



Published by  
the New Jersey Department of Agriculture—  
State Soil Conservation Committee



# *The Standards for Soil Erosion and Sediment Control In New Jersey*



7th Edition, January 2014



Cover: Restoration of 800 feet of the Ramapo River bank after damage by Hurricane Irene in August 2011. Restoration by the Boro of Oakland, Bergen County NJ Spring 2013 (completed). Technical and funding assistance from the USDA Natural Resources Conservation Service. Erosion Control oversight by the Bergen County Soil Conservation District.

**STANDARDS**  
**FOR**  
**SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY**

Adopted  
December 2013

Vegetative and Engineering Standards, chapters 1 - 32 inclusive are promulgated as “Standards” pursuant to the Soil Erosion and Sediment Control Act of 1975 as amended (N.J.S.A. 4:24-39 et seq.) and New Jersey Administrative Code (N.J.A.C. 2:90-1.1 et seq.).

By the

**NEW JERSEY STATE SOIL CONSERVATION COMMITTEE**

**Douglas H. Fisher, Chairman**, Secretary, New Jersey Department of Agriculture

**Robert Martin**, Commissioner, New Jersey Department of Environmental Protection

**Dr. Robert M. Goodman**, Exec. Dean, School of Environmental and Biological Sciences, Rutgers University

**Dr. Larry Katz**, Director, Rutgers Cooperative Extension, Cook College

**Carrie Mosley**, State Conservationist, USDA Natural Resources Conservation Service

**Raymond Cywinski**, Supervisor, Bergen County Soil Conservation District

**Priscilla Hayes**, Supervisor, Mercer County Soil Conservation District

**Barbara Rosko**, Supervisor, Sussex County Soil Conservation District

**Anthony DiLodovico**, Supervisor, Ocean County Soil Conservation District

**Charles Buscaglia**, Supervisor, Freehold Soil Conservation District

**Joseph Lomax**, Supervisor, Cape-Atlantic Conservation District

**John Kocubinski**, Governor’s Appointee

**Frank Minch**, Executive Secretary, State Soil Conservation Committee

## FOREWORD AND ACKNOWLEDGMENTS

2014 marks the 38<sup>th</sup> year of service to New Jersey by the Soil Erosion and Sediment Control Program administered by the Department of Agriculture and the New Jersey Soil Conservation Districts. Since the inception of the idea to apply conservation practices to urban development in 1976, New Jersey has significantly evolved in its approach to erosion control. From simple hay bales for filtering runoff, to advanced computer simulations which model watershed runoff, New Jersey's erosion control practices have taken advantage of developing technologies. Periodically the Department, and Soil Conservation Districts update the "*Standards for Soil Erosion and Sediment Control* " to reflect the ongoing emergence of science and technology.

The *Standards* are a blend of agronomic science and state of the art engineering practices, embodied in 32 individual design chapters and detailed appendices that enable developers to successfully design erosion control practices for construction sites. Soil loss prevention is addressed both during as well as after construction to safeguard New Jersey's natural resources.

Since 1976, more than 920,000 acres of land have been protected from erosion by the application of construction site best management practices to control erosion. This equates to more than 28 million tons of soil that have been prevented from entering the state's waterways. Erosion protection allows for the continuation of recreational opportunities, aids in flood prevention efforts and minimizes the need for water treatment.

The seventh edition of the *Standards* has been revised to include additional guidance for assessing downstream stability, rip rap design, the use of infiltration and additional options for vegetation used in the Pinelands National Reserve. Future revisions are planned to enhance the quality of soil used in establishing vegetation for stabilization of development sites.

The New Jersey Department of Agriculture acknowledges its long-time partners - the United States Department of Agriculture – Natural Resources Conservation Service, the state's 15 Soil Conservation Districts, Rutgers University and the New Jersey Department of Environmental Protection for their assistance in developing these *Standards*. Additionally, the Department appreciates the valued expertise of the New Jersey Pinelands Commission, the New Jersey Department of Transportation and the many representatives of the New Jersey Builders Association and Professional Consulting Engineers who assisted in this project. These partnerships have achieved great success in the minimization of damage due to excessive stormwater runoff and related soil loss from construction sites while at the same time promoting concepts of good stewardship of the state's resources to all of New Jersey's residents.

