

New Jersey Stormwater Best Management Practices Manual

February 2004

A P P E N D I X A

Low Impact Development Checklist

A checklist for identifying nonstructural stormwater management strategies incorporated into proposed land development

According to the NJDEP Stormwater Management Rules at N.J.A.C. 7:8, the groundwater recharge, stormwater quality, and stormwater quantity standards established by the Rules for major land development projects must be met by incorporating nine specific nonstructural stormwater management strategies into the project's design to the maximum extent practicable.

To accomplish this, the Rules require an applicant seeking land development approval from a regulatory board or agency to identify those nonstructural strategies that have been incorporated into the project's design. In addition, if an applicant contends that it is not feasible to incorporate any of the specific strategies into the project's design, particularly for engineering, environmental, or safety reasons, the Rules further require that the applicant provide a basis for that contention.

This checklist has been prepared to assist applicants, site designers, and regulatory boards and agencies in ensuring that the nonstructural stormwater management requirements of the Rules are met. It provides an applicant with a means to identify both the nonstructural strategies incorporated into the development's design and the specific low impact development BMPs (LID-BMPs) that have been used to do so. It can also help an applicant explain the engineering, environmental, and/or safety reasons that a specific nonstructural strategy could not be incorporated into the development's design.

The checklist can also assist municipalities and other land development review agencies in the development of specific requirements for both nonstructural strategies and LID-BMPs in zoning and/or land use ordinances and regulations. As such, where requirements consistent with the Rules have been adopted, they may supersede this checklist.

Finally, the checklist can be used during a pre-design meeting between an applicant and pertinent review personnel to discuss local nonstructural strategies and LID-BMPs requirements in order to optimize the development's nonstructural stormwater management design.

Since this checklist is intended to promote the use of nonstructural stormwater management strategies and provide guidance in their incorporation in land development projects, municipalities are permitted to revise it as necessary to meet the goals and objectives of their specific stormwater management program and plan within the limits of N.J.A.C. 7:8.

Low Impact Development Checklist

A checklist for identifying nonstructural stormwater management strategies incorporated into proposed land development

Municipality: Township of West Orange

County: Essex Date: 2/16/2022

Review board or agency: Planning Board

Proposed land development name: Proposed Site Improvements

Lot(s): 9 Block(s): 166.15

Project or application number: PB-21-10

Applicant's name: Altera 769, LLC

Applicant's address: 5910 N. Central Expressway, Suite 1360

Dallas, Texas 75206

Telephone: 972-897-4961 Fax: _____

Email address: etillman@alteradevco.com

Designer's name: Robert J. Colucco, PE - Dynamic Engineering Consultants, PC

Designer's address: 245 Main Street, Suite 110

Chester, NJ 07930

Telephone: 908-879-9229 Fax: 908-879-0222

Email address: rcolucco@dynamiccec.com

Part 1: Description of Nonstructural Approach to Site Design

In narrative form, provide an overall description of the nonstructural stormwater management approach and strategies incorporated into the proposed site's design. Attach additional pages as necessary. Details of each nonstructural strategy are provided in Part 3 below.

The development has been designed to minimize impervious surface and land disturbance while maintaining characteristics of the existing site to the maximum extent practicable and keeping within the requirements of the Township of West Orange Land Use Ordinance and NJAC 7:8. Soil erosion and sediment control prevention measures have been incorporated into the design to prevent soil erosion and the release of sediments off-site. Temporary silt fencing and inlet filters are proposed during construction to trap sediments resulting from disturbance on-site. Construction fencing and tree protection fencing encourages the protection of existing vegetation on-site. The proposed site design as shown in the accompanying engineering drawings has been designed to limit impervious coverage where feasible. The proposed stormwater management system and drainage design will serve to slow peak stormwater runoff and increase the time for stormwater to leave the site when compared to existing conditions. The proposed development has been designed to disturb only areas required for the construction of the parking areas and associated site improvements. The project contractors shall be directed to minimize soil compaction in proposed lawn areas as well as areas of the proposed basin. The proposed landscaping design has been prepared to provide an aesthetic interior and perimeter of the site and include native species. Plantings will be low maintenance and resilient to parking area pollutants. Some areas of grass swales are provided along the exterior landscaped areas of the site. Due to the size of the required stormwater management basin as well as the challenging grading throughout the site, a walled bioretention basin was required to provide adequate storage for water quantity purposes. The proposed development has been designed to incorporate preventive source controls including an aboveground bioretention basin in accordance with NJDEP BMP standards for treatment of stormwater runoff. Storm drain inlets and trash racks are provided to prevent discharge of trash and debris, and a facility maintenance and operation plan is provided which includes directions for regular sweeping and trash collection.

