



September 4, 2020

Mr. Scott MacCallum, P.Eng, M.B.A.
Director of Operations
Clayton Developments Limited
255 Lacewood Drive, Suite 100C
Halifax, NS B3M 4G2

Dear Mr. MacCallum,

Re: Municipal Servicing Brief
Penhorn Mall Site Residential Development, Dartmouth, NS

INTRODUCTION AND BACKGROUND

The following letter outlines the preliminary review of municipal servicing issues for the above-noted development. Further information on the stormwater management approach for this development can be found in the Master Stormwater Management Plan (MSWMP) prepared by Strum Consulting.

In accordance to the Halifax Regional Centre Plan (Package A), "A Community Vision for the Penhorn Mall site was approved in principle by Regional Council in October of 2009 as a mixed-use area clustered around the transit terminal on Portland Street. The redevelopment concept includes pedestrian and transit oriented spaces and corridors, a range of medium to high density housing choices. Public amenity spaces including Penhorn Lake and Brownlow Park will support the development of this community, and additional open spaces and open space connections will be provided."

The Penhorn residential development being considered will consist of a combination of multi-unit apartment buildings and single-family townhouse units with public open space and walking trails. The Penhorn development is to be fully serviced with water, wastewater, and stormwater systems connected to existing local municipal systems.

The subject site is a property located at 535 Portland Street, Dartmouth, NS (PID 00222844). The site is an approximately 12.53 hectare (31 acre) property bounded by Penhorn Lake to the north, Highway 111 to the east, Portland Street to the south, and parkland and residential development to the west. The subject site is currently owned by Crombie Penhorn Mall (2011) Limited. The site contains an existing approximately 7,200 m² commercial building which was constructed in 1982 and underwent a major renovation in 2009 when a large section of the former mall was demolished. The existing building underwent further redevelopment, transitioning to a primarily office building in 2018.

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The subject site borders a commercial property owned by Penhorn Plaza Holdings Limited (PID 41331281). This neighbouring commercial property was subdivided from the subject site in 2010 and contains multiple commercial units including a Sobeys grocery store, Sobeys gas bar, and commercial strip plaza buildings. The subject site is also bordered by a forested municipal property (PID 00222851) and Penhorn Lake to the north.

STORMWATER

Further, detailed information on the stormwater management approach for this development is contained in the MSWMP report, completed by Strum Consulting. This development will utilize progressive best management practices and low impact design methodology in the management of stormwater. This approach is anticipated to include the use of a combination of the following best management practices, which are described in greater detail in the MSWMP:

- Rain Barrels
- Perforated Stormwater Piping
- Infiltration Trenches
- Rain Gardens
- Bio Swales
- Filter Strips
- Permeable Pavers
- CDS Units

The usage of these BMP's is focussed on mitigating the impact of this development during rainfall events, with a focus on stormwater quantity (volume, peak flow), and quality (TSS, TP, and temperature).

Runoff from the newly developed areas will be discharged to the existing stormwater management system at the following locations:

- Existing outfall into Penhorn Lake
- Existing piped system across Highway 111 to Athorpe Drive
- Existing piped system on Pedder's Way.

Strum has evaluated the existing peak stormwater flows reaching these three locations under existing conditions, and under full development. Through the use of on-site stormwater storage and the BMP's noted above, the post development flows have been attenuated to be within 10% of the predevelopment flows. Strum has also reviewed the local receiving stormwater infrastructure and has confirmed that the existing infrastructure is adequately sized to accept the anticipated flows.

Public stormwater infrastructure will be constructed within public road right of ways and public easements. Stormwater laterals will be constructed to provide service to individual lots. Stormwater retention will be provided both on individual lots and within the public road ROW through innovative road cross section design.

WATER

Water service for this site is provided from connection to the existing municipal water system. The existing water system in this area is primarily fed through a large 600 mm diameter transmission main that runs along Portland Street adjacent to this site. The existing water system is located within the Dartmouth Intermediate East pressure zone, with a reported hydraulic grade line of 101 m to 107 m. This portion of the Halifax Water distribution system is fed from the Lake Major Treatment facility, with the closest water storage tank being the Mount Edward Water Reservoir on Mount Edward Road (PID 00196360).

