Preliminary

Preliminary Functional Servicing and Stormwater Management Report 215 Lexington, Waterloo

Prepared for Hygate Living
by IBI Group

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1 Introduction

IBI Group was retained by Hygate Living to prepare a Functional Servicing and Stormwater Management (SWM) Report for Phase 2 of a proposed development located at 215-229 Lexington Road in the City of Waterloo.

The total land area of the site is 1.925 hectares and is bound by Lexington Road to the north west, Conestoga Parkway to the south, and low rise residential to the northwest and WMB Church - Waterloo Site is adjacent to the north eastern property line of the site.

Please refer to Figure 1 below for the location of the proposed development.



Figure 1: Site Location *(source Region of Waterloo gis.region.waterloo.on.ca)*

The site will be comprised of building development in the form of 7 storey building at Lexington Road and a second terracing 'U – shaped' 12 storey building at the rear/ south of the site. In total, 453 units are currently proposed supported by two levels of underground parking, and surface parking comprising of 551 parking stalls which are shared with Phase 1 of the development. The 'U' shaped building reaches a maximum height of 12 storeys and terraces down towards the south/southeast to minimize massing impacts on the adjacent areas. Other supporting land uses will include existing amenities, stormwater management facilities, landscaped areas, and existing natural areas that are to be maintained. Refer to **Appendix A** for the Site Plan and Engineering Drawings.

This report will describe the preliminary functional grading and servicing for the development in order to demonstrate the feasibility and approach for the design of the proposed development from a site municipal engineering perspective.

2 Existing Conditions

The existing subject property is currently occupied by Pinehaven Nursing Home, asphalt parking lot areas, a retaining wall, SWM pond and vegetated areas as shown on Figure 2, below. Phase 1 of the development comprises of a 6-storey apartment building, located on the southwest side of the site fronting Lexington Road. The existing Pinehaven Nursing home building and parking lot will be demolished and removed to facilitate the proposed development.



Figure 1: Site Location and Aerial Photo *(source Google)*

2.1 Existing Roads and Pedestrian Access

The subject site is fronted by Lexington Road to the northwest, Highway 85 (Conestoga Parkway) to the south, and lowr-ise residential buildings to the northeast. Current vehicular access to the subject lands is from Lexington Road. Pedestrian access is provided by a sidewalk along Lexington Road.

2.2 Existing Topography and Drainage

In general, the existing overland flow direction of the subject lands is southeast towards the existing stormwater management pond located at the southmost portion of the site. There is moderate to steep topography at the southern portion of the site toward the vegetation area located to the east property line of the site.

2.3 Existing Municipal Servicing

On a review of existing GIS information and visual field inspection, the site is currently serviced by the municipal sanitary and water along Lexington Road. Stormwater for the site is managed by private storm sewer system that outlets to a SWM pond onsite at the southern portion of the site. Below is a summary of existing infrastructure in place:

- Storm Drainage: There is existing storm infrastructure within the existing development. The water is currently collected by catch basins located in the existing lows spots of the parking lots throughout the site, and runs through a private storm sewer system along the southeast property line of the site into an existing headwall located at the south eastern corner. Stormwater from the front parking lot along Lexington is collected into catch basins in the parking lot and routed along the northeast property through a storm sewer network that outlets to the existing stormwater management pond at the southern area of the site.
- Sanitary Sewage: An existing 200mm diameter Asbestos Cement sanitary sewer is located on Lexington Road. Phase 1 of the development is connected to the municipal sanitary sewer at the northeast end of the property.
- Potable Water: An existing 300mm diameter watermain is located on Lexington Road.
- Fire protection: An existing fire hydrant is located northeast of the site at Davenport Road and Lexington Road intersection.

2.4 Utilities

Electric, natural gas, and telecommunication services exist within close proximity to the subject development on Lexington Road.

3 Proposed Conditions

Phase 2 of the development will comprise of two buildings. One 7-storey building fronting Lexington Road east of Phase 1, and a second 'U – shaped' 12-storey building at the rear/ south of the site. There will be 2-levels of underground parking that will service both of the proposed buildings.

The following sections describe the preliminary design of the area grading and municipal servicing for Phase 2 of the proposed development. The purpose of the preliminary design is to demonstrate the feasibility of the development, outlining the general strategy for the grading, and municipal servicing. The final design (to be completed during the Site Plan Approval stage) will establish the details of the development's design.

3.1 Proposed Roads and Pedestrian Access

The proposed buildings will have vehicular access to underground parking from Lexington Road. Pedestrian access to the main entrance to the proposed buildings is provided from Lexington Road.

3.2 Grading Design

The grading of the site will direct drainage from the narrow strip of land surrounding the building to the catch basins located at the low areas, with the grading matching existing property line elevations.

The development's proposed area grading will generally direct drainage internally to low areas within the proposed driveway and parking areas. These low areas will have catch basins which will collect stormwater through a private storm system and convey it to the existing SWM located at the south eastern corner.

All hard surfaces will be sloped from 0.5% (minimum) to 5% (maximum) to provide adequate drainage while ensuring that vehicular and pedestrian access routes are accessible. The

northeast side of the site will have a ramp to access the underground parking, the ramp will comprise of a slope between 6.0% to 8.0%. A minimum of 2% and a maximum of 33% (3:1) slope will be used for landscaped areas.

Refer to **Appendix A** for the preliminary grading of the site.

3.3 Stormwater Servicing

The stormwater management criteria for this development are based on the requirements of the Region of Waterloo, the City of Waterloo, and the Ministry of Environment, Conservation and Parks guidelines.

The requirements include:

- Peak flows are to be controlled to existing condition levels for the 2-year, 5 year and the 100 year storm events;
- Minor storm runoff is to be piped to the private storm system located inside the site, and major runoff is going to existing storm pond located at the south side of the site;
- Stormwater quality controls are to be provided to an Enhanced Protection Level.

Refer to **Appendix A** for the functional layout of the proposed storm sewer and existing SWM pond.

The existing SWM pond will be shortened and will be compensated by proposed roof top stormwater storage tanks located on proposed Building A and Building B.

Stormwater quality control will be provided using the existing oil/grit separator (OGS) units at the outlet of the SWM pond. During detailed design we will evaluate the required sizing of the OGS units and will upsize the units is required.

3.4 Sanitary Servicing

The Site is located within the City of Waterloo's municipal sanitary servicing area. The proposed buildings will be connected to an existing private 250mm diameter PVC sewer on site that connects to the existing 200mm diameter municipal sanitary sewer on Lexington Road. The theoretical capacity of the receiving 200mm PVC diameter municipal sanitary sewer on Lexington Road is approximately 55.8 L/s at 2.65%.

Based on calculations, the peak flow produced by the proposed development will be 14.6 L/s which is 26.16% of the capacity of the receiving municipal sewer on Lexington Road. The City will be contacted to confirm the overall capacity in its sanitary network using its sanitary model. The results will be included in a future submission.

The functional layout of the proposed sanitary system is shown on the functional servicing plan in **Appendix A**. Refer to **Appendix B** for calculations related to the sanitary servicing of the development.

3.5 Water Supply and Distribution

The proposed water supply for the subject development will be a service connection to the existing 300mm diameter municipal watermain on Lexington Road. All watermain and appurtenances will be designed and constructed in accordance with the current municipal and American Water Works Association standards and specifications.

The buildings will be designed as a non-combustible building with a full sprinkler system inside the building and in the below grade parking garage. All floors will be divided into fire zones of no more than 1000 sq.m. per the Ontario Building Code (OBC). As per the OFM Guideline (Office of

the Fire Marshal) Fire Protection Water Supply Guideline for Part 3 in the OBC section 6.2 and Section 9.1, a sprinkler contractor designing a sprinkler system for a building will determine the minimum water supply requirements and calculate the total fire protection water supply required for the building. The contractor will be obtained during the detailed design stage and will calculate and design the sprinklers for total fire protection.

