Elgin Park Redevelopment
287-327 Elgin Street East
Coburg, Ontario

FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT

Prepared for:

Barry Bryan Associates

Prepared by:

MGM Consulting Inc.
400 Bronte Street South
Suite 201
Milton, Ontario
L9T 0H7

File No. 2020-034

Date: August 28, 2020

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Figures

Appendices

1. INTRODUCTION

MGM Consulting Inc. has been retained by Barry Bryan Associates to prepare a Functional Servicing and Stormwater Report to address the site-specific infrastructure required to support a proposed Rezoning Application for redevelopment of a property located at 287-327 Elgin Street East in the Town of Cobourg.

The legal description of the subject lands is Part of Lots 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94 & 95, Registered Plan No 227, Town of Cobourg, County of Northumberland.

2. EXISTING CONDITIONS AND DEVELOPMENT LIMITS

The subject site has an area in the order of 0.796 ha, proposed for redevelopment. The site abuts existing residential lots along its south and east limits, Elgin Street E. to the north and D'Arcy Street to the west. The site is currently developed with two storey semi-detached residential houses with independent entrances off of Elgin Street E. for each household unit. Storm runoff from the front yards of the houses currently sheet flows to the Elgin Street right of way. Storm runoff from the rear yards is divided with a portion convey to an existing catchbasin located at the south-west corner of the site which is currently connected to the municipal storm sewer on D'Arcy Street and the remaining drainage conveyed to the east to the south-east corner of the site.

The site is contributory to northwest of Midtown Creek watershed and under the jurisdiction of Ganaraska Region Conservation Authority (GRCA). Site topographic survey has been provided to GRCA staff for review and the site perimeter elevation is below the regulatory water surface elevation in this area. Coordination with GRCA staff is included in **Appendix E**.

The existing site drainage areas are indicated in Figure No. 1.

3. PROPOSED DEVELOPMENT SCENARIO

The proposed development includes for the demolition of all existing houses and the construction of four 2-storey residential building along the north side and surface parking areas along the south side of the site with two vehicular accesses off of Elgin Street. Where roofs drain toward the rear of the buildings, rainwater leaders will be directed to small infiltration pit.

All existing sanitary lateral connection service the existing buildings shall be capped at the property line and all existing watermain service connection shall be capped the mainline as per regional standard.

4. PROPOSED GRADING AND DRAINAGE

The proposed site grading will take into account the existing topography, perimeter elevations, as required to accommodate the proposed building finish floor elevation, provide safe vehicular and pedestrian access and to provide minimum cover on storm servicing as required for frost protection. Slopes within the paved areas of the site will typically be set between 1% and 5%. Grading will also be completed such that majority of the storm drainage from the development area will be contained with storm runoff being conveyed to proposed on site catchbasins, swales and bioswales, and an internal storm system, outletting to the existing storm sewer within the Elgin Street right of way. Drainage off of building roofs will be conveyed to landscaped areas of the site via rainwater leaders.

As indicated in Section 3.0, a portion of the rear roofs will be directed to infiltration pits. Redirection of clean roof water will promote groundwater recharge. An overflow from the pits will redirect storm flows to the proposed private storm sewer in the event the pits are full.

Proposed site grading is indicated on the Site Grading Plan, Drawing No. CV-2.

Emergency overland during severe storm events, or when an outlet is blocked, will be to Elgin Street right of way at an elevation of 99.00 m through the east vehicular access.

5. PROPOSED STORMWATER MANAGEMENT

Proposed storm water management controls for the site have been completed based on the proposed redevelopment area of 0.796ha. The following summarizes the proposed minor and major storm drainage systems, and the stormwater management features proposed for the subject site. Detailed calculations supporting the selection of proposed storm servicing and stormwater management are included in **Appendix A**.

Water Quantity Storage Requirements

The stormwater management design has been based on reducing flows from the site to below the peak flows during the 2 to 100 year storm event based on a pre-development runoff coefficient of 0.44.

Pre and post development storm drainage areas for the site are included as **Figures 1 and 2**.

Water Quality Requirement

Stormwater quality controls are proposed as required to remove and estimated 80% of the total suspended solids, on an annual loading basis.

5.1 Proposed Minor Storm System

The proposed minor storm system for the site is to be designed based on rainfall intensities

provided by the Ganaraska Region Conservation Authority with the internal storm sewers being designed to convey the flows during a 5-year storm event without surcharging. Proposed storm servicing is indicated on Site Servicing Plan, Drawing CV-3.

The detailed storm sewer design will be confirmed during the detailed design phase.

5.2 Proposed Major Storm System

Major storm flows from the site are to be conveyed to Elgin Street right of way through proposed east vehicular access at an elevation of 99.00m. This elevation is 400 mm below the lowest building floor elevation proposed within the site. Perimeter elevations surrounding attenuated areas of the site have been set at a minimum elevation of 99.10 m to ensure conveyance of overland flow to the municipal right of way and contain major site flow without impact adjacent properties.

5.3 Proposed Stormwater Rate Controls and Site Storage

Stormwater rate controls have been provided as required to control post development flows from the site to the peak flow during 2 to 100 year storm events based on the pre-development runoff coefficient. Based on a site area of 0.796 ha, the allowable storm flows from the site are as indicated below:

Storm Events	Allowable Flows (m^3)
2	0.0621
5	0.0777
10	0.0889
25	0.1151
50	0.1190
100	0.1270

Rate controls have been provided with the installation of a 150 mm diameter orifice tube, installed at the outlet of proposed MH No. 2, which will cause the post development flows during the 2 and 100 year storm events to be controlled to 0.056 cms and 0.096 cms respectively, which are both below the calculated allowable flow rates.

On-site storage has been provided as required, including 64.5 m^3 within the proposed storm

system and 172.3 m^3 of surface storage within pavement and bio-swales areas which exceeds the calculated required storage of 117.6 m^3 during the 100-year storm event.

Detailed Stormwater Management Calculations are included in **Appendix A**.

5.4 Proposed Storm Water Quality Controls

The current stormwater quality control objective is to provide an "enhanced" level of treatment which is equivalent to removing 80% of the total suspended solids from the site runoff on an annual loading basic. Quality treatment is proposed to be provided via a "treatment train" including a package treatment unit (oil/grit separator), the proposed bio-swales and isolator row storage chamber.

