Fieldcrest Subdivision Phase 2

Water Distribution Report

Project Location:
Concession 10, Lot 13, Caradoc, ON

Prepared for:
Fieldcrest Ltd.
7-521 Nottinghill Road
London, ON N6K 4L4

Prepared by:
MTE Consultants
123 St. George Street
London, ON N6A 3A1

June 18, 2024

MTE File No.: 44465-104

Engineers, Scientists, Surveyors.

Contents

Appendices

1.0 INTRODUCTION

MTE Consultants Inc. (MTE) was retained by Fieldcrest Ltd. to complete a water distribution report for Fieldcrest Subdivision Phase 2. The development is a residential development approximately 21.7 ha in total, of which, the Phase 2 portion is 7.3 ha.

The site is located at the north-east corner of the intersection of Carroll Street East and Queen Street in the Municipality of Strathroy-Caradoc. The property is bounded to the north and west by existing residential lots, to the south by Carroll Street East and east by agricultural lands.

The proposed phase will be fed by multiple connections to the existing watermains. Connections to Willis Ave, Alexander Circle, and Carroll Street East are proposed.

This report addresses the water distribution requirements set forth by the Municipality of Strathroy-Caradoc, and proposes a design which meets these requirements. The water distribution plan is included as Appendix B in this report.

2.0 CRITERIA

The water distribution design criteria for the subject site, as provided by the Municipality of Strathroy-Caradoc are as follows:

- Operating pressures during all domestic scenarios shall be between 350-480 kPa (50 to 70 psi) and not less than 274 kPa (40 psi);
- Operating pressures shall not fall below 140 kPa during the Max Day + Fire Flow Scenario;
- The maximum pressures in the distribution system should not exceed 700 kPa (100 psi);
- The pipes shall be designed so that the velocity for normal rates will be between 0.9 and 1.5 m/s. The maximum velocity for fire demand shall not exceed 3.0 m/s
- Average day domestic demand for design shall be 250 litres per day per capita.
- Maximum peaking factors of 3.5 for maximum day and 7.8 for maximum hour shall be used for design.
- Fire flow requirements should be estimated using the “Water Supply for Public Fire Protection – A Guide to Recommended Practice” (latest version) prepared by Fire Underwriters Survey (FUS), Insurers’ Advisory Organization. For further fire related requirements refer to the Ontario Building Code, the Ontario Fire Code, and NFPA 13 Standards. According to the FUS short method, the required fire flow for single family houses with 3 to 10m side separation is 66 l/s. The more conservative fire flow requirement of 76 l/s was used in the model.

  The future medium density block consists of several townhouse blocks in the back-to-back unit configuration. Therefore, the full FUS required fire flow calculation method was used. Block 278 required fire flow was calculated based on the largest townhouse block that has 14 back-to-back units with the total base area of approximately 941 m^2. As this is larger than 600 m^2, it is assumed a firewall separation will be constructed splitting the townhouse block with 6 units west of the firewall and 8 units east of the firewall. Assuming Type IV-C Mass Timber construction type (ordinary mass timber, exterior walls 1hr rating, other no rating), limited combustible occupancy, no sprinklers, combined exposure factor of 15%, and

the townhouse block base area of 478 m^2 (based on the 8 unit section of the 14 back-to-back units townhouse block, with upper floors assumed to be overhanging the porch and garage), the required fire flow for Block 278 is 8,000 l/min or 133 l/s.

- Hazen Williams "C" friction factor values shall be used for design regardless of material:

Diameter	"C" Factor
100 and 150mm	100
200 and 250mm	110
300 to 600mm	120
Over 600mm	130

- Minimum pipe size of 150mmØ.

3.0 GENERAL INFORMATION

3.1 Existing Conditions and Infrastructure

- Proposed grades within Phase 2 vary between 232.15 and 233.87 masl.;
- The proposed phase will connect to:
  - Existing 200mmØ watermain on Willis Avenue;
  - Existing 200mmØ watermain on Alexander Circle;
  - Temporary 200mmØ connection to the existing 400mmØ watermain on Carroll Street East; and
  - Existing 400mmØ watermain on Carroll Street East with a 250mmØ connection.
- Two 200mmØ stubs will be installed on Willis Avenue to service future development located north-east of Phase 2, in Block 278, and a 200mmØ stub will be installed on Davis Terrace to service future development east of Phase 2.
- Two hydrant flow tests were done in the vicinity of the development. The flow test on Carroll Street East resulted in a static pressure of 59 psi, which corresponds to a hydraulic grade of 274.49m, and the equivalent flow of 285 l/s at the residual pressure of 20 psi. The flow test on Abbott Street resulted in a static pressure of 57 psi, which corresponds to a hydraulic grade of 272.37m, and the equivalent flow of 213 l/s at the residual pressure of 20 psi. The lower hydraulic grade of 272.37m was used as the boundary condition in the hydraulic model.

3.2 Capacity

As detailed in this report, the existing water distribution infrastructure can supply the required domestic and fire suppression flows at pressures which meet or exceed the Municipality's minimum requirements.

3.3 External Works

No external water works are required for this development.

3.4 Effect of Development on Existing Infrastructure

No negative effects or conflicts with the existing infrastructure are anticipated as a result of the proposed development.

3.5 Oversizing

No oversizing of infrastructure is required for this project.

3.6 Water System Area Plans

A water distribution plan is attached in Appendix B.

3.7 Water Network Analysis

Modelling of the proposed subdivision has been completed and is further described in the following sections.

3.8 Phasing

The proposed development is Phase 2 of the larger Fieldcrest residential development.

3.9 Water Services

Proposed water services for the residential lots will be 25mm Municipex as per Municipal standards.

4.0 WATER DISTRIBUTION MODELLING

The water distribution modelling for the site was completed using WaterCAD Connect Edition. The site was modelled using a series of nodes connected by pipes. Demands were applied at the nodes and attributes assigned to the connecting pipes in keeping with Municipality standards.

The water supply model includes the existing infrastructure on Carroll Street East, Queen St, Abbott Street and Willis Avenue. Future residential developments are modelled in the Ultimate Buildout water supply model.

Water supply was modelled as a reservoir. A sketch of the model network is included along with detailed calculations and modelling result summaries. Modelling assumptions and rational are detailed further in the following sections.

As noted previously, the proposed phase will have a 4 connections to the existing infrastructure. There are 118 single family residential units in Phase 2. There are 61 single family residential units in the future development to the east, and approximately 118 medium density units in the future development of Block 278.

4.1 Water Supply

Water supply for the proposed subdivision was modelled as a reservoir with a surface elevation equal to the local HGL of 272.37 masl as per the hydrant flow test. The reservoir was connected to the system at the intersection of Carroll Street East and Queen Street. Phase 2 is connected to the system with the previously mentioned connections. Future residential developments will connect to the 200mmØ stubs on Willis Avenue and Davis Terrace.

4.2 Demands

The proposed internal network was modelled as a series of nodes and pipes. The nodes were placed at strategic locations within the proposed site and future development. Demands were assigned to the nodes based on their proximity to the surrounding lots / blocks. Demands were assigned to nodes based on the number of units in the vicinity, a population of 2.4 persons per unit (ppu) for the single family units and 2.4 ppu for the medium density units, and an average day consumption of 250 L per person. Peaking factors of 3.5 and 7.8 were used for the max day and peak hour scenarios respectively in keeping with Municipality standards. Detailed demand calculations are included in Appendix A.

5.0 RESULTS

5.1 Phase 2

5.1.1 Domestic and Fire Flows

AVERAGE DAY

Under this scenario, the minimum pressure in the Phase 2 system was computed to be 377 kPa (>275 kPa minimum required. Watermain velocity is under 1.5 m/s. A full summary of modelling results is included in Appendix A.

PEAK HOUR

Under this scenario, the minimum pressure in the Phase 2 system was computed to be 376 kPa (>275 kPa minimum required). Watermain velocity is under 1.5 m/s. A full summary of modelling results is included in Appendix A.

MAX DAY + FIRE

The Fire Flow Analysis feature within the WaterCAD program was used to determine the maximum flow available at all of the junctions in Phase 2 with the maximum watermain velocity of 3.0 m/s and minimum residual pressure of 140 kPa. A full summary of the modelling results is included in Appendix A.

The required fire flow of 76 l/s is available at each model junction. The available fire flows in Phase 2 range from 132 l/s to 271 l/s at the maximum pipe velocity of 3.0 m/s.

Based on the expected fire flow availability, all proposed hydrant tags will be light blue.

5.2 Ultimate Condition

Under this condition it was considered that the future development on Newton Avenue is connected to Phase 2 and that Block 278 medium density development is connected to Willis Avenue and Newton Avenue. Nodes were added to the network to account for the future development. Demands were assigned based on the number of units in the vicinity of the nodes. The population of Block 278 is based on 118 medium density units. The temporary connection from Carroll Street East to Alexander Circle is assumed to be removed or abandoned at this point.