A hydrant flow test was performed in May 2019 by C&H Suppression Systems at the existing fire hydrant located in front of the site at Lexington Road and Davenport, confirming there is sufficient flow available in the water system to provide fire protection to the proposed buildings. The hydrant is connected to the 300mm diameter municipal watermain. The flow test will be used by the selected sprinkler contractor to design the sprinkler system to provide the required fire flow protection at detailed design.

An existing private fire hydrant is located at the driveway entrance to the proposed site and is connected to the existing 200mm diameter private watermain on site, that is connected to the existing 300mm diameter municipal watermain on Lexington Road.

The preliminary layout of the proposed water servicing is shown in **Appendix A**. The water demand calculations, fire flow calculations and hydrant test results are shown in **Appendix C.**

4 Erosion and Sediment Control

During construction, erosion and sediment control measures will be required. Details of these controls will be provided during detailed engineering design. The measures will be in accordance with the City of Waterloo and Grand River Conservation Authority requirements and will include, as a minimum:

- Silt fence erected around the site perimeter before any grading or topsoil stripping begins on the site to protect adjacent areas from migration of sediment in overland flow.
- A “mud mat” installed at the construction entrance(s) to the site to minimize the amount of sediment transported offsite by construction vehicles;
- Disturbed areas stabilized as quickly as possible to minimize the opportunity for erosion; and,
- Slopes greater than 5:1 stabilized using suitable methods (e.g. erosion control mats, tackifier, etc.) as soon as practical.

5 Utilities

The various utilities (i.e., Hydro, Gas, Cable and Telephone) all have existing facilities adjacent to the site on Lexington Road. Extension of these existing facilities by the respective utility company will provide servicing for the proposed development.

It is anticipated that each of these utilities will, as required, identify their specific requirements through the standard application circulation, review and design process.

6 Summary

This Report demonstrates that the proposed development is feasible from a municipal grading and servicing perspective in accordance with municipal design and construction standards. The following summarizes the key aspects of the functional design presented in this report.

- The site will be graded per municipal guidelines, and ground elevations at the site limits will be matched into existing grades at property lines.
- The preliminary stormwater management will provide quantity and quality control for stormwater runoff generated by the proposed development for the 5 year and 100 year storm events, and the onsite storm network will convey the minor stormwater flows to the existing storm water management pond.
- The development will be serviced by the existing 200mm diameter watermain on site, which is connected to the 300mm diameter municipal watermain on Lexington Road, and a private fire hydrant is located at the entrance to the site. The nearest public fire hydrant is at the intersection of Lexington Road and Davenport Road across from the development.

At the final design stage, detailed grading, servicing and stormwater management control designs will be prepared and provided to the approval authorities. All design will conform to local and provincial municipal design standards.

We trust the foregoing demonstrates the proposed design methodology for the development and is satisfactory to support the rezoning application.

All of which is respectfully submitted.

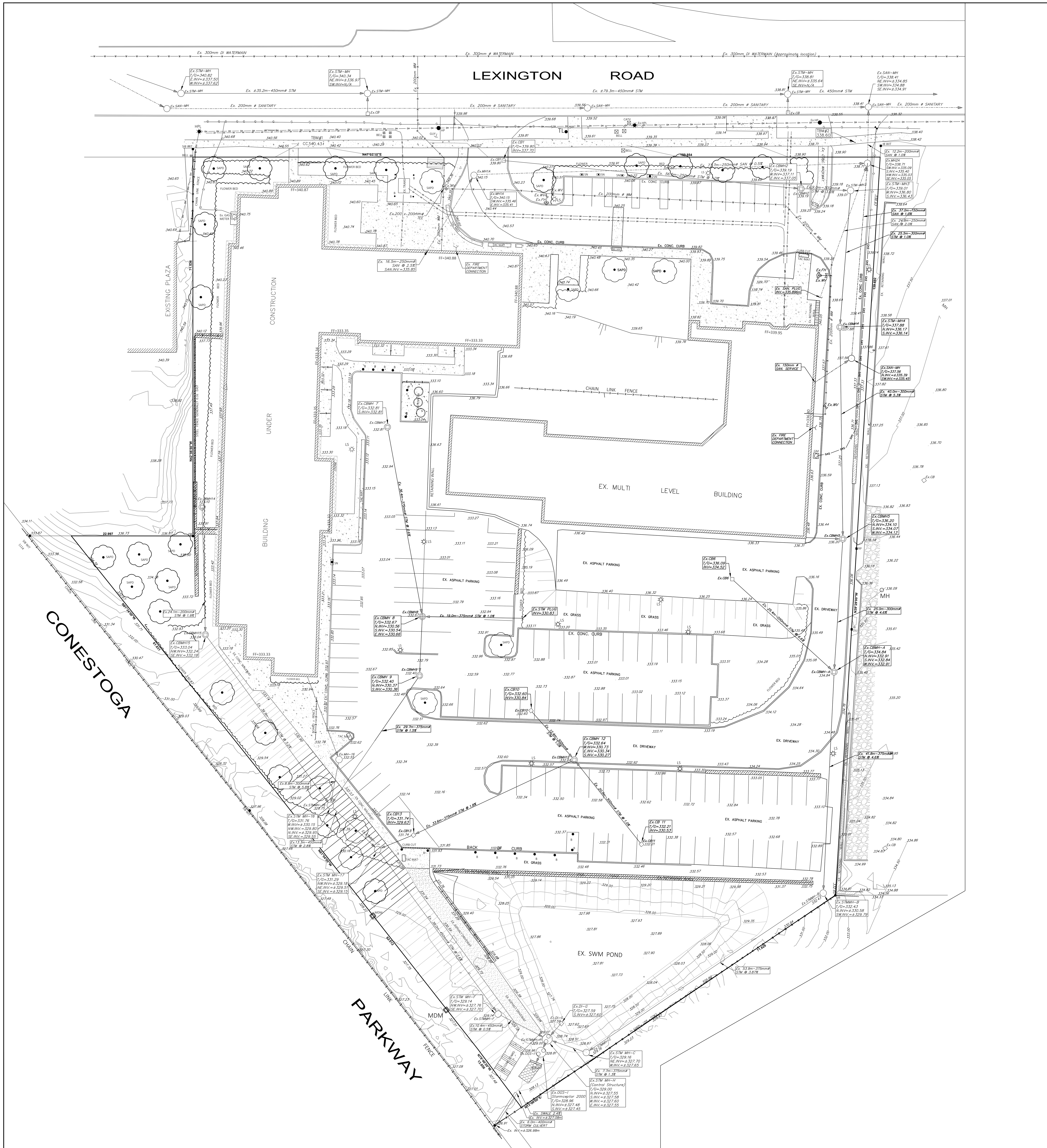
Yours truly

IBI GROUP



Julianna Arcese, P.Eng.
Civil Engineer

APPENDIX A: Drawings



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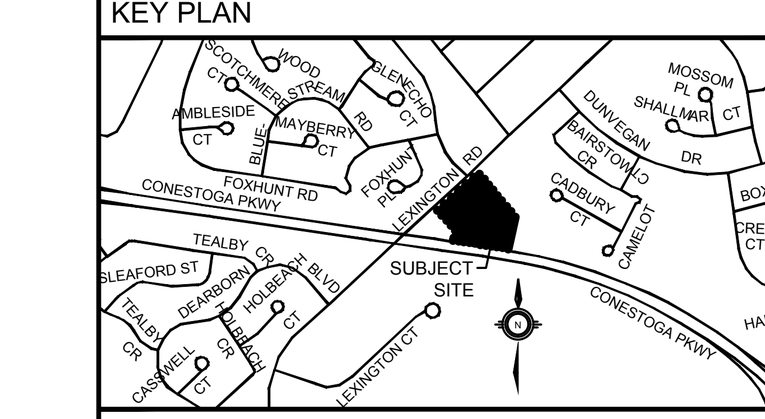
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No.	DESCRIPTION	DATE
1	ISSUED FOR ZBA - FIRST SUBMISS.	2022-06-17
2	####	####
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KEY PLAN



