Functional Servicing Report
Dave and Donna Latchford

# 226/228 Main Street East – Town of Grimsby

Prepared for Dave and Donna Latchford
by IBI Group

January 14, 2019

# Contents



# Figures



# Appendices

# 1 Introduction

IBI Group has been retained by Dave and Donna Latchford to prepare a functional servicing report in support of the proposed residential development at the above noted address. This report outlines the proposed infrastructure to service the new development. Please refer to **Figure 1.1** below for the location of the proposed development.

The proposed development is an 8 lot residential development. The site development area is approximately 0.38ha and will be developed for the purpose of creating additional residential lots.


(Source: 2018 Google)

**Figure 1.1: Project Location**

# 2 Existing Site Conditions

The property has an area of approximately 0.38 ha of which includes an existing residential house with a separate garage. The remainder of the properly is vacant green space. The property is bordered by Main Street East to the north and residential developments to the east, west, and south. The lands are generally sloped from the south to north towards Main Street East.

## 2.1 Roads

The site fronts on Main Street East. The property currently has site access via the north frontage along Main Street East.

## 2.2 Sidewalks

There is an existing municipal sidewalk that abuts the proposed site on the north frontage along Main Street East.

## 2.3 Sanitary Sewers

There is an existing 200mm sanitary sewer which increases to a 250mm sanitary sewer downstream, located along Main Street East.

## 2.4 Watermains

There is currently a 300mm watermain located along the north side of Main Street East. There are two hydrants, one located approximately 50m west of the development site, at 221 Main Street East and other located 50m east of the site, at 233 Main Street East.

## 2.5 Storm Sewers

There are no existing municipal storm sewers available along the site frontage on Main Street East. However, there is a 1650mm storm sewer located approximately 180m west of the site conveyed west. Furthermore there is also a 600mm storm sewer approximately 80m west of the site with an inlet on Main Street East which conveys runoff north.

## 2.6 Grading

The lands are generally flat, sloping from 1.0% to 2.5%. The majority of the site storm water runoff from the site is conveyed overland and outlets north towards Main Street East.

## 2.7 Utilities

The subject lands are in a developed residential area. Gas, electricity, overhead telephone, and cable services are present.

# 3 Proposed Development

The proposed development consists of 8 single family dwellings with a private road off Main Street East. A concept showing the layout of the proposed developments is provided in **Appendix A**.

# 4 Proposed Conditions

The proposed development site plan application requires a review of the grading, drainage, sewers, water, and the provision for other utilities. A review of each of these components is provided to determine the general design requirements for the detailed engineering submission.

## 4.1 Roads

The proposed development will be accessed by a private roadway connecting to Main Street East.

## 4.2 Grading

The proposed grading will maintain positive drainage away from houses, toward the proposed private road, which will then be conveyed through a storm sewer and ultimately into the municipal storm water network.

## 4.3 Sanitary Sewers

Analysis has been completed to demonstrate that the proposed development will produce a peak sanitary flow of **1.08 L/s**; refer to **Appendix B** for waste water demand calculations. The proposed development will outlet to the existing 200mm sanitary sewer on Main Street East.

## 4.4 Watermains

Based on quantities of fixtures for the proposed development we estimate a maximum domestic flow of **2.3 L/s**; see **Appendix C** for water demand calculations.

Hydrant flow testing was performed on the hydrant on the North side of Main Street East, approximately 50m east of the site, in front of house 233 Main Street East at 9:00am on September 5, 2018. The results indicated a theoretical available flow at 20psi of **353 L/s** (**5599 gal(US)/min**), see **Appendix D** for results.

Using the method outlined in the Fire Underwriters Survey, Part II, we analyzed the required fire flow for the wood framed dwellings. It was determined that the maximum fire flow requirement for this scenario was **166.7 L/s (2642 gal(US)/min)**; see **Appendix C** for calculations. As the maximum anticipated fire flow and peak domestic flow is less than theoretical hydrant flow obtained from Jackson Waterworks, the development can be adequately supplied with fire flow protection for a ground hydrant.

## 4.5 Storm Water Drainage and Management

There are two possible alternatives for how stormwater management can be addressed for the proposed development. For the sake of this report, preliminary analysis was done on each of the scenarios to confirm that the Town standards can be met for either of the alternatives. At a future detailed submission, the preferred strategy will selected and a full storm water management report will be provided. The alternatives discussed with the Town and both seen as viable options. As Main Street East is a Regional road, these options will need to be discussed with the region. At the time of this submission, we have made attempts to but have not yet reviewed the proposed alternatives with Niagara Region engineering staff. Below is a brief summary of the possible options.

