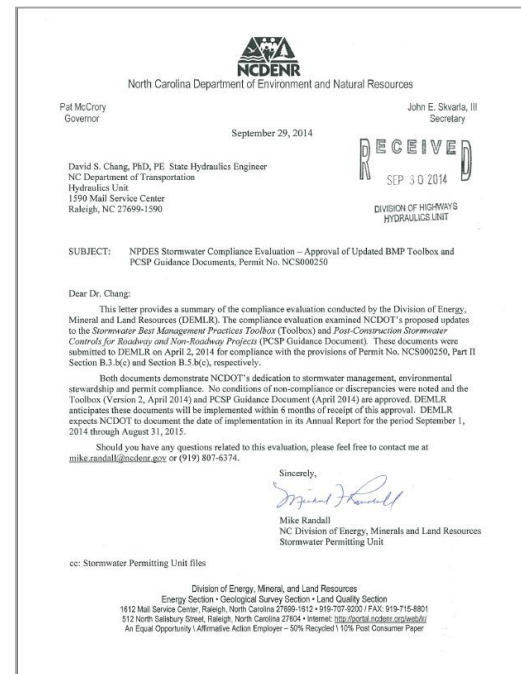
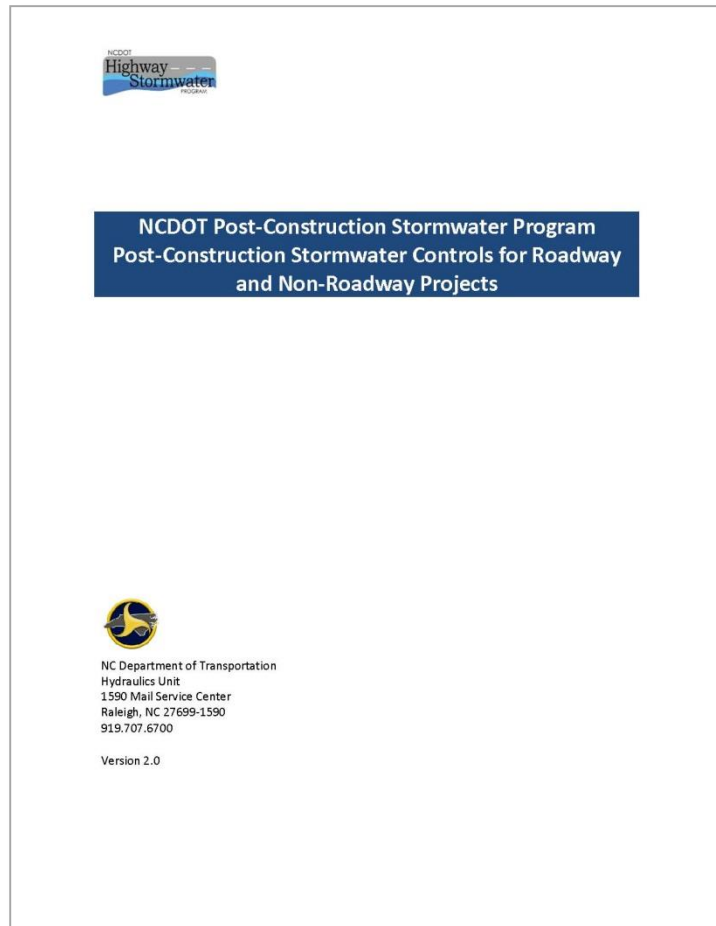
PCSP Applies to Design Phase

A: It means permanent stormwater controls which remain in place after construction



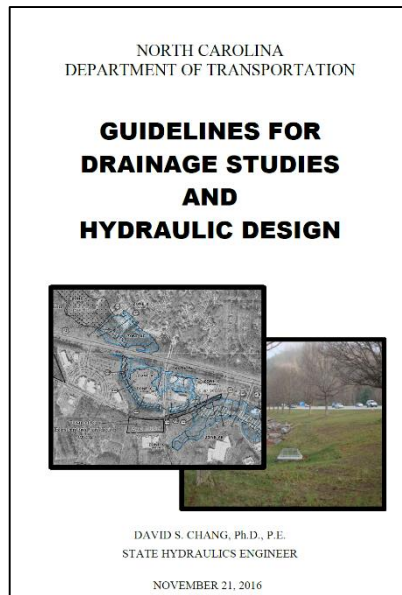
Post-Construction Stormwater Program (PCSP)

- Updated PCSP and BMP Toolbox approved in September 29, 2014

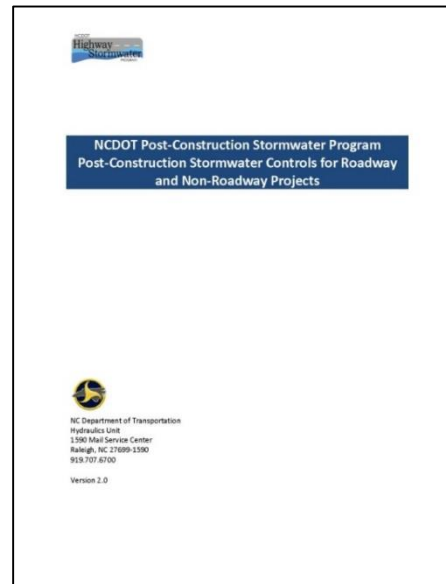


Post-Construction Stormwater Program (PCSP)