5.2.1 Domestic and Fire Flows

AVERAGE DAY

Under this scenario, the minimum pressure in the subdivision was computed to be 377 kPa (>275 kPa minimum required. Watermain velocity is under 1.5 m/s. A full summary of the modelling results is included in Appendix A.

PEAK HOUR

Under this scenario, the minimum pressure in the subdivision was computed to be 374 kPa (>275 kPa minimum required). Watermain velocity is under 1.5 m/s. A full summary of the modelling results is included in Appendix A.

MAX DAY + FIRE

The Fire Flow Analysis feature within the WaterCAD program was used to determine the maximum flow available at all the junctions in the subdivision with the maximum watermain velocity of 3.0 m/s and minimum residual pressure of 140 kPa. A full summary of the modelling results is included in Appendix A.

Fire flow of 76 l/s available in future developments. Fire flow available within Block 278 varies from 93 to 129 L/s. Maximum available fire flow of 127 l/s at velocity of 3.0 m/s on Newton Ave.

Based on the expected fire flow availability, all proposed hydrant tags within the subdivision will be light blue. Depending on placement within Block 278, the markers may be green.

5.3 Quality Turnover

Quality turnover was modelled for Phase 2 as an age analysis with a duration of 336 hrs. The max age in the system was determined for 0% occupancy, 25% occupancy, 50% occupancy, and full buildout of Phase 2. Where the domestic demands were insufficient to draw the required volume of water through the site, an automatic flusher was modelled to reduce the age in the system to below 72 hrs.

Two automatic flushing units are proposed for the site on Payne Circle. Per the Municipality standards, the automatic flushing units will be 2” 9800 Eclipse by Kupferle. Based on the expected pressure at flusher locations of 55 psi, a flow rate of 10.16 l/s has been assigned to the flushing units.

Draw requirements are discussed below.

5.3.1 0% Occupancy

For this scenario no domestic demands were applied in the model in Phase 2. Demands from existing development from earlier phases was modelled. Based on the results of the age analysis, both flushers should be set to draw for a period of 15 mins/day (9.1 m^3/day). Maximum age in the system was modelled to be 68.0 hours.

5.3.2 25% Occupancy

For this scenario domestic demands equivalent to 25% of the demand from the Phase 2 single family units were applied at each node in the model. Based on the results of the age analysis, the both flushers should be set to draw for a period of 9 mins/day (5.5 m^3/day). Maximum age in the system was modelled to be 68.0 hours.

5.3.3 50% Occupancy

For this scenario domestic demands equivalent to 50% of the demand from the Phase 2 single family units were applied at each node in the model. Based on the results of the age analysis, the domestic demand will be sufficient to allow for the water flusher at J-5 to be decommissioned. The flusher at J-6 may be reduced to running only 3. Minutes per day (1.8 m^3/day). Maximum age in the system was modelled to be 62 hours at J-6 model junction. It is noted that the model assumes an even distribution of buildout through the site. Depending on how the buildout actually occurs, both flushers may be able to be decommissioned at this stage of buildout provided modelling specific to the actual site buildout confirms this.

5.3.4 100% Occupancy

The model indicates that at 100% occupancy of Phase 2 the maximum age within the system was modelled to be approximately 43 hrs.

Quality turnover for the Ultimate scenario was not examined. It is assumed that Phase 2 will be built out by the time the lands to the north or the cul-de-sac proceed and sufficient demand will be provided to meet the turnover requirements internal to the phase. Quality turnover for the future developments will need to be examined at the time of development to ensure quality turnover within the future development areas and that the existing developments are not negatively impacted.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the foregoing analysis, it is concluded that:

i. the existing and proposed water distribution networks can provide the required flow rates at adequate pressures for all domestic and fire flows; and

ii. Utilizing the proposed flushing volumes as occupancy proceeds, water quality issues are not anticipated within the site.

All of which is respectfully submitted,

MTE Consultants Inc.

Joshua Monster, P.Eng.
Technical Practice Leader
519-204-6510 ext. 2202
jmonster@mte85.com

JJM:azp

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Appendix A

Fire Flow Tests
Summary of Modelling Demands
Summary of Modelling Results
Modelling Layout Sketch

NORTHERN SPRINKLER DESIGN

FLOW TEST REPORT

Form SD-003A RevDate: Dec 01, 2021

PROJECT INFORMATION			
Project Name:	Carrol Street East Flow Test	Design Project #:	2022-NSD-080
Site Address:	Carrol Street (E of Queen) Strathroy, ON	Const. Project #:	NA
City Contact:	Paul 519-245-1105 x 274	Phone #:	519-245-1105-274
Flow Tester:	**Andy Coghlin**	Phone #:	**519-476-0761**
Technical Contact:	**Andy Coghlin**	Phone #:	**519-476-0761**

SITE INFORMATION

SITE MAP

N

Note: If the main is a dead end, the flowing hydrant shall be closest to the dead end

ITEMS TO LABEL ON MAP	HYDRANTS USED	MAIN SIZE
☑ Static / Residual & Flow Hydrants	☑ City Hydrant(s)	City: 16"
☐ Flow Direction (if the main is dead end)	☐ Site Hydrant(s)	Site:

SITE NOTES

445 Colborne St. London, ON N6B 2T2 northernsprinklerdesign.com 1-866-798-1154

NORTHERN SPRINKLER DESIGN

FLOW TEST REPORT

Form SD-003A RevDate: Dec 01, 2021

TEST INFORMATION			
Minimum Required Flow:	NA	Min Ports:	2
Personnel Present:	Andy Coghlin	Test Date:	2022-05-10
City / External Company:	City of Strathroy	Test Time:	7:30am

TEST EQUIPMENT	
☐ Hose Monsters with built in Pitot	Hose length used:
☐ Hand held pitot gauge	☑ Pollard diffuser elbow with built in Pitot
☐ Other:	

TEST RESULTS

Number of Ports	Outlet Size (IN)	Discharge Coefficient	Pitot Reading (PSI)	Total Flow (GPM)	Static / Residual Pressure (PSI)
0 Ports	STATIC				59
1 Port	2.5	0.9	44	1,113	57
2 Ports	2.5	0.9	24 / 24	1,645	53
3 Ports	2.5	0.9		0	
4 Ports	2.5	0.9		0	
0 Ports	STATIC RE-CHECK				

TEST NOTES

Please note that we flowed for 30 seconds for 1 Port and 30 seconds for 2 Ports as well.

HYDRAULIC ADJUSTMENTS (FOR OFFICE USE ONLY)			
ADJUSTMENTS FOR HYDRAULIC GRADE LINE (HGL)			
Reservoir HGL (m):		Site Elevation (m):	
Theoretical Static Head (PSI):	0	PSI to subtract from test pressures:	0
OTHER HYDRAULIC ADJUSTMENTS			
Other adjustment as required by the City / AHJ:			

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Fieldcrest Subdivision Phase 2

Project No. 44465-104

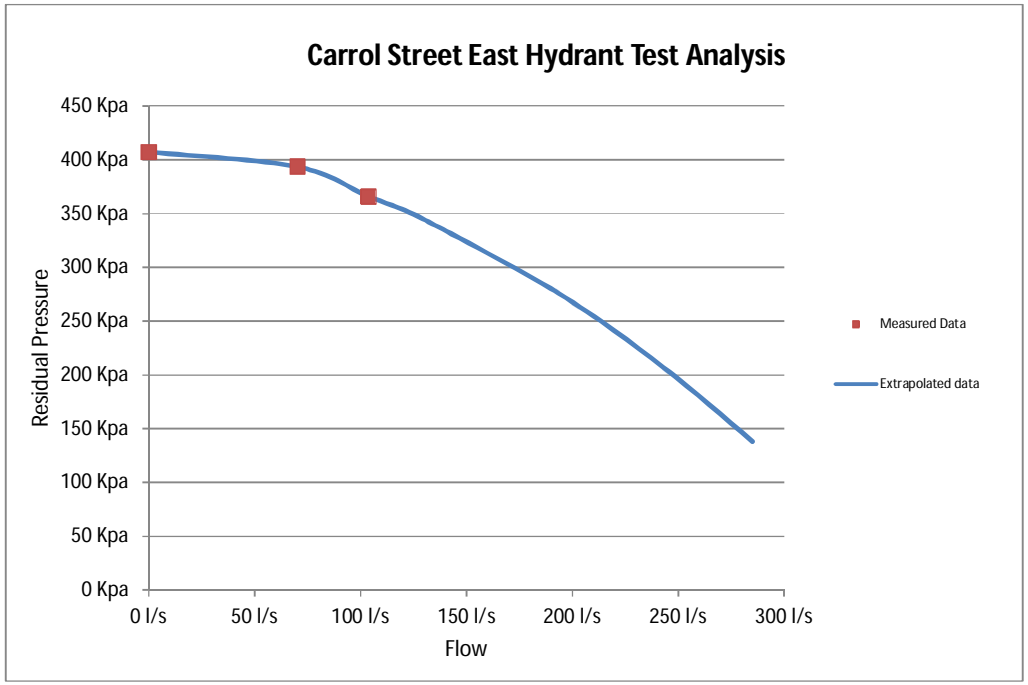
Test 1 - Northern Sprinkler Design

Flow Test Results of May 10, 2022

Location: Residual: NE corner of Queen St and Carrol St E

Flow: 312 Carrol St E

Test Results			
Flow US. GPM	Residual Pressure psi	Flow L/s	Residual Presure kPa
0	59	0	407
1113	57	70	393
1645	53	104	366



