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**39 & 53 Carss Street,
Town of Almonte
Serviceability Report**

Prepared for: 2607129 Ontario Inc.

**39 & 53 CARSS STREET
ALMONTE, ONTARIO**

SERVICEABILITY REPORT

Prepared by:

NOVATECH

Suite 200, 240 Michael Cowpland Drive
Ottawa, Ontario
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Issued: September 30, 2025

Revised: October 14, 2025

Ref: R-2025-88

Novatech File: 119186

October 14, 2025

BY EMAIL

Municipality of Mississippi Mills
Roads & Public Works Department
3131 Old Perth Road, P.O. Box 400
Almonte, Ontario
K0A 1A0

Attention: Michel Asselin, P.Eng., Senior Development and Capital Projects Engineer

Dear **Michel Asselin**:

**Re: Applications for Official Plan & Zoning By-law Amendments
39 & 53 Carss Street Development
Serviceability Report
Our File No.: 119186**

Please find enclosed the revised report entitled "39 & 53 Carss Street – Serviceability Report" dated October 14, 2025. This report has been updated to reflect additional information on the existing servicing, and the report outlines the preliminary servicing design for the proposed development with respect to water, sanitary and storm servicing, and stormwater management. This report is submitted in support of applications for Official Plan Amendment and Zoning By-law Amendment for the properties known municipally as 39 and 53 Carss Street.

If you have any questions, please contact the undersigned.

Yours truly,

NOVATECH



Trevor McKay, P.Eng.
Senior Project Manager

TABLE OF CONTENTS

1.0.	INTRODUCTION	1
2.0.	EXISTING DEVELOPMENT	1
3.0.	PROPOSED DEVELOPMENT	1
3.1.	SITE A: PINEHURST MANOR BOUTIQUE INN AND SPA.....	2
3.2.	SITE B: PINEHURST LODGE SENIORS APARTMENTS.....	2
4.0.	SANITARY SERVICING	3
4.1.	MUNICIPAL SYSTEM.....	3
4.2.	SITE A	3
4.3.	SITE B	4
5.0.	WATER SERVICING.....	4
5.1.	MUNICIPAL SYSTEM.....	5
5.2.	PRELIMINARY WATER DEMAND - SITE A.....	6
5.3.	PRELIMINARY WATER DEMAND - SITE B.....	6
6.0.	STORM SERVICING & STORMWATER MANAGEMENT	6
6.1.	SITE A	7
6.2.	SITE B	7
7.0.	EROSION AND SEDIMENT CONTROL MEASURES	7
8.0.	CONCLUSIONS AND RECOMMENDATIONS	8
9.0.	CLOSURE	8

List of Figures

- Figure 1 Key Plan
- Figure 2 Existing Conditions / Aerial Plan View
- Figure 3 Conceptual Servicing Design

List of Appendices

- Appendix A Concept Site Plan
- Appendix B Carss Street and Union Street Plan and Profiles
- Appendix C Sanitary Sewer Calculations and Supporting Documents
- Appendix D Water Calculations and Supporting Documents

1.0. INTRODUCTION

Novatech has prepared this Serviceability Report on behalf of 2607129 Ontario Inc. (the “owner”) in relation to applications for Official Plan Amendment and Zoning By-law Amendment for the properties located at 39 and 53 Carss Street in the former Town of Almonte within the Municipality of Mississippi Mills (the “subject lands”).

The subject lands represent two contiguously owned parcels referred to hereinafter as Site A (39 Carss Street) and Site B (53 Carss Street), as demonstrated on **Figure 1**. Situated along the Mississippi River, the historic Pinehurst Manor is a private residence nestled in the interior of Site A, and which overlooks the natural landscape of the grounds with views of the river, waterfalls and gardens. Site B is also used for residential purposes and is occupied by a more modest and contemporary detached dwelling.

The owner recognizes that there is a unique opportunity to share the history and beauty of the vast Pinehurst Manor estate and envisions the development of a boutique inn featuring guest accommodations, indoor and outdoor spa amenities, and dining and banquet hall facilities on site. The parcel adjacent to the estate is intended for the development of complementary private residential apartment units to be marketed towards seniors. The purpose of the requested Official Plan and Zoning By-law amendments is to create a policy and regulatory framework to support such uses and establish the principles upon which development of the sites are to be based.

This Serviceability report demonstrates that the proposed conceptual development can be serviced with the existing Municipal infrastructure surrounding the property.

2.0. EXISTING DEVELOPMENT

The subject lands are located along Carss Street, west of Union Street N, within the urban area of the Town of Almonte. Site A is irregular in shape and has a total area of approximately 4.04 hectares and frontage of approximately 9.18 meters along the south side of Carss Street with an additional approximately 18.7 meters of frontage along an unopened road allowance being an extension of Brookdale Avenue. The central portion of the site is comprised of the Pinehurst Manor residence and several outbuildings. The surrounding area has large lawns and landscaped open space and gardens, while the balance consists predominantly of tree cover. The site generally slopes to the south and west, towards the Mississippi River.

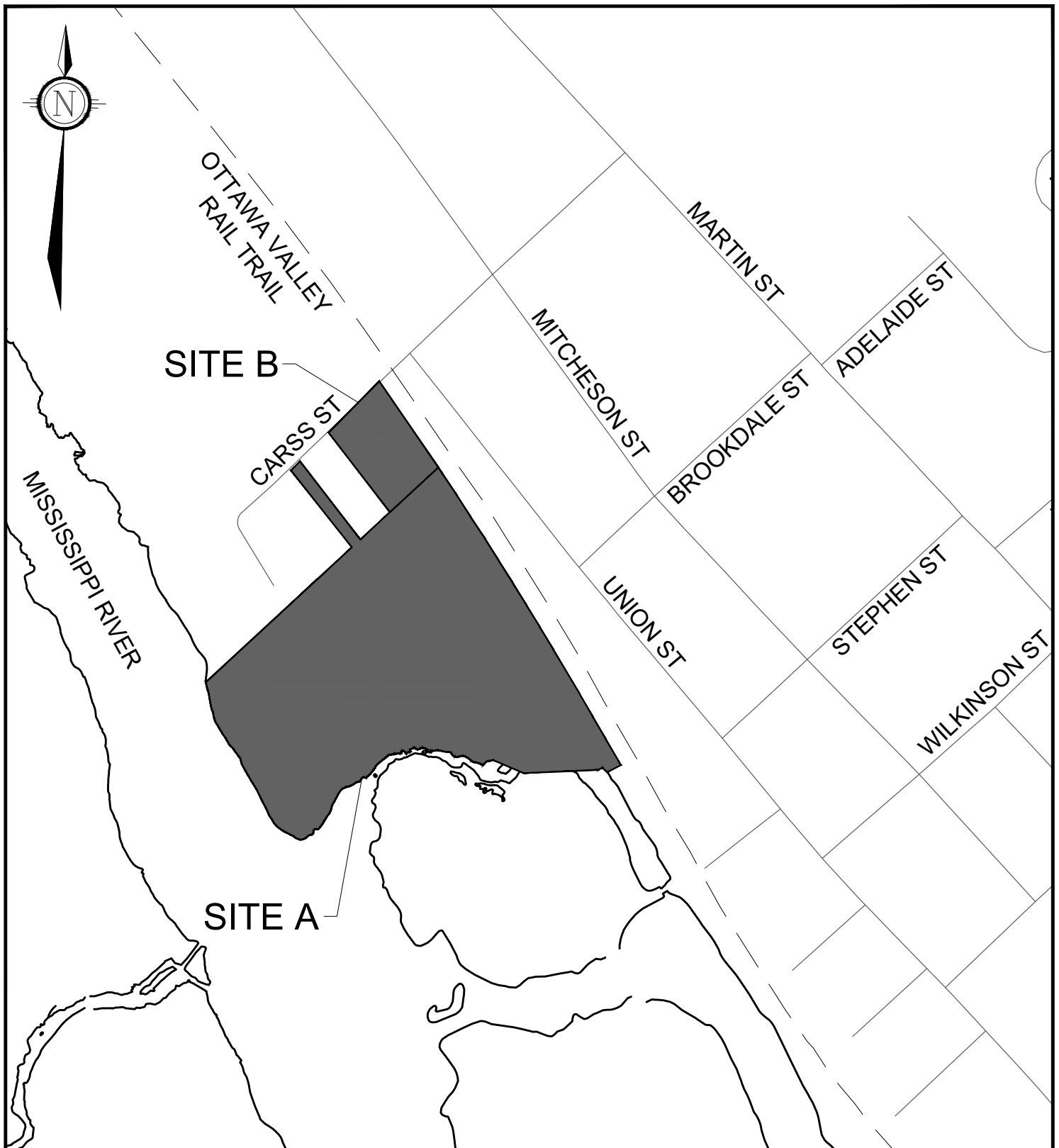
Site B is rectangular in shape and has a total area of approximately 0.39 hectares with a frontage of approximately 53.14 meters along the south side of Carss Street. The site is occupied by an existing residential dwelling. The majority of the site is landscaped open space, with mature trees lining the side and rear property lines. The site generally slopes towards the west, draining the existing ditch on Carss Street.

Refer to **Figure 2** for an aerial photo of the properties.

3.0. PROPOSED DEVELOPMENT

A Conceptual Site Plan has been prepared by Graff Architecture to illustrate the future vision for the subject property (**Appendix A**).

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MUNICIPALITY of MISSISSIPPI MILLS
39 & 53 CARSS STREET

KEY PLAN

SCALE

N.T.S

DATE

SEP 2025

JOB

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FIGURE

FIGURE 1

\\novatech2018\nova2019\119186\CAD\Design\Figures\Design Brief\119186-FIG2-EXC.dwg, EXC, Sep 29, 2025 - 10:33am, mdouglas



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MUNICIPALITY of MISSISSIPPI MILLS
39 & 53 CARSS STREET

EXISTING CONDITIONS /
AERIAL PLAN VIEW

SCALE 1 : 2500

DATE SEP 2025 JOB 119186 FIGURE FIGURE 2

3.1. SITE A: PINEHURST MANOR BOUTIQUE INN AND SPA

Site A can be characterized as a mix of tourist-service uses which to be marketed as a boutique inn and spa. The inn will feature the original Pinehurst Manor at its centre alongside new guest accommodation in the form of hotel suites and private cabins. Bed and breakfast style guest rooms will also continue to be offered within the existing Pinehurst Manor. The related spa will provide indoor and outdoor amenities, such as pools, saunas, relaxation areas and treatment rooms. A restaurant will provide on-site dining services and an addition to the existing Pinehurst Manor will serve as a banquet hall for events.

Development would involve retrofitting and enlarging the existing manor with one to three-storey additions to provide for approximately eight (8) bed and breakfast style guest rooms, a restaurant for all guests with new commercial kitchen, and a banquet hall with verandah and seven (7) hotel suites above. The manor would no longer function as a private residence. The existing detached carriage house would also be converted to accommodate an accessory dwelling unit for housing the property manager, as well as administrative offices and amenity space or storage.

In addition, a new three-storey building with walkout basement is proposed near the main entry from Brookdale Street featuring approximately 12 hotel guest rooms and the primary spa facility. A separate two-storey building will provide an additional eight (8) hotel guest rooms. A total of 27 one-storey guest cabins are also proposed in groupings throughout the site. A series of pedestrian pathways will connect buildings, amenities and waterfront areas.

In total, approximately 62 guest rooms will be available on site. On occasion, these rooms may be booked for private events. It is anticipated that such events would have capacity of up to approximately 175 guests. The spa and restaurant would be closed to the public during larger events to allow for private use of the grounds and full access to parking facilities.

A series of internal roadways and pedestrian pathways will link buildings, parking areas, and amenities, with the balance of the property remaining as landscaped or treed areas. Parking areas will be provided for convenient access to all buildings. The private cabins may also have independent parking spaces. Primary access is proposed via the road allowance extension of Brookdale Street, with secondary access proposed via the existing driveway from Carss Street. Signage and lighting will be respectful of adjacent uses and will assist with wayfinding for guests.

The natural qualities of the site will be preserved to the greatest extent possible. Tree removal will be strategic to maintain existing health vegetation and will be supplemented by new plantings to contribute to the landscape. The shoreline areas will remain largely undisturbed aside from potential pedestrian pathways and amenities that require access or proximity to water such as docks and gazebos.

3.2. SITE B: PINEHURST LODGE SENIORS APARTMENTS

Site B is intended for medium-density residential use up to four storeys in height. Development representing highest use of the site is envisioned as a four-storey seniors apartment building with approximately 45 dwelling units. The development aims to support aging-in-place by providing greater housing choice for seniors seeking to downsize and remain in the community. The unit mix would consist of predominantly one-bedroom units given to cater to the anticipated one or two-person household.

One level of parking would be provided below-grade with supplemental surface parking for residents and visitors. Access would be provided directly from Carss Street.

Amenity areas for residents would comprise interior lounges and communal spaces, as well as potentially private balconies and terraces. Residents would also have access to the Pinehurst Manor grounds via a pedestrian pathway connection. Existing vegetation would be retained to the extent possible to maintain natural screening between properties.

4.0. SANITARY SERVICING

It is understood that the existing residential buildings are serviced by individual onsite septic systems. The septic systems would be decommissioned and separate connections to the municipal sanitary sewer system would be completed as part of site plan development.

4.1. MUNICIPAL SYSTEM

The municipal sanitary sewer system adjacent to the site consists of a newly constructed gravity sewer (250mm) on Union Street that flows north to a proposed gravity sewer (250mm) on Carss Street and then to the lift station proposed as part of the Hilan Village development. Sanitary flows will ultimately be pumped to the existing gravity sewer system on Union Street, south of the site. For reference, profile drawings of the Union Street and Carss Street works are included in **Appendix B**, along with excerpts from the excerpts from the Hilan Hills Servicing Brief (Kollaard, 2023) in **Appendix C**.

The Kollaard report indicates that the proposed sanitary lift station has been design for 6.38L/s of peak domestic flow and 1.09L/s of infiltration flow (7.47L/s total) for all offsite areas tributary to the lift station. The report does not indicate exactly which offsite areas are accounted for; however, it indicates that the area is roughly equal to the site area (7.4ha).

