

Functional Servicing Report

Proposed Residential Development

**97 Gorham Road
Fort Erie
Ontario**

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97 Gorham Road

Functional Servicing Report

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1.0 Introduction

This functional servicing report (FSR) serves to demonstrate how servicing of the subject development can be appropriately achieved and to provide a basis for detailed engineering. It also evaluates how the proposed development will impact the Town and Region's existing infrastructure capacity. This FSR will discuss the following key aspects of municipal design:

- Water Supply and Distribution
- Sanitary Sewerage
- Drainage and Stormwater Management
- Parking and Roadway
- Utility Servicing
- Servicing Locations

2.0 Background

This proposal contemplates the re-development of the subject property as two 4-storey buildings containing a total of 72 rental apartment units, and associated parking from the currently 10 apartment units on the 0.65ha property at 97 Gorham Road. The property currently has frontage along the west side of Gorham Road, in Crystal Beach, Fort Erie.

The property is bounded by a residential R1 zone on the north side, an agricultural A1 Zone on the west side, a highway commercial C3 zone on the south side, and a municipal road allowance Gorham Road to the east. The development proposal is to convert the current Residential Multiple 1 RM1 Zone into a Residential Multiple 2 RM2 Zone. The full build-out proposes a total combined property area of 0.65 hectares.

A conceptual site servicing plan, CS-1, is shown in *Appendix A*. An aerial map showing the subject property with existing utilities is found in Figure 1.

Town of Fort Erie



Figure 1. Aerial Map of Development Site with Existing Utilities

3.0 Water Supply and Distribution

Based on Region-provided information, the existing municipal water distribution system around the site consists of a 300 mm diameter PVC watermain on the east side of the Gorham Road right-of-way. An existing 50mm service connection from Gorham Road is located at the east entrance to the site close to the property line. A new 200mm line is proposed to replace the existing 50mm lateral at this connection.

The population projection and water demand for the development site are summarized in Table 1.

Dwelling Units	Population	Average Day Demand (L/s)	Maximum Day Demand (L/s)	Peak Hour Demand (L/s)
72	216	0.75	1.43	2.15

Design Criteria:

Residential Average Day Demand: 320 Lpcd

Maximum Day Demand: 570 Lpcd

Peak Hour Demand: 860 Lpcd

The average day demand, maximum day demand and peak hour demand are based on the Town's Subdivision Control Guideline 2018.

The Town of Fort Erie's water system is supplied by Rosehill water treatment plant. There is one single pressure zone of 241 in the water system. The proposed finished floor elevation for the two buildings are 193.93 and 194.29. The hydrant flow test results from 2007 shows a static pressure of 65 psi at 120 Gorham Road and 63 psi at southwest corner of Farr Avenue and Ridgeway Road. A hydraulic model is built with these boundary conditions to size the pipe and evaluate impact to the Town's existing infrastructure capacity using Bentley WaterCAD V8i.

Steady state analysis was performed under four scenarios:

- Average day demand
- Maximum day demand
- Peak hour demand
- Maximum day demand + fire flow

Based on the modeling results, the available pressure at the connection under different scenarios is summarized in Table 2.

Existing 300mm Main @ connection Available Pressure	ADD (kPa)	MDD (kPa)	PHD (kPa)	MDD+FF* (kPa)
	466.1	466.1	466.0	451.2

*Residual pressure with 150 L/s fire flow requirement

Initial Estimate of Required Fire Flow:

Formula: $F = 220 * C * \text{SQRT}(A)$

F = the required fire flow in litres per minute

C = coefficient related to the type of construction

= 1.5 for wood frame construction (structure essentially all combustible)

= 1.0 for ordinary construction (brick or other masonry walls, combustible floor and interior)
= 0.8 for non-combustible construction (unprotected metal structural components, masonry or metal walls)
= 0.6 for fire resistive construction (fully protected frame, floor, roof)
A = the total floor area in square metres (incl all storeys but not basements at least 50% below grade)
* for fire resistive buildings, consider the two (2) largest adjoining floors plus 50% of each of any floors immediately above them up to eight (8), when the vertical openings are inadequately protected. If the vertical openings and exterior vertical communications are properly protected (one hour rating), consider only the area of the largest floor plus 25% of each of the two (2) immediately adjoining floors.

In order to determine the total Design Water Demand, Fire Flow Demand has been estimated as per the Fire Underwriters Survey. It has been assumed that the buildings will be constructed with limited combustible materials and a sprinkler system. The Required Fire Flow Demand has been estimated to be 152.0 L/s for the north building and 128.0 L/s for the south building.

Two existing hydrants around the development site are at:

- Hydrant in front of 120 Gorham Road
- Hydrant on South-west corner of Farr Ave./Ridgeway Rd.