Under the existing site conditions, storm water runoff is directed towards Main Street East where it is then conveyed overland towards the 600mm storm sewer mentioned in **Section 2.5**. One alternative is to extend a sewer from the existing 600mm storm sewer to the frontage of the development lands to allow the pre-development site storm runoff path to be maintained. Under this alternative, stormwater quantity control is required to control post-development peak release rates to match pre-development rates. Preliminary analysis was done which confirm that this condition can be met with stormwater detention tank with an approximate storage volume of 70cu.m to be controlled by an orifice plate on the outlet.

The second alternative is to extend a sewer from the 1650mm storm sewer to the frontage of the development lands to allow site runoff to be conveyed into the system as previously designed. Although the pre-development runoff conditions are as mentioned above, the subject lands were accounted for in the design of the 1650mm storm sewer (mentioned in **Section 2.5**) as outlined in the storm drainage area plan (part of the Stormwater Management Plan, Dorchester Estates, Phase 1 (Revised) by Philips Planning and Engineering Ltd, June, 1995). The plan indicates that the sewer was designed to receive runoff from the subject lands under 35% impervious site conditions. In order to convey site runoff to this system, on-site stormwater quantity control is required to control runoff to match runoff conditions for the site lands at 35% impervious. Preliminary modeling was done which indicates that the site runoff under the proposed development condition can be controlled with detention tank with 45cu.m of storage volume controlled by an orifice control plate at the site outlet.

With either of the above mentioned options, stormwater quality control will also be required. A detailed design to meet the Town's quality control criteria will be provided at a future detailed submission, however the quality requirements can be met with pre-treatment of the storm water though swales, inline treatment and an OGS unit. Low impact development design alternatives will be reviewed and implemented where possible.

## 4.6 Overland flow

The site's overland flow route will be towards the privately owned road and conveyed to Main Street East.

## 4.7 Utilities

It is anticipated that gas, electricity, overhead telephone, and cable are available and will be installed for the proposed development.

# 5 Conclusion

Based on the components reviewed in this Functional Servicing Report, we recommend that the Town of Grimsby accept this report as a review of the required servicing, storm water management, and utility requirements indicating that this development is currently serviceable according to all current design standards.

We trust that this report sufficiently provides a review of the servicing requirements for this proposed development. However, should you have any questions or require additional information, please do not hesitate to contact us.

