

---

**760 MOSLEY STREET TOWNHOUSES  
ADA HOMES LTD.  
TOWN OF WASAGA BEACH  
OPERATIONS AND MAINTENANCE MANUAL**

---



Prepared by:

Pinestone Engineering Ltd.  
Barrie Office  
20 Bell Farm Road, Unit 1  
Barrie, Ontario L4M 6E4

Phone: 705-503-1777

Email: [pinestone@pel.ca](mailto:pinestone@pel.ca)

Web: [www.pel.ca](http://www.pel.ca)

September 19, 2017  
17-11290B – rev. 0

**TABLE OF CONTENTS**

<b>1.0 INTRODUCTION .....</b>	<b>1</b>
<b>2.0 WATERMAIN DISTRIBUTION SYSTEM.....</b>	<b>1</b>
2.1 Design .....	1
2.2 Watermain Testing Requirements .....	2
2.3 Operation and Maintenance .....	2
<b>3.0 SANITARY COLLECTION SYSTEM.....</b>	<b>3</b>
3.1 Design .....	3
3.2 Sanitary Sewer Testing Requirements .....	3
3.3 Operation and Maintenance .....	3
<b>4.0 STORM WATER MANAGEMENT FACILITY.....</b>	<b>4</b>
4.1 Design .....	4
4.2 Operation and Maintenance .....	4
<b>5.0 SNOW STORAGE / REMOVAL .....</b>	<b>7</b>
<b>6.0 RECOMMENDATIONS AND CONCLUSIONS .....</b>	<b>8</b>

## **1.0 INTRODUCTION**

ADA Custom Homes Ltd. is constructing a 14-unit townhouse development at 760 Mosley Street in the Town of Wasaga Beach. The property area is approximately 0.27 hectares in size and is legally described as all of Lots 37, 38 and 49, and Part of Lot 48, Registered Plan No.674, in the Town of Wasaga Beach, County of Simcoe. The development consists of 14 townhouses with individual driveways and landscape amenity areas. Access to the units will be provided via a main driveway which will traverse the south property limit and extend from Mosley Street to Dunkerron Avenue.

Municipal water and sanitary sewer servicing will be extended to the site from the mains on Dunkerron Avenue north-west of the site. The existing site services will be abandoned per Town guidelines. Low impact development practices have been utilized to provide both quantity and quality control of storm water.

The purpose of this report is to provide design, operation and maintenance details pertaining to the watermain, sanitary and storm water infrastructure proposed for the development.

## **2.0 WATERMAIN DISTRIBUTION SYSTEM**

### **2.1 Design**

Water servicing for the development will be provided by a 150mm dia. service connection to the existing 150mm dia. PVC watermain located within the Dunkerron Avenue right-of-way. A proposed 150mm dia. PVC DR18 watermain will be extended into the site along the proposed main driveway, and will terminate with a 50mm dia. blow-off assembly. A 150mm dia. valve and box will be located at the watermain connection point within the Dunkerron Avenue right-of-way. The blow off assembly is located at the end of the line to provide a location for flushing the main ensuring no stagnant water. Each townhouse unit will be serviced by a 25mm dia. PE Series 160 water service with curb stop extending from the proposed 150mm dia. watermain. The curb stops will be located in the front yard landscape areas and are identified with a metal cap at finished grade.

Depth of bury will be 1.7m minimum and pipe embedment and backfill will be in accordance with OPSD 802.010. A minimum 1.5m horizontal or 0.5m vertical pipe separation will be maintained between sanitary sewers and watermains.

Each unit will have a water meter installed inside the unit in accordance with Town Standard Drawing No. 14A. Each meter shall be a 'Sensus' 25mm type complete with a 'Flexnet' remote touchpad and transmitter installed adjacent to the hydro meter.

The existing hydrant on 18<sup>th</sup> Street North is located within 90m of all units and will provide fire protection for the units.

The system design is shown on DWG - SS1 appended to the manual.

## **2.2 Watermain Testing Requirements**

As stated in the Town of Wasaga Beach Engineering Standards,

- All watermains shall be swabbed, hydrostatic pressure tested, flushed and disinfected in accordance with current OPSS 441 specifications. The procedures for disinfecting watermains shall be in accordance with the latest revision of AWWA C651.
- The Developer shall arrange the watermain test and shall inform the Town Engineer when a section has completed a satisfactory pre-test for leakage testing and is ready for the final leakage testing inspection. A minimum of 48 hours notice is required for the Town Engineer to coordinate testing, operation of valves and connections with the Town and Public Works staff. Any sections failing the test shall be repaired and retested at the Developer's expense.
- Two series of bacteriological tests are to be conducted in accordance with AWWA C651 after residual chlorine level testing and system flushing to reestablish municipal system chlorine levels
- The Developer / contractor is responsible to arrange for a certified technician to obtain water samples for bacteriological testing. Bacteriological testing shall be undertaken by an accredited laboratory and the results shall be in accordance with the Ministry of the Environment Guidelines. Prior to connecting a new watermain to the municipal distribution system, the Developer must provide satisfactory bacteriological test results to the Town Engineer.
- Tracer wire continuity of current must be tested and certified by Public Works staff prior to acceptance and placement of base course asphalt.