A Stormceptor Model EF04 is proposed to assist in achieving the water quality objectives. Based on the manufacturer's modeling software, the selected unit has been designed to provide the removal of an estimated 80% of the Total Suspended Solids. However, the Ganaraska Region Conservation Authority have adopted a policy that considers the TSS removal efficiency of standalone OGS units to be 50% regardless of the manufacturer's claims. As such only 50% TSS removal has been considered as what is being provided by the package treatment unit.

In the effort of integrating LID measures under the post development condition, small infiltration pits are proposed to promote ground water infiltration and bio-swales as part of the treatment train to provide additional TSS removal. The exact location of infiltration pit will be determined by consultation with geotechnical engineer.

A summary of total TSS removal achieved by the proposed treatment train is included in **Appendix A**. Output from the manufacturer's modeling software used to select the proposed package treatment unit is included in **Appendix C**.

6. SEDIMENT AND EROSION CONTROLS DURING CONSTRUCTION

In 2006, The Greater Golden Horseshoe Area Conservation Authorities prepared a guideline entitled "Erosion & Sediment Control Guideline for Urban Construction". Based on the guideline, all projects involving the removal of topsoil or site alteration requires an ESC (Erosion and Sediment Control) Plan in place prior to commencing construction. Failure to adhere to the plan could lead to the potential for prosecution under the various pieces of environmental legislation.

The following principles assist in creating an effective ESC Plan.

(Ref. Erosion and Sediment Control Guidelines for Urban Construction)

- Adopt a multi-barrier approach to provide erosion and sediment control through erosion controls first.
- Retain existing ground cover and stabilize exposed soils with vegetation

where possible.
- Limit the duration of soil exposure and phase construction where possible.
- Limit the size of disturbed areas by minimizing nonessential clearing and grading.
- Minimize slope length and gradient of disturbed areas.
- Maintain overland sheet flow and avoid concentrated flows.
- Store/stockpile soil away (e.g. greater than 15 meters) from watercourses, drainage features and top of steep slopes.
- Ensure contractors and all involved in the ESC practices are trained in ESC Plan, implementation, inspections, maintenance, and repairs.
- Adjust ESC Plan at construction site to adapt to site features.
- Assess all ESC practices before and after all rainfall and significant snowmelt events.

The guideline stresses that prevention of erosion is the preferred mitigation measure for reducing the potential for sedimentation.

Erosion and sediment control measures can be categorized as Erosion prevention controls and Sediment controls.

Erosion controls include minimizing the reduction in vegetative ground cover or immediate stabilization of disturbed areas by top soiling, seeding, sodding, mulching, erosion control blankets, etc.

Sediment Controls are further broken down into Perimeter Controls, Settling Controls and Filtration Controls. Some major perimeter controls include silt fences, cut-off swales and mud-mats. Settling controls reduce run-off velocity allowing the soil particles to settle out. Settling controls include sediment traps, rock check dams, straw bales and sediment control ponds. Filtration controls are achieved by filtering silt laden water through the use of a filter media such as a geotextile or sand. Filtration controls include storm inlet filter cloths, sediment bags and filter rings.

7. PROPOSED SANITARY SERVICING

Sanitary servicing is proposed with a 200mm connection to the existing 375mm sanitary sewer located within D'Arcy Street right of way. Based on the available invert elevation of 94.85m a gravity sewer connection can be provided to drain fixtures at the ground floor level and above. Basement plumbing fixtures in Buildings 2, 3, & 4 will need to be pumped to the proposed sanitary connection. Gravity sanitary servicing is proposed beyond the building envelopes as indicated on the Site Servicing Plan, Drawing No. CV-3.

Due to the anticipated intensification associated with the development. a slight increase in flow of 0.79 L/s are anticipated. An existing and proposed sanitary flow calculation has been attached in **Appendix D**. The slight increase in flows do not warrant a downstream sewer analysis based on discussion with City staff.

Based on discussion with municipal staff, there are 18 existing services along Elgin Street that will require capping at the property line. A maintenance hole will also be required at the property line for the proposed development.

8. PROPOSED WATER SERVICING

A preliminary calculation for the required water demand for fire protection and domestic supply is included in **Appendix B**. The proposed water supply requirements are calculated in accordance with the Fire Underwriter Survey and MOE Design Guidelines for Drinking Water Systems.

As indicated, the estimated domestic water consumption of 1.52 L/s is required to service the proposed development. The maximum daily demand plus fire flow is calculated as 84.86 L/sec which is the flow that is required to be available at a local hydrant at a minimum pressure of 140 KPa. Fire protection for the proposed buildings will be provided from two existing fire hydrants located north of Elgin Street and north-west corner intersection of Elgin St. and D'Arcy St. The final location of the domestic water service connections will be confirmed during the detailed design phase.

A pressure and flow test will be provided as required to confirm adequate flow are pressure for fire protection during the detailed design phase.

A new 50mm watermain is proposed to provide domestic water supply to the site

Preliminary fire flow calculations are included in **Appendix B**.

9. SUMMARY

The following summarizes the proposed site works as required to accommodate the proposed site redevelopment:

- Site grading can be completed taking into account perimeter elevations, and as required to accommodate the proposed building finish floor elevation, provide safe vehicular and pedestrian access and to provide minimum cover on storm servicing as required for frost protection, convey storm flows to proposed drainage features and to safely convey major storm flows to the adjacent municipal right of way,
- Storm drainage is provided to contain site drainage, convey minor storm flows to the existing municipal storm system, and as required to convey the 5 year storm flows without surcharging,
- Stormwater management peak flow objectives can be achieved with the installation of a control orifice that will control the post development flows to below the pre-development level calculated for 2-100 year flow based on the existing site runoff coefficient.
- Sufficient on-site storage can be provided in surface ponding areas, and below ground in the internal storm system and proposed underground storage chambers.

