

# Draft Functional Servicing Report – Cosburn Transit Oriented Communities

1030 – 1052 Pape Avenue, 1002 – 1028 Pape Avenue, 103 – 109 Cosburn Avenue  
Toronto Ontario M4K 3W2

Issued for Rezoning

Contract RFS-2019-NAFC-110

PO 214244

HDR Project 10206938



Ontario Line Technical Advisor

TORONTO, ONTARIO

November 2022

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## Abbreviations

BMP	Best Management Practice
DRM	Design Requirement Manual
GFA	Gross Floor Area
HGL	Hydraulic Grade Lines
HGRA	High Volume Groundwater Recharge Areas
IBC	Initial Business Case
IDF	Intensity-Duration-Frequency
IO	Infrastructure Ontario
MECP	Ministry of the Environment, Conservation, and Parks
OGS	Oil and Grit Separator
OL	Ontario Line
RCD	Reference Concept Design
SUE	Subsurface Utility Engineering
TGS	Toronto Green Standard
TCM681	Toronto Municipal Code Chapter 681
TOC	Transit Oriented Communities
TSS	Total Suspended Solids
TRCA	Toronto and Region Conservation Authority
WWFMG	Wet Weather Flow Management Guidelines

# 1 Introduction

The Province of Ontario is planning to build a new 15.5 km rapid transit line serving the City of Toronto. The development of this line is being managed jointly by Metrolinx, the Provincial Transit Agency responsible for the Greater Toronto and Hamilton Area, and Infrastructure Ontario (IO). Transit-Oriented Communities (TOCs) are proposed at the Ontario Line Stations to integrate high density, mixed-use developments with the transit infrastructure.

HDR Inc. has been retained by Metrolinx to prepare a Functional Servicing Report to assess servicing requirements for the proposed Cosburn TOC at two separate sites in the East York neighbourhood near the proposed Cosburn Station. This Functional Servicing Report provides a conceptual study for water, sanitary sewer, and storm drainage for the proposed developments.

A Stormwater Management Report outlining the proposed stormwater management strategy for this site has been prepared by OneTeam under a separate cover. In preparation of this report, OneTeam staff reviewed the available information for existing utilities and the associated Ontario Line Reference Concept (RCD) plans.

## 1.1 Site Description

There are two proposed developments at the East York neighbourhood located west of Pape Avenue.

North Site (1030-1052 Pape Avenue) is located at the northwest quadrant of the intersection of Pape Avenue and Cosburn Avenue, with Gamble Avenue bordering its northerly limits. The existing site consists of multiple two-storey mixed-use buildings to south, and an empty fenced off lot to the north (previously a gas station).

South Site (1002-1028 Pape Avenue, 103-109 Cosburn Avenue) is located at the southwest quadrant of the intersection of Pape Avenue and Cosburn Avenue, with Gowan Avenue bordering its southerly limits. The site is currently being utilized to house multiple two-storey and three-storey mixed-used buildings.



Figure 1-1 Aerial Map of Proposed Site

## 1.2 Proposed Development

Based on the preliminary reference concept designs, the proposed development at these locations consists of one mixed-use development for each site.

The development at North Site consists of a 28-storey mixed use building. The basement levels will be utilized for mechanical and electrical spaces and transit related infrastructure, with access to the future station from the south side of the building. Commercial retail space, visitor parking, and residential facilities will take up the ground level, and residential living spaces occupying the upper levels of the building. The transit station will also take part on the ground level.

South Site will house a 29-storey mixed-use building. The proposed design shows that the basement levels will be used to accommodate the future station and will have space for bicycle parking, mechanical and electrical equipment. The ground level will consist of commercial retail and the remaining levels above will be residential living space.

## 2 Site Condition

### 2.1 Existing Topography

Both sites are situated on flat concrete lots with two- to three-storey buildings occupying either the entirety of the site or part of it.

North Site has an approximate area of 0.37 Ha. Multiple 2-3 storey mixed use buildings are currently located on the south portion of the property adjacent to Cosburn Avenue while the north portion of the property adjacent to Gamble Avenue is a vacant lot. The existing ground condition of the property is generally flat from south to north. Just north of the existing buildings, the ground gently slopes from south to north, with water runoff spilling into Gamble Avenue. The east to west profile is generally flat throughout the entire site.

South Site is currently a generally flat lot with an approximate area of 0.33 Ha. The entire site is currently occupied by multiple 2-3 storey mixed use buildings. A north – south alleyway currently separates South Site from the adjacent property to its west. The site slopes gently to the south towards Gowan Avenue.

### 2.2 Existing Utility Information

The existing utility information surrounding the sites is provided on the Site Servicing Plan attached in **Appendix A**. Note that all existing utility information is based on Quality Levels B, C, and D Subsurface Utility Engineering (SUE) investigation that was carried out in 2020 - 2022. Prior to detailed design and construction, it is recommended that the Development Co confirm the existing underground and aerial utilities and the vertical elevation information. At the time when this report is prepared, the sewer capacity information was not available.

### 2.3 Proposed Site Grading

The proposed grading for both developments are provided in **Appendix A**.

North Site's proposed grading follows the existing topography of the site in general. Stormwater runoff (within allowable limits) will be discharged to the storm sewer on Pape Avenue via a 300 mm proposed storm sewer connection.

South Site's proposed grading also follows the existing site topography, with a gentle north to south slope. Stormwater runoff (within allowable limits) will be discharged to the storm sewer on Gowan Avenue via a 300 mm proposed storm sewer connection.

The proposed grading around the TOC allows positive drainage away from the buildings, with 1 – 3% slopes across the sidewalks, in accordance with the City standard.



## 3 Water Supply

### 3.1 Existing Condition

As per the available SUE plans, there are the following watermains in the vicinity of the site: a 300 mm watermain along Pape Avenue; a 150 mm watermain along Gowan Avenue; a 300 mm watermain along Cosburn Avenue; a 150 mm and a 200 mm watermain along Gamble Avenue.

The existing buildings on North Site are connected to the 300 mm diameter watermain running along Pape Avenue. SUE surveys show five watermain connections from the Pape Avenue watermain leading back into the existing buildings. Since these buildings will be replaced by the proposed TOC development, the watermain connections will have to be plugged, and new connections established.

The existing buildings on South Site are connected to the 300 mm diameter watermain running along Pape Avenue and 150 mm watermain along Gowan Avenue. There are currently 17 connections from the Pape Avenue watermain leading and one connection from Gowan Avenue into the site. These connections will have to be plugged with the installation of the new connections servicing the proposed TOC facility.

### 3.2 Water Supply

Under the Ontario Building Code (OBC), every dwelling unit shall be supplied with a water distribution system where drinking water is available (Section 9.31.3.1). The OBC also states that every water distribution system shall be connected to a watermain that is part of the municipal drinking water system unless otherwise stated in OBC Article 7.1.5.3.

The OBC also requires that both office space and residential space be built from non-combustible construction, and sprinklered, unless otherwise stated in Subsection 3.2.6 and 3.2.2.7 of the OBC. In addition, the OBC does not require fire hydrants within a building but mandates that a hydrant is located within 90 m horizontally of any portion of a building perimeter which is required to face a street.

The watermain network will be designed and constructed to the City of Toronto's Design Criteria for Sewers and Watermains (2019). A Site Servicing Plan in Appendix A has been prepared to show the potential locations of the watermain service connections to the developments. The water demand for the proposed sites was calculated per City of Toronto's Design Criteria for Sewers and Watermains (2019) and using site statistics provided by the architect. Water demand calculation summaries for Sites A and C are provided in **Table 3-1** and **Table 3-2** respectively.

**Table 3-1 North Site Development Water Demand Calculation Summary**

Parameter/ Items	Residential	Commercial
Average Day Water Consumption Rate	190 L/capita/day	190 L/capita/day
Total North Site Area	3,669 m <sup>2</sup>	
Total GFA	21,850 m <sup>2</sup>	517 m <sup>2</sup>
Residential units	300	n/a
Residential/ commercial population	910	130
Peaking factor – peak hour	2.5	1.2
Average Water Demand from Site	2.0 L/s	0.3 L/s
Peak Water Demand from Site	5.0 L/s	0.3 L/s

**Table 3-2 South Site Development Water Demand Calculation Summary**

Parameter/ Items	Residential	Commercial
Average Day Water Consumption Rate	190 L/capita/day	190 L/capita/day
Total South Site Area	3,225 m <sup>2</sup>	
Total GFA	23,492 m <sup>2</sup>	1,691 m <sup>2</sup>
Residential units	323	n/a
Residential/ commercial population	984	300
Peaking factor – peak hour	2.5	1.2
Average Water Demand from Site	2.2 L/s	0.7 L/s
Peak Water Demand from Site	5.4 L/s	0.8 L/s

The estimated fire flow requirements were calculated based on recommendations by the City of Toronto's Fire flow requirement. These were determined to be 26,321.9 L/min for the North Site, and 27,929.7 L/min for the South Site. It must be noted that these values were calculated without factoring in the adjustment factors based on building occupancy, construction, and sprinkler coverage. The fire flow requirement is expected to be further reduced at the detailed design stage, once building construction and usage information has been determined. Detailed calculations can be found in **Appendix B**.

North Site will have two separate water main connections since the building height is proposed to be greater than 84 m (as per *City of Toronto Design Criteria for Sewers and Watermains – January 2021*). There will be two 250 mm water service connection to the existing 300 mm mainline watermain on Pape Avenue. Both connections will split into a 250 mm fire service and a 200 mm domestic service at the development end of the connection.

South Site will also have two separate watermain connections due to the height of building being over than 84 m. Two 300 mm connection will connect to the existing 300 mm watermain on Pape Avenue. Each of the 300 mm connections will split into a 300 mm fire service and 250 mm domestic water service as per *City of Toronto Standards T-1104.02-3*.

## 4 Sanitary Servicing

### 4.1 Existing Condition

The two sites are surrounded by existing sanitary sewers. There is a 1050 mm Sanitary Sewer on Pape Avenue east of Cosburn Avenue and a 675 mm VIT Sanitary Sewer on Gamble Avenue. There is also a 1650 mm sanitary sewer on Pape Avenue west of Cosburn Avenue and there is a 600 mm sanitary sewer on Gowan Avenue.

### 4.2 Proposed Sanitary Flow

Sanitary flows for the proposed developments were calculated based on design parameters from the *City of Toronto Design Criteria for Sewers and Watermains (2021)* and site statistics provided by the architect. **Table 4-1** and **Table 4-2** summarize the sanitary flow calculations for the proposed development on North Site and South Site respectively. Detailed sanitary flow calculations are included in **Appendix C**.

**Table 4-1 North Site Development Sanitary Demand Calculation Summary**

Parameter/ Items	Residential	Commercial
Sanitary Demand Rate	450 L/capita/day	0 L/capita/day
Commercial Average Flow	n/a	180,000 L/floor ha/day
Total GFA	21,850 m <sup>2</sup>	517 m <sup>2</sup>
Peaking Factor	3.8	n/a
Peak Sanitary Flow	4.72 L/s	0.11 L/s
Groundwater Discharge to Sanitary Sewer	0.10 L/s	
Maximum Cumulative Flow with Peaking Factor	18.13 L/s	

**Table 4-2 South Site Development Sanitary Demand Calculation Summary**

Parameter/ Items	Residential	Commercial
Sanitary Demand Rate	450 L/capita/day	0 L/capita/day
Commercial Average Flow	n/a	180,000 L/floor ha/day
Total GFA	23,492 m <sup>2</sup>	1,691 m <sup>2</sup>
Peaking Factor	3.8	n/a
Peak Sanitary Flow	5.13 L/s	0.35 L/s
Groundwater Discharge to Sanitary Sewer	0.08 L/s	
Maximum Cumulative Flow with Peaking Factor	19.91 L/s	

### 4.3 Sanitary Service Connection

The North Site will be connected to the existing 675 mm sanitary sewer along Gamble Avenue via a 300 mm connection. The South Site will have a single 300 mm connection to the existing 1650 mm sanitary sewer along Pape Avenue and will start at the midpoint of the lot connecting to the mainline and having the watermain connections to the right of them.

# 5 Storm Drainage and Stormwater Management

## 5.1 Existing Condition

Minor flows within the vicinity of the site are captured via a number of catch basins and conveyed into existing storm sewers, which includes a 1500 mm storm sewer along Pape Avenue and existing storm sewers along Gowan Avenue, Cosburn Avenue, and Gamble Avenue. Please refer to the Existing Conditions Drainage Plan in **Appendix D**.

Pape Avenue slopes continuously from north to south. The major overland flows along Gowan Avenue, Cosburn Avenue, and Gamble Avenue run towards the west.

The City is working on the InfoWorks model for this area. With the limited information that is currently available, it is not possible to further comment on where the existing buildings are draining.

## 5.2 Stormwater Management Criteria

Stormwater management requirements are specified by the authorities having jurisdiction over the Project. These requirements apply to all locations where the proposed design will influence or be influenced by surface water runoff. The stormwater management design criteria are described below and supplemented by the Project Specific Output Specifications (PSOS). The key criteria applicable to this Project are summarized in the following sections.

### 5.2.1 Quality Control

- Provide a long-term average removal of 80% of total suspended solids (TSS) from the storm runoff of additional impervious areas (TRCA Guidelines).
- Provide a long-term average removal of 80% of TSS on an annual loading basis from all the storm runoff leaving the site (WWFMG, TGS).
  - Oil-Grit Separator (OGS) devices are credited with a maximum of 50% TSS removal (WWFMG, TRCA).

### 5.2.2 Quality/ Flood Control

- Protect against surface flooding from ponding on streets during the 100-year event. Consult Toronto Water – Sewer Asset Planning Section for developments within the City's chronic basement flooding areas (WWFMG).
- Drainage discharged to the municipal storm sewer must be controlled to the peak release rate from the lower of:
  - the existing conditions peak flow from design event with a 2-year return period assuming a runoff coefficient of 0.5, if the existing imperviousness is greater than 50%; and,
  - the existing capacity of the storm sewer (WWFMG).
- In absence of an approved or adequate overland flow route, all flow from the 2-year up to the 100-year return storm events shall be stored on-North Site and released at the allowable release rate as defined above (WWFMG).

- Peak flows should be calculated using the intensity-duration-frequency (IDF) information in the WWFMG.

### 5.2.3 Water Balance

- Retain all runoff from the 5 mm rainfall event on site through infiltration, evaporation, and/or rainwater reuse (WWFMG, TGS Version 4 - Tier 1).
- For sites located in high volume groundwater recharge areas (HGRA), pre-development groundwater recharge rates should be maintained (TRCA).

### 5.2.4 Erosion Control

- For infill/redevelopment sites (<2 ha), where the site does not drain to a sensitive watercourse, erosion control should be provided through the retention of a small design rainfall event (typically 5 mm). This is often achieved by satisfying the water balance retention requirement (WWFMG, TRCA).

## 5.3 Stormwater Management Plan

As per the applicable stormwater management (SWM) criteria summarized in **Section 5.2**, water balance, water quantity, quality and erosion control for the proposed Cosburn development sites is required. The stormwater BMP considered for the site include green roofs, underground detention/retention tanks, and OGS units. The Proposed Conditions Drainage Plan is presented in **Appendix D**.

All building openings should be protected from flooding. During detail design, depth of overland flow at these locations should be calculated using dual drainage models to confirm that all openings to the buildings will have sufficient freeboard above the maximum water elevation during the 100-year storm event. The RCD satisfies the SWM and drainage requirements for the Proposed Cosburn Sites as follows:

#### **Quantity Control:**

Storage tank units with orifice control are proposed in the first underground level to provide quantity control. The north site will have a 104 m<sup>3</sup> storage tank with an allowable release rate of 53 L/s. The south site will have a 116 m<sup>3</sup> storage tank with an allowable release rate of 53 L/s.

#### **Quality Control:**

Quality control for each site will be provided via the proposed green roof, catch basin shields, the water captured in the storage tanks for reuse and OGS units. For the north site, a 26 m<sup>3</sup> reuse volume is required to meet quality requirements. For the south site, a 37 m<sup>3</sup> reuse volume is required to meet quality requirements.

#### **Water Balance:**

Green roof and water reuse are proposed to satisfy the 5 mm retention requirement. Reuse volume for quality control of 26 m<sup>3</sup> and 37 m<sup>3</sup> for the north and south sites, respectively, will exceed the water balance requirements.

**Minor Drainage System:**

Water captured from the roofs of the building will be discharged into the existing storm sewer systems after receiving quality and quantity treatment.

**Major Drainage System:**

Major system drainage patterns will be generally maintained under proposed conditions. For the proposed aboveground structures, major system flows will be captured and controlled using underground storage.

A summary of the required storage is presented in **Table 5-1** below.

**Table 5-1 Summary of the Required Storage**

ID	North & South Site Areas (ha)		Proposed Green Roof (ha)	Required Storage Volume for Quantity Control (m <sup>3</sup> )	Proposed Storage Volume for Water Balance Reuse (m <sup>3</sup> )
	Exist.	Prop.			
North Site	0.43	0.43	0.16	104	26
South Site	0.43	0.43	0.11	116	37

For details of the stormwater management requirement and design, refer to the Stormwater Management Report under a separate cover.

## 6 Site Utilities

All three sites will be serviced by utilities provided by Enbridge Gas, Toronto Hydro, and relevant telecommunications providers. Future utility coordination is required with each utility company to determine the feasibility, requirements, and connection locations for their respective service.

### 6.1 Electrical Service

Electrical services will be provided by Toronto Hydro. Surveys currently show existing Toronto Hydro conduits within the vicinity of all proposed developments. The developer is to initiate discussions with Toronto Hydro to determine the requirements and connection locations for electrical service.

### 6.2 Gas Service

Gas service will be provided by Enbridge Gas. Available SUE surveys of the area indicate that the existing buildings on North Site are currently serviced by six gas lines along the frontage of Pape Avenue. These service connections are connected to a 200 mm gas main located underneath Pape Avenue. The existing buildings on South Site are connected to a 200 mm gas main along Pape Avenue via eleven gas service connections located on the easterly limits of the lot. The developer is to initiate discussions with Enbridge Gas to determine the connection requirements and locations of gas service to the proposed Sites A and C developments.

### 6.3 Communication

Surveys currently show cables from Rogers and Bell traversing the extent of all sites. The developer is to coordinate with the relevant communication systems provider to determine connection requirements.

## 7 Conclusions and Summary

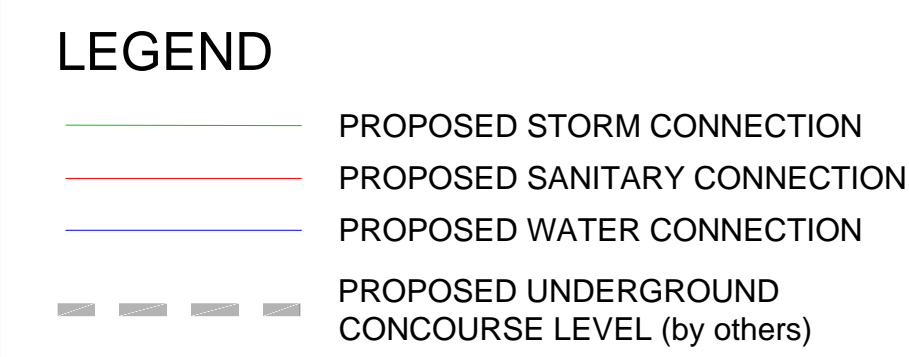
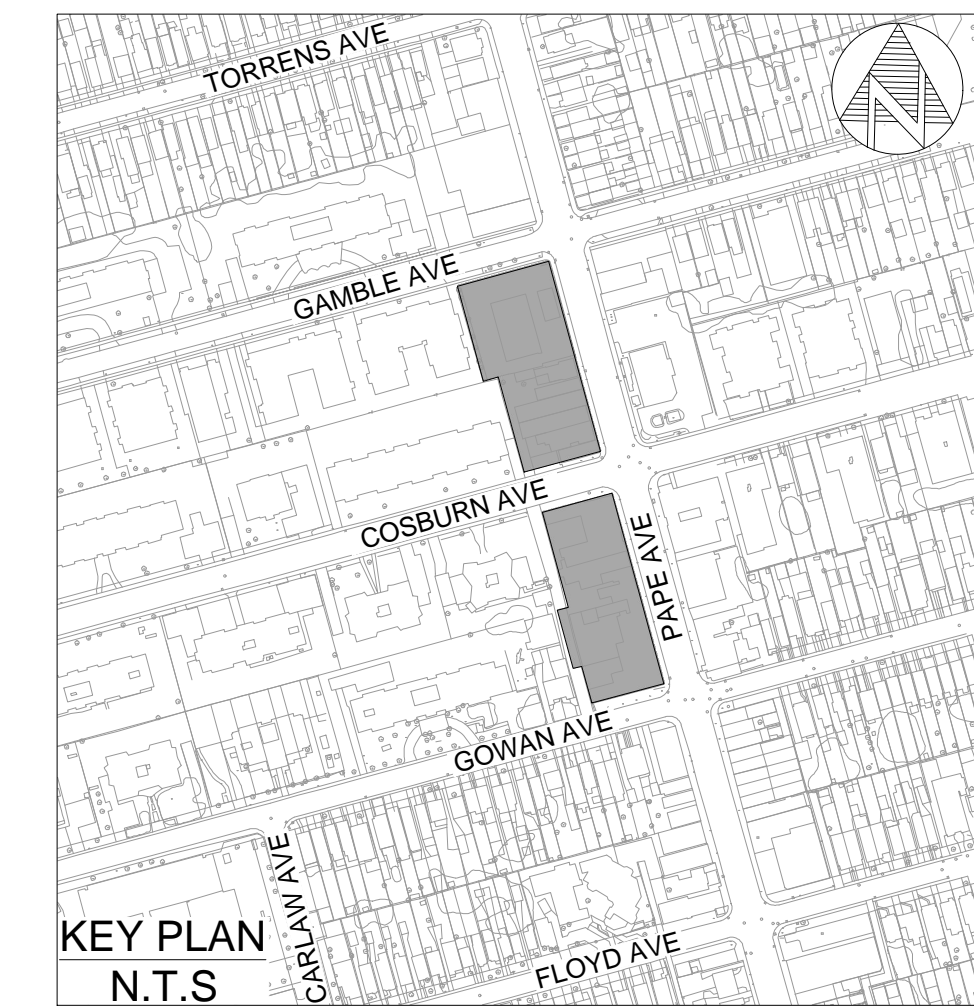
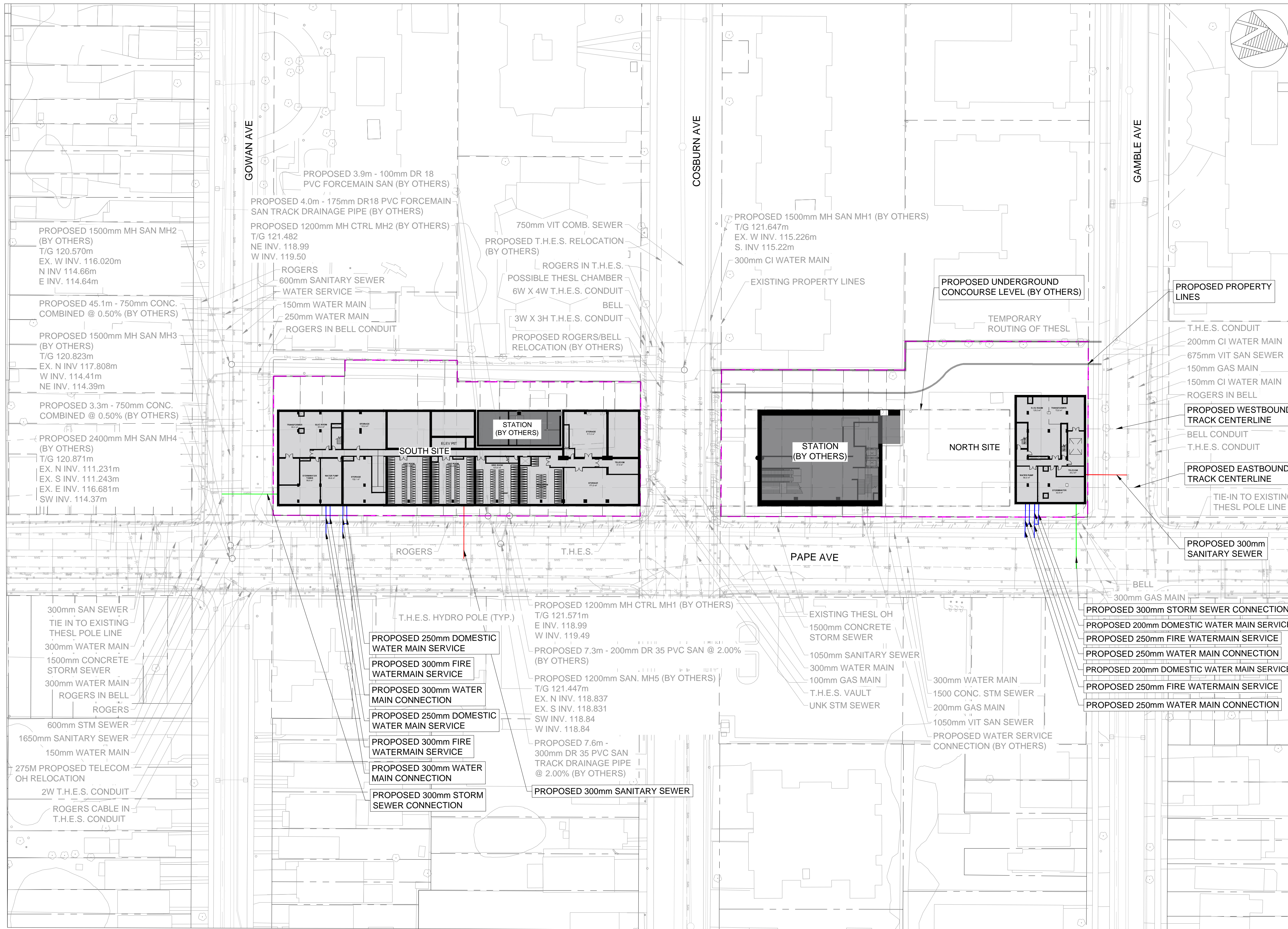
A Functional Servicing Report has been prepared to support a preliminary rezoning submission for the proposed Cosburn TOC development along Pape Avenue in the City of Toronto. Due to limitations in the available existing utility information, this report focuses on the proposed development water demand, sanitary demand, and stormwater management requirements.

To confirm the capacity of the existing water and sewer infrastructure to accommodate the proposed TOC, further studies and coordination with the City of Toronto are needed during the detailed design phase.



# Appendix A. Site Servicing Plan and Grading Plan





- NOTES:**
- EXISTING UTILITY INFORMATION SHOWN IS BASED ON SUBSURFACE UTILITY ENGINEERING (SUE) QL-B, QL-C AND QL-D. ALL LOCATIONS AND DEPTH ARE TO BE CONFIRMED BY THE CONTRACTOR PRIOR CONSTRUCTION.
  - FOR PROPOSED PUBLIC UTILITY RELOCATION WITHIN ROW, REFER TO CIVIL RELOCATION PLANS. DRY UTILITY RELOCATIONS TO BE CONFIRMED WITH PRIVATE UTILITY COMPANIES.
  - NOT ALL AERIAL UTILITIES HAVE BEEN IDENTIFIED OR SHOWN ON THIS PLAN.
  - FINAL SITE SERVICING WILL BE AS PER TOC DESIGN DEVELOPMENT

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PLOTTED BY: ALKADHALLY, HANEN

REVISIONS		REVISIONS	
1	RCD	2022-10-28	4
2			5
3			6

**RCD**  
NOT FOR CONSTRUCTION  
DD MONTH YYYY



STATUS

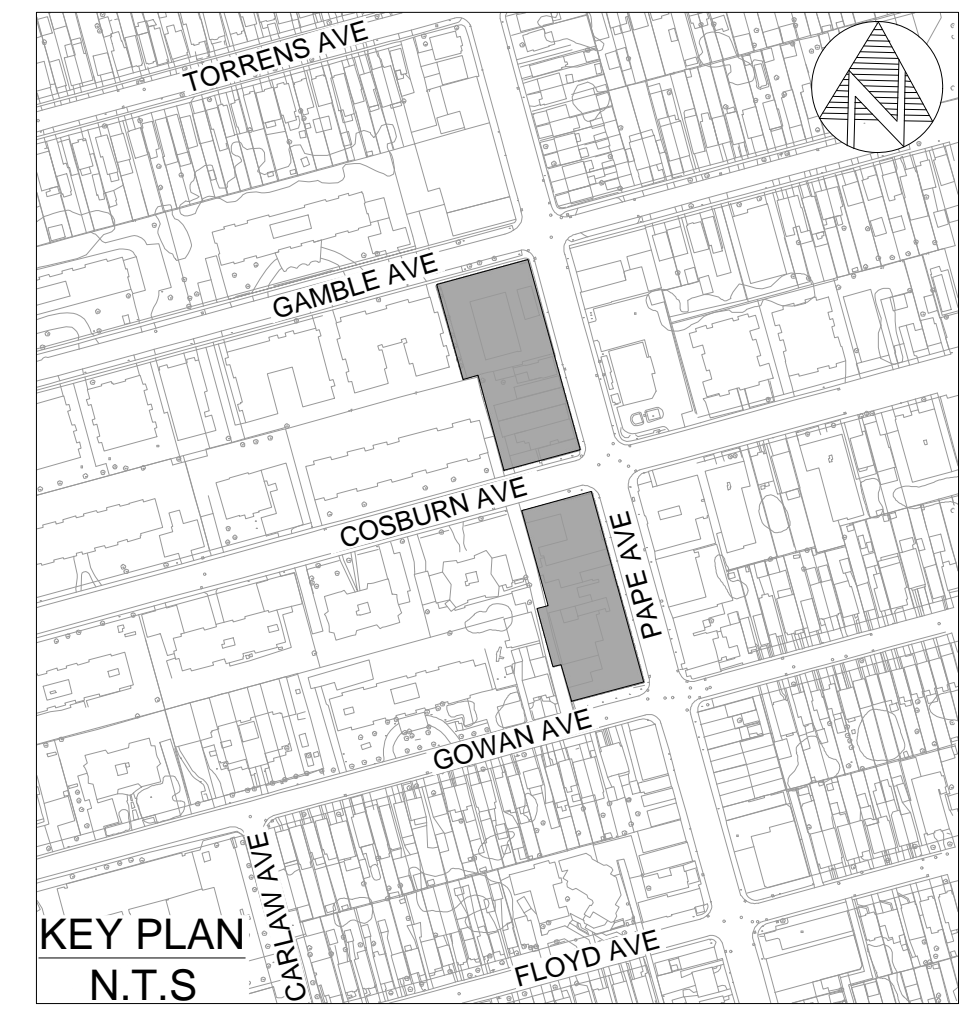


DESIGNED H. ALKADHALLY  
DRAWN H. ALKADHALLY  
CHECKED  
APPROVED

**ONTARIO LINE SUBWAY**  
TITLE  
**COSBURN STATION TOC**  
SERVICING PLAN

Plot Date: 28 October 2022  
  
 Dwg. No. GR0500-04-SF002 Sheet No.





**LEGEND**

- 90.33 EXISTING ELEVATION
- BOC 89.62 EXISTING BACK OF CURB ELEVATION
- EL:89.66 PROPOSED ELEVATION
- BOC:89.66 PROPOSED BACK OF CURB ELEVATION
- 2.0% GRADING SLOPE
- ➔ OVERLAND FLOW DIRECTION
- ▲ BUILDING ENTRANCE
- - - PROPOSED UNDERGROUND CONCOURSE LEVEL (BY OTHERS)

- NOTE**
1. ALL GRADES WITHIN THE REGULATORY FLOOD PLAIN WILL BE MAINTAINED OR MATCHED.
  2. THE EXISTING DRAINAGE PATTERN IN THE AREA OF THE SITE SHOULD BE MAINTAINED.
  3. ALL DRAINAGE TO BE COLLECTED AND APPROPRIATELY CONTROLLED, TREATED, AND DISTRIBUTED AS PER CITY OF TORONTO STANDARDS.
  4. CURRENTLY GRADING IS BASED ON LIDAR SURVEY. GRADES TO BE CONFIRMED WITH DETAIL SURVEY. GRADING TO FOLLOW CITY OF TORONTO STANDARDS.
  5. FINAL SITE GRADING WILL BE AS PER TOC DESIGN DEVELOPMENT.
  6. FIRST FLOOR ELEVATIONS (FFE) ARE SHOWN BASED ON CURRENT INFORMATION IN THE ARCHITECTURAL DRAWINGS. FFE SHOULD BE CONFIRMED DURING DETAILED DESIGN.

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PLOTTED BY: GARGAT, OLGA

REVISIONS		REVISIONS	
1	RCD 2022-10-27	4	
2		5	
3		6	

**RCD**  
NOT FOR CONSTRUCTION  
DD MONTH YYYY

SCALE(S) 1:500

STATUS



DESIGNED F. CHUA  
DRAWN H. ALKHADHALY  
CHECKED  
APPROVED

**ONTARIO LINE SUBWAY**  
**COSBURN STATION**  
**TOC**  
GRADING PLAN

Plot Date: 28 October 2022

**METROLINX**  
Infrastructure Ontario

Dwg. No. GR0500-04-SF002 Sheet No.

## Appendix B. Water Demand Calculations





## Appendix C. Sanitary Flow Demand Calculation

**DESIGN CALCULATION**  
**Sanitary Flow Demand**

Location: Cosburn TOC  
North Site

Items	Water Demand Calculation		Remark
<b>Site Parameters</b>			
Average waste water flow	450	l/capita/day	Multi-unit high-rise = 450 litres / capita /day (City of Toronto Design Criteria for Sewers and Watermain)
Non-Residential average flow	180000	l/floor hectare/day	Commercial = 180000 litres/ floor hectare / day (City of Toronto Design Criteria for Sewers and Watermain)
Total Site Area	3669	Sq.m	
Total GFA	Residential 21850	Non-Residential 517	Sq.m
Residential Units	300	n/a	
Residential/Non-Residential Population	906	130	Occupant Load from Arch Stats
Peaking Factor	Residential 3.8	Non-Residential n/a	Non-residential peak factor is included in average flow
Extraneous Flow			
Infiltration allowance (< 10 ha)	0.26	l/s/ha	
Residential Flow	4.72	l/s	
Non-Residential Flow	0.11	l/s	
Infiltration Flow	0.10	l/s	
<b>Maximum Cumulative Flow with peaking factor</b>	<b>18.13</b>	<b>l/s</b>	



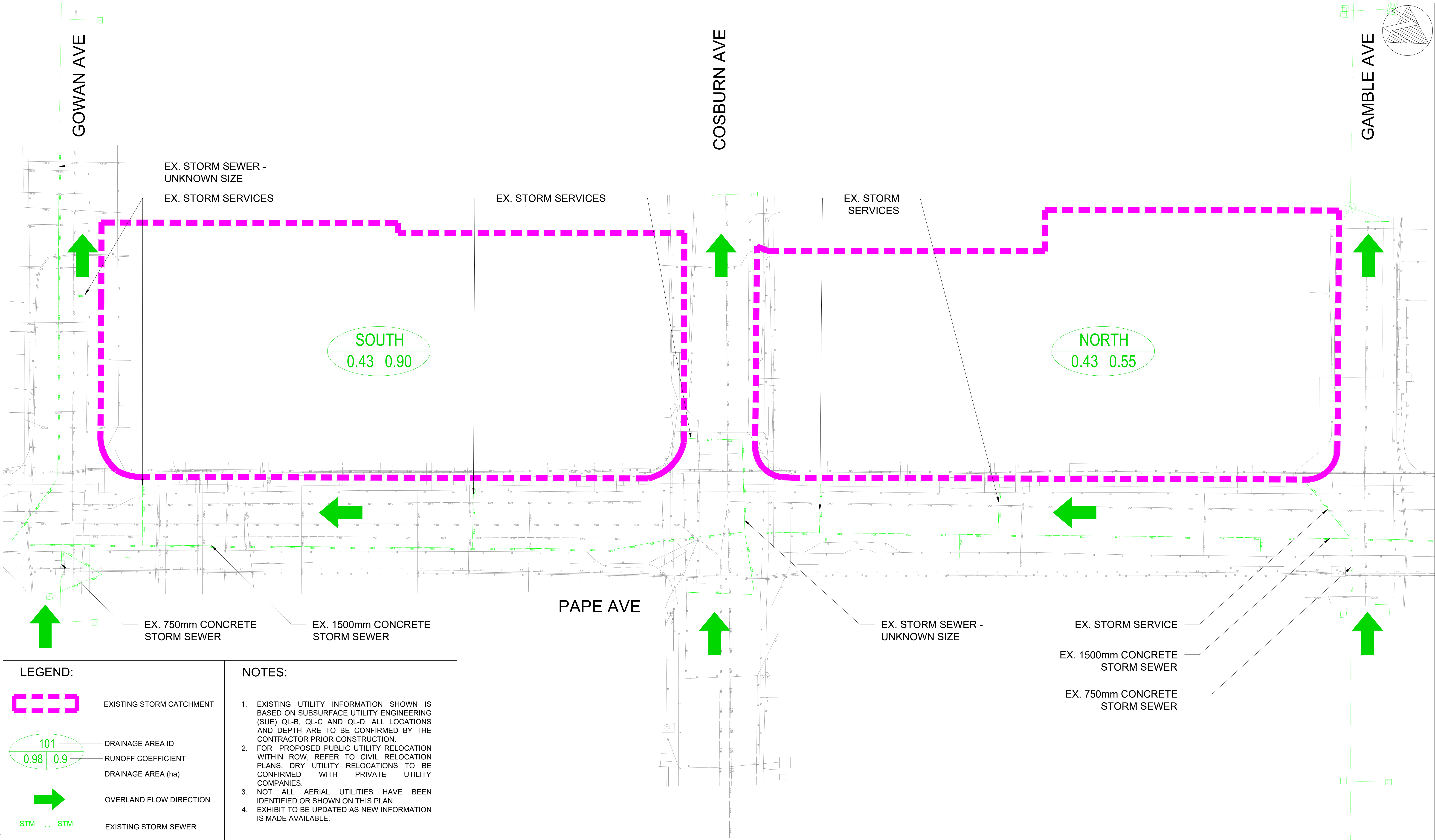
**DESIGN CALCULATION**  
**Sanitary Flow Demand**

Location: Cosburn TOC  
South Site

Items	Water Demand Calculation		Remark
<b>Site Parameters</b>			
Average waste water flow	450	l/capita/day	Multi-unit high-rise = 450 litres / capita /day (City of Toronto Design Criteria for Sewers and Watermain)
Non-Residential average flow	180000	l/floor hectare/day	Commercial = 180000 litres/ floor hectare / day (City of Toronto Design Criteria for Sewers and Watermain)
Total Site Area	3225	Sq.m	
Total GFA	Residential 23492	Non-Residential 1691	Sq.m
Residential Units	323	n/a	
Residential/Non-Residential Population	984	300	Occupant load from arch stats
Peaking Factor	Residential 3.8	Non-Residential n/a	Non-residential peak factor is included in average flow
<b>Extraneous Flow</b>			
Infiltration allowance (< 10 ha)	0.26	l/s/ha	
Residential Flow	5.13	l/s	
Non-Residential Flow	0.35	l/s	
Infiltration Flow	0.08	l/s	
<b>Maximum Cumulative Flow with peaking factor</b>	<b>19.91</b>	<b>l/s</b>	

# Appendix D. Drainage Plan

FILE: 10206938-drc0300-04-sf002.dwg  
 PLOTTED BY: KHODADADI, MAHSA



**LEGEND:**

- EXISTING STORM CATCHMENT
- DRAINAGE AREA ID
- RUNOFF COEFFICIENT
- DRAINAGE AREA (ha)
- OVERLAND FLOW DIRECTION
- EXISTING STORM SEWER

**NOTES:**

1. EXISTING UTILITY INFORMATION SHOWN IS BASED ON SUBSURFACE UTILITY ENGINEERING (SUE) QL-B, QL-C AND QL-D. ALL LOCATIONS AND DEPTH ARE TO BE CONFIRMED BY THE CONTRACTOR PRIOR CONSTRUCTION.
2. FOR PROPOSED PUBLIC UTILITY RELOCATION WITHIN ROW, REFER TO CIVIL RELOCATION PLANS. DRY UTILITY RELOCATIONS TO BE CONFIRMED WITH PRIVATE UTILITY COMPANIES.
3. NOT ALL AERIAL UTILITIES HAVE BEEN IDENTIFIED OR SHOWN ON THIS PLAN.
4. EXHIBIT TO BE UPDATED AS NEW INFORMATION IS MADE AVAILABLE.