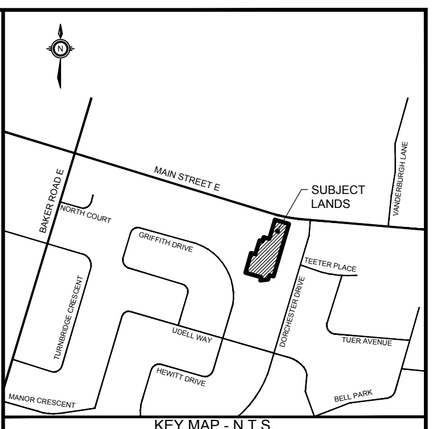
Respectfully submitted,
**IBI Group**


**Muaadh Solomah, EIT** **John Iezzi, P. Eng.**

# Appendix A

Preliminary Concept Plan

| ZONING DETAILS | | | | |
|---|---|---|---|---|
| PROPOSED ZONE | MAIN STREET (MS.50 - SITE SPECIFIC) ZONE | | | |
| PERMITTED USES | SINGLE DETACHED DWELLING | | | |
| PROVISIONS | | REQUIRED | PROVIDED | MODIFICATION |
| MIN. LOT AREA | LOT 1 | 650.0 m² | 640.5 m² | X |
| | LOT 2-8 | N/A | 347.7 m² | X |
| MIN. LOT FRONTAGE | LOT 1 | 18.0 m | 20.35 m | |
| | LOT 2-8 | N/A | 12.0 m | X |
| MIN. FRONT YARD | LOT 1 | 12.28 m | 11.96 m | X |
| | LOT 2-8 | N/A | 4.5 m | X |
| MIN. EXTERIOR SIDE YARD | LOT 1 | 6.0 m | 4.5 m | X |
| | LOT 2-8 | 6.0 m | 3.0 m | X |
| MIN. INTERIOR SIDE YARD | LOT 1 | 1.8 m | 4.5 m | X |
| | LOT 2-8 | 1.8 m | 1.55 m | X |
| MIN. REAR YARD | LOT 1 | 27.5 m | 1.5 m | X |
| | LOT 2-8 | N/A | 5.0 m | X |
| MAX. BUILDING DEPTH | LOT 1 | 20.0 m | 17.9 m | |
| | LOT 2-8 | 20.0 m | 20.8 m | X |
| MAX. BUILDING HEIGHT | | 9.0 m | PROVIDED | |
| GENERAL PROVISIONS | | | | |
| NUMBER OF PARKING SPACES PER UNIT | | 2 | 2 + 0.625 PER VISITOR | |
| PARKING SETBACK | | NO PARKING SPACE WITHIN 3.0 m OF A STREET LINE OR WITHIN ANY VISIBILITY TRIANGLE | PROVIDED | |
| PARKING SPACE DIMENSIONS | | 2.75 m X 5.75 m | PROVIDED | |
| AISLE WIDTH TWO-WAY TRAFFIC | | 6.0 m | 6.0 m | |




KEY MAP - N.T.S.

LEGEND

CONSTRUCTION NORTH

REGIONAL ROAD No. 81
MAIN STREET EAST

C/L of Asphalt
Edge of Asphalt
MH
S-MH
C
Concrete
Sidewalk
CO
High Voltage Service Box on Concrete Pad
CS
SIB
SSIB
IB
N72°15'00"W
27.74
6.40
BLOCK 10
(0.30 RESERVE)
N. W. Angle
LOT 3 CON. 2
Interlocking Brick
11.96
20.35
0.99
6.00
4.50
31.48
38.47
N17°51'30"E
LOT 1
DEVELOPABLE AREA
170m² (1,829ft²)
Subject to Easement as in INST. LT178349
PART 1
PLAN 30R-9241
PART 2
PLAN 30R-9241
CB
EXISTING RESIDENTIAL
FIRE ROUTE
1.55
LOT 2
DEVELOPABLE AREA
154m² (1,657ft²)
19.50
4.53
11.86
N70°51'30"W
0.89
R15.02
3.15
8.78
N19°05'00"E
4.63
N71°34'50"W
1.24
2.75
2.52
27.77
N19°20'15"E
LOT 4
CONCESSION 2
LOT 3
26.38
4.52
6.18
LOT 3
DEVELOPABLE AREA
142m² (1,528ft²)
12.00
N17°51'40"E
R28.47
30.50
8.89
8.65
LOT 4
DEVELOPABLE AREA
140m² (1,506ft²)
PART 72
PLAN 30R-8865
13.50
3.00
8.08
N74°34'45"W
1.70
R9.00
R12.00
8.44
N15°02'50"E
5.50
5.46
105.46
PART 3
PART 4
PART 5
PART 6
PART 7
PART 8
PART 10
PART 15
EXISTING RESIDENTIAL
13.34
13.00
13.46
4.50
LOT 8
DEVELOPABLE AREA
209m² (2,249ft²)
LOT 7
DEVELOPABLE AREA
201m² (2,163ft²)
LOT 6
DEVELOPABLE AREA
202m² (2,174ft²)
LOT 5
DEVELOPABLE AREA
130m² (1,399ft²)
31.36
31.42
33.54
22.57
19.37
5.01
30.74
N18°02'50"E
REG'D. PLAN 30M-236
BLOCK 81
PART 48
PLAN 30R-8865
N72°08'30"W
7.66
1.00
N17°34'20"E
8.94
2.00
N71°57'10"W
31.57
2.15
PART 47
PLAN 30R-8865
4.83
N17°51'30"E
N88°36'40"E
14.51
PART 46
PLAN 30R-8865
PART 45
PLAN 30R-8865
PART 5
PLAN 30R-9241
PART 6
PLAN 30R-9241
REGISTERED PLAN 30M-2375

NOT FOR CONSTRUCTION

SOURCE:
BASE INFORMATION PROVIDED BY KIRKUP MASCOE URE SURVEYING LTD., DATED DECEMBER 11, 2017.

BENCHMARK
ELEVATIONS ARE GEODETIC AND WERE DERIVED FROM BENCH MARK 0011963U3506, HAVING A PUBLISHED ELEVATION OF 97.088 METRES.