The two fire hydrants together cannot provide 90m coverage for the two buildings as shown in Figure 2. A new fire hydrant is proposed for this development. The hydraulic model shows that the available fire flow at the site is greater than 300 L/s with a minimum residual pressure of 140 kPa.

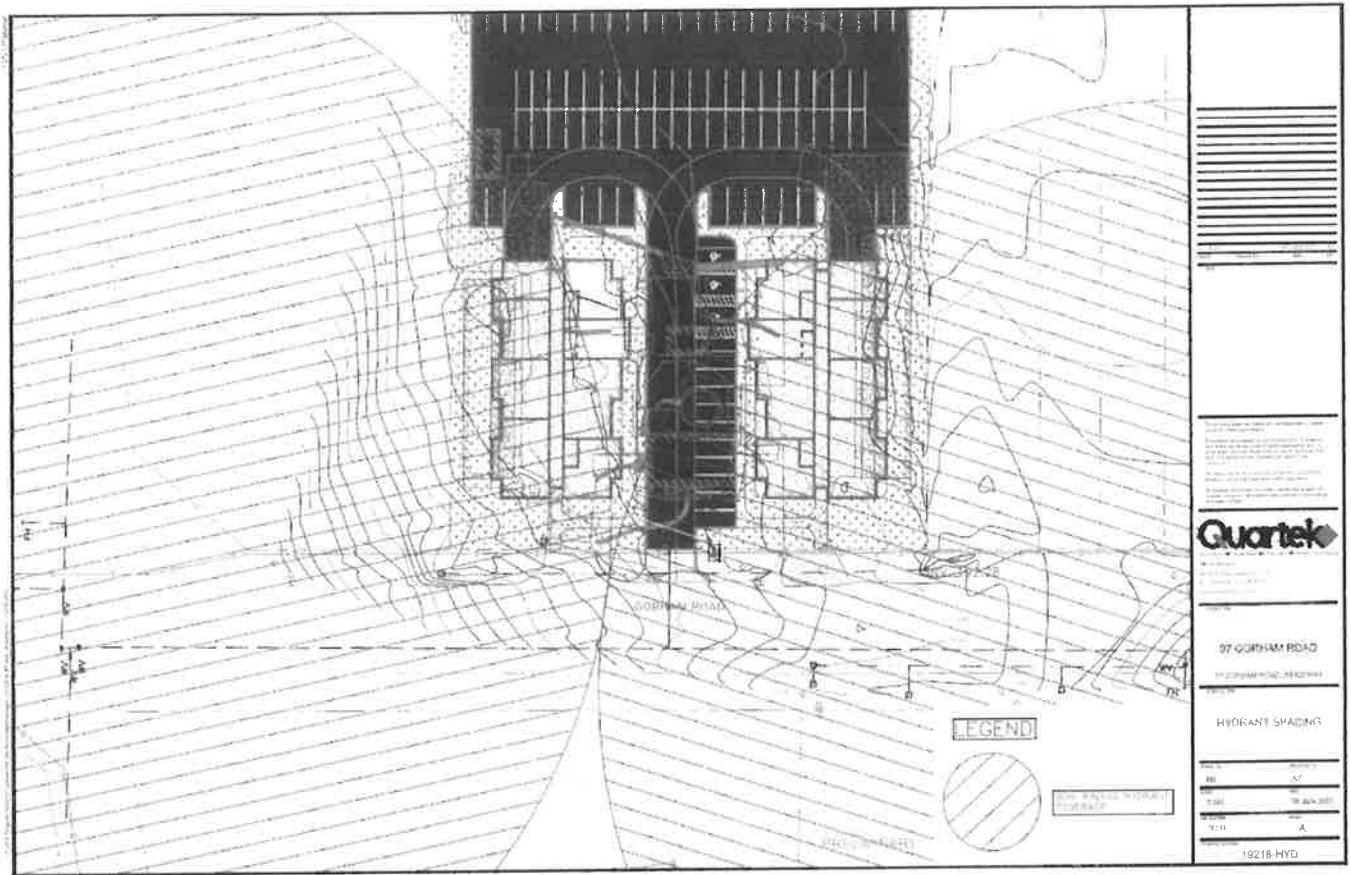


Figure 2.0 Fire Hydrant Coverage

The impact to the existing water distribution system performance caused by the new development under three scenarios are summarized in Table 3.

Table 3 Evaluation of the Impact to the Existing System Performance

Existing 300mm Main Pressure drop	ADD (kPa)	MDD (kPa)	PHD (kPa)
	0.2	0.2	0.1

4.0 Sanitary Sewerage

There is a 200mm asbestos cement sanitary sewer on Gorham Road around the development site. Town's record drawings show the site was serviced through a 125mm lateral connection. Sanitary flows will be collected from each building through 200mm diameter PVC service laterals and conveyed to a new manhole installed on the Gorham Road road allowance on the existing 200mm sewer main. The Gorham Road sewer will flow north to Nigh Road Pumping Station by gravity.

