



**Stormwater Report**  
*In Support of*

**A Request for Site Plan Review**

*FOR*

**218 Cabot Street**  
**(Parcel ID 11-247)**  
*Beverly, MA 01915*

*Prepared By:*  
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#26040

*Prepared For:*  
**LEGGAT McCALL PROPERTIES**  
10 Post Office Square  
Boston, MA 02109

**June 2022**

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**STORMWATER MANAGEMENT REPORT**  
**218 Cabot Street**  
**BEVERLY, MA**

**1.0 PROJECT SUMMARY**

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Leggat McCall Properties proposes to construct a mixed-use Commercial/Residential Apartment building on the subject property. Drainage facilities for the property have been designed to match the current conditions in which the stormwater is collected and directed into the City's Drainage System in Federal and Chapman Streets. To mitigate for stormwater impacts a subsurface infiltration system is proposed.

This report is part of a Request for Site Plan Review filing with the Planning Board.

**Existing Site Description**

The existing site consists almost entirely of impervious surface consisting of buildings and paved parking areas. The site is quite flat having a gradient of 1% or less over the parking area. Stormwater flow from the lot travels northwesterly into the City's Drainage System as noted above.

**Proposed Site Description**

The proposed improvements include construction of a new apartment building and rehabilitation of existing commercial buildings on Cabot Street. In the proposed conditions the buildings will cover most of the property. Parking is contained within the building footprint. There will be a reduction however in the area of impervious surface on the property compared to the existing condition. This is accomplished by introducing landscaped areas along the building perimeter and within a proposed rooftop courtyard. The project also includes a subsurface infiltration system to mitigate for potential stormwater impacts as well.

**Soil Conditions**

The Natural Resources Conservation Service (NRCS) Web Soil Survey of Essex County defines soils in the project area as Urban Land. This is considered as developed land which is confirmed by observation of the site. It is good engineering practice to treat Urban Land as Hydrologic Soil Group (HSG) "C".

## 2.1 STORMWATER MANAGEMENT STANDARDS

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

*No new stormwater conveyances may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.*

There are no new untreated stormwater discharges proposed with the completion of this project. Stormwater from the building rooftops will be directed into the subsurface infiltration system. The system then discharges into the City's Drainage System on Federal and Chapman Streets.

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

*Stormwater management systems must be designed so that the post-development peak discharge rates do not exceed pre-development peak discharge rates.*

There is a reduction in post developments rates because there is a reduction in the amount of impervious surfaces proposed for this property. The property is 53,658 S.F. The pre-development impervious surfaces totals 53,000 S.F. The post -development impervious surfaces total 51,687 S.F. This results in a reduction in the Composite Curve Number from 97.8 to 97.1. From this reduction it can be concluded that there is a reduction of peak flows from the property from the pre-development condition to the post-development condition.

### **Standard 3: Recharge**

*Loss of annual recharge to groundwater should be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from the pre-development conditions, based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.*

The Massachusetts Stormwater Handbook states that loss of annual recharge to groundwater shall be eliminated or minimized. The annual recharge from the post-development site shall approximate the annual recharge from the pre-development conditions based on soil type.

As discussed under the soils section, surficial soils on-site are assumed to be Hydrologic Soil Group "C" in the area of new construction. Therefore, the required recharge volume is calculated based on a target depth of 0.25 inches over the proposed impervious area. The required and provided volumes for the recharge system is as follows:

#### *Subsurface Infiltration System*

Required Recharge Volume = Target Depth\*Impervious Area = 0.25"\*51,687 S.F. = 1077 Cubic Feet

Provided Recharge Volume = 1080 Cubic Feet

#### Standard 4: Water Quality

*For new developments, stormwater management systems must be designed to remove 80% of the average annual load (post-development conditions) of Total Suspended Solids (TSS). It is presumed that this standard is met when:*

- a. Suitable nonstructural practices for source control and pollution prevention are implemented.*
- b. Stormwater management BMPs are sized to capture the prescribed runoff volume.*
- c. Stormwater management BMPs are maintained as designed.*

The Massachusetts Stormwater Handbook states that systems shall be designed to remove 80% of the average annual post-development construction load of Total Suspended Solids (TSS). The only proposed impervious area onsite is the proposed building and some concrete walkways.

Water quality calculations for the subsurface stormwater infiltration system is governed by Water Quality Depth. The water quality volume target depth is 0.5” over the inflowing impervious area. Using a subsurface infiltration system removes 80% of TSS. It should be noted that all of the stormwater from the site comes from rooftops. Rooftop stormwater is considered to be “clean”.