Given the lack of detail to support the assignment of offsite flows to the proposed sanitary lift station, for the purposes of this report, it is assumed that the 39 and 53 Carss Street properties (4.43ha) account for approximately 60% of the intended offsite sanitary drainage area, which would provide an allowable total peak flow rate of 4.48L/s.

4.2. SITE A

Site A is situated lower than the surrounding streets (Carss & Union). All development within this portion of the site will likely be serviced with onsite gravity sanitary sewers outletting to an onsite lift station, which will pump flows to the existing sanitary sewer on either Carss Street or Union Street, which will ultimately outlet to the Hilan Village lift station.

The total theoretical peak sanitary flow from the proposed development was calculated based on the conceptual site plan and Appendix 4-A of the Ottawa Sewer Design Guidelines, and Tables 3.1.17.1, 8.2.1.3.A, and 8.2.1.3.B of the OBC (2012). Table 3.1.17.1 confirmed the number of people based on area (m²). Appendix 4-A, 8.2.1.3A and 8.2.1.3B confirm the demand.

The anticipated use of the site as described in **Sections 3.1** and **3.2** (i.e. reducing flows from different sources during larger events) has not been completed for this feasibility study. This approach is considered conservative and actual peak flows based on the current anticipated usage will be lower than those calculated by the methodology used in this report. Refer to calculations included in **Appendix C**. It is recommended that, at detailed engineering design for site plan control application, a more detailed assessment of the sanitary and water demands be completed based on additional site information.

Peak sanitary flows for Site A were calculated based on the factors below and summarized in **Table 4.1**:

- Theoretical Daily Flow = 87275.0/day (1.01L/s)
- Peaking Factor = 4.0 (Residential) / 1.5 (Commercial)
- Total Site Area = 4.04 ha
- Infiltration Rate = 0.33 L/s/ha

Table 4.1: Peak Sanitary Flows Summary – Site A

Flow Type	Design Flow (L/s)	Area (ha)	Sanitary Peak Flows (L/s)
Residential	0.014	-	0.055
Commercial	0.996	-	1.495
Infiltration	-	4.04	1.333
Sanitary Peak Flow – Site A			2.883

4.3. SITE B

Site B is anticipated to be serviced by gravity sewers connecting to the proposed sewer on Carss Street. Depending on the detailed design of the site, a sanitary sump pump may be required for flows from the basement level of the proposed building. Peak sanitary flows for Site B were calculated to be based on the factors below and presented in **Table 4.2**:

- Population Design Flow = 350L/per/day
- Peaking Factor = 4.0
- Total Site Area = 0.39 ha
- Infiltration Rate = 0.33 L/s/ha

Table 4.2: Peak Sanitary Flows Summary – Site B

Flow Type	Population	Area (ha)	Sanitary Peak Flows (L/s)
Residential	81	-	1.313
Infiltration	-	0.39	0.129
Sanitary Peak Flow – Site B			1.442

The total combined peak flow from these sites is calculated to be **4.33L/s**, which is in line with the approximately 4.48L/s that was inferred (see **Section 4.1**) to be available for these sites. As the Carss Street sanitary sewer and Hilan Development sanitary lift station designs have accounted for the servicing of the adjunct residential lands (7.47L/s), which includes the 39 and 53 Carss Street properties, the proposed development is serviceable by the existing and proposed municipal sanitary sewer system.

5.0. WATER SERVICING

The Site A (39 Carss Street) property has a small diameter water service entering the site from the unopened road allowance at Brookdale Street and Union Street. It is anticipated that any new development on this property will require an upgrade to this existing water service.

Site B (53 Carss Street) is understood (from owner) to have a municipal water service. It is unclear at this time where the service is connected to the municipal system, although it is possible it is connected to the 39 Carss Street service. It is anticipated that any new development on this property will require the construction of a municipal water service and the decommissioning of the existing water well.

5.1. MUNICIPAL SYSTEM

There is an existing 300mm dia. watermain on Union Street and a proposed 300mm dia. watermain on Carss Street, which will ultimately connect to a watermain crossing the Mississippi River. For reference, a profile of the proposed Carss Street watermain and existing Union Street watermain is included in **Appendix B**.

The existing municipal water system surrounding the site is currently operating, and is projected to continue operating, within allowable system pressures and well above minimum pressure requirements during peak hour and maximum day + fire flow demands. **Table 5.1** confirms the anticipated operating conditions adjacent to the site, as presented in the Mississippi Mills Water and Wastewater Infrastructure Master Plan (December 2024), refer to excerpts in **Appendix D**.

Table 5.1 – Existing Watermain Operating Conditions

Demand	Timing	Available Pressure (kPA)	Available Fire Flow (L/s)
Average Daily (High Pressure) <i>Max. = 700kPA</i>	Short term	552	N/A
	Mid Term	517	N/A
	Long Term	517	N/A
Peak Hour <i>Min. = 275kPA</i>	Short term	507	N/A
	Mid Term	452	N/A
	Long Term	466	N/A
Max. Daily and Fire Flow <i>Min. = 140kPA</i>	Short term	N/A	197
	Mid Term	N/A	218
	Long Term	N/A	190

Source: Mississippi Mills Water and Wastewater Infrastructure Master Plan (December 2024)
Short term is years 2023-2028, Mid Term is years 2028-2038, Long Term is years 2038-2048

The design requirements for a water system within the Municipality of Mississippi Mills are:

Demands and Peaking Factors

- Residential Demand = 350L/cap/day
- Commercial Demand = 28,000L/ha/day
- Max Daily Peaking Factor = 1.5*HP (Commercial)
- Peak Hour Peaking Factor = 1.8*MD (Commercial)

Note: The residential peaking factors for this site have been based on MOE design guidelines for small systems (Population < 500 persons).

System Pressure

- Maximum Allowable Pressure = 700kPa (100psi)
- Minimum Allowable Pressure (excluding fire flow) = 275kPa (40psi)
- Minimum Allowable Pressure (including fire flow) = 140kPa (20psi)
- Maximum Age = 24 hours (on-site)

5.2. PRELIMINARY WATER DEMAND - SITE A

Site A can be serviced from either Union Street or Carss Street, with a second connection to the available from the other Street if a looped connection is required to supply sufficient fire flow rates. During detailed engineering design, fire flow requirements will be determined, and hydraulic boundary conditions will be requested from the municipality to size of the onsite water services. The preliminary water demands calculated for the site are presented in **Table 5.2** and the supporting calculations can be found in **Appendix D**.

Table 5.2: Water Demand Summary – Site A

Demand Type	Avg. Daily Demand (L/s)	Max. Daily Demand (L/s)	Peak Hour Demand (L/s)	FUS Fire Flow (L/s)
Residential	0.014	0.131	0.197	TBD
Commercial	0.996	1.495	2.690	
Total	1.010	1.626	2.887	

5.3. PRELIMINARY WATER DEMAND - SITE B

Site B can be serviced by a water connection to the proposed watermain on Carss Street. Refer to **Figure 3 – Conceptual Servicing Design** for possible watermain connection points. The preliminary water demands calculated for the site are presented in **Table 5.3** and the supporting calculations can be found in **Appendix D**.

Table 5.3: Water Demand Summary – Site B

Demand Type	Avg. Daily Demand (L/s)	Max. Daily Demand (L/s)	Peak Hour Demand (L/s)	FUS Fire Flow (L/s)
Residential	0.33	3.12	4.69	TBD
Total	0.33	3.12	4.69	

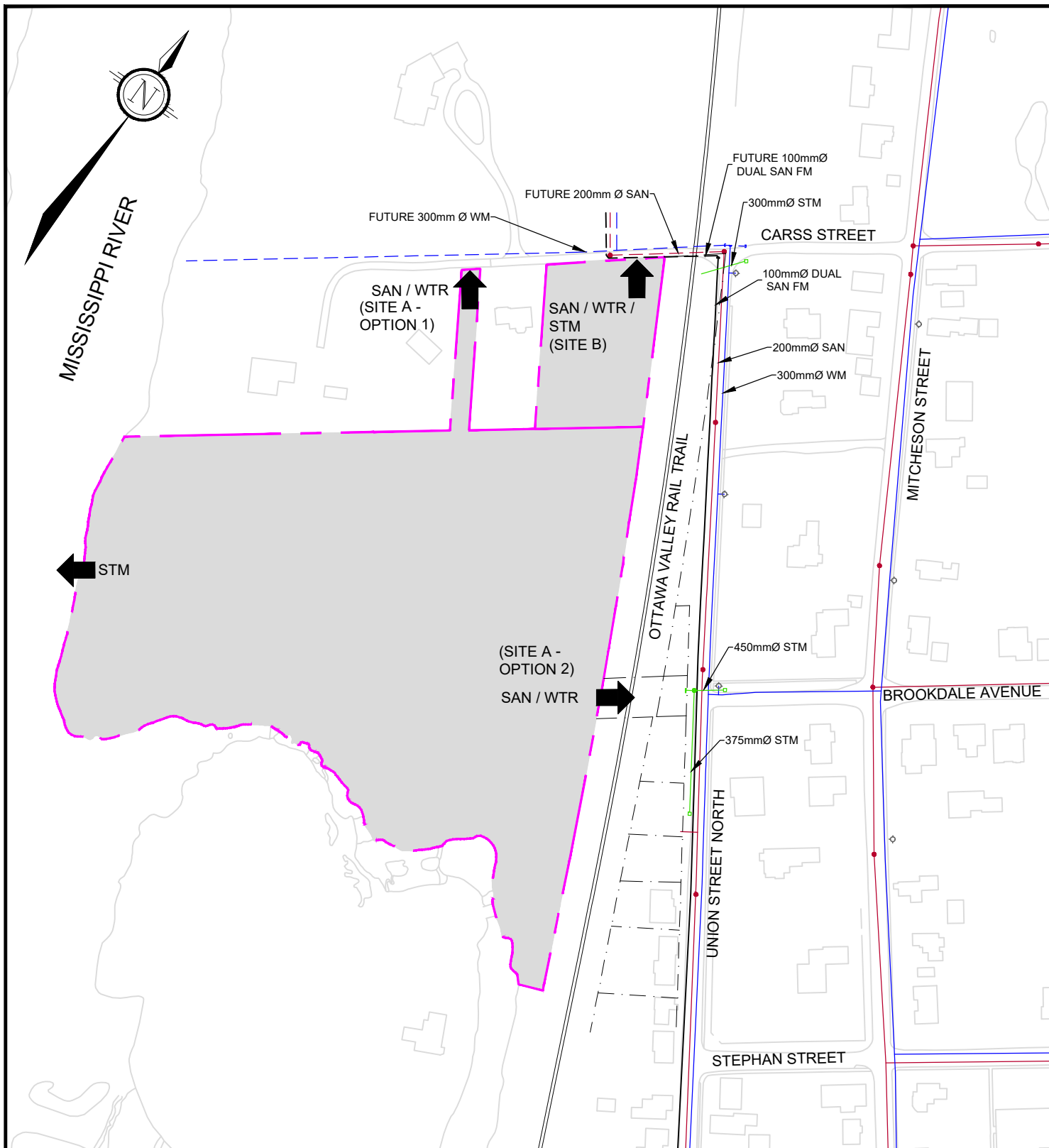
Fire flow demands for the site will be calculated in accordance with the Ontario Building Code or Fire Underwriters Survey (2020) for site plan control applications. During detailed engineering design, hydraulic boundary conditions will be requested from the municipality to size of the onsite water services.

For all time horizons studied by the Infrastructure Master Plan, the watermain network surrounding the subject site functions well within the design criteria established by the Municipality. Each site will be serviced by at least one connection to a 300mm watermain, and the connections could be looped if required based on detailed design criteria. It is anticipated that the fire flow requirements which will be submitted as part of future site plan control applications will be the determining factor in required water service sizes. The proposed development is serviceable by the existing and proposed municipal water system.

6.0. STORM SERVICING & STORMWATER MANAGEMENT

There are no existing municipal storm sewers in the area which can service the sites. Carss Street is serviced by roadside ditches. Union Street has a local storm sewer system, however this system outlets to a headwall within the existing unopened road allowance on the west side of the 39 Carss Street Property. The existing flows from all adjacent municipal right of ways ultimately drain overland to the Mississippi River.

\\novatech2018\nova2019\119186\CAD\Design Brief\119186-FIG4-CSD2.dwg, 8x11, Sep 29, 2025 - 10:47am, mdouglas



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MUNICIPALITY of MISSISSIPPI MILLS
39 & 53 CARSS STREET

CONCEPTUAL SERVICING DESIGN

SCALE 1 : 2500

DATE SEP 2025 JOB 119186 FIGURE FIGURE 3

6.1. SITE A

The existing grading of Site A flows to the south and west, to the Mississippi River. Stormwater collected onsite will be directed to onsite swales or into onsite storm sewers. Ultimately all stormwater flows will outlet uncontrolled into the Mississippi River. However, because the site is located within the jurisdiction of the Mississippi Valley Conservation Authority (MVCA) an 'enhanced' level of protection, equivalent to a long-term average removal of 80% Total Suspended Solids (TSS) is required for stormwater leaving the site.

The method of treatment will be confirmed during the site plan control application; however the prescribed level of treatment can generally be achieved with Oil and Grit Separators (OGS) or other TSS removal methods. Refer to **Figure 3** – Conceptual Servicing Design for the conceptual location of the stormwater discharge from the site outlet into the Mississippi River.

6.2. SITE B

The existing grading of Site B flows to the west, to the existing Carss Street roadside ditch. Stormwater collected onsite will be directed to onsite swales or into onsite storm sewers. Quality control will be required to meet an 'enhanced' level of protection, equivalent to a long-term average removal of 80% Total Suspended Solids (TSS) for stormwater leaving the site.

There are two options for a stormwater outlet for Site B. The first alternative would be to modify (lower) the existing ditch on Carss Street and providing an outlet to the ditch. The second option would be to enter into a servicing agreement with the 39 Carss Street property and outlet directly to the Mississippi River through the private storm sewer system on that property. If the site outlets to the Carss Street roadside ditch, it is anticipated that the site will require quantity control of stormwater flows to restrict the outflows to match pre-development conditions.

