



REPORT
PROJECT: 135853-5.2.2

**SITE SERVICING & STORMWATER
MANAGEMENT DESIGN BRIEF
SOUTH KEYS MALL
SOUTH PHASE - PHASE 1
2200 BANK STREET
CITY OF OTTAWA**



Prepared for SmartCentres Real Estate Investment Trust
by ARCADIS/IBI Group

OCTOBER 19, 2023

Document Control Page

DATE:	2023-10-19
PROJECT NAME:	South Keys – Phase 1
REPORT TITLE:	SITE SERVICING & STORMWATER MANAGEMENT DESIGN BRIEF SOUTH KEYS MALL SOUTH PHASE - PHASE 1 2200 BANK STREET CITY OF OTTAWA
ARCADIS REFERENCE:	
VERSION:	
DIGITAL MASTER:	[File Location]
ORIGINATOR:	[Name]
REVIEWER:	[Name]
AUTHORIZATION:	[Name]
CIRCULATION LIST:	
HISTORY:	

Table of Contents

1	INTRODUCTION	1
1.1	Scope	1
1.2	Subject Property	1
1.3	Existing Conditions	1
1.4	Phasing	2
1.5	Pre-Consultation	2
1.6	Phasing	2
1.7	Watercourses and Setbacks	3
1.8	Existing Private Services	3
2	WATER SUPPLY	4
2.1	Existing Conditions	4
2.2	Design Criteria	4
2.2.1	Water Demands	4
2.2.2	System Pressure	4
2.2.3	Fire Flow Rate	4
2.2.4	Boundary Conditions	5
2.2.5	Hydraulic Model	5
2.3	Proposed Water Plan	5
3	WASTEWATER DISPOSAL	7
3.1	Existing Conditions	7
3.2	Design Criteria	7
3.3	Sanitary Sewer Design	8
4	STORMWATER MANAGEMENT	9
4.1	Existing Conditions	9
4.2	Design Criteria	9
4.3	Proposed Minor System	9
4.4	Stormwater Management	10
4.5	Inlet Controls	10
4.6	On-Site Detention	11
4.6.1	Site Inlet Control	11
4.6.2	Roof Inlet Controls	12
4.6.3	Overall Release Rate	12
4.7	Water Quality	12

5	EROSION AND SEDIMENTATION CONTROL PLAN	13
6	GRADING AND DRAINAGE PLAN	14
7	APPROVALS AND PERMIT REQUIREMENTS	15
7.1	City of Ottawa.....	15
7.2	Existing Conditions.....	15
7.3	Conservation Authority.....	15
8	CONCLUSIONS AND RECOMMENDATIONS	16
8.1	Conclusions.....	16
8.2	Recommendations	16

List of Appendices

- A June 10, 2021 City of Ottawa Pre-Consultation Notes

- B Watermain Demand Calculations
 Fire Flow Calculations
 Boundary Conditions
 Hydraulic Model Results

- C Sanitary Sewer Design Sheet – Phase 1 and Master Plan
 Drawing 135853 C-400 Sanitary Drainage Area Plan – Phase 1
 Drawing 135853 C-401 Sanitary Drainage Area Plan – Master Plan
 Drawing 135853 C-001 Site Servicing Plan

- D Storm Sewer Design Sheet
 Drawing 135853 C-500 Storm Drainage Area Plan
 Runoff Coefficient Calculations
 Stormwater Management Calculations

- E Drawing 135853-C-600 Ponding Plan

- F Drawing 135853-C-900 Erosion and Sedimentation Control Plan
 Drawing 135853-C-200 Grading and Drainage Plan

1 INTRODUCTION

1.1 Scope

ARCADIS/IBI Group has been retained by SmartCentres Real Estate Investment Trust (REIT) on behalf of the Joint Venture Applicant, Calloway REIT (South Keys) Inc. and Canadian Property Holdings (South Keys) Inc. to undertake the suite of civil engineering documents needed in support of a Site Plan Control application and a Zoning By-Law Amendment application for a proposed high rise residential development to be located at 2200 Bank Street, Ottawa. This report will contain the following documents: A Site Servicing Plan; a Grading and Drainage Plan; a Stormwater Management Plan; a Site Servicing Plan; a Water Hydraulic Assessment and an Erosion and Sedimentation Control Plan.

This report will present a detailed servicing scheme to support the development including sections on water supply, wastewater collection and disposal and management of stormwater. This brief will also demonstrate the adequacy of the municipal services needed to support the ultimate development of the site. This report has been prepared in accordance with the current Servicing Study Guidelines for development applications in the City of Ottawa.

1.2 Subject Property

The proposed development is located in the South Keys Shopping Centre. The site is bounded by Daze Street to the east, existing commercial, including a Walmart outlet, to the north, a transit station to the west and a parking lot to the south. The ultimate Master Plan will include up to eight high rise buildings to be constructed in four phases. The total property covers 3.34 ha and Phase 1 which covers an area of 1.80 ha also includes an area called Transit Plaza. It is the intention that in time, ownership of that area be transferred to the City of Ottawa. **Figure 1** shows the ultimate buildout Master Plan and **Figure 2** shows the Phase 1 plan.

The subject site is currently a commercial area supported with surface parking. The site is presently improved with three retail outlets, a Cineplex movie theatre and a Montana's Steak House restaurant.

Phase 1 will include the removal of the three retail outlets adjacent to the cinema and construction of one high rise tower, 21 storeys in height and one 9-stoey podium. Phase 1 will include about 290 units and about 645m² of ground floor retail space. Parking will be accommodated in a 2-storey podium.

1.3 Existing Conditions

As noted earlier, the subject property consists of retail outlets, a cinema, and a restaurant. All parking is accommodated on a surface lot. **Figure 3** shows the location of existing major infrastructure including watermains, sanitary and storm sewers. Access to the site is available from one of three locations from Daze Street.

Water is provided to the site from the existing 300 mm main on Daze Street. There are existing 150, 200 and 300 mm mains to the north side of the site that connects to the Daze mains.

The existing sanitary outlet for the site includes a 250 mm dia pipe that runs west to east along the Transit Plaza area which in turn discharges into a 375 mm dia sanitary sewer located northwest of the property. Two existing sanitary sewers connect to this outlet sewer; a 150 mm dia pipe which services the restaurant and a 250 mm dia pipe provides service to the retail outlets and the movie theatre.

All storm sewers on the site drain towards a 1200 x 3000 concrete culvert which is located in the future Transit Plaza. That trunk sewer eventually discharges into the Sawmill Creek Stormwater Facility. Similar to the sanitary sewer system, two storm sewers service the existing developments; a 250 mm dia storm sewer collects runoff from the restaurant and surrounding parking lot and a series of storm sewers ranging in size from 375 mm dia to 525 mm dia service the balance of the site. The latter storm sewer system also provides an outlet for a portion of an office building site located to the south of the subject site. The existing parking lot is fitted with a number of catchbasins which connect to the two local storm sewers.

1.4 Phasing

As noted above, the Owner proposes to re-develop the site in four phases. Phase 1 will include one-21 storey tower joined by a 9-storey podium. Phase 1 will also include two roadway connections to Daze Street, one on either side of the Montana Steakhouse restaurant. The one to the north, and adjacent to the Transit Plaza, will be a new connection to Daze Street including a right-in, right-out operation. The second, located to the south of the restaurant, will replace an existing driveway which presently provides a “3/4” movement entrance.

The Phase 1 development will also include provision of modified parking lots for the restaurant and movie theatre. Development of the new driveways will include removal of about 100 parking spaces but will leave sufficient parking for both the restaurant and theatres. Phase 1 is expected to be fully occupied by 2026 and full build out of the Master Plan in about 15 years after Phase 1.

1.5 Pre-Consultation

There was a pre-consultation meeting with the City of Ottawa on June 10, 2021 to discuss development of the subject property. A copy of the meeting notes is included in **Appendix A**. Among other things, some of the items discussed were as follows:

- Official Plan
- Zoning Information
- Infrastructure
- Planning
- Urban Design
- Parks
- Trees
- Environment
- Conservation Authority
- Transportation
- OC Transpo

1.6 Phasing

A geotechnical report “Proposed Multi-Storey Buildings, South Keys Redevelopment – Phase 1, 2210 Bank Street, Ottawa, Ontario” dated September 13, 2021, has been prepared by Paterson Group for Phase 1.

The objective of the investigation was to prepare a report to:

- Determine the subsoil and groundwater conditions at the site by means of test pits and boreholes and;
- To provide geotechnical recommendations pertaining to design of the proposed development including construction considerations.

The report recommendations were based on the findings and observations from several boreholes and test pits. Among other items, the report recommendations deal with:

- Site Grading
- Foundations Design, including Rock Anchors
- Pavement Structure
- Sewer and Watermain Construction
- Groundwater Control
- Grade Raises
- Design of Earthquakes
- Basement Wall
- Winter Construction
- Corrosion Potential and Sulphate

The report confirmed that the site consists mostly of brown silty sand over a layer of very stiff to stiff silty clay up to 4.5 m deep. Underlying the silty clay deposit below approximate depths of 9 m to 12 m, interbedded layers of compact to dense sandy silt, silty sand and/or firm to stiff silty clay were encountered. Practical refusal of the DCPT's were encountered at depths ranging from 25.1 m to 29.4 m below the existing ground surface.

1.7 Watercourses and Setbacks

There are no watercourses on the subject property, so developments will not be subject to setback distances.

1.8 Existing Private Services

It is unlikely there are any private wells or septic systems on an adjacent to the subject property. The site and surrounding properties are likely serviced from the City's central water supply.

2 WATER SUPPLY

2.1 Existing Conditions

As stated in Section 1.3 there is an existing 300 mm watermain on Daze Street and there are 150, 200 and 300 mm watermains north of the site that connects to the 300 mm on Daze Street. A connection to the Daze Street watermain and a connection to the existing mains north of the site will provide a looped system.

2.2 Design Criteria

2.2.1 Water Demands

Water demands are based on Table 4.2 - Consumption Rates for Subdivisions of 501 to 3,000 persons of the Ottawa Design Guidelines – Water Distribution. Water demands have been calculated for the Phase 1 which consists of 290 apartment units, calculations are also provided for the ultimate buildout which contains three additional residential buildings. A watermain demand calculation sheet is included in **Appendix B** and the total water demands are summarized as follows:

	<u>Phase 1</u>	<u>Ultimate</u>
Average Day	1.69 l/s	9.07 l/s
Maximum Day	4.23 l/s	22.66 l/s
Peak Hour	9.30 l/s	49.85 l/s

2.2.2 System Pressure

The 2010 City of Ottawa Water Distribution Guidelines states that the preferred practice for design of a new distribution system is to have normal operating pressures range between 345 kPa (50 psi) and 552 kPa (80 psi) under maximum daily flow conditions. Other pressure criteria identified in the guidelines are as follows:

Minimum Pressure	Minimum system pressure under peak hour demand conditions shall not be less than 276 kPa (40 psi)
Fire Flow	During the period of maximum day demand, the system pressure shall not be less than 140 kPa (20 psi) during a fire flow event.
Maximum Pressure	Maximum pressure at any point in the distribution system shall not exceed 689 kPa (100 psi). In accordance with the Ontario Building/Plumbing Code, the maximum pressure should not exceed 552 kPa (80 psi). Pressure reduction controls may be required for buildings where it is not possible/feasible to maintain the system pressure below 552 kPa.

2.2.3 Fire Flow Rate

A fire flow rate for the Phase 1 building has been calculated with the Fire Underwriters Survey (FUS). A flow rate of 8,000 l/min (133 l/s) has been determined, it is expected that the future buildings will have a similar fire flow rate. A copy of the FUS calculation is included in **Appendix B**.

2.2.4 Boundary Conditions

The City of Ottawa has provided a hydraulic boundary condition at the proposed connection to the 300 mm main on Daze Street. The boundary condition is based on the water demand and fire flow rates provided and a separate boundary condition is provided for the ultimate buildout scenario. The minimum HGL and max day plus fire elevations for the ultimate scenario is used in the model as they represent the worst case, for the maximum HGL the Phase 1 value is used as it is higher than the ultimate. A copy of the boundary conditions received October 16, 2023 is included in **Appendix B** and are summarized as follows:

BOUNDARY CONDITIONS	
SCENARIO	HGL (m)
	PHASE 1
Minimum HGL	123.9
Maximum HGL	131.5
Max Day + Fire Flow (133 l/s)	126.5

2.2.5 Hydraulic Model

A computer model for the phase 1 development has been developed using the InfoWater program. The model incorporates the boundary condition provided by the City and is run for basic day (maximum HGL), peak hour (minimum HGL) and max day plus fire which evaluates the fire flows. Water demands for Phase 1 has been applied to Node J16 in the model, Node J12 has Phases 2 and 3 water demands while Node J14 has the Phase 4 demands. A schematic of the water model is included in **Appendix B**.

2.3 Proposed Water Plan

The hydraulic water model was run for the ultimate development for minimum pressure and fire flows and for Phase 1 for maximum HGL. Results of the hydraulic model are included in **Appendix B** and summarized as follows:

SCENARIO	RESULTS
Basic Day Pressure (Max HGL) kPa	409.34-448.78
Peak Hour Pressure (Min HGL) kPa	334.87-374.31
Max Day & Fire (133 l/s) Residual Pressure kPa	286.20-326.47

Maximum Pressure	Under the Phase 1, the pressures are below 552 kPa (80 psi) therefore pressure reducing control is not required for this development.
Minimum Pressure	All nodes exceed the minimum requirement of 276kpa during peak hour conditions for the Phase 1 development.
Fire Flow	The residual pressures for all nodes on site are all above the minimum of 140 kPa (20 psi) during the fire flow event in the Phase 1 development.

3 WASTEWATER DISPOSAL

3.1 Existing Conditions

The site is presently serviced with two sanitary sewers; a 150 mm dia pipe that services the Montana restaurant and a 250 mm dia sewer that services the three retail outlets and the Cineplex theatres. Neither of these sewers is over sized for upstream properties. Both the sewers outlet to a 250 mm sanitary sewer located in the Transit Plaza area which in turn outlets to a 375 mm dia sanitary sewer that runs northward in front of the Walmart building.

3.2 Design Criteria

The proposed sanitary sewers for the subject site will be based on the City of Ottawa design criteria. It should be noted that the sanitary sewer design for this study incorporates the latest City of Ottawa design parameters identified in Technical Bulletin ISTB-2018-01. Our analysis is threefold; flow calculation for existing conditions and flow calculations for the interim condition (Phase 1) and flow calculation for the ultimate Master Plan. The following criteria was used in our calculations.

• Minimum Velocity	0.6 m/s
• Maximum Velocity	3.0 m/s
• Manning Roughness Coefficient	0.013
• Total # residential of units	290 (Phase1)–1710 (Ultimate)
• Population Density	1.9 ppu
• Residential Average Flow	280 l/p/d
• Commercial/Institutional Average Flow	28.000 l/gross Ha/d
• Residential Peaking Factor	Harmon Formula (max 4, min 2) K=0.8
• Commercial/Institutional Peaking Factor	1.5 if ICI >20% 1.0 if ICI in <20%
• Infiltration Allowance	0.33 L/s/Ha
• Minimum Sewer Slopes - 200 mm diameter	0.32%

A spreadsheet with the proposed Phase 1 and Master Plan (buildout) conditions and related drainage area plan are included in **Appendix C**.

Based on the Phase 1 analysis which assumes some of the site remains as commercial, there is plenty of spare capacity in the proposed sewer system. The existing 150 mm dia sewer which serves the restaurant has a spare capacity of 99% and the existing 250 mm dia pipe which will service the cinema and the Phase 1 towers will have a spare capacity of 91%. The 250 mm dia outlet sewer which collects wastewater from the total property, as well as the transit station, will have a spare capacity of about 78%. The flow from the transit station is considered negligible.

The second analysis for full buildout of the south Master Plan also indicates that the phase 1 and existing sewers will also have spare capacity. The Master Plan includes eight towers and

associated driveways. For this situation there will be only one 250 mm dia sanitary sewer for the site and all drainage areas will be residential with a total buildout of 1556 units and a total expected population of 2956.

The existing 250 mm dia sewer immediately north of building 1 will have a spare capacity of 75% and the downstream 250 mm dia sewer will have a spare capacity of 29%. Therefore, the existing downstream sanitary sewers have sufficient available capacity to provide an adequate outlet for both the Phase 1 development and full buildout of the south Master Plan.

3.3 Sanitary Sewer Design

The proposed sanitary plan for Phase 1 is show as Drawing C-001 which is located in **Appendix C**. The existing 150 mm dia sanitary sewer serving the Montana's Steakhouse restaurant is proposed to remain. The existing sanitary sewer system which services the retail outlets and cinema is proposed to be modified. The latter system includes two sewer sections with 250 mm dia sewers. For Phase 1 it is proposed to leave some of the existing pipes near the cinema as is and replace the centre section in front of Phase 1 with a new relocated 250 mm dia pipe between MH's 6A and 4A. MH 4A is proposed to be located at the existing downstream 250 mm dia pipe. A 150 mm dia service connection will serve the new Phase 1 development.

4 STORMWATER MANAGEMENT

4.1 Existing Conditions

Figure 3 shows the location of major municipal infrastructure, including storm sewers, in the vicinity of the subject property. The existing storm sewer outlet for the property is an existing 1200 x 3000 box culvert located in the Transit Plaza. That culvert eventually empties into the downstream Sawmill Creek Stormwater Management Facility. There are two smaller storm sewers which collect runoff from the property and route the flows to the box culvert.

The smaller of these is a 250 mm dia sewer which serves the Montana restaurant and a nearby portion of the surface parking lot. The second is a sewer system ranging in size from 375 mm dia to 525 mm dia which serves the balance of the site including the retail outlets and the cinema. The latter sewer is also oversized for some runoff from the neighbouring development to the south of the subject site.

4.2 Design Criteria

The following design criteria was used to assess the capacity of the existing storm sewer system using the Rational Method.

- Design Storm 1:5-year return
- Initial Time of Concentration 10 minutes
- Runoff Coefficients 0.20 to 0.90
- Pipe Velocities 0.80 m/s to 3.0 m/s

Most of the site is assumed to have a runoff coefficient of 0.90 including buildings and parking lots. Based on the proposed Phase 1 plan, which includes some landscaped areas, runoff coefficient of some sub-drainage areas was adjusted to account for the landscaping. A copy of the runoff coefficients calculations for drainage areas 1, 2, 6, 8, 9 and 10 are included in **Appendix D**.

Based on these criteria, an assessment was completed for Phase 1. A relevant drainage area plan and spreadsheet are included in **Appendix D**. The analysis uses the Rational Method to assess the ability of the proposed Phase 1 minor storm sewer system to adequately drain the site. The analysis includes a review of the Phase 1 system assuming uncontrolled flows and controlled flows.

For the uncontrolled situation the 250 mm dia sewer which services the restaurant has a spare capacity of 75%, while the larger 525 mm dia storm sewer has a spare capacity of -5.8%.

The existing sewer is slightly undersized, however in order to avoid an unwanted connection to the big trunk storm sewer, we propose to accept a minor surcharge in the existing 525mm sewer which will be lost by the time we connect to any of the proposed buildings.

No further analysis was completed for the full buildout of the south Master Plan. It is reasonable to assume that with additional landscaped area and outlet controls, the flows under that condition will be less than those calculated for Phase 1.

4.3 Proposed Minor System

The proposed minor storm plan for Phase 1 is indicated on Drawing C-100. The existing 250 mm dia storm sewer servicing the restaurant and adjacent parking area is proposed to remain as is. A portion of the 375/525 storm sewer adjacent to the Phase 1 development is proposed to be replaced with a 600mm sewer starting from monitoring manhole 8. New storm sewers are

proposed for the new driveways which connect to Daze Street. A 300 mm dia storm pipe will provide service for the Phase 1 building.

4.4 Stormwater Management

The subject site will be limited to a release rate the 5-year flow generated from the site using a $C=0.50$ (per pre-consult notes). This will be achieved through a combination of new inlet control devices (ICD's) at inlet locations and surface storage. Flows generated that are in excess of the site's allowable release rate will be stored on site in strategic surface storage areas or by the use of building rooftop and or cistern storage and gradually released into the minor system so as not to surcharge the downstream sewers. The maximum surface retention depth of the re-developed areas will be limited to 300mm during a 1:100-year event. Overland flow routes will be provided in the grading and parking area design to permit emergency overland flow from the site.

At certain locations within the site, the opportunity to store runoff is limited due to grading constraints and building geometry. There were existing uncontrolled flows within the Phase 1 site limits prior to the proposed development, these are drainage areas 20, 18, 21, and 3 as shown on drainage area plan C-500 located in **Appendix D**. As these were existing, the flows generated were not subtracted from the site's allowable release rate.

Previously, drainage area 10 was set as uncontrolled, however after further review, the design has been changed to accommodate drainage area 10 as controlled to the 1:100-year storm. In order to achieve this, a low point was created as shown on the grading plan and the pipe from MH7 to MH8 has been oversized to 600mm dia. to provide the needed storage (refer to Section 4.5 for calculation).

In the absence of the existing stormwater management report, we have assumed a flow control of 4 L/s for the existing Montana's building. Prior to site plan approval the presence of flow control roof drains will be confirmed. Furthermore, stormwater management practices for the existing Montana's parking lot are unknown and as such, new inlet control devices have been specified for those catchbasins.

Refer to the SWM calculations in **Appendix D** for further details, which have been summarized below.

4.5 Inlet Controls

The allowable release rate for the 1.52 Ha Phase 1 portion of the site can be calculated as follows:

$$\begin{aligned}
 Q_{\text{allowable}} &= 2.78 \times C \times i_{100\text{yr}} \times A \quad \text{where:} \\
 C &= 0.50 \\
 i_{5\text{yr}} &= \text{Intensity of 5-year storm event (mm/hr)} \\
 &= 998.071 \times (T_c + 6.053)^{0.814} = 76.87 \text{ mm/hr; where } T_c = 10.00 \text{ minutes} \\
 A &= \text{Area} = 1.52 \text{ Ha} \\
 &= \mathbf{220.14 \text{ L/s}}
 \end{aligned}$$

Since there are no uncontrolled areas, the maximum allowable release rate from the site can then be determined as:

$$\begin{aligned}
 Q_{\text{max allowable}} &= Q_{\text{restricted}} - Q_{\text{uncontrolled}} \\
 &= 220.14 \text{ L/s} - 0.00 \text{ L/s} \\
 &= \mathbf{220.14 \text{ L/s}}
 \end{aligned}$$

Based on the flow allowance at the various inlet locations, a combination of various sizes of inlet control devices (ICDs) were chosen in the design. The design of the inlet control devices is unique to each drainage area and is determined based on a number of factors, including hydraulic head and allowable release rate. The inlet control devices were sized according to the manufacturer’s design charts. The restrictions will cause the on-site catchbasins and manholes to surcharge, generating surface ponding in the parking areas and/or in-line storage in the sewers. Ponding locations and elevations are summarized on the Ponding Plan 135853-C-600, and included in **Appendix E**.

4.6 On-Site Detention

Any excess storm water up to the 100-year event is to be stored on-site in order to not surcharge the downstream municipal storm sewer system. Detention will be provided in parking and vehicle access areas, building rooftops and cistern(s), where feasible. As previously noted, the volume of storage is dependent on the characteristics of each individual drainage area and the ICD’s were chosen accordingly.

4.6.1 Site Inlet Control

All parking and landscape areas will have restricted flow to the storm sewer system.