Key design data for sanitary sewage servicing is as follows:

Table 3 Sanitary Design Parameters

No. of Residence Units	72
Total Design Population	216 persons
Peaking Factor	Babbitt Equation
Mean sewage flow	320 L/cap/day
Sewage shed area (total)	0.65 ha
Manning's 'n'	0.013
Infiltration Rate	0.28 L/ha•s

Average Sewage flow from each building: $320 \times (216/2) / (24 \times 3600) = 0.4 \text{ L/s}$

Peaking Factor: $5 / (108/1000)^{0.2} = 7.8 > 4.5$, so use 4.5

I/I flow: $0.28 \times 0.65 / 2 = 0.09$

Peak sewage flow: $0.4 \times 4.5 + 0.09 = 1.89 \text{ L/s}$

From the above, we estimate the peak sewage flow at 1.89 L/s for each new building and 3.78 L/s for the whole new development. The peak sewage flow for the existing 10 units is estimated at 0.68 L/s. so the new development will create an increase of peak sewage flow by 3.1 L/s. It is noted that capacity of the receiving sewer, 200mm diameter Asbestos Cement with a slope of 5.0% based on Quartek's survey, is 73.1 L/s. This additional flow represents 4.2% of the sewer's capacity (assuming uncharged operation).

The depth of the 200mm service connection and the 200mm sewer is around 3.3m.

We expect that there will be no impediments to sanitary sewer servicing for the development using currently existing municipal sewage works.

5.0 Drainage and Stormwater Management

The existing site topography features a general slope down from the southeast corner to the northwest corner. The elevation of the site varies from 194.88 to 191.48. The existing municipal servicing relevant to storm drainage is a 300mm CSP sewer line on the west side of Gorham road right of way. The existing site drainage is divided into two drainage areas: one small portion on the east side of the existing development drains to the 300mm storm sewer on Gorham Road while the majority of the site flows northwest to an existing natural swale. The Storm sewer on Gorham Road has an outfall just north of the property line into the roadside ditch then follows the natural swale on the north property boundary to the west.

In the pre-consultation meeting notes, Niagara Region has indicated that there are no requirements for flow control with respect to the regional infrastructure capacity. However, the stormwater management objectives are to try to attenuate the post-development peak release rate close to pre-development level as much as possible.

Minor system stormwater flows will be collected by new storm sewers in the driveway and parking lot and conveyed to a new outfall at the northwest corner into the existing swale. Flows in excess of the minor system will be temporarily stored on the surface of the parking lot and driveway prior to being discharged.

Design criteria

The stormwater management criteria used for the analysis of the site is as follows:

1. Post-development runoff generated from the site during the 1:5 year return storm events is to be attenuated close to the pre-development flow rates.
2. Water quality control is required prior to the discharge of runoff from the site.
3. Minor storm flows are to be temporarily stored on the surface of the parking lot prior to discharging.

The Town of Fort Erie’s design storm is used to size the quality and quantity control components of the stormwater management. The parameters are summarized in Table 4 below and are incorporated in our computerized modelling using MIDUSS.

Table 4: Design Storm Parameters

Storm Return Period	IDF Curve Parameters			Maximum intensity (mm/hr)	Total Depth (mm)
	a	b	c		
5 year	747.93	6.8	0.768	112.37	40.42
100 year	1083.55	6.618	0.735	178.64	69.63

**rainfall intensity, $I = a/(t+b)^c$, where t = time of concentration (min.)*

Ratio of time to peak = 0.4

Grading design is to direct minor storm runoff to the on-site collection points, provide on-site storage for excess 5-year storm runoff and direct major system runoff to Gorham Road right-of-way and perimeter of the property. Site grading will also take into consideration the following:

- The proposed grading will match all existing grade elevations along the property limit.
- Minimize disruption to existing municipal rights-of-way containing existing utilities and services;
- Promote drainage into the minor storm sewer system;
- Building floor level will be set to avoid building/property damage during all design storms;



Niagara Regional staff have indicated that stormwater runoff should be captured and treated to a Normal level of protection prior to discharge from the development site. One oil/grit separator will be installed to treat the water prior to leaving the site.

No regulated floodplains affect the subject site.

6.0 Parking and Roadways

Per attached site plan drawing, the intent is to construct a 7.6m wide driveway, consistent with Ontario Building Code requirements for fire route access, e.g. 12m centreline radius. Parking areas to be bounded by standard barrier curb only per OPSD 600.110.

7.0 Utility Servicing

Hydro, Gas, and Bell services are all located in the Gorham Road right-of-way. Preliminary conversations with Bell and Hydro suggest no impediment to servicing. Enbridge will require some additional review to determine if there are any issues.

