



BURNSIDE

**Blue Mountain Center
Functional Servicing and
Stormwater Management Brief**

**North American Development Group
2851 John Street, Suite One
Markham ON L3R 5R7**

**R.J. Burnside & Associates Limited
3 Ronell Crescent
Collingwood ON L9Y 4J6 CANADA**

**October 31, 2019
300044364.0000**

Blue Mountain Center
October 31, 2019

Distribution List

No. of Hard Copies	PDF	Email	Organization Name
-	No	Yes	MHBC Planning, Urban Design & Landscape Architects Oz Kemal, B.E.S., M.C.I.P., R.P.P., Partner (okemal@mhbcplan.com)

Record of Revisions

Revision	Date	Description
-	June 21, 2019	North American Development Group
1	October 31, 2019	North American Development Group

R.J. Burnside & Associates Limited

Report Prepared By:



Alex O'Donnell
Engineering Assistant
AO:kd

Report Reviewed By:



Curtis Scobie, P.Eng.
Project Engineer
CS:kd

Blue Mountain Center
 October 31, 2019

Table of Contents

1.0 Introduction 1
 1.1 Location and Site Description 1
 1.2 Development Proposal..... 1
2.0 Terms of Reference 1
3.0 Background and Existing Land Use 2
 3.1 Existing Site Conditions 2
 3.2 Geotechnical Conditions 2
4.0 Stormwater Management..... 2
 4.1 Existing Conditions and Drainage..... 2
 4.2 Post Development Conditions and Drainage 2
 4.3 Stormwater Quantity Control..... 2
 4.4 Stormwater Quality Control..... 3
 4.5 Sediment and Erosion Control 3
5.0 Potable Water Supply & Fire Suppression..... 3
 5.1 Fire Flows 3
 5.2 Water Demand 4
6.0 Sanitary Servicing 4
 6.1 Estimated Wastewater Flows..... 4
7.0 Grading..... 4
8.0 Ancillary Utilities 5
9.0 Conclusions 5

Appendices

- Appendix A Water Demand Calculations
- Appendix B Sanitary Flow Calculations

Drawing List

- C101 – Grading Plan
- C102 – Servicing Plan

Blue Mountain Center
October 31, 2019

Disclaimer

Other than by the addressee, copying or distribution of this document, in whole or in part, is not permitted without the express written consent of R.J. Burnside & Associates Limited.

Blue Mountain Center
October 31, 2019

1.0 Introduction

R.J. Burnside and Associates Limited (Burnside) was retained by North American Development Group, to undertake engineering design of stormwater drainage, grading and servicing for the addition of a new building on an existing commercial site in the Town of Collingwood. The purpose of this study is to demonstrate that the proposed development can be serviced for potable water supply, sanitary sewage, drainage and stormwater management within the framework of Municipal Approval Authority requirements.

1.1 Location and Site Description

The proposed site is located on the north side of First Street Extension in Collingwood, in the south-east corner of the existing parking lot of the Galaxy Cinemas Theatre. The site is zoned as C2-4 in the Town and is currently designated as Regional Commercial District in the Official Plan.

The site is a portion of a larger commercial property. The property is bordered by Old Mountain Road to the north and west, First Street Extension to the south and Balsam Street to the east. There is a separate parcel of land in the south-east corner of the block that is a separate property.

The site will front onto First Street Extension, using the existing entrance West of the existing Pizza Pizza restaurant. The site is proposed in an existing commercial development, where there is currently paved parking.

1.2 Development Proposal

The proposed addition to the development consists of a single commercial building with associated parking on site.

Entrance into the proposed site will be provided through the existing site access off of First Street Extension. No changes to the existing entrance are proposed.

2.0 Terms of Reference

The terms of Reference used for the scope of this Report are as follows:

- Town of Collingwood's Development Standards (July 2007)
- Pre-Consultation Comments received from the Town of Collingwood (March 2019)
- Legal and Topographical survey, ZEPT (2019)
- Geotechnical Investigation, Peto MacCallum Ltd. (May 2019)
- Site Plan, Scoler Lee Borenstein & Associates (March 2019)

3.0 Background and Existing Land Use

3.1 Existing Site Conditions

Currently, the portion of the site that is being developed serves as a section of a parking lot that services the Galaxy Cinemas Theatre on the same property. There are currently some trees, shrubs, and grass along the east and south edges of the site. There is also an existing 1.5 m wide sidewalk bordering the east and south edges of the site.