The following Table summarizes the on-site storage requirements during both the 1:5-year and 1:100-year events.

ICD AREA	TRIBUTARY AREA	AVAILABLE STORAGE (M ³)	100-YEAR STORM		5-YEAR STORM	
			RESTRICTED FLOW (L/S)	REQUIRED STORAGE (M ³)	RESTRICTED FLOW (L/S)	REQUIRED STORAGE (M ³)
9	0.15	6.15	35	23.12	35	4.42
8	0.06	0.00	12	7.99	12	1.27
2	0.15	22.24	30	7.93	30	1.88
1	0.08	31.98	26	1.27	26	7.31
4	0.06	13.00	10	12.24	10	3.57
5	0.07	0.46	6	21.00	6	7.77
7	0.08	18.00	12	17.55	12	5.40
6	0.16	53.46	10	53.46	10	16.91
10	0.19	30.58	45	30.02	45	6.66
TOTAL	1.00	175.87	186	174.58	186	55.19

In all instances the required storage is met with surface ponds which retain the stormwater and discharge at the restricted flow rate to the sewer system. Refer to the ponding plan in **Appendix E** for storage information.

4.6.2 Cistern

An internal cistern has been proposed to capture building runoff for the Phase 1 tower and associated podium area. The existing building will have roof drains that will be connected internally to the cistern. The cistern has been sized to a minimum volume of 173.19m³. To help control the amount of stormwater being released into the system, the cistern will be equipped with a constant flow pump of 30 L/s. Refer to calculation included in **Appendix D**. A summary table on the drawing that indicates the proposed release rates. The restricted flow rate for the existing Montana’s has been assumed and will need to be confirmed prior to final approval.

ICD AREA	TRIBUTARY AREA	100-YEAR STORM		5-YEAR STORM	
		RESTRICTED FLOW (L/S)	REQUIRED STORAGE (M ³)	RESTRICTED FLOW (L/S)	REQUIRED STORAGE (M ³)
Ex Montana's	0.07	4	25.06	4	10.02
Phase 1 Tower	0.41	30	173.19	30	73.02
TOTAL	0.48	34	198.25	34	83.04

4.6.3 Overall Release Rate

As demonstrated above, the site uses existing and new inlet control devices to restrict the 100-year storm event to the criteria set out in the pre-consult notes. Restricted stormwater will be contained onsite by utilizing surface ponding and building storage. In the 100-year event, there will be no overflow off-site from restricted areas.

The sum of restrictions on the site, rooftops and cistern is (186 l/s + 34 l/s) 220.0 l/s, which is less than the allowable release of 220.14 l/s noted in section 4.5.

4.6.4 100 year + 20% Stress Test

A cursory review of the 100yr event + 20% has been performed using the modified rational method. The Peak flow from each area during a 100-year event has been increased by 20%. The calculations have been included in **Appendix D**.

A summary of the require storage volumes, and overflow balances is provided below.

DRAINAGE AREA	ICD RESTRICTED FLOW (L/s)	100yr20 STORAGE REQUIRED (m ³)	SURFACE STORAGE PROVIDED (m ³)	100yr20 OVERFLOW (m ³)
9	35	31.94	6.15	25.79
8	12	11.03	0.00	36.82
2	30	12.39	22.24	26.97
1*	26	3.08	31.98	28.32*
4	10	16.48	13.00	3.48
5	6	27.22	0.46	30.24
7	12	23.50	18.00	5.50
6	10	67.86	53.46	19.90
10*	45	40.07	30.58	9.49*
TOTAL	186			186.51

*Overflow off-site

DRAINAGE AREA	100yr20 OVERFLOW (m ³)	Time of Concentration	100yr20 OVERFLOW (l/s)	DEPTH (m)
9	25.79	10	42.98	0.03
8	36.82	10	61.36	0.04
2	26.97	8	56.19	0.04
1*	28.32*	5	94.39*	0.05
4	3.48	15	3.87	0.00
5	30.24	28	18.00	0.02
7	5.50	17	5.39	0.00
6	19.90	35	9.48	0.02
10*	9.49*	15	10.55*	0.02
TOTAL	37.81		104.94	

The overland flow from both drainage areas 1 and 10 is directed to Daze Street. The volume of overflow is 37.81 m³. For area 1, based on a TC of 5 minutes, this volume can be reverse calculated to 94.39 L/s. Similarly for area 10, based on a TC of 15 minutes, the volume is calculated to be 10.55 L/s. Channel cross section was used to determine the depth of the flow for each area. Refer to calculation sheet in **Appendix D**.

4.7 Water Quality

The subject site is tributary to the existing Sawmill Creek Stormwater Management Facility (SWMF) which currently provides quality control for the stormwater flows from the existing lands. The proposed development will change some land use from vehicle parking areas to landscaped lands and building footprint, as such sediment loading on the SWMF should be less. Confirmation with the RVCA confirming the above is ongoing.

5 EROSION AND SEDIMENTATION CONTROL PLAN

During construction, existing stream and storm water conveyance systems can be exposed to significant sediment loadings. A number of construction techniques designed to reduce unnecessary construction sediment loadings may be used such as;

- The installation of straw bales within existing drainage features surrounding the site;
- Bulkhead barriers will be installed in the outlet pipes;
- Sediment capture filter socks will remain on open surface structures such as manholes and catchbasins until these structures are commissioned and put into use;
- Installation of silt fence, where applicable, around the perimeter of the proposed work area.

During construction of the services, any trench dewatering using pumps will be fitted with a “filter sock.” Thus, any pumped groundwater will be filtered prior to release to the existing surface runoff. The contractor will inspect and maintain the filter sock as needed including sediment removal and disposal.

All catchbasins, and to a lesser degree manholes, convey surface water to sewers. Consequently, until the surrounding surface has been completed these structures will be protected with a sediment capture filter sock to prevent sediment from entering the minor storm sewer system. These will stay in place and be maintained during construction and build-out until it is appropriate to remove them.

During construction of any development both imported and native soils are stockpiled. Mitigative measures and proper management to prevent these materials entering the sewer systems is needed.

During construction of the deeper water mains and sewers, imported granular bedding materials are temporarily stockpiled on site. These materials are however quickly used up and generally before any catchbasins are installed.

The Erosion and Sedimentation Control Plan 135853-C-900 is included in **Appendix E**.

6 GRADING AND DRAINAGE PLAN

The proposed Grading and Drainage Plan is shown on drawing 135853-C-200 which is included in **Appendix F**. The Plan provides details of how the development ties into adjacent properties including Daze Street and the Transit Plaza. The plan indicates that much of the existing parking lot will remain to service the cinema and restaurant. Some modest changes to the existing parking lot are proposed west of the restaurant to ensure positive drainage to two proposed parking lot catchbasins.

The plan is designed to route major flow towards Daze Street and safely away from the site. The new driveway has been designed where possible to maximize on-site parking in order to minimize site runoff.

7 APPROVALS AND PERMIT REQUIREMENTS

7.1 City of Ottawa

The City of Ottawa reviews all development documents including this report and working drawings. Upon completion, the City will approve the local watermains, under Permit No. 008-202, submit the sewer ECA application to the province and eventually issue a Commence Work Notification.

7.2 Existing Conditions

The Ministry of Environment, Conservation, and Parks (MECP) will approve the local sewers under Section 53 of the Ontario Water Resources Act and issue an Environmental Compliance Approval. The MECP may also have to issue a Permit To Take Water.

7.3 Conservation Authority

The Rideau Valley Conservation has been contacted to discuss quality treatment of surface runoff. ARCADIS will follow up with the agency.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

This report and the accompanying working drawings clearly indicate that the proposed development meets the requirements of the stakeholder regulators, including the City of Ottawa, provincial MECP and RVCA. The proposed development is in general conformance with the City of Ottawa design guidelines.

Downstream sanitary sewers were designed with the proposed development area included. There is a reliable water supply available adjacent to the proposed development and the Owner will be required to detail stormwater on site to ensure the existing downstream storm sewers are not surcharged.

8.2 Recommendations

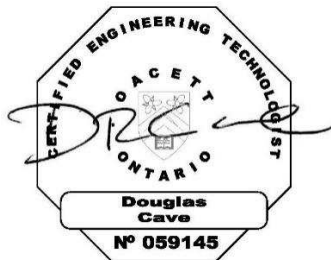
It is recommended that the regulators review this submission with an aim of providing the requisite approvals to permit the owners to proceed to the construction stage of the subject site.

In summary, this report demonstrates that Phase 1 of the proposed 2200 Bank Street redevelopment and ultimate re-developments can be serviced by the adjacent existing municipal infrastructure. All municipal infrastructure designs have been done in conformance with current City of Ottawa guidelines.

Based on the information provided herein, the development can be serviced to meet City of Ottawa requirements.

Prepared by:

ARCADIS

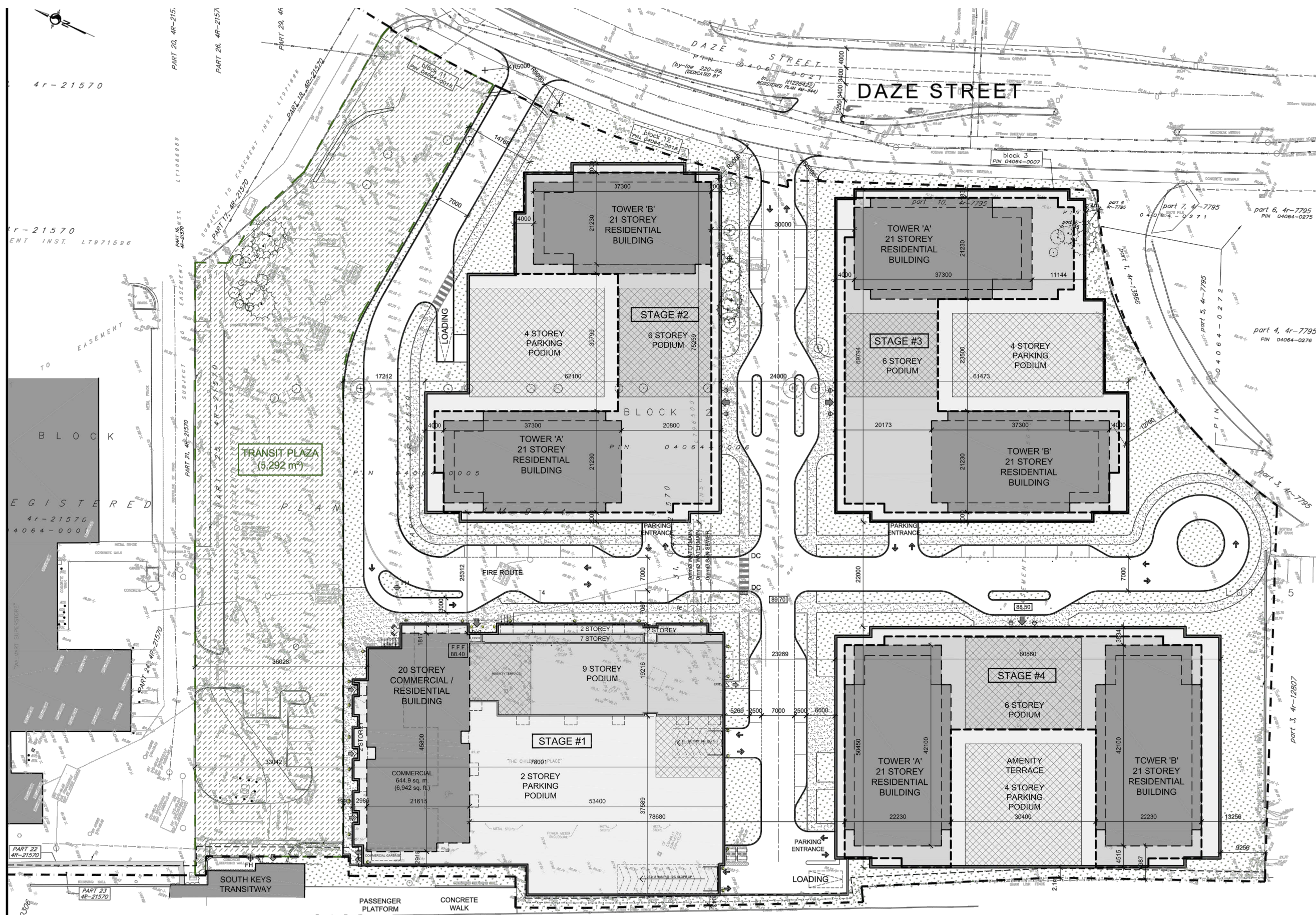


Douglas Cave, C.E.T.
Associate



Anton Chettrar, P.Eng.
Civil Engineer

J:\35853_SouthKeyPhs1\7.0_Production\7.03_Design\04_Civil\Land\Figures\FIGURE 1 - MASTER PLAN BUILD OUT.dwg Layout Name: Layout1 Plot Scale: 1:5.13 Plotted At: 10/19/2023 Last Saved By: dsium



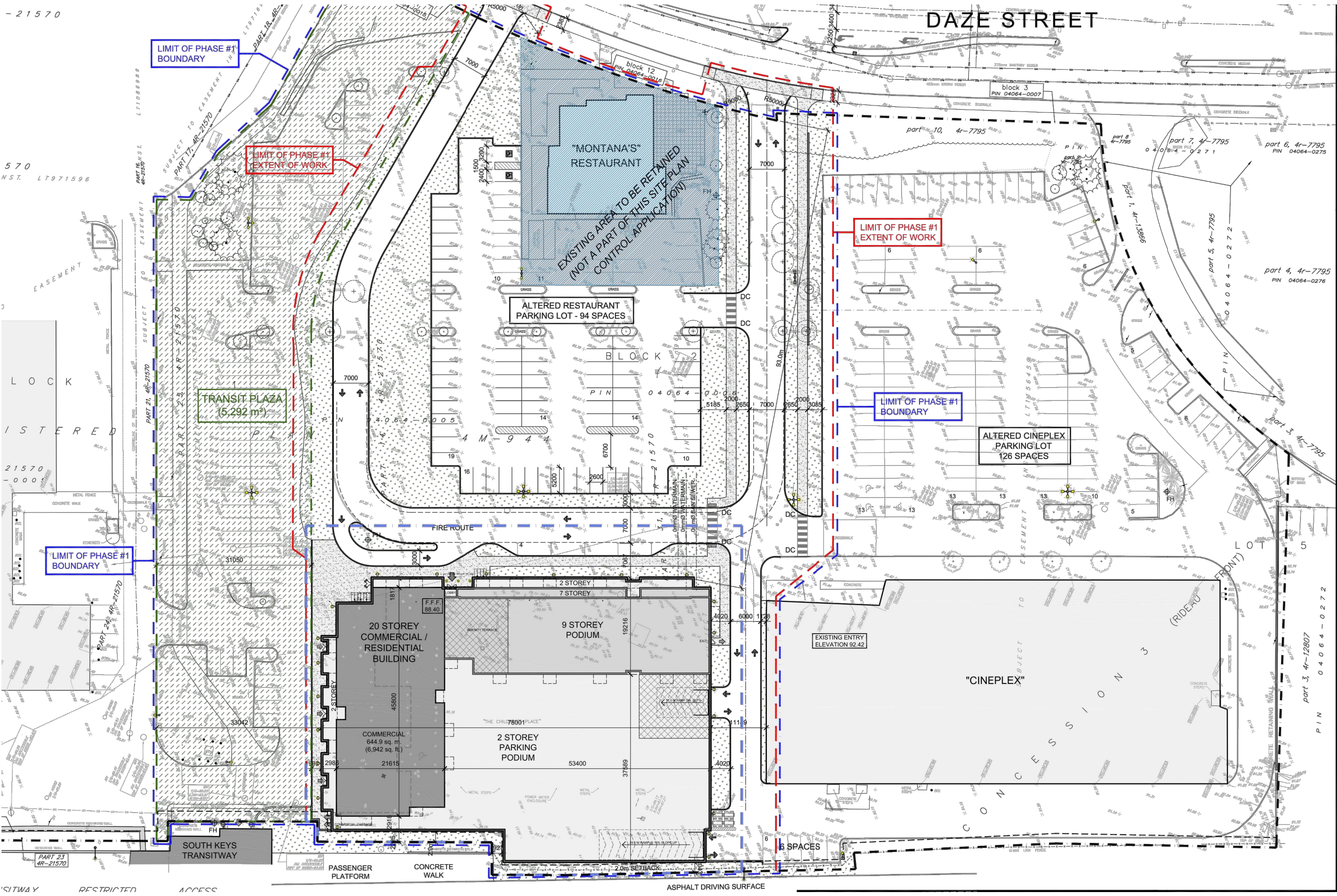
Scale
N.T.S.

Project Title
**SOUTH KEYS MALL
2200 BANK STREET
SOUTH PHASE - PHASE 1**

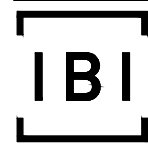
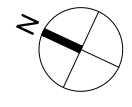
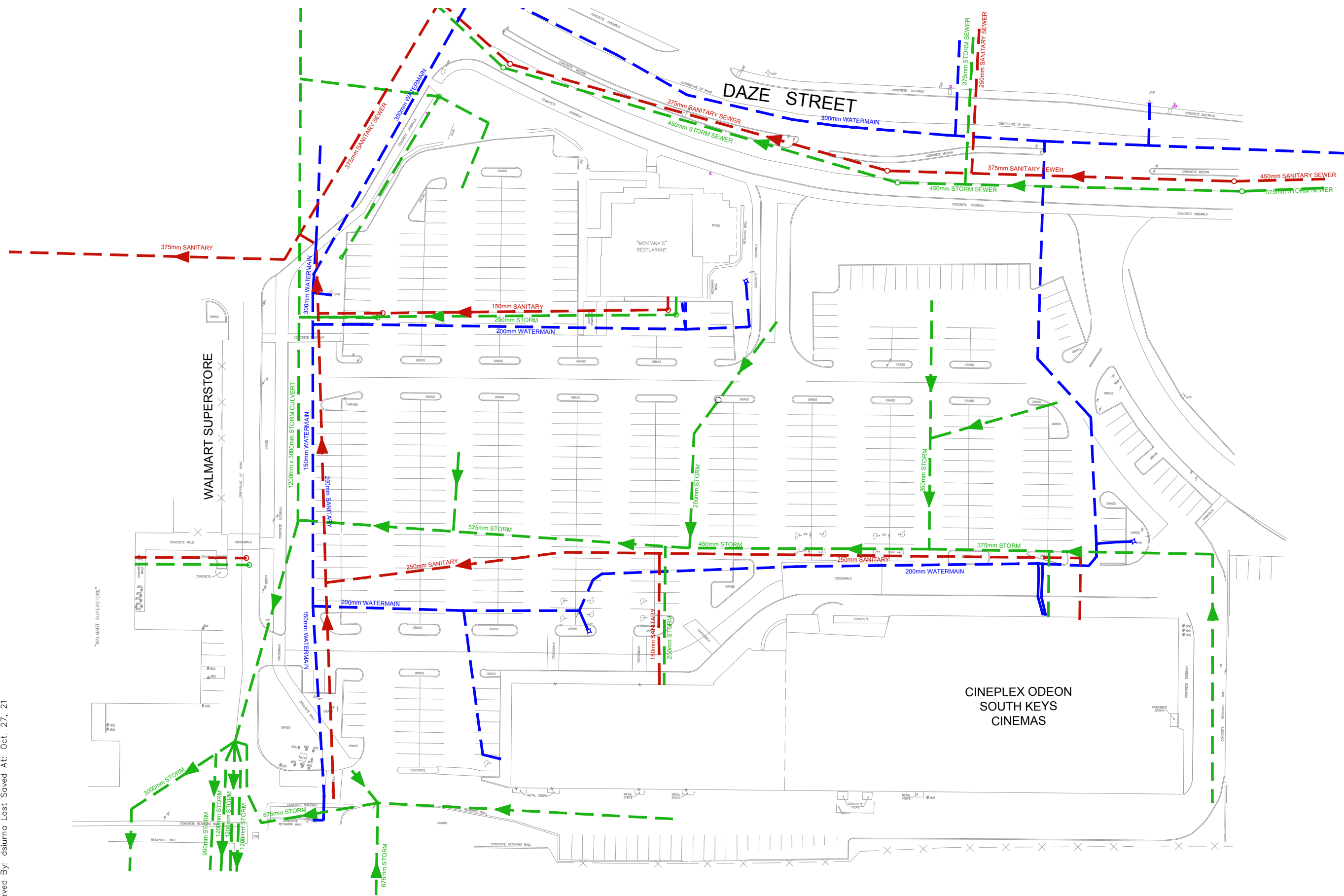
Drawing Title
MASTER PLAN BUILD OUT

Sheet No.
FIGURE 1

J:\35853_SouthKeyPhs1\7.0_Production\7.03_Design\04_Civil\Land\Figures\FIGURE 2 - PHASE 1 PLAN.dwg Layout Name: FIGURE 2 - PHASE 1 PLAN Plot Scale: 1:5.13 Plotted At: 10/19/2023 Last Saved: 10/19/2023



J:\135853_SouthKeyPh1\7.0_Production\7.03_Design\04_Civil_Land\Figures\FIGURE 3 - EXISTING MUNICIPAL INFRASTRUCTURE.dwg Layout Name: FIGURE 3 - EXISTING MUNICIPAL INFRASTRUCTURE Plot Scale:
Saved By: dsurna Last Saved At: Oct. 27, 21



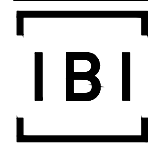
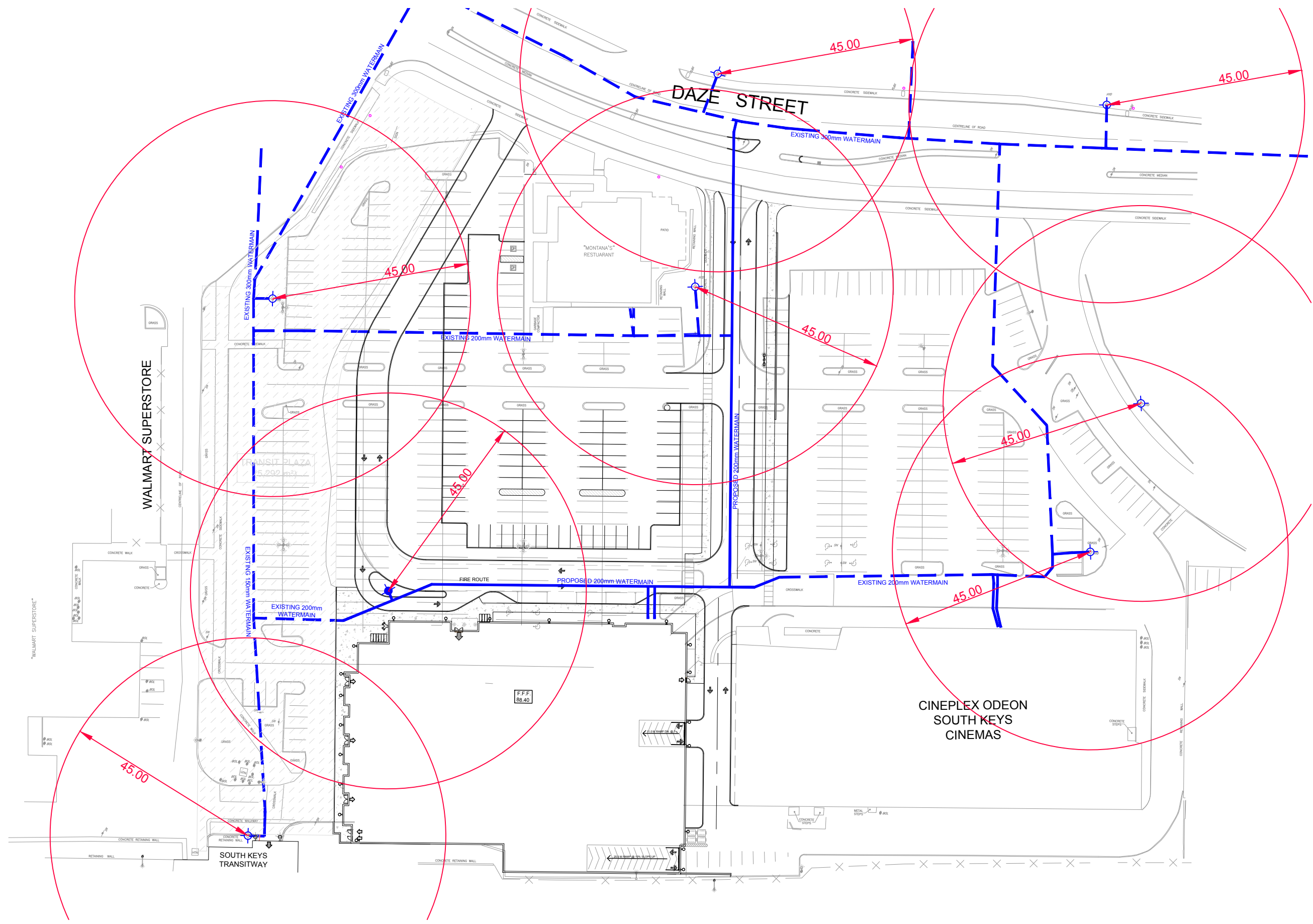
Scale
N.T.S.