LEGEND

- CB – EXISTING CATCH BASIN
- STM–MH – EXISTING STORM MANHOLE
- CBMH – EXISTING CB MANHOLE
- – EXISTING STORM FLOW DIRECTION
- SAN–MH – EXISTING SANITARY MANHOLE
- – EXISTING SANITARY FLOW DIRECTION
- HYD – EXISTING HYDRANT
- WV – EXISTING WATER VALVE
- – EXISTING WATERMAIN
- – EXISTING DECIDUOUS TREE REMAIN
- – EXISTING CONIFEROUS TREE TO REMAIN
- – TREE TO BE REMOVED
- MH ST – REMOVE EXISTING STORM, SANITARY SEWER AND WATERMAIN INCLUDING STRUCTURES AND FITTINGS.
- 364.00 – ORIGINAL GROUND CONTOUR
- 340.11 – ORIGINAL GROUND ELEVATION
- – EXISTING WOOD BOARD FENCE
- x – EXISTING CHAIN LINK FENCE
- – EXISTING OVERLAND FLOW ROUTE

True North

Construction North

LEGAL INFO
LEGAL PLAN PREPARED BY VAN HARTEN SURVEYING INC. PLAN OF SURVEY OF PART OF BLOCK A, REGISTERED PLAN 1313 AND PART OF LOT 7, GERMAN COMPANY TRACT, CITY OF WATERLOO, REGIONAL MUNICIPALITY OF WATERLOO

BENCHMARK INFO
ELEVATIONS ARE BASED ON GPS OBSERVATIONS FROM PERMANENT REFERENCE STATIONS IN THE NAD83 (CSRS-2010) COORDINATE SYSTEM, WITH HEIGHT CONVERTED TO ORTHOMETRIC ELEVATIONS ON THE CVGD28 DATUM (1978 ADJUSTMENT) WITH GEOID MODEL HTv2.0, AS SUPPLIED BY NATURAL RESOURCES CANADA.

SITE BENCHMARKS:
TBM #1: CUT CROSS IN CONCRETE SIDEWALK ALONG LEXINGTON ROAD, APPROX. 24.5m NORTH FROM THE NORTH-WEST CORNER OF THE SUBJECT PROPERTY, HAVING AN ELEVATION OF 340.43 METRES.

TBM #2: CUT CROSS IN CONCRETE SIDEWALK ALONG LEXINGTON ROAD , APPROX. 5m NORTH-WEST FROM THE NORTH-EAST CORNER OF THE SUBJECT PROPERTY, HAVING AN ELEVATION OF 338.60 METRES.

THIS PLAN TO BE READ IN CONJUNCTION WITH THE GRADING PLAN, SERVICING PLAN, DETAILS AND NOTES PLAN, TREE PRESERVATION PLAN, LANDSCAPE PLAN AND THE STORM WATER MANAGEMENT REPORT PREPARED BY IBI GROUP.

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5. NO CONSTRUCTION WORK TO BE UNDERTAKEN ON THE SUBJECT PROPERTY WITHOUT FINAL ENGINEERING ACCEPTANCE AND A BUILDING PERMIT ISSUED BY THE CITY.
6. PAVEMENT DESIGN AS PER GEOTECHNICAL REPORT.
7. ALL WORK TO BE DONE IN ACCORDANCE WITH STANDARDS AND SPECIFICATION OF THE REGION OF PEEL, CITY OF BRAMPTON AND OPSD EXCEPT WHICHEVER ARE MORE STRINGENT.
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11. THE ENGINEERING ACCEPTANCE OF THIS PLAN DOES NOT EXEMPT THE OWNER'S BONDED CONTRACTOR FROM THE REQUIREMENTS TO OBTAIN THE VARIOUS PERMITS AND ADDITIONAL APPROVALS REQUIRED TO COMPLETE CONSTRUCTION PROJECT.

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PROJECT

215 LEXINGTON DRIVE
RETIREMENT RESIDENCE

CITY OF WATERLOO

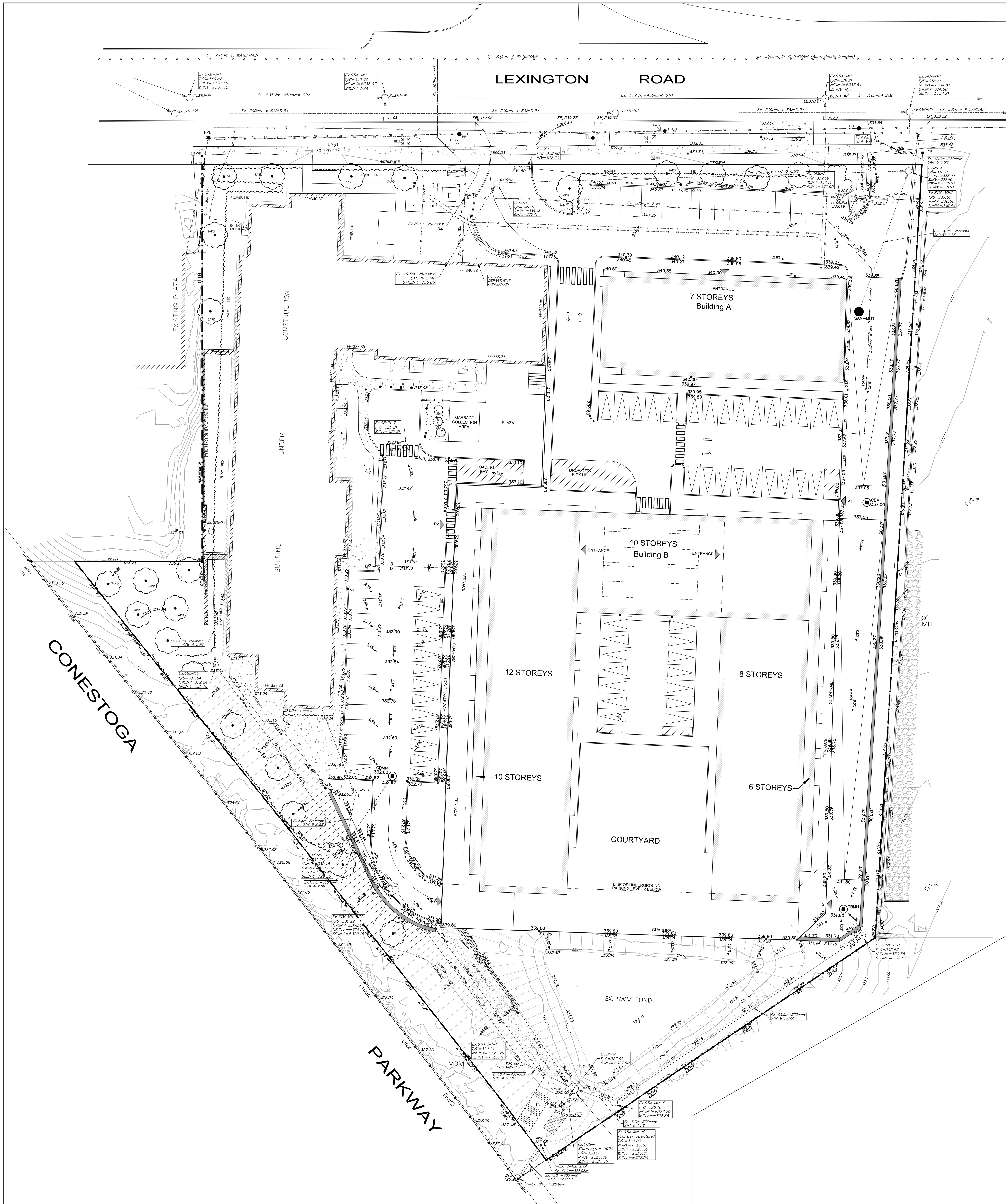
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EXISTING CONDITION AND REMOVAL PLAN