Water service throughout this development will be provided via a series of publicly owned watermain located in public right of ways or easements. Individual laterals will be provided to each property and sized in consideration of the individual demands. It is anticipated that the majority of buildings located within this development will be serviced with both sprinkler and domestic water service. Based on water modelling completed by Strum, it is anticipated that 300 mm diameter public watermain will be required to provide adequate fire flows in accordance with Halifax Water Standards. Laterals to each property will be provided as 300 mm diameter, with a possible reduction in lateral sizing once building use and size are finalized.

WASTEWATER

Wastewater servicing for this development will also be provided through a series of publicly owned wastewater mains and laterals to each lot. Wastewater mains will be located within public street right of ways or easements. Wastewater main sizing has been completed using Halifax Water Standards and the Atlantic Canada Wastewater Guidelines Manual for Collection, Treatment, and Disposal. Three potential discharge locations for connections to the existing municipal wastewater system have been identified:

1. Peddars Way, through Cranston Avenue to Prince Albert Road.
2. Across Highway 111, through Virginia Avenue and Bowser Avenue to Oakwood Court.
3. Berkley Brae, through Somerset Street and Celtic Drive to Prince Albert Road.

A review of these routes for capacity constraints was completed in accordance with Halifax Water Standards, and using zoning information from HRM to determine tributary flows to each portion of the wastewater system. This analysis identified the following available capacities within the existing wastewater system:

1. Peddars Way – Available Capacity = 21.8 L/sec
2. Highway 111 – Available Capacity = 45.0 L/sec
3. Berkley Brae – Available Capacity = 58.7 L/sec

The current design for this site contemplates connections to the municipal system at Peddars Way and Highway 111 only, with no connection being proposed for Berkley Brae. Based on the current site

plan, peak design flows from this site will not exceed available capacity, with the following peak design flows being anticipated:

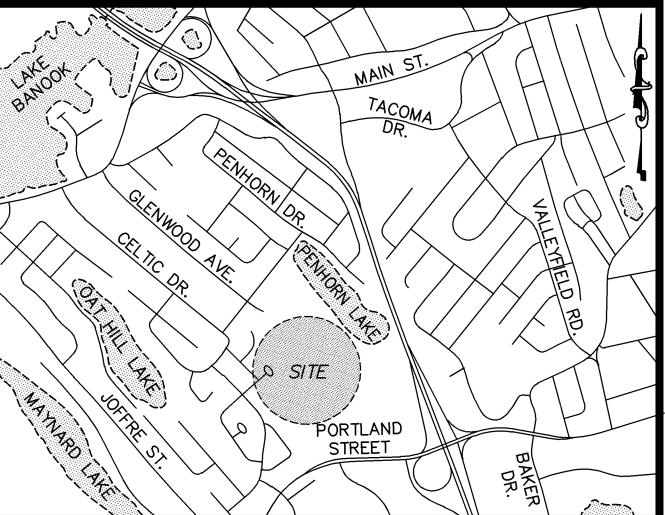
1. Peddars Way – Design Flow = 20.7 L/sec
2. Highway 111 – Design Flow = 15.2 L/sec
3. Berkley Brae – Design Flow = 0.0 L/sec

We trust that this letter meets with your current requirements. If you have any questions, please contact us.