8.0 Service Locations

Appendix A contains drawing 19218-SSG, a schematic representation of the approximate locations of existing services and possible locations for proposed services for the development.

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Project Designer

Functional Servicing Report

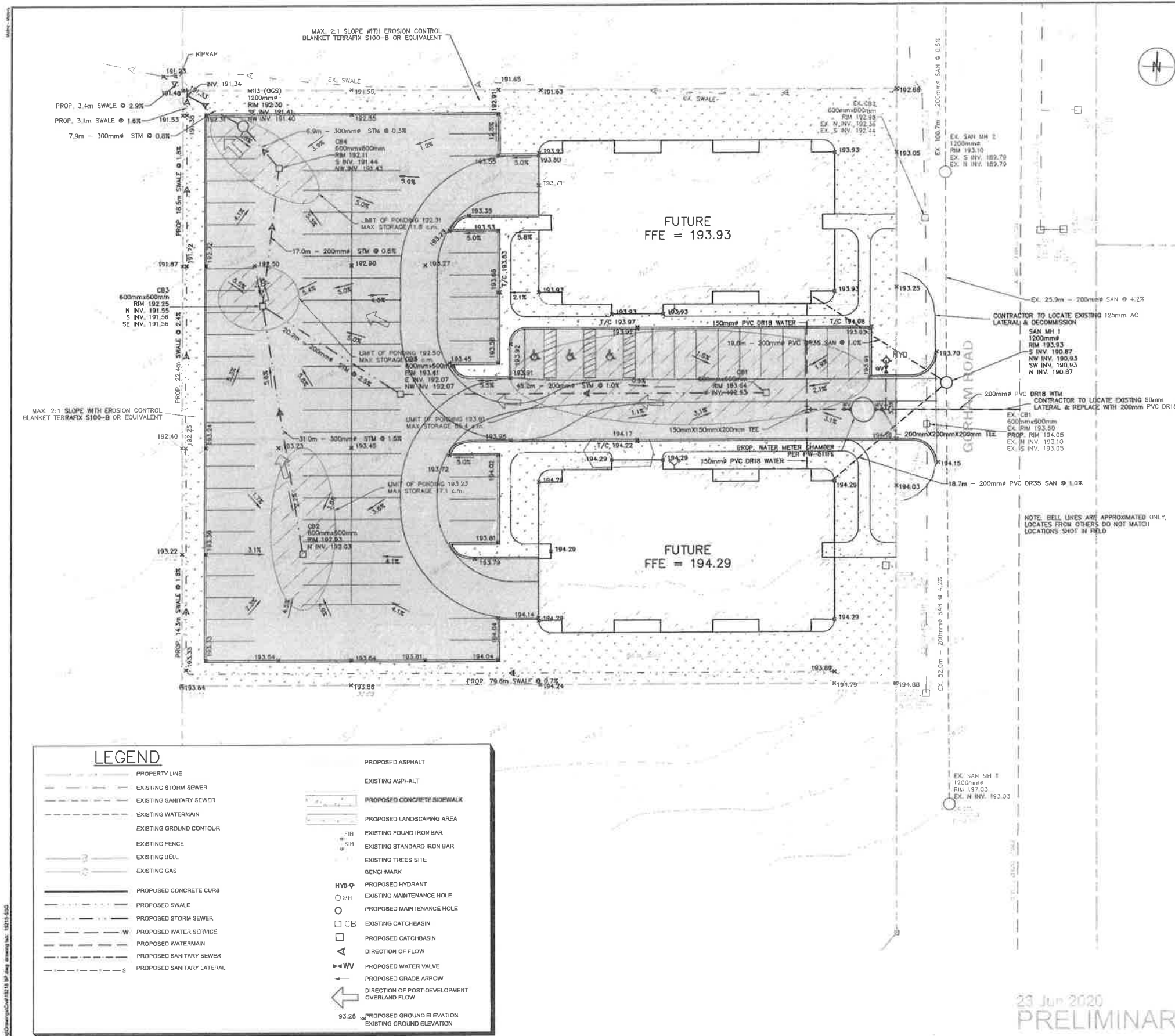
Proposed Residential Development

97 Gorham Road

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APPENDIX A

Conceptual Site Servicing Drawing



- GENERAL NOTES**
- THE POSITION OF POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND ABOVE GROUND UTILITIES AND STRUCTURES ARE 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 CONFIRM THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.
 - ALL AREAS DISTURBED BY THE CONTRACTOR DURING THE CONSTRUCTION OF THE WORKS HEREIN, SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER AS DETERMINED BY THE ENGINEER. ALL GRASS AND VEGETATION COVERED AREAS SHALL BE RESTORED BY PLACING A MINIMUM 100mm OF TOPSOIL AND 500 TO ESTABLISH A GRASS COVER TO THE SATISFACTION OF THE TOWN, UNLESS NOTED OTHERWISE.
 - ALL CONSTRUCTION SIGNING MUST CONFORM TO ONTARIO TRAFFIC MANUAL BOOK 7.
 - ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE "OCCUPATIONAL HEALTH AND SAFETY ACT". THE GENERAL CONTRACTOR SHALL BE DEEMED TO BE THE CONTRACTOR AS DEFINED IN THE ACT.
 - TOWN OF FORT ERIE STANDARD DRAWINGS OPSS AND OPSS SHALL CONSTITUTE PART OF THE ENGINEERING DESIGN AND CONSTRUCTION CONTRACT.
 - GRANULAR BACKFILL AROUND MANHOLES AND CATCH BASINS SHALL BE COMPACTED BY MECHANICAL MEANS TO A MINIMUM OF 95% SPD.
 - ALL PROPOSED DWELLINGS IN THE SUBDIVISION BE EQUIPPED WITH INDIVIDUAL SUMP AND PUMP FOR THE FOUNDATION DRAINS TO DISCHARGE TO A SPLASH PAD DIRECTING THE FLOW AWAY FROM THE FOUNDATION WALL.
 - ANY AREAS WITHIN THE R.O.W. WHICH REQUIRE FILL IN EXCESS OF 0.30m ARE SUBJECT TO COMPACTION TESTS AND SUCH TESTS MUST SHOW A MINIMUM COMPACTION OF 95% SPD AT ALL DEPTHS.
 - MANHOLE AND CATCH BASIN COVERS ARE TO BE SET FLUSH WITH BASE COURSE ASPHALT AND ADJUSTED TO FINAL GRADE PRIOR TO INSTALLING TOP LIFT OF ASPHALT.
 - EROSION AND SILTATION CONTROL WORKS SHALL BE AS SHOWN ON THE SUBDIVISION GRADE CONTROL PLAN. SILTATION CONTROL MEASURES MUST BE IN PLACE PRIOR TO START OF CONSTRUCTION AND MAINTAINED FOR THE DURATION.
- STORM SEWER NOTES**
- STORM MANHOLES SHALL BE IN ACCORDANCE WITH OPSS 701.010, 701.011, 701.012 & 701.013 WITH ADJUSTABLE FRAME AND COVER PER TOWN APPROVED TYPES.
 - STORM SEWER PIPE SHALL BE CONSTRUCTED OF CONCRETE PIPE OR POLYVINYL CHLORIDE PIPE AS DETAILED IN THE CONTRACT DOCUMENTS AND TO THE SPECIFICATIONS OUTLINED BELOW, AS APPLICABLE.
 - CONCRETE SEWER PIPE 375mm IN DIAMETER AND SMALLER SHALL CONFORM TO ASTM SPECIFICATIONS C14-88T, OR LATEST REVISION THEREOF. STANDARD STRENGTH OR EXTRA STRENGTH AS REQUIRED.
 - REINFORCED CONCRETE SEWER PIPE 300mm DIAMETER AND LARGER SHALL BE STEEL REINFORCED AND SHALL CONFORM TO A.S.T.M. SPECIFICATION C76-88T, OR LATEST REVISION THEREOF. CLASS 50-D, 65-D, 100-D OR 140-D, AS REQUIRED.
 - CORRUGATED STEEL PIPE SHALL CONFORM TO AASHTO SPECIFICATIONS M218, M136, M190 AND M167.
 - POLYVINYL CHLORIDE FITTINGS & PIPE SHOULD BE MANUFACTURED IN ACCORDANCE WITH THE LATEST REVISIONS OF CSA B182.1 AND CSA B182.2.
 - GENERALLY A MINIMUM CLEARANCE OF 225mm SHALL BE PROVIDED BETWEEN THE OUTSIDE OF THE PIPE BARRELS AT THE POINT OF PIPE CROSSING FOR STORM SEWERS AND OTHER UTILITIES. FOR WATERMAIN CROSSING, SEE WATERMAIN NOTES. WHERE THE MINIMUM CLEARANCE OF 225mm CANNOT BE OBTAINED, THE PIPES AT THE CROSSING SHALL BE CONCRETE ENCASED.
