



# ***North Hudson Sewerage Authority Requirements and Checklist for Sanitary, Stormwater and Dewatering Connections***

Applicant: \_\_\_\_\_ Application No.: \_\_\_\_\_  
Site Address, City: \_\_\_\_\_ Engineering Firm: \_\_\_\_\_  
Reviewed by: \_\_\_\_\_ Date: \_\_\_\_\_

The following details the requirements to connect sanitary, stormwater, and dewatering activities to the North Hudson Sewerage Authority's (Authority) collection system. It also details the requirements for increases in stormwater flows to existing stormwater connections through partial or complete redevelopment of a site.

**Review Type:** (check all that apply)

- \_\_\_ New Development – sanitary and stormwater connection and stormwater management system
- \_\_\_ Redevelopment – sanitary and stormwater connection and possible stormwater management system
- \_\_\_ Dewatering Connection – temporary during construction

**NOTE: The Authority will not approve sewer connections for residential, commercial, or retail developments that do not comply with N.J.A.C 7:13, Flood Hazard Area Control Act Rules.**

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**General Submission Requirements**

1. Two (2) copies of forms TWA-1, WQM-006, and WQM-003. Forms must be signed and sealed by a Licensed Professional Engineer. Submission to the State for approval is only required for sanitary discharge greater than 8,000 gallons per day (gpd). A copy of the State approval is required prior to connection authorization by the NHSA.
2. Provide the email address to direct correspondence to owner to expedite return of reviews.
3. Two (2) copies of Plans and Specifications for proposed connection in accordance with NJAC criteria, and detention system, certified by a Licensed Land Surveyor or Professional Engineer that includes, but is not limited to, the following information:
  - Name of Applicant
  - Name of Project
  - Name of Owner, if different from that of Applicant
  - Block and Lot numbers on the current Tax Assessment Map
  - North Arrow
  - Date of preparation of plans and revision dates
  - Graphic scale and reference median
  - Benchmark elevation datum source
  - Floor plans indicating units and/or use of proposed space
  - Details of methods to minimize infiltration and inflow
  - Proof of compliance with pretreatment program, if applicable.

4. Stormwater Management Report
5. Grading Plan: must also demonstrate the ability to eliminate street flooding
6. Dewatering summary

## **Technical Requirements**

### **1. All Permanent Connections**

- a. Plans, specifications and other information must meet the requirements of NJAC 7:14A – 23.6 Sanitary Sewer Design.
- a. Laterals shall be separated from water mains by a distance of at least ten (10) feet horizontally. If such separation is not possible, such as in the cases of a lateral crossing or being within ten (10) feet horizontally, provide a detail to meet the requirements of NJAC 7:14A – 23.6.
- b. If either the sanitary or stormwater lateral is greater than six (6) inches in diameter, they shall not be combined to connect to the sewer main. If both the sanitary and stormwater laterals are less than six (6) inches, they can be combined to connect to the sewer main provided the capacity is adequate (capable of draining the 2 year 24 hour storm).
- c. No connection shall be made to an existing manhole or inlet manhole.
- d. If the sanitary or stormwater lateral is greater than six (6) inches, the connection shall be made using a new doghouse manhole. All manholes shall be precast concrete with integral Z-lock for pipe connection unless space does not allow. The lateral shall enter the manhole at its invert or top of bench.
- e. If the sanitary or stormwater lateral is less than or equal to six (6) inches, the connection shall be made through a core drilled hole in the existing sewer pipe. No connection shall use oakum. The connection to circular pipes shall use a cast iron saddle with stainless steel bands and rubber gasket. The connection to non-circular pipes shall use an A-Lok seal.
- f. Connections to brick sewers must be sealed with an A-Lok or Kor-N-Seal gasket to prevent leakage.
- g. The following notes must be on the plan:
  - i. “The Contractor is responsible for the stabilization of the existing sewer main, structures and appurtenances during connection.”
  - ii. “North Hudson Sewerage Authority shall be notified at least 72 hours prior to connection to the sewer main.”
- h. In the City of Hoboken, PVC and HDPE laterals are not permitted; ductile iron pipe is required.
- i. The following information pertaining to the laterals must be shown on the plans:
  - i. Location of the connection from the building to the sewer main
  - ii. Material
  - iii. Size
  - iv. Slope: minimum slope of 0.4%
  - v. Invert elevation at building exit
  - vi. Invert elevation at sewer main connection
  - vii. Profile of lateral, also showing other utilities

- j. Connection detail, manhole detail and drop connection detail must be shown on the plans if applicable.
- k. Manhole covers shall be a minimum of 24 inches in diameter and engraved with North Hudson Sewerage Authority information.