SCALE
3 1 0 2 4 8
1:200 (m)

| | |
|---|---|
| DESIGN BY: S.CHALMERS | CHECKED BY: J.ARIENS |
| DRAWN BY: S.CHALMERS | DATE: 2018-10-16 |

| # | DATE | BY | DESCRIPTION |
|---|---|---|---|
| 0 | 2018/10/16 | SC | FIRST ZONING BYLAW SUBMISSION |

DRAWING ISSUE RECORD

APPROVALS


**IBI GROUP**
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**ibigroup.com**


REGION OF
NIAGARA

CARRIDGE HOUSE LANE
226-228 MAIN STREET E.,
GRIMSBY, ON

SITE PLAN

FILE NUMBER: 115202
SHEET NUMBER: SP1


FILE:J:\115202_226_MainSt_Grm\5.9 Drawings\59pln\layouts\115202sp.dwg LAYOUT:36x24
LAST SAVED BY:Stephanie.chalmers, Monday, December 17, 2018 3:05:08 PM PLOTTED BY:Stephanie Chalmers Tuesday, December 18, 2018 9:33:53 AM

# Appendix B

Waste Water Demand Analysis

# Sanitary Flow Review

Project: 226/228 Main Street East
File No: 115202
Date: 12/13/2018
Sheet By: MS
Checked By: JI

**REQUIREMENT**
Design Flow = Average Dry Weather Flow X Average Peak Wastewater Flow Factor + Infiltration Allowance

***Maximum Daily Flow***

| | | | |
|---|---|---|---|
| | Site Area | 0.380 | ha |
| Building Type | Townhouses | | |
| Multi-unit residential building | 4-Bedroom Dwelling | 8 | |
| | Daily Design Sanitary Flow per 4-Bedroom Dwelling[1] | 2000 | L/Dwelling/day |
| | **Total** | **16000** | **L/day** |
| | Dry Weather Flow[2] = | 16000 | l/day |
| | = | 16.00 | $m^3$/day |
| | = | 0.185 | l/s |
| | Equivalent Population = | 44.44 | persons (at 360L/day/person[2]) |
| | Peaking Factor[2] = | 5 | |
| | Equivalent Population Density = | 117 | ppha |
| | Infiltration Allowance[2] = | 0.40 | L/s/ha |
| | = | 0.152 | L/s |
| | **Design Flow[2] =** | **1.08** | **L/s** |

Reference Material:
Ontario Building Code Part 8 - Table 8.2.1.3.A

# Appendix C

Water Demand Analysis

## Domestic Water Flow Review

Project: 226/228 Main Street East
File No: 115202
Date: 12/13/2018
Sheet By: MS
Checked By: JI

| Fixture (Private use unless otherwise stated) | Fixture Units per Fixture (OBC Table 7.6.3.2) | Number of dwellings | Proposed Quantity | Proposed Fixture Units |
|---|---|---|---|---|
| Bathroom Group with Flush Tank (Greater than 6 LPF Flush) | 6.0 | 8 | 24 | 144 |
| Private Use Domestic Clothes Washer (3.5 kg) | 1.4 | 8 | 8 | 11.2 |
| Dishwasher | 1.4 | 8 | 8 | 11.2 |
| Lavatory (Greater than 8.3 L/min) | 1.0 | 8 | 8 | 8 |
| Kitchen Sink (Greater than 8.3 L/min) | 2.0 | 8 | 8 | 16 |
| **Total** | | | | **231** |

Maximum Water Demand Proposed = 30.0 gpm Imperial (AWWA M22)
**= 2.3 L/s**

Notes:

Assuming 4 bedroom dwellings. To be confirmed at a further detailed submission

## Fire Flow Review

Project: 226/228 Main Street East
File No: 115202
Date: 13-Dec-18
Sheet By: MS
Checked By: JI