 - STORM MANHOLE BENCHING SHALL BE IN ACCORDANCE WITH OPSS 701.021. ALL BENCHING INSIDE MANHOLES SHALL BE A MINIMUM OF 150mm IN WIDTH.
 - STORM SEWER BEDDING TO BE AS PER OPSS 802 SERIES. WITH FULL GRANULAR 'A' COVER, ALL BEDDING AND COVER MATERIAL TO BE COMPACTED TO 100% STANDARD PROCTOR DENSITY. BACKFILL MATERIAL TO BE SELECT NATIVE COMPACTED TO 95% STANDARD PROCTOR DENSITY, WITH THE TOP 500mm OF MATERIAL COMPACTED TO 100% SPD.
 - ROADWAY CATCH BASINS AND TWIN INLET CATCH BASINS SHALL CONFORM TO OPSS 705.010 AND 705.020, RESPECTIVELY. CATCH BASIN FRAME AND GRATE SHALL MEET OPSS 400.020. CATCH BASIN CONNECTIONS TO BE 200mm AND 250mm, RESPECTIVELY. CATCH BASIN LEADS TO BE PVC DR35. STREET CATCH BASIN LEADS TO HAVE A MINIMUM SLOPE OF 2.0% UNLESS OTHERWISE NOTED.
 - REAR LOT CATCH BASINS SHALL CONFORM TO OPSS 705.010 WITH FRAME AND GRATE AS PER OPSS 400.100. CATCH BASIN LEAD TO BE PVC RIBBED CSA B182.4.
 - SILT SACKS SHALL BE PLACED UNDER THE GRATES IN ALL STREET AND REAR LOT CATCH BASINS TO TRAP SEDIMENT. SILT SACKS SHALL BE CLEANED REGULARLY BY THE OWNER AND SHALL NOT BE REMOVED UNTIL SUCH TIME AS THE CURBS ARE CONSTRUCTED AND ALL TURF AREAS ARE GRADED AND SODDED. SILT SACK FOR CATCH BASINS SHALL BE TERRAFIX OR APPROVED EQUIVALENT.
 - ALUMINUM MANHOLE STEPS ARE TO BE AS PER OPSS 405.020.
- SANITARY SEWER NOTES**
- SANITARY MANHOLES SHALL CONFORM TO OPSS 701.010, AND FRAMES AND COVER SHALL BE ADJUSTABLE PER TOWN APPROVED TYPES. ALL PRECAST JOINTS TO BE WRAPPED WITH WATERPROOFING MEMBRANE (BLUE SKIN).
 - SANITARY SEWER PIPE SHALL BE CONSTRUCTED OF POLYVINYL CHLORIDE PIPE (PVC) AND SHALL BE MANUFACTURED IN ACCORDANCE WITH THE LATEST REVISION OF CSA B182.1 AND CSA B182.2.
 - FOR MAIN SEWERS, THE STANDARD DIMENSION RATIO OF THE 200mm PVC PIPE SHALL BE DR35 AND DR28 FOR 150mm.
 - FOR SERVICE CONNECTIONS THE STANDARD DIMENSION RATIO OF THE PVC PIPE SHALL BE DR28.
 - THE BEDDING REQUIRED FOR PVC MAIN SEWER AND SERVICE CONNECTIONS SHALL BE AS PER OPSS 802 SERIES.
 - SANITARY MANHOLE BENCHING PER OPSS 701.021. ALL BENCHING WITHIN MANHOLES SHALL BE A MINIMUM OF 150mm IN WIDTH.
 - SANITARY SERVICE LATERALS TO BE 100mm (GREEN) PVC DR28 FOR RESIDENTIAL CONNECTIONS AND FOLLOW OPSS 1006.020, WITH MANUFACTURED TEES. SANITARY SERVICE CONNECTIONS SHALL BE INSTALLED AT A MINIMUM 2.0% GRADE. SANITARY CLEANOUT SHALL BE INSTALLED AT THE PROPERTY LINE AT BUILDING PERMIT STAGE.
 - SANITARY CONNECTIONS SHALL GENERALLY BE LOCATED IN ACCORDANCE WITH TOWN OF FORT ERIE STANDARD DRAWING PW-301 FE. SEE THIS SHEET FOR DETAIL.
 - ALUMINUM MANHOLE STEPS ARE TO BE AS PER OPSS 405.020.
 - EXTERIOR DROP STRUCTURES ARE TO BE AS PER OPSS 1003.010 & 1003.020 AS SHOWN ON THE DRAWINGS.
- SAFETY PLATFORMS FOR SANITARY MANHOLES ARE TO BE PER OPSS 404.020.**
- CONNECTIONS TO ALL SANITARY MANHOLES (EXISTING AND PROPOSED) SHALL BE WITH KOR-N-SEAL ADAPTOR FOR PVC OR HOPE PIPE.
 - SANITARY SEWER LATERALS CONNECTION TO EXISTING SANITARY SEWER MUST BE MADE WITH KOR-N-TEE ADAPTORS.
 - SANITARY SEWER BEDDING TO BE AS PER OPSS 802 SERIES. WITH FULL GRANULAR 'A' COVER, ALL BEDDING AND COVER MATERIAL TO BE COMPACTED TO 100% STANDARD PROCTOR DENSITY.
 - BACKFILL MATERIAL TO BE SELECT NATIVE COMPACTED TO 95% STANDARD PROCTOR DENSITY, WITH THE TOP 500mm OF MATERIAL COMPACTED TO 100% SPD.
 - ALL SERVICE CONNECTIONS SHALL BE PROVIDED WITH A CLEANOUT AT THE PROPERTY LINE.
 - MANHOLE BENCHING SHALL CONFORM TO OPSS 701.021.
 - MINIMUM COVER FOR SANITARY SEWERS IS 2.4 METRES.
- WATERMAIN NOTES**
- WATERMANS SHALL BE A.W.W.A. C900 PVC CLASS 235 (DR18) WITH GASKETED JOINTS, OR APPROVED EQUIVALENT IN ACCORDANCE WITH OPSS 701.010, 701.011, 1003.020 AND 1109.011 AND THE TOWN OF FORT ERIE MUNICIPAL STANDARDS.