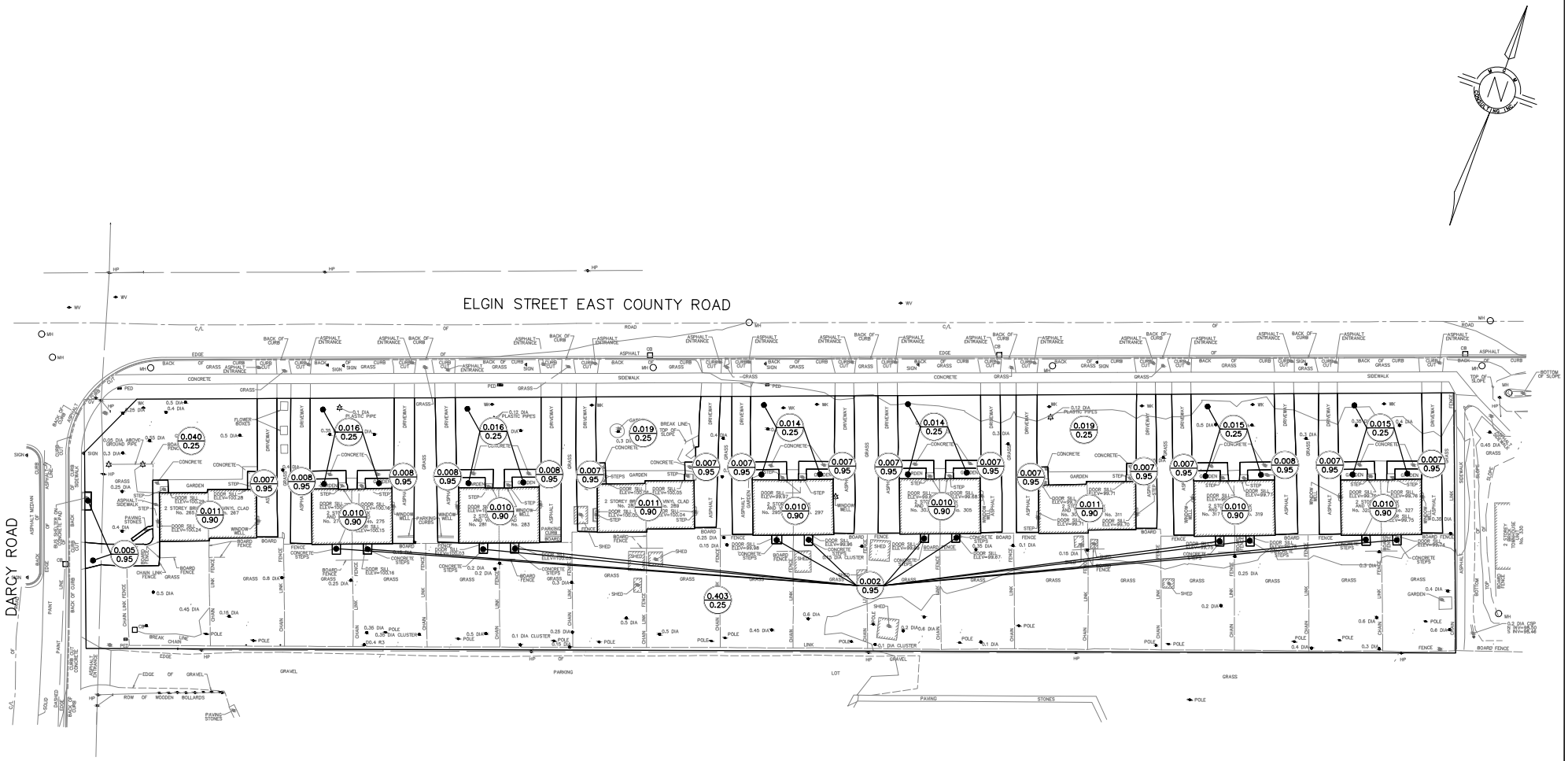
- Stormwater quality controls are proposed to be achieved using a "treatment train" that includes a package treatment unit, and treatment provided by proposed bio-swales, and isolator row inside storage chamber,
- Sediment and erosion controls as indicated on the Removals/Sediment and Erosion Control Plan are to be implemented prior to construction and maintained until the site is stabilized.

Prepared by:

MGM CONSULTING INC.

Calvin Dang, B.Eng

M.L. Stairs, P.Eng.



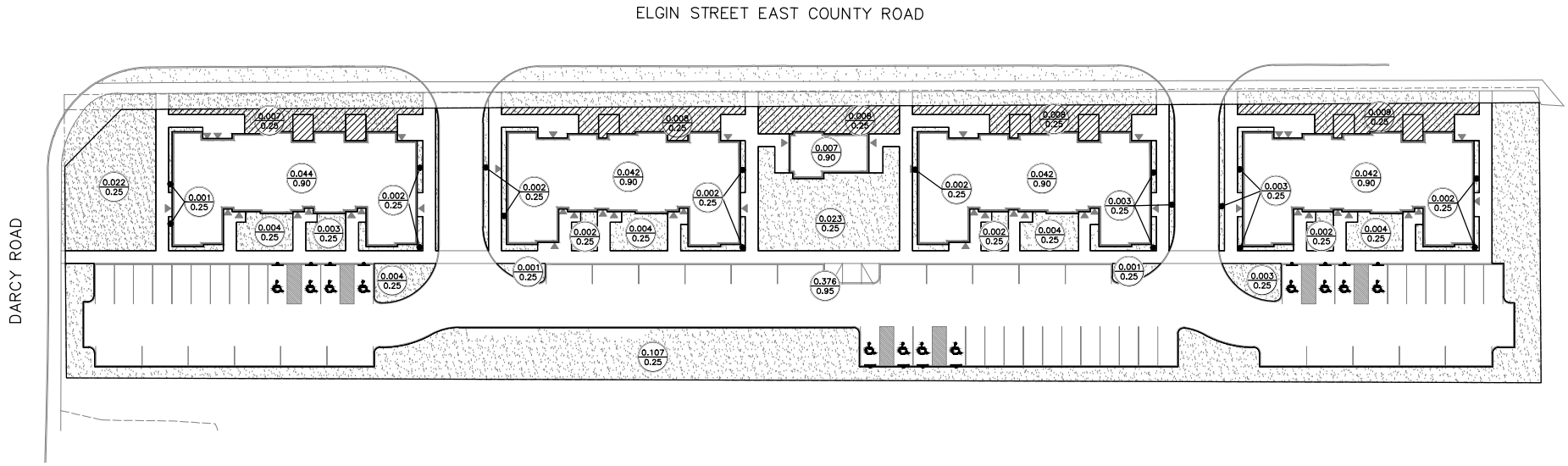
287-327 EGLIN STREET EAST
EGLIN PARK REDEVELOPMENT PROJECT

EXISTING DRAINAGE AREAS

MGM CONSULTING INC
Consulting Engineering & Project Management
400 Bronte Street South
Suite 201
Milton, Ontario
L9T 0H7
Tel: (905)567-8678
Fax: (905)875-1339
Email: mgm@mgm.on.ca
www.mgm.on.ca