In summary, the proposed stormwater flows from the two sites will not be directed to existing storm sewers. All stormwater flows will be treated onsite and discharge to the Mississippi River. A SWM analysis will be required to be completed as part of future site plan control applications.

7.0. EROSION AND SEDIMENT CONTROL MEASURES

Temporary erosion and sediment control measures will be required on-site during construction in accordance with the Best Management Practices for Erosion and Sediment Control. This includes the following temporary measures:

- Filter bags/socks will be placed in existing catchbasins and manholes surrounding the site, and will remain in place until vegetation has been established and construction is completed;
- Silt fencing will be placed along the surrounding construction limits;
- Mud mats will be installed at the site entrances;
- The contractor will be required to perform regular street sweeping and cleaning as required, to suppress dust and to provide safe and clean roadways adjacent to the construction site;

The erosion and sediment control measures will be required prior to construction and will remain in place during all phases of construction. Regular inspection and maintenance of the erosion control measures will be undertaken.

8.0. CONCLUSIONS AND RECOMMENDATIONS

This Serviceability Report has evaluated the water, sanitary, storm, and stormwater management for the proposed 39 & 53 Carss Street development, located in the Municipality of Mississippi Mills.

The principal findings and conclusions of this report are as follows:

- Water servicing, domestic supply and fire protection, will be provided by connecting to the proposed Carss Street 300mm dia. watermain. Additional connections to the Carss Street and Union Street watermains are available for each site, if required.
- Sanitary servicing will be provided by the proposed Carss Street 250mm sanitary sewer. The Carss Street sanitary sewer outlets to a proposed sanitary lift station that is included in the approved Hilan Development, by others. Site A will require an onsite sanitary lift station, while Site B can be serviced by gravity to the proposed Carss Street sanitary sewer.
- Storm flows will be treated as required to achieve a minimum 80% TSS. Site A will outlet directly to the Mississippi River. Site B will outlet either to the roadside ditch on Carss Street or through Site A to the Mississippi River.
- Temporary erosion and sediment control measures will be required during construction.

9.0. CLOSURE

This report entitled “39 & 53 Carss Street – Serviceability Report” is submitted in support of applications for Official Plan Amendment and Zoning By-law Amendment.

Please contact the undersigned should you have any questions or require additional information.

NOVATECH

Prepared by:



Trevor McKay, P.Eng.
Senior Project Manager
Land Development Engineering



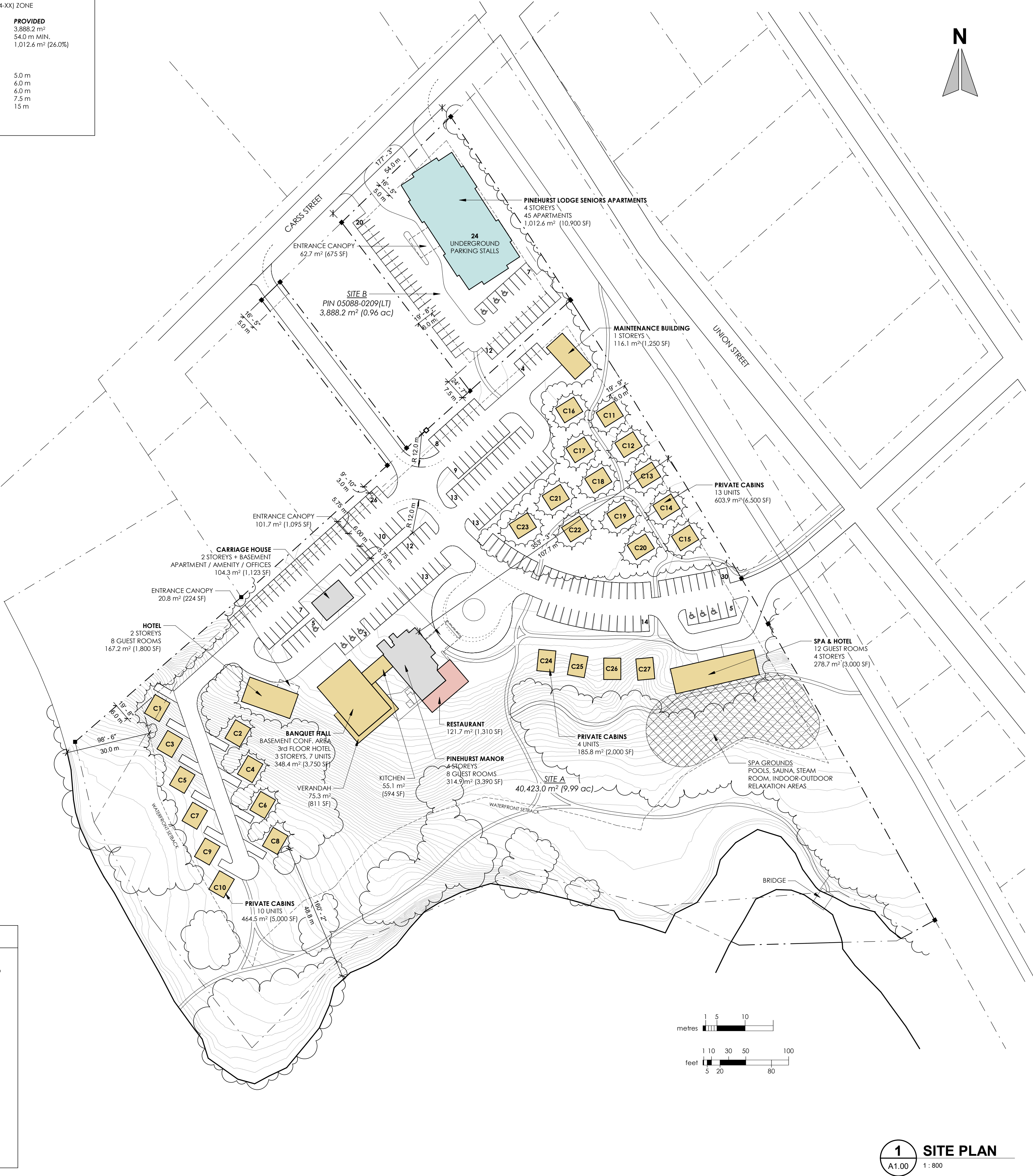
APPENDIX A

Concept Site Plan

SITE A CALCULATIONS			SITE B CALCULATIONS		
ZONE: RESIDENTIAL FOURTH DENSITY, SPECIAL PROVISIONS (R4-YY) ZONE			ZONE: RESIDENTIAL FOURTH DENSITY, SPECIAL PROVISIONS (R4-XX) ZONE		
BY-LAW CATEGORY	REQUIREMENT	PROVIDED	BY-LAW CATEGORY	REQUIREMENT	PROVIDED
LOT AREA	600 m² MIN.	40,423.0 m²	LOT AREA	600 m² MIN.	3,888.2 m²
LOT FRONTAGE	30 m MIN.		LOT FRONTAGE	30.0 m MIN.	54.0 m MIN.
LOT COV. - BUILDING	-	2,835.9 m²	LOT COVERAGE	40% (1,750 m²) MAX.	1,012.6 m² (26.0%)
LOT COV. - CANOPY	-	122.5 m²	AMENITY SPACE	-	
LOT COV. TOTAL	45% (18,167 m²) MAX.	7.3% (2,958.4 m²)	LANDSCAPED AREA	-	
LANDSCAPED AREA	-				
FRONT YARD (INW)	5.0 m	6.0 m	FRONT YARD	5.0 m	5.0 m
INTERIOR YARD (IN)	6.0 m	6.0 m	INTERIOR YARD (IN)	6.0 m	6.0 m
INTERIOR YARD (SE-EP ZONE)	30.0 m	30.0 m	INTERIOR YARD (S)	6.0 m	6.0 m
REAR YARD (SE-EP ZONE)	30.0 m	30.0 m	REAR YARD	7.5 m	7.5 m
MAX. BLD. HEIGHT	11 m	14 m	MAX. BLD. HEIGHT	11 m	15 m

GENERAL SITE INFORMATION	
PROPERTY AREA:	44,312 m² (476,966 SF)
LEGAL DESCRIPTION:	PART OF LOTS 16 AND 17 CONCESSION 9 GEOGRAPHIC TOWNSHIP OF RAMSAY, FORMERLY TOWN OF ALMONTE, NOW IN THE TOWN OF MISSISSIPPI MILLS, COUNTY OF LANARK
SURVEY:	DRAWING BASED ON SURVEY BY MCINTOSH PERRY SURVEYING INC. DATED MARCH 4, 2019, JOB NUMBER 18-4381, DRAWING D18-4381

PARKING CALCULATIONS					
BUILDING (SITE PART)	USE TYPE	UNIT RATE	UNITS / AREA (m²)	REQ'D SPACES	SPACES PROVIDED
PART A					
PINEHURST MANOR	BED & BREAKFAST	1.0x / GUEST ROOM	8 GUEST ROOMS	8	10
RESTAURANT	RESTAURANT	3x / 50m² + 10x / 100m²	176.8 m² GFA	18	18
RESTAUR. WITHIN MANOR	RESTAURANT	10x / 100m²	~158 m² GFA	16	18
RESTAURANT BASEMENT	B&B AMENITY SPACE	NO PARKING LOAD	N/A	0	0
CARRIAGE HOUSE	ACCESSORY DWELLING	0.5x / DWELLING	1x UNIT (MANAGER SUITE)	0.5	3
SPA	WELLNESS SPA	2.5x / 100 m²	557.4 m² GFA	14	14
SPA HOTEL	RENTAL SUITE (HOTEL)	1x / GUEST ROOM	12 UNITS	12	12
BANQUET BASEMENT	PLACE OF ASSEMBLY	10x / 100 m² GFA	174.2 m²	18	18
BANQUET HALL	PLACE OF ASSEMBLY	10x / 100 m² GFA	348.4 m²	35	38
BANQUET VERANDAH	PLACE OF ASSEMBLY	NO PARKING LOAD	N/A	0	0
BANQUET HOTEL	RENTAL SUITE (HOTEL)	1x / GUEST ROOM	7 UNITS	7	8
HOTEL	RENTAL SUITE (HOTEL)	1x / GUEST ROOM	8 UNITS	8	12
CABINS	RENTAL SUITE (HOTEL)	1x / GUEST ROOM	27 UNITS	27	27
MAINTENANCE BUILDING	ACCESSORY USE	NO PARKING LOAD	N/A	0	0
			TOTAL	162	182
PART B					
APARTMENT	DWELLINGS	1.2x / DWELLING	45 SUITES	54	54
VISITOR	VISITOR	0.2x / DWELLING	45 SUITES	9	9
			TOTAL	63	63
NOTE: SOME ITEMS LISTED WITH MULTIPLE ENTRIES (RESTAURANT / BANQUET HALL) ARE CONTIGUOUS SUITES AND NOT TO BE INTERPRETED AS SEPARATE ENTITIES					



1 SITE PLAN
A1.00 1:800



ISSUED FOR		
1	2024-10-29	CONCEPT SITE PLAN (ver.6)
2	2024-02-18	CONCEPT SITE PLAN (ver.7)
3	2025-03-10	CONCEPT SITE PLAN (ver.8)
4	2025-03-24	CONCEPT SITE PLAN (ver.9)
5	2025-04-11	CONCEPT SITE PLAN (ver.10)
6	2025-08-07	CONCEPT SITE PLAN (ver.11)

METRIC
THIS DRAWING IS COPYRIGHTED AND MUST NOT BE USED, REPRODUCED, OR REVISED WITHOUT WRITTEN PERMISSION.
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REPORT INCONSISTENCIES AND OMISSIONS TO THE CONSULTANT FOR CLARIFICATION BEFORE COMMENCING WITH THE WORK.
DEVIATIONS FROM THE CONTRACT DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE CONSULTANT ARE SUBJECT TO CORRECTION AT THE CONTRACTOR'S EXPENSE.