Project Title
**SOUTH KEYS MALL
2200 BANK STREET
SOUTH PHASE - PHASE 1**

Drawing Title
**EXISTING MUNICIPAL
INFRASTRUCTURE**

Sheet No.
FIGURE 3

J:\35853_SouthKeyPhs1\7.0_Production\7.03_Design\04_Civil\Land\Figures\FIGURE 4 - HYDRANT COVERAGE.dwg Layout Name: FIGURE 4 HYDRANT COVERAGE Plot Scale: 1:5.13 Plotted At: 10/19/2023 10:17:23



Scale
N.T.S.

Project Title
SOUTH KEYS MALL
2200 BANK STREET
SOUTH PHASE - PHASE 1

Drawing Title
HYDRANT COVERAGE

Sheet No.
FIGURE 4

APPENDIX A

- June 10, 2021 City of Ottawa Pre-Consultation Notes

2200 Bank Street
Meeting Summary Notes
June 10, 2021, Online Teams Meeting

Attendees:

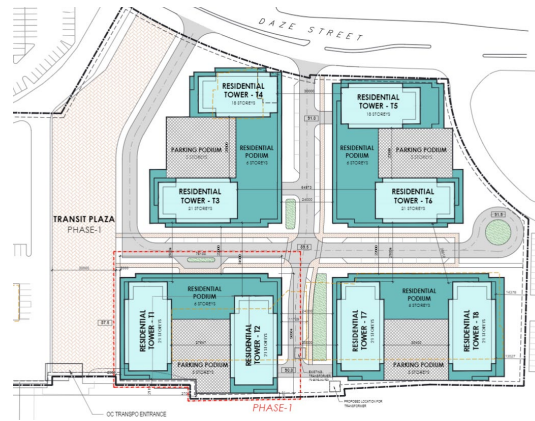
- Heather Jenkins, Smart Centres
- Mauro Pambianchi, Smart Centres
- Nancy Meloshe, Consultant
- Barrett Wagar, Consultant
- Rod Lahey, Architect
- Pat McMahon (Transportation Project Manager, City of Ottawa)
- Golam Sharif (Project Manager, City of Ottawa)
- Bruce Bramah, Engineering Intern, City of Ottawa
- Mark Young (Urban Designer, City of Ottawa)
- Phil Castro, Parks Planner, City of Ottawa
- Claire Lee, Urban Design Student
- Yvonne Mitchell, Planning Student
- Tracey Scaramozzino (File Lead, Planner, City of Ottawa)

Not in Attendance:

- Matthew Hayley, Environmental Planner
- Mark Richardson, Planning Forester
- Jamie Batchelor/Eric Lalonde (RVCA)

Issue of Discussion:

- Phase 1 of re-development of 2200 Bank Street, Former Children's Place/Retail Area – abutting movie theatre
- 1 mixed-use building with 6-storey podium, 2 21-storey towers (481 du), 5-storey above ground parking podium and 1 storey u/g (348 parking spaces), 629 m² ground floor retail, indoor amenity area, Transit Plaza
- Applicant indicated that their understanding of the level of public transit, even at the O-train station, was not sufficient enough to reduce the parking rate.



Overall Concept



Shows animated street frontages

1. Official Plan:

- a. General Urban Area
- b. South Keys to Blossom Park Bank Street Secondary Plan and CDP

2. Zoning Information

- a. MC [2284] S349-h

3. Infrastructure/Servicing (Golam Sharif, Bruce Bramah)

Infrastructure

If existing services are to be reused, a CCTV scan is required to verify the absence of any service or structural defects. A stamped and signed memo prepared by a relevant professional is also required that addresses the condition of the service and provides any recommendations.

Please provide water boundary conditions and expected flow rates for both Sanitary and Storm including phase 1 or the complete site to ensure the sewer capacity is available.

Water

Existing public services:

- Daze Street. – 305mm PVC

Water redundancy would be required for this development based on the number of proposed units.

- Watermain Frontage Fees to be paid (\$190.00 per metre) **Yes** **No**

Boundary conditions:

Civil consultant must request boundary conditions from the City's assigned Project Manager prior to first submission.

- Water boundary condition requests must include the location of the service(s) and the expected loads required by the proposed developments. Please provide all the following information:
 - Location of service(s)
 - Type of development and the amount of fire flow required (as per FUS, 1999).
 - Average daily demand: ___ l/s.
 - Maximum daily demand: ___ l/s.
 - Maximum hourly daily demand: ___ l/s.
- Fire protection (Fire demand, Hydrant Locations)
- A water meter sizing questionnaire (water data card) will have to be completed prior to receiving a water permit (water card will be provided post approval)

Sanitary Sewer

Existing public services:

- Daze Street – 375mm PVC

Is a monitoring manhole required on private property? **Yes** **No**

- The designer should be aware there may be limited capacity in the downstream sanitary sewer system. The sanitary demand needs to be coordinated with the City Planning Dept. to determine if the existing sanitary sewer system has sufficient capacity to support the proposed rezoning. Provide sanitary demands to the City project manager for coordination.

Storm Sewer

Existing public services:

- Daze Street – 450mm PVC (Suggested connection)
- 3000mm STM Trunk north of property
- The Environmental Site Assessment (ESA) may provide recommendations where site contamination may be present. The recommendations from the ESA need to be coordinated with the servicing report to ensure compliance with the Sewer Use By-Law.



Stormwater Management

Quality Control:

- Rideau Valley Conservation Authority to provide quality control requirements for property. (Sawmill Creek)

Quantity Control:

- Allowable Runoff coefficient (C): C = the lesser of the existing pre-development conditions to a maximum of 0.5.
- Time of concentration (Tc): Tc = pre-development; maximum Tc = 10 min
- Allowable flowrate: Control the 100-year storm events to the 5-year storm event.

Ministry of Environment, Conservation and Parks (MECEP)

All development applications should be considered for an Environmental Compliance Approval, under MECEP regulations.

- The consultants determine if an approval for sewage works under Section 53 of OWRA is required and determines what type of application. The City's project manager may help confirm and coordinate with the MECEP as required.
- The project will be either transfer of review (standard), transfer of review (additional), direct submission, or exempt as per O. Reg. 525/98.
- Pre-consultation is not required if applying for standard or additional works (Schedule A of the Agreement) under Transfer Review.
- Pre-consultation with local District office of MECEP is recommended for direct submission.
- Consultant completes an MECEP request form for a pre-consultation. Sends request to moeccottawasewage@ontario.ca
- [ECA applications are required to be submitted online through the MECEP portal. A business account required to submit ECA application. For more information visit https://www.ontario.ca/page/environmental-compliance-approval](https://www.ontario.ca/page/environmental-compliance-approval)

- g. [It is unclear if the proposed development will remain as one property. An ECA will be required where the stormwater management services more than one property parcel.](#)

NOTE: Site Plan Approval, or Draft Approval, is required before any Ministry of the Environment and Climate Change (MOECC) application is sent.

General Service Design Comments

- The City of Ottawa requests that all new services be located within the existing service trench to minimize necessary road cuts.
- Monitoring manholes should be located within the property near the property line in an accessible location to City forces and free from obstruction (i.e. not a parking).
- Where service length is greater than 30 m between the building and the first maintenance hole / connection, a cleanout is required.
- The City of Ottawa Standard Detail Drawings should be referenced where possible for all work within the Public Right-of-Way.
- The upstream and downstream manhole top of grate and invert elevations are required for all new sewer connections.
- Services crossing the existing watermain or sewers need to clearly provide the obvert/invert elevations to demonstrate minimum separation distances. A watermain crossing table may be provided.

Other

Are there are Capital Works Projects scheduled that will impact the application?

Yes

No

References and Resources

-
- As per section 53 of the Professional Engineers Act, O. Reg 941/40, R.S.O. 1990, all documents prepared by engineers must be signed and dated on the seal.
 - All required plans are to be submitted on standard A1 size sheets (594mm x 841mm) sheets, utilizing a reasonable and appropriate metric scale as per City of Ottawa Servicing and Grading Plan Requirements: title blocks are to be placed on the right of the sheets and not along the bottom. Engineering plans may be combined, but the Site Plans must be provided separately. Plans shall include the survey monument used to confirm datum. Information shall be provided to enable a non-surveyor to locate the survey monument presented by the consultant.
 - All required plans & reports are to be provided in *.pdf format (at application submission and for any, and all, re-submissions)
 - Please find relevant City of Ottawa Links to Preparing Studies and Plans below:
<https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans#standards-policies-and-guidelines>
 - To request City of Ottawa plan(s) or report information please contact the City of Ottawa Information Centre:
InformationCentre@ottawa.ca<mailto:InformationCentre@ottawa.ca>
(613) 580-2424 ext. 44455

- geoOttawa
<http://maps.ottawa.ca/geoOttawa/>

4. Initial Planning Comments (Tracey Scaramozzino)

- a. Rezoning is req'd for lifting of the holding provision, and to increase floorplate size
- b. More comments will be provided once more detailed plans are submitted.
- c. Concern over the abundance of vehicular parking that is being provided – especially when NO parking is required.
- d. Sidewalks on the east-west road should be on both sides, as detailed in the Secondary Plan. The sidewalks are currently only shown on the south side.
- e. Ensure ample plantings within the site and along perimeter and along the transit plaza – along with street furniture
- f. Discuss proposal with local Councillor and Community Associations
- g. Subject to the UDRP
- h. Ensure metric dimensions are on the actual submission drawings.
- i. Provide ped connection out from cul-de-sac out to private road into the medical bldg.
- j. (This site has a drop-off space in front of the 6-storey podium, while none of the other buildings/phases have one because this site has been more detailed)
- k. Show adequate/ample amenity space inside and outside.
- l. As per Applicant's request on projections, please see S. 64 of the Zoning Bylaw which permits projections (with caveats) for "mechanical and service equipment penthouse, elevator or stairway penthouses – bylaw 2014-94"
- m. Will the transit plaza be conveyed to the City or stay under private ownership?

5. Urban Design Comments (Mark Young)

1. The subject site is located in a Design Priority Area. The applications will be subject to the review of the Urban Design Review Panel.
2. A Design Brief is required as part of your application submission. A terms of reference is included.
3. Thank you for providing concept plans for the entire redevelopment of the subject lands. This is very helpful in understanding how the first phase fits within the larger long-term vision.

Zoning By-law Amendment:

1. Additional information, study and justification are required to support an increase in the floorplate size above the currently required maximum of 750 sq. m. as indicated in the Secondary Plan and Zoning By-law.

Site Plan Application:

1. It is understood that the proposed internal streets will be private. They should be designed to look and feel like public streets and be accessible to the general public. Please provide additional cross-sections to provide a better sense of what is proposed within the private streets.
2. A private street adjacent to the Transit Plaza may be challenging, given a general desire to use this for drop off and pick up associated with the transit station.
3. Layout and access as they relate to this site and the transit station should be included as part of design brief materials.
4. Grade related units should be considered where feasible and designed to allow for the appropriate relationship between public and private realm.

6. Parks (Phil Castro)

- a. Parkland dedication will be required as a condition of site plan control. The determination of the parkland area to be dedicated will be in accordance with the City's Parkland Dedication By-law and will be capped at 10 percent of the land area under consideration for residential apartment purposes. As discussed during the preapplication consultation meeting, the final parkland area to be dedicated will depend upon the future proposed uses and densities. How this is determined and addressed will require further discussion during the review of a formal submission.

7. Trees (Mark Richardson)

TCR requirements:

1. a Tree Conservation Report (TCR) must be supplied for review along with the suite of other plans/reports required by the City
 - a. an approved TCR is a requirement of Site Plan approval.
2. As of January 1 2021, any removal of privately-owned trees 10cm or larger in diameter, or publicly (City) owned trees of any diameter requires a tree permit issued under the Tree Protection Bylaw (Bylaw 2020 – 340); the permit will be based on an approved TCR and made available at or near plan approval.
3. The Planning Forester from Planning and Growth Management as well as foresters from Forestry Services will review the submitted TCR
 - a. If tree removal is required, both municipal and privately-owned trees will be addressed in a single permit issued through the Planning Forester
 - b. Compensation may be required for city owned trees – if so, it will need to be paid prior to the release of the tree permit
4. the TCR must list all trees on site by species, diameter and health condition
5. please identify trees by ownership – private onsite, private on adjoining site, city owned, co-owned (trees on a property line)

6. the TCR must list all trees on adjacent sites if they have a critical root zone that extends onto the development site
7. If trees are to be removed, the TCR must clearly show where they are, and document the reason they cannot be retained
8. All retained trees must be shown and all retained trees within the area impacted by the development process must be protected as per City guidelines available at [Tree Protection Specification](#) or by searching Ottawa.ca
 - a. the location of tree protection fencing must be shown on a plan
 - b. show the critical root zone of the retained trees
 - c. if excavation will occur within the critical root zone, please show the limits of excavation
9. the City encourages the retention of healthy trees; if possible, please seek opportunities for retention of trees that will contribute to the design/function of the site.
10. For more information on the process or help with tree retention options, contact Mark Richardson mark.richardson@ottawa.ca or on [City of Ottawa](#)

LP tree planting requirements:

For additional information on the following please contact tracy.smith@Ottawa.ca

Minimum Setbacks

- Maintain 1.5m from sidewalk or MUP/cycle track.
- Maintain 2.5m from curb
- Coniferous species require a minimum 4.5m setback from curb, sidewalk or MUP/cycle track/pathway.
- Maintain 7.5m between large growing trees, and 4m between small growing trees. Park or open space planting should consider 10m spacing.
- Adhere to Ottawa Hydro's planting guidelines (species and setbacks) when planting around overhead primary conductors.

Tree specifications

- Minimum stock size: 50mm tree caliper for deciduous, 200cm height for coniferous.
- Maximize the use of large deciduous species wherever possible to maximize future canopy coverage
- Tree planting on city property shall be in accordance with the City of Ottawa's Tree Planting Specification; and include watering and warranty as described in the specification (can be provided by Forestry Services).
- Plant native trees whenever possible
- No root barriers, dead-man anchor systems, or planters are permitted.
- No tree stakes unless necessary (and only 1 on the prevailing winds side of the tree)

Hard surface planting

- Curb style planter is highly recommended
- No grates are to be used and if guards are required, City of Ottawa standard (which can be provided) shall be used.
- Trees are to be planted at grade

Soil Volume

- Please ensure adequate soil volumes are met:

Tree Type/Size	Single Tree Soil Volume (m3)	Multiple Tree Soil Volume (m3/tree)
Ornamental	15	9
Columnar	15	9
Small	20	12
Medium	25	15
Large	30	18
Conifer	25	15

Sensitive Marine Clay

- Please follow the City's 2017 Tree Planting in Sensitive Marine Clay guidelines

8. Environment (Matthew Hayley)

1. Sawmill Creek runs along a portion of the eastern boundary of the larger site (visible on page 3 of the Concept Master Plan along Bank Street). That area currently zoned EP will need to continue be zoned EP and set aside. The redevelopment site does not share a boundary with Sawmill Creek, however any servicing and site alterations need to support the redevelopment adjacent to the watercourse will need to be mindful of the impact on the feature and the direction from the RVCA followed.
2. Bird Safe Design, Given the height of the proposal (mid to high rise) the proposal will need to review and incorporate bird safe design elements and as part of the site plan a review of elevation drawings will be needed to assess impact due to the proximity of green corridor to the west. Please review the Bird Safe Design Guidelines for details however in brief some items of concern are glass and related design traps such as corner glass and fly-through conditions, ventilation grates and open pipes, some types of landscaping, and light pollution.
3. Consider the impact this site has on the urban heat island effect and look for ways to reduce the heat generated through the provision of shade or other approaches (look to the high performance building standards for example).

9. Conservation Authority (Jamie Batchelor, RVCA)

Stormwater Management

Any new development will need to be in accordance with the Samwill Creek Subwatershed Study. This includes water quality treatment of 'enhanced' (80%TSS Removal). The opportunity for the inclusion of LID measures should be considered for the stormwater management plan.

10. Transportation (Pat McMahon)

- Ensure that a Transportation Impact Assessment (TIA) Screening form is included with the application. In this case, a TIA is required and should be started as soon as possible.
 - o Start this process as soon as possible.
 - o An update to the TRANS Trip Generation Manual has been completed (October 2020). This manual (and trip calculator) is to be utilized for this TIA and can be provided upon request.
 - o Applicant advised that their application will not be deemed complete until the submission of the draft step 1-4, including the functional draft RMA package and/or monitoring report (if applicable). Collaboration and communication between development proponents and City staff are required at the end of every step of the TIA process.
- Noise Impact Studies required for the following:
 - o Road (within 100m of light rail corridor)
 - o Aircraft (within the Airport Vicinity Development Zone)
- Clear throat requirements for residential developments with greater than 200 units and accessing a collector road are 25m.
- As the proposed site is commercial and residential, AODA legislation applies to all areas accessible to the public (i.e. outdoor pathways, parking, etc.).
- On site plan:
 - o Show all details of the roads abutting the site up to and including the opposite curb; include such items as pavement markings, accesses and/or sidewalks.
 - o Turning templates will be required for all accesses showing the largest vehicle to access the site; required for internal movements and at all access (entering and exiting and going in both directions).
 - o Show all curb radii measurements; ensure that all curb radii are reduced as much as possible
 - o Show lane/aisle widths.
 - o Sidewalk is to be continuous across accesses as per City Specification 7.1.
- Site is within 100m of future South Keys LRT Station – therefore TOD measures apply. As per the South Keys to Blossom Park CDP, a site-specific plan as well as a local Transportation Management Association is encouraged. To achieve

target mode shares within TOD zones, we highly recommend developments to provide as many TDM measures as possible. Given the need for sustainable travel modes, providing at least one bicycle space per unit is strongly encouraged. To reduce provided parking costs, car-sharing options would be equitable for the residents and could also save the development in costs for providing and maintaining the parking structure.

- As per the CDP, 30m ROW protection is encouraged along Daze. As the development progresses, be aware that the frontage along Daze may change, and the layout of the plaza as well as a result.
- The plaza forms part of the Hunt Club Neighbourhood Extension, consider working with the cycling group to consolidate efforts.
- Sidewalks are required on both sides of local streets, as per the CDP.

11. OC Transpo/O-train (Erica Springate will comment on future revisions)

- a. There won't be any changes to the OC Transpo Bus station at South Keys. The only changes will be the pedestrian underpass between the Bus Station and O-train and the O-train platform itself (Tracey Scaramozzino, via Mark Antunes-Alves)
- b. The former Trillium Line service operated at a 12-minute headway in all time periods. The timing will remain, once the Trillium Line expansion is complete.
- c. The Confederation Line runs between a 3-5 minute headway. (Tracey via Matthew Wolstenholme)

12. Waste Collection

- a. Please see City's Waste Management Guidelines for multi-unit residential:
<http://ottawa.ca/calendar/ottawa/citycouncil/pec/2012/11-13/Solid%20Waste%20Collection%20Guidelines%20-%20Doc%201.pdf>

13. General Information

- a. Ensure that all plans and studies are prepared as per City guidelines – as available online...
<https://ottawa.ca/en/city-hall/planning-and-development/information-developers/development-application-review-process/development-application-submission/guide-preparing-studies-and-plans>

APPENDIX B

- Watermain Demand Calculations
- Fire Flow Calculations
- Boundary Conditions
- Hydraulic Model Results



IBI GROUP
 333 PRESTON STREET
 OTTAWA, ON
 K1S 5N4

WATERMAIN DEMAND CALCULATION SHEET

PROJECT : South Keys - Smart Centers
 LOCATION : City of Ottawa

FILE: 135853.6.04
 DATE PRINTED: 2023-09-20
 DESIGN: 2023-09-20
 PAGE: 1 OF 1

NODE	RESIDENTIAL				NON-RESIDENTIAL			AVERAGE DAILY DEMAND (l/s)			MAXIMUM DAILY DEMAND (l/s)			MAXIMUM HOURLY DEMAND (l/s)			FIRE DEMAND (l/min)
	Single	Town	Apt	POP'N	INDTRL (ha.)	COMM. (ha.)	RETAIL (m ²)	Res.	Non-res.	Total	Res.	Non-res.	Total	Res.	Non-res.	Total	
Phase 1																	
J16			290	522				1.69	0.00	1.69	4.23	0.00	4.23	9.30	0.00	9.30	9,000
Phase 2 & 3																	
J12			807	1,453				4.71	0.00	4.71	11.77	0.00	11.77	25.89	0.00	25.89	8,000
Phase 4																	
J14			457	823				2.67	0.00	2.67	6.66	0.00	6.66	14.66	0.00	14.66	8,000
Ultimate - Total			1264	2,797						9.07	18.43		22.66	40.55		49.85	

ASSUMPTIONS

RESIDENTIAL DENSITIES	AVG. DAILY DEMAND	MAX. HOURLY DEMAND
Apartment (ave) 1.8 p / p / u	Residential:** 280 l / cap / day	Residential: 1,540 l / cap / day
	Industrial: l / ha / day	Industrial: l / ha / day
	Commercial: l / ha / day	Commercial: l / ha / day
	Retail: 2,500 l / 1000m ² / day	Retail: 11,250 l / 1000m ² / day
** Residential Daily Demand reduced to coincide with current waste water guidelines	MAX. DAILY DEMAND	FIRE FLOW
	Residential: 700 l / cap / day	From FUS Calculation 8,000 l / min
	Industrial: l / ha / day	
	Commercial: l / ha / day	
	Retail: 6,250 l / 1000m ² / day	

STEP	Contents	Description	Adjustment Factor	Result
1	Floor Area	Building A		m2
	Total Storey			20 storey
	Total Effective Floor Area			7179 m2
2	Type of Construction	Type V Wood Frame	1.5	Type II Noncombustible Construction 0.8
		Type III Ordinary Construction	1.0	
		Type II Noncombustible Construction	0.8	
		Type I Fire Resistive Construction	0.6	
3	Required Fire Flow	RFF = 220C _v /A		15000 L/min
4	Occupancy and Contents	Noncombustible Contents	-25%	Noncombustible Contents. -15%
		Limited Combustible Contents	-15%	
		Combustible Contents	0%	
		Free Burning Contents	15%	
		Rapid Burning Contents	25%	
	Fire Flow			12750 L/min
5	Automatic Sprinkler Protection	Automatic Sprinkler Conforming to NFPA 13 Standard Water Supply for both the system and Fire Department Hose Lines	-30%	Yes -30%
			-10%	Yes -10%
		Fully Supervised System	-10%	No
	Fire Flow			7650 L/min
6	Exposure Adjustment	Based on Table 6 Exposure Adjustment Charges for Subject Building		
	North	Separation (m)	>30	With unprotected opening 0%
		Length X Height Factor (m.storeys)	0	
		Construction Type	Type II	
	South	Separation (m)	25	With unprotected opening 4%
		Length X Height Factor (m.storeys)	0	
Construction Type		Type II		
East	Separation (m)	>30	With unprotected opening 0%	
	Length X Height Factor (m.storeys)	0		
	Construction Type	Type II		
West	Separation (m)	>30	With unprotected opening 0%	
	Length X Height Factor (m.storeys)	0		
	Construction Type	Type II		
	Fire Flow			7956 L/min
7	Total Required Fire Flow	Rounded to Nearest 1000 L/min		8000 L/min

Notes 1. Fire flow calculation are based on Fire Underwriters Survey version 2020.