3.2 Geotechnical Conditions

A geotechnical investigation was undertaken by Peto MacCallum Ltd. to assess the subsurface conditions at the site. All the boreholes were drilled through the parking lot pavement. The asphalt thickness was found to consistently be 100 mm thick. Underlying the asphalt, the granular base was found to be an average thickness of 148 mm. Underlying the base, the granular subbase was found to be an average thickness of 175 mm. A layer of silty sand fill was encountered in all four boreholes to a depth ranging from 0.9 m to 1.7 m. Shallow bedrock is presumed to be below the fill.

4.0 Stormwater Management

4.1 Existing Conditions and Drainage

Currently, the existing site is graded internally to multiple low points containing catchbasins tied to a storm sewer system. The underground storm system falls to the West where there is an oil grit separator to provide quality control before it ties into the stormwater system on Old Mountain Road. This system ultimately drains to the Black Ash Creek.

4.2 Post Development Conditions and Drainage

After construction of the proposed building, the post development drainage pattern will remain unchanged from existing conditions. The proposed building will have fall towards the existing catchbasin immediately West of the building where quantity and quality control will be maintained.

4.3 Stormwater Quantity Control

As the site is currently fully paved, there will be no increase in stormwater quantities from the development of this site. There is currently a catch basin west of the site that the site drainage currently drains to. Proposed conditions are to match existing conditions with a small decrease in quantity due to landscape areas around the proposed building. The existing impervious area in the development boundary is 1630 m². while the proposed impervious area after construction of the proposed building will be 1432 m².

Blue Mountain Center
October 31, 2019

4.4 Stormwater Quality Control

There is currently an oil grit separator to the West of the existing Galaxy Cinema that has been sized for the existing conditions. Runoff quality should remain the same or improve. Therefore, there is no need for additional stormwater quality controls to be implemented.

4.5 Sediment and Erosion Control

Sediment and erosion control is not anticipated to be a major concern for this already developed site. During the construction phase, mitigation of erosion and sediment movement off site will be very important. The following measures shall be employed to ensure the appropriate degree of protection:

- Silt fences shall be installed along the south east perimeter of the site as per OPSD 219.130.
- An inlet sediment control device is to be installed in the catch basin west of the proposed development (see Drawing C102 for detail).

5.0 Potable Water Supply & Fire Suppression

The surrounding area, predominantly commercial, obtains water from the municipal supply. For the proposed development site, the property will tie-in to the existing 200 mm diameter water supply that is present on the property, north of the proposed development. A 50 mm diameter copper water service connection will be installed to service the site, with a separate water meter installed at the proposed building.

5.1 Fire Flows

From the Town of Collingwood Design Standards, the following fire flow requirements will apply for a downtown commercial development:

- Minimum 136 l/sec (1800 gpm) @ 138 kPa residual (20 psi).
- Preferred 189 l/sec (2500 gpm) @ 138 kPa residual (20 psi).

The nearest fire hydrant is proposed to be located at the north end of the proposed parking lot, within the development site. The distance from the furthest corner of the building is approximately 43 m. This fire hydrant will be used for fire flows for the proposed development.

Blue Mountain Center
October 31, 2019

5.2 Water Demand

Peak water demands were calculated based on assumed water fixtures for the site and conversions were calculated using ASHRAE Fundamentals. The following fixtures were assumed:

- 2 x tank type water closets (toilets)
- 2 x Lavatories
- 1 x Kitchen Sink
- 1 x ½ inch hose bib

As per Part 7 of the Ontario Building Code (OBC), the peak demand rate for the proposed development, not including fire flows, will be 0.55 L/s. Including fire flows, the preferred demand rate will be 189.55 L/s.

See Appendix A – “Water Demand Calculations” for calculations.

6.0 Sanitary Servicing

The property is currently serviced by a 200 mm dia. PVC service off of Balsam Street. This service currently runs through the portion of the site that is being developed. The existing service will be removed and a new one installed to the north of the proposed building to eliminate conflict. The proposed sanitary service will then connect back into the existing run of sanitary sewer just east of the proposed building.

6.1 Estimated Wastewater Flows

For design purposes it is assumed the site will include 2 tank type water closets (toilets), 2 lavatories, and 1 kitchen sink.

Based on information from the Ontario Building Code, infiltration, and the above flow inputs, the estimated peak flows were calculated to be 1.55 L/s. See Appendix B – “Sanitary Flow Calculations”.

7.0 Grading

The development site has been minimally graded in a manner that matches the existing conditions of the site and ensures sufficient drainage of the development. The key objectives in grading consist of the following:

- Providing adequate slopes to ensure positive drainage away from the building.
- Maintaining existing drainage patterns.

Blue Mountain Center
October 31, 2019

8.0 Ancillary Utilities

At the proposed development site, there is access to both hydro and telephone. Permission to utilize these utilities will be obtained.

9.0 Conclusions

This Functional Servicing and Stormwater Management Brief has demonstrated how the additional development to the Blue Mountain Center can be serviced.