Thank you,



Chris Boudreau, P.Eng.
Manager, Engineering
cboudreau@strum.com



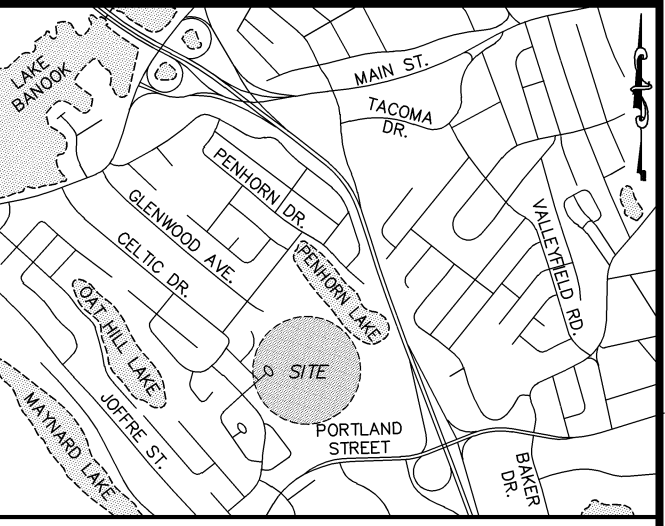
Key Plan NOT TO SCALE

- LEGEND**
- SANITARY M.H. & SEWER
 - GRAVITY PIPE FLOW DIRECTION
 - FORCEMAIN FLOW DIRECTION
 - RIGHT OF WAY
 - PROPERTY BOUNDARY
 - EXISTING PROPERTY BOUNDARY
 - FUTURE ASPHALT
 - FUTURE HIGHWAY
 - EXISTING BUILDING
 - PROPOSED BUILDING
 - EXISTING WATERCOURSE
 - 1 IN 20 YEAR FLOODPLAIN LIMIT
 - 1 IN 100 YEAR FLOODPLAIN LIMIT

- NOTES:**
- Contour interval is 1.0 metre, based on LRIS mapping blended with actual field data, provided by Servant, Dunbrack, McKenzie & MacDonald Ltd.
 - All sanitary pipes modelled as PVC DR35.
 - 1&I tributary areas do not include undeveloped lands that do not naturally drain towards the streets.
 - Commercial sanitary flows based on equivalent population of 75 people per hectare.


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No	Description	Date	By
Revision or Issue			
Project PENHORN PLAZA DARTMOUTH NOVA SCOTIA			
Drawing SANITARY SYSTEM MASTER PLAN			
Scale 1:1			
Date	Design	Check	Drawn
20-XX-XX	CTP	CNB	MMH
Project No. 20-7306		Sheet 1 Of 3	
Drawing No. A01		Rev. 0	