ARCHITECT & PRIME CONSULTANT
GRAFF ARCHITECTURE
1358 RIDEAU FERRY ROAD
PERTH, ONTARIO K7H 3C7
Tel: (613)-900-1963

KEYPLAN

SEAL

PINEHURST DEVELOPMENT

39 CARSS STREET
ALMONTE, ON K0A 1A0

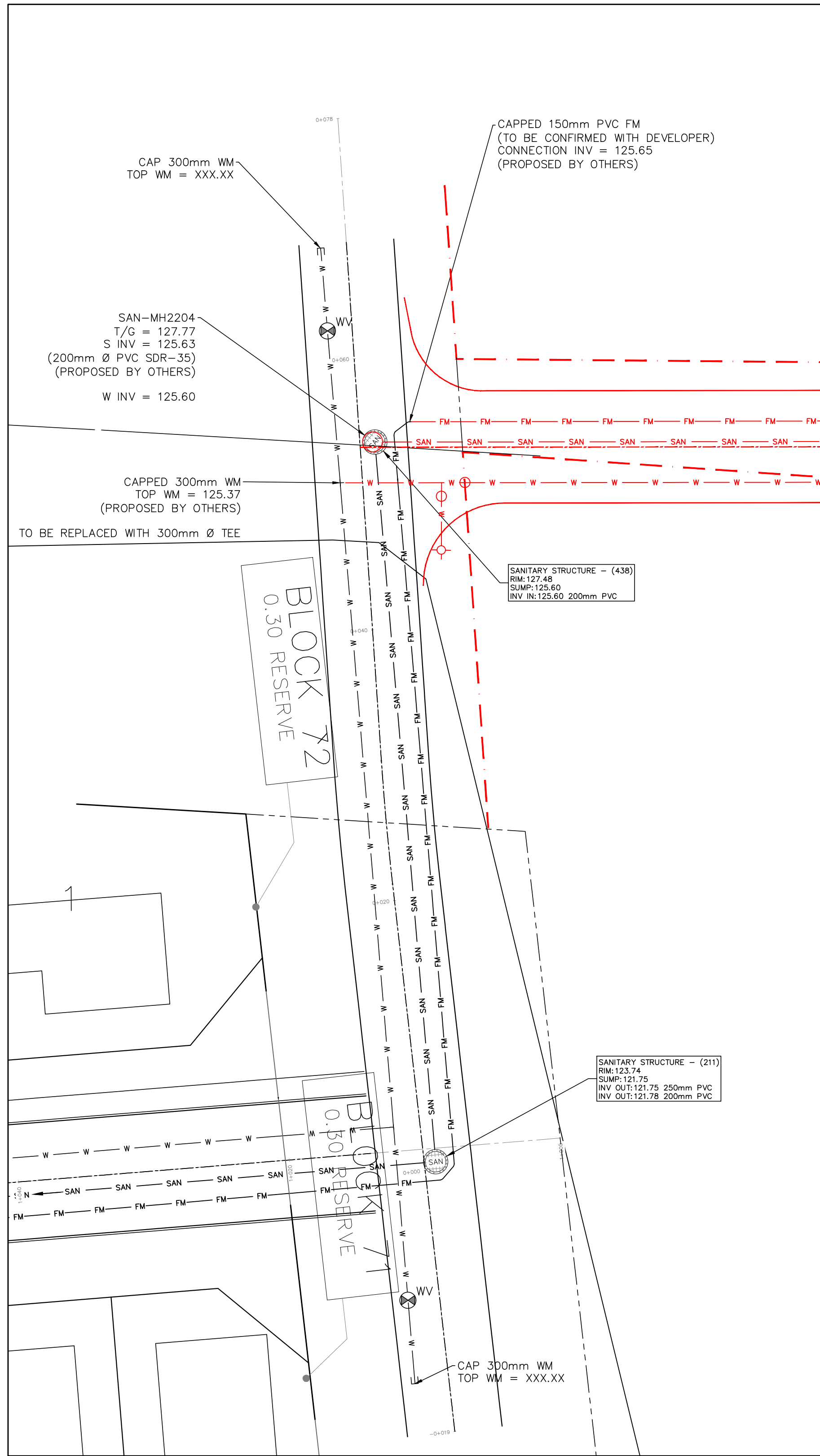
CONCEPT SITE PLAN

DRAWN: GJG
PLOT DATE: 2025-08-27 3:02:20 PM

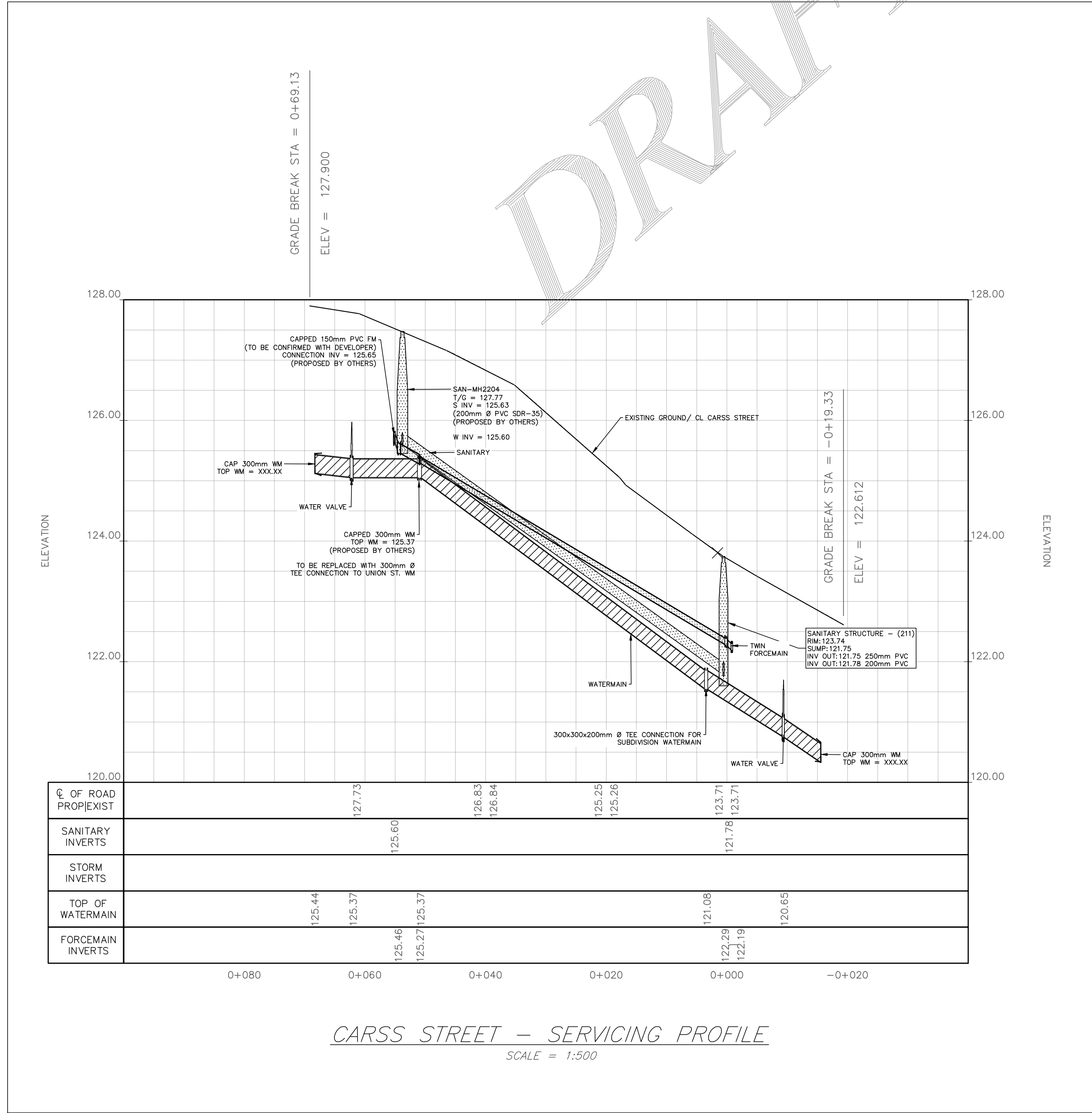
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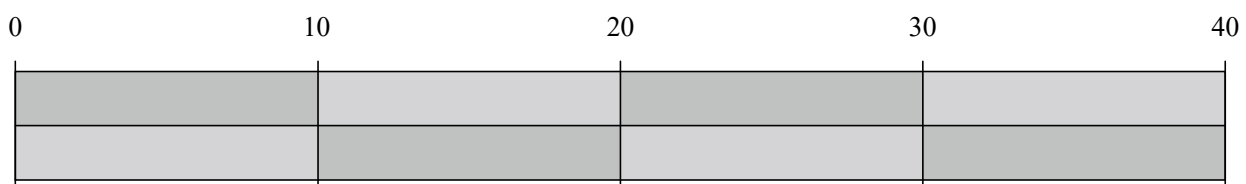
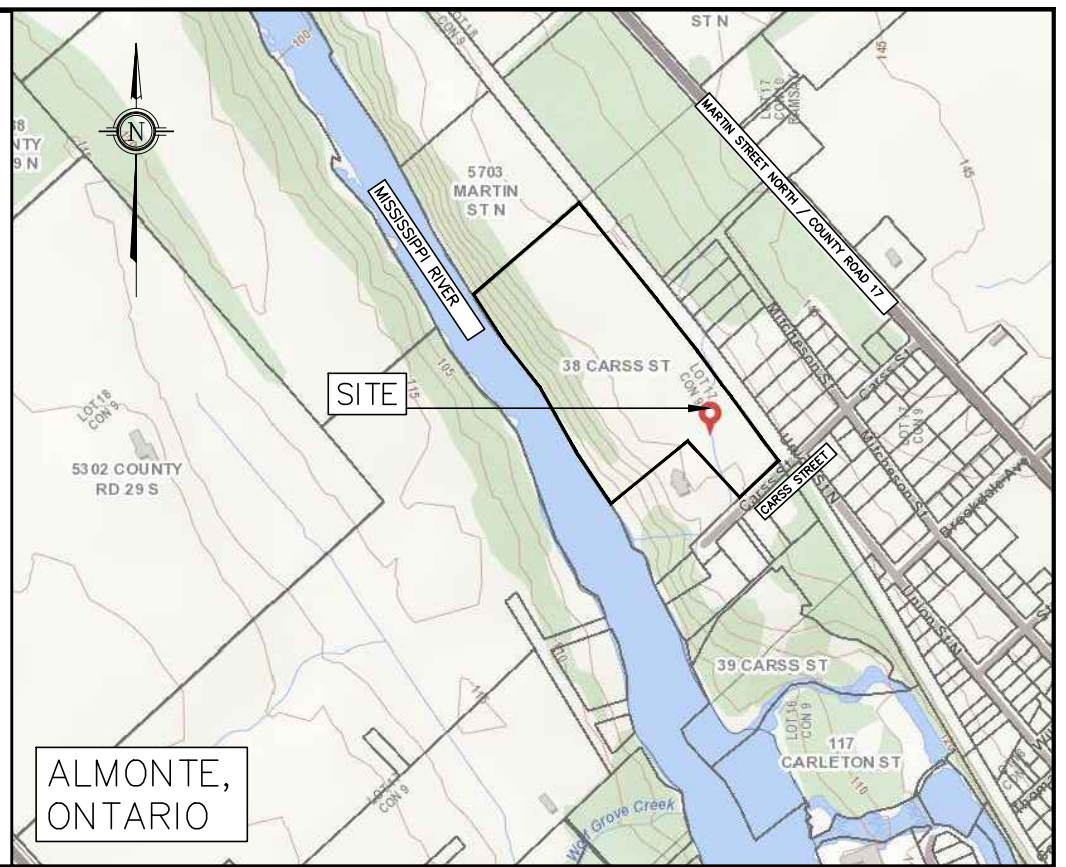
APPENDIX B
Carss Street and Union Street Plan and Profiles



CARSS STREET – SERVICING PLAN
SCALE = 1:250



CARSS STREET – SERVICING PROFILE
SCALE = 1:500



SCALE: 1:250 METERS

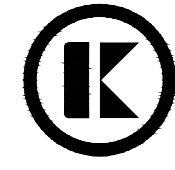


LEGEND	
	PIPE FLOW DIRECTION
	STORM STRUCTURE
	SANITARY STRUCTURE
	SANITARY PIPE
	STORM PIPE
	PROPOSED FIRE HYDRANT
	TOP OF SLOPE
	WATERMAIN
	SANITARY FORCEMAIN
	PROPOSED WATER VALVE

- NOTES:
- ALL DIMENSIONS ARE IN METRES, UNLESS OTHERWISE SPECIFIED; ALL ELEVATIONS ARE IN METRES AND ARE GEODETIC.
 - THIS IS NOT A LEGAL SURVEY.
 - BOUNDARY INFORMATION DERIVED FROM ANNIS, O'SULIVAN VOLLEBEKK LTD.
 - EXISTING SERVICES INFORMATION SHOWN ARE BASED ON BEST CURRENT INFORMATION. CONTRACTOR TO VERIFY EXACT LOCATION AND REPORT ANY DISCREPANCIES TO KOLLAARD ASSOCIATES INC.
 - CLIENT IS RESPONSIBLE FOR ACQUIRING ALL NECESSARY PERMITS.
 - CONTRACTOR TO VERIFY THAT APPROPRIATE PERMITS HAVE BEEN ACQUIRED PRIOR TO ANY CONSTRUCTION.
 - CONTRACTOR IS RESPONSIBLE FOR LOCATION AND PROTECTION OF UTILITIES.
 - ALL DIMENSIONS TO BE VERIFIED ON SITE BY CONTRACTOR PRIOR TO CONSTRUCTION.
 - THIS DRAWING IS NOT FOR CONSTRUCTION UNTIL ALL APPROVALS HAVE BEEN GRANTED.
 - INSPECTION OF ROUGH GRADE BY KOLLAARD ASSOCIATES INC. AND MUNICIPALITY MUST BE CONDUCTED PRIOR TO PLACEMENT OF TOPSOIL OR SOD.
 - HYDRO SERVICE TO BE INSTALLED ACCORDING TO THE SPECIFICATIONS OF SERVICE PROVIDER AND THE MECHANICAL ENGINEER.
 - ALL MATERIALS AND CONSTRUCTION TO BE IN ACCORDANCE WITH MUNICIPAL STANDARDS AND ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS.
 - ANY CHANGES MADE TO THIS PLAN MUST BE VERIFIED AND APPROVED BY KOLLAARD ASSOCIATES, INC.
 - THIS DRAWING IS PART OF KOLLAARD ASSOCIATES DESIGN REPORT # 210864.

No.	REVISION	DATE	BY
3	REVISED SITE PLAN & RESPONSE TO REVIEW COMMENTS	13.OCT.2023	JR
2	ISSUED FOR REVISED SITE PLAN (2022-11-28)	10.JAN.2023	AJ
1	ISSUED IN RESPONSE TO REVIEW COMMENTS	24.OCT.2022	SD

CONSULTANTS



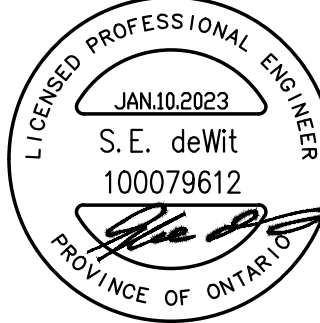
Kollaard Associates
Engineers

BOX 189
210 PRESCOTT STREET
KEMPTVILLE, ONTARIO
K0G 1A0
FACSIMILE (613) 258-0475

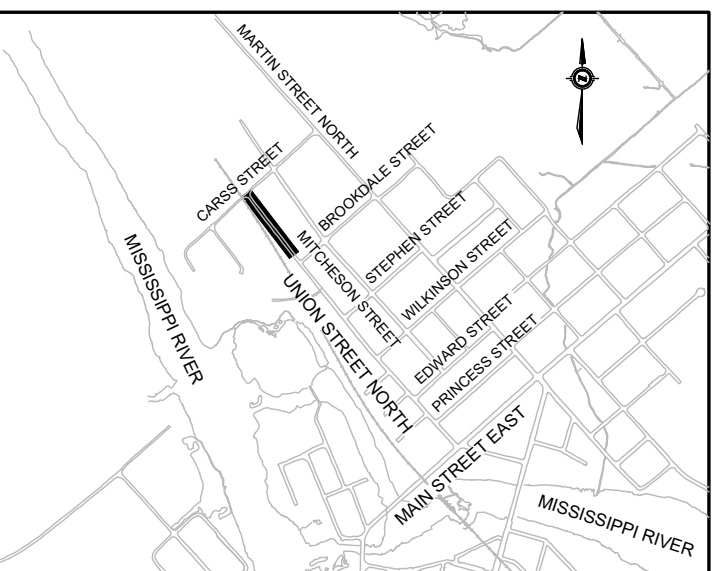
(613) 860-0923

DESIGN	SD
DRAWN	JR
CHECKED	SD
APPROVED	SD

STAMP



CLIENT NAME	WESTVIEW PROJECTS INC.	PROJECT No.	210864
PROJECT NAME	PROPOSED RESIDENTIAL SUBDIVISION	DATE	11.APRIL.2022
PROJECT LOCATION	38 CARSS STREET, ALMONTE, ONTARIO	SCALE	AS NOTED
DRAWING	SERVICING PLAN & PROFILE CARSS STREET	DRAWING No.	210864-PP-CARSS



UTILITY NOTES:

- | | | | | |
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| 03 | 11/02/2024 | ISSUED FOR TENDER | M.M. | |
| 02 | 01/09/2023 | ISSUED FOR DETAILED DESIGN | M.M. | |
| 01 | 17/04/2023 | ISSUED FOR PRELIMINARY DESIGN | M.M. | |
| No. | DATE | DESCRIPTION | BY | |



CLIENT

UNION STREET NORTH REHABILITATION

DESIGNED BY _____

DRAWN BY

S.S. & J.B.