 - WATER SERVICE CONNECTIONS SHALL BE 20mm TYPE 'K' SOFT COPPER AS PER OPSS 1104.010 & TOWN OF FORT ERIE STANDARD DRAWING PW-301 FE. SEE THIS SHEET FOR DETAIL.
 - ALL DOMESTIC WATER SERVICE CONNECTIONS SHALL HAVE MAINSTOPS (COMPRESSION TYPE FITTINGS) INSTALLED AT THE WATERMAIN EQUAL TO THE WATER SERVICE CONNECTION DIAMETER.
 - ALL SERVICE CONNECTIONS SHALL HAVE CURB STOPS (COMPRESSION TYPE FITTINGS) BOXES INSTALLED AT AN APPROVED LOCATION. ALL SERVICE TAPS SHALL BE DONE WITH A SADDLE AT 22.5 DEGREE ANGLE ABOVE HORIZONTAL.
 - PROVIDE MINIMUM 0.15m VERTICAL CLEARANCE BETWEEN THE WATERMAIN AND INFRASTRUCTURE CROSSING THE TRENCH, WHERE THE WATERMAIN CROSSES SANITARY OR STORM SEWERS OR LATERALS, PROVIDE MINIMUM 0.50m CLEARANCE BETWEEN THE OUTSIDE OF WATERMAIN AND OUTSIDE OF SEWER OR LATERAL.
 - VERTICAL AND HORIZONTAL ALIGNMENT OF WATERMAIN TO BE ACHIEVED BY BENDING OF THE PIPE BARREL IN ACCORDANCE WITH THE MANUFACTURERS DIRECTIONS.
 - WATERMAIN BEDDING SHALL BE GRANULAR 'A' BEDDING AND COVER MATERIAL AS PER OPSS 802 SERIES. ALL BEDDING AND COVER MATERIAL TO BE COMPACTED TO 100% SPD. BACKFILL MATERIAL TO BE SELECT NATIVE COMPACTED TO 95% SPD, WITH THE TOP 500mm OF MATERIAL COMPACTED TO 100% SPD.
 - HIGH GRADE ZINC SACRIFICIAL ANODES SHALL BE INSTALLED ON ALL METALLIC FITTINGS, HYDRANTS, VALVES AND WATER SERVICES CONNECTIONS, PER TOWN STANDARDS.
 - MINIMUM COVER OVER WATERMAIN AND SERVICES SHALL BE 1.70m FROM THE TOP OF PIPE TO THE FINISHED GROUND ELEVATION.
 - THRUST RESTRAINTS SHALL BE MECHANICAL RESTRAINTS APPROVED BY TOWN.
 - A TRACER WIRE SHALL BE INSTALLED WITH ALL NON-METALLIC PIPES FOR THE WATERMAIN. TRACER WIRE CONTINUITY OF ELECTRICAL CURRENT MUST BE TESTED AND VERIFIED BY THE CONTRACTOR. TRACER WIRE TO BE DIRECTLY CONNECTED TO EACH WATER SERVICE CONNECTION.
 - HYDRANTS SHALL BE IN ACCORDANCE WITH OPSS 1105.010 WITH A MINIMUM 150mm LEADS AND DRAIN HOLES PLUGGED BY MANUFACTURER, ANCHOR TEE & SECONDARY VALVE ASSEMBLY TO BE USED.
 - HYDRANTS ACCEPTABLE TO THE TOWN OF FORT ERIE SHALL BE CANADA VALVE CENTURY, MCAMITY M67, AMERICAN A.V.K., DARLING B508 WITH TWO 65mm HOSE NOZZLES & ONE 114mm PUMPER NOZZLE INCLUDING STORTZ CONNECTION.
 - HYDRANTS & VALVES SHALL BE PROVIDED WITH ANODE PROTECTION, TYPE DZP 110-24 (SP-24) OR APPROVED EQUAL COMPLETE WITH BRASS OR STAINLESS STEEL CLAMP.
- ROAD CONSTRUCTION AND GRADING NOTES**
- CONCRETE CURB AND GUTTER PER OPSS 600.040
 - SIDEWALK SHALL CONFORM TO OPSS 310.010 AND 310.020. ALL INTERSECTIONS ARE TO BE CONSTRUCTED WITH DEPRESSIONS IN ACCORDANCE WITH OPSS 310.030 UNLESS OTHERWISE NOTED.
 - THE FOLLOWING PAVEMENT STRUCTURES SHALL BE USED, UNLESS OTHERWISE SPECIFIED:
 - LOCAL ROADS - 200mm R.O.W.
 - 40mm ASPHALT SURFACE COURSE (HL3)
 - 50mm ASPHALT BINDER COURSE (HL8)
 - 450mm - 16mm DIAMETER CRUSHER RUN LIMESTONE (GRANULAR A)
 - BOULEVARDS SHALL BE A MINIMUM 100mm TOPSOIL AND 500. (PW-501 FE)
 - ROAD CROSS-SECTION LAYOUT SHALL BE IN ACCORDANCE WITH DETAILS SHOWN ON THIS PAGE.
 - LOT GRADING TO BE AS PER TOWN OF FORT ERIE STANDARDS.
 - MANHOLE COVERS AND CATCH BASIN LIDS TO BE SET TO BASE COURSE ASPHALT GRADE AND TO BE RAISED PRIOR TO TOP COURSE ASPHALT BEING LAID.
 - SIDEWALKS SHALL BE CONSTRUCTED USING 30MPA CONCRETE, MINIMUM 125mm THICK ON 150mm DEEP COMPACTED GRANULAR 'A' BASE. SIDEWALKS SHALL BE CONTINUOUS THROUGH DRIVEWAYS.
 - ALL SIDEWALK RAMPS SHALL COME WITH TACTILE WARNING SURFACE INDICATORS IN ACCORDANCE WITH THE SPECIFICATIONS IN THE NIAGARA PENINSULA STANDARD CONTRACT DOCUMENTS - SPECIAL PROVISIONS CONTRACT ITEMS B34.
 - ALL SWALES LESS THAN 1.5% SHALL BE PROVIDED WITH A SUBDRAIN AND OUTLETING TO A CATCHBASIN