***Required Fire Flow***

Formula F = 220 * C √ A (Part II, Fire Underwriters Survey, 1999)

| Assumptions | DWELLING 2 | DWELLING 7 | |
|---|---|---|---|
| Subject Floor Area | 200.0 | 200.0 | $m^2$ |
| Floor Area Above | 0.0 | 0.0 | $m^2$ |
| Floor Area Below | 163.0 | 163.0 | $m^2$ |
| Shared Walls | 0 | 0 | ea. |
| North Separation* | 3.0 | 3.0 | m |
| North Adjustment | 25% | 25% | |
| East Separation* | 20.0 | 3.0 | m |
| East Adjustment | 15% | 25% | |
| South Separation* | 3.0 | 10.0 | m |
| South Adjustment | 25% | 20% | |
| West Separation* | 3.0 | 0.0 | m |
| West Adjustment | 25% | 0% | |
| Occupancy Fire Hazard Adjustment | -15% | -15% | |
| A = | 363 | 363 | $m^2$ |
| C = | 1.5 | 1.5 | wood frame construction = 1.5 |
| F = | 6287.34 | 6287.34 | l/min |
| Rounded F = | 6000 | 6000 | l/min |
| Adjustmented due to Occupancy Fire Hazard F = | 5100 | 5100 | |
| Interior Firewall Adjustment | 0 | 0 | (10% per unpeirced party wall) |
| Exposure Adjustment | 4590 | 3570 | (see Separation Table) |
| | | | to NFPA 13 and other NFPA Standards) |
| Adjusted F = | 10000.0 | 9000.0 | |
| **Required Fire Flow =** | **166.7** | **150.0** | **l/s** |

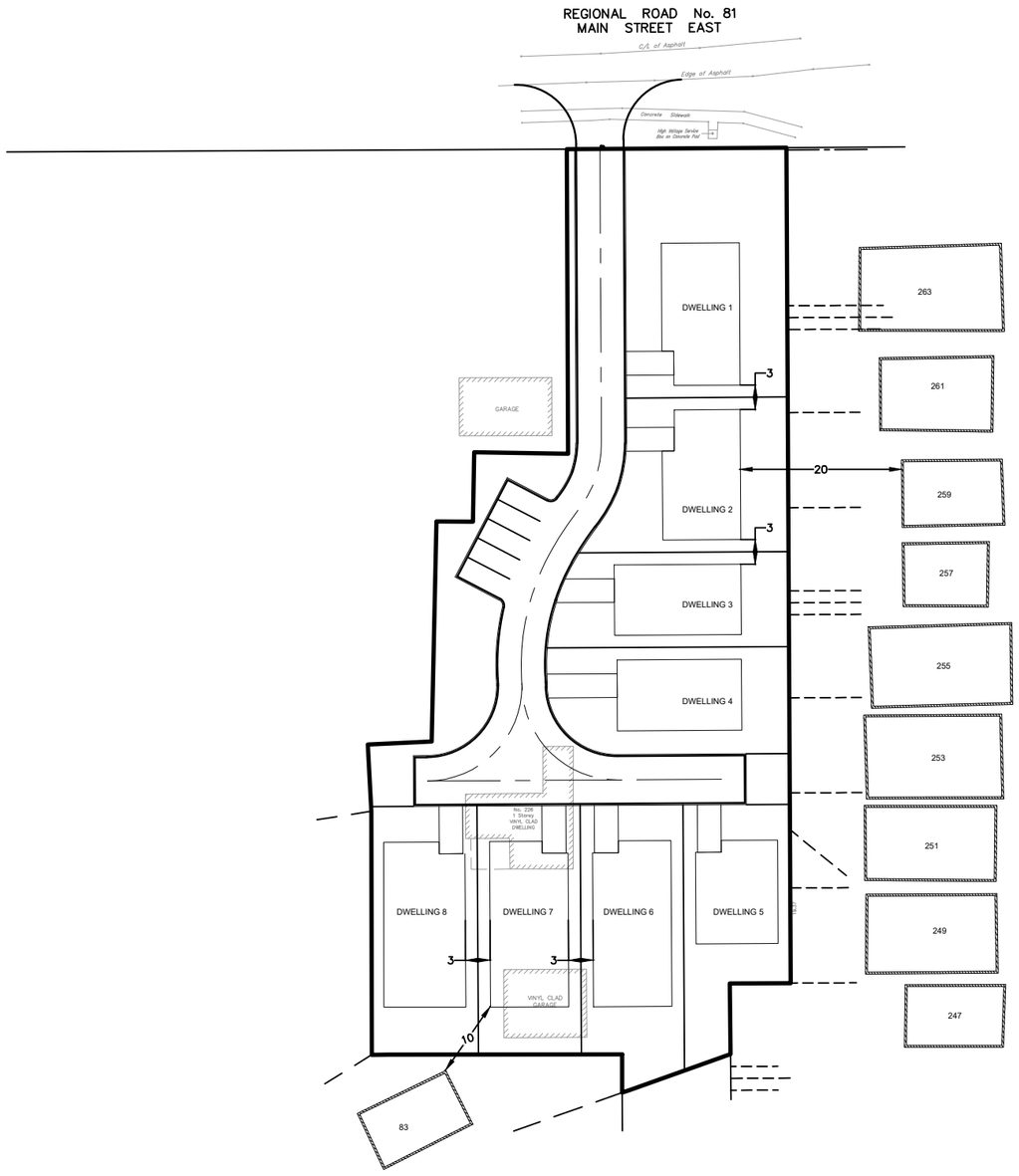
| | | |
|---|---|---|
| **MIN REQUIRED FLOW =** | **166.7** | **l/s** |
| **(@20psi theoretical)** | **2642** | **gal(US)/min** |
| **Available Fire Flow** | **353** | **l/s** |
| **(@20psi theoretical)** | **5599** | **gal(US)/min** |