For a total required flow demand of **84.97 L/s** the equivalent residual pressure is

379 **kPa**

55 **psi**

For a residual pressure of **20 psi** or **140 kPa** the equivalent flow is

285 **L/s**

4520 **USGPM**

3763 **IGPM**

1 USG = 3.785 litres

1 IG = 4.546 litres

1 psi = 6.9 kpa

NORTHERN SPRINKLER DESIGN

FLOW TEST REPORT

Form SD-003A RevDate: Dec 01, 2021

PROJECT INFORMATION			
Project Name:	Willis Ave /Abbott Strathroy, ON Flow	Design Project #:	2022-NSD-080
Site Address:	Willis/Abbott St. Strathroy, ON	Const. Project #:	NA
City Contact:	Paul 519-245-1105 x 274	Phone #:	519-245-1105-274
Flow Tester:	**Andy Coghlin**	Phone #:	**519-476-0761**
Technical Contact:	**Andy Coghlin**	Phone #:	**519-476-0761**

SITE INFORMATION

SITE MAP

Note: If the main is a dead end, the flowing hydrant shall be closest to the dead end

ITEMS TO LABEL ON MAP	HYDRANTS USED	MAIN SIZE
☑ Static / Residual & Flow Hydrants	☑ City Hydrant(s)	City: 6"
☐ Flow Direction (if the main is dead end)	☐ Site Hydrant(s)	Site:

SITE NOTES

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NORTHERN SPRINKLER DESIGN

FLOW TEST REPORT

Form SD-003A RevDate: Dec 01, 2021

TEST INFORMATION			
Minimum Required Flow:	NA	Min Ports:	2
Personnel Present:	Andy Coghlin	Test Date:	2022-05-10
City / External Company:	City of Strathroy	Test Time:	8:30am

TEST EQUIPMENT	
☐ Hose Monsters with built in Pitot	Hose length used:
☐ Hand held pitot gauge	☑ Pollard diffuser elbow with built in Pitot
☐ Other:	

TEST RESULTS

Number of Ports	Outlet Size (IN)	Discharge Coefficient	Pitot Reading (PSI)				Total Flow (GPM)	Static / Residual Pressure (PSI)
0 Ports	STATIC							57
1 Port	2.5	0.9	34				979	50
2 Ports	2.5	0.9	22	22			1,575	48
3 Ports	2.5	0.9					0	
4 Ports	2.5	0.9					0	
0 Ports	STATIC RE-CHECK							

TEST NOTES

Please note that we flowed for 30 seconds for 1 Port and 30 seconds for 2 Ports as well.

HYDRAULIC ADJUSTMENTS (FOR OFFICE USE ONLY)			
ADJUSTMENTS FOR HYDRAULIC GRADE LINE (HGL)			
Reservoir HGL (m):		Site Elevation (m):	
Theoretical Static Head (PSI):	0	PSI to subtract from test pressures:	0
OTHER HYDRAULIC ADJUSTMENTS			
Other adjustment as required by the City / AHJ:			

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Fieldcrest Subdivision Phase 2

Project No. 44465-104

Test 2 - Northern Sprinkler Design

Flow Test Results of May 10, 2022

Location: Residual: W of Abbott St and Alexander Circle

Flow: NE corner of Abbott St and Willis Ave

Test Results			
Flow US. GPM	Residual Pressure psi	Flow L/s	Residual Presure kPa
0	57	0	393
979	50	62	345
1575	48	99	331

For a total required flow demand of **84.97 L/s** the equivalent residual pressure is

338 **kPa**

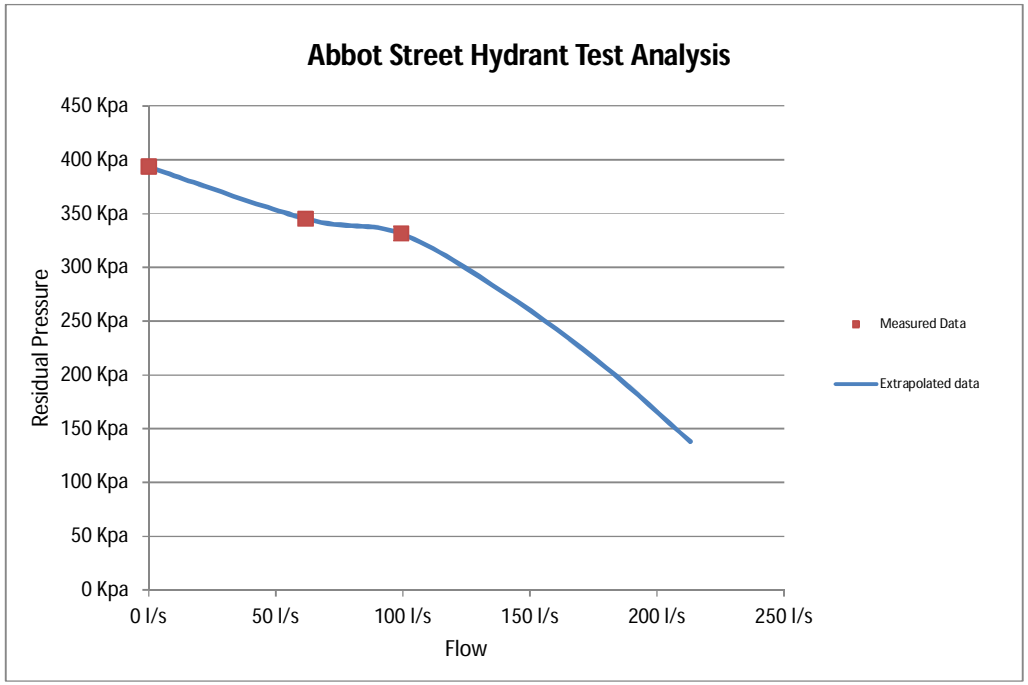
49 **psi**

For a residual pressure of **20 psi** or **140 kPa** the equivalent flow is

213 **L/s**

3379 **USGPM**

2814 **IGPM**



1 USG = 3.785 litres

1 IG = 4.546 litres

1 psi = 6.9 kpa

Subject: Demand Summary
Project: Fieldcrest Subdivision Phase 2
Project No.: 44465-104
Client: Fieldcrest Ltd.
Date: 18-Jun-24

Peaking Factors: Maximum Day = **3.5**
Peak Hour = **7.8**

Fire Flows: Per the FUS short method **66 l/s**
Conservative fire flow demand of **76 l/s** considered in the model
Fire flow of **133 l/s** per the FUS calculation for the Future Medium Density Block

Table 1

Junction	Units		Elevation	Population	Demand		
	MD	SFH			Average Day Demand (l/s)	Max Day Demand (l/s)	Max Hour Demand (l/s)
Existing							
J-15		29	232.05	70	0.20	0.71	1.58
J-16		31	232.65	75	0.22	0.76	1.69
J-17		8	232.83	20	0.06	0.20	0.45
J-18		19	233.85	46	0.13	0.47	1.04
Phase 2							
J-3		6	233.61	15	0.04	0.15	0.34
J-4		8	233.67	20	0.06	0.20	0.45
J-5		20	233.53	48	0.14	0.49	1.08
J-6		14	233.87	34	0.10	0.34	0.77
J-7		16	232.58	39	0.11	0.39	0.88
J-8		12	232.96	29	0.08	0.29	0.65
J-11		8	232.15	20	0.06	0.20	0.45
J-12		7	232.42	17	0.05	0.17	0.38
J-13		7	233.54	17	0.05	0.17	0.38
J-14		12	233.84	29	0.08	0.29	0.65
J-21		0	232.96	0	0.00	0.00	0.00
J-22		8	233.32	20	0.06	0.20	0.45
Future							
J-9		30	233.03	72	0.21	0.73	1.63
J-10		31	233.87	75	0.22	0.76	1.69
J-50	16		233	39	0.11	0.39	0.88
J-51	9		233	22	0.06	0.22	0.50
J-52	12		233	29	0.08	0.29	0.65
J-53	22		233	53	0.15	0.54	1.20
J-54	13		233	32	0.09	0.32	0.72
J-55	13		233	32	0.09	0.32	0.72
J-56	11		233	27	0.08	0.27	0.61
J-57	17		233	41	0.12	0.42	0.93
J-58	5		233	12	0.03	0.12	0.27
Total	118	266		933	2.70	9.45	21.06