The calculation used to determine water quality volume is as follows. See **Table 4** for a summary of the water quality volumes for each of the proposed subsurface infiltration/detention BMPs.

$$\text{Water Quality Volume} = \text{Target Depth} * \text{Impervious Area}$$

**Table 4 – Water Quality Volume Compliance Summary**

| BMP                    | Target Depth<br>(in) | Impervious Area<br>(SF) | Target Water Quality Volume<br>(CF) | Provided Water Quality Volume<br>(CF) |
|------------------------|----------------------|-------------------------|-------------------------------------|---------------------------------------|
| Infiltration System PS | 0.5                  | 51,687                  | 2154                                | 1080                                  |

The water quality volume is not met as noted above. However, this requirement is still met for two reasons. First the rooftop stormwater is considered to be clean and second this project meets the definition of a redevelopment project. See Standard 7 below. As such this standard only needs to be met to the maximum extent practicable. The site design has maximized the size of the subsurface infiltration system and as such this project meets this Standard 4 to the maximum extent practicable.

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

*Stormwater discharges from areas with higher potential pollutant loads require the use of specific stormwater management BMPs. The use of infiltration practices without pretreatment is prohibited.*

Stormwater Standard 5 is not applicable to this project. The proposed development will not be subject to higher potential pollutant loads as defined in the Massachusetts Department of Environmental Protection Wetlands and Water Quality Regulations.

LUHPPLs are identified in 310 CMR 22.20B(2) and C(a)-(k) and (m) and CMR 22.21(2)(a)(1)-(8) and (b)(1)-(6), areas within a site that are the location of activities that are subject to an individual National Pollutant Discharge Elimination System (NPDES) permit or the NPDES Multi-sector General Permit; auto fueling facilities, exterior fleet storage areas, exterior vehicle service and equipment cleaning areas; marinas and boatyards; parking lots with high-intensity-use; confined disposal facilities and disposal sites.

### **Standard 6: Critical Areas**

*Stormwater discharges to critical areas must utilize certain stormwater management BMPs approved for “critical areas”. Critical areas are Outstanding Resource Waters (ORWs), shellfish beds, swimming beaches, cold-water fisheries, and recharge areas for public water supplies.*

Standard 6 is not applicable to this project given that stormwater will not be discharged to a critical area. Critical areas are defined as Outstanding Resource Waters and Special Resource Waters as designated in 314 CMR 4.0, recharge areas for public water supplies as defined in 310 CMR 22.02 (including Zone II and Interim Wellhead Protection Areas), bathing beaches as defined in 105 CMR 445.000, cold water fisheries and shellfish growing areas as defined in 314 CMR 9.02 and 310 CMR 10.04.

### **Standard 7: Redevelopment**

*Redevelopment of previously developed sites must meet the Stormwater Management Regulations to the maximum extent practicable. However, if it is not practicable to meet all the Standards, new stormwater management systems must be designed to improve existing conditions.*

This project is considered a redevelopment project because there will be an overall decrease in impervious area associated with this project. The proposed project will comply with nine of the ten Massachusetts Stormwater Management Standards with the exception of Standard 4 which it meets “to the maximum extent practicable”.

### **Standard 8: Construction Period Pollution Prevention and Erosion & Sedimentation Control**

*Erosion and sediment controls must be implemented to prevent impacts during construction or land disturbance activities.*

A “Construction Period Pollution Prevention Plan” report is included in the Appendix A of this report. This program details the construction period operation and maintenance plan and sequencing for pollution prevention measures and erosion and sedimentation controls. Locations of erosion control measures for the project are depicted on the site plan set accompanying this report.

### **Standard 9: Operations and Maintenance Plan**

*All stormwater management systems must have an operation and maintenance plan to ensure that systems function as designed.*

An “Operation and Maintenance Plan” is included in Appendix B of this report. This long-term operation and maintenance program provides details and the schedule for routine and non-routine maintenance tasks to be implemented at the completion of the project.

### **Standard 10: Prohibition of Illicit Discharges**

*Illicit discharges to the stormwater management system are prohibited.*

There are no known illicit discharges anticipated through the completion of this project. During construction and post construction procedures are provided to dissipate the potential for illicit discharges to the drainage system. An illicit discharge compliance statement can be found in Appendix C.