K.M.

DATE _____

PROJECT NO. _____

470417	
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[illegible]

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APPENDIX C
Sanitary Sewer Calculations &
Hilan Village Servicing Report Excerpts

Water and Sanitary Demand Calculation Sheet



Novatech Project #: 119186
Project Name: Pinehurst Resort & Nordic Spa
Date: 9/30/2025
Input By: Mark Bowen
Reviewed By: Trevor McKay
Drawing Reference: Concept Site Plan (ver. 11), dated August 7, 2025

Location	Proposed Use / Occupancy Type	Unit of Measure	Volume (L/per capita/day)	Size (Area/Room/Seat/Ppl)	Total Daily Design Demands (L/day)
SITE A (39 Carss Street)					
Commercial					
Building A Pinehurst Manor (Existing 2.5 Storey Dwelling + Restaurant & Banquet Hall Additions)	Main Floor Restaurant and Banquet Hall ¹	# of Seats	125	175	21875.0
	15 Hotel Rooms (Regular) ²	2.0 ppl/room	225	30	6750.0
Cabins (C1-C27)	27 Rental Cabins with Washrooms ³	2.0 ppl/Cabin	500	54	27000.0
Building E - Nordic Spa	Spa ⁴	1.0ppl/4.6m ²	122	130	15860.0
	12 Hotel Rooms (Regular) ²	2.0 ppl/room	225	24	5400.0
	Water Ammenities (Pools, Hot tubs, Saunas, etc.) ⁵	-	-	-	9200.0
				Commercial Subtotal	86085.0
Residential					
Carriage House	Accessory Dwelling Unit + Office (Single Family Dwelling Unit Equivalent) ⁶	3.4 ppl/unit	350	3.4	1190.0
				Residential Subtotal	1190.0
SITE B (53 Carss Street) - Residential					
Pinehurst Lodge Seniors Apartments	4 Storey Apartment Building (45 Units) ⁷	1.8 ppl/unit	350	81.0	28350.0
				Site B Total	28350.0

Reference: Ontario Building Code, Part 8 (2012), Tables 8.2.1.3.A & 8.2.1.3.B
Ontario Building Code, Part 3 (2012), Table 3.1.17.1
City of Ottawa - Sewer Design Guidelines (2012 and Technical Bulletins), Appendix 4-A
MOE - Design Guidelines for Sewage Works (2008)

Notes: 1. Number of Seats based on client information of 175 persons attending large events. Flow rate from Table 4-A, Restraunt - Ordinary (not 24hrs).
2. Based on 2.0 people per hotel room (OBC 3.1.17.1b) and 225L/per/d per Table 4-A (full housekeeping facilities).
3. 2.0 people per cabin (single room - OBC 3.1.17.1b). Flow rate from Table 8.2.1.3 A - Resort hotel, cottage (500L/per/d).
4. Spa (560m²) to have a maximum occupancy of 120 persons (4.6m²/person - per Table 3.1.17.1). Flow rate from Table 4-A, Beauty Salon.
5. Pool draining, backwashing, evaporation & splash waste, and other water consumption and discharge activities are anticipated to be completed on an ongoing basis to avoid extreme peak demands. The demands have been based on a 25% of the design demands for a similar project, which was designed to accomodate 10x more people. These assumptions will be refined at site plan control.
6. Carriage house to function as apartment + offices. Assume single family dwelling equivalent. Demand is 350L/per/d.
7. 1.8person/unit (Average Apartment occupancy) and demand 350L/person/d per Mississippi Mills design guidelines.



management facility developed for the site which discharges to the Mississippi River to the west of the site.

The existing municipal water services will be extended from offsite and looped through the proposed development to ensure there is adequate water available and to increase the looping within the Municipal system.

Internal sanitary services will be provided by means of sanitary sewers directing flow by gravity to a sanitary lift station to be located in Park Block 2. The sanitary lift station will discharge to the existing municipal sewer system by means of a triplex pump system and force mains.

2 SANITARY SERVICES

The sanitary sewers for the proposed development have been designed using the City of Ottawa Sewer design guidelines as amended.

As previously indicated, the proposed development will consist of a mixture single family dwellings, semi-detached dwellings and rowhouse development. There is also potential for 3 apartment building blocks to be constructed at the northeast corner of the site. As such this potential has been included in the analysis.

As previously indicated, there are no municipal sanitary sewers within the adjacent Carss Street or within proximity to the site which would facilitate the connection to the municipal system by means of a gravity sewer.

The proposed sanitary sewer within the development will consist of 250 mm diameter SDR 28 gasketed pipe. The pipe will be placed a minimum of 2.1 metre below the surface of the street and will discharge by gravity to a sanitary lift station to be located in Park Block 66. A the sanitary lift station will pump the sanitary sewage to the existing municipal system by means of a force main.

2.1 Municipal Connection

Preliminary Plans for the Union Street North Rehabilitation indicated that the rehabilitation will include the extension of the existing 300 mm diameter municipal gravity sanitary sewer along Union Street North to about 69 m north of Stephen Street. 66% milestone submission drawings for the proposed Union Street North Rehabilitation (Union Street Plans) indicate that a new gravity sanitary sewer will be installed along Union Street beginning at about 77 metres north



of Stephen Street and ending at the Carss Street intersection. This gravity sewer is to be extended along Carss Street and into the proposed development discharging into the proposed sanitary lift station.

The Union Street Plans show that a sanitary force main will be installed during the rehabilitation of Union Street and will extend to the extension of the existing gravity sewer about 69 m north of Stephen Street. It is understood that the developer is responsible for the design of the force main. It is understood that the proposed sanitary works will be completed prior to the completion of the servicing works for the proposed development.

2.2 Sanitary Demand

The sanitary flow from the proposed development was calculated as follows:

Proposed Subdivision (Residential)

Total domestic pop:

Single Family Dwellings (37)	x 3.1 ppu:	= 125.8
Semi-detach and Duplex (30)	x 2.7 ppu:	= 81
Rowhouse (townhome) (25)	x 2.7 ppu:	= 67.5
<u>*Apartment Block (57 units)</u>	<u>x 2.1 ppu:</u>	<u>= 119.7</u>
Total:		= 394

*The 57 apartment units represents three 19 unit apartment buildings. It is noted that each apartment building would be constructed in place of 3 rowhouse units. The units from both the rowhouses and the apartment building have been included in the calculation.

$$Q_{\text{Domestic}} = 394 \times 350 \text{ L/person/day} \times (1/86,400 \text{ sec/day}) = 1.596 \text{ L/sec}$$

$$\text{Peaking Factor} = 1 + \frac{14}{4 + (394/1000)^{0.5}} \times 1 = 4.02 - \text{maximum } 4.0$$

$$Q_{\text{Peak Domestic Development}} = 1.596 \text{ L/sec} \times 4 = 6.38 \text{ L/sec}$$

Infiltration

$$Q_{\text{Infiltration}} = 0.33 \text{ L/ha/sec} \times 3.3 \text{ ha} = 1.09 \text{ L/sec}$$



Total Peak Sanitary Flow from Development = $6.38 + 1.09 = 7.47$ L/sec

Proposed Flows from Offsite

It is understood that there are additional lands north and east of the proposed Hilan Village development site that are within the village boundaries. As such there is a potential for future offsite development. It is understood that this potential future offsite development may connect to the proposed sanitary sewer system within the Hilan Village development. It is also understood that the municipality is anticipating the installation of a sanitary sewer along the north end of Union Street and along Carss Street that may flow by gravity to the sanitary sewer system within the proposed development. A review of the adjacent offsite area available for potential future development indicates that the total offsite area appears to be similar in size to the area of the proposed development.

Since the potential total off site area appears to be similar in size to the proposed development the flow from the proposed development was doubled.

$$Q_{\text{Peak offsite}} = Q_{\text{Peak Domestic Development}} = 6.38 \text{ L/sec}$$

$$Q_{\text{infiltration offsite}} = Q_{\text{Infiltration Development}} = 1.09 \text{ L/sec}$$

Total peak sanitary sewer flow to the Sanitary pump station.

$$Q_{\text{peak}} = 2 \times 6.38 + 2 \times 1.09 = 14.94 \text{ L/sec}$$

Sanitary Sewer Mains

The proposed sanitary sewers will consist of 250 mm diameter PVC SDR35 pipe. The location of the sewer mains is indicated on the site servicing drawings as well as the plan and profile drawings. The first section of each gravity sewer main will be installed with a minimum slope of 1% to ensure minimum velocity within the pipes. Detailed sewer design sheets will be completed during submission for subdivision approval. It is noted that the minimum allowable slope for a 250 mm diameter pipe is 0.44% resulting in a flow capacity of 39 L/s. This is well in excess of the expected maximum flow of 7.5 L/sec calculated above. As such calculations for the capacity and velocity of each individual sewer pipe section has not been completed at this time.

Sanitary Force main

It is anticipated that the pump station will receive a peak flow of 14.94 L/sec rounded to 15 L/sec. The force main will consist of 2 nominal 100 mm diameter PVC DR 25 Pressure Class 165



pipe. The triplicate pumps in the lift station will be connected to one of the two pipes. The second pipe is installed for redundancy.

It is anticipated that the sanitary force mains installed during the development will connect to the force main stub at the intersection of Union Street and Carss Street as shown on the plan and profile drawing. It is understood that the Municipality of Mississippi Mills will be upgrading the sanitary sewer along Union Street. The exact connection point is therefore not known at this time. It is understood that this work will likely be completed in the year 2024.

Pump Station Design Capacity

The sanitary lift station will consist of a pre-engineered pump station with an expected internal diameter of 2.5 metres. The station will have a depth of about 6.0 metres and will be equipped with three identical submersible pumps. The pump station will be designed to have a firm capacity equal to the design peak flow rate into the pump station. That is each of the three pumps should have a capacity of one half of the design peak inflow or 7.5 L/sec.

Each pump will be connected to one of two force mains which will be used to convey the sanitary discharge from the pump station to the gravity sewer along Union Street. The sanitary pumps will be designed to discharge one half of the peak sanitary demand at a minimum vertical head of 15 metres and a force main length of 500 metres. The force main will consist of PVC DR25 class 165 kPa pressure pipe.

3 WATER SERVICES

3.1 Watermain and Connection

Preliminary Plans for the Union Street North Rehabilitation indicated that the rehabilitation will include the extension of the municipal water main along Union Street North. 66% milestone submission drawings for the proposed Union Street North Rehabilitation (Union Street Plans) indicate that the proposed watermain extended along Union Street will consist of a 300 mm diameter PVC Class 235 (DR18) watermain which will be capped in the west bound lane of Carss Street. It is understood that the proposed works will be completed prior to the completion of the servicing works for the proposed development.

The 2018 Master Plan indicates that the proposed watermain all Carss Street extended from Union Street North to the Mississippi River will consist of a 300 mm diameter PVC watermain. The proposed development will be serviced by means of this 300 mm diameter PVC water main which will be extended from the above noted 300 mm PVC watermain. It is considered that the proposed cap will be replaced with a 300 x 300 x 300 diameter tee. A valve will be installed

APPENDIX D
Water Calculations &
Mississippi Mills Water and Wastewater
Infrastructure Master Plan Excerpts

Water and Sanitary Demand Calculation Sheet



Novatech Project #: 119186
Project Name: Pinehurst Resort & Nordic Spa
Date: 9/30/2025
Input By: Mark Bowen
Reviewed By: Trevor McKay
Drawing Reference: Concept Site Plan (ver. 11), dated August 7, 2025

Location	Proposed Use / Occupancy Type	Unit of Measure	Volume (L/per capita/day)	Size (Area/Room/Seat/Ppl)	Total Daily Design Demands (L/day)
SITE A (39 Carss Street)					
Commercial					
Building A Pinehurst Manor (Existing 2.5 Storey Dwelling + Restaurant & Banquet Hall Additions)	Main Floor Restaurant and Banquet Hall ¹	# of Seats	125	175	21875.0
	15 Hotel Rooms (Regular) ²	2.0 ppl/room	225	30	6750.0
Cabins (C1-C27)	27 Rental Cabins with Washrooms ³	2.0 ppl/Cabin	500	54	27000.0
Building E - Nordic Spa	Spa ⁴	1.0ppl/4.6m ²	122	130	15860.0
	12 Hotel Rooms (Regular) ²	2.0 ppl/room	225	24	5400.0
	Water Ammenities (Pools, Hot tubs, Saunas, etc.) ⁵	-	-	-	9200.0
				Commercial Subtotal	86085.0
Residential					
Carriage House	Accessory Dwelling Unit + Office (Single Family Dwelling Unit Equivalent) ⁶	3.4 ppl/unit	350	3.4	1190.0
				Residential Subtotal	1190.0
SITE B (53 Carss Street) - Residential					
Pinehurst Lodge Seniors Apartments	4 Storey Apartment Building (45 Units) ⁷	1.8 ppl/unit	350	81.0	28350.0
				Site B Total	28350.0

Reference: Ontario Building Code, Part 8 (2012), Tables 8.2.1.3.A & 8.2.1.3.B
Ontario Building Code, Part 3 (2012), Table 3.1.17.1
City of Ottawa - Sewer Design Guidelines (2012 and Technical Bulletins), Appendix 4-A
MOE - Design Guidelines for Sewage Works (2008)

Notes: 1. Number of Seats based on client information of 175 persons attending large events. Flow rate from Table 4-A, Restraunt - Ordinary (not 24hrs).
2. Based on 2.0 people per hotel room (OBC 3.1.17.1b) and 225L/per/d per Table 4-A (full housekeeping facilities).
3. 2.0 people per cabin (single room - OBC 3.1.17.1b). Flow rate from Table 8.2.1.3 A - Resort hotel, cottage (500L/per/d).
4. Spa (560m²) to have a maximum occupancy of 120 persons (4.6m²/person - per Table 3.1.17.1). Flow rate from Table 4-A, Beauty Salon.
5. Pool draining, backwashing, evaporation & splash waste, and other water consumption and discharge activities are anticipated to be completed on an ongoing basis to avoid extreme peak demands. The demands have been based on a 25% of the design demands for a similar project, which was designed to accomodate 10x more people. These assumptions will be refined at site plan control.
6. Carriage house to function as apartment + offices. Assume single family dwelling equivalent. Demand is 350L/per/d.
7. 1.8person/unit (Average Apartment occupancy) and demand 350L/person/d per Mississippi Mills design guidelines.