The findings are summarized below:

- The site will be serviced in accordance with Town of Collingwood design criteria.
- The proposed commercial development can be developed using connections to existing services on site.
- The recommended sanitary sewer discharge point is into the existing sanitary sewer just east of the proposed building.
- The recommended potable water connection is from the existing 200 mm diameter water supply running just North of the proposed building.
- The site can be graded to be compatible with adjacent lands and existing roads and entrances.
- Stormwater quantity control is not an issue as the impervious area on site is reduced as a function of the proposed landscaped areas surrounding the proposed building.
- Stormwater quality control will be achieved through the use of the existing oil grit separator



BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix A

Water Demand Calculations

Project: Blue Mountain Center
Water Demand Calculations

Prepared by:	A. O'Donnell
Checked by:	C. Scobie
Project No:	300044364
Date	Oct. 30, 2019
Updated:	

Domestic Demand

Fixture Units = 12.3 (See "Mechanical Design Calculations" For Fixture Count)
Peak Flow = 8.7 usgpm
Peak Flow = 0.55 L/s

Fire Flow

Minimum = 136 L/s (From Town of Collingwood Design Standards)
Preferred = 189 L/s
Fire Flow = 189.00 L/s

Total Peak Flow = 189.55 L/s

Mechanical Design Calculations

A1. DETERMINING TOTAL NUMBER OF FIXTURE UNITS

Date:	Oct. 30, 2019
Project #:	300044364, Blue Mountain Center

Anything highlighted yellow, please read before designing

Two methods of determining total fixture units are listed below. The first, "WATER DEMAND", will be used on small general projects such as commercial buildings, houses and offices to determine both hot, cold and total demand. The second listed below, "WATER DEMAND - HOT WATER - SPECIALTY PROJECTS", will be used when designing high hot water load projects such as hospitals, high rise buildings etc. (The first method will still be used to determine cold water and total load)

WATER DEMAND

1A. Water Demand For PUBLIC / COMMERCIAL Occupancy (Table 7.6.3.2.A.)

Notes: Values in blue are to be entered. Values in red are not to be modified. Values in black will change according to the calculations.

ITEM	TYPE	# OF FIXTURES	Min. Size of Supply Pipe, in.	FIXTURE UNITS - COLD	FIXTURE UNITS - HOT	TOTAL FIXTURE UNITS	HOT TOTAL, FU's	COLD TOTAL, FU's	TOTAL DEMAND, FU's	
Bathroom Group	Flush Tank with 6 LPF	-	N/A	-	-	-	-	-	-	
	Flush Tank with greater than 6 LPF	-	N/A	-	-	-	-	-	-	
	With more than 3 fixtures	-	N/A	-	-	-	-	-	-	