Q:\44465\104\Water Supply\[44465-104 Demand Calculation.xls]Demand

PHASE 2 AVERAGE DAY

Junction Table - Time: 0.00 hours

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Age (Maximum) (hours)	Demand (Maximum) (L/s)
J-3	233.61	0.04	272.37	379	(N/A)	0.04
J-4	233.67	0.06	272.37	379	(N/A)	0.06
J-5	233.53	0.14	272.37	380	(N/A)	0.14
J-6	233.87	0.10	272.37	377	(N/A)	0.10
J-7	232.58	0.11	272.37	389	(N/A)	0.11
J-8	232.96	0.06	272.37	386	(N/A)	0.06
J-9	233.03	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-10	233.87	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-11	232.15	0.05	272.37	394	(N/A)	0.05
J-12	232.42	0.05	272.37	391	(N/A)	0.05
J-13	233.54	0.05	272.37	380	(N/A)	0.05
J-14	233.84	0.08	272.37	377	(N/A)	0.08
J-15	232.05	0.20	272.37	395	(N/A)	0.20
J-16	232.65	0.22	272.37	389	(N/A)	0.22
J-17	232.83	0.06	272.37	387	(N/A)	0.06
J-18	233.85	0.13	272.37	377	(N/A)	0.13
J-19	230.72	0.00	272.37	408	(N/A)	0.00
J-20	231.80	0.00	272.37	397	(N/A)	0.00
J-21	232.96	0.00	272.37	386	(N/A)	0.00
J-22	233.32	0.06	272.37	382	(N/A)	0.06
J-23	231.60	0.00	272.37	399	(N/A)	0.00
J-25	233.00	0.00	272.37	385	(N/A)	0.00
J-35	233.47	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-56	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-55	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-54	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-53	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-52	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-51	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-50	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-57	233.30	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)

PHASE 2 AVERAGE DAY

Junction Table - Time: 0.00 hours

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Age (Maximum) (hours)	Demand (Maximum) (L/s)
J-58	233.60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)

PHASE 2 AVERAGE DAY

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Flow (Absolute) (L/s)
P-2	248	J-19	J-25	250.0	110.0	0.33
P-4	82	J-17	J-18	200.0	110.0	0.07
P-5	23	J-18	J-14	200.0	110.0	0.01
P-6	123	J-14	J-3	200.0	110.0	0.07
P-7	80	J-3	J-4	200.0	110.0	0.17
P-8	105	J-4	J-6	200.0	110.0	0.04
P-10	107	J-5	J-4	200.0	110.0	0.06
P-12(1)	63	J-7	J-21	200.0	110.0	0.30
P-12(2)	11	J-21	J-8	200.0	110.0	0.49
P-13	77	J-8	J-20	250.0	110.0	0.55
P-15(1)	118	J-9	J-35	200.0	110.0	(N/A)
P-15(2)	158	J-35	J-10	200.0	110.0	(N/A)
P-16	74	J-7	J-12	200.0	110.0	0.19
P-17	80	J-12	J-11	200.0	110.0	0.14
P-18	81	J-11	J-15	200.0	110.0	0.09
P-19	211	J-15	J-16	200.0	110.0	0.08
P-20	62	J-16	J-17	200.0	110.0	0.33
P-21	176	J-18	J-13	200.0	110.0	0.21
P-22(1)	142	J-25	J-23	400.0	120.0	1.08
P-22(2)	282	J-23	J-20	400.0	120.0	0.55
P-23	101	J-3	J-13	200.0	110.0	0.27
P-24	226	J-9	J-10	200.0	110.0	(N/A)
P-25	213	J-16	J-15	150.0	100.0	0.03
P-26	103	J-5	J-22	200.0	110.0	0.08
P-27	107	J-22	J-6	200.0	110.0	0.06
P-29	81	J-22	J-21	200.0	110.0	0.19
P-30	77	J-21	J-9	200.0	110.0	(N/A)
P-32	22	R-2	J-25	400.0	120.0	1.41
P-34	90	J-19	J-17	200.0	110.0	0.33
P-35	20	J-13	J-23	200.0	110.0	0.54
P-50	79	J-50	J-12	200.0	110.0	(N/A)

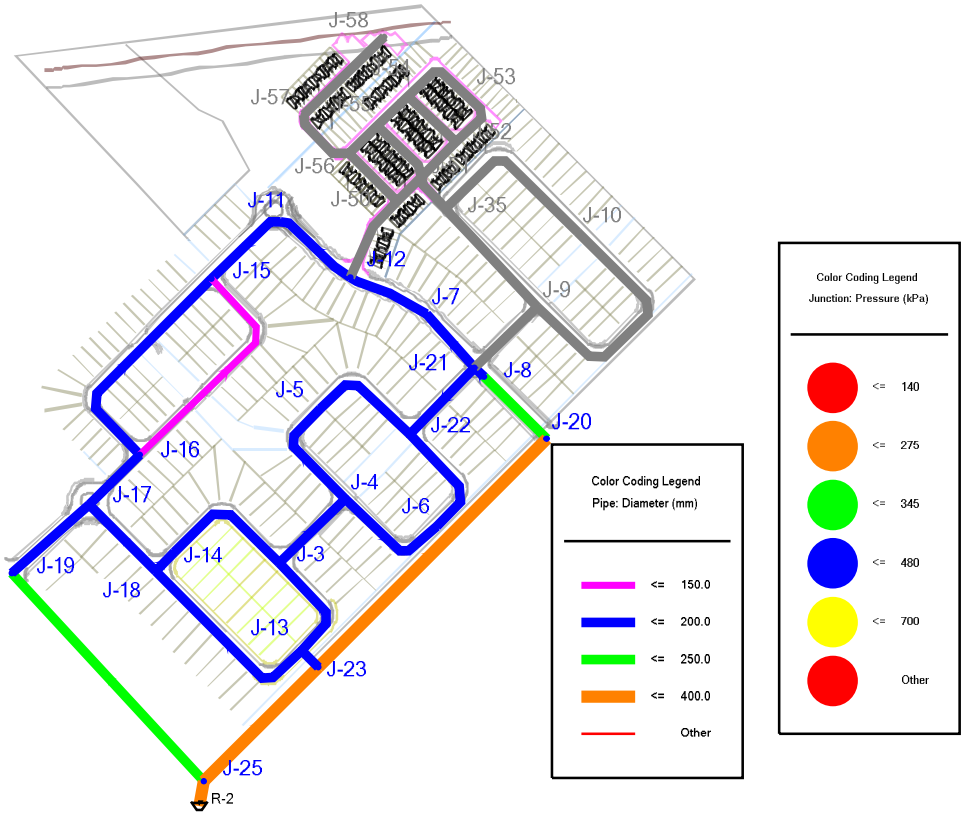
PHASE 2 AVERAGE DAY

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Flow (Absolute) (L/s)
P-51	31	J-51	J-50	200.0	110.0	(N/A)
P-52	43	J-52	J-51	200.0	110.0	(N/A)
P-53	63	J-53	J-52	200.0	110.0	(N/A)
P-54	60	J-54	J-53	200.0	110.0	(N/A)
P-55	37	J-55	J-54	200.0	110.0	(N/A)
P-56	35	J-56	J-55	200.0	110.0	(N/A)
P-57	58	J-56	J-57	200.0	110.0	(N/A)
P-58	98	J-57	J-58	200.0	110.0	(N/A)
P-59	59	J-56	J-50	200.0	110.0	(N/A)
P-60	60	J-55	J-51	200.0	110.0	(N/A)
P-61	58	J-54	J-52	200.0	110.0	(N/A)
P-62	36	J-51	J-35	200.0	110.0	(N/A)