Part 2: Review of Local Stormwater Management Regulations

Title and date of stormwater management regulations used in development design:

NJAC 7:8 3/20/2020; Township of West Orange Land Use Ordinance

Do regulations include nonstructural requirements? Yes: X No: _____

If yes, briefly describe: Maintain existing conditions to the maximum extent practicable and restoring/preserving natural areas. Vegetated conveyance systems are provided wherever practical

List LID-BMPs prohibited by local regulations: N/A

Pre-design meeting held? Yes: X Date: 6/12/2020 No: 1

Meeting held with: Project Team

Pre-design site walk held? Yes: X Date: 6/12/2020 No: 1

Site walk held with: Project Team

Other agencies with stormwater review jurisdiction:

Name: Hudson Essex Passaic SCD

Required approval: Soil Erosion and Sediment Control Certification

Name: Essex County Planning Board

Required approval: Site Plan Approval

Name: _____

Required approval: _____

Part 3: Nonstructural Strategies and LID-BMPs in Design

3.1 Vegetation and Landscaping

Effective management of both existing and proposed site vegetation can reduce a development's adverse impacts on groundwater recharges and runoff quality and quantity. This section of the checklist helps identify the vegetation and landscaping strategies and nonstructural LID-BMPs that have been incorporated into the proposed development's design to help maintain existing recharge rates and/or minimize or prevent increases in runoff quantity and pollutant loading.

A. Has an inventory of existing site vegetation been performed? Yes: X No:

If yes, was this inventory a factor in the site's layout and design? Yes: X No:

B. Does the site design utilize any of the following nonstructural LID-BMPs?

Preservation of natural areas? Yes: X No: If yes, specify % of site: 15%

Native ground cover? Yes: X No: If yes, specify % of site: 15%

Vegetated buffers? Yes: No: X If yes, specify % of site:

C. Do the land development regulations require these nonstructural LID-BMPs?

Preservation of natural areas? Yes: No: X If yes, specify % of site:

Native ground cover? Yes: No: X If yes, specify % of site:

Vegetated buffers? Yes: No: X If yes, specify % of site:

D. If vegetated filter strips or buffers are utilized, specify their functions:

Reduce runoff volume increases through lower runoff coefficient: Yes: No: X

Reduce runoff pollutant loads through runoff treatment: Yes: No: X

Maintain groundwater recharge by preserving natural areas: Yes: No: X

3.2 Minimize Land Disturbance

Minimizing land disturbance is a nonstructural LID-BMP that can be applied during both the development's construction and post-construction phases. This section of the checklist helps identify those land disturbance strategies and nonstructural LID-BMPs that have been incorporated into the proposed development's design to minimize land disturbance and the resultant change in the site's hydrologic character.

- A. Have inventories of existing site soils and slopes been performed? Yes: X No: _____

If yes, were these inventories factors in the site's layout and design? Yes: X No: _____

- B. Does the development's design utilize any of the following nonstructural LID-BMPs?

Restrict permanent site disturbance by land owners? Yes: _____ No: X

If yes, how: _____

Restrict temporary site disturbance during construction? Yes: X No:

If yes, how: Silt fences and inlet filters will be constructed to restrict soil erosion and the
release of sediments off-site

Consider soils and slopes in selecting disturbance limits? Yes: X No: _____

If yes, how: The limits of disturbance were minimized to meet existing slopes to the maximum
extent practicable

C. Specify percentage of site to be cleared: 46% Regraded: 46%

D. Specify percentage of cleared areas done so for buildings: 0%

For driveways and parking: 82% For roadways: 0%

E. What design criteria and/or site changes would be required to reduce the percentages in C and D above?

A reduction in proposed parking spaces, thus intensifying the required parking variance
associated with the proposed development

F. Specify site's hydrologic soil group (HSG) percentages:

HSG A: _____ HSG B: _____ HSG C: _____ HSG D: 100

G. Specify percentage of each HSG that will be permanently disturbed:

HSG A: _____ HSG B: _____ HSG C: _____ HSG D: 46

H. Locating site disturbance within areas with less permeable soils (HSG C and D) and minimizing disturbance within areas with greater permeable soils (HSG A and B) can help maintain groundwater recharge rates and reduce runoff volume increases. In light of the HSG percentages in F and G above, what other practical measures if any can be taken to achieve this?

100% of site disturbance will be within areas of less permeable soils

I. Does the site include Karst topography?

Yes: _____ No: X

If yes, discuss measures taken to limit Karst impacts:

3.3 Impervious Area Management

New impervious surfaces at a development site can have the greatest adverse effect on groundwater recharge and stormwater quality and quantity. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into a proposed development's design to comprehensively manage the extent and impacts of new impervious surfaces.