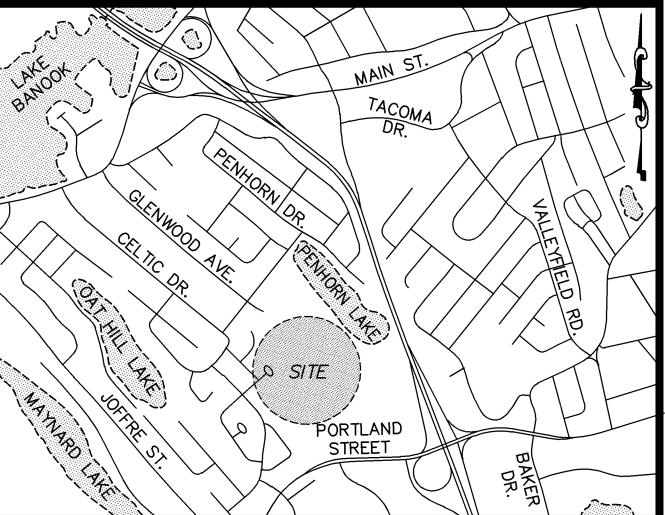
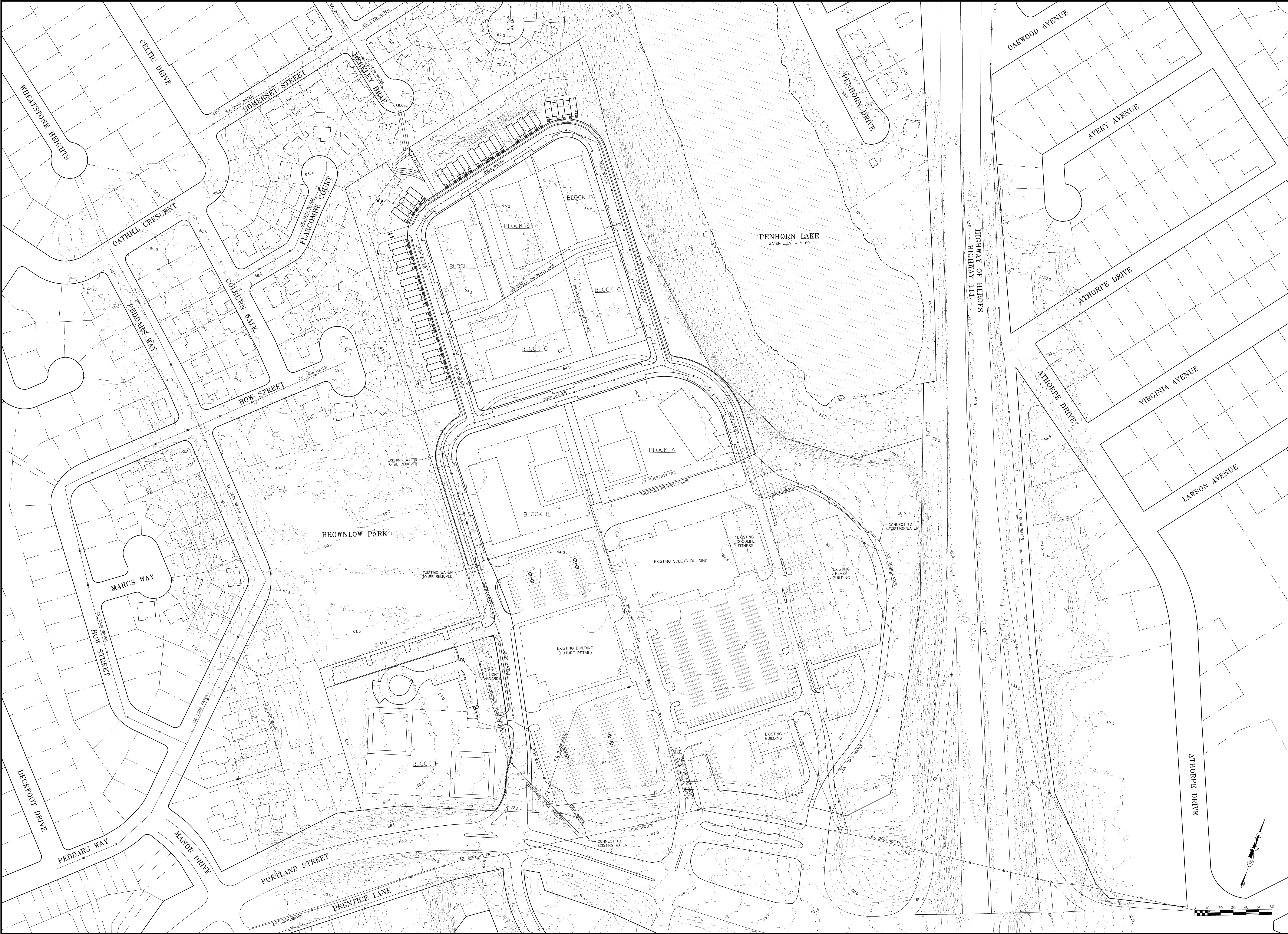
DRAFT NOT FOR CONSTRUCTION
JUN-12-20



- Key Plan NOT TO SCALE
- LEGEND
- STORM M.H. & SEWER
 - GRAVITY PIPE FLOW DIRECTION
 - FLOW DIRECTION ARROW
 - PUBLIC CULVERT
 - PRIVATE OUTFALL
 - RIGHT OF WAY
 - PROPERTY BOUNDARY
 - EXISTING PROPERTY BOUNDARY
 - FUTURE ASPHALT
 - FUTURE HIGHWAY
 - EXISTING BUILDING
 - PROPOSED BUILDING
 - EXISTING WETLAND
 - PROPOSED EASEMENT
 - 1 IN 20 YEAR FLOODPLAIN LIMIT
 - 1 IN 100 YEAR FLOODPLAIN LIMIT

- NOTES:
1. Contour interval is 1.0 metre, based on LRIS mapping blended with actual field data provided by Servant, Dunbrack, McKenzie & MacDonald Ltd.
 2. All proposed storm pipes to be confirmed at time of site design.

