

**Stamski And McNary, Inc.**

**Engineering - Planning – Surveying**

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# **Stormwater Operation and Maintenance Manual**

For

**100-102 Nonset Path**

Acton, MA

**July 1, 2013**

**Responsible Party:**

Nagog Woods Community Corporation  
100 Nonset Path  
Acton, MA 01718

SM-5059

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## **Drainage Narrative**

## **Stormwater Management**

The proposed project is to upgrade an existing tennis court to a proposed tennis court with a dome to allow for year round use.

### Pre-Development

The site is approximately 8.99 acres and contains a building, pool, tennis courts and associated appurtenances. There is Bordering Vegetated Wetland (BVW) and Unnamed Perennial Stream located on the southern portion of the site. The existing tennis courts are within the 200-foot Riverfront Area and are also 36.5 feet away from the BVW. Currently, there are no controls in place to manage stormwater runoff.

### Post-Development

The existing tennis court will be removed and a new court with associated walkways and grading put in its place. Impervious area will increase by approximately 4,198 sf due to new walkways associated with the tennis courts. Bio-retention areas are proposed with the new courts to treat the increase in impervious area.

### **Compliance with MA DEP Stormwater Management Standards**

Compliance with the Stormwater Management Standards is as follows:

#### **Standard 1: No Untreated Discharges**

No untreated discharges to the wetlands are proposed. The walkways and tennis courts are clean runoff that will be filtered by grass before entering the wetlands and two bio-retention areas are proposed to treat the increased impervious area.

#### **Standard 2: Peak Rate Attenuation**

The Post-Development peak discharge rates must not be increased from pre-development rates for the 2-year and 10-year storm events. Also, offsite flood impact from the 100-year storm must not be increased. With a combination of infiltration and detention, the peak runoff volume has been decreased. The peak runoff volumes are in the attached bio-retention area sizing calculations.

#### **Standard 3: Stormwater Recharge**

The bio-retention areas have been sized to infiltrate the required recharge volume as specified in the Massachusetts Stormwater Handbook to the maximum extent practicable. The "Simple Dynamic" method was used with a Rawls Rate of 1.02 in/hr in sizing the required storage volume to infiltrate the recharging runoff. Calculations were performed to insure drawdown within 72 hours to provide storage for the next storm event. Detailed calculations showing compliance with Standard 3 have been attached to this report.

#### **Standard 4: Water Quality**

The required water quality volume for this project is 0.5" of runoff over the impervious area since the infiltration rate is less than 2.4 inches per hour. This volume will be

treated to meet the 80% TSS removal requirement of Standard 4. For this redevelopment, the bio-retention area will treat the added impervious runoff area. It is our opinion that the runoff from walkways will not contain sand and chemicals like a road, therefore the filtering of the water through grass will provide adequate pre-treatment. Calculations showing treatment levels are attached.

**Standard 5: Land Uses with Higher Potential Pollutant Loads**

The site is will not contain “land uses with higher potential pollutant loads.”

**Standard 6: Critical Areas**

The site does not discharge runoff to critical areas.

**Standard 7: Redevelopment**

The proposed project is redevelopment.

**Standard 8: Construction Period Controls**

The erosion and sedimentation control measures will be followed in accordance with the Plan and will be consistent with the requirements of the NPDES Construction General Permit. The project will require coverage under the NPDES Construction General Permit.

**Standard 9: Operation and Maintenance Plan**

An Operation and Maintenance Plan is included in this report.

**Standard 10: Illicit Discharges to Drainage System**

An Illicit Discharge Compliance will be provided prior to the discharge of stormwater runoff to the post-construction stormwater BMP's.