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**CONSTRUCTION PERIOD POLLUTION  
PREVENTION PLAN**

**CONSTRUCTION PERIOD POLLUTION PREVENTION PLAN  
FOR A PROPOSED STORMWATER MANAGEMENT SYSTEM  
218 CABOT STREET  
BEVERLY, MA**

**Project Name:** 218 Cabot Street  
Beverly, Massachusetts

**Owner Name:** Leggat McCall Properties  
10 Post Office Square  
Boston, Massachusetts 02109

**Party Responsible for Maintenance:** Leggat McCall Properties

**Project Description:**

Leggat McCall Properties proposes to construct a mixed-use Commercial/Residential Apartment building on the subject property. Drainage facilities for the property have been designed to match the current conditions in which the stormwater is collected and directed into the City's Drainage System in Federal and Chapman Streets. To mitigate for stormwater impacts a subsurface infiltration system is proposed.

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Prior to construction, a Stormwater Pollution Prevention Plan (SWPPP) will be prepared and submitted.

**General Construction Sequence:**

1. Install erosion control devices
2. Install drainage, utilities, new foundation.
3. Building construction and exterior work will commence.
4. Complete site improvements (curbing, walks, landscape, etc.)
5. Install finish pavers.



## **Erosion and Sedimentation Control Measures During Construction Activities**

### **Erosion Control Sock**

Erosion Control Socks are proposed to be installed, as shown on the site plan, around the perimeter of the redevelopment. The barriers are burlap fabric mitts filled with compost blends and shall be installed prior to the commencement of any work on-site and in accordance with the design plans. An additional supply of socks shall be on-site to replace and/or repair socks that have been disturbed. The lines of socks shall be inspected and maintained on a weekly basis during construction. Deposited sediments shall be removed when the level of deposition reaches approximately one-half the height of the Erosion Control Sock.

### **Surface Stabilization**

The surface of all disturbed areas shall be stabilized during and after construction as soon as practical but no more than fourteen (14) days after construction activity has temporarily or permanently ceased on that portion of the site. Temporary measures shall be taken during construction to prevent erosion and siltation. No construction sediment shall be allowed to enter any infiltration systems or the raingarden. All disturbed slopes will be stabilized with a permanent vegetative cover. Stabilization netting or tackifier applied with hydroseeding shall be used on all slopes 3:1 or greater. Some or all of the following measures will be utilized on this project as conditions may warrant.

- a. Temporary Seeding
- b. Temporary Mulching
- c. Permanent Seeding
- d. Placement of Sod
- e. Hydroseeding
- f. Placement of Hay
- g. Placement of Jute Netting

Water shall be applied as required to control dust on site. Watering equipment shall consist of pipelines, tanks, tank trucks, or other devices, as required, which are capable of applying a uniform spread of water over the surface.

### **Street Sweeping**

Any sediment tracked onto public right-of-ways or parking areas shall be swept at the end of each working day.

### **Interim Erosion Control**

Additional erosion control measures shall be implemented as conditions warrant during construction or as directed by the owner or owner's representative.

### **Construction Entrance**

Install the construction entrance as detailed on the site plans. The entrance should be maintained in a condition that will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic topdressing with additional stone. Inspect entrance/exit pad and sediment disposal area weekly and after heavy rains or heavy use. Remove mud and sediment tracked or

washed onto public roads immediately. Mud and soil particles will eventually clog the voids in the gravel and the effectiveness of the gravel pad will not be satisfactory. When this occurs, the pad should be top dressed with new stone. Complete replacement of the pad may be necessary when the pad becomes completely clogged. Reshape pad as needed for drainage and runoff control. Repair any broken road pavement immediately.

### **Topsoil Stockpile**

Locate the topsoil stockpile so it does not interfere with work on the site maintaining a 50' buffer from wetland areas. Side slopes of the stockpile should not exceed 2:1. Surround all stockpiles with silt fence or erosion control socks. Either seed or cover stockpiles with clear plastic or other mulching materials within 7 days of the formation of the stockpile.

### **Removal**

All facilities used as temporary measures shall be cleaned prior to being put into final operation. When construction is complete, the contractor shall remove all siltation devices after re-vegetation of disturbed areas and after written approval from the project engineer.

### **Provisions for storing paints, cleaners, automotive waste and other potentially hazardous household waste products inside or under cover**

- All materials on site will be stored inside in a neat, orderly, manner in their appropriate containers with the original manufacturer's label. Appropriate cover of materials shall be provided to prevent these chemicals from contact with rainwater.
- Only store enough material necessary. Whenever possible, all of a product shall be used up before disposing of container.
- Manufacturer, local, and State recommendations for proper use and disposal shall be followed.