PHASE 2 AVERAGE DAY

Named View - 1 - Time: 0.00 hours



PHASE 2 PEAK HOUR

Junction Table - Time: 0.00 hours

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Age (Maximum) (hours)	Demand (Maximum) (L/s)
J-3	233.61	0.31	272.32	379	(N/A)	0.31
J-4	233.67	0.47	272.32	378	(N/A)	0.47
J-5	233.53	1.09	272.32	380	(N/A)	1.09
J-6	233.87	0.78	272.32	376	(N/A)	0.78
J-7	232.58	0.86	272.32	389	(N/A)	0.86
J-8	232.96	0.47	272.32	385	(N/A)	0.47
J-9	233.03	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-10	233.87	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-11	232.15	0.39	272.31	393	(N/A)	0.39
J-12	232.42	0.39	272.32	390	(N/A)	0.39
J-13	233.54	0.39	272.33	380	(N/A)	0.39
J-14	233.84	0.62	272.32	377	(N/A)	0.62
J-15	232.05	1.56	272.31	394	(N/A)	1.56
J-16	232.65	1.72	272.31	388	(N/A)	1.72
J-17	232.83	0.47	272.32	386	(N/A)	0.47
J-18	233.85	1.01	272.32	376	(N/A)	1.01
J-19	230.72	0.00	272.33	407	(N/A)	0.00
J-20	231.80	0.00	272.33	397	(N/A)	0.00
J-21	232.96	0.00	272.32	385	(N/A)	0.00
J-22	233.32	0.47	272.32	382	(N/A)	0.47
J-23	231.60	0.00	272.33	399	(N/A)	0.00
J-25	233.00	0.00	272.33	385	(N/A)	0.00
J-35	233.47	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-56	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-55	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-54	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-53	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-52	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-51	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-50	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-57	233.30	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)

PHASE 2 PEAK HOUR

Junction Table - Time: 0.00 hours

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Age (Maximum) (hours)	Demand (Maximum) (L/s)
J-58	233.60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)

PHASE 2 PEAK HOUR

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Flow (Absolute) (L/s)
P-2	248	J-19	J-25	250.0	110.0	2.54
P-4	82	J-17	J-18	200.0	110.0	0.54
P-5	23	J-18	J-14	200.0	110.0	0.10
P-6	123	J-14	J-3	200.0	110.0	0.52
P-7	80	J-3	J-4	200.0	110.0	1.30
P-8	105	J-4	J-6	200.0	110.0	0.33
P-10	107	J-5	J-4	200.0	110.0	0.50
P-12(1)	63	J-7	J-21	200.0	110.0	2.31
P-12(2)	11	J-21	J-8	200.0	110.0	3.82
P-13	77	J-8	J-20	250.0	110.0	4.29
P-15(1)	118	J-9	J-35	200.0	110.0	(N/A)
P-15(2)	158	J-35	J-10	200.0	110.0	(N/A)
P-16	74	J-7	J-12	200.0	110.0	1.45
P-17	80	J-12	J-11	200.0	110.0	1.06
P-18	81	J-11	J-15	200.0	110.0	0.67
P-19	211	J-15	J-16	200.0	110.0	0.62
P-20	62	J-16	J-17	200.0	110.0	2.61
P-21	176	J-18	J-13	200.0	110.0	1.65
P-22(1)	142	J-25	J-23	400.0	120.0	8.46
P-22(2)	282	J-23	J-20	400.0	120.0	4.29
P-23	101	J-3	J-13	200.0	110.0	2.13
P-24	226	J-9	J-10	200.0	110.0	(N/A)
P-25	213	J-16	J-15	150.0	100.0	0.27
P-26	103	J-5	J-22	200.0	110.0	0.60
P-27	107	J-22	J-6	200.0	110.0	0.45
P-29	81	J-22	J-21	200.0	110.0	1.51
P-30	77	J-21	J-9	200.0	110.0	(N/A)
P-32	22	R-2	J-25	400.0	120.0	11.00
P-34	90	J-19	J-17	200.0	110.0	2.54
P-35	20	J-13	J-23	200.0	110.0	4.17
P-50	79	J-50	J-12	200.0	110.0	(N/A)

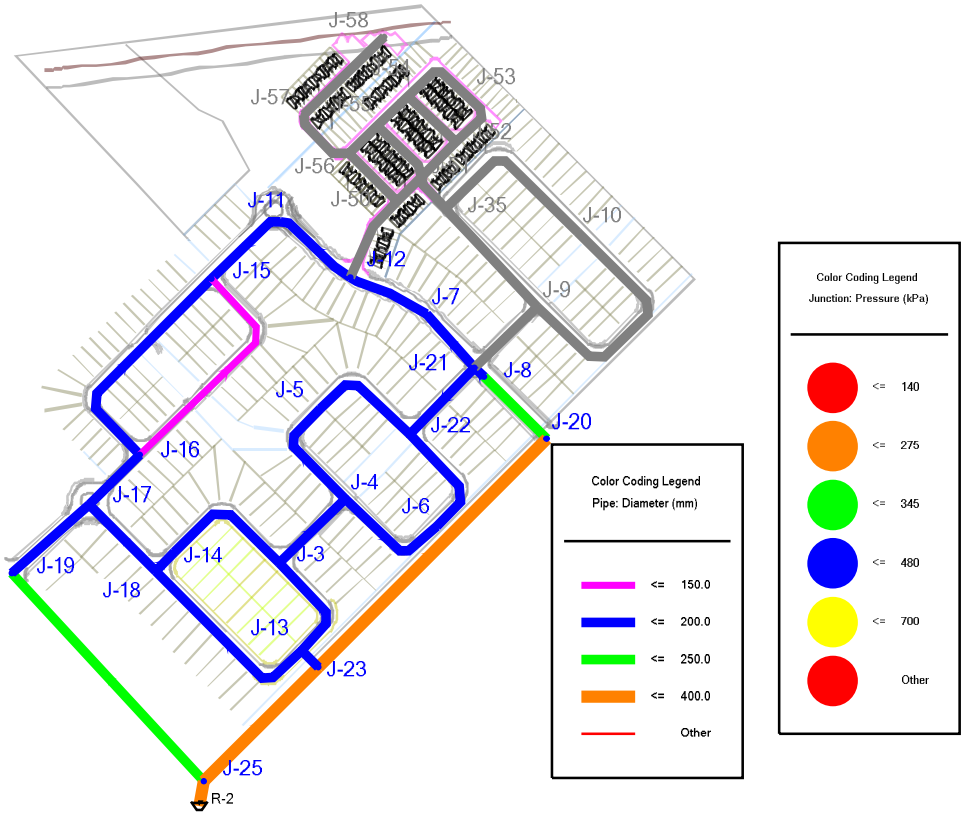
PHASE 2 PEAK HOUR

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Flow (Absolute) (L/s)
P-51	31	J-51	J-50	200.0	110.0	(N/A)
P-52	43	J-52	J-51	200.0	110.0	(N/A)
P-53	63	J-53	J-52	200.0	110.0	(N/A)
P-54	60	J-54	J-53	200.0	110.0	(N/A)
P-55	37	J-55	J-54	200.0	110.0	(N/A)
P-56	35	J-56	J-55	200.0	110.0	(N/A)
P-57	58	J-56	J-57	200.0	110.0	(N/A)
P-58	98	J-57	J-58	200.0	110.0	(N/A)
P-59	59	J-56	J-50	200.0	110.0	(N/A)
P-60	60	J-55	J-51	200.0	110.0	(N/A)
P-61	58	J-54	J-52	200.0	110.0	(N/A)
P-62	36	J-51	J-35	200.0	110.0	(N/A)

PHASE 2 PEAK HOUR

Named View - 1 - Time: 0.00 hours



PHASE 2 FIRE FLOW

Fire Flow Report - Time: 0.00 hours

Label	Zone	Flow (Total Needed) (L/s)	Fire Flow (Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Residual @ Total Flow Needed) (kPa)	Junction w/ Minimum Pressure (Zone)	Pressure (Calculated System Lower Limit) (kPa)	Velocity of Maximum Pipe (m/s)
J-3	<None>	76.14	178.14	223	348	J-4	236	3.00
J-4	<None>	76.21	173.95	201	341	J-6	211	3.00
J-5	<None>	76.49	180.18	151	334	J-6	201	3.00
J-6	<None>	76.35	180.29	147	331	J-4	203	3.00
J-7	<None>	76.38	131.90	278	350	J-12	287	3.00
J-8	<None>	76.21	220.83	175	358	J-21	179	3.00
J-9	<None>	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-10	<None>	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-11	<None>	76.17	177.36	149	343	J-15	186	3.00
J-12	<None>	76.17	152.76	218	344	J-11	239	3.00
J-13	<None>	76.17	134.74	305	354	J-18	306	3.00
J-14	<None>	76.28	151.27	255	343	J-18	268	3.00
J-15	<None>	76.70	167.23	179	345	J-11	207	3.00
J-16	<None>	76.77	135.66	266	347	J-15	285	3.00
J-17	<None>	76.21	223.77	140	355	J-16	150	2.93
J-18	<None>	76.45	191.31	198	346	J-14	204	3.00
J-19	<None>	76.00	231.81	140	375	J-17	169	3.00
J-20	<None>	76.00	258.29	149	373	J-6	140	2.09
J-21	<None>	76.00	151.64	280	357	J-6	280	3.00
J-22	<None>	76.21	164.01	226	345	J-6	230	3.00
J-23	<None>	76.00	263.48	162	377	J-6	140	2.14
J-25	<None>	76.00	270.91	149	365	J-6	140	2.20
J-35	<None>	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-50	<None>	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-51	<None>	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-52	<None>	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-53	<None>	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-54	<None>	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)