REVISIONS	
1	4
2	5
3	6

REVISIONS	
4	5
5	6

**RCD**  
 NOT FOR CONSTRUCTION  
 DD MONTH YYYY

SCALE(S) 1:300

STATUS

**ONETEAM**  
 ONTARIO LINE TECHNICAL ADVISOR

DESIGNED	D. NUTTALL
DRAWN	M. KHODADADI
CHECKED	
APPROVED	

**ONTARIO LINE SUBWAY**

TITLE  
**COSBURN STATION  
 TOC**  
 EXISTING DRAINAGE PLAN

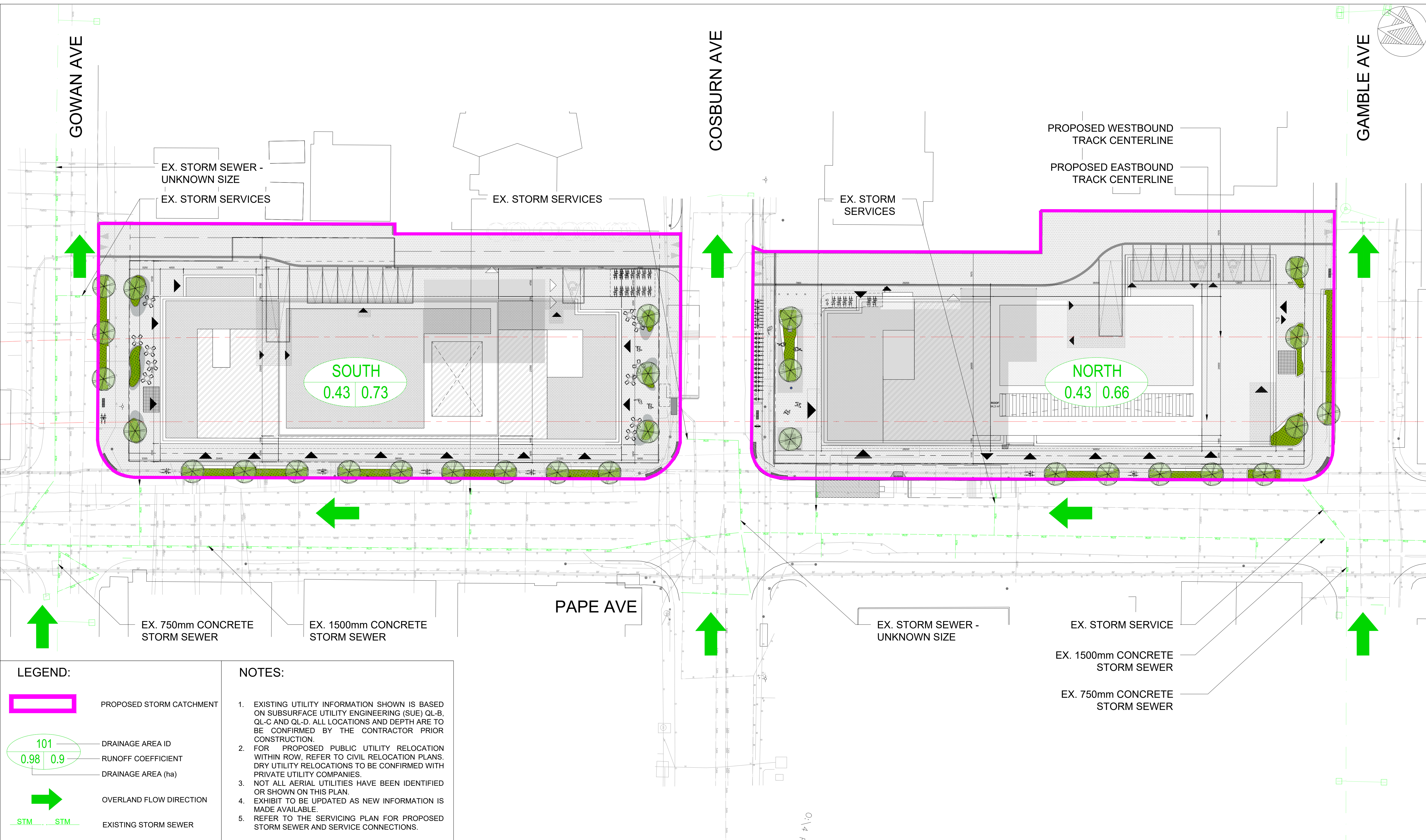
Plot Date: 28 October 2022

**Infrastructure Ontario**

Dwg. No. \_\_\_\_\_ Sheet No. \_\_\_\_\_



FILE: 10206938-drc0300-04-sf002.dwg  
 PLOTTED BY: KHODADADI, MAHSA



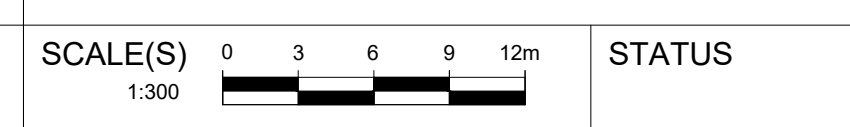
**LEGEND:**

	PROPOSED STORM CATCHMENT
	DRAINAGE AREA ID RUNOFF COEFFICIENT DRAINAGE AREA (ha)
	OVERLAND FLOW DIRECTION
	EXISTING STORM SEWER

- NOTES:**
- EXISTING UTILITY INFORMATION SHOWN IS BASED ON SUBSURFACE UTILITY ENGINEERING (SUE) QL-B, QL-C AND QL-D. ALL LOCATIONS AND DEPTH ARE TO BE CONFIRMED BY THE CONTRACTOR PRIOR CONSTRUCTION.
  - FOR PROPOSED PUBLIC UTILITY RELOCATION WITHIN ROW, REFER TO CIVIL RELOCATION PLANS. DRY UTILITY RELOCATIONS TO BE CONFIRMED WITH PRIVATE UTILITY COMPANIES.
  - NOT ALL AERIAL UTILITIES HAVE BEEN IDENTIFIED OR SHOWN ON THIS PLAN.
  - EXHIBIT TO BE UPDATED AS NEW INFORMATION IS MADE AVAILABLE.
  - REFER TO THE SERVICING PLAN FOR PROPOSED STORM SEWER AND SERVICE CONNECTIONS.

REVISIONS	REVISIONS
1	4
2	5
3	6

**RCD**  
 NOT FOR CONSTRUCTION  
 DD MONTH YYYY



DESIGNED D. NUTTALL  
 DRAWN M. KHODADADI  
 CHECKED  
 APPROVED

<b>ONTARIO LINE SUBWAY</b>		Plot Date: 28 October 2022
<b>TITLE</b> COSBURN STATION TOC PROPOSED DRAINAGE PLAN		 Dwg. No. Sheet No.