Floor	Area (m2)	Two Largest Floor	Floors Above at 50%
7	1616	1616	
8	1616	1616	
9	1530		765
10	1530		765
11	678		339
12	831		415.5
13	831		415.5
14	831		415.5
15	831		415.5
16	831		415.5
Total	11125		7178.5

(Note: For fire-resistive buildings, consider two largest adjoining floors plus 50% of each of any floors immediately above them up to eight.)

WATER MODEL

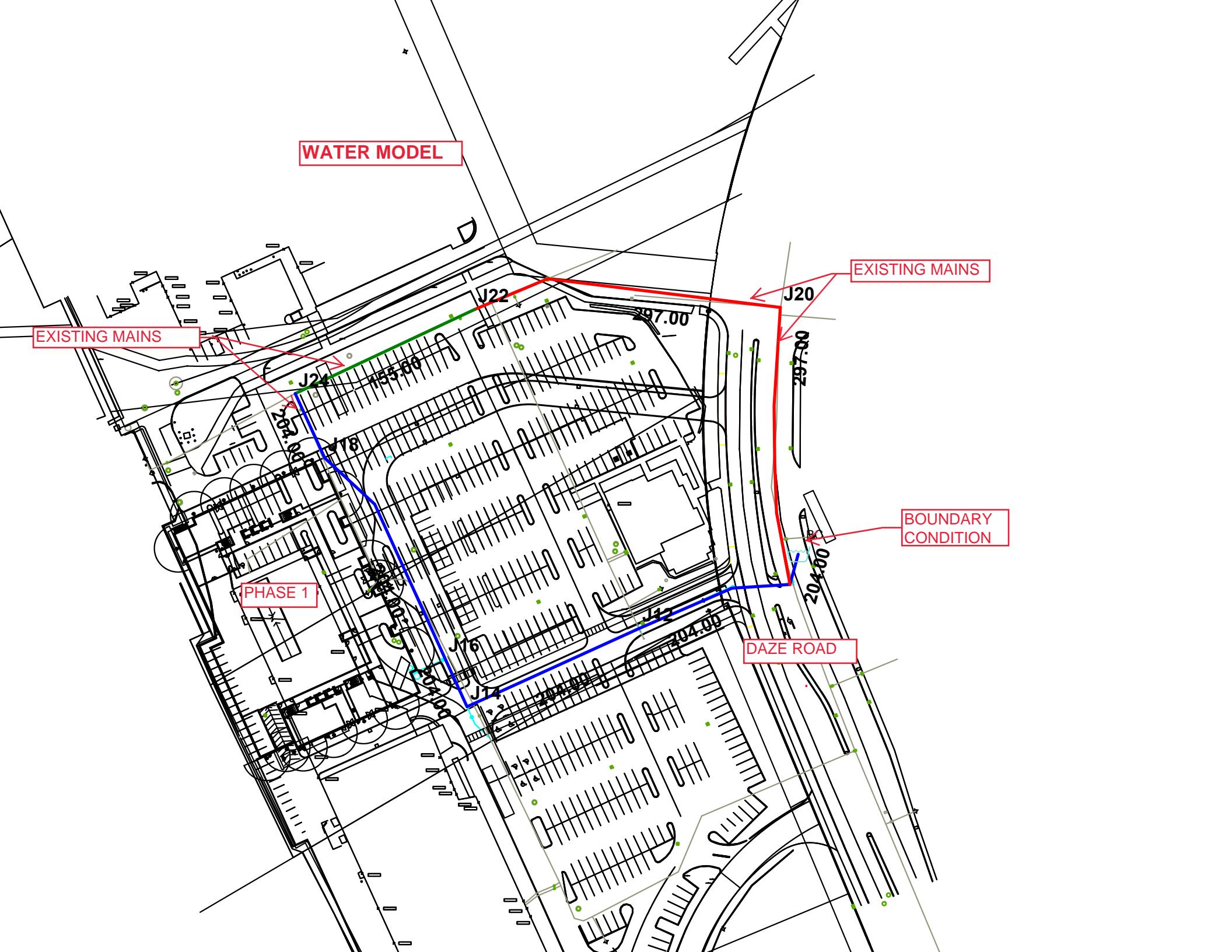
EXISTING MAINS

EXISTING MAINS

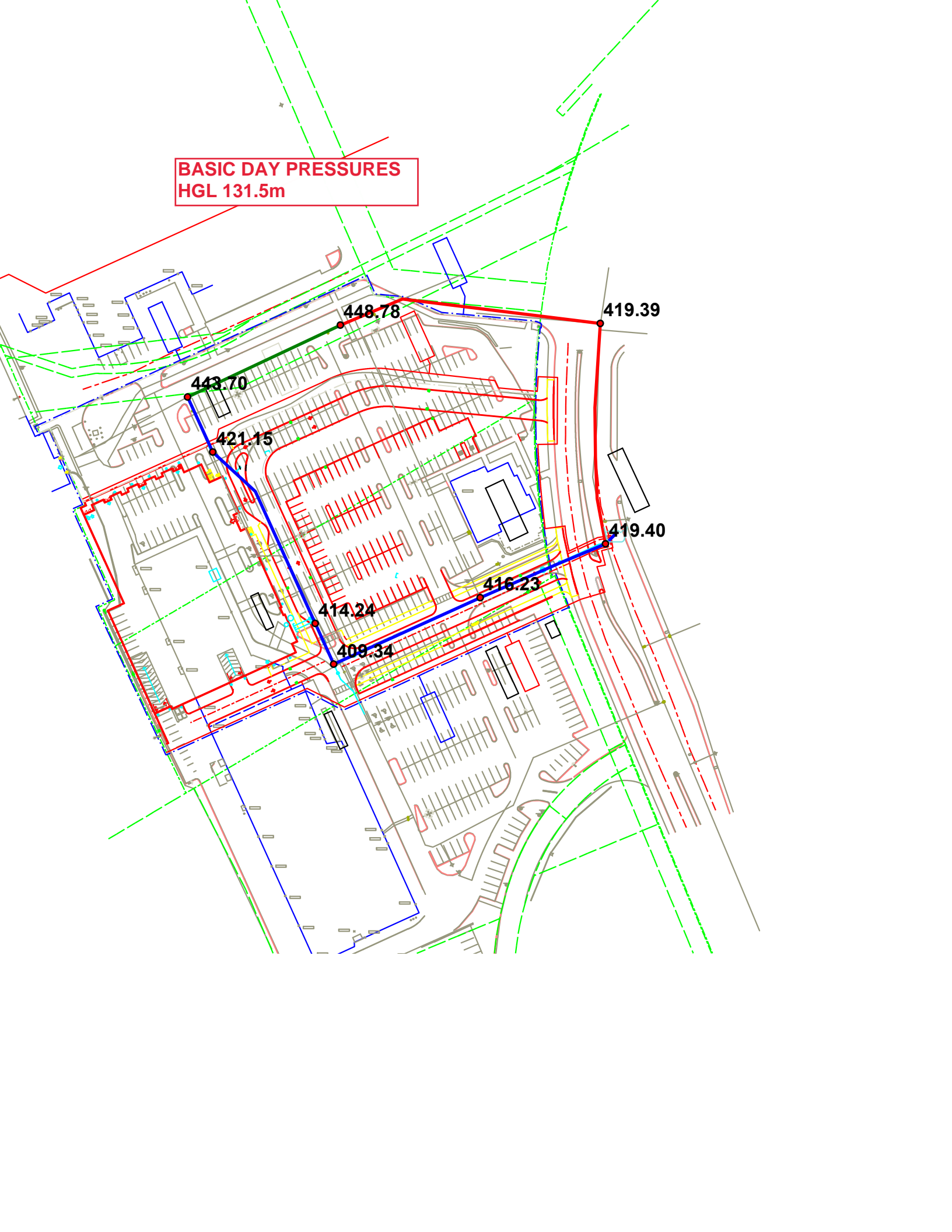
BOUNDARY CONDITION

PHASE 1

DAZE ROAD



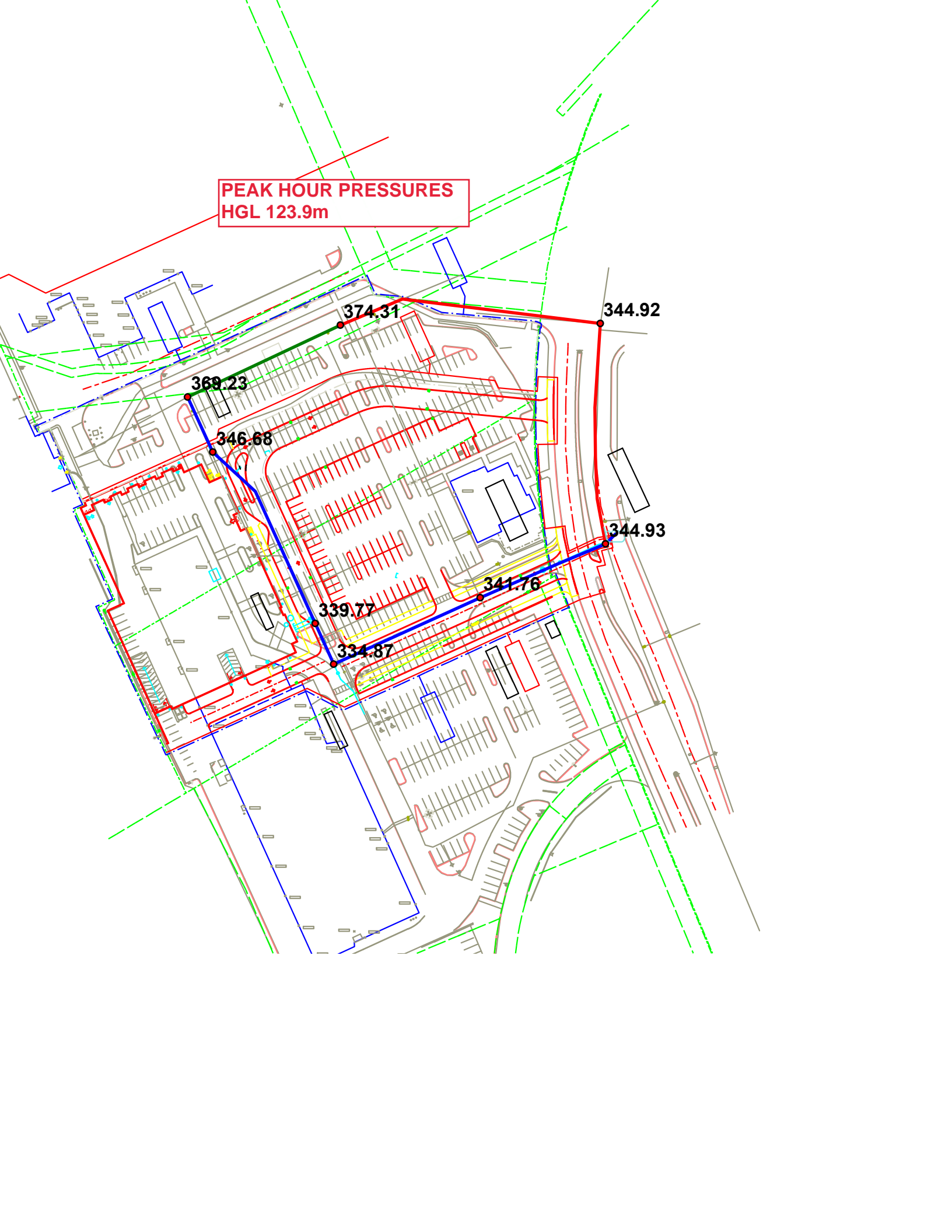
BASIC DAY PRESSURES
HGL 131.5m



Basic Day (Max HGL) HGL - 131.5m - Junction Report

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	<input type="checkbox"/>	J10	0.00	88.70	131.50	419.40
2	<input type="checkbox"/>	J12	4.71	89.00	131.48	416.23
3	<input type="checkbox"/>	J14	2.67	89.70	131.47	409.34
4	<input type="checkbox"/>	J16	1.69	89.20	131.47	414.24
5	<input type="checkbox"/>	J18	0.00	88.50	131.48	421.15
6	<input type="checkbox"/>	J20	0.00	88.70	131.50	419.39
7	<input type="checkbox"/>	J22	0.00	85.70	131.50	448.78
8	<input type="checkbox"/>	J24	0.00	86.20	131.48	443.70

**PEAK HOUR PRESSURES
HGL 123.9m**



Peak Hour HGL 123.5m - Junction Report

		ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (kPa)
1	<input type="checkbox"/>	J10	0.00	88.70	123.90	344.93
2	<input type="checkbox"/>	J12	4.71	89.00	123.88	341.76
3	<input type="checkbox"/>	J14	2.67	89.70	123.87	334.87
4	<input type="checkbox"/>	J16	1.69	89.20	123.87	339.77
5	<input type="checkbox"/>	J18	0.00	88.50	123.88	346.68
6	<input type="checkbox"/>	J20	0.00	88.70	123.90	344.92
7	<input type="checkbox"/>	J22	0.00	85.70	123.90	374.31
8	<input type="checkbox"/>	J24	0.00	86.20	123.88	369.23

Peak Hour HGL 123.5m - Pipe Report

		ID	From Node	To Node	Length (m)	Diameter (mm)	Roughness	Flow (L/s)	Velocity (m/s)	Headloss (m)	HL/1000 (m/k-m)	Status	Flow Reversal Count
1	<input type="checkbox"/>	P11	J10	J12	60.00	204.00	110.00	6.75	0.21	0.02	0.39	Open	0
2	<input type="checkbox"/>	P13	J12	J14	71.00	204.00	110.00	2.04	0.06	0.00	0.04	Open	0
3	<input type="checkbox"/>	P15	J14	J16	20.00	204.00	110.00	-0.63	0.02	0.00	0.01	Open	0
4	<input type="checkbox"/>	P17	J16	J18	92.00	204.00	110.00	-2.32	0.07	0.00	0.05	Open	0
5	<input type="checkbox"/>	P19	J10	BC	1.00	204.00	110.00	-9.07	0.28	0.00	0.67	Open	0
6	<input type="checkbox"/>	P21	J20	J10	104.00	297.00	120.00	-2.32	0.03	0.00	0.01	Open	0
7	<input type="checkbox"/>	P23	J20	J22	120.00	297.00	120.00	2.32	0.03	0.00	0.01	Open	0
8	<input type="checkbox"/>	P25	J22	J24	75.00	155.00	100.00	2.32	0.12	0.02	0.24	Open	0
9	<input type="checkbox"/>	P27	J24	J18	24.00	204.00	110.00	2.32	0.07	0.00	0.05	Open	0

**PEAK HOUR PRESSURES
HGL 126.5m**



		ID	Total Demand (L/s)	Hydrant Available Flow (L/s)	Critical Node ID for Design Run	Critical Node Pressure at Available Flow (kPa)	Critical Node Pressure at Fire Demand (kPa)	Critical Pressure for Design Run (kPa)	Hydrant Design Flow (L/s)	Hydrant Pressure at Design Flow (kPa)
1	<input type="checkbox"/>	J12	138.04	354.01	J12	139.96	326.47	19.99	445.95	139.96
2	<input type="checkbox"/>	J14	136.00	261.96	J14	139.96	293.44	19.99	332.18	139.96
3	<input type="checkbox"/>	J16	135.02	253.39	J16	139.96	293.30	19.99	320.11	139.96
4	<input type="checkbox"/>	J18	133.33	230.53	J18	139.96	286.20	19.99	289.58	139.96

Chetrar, Anton

From: Sevigny, John <John.Sevigny@ottawa.ca>
Sent: Monday, October 16, 2023 11:26 AM
To: Chetrar, Anton
Cc: Moffatt, Jim; Cave, Doug; Bramah, Bruce
Subject: RE: South Keys - Phase 1 - Boundary Conditions
Attachments: 1131 Hunt Club October 2023.pdf

Follow Up Flag: Follow up
Flag Status: Completed

Hi Anton,
Fresh of the presses. See attached and below.

Note: We didn't provide a BC for connection#2 because it is a private watermain.

******The following information may be passed on to the consultant, but do NOT forward this e-mail directly.******

The following are boundary conditions, HGL, for hydraulic analysis at 1131 Hunt Club Road (zone 2W2C) assumed to be connected to the 305 mm on Daze Street (see attached PDF for location).

Minimum HGL = 123.9 m

Maximum HGL = 131.5 m

Max Day + Fire Flow (133.3 L/s) = 126.5 m

These are for current conditions and are based on computer model simulation.

Disclaimer: The boundary condition information is based on current operation of the city water distribution system. The computer model simulation is based on the best information available at the time. The operation of the water distribution system can change on a regular basis, resulting in a variation in boundary conditions. The physical properties of watermains deteriorate over time, as such must be assumed in the absence of actual field test data. The variation in physical watermain properties can therefore alter the results of the computer model simulation.

John Sevigny, C.E.T.

Senior Project Manager

Development Review, Suburban Services | *Examen des projets d'aménagement, Services suburbains*

Planning, Real Estate and Economic Development Department | Direction générale de la planification, des biens immobiliers et du développement économique

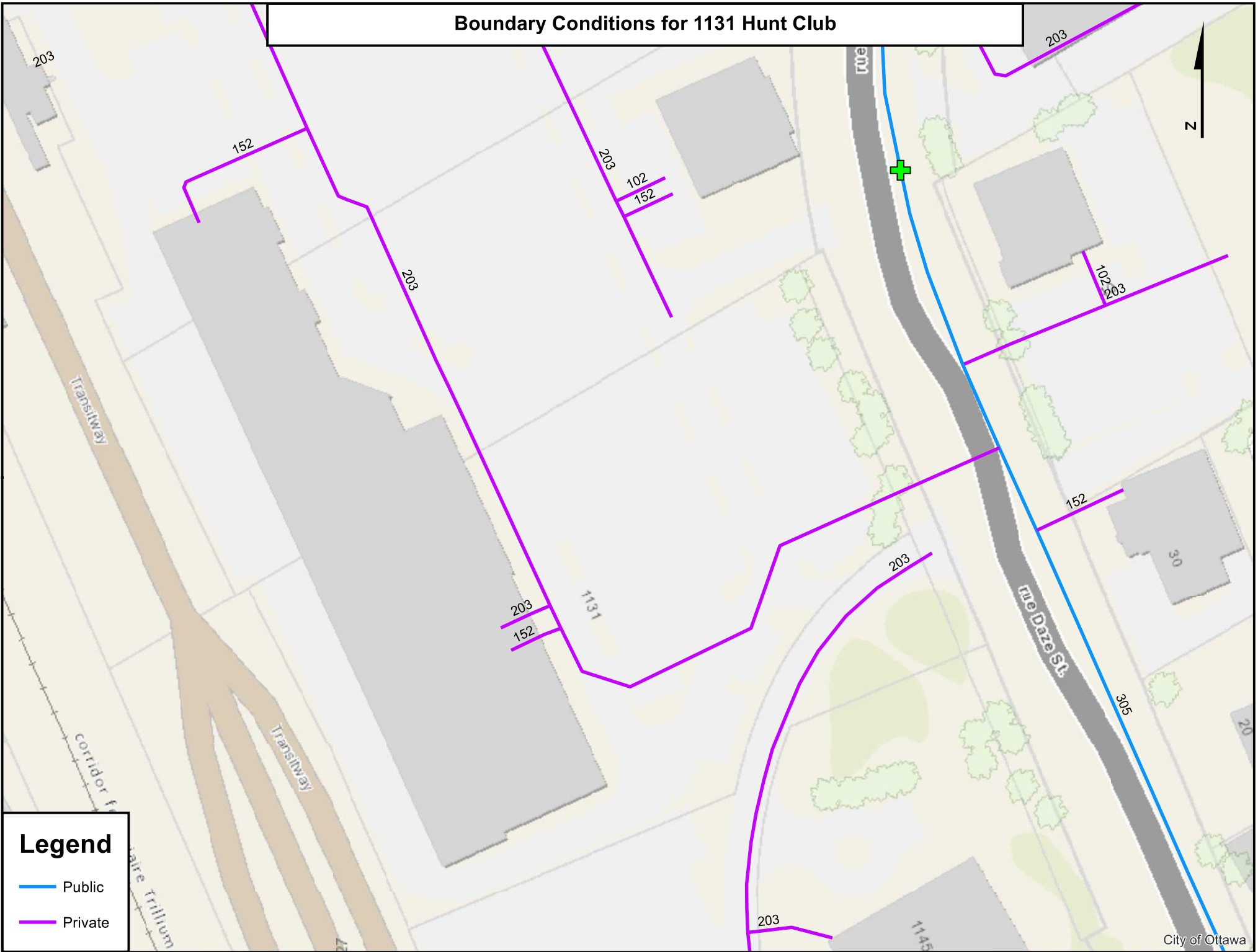
City of Ottawa | Ville d'Ottawa

110 Laurier Avenue West. Ottawa, ON | 110, avenue. Laurier Ouest. Ottawa (Ontario) K1P 1J1

613.580.2424 ext./poste **14388**, fax/télé:613-580-2576, john.sevigny@ottawa.ca

From: Chetrar, Anton <anton.chetrar@arcadis.com>
Sent: October 16, 2023 9:05 AM
To: Sevigny, John <John.Sevigny@ottawa.ca>; Bramah, Bruce <bruce.bramah@ottawa.ca>
Cc: Moffatt, Jim <jim.moffatt@arcadis.com>; Cave, Doug <doug.cave@arcadis.com>
Subject: RE: South Keys - Phase 1 - Boundary Conditions