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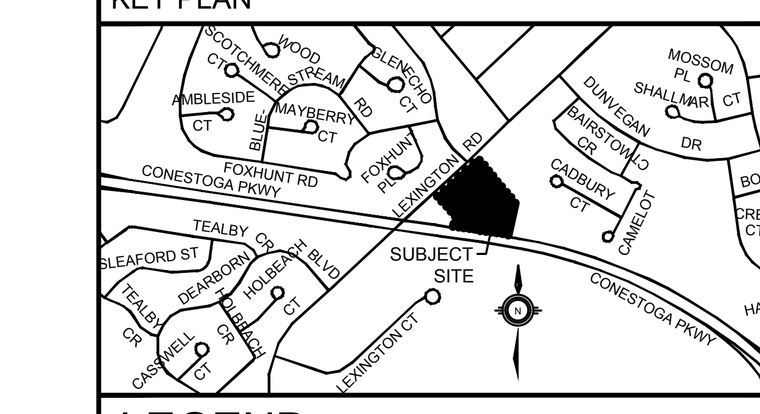
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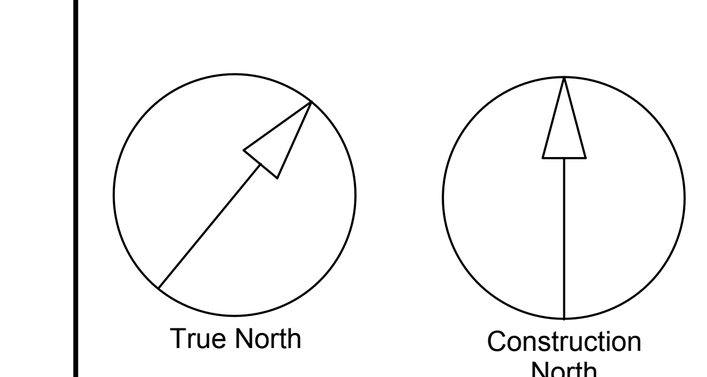
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KEY PLAN



LEGEND

- ×346.00 – PROPOSED GRADE ELEVATION
- ×156.41 – EXISTING GRADE ELEVATION
- 2.0% – PROPOSED SLOPE
- D/D – DRAINAGE DIVIDE
- – PROPOSED STORM MANHOLE
- CB – EXISTING CATCH BASIN
- ST-MH – EXISTING STORM MANHOLE
- CBMH – EXISTING CB MANHOLE
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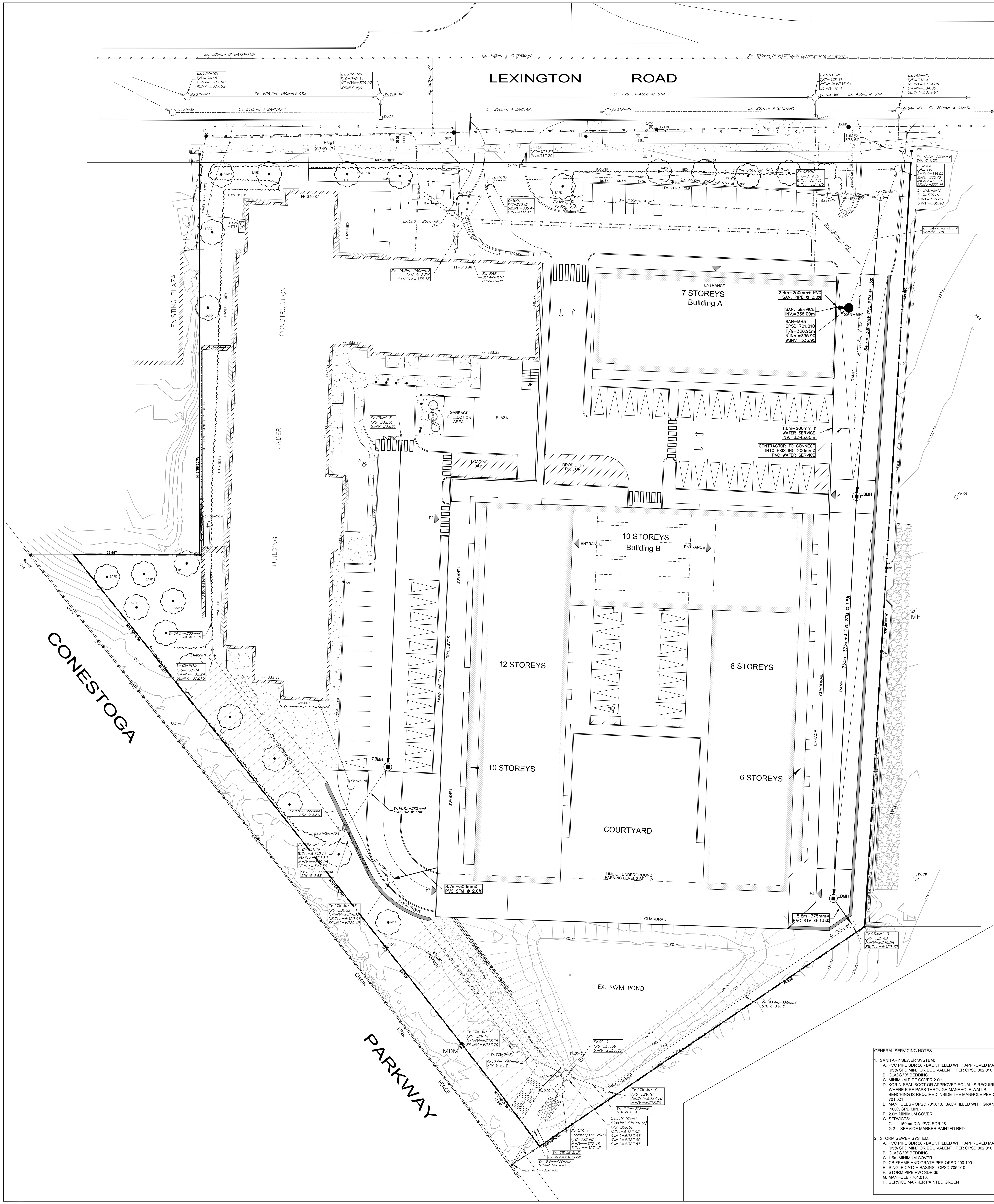
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PROJECT MGR: D. GALBRAITH	APPROVED BY: J. ARCESE

SHEET TITLE
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SITE GRADING PLAN

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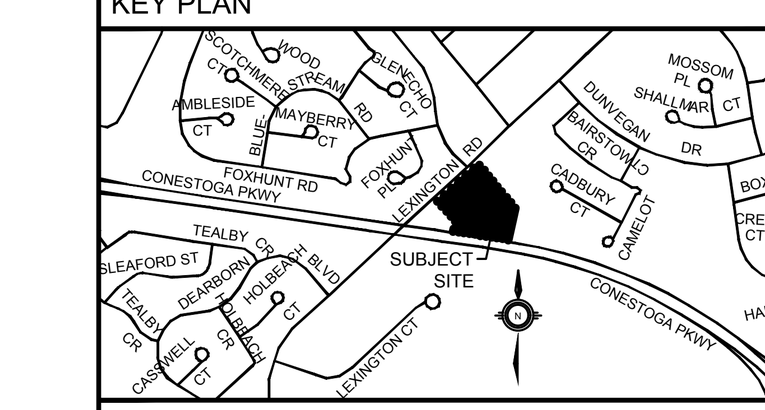
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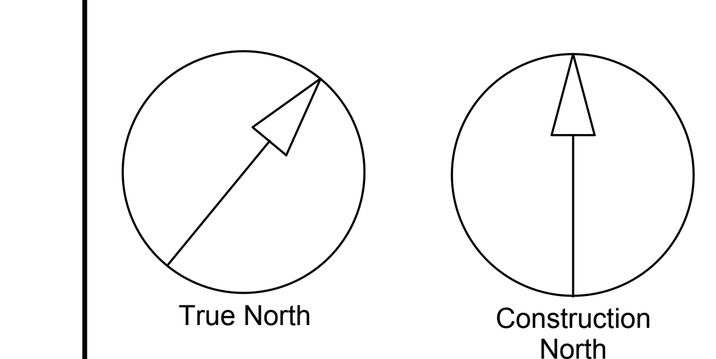
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CONSTRUCTION NOTES