## **2.3 Operation and Maintenance**

All valves should be exercised twice annually to ensure they remain accessible and operational. Inspection and operation of valves (valve and boxes / hydrant valves / curb stop valves, etc) shall be undertaken by a qualified operator certified by the Ministry of the Environment (MOE) and a copy of the inspection provided to the Public Works Department.

Alternatively, arrangements can be made with the Town to have certified operators of the Public Works Department undertake the inspection and maintenance of hydrants and valves, at the Owner's expense.

The owner is responsible for their service and associated maintenance from their site to the trunk watermain within the Dunkerron Avenue right-of-way.

### **3.0 SANITARY COLLECTION SYSTEM**

#### **3.1 Design**

The development will be serviced by connecting to the existing 450mm dia. concrete main using an approved manufacturers tee. A 200mm dia. PVC SDR35 sanitary sewer will be extended along the proposed driveway at a 1% gradient and will terminate at a proposed sanitary manhole. A sanitary manhole will be installed at the street right-of-way line for access for inspection and cleaning. Each townhouse unit will be serviced via an individual 125mm dia. PVC SDR28 service lateral installed to Town standards.

The system design is shown on DWG - SS1 appended to the manual.

#### **3.2 Sanitary Sewer Testing Requirements**

As stated in the Town of Wasaga Beach Engineering Standards,

- Sanitary sewers shall be cleaned, flushed and tested for soundness and deflection in accordance with the current OPSS 410 specifications.
- The complete system shall be flushed and inspected by an approved video camera testing company and the Town Engineer shall be provided with a copy of the appropriate data.
- CCTV inspection shall be undertaken per OPSD 409 as directed by the Town following the installation of all utilities. CCTV inspections are to be conducted:
  - Prior to the issuance of the Certificate of Substantial Completion (Basic Services), and;
  - Prior to the placement of surface course asphalt.

#### **3.3 Operation and Maintenance**

All sanitary maintenance holes should be inspected twice annually. In the event of a blockage, a CCTV inspection should be undertaken by a plumber or mechanical contractor to determine the cause and location of the blockage and subsequent cleaning / flushing / repair required.

The owner is responsible for their service and associated maintenance from their site to the trunk sanitary sewer within the Dunkerron Avenue right-of-way.

## **4.0 STORM WATER MANAGEMENT FACILITY**

### **4.1 Design**

The proposed storm water management plan for the site consists of utilizing low impact development infiltration techniques for storm water quantity and quality control. Soakaway pits will be utilized to infiltrate all roof water providing peak flow reduction and quality control. The soakaway pits will be constructed in the rear yard landscape amenity area. Roof drainage will be directed to the soakway pits via roof leaders, and will have an overflow disconnection to surface. Each pit will accept runoff from the rooftop area of one unit and will have a footprint of 3.8m<sup>2</sup> (1.6m wide x 2.4m long x 2.0m deep). The soakaway pits are lined with geotextile fabric and are filled with clean granular stone that receive runoff via a perforated pipe inlet and allow it to infiltrate into the native soil.

Bioretention cells will be constructed in the front yard landscape amenity areas along the main driveway and will receive runoff from the individual driveways and main driveway via curb cuts. The bioretention cells will provide reduction of peak flow rates and quality control through evapotranspiration and infiltration of runoff. Each bioretention cell will be 8.4m<sup>2</sup> (2.1m wide x 4.0m long). The primary component of the bioretention cell is the filter bed which is a mixture of sand, fines and organic material. Mulch ground cover and plants adapted to the conditions of storm water are also important.

A maximum ponding depth of 150mm will be permitted in each cell. A 150mm dia. overflow pipe will be installed in each cell and will be connected to a 200mm dia. / 250mm dia. perforated underdrain. A 200mm dia. perforated underdrain wrapped in a filter sock will be installed for the cells between units 1-7, and has been designed for the 100 year storm event. The drain will be installed at 0.4% and will discharge to the existing downgradient catch basin #2 on Mosley Street. A 250mm dia. perforated underdrain will be installed for the cells between units 8-14, and has also been designed for the 100 year storm event. The drain will be installed at 0.4% and will discharge to a proposed off road catch basin on the east side of the Dunkerron access entrance to the site.

The design is shown on DWG - GP1 appended to this manual.

### **4.2 Operation and Maintenance**

During construction, the location of the soakaway pits and bioretention cells should be clearly identified to ensure no vehicular traffic is allowed near the facilities. Minimizing compaction of the soil is important. Sediment control fencing should be placed around the pits/cells until the pits/cells are completed and vegetation has been established on the surface to ensure sediment does not clog the pit/cell.