Boundary Conditions for 1131 Hunt Club



Legend

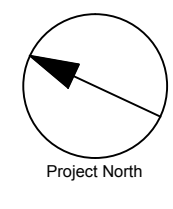
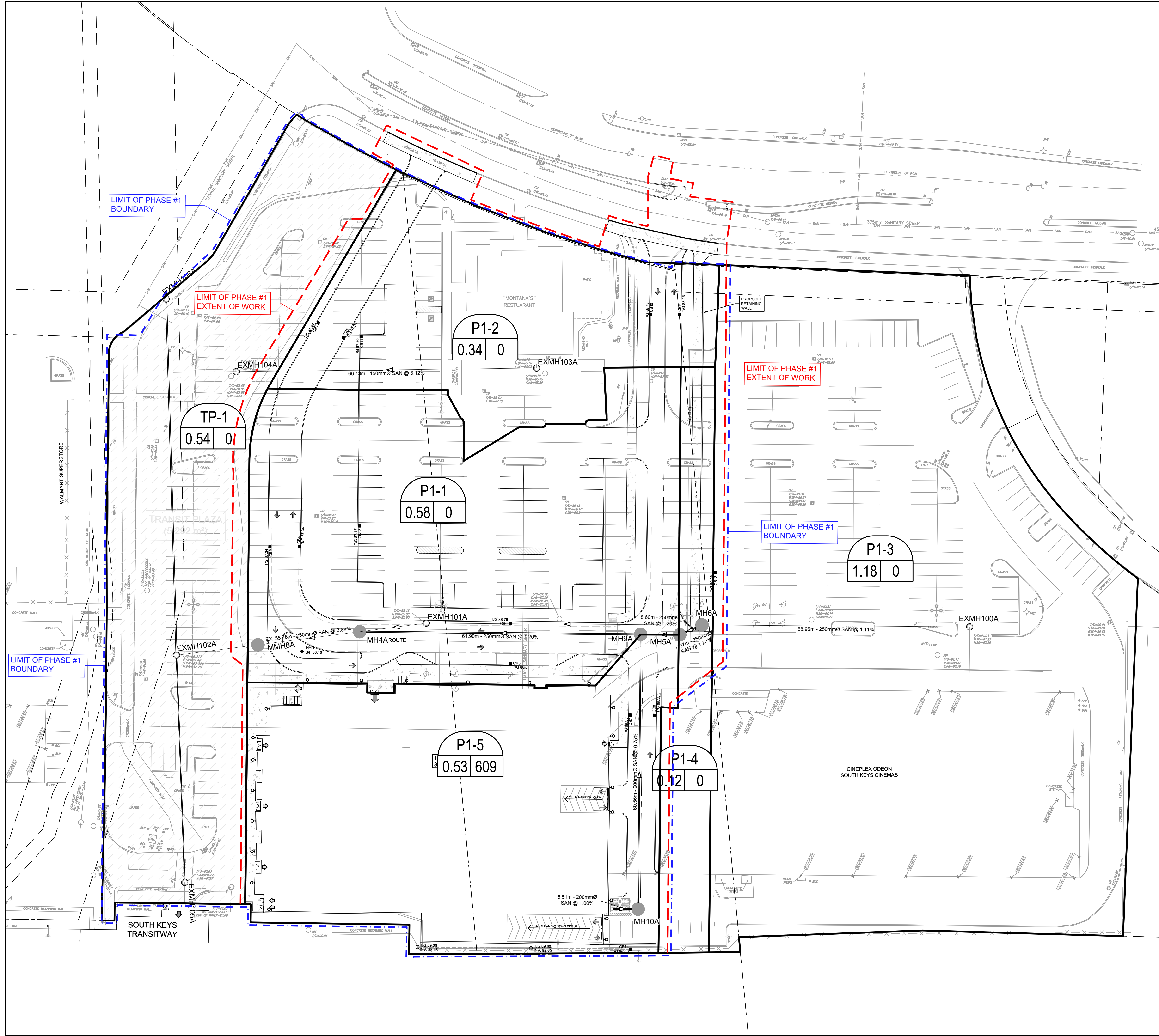
- Public
- Private

APPENDIX C

- Sanitary Sewer Design Sheet – Phase 1 and Master Plan
- Drawing 135853 C-400 Sanitary Drainage Area Plan – Phase 1
- Drawing 135853 C-401 Sanitary Drainage Area Plan – Master Plan
- Drawing 135853 C-001 Site Servicing Plan

LOCATION				RESIDENTIAL										ICI AREAS						INFILTRATION ALLOWANCE			FIXED FLOW (L/s)		TOTAL FLOW (L/s)	PROPOSED SEWER DESIGN										
STREET	AREA ID	FROM MH	TO MH	AREA w/ Units (Ha)	UNIT TYPES			AREA w/ Units (Ha)		POPULATION		RES PEAK FACTOR	PEAK FLOW (L/s)	AREA (ha)		ICI PEAK FACTOR	PEAK FLOW (L/s)	AREA (ha)		IND	CUM	L/s	IND	CUM	L/s	IND	CUM	L/s	CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (m/s)	AVAILABLE CAPACITY (L/s)		
					SF	TH/SD	1 Bed APT	2 Bed APT	IND	CUM	IND			CUM	IND			CUM	IND																CUM	IND
Phase 1 Conditions																																				
Montano's Restaurant	PI-2	ExMH103A	ExMH104A						0.0	0.0	3.80	0.00		0.34	0.34	150	0.17	0.34	0.34	0.11					0.0	0.28	28.06	66.13	150	3.12	1.538	27.79	99.07%			
Phase 1 Building																																				
	PI-3	ExMH100A	MH6A						0.0	0.0	3.80	0.00	1.8	1.8	150	0.57	1.8	1.8	0.39					0.0	0.96	65.36	58.00	250	1.11	1.290	64.40	96.83%				
	PI-4	MH8A	MH9A						0.0	0.0	3.80	0.00	0.12	1.30	150	0.63	0.12	1.30	0.43					0.0	1.06	67.96	5.37	250	1.20	1.341	66.90	96.44%				
		MH5A	MH6A						0.0	0.0	3.80	0.00	0.00	1.30	150	0.63	0.00	1.30	0.43					0.0	1.06	67.96	8.60	250	1.20	1.341	66.90	96.44%				
	PI-5	MH9A	MH9A	1.11				290	0.12	551.0	551.0	3.36	6.00	0.00	0.00	100	0.00	1.23	1.23	0.41				0.0	6.41	29.63	80.56	200	0.75	0.914	23.22	78.37%				
	PI-1	MH9A	MH4A					0.58	34.8	585.8	3.35	6.36	0.00	1.30	150	0.63	0.00	1.88	0.62					0.0	7.61	87.96	81.90	250	1.20	1.341	69.35	88.90%				
		MH4A	ExMH102A						0.0	585.8	3.35	6.36	0.00	1.30	150	0.63	0.00	1.88	0.62					0.0	7.61	34.22	5.51	200	1.00	1.055	26.60	77.75%				
Building Service Lateral																																				
Total Flow	TP-1	ExMH102A	ExMH106A	0.54					0.0	585.8	3.35	6.36		0.00	1.30	150	0.63	0.54	2.42	0.80				0.00	7.79	42.08	50.70	250	0.46	0.830	34.29	81.48%				
Master Plan (Full Buildout)																																				
	UL-3, UL-4	ExMH100A	MH6A	1.36				863		1639.7	1639.7	3.12	16.58	0.00	0.00	100	0.00	1.35	1.35	0.45				0.00	17.03	65.36	58.95	250	1.11	1.290	48.33	73.94%				
		MH5A	MH5A					0.0	1639.7	3.12	16.58	0.00	0.00	100	0.00	0.00	1.35	0.45						0.00	17.03	67.96	5.37	250	1.20	1.341	50.83	74.94%				
		MH5A	MH9A					0.0	1639.7	3.12	16.58	0.00	0.00	100	0.00	0.00	1.30	0.45						0.00	17.03	67.96	8.60	250	1.20	1.341	50.93	74.94%				
	UL-1, UL-2	MH8A	MH4A	1.39				693		1376.7	2956.4	2.96	28.34	0.00	0.00	100	0.00	1.39	2.74	0.90				0.00	29.25	67.96	61.90	250	1.20	1.341	38.71	56.96%				
		MH4A	ExMH102A					0.0	2956.4	2.96	28.34	0.00	0.00	100	0.00	0.00	2.74	0.90						0.00	29.25	121.89	56.48	250	3.86	2.405	92.64	76.00%				
Total Flow		ExMH102A	ExMH106A	0.54				0.53	0.0	2956.4	2.96	28.34		0.00	0.00	100	0.00	1.07	3.81	1.26				0.00	29.60	42.08	50.70	250	0.46	0.830	12.46	29.65%				

Design Parameters:		Notes:				Designed: AC		No.:		Revision										Date			
Residential	ICI Areas	1. Manning's coefficient (n) =	0.013			2. Demand (per capita):	280 L/day		1	SPA Submission No. 1 for City Review										2021-10-28			
SF 3.4 p/p/u		3. Infiltration allowance:	0.33 L/s/ha	200 L/day					2	SPA Submission No. 2 for City Review										2023-10-19			
TH/SD 2.7 p/p/u	INST 28,000 L/ha/day	4. Residential Peaking Factor:																					
1 Bed 14 p/p/u	COM 35,000 L/ha/day	Harmon Formula = 1+(14+ P-1000 *0.5) 0.8																					
2 Bed 19 p/p/u	IND 35,000 L/ha/day	where K = B Correction Factor																					
Other 60 p/p/ha	MCE Chart	5. Commercial and Institutional Peak Factors based on total area, 1.5 if greater than 20%, otherwise 1.0																					
						Dwg. Reference: 135853-400 and 401		File Reference: 135853-6.04.04												Date: 2021-10-28		Sheet No: 1 of 1	

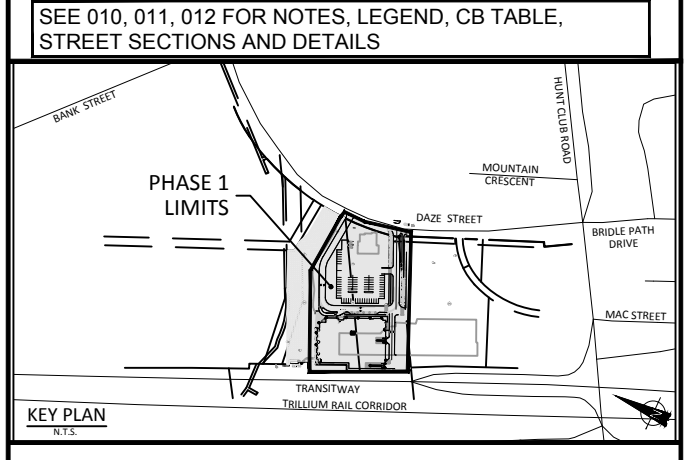


CLIENT
SMARTCENTRES
 REAL ESTATE INVESTMENT TRUST
 3200 HIGHWAY 7
 VAUGHAN, ON L4K 5Z6
 TEL: 905 326 6400

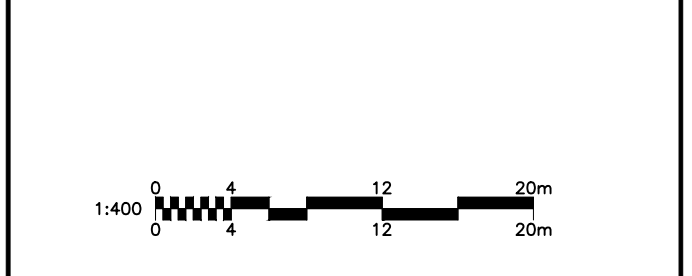
COPYRIGHT
 This drawing has been prepared solely for the intended use. This any reproduction or distribution for any purpose other than authorized by IBI Group is forbidden. Written dimensions shall have precedence over scaled dimensions. Contractors shall verify and be responsible for all dimensions and conditions on the job, and IBI Group shall be informed of any variations from the dimensions and conditions shown on the drawing. Shop drawings shall be submitted to IBI Group for general conformance before proceeding with fabrication.
 IBI Group Professional Services (Canada) Inc.
 is a member of the IBI Group of companies

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR SPA	2021-10-28
2	REVISED AS PER NEW SITE PLAN	2023-10-19
3		
4		
5		
6		
7		



CONSULTANTS
 Project Coordinator
 Architect: RLA Architectue
 Landscape: Levstek consultants
 Surveyor: Stantec
 Geotech: Paterson Group
 Transportation Engineer: IBI Group
 Urban Planner: Stantec



IBI GROUP
 400 - 333 Preston Street
 Ottawa ON K1S 9M4 Canada
 tel 613 225 1311 fax 613 225 9866
 ibigroup.com

PROJECT
SOUTH KEYS MALL
 2200 BANK STREET
 SOUTH PHASE - PHASE 1

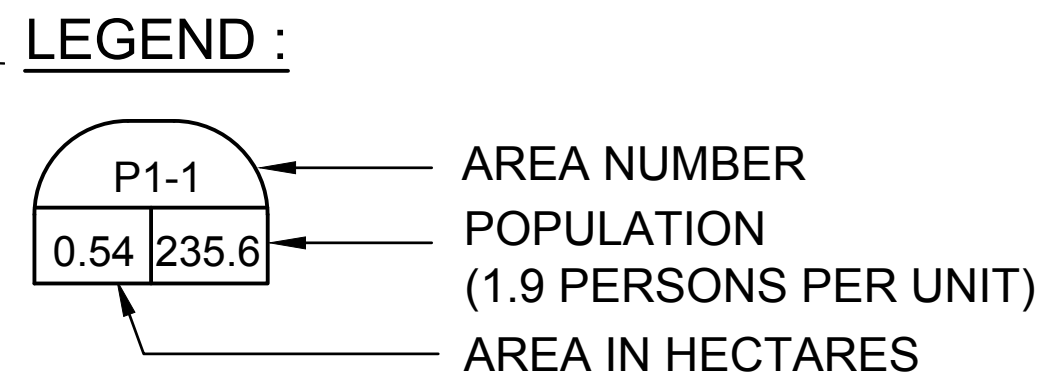
PROJECT NO:
 135853
 DRAWN BY:
 D.P.S.
 PROJECT MGR:
 J.I.M.

CHECKED BY:
 A.C.
 APPROVED BY:
 J.I.M.

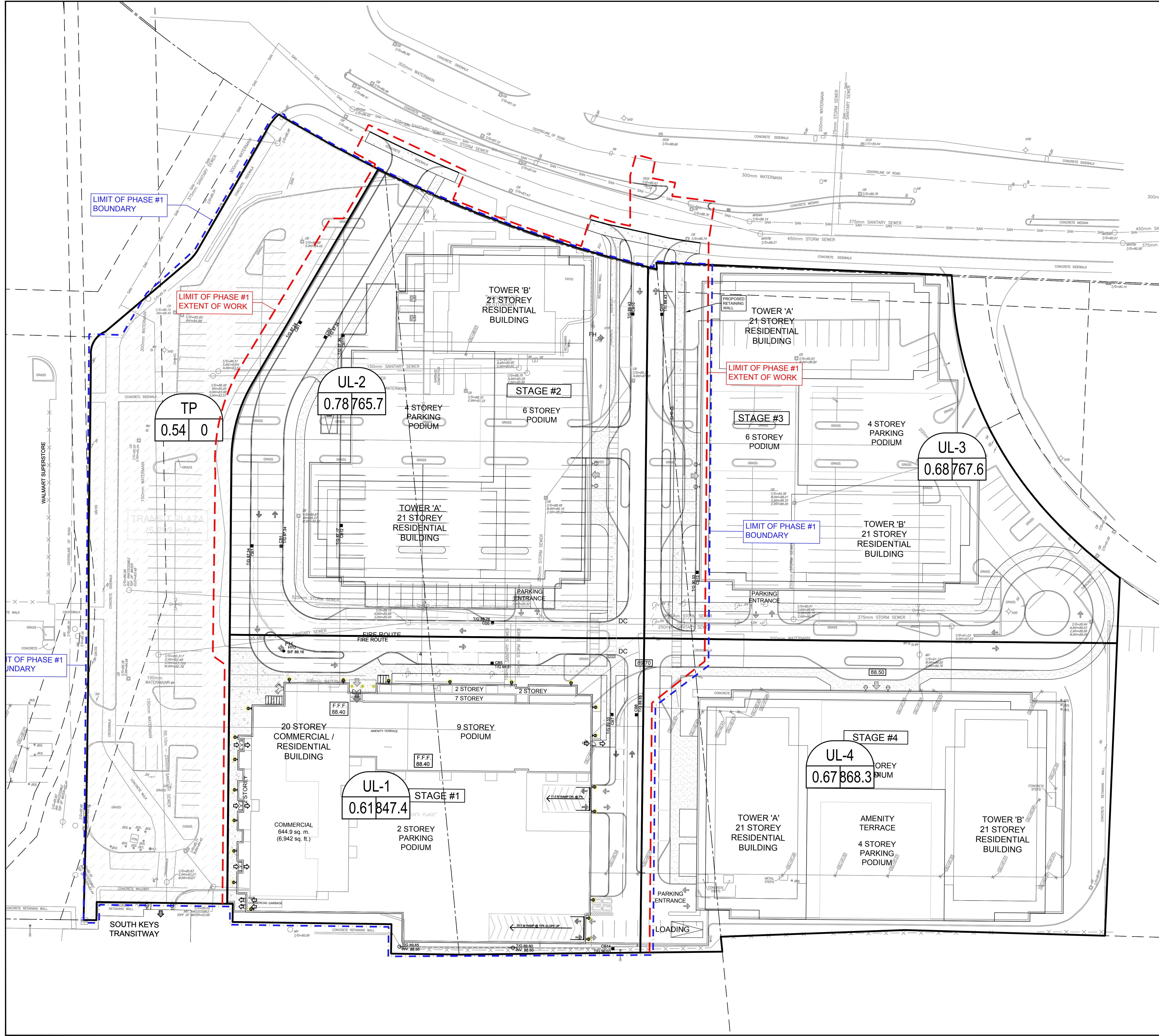
SHEET TITLE
SANITARY DRAINAGE
AREA PLAN

SHEET NUMBER
C-400

ISSUE
2

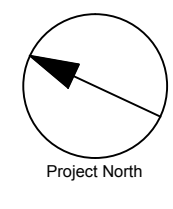


CITY FILE No. D07-12-21-0182
 File Location: J:\135853_SouthKeys\17_0_Production\03_Design\04_Civil\Sheets\C-400_SANITARY DRAINAGE AREA PLAN.dwg Last Saved: October 16, 2023, by dauma Plotted: Thursday, October 19, 2023 1:16:19 PM by Don Suma



LEGEND :

	AREA NUMBER
	POPULATION (1.9 PERSONS PER UNIT)
	AREA IN HECTARES

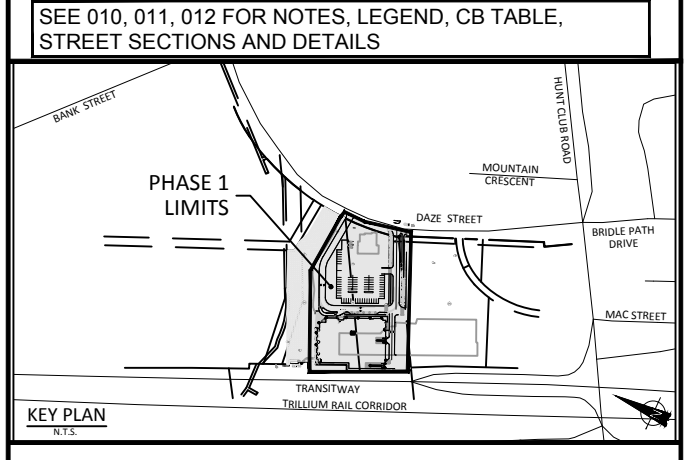


CLIENT
SMARTCENTRES
 REAL ESTATE INVESTMENT TRUST
 3200 HIGHWAY 7
 VAUGHAN, ON L4K 4Z6
 TEL: 905 326 6400

COPYRIGHT
 This drawing has been prepared solely for the intended use. Any reproduction or distribution for any purpose other than that authorized by IBI Group is forbidden. Written dimensions shall have precedence over scaled dimensions. Contractors shall verify and be responsible for all dimensions and conditions on the job, and IBI Group shall be relieved of any liabilities from the dimensions and conditions shown on the drawing. Shop drawings shall be submitted to IBI Group for general conformance before proceeding with fabrication.
 IBI Group Professional Services (Canada) Inc.
 is a member of the IBI Group of companies

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR SPA	2021-10-28
2	REVISED AS PER NEW SITE PLAN	2023-10-19
3		
4		
5		
6		
7		



CONSULTANTS

Project Coordinator
 Architect: RLA Architectue
 Landscape: Levstek consultants
 Surveyor: Stantec
 Geotech: Paterson Group
 Transportation Engineer: IBI Group
 Urban Planner: Stantec



IBI GROUP
 400 - 333 Preston Street
 Ottawa ON K1S 5M4 Canada
 tel 613 225 1311 fax 613 225 5868
 ibigroup.com

PROJECT
SOUTH KEYS MALL
 2200 BANK STREET
 SOUTH PHASE - PHASE 1

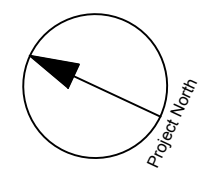
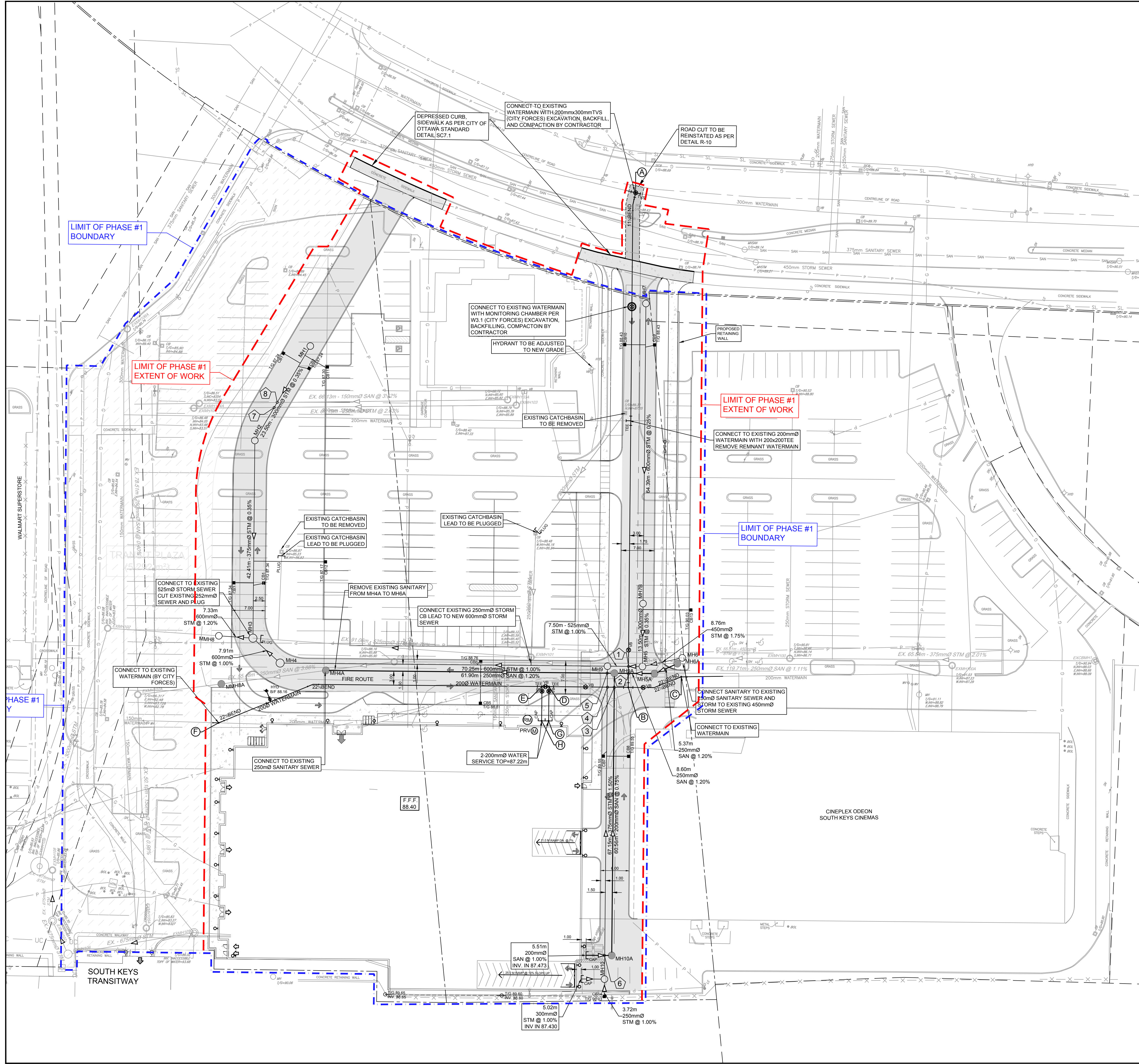
PROJECT NO:
135853

DRAWN BY: D.P.S.	CHECKED BY: A.C.
PROJECT MGR: J.I.M.	APPROVED BY: J.I.M.