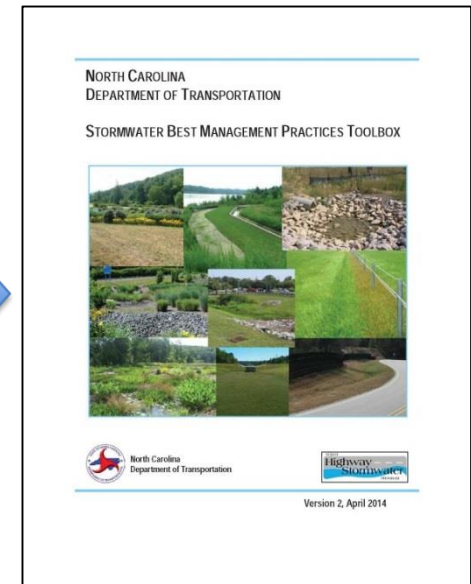
Drainage Guidelines



PCSP



BMP Toolbox



Stormwater Management Plan



PCSP Applies to New Built-Upon Area...

Roadway Projects

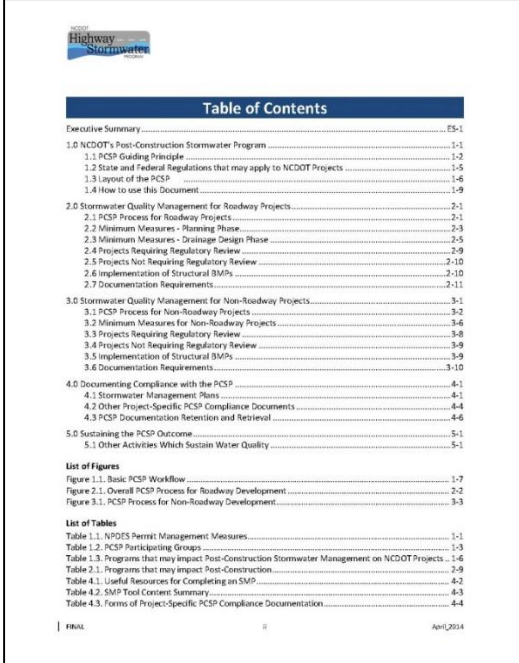


Non-roadway Projects



PCSP Document Table of Contents

1. NCDOT's Post-Construction Program
2. Stormwater Quality Management for Roadway Projects
3. Stormwater Quality Management for Non-Roadway Projects
4. Documenting Compliance with the PCSP
5. Sustaining the PCSP Outcome



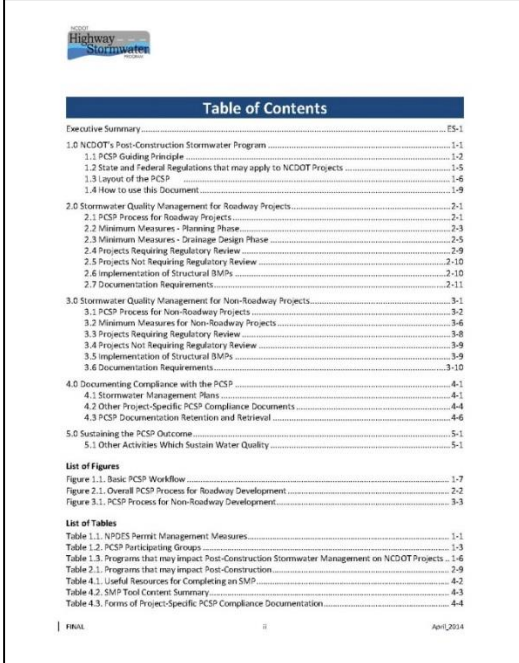
The image shows the cover of the PCSP Document Table of Contents. At the top left is the logo for 'Highway Stormwater' with 'NCDOT' above it. The title 'Table of Contents' is centered in a blue box. Below the title is a detailed list of sections and their corresponding page numbers. The sections are organized into four main categories: 1.0 NCDOT's Post-Construction Stormwater Program, 2.0 Stormwater Quality Management for Roadway Projects, 3.0 Stormwater Quality Management for Non-Roadway Projects, and 4.0 Documenting Compliance with the PCSP. There are also sections for 'List of Figures' and 'List of Tables'. At the bottom right, the date 'April 2014' is printed.