## **2. Sanitary Connections**

- a. Check the capacity of existing sewer mains to ensure that flow does not back up.
- b. A FOG (fat-oil-grease) removal system (grease traps or grease interceptors) shall be provided for Food Service Establishments and commercial facilities. Provide the following information: number of units, size and whether they are automatic or manual.

## **3. Stormwater Connections**

- a. Sizing calculations shall be submitted by the Applicant, signed and sealed by a Licensed Professional Engineer. Stormwater laterals must have adequate capacity to handle drainage from property during a two (2) year 24 hour storm event. Method of collection of stormwater on property must be shown on the plans (i.e., catch basins in parking lots, roof drains, etc.).
- b. Grading on the lot (minimum two (2) foot contours) shall be shown to ensure proper drainage of stormwater from the site.

## **4. Drop Connections**

- a. A drop connection is needed if the invert of the lateral is greater than two (2) feet above the invert of the sewer main. Drops can be made adjacent to the building or to the sewer main. The bottom elbow of the drop pipe shall be concrete encased.
- b. If coring into the sewer main with an adjacent drop connection, the sewer main shall be concrete encased for a minimum of five (5) feet on either side of the connection. If using plastic drop pipe without lateral encasement, encasement of sewer main is not necessary.
- c. If constructing a new manhole, a drop connection is needed if the invert of the lateral is greater than two (2) feet above the invert/top of bench of the manhole. Drop connections shall be outside the manhole.
- d. The location of the lateral in the manhole must be such that it does not conflict with other pipes entering the manhole or with other manhole features such as manhole steps and benches.

## **5. Stormwater Management Systems<sup>1,2</sup>**

- a. Definition:
  - i. new developments: construction on land where there had not been previous construction (i.e. woods, grass fields)
  - ii. redevelopments: reconstruction or modification to any existing, previously developed land such as residential, commercial, industrial, institutional, or road/highway which involves soil disturbance

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<sup>1</sup> All connections that direct stormwater to a storm pipe that discharges directly to a body of water (Waters of the State) and not to a North Hudson Sewerage Authority wastewater treatment plant shall strictly follow N.J.A.C 7:8 regulations.

<sup>2</sup> All New Jersey regulations regarding contaminated soil and contaminated groundwater shall be strictly followed.

- b. All Applicants within the Authority's service area must provide stormwater management for:
  - i. new developments regardless of the extent of soil disturbance
  - ii. redevelopments that disturb more than one-quarter (0.25) acre of land
  - iii. redevelopments that will not decrease the impervious area by at least 25%
  - iv. site modifications that have an existing stormwater connection and stormwater management system and will convert pervious area to impervious area or that create any amount of increase in impervious area (i.e. additional parking spaces)
  
- c. The following developments are exempt:
  - i. new residential developments with sanitary sewer flows of less than 400 gpd
  - ii. residential redevelopments with sanitary sewer flows of less than 400 gpd
  - iii. any redevelopment that decreases impervious space by 25% or more
  
- d. Stormwater management for new developments and redevelopments can be achieved using the following Stormwater Management Systems:
  - i. stormwater detention system
  - ii. green roofs (see Appendix A)
  - iii. rain gardens (see Appendix A)
  - iv. any system that satisfactorily meets design requirements as found in the New Jersey Department of Environmental Protection's *New Jersey Stormwater Best Management Practices Manual*.
  
- e. For all new developments that disturb more than one (1) acre of land or that propose an additional one-quarter of an acre (0.25 ac) of impervious area, the stormwater management system shall be designed as detailed in these requirements and in accordance with NJAC 7:8 Stormwater Management Subchapters 1, 5 & 6 and other more stringent requirements herein.
  