SHEET TITLE
SANITARY DRAINAGE
 AREA PLAN
 MASTER PLAN

SHEET NUMBER C-401	ISSUE 2
------------------------------	-------------------

CITY FILE No. D07-12-21-0182



STM STRUCTURE TABLE

NAME	RIM ELEV.	INVERT IN	INVERT IN AS-BUILT	INVERT OUT	INVERT OUT AS-BUILT	DESCRIPTION
EXCMH1	91.79			NW88.030		EXISTING CB MANHOLE
EXMH100	90.78	SE86.710		NW86.140		EXISTING MANHOLE
EXMH101	89.29	SE85.520 NE85.590		N85.450		EXISTING MANHOLE
EXMH102	88.08	S83.747		W83.400		EXISTING MANHOLE
MH1	87.38			W85.050		1200mmØ OPSD-701.010
MH2	87.62	E84.968		SW84.893		1200mmØ OPSD-701.010
MH3	87.76	NE84.744 S84.286		N84.256		1500mmØ OPSD-701.011
MH4	87.95	SE84.395		N84.365		1500mmØ OPSD-701.011
MH5	89.88	SE85.697 NE85.363		NW85.268		1200mmØ OPSD-701.010
MH6	90.36	SE85.882		NW85.850		1200mmØ OPSD-701.010
MH7	88.58			SW85.591		1200mmØ OPSD-701.010
MH7B	89.52	NE85.431		SW85.411		Eccentric Cylinder Metric
MH9	89.51	SE85.193 SW85.323		NW85.098		1200mmØ OPSD-701.010
MH10	90.04	NW87.380 SW88.510		NE86.330		1200mmØ OPSD-701.010

SAN STRUCTURE TABLE

NAME	RIM ELEV.	INVERT IN	INVERT IN AS-BUILT	INVERT OUT	INVERT OUT AS-BUILT	DESCRIPTION
EXMH100A	91.03			NW87.230		1200mmØ OPSD-701.010
EXMH101A	88.48	SE85.900		NW85.880		1200mmØ OPSD-701.010
EXMH102A	86.32	SE83.728 SW82.780		NE82.480		1200mmØ OPSD-701.010
MH4A	88.23	SE85.327		NW85.307		1200mmØ OPSD-701.010
MH5A	90.02	SE86.492		NW86.193		1200mmØ OPSD-701.010
MH6A	90.35	SE86.575		NW86.557		1200mmØ OPSD-701.010
MH8A	89.61	SE86.090 SW86.180		NW86.070		1200mmØ OPSD-701.010
MH10A	89.98	NW87.418		NE86.634		1200mmØ OPSD-701.010
MMH8A	87.73	SE84.429		NW84.429		1200mmØ OPSD-701.010

WATERMAIN SCHEDULE

Station	Description	Finished Grade	Top of Watermain	Watermain Cover	As Built Watermain
A 0+000.00	CONNECT TO EXISTING 300 Ø WITH 200TVS	88.87	85.27	2.40	
0+002.66	11.25 BEND	88.58	86.18	2.40	
0+020.00		88.55	86.15	2.40	
0+024.51	MONITORING CHAMBER PER W3.1	88.56	86.16	2.40	
0+040.00		88.83	86.43	2.40	
0+048.99	200mmØ TEE	88.97	86.57	2.40	
0+060.00		89.13	86.73	2.40	
0+080.00		89.39	86.99	2.40	
0+086.19	200VAVB	89.54	87.24	2.40	
0+100.00		89.69	87.29	2.40	
B 0+106.19	200mmØ TEE	89.84	87.44	2.40	
C 0+000.00	CONNECT TO EXISTING 200mmØ WITH 22.5 BEND	90.30	87.90	2.40	
0+006.26	22.5 BEND	90.30	87.90	2.40	
0+008.58	200VAVB	90.01	87.61	2.40	
B 0+011.81	200mmØ TEE	89.84	87.44	2.40	
0+020.00		89.55	87.15	2.40	
0+020.97	200VAVB	89.52	87.12	2.40	
D 0+028.83	200mmØ TEE FOR BUILDING SERVICE	89.30	86.90	2.40	
0+029.58	200VAVB	89.28	86.88	2.40	
E 0+030.33	200mmØ TEE FOR BUILDING SERVICE	89.26	86.86	2.40	
0+040.00		88.99	86.59	2.40	
0+060.00		88.56	86.16	2.40	
0+079.47	22.5 BEND	88.13	85.73	2.40	
0+080.00		88.11	85.71	2.40	
0+089.24	150mmØ HYDRANT TEE	87.97	85.57	2.40	
F 0+101.33	CONNECT TO EXISTING 200mmØ WITH 22.5 BEND	87.40	84.66	2.74	
D 0+000.00	200mmØ TEE FOR BUILDING SERVICE	89.30	86.90	2.40	
0+001.00	200VAVB	89.31	86.91	2.40	
G 0+007.737	200mmØ CAP FOR BUILDING SERVICE	89.62	87.22	2.40	
E 0+000.00	200mmØ TEE FOR BUILDING SERVICE	89.26	86.86	2.40	
0+001.00	200VAVB	89.28	86.88	2.40	
H 0+007.737	200mmØ CAP FOR BUILDING SERVICE	89.62	87.22	2.40	

Pipe Interference Table

Crossing No.	PIPE 1	PIPE 2	Clearance
1	WTR Bottom 87.118	STM Top 85.852	1.266
2	WTR Bottom 87.154	SAN Top 86.384	0.771
3	WTR Bottom 87.022	SAN Top 86.408	0.614
4	WTR Bottom 87.069	STM Top 85.777	1.293
5	SAN Bottom 86.044	STM Top 85.732	0.313
6	SAN Bottom 87.427	STM Top 86.640	0.787
7	STM Bottom 84.968	STM Top 84.281	0.706
8	STM Bottom 84.992	SAN Top 84.214	0.778

CLIENT

 3200 HIGHWAY 7
 VAUGHAN, ON L4K 5Z6
 TEL: 905.326.6400

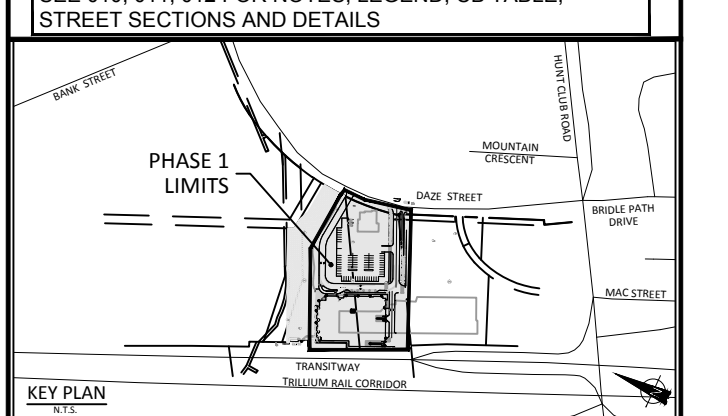
COPYRIGHT
 This drawing has been prepared solely for the intended use. Any reproduction or distribution for any purpose other than that authorized by IBI Group is forbidden. Written dimensions shall have precedence over scaled dimensions. Contractors shall verify and be responsible for all dimensions and conditions on the job, and IBI Group shall be informed of any variations from the dimensions and conditions shown on the drawing. Shop drawings shall be submitted to IBI Group for general conformance before proceeding with fabrication.

IBI Group Professional Services (Canada) Inc.
 is a member of the IBI Group of companies.

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR SPA	2021-10-28
2	REVISED AS PER NEW SITE PLAN	2023-10-19
3		
4		
5		
6		
7		

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS.



CONSULTANTS

Project Coordinator
 Architect: RLA Architecture
 Landscape: Levstek consultants
 Surveyor: Stantec
 Geotech: Paterson Group
 Transportation Engineer: IBI Group
 Urban Planner: Stantec



SEAL

IBI GROUP
 400 - 333 Preston Street
 Ottawa ON K1S 9N4 Canada
 tel 613 225 1311 fax 613 225 5868
 ibigroup.com

PROJECT
SOUTH KEYS MALL
 2200 BANK STREET
 SOUTH PHASE - PHASE 1

PROJECT NO: 135853
DRAWN BY: D.P.S.
PROJECT MGR: J.I.M.

CHECKED BY: A.C.
APPROVED BY: J.I.M.

SHEET TITLE
SITE SERVICING PLAN

SHEET NUMBER C-001 **ISSUE** 2

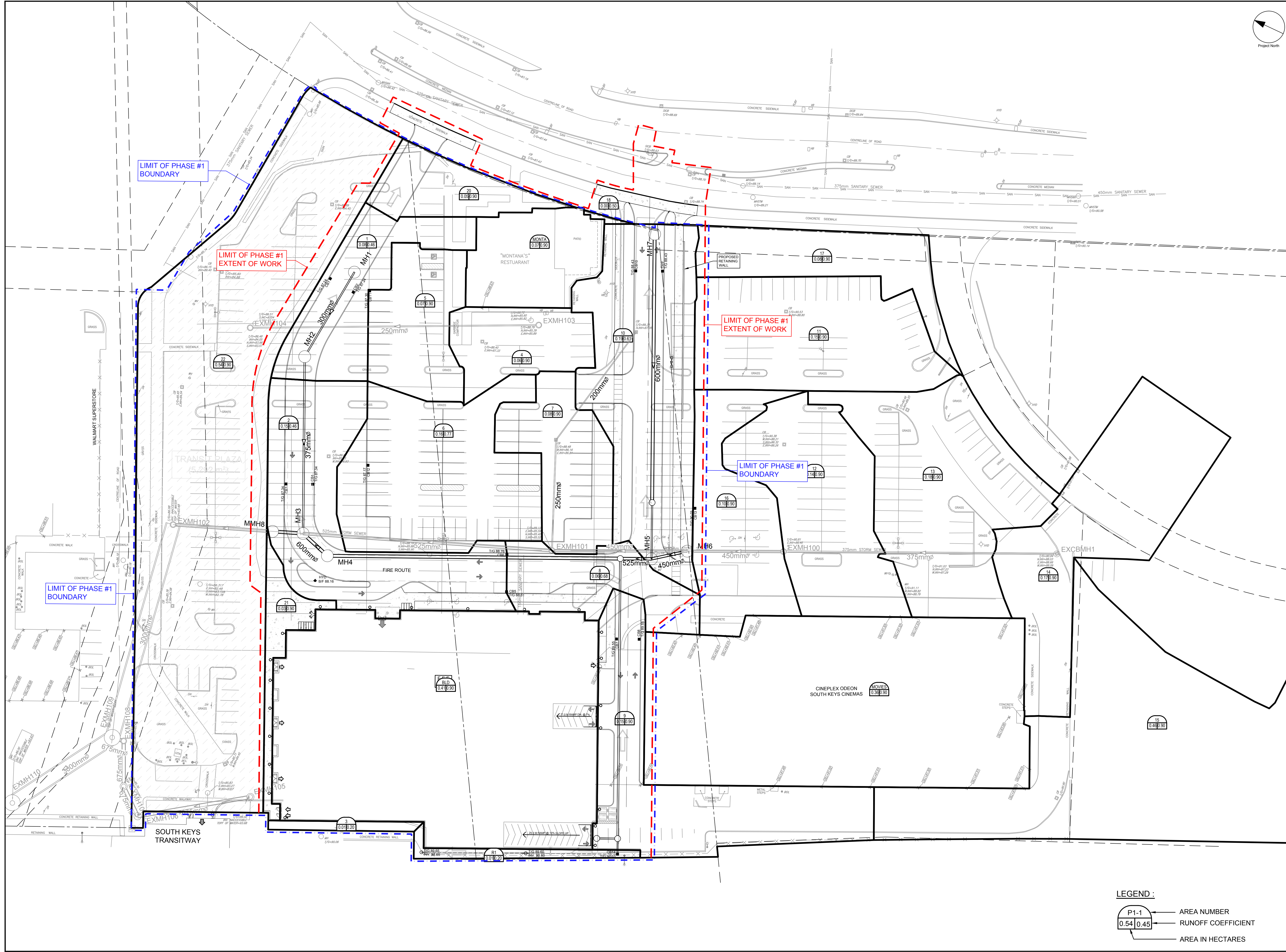
CITY FILE No. D07-12-21-0182
 File Location: \\113853_SouthKeysPh1\7_0_Production\7_03_Deign\04_Civil\Sheets\C001 SITE SERVICING PLAN.dwg Last Saved: October 19, 2023, 1:52:10 PM by dsama
 Ploated: Thursday, October 19, 2023, 1:52:10 PM by Don Suna

APPENDIX D

- Storm Sewer Design Sheet
- Drawing 135853 C-500 Storm Drainage Area Plan
- Runoff Coefficient Calculations
- Stormwater Management Calculations
- Storage Calculations
- Orifice Calculations
- Overflow Depth Calculations

LOCATION				AREA (Ha)															RATIONAL DESIGN FLOW															SEWER DATA							
STREET	AREA ID	FROM	TO	C _f 0.20	C _f 0.25	C _f 0.40	C _f 0.46	C _f 0.53	C _f 0.59	C _f 0.76	C _f 0.78	C _f 0.84	C _f 0.90	IND 2.78AC	CUM 2.78AC	INLET (min)	TIME IN PIPE	TOTAL (min)	I(9) (mm/hr)	I(15) (mm/hr)	I(18) (mm/hr)	I(180) (mm/hr)	5yr PEAK FLOW (L/s)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW IND	FIXED FLOW CUM	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm)			VELOCITY (m/s)	VELOCITY (ft/s)	AVAIL CAP (L/s)	AVAIL CAP (%)			
Phase 1 Uncontrolled Flows																																									
Montana's Restaurant	4, MONTA	ExMH 103	ExMH 104											0.13	0.33	0.33	10.00	0.58	10.58	76.81	104.19	122.14	178.56	24.96	33.89	39.73	58.08	0.00	0.00	24.96	100.61	69.19	250	250				2.63	1.986	75.63	75.17%
China and Outlets	1, 5, 2, 6	MH1 MH2	MH2 MH3				0.08							0.07	0.29	0.28	10.00	0.48	10.48	76.81	104.19	122.14	178.56	21.31	29.91	33.89	48.54	0.00	0.00	28.91	59.68	23.50	300	300				0.35	0.918	30.77	51.68%
							0.15			0.16				0.57	0.85	10.48	0.74	11.22	75.01	101.73	119.24	174.30	63.42	86.00	100.81	147.35	0.00	0.00	86.00	108.21	42.41	375	375				0.35	0.949	22.21	20.52%	
14, 15, MOVIES		ExCDB1	ExMH 100											0.99	2.48	2.48	11.00	0.48	11.48	73.17	99.19	116.25	169.91	181.23	245.70	287.95	420.86	0.00	0.00	181.23	269.32	65.54	375	375				2.01	2.275	78.09	30.16%
11, 12, 13		ExMH 100	MH6											0.47	1.18	3.65	11.48	0.20	11.68	71.55	96.97	113.64	165.07	261.38	354.24	415.12	605.65	0.00	0.00	261.38	314.77	23.00	450	450				1.12	1.917	53.40	16.96%
		MH6	MH5											0.00	3.65	11.68	0.06	11.74	70.90	96.08	112.59	164.53	259.01	350.99	411.29	601.02	0.00	0.00	350.99	393.47	8.76	450	450				1.75	2.397	42.48	10.80%	
10, 16		MH7	MH7B				0.19							0.31	0.31	10.00	0.98	10.98	76.81	104.19	122.14	178.56	23.94	32.47	38.06	55.65	0.00	0.00	32.47	320.28	64.39	600	600				0.25	1.097	287.81	89.86%	
		MH7B	MH5											0.10	0.25	0.56	10.98	0.28	11.26	73.24	99.30	116.37	170.09	41.15	55.79	65.38	95.56	0.00	0.00	55.79	59.68	13.50	300	300				0.35	0.918	3.89	6.52%
		MH5	MH9											0.00	4.21	11.74	0.06	11.80	70.71	95.82	112.38	164.07	268.02	403.84	473.22	691.51	0.00	0.00	403.84	448.68	1.50	525	525				1.00	2.008	44.62	9.89%	
9, BLD, R1		MH0	MH9	0.01										0.15	0.41	1.38	10.00	0.57	10.57	76.81	104.19	122.14	178.56	106.12	143.96	168.76	248.71	0.00	0.00	143.96	224.02	67.15	375	375				1.50	1.965	80.06	35.74%
7, B		MH9	MH4							0.06				0.08	0.33	5.92	11.60	0.53	12.34	70.51	95.54	111.96	163.60	477.68	565.94	663.16	969.05	0.00	0.00	565.94	640.56	70.25	600	600				1.00	2.195	74.62	11.65%
		MH4	MH3											0.00	5.92	12.34	0.06	12.40	68.86	93.28	109.29	159.69	407.90	552.54	647.38	945.89	0.00	0.00	552.54	640.56	7.91	600	600				1.00	2.195	88.02	13.74%	
		MH3	MMH8											0.00	6.77	12.40	0.06	12.45	68.68	93.03	109.00	159.26	464.90	629.72	737.81	1,078.00	0.00	0.00	629.72	671.82	8.00	600	600				1.10	2.302	42.10	6.27%	
		MMH8	ExTrunk											0.00	6.77	12.40	0.13	12.53	68.68	93.03	109.00	159.26	464.90	629.72	737.81	1,078.00	0.00	0.00	629.72	695.21	20.92	525	525				1.76	2.664	-34.51	-5.80%	
Building Service lateral														0.41	1.03	1.03	10.00	0.18	10.18	76.81	104.19	122.14	178.56	78.75	106.88	125.30	153.17	0.00	0.00	78.75	100.88	14.99	300	300				1.00	1.983	22.09	21.90%

Definitions: Q = 2.78CIA, where: Q = Peak Flow in Litres per Second (L/s) A = Area in Hectares (Ha) I = Rainfall intensity in millimetres per hour (mm/hr) [I = 732.95 / (TC+8.99)(0.814)] 2 YEAR [I = 998.07 / (TC+6.05)(0.814)] 5 YEAR [I = 174.184 / (TC+6.014)(0.816)] 10 YEAR [I = 1735.688 / (TC+6.014)(0.820)] 100 YEAR	Notes: 1. Mannings coefficient (n) = 0.013	Designed: AC Checked: DRC Dwg. Reference: 135853-500	<table border="1"> <thead> <tr> <th>No.</th> <th>Revision</th> <th>Date</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>SPA Submission No. 1 for City Review</td> <td>2021-10-28</td> </tr> <tr> <td>2</td> <td>SPA Submission No. 2 for City Review</td> <td>2023-10-19</td> </tr> </tbody> </table> <table border="1"> <tr> <td>File Reference: 135853-0.04.04</td> <td>Date: 2021-10-28</td> <td>Sheet No: 1 of 1</td> </tr> </table>	No.	Revision	Date	1	SPA Submission No. 1 for City Review	2021-10-28	2	SPA Submission No. 2 for City Review	2023-10-19	File Reference: 135853-0.04.04	Date: 2021-10-28	Sheet No: 1 of 1
No.	Revision	Date													
1	SPA Submission No. 1 for City Review	2021-10-28													
2	SPA Submission No. 2 for City Review	2023-10-19													
File Reference: 135853-0.04.04	Date: 2021-10-28	Sheet No: 1 of 1													



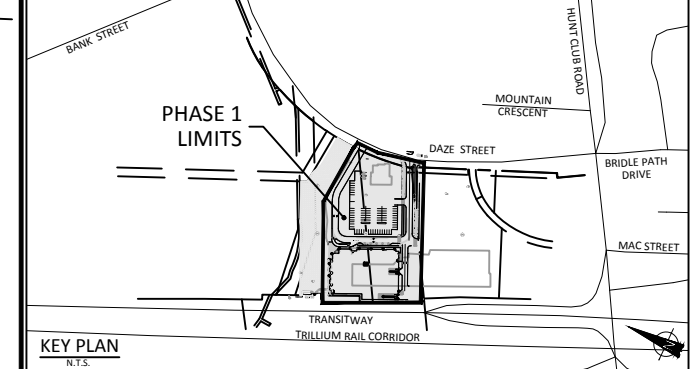
COPYRIGHT
 This drawing has been prepared solely for the intended use. This any reproduction or distribution for any purpose other than that authorized by IBI Group is forbidden. Written dimensions shall have precedence over scaled dimensions. Contractors shall verify and be responsible for all dimensions and conditions on the job, and IBI Group shall be relieved of any liabilities from the dimensions and conditions shown on the drawing. Shop drawings shall be submitted to IBI Group for general confirmation before proceeding with fabrication.

IBI Group Professional Services (Canada) Inc.
 is a member of the IBI Group of companies

ISSUES

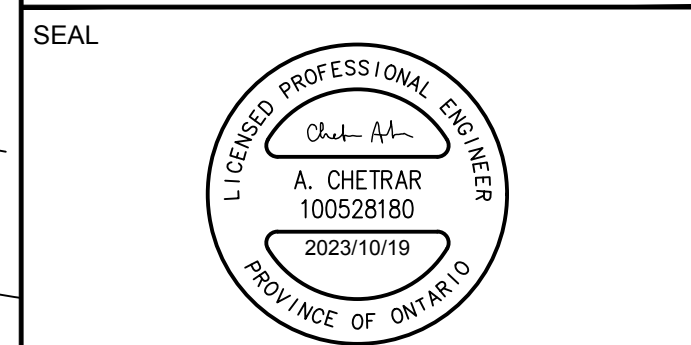
No.	DESCRIPTION	DATE
1	ISSUED FOR SPA	2021-10-28
2	REVISED AS PER NEW SITE PLAN	2023-10-19
3		
4		
5		
6		
7		

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS



CONSULTANTS

Project Coordinator
 Architect: RLA Architectue
 Landscape: Levstek consultants
 Surveyor: Stantec
 Geotech: Paterson Group
 Transportation Engineer: IBI Group
 Urban Planner: Stantec



IBI GROUP
 400 - 333 Preston Street
 Ottawa ON K1S 5M4 Canada
 tel 613 225 1311 fax 613 225 5868
 ibigroup.com

PROJECT
 SOUTH KEYS MALL
 2200 BANK STREET
 SOUTH PHASE - PHASE 1

PROJECT NO:
 135853

DRAWN BY: D.P.S. **CHECKED BY:** A.C.
PROJECT MGR: J.I.M. **APPROVED BY:** J.I.M.