FIGURE #1

DATE: AUG 2020
SCALE: NTS
DWG#: 2020-034 C4



LEGENDS:

UNATTENUATED AREAS

0.016 0.25 — DRAINAGE AREA (ha) / RUN-OFF CO-EFFICIENT

287-327 EGLIN STREET EAST
EGLIN PARK REDEVELOPMENT PROJECT

PROPOSED DRAINAGE AREAS

MGM CONSULTING INC
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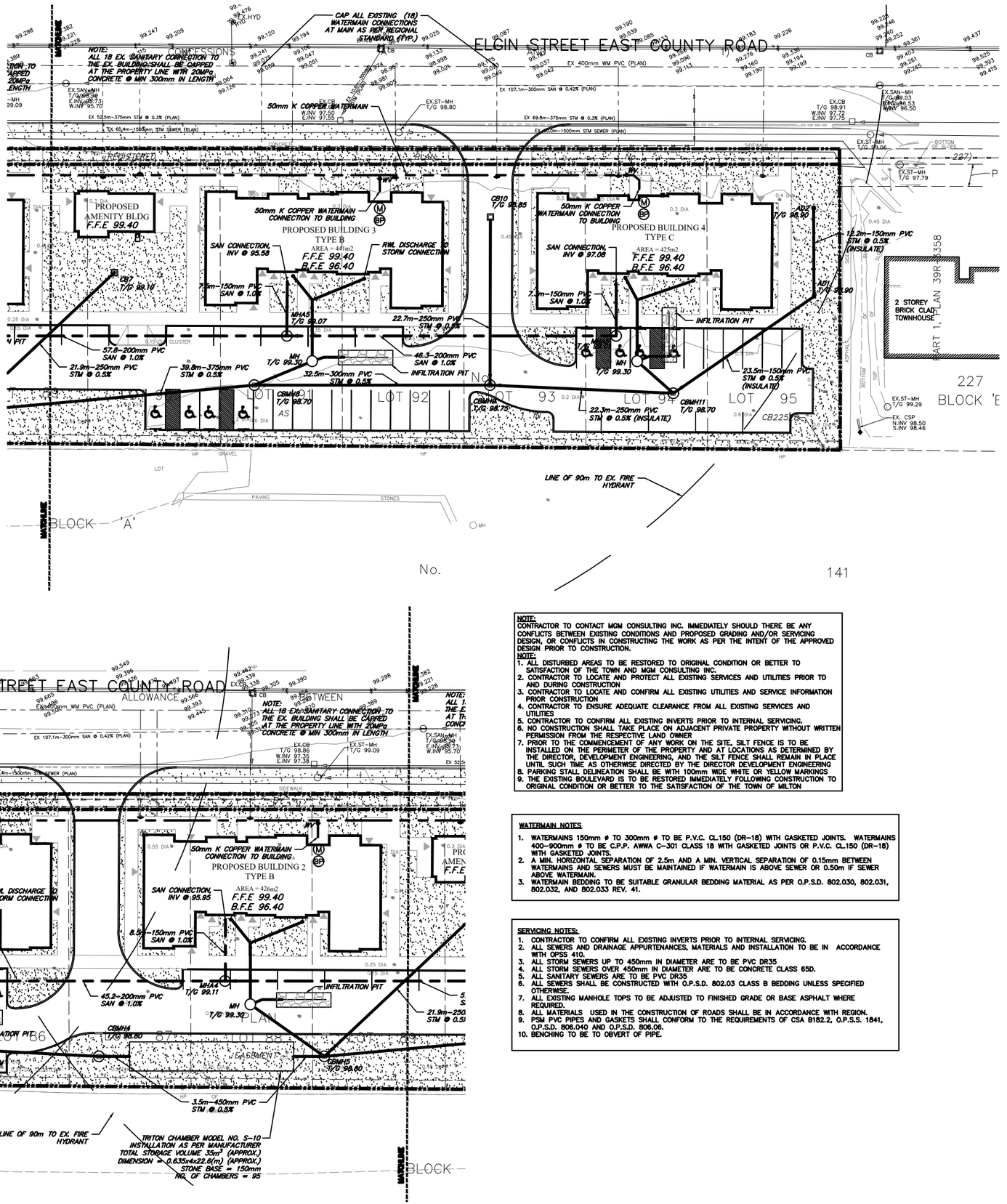
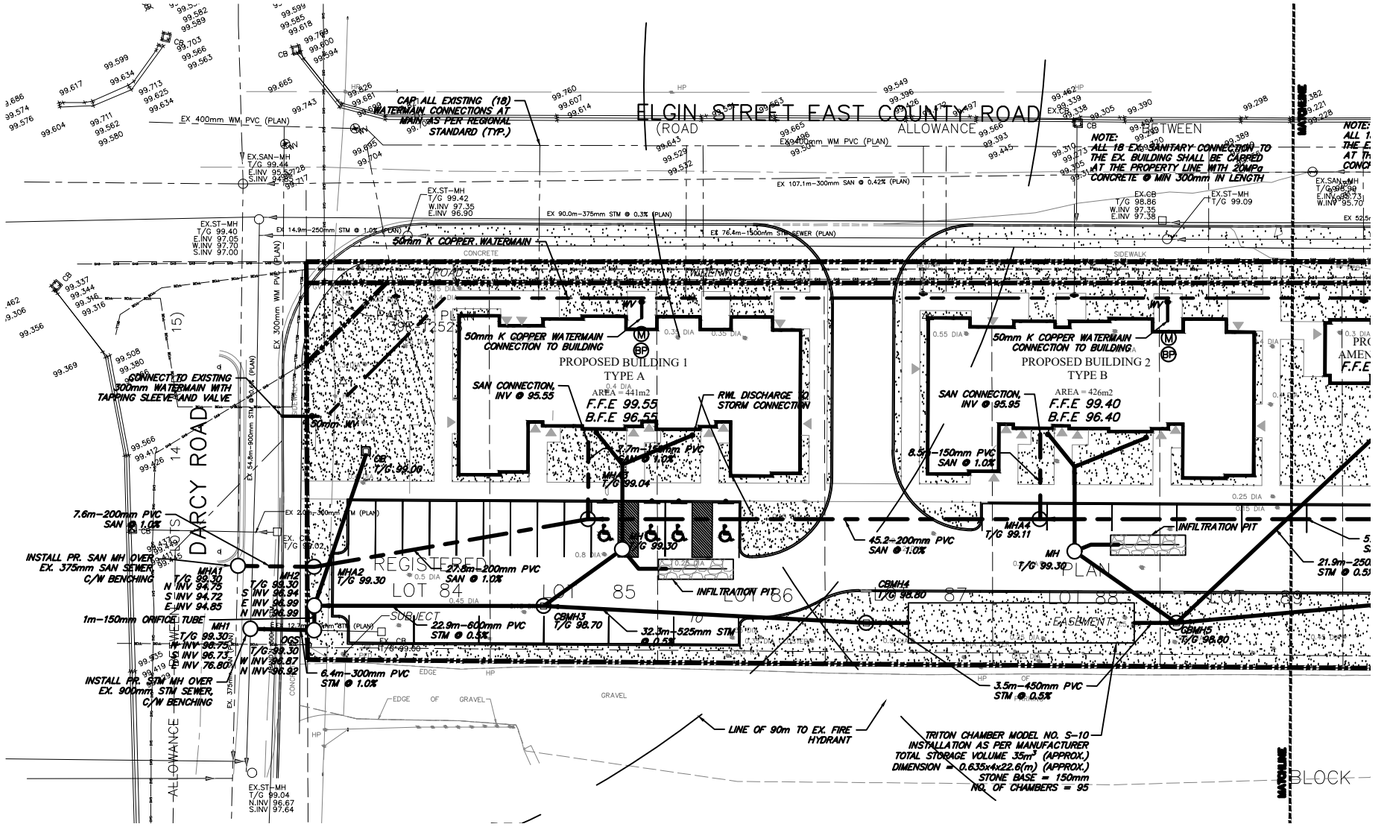
FIGURE #2