Bath tub	(with or without shower)	0	1/2	3.0	3.0	4.0	0.00	0.00	0.00	
	with 3/4 in. spout	0	3/4	7.5	7.5	10.0	0.00	0.00	0.00	
Bedpan Washer		0	1	7.5	7.5	10.0	0.00	0.00	0.00	
Bidet		-	3/8	-	-	-	-	-	-	-----> Bidet fixture units not available for Public use
Clothes Washer	3.5 kg (7 lbs, 11 oz)	0	1/2	2.25	2.25	3.0	0.00	0.00	0.00	
	6.8 kg (15 lbs)	0	1/2	3.00	3.00	4.0	0.00	0.00	0.00	
	Commercial	-	N/A	-	-	-	-	-	-	-----> Refer to Note 5
Dental Lavatory		0	3/8	1.5	1.5	2.0	0.00	0.00	0.00	
Dental Unit, Cuspidor		0	3/8	1.0	-	1.0	-	0.00	0.00	
Dishwasher	Commercial	-	N/A	-	-	-	-	-	-	-----> Refer to Note 5
	Domestic	-	3/8	-	-	-	-	-	-	
Drinking Fountain or Water Cooler		0	3/8	0.25	-	0.25	-	0.00	0.00	
Hose Bibb	with 1/2 supply	1	1/2	2.5	-	2.5	-	2.50	2.50	
	with 3/4 supply	0	3/4	6.0	-	6.0	-	0.00	0.00	
	combination hot and cold with 1/2 supply	0	1/2	1.9	1.9	2.5	0.00	0.00	0.00	
Lavatory	8.3 L/min or less	2	3/8	1.5	1.5	2.0	3.00	3.00	4.00	
	greater than 8.3 L/min	0	3/8	1.5	1.5	2.0	0.00	0.00	0.00	
Shower	Shower Head, 9.5 L/min or less per head	0	1/2	3.0	3.0	4.0	0.00	0.00	0.00	
	Shower Head, greater than 9.5 L/min per head	0	1/2	3.0	3.0	4.0	0.00	0.00	0.00	
	Shower, spray, multi-head, fixture unit per head	0	N/A	3.0	3.0	4.0	0.00	0.00	0.00	-----> Refer to Manufacturers recommendations for min. s
Sink	Sink, Bar	0	3/8	1.5	1.5	2.0	0.00	0.00	0.00	
	Sink, Clinic service faucet	0	1/2	2.25	2.25	3.0	0.00	0.00	0.00	
	Sink, Clinic service with direct flush valve	0	1	6.0	-	6.0	-	0.00	0.00	
	Sink, kitchen, commercial, per faucet	0	1/2	3.00	3.00	4.0	0.00	0.00	0.00	
	Sink, kitchen, domestic, 8.3 L/min or less	1	3/8	1.00	1.00	1.4	1.00	1.00	1.40	
	Sink, kitchen, domestic, greater than 8.3 L/min	0	3/8	1.50	1.50	2.0	0.00	0.00	0.00	
	Sink, laboratory	0	3/8	1.50	1.50	2.0	0.00	0.00	0.00	
	Sink, laundry (1 or 2 compartments)	0	3/8	1.00	1.00	1.4	0.00	0.00	0.00	
	Sink, service or mop basin	0	1/2	2.25	2.25	3.0	0.00	0.00	0.00	
	Sink, washup, per faucet	0	1/2	1.50	1.50	2.0	0.00	0.00	0.00	
Urinal	Urinal, with direct flush valve	-	3/4	-	-	-	-	-	-	-----> Refer to and input numbers into "Sizing of Water Distribution Systems for Urinals with Direct Flush Valves, Table 7.6.3.2.B."
	Urinal, with flush tank	0	3/8	3.0	-	3.0	-	0.00	0.00	
	Urinal, with self-closing metering valve	0	1/2	4.0	-	4.0	-	0.00	0.00	
Water Closet	Water Closet, 6 LPF or less with flush tank	2	3/8	2.2	-	2.2	-	4.40	4.40	
	Water Closet, greater than 6 LPF with flush tank	0	3/8	5.0	-	5.0	-	0.00	0.00	
	Water Closet, with direct flush valve	-	1	-	-	-	-	-	-	-----> 12
8.3L/min = 2.19 gpm										
Total:		6				TOTAL	4.00	10.90	12.30	