SHEET TITLE
 STORM DRAINAGE
 AREA PLAN

SHEET NUMBER C-500 **ISSUE** 2

LEGEND :

	AREA NUMBER
	RUNOFF COEFFICIENT
	AREA IN HECTARES



ARCADIS
 500-333 Preston Street
 Ottawa, Ontario K1S 5N4 Canada
 arcadis.com

IBI GROUP

RUN-OFF COEFFICIENTS

South Keys Phase 1 | Smart Centers
 135853-6.0 | Rev #2 | 2023-10-04
 Prepared By: AC | Checked By: DRC

	AREA 1			AREA 2			AREA 6			AREA 8			AREA 9			AREA 10		
	GRASS	ROOF	ASPHALT	GRASS	ROOF	ASPHALT	GRASS	ROOF	ASPHALT	GRASS	ROOF	ASPHALT	GRASS	ROOF	ASPHALT	GRASS	ROOF	ASPHALT
	535.00		315.00	807.00		705.00	300.00		1318.00	109.00		536.00	124.10		1377.90	826.73		1060.97
TOTAL (m²)	535.00	0.00	315.00	807.00	0.00	705.00	300.00	0.00	1318.00	109.00	0.00	536.00	124.10	0.00	1377.90	826.73	0.00	1060.97
	850.00			1512.00			1618.00			645.00			1502.00			1887.70		

Runoff Coefficient (C):	0.2	0.9	0.9	0.2	0.9	0.9	0.2	0.9	0.9	0.2	0.9	0.9	0.2	0.9	0.9	0.2	0.9	0.9
Ave. Runoff Coefficient (C):	0.46			0.53			0.77			0.78			0.84			0.59		

Runoff Coefficient Used(C):	0.46			0.53			0.77			0.78			0.84			0.59		
------------------------------------	-------------	--	--	-------------	--	--	-------------	--	--	-------------	--	--	-------------	--	--	-------------	--	--



ARCADIS IBI GROUP

500-333 Preston Street
Ottawa, Ontario K1S 5N4 Canada
arcadis.com

UNDERGROUND STORAGE CALCULATIONS

South Keys Phase 1 | SmartCenters
135853-6.0 | Rev #1 | 2023-10-03
Prepared By: AC | Checked By: DC

IBI GROUP

<i>Structure Storage</i>		<i>AREA 1</i>					
	Base	Top	Height	Dia. / Width	X-sec Area	Volume	
CB1	85.240	87.24	2.00	600	0.360	0.72	
CB2	85.240	87.24	2.00	600	0.360	0.72	
Total						1.44	

TOTAL AREA 1	1.44
---------------------	-------------



ARCADIS IBI GROUP

500-333 Preston Street
Ottawa, Ontario K1S 5N4 Canada
arcadis.com

UNDERGROUND STORAGE CALCULATIONS

South Keys Phase 1 | SmartCenters
135853-6.0 | Rev #1 | 2023-10-03
Prepared By: AC | Checked By: DC

IBI GROUP

Pipe Storage		AREA 10				
From	To	Length	Diameter	X-sec Area	Volume	
MH 7	MH 5	64.00	600	0.283	18.10	
Total					18.10	

Structure Storage		AREA 10					
	Base	Top	Height	Dia. / Width	X-sec Area	Volume	
CB9	86.660	88.66	2.00	600	0.360	0.72	
CB10	86.570	88.57	2.00	600	0.360	0.72	
CB11	0.000	2.00	2.00	600	0.360	0.72	
CB12	0.000	2.00	2.00	600	0.360	0.72	
MH7	86.300	88.62	2.32	1500	1.767	4.10	
MH7B	86.300	88.62	2.32	1500	1.767	4.10	
Total						11.08	

TOTAL AREA 10	29.18
----------------------	--------------

Orifice coefficients	
Cv =	0.60
Cv =	0.65

	Invert (m)	Diameter (mm)	Centre ICD (m)	Max. Pond Elevation (m)	Hydraulic Slope (m)	Target Flow (l/s)	Theoretical		Recommended	
							Orifice (m)	Actual Flow (l/s)	Orifice (m)	Actual Flow (l/s)
Area 1	85.740	200	85.840	87.47	1.630	26.00	0.0875	26.00	0.087	25.92
Area 2	85.840	200	85.940	87.60	1.660	30.00	0.0936	30.00	0.0935	29.93
Area 4	87.330	200	87.430	88.62	1.190	10.00	0.0587	10.00	0.059	9.96
Area 5	85.950	200	86.050	87.45	1.400	6.00	0.0437	6.00	0.0436	5.98
Area 6	86.140	200	86.240	87.64	1.400	10.00	0.0564	10.00	0.056	9.97
Area 7	86.140	200	86.240	88.56	2.320	12.00	0.0545	12.00	0.055	12.02
Area 8	87.260	200	87.360	88.76	1.400	12.00	0.0629	12.45	0.0629	12.44
Area 9	88.150	200	88.250	89.70	1.450	35.00	0.1046	35.00	0.104	34.61
Area 10 (MH8)	85.410	300	85.560	88.52	2.960	45.00	0.0992	45.00	0.099	44.81
						186.00				185.65



Overflow Area 9

New Flow Section Required 1:100 year flow =		28.28 l/s		or	0.028 Cu m/sec	
New Flow Section Required 1:100 year + 20% flow =		42.98 l/s		or	0.043 Cu m/sec	
Overflow Slope		Overflow X-Section			Overflow Capacity - Q	
Length =	27.90 m	Side Slope 1 =	2.00 %	From Seelye n =	0.013 (Channels)	
Up Stream Ground Elev =	89.70 m	Side Slope 2 =	2.00 %	100 Year Q =	0.028 Cu M/sec	
Down Stream Ground Elev =	88.81 m	Bottom Width =	0.00 m	100 Year Velocity =	0.78 M/s	
Difference =	0.89 m			100 Y + 20% Q =	0.045 Cu M/sec	
Ditch Slope =	3.19 %			100 Y + 20% Velocity =	0.87 M/s	
		Water depth =	0.027 m	0.032 m		
		X-Sect. Area =	0.04 m ²	0.05 m ²		
		Wetted Per. =	2.70 m	3.20 m		

Overflow Area 8

New Flow Section Required 1:100 year flow =		41.59 l/s		or	0.042 Cu m/sec	
New Flow Section Required 1:100 year + 20% flow =		61.36 l/s		or	0.061 Cu m/sec	
Overflow Slope		Overflow X-Section			Overflow Capacity - Q	
Length =	78.76 m	Side Slope 1 =	2.00 %	From Seelye n =	0.013 (Channels)	
Up Stream Ground Elev =	88.81 m	Side Slope 2 =	2.00 %	100 Year Q =	0.042 Cu M/sec	
Down Stream Ground Elev =	87.34 m	Bottom Width =	0.00 m	100 Year Velocity =	0.70 M/s	
Difference =	1.47 m			100 Y + 20% Q =	0.062 Cu M/sec	
Ditch Slope =	1.87 %			100 Y + 20% Velocity =	0.77 M/s	
		Water depth =	0.035 m	0.040 m		
		X-Sect. Area =	0.06 m ²	0.08 m ²		
		Wetted Per. =	3.45 m	4.00 m		

Overflow Area 1

New Flow Section Required 1:100 year flow =		1.58 l/s		or	0.002 Cu m/sec	
New Flow Section Required 1:100 year + 20% flow =		94.39 l/s		or	0.094 Cu m/sec	
Overflow Slope		Overflow X-Section			Overflow Capacity - Q	
Length =	26.13 m	Side Slope 1 =	2.00 %	From Seelye n =	0.013 (Channels)	
Up Stream Ground Elev =	87.54 m	Side Slope 2 =	2.00 %	100 Year Q =	0.002 Cu M/sec	
Down Stream Ground Elev =	87.24 m	Bottom Width =	0.00 m	100 Year Velocity =	0.26 M/s	
Difference =	0.30 m			100 Y + 20% Q =	0.095 Cu M/sec	
Ditch Slope =	1.15 %			100 Y + 20% Velocity =	0.72 M/s	
		Water depth =	0.011 m	0.052 m		
		X-Sect. Area =	0.01 m ²	0.13 m ²		
		Wetted Per. =	1.11 m	5.15 m		

Overflow Area 2

New Flow Section Required 1:100 year flow =		22.18 l/s		or	0.022 Cu m/sec	
New Flow Section Required 1:100 year + 20% flow =		56.19 l/s		or	0.056 Cu m/sec	
Overflow Slope		Overflow X-Section			Overflow Capacity - Q	
Length =	26.13 m	Side Slope 1 =	2.00 %	From Seelye n =	0.013 (Channels)	
Up Stream Ground Elev =	87.54 m	Side Slope 2 =	2.00 %	100 Year Q =	0.023 Cu M/sec	
Down Stream Ground Elev =	87.24 m	Bottom Width =	0.00 m	100 Year Velocity =	0.50 M/s	
Difference =	0.30 m			100 Y + 20% Q =	0.057 Cu M/sec	
Ditch Slope =	1.15 %			100 Y + 20% Velocity =	0.63 M/s	
		Water depth =	0.030 m	0.043 m		
		X-Sect. Area =	0.05 m ²	0.09 m ²		
		Wetted Per. =	3.00 m	4.25 m		

Overflow Area 5

New Flow Section Required 1:100 year flow =		12.23 l/s		or	0.012 Cu m/sec	
New Flow Section Required 1:100 year + 20% flow =		18.00 l/s		or	0.018 Cu m/sec	
Overflow Slope		Overflow X-Section			Overflow Capacity - Q	
Length =	3.00 m	Side Slope 1 =	2.00 %	From Seelye n =	0.013 (Channels)	
Up Stream Ground Elev =	87.45 m	Side Slope 2 =	2.00 %	100 Year Q =	0.012 Cu M/sec	
Down Stream Ground Elev =	87.24 m	Bottom Width =	0.00 m	100 Year Velocity =	0.85 M/s	
Difference =	0.21 m			100 Y + 20% Q =	0.018 Cu M/sec	
Ditch Slope =	7.00 %			100 Y + 20% Velocity =	0.94 M/s	
		Water depth =	0.017 m	0.020 m		
		X-Sect. Area =	0.01 m ²	0.02 m ²		
		Wetted Per. =	1.70 m	1.97 m		

Overflow Area 6

New Flow Section Required 1:100 year flow =		0 l/s		or	0.000 Cu m/sec	
New Flow Section Required 1:100 year + 20% flow =		9.48 l/s		or	0.009 Cu m/sec	
Overflow Slope		Overflow X-Section			Overflow Capacity - Q	
Length =	6.00 m	Side Slope 1 =	2.00 %	From Seelye n =	0.013 (Channels)	
Up Stream Ground Elev =	87.64 m	Side Slope 2 =	2.00 %	100 Year Q =	0.000 Cu M/sec	
Down Stream Ground Elev =	87.34 m	Bottom Width =	0.00 m	100 Year Velocity =	0.11 M/s	
Difference =	0.30 m			100 Y + 20% Q =	0.010 Cu M/sec	
Ditch Slope =	5.00 %			100 Y + 20% Velocity =	0.72 M/s	
		Water depth =	0.001 m	0.017 m		
		X-Sect. Area =	0.00 m ²	0.01 m ²		
		Wetted Per. =	0.10 m	1.70 m		

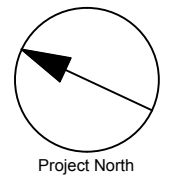
Overflow Area 10

New Flow Section Required 1:100 year flow =		0 l/s		or	0.000 Cu m/sec	
New Flow Section Required 1:100 year + 20% flow =		10.55 l/s		or	0.011 Cu m/sec	
Overflow Slope		Overflow X-Section			Overflow Capacity - Q	
Length =	35.00 m	Side Slope 1 =	2.00 %	From Seelye n =	0.013 (Channels)	
Up Stream Ground Elev =	88.52 m	Side Slope 2 =	2.00 %	100 Year Q =	0.000 Cu M/sec	
Down Stream Ground Elev =	87.43 m	Bottom Width =	0.00 m	100 Year Velocity =	0.09 M/s	
Difference =	1.09 m			100 Y + 20% Q =	0.011 Cu M/sec	
Ditch Slope =	3.11 %			100 Y + 20% Velocity =	0.61 M/s	
		Water depth =	0.001 m	0.019 m		
		X-Sect. Area =	0.00 m ²	0.02 m ²		
		Wetted Per. =	0.10 m	1.90 m		

Q = A*(1.49/n)*R^{2/3}*S^{1/2} where: A = cross sectional area in Sq. m
n = friction coefficient
R = hydraulic radius = A/wetted perimeter (wp) in m

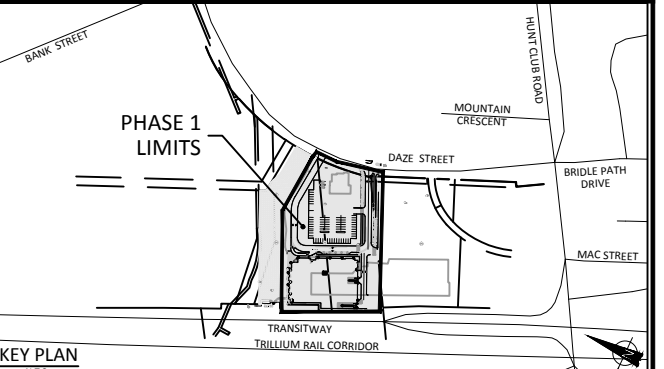
APPENDIX E

- Drawing 135853 C-600 Ponding Plan



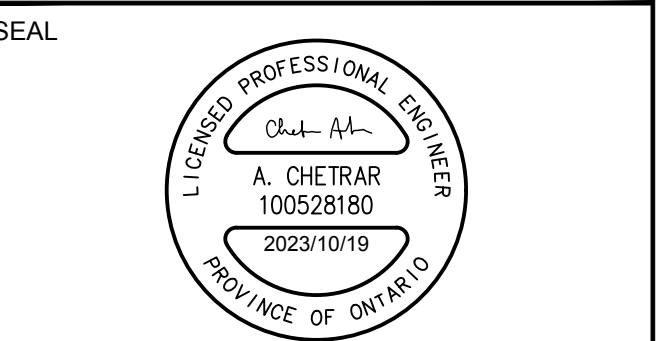
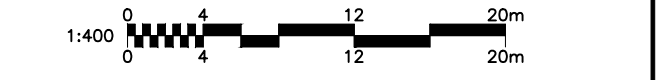
ISSUES		
No.	DESCRIPTION	DATE
1	ISSUED FOR SPA	2021-10-28
2	REVISED AS PER NEW SITE PLAN	2023-10-19
3		
4		
5		
6		
7		

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS



CONSULTANTS

- Project Coordinator
- Architect: RLA Architectue
- Landscape: Levstek consultants
- Surveyor: Stantec
- Geotech: Paterson Group
- Transportation Engineer: IBI Group
- Urban Planner: Stantec



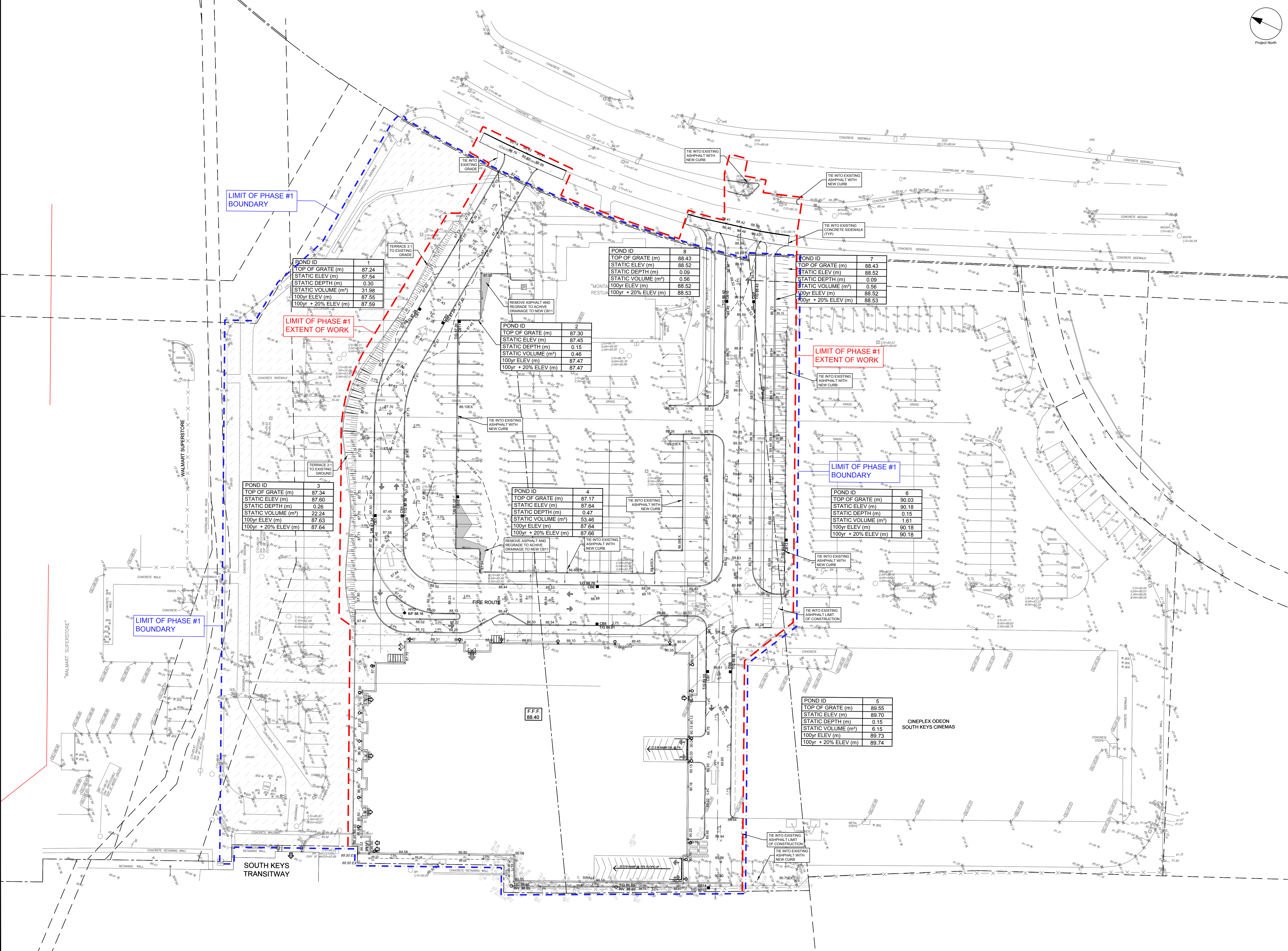
IBI IBI GROUP
 400 - 333 Preston Street
 Ottawa ON K1S 5N4 Canada
 tel 613 225 1311 fax 613 225 5868
 ibigroup.com

PROJECT
SOUTH KEYS MALL
2200 BANK STREET
 SOUTH PHASE - PHASE 1

PROJECT NO:
 135853
 DRAWN BY: D.P.S. CHECKED BY: A.C.
 PROJECT MGR: J.I.M. APPROVED BY: J.I.M.

SHEET TITLE
SITE PONDING PLAN

SHEET NUMBER
C-600 ISSUE
2



POND ID 1	
TOP OF GRATE (m)	87.24
STATIC ELEV (m)	87.54
STATIC DEPTH (m)	0.30
STATIC VOLUME (m³)	31.98
100yr ELEV (m)	87.55
100yr + 20% ELEV (m)	87.59

POND ID 8	
TOP OF GRATE (m)	88.43
STATIC ELEV (m)	88.52
STATIC DEPTH (m)	0.09
STATIC VOLUME (m³)	0.56
100yr ELEV (m)	88.52
100yr + 20% ELEV (m)	88.53

POND ID 7	
TOP OF GRATE (m)	88.43
STATIC ELEV (m)	88.52
STATIC DEPTH (m)	0.09
STATIC VOLUME (m³)	0.56
100yr ELEV (m)	88.52
100yr + 20% ELEV (m)	88.53

POND ID 2	
TOP OF GRATE (m)	87.30
STATIC ELEV (m)	87.45
STATIC DEPTH (m)	0.15
STATIC VOLUME (m³)	0.46
100yr ELEV (m)	87.47
100yr + 20% ELEV (m)	87.47

POND ID 6	
TOP OF GRATE (m)	90.03
STATIC ELEV (m)	90.18
STATIC DEPTH (m)	0.15
STATIC VOLUME (m³)	1.61
100yr ELEV (m)	90.18
100yr + 20% ELEV (m)	90.18

POND ID 3	
TOP OF GRATE (m)	87.34
STATIC ELEV (m)	87.60
STATIC DEPTH (m)	0.26
STATIC VOLUME (m³)	22.24
100yr ELEV (m)	87.63
100yr + 20% ELEV (m)	87.64

POND ID 4	
TOP OF GRATE (m)	87.17
STATIC ELEV (m)	87.64
STATIC DEPTH (m)	0.47
STATIC VOLUME (m³)	53.46
100yr ELEV (m)	87.64
100yr + 20% ELEV (m)	87.65