Douglas H. Fisher  
Secretary, New Jersey Department of Agriculture  
January 2014

**COMMITTEE FOR REVIEW AND DEVELOPMENT OF  
STANDARDS FOR SOIL EROSION  
AND  
SEDIMENT CONTROL**

**January 2014**

Mr. William Brash  
District Director  
Mercer County Soil Conservation District

Mr. Anthony DiLodivico  
President  
Tony D Environmental Permitting,  
LLC

Mr. Steven Jacobus  
Watershed Team Leader  
Division of Watershed Management N.J.  
Department of Environmental Protection

Mr. David Lamm, P.E.  
State Conservation Engineer  
Natural Resources Conservation Service  
U.S. Department of Agriculture

Mr. John Showler, P.E.,  
State Erosion Control Engineer  
State Soil Conservation Committee  
N.J. Department of Agriculture

Mr. Angelo Caruso  
District Manager  
Bergen County Soil Conservation District

Mr. David Earl, ASLA  
Section Chief  
Office of Landscape Architecture  
NJ Department of Transportation

Mr. Paul Schiariti, P.E.  
NPS Coordinator  
Mercer County Soil Conservation  
District

Mr. Anthony Castillo, P.E.  
Principle  
SESI Consulting Engineers, Inc.

Mr. Wayne Birchler, P.E.  
Former District Engineer  
Gloucester County Soil Conservation  
District

Mr. Ken Marsh, P.E.  
Supervisor (retired)  
Somerset-Union Soil Conservation  
District

Mr. David Kreck, P.E.  
Senior Managing Engineer  
Rodriguez Consulting, LLC

Mr. Richard Eigenbrood  
Natural Resource Conservationist  
(retired)  
Gloucester County Soil Conservation  
District

Ms. Stephanie Murphy, PhD.  
Soil Scientist  
Rutgers University

Mr. Ernest Thurlow, PhD.  
Manager (retired)  
Somerset-Union Soil Conservation  
District

Mr. Don Knezick  
President  
Pinelands Nursery

Mr. David Friedman  
Manager (retired)  
Ocean County Soil Conservation  
District

Ms. Amy Karpati, PhD  
Director for Conservation Science  
Pinelands Preservation Alliance

Ms. Valarie Hrable, P.E.  
Manager, Hydrology & Hydraulics  
Greenman & Pedesen, Inc.

Mr. Robert McCarthy, P.E.  
Principle  
DW Smith, Inc.

Mr. Brian McClendon  
Section Chief  
Stormwater Permitting NJDEP

Mr. Ron Bannister  
Environmental Specialist  
Groundwater NJDEP

Mr. Fred Bowers, PhD  
Section Chief (retired)  
Groundwater NJDEP

Mr. Barry Chalofsky  
Bureau Chief (retired)  
Stormwater Permitting, NJDEP

Ms. Robyn Jeney  
Regulatory Programs Specialist  
New Jersey Pinelands Commission

# Developing a Successful Plan to Control Soil Erosion on Construction Sites

“He who fails to plan, plans to fail...” is an oft-quoted proverb. Its original author is unknown, but it is frequently attributed to such famous individuals as Benjamin Franklin, Abraham Lincoln and Winston Churchill. Regardless of who coined the phrase, failure to plan (properly) is never more evident than in a poorly thought out erosion and sediment control plan. Once a slope has eroded, or an infiltration basin has failed, it is too late to ‘plan’. It is only time to react and correct. And usually, it costs more to do something twice, than to do it right the first time.