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2. Stormwater Quality Management for Roadway Projects
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5. Sustaining the PCSP Outcome



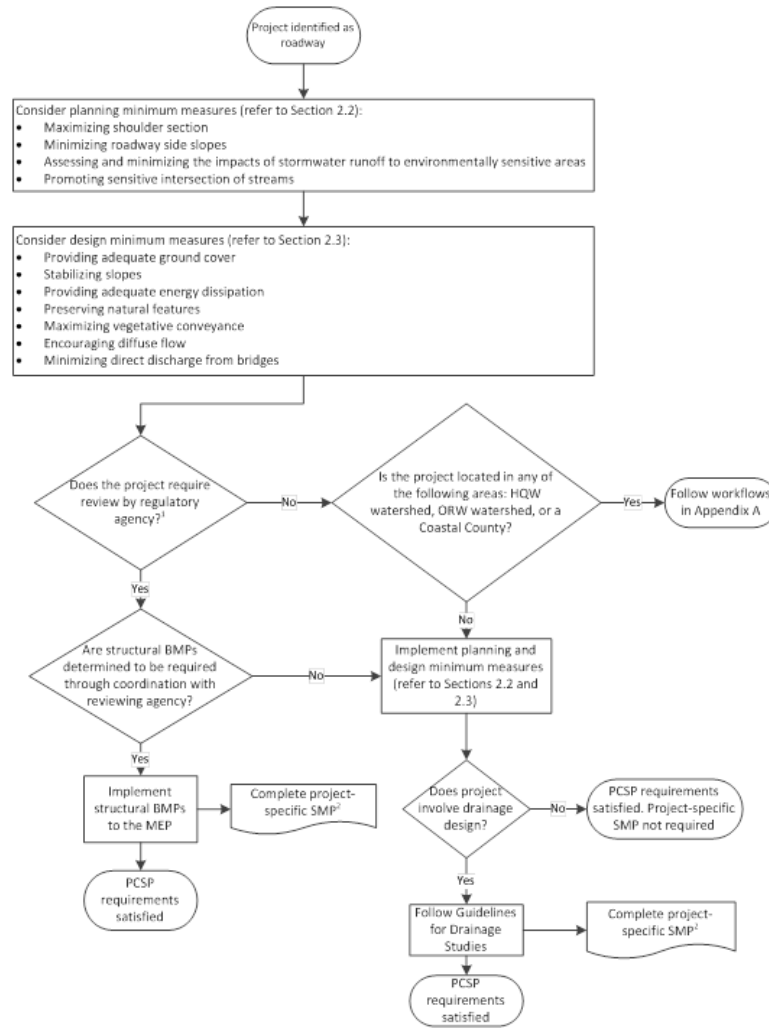
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Figure 2.1 – Roadway Project Workflow



¹Includes the following programs: 404/401 Water Quality Certification, Isolated Wetlands/Waters, Merger Process, Riparian Buffer Authorizations, CAMA Permits, Endangered Species Act/Section 7 Consultation.

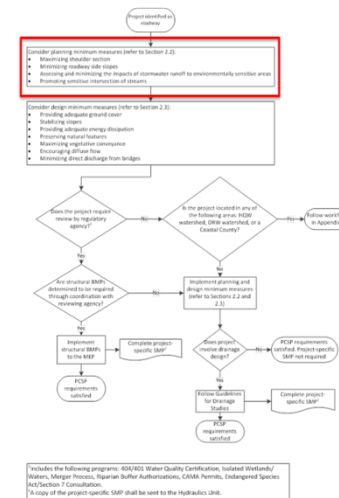
²A copy of the project-specific SMP shall be sent to the Hydraulics Unit.



Figure 2.1 – Planning Minimum Measures

Consider planning minimum measures (refer to Section 2.2):

- Maximizing shoulder section
- Minimizing roadway side slopes
- Assessing and minimizing the impacts of stormwater runoff to environmentally sensitive areas
- Promoting sensitive intersection of streams



Roadway – Planning Minimum Measures

Assessing and Minimizing the Impacts of Stormwater Runoff to Environmentally Sensitive Areas

Definition:

Selecting alignments or design options that minimize impacts to sensitive streams.

Merger concurrence point 2/3



When evaluating various alternative corridors (new locations) or design options (widening and other improvements), consider the alternative or option that avoids high quality or otherwise environmentally-sensitive areas. These areas include habitat for protected, threatened, and endangered species, sensitive streams, and jurisdictional wetlands. If total avoidance of an environmentally-sensitive area is not feasible, the alternative or design options considered should be ones that minimize impacts.

Key Considerations

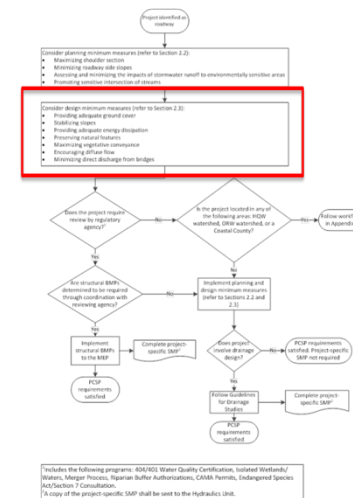
- Many factors are considered when selecting the preferred alternative for either the roadway corridor or improvement design option. The final selection must fulfill the purpose and need of the roadway project and balance potential impacts on the human and natural environment.
- Environmentally-sensitive streams include nutrient sensitive waters, outstanding resource waters, high quality waters, jurisdictional wetlands, waters with an existing impairment, and all waters in Coastal Area Management Act (CAMA) counties.



Figure 2.1 – Design Minimum Measures

Consider design minimum measures (refer to Section 2.3):

- Providing adequate ground cover
- Stabilizing slopes
- Providing adequate energy dissipation
- Preserving natural features
- Maximizing vegetative conveyance
- Encouraging diffuse flow
- Minimizing direct discharge from bridges



Roadway – Design Minimum Measures

Maximizing Vegetative Conveyance

Definition:

Selecting swales and filter strips for stormwater conveyance wherever possible.