1B. Water Demand For PRIVATE Occupancy (Table 7.6.3.2.A.)

ITEM	TYPE	# OF FIXTURES	Min. Size of Supply Pipe, in.	FIXTURE UNITS - COLD	FIXTURE UNITS - HOT	TOTAL FIXTURE UNITS	HOT TOTAL, FU's	COLD TOTAL, FU's	TOTAL DEMAND, FU's	
Bathroom Group	Flush Tank with 6 LPF	0	N/A	2.7	1.5	3.6	0.00	0.00	0.00	-----> Refer to Note 3
	Flush Tank with greater than 6 LPF	0	N/A	4.0	3.0	6.0	0.00	0.00	0.00	-----> Refer to Note 3
	With more than 3 fixtures	-	N/A	-	-	-	-	-	-	-----> Refer to Note 4
Bath tub	(with or without shower)	0	1/2	1.0	1.0	1.4	0.00	0.00	0.00	
	with 3/4 in. spout	0	3/4	7.5	7.5	10.0	0.00	0.00	0.00	
Bedpan Washer		-	1	-	-	-	-	-	-	
Bidet		0	3/8	1.5	1.5	2.0	0.00	0.00	0.00	
Clothes Washer	3.5 kg (7 lbs, 11 oz)	0	1/2	1.00	1.00	1.4	0.00	0.00	0.00	
	6.8 kg (15 lbs)	-	1/2	-	-	-	-	-	-	
Dental Lavatory	Commercial	-	N/A	-	-	-	-	-	-	-----> Refer to Note 5
		-	3/8	-	-	-	-	-	-	
Dental Unit, Cuspidor		-	3/8	-	-	-	-	-	-	
Dishwasher	Commercial	-	N/A	-	-	-	-	-	-	-----> Refer to Note 5
	Domestic	0	3/8	-	1.4	1.4	0.00	-	0.00	
Drinking Fountain or Water Cooler		-	3/8	-	-	-	-	-	-	
Hose Bibb	with 1/2 supply	0	1/2	2.5	-	2.5	-	0.00	0.00	
	with 3/4 supply	0	3/4	3.0	-	3.0	-	0.00	0.00	
	combination hot and cold with 1/2 supply	0	1/2	1.9	1.9	2.5	0.00	0.00	0.00	
Lavatory	8.3 L/min or less	0	3/8	0.5	0.5	0.7	0.00	0.00	0.00	
	greater than 8.3 L/min	0	3/8	0.8	0.8	1.0	0.00	0.00	0.00	
Shower	Shower Head, 9.5 L/min or less per head	0	1/2	1.0	1.0	1.4	0.00	0.00	0.00	
	Shower Head, greater than 9.5 L/min per head	0	1/2	1.5	1.5	2.0	0.00	0.00	0.00	
	Shower, spray, multi-head, fixture unit per head	0	N/A	1.0	1.0	1.4	0.00	0.00	0.00	-----> Refer to Manufacturers recommendations for min. size of supply pipe
Sink	Sink, Bar	0	3/8	0.8	0.8	1.0	0.00	0.00	0.00	
	Sink, Clinic service faucet	-	1/2	-	-	-	-	-	-	
	Sink, Clinic service with direct flush valve	-	1	-	-	-	-	-	-	
	Sink, kitchen, commercial, per faucet	-	1/2	-	-	-	-	-	-	
	Sink, kitchen, domestic, 8.3 L/min or less	0	3/8	1.00	1.00	1.4	0.00	0.00	0.00	
	Sink, kitchen, domestic, greater than 8.3 L/min	0	3/8	1.50	1.50	2.0	0.00	0.00	0.00	
	Sink, laboratory	-	3/8	-	-	-	-	-	-	
	Sink, laundry (1 or 2 compartments)	0	3/8	1.00	1.00	1.4	0.00	0.00	0.00	
	Sink, service or mop basin	-	1/2	-	-	-	-	-	-	
	Sink, washup, per faucet	-	1/2	-	-	-	-	-	-	
Urinal	Urinal, with direct flush valve	-	3/4	-	-	-	-	-	-	-----> Refer to and input numbers into "Sizing of Water Distribution Systems for Urinals with Direct Flush Valves, Table 7.6.3.2.B below."
	Urinal, with flush tank	0	3/8	3.0	-	3.0	-	0.00	0.00	
	Urinal, with self-closing metering valve	0	1/2	2.0	-	2.0	-	0.00	0.00	
Water Closet	Water Closet, 6 LPF or less with flush tank	0	3/8	2.2	-	2.2	-	0.00	0.00	
	Water Closet, greater than 6 LPF with flush tank	0	3/8	3.0	-	3.0	-	0.00	0.00	
	Water Closet, with direct flush valve	-	1	-	-	-	-	-	-	-----> Refer to and input numbers into "Sizing of Water Distribution Systems for Water Closets with Direct Flush Valves, Table 7.6.3.2.C."
		0				TOTAL	0.00	0.00	0.00	

Notes:

- 1) The fixture unit values in the above tables are not applicable in certain assembly occupancies because of surges in use by the occupants. For such occupancies, refer to specific design information. (Table 7.6.3.2.A, note 1)
- 2) For fixtures not indicated in this Table, refer to Table 7.6.3.2.D. (Table 7.6.3.2.A, note 2)
- 3) Bathroom group is based on 1/2 in. size bathtub supply pipe. (Table 7.6.3.2.A, note 3), Bathroom group means a group of plumbing fixtures installed in the same room, consisting of one domestic-type lavatory, one water closet and either one bathtub, with or without a shower, or one one-headed shower. (Division A - Part 1 defined terms)
- 4) Add additional fixture to the fixture load for bathroom group. (Table 7.6.3.2.A., note 4)
- 5) Refer to the manufacturer's recommendations. (Table 7.6.3.2.A., note 5)
- 6) For fixture unit values for fixtures with direct flush valves, see Sentence 7.6.3.2.(4) and Tables 7.6.3.2.B. and 7.6.3.2.C. (Table 7.6.3.2.A, note 6)

2. Sizing of Water Distribution Systems for URINALS with DIRECT FLUSH VALVES (PUBLIC / COMMERCIAL / PRIVATE Occupancy) (Table 7.6.3.2.B.)

Enter any value in "# of fixtures based on number of valves" to get appropriate fixture units (i.e. if there are 5 urinals put an 'x' in the row for 5 'number of valve:

ITEM	Number of valves	# OF FIXTURES BASED ON NUMBER OF VALVES	Min. Size of Supply Pipe, in.	INDIVIDUAL FIXTURE UNITS ASSIGNED IN DECREASING VALUES	FIXTURE UNITS IN ACCUMULATIVE VALUES	TOTAL DEMAND, FU's
Urinal	1	0	3/4	20.0	20.00	0.00
	2	0	3/4	15.0	35.00	0.00
	3	0	3/4	10.0	45.00	0.00
	4	0	3/4	8.0	53.00	0.00
	5	0	3/4	5.0	58.00	0.00
	6	0	3/4	5.0	63.00	0.00
	7	0	3/4	5.0	68.00	0.00
	8	0	3/4	5.0	73.00	0.00
	9	0	3/4	5.0	78.00	0.00
	10	0	3/4	5.0	83.00	0.00
	11	0	3/4	5.0	88.00	0.00
	12	0	3/4	5.0	93.00	0.00
	13	0	3/4	5.0	98.00	0.00
	14	0	3/4	5.0	103.00	0.00
	15	0	3/4	5.0	108.00	0.00
		0		This Column is for reference only and the total demand will be calculated by entering the number of fixtures.	TOTAL	0.00

When 5 or more valves are selected the "individual fixture units assigned in decreasing values" will be 5 each and the fixture units in accumulative value will be plus 5 for each additional fixture in excess of 5

Notes:

1) The accumulative fixture unit values are the total values to be used in conjunction with Table 7.6.3.2.A. (Table 7.6.3.2.B., note 1)

3A. Sizing of Water Distribution Systems for WATER CLOSETS with DIRECT FLUSH VALVES (PUBLIC / COMMERCIAL Occupancy) (Table 7.6.3.2.C.)

Enter any value in "# of fixtures based on number of valves" to get appropriate fixture units (i.e. if there are 5 urinals put an 'x' in the row for 5 'number of valve:

ITEM	Number of valves	# OF FIXTURES BASED ON NUMBER OF VALVES	Min. Size of Supply Pipe, in.	INDIVIDUAL FIXTURE UNITS ASSIGNED IN DECREASING VALUES	FIXTURE UNITS IN ACCUMULATIVE VALUES	TOTAL DEMAND, FU's
Water Closets	1	0	1	40.0	40.00	0.00
	2	0	1	30.0	70.00	0.00
	3	0	1	20.0	90.00	0.00
	4	0	1	15.0	105.00	0.00
	5	0	1	10.0	115.00	0.00
	6	0	1	10.0	125.00	0.00
	7	0	1	10.0	135.00	0.00
	8	0	1	10.0	145.00	0.00
	9	0	1	10.0	155.00	0.00
	10	0	1	10.0	165.00	0.00
	11	0	1	10.0	175.00	0.00
	12	0	1	10.0	185.00	0.00
	13	0	1	10.0	195.00	0.00
	14	0	1	10.0	205.00	0.00
	15	0	1	10.0	215.00	0.00
		0		This Column is for reference only and the total demand will be calculated by entering the number of fixtures.	TOTAL	0.00

When 5 or more valves are selected the "individual fixture units assigned in decreasing values" will be 10 each and the fixture units in accumulative value will be plus 10 for each additional fixture in excess of 5

Notes:

1) The accumulative fixture unit values are the total values to be used in conjunction with Table 7.6.3.2.A. (Table 7.6.3.2.C., note 1)

3B. Sizing of Water Distribution Systems for WATER CLOSETS with DIRECT FLUSH VALVES (PRIVATE Occupancy) (Table 7.6.3.2.C.)

Enter any value in "# of fixtures based on number of valves" to get appropriate fixture units (i.e. if there are 5 urinals put an 'x' in the row for 5 number of valve:

ITEM	Number of valves	# OF FIXTURES	Min. Size of Supply Pipe,	INDIVIDUAL FIXTURE UNITS ASSIGNED IN DECREASING VALUES	FIXTURE UNITS IN ACCUMULATIVE VALUES	TOTAL DEMAND, FU's
Water Closet	1	0	1	40.0	40.00	0.00
	2	0	1	30.0	70.00	0.00
	3	0	1	20.0	90.00	0.00
	4	0	1	15.0	105.00	0.00
	5	0	1	6.0	111.00	0.00
	6	0	1	6.0	117.00	0.00
	7	0	1	6.0	123.00	0.00
	8	0	1	6.0	129.00	0.00
	9	0	1	6.0	135.00	0.00
	10	0	1	6.0	141.00	0.00
	11	0	1	6.0	147.00	0.00
	12	0	1	6.0	153.00	0.00
	13	0	1	6.0	159.00	0.00
	14	0	1	6.0	165.00	0.00
	15	0	1	6.0	171.00	0.00
0				TOTAL		0.00

This Column is for reference only and the total demand will be calculated by entering the number of fixtures.

When 5 or more valves are selected the "individual fixture units assigned in decreasing values" will be 6 each and the fixture units in accumulative value will be plus 6 for each additional fixture in excess of 5

Notes:
1) The accumulative fixture unit values are the total values to be used in conjunction with Table 7.6.3.2.A. (Table 7.6.3.2.C., note 1)

4A. Hydraulic Loads of Fixtures Not Listed in Table 7.6.3.2.A. (Additional Water Demand for PUBLIC Occupancy) (Table 7.6.3.2.D.)