**760 MOSLEY STREET TOWNHOUSES - ADA HOMES LTD.  
TOWN OF WASAGA BEACH  
OPERATIONS AND MAINTENANCE MANUAL**

---

For the soakaway pits, maintenance should include cleaning out leaves, debris and accumulated sediment caught in eavestrough and inlet pipes twice annually or as needed. A monitoring well is required in each soakaway pit. It is a vertical non-perforated pipe with a cap which is connected to the inlet pipe and provides a means of inspecting and flushing them out as part of routine maintenance. It also allows for monitoring of the length of time required to fully drain the pit. Inspection via the well should be performed at least annually and following every major storm event (>25mm) to ensure the facility drains within the maximum acceptable time (72 hours). If the drain time exceeds 72 hours, the pit should be drained via pumping and the perforated pipe should be cleaned out. If slow drainage persists, system replacement may be required. It is expected that the life of a soakaway pit is greater than 30 years if regular maintenance is performed. The typical detail for the soakaway pit is appended to this report.

Dependent on the plantings selected, bioretention cells require routine inspection and maintenance of the landscaping including weeding, pruning and litter removal. The facility should be inspected after major storms (>25mm) and twice annually. Inspection should include assessing the vegetation density (80% minimum), damage from foot or vehicle traffic, channelization, trash/debris, sediment and structural damage.

The “Low Impact Development Storm Water Management Planning and Design Guide” prepared by the Credit Valley Conservation Authority (CVC) and the Toronto and Region Conservation Authority (TRCA), lists the following routine and annual inspection / maintenance activities for the continued operation of bioretention areas.

**760 MOSLEY STREET TOWNHOUSES - ADA HOMES LTD.  
TOWN OF WASAGA BEACH  
OPERATIONS AND MAINTENANCE MANUAL**

---

Suggested Routine Inspection & Maintenance Activities for Bioretention

Activity	Schedule
Inspect for vegetation density (min. 80% coverage), damage by foot or vehicle traffic, channelization, accumulation of debris, trash and sediment, and structural damage to pretreatment devices	After every major rainfall (>25mm), quarterly for first two years, and twice annually thereafter.
Regular watering during first two years as required until vegetation is established	As needed for first two years.
Removal of trash and debris from pretreatment devices, the bioretention area surface and inlet and outlet areas	Twice annually at minimum. More frequently if desired for aesthetic reasons.
<ul style="list-style-type: none"> <li>- Removal of accumulated sediment from pretreatment devices, inlets and outlets</li> <li>- Trim trees and shrubs</li> <li>- Replace dead vegetation, remove invasive growth</li> <li>- Repair eroded or sparsely vegetated areas</li> <li>- Remove accumulated sediment on the bioretention area surface when dry and exceeds 25mm depth</li> <li>- If gullies are observed along the surface, regrading and revegetating may be required</li> </ul>	Annually or as needed.



Suggested Annual Spring Inspection & Corrective Actions for Bioretention

Inspection Item	Corrective Actions
Vegetation health, diversity and density	<ul style="list-style-type: none"> <li>- Remove dead and diseased plants</li> <li>- Add reinforcement planting to maintain desired vegetation density</li> <li>- Prune woody matter</li> <li>- Check soil pH for specific vegetation</li> <li>- Add mulch to maintain 75mm layer</li> </ul>
Sediment build up and clogging at inlets	<ul style="list-style-type: none"> <li>- Remove sand that may accumulate at the inlets or on the filter bed surface following snow melt</li> <li>- Examine drainage area for bare soil and stabilize. Apply erosion control devices (silt fence) until area is stabilized</li> <li>- Check that the pre-treatment (if provided) is functioning properly</li> </ul>
Ponding for more than 48 hours	<ul style="list-style-type: none"> <li>- Check underdrain for clogging and flush out</li> <li>- Apply core aeration or deep tilling</li> <li>- Mix amendments into the soil</li> <li>- Remove the top 75mm of bioretention soil</li> <li>- Replace bioretention soil</li> </ul>

The typical detail for the bioretention cell is appended to this report.

## **5.0 SNOW STORAGE / REMOVAL**

The owner is responsible to provide snow clearing operations for the parking facilities and all accesses. Snow storage must be on the subject property and must not encroach the municipal right-of-way or adjacent properties. It must not conflict with the operation of drainage systems.

In the event that there is insufficient space on site for snow storage in accordance with the accepted Site Plan, snow accumulation will be required to be removed off-site at the owner's expense.

## 6.0 RECOMMENDATIONS AND CONCLUSIONS

It is recommended that this manual be utilized during construction by the contractor(s) and kept on site once construction has been completed to be utilized by maintenance personnel. Regular preventative maintenance is vital in maintaining the effectiveness of the site servicing infrastructure and site features. It is recommended that the owner utilize the guidelines presented in this manual and undertake regular operation and maintenance of the site infrastructure.

All of which is respectfully submitted,

**PINESTONE ENGINEERING LTD.**

*Brigitte South*

Brigitte South, C.E.T.



*Joe Voisin*

Joe Voisin, P.Eng.