**Design Basis**

1. The United States Department of Agriculture Natural Resource Conservation Service (N.R.C.S.) TR55 methodology was used to determine offsite rates of runoff.
2. The twenty-four hour rainfall, taken from N.R.C.S. publications, is 6.4 inches for the 100-year storm, 5.3 inches for the 25-year storm, 4.5 inches for the 10-year storm, and 3.1 inches for the 2-year storm event.
3. The soil types of the site were taken from the N.R.C.S. Soil Survey Map for Littleton.
4. Soil conditions were based on on-site soil evaluations.
5. The Natural Resources Conservation Service (N.R.C.S.) soil survey indicated the presences of Woodbridge Fine Sandy Loam and Freetown Muck. These soil groups rate as Hydrologic Groups C and D respectively.

## **Long Term Operation and Maintenance Plan**

**Schedule for Inspection and Maintenance:**

**Bio-Retention Areas:**

The bio-retention areas shall be inspected after every major storm event for the first three months after construction, and inspected as stated below thereafter. Bio-retention areas require careful attention while plants are being established and seasonal landscaping maintenance thereafter.

Seasonal landscaping maintenance includes, but is not limited to:

- Inspecting and removing trash monthly
- Inspecting soil and repairing eroded areas monthly
- Top dress stone annually in the spring
- Removing dead vegetation annually in the spring or fall
- Replacing dead vegetation annually in the spring
- Pruning annually in the spring or fall
- Replacing entire media and all vegetation as needed in the late spring or early summer
- Re-stone void areas as needed
- Side slopes of the channel shall be inspected for erosion. All eroded areas found shall receive 6" of loam and be reseeded per original design plan. Areas of continued erosion shall be stabilized with 3" minus riprap.
- If there is ponding due to clogging, immediately address the reasons for the ponding
- Because the soil medium filters contaminants from the runoff, the cation exchange capacity of the soil media will eventually be exhausted. Thus, it is necessary to replace the soil media to prevent contaminants from migrating to the groundwater, as necessary. Using small shrubs and plants instead of larger trees will make it easier to replace the media with clean material when needed.

**Emergency Contacts:**

In the event of a hazardous materials spill on the site the following parties shall be contacted:  
Fire Department: ph: 978-264-9645

**Records:**

The Responsible Party shall maintain an inspection log of all elements of the storm water management plan. The Responsible Party shall maintain a maintenance log documenting the inspection and maintenance of the drainage structures under his control. A copy of the erosion control and storm water maintenance plan and inspection logs shall be kept onsite at all times.

**Responsibility Party:**

The Applicant shall be responsible for all inspection and maintenance of the items included in the Manual.

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

## **Operation and Maintenance Sample Inspection Log**

**100-102 Nonset Path**  
Operation and Maintenance Inspection Log

Year: \_\_\_\_\_

**Inspection Items:**                      **Frequency:**  
**Bio-Retention Area**                      **Monthly**

**Bio-Retention Area 1:**

Previous Inspection Date: \_\_\_\_\_  
Inspection Date: \_\_\_\_\_  
Inspector Name: \_\_\_\_\_  
Sediment Forebay: \_\_\_\_\_  
Erosion in Basin: \_\_\_\_\_  
Outlet Structure: \_\_\_\_\_  
Comments: \_\_\_\_\_