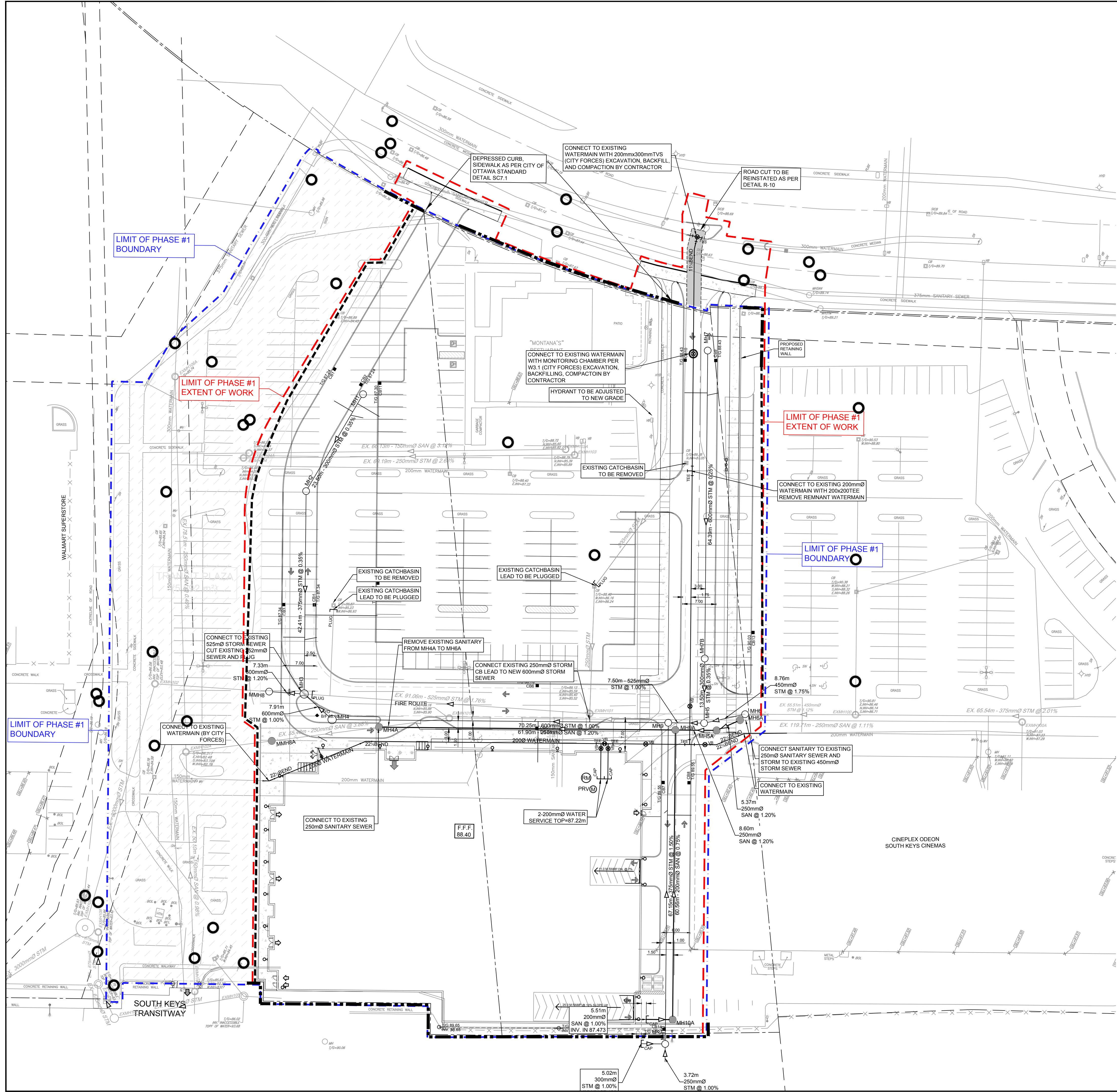
POND ID 5	
TOP OF GRATE (m)	89.55
STATIC ELEV (m)	89.70
STATIC DEPTH (m)	0.15
STATIC VOLUME (m³)	6.15
100yr ELEV (m)	89.73
100yr + 20% ELEV (m)	89.74

FFF
 88.40

CINEPLEX ODEON
 SOUTH KEYS CINEMAS

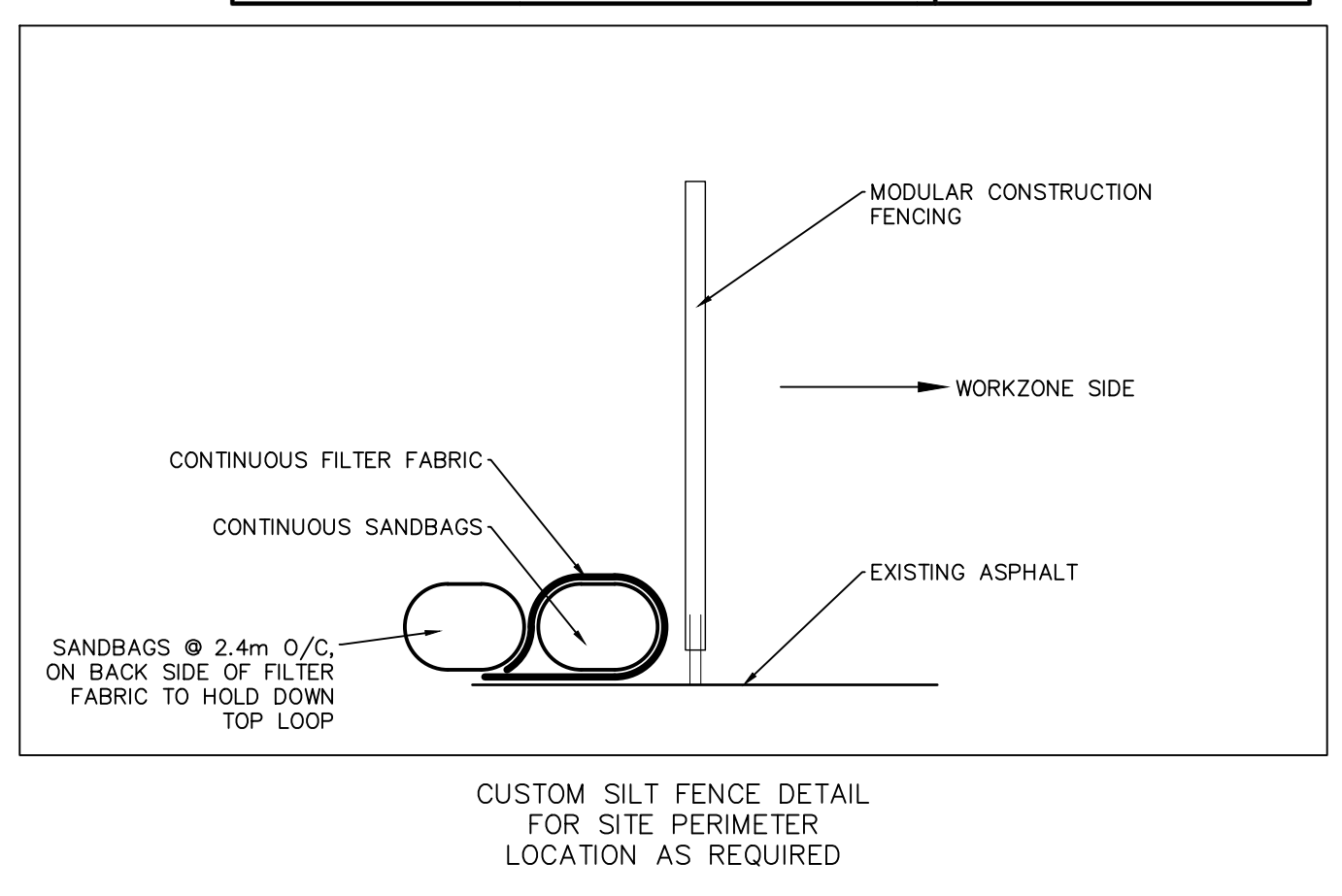
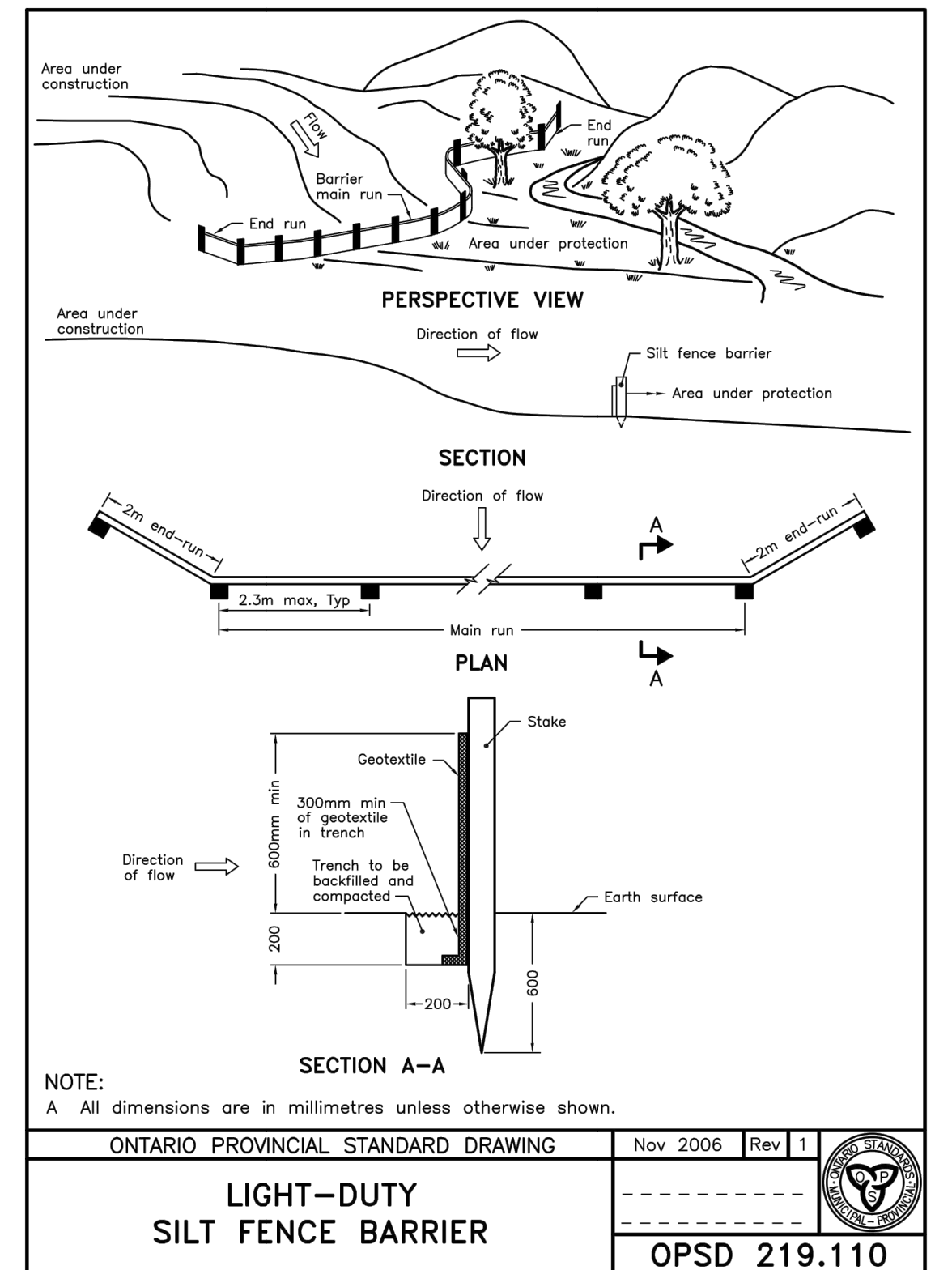
APPENDIX F

- Drawing 135853 C-900 Erosion and Sedimentation Control Plan
- Drawing 135853 C-200 Grading and Drainage Plan



- LEGEND :**
- LIGHT DUTY SILT FENCE AS PER OPD-219.110
 - - - - CUSTOM SILT FENCE (AS PER DETAIL)
 - CB
○ SILT SACK PLACED UNDER EXISTING CB COVER OR MH COVER
 - ▨ TEMPORARY MUD MAT 0.15m THICK 50mm CLEAR STONE ON NON WOVEN FILTER CLOTH

- NOTES:**
1. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.
 2. SILT FENCE TO BE ERECTED PRIOR TO EARTH WORKS BEING COMMENCED. SILT FENCE TO BE MAINTAINED UNTIL VEGETATION IS ESTABLISHED OR UNTIL START OF SUBSEQUENT PHASE.
 3. STRAW BALE SEDIMENT TRAPS TO BE CONSTRUCTED IN EXISTING ROAD SIDE DITCHES. TRAPS TO REMAIN AND BE MAINTAINED UNTIL VEGETATION IS ESTABLISHED.
 4. SILT SACK TO BE PLACED AND MAINTAINED UNDER COVER OF ALL CATCHBASINS. GEOTEXTILE SILT SACK IN STREET CBS TO REMAIN UNTIL ALL CURBS ARE CONSTRUCTED. GEOTEXTILE FABRIC IN RYCBs TO REMAIN UNTIL VEGETATION IS ESTABLISHED. ALL CATCHBASINS TO BE REGULARLY INSPECTED AND CLEANED, AS NECESSARY, UNTIL SOD AND CURBS ARE CONSTRUCTED.
 5. CONTRACTOR TO PROVIDE DETAILS ON LOCATION(S) AND DESIGN OF DEWATERING TRAP(S) PRIOR TO COMMENCING WORK. CONTRACTOR ALSO RESPONSIBLE FOR MAINTAINING TRAP(S) AND ADJUSTING SIZE(S) IF DEEMED REQUIRED BY THE ENGINEER DURING CONSTRUCTION.
 6. CONTRACTOR TO PROTECT EXISTING CATCHBASINS WITH FILTER CLOTH UNDER THE COVERS TO TRAP SEDIMENTATION. REFER TO IDENTIFIED STRUCTURES.
 7. WORKS NOTED ABOVE ARE TO BE INSTALLED, INSPECTED, MAINTAINED AND ULTIMATELY REMOVED BY SERVICING CONTRACTOR.
 8. THIS IS A "LIVING DOCUMENT" AND MAY BE MODIFIED IN THE EVENT THE PROPOSED CONTROL MEASURES ARE INSUFFICIENT



CLIENT

SMARTCENTRES
REAL ESTATE INVESTMENT TRUST
3200 HIGHWAY 7
VAUGHAN, ON L4K 5Z6
TEL: 905 326 6400

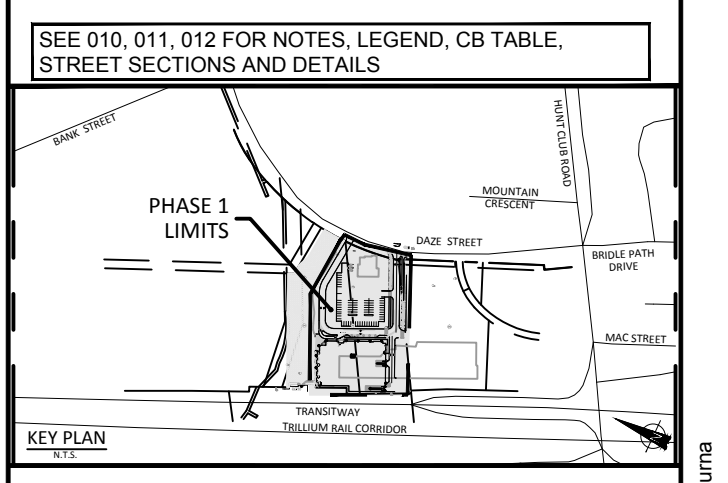
COPYRIGHT

This drawing has been prepared solely for the intended use. Any reproduction or distribution for any purpose other than authorized by IBI Group is forbidden. Written dimensions shall have precedence over scaled dimensions. Contractors shall verify and be responsible for all dimensions and conditions on the job, and IBI Group shall be informed of any variations from the dimensions and conditions shown on the drawing. Shop drawings shall be submitted to IBI Group for general conformance before proceeding with fabrication.

IBI Group Professional Services (Canada) Inc.
is a member of the IBI Group of companies

ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR SPA	2021-10-28
2	REVISED AS PER NEW SITE PLAN	2023-10-19
3		
4		
5		
6		
7		



LEGEND

Project Coordinator
Architect: RLA Architectue
Landscape: Levstek consultants
Surveyor: Stantec
Geotech: Paterson Group
Transportation Engineer: IBI Group
Urban Planner: Stantec

SEAL

LICENCED PROFESSIONAL ENGINEER
A. CHETRAR
100528180
2023/10/19
PROVINCE OF ONTARIO

IBI GROUP
Suite 400 - 333 Preston Street
Ottawa ON K1S 5N4 Canada
Tel: 613 225 1311 | 613 241 3300 Fax: 613 225 9868
ibigroup.com

PROJECT

SOUTH KEYS MALL
2200 BANK STREET

SOUTH PHASE - PHASE 1

PROJECT NO: 135853
DRAWN BY: D.P.S.
PROJECT MGR: J.I.M.

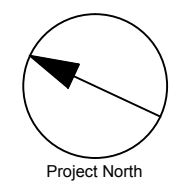
CHECKED BY: A.C.
APPROVED BY: J.I.M.

SHEET TITLE

EROSION AND SEDIMENTATION CONTROL PLAN

SHEET NUMBER C-900 **ISSUE** 2

CITY FILE No. D07-12-21-0182



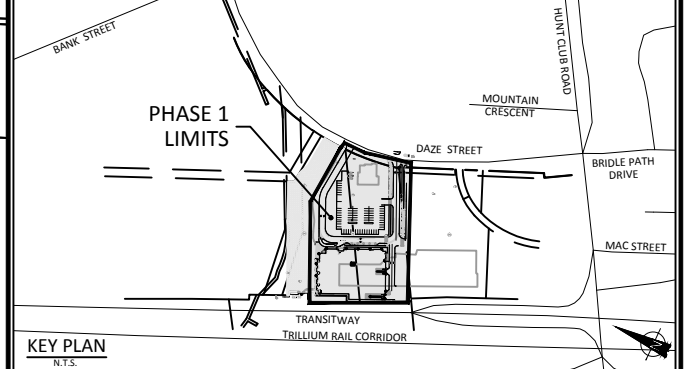
CLIENT
SMARTCENTRES
 REAL ESTATE INVESTMENT TRUST
 3200 HIGHWAY 7
 VAUGHAN, ON L4K 5Z6
 TEL: 905 326 6400

COPYRIGHT
 This drawing has been prepared solely for the intended use. Any reproduction or distribution for any purpose other than authorized by IBI Group is forbidden. Written dimensions shall have precedence over scaled dimensions. Contractors shall verify and be responsible for all dimensions and conditions on the job, and IBI Group shall be informed of any variations from the dimensions and conditions shown on the drawing. Shop drawings shall be submitted to IBI Group for general confirmation before proceeding with fabrication.
 IBI Group Professional Services (Canada) Inc.
 is a member of the IBI Group of companies

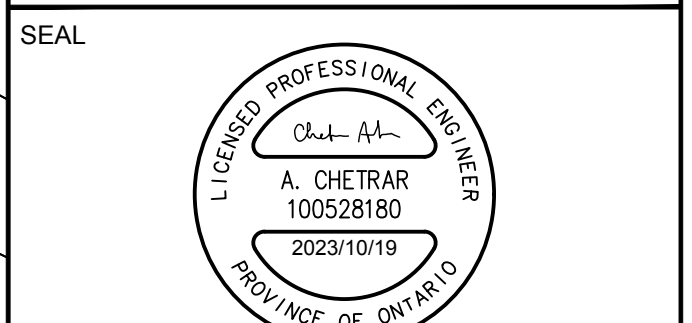
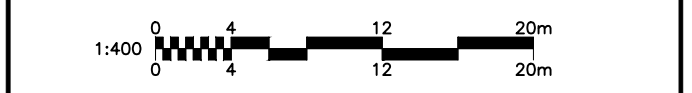
ISSUES

No.	DESCRIPTION	DATE
1	ISSUED FOR SPA	2021-10-28
2	REVISED AS PER NEW SITE PLAN	2023-10-19
3		
4		
5		
6		
7		

SEE 010, 011, 012 FOR NOTES, LEGEND, CB TABLE, STREET SECTIONS AND DETAILS



CONSULTANTS
 Project Coordinator
 Architect: RLA Architectue
 Landscape: Levstek consultants
 Surveyor: Stantec
 Geotech: Paterson Group
 Transportation Engineer: IBI Group
 Urban Planner: Stantec



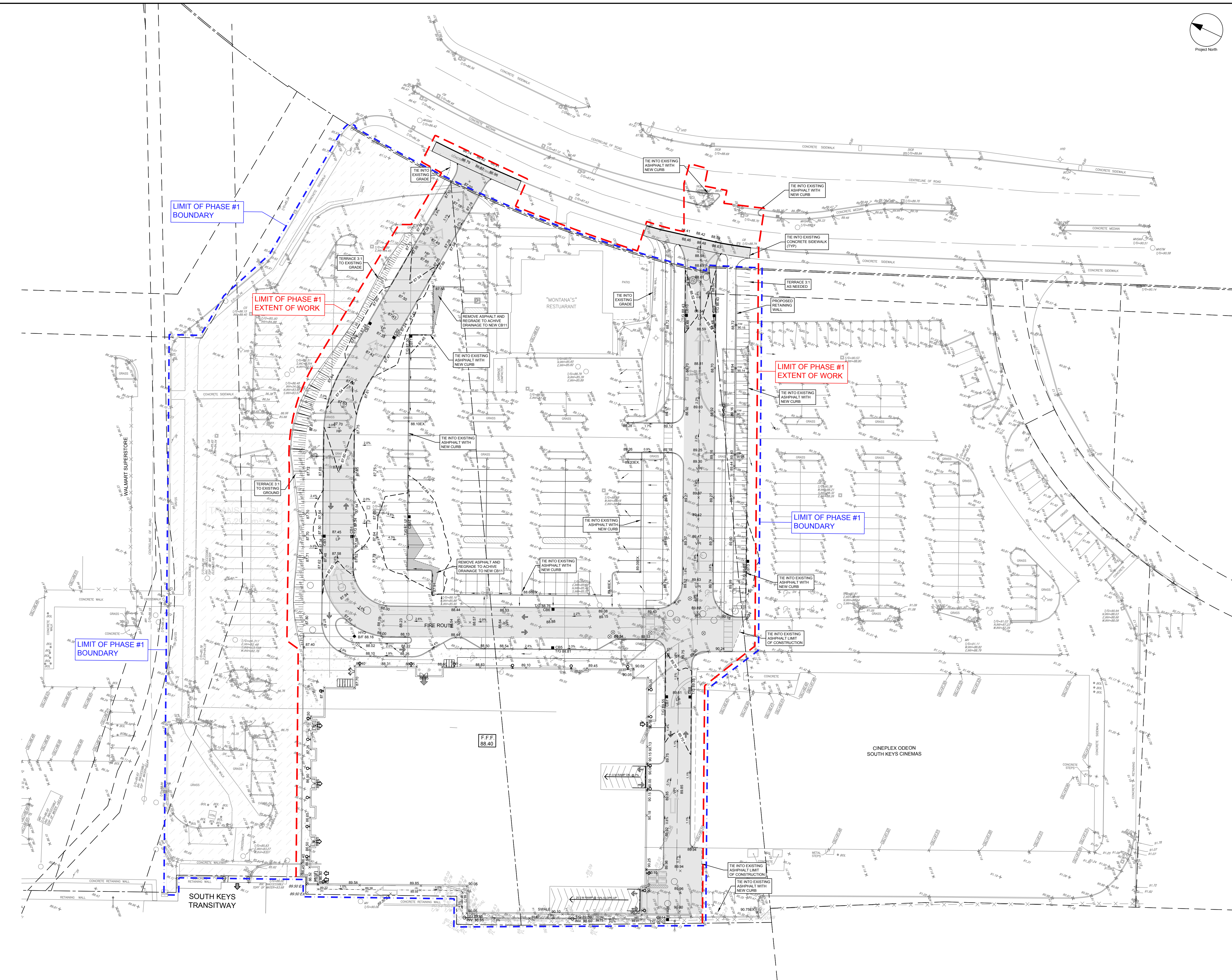
IBI GROUP
 400 - 333 Preston Street
 Ottawa ON K1S 9N4 Canada
 tel 613 225 1311 fax 613 225 5868
 ibigroup.com

PROJECT
SOUTH KEYS MALL
2200 BANK STREET
 SOUTH PHASE - PHASE 1

PROJECT NO:
 135853
 DRAWN BY: D.P.S. CHECKED BY: A.C.
 PROJECT MGR: J.I.M. APPROVED BY: J.I.M.

SHEET TITLE
GRADING AND DRAINAGE PLAN

SHEET NUMBER
C-200 ISSUE
2



CITY FILE No. D07-12-21-0182
 File Location: \\113853_SouthKeys\PH17_0_Production\7_03_Design\7_03_Site\Sheets\C200 SITE GRADING PLAN.dwg
 Last Saved: October 19, 2023, by dsilva
 Plotted: Thursday, October 19, 2023, 1:19:56 PM by Don Slama
 SCALE CHECK