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No	Description	Date	By
Revision or Issue			
			
Project PENHORN PLAZA DARTMOUTH NOVA SCOTIA			
Drawing STORM SYSTEM MASTER PLAN			
Scale 1:1			
Date	XX-XX-XX	Drawn	MMH
Design	CTP	Check	APPROV.
CTP	CNB	CNB	CNB
Project No.	20-7306	Sheet	2 Of 3
Drawing No.	A02	Rev.	0



- Key Plan NOT TO SCALE
- LEGEND
- W-W-W GATE VALVE & WATERMAIN
 - HYDRANT
 - RIGHT OF WAY
 - PROPERTY BOUNDARY
 - EXISTING PROPERTY BOUNDARY
 - FUTURE ASPHALT
 - FUTURE HIGHWAY
 - EXISTING BUILDING
 - PROPOSED BUILDING
 - EXISTING WATERCOURSE
 - 1 IN 20 YEAR FLOODPLAIN LIMIT
 - 1 IN 100 YEAR FLOODPLAIN LIMIT

- NOTES:
- Contour interval is 0.5 metre, based on LRIS mapping blended with actual field data provided by Servant, Dunbrack, McKenzie & MacDonald Ltd.
 - Domestic and fire flow modelled in accordance with Halifax Water (HW) Standards. Model was constructed and updated based on MEH's existing WaterCAD system model and Reference Manual dated July 25, 2008.
 - All water lines modelled as PVC DR18 with a Hazen Williams roughness coefficient, C, of 130.
 - Water Model utilizes the following assumptions:
 - Normal low tank level: 61.26m (201')
 - Normal high tank level: 64.31m (211')
 - Domestic demand is based on the following:
 - 2008 MEH historical records where available.
 - Residential population density based on Halifax Water Standards
 - ICI population density based on MEH Standards (45 people/hectare).
 - Average Day/Max. Day/Max. Hour/Min. Hour Demands based on MEH Standards.
 - Fire flow demand based on HW Standards:
 - Residential: 3300 L/min
 - ICI: 13620 L/min
 - Min. Pressure: 40 PSI (Max. Hourly Demand)
 - Max. Pressure: 90 PSI (Min. Hourly Demand)
 - Min. Pressure: 22 PSI at point of withdrawal, 10 PSI elsewhere (Fire Flow + Max. Day Demand)
 - Max. Velocity: 1.4 m/s (Max. Hourly Demand)
 - Max. Velocity: 2.4 m/s (Fire Flow + Max. Day Demand)
 - Max Hour and Fire flow analysis completed assuming all tanks are at their normal low operations level 61.26m (201'). Min Hour analysis completed assuming all tanks are at their normal high operations level 64.31m (211').
 - Based on the model results, the existing system has several locations that do not comply with minimum pressure during Max Hour demand (Robert Scott Drive & Kali Lane). This condition is generally unchanged by the addition of the new development.
 - Fire flow for the commercial area of this development is being limited by maximum velocity in pipe 7-11 near the existing Lantz water tower. An increased maximum allowable velocity of 2.6m/s is required to provide adequate fire flow to this development in the ultimate build-out.

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No	Description	Date	By

Revision or Issue

Strum
CONSULTING

Project PENHORN PLAZA
DARTMOUTH
NOVA SCOTIA

Drawing WATER SYSTEM
MASTER PLAN

Scale 1:1	Date XXX-XX-XX	Drawn MMH
	Design CTP	Check CNB
	Project No. 20-7306	Sheet 3 of 3
	Drawing No. A03	Rev. 0