Water Demand Design Sheet



Novatech Project #: 119186
Project Name: Pinehurst Resort & Nordic Spa
Date: 9/30/2025
Input By: Trevor McKay
Reviewed By: Trevor McKay
Drawing Reference: Concept Site Plan (ver. 11), Aug 7, 2025

Legend: Input by User No Input Required
 Calculated Cells →

Reference: Ottawa Design Guidelines - Water Distribution (2010 and TBs)
 MOE Design Guidelines for Drinking-Water Systems (2008)
 Fire Underwriter's Survey Guideline (2020)
 Ontario Building Code, Part 3 (2012)
 Mississippi Mills Design Guidelines

Small System = YES

	# of Dwellings	Area (ha.)	Pop. Equiv.	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
Residential Input						
Singles	1		3.40	0.01	0.13	0.20
Industrial / Commercial / Institutional (ICI) Input						
Other Uses ¹				1.00	1.49	2.69
Totals	1	0.00	3.40	1.01	1.63	2.89

1. Refer to Water and Sanitary Demand Calculation Sheet for Summary of Commercial Demands (86085.0L/day).

Summary

i. Type of Development and Units:	Resort and Spa (Commercial), with 1 Residence
ii. Site Address:	39 Carss Street (Site A)
iv. Average Day Flow Demand:	1.01 L/s
v. Peak Hour Flow Demand:	2.89 L/s
vi. Maximum Day Flow Demand:	1.63 L/s

Design Parameters

Residential					
Unit Type Population Equiv.	Singles	Semis/ Towns	Apts (2-BR)	Apts (1-BR)	Apts (Avg)
	3.4	2.7	2.1	1.4	1.8
Daily Demand	L/per person/day				
Average Demand	350				

Residential Peaking Factors		Max Day (x Avg Day)	Peak Hour (x Avg Day)
Small System (If Applicable) <i>Modified</i>	Pop.		
	0	9.50	14.30
	30	9.50	14.30
	150	4.90	7.40
	300	3.60	5.50
	450	3.00	5.50
	500	2.90	5.50

Institutional / Commercial / Industrial				
Industrial		Commercial	Institutional	Other Use
Light	Heavy			
L/gross ha/day				L/m²/day
35,000	55,000	28,000	28,000	5
10,000	17,000	17,000	17,000	3

ICI Peaking Factors	Max Day (x Avg Day)	Peak Hour (x Avg Day)
	1.50	2.70

NOVATECH

M:\2019\119186\DATA\Calculations\Sewer Calcs\Water\20250930-WATER-Demand.xlsx

Water Demand Design Sheet



Novatech Project #: 119186
Project Name: Pinehurst Lodge Seniors Apartment
Date: 9/30/2025
Input By: Trevor McKay
Reviewed By: Trevor McKay
Drawing Reference: Concept Site Plan (ver. 11), Aug 7, 2025

Legend: Input by User
 Calculated Cells →

Reference: Ottawa Design Guidelines - Water Distribution (2010 and TBs)
 MOE Design Guidelines for Drinking-Water Systems (2008)
 Fire Underwriter's Survey Guideline (2020)
 Ontario Building Code, Part 3 (2012)
 Mississippi Mills Design Guidelines

Small System = YES

	# of Dwellings	Area (ha.)	Pop. Equiv.	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
Residential Input						
Singles			0.00	0.00	0.00	0.00
Semis / Townhomes			0.00	0.00	0.00	0.00
Apartments (2-BR)			0.00	0.00	0.00	0.00
Apartments (1-BR)			0.00	0.00	0.00	0.00
Apartments (Avg)	45		81.00	0.33	3.12	4.69
Totals	45	0.00	81.00	0.33	3.12	4.69

Summary

i. Type of Development and Units:	4-storey Seniors Apartment Building
ii. Site Address:	53 Carss Street (Site B)
iv. Average Day Flow Demand:	0.33 L/s
v. Peak Hour Flow Demand:	4.69 L/s
vi. Maximum Day Flow Demand:	3.12 L/s

Design Parameters

Residential					
Unit Type Population Equiv.	Singles	Semis/ Towns	Apts (2-BR)	Apts (1-BR)	Apts (Avg)
	3.4	2.7	2.1	1.4	1.8
Daily Demand	L/per person/day				
Average Demand	350				

Residential Peaking Factors		Max Day (x Avg Day)	Peak Hour (x Avg Day)
Small System (If Applicable)	Pop.		
	0	9.50	14.30
	30	9.50	14.30
	150	4.90	7.40
	300	3.60	5.50
	450	3.00	5.50
	500	2.90	5.50

Phase 2 Report

Mississippi Mills Water and Wastewater Infrastructure Master Plan

- Drinking Water Works Permit (DWWP) No. 178-201, Issue No. 5, dated November 26, 2021.
- Municipal Drinking Water License (MDWL) No. 178-101, Issue No. 5, dated November 26, 2021, which outlines an approved total combined rated capacity of 86.5 L/s.

As indicated above, all wells except Well 6 are not operating at their full demonstrated yield potential and could be considered for additional supply. Well 6 will not be considered for operation beyond the observed operating limit (11.9 L/s) as pumping at higher rates result in increased sediment production and turbidity. Turbidity reduction may require substantial treatment, which is impractical or cost intensive.

Groundwater wells are known to produce water with elevated levels of hardness, as seen in the existing Almonte wells. It is understood some water users in the Almonte system utilize water softeners to treat this hardness.

Table 6 summarizes historic potable water demands for 2018 through to 2022 for the Almonte Ward. The 2008-2011 average/maximum values that were the design basis for the 2012 Master Plan, and the 2012-2016 average/maximum values used in the 2018 Master Plan update, are provided for reference.

Table 6: Historical Potable Water Demands (2018-2022)

Year	Average Day Demand		Maximum Day Demand	
	m ³ /day	L/s	m ³ /day	L/s
Average/Max (2008-2011)	1726	20	3893	38.1
Average/Max (2012-2016)	1729	20	3754	43.4
2018	1969	22.8	3024	35.0
2019	2047	23.7	3284	38.0
2020	2038	23.6	3571	41.3
2021	2367	27.4	3817	44.2
2022	2530	29.3	4624	53.5
Average/Max (2018-2022)	2190	25.4	4624	53.5

4.2 Design Criteria

Table 7 summarizes the water demand rates used as the design basis to evaluate the Municipality's potable water system.

Table 7: Design Criteria–Water Demand Rates

Land Use	Design Criteria	Maximum Day Factor	Peak Hour Factor
Existing and Future Residential	350 L/cap/day	2.5	2.2
Existing and Future Light Industrial	35,000 L/ha/day	1.5	1.8
Existing and Future Commercial	28,000 L/ha/day	1.5	1.8

Phase 2 Report

Mississippi Mills Water and Wastewater Infrastructure Master Plan

The existing average day demand of 25.4 L/s, when divided by the 2021 census population, results in a water demand comparable to the design value of 350 L/d per capita. However, the 25.4 L/s of historical demand includes industrial, commercial, and institutional (ICI) demands in addition to residential demands. Therefore, the design criteria value of 350 L/d for residential demands in both existing and future demand projections is a conservative estimate. The ICI demand is calculated separately in the future demand projections using the per-hectare demand criteria listed in the table above.

Water pumping stations or wells are rated on their 'firm' pumping capacity. Firm capacity is based on the capacity of the station or system, with the largest pump out of service. Pumping stations or well systems are sized based on maximum day flows for areas with sufficient water storage volume, and peak hour flows for areas without sufficient storage.

Storage capacities are based on the Ministry of Environment Conservation and Parks (MECP) Guidelines for Drinking Water Systems (MECP, 2008). The total storage capacity requirements for a pressure zone are the sum of the equalization storage, fire storage, and emergency storage allowances per the MECP guidelines. These design criteria are summarized in Table 8.

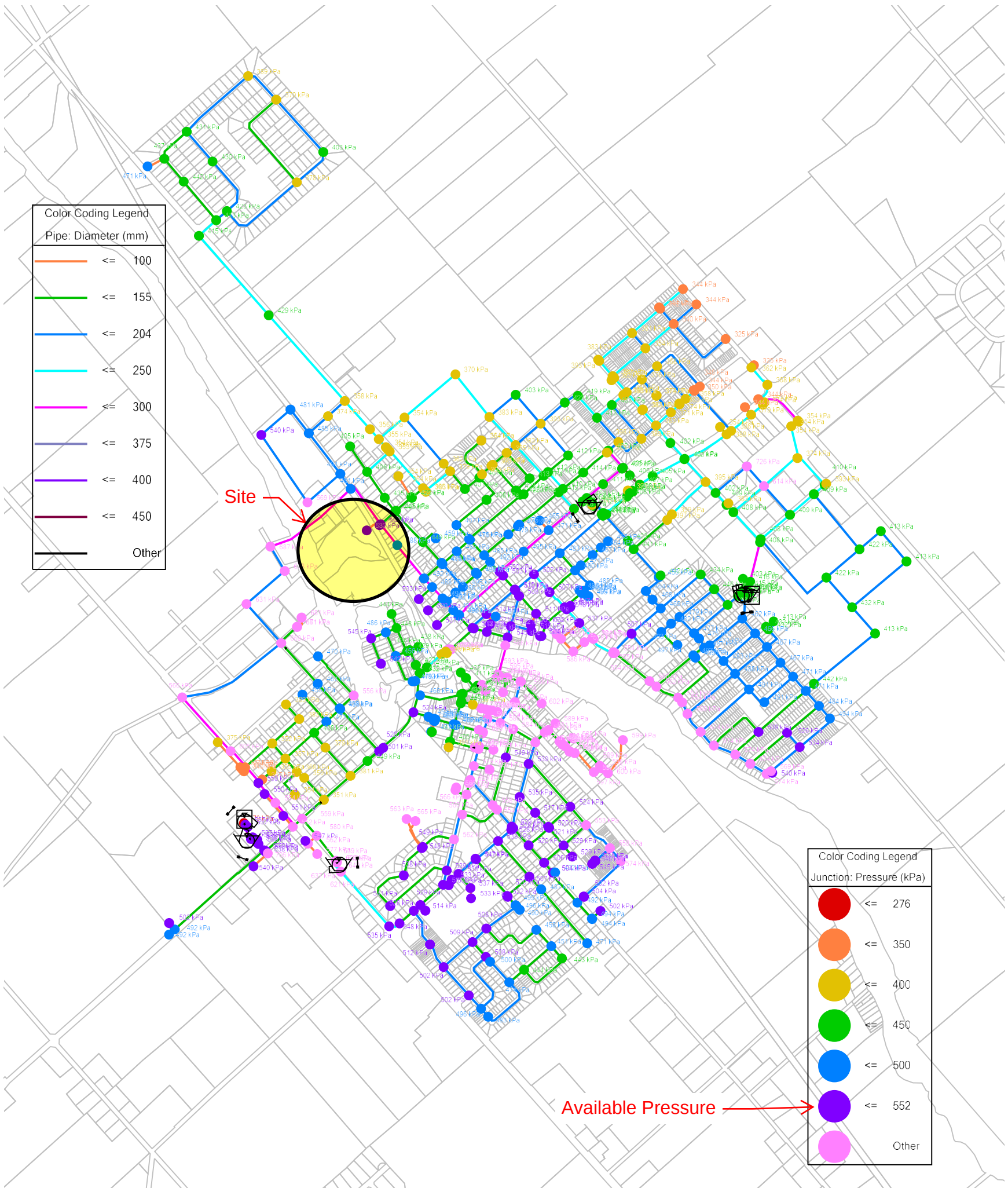
Table 8: Design Criteria–Water Infrastructure and Facilities

Component	Description	Design Criteria
Pumping or Well Systems	- With Adequate Zone Storage Available - Without Adequate Zone Storage Available	- Maximum Day Flows to Zone and All Subsequent Zones - Peak Hour Flows to Zone and Maximum Day Flows to All Subsequent Zones
Storage	- A–Fire Storage - B–Equalization Storage - C–Emergency Storage - Total	- Largest Expected Fire Volume 25% of Maximum Day Demand 25% of 'A' + 'B' 'A' + 'B' + 'C'
Fire Flows ⁽¹⁾	Existing Development - Residential - Industrial Commercial and Institutional (ICI) New Development - Less than 3 m - Residential 3 to 10 m - Residential 10.1 to 30 m - Residential Over 30 m	Ontario Building Code ~45 L/s 100 to 150 L/s Fire Underwriters Survey ⁽²⁾ 133 L/s (8,000 L/min) 67 L/s (4,000 L/min) 50 L/s (3,000 L/min) 33 L/s (2,000 L/min)
System Pressure	Normal Operating Conditions	275 kPa (40 psi) to 700 kPa (100 psi)
(1) This scenario was modelled assuming a minimum pressure of 140 kPa (20 psi) at any junction or hydrant within the service area. (2) Fire flow assessment criteria from the Fire Underwriters Survey, 2020.		