- f. The stormwater management system shall be designed to meet both i and ii requirements:
  - i. Water Quality: Detain a design storm of 1.25 inches of rainfall in two (2) hours for the entire impervious space without discharging from the secondary/emergency spillway.
  - ii. Water Quantity/Peak Discharge:
    - 1) If the impervious area of the post-developed site is less than or equal to the impervious area of the pre-developed site, demonstrate through hydrologic and hydraulic analysis that the post-construction stormwater hydrograph for each discharge point from the site does not exceed the pre-construction runoff hydrograph, at any point in time, for the two (2), ten (10), and one hundred (100) year storm events individually; or
    - 2) If the impervious area of the post-developed site is greater than the impervious area of the pre-developed site, the post-development peak discharge shall be<sup>3</sup>:
      - 50 percent of the pre-developed condition for the 2 year storm
      - 75 percent of the pre-developed condition for the 10 year storm and
      - 80 percent of the pre-developed condition for the 100 year storm
  
- g. The design storms for water quantity/peak discharge shall be defined as either the estimated maximum rainfall for the estimated time of concentration of the runoff at the site when using a design method such as the Modified Rational Method, or a 24-hour storm event using the rainfall

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<sup>3</sup> See exception for redevelopment with green roofs in Appendix A

distribution recommended by the Natural Resource Conservation Service (NRCS), formerly the U.S. Soil Conservation Service, procedures.

- h. Credits are given for water quality volume and water quantity volume for redevelopments that will utilize either green roofs or rain gardens as the stormwater management systems. These credits can be found in Appendix A. These credits do not apply for new developments.
- i. See Appendix B for a Stormwater Management System Flow Chart that determines the types of stormwater management controls required for development and redevelopment as identified in 5.a. to 5.h above.
- j. Provide mechanisms to prevent debris from entering the laterals when there is overland flow.
- k. Provide a detail of the control structure(s).
- l. Buried detention systems shall have a minimum of two (2) access points for inspection and maintenance.
- m. Submit an Operation and Maintenance schedule for the stormwater management system including detailed maintenance requirements and maintenance plans
  - i. Stormwater management systems designed based on the NJ Stormwater BMP manual - the maintenance plan must satisfy the requirements detailed in the BMP manual.
  - ii. Planting plans must be submitted for green roofs and rain gardens
  - iii. The following must be included in the maintenance plan for green roofs and rain gardens:
    - a. Watering plans for periods of excessively long dry weather
    - b. Weeding plans
    - c. Replanting requirements
    - d. Inspections
  - iv. Maintenance records must be kept on-site for a period of three years by the owner of the stormwater management system. These records shall be made available to the Authority within 72 hours upon the Authority's request to review these records.
  - v. The Authority reserves the right to inspect all stormwater management systems. The owner of the stormwater management system shall provide access for inspection to the Authority within 72 hours of the Authority's request to inspect the stormwater management systems.
  - vi. Failure to maintain adequate maintenance records, perform maintenance, and/or deny the Authority access to maintenance records or inspection without cause is subject to fines by the Authority as detailed in the *Sewer Connection: Application Procedures and Fee Schedule* document.
- n. The Authority reserves the right to place a deed restriction(s) on the site. Any number of the following restrictions may be applied:
  - i. A deed restriction that requires the owner to reassess its stormwater management requirements and potentially upgrade its stormwater management systems when pervious area is converted to impervious area on the owner's property, or the property size is increased with any amount of impervious area.
  - ii. A deed restriction (and/or contractual agreement) that requires the stormwater management system to be properly maintained – should it be determined that the system

has not been properly maintained, the Authority reserves the right to perform the required maintenance and charge the Owner for such services.

- iii. If an owner wishes at any time to abandon a constructed rain garden or green roof, the owner is compelled to install a new stormwater management system.

## 6. Special Conditions

- a. Any property constructed in the Southwest portion of Hoboken must provide pumps for the sanitary and/or stormwater flow or calculations showing that pumps are not necessary.
- b. If unsure, the Applicant should contact the Authority to determine whether a project is subject to these special conditions.