Though not an exhaustive list, the following represent many of the primary design considerations and constraints in preparing an effective erosion control plan. Effective erosion control should be integrated into planning for stormwater management, and not done as an after-thought. A properly developed plan should address the following aspects of site construction when designing for erosion control:

## General Considerations-

1. Design report included and submitted to the district
2. Table of Contents for the design report denoting location of erosion control designs
3. Plan drawn at proper scale (usually not less than 1:50)
4. Erosion Control Plan sheets labeled, signed and sealed by a NJ Licensed Engineer or Architect
5. Pre and post construction contours clearly labeled and depicted
6. Limits of disturbance clearly delineated and corresponding to area of disturbance on the application form
7. Temporary controls such as sediment barriers, inlet filters graphically depicted on plan sheets
8. Details for erosion control applications clearly shown on a ‘detail sheet’; dimensions correspond to design report
9. District notes, vegetative stabilization specifications and other notes shown on the detail page
10. Soil delineations shown on the erosion control plan sheets
11. Other natural features, such as streams, wetlands and buffers delineated on plan sheets
12. Permanent structures graphically depicted on plan sheets (piping, basins, rip rap outlets, swales, basins etc)
13. Offsite improvements (sewer, water, storm drainage, electrical utilities) shown and included in area calculations
14. Proposed staging and stockpile areas depicted (on and off site).

## Construction Disturbance Considerations-

1. Phasing of disturbed areas (minimizing open soil areas)
2. Sequence of construction specific to the site (avoid generic sequencing)
3. Stormwater management on a construction site
  - a. Temporary sediment basins with design support and appropriate details
  - b. Diversions & swales
  - c. Grading
  - d. Filtering via pumped discharge
  - e. Dewatering excavations and points of discharge
4. Temporary stabilization with vegetation, mulch, man-made materials etc.
5. Location of temporary controls such as inlet filters, sediment barriers, construction entrances
6. Soil movement – cuts, fills, removal, stockpiles and importation shown on plans
7. Minimization of soil compaction – restrict vehicle travel, avoid working wet soils, restore if needed

## Hydrologic Design Considerations-

1. Correct application of hydrologic analysis both onsite and within the local drainage area
  - a. Correct unit hydrograph (i.e., Delmarva for coastal plain areas)
  - b. Pre and post drainage area maps with Tc flow paths and POI’s identified
  - c. Realistic sheet flow length in time of concentration (in all cases, not to exceed 100’)
  - d. Correct pre and post development runoff coefficients
  - e. Influence of geology (esp. limestone prone areas)
  - f. Submission of electronic modeling files to the district
  - g. Submission of Hydrologic Summary forms for each basin
2. Assessment of pre and post development flows for the 2, 10 and 25 (rip rap) year storm events

3. Determination of soil types and their associated limitations (i.e., depth to ground water, slope stability) using the Web Soil Survey (<http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>)
4. Final points of discharge from the site and stability at those locations
5. Discharging to agricultural fields (generally not permitted due to stability concerns)
6. Infiltration and failure analysis for stability
7. Impact of discharge beyond the limits of the project (off site stability)
8. Stability of slopes – both from overland flow as well as impacts due to infiltration saturation
9. Proper use of permanent vegetative cover – species selection, irrigation, soil quality, maintenance
10. Use of turf reinforcement matting on steep slopes or channel lining
11. Rock rip rap sizing, gradation and availability; alternate use of gabions or reinforced concrete
12. Grass water way designs using vegetative retardance (D & E) factors, soil conditions, velocity, proper vegetation and reinforcement mating

#### **Requirements of Other Agencies-**

1. NJ Department of Environmental Protection-
  - a. Stormwater Rules
  - b. Wetlands
  - c. Highlands
  - d. Stream Encroachment
2. Residential Site Improvement Standards
3. NJ Department of Transportation
4. NJ Pinelands Commission
5. County and municipal construction codes

When preparing an erosion control plan, one resource which should not be overlooked is New Jersey's 15 Soil Conservation Districts. With a broad spectrum of expertise in the areas of erosion and sediment control, agronomy, horticulture and stormwater management, District staff are available to assist designers with development of reliable and effective strategies for controlling erosion from construction sites. A list of New Jersey Soil Conservation District contact information is found in Appendix E of the Standards.