DATE: AUG 2020
SCALE: NTS
DWG#: 2020-034 C4

CONSTRUCTION NOTES AND SPECIFICATIONS:

1. PRIOR TO CONSTRUCTION, THE CONTRACTOR MUST:
   - 1.1. CHECK AND VERIFY ALL EXISTING CONDITIONS, LOCATIONS AND ELEVATIONS WHICH INCLUDES BUT NOT LIMITED TO THE BENCHMARK ELEVATIONS, EXISTING SERVICE CONNECTIONS AND EXISTING INVERTS. REPORT ALL DISCREPANCIES TO THE ENGINEER PRIOR TO PROCEEDING.
   - 1.2. OBTAIN ALL UTILITY LOCATES AND REQUIRED PERMITS AND LICENSES.
   - 1.3. VERIFY THAT THE FINISHED FLOOR ELEVATIONS AND BASEMENT FLOOR ELEVATIONS (WHICH MAY APPEAR ON THE PLAN) COMPLY WITH THE FINAL ARCHITECTURAL DRAWINGS.
   - 1.4. CONFIRM ALL DRAWINGS USED FOR CONSTRUCTION ARE OF THE MOST RECENT REVISION.
2. THE CONTRACTOR SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO EXISTING WORKS
3. ALL UNDERGROUND SERVICES ARE TO BE CONSTRUCTED IN FULL COMPLIANCE WITH ONTARIO PROVINCIAL BUILDING CODE (PART 7, PLUMBING) AND THE REQUIREMENTS OF THE TOWN OF MILTON AND THE REGIONAL MUNICIPALITY OF HALTON; WHICH CODES AND REGULATIONS SHALL SUPERSEDE ALL OTHERS.
4. CONTRACTOR IS RESPONSIBLE FOR CONTACTING ENGINEER 48 HOURS PRIOR TO COMMENCING WORK TO ARRANGE FOR INSPECTION. ENGINEER TO DETERMINE DEGREE OF INSPECTION AND TESTING REQUIRED FOR CERTIFICATION OF UNDERGROUND SERVICES INSTALLATION AS MANDATED BY ONTARIO BUILDING CODE, VISION C, PART 1 SECTION 1.2.2, GENERAL REVIEW. FAILURE TO NOTIFY ENGINEER WILL RESULT IN EXTENSIVE POST CONSTRUCTION INSPECTION AT CONTRACTOR'S EXPENSE.
5. SITE SERVICING CONTRACTOR TO TERMINATE ALL SERVICES 1.0 METRES FROM FOUNDATION WALL.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC AND SAFETY MEASURES DURING THE CONSTRUCTION PERIOD INCLUDING THE SUPPLY, INSTALLATION AND REMOVAL OF ALL NECESSARY SIGNALS, DELINEATORS, MARKERS AND BARRIERS. ALL SIGNS, ETC. SHALL CONFORM TO THE STANDARDS OF THE LOCAL MUNICIPALITY AND THE MTO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES
7. THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND 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 DAMAGE TO THEM
8. ALL REMOVALS SHALL BE IN ACCORDANCE WITH OPSS 510. ALL REMOVED MATERIALS SHALL BE DISPOSED OFF SITE.
9. SILTATION CONTROL SHALL BE MAINTAINED DURING ALL PHASES OF CONSTRUCTION.
10. ALL GRADING WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH OPSS 206.
11. THE CONTRACTOR TO NOTIFY ENGINEER PRIOR TO SAWCUTTING EXISTING ASPHALT FOR CONFIRMATION OF POSITIVE DRAINAGE
12. ALL GRANULAR MATERIAL SHALL CONFORM TO OPSS 1010, AND BE INSTALLED IN ACCORDANCE WITH OPSS 314.
13. ALL ASPHALT MATERIALS SHALL BE IN ACCORDANCE WITH OPSS 1101 AND BE INSTALLED IN ACCORDANCE WITH OPSS 310.
14. CONCRETE SHALL BE IN ACCORDANCE WITH OPSS 1350 AND HAVE MINIMUM COMPRESSIVE STRENGTH OF 30MPA AFTER 28 DAYS.
15. SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH OPSS 410. TRENCH BACKFILL TO BE APPROVED NATIVE MATERIAL
16. CATCHBASIN AND MANHOLE ADJACENT SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 408.
17. ALL DISTURBED GRASSED AREAS ARE TO BE RESTORED WITH 150MM DEPTH TOPSOIL AND SOD.
18. TOPSOIL SHALL BE IN ACCORDANCE WITH OPSS 570 AND SOD IN ACCORDANCE WITH OPSS 571.