### **Construction Vehicles & Equipment**

- At the end of each work day, all construction vehicles shall be parked outside the 100' buffer to the bordering vegetated wetlands.
- All fueling and maintenance of vehicles and equipment shall be performed outside resource buffer zones. Storage, handling and disposal of fuels and liquids in relation to construction vehicles and equipment shall be conducted in compliance with National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges from Construction Activities (CGP) 2017 Section 2.3.

### **Spill prevention and response plans**

- Spill Control Practices shall be in conformance with the guidelines set forth in the National Pollutant Discharge Elimination System (NPDES) CGP 2017.
- Clean up spills immediately, using dry cleanup methods where possible and dispose of used materials properly. Do not clean surfaces or spills by hosing the area down. Eliminate the source of the spill to prevent a discharge or a continuation of an ongoing discharge.
- Spill kits shall be readily available onsite during construction.

### **Provisions for maintenance of lawns, gardens, and other landscaped areas**

- Grass shall not be cut shorter than 2 to 3 inches and mulch clipping should be left on lawn as a natural fertilizer.

- Refer to landscape plans for maintenance of planted areas.
- Use low volume water approaches such as drip-type or sprinkler systems. Water plants only when needed to enhance root growth and avoid runoff problems.
- The use of mulch shall be utilized where possible. Mulch helps retain water and prevents erosion.

**Requirements for storage and use of fertilizers, herbicides and pesticides**

- Fertilizers used will be applied only in the minimum amounts recommended by the manufacturer. Once applied, fertilizer will be worked into the soil to limit exposure to storm water. Storage will be in a covered shed. The contents of any partially used bags of fertilizer will be transferred to a sealable plastic bin to avoid spills.
- Do not fertilize before a rainstorm.
- Consider using organic fertilizers. They release nutrients more slowly.
- Pesticides shall be applied on lawns and gardens only when necessary and applied only in the minimum amounts recommended by the manufacturer.

**Provisions for solid waste management**

- All solid waste shall be disposed of in accordance with local town regulations.

STORMWATER MANAGEMENT  
CONSTRUCTION PHASE

**INSPECTION SCHEDULE AND EVALUATION CHECKLIST**

PROJECT LOCATION: 218 Cabot Street, Beverly, Massachusetts  
 Major Event = Rainstorm of 1/4-inch or more

| Inspection Date | Inspector | Area Inspected                 | Best Management Practice (yes/no) | Required Inspection Frequency if BMP | Comments | Recommendation | Follow-up Inspection Required (yes/no) |
|-----------------|-----------|--------------------------------|-----------------------------------|--------------------------------------|----------|----------------|--|
|                 |           | Erosion Control Sock           | No                                | Weekly and After Major Storm Events  |          |                |  |
|                 |           | Subsurface Infiltration System | Yes                               | Weekly and After Major Storm Events  |          |                |  |
|                 |           | Construction Entrance          | No                                | Weekly and After Major Storm Events  |          |                |  |
|                 |           | Soil Stockpile Area            | No                                | Weekly and After Major Storm Events  |          |                |  |
|                 |           |                                |                                   |                                      |          |                |  |
|                 |           |                                |                                   |                                      |          |                |  |
|                 |           |                                |                                   |                                      |          |                |  |
|                 |           |                                |                                   |                                      |          |                |  |

- 
- (1) Refer to the Massachusetts Stormwater Handbook, Volume Two: Stormwater Technical Handbook (February 2008) for recommendations regarding frequency for inspection and maintenance of specific BMP's.
  - (2) Inspections to be conducted by a qualified professional knowledgeable in the principles & practice of erosion and sediment controls and pollution prevention.

Limited or no use of sodium chloride salts, fertilizers or pesticides recommended.

Other notes: (Include deviations from: Con. Comm. Order of Conditions, PB Approval, Construction Sequence and Approved Plan) Stormwater Control Manager: \_\_\_\_\_

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## OPERATION AND MAINTENANCE PLAN

**OPERATION AND MAINTENANCE PLAN  
218 CABOT STREET  
BEVERLY, MA**

The information provided herein is intended to provide the base information for operation and maintenance of the site in perpetuity subject to updates and revisions as required at a future date. As such, all future property owners must be notified in writing of this plan and be provided with a copy of this plan, a complete set of the design drawings and/or a completed as-built plan showing all the drainage features as they were constructed, which are considered part of this document.