LEGEND	
	PROPERTY LINE
	EXISTING STORM SEWER
	EXISTING SANITARY SEWER
	EXISTING WATERMAIN
	EXISTING GROUND CONTOUR
	EXISTING FENCE
	EXISTING BELL
	EXISTING GAS
	PROPOSED CONCRETE CURB
	PROPOSED SWALE
	PROPOSED STORM SEWER
	PROPOSED WATER SERVICE
	PROPOSED WATERMAIN
	PROPOSED SANITARY SEWER
	PROPOSED SANITARY LATERAL
	PROPOSED ASPHALT
	PROPOSED CONCRETE SIDEWALK
	PROPOSED LANDSCAPING AREA
	EXISTING FOUND IRON BAR
	EXISTING STANDARD IRON BAR
	EXISTING TREES SITE
	BENCHMARK
	PROPOSED HYDRANT
	EXISTING MAINTENANCE HOLE
	PROPOSED MAINTENANCE HOLE
	EXISTING CATCHBASIN
	PROPOSED CATCHBASIN
	DIRECTION OF FLOW
	PROPOSED WATER VALVE
	PROPOSED GRADE ARROW
	DIRECTION OF POST-DEVELOPMENT OVERLAND FLOW
	PROPOSED GROUND ELEVATION
	EXISTING GROUND ELEVATION