1. CONTRACTOR IS REQUIRED TO REFER THE APPROVED VEGETATION MANAGEMENT PLAN WITH RESPECT TO THE INFORMATION FOR TREE REMOVAL / TREE PROTECTION.
2. EXISTING CONCRETE SIDEWALK TO REMAIN UNTIL ALL CONSTRUCTION WORKS HAVE FINISHED.
3. CONCRETE WORKS (CURB AND GUTTER, SIDEWALKS) OF PAVING WILL NOT BE PERMITTED AFTER NOVEMBER 30th OF EACH YEAR UNLESS SPECIFICALLY APPROVED IN WRITING BY THE DIRECTOR OF ENGINEERING SERVICES.
4. ALL MUNICIPAL DRAIN INLETS, ON SITE CB AND MH's (UPON COMPLETION OF SERVICING), OR ANY OTHER CB INLETS IN THE AREA OF THE SITE AND ON HAUL ROUTES MUST BE PROTECTED WITH FILTER FABRIC, OR EQUIVALENT BARRIERS MEETING CRITERIA, STANDARDS AND SPECIFICATIONS ACCEPTABLE BY THE ENGINEERING AND CONSTRUCTION DIVISION.
5. NO CONSTRUCTION WORK TO BE UNDERTAKEN ON THE SUBJECT PROPERTY WITHOUT FINAL ENGINEERING ACCEPTANCE AND A BUILDING PERMIT ISSUED BY THE CITY.
6. PAVEMENT DESIGN AS PER GEOTECHNICAL REPORT.
7. ALL WORK TO BE DONE IN ACCORDANCE WITH STANDARDS AND SPECIFICATION OF THE REGION OF PEEL, CITY OF BRAMPTON AND OPSD EXCEPT WHICHEVER ARE MORE STRINGENT.
8. NEW CURBS AND SOD TO BE REINSTATED AS REQUIRED. ANY AREAS IN RIGHT OF WAY DISTURBED THROUGH CONSTRUCTION TO BE REPLACED AT THE DEVELOPERS COST.
9. CITY OF BRAMPTON ENGINEERING DEPARTMENT MUST BE NOTIFIED OF ANY SIGNIFICANT CHANGES TO THE APPROVED DESIGN THAT MAY OCCUR DURING CONSTRUCTION
10. CONTRACTOR IS RESPONSIBLE FOR RESTORING ALL AFFECTED PROPERTY TO ORIGINAL CONDITION, AT THE OWNER'S EXPENSE.
11. THE ENGINEERING ACCEPTANCE OF THIS PLAN DOES NOT EXEMPT THE OWNER'S BONDED CONTRACTOR FROM THE REQUIREMENTS TO OBTAIN THE VARIOUS PERMITS AND ADDITIONAL APPROVALS REQUIRED TO COMPLETE CONSTRUCTION PROJECT.

LEGAL INFO

LEGAL PLAN PREPARED BY VAN HARTEN SURVEYING INC. PLAN OF SURVEY OF PART OF BLOCK A, REGISTERED PLAN 1313 AND PART OF LOT 7, GERMAN COMPANY TRACT, CITY OF WATERLOO, REGIONAL MUNICIPALITY OF WATERLOO

BENCHMARK INFO

ELEVATIONS ARE BASED ON GPS OBSERVATIONS FROM PERMANENT REFERENCE STATIONS IN THE NAD83 (CSRS-2010) COORDINATE SYSTEM, WITH HEIGHT CONVERTED TO ORTHOMETRIC ELEVATIONS ON THE CVGD28 DATUM (1978 ADJUSTMENT) WITH GEOID MODEL HTv2.0, AS SUPPLIED BY NATURAL RESOURCES CANADA.

SITE BENCHMARKS:

TBM #1: CUT CROSS IN CONCRETE SIDEWALK ALONG LEXINGTON ROAD, APPROX. 24.5m NORTH FROM THE NORTH-WEST CORNER OF THE SUBJECT PROPERTY, HAVING AN ELEVATION OF 340.43 METRES.

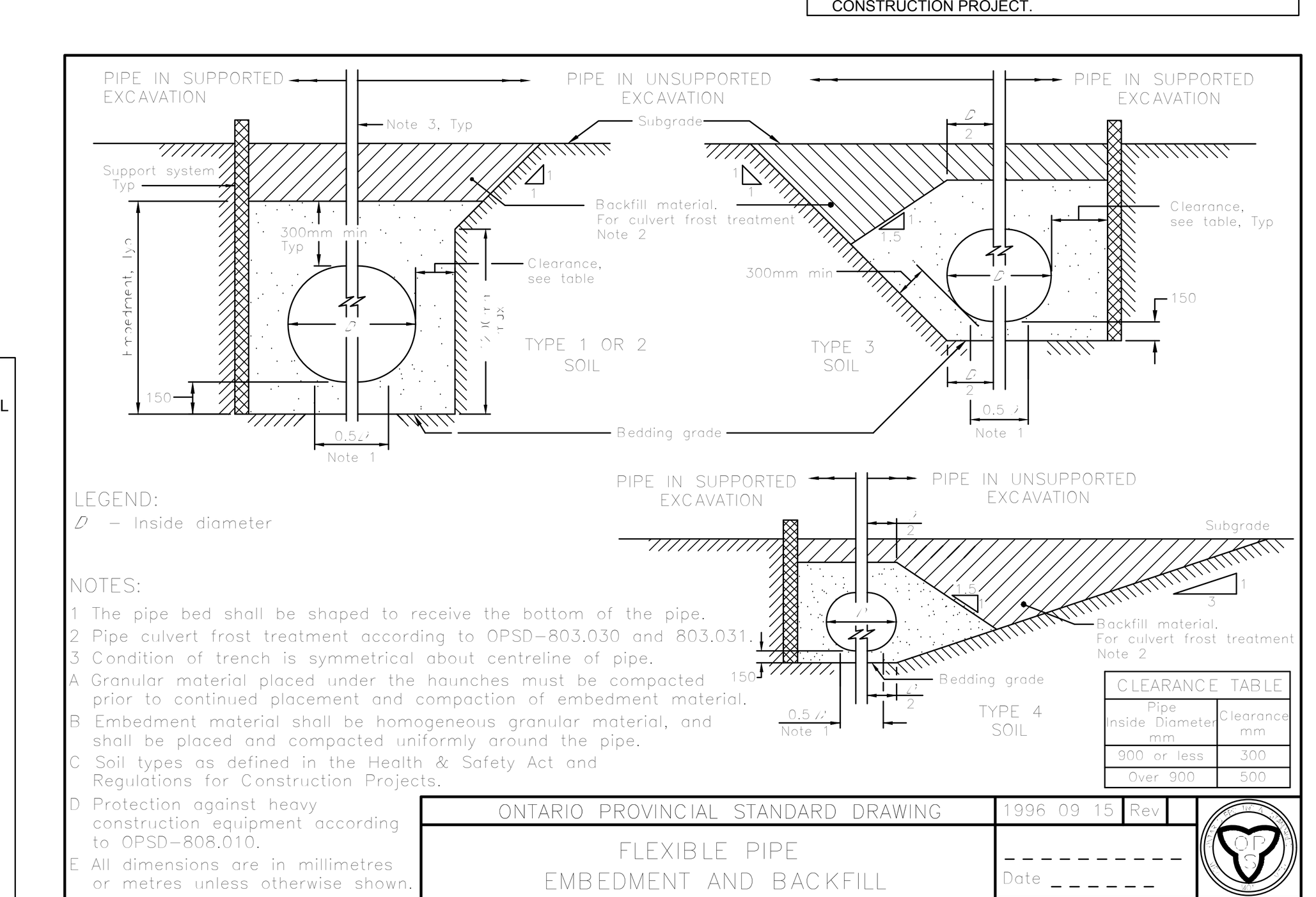
TBM #2: CUT CROSS IN CONCRETE SIDEWALK ALONG LEXINGTON ROAD , APPROX. 5m NORTH-WEST FROM THE NORTH-EAST CORNER OF THE SUBJECT PROPERTY, HAVING AN ELEVATION OF 338.60 METRES.