Stormwater management system owner: Leggat McCall Properties  
The party responsible for operation and maintenance: Leggat McCall Properties  
10 Post Office Square  
Boston, Massachusetts 02109

**ILLCIT DISCHARGE - PRACTICES TO MINIMIZE STORM WATER CONTAMINATION**

- All waste materials will be collected and stored in a securely lidded metal dumpster.
- All trash and debris from the site will be deposited in the dumpster. The dumpster will be emptied on a regular schedule prior to being over full.
- All personnel will be instructed regarding the correct procedure for waste disposal.
- Good housekeeping and spill control practices will be followed to minimize storm water contamination from petroleum products, paints, and cleaning products.
- All site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage.
- Spill kits will be provided with any activity that could provide contamination.
- All paint containers and curing compounds will be tightly sealed and stored when not required for use. Excess paint will not be discharged to the storm sewers, but will be properly disposed according to the manufacturer's instructions.
- All spills will be cleaned up immediately upon discovery. Spills large enough to reach the storm sewers will be reported to the Massachusetts Department of Environmental Protection Northeast Regional Office at 1-888-304-1133.

**INFILTRATION BMP**

The infiltration BMP (subsurface chamber system) shall be inspected after every major storm for the first few months to ensure it is stabilized and functioning properly. If necessary, corrective action shall be taken until the system functions properly. Inspectors should note how long water remains standing in the inspection port after a storm; standing water within the system 48 to 72 hours after a storm indicates that the infiltration capacity may have been overestimated. If the ponding is due to clogging, immediately address the reasons for the clogging. Thereafter, inspect the infiltration BMP at least twice per year.

**VEGETATED AREAS MAINTENANCE**

Although not a structural component of the drainage system, the maintenance of vegetated areas may affect the functioning of stormwater management practices. This includes the health/density of vegetative cover and activities such as the application and disposal of lawn and garden care products, disposal of leaves and yard trimmings.

*Initial Post-Construction Inspection*

During the initial period of vegetation establishment, pruning and weeding are required twice in the first year by contractor or owner. Any dead vegetation/plantings found after the first year will

be replaced. Proper mulching is mandatory and regular watering may be required initially to ensure proper establishment of new vegetation.

*Long-Term Maintenance*

The planted areas shall be inspected on a semi-annual basis and any litter removed. Weeds and invasive plant species shall be removed by hand. Maintain planted areas adjacent to pavement to prevent soil washout. Immediately clean any soil deposits on pavement. Leaf litter and other detritus shall be removed twice per year. If needed to maintain aesthetic appearance, perennial plantings may be trimmed at the end of the growing season.

Trees and shrubs shall be inspected twice per year to evaluate health and attended to as necessary. Seeded ground cover or grass areas shall not receive mulching. Re-seed bare areas; install appropriate erosion control measures when native soil is exposed, or erosion channels are forming. Plant alternative mixtures of grass species in the event of unsuccessful establishment. The grass vegetation should not be cut to a height less than four inches.

*Pesticide/Herbicide Usage*

No pesticides are to be used unless a single spot treatment is required for a specific control application.

**AS-BUILT**

For final locations of stormwater management facilities on site, refer the As-Built which will be prepared after completion of construction.

**BUDGET**

The estimated operation and maintenance budget is \$2,000 per year.

218 Cabot Street, Beverly, Massachusetts  
Stormwater Operation and Maintenance Plan

INSPECTION SCHEDULE AND EVALUATION CHECKLIST

| <b>Best Management practice</b> | Inspection Frequency | Date Inspected | Contractor | Current Conditions and Minimum Maintenance / Repairs, If Necessary | Completed Maintenance / Repair (i.e., date, contractor, tasks complete, etc.) |
|---------------------------------|----------------------|----------------|------------|--|---|
| <b>Infiltration System</b>      | Biannual             |                |            |  |   |
| <b>Overall Site Condition</b>   | Quarterly            |                |            |  |   |
|                                 |                      |                |            |  |   |
|                                 |                      |                |            |  |   |

Property Manager: \_\_\_\_\_ Date: \_\_\_\_\_



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**ILLICIT DISCHARGE COMPLIANCE  
STATEMENT**

**Illicit Discharge Compliance Statement per Standard 10**

Stormwater discharges within the project area have been evaluated for the presence of non-stormwater sources. These observations were performed throughout the design phase. As of the date of this statement, there are no known or visible signs of non-stormwater discharges towards the City of Beverly Drainage System.

If during construction, non-stormwater discharges are identified, they shall be recorded, and the issuing authority shall be notified.

Applicants Certification

I certify that I have read, understand, and agree to the statement above.

Signed:  Date: 6/30/22