Merger concurrence points 4B/4C

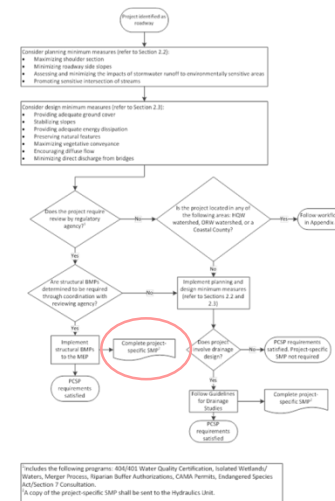
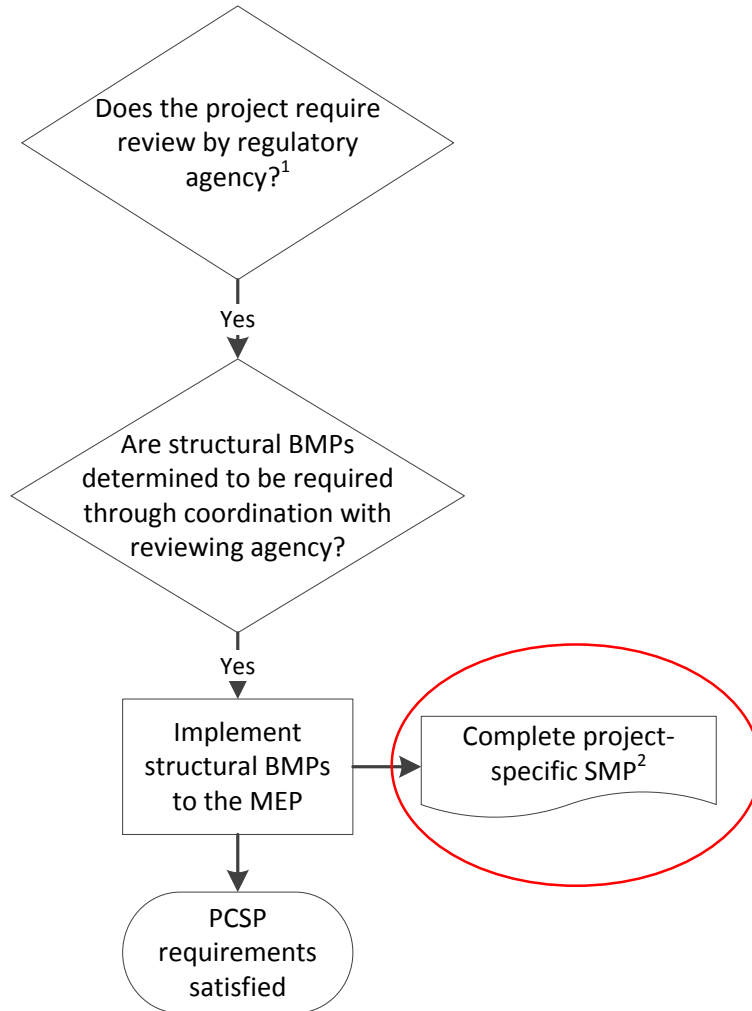


Incorporating vegetation into the drainage system reduces flow velocity while also promoting sedimentation, filtration, and infiltration. Maximizing vegetative conveyance is a minimum measure where vegetated features are preferentially selected for runoff conveyance to take advantage of these passive stormwater treatment benefits. Examples of maximizing vegetative conveyance include selecting a swale over pipe conveyance and selecting vegetated options for channel linings where appropriate.

Key Considerations:

- When pipe structures are necessary to collect runoff from the roadway (such as in curb and gutter sections), every effort should be made to direct runoff from the pipe outlet to vegetated areas. Proper energy dissipation and transitions should be implemented.
- To the extent possible, the designer should maintain the predevelopment drainage areas and flow patterns to support greater use of vegetative conveyance. Consolidating drainage areas may preclude vegetative conveyance due to the increased discharges and velocities.
- Evaluate vegetated options for channel linings before considering “hardened” lining types.

Figure 2.1 – Beyond Minimum Measures (1)



Stormwater Management Plan (SMP)

(Project or TIP No.)_HYD_SMPv2.07_YYYYMMDD) (Oct 2016).xls [Compatibility Mode] - Excel

McDaniel, Andrew H.