PHASE 2 FIRE FLOW

Fire Flow Report - Time: 0.00 hours

Label	Zone	Flow (Total Needed) (L/s)	Fire Flow (Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Residual @ Total Flow Needed) (kPa)	Junction w/ Minimum Pressure (Zone)	Pressure (Calculated System Lower Limit) (kPa)	Velocity of Maximum Pipe (m/s)
J-55	<None>	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-56	<None>	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-57	<None>	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-58	<None>	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)

PHASE 2 AGE ANALYSIS

Junction Table - Time: 0.00 hours

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Age (Maximum) (hours)	Demand (Maximum) (L/s)
J-3	233.61	0.04	272.37	379	8.668	0.04
J-4	233.67	0.06	272.37	379	12.886	0.06
J-5	233.53	0.14	272.37	380	34.673	0.14
J-6	233.87	0.10	272.37	377	40.505	0.10
J-7	232.58	0.11	272.37	389	26.998	0.11
J-8	232.96	0.06	272.37	386	24.936	0.06
J-9	233.03	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-10	233.87	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-11	232.15	0.05	272.37	394	35.577	0.05
J-12	232.42	0.05	272.37	391	30.468	0.05
J-13	233.54	0.05	272.37	380	5.429	0.05
J-14	233.84	0.08	272.37	377	25.228	0.08
J-15	232.05	0.20	272.37	395	42.735	0.20
J-16	232.65	0.22	272.37	389	16.676	0.22
J-17	232.83	0.06	272.37	387	15.054	0.06
J-18	233.85	0.13	272.37	377	12.675	0.13
J-19	230.72	0.00	272.37	408	10.923	0.00
J-20	231.80	0.00	272.37	397	23.025	0.00
J-21	232.96	0.00	272.37	386	25.140	0.00
J-22	233.32	0.06	272.37	382	28.780	0.06
J-23	231.60	0.00	272.37	399	5.096	0.00
J-25	233.00	0.00	272.37	385	0.538	0.00
J-35	233.47	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-56	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-55	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-54	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-53	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-52	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-51	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-50	233.00	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
J-57	233.30	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)

PHASE 2 AGE ANALYSIS

Junction Table - Time: 0.00 hours

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Age (Maximum) (hours)	Demand (Maximum) (L/s)
J-58	233.60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)

ULTIMATE AVERAGE DAY

Junction Table - Time: 0.00 hours

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Age (Maximum) (hours)	Demand (Maximum) (L/s)
J-3	233.61	0.04	272.37	379	(N/A)	0.04
J-4	233.67	0.06	272.37	379	(N/A)	0.06
J-5	233.53	0.14	272.37	380	(N/A)	0.14
J-6	233.87	0.10	272.37	377	(N/A)	0.10
J-7	232.58	0.11	272.37	389	(N/A)	0.11
J-8	232.96	0.06	272.37	386	(N/A)	0.06
J-9	233.03	0.21	272.37	385	(N/A)	0.21
J-10	233.87	0.22	272.37	377	(N/A)	0.22
J-11	232.15	0.05	272.37	394	(N/A)	0.05
J-12	232.42	0.05	272.37	391	(N/A)	0.05
J-13	233.54	0.05	272.37	380	(N/A)	0.05
J-14	233.84	0.08	272.37	377	(N/A)	0.08
J-15	232.05	0.20	272.37	395	(N/A)	0.20
J-16	232.65	0.22	272.37	389	(N/A)	0.22
J-17	232.83	0.06	272.37	387	(N/A)	0.06
J-18	233.85	0.13	272.37	377	(N/A)	0.13
J-19	230.72	0.00	272.37	408	(N/A)	0.00
J-20	231.80	0.00	272.37	397	(N/A)	0.00
J-21	232.96	0.00	272.37	386	(N/A)	0.00
J-22	233.32	0.06	272.37	382	(N/A)	0.06
J-23	231.60	0.00	272.37	399	(N/A)	0.00
J-25	233.00	0.00	272.37	385	(N/A)	0.00
J-35	233.47	0.00	272.37	381	(N/A)	0.00
J-56	233.00	0.08	272.37	385	(N/A)	0.08
J-55	233.00	0.09	272.37	385	(N/A)	0.09
J-54	233.00	0.09	272.37	385	(N/A)	0.09
J-53	233.00	0.15	272.37	385	(N/A)	0.15
J-52	233.00	0.08	272.37	385	(N/A)	0.08
J-51	233.00	0.06	272.37	385	(N/A)	0.06
J-50	233.00	0.11	272.37	385	(N/A)	0.11
J-57	233.30	0.12	272.37	382	(N/A)	0.12

ULTIMATE AVERAGE DAY

Junction Table - Time: 0.00 hours

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Age (Maximum) (hours)	Demand (Maximum) (L/s)
J-58	233.60	0.03	272.37	379	(N/A)	0.03

ULTIMATE AVERAGE DAY

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Flow (Absolute) (L/s)
P-2	248	J-19	J-25	250.0	110.0	0.90
P-4	82	J-17	J-18	200.0	110.0	0.30
P-5	23	J-18	J-14	200.0	110.0	0.12
P-6	123	J-14	J-3	200.0	110.0	0.04
P-7	80	J-3	J-4	200.0	110.0	0.00
P-8	105	J-4	J-6	200.0	110.0	0.04
P-10	107	J-5	J-4	200.0	110.0	0.01
P-12(1)	63	J-7	J-21	200.0	110.0	0.58
P-12(2)	11	J-21	J-8	200.0	110.0	1.69
P-13	77	J-8	J-20	250.0	110.0	1.75
P-15(1)	118	J-9	J-35	200.0	110.0	0.32
P-15(2)	158	J-35	J-10	200.0	110.0	0.00
P-16	74	J-7	J-12	200.0	110.0	0.47
P-17	80	J-12	J-11	200.0	110.0	0.07
P-18	81	J-11	J-15	200.0	110.0	0.12
P-19	211	J-15	J-16	200.0	110.0	0.23
P-20	62	J-16	J-17	200.0	110.0	0.54
P-21	176	J-18	J-13	200.0	110.0	0.05
P-22(1)	142	J-25	J-23	400.0	120.0	1.75
P-22(2)	282	J-23	J-20	400.0	120.0	1.75
P-23	101	J-3	J-13	200.0	110.0	0.00
P-24	226	J-9	J-10	200.0	110.0	0.22
P-25	213	J-16	J-15	150.0	100.0	0.10
P-26	103	J-5	J-22	200.0	110.0	0.15
P-27	107	J-22	J-6	200.0	110.0	0.14
P-29	81	J-22	J-21	200.0	110.0	0.36
P-30	77	J-21	J-9	200.0	110.0	0.75
P-32	22	R-2	J-25	400.0	120.0	2.65
P-34	90	J-19	J-17	200.0	110.0	0.90
P-35	20	J-13	J-23	200.0	110.0	(N/A)
P-50	79	J-50	J-12	200.0	110.0	0.49