NOTE:
CONTRACTOR TO CONTACT MGM CONSULTING INC. IMMEDIATELY SHOULD THERE BE ANY CONFLICTS BETWEEN EXISTING CONDITIONS AND PROPOSED GRADING AND/OR SERVICING DESIGN, OR CONFLICTS IN CONSTRUCTING THE WORK AS PER THE INTENT OF THE APPROVED DESIGN PRIOR TO CONSTRUCTION.

NOTE:
1. ALL DISTURBED AREAS TO BE RESTORED TO ORIGINAL CONDITION OR BETTER TO SATISFACTION OF THE TOWN AND MGM CONSULTING INC.
2. CONTRACTOR TO LOCATE AND PROTECT ALL EXISTING SERVICES AND UTILITIES PRIOR TO AND DURING CONSTRUCTION
3. CONTRACTOR TO LOCATE AND CONFIRM ALL EXISTING UTILITIES AND SERVICE INFORMATION PRIOR CONSTRUCTION
4. CONTRACTOR TO ENSURE ADEQUATE CLEARANCE FROM ALL EXISTING SERVICES AND UTILITIES
5. CONTRACTOR TO CONFIRM ALL EXISTING INVERTS PRIOR TO INTERNAL SERVICING.
6. NO CONSTRUCTION SHALL TAKE PLACE ON ADJACENT PRIVATE PROPERTY WITHOUT WRITTEN PERMISSION FROM THE RESPECTIVE LAND OWNER
7. PRIOR TO THE COMMENCEMENT OF ANY WORK ON THE SITE, SILT FENCE IS TO BE INSTALLED ON THE PERIMETER OF THE PROPERTY AND AT LOCATIONS AS DETERMINED BY THE DIRECTOR, DEVELOPMENT ENGINEERING, AND THE SILT FENCE SHALL REMAIN IN PLACE UNTIL SUCH TIME AS OTHERWISE DIRECTED BY THE DIRECTOR DEVELOPMENT ENGINEERING
8. PARKING STALL DELINEATION SHALL BE WITH 100mm WIDE WHITE OR YELLOW MARKINGS
9. THE EXISTING BOULEVARD IS TO BE RESTORED IMMEDIATELY FOLLOWING CONSTRUCTION TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE TOWN OF MILTON

WATERMAIN NOTES
1. WATERMAINS 150mm ø TO 300mm ø TO BE P.V.C. CL.150 (DR–18) WITH GASKETED JOINTS. WATERMAINS 400–900mm ø TO BE C.P.P. AWWA C–301 CLASS 18 WITH GASKETED JOINTS OR P.V.C. CL.150 (DR–18) WITH GASKETED JOINTS.
2. A MIN. HORIZONTAL SEPARATION OF 2.5m AND A MIN. VERTICAL SEPARATION OF 0.15mm BETWEEN WATERMAINS AND SEWERS MUST BE MAINTAINED IF WATERMAIN IS ABOVE SEWER OR 0.50m IF SEWER ABOVE WATERMAIN.
3. WATERMAIN BEDDING TO BE SUITABLE GRANULAR BEDDING MATERIAL AS PER O.P.S.D. 802.030, 802.031, 802.032, AND 802.033 REV. 41.

SERVICING NOTES:
1. CONTRACTOR TO CONFIRM ALL EXISTING INVERTS PRIOR TO INTERNAL SERVICING.
2. ALL SEWERS AND DRAINAGE APPURTENANCES, MATERIALS AND INSTALLATION TO BE IN ACCORDANCE WITH OPSS 410.
3. ALL STORM SEWERS UP TO 450mm IN DIAMETER ARE TO BE PVC DR35
4. ALL STORM SEWERS OVER 450mm IN DIAMETER ARE TO BE CONCRETE CLASS 65D.
5. ALL SANITARY SEWERS ARE TO BE PVC DR35
6. ALL SEWERS SHALL BE CONSTRUCTED WITH O.P.S.D. 802.03 CLASS B BEDDING UNLESS SPECIFIED OTHERWISE.
7. ALL EXISTING MANHOLE TOPS TO BE ADJUSTED TO FINISHED GRADE OR BASE ASPHALT WHERE REQUIRED.
8. ALL MATERIALS USED IN THE CONSTRUCTION OF ROADS SHALL BE IN ACCORDANCE WITH REGION.
9. PSM PVC PIPES AND GASKETS SHALL CONFORM TO THE REQUIREMENTS OF CSA B182.2, O.P.S.S. 1841, O.P.S.D. 806.040 AND O.P.S.D. 806.06.
10. BENCHING TO BE TO OBVERT OF PIPE.

DO NOT SCALE THE DRAWINGS
CHECK AND VERIFY ALL DIMENSIONS AT THE SITE.

DRAWINGS ARE NOT TO BE USED FOR CONSTRUCTION UNTIL SIGNED AND SEALED BY THE CONSULTANT.

BENCHMARK

ELEVATIONS HEREON ARE GEODETIC AND ARE REFERRED TO THE ONTARIO MINISTRY OF NATURAL RESOURCES AND FORESTRY CONTROL STATION 0011967U056 AND 0011960U8506. HAVING PUBLISHED ELEVATIONS OF 77.489m AND 79.568m (CGVD-2013) RESPECTIVELY.