WBS Element:

North Carolina Department of Transportation									
Highway Stormwater Program									
STORMWATER MANAGEMENT PLAN									
FOR NCDOT PROJECTS									
WBS Element:		TIP No.:		County(ies):		Page 1 of 1			
General Project Information									
WBS Element:		TIP Number:		Project Type:		Date:			
NCDOT Contact:		Contractor / Designer:		Address:					
Address:		Address:							
Phone:		Phone:							
Email:		Email:							
City/Town:		County(ies):		CAMA County?					
River Basin(s):									
Wetlands within Project Limits?									
Project Description									
Project Length (lin. miles or feet):		Surrounding Land Use:							
		Proposed Project		Existing Site					
Project Built-Up Area (ac.)		ac.		ac.					
Typical Cross Section Description:									
Annual Avg Daily Traffic (veh/hr/day):		Design/Future: Year		Existing: Year					
General Project Narrative: (Description of Minimization of Water Quality Impacts)									
Waterbody Information									
Surface Water Body (1):		NCDWR Stream Index No.:							
NCDWR Surface Water Classification for Water Body		Primary Classification:							
		Supplemental Classification:							
<p>General Project Information Swales Filter Strip PSHs, Energy Diss. Level Spreader, HSB, & Forebay Other BMPs Bridge to Culvert CAMA Map</p>									

Page 1



Figure 2.1 – Beyond Minimum Measures (2)