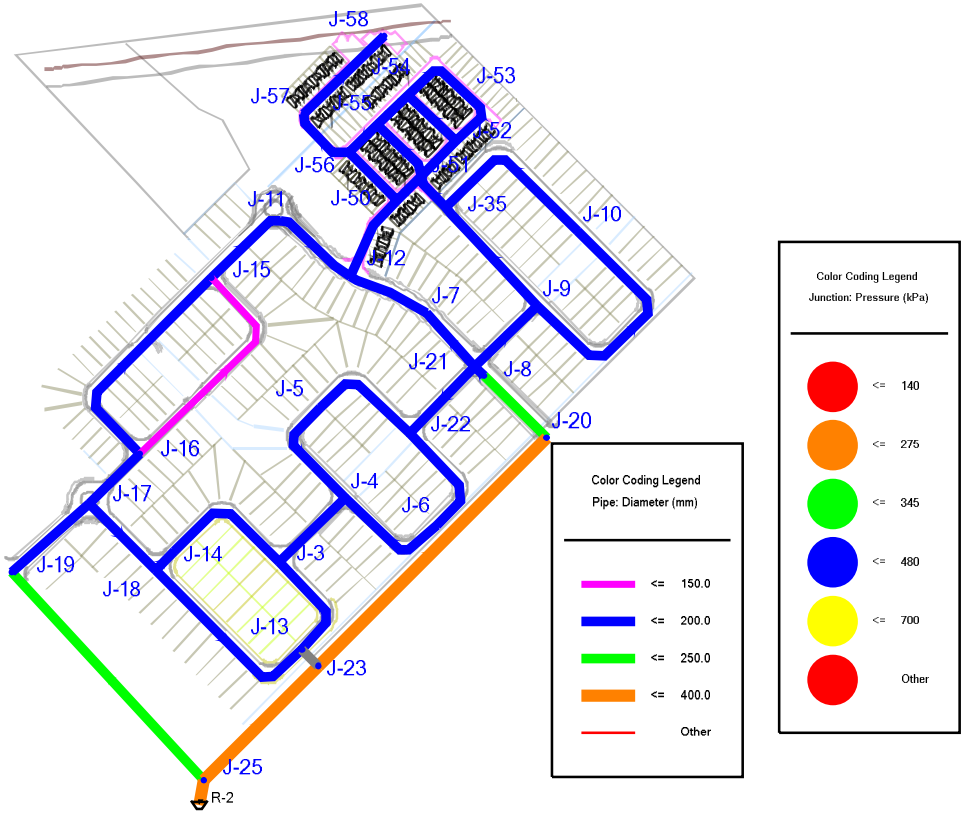
ULTIMATE AVERAGE DAY

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Flow (Absolute) (L/s)
P-51	31	J-51	J-50	200.0	110.0	0.16
P-52	43	J-52	J-51	200.0	110.0	0.23
P-53	63	J-53	J-52	200.0	110.0	0.09
P-54	60	J-54	J-53	200.0	110.0	0.06
P-55	37	J-55	J-54	200.0	110.0	0.09
P-56	35	J-56	J-55	200.0	110.0	0.01
P-57	58	J-56	J-57	200.0	110.0	0.15
P-58	98	J-57	J-58	200.0	110.0	0.03
P-59	59	J-56	J-50	200.0	110.0	0.22
P-60	60	J-55	J-51	200.0	110.0	0.19
P-61	58	J-54	J-52	200.0	110.0	0.06
P-62	36	J-51	J-35	200.0	110.0	0.32

ULTIMATE AVERAGE DAY

Named View - 1 - Time: 0.00 hours



ULTIMATE PEAK HOUR

Junction Table - Time: 0.00 hours

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Age (Maximum) (hours)	Demand (Maximum) (L/s)
J-3	233.61	0.31	272.15	377	(N/A)	0.31
J-4	233.67	0.47	272.15	377	(N/A)	0.47
J-5	233.53	1.09	272.15	378	(N/A)	1.09
J-6	233.87	0.78	272.15	375	(N/A)	0.78
J-7	232.58	0.86	272.14	387	(N/A)	0.86
J-8	232.96	0.47	272.17	384	(N/A)	0.47
J-9	233.03	1.64	272.13	383	(N/A)	1.64
J-10	233.87	1.72	272.12	374	(N/A)	1.72
J-11	232.15	0.39	272.13	391	(N/A)	0.39
J-12	232.42	0.39	272.13	389	(N/A)	0.39
J-13	233.54	0.39	272.15	378	(N/A)	0.39
J-14	233.84	0.62	272.15	375	(N/A)	0.62
J-15	232.05	1.56	272.13	392	(N/A)	1.56
J-16	232.65	1.72	272.14	387	(N/A)	1.72
J-17	232.83	0.47	272.15	385	(N/A)	0.47
J-18	233.85	1.01	272.15	375	(N/A)	1.01
J-19	230.72	0.00	272.19	406	(N/A)	0.00
J-20	231.80	0.00	272.21	396	(N/A)	0.00
J-21	232.96	0.00	272.16	384	(N/A)	0.00
J-22	233.32	0.47	272.15	380	(N/A)	0.47
J-23	231.60	0.00	272.23	398	(N/A)	0.00
J-25	233.00	0.00	272.23	384	(N/A)	0.00
J-35	233.47	0.00	272.12	378	(N/A)	0.00
J-56	233.00	0.62	272.12	383	(N/A)	0.62
J-55	233.00	0.70	272.12	383	(N/A)	0.70
J-54	233.00	0.70	272.12	383	(N/A)	0.70
J-53	233.00	1.17	272.12	383	(N/A)	1.17
J-52	233.00	0.62	272.12	383	(N/A)	0.62
J-51	233.00	0.47	272.12	383	(N/A)	0.47
J-50	233.00	0.86	272.12	383	(N/A)	0.86
J-57	233.30	0.94	272.12	380	(N/A)	0.94

ULTIMATE PEAK HOUR

Junction Table - Time: 0.00 hours

Label	Elevation (m)	Demand (L/s)	Hydraulic Grade (m)	Pressure (kPa)	Age (Maximum) (hours)	Demand (Maximum) (L/s)
J-58	233.60	0.23	272.12	377	(N/A)	0.23

ULTIMATE PEAK HOUR

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Flow (Absolute) (L/s)
P-2	248	J-19	J-25	250.0	110.0	7.04
P-4	82	J-17	J-18	200.0	110.0	2.35
P-5	23	J-18	J-14	200.0	110.0	0.93
P-6	123	J-14	J-3	200.0	110.0	0.30
P-7	80	J-3	J-4	200.0	110.0	0.01
P-8	105	J-4	J-6	200.0	110.0	0.35
P-10	107	J-5	J-4	200.0	110.0	0.11
P-12(1)	63	J-7	J-21	200.0	110.0	4.52
P-12(2)	11	J-21	J-8	200.0	110.0	13.17
P-13	77	J-8	J-20	250.0	110.0	13.63
P-15(1)	118	J-9	J-35	200.0	110.0	2.47
P-15(2)	158	J-35	J-10	200.0	110.0	0.02
P-16	74	J-7	J-12	200.0	110.0	3.66
P-17	80	J-12	J-11	200.0	110.0	0.55
P-18	81	J-11	J-15	200.0	110.0	0.94
P-19	211	J-15	J-16	200.0	110.0	1.76
P-20	62	J-16	J-17	200.0	110.0	4.22
P-21	176	J-18	J-13	200.0	110.0	0.41
P-22(1)	142	J-25	J-23	400.0	120.0	13.63
P-22(2)	282	J-23	J-20	400.0	120.0	13.63
P-23	101	J-3	J-13	200.0	110.0	0.02
P-24	226	J-9	J-10	200.0	110.0	1.74
P-25	213	J-16	J-15	150.0	100.0	0.75
P-26	103	J-5	J-22	200.0	110.0	1.21
P-27	107	J-22	J-6	200.0	110.0	1.13
P-29	81	J-22	J-21	200.0	110.0	2.80
P-30	77	J-21	J-9	200.0	110.0	5.84
P-32	22	R-2	J-25	400.0	120.0	20.67
P-34	90	J-19	J-17	200.0	110.0	7.04
P-35	20	J-13	J-23	200.0	110.0	(N/A)
P-50	79	J-50	J-12	200.0	110.0	3.83