Mississippi Mills Almonte Water Master Plan

Average Day Demand

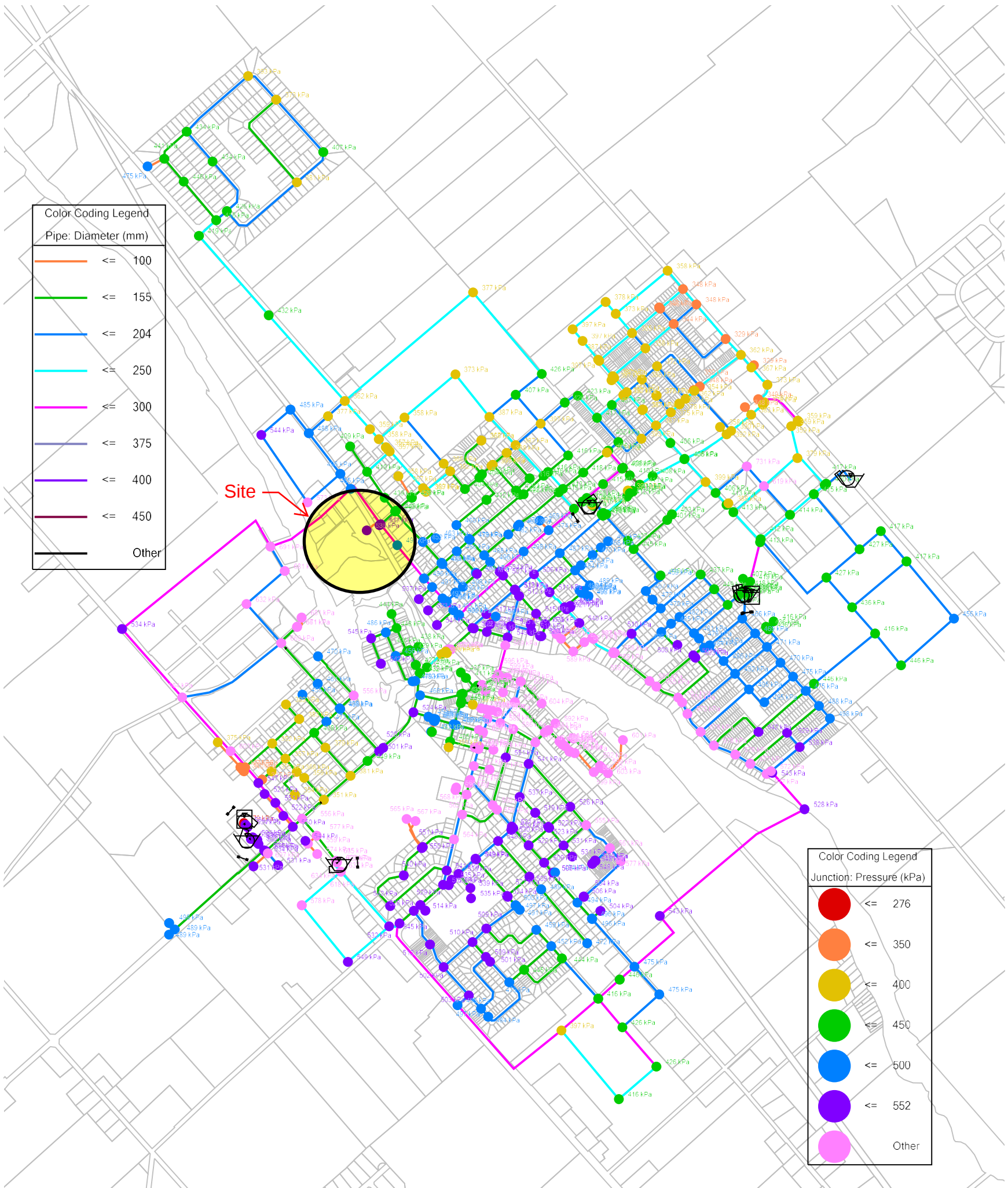
Short Term (2023 to 2028) with Upgrades



Mississippi Mills Almonte Water Master Plan

Average Day Demand

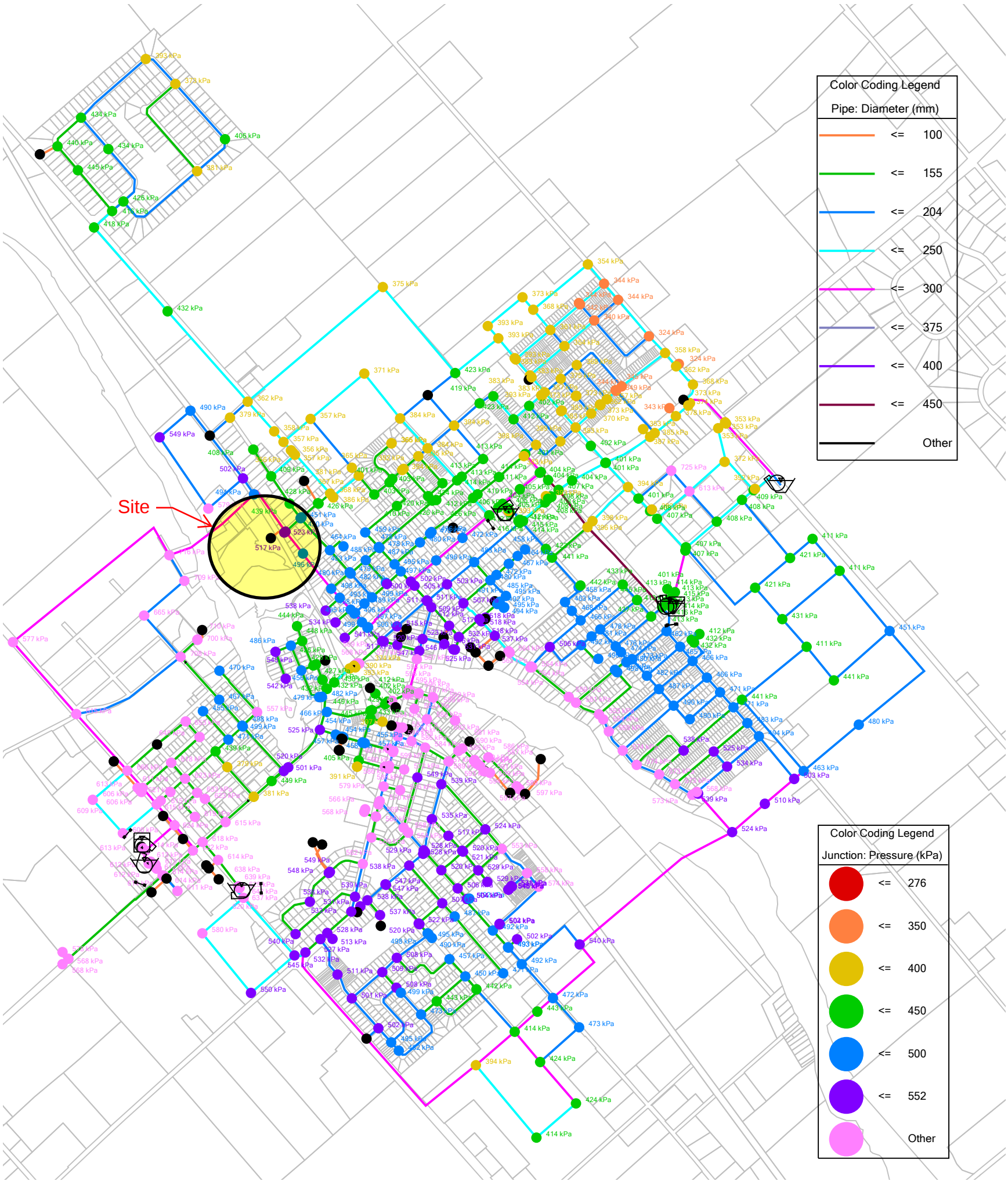
Mid Term (2028 to 2038) with Upgrades



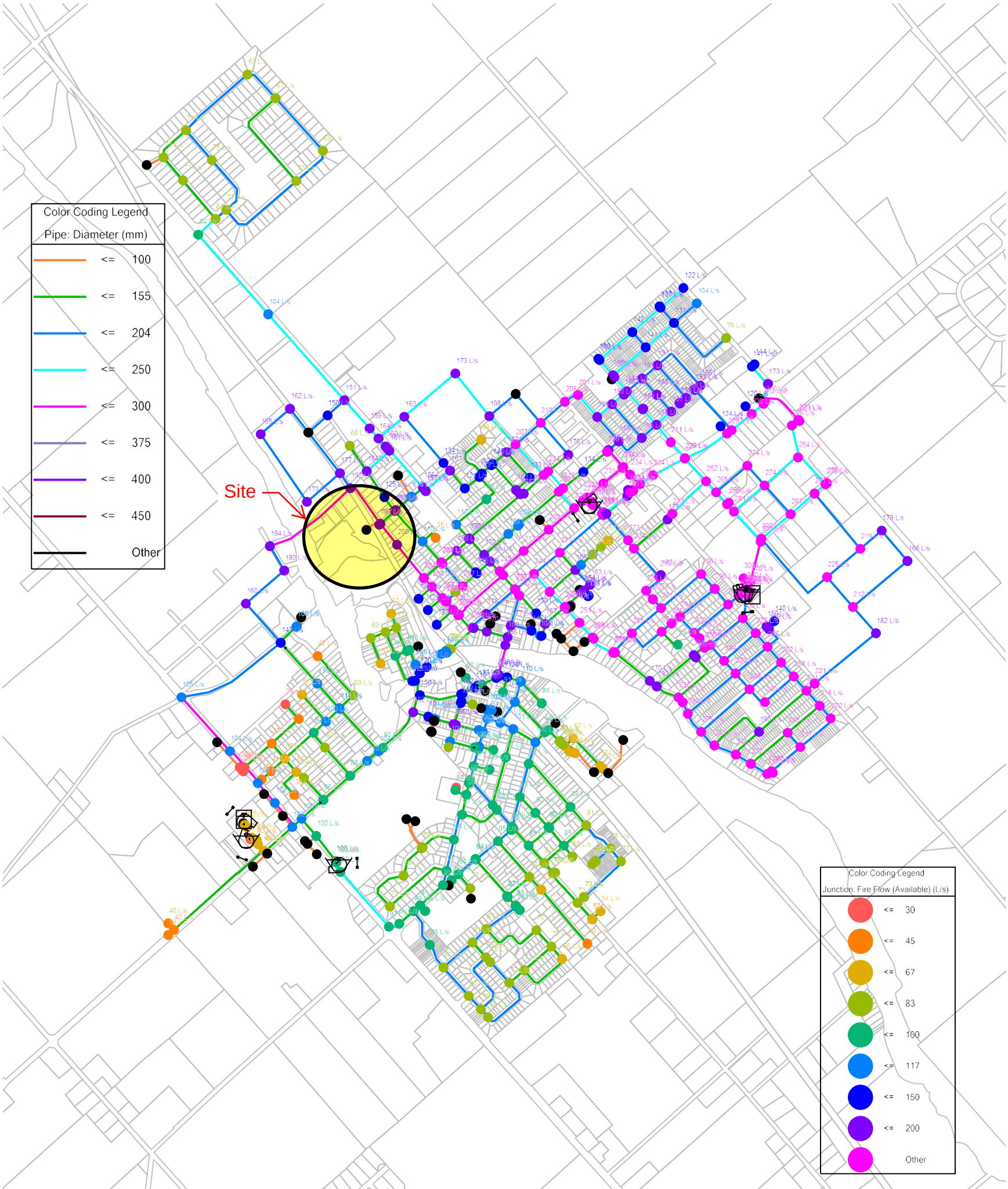
Mississippi Mills Almonte Water Master Plan