## 7. Dewatering Connection and Operations Requirements

- a. Connections During Construction (Temporary Dewatering)
  - i. All temporary dewatering applications must including the following:
    - 1) Water quality data showing that the water from the dewatering operation meets the Authority's standards. **Table 1** below represents the Authority's requirements for discharge. The initial water needs to be contained until the water quality is proven to meet the Authority's standards.
    - 2) Dewatering plan:
      - a. The anticipated duration of the dewatering operation
      - b. A sampling schedule to monitor the water quality to ensure that it is continuously meeting the Authority's standards throughout the entire dewatering operation. The schedule should, at minimum have initial sampling/testing requirement of every two weeks until the dewatering treatment system compliance is confirmed. With confirmation of acceptable discharge, the frequency of testing/reporting can be reduced to a minimum of once per month.
    - 3) A contingency plan which addresses the handling of the water in the case where the Authority's capacity requirements are exceeded.
  - ii. A flow meter shall be installed on the discharge piping and shall be able to provide instantaneous flow rates and totalized flow.
  - iii. Show the flow meter location and details on the plans.
  - iv. Provide a detail of the connection to the combined sewer system and a plan for abandonment of the temporary connection.
  - v. The Applicant must submit an estimated discharge flow rate in gallons per day (gpd) through the connection to the Authority's sewer system. The flow rate will be used to determine the connection or tapping fee.
  - vi. A plan that prevents stormwater from entering the dewatering activities to the best extent practical.
  - vii. Show that all dewatering flow directly enters the combined sewer system and is not discharged to the street, land, water body (Waters of the State), or any other surface or structure.

- viii. All water shall be settled in a fractionation tank (frac tank) prior discharge to remove sediment.
- ix. Identify the estimated last day of construction. This day will be called the First Day of permanent connection.

b. Dewatering Post Construction (Permanent Dewatering)

All permanent dewatering applications and designs must include:

- i. All water shall be settled in a fractionation tank (frac tank) prior discharge to remove sediment.
- ii. All permanent dewatering operations must be separately connected to the Authority's sewer system and cannot be connected to the Authority's sewer system through the Owner's stormwater or sanitary connections. Such connections shall meet the following requirements:
  - 1) Shall follow all technical requirements for temporary connections as identified above. However, with confirmation of acceptable discharge, the frequency of testing/reporting can be reduced to a minimum of once per quarter.
  - 2) Shall include a valve box with an isolation valve and a permanent flow meter located in the street.
  - 3) The meter shall be equipped with automatic reporting technology that will transmit readings, at least daily, to the Authority.
  - 4) The valve box shall have a locking cover.
  - 5) The Owner of the Property shall provide the Authority with three (3) keys to the valve box.
  - 6) The Authority shall have uninhibited access to the valve box, valve, and permanent flow meter.
- iii. All permanent dewatering operations must be designed so that no stormwater enters the dewatering area (dry well and/or wet well). All permanent dewatering operations must not be in the flood zone; however, should stormwater enter the dewatering area (dry well and/or wet well), provisions shall be incorporated into the design to allow the area to be completely pumped out within 24 hours.
- iv. The Authority shall receive any and all State required monitoring reports. The Authority reserves the right to stop receiving the water based on report results.
- v. The Owner of the Property shall be required to maintain the valve box, valve, and flow meter based on the Owner's independent maintenance schedule and upon request by the Authority. All maintenance requests by the Authority must be completed within 21 days or as negotiated between the Owner and the Authority. Upon failure to perform the requested maintenance, the Authority reserves the right to correct the problem and bill the Owner for repair services.
- vi. Failed meter readings shall be estimated based on the guidelines provided in the *Sewer Connection: Application Procedures and Fee Schedule* document.
- vii. Failure to maintain the equipment (valve box, valve, and flow meter) as requested by the Authority; tampering with equipment (includes disconnecting or breaking equipment);

and/or failure to provide annual dewatering payments are subject to fines and/or shutting access to the Authority's collection system for the dewatering operations.

- viii. Fines are detailed in the *Sewer Connection: Application Procedures and Fee Schedule* document.