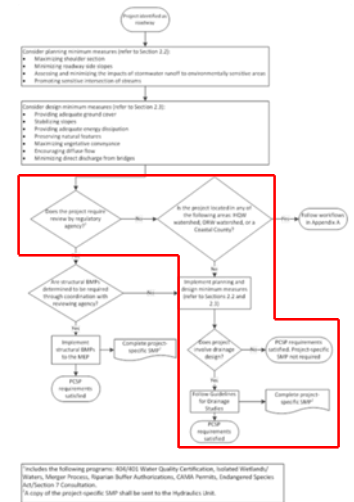
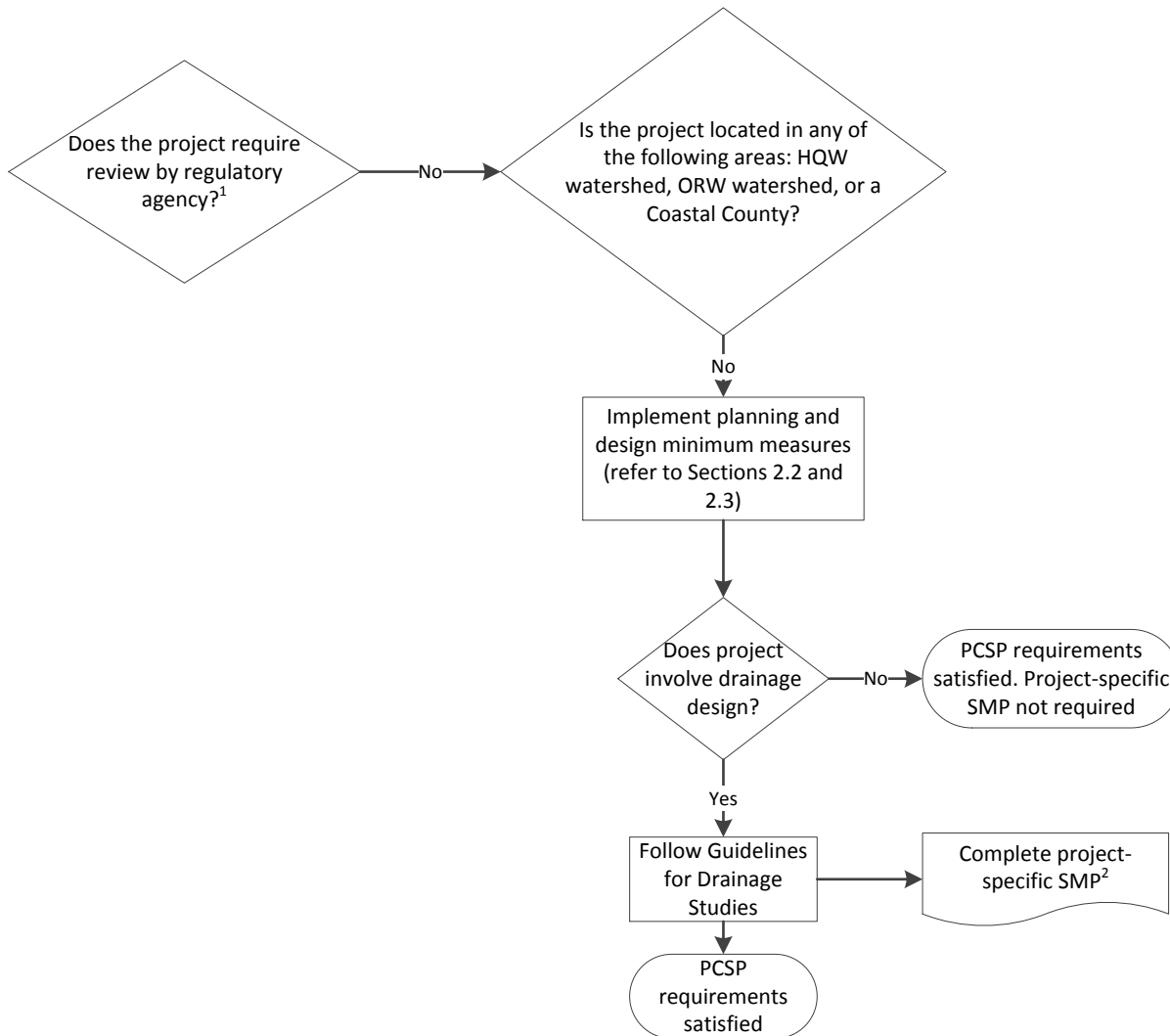
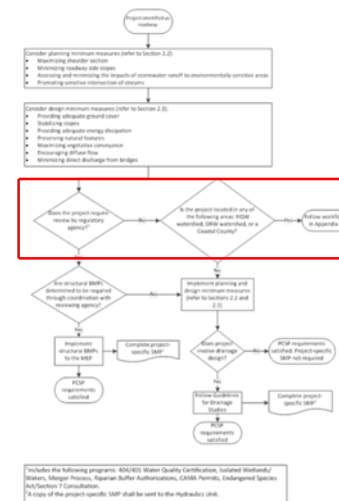
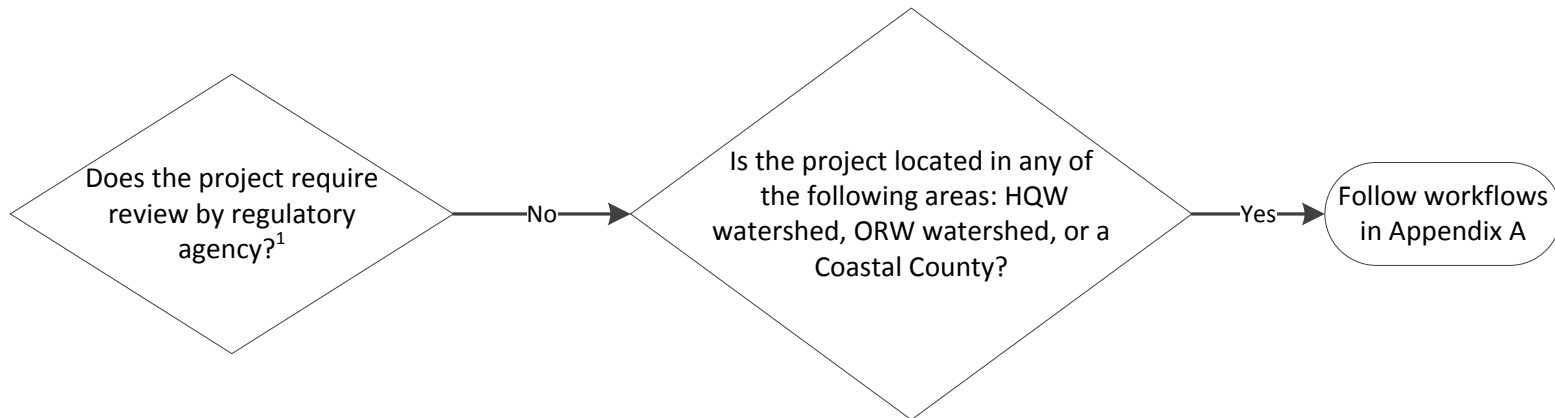
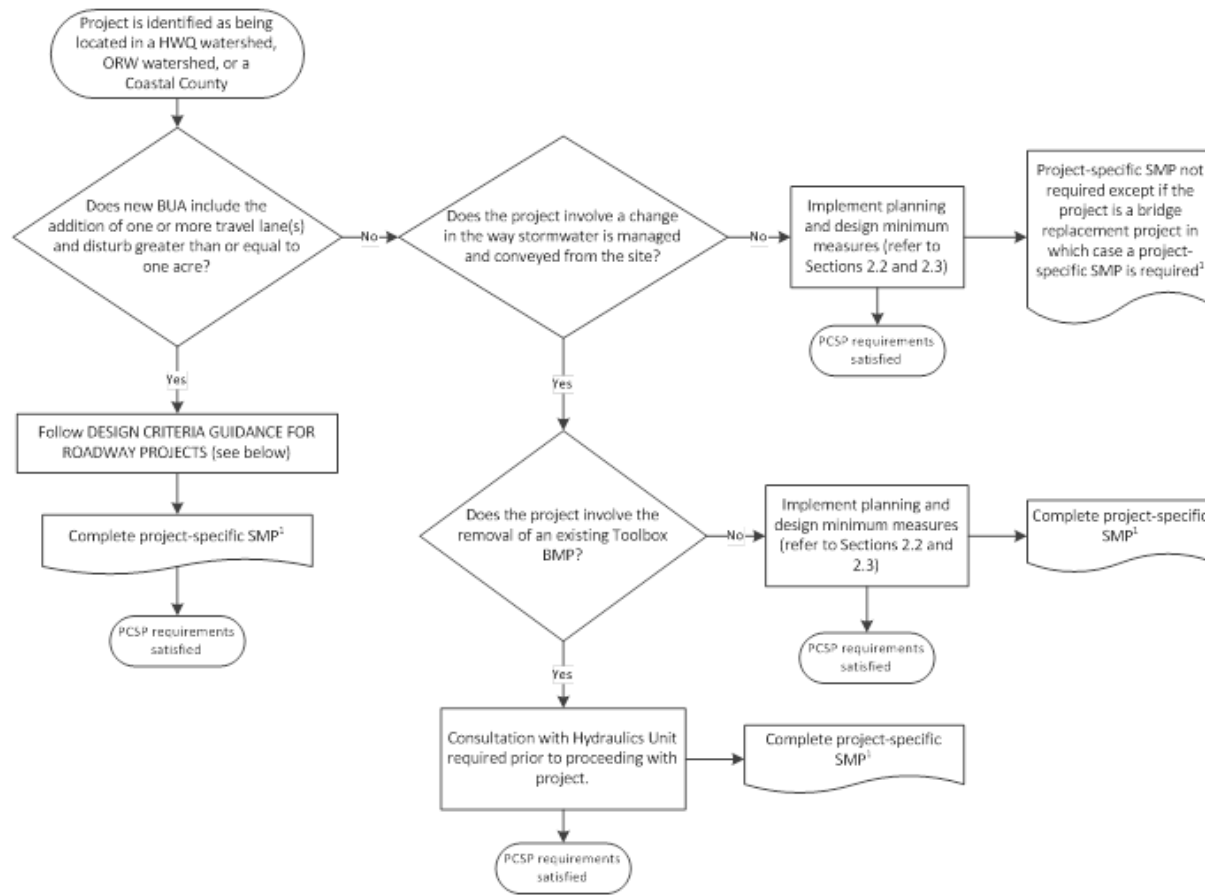


