

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.

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Municipality: WEST ORANGE

County: ESSEX COUNTY Date: _____

Review board or agency: WEST ORANGE PLANNING BOARD

Proposed land development name: THE REDWOOD

Lot(s): 33 Block(s): 151

Project or application number: THE REDWOOD

Applicant's name: REDWOOD LLC c/o PAGANO REAL ESTATE

Applicant's address: 420 BOULEVARD, SUITE 201

MOUNTAIN LAKES, NEW JERSEY 07046

Telephone: (201)493-0300 Fax: _____

Email address: ROBERT@PAGANOREALESTATE.COM

Designer's name: PETRY ENGINEERING, LLC

Designer's address: 155 PASSAIC AVENUE, SUITE 350, FAIRFIELD NJ 07004

Telephone: (973)227-7004 Fax: (973)227-7074

Email address: MIKEPETRY@PETRYENGINEERING.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 OVERALL STRATEGY FOR MEETING THE STORMWATER

REQUIREMENTS WAS TO INCORPORATE SUBSURFACE DETENTION

SYSTEMS. STORMWATER RUNOFF FROM THE SITE REACHES THESE

BASINS THROUGH A SERIES OF PIPING AND INLETS. THE PROPOSED

IMPERVIOUS COVERAGE FOR THE PROJECT IS 72.9% WHERE 75% IS

PERMITTED PER TOWN ORDINANCE.

NON-STRUCTURAL STRATEGY NO. 4 IS TO MINIMIZE THE DECREASE

THE DECREASE IN PRE-CONSTRUCTION TIME OF CONCENTRATION.

THE TIME OF CONCENTRATION FOR THE PURPOSE OF DESIGNING THE

STORMWATER SYSTEM WAS 10 MINUTES IN EXISTING AND PROPOSED

CONDITIONS.

NON-STRUCTURAL STRATEGY NO. 9 IS TO PROVIDE PREVENTATIVE

SOURCE CONTROLS. ALL OF THE PROPOSED INLETS WILL COMPLY

WITH NJPDES STORM DRAIN CRITERIA. IN ADDITION, THE REFUSE

AREA IS TO BE LOCATED INSIDE THE BUILDING WHICH WILL HELP

STOP TRASH AND DEBRIS FROM CONTAMINATING STORMWATER

RUNOFF.

Part 2: Review of Local Stormwater Management Regulations

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

TOWNSHIP OF WEST ORANGE §25-29 STORMWATER CONTROL (12/14/2021)

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

If yes, briefly describe: §25-29.1(a) STIPULATES THAT FLOOD CONTROL AND POLLUTANT REDUCTION SHALL BE ACHIEVED WITH THE USE OF GI BMP AND NONSTRUCTURAL STORMWATER MANAGEMENT STRATEGIES

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

Pre-design meeting held? Yes: _____ Date: _____ No: X

Meeting held with: N/A

Pre-design site walk held? Yes: _____ Date: _____ No: X

Site walk held with: N/A

Other agencies with stormwater review jurisdiction:

Name: ESSEX COUNTY

Required approval: YES

Name: NJDEP _____

Required approval: YES

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:

TREES WILL NEED TO BE REMOVED AS A RESULT

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: 3.9%

Native ground cover? Yes: X No: If yes, specify % of site: 5.0%

Vegetated buffers? Yes: No: 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: N/A

Reduce runoff pollutant loads through runoff treatment: Yes: No: N/A

Maintain groundwater recharge by preserving natural areas: Yes: No: N/A

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: N/A

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

If yes, how: LIMITED TO ONLY ACTIVELY DISTURBED AREA

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

If yes, how: THE PROPOSED IMPROVEMENTS HAVE STAYED AWAY FROM

 THE STEEP SLOPES CLOSEST TO THE STREAM.