SURVEY INFORMATION BY: J.D. BARNES LIMITED
REFERENCE No: 20-25-815-00
DATED: 05/14/2020

NO.	ISSUES	DATE	BY
1	ISSUED FOR REZONING	8/28/20	CD

LEGEND

CB	EXISTING CATCHBASIN
GV	EXISTING GAS VALVE
MH	EXISTING MANHOLE
HP	EXISTING HYDRO POLE
PED	EXISTING TELEPHONE PEDESTAL
WK	EXISTING WATER KEY
WV	EXISTING WATER VALVE
OC	EXISTING OVERHEAD CABLES
	EXISTING CONIFEROUS TREE
	EXISTING DECIDUOUS TREE
CB	PROPOSED CATCH BASIN
AD1	PROPOSED AREA DRAIN
CBMH1	PROPOSED CB MANHOLE
MH1	PROPOSED STORM MANHOLE
OGS	PROPOSED OIL GRID SEPERATOR
	PROPOSED STORM SEWER
MHA1	PROPOSED SANITARY MANHOLE
	PROPOSED SANITARY SEWER
WV	PROPOSED WATER VALVE
	PROPOSED WATERMAIN

NO.	REVISIONS	DATE	BY

MGM CONSULTING INC
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Email: mgm@mgm.on.ca www.mgm.on.ca

PROJECT:

EGLIN PARK REDEVELOPMENT PROJECT

287-327 Eglin Street East
Coburg, Ontario

DRAWING:

SERVICING PLAN

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e-mail: bba@bba-archeng.com

PROFESSIONAL ENGINEERS PROVINCE OF ONTARIO M. L. STAIRS AUG 28, 2020

DESIGN BY: AP	DOC. CONTROL DATE:
DRAWN BY: XX	% COMPLETE:
CHECKED BY: XX	INITIAL:
DATE: JULY 2020	
SCALE: 1:300	
FILE: 2020-034	

PROJECT NO: **19284**

DRAWING NO: **CV-2**

CONSTRUCTION NOTES AND SPECIFICATIONS:

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   - 1.4. CONFIRM ALL DRAWINGS USED FOR CONSTRUCTION ARE OF THE MOST RECENT REVISION.
2. THE CONTRACTOR SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO EXISTING WORKS
3. ALL UNDERGROUND SERVICES ARE TO BE CONSTRUCTED IN FULL COMPLIANCE WITH ONTARIO PROVINCIAL BUILDING CODE (PART 7, PLUMBING) AND THE REQUIREMENTS OF THE TOWN OF MILTON AND THE REGIONAL MUNICIPALITY OF HALTON; WHICH CODES AND REGULATIONS SHALL SUPERSEDE ALL OTHERS.
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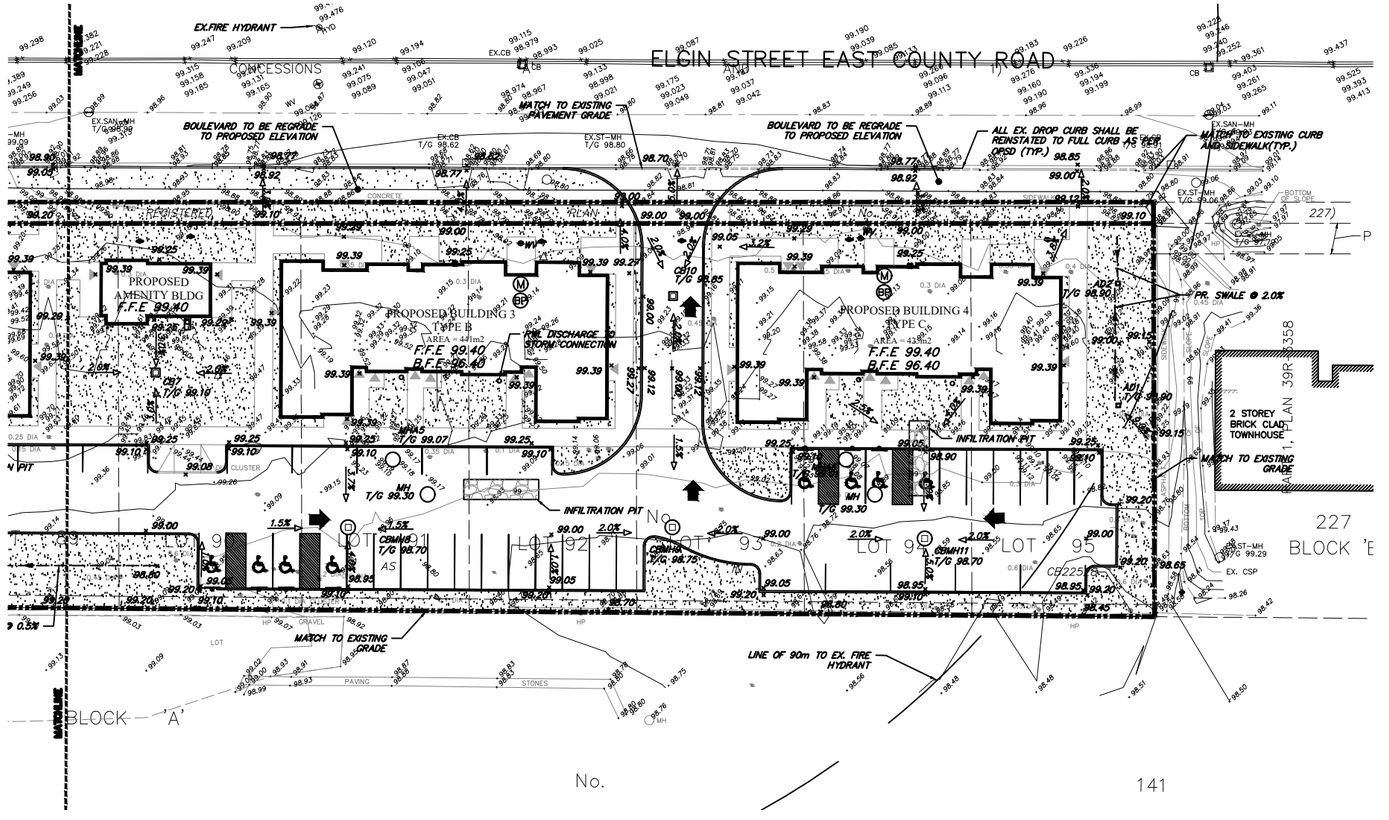
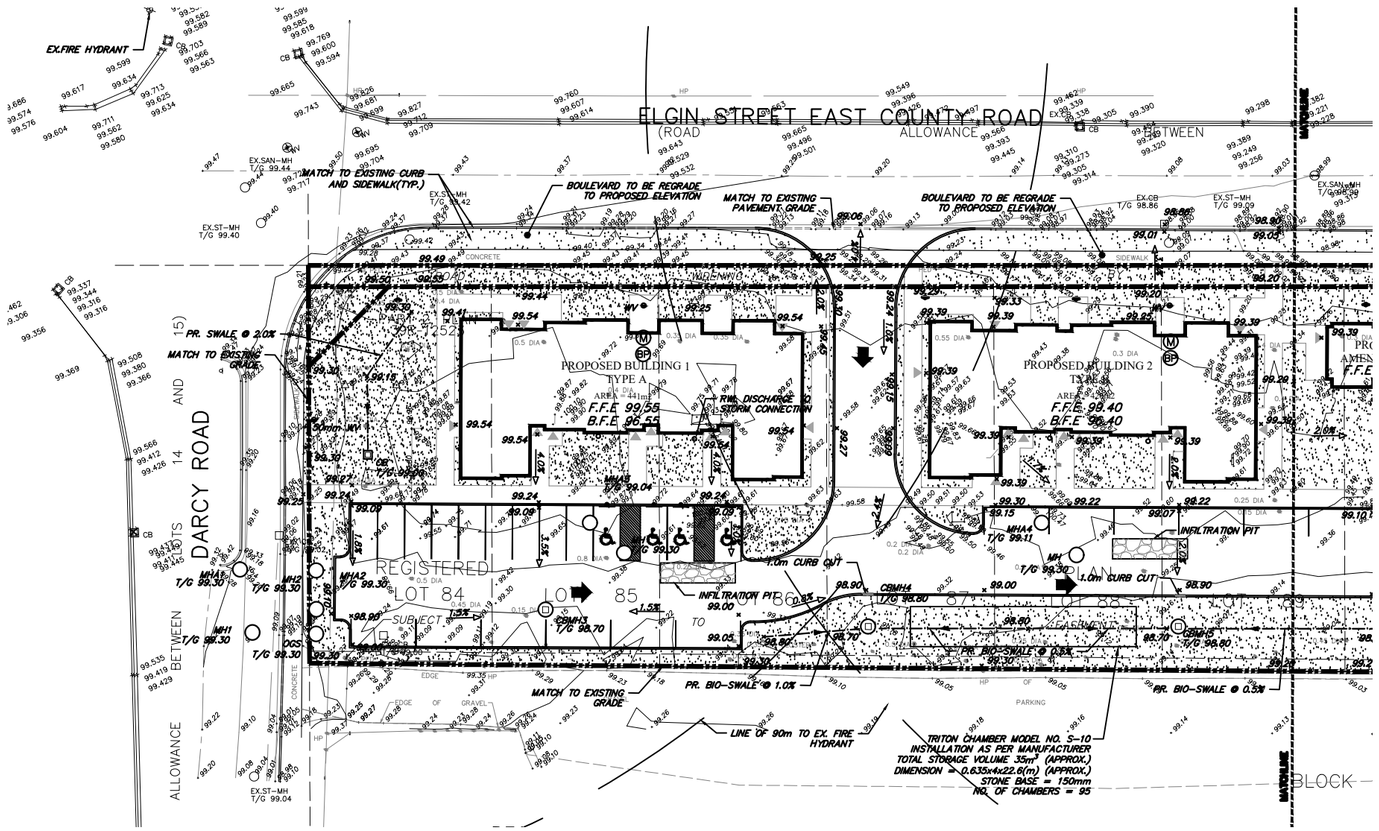
8. ALL REMOVALS SHALL BE IN ACCORDANCE WITH OPSS 510. ALL REMOVED MATERIALS SHALL BE DISPOSED OFF SITE.
9. SILTATION CONTROL SHALL BE MAINTAINED DURING ALL PHASES OF CONSTRUCTION.
10. ALL GRADING WORK SHALL BE CARRIED OUT IN ACCORDANCE WITH OPSS 208.
11. THE CONTRACTOR TO NOTIFY ENGINEER PRIOR TO SAWCUTTING EXISTING ASPHALT FOR CONFIRMATION OF POSITIVE DRAINAGE
12. ALL GRANULAR MATERIAL SHALL CONFORM TO OPSS 1010, AND BE INSTALLED IN ACCORDANCE WITH OPSS 314.
13. ALL ASPHALT MATERIALS SHALL BE IN ACCORDANCE WITH OPSS 1101 AND BE INSTALLED IN ACCORDANCE WITH OPSS 310.
14. CONCRETE SHALL BE IN ACCORDANCE WITH OPSS 1350 AND HAVE MINIMUM COMPRESSIVE STRENGTH OF 30MPA AFTER 28 DAYS.
15. SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH OPSS 410. TRENCH BACKFILL TO BE APPROVED NATIVE MATERIAL.
16. CATCHBASIN AND MANHOLE ADJACENT SHALL BE COMPLETED IN ACCORDANCE WITH OPSS 408.
17. ALL DISTURBED GRASSED AREAS ARE TO BE RESTORED WITH 150MM DEPTH TOPSOIL AND SOD.
18. TOPSOIL SHALL BE IN ACCORDANCE WITH OPSS 570 AND SOD IN ACCORDANCE WITH OPSS 571.