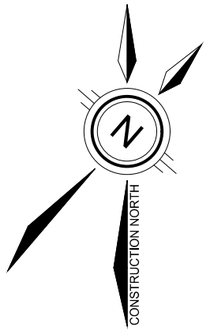
Notes:
All calculations and factors from "Water Supply for Public Fire Protection" by the Fire Underwriters Survey, 1999

*9999 denotes nearest building > 45m away, refer to exposure Figure 1.
Hydrant Test completed by Jackson Waterworks on Sept 5th, 2018 at 9:00am

**Separation Table**

| Separation | | |
|---|---|---|
| From | To | Charge |
| 0 | 3 | 25% |
| 3.1 | 10 | 20% |
| 10.1 | 20 | 15% |
| 20.1 | 30 | 10% |
| 30.1 | 45 | 5% |

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**ibigroup.com**

FIGURE 1

EXPOSURE DISTANCES

UNITS ALL ONE FIRE AREA

| | |
|---|---|
| SCALE | 1:750 |
| DATE | DECEMBER 14, 2018 |
| PROJECT No. | 115202 |

# Appendix D

Hydrant Flow Test Results

JACKSON WATERWORKS

Telephone: (905) 547-6770
Toll Free: (800)-734-5732
E-mail: jww@bellnet.ca
Website: www.jacksonwaterworks.ca

Ms. Chloe Cao
**IBI Group**
360 James Street North, Suite 200, East Wing
Hamilton Ontario **L8L 1H5**

**06 September 2018**

Jackson Waterworks has recently completed fire hydrant flow testing at 226 Main Street East in Grimsby.

We define the Test Hydrant as the one being flowed, and the Base Hydrant as the one where static and residual pressures are recorded. Wherever possible, we inspect the secondary valve for the Test Hydrant to make sure it is in the fully open position. Likewise, we count the number of turns needed to open the Test Hydrant (to make sure it is opening completely).

The secondary valve for the Test Hydrant could not be located for inspection at the time of the test.

Testing was completed in accordance with NFPA 291 guidelines.

There were no irregularities to report.

Trusting this meets with your approval, we are...