THIS PLAN TO BE READ IN CONJUNCTION WITH THE GRADING PLAN, SERVICING PLAN, DETAILS AND NOTES PLAN, TREE PRESERVATION PLAN, LANDSCAPE PLAN AND THE STORM WATER MANAGEMENT REPORT PREPARED BY IBI GROUP.

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND ABOVEGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM.

GENERAL SERVICING NOTES

1. SANITARY SEWER SYSTEM:
   A. PVC PIPE SDR 28 - BACK FILLED WITH APPROVED MATERIAL (95% SPD MIN.) OR EQUIVALENT. PER OPSD 802.010
   B. CLASS "B" BEDDING
   C. MINIMUM PIPE COVER 2.0m.
   D. KOR-N-SEAL BOOT OR APPROVED EQUAL IS REQUIRED WHERE PIPE PASS THROUGH MANEHOLE WALLS. BENCHING IS REQUIRED INSIDE THE MANHOLE PER OPSD 701.021.
   E. MANHOLES - OPSD 701.010, BACKFILLED WITH GRAN. 'B' (100% SPD MIN.)
   F. 2.0m MINIMUM COVER.
   G. SERVICES:
      G.1. 150mmDIA PVC SDR 28
      G.2. SERVICE MARKER PAINTED RED
2. STORM SEWER SYSTEM:
   A. PVC PIPE SDR 28 - BACK FILLED WITH APPROVED MATERIAL (95% SPD MIN.) OR EQUIVALENT. PER OPSD 802.010
   B. CLASS "B" BEDDING.
   C. 1.5m MINIMUM COVER.
   D. CB FRAME AND GRATE PER OPSD 400.100.
   E. SINGLE CATCH BASINS - OPSD 705.010.
   F. STORM PIPE PVC SDR 35
   G. MANHOLE - 701.010.
   H. SERVICE MARKER PAINTED GREEN
5. WATERMAIN SYSTEM:
   A. PVC PIPE SDR 28 - BACK FILLED WITH APPROVED MATERIAL (95% SPD MIN.) OR EQUIVALENT. PER OPSD 802.010
   B. CLASS "B" BEDDING.
   C. 150mmØ (IPEX-BLUE BRUTE B1373) DR18 PVC PIPE
   D. 2.0m MINIMUM COVER.
   E. MIN. VERTICAL CLEARANCE BETWEEN WATER MAIN AND OTHER SERVICES = 0.5m.
   F. MIN. HORIZ. CLEARANCE BETWEEN WATER MAIN AND OTHER SERVICES = 2.5m.
   G. HYDRANTS ON WATER MAINS LESS THAN 300mm, 2-65mm NOZZLES, 150mm MECHANICAL JOINT INLET.
   H. FIRE HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH OPSD 1105.010
      H.1. <300mm DIAMETER, HYDRANT SHALL HAVE 1-100M DIAMETER NOZZLE WITH STORZ CONNECTION, 2-65mm DIAMETER NOZZLES, AND 150mm MECHANICAL JOINT OUTLET
      H.2. DRAIN PLUGS SHALL BE UNPLUGGED.
   I. SERVICE MARKER PAINTED BLUE
   J. 8 GAUGE TRACER WIRE TO BE INSTALLED ALONG THE LENGTH OF THE WATER SERVICE
   K. ALL NEW PRIVATE FIRE SERVICE MAINS TO BE TESTED HYDROSTATICALLY AT NOT LESS THAN 200psi PRESSURE FOR TWO HOURS PER BUILDING CODE.
   L. CONCRETE THRUST BLOCK TO BE INSTALLED ON ALL BENDS.
   M. EXISTING SERVICES TO BE REMOVED AND CAPPED AT MAIN.



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Waterloo ON N2L 3V3 Canada
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PROJECT

215 LEXINGTON DRIVE RETIREMENT RESIDENCE

CITY OF WATERLOO

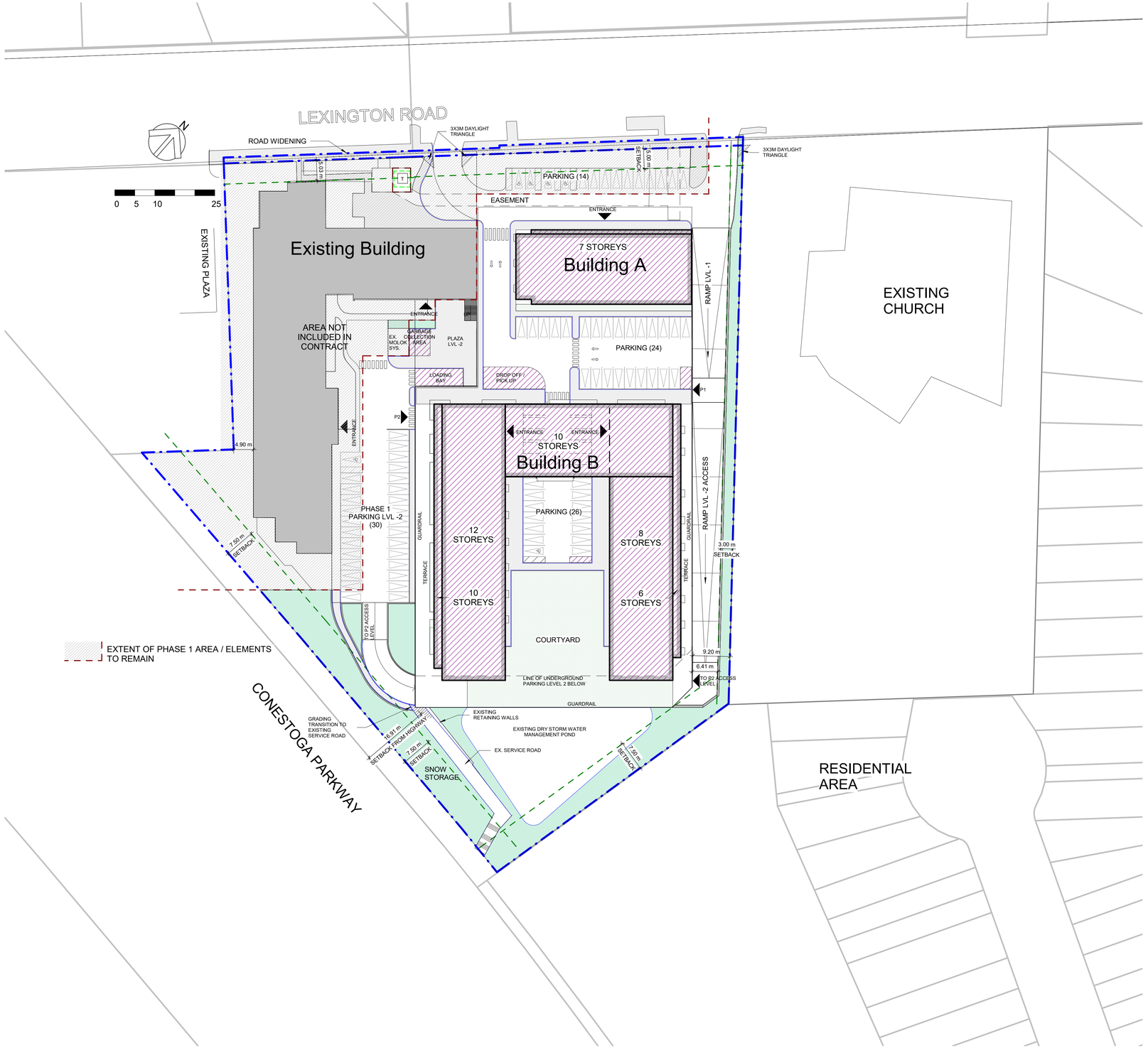
PROJECT NO: 133176	SCALE: 1:250
DRAWN BY: E. CERIC	CHECKED BY: E. CERIC
PROJECT MGR: D. GALBRAITH	APPROVED BY: J. ARCESE