Average Day Demand

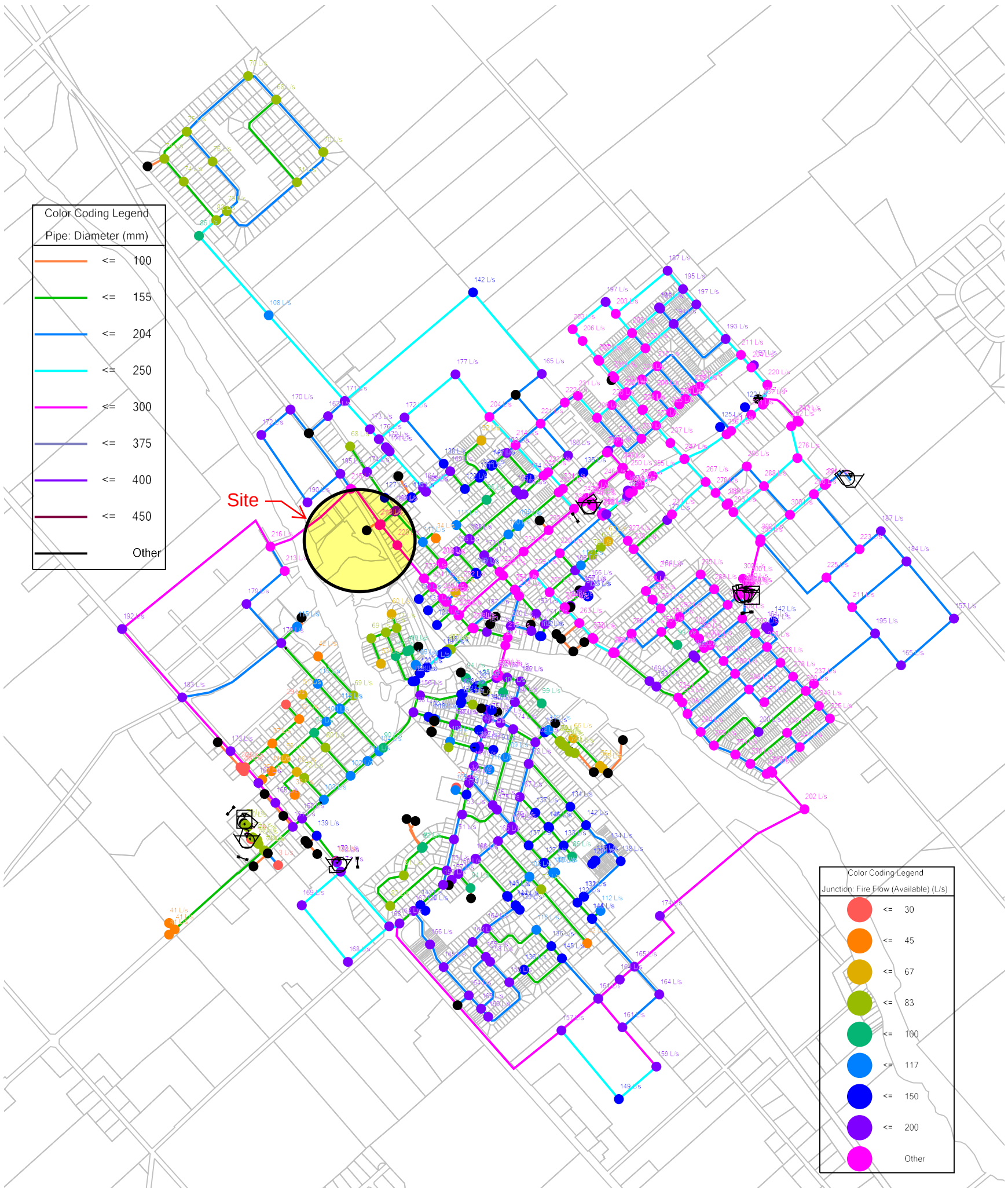
Long Term (2038 to 2048) with Upgrades



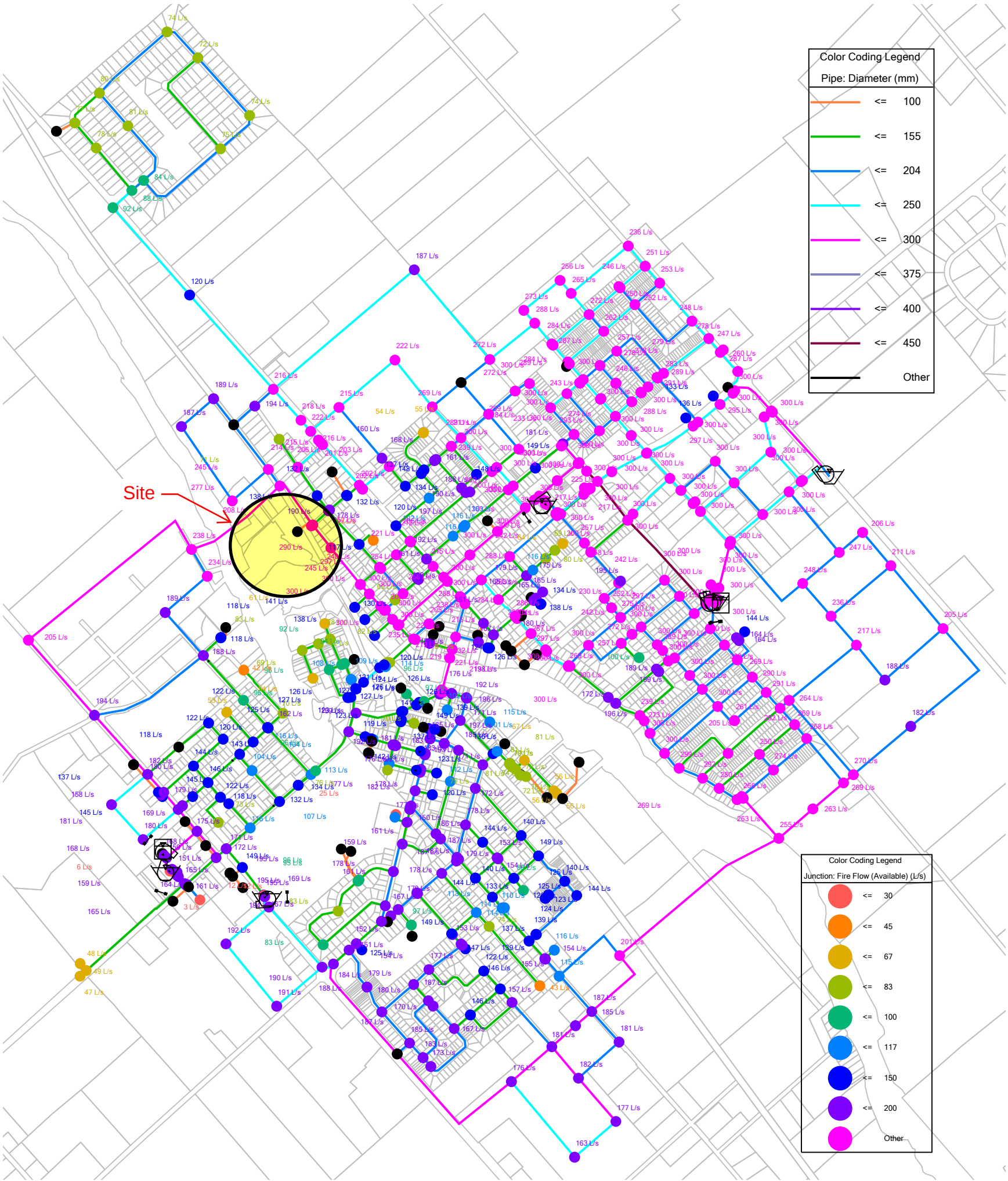
Mississippi Mills Almonte Water Master Plan
Maximum Day Demand with Fire Flow
Short Term (2023 to 2028) with Upgrades



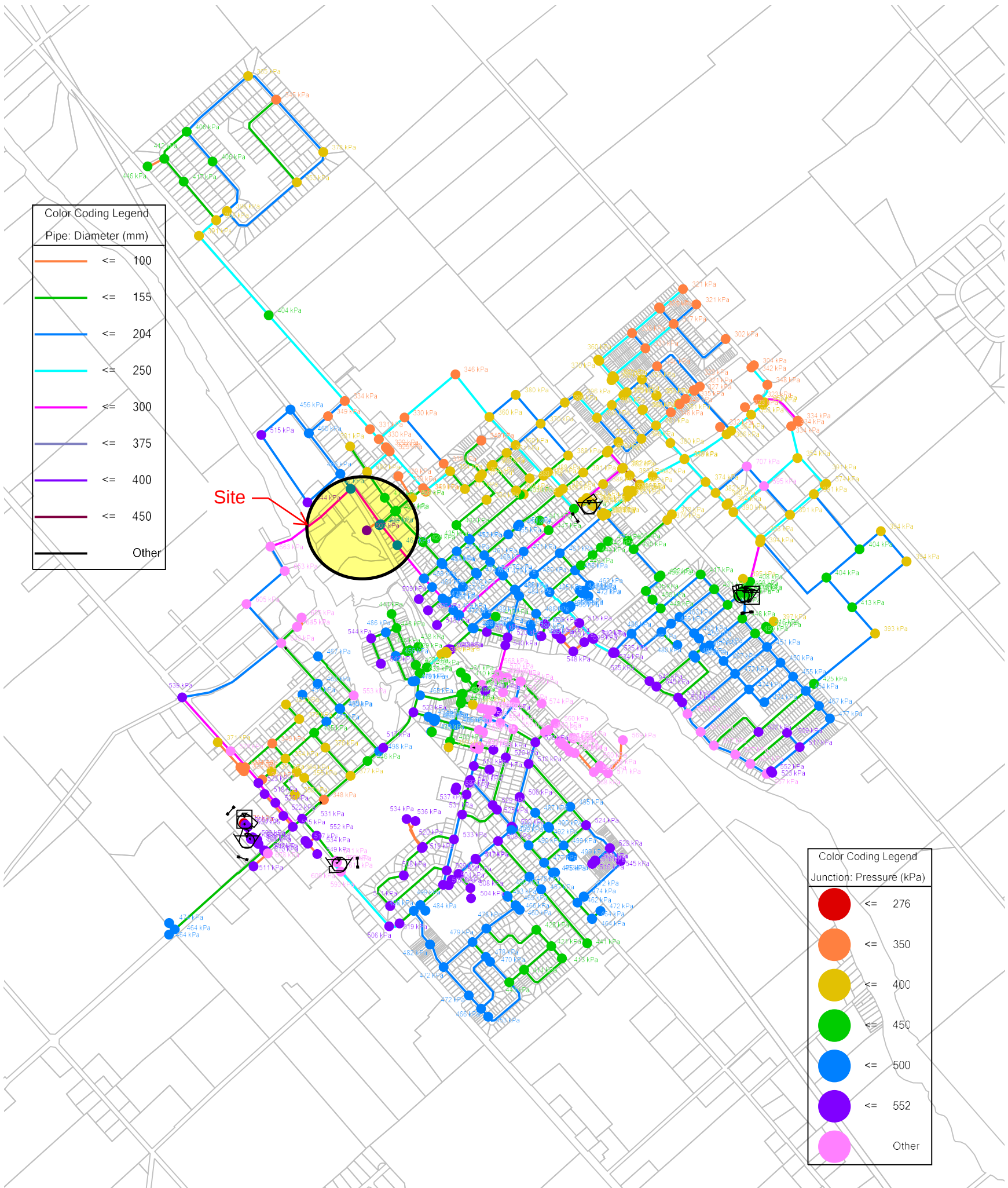
Mississippi Mills Almonte Water Master Plan
Maximum Day Demand with Fire Flow
Mid Term (2028 to 2038) with Upgrades



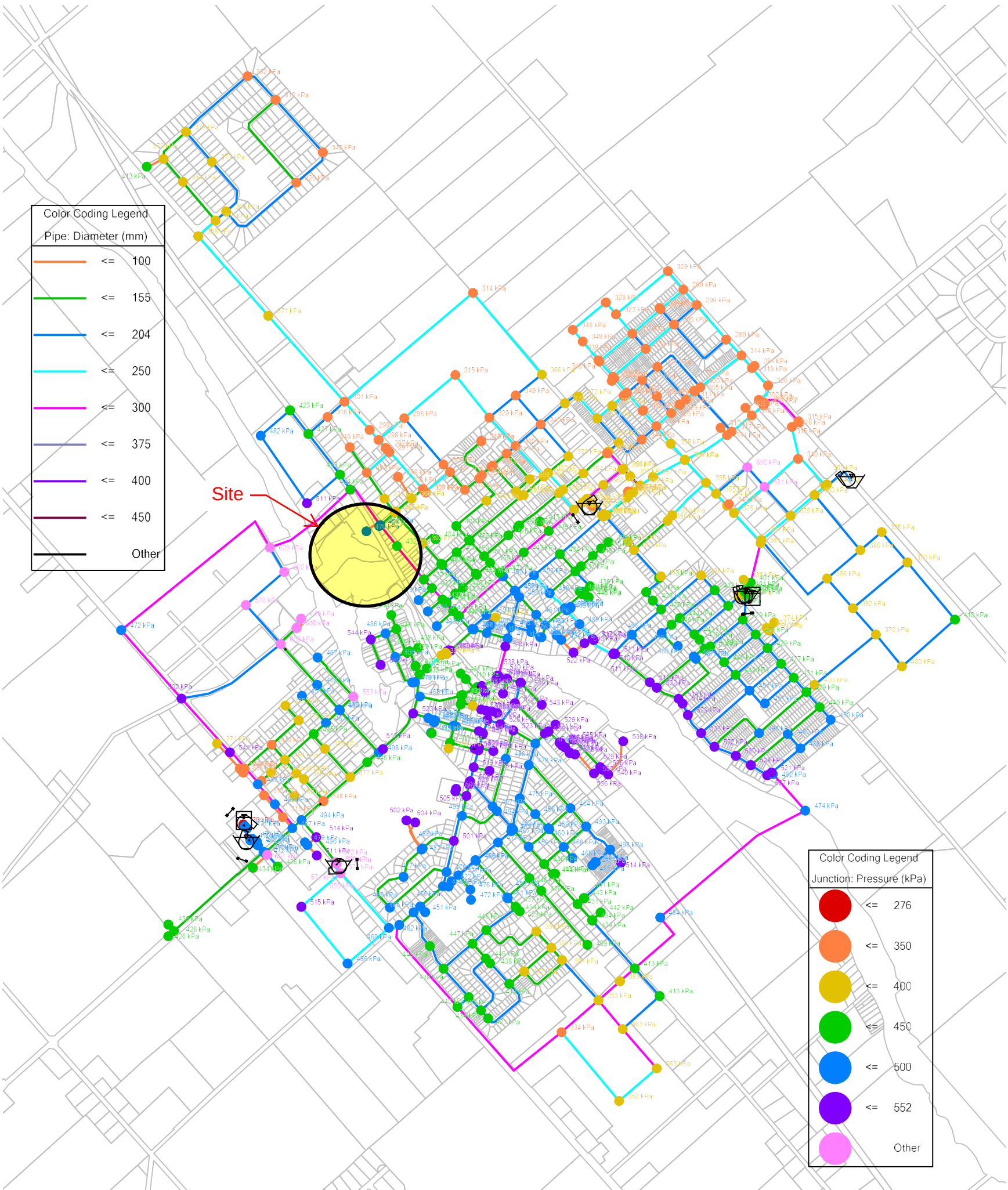
Mississippi Mills Almonte Water Master Plan
Maximum Day Demand with Fire Flow
Long Term (2038 to 2048) with Upgrades



Mississippi Mills Almonte Water Master Plan
Peak Hour Demand
Short Term (2023 to 2028) with Upgrades



Mississippi Mills Almonte Water Master Plan
Peak Hour Demand
Mid Term (2028 to 2038) with Upgrades



Mississippi Mills Almonte Water Master Plan

Peak Hour Demand

Long Term (2038 to 2048) with Upgrades