ITEM	TYPE	Min. Size of Supply Pipe, in.	# OF FIXTURES	FIXTURE UNITS	HOT TOTAL, FU's	COLD TOTAL, FU's	TOTAL DEMAND, FU's
General Water Demand	The following are general values for use when specific fixtures are not listed in this chart.	3/8	0	2.0	0.00	0.00	0.00
		1/2	0	4.0	0.00	0.00	0.00
		3/4	0	6.0	0.00	0.00	0.00
		1	0	10.0	0.00	0.00	0.00
TOTAL					0.00	0.00	0.00

IF THE PLUMBING FIXTURE BEING ENTERED HAS BOTH HOT AND COLD WATER, THE TOTALS MUST BE ADDED TO THE OVERALL TOTAL FOR HOT AND COLD WATER IN CELLS E243 AND E244

4B. Hydraulic Loads of Fixtures Not Listed in Table 7.6.3.2.A. (Additional Water Demand for PRIVATE Occupancy) (Table 7.6.3.2.D.)

ITEM	TYPE	Min. Size of Supply Pipe, in.	# OF FIXTURES	FIXTURE UNITS	HOT TOTAL, FU's	COLD TOTAL, FU's	TOTAL DEMAND, FU's
General Water Demand	The following are general values for use when specific fixtures are not listed in this chart.	3/8	0	1.0	0.00	0.00	0.00
		1/2	0	2.0	0.00	0.00	0.00
		3/4	0	3.0	0.00	0.00	0.00
		1	0	6.0	0.00	0.00	0.00
						TOTAL	0.00

IF THE PLUMBING FIXTURE BEING ENTERED HAS BOTH HOT AND COLD WATER, THE TOTALS MUST BE ADDED TO THE OVERALL TOTAL FOR HOT AND COLD WATER IN CELLS E243 AND E244

References: ASHRAE Fundamentals, 2009, Ch.22 - Pipe Sizing - Table 13 (Demand Weights of Fixtures in Fixture Units)(OBC values are to be used)
OBC 2014, Tables 7.6.3.2.A, 7.6.3.2.B, 7.6.3.2.C & 7.6.3.2.D

Summary

Maximum Hot Fixture Units	4.00
Maximum Cold Fixture Units	10.90
TOTAL DEMAND	12.30



BURNSIDE

[THE DIFFERENCE IS OUR PEOPLE]

Appendix B

Sanitary Flow Calculations

Appendix B

Project: Blue Mountain Center
Sanitary Flow Calculations

Prepared by:	A.O'Donnell
Checked by:	C. Scobie
Project No:	300044364
Date	Oct. 30, 2019
Updated:	

Residential Sanitary Contribution

Minimum Slope = 1.00%
Fixtures = 12.5 (See A2 - Determining
Total Number of Fixture
Units)
Flow = 24 usgpm
Flow = 1.51 L/s

Infiltration

Infiltration Allowance = 0.23 L/ha/s
Total Site Area = 0.19 ha
Infiltration = 0.04 L/s

Total Peak Flow = 1.55 L/s

A2. DETERMINING TOTAL NUMBER OF FIXTURE UNITS

Project: Blue Mountain Center
 Project Number: 300044364

DRAINAGE

Anything highlighted yellow, please read before designing

1. Water Drainage for Public/Commercial/Private Occupancy (Table 7.4.9.3, Min. Permitted Size of Fixture Outlet Pipe and Hydraulic Loads for Fixtures)

Notes: Values in blue are to be entered. Values in red are not to be modified. Values in black will change according to the calculations.
 If there is a blue value in the "Trap Size" column, the size of the trap must be entered as the fixture units are dependent upon this.