NOTE:
CONTRACTOR TO CONTACT MGM CONSULTING INC. IMMEDIATELY SHOULD THERE BE ANY CONFLICTS BETWEEN EXISTING CONDITIONS AND PROPOSED GRADING AND/OR SERVICING DESIGN, OR CONFLICTS IN CONSTRUCTING THE WORK AS PER THE INTENT OF THE APPROVED DESIGN PRIOR TO CONSTRUCTION.

NOTE:
1. ALL DISTURBED AREAS TO BE RESTORED TO ORIGINAL CONDITION OR BETTER TO SATISFACTION OF THE TOWN AND MGM CONSULTING INC.
2. CONTRACTOR TO LOCATE AND PROTECT ALL EXISTING SERVICES AND UTILITIES PRIOR TO AND DURING CONSTRUCTION
3. CONTRACTOR TO LOCATE AND CONFIRM ALL EXISTING UTILITIES AND SERVICE INFORMATION PRIOR CONSTRUCTION
4. CONTRACTOR TO ENSURE ADEQUATE CLEARANCE FROM ALL EXISTING SERVICES AND UTILITIES
5. CONTRACTOR TO CONFIRM ALL EXISTING INVERTS PRIOR TO INTERNAL SERVICING.
6. NO CONSTRUCTION SHALL TAKE PLACE ON ADJACENT PRIVATE PROPERTY WITHOUT WRITTEN PERMISSION FROM THE RESPECTIVE LAND OWNER
7