C. Specify percentage of site to be cleared: 90% Regraded: 90%

D. Specify percentage of cleared areas done so for buildings: 31.8%

For driveways and parking: 36.3% For roadways:

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

**IT IS NOT POSSIBLE TO REDUCE THESE VALUES BECAUSE THE SITE IS
CURRENTLY VACANT AND THE SITE NEEDS TO BE RE-GRADED IN ITS
ENTIRETY IN ORDER TO CONSTRUCT THE PROPOSED BUILDING AND
PARKING.**

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

HSG A: 0.0% HSG B: 0.0% HSG C: 12.8% HSG D: 9.2%
UNKNOWN: 78.0%

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

HSG A: 0.0% HSG B: 0.0% HSG C: 100.0% HSG D: 100.0%
UNKNOWN: 100.0%

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?

I. Does the site include Karst topography?

Yes: _____ No: X

If yes, discuss measures taken to limit Karst impacts:

N/A

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: 85.4% Proposed: 72.9%

B. Specify maximum site impervious coverage allowed by regulations: 75%

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

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

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: 338 Regulations: 284

F. Specify percentage of total site impervious cover created by buildings: **31.8%**

By driveways and parking: **36.3%** By roadways: _____

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

REDUCTION OF BUILDING FOOTPRINT WOULD RESULT IN

DECREASE OF PROPOSED UNITS. THEREFORE, THE AMOUNT OF

PARKING WOULD DECREASE AS WELL.

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

Total site: **0.0%** Buildings: **0.0%** Driveways and parking: **0.0%** Roads: **0.0%**

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

Total site: **0.0%** Buildings: **0.0%** Driveways and parking: **0.0%** Roads: **0.0%**

J. Specify percentage of total building roof area that will be vegetated: **0.0%**

K. Specify percentage of total parking area located beneath buildings: **49.7%**

L. Specify percentage of total parking located within multi-level parking deck: **0.0%**

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: 100.0% Vegetated swale: 5.0% Natural channel: 0.0%

Stormwater management facility: 0.0% Other: 0.0%

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?

THE SITE CONSISTS OF A SWALE THAT IS LOCATED IN THE REAR

AND THE PROPOSED SYSTEM IS SIZED ACCORDING TO ALL REGULATIONS.

BUILDING AND IMPERVIOUS COVERAGE ARE BOTH IN COMPLIANCE

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 SITE HAS BEEN GRADED TO REDUCE
EXCESSIVE SLOPES ON PERVIOUS AREAS ON THE SITE.

Increase overland flow roughness: TO INCREASE OVERLAND FLOW ROUGHNESS
OF THE ASPHALT, IT WOULD NEED TO BE REPLACED WITH A DIFFERENT
MATERIAL. NOTE, THE SITE COMPLIES WITH IMPERVIOUS COVERAGE.

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 TRASH ROOMS (INSIDE BUILDING)

Specify the spacing between the trash receptacles: N/A

Compare trash receptacles proposed with those required by regulations:

Proposed: 2 TRASH ROOMS (INSIDE BUILDING) 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: 0 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: 100%

D. Maintenance

Specify the frequency of the following maintenance activities:

Street sweeping: Proposed: N/A Regulations: N/A

Litter collection: Proposed: N/A Regulations: N/A

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

THE TRASH ROOMS ARE LOCATED INSIDE THE BUILDING AND THEREFORE
LARGE TRASH AND DEBRIS WILL NOT CONTAMINATE STORMWATER RUNOFF.

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.

IN ORDER FOR THIS BUILDING TO BE CONSTRUCTED AS PROPOSED

THE ENTIRE SITE WILL NEED TO BE DISTURBED. THE PROPOSED LAYOUT

DOES NOT PROVIDE ROOM FOR AN OPEN-CHANNEL CONVEYANCE SYSTEM

AND THAT IS WHY TWO (2) SUBSURFACE DETENTION SYSTEMS ARE

PROPOSED AS A MEANS OF STORMWATER MANAGEMENT. NOTE, THE

PROPOSED SITE MODIFICATIONS COMPLY WITH BOTH BUILDING AND

IMPERVIOUS COVERAGE REQUIREMENTS FOR WEST ORANGE.