A. Specify impervious cover at site: Existing: 57.3% Proposed: 70.1%

B. Specify maximum site impervious coverage allowed by regulations: 50%

C. Compare proposed street cartway widths with those required by regulations: N/A

Type of Street	Proposed Cartway Width (feet)	Required Cartway Width (feet)
Residential access – low intensity		
Residential access – medium intensity		
Residential access – high intensity with parking		
Residential access – high intensity without parking		
Neighborhood		
Minor collector – low intensity without parking		
Minor collector – with one parking lane		
Minor collector – with two parking lanes		
Minor collector – without parking		
Major collector		

D. Compare proposed parking space dimensions with those required by regulations:

Proposed: 9' x 18' Regulations: 9' x 18'

E. Compare proposed number of parking spaces with those required by regulations:

Proposed: 282 Regulations: 452

F. Specify percentage of total site impervious cover created by buildings: N/A

By driveways and parking: +/- 73% By roadways: N/A

G. What design criteria and/or site changes would be required to reduce the percentages in F above?

A reduction in proposed parking spaces, thus intensifying the required parking variance
associated with the proposed development

H. Specify percentage of total impervious area that will be unconnected:

Total site: 0 Buildings: 0 Driveways and parking: 0 Roads: 0

I. Specify percentage of total impervious area that will be porous:

Total site: 0 Buildings: 0 Driveways and parking: 0 Roads: 0

J. Specify percentage of total building roof area that will be vegetated: 0

K. Specify percentage of total parking area located beneath buildings: 0

L. Specify percentage of total parking located within multi-level parking deck: 0

3.4 Time of Concentration Modifications

Decreasing a site's time of concentration (Tc) can lead directly to increased site runoff rates which, in turn, can create new and/or aggravate existing erosion and flooding problems downstream. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into the proposed development's design to effectively minimize such Tc decreases.

When reviewing Tc modification strategies, it is important to remember that a drainage area's Tc should reflect the general conditions throughout the area. As a result, Tc modifications must generally be applied throughout a drainage area, not just along a specific Tc route.

A. Specify percentage of site's total stormwater conveyance system length that will be:

Storm sewer: 39% Vegetated swale: 27% Natural channel: _____

Stormwater management facility: 34% Other: _____

Note: the total length of the stormwater conveyance system should be measured from the site's downstream property line to the downstream limit of sheet flow at the system's headwaters.

B. What design criteria and/or site changes would be required to reduce the storm sewer percentages and increase the vegetated swale and natural channel percentages in A above?

A reduction in proposed parking spaces, thus intensifying the required parking variance
associated with the proposed development

C. In conveyance system subareas that have overland or sheet flow over impervious surfaces or turf grass, what practical and effective site changes can be made to:

Decrease overland flow slope: The overland flow slope in the parking areas mimic existing conditions.

Additional disturbance to existing steep slopes, construction of additional retaining walls, and rework/regrade
of existing parking areas in order to meeting existing grades surrounding the subject site

Increase overland flow roughness: N/A - extensive landscaping is proposed in open space
areas to increase overland flow roughness

3.5 Preventative Source Controls

The most effective way to address water quality concerns is by pollution prevention. This section of the checklist helps identify those nonstructural strategies and LID-BMPs that have been incorporated into the proposed development's design to reduce the exposure of pollutants to prevent their release into the stormwater runoff.

A. Trash Receptacles

Specify the number of trash receptacles provided: 2

Specify the spacing between the trash receptacles: N/A

Compare trash receptacles proposed with those required by regulations:

Proposed: 2 Regulations: N/A

B. Pet Waste Stations

Specify the number of pet waste stations provided: 0

Specify the spacing between the pet waste stations: N/A

Compare pet waste stations proposed with those required by regulations:

Proposed: N/A Regulations: N/A

C. Inlets, Trash Racks, and Other Devices that Prevent Discharge of Large Trash and Debris

Specify percentage of total inlets that comply with the NJPDES storm drain inlet criteria: 19

D. Maintenance

Specify the frequency of the following maintenance activities:

Street sweeping: Proposed: At Owner's Discretion Regulations: N/A

Litter collection: Proposed: At Owner's Discretion Regulations: N/A

Identify other stormwater management measures on the site that prevent discharge of large trash and debris:

Inlet grates which prevent trash from entering the stormwater conveyance network

E. Prevention and Containment of Spills

Identify locations where pollutants are located on the site, and the features that prevent these pollutants from being exposed to stormwater runoff:

Pollutant: N/A Location: N/A

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: N/A Location: N/A

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: N/A Location: N/A

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: N/A Location: N/A

Feature utilized to prevent pollutant exposure, harmful accumulation, or contain spills:

Pollutant: N/A Location: N/A

Part 4: Compliance with Nonstructural Requirements of NJDEP Stormwater Management Rules

1. Based upon the checklist responses above, indicate which nonstructural strategies have been incorporated into the proposed development's design in accordance with N.J.A.C. 7:8-5.3(b):

No.	Nonstructural Strategy	Yes	No
1.	Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss.	X	
2.	Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces.	X	
3.	Maximize the protection of natural drainage features and vegetation.	X	
4.	Minimize the decrease in the pre-construction time of concentration.	X	
5.	Minimize land disturbance including clearing and grading.	X	
6.	Minimize soil compaction.	X	
7.	Provide low maintenance landscaping that encourages retention and planting of native vegetation and minimizes the use of lawns, fertilizers, and pesticides.	X	
8.	Provide vegetated open-channel conveyance systems discharge into and through stable vegetated areas.	X	
9.	Provide preventative source controls.	X	

2. For those strategies that have not been incorporated into the proposed development's design, provide engineering, environmental, and/or safety reasons. Attached additional pages as necessary.