## **Procedure for the evaluation of new erosion control technologies, products and services for compliance with the Standards for Soil Erosion and Sediment Control in New Jersey**

In order to address opportunities to utilize new and innovative technologies, products and services (TPS) for sediment and erosion control, the New Jersey Department of Agriculture, State Soil Conservation Committee (SSCC) has adopted the following evaluation process which is intended to provide compliance with the Standards.

The Standards include, where appropriate and necessary, design and performance specifications so that any TPS which meets these specifications would be acceptable for use on construction sites in New Jersey for compliance with the Act without the need for extensive (and expensive) laboratory testing. A new TPS which differs from design or performance standards, or which attempts to define a non-standardized practice must be field tested in New Jersey prior to acceptance.<sup>1</sup>

Field performance will be monitored by Soil Conservation District personnel as well as the NJDA State Erosion Control Engineer (as needed). The process for TPS field evaluation is as follows:

1. The vendor will provide a written request for evaluation to the State Engineer and the local Soil Conservation District where the product is to be evaluated. The request must include a physical/chemical description of the product, design limitations (if any), what function the product is intended to perform, and which Standard it is to be used in compliance for. Laboratory or other supplier-derived test data may also be submitted if desired.
2. The State Engineer will review the request and consult with the respective district or districts to verify that the TPS being proposed is appropriate for the intended application and site location. Alternative locations may be suggested if the proposed location is not deemed adequate for a complete evaluation. Written permission and agreement for allowing the evaluation must be secured from the site owner and is the responsibility of the vendor, with a copy provided to the district and State Engineer.<sup>2</sup> The State Engineer can provide written confirmation to the site owner that for testing and evaluation purposes, the owner is assisting the State in its evaluation of a new product and will not be liable for a lack of erosion control compliance with their certified plan due to product failure as long as the product is properly installed and is provided with the appropriate routine maintenance, as would be the case for the use of any erosion control product.
3. The State Engineer will advise the SSCC and other districts of the request for testing at the next SSCC meeting.
4. Once a proper location is secured, the vendor will oversee and provide training (if necessary) for proper installation of the product to ensure an adequate evaluation is performed. During the evaluation, District staff and/or the State Engineer will monitor and observe the performance of the TPS and maintain observations in project record notes as part of routine inspections. The TPS must be properly installed and in good working order during a test event to be considered as a viable test. Unintentional damage or improper installation and subsequent failure will not count as a viable test. The State Engineer may consult with other experts, as needed, to ensure comprehensive evaluation. The vendor will be notified if any product failure or damage occurs so that corrective action may be taken, if appropriate, to restore proper functioning of the TPS.
5. TPS's which are intended to secure against erosion by resisting the forces of water and/or wind will be evaluated for 3 discrete events, each of which must meet the minimum event criteria (such as minimum precipitation depth, flow rate, velocity, etc.) prescribed by the vendor or as stipulated in the applicable Standard. For TPS's intending to promote or enhance vegetative stabilization an evaluation period of two consecutive growing seasons will be observed to determine product performance.
6. The State Engineer will review notes, photos, etc. and present findings and conclusions to the SSCC with recommendations. These recommendations may be:
  - (1) the TPS is acceptable for use anywhere in NJ;
  - (2) the TPS is acceptable for use only in particular locations in NJ

---

<sup>1</sup> Not every Standard is based on design and/or performance criteria. Certain Standards require computation or specific materials in their application for compliance.

<sup>2</sup> Neither the Soil Conservation District nor the State Engineer may compel a project owner to allow the use of a new product for testing on his or her site. Assistance is strictly voluntary on the part of the owner.



(3) the TPS is acceptable for use only for particular site and/or weather conditions

(4) the TPS is not acceptable for use in NJ.

The SSCC may, at its pleasure and discretion, accept, accept with modifications or reject the recommendations.