<b>TABLE 1</b>		
<b>North Hudson Sewerage Authority - Sewer Connection Limitations</b>		
<b>Pollutant</b>	<b>NHSA Limit (mg/L)</b>	<b>Sample Type</b>
Arsenic	0.043	Composite
Cadmium	0.016	Composite
Chromium (Total)	2.00	Composite
Copper	2.04	Composite
Lead	0.365	Composite
MBAS (surfactants)	100	Grab <sup>2</sup>
Mercury	0.034	Composite
Nickel	0.723	Composite
Tetrachlorethane <sup>1</sup>	0.4	Grab <sup>2</sup>
Zinc	3.61	Composite
BOD	250	Composite
Oil & Grease	50	Grab <sup>2</sup>
TSS (Total Suspended Solids)	190	Composite

Notes:

1 – Includes two isomers, 1, 1, 2, 2 - tetrachloroethane and 1, 1, 1, 2 - tetrachloroethane

2 – Grab samples will be collected for analysis of organic pollutants.

## **8. Pumped Connections and Permanent Dewatering Pumps**

- a. Pump calculations and pump curves must be submitted for the pumping system.
- b. Back up pumps must be provided in the event of pump failure.
- c. The control and alarm system must be detailed in the submittal.
- d. Pumps must be selected so that the force of discharge into the sewer will not adversely impact the structural integrity of the sewer.
- e. A maintenance plan for the pumps must be submitted. Pumps must be placed so that they can be accessed for maintenance and replacement.



# APPENDIX A

## **GREEN ROOF\***

Green roofs can effectively retain rainwater and reduce peak runoff volumes. Green roofs may be able to satisfy the requirements in Section 5falone, or additional measures such as rain gardens or underground detention systems may be required. The following details how to calculate the effects a green roof will have on the requirements of Section 5fand if additional measure will be required.

### **Water Quality**

The water quality volume detained by a green roof is calculated as follows:

$A$  = Surface area of the green roof [square feet]

$V_{SM}$  = Volume of the soil media [cubic feet]

$V_{DL}$  = Volume of the drainage layer [cubic feet]

$D_{SM}$  = Depth of the soil media [feet]

$D_{DL}$  = Depth of the drainage layer [feet]

$D_P$  = Depth of ponding above the soil surface [feet]

$n_{SM}$  = porosity of the soil media [default to 20% unless otherwise known]

$n_{DL}$  = porosity or storage space of the drainage layer [default to 25% unless otherwise known]

$S$  = Storage volume [cubic feet]

Formula:

$$S = A \times (D_{SM} \times n_{SM} + D_{DL} \times n_{DL} + D_P)$$

The water quality volume requiring detention for a **new development** is calculated as follows:

$IP$  = Impervious area [square feet]

$GR$  = Area of green roof [square feet]

1.25 = inches of rain for water quality [inches]

12 = inches in a foot [inches/foot]

$WQ_d$  = Water quality volume requiring detention for a new development [cubic feet]

$$WQ_d = (IP + GR) \times 1.25 / 12$$

If the  $S$  is greater than  $WQ_d$  no additional storage is required

If  $S$  is less than  $WQ_d$  storage equal to  $(WQ_d - S)$  is required

The water quality volume requiring detention for a **redevelopment** is calculated as follows:

$IR$  = % Impervious reduction =  $(100\% - (100\% \times \text{post-redeveloped impervious area/pre-redeveloped impervious area}))$  [%] [Note: even though the green roof is being considered pervious for the water quantity calculations, it is considered impervious for water quality calculations].

$WQ_d$  = Water quality volume requiring detention for a new development [cubic feet]

$WQ_r$  = Water quality volume requiring detention for a redevelopment [cubic feet]

$$WQ_r = WQ_d \times (3 \times (25\% - \% IR))$$

If the  $S$  is greater than  $WQ_r$  no additional storage is required

If  $S$  is less than  $WQ_r$  storage equal to  $(WQ_r - S)$  is required

### **Water Quantity**

When determining the requirement for peak discharge the green roof can be considered pervious and has a curve number (CN )of:

- 66 for a 2 year storm (Virginia DCR Stormwater Design Specifications No. 5)
- 72 for a 10 year storm (Virginia DCR Stormwater Design Specifications No. 5)
- 75 for a 100 year storm (Virginia DCR Stormwater Design Specifications No. 5)

Use the entire pre-development and post-development area (including the green roof area) when identifying the pre- and post-construction peak reductions for a **new development**.