Yours truly,

Mark Schmidt
Jackson Waterworks

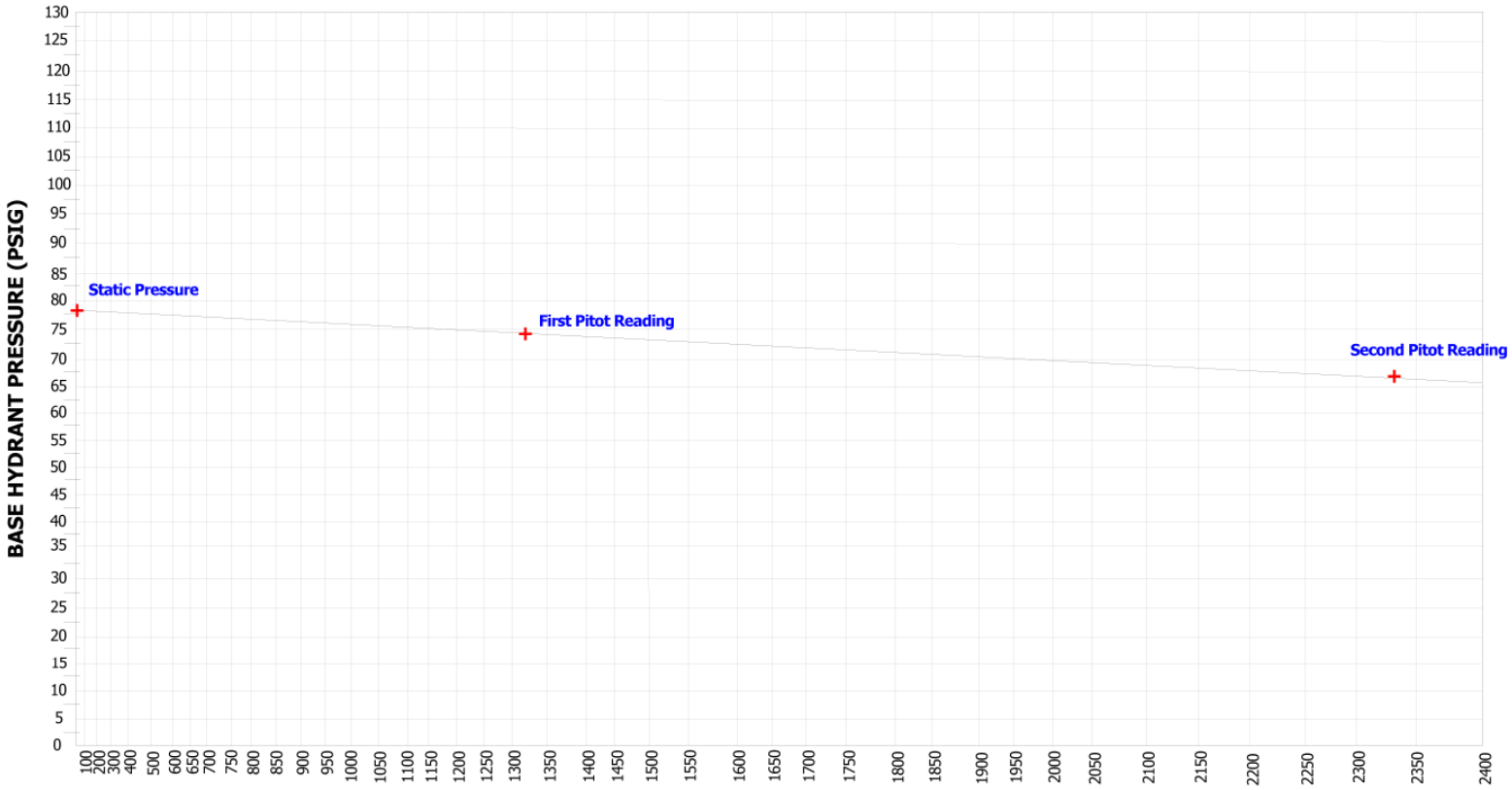
221 Sherman Avenue North, Hamilton, Ontario L8L 6N2

JACKSON WATERWORKS

Telephone: (905) 547-6770
Toll Free: (800)-734-5732
E-mail: jww@bellnet.ca
Website: www.jacksonwaterworks.ca

# FIRE HYDRANT FLOW TEST RESULTS

## TEST #1 of 1




| No. of Ports Open | Port Dia. (in) | Pitot Reading (psig) | Pitot Conversion (usgpm) Conversion Factor = 0 | Residual Pressure (psig) |
|---|---|---|---|---|
| 1 | 2.50 | 62 | 1321 | 74 |
| 2 | 2.50 | 48/48 | 2326 | 67 |
| **THEORETICAL FLOW @ 20psi** | | | **5599** | |

| | |
|---|---|
| Test Date | 05 September 2018 |
| Test Time | 09:00am |
| Pipe Diameter (in) | 12 |
| Static Pressure (psig) | 78 |

## Site Information

| | | |
|---|---|---|
| Site Name or Developer Name | David & Donna Latchford | Engineer/Architect: IBI Group Inc. |
| Site Address/Municipality | 226 Main Street East, Grimsby | |
| Location of Test Hydrant | In Front of 233 Main Street East | |
| Location of Base Hydrant | Near 221 Main Street East | |
| Comments | Testing has been completed in accordance with NFPA-291 guidelines wherever and whenever possible and practical. Conversion factors for pitot tube readings have been used depending on hose nozzle internal design and installation profile. Refer to attached cover letter for additional information. | |
| Verified By |  | Mark Schmidt |

221 Sherman Avenue North, Hamilton, Ontario L8L 6N2