7. A TPS that is found to be acceptable for use in NJ (with or without conditions) will be identified in a TPS Bulletin (PSB) to be maintained and published by NJDA-SSCC. Conditions or limitations of the TPS will be identified in the bulletin, which will be published on the Department's website and will be available for public download. The vendor will be provided a copy of the findings and conclusions along with a copy of a TPS Bulletin, if one is issued.
8. Once a TPS Bulletin is issued, no further written approval or requests for use will be required for inclusion on soil erosion and sediment control plans or as an equivalent substitute to controls that are already shown on a plan. All manufacturer installation details, maintenance requirements and limitations must be included on the plan adjacent to the installation details.

Compliance with the Standards is required by N.J.S.A. 4:24-39 et seq. for all construction sites in New Jersey which meet the definition of a soil disturbance 'project' as defined in the Act. As a result, the specific inclusion of proprietary, manufactured products, product names, technologies or services is prohibited in that this may constitute the endorsement of one product over another by the State. Generic products which have historically been used for controlling erosion and are considered to be in the public domain may be generically referenced in the Standards without the use of trade-marked <sup>TM</sup> names.

# State Soil Conservation Committee

## Standards For Soil Erosion and Sediment Control in New Jersey

### *Table of Contents*

2014 State Soil Conservation Committee Members.....	i
Forward and Acknowledgements.....	ii
Committee for Review and Development of Standards.....	iii
Developing a Successful Erosion Control Plan.....	iv
Accommodation of New Erosion Control Products.....	v
Table of Contents.....	vi

### **Vegetative Standards**

Acid Soils Management.....	1-1
Dune Stabilization.....	2-1
Maintaining Vegetation .....	3-1
Permanent Vegetative Cover for Soil Stabilization .....	4-1
Stabilization with Mulch Only.....	5-1
Stabilization with Sod .....	6-1
Temporary Vegetative cover for Soil Stabilization.....	7-1
Topsoiling .....	8-1
Tree Protection During Construction .....	9-1
Trees, Shrubs and Vines .....	10-1

### **Engineering Standards**

Channel Stabilization .....	11-1
Conduit Outlet Protection .....	12-1
Detention Structures.....	13-1
Dewatering.....	14-1
Diversions .....	15-1
Dust Control.....	16-1
Grade Stabilization Structure .....	17-1
Grassed Waterway .....	18-1
Land Grading .....	19-1

Lined Waterway .....	20-1
Off-Site Stability analysis .....	21-1
Riprap .....	22-1
Sediment Barrier .....	23-1
Sediment Basin .....	24-1
Slope Protection Structures .....	25-1
Soil Bioengineering .....	26-1
Stabilized Construction Access.....	27-1
Storm Sewer Inlet Protection .....	28-1
Stream Crossing .....	29-1
Subsurface Drainage .....	30-1
Traffic Control .....	31-1
Turbidity Barrier .....	32-1

## Appendices

The Universal Soil Loss Equation.....	A1-1
Application Requirements, Forms & Addendum for Reporting Corporate Ownership .....	A2-1
Guide for Construction Specifications .....	A3-1
Maintenance of Structural Measures.....	A4-1
Guide for Installing Soil Stabilization Matting .....	A5-1
Diversion and Grass Waterway Design Procedure .....	A6-1
Sediment Basin Design Procedure .....	A7-1
Channel Stability Analysis Procedure.....	A8-1
Modified Rational Method.....	A9-1
Structural Guidelines for Detention Basins .....	A10-1
References.....	A11-1
Guidelines for Plan Review (reserved).....	A12-1
Anderson Land Use Code for Detention Basin Summary Form.....	A13-1
Example Seed Specifications and Grass - Legume - Shrub Planting Guide .....	B-1
Soil Erosion and Sediment Control Act.....	C1-1
New Jersey Administrative Code 2:90-1.1 et seq. ....	C2-1

Chronology of the “Standards for Soil Erosion and Sediment Control in New Jersey” .....C3-1

Glossary of Terms ..... D1-1

Directory of Soil Conservation Districts in New Jersey .....E1-1

Treatment of Limestone Areas.....K-1