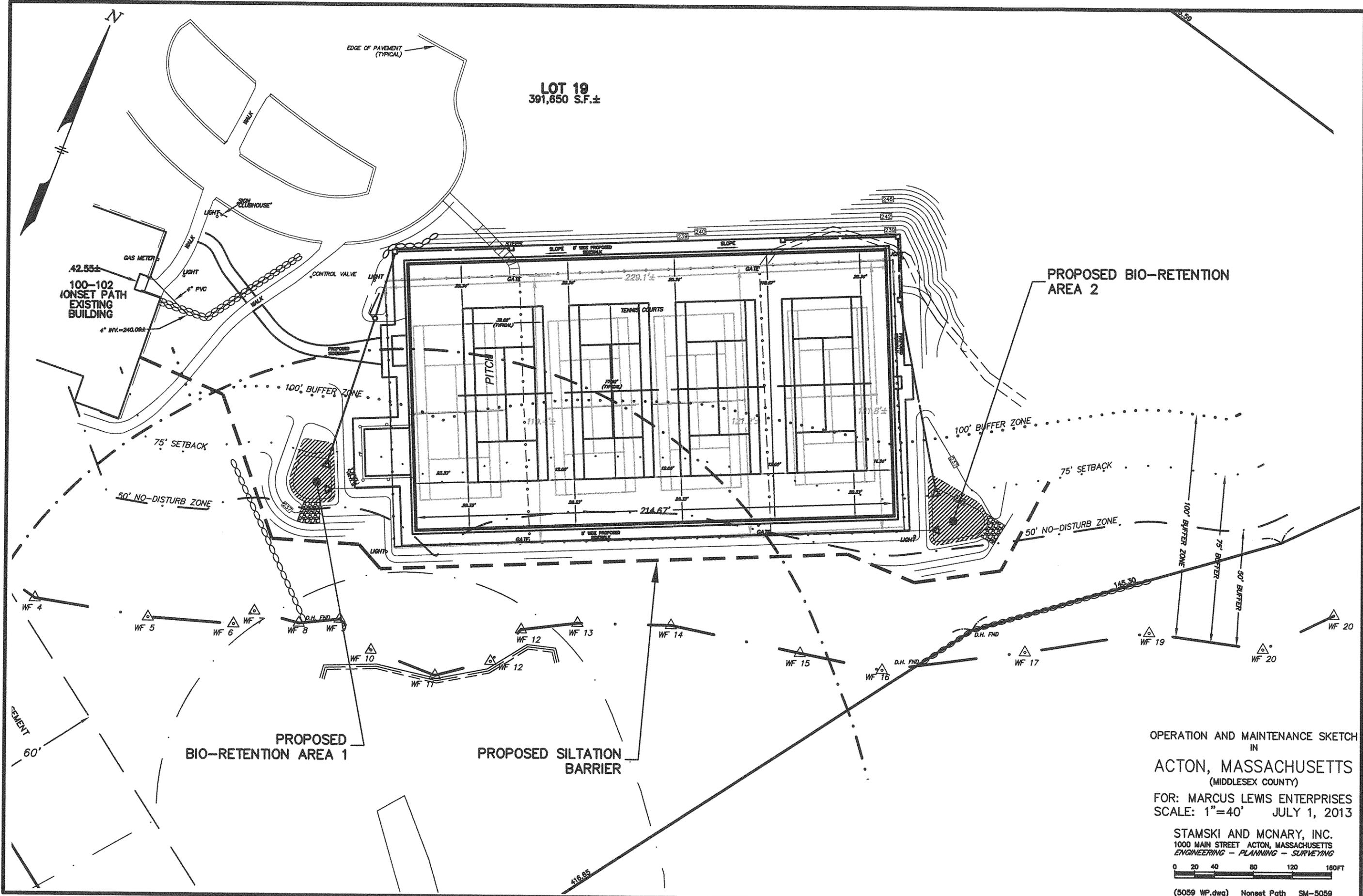
Action Required:

**Bio-Retention Area 2:**

Previous Inspection Date: \_\_\_\_\_  
Inspection Date: \_\_\_\_\_  
Inspector Name: \_\_\_\_\_  
Sediment Forebay: \_\_\_\_\_  
Erosion in Basin: \_\_\_\_\_  
Outlet Structure: \_\_\_\_\_  
Comments: \_\_\_\_\_

Action Required:

## **Operation and Maintenance Sketches**



**LOT 19**  
391,650 S.F. ±

**PROPOSED BIO-RETENTION AREA 2**

**PROPOSED BIO-RETENTION AREA 1**

**PROPOSED SILTATION BARRIER**

OPERATION AND MAINTENANCE SKETCH  
IN  
ACTON, MASSACHUSETTS  
(MIDDLESEX COUNTY)  
FOR: MARCUS LEWIS ENTERPRISES  
SCALE: 1"=40' JULY 1, 2013

STAMSKI AND McNARY, INC.  
1000 MAIN STREET ACTON, MASSACHUSETTS  
ENGINEERING - PLANNING - SURVEYING

0 20 40 80 120 160 FT

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