Use only the impervious pre-development area and the impervious post-development area plus the green roof area when identifying the pre- and post-construction peak reductions for a **redevelopment**.

Additionally, the requirement of 5.f.ii.2 is replaced with: the peak runoff flow for the 2, 10, and 100 year storm post-development must be equal to or less than the pre-development peaks flows.

### **Other Requirements**

- The soil media must be of Hydraulic Soil Group A or B but not Group D.

**\*These design guidelines will be superseded following the establishment of Green Roof Standards by the New Jersey Department of Environmental Protection in its *New Jersey Stormwater Best Management Practices Manual – Chapter 9.8***

## **RAIN GARDENS\***

Rain gardens can effectively retain rainwater and reduce peak run off volumes. Rain gardens can be used to help satisfy the requirements in Section 5f however, additional measures such as green roofs or underground detention systems will most likely be required. The following details how to calculate the effects a green roof will have on the requirements of Section 5f and if additional measures will be required. Refer to *The Rain Garden Manual of New Jersey* for specific design parameters to follow.

### **Water Quality**

The volume detained by a rain garden is calculated as follows:

A = Surface area of the rain garden [square feet]

$D_p$  = Depth of ponding above the soil surface [feet]

S = Storage volume [cubic feet]

Formula:

$$S = A \times (D_p)$$

The water quality volume requiring detention for a **new development** is calculated as follows:

IP = Impervious area draining to rain garden [square feet]

1.25 = inches of rain for water quality [inches]

12 = inches in a foot [inches/foot]

$WQ_d$  = Water quality volume requiring detention for a new development [cubic feet]

$$WQ_d = IP \times 1.25 / 12$$

If the S is greater than  $WQ_d$  no additional storage is required

If S is less than  $WQ_d$  storage equal to ( $WQ_d - S$ ) is required

The water quality volume requiring detention for a **redevelopment** is calculated as follows:

IR = % Impervious reduction = (100% - (100% x post-redeveloped impervious area/pre-redeveloped impervious area)) [%] [Note: even though the rain garden is being considered pervious for the water quantity calculations, it is considered impervious for water quality calculations].

$WQ_d$  = Water quality requiring detention for a new development [cubic feet]

$WQ_r$  = Water quality requiring detention for a redevelopment [cubic feet]

$$WQ_r = WQ_d \times (3 \times (25\% - \% IR))$$

If the S is greater than  $WQ_r$  no additional storage is required

If S is less than  $WQ_r$  storage equal to ( $WQ_r - S$ ) is required

### **Water Quantity**

When determining the requirement for peak discharge for the three design storms, the rain garden can be considered a temporary "pond" with capacity equal to the water quality volume before overflowing.

Use the entire pre-development and post-development area when identifying the pre- and post-construction peak reductions for a **new development**.

Use only the impervious pre-development area and the impervious post-development area plus the rain garden area when identifying the pre- and post-construction peak reductions for a **redevelopment**.

Additionally, the requirement of 5.f.ii.2 is replaced with: the peak runoff flow for the 2, 10, and 100 year storm post-development must be equal to or less than the pre-development peaks flows.

### **Other Requirements**

- Ponding depth above the rain garden bed shall be greater than 2 inches but not exceed 4 inches.
- The soil composition shall be such that the ponded water shall drain within 72 hours
- Drainage area to pond area shall not exceed 5:1
- A minimum length to width ratio of 2:1 is recommended
- The soil media should be of Hydraulic Soil Group A or B but not Group D: See *New Jersey Stormwater Best Management Practices Manual – page 9.1-4 for specific mix.*

***\*As these guidelines reflect the *New Jersey Stormwater Best Management Practices Manual – Chapter 9.1 – Bioretention Systems* standards or, at a minimum, the *Rutgers University’s standards in The Rain Garden Manual of New Jersey* shall be followed.***

# APPENDIX B

## Water Quality Management Decision Flow Chart