ITEM	TYPE	Supply Control	# OF FIXTURES	TRAP SIZE (in) (if applicable)	Min. Size of Fixture Outlet Pipe (in)	FIXTURE UNITS	TOTALS
Autopsy table			0		1.5	2.0	0.0
Bathroom Group		Flush Tank	0		N/A	6.0	0.0
		Direct Flush Valve	0		N/A	8.0	0.0
Bath tub	(with or without shower)		0		1.5	1.5	0.0
Bath	Foot, Sitz or Slab		0		1.5	1.5	0.0
Bed Pan Washer			0		3	6.0	0.0
Beer Cabinet			0		1.5	1.5	0.0
Bidet			0		1.25	1.0	0.0
Chinese Range			0		1.5	3.0	0.0
Clothes Washer	Domestic		0	0	N/A	0.0	0.0
	Commercial		0	0	N/A	0.0	0.0
Cup Sinks			0		1.25	2.0	0.0
Dental Unit or Cuspidor			0		1.25	1.0	0.0
Dishwasher	Domestic		0		1.5	1.0	0.0
	<i>is connected to garbage grinder or domestic sink? Enter "0" for "NO". "1" for "YES":</i> 0						
	Commercial Type		0		2	3.0	0.0
Drinking Fountain			0		1.25	2.0	0.0
Fish Tank or Tray			0		1.5	1.5	0.0
Floor Drain			0	0	N/A	0.0	0.0
Garbage Grinder	Commercial Type		0		2	3.0	0.0
Icebox			0		1.25	1.0	0.0
Laundry Tray	Single or Double units or 2 Single units with Common Trap		0		1.5	1.5	0.0
	3 Compartments		0		1.5	2.0	0.0
Lavatory	Barber or Beauty Parlor		0		1.5	1.5	0.0
	Dental		0		1.25	1.0	0.0
	Domestic type single or 2 single with common trap		0	Min. 1.25	1.25	1.0	0.0
	Multiple or industrial type		2	Min. 1.5	1.5	1.5	3.0
			0		1.5	3.0	0.0
Macerating Toilet System	For Single Bathroom		0	*not less than 0.75	0.75	4.0	0.0
Potato Peeler			0		2	3.0	0.0
Shower Drain	From 1 Head		0	Min. 1.5	1.5	1.5	0.0
	From 2 or 3 Heads		0	Min. 2	2	3.0	0.0
	From 4 to 6 Heads		0	Min. 3	3	6.0	0.0
Sink	Domestic and other small type with or without garbage grinders, single, double or 2 single with a common trap		0		1.5	1.5	0.0
	Other Sinks		1	1.5	N/A	1.5	1.5
Urinal	Pedestal, Siphon Jet or Blowout Type		0		2	4.0	0.0
	Stall, Washout Type		0		2	2.0	0.0
	Wall	Washout Type	0		1.5	1.5	0.0
		Other Types	0		2	3.0	0.0
Water Closet		Flush Tank	2		3	4.0	8.0
		Direct Flush	0		3	6.0	0.0
TOTAL:							12.5

2. Additional Water Drainage for Public/Commercial/Private Occupancy (Table 7.4.10.2, Permitted Hydraulic Load from a Fixture Based on Size of Trap)

ITEM	TYPE	Supply Control/Name of Fixture	# OF FIXTURES	TRAP SIZE (in) (if applicable)	FIXTURE UNITS	TOTALS
General Drainage	The following are general values for use when specific fixtures are not listed in Table 7.4.9.3. Each is dependent only on trap size.		0	1.25	1.0	0.0
			0	1.50	2.0	0.0
			0	2.00	3.0	0.0
			0	2.50	4.0	0.0
			0	3.00	5.0	0.0
			0	4.00	6.0	0.0
TOTAL:						0.0

3. Additional Water Drainage for Public/Commercial/Private Occupancy (Table 7.4.10.3, Max. Permitted Hydraulic Load from Fixtures with Semi-continuous Flows)

ITEM	TYPE	Supply Control/Name of Fixture	# OF FIXTURES	TRAP SIZE (in) (if applicable)	FIXTURE UNITS	FLOW, L/s	TOTALS
General Drainage	The following are general values for use when specific fixtures are not listed in Table 7.4.9.3. Each is dependent on a semi-continuous flow.		0	1.50	3.0	0.00 - 0.090	0.0
			0	2.00	6.0	0.091 - 0.190	0.0
			0	3.00	27.0	0.191 - 0.850	0.0
			0	4.00	180.0	0.851 - 5.700	0.0
TOTAL:							0.0

4. Additional Water Drainage for Public/Commercial/Private Occupancy (Items 7.4.10.3 (1) & (2))

ITEM	TYPE	Supply Control/Name of Fixture	FLOW (L/s)	FIXTURE UNITS	TOTALS
General Drainage	The following are general values for use when specific fixtures are not listed in Table 7.4.9.3. Each is dependent on a continuous flow fixture such as a pump or an air-conditioning fixture. Review Note 1		0	31.7	0.0
Note 1: The hydraulic load from a fixture that produces a continuous flow, such as a pump or an air-conditioning fixture, 31.7 fixture units for each litre per second of flow (OBC 2014 7.4.10.3 (1))					TOTAL: 0.0

Fixture or Equipment that drains to a storm drainage system

Note: Where a fixture or equipment that produces a continuous or semi-continuous flow drains to a storm drainage system, the hydraulic load from the fixture is 900 litres for each litre per second of flow.

References: OBC 2014, Tables 7.4.9.3, 7.4.10.2 and 7.4.10.3

Summary

Total Drainage Fixture Units	12.5
------------------------------	------