23 Jun 2020
PRELIMINARY

<p>Do not scale drawings. Refer any discrepancies to Quortek Group Inc. before proceeding.</p> <p>Drawings must be sealed by the Architect and / or Engineer prior to the use for any building permit application and / or governmental approval. Seals must be signed by the Architect and / or Engineer before drawings are used for any construction.</p> <p>All construction to be in accordance with the current Ontario Building Code and all applicable Ontario regulations.</p> <p>All drawings and related documents remain the property of Quortek Group Inc. All drawings are protected under copyright and other applicable laws.</p>	<p>approved by:</p> <p>APPROVED BY</p> <p>DATE: DAY/MONTH/YEAR</p> <p>CAD FILE: 19218 BP.dwg</p>	<p>Quortek</p> <p>Architects • Planners Engineers • Project Managers</p> <p>T: 905.884.8444 F: 905.884.8444 89 - 91 St. Paul Street, Suite 100, St. Catharines, ON, L2R 3K3 www.quortekgroup.com</p>	<p>project title</p> <p>97 GORHAM ROAD</p> <p>drawing title</p> <p>SITE SERVICES AND GRADING</p>	<p>drawn by</p> <p>NS</p> <p>designed by</p> <p>AY</p> <p>date</p> <p>31/3/2020</p> <p>job number</p> <p>19218</p> <p>issue</p> <p>A</p> <p>drawing number</p> <p>19218-SSG</p>
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