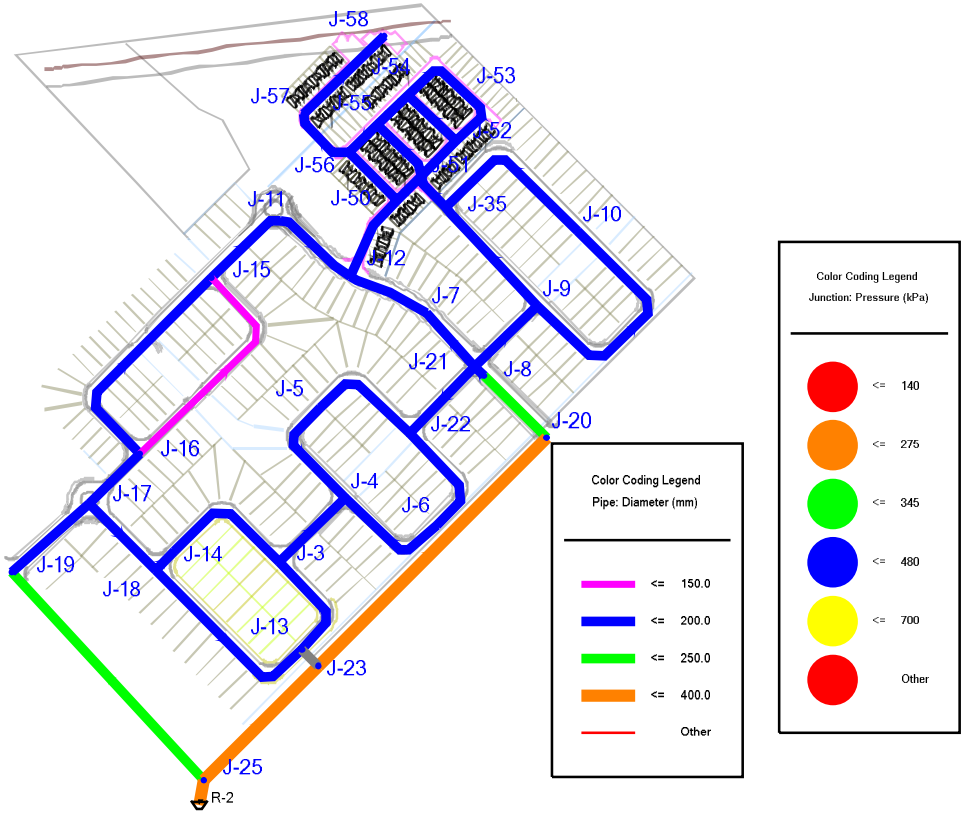
ULTIMATE PEAK HOUR

Pipe Table - Time: 0.00 hours

Label	Length (Scaled) (m)	Start Node	Stop Node	Diameter (mm)	Hazen-Williams C	Flow (Absolute) (L/s)
P-51	31	J-51	J-50	200.0	110.0	1.23
P-52	43	J-52	J-51	200.0	110.0	1.79
P-53	63	J-53	J-52	200.0	110.0	0.68
P-54	60	J-54	J-53	200.0	110.0	0.49
P-55	37	J-55	J-54	200.0	110.0	0.71
P-56	35	J-56	J-55	200.0	110.0	0.05
P-57	58	J-56	J-57	200.0	110.0	1.17
P-58	98	J-57	J-58	200.0	110.0	0.23
P-59	59	J-56	J-50	200.0	110.0	1.74
P-60	60	J-55	J-51	200.0	110.0	1.46
P-61	58	J-54	J-52	200.0	110.0	0.48
P-62	36	J-51	J-35	200.0	110.0	2.49

ULTIMATE PEAK HOUR

Named View - 1 - Time: 0.00 hours



ULTIMATE FIRE FLOW

Fire Flow Report - Time: 0.00 hours

Label	Zone	Flow (Total Needed) (L/s)	Fire Flow (Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Residual @ Total Flow Needed) (kPa)	Junction w/ Minimum Pressure (Zone)	Pressure (Calculated System Lower Limit) (kPa)	Velocity of Maximum Pipe (m/s)
J-3	<None>	76.14	144.28	212	327	J-13	221	3.00
J-4	<None>	76.21	136.56	230	327	J-6	239	3.00
J-5	<None>	76.49	134.08	219	322	J-6	247	3.00
J-6	<None>	76.35	134.10	215	319	J-4	247	3.00
J-7	<None>	76.38	127.98	278	346	J-58	284	3.00
J-8	<None>	76.21	188.88	215	353	J-10	208	3.00
J-9	<None>	76.74	126.23	267	337	J-10	263	3.00
J-10	<None>	76.77	126.90	209	310	J-35	262	3.00
J-11	<None>	76.17	135.13	246	341	J-15	264	3.00
J-12	<None>	76.17	131.59	271	346	J-58	269	3.00
J-13	<None>	76.17	147.70	172	318	J-3	215	3.00
J-14	<None>	76.28	138.00	220	324	J-18	233	3.00
J-15	<None>	76.70	141.51	228	340	J-11	252	3.00
J-16	<None>	76.77	144.31	232	339	J-15	257	3.00
J-17	<None>	76.21	169.03	210	345	J-18	211	3.00
J-18	<None>	76.45	151.38	203	327	J-14	205	3.00
J-19	<None>	76.00	221.81	140	370	J-18	154	2.93
J-20	<None>	76.00	248.81	157	370	J-10	140	2.05
J-21	<None>	76.00	123.61	303	351	J-10	294	3.00
J-22	<None>	76.21	133.30	251	334	J-6	250	3.00
J-23	<None>	76.00	259.34	161	375	J-10	140	2.14
J-25	<None>	76.00	266.44	149	363	J-10	140	2.19
J-35	<None>	76.00	127.78	252	330	J-10	255	3.00
J-50	<None>	133.38	129.17	254	247	J-58	249	3.00
J-51	<None>	133.21	128.76	254	246	J-58	250	3.00
J-52	<None>	133.28	128.82	239	230	J-53	241	3.00
J-53	<None>	133.52	128.84	224	214	J-54	241	3.00
J-54	<None>	133.31	128.85	238	229	J-53	241	3.00

ULTIMATE FIRE FLOW

Fire Flow Report - Time: 0.00 hours

Label	Zone	Flow (Total Needed) (L/s)	Fire Flow (Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Residual @ Total Flow Needed) (kPa)	Junction w/ Minimum Pressure (Zone)	Pressure (Calculated System Lower Limit) (kPa)	Velocity of Maximum Pipe (m/s)
J-55	<None>	133.31	128.91	244	236	J-58	243	3.00
J-56	<None>	133.28	128.99	239	231	J-58	234	3.00
J-57	<None>	76.42	93.72	268	304	J-58	265	3.00
J-58	<None>	76.10	93.72	212	265	J-57	268	3.00

Appendix B

Water Distribution Plan

\\MTE85.LOCAL\MTE\DWG\P\44465\104\PHASE 2\PHASE_2_CURRENT\44465-104_W1.DWG

WATERMAIN NOTES

1. ALL WATERMAIN TO BE PVC C900, CL-150, DR18.
2. ALL SERVICES TO BE APPROVED CROSSED-LINK POLYETHELENE(PEX) BLUE COLOUR - 25mmøW/S.
3. THRUST RESTRAINTS SHALL BE PROVIDED AT ALL FITTINGS, BENDS, TEES, VALVES, HYDRANTS, CROSSES, REDUCERS, AND PLUGGED & CAPPED DEAD ENDS IN ACCORDANCE WITH THE MUNICIPALITY OF STRATROY-CARADOC STANDARD CONTRACT DOCUMENTS FOR M.C.P.
4. WHERE THE COVER TO WATER SERVICES CROSSING STORM SEWERS IS LESS THAN 1.7m, THE SERVICE SHALL BE ADEQUATELY INSULATED OVER THE AFFECTED LENGTH OF SERVICE.
5. ALL WATERMAIN TO HAVE 12 GAUGE TRACER WIRE STRAPPED ALONG THE TOP OF THE PIPE.
6. ALL WATERMAIN & APPURTENANCES SHALL BE CONSTRUCTED AS PER THE MUNICIPALITY OF STRATHROY CARADOC STANDARDS.
7. ALL WATERMAIN VALVES SHALL BE GATE VALVES MANUFACTURED TO AWWA C-500. ALL VALVES TO OPEN CLOCKWISE.
8. ALL FIRE HYDRANTS TO BE 3-WAY W/ STORZ CONNECTION, OPENING CLOCKWISE
9. CURB BOXES TO HAVE STAINLESS STEEL RODS
10. INSTALLATION, HYDROSTATIC TESTING, SWABBING, FLUSHING AND DISINFECTION SHALL BE DONE IN ACCORDANCE WITH THE MUNICIPALITY OF STRATROY-CARADOC GENERAL SPECIFICATIONS FOR WATER DISTRIBUTION SYSTEMS.
11. ANY EXISTING SERVICES BEING ABANDONED ARE TO BE CUT & CAPPED AT THE SOURCE. ANY EXISTING CURB STOP MUST BE CUT 600mm BELOW FINISHED GROUND

LEGEND

- 46 — DENOTES LOT NUMBERS
- PHASE LIMIT
- WATERMAIN
- FIRE HYDRANT (C\W 150 LEAD & STORZ CONNECTION)
- WV — WATER VALVE

WILLIS AVENUE
ABBOTT STREET
WILLIS AVENUE
BLOCK 278
QUEEN STREET
ALEXANDER CIRCLE
ALEXANDER CIRCLE
ALEXANDER CIRCLE
BLOCK 271
COOPER GATE
BLOCK 273
PAYNE CIRCLE
PAYNE CIRCLE
DAVIS TERRACE
DAVIS TERRACE
WILLIS AVENUE
NEWTON AVENUE
NEWTON AVENUE
BLOCK 274
BLOCK 277
CARROLL STREET

CONNECT TO EX. WM
CAP & 50mm B.O.
200x200 TEE
250x200 REDUCER
(2) 250x200 TEE
LIVE TAP TO EX. WM WITH TS&WV

CPED

EXISTING SERVICES	DRAWING #, SOURCE	DATE	CONSTRUCTED SERVICES	COMPLETION	DETAILS	No.	REVISIONS	DATE	CONSULTANT
					DESIGN JAC				
					DRAWN BY DF				
					CHECKED KAM				
					APPROVED DS				
					DATE JAN 23, 2024				

CONSULTANT OR DIVISION

MTE
Engineers, Scientists, Surveyors

ENGINEER'S STAMP

STRATHROY-CARADOC
URBAN OPPORTUNITY - RURAL HOSPITALITY

SCALE

SCALE - 1 : 750
7.5m 0 15m

FIELDCREST SUBDIVISION - PHASE 2
FIELDCREST LTD.

WATER SERVICING PLAN

PROJECT No. 44465-104
SHEET No. 6
PLAN FILE No.