SHEET TITLE

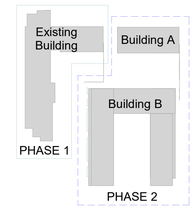
FUNCTIONAL SITE SERVICING PLAN

SHEET NUMBER	ISSUE
04	1

SCALE CHECK



1 SITE PLAN
A-1002 Scale: 1 : 500



UNITS		
Name	Count	Bedrooms
1B	167	167
1B+D	122	122
2B	164	328
Total	453	617

UNITS BY BUILDING		
Name	Count	Bedrooms
BUILDING A		
1B	18	18
1B+D	19	19
2B	34	68
	71	105
BUILDING B		
1B	149	149
1B+D	103	103
2B	130	260
	382	512
Grand total	453	617

PARKING SCHEDULE	
Level	Count
P2	251
P1	236
LEVEL 01	64
TOTAL	551

DETAILS OF DEVELOPMENT
215 Lexington Rd. Waterloo

PROVISION		REQUIRED	PROVIDED
ZONING		Residential Mixed-Use 'RMU-20'	
GROSS LOT AREA (m²)		19,255.4m² (1.925 ha)	
ROAD WIDENING (m²)		209.10m² (0.021 ha)	
NET LOT AREA (m²)		19,046.3 (1.904 ha)	
SETBACKS	Front Yard (m)	5.0	5.0
	Rear Yard (m)	7.5	7.5
	East Ext. Side Yard (m)	3.0	9.2
	West Ext. Side Yard (m)	3.0	4.9
DENSITY	G.F.A.	-	33,966.1m²
	450 bedrooms per ha. Phase 1: 216 Units-248 Beds Phase 2: 453 Units-617 Beds	866 beds	865 beds
BUILDING AREA (m²) (Including existing building, no additional structures)		-	PHASE 2 3,748.75m2 PHASE 1 EX.BLDG 2,359.7m2
BUILDING COVERAGE(%) (Including existing building, no additional structures)		-	PHASE 2 20% PHASE 1 EX. BLDG 12%
NUMBER OF STOREYS		6	12
BUILDING HEIGHT (m)		20.0m	40.0m MEASURED AT THE FRONT OF BUILDING A
RES. UNITS TOTAL		-	453
PARKING	PHASE 1 EX. BLDG	Assisted Living: 1 space per 3 units = 56 Stalls Seniors Apartments: 0.7 space per unit = 35 Stalls Total: 91 Stalls	Assisted Living: 1 space per 3 units = 56 Stalls Seniors Apartments: 1.0 space per 3 units = 17 Stalls Total: 73 Stalls
	PHASE 2 NEW BLDG	Resident: 1.15 space per unit = 521 Stalls Visitor: 0.10 space per unit = 46 Stalls Total: 567 Stalls	Resident: 1.0 space per unit = 453 Stalls Visitor: 0.05 space per unit = 25 Stalls Total: 478 Stalls
	TOTAL	658	551
B.F. PARKING (Included)		*14 (7 Type A-7 Type B)	14 (7 Type A-7 Type B)
*B.F. Spaces required based on the proposed site-specific parking rates			
BICYCLE STR	TOTAL	332	332
	TYPE A	166	283
	TYPE B*	166	49
	Req. 0.3 of each type per total number of parking.		
*Type B can substituted by Type A provision.			
LANDSCAPE AREA (m²)		5,711.19m2	6,953.88m2
LANDSCAPE AREA (%)		30%	36%
AMENITY AREA (m²)		PHASE 2 1,687 m2 COMMON AMENITIES REQ.* 506.1m2 PHASE 1 EX. BLDG 712m2	PHASE 2 3,021 m2 COMMON AMENITIES 655.3m2 BALCONIES 2,146 m2 PHASE1 EX. BLDG 2,120m2
*30% of required Amenity Area shall be common amenities			

CLIENT

Hygate Living

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

ISSUES

NO.	ISSUANCE	STATUS	DATE
3	ISSUED FOR OPA		05/31/22
2	ISSUED FOR COORDINATION		06/05/22
1	ISSUED FOR COSTING		29/04/22

SEAL

SUB CONSULTANT

PRIME CONSULTANT

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PROJECT
215 Lexington Rd, Waterloo

PROJECT NO:	133176
DRAWN BY:	JCM/AH
CHKD' BY:	RG
SCALE:	As indicated
DATE:	28/04/2022

SHEET TITLE
Proposed Site Plan

SHEET NUMBER
A-1002

APPENDIX B: Sanitary Calculations

POST-DEVELOPMENT SANITARY DESIGN SHEET

215 Lexington Road
CITY OF WATERLOO

DATE: June 19, 2022

FILE: 133176
DESIGN: D.Pham
CHECK: JA

LOCATION			Population and Area					CUMULATIVE						SEWER DATA					
Street	From MH	To MH	Apartment 1.76 ppu	Single 3.3 ppu	C3-20 450 bd/ha	Representative Population	Area (ha.)	Representative Population	Area (ha)	Avg. Flow (l/s)	Peaking Factor	Infiltr. (l/s)	Peak Flow (l/s)	Pipe dia. (mm)	Slope (%)	Cap. (l/s)	Vel. (m/s)	Avail. Cap. (l/s)	Percent Full (%)
Upstream Contribution																			
External 1	EX. SAN-MH	EX. SAN-MH	0	15	0	50	2.132	50	2.13	0.20	4.32	0.5	1.4	200	0.99	34.1	1.05	32.7	4.11%
External 2	EX. SAN-MH	EX. SAN-MH	0	0	0.403	181	0.565		0.57	0.24	4.50	0.1	1.2	200	1.07	35.3	1.09	34.1	3.40%
Lexington Road	EX. SAN-MH	EX. SAN-MH	0	0	0	0	0.137		2.83	0.44	4.50	0.7	2.7	200	2.49	53.8	1.66	51.1	5.02%
215 Lexington Site Development	Ex. Stub	EX. MH1A	216	0	0	380	0.736	380	0.74	1.54	4.03	0.2	6.4	200	2.50	54.2	1.67	47.8	11.81%
(Phase 1 Existing Building)	EX. MH1A	EX. MH2A	0	0	0	0	0.000	380	0.00	1.54	4.03	0.0	6.2	250	0.50	44.1	0.87	37.9	14.06%
215 Lexington Site Development	SAN-MH1	EX. MH2A	524	0	0	922	1.263	922	1.26	3.74	3.82	0.3	14.6	200	2.00	48.3	1.49	33.7	30.23%
(Proposed Building A + B)	EX. MH2A	EX. SAN-MH	0	0	0	0	0.000	1302	2.00	5.27	3.72	0.5	20.1	200	1.00	34.4	1.06	14.3	58.43%
Lexington Road (downstream)	EX. SAN-MH	EX. SAN-MH	0	0	0	0	0	1352	4.83	5.72	3.71	1.2	22.4	200	2.65	55.8	1.72	33.4	40.14%

Reference: MOE Sewer Design Guidelines

AVERAGE FLOWS

Industrial - Flow =	0.5	L/s/ha
Commercial - Flow =	0.6	L/s/ha
Residential - Flow =	350	l/cap./day
=	0.00405	l/s/cap
Infiltration - Flow =	0.25	l/ha.sec.