Figure 2.1 – Beyond Minimum Measures (3)



Appendix A – Guidelines for Roadway Projects in ORW Watersheds, HWQ Watersheds, and Coastal Counties



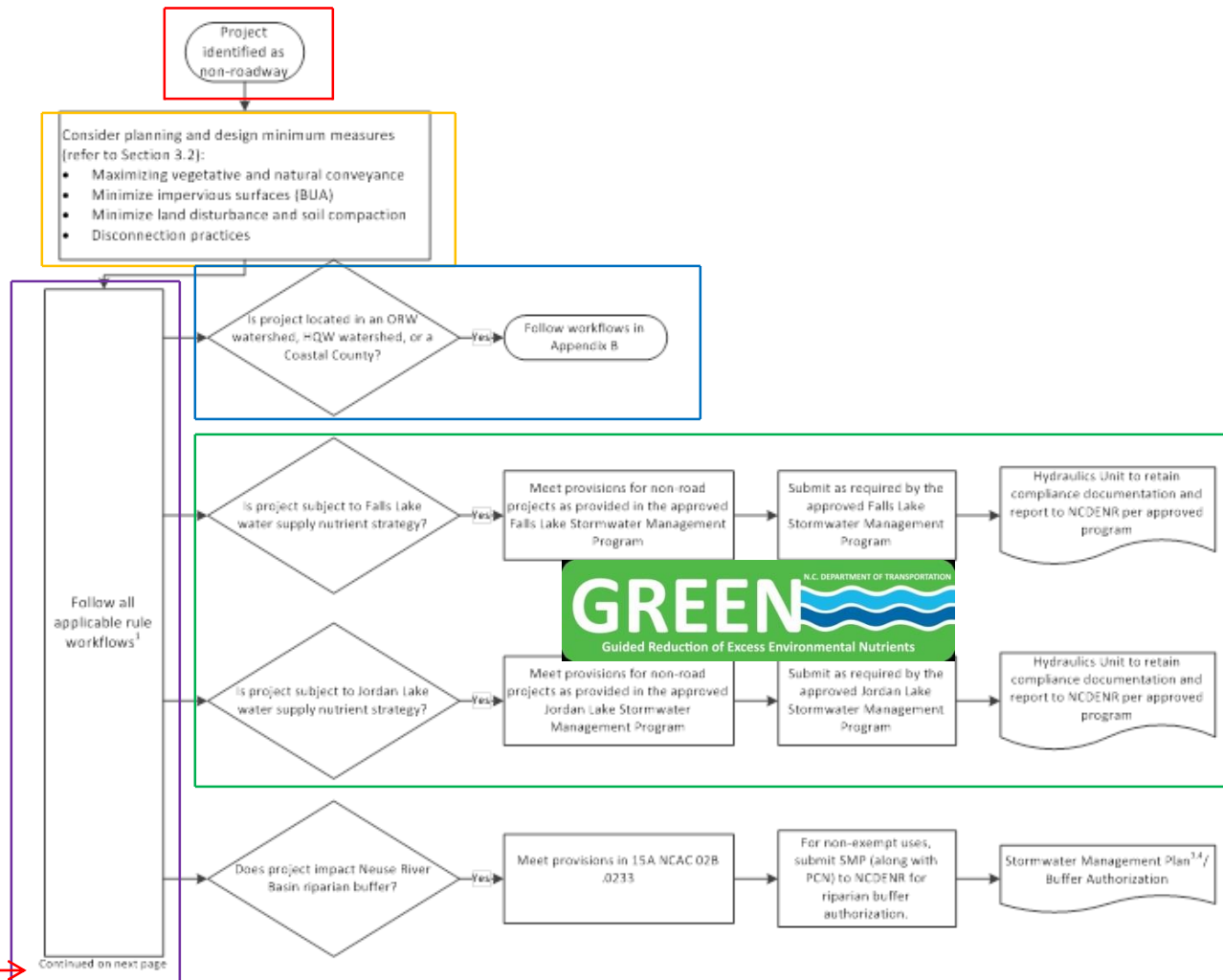
²A copy of the project-specific SMP shall be sent to the Hydraulics Unit.



Non-Roadway Projects



Figure 3.1 – Non-Roadway Workflow



Refer to Figure 3.1 in Section 3 for full workflow



Highway Stormwater Program Connect Site

Connect NCDOT
BUSINESS PARTNER RESOURCES

Doing Business | Bidding & Letting | Projects | **Resources** | Local Governments

Asset Management | Environmental | Geotechnical | **Hydraulics** | Materials & Tests | Photogrammetry | Specifications | Structures | Traffic Safety

Hydraulics

Guidelines and resources for hydraulic design and highway drainage.

Connect NCDOT > Resources > Hydraulics

- Guidelines for Drainage Studies**
Guidance in the methods, procedures, policies, and criteria for Drainage Studies and Hydraulic Design.
[Read More ->](#)
- Highway Stormwater Program (HSP)**
Highway Stormwater Program products and useful links.
[Read More ->](#)
- Hydraulic Forms and Checklists**
Forms, Checklists and Resources
[Read More ->](#)
- Hydraulic/FEMA Coordination**
Meeting information, forms, submittals, requests, and other resources.
[Read More ->](#)
- Memos & Guidance**
Documents to supplement the Guidelines for Drainage Studies and Hydraulic Design.

Interagency Concurrence Meetings (Merger 4b / 4c)

Hydraulics Conference Room

Contact Us to reserve the **Hydraulics Conference Room**.

Concurrence Meeting Agendas and Calendar

Hydraulics Prequalification Tiers

Helpful Links

- Go NCI ArcGIS Maps
- NOAA Precipitation Frequency Data
- NOAA Tides and Currents

Connect NCDOT
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Highway Stormwater Program (HSP)

Highway Stormwater Program products and useful links

Connect NCDOT > Resources > Hydraulics > Highway Stormwater Program (HSP)

About the Program

The Highway Stormwater Program (HSP) was established in 1998 as an NCDOT-wide initiative to protect and improve water quality while fulfilling NCDOT's mission of providing and supporting a safe and integrated transportation system that enhances the state. A joint effort of the Hydraulics Unit and Roadside Environmental Unit, the HSP has created and maintains tools and resources for business partners, educators and the general public.

[Read More](#)

Products

- Post-Construction Stormwater Program Manual (PCSP)**
The purpose of the PCSP is to regulate stormwater from new NCDOT impervious surfaces, direct implementation of the BMP Toolbox and preparation of Stormwater Management Plans.
[Read More](#)
- BMP Toolbox Manual**
The Best Management Practices Toolbox provides guidance on the design of post-construction BMPs for NCDOT projects.
[Read More](#)
- Stormwater Management Plan Version 2.07 (SMP)**
The Stormwater Management Plan is a comprehensive document that summarizes project information and post-construction source control and treatment measures.
[Read More](#)
- State Nutrient Rule Compliance - Nutrient Accounting Tool**
The North Carolina Environmental Management Commission (EMC) has adopted Nutrient Roles for Jordan Lake and Falls Lake and NCDOT's GREEN Program guides the Department's compliance.
[Read More](#)
- Environmental Sensitivity Map (ESM)**
The ESM is an online mapping system that allows planners, designers, and engineers to view proposed project locations and nearby environmental features as a tool to support the avoidance and minimization of impacts.
[Read More](#)

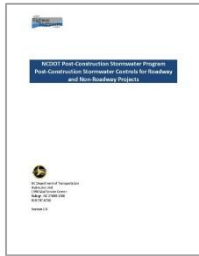
SW Resources | SW Documents

- [Submit SMP](#)
- [2014 Impaired Waters Map \(Division of Water Resources\)](#)
- [NC 305\(b\) and 303\(d\) List \(Division of Water Resources\)](#)
- [Surface Water Classifications \(Division of Water Resources\)](#)
- [USGS National Water Information System \(NWIS\)](#)
- [Surface Water Classifications Map \(Web GIS\)](#)
- [Multi-Sensor Precipitation Estimates \(MPE\)](#)

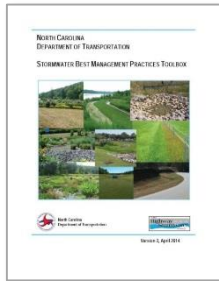
Employee Directory
Staff contacts for *Hydraulics Unit*.

Contact Form
For questions & feedback about this area of Connect NCDOT, contact *Hydraulics Unit*.

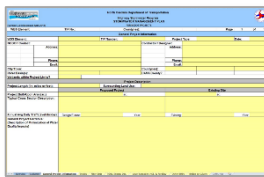
In Review...



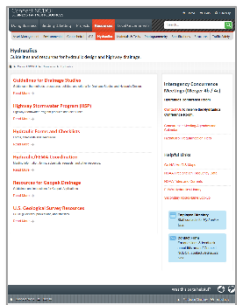
The PCSP contains all the information you need to know to comply with stormwater management regulations



The BMP Toolbox is the design guidance manual that should be used for stormwater control measures on NCDOT projects



A project specific Stormwater Management Plan (SMP) is required and is your proof of compliance with the PCSP



The Hydraulics Unit Connect site is the repository for the latest versions of these documents



Questions?

Andy McDaniel, PE
Hydraulics Unit
919.707.6737
ahmcdaniel@ncdot.gov