PEAKING FACTORS

Harmon Peaking Factor, M = 1 + (14 / (4 + P^0.5))
where, P = population in thousands

PIPE CRITERIA

n=	*0.013*	PVC
Pipe Velocities:	*0.60*	m/s min.
	3.00	m/s max.

*Apartment density based on City of Waterloo Development Manual Sanitary Sewer Densities
*Existing Commercial Properties based on maximum density in City of Waterloo Zoning By-law

IBI

PRE-DEVELOPMENT SANITARY DESIGN SHEET

DATE: June 19, 2022

215 Lexington
CITY OF WATERLOO

FILE: 133176
DESIGN: D.Pham
CHECK: JA

LOCATION			Population and Area					CUMULATIVE						SEWER DATA					
Street	From MH	To MH	Apartment 1.76 ppu	Single 3.3 ppu	C3-20 450 bd/ha	Representative Population	Area (ha.)	Representative Population	Area (ha)	Avg. Flow (l/s)	Peaking Factor	Infiltr. (l/s)	Peak Flow (l/s)	Pipe dia. (mm)	Slope (%)	Cap. (l/s)	Vel. (m/s)	Avail. Cap. (l/s)	Percent Full (%)
Upstream Contribution																			
External 1	EX. SAN-MH	EX. SAN-MH	0	15	0	50	2.132	50	2.13	0.20	4.32	0.5	1.4	200	0.99	34.1	1.05	32.7	4.11%
External 2	EX. SAN-MH	EX. SAN-MH	0	0	0.403	181	0.565		0.57	0.24	4.50	0.1	1.2	200	1.07	35.3	1.09	34.1	3.40%
Lexington Road	EX. SAN-MH	EX. SAN-MH	0	0	0	0	0.137		2.83	0.44	4.50	0.7	2.7	200	2.49	53.8	1.66	51.1	5.02%
215 Lexington Site Development (Phase 1 Existing Building)	Ex. Stub	EX. MH1A	216	0	0	380	1.999	380	2.00	1.54	4.03	0.5	6.7	200	2.50	54.2	1.67	47.5	12.36%
	EX. MH1A	EX. MH2A	0	0	0	0	0.000	380	2.00	1.54	4.03	0.5	6.7	250	0.50	44.1	0.87	37.4	15.19%
	EX. MH2A	EX. SAN-MH	0	0	0	0	0.000	380	2.00	1.54	4.03	0.5	6.7	200	1.00	34.4	1.06	27.7	19.48%
Lexington Road	EX. SAN-MH	EX. SAN-MH	0	0	0	0	1.039	430	5.87	1.98	4.01	1.5	9.4	200	2.65	55.8	1.72	46.4	16.85%

Reference: MOE Sewer Design Guidelines

AVERAGE FLOWS

Industrial - Flow =	0.5	L/s/ha
Commercial - Flow =	0.6	L/s/ha
Residential - Flow =	350	l/cap./day
=	0.00405	l/s/cap
Infiltration - Flow =	0.25	l/ha.sec.

PEAKING FACTORS

Harmon Peaking Factor, M = 1 + (14 / (4 + P^0.5))
where, P = population in thousands

PIPE CRITERIA

n=	*0.013*	PVC
Pipe Velocities:	*0.60*	m/s min.
	3.00	m/s max.

*Apartment density based on City of Waterloo Development Manual Sanitary Sewer Densities
*Existing Commercial Properties based on maximum density in City of Waterloo Zoning By-law

APPENDIX C: Water Demand and Fire Flow Calculations

215 Lexington - Building A
City of Waterloo
DOMESTIC WATER DEMAND

File No: 133176
Date: 01-31-2022
Sheet By: DP
Checked By: JA

Proposed Residential Apartment	Population Density[1]	Units	Equivalent Population (persons)	Water Demand[1] @ 225 L/p/day (L/day)
Building A	1.77 PPU	71	126	34,020
Building B	1.77 PPU	453	802	216,540
	Total	**524**	**928**	**250,560**

	Peaking Factor[1]	Total Flow
Average day (L/day)	0.4	100,224
Average day (L/s)	0.4	1.16
Maximum day (L/day)	2.75	275,616
Maximum day (L/s)	2.75	3.19
Peak hour (L/hr)	4.13	17,247
Peak hour (L/s)	4.13	4.79

1 - Region of Waterloo - Planning Department
2 - MECP-Design Guidelines for Drinking-Water Systems

City of Waterloo
Fire Flow Review

Project: 215 Lexington
File No: 133176
Date: 2022-06-17
Sheet By: DP
Checked By: JA

Required Fire Flow

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

	Multi-Unit Residential Dwelling		
	Building A	**Building B**	
Assumptions	Fire resistive Construction	Fire resistive Construction	
Largest Area	769.0	2895.8	m^2
Adjacent above	769.0	2895.8	m^2
Adjacent below	769.0	2895.8	m^2
Shared Walls	0	0	ea.
North Separation*	*9999	25.0	m
North Adjustment	**0%**	**10%**	
East Separation*	29.0	*9999	m
East Adjustment	**10%**	**0%**	
South Separation*	25.0	*9999	m
South Adjustment	**10%**	**0%**	
West Separation*	9.8	23.9	m
West Adjustment	**20%**	**10%**	
Occupancy Fire Hazard Adjustment	-15%	-15%	(Limited Combustable)
A =	1153.5	4343.7	m^2 - See notes
C =	0.6	0.6	(Fire-resistive construction)
F =	**4,483.14**	**8699.69**	L/min
Rounded F =	**4,000**	**9,000**	L/min
Adjustmented due to Occupancy Fire Hazard F =	**3,400**	**7,650**	
Interior Firewall Adjustment	**0.00**	**0.00**	(15% per unpeirced party wall)
Exposure Adjustment	**1,360**	**1530**	(see Separation Table)
Sprinkler Adjustment	**-1,700.00**	**-3,825.00**	(50% reduction, Complete automatic sprinkler system)
Adjusted F =	3,000.0	5,000.0	L/min
Required Fire Flow =	**50.0**	**83.3**	**L/s**
MIN REQUIRED FLOW =	**50.0**	**83.3**	**L/s**
(@20psi theoretical)	**792.52**	**1321**	**gal(US)/min**

Notes:

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

2 *9999 denotes nearest building > 45m away,

3 Assumptions based on preliminary floor plans prepared by architect, to be confirmed with architect and client at a later date.

4 Assuming vertical openings and vertical communications are fully protected

Separation Table

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

Hydrant Flow Test
215 Lexington Rd
Waterloo, ON

WO# 37228

C&H FIRE SUPPRESSION SYSTEMS INC.

Static Hydrant at Lexington Rd and Davenport Rd.
Flow Hydrant at Lexington Rd and Anndale Rd.

Static Pressure	58 PSI
Residual Pressure (1)	54 PSI
Residual Pressure (2)	
Residual Pressure (3)	

Co efficient value	0.9

Pitot Reading (1)	46 PSI
Outlet Size (1)	2.5 inches
Pitot Reading (2)	
Outlet Size (2)	
Pitot Reading (3)	
Outlet Size (3)	
Flow 1 Calculated	1138 USGPM
Flow 2 Calculated	0 USGPM
Flow 3 Calculated	0 USGPM

# of Outlets Flowed (1)	1
# of Outlets Flowed (2)	0
# of Outlets Flowed (3)	0

Graph Data:

Pressure Values (y-axis)	Flow Values (x-axis)
58	0
54	1138

Time of Test :	12:00 PM
03-May-19	
Performed by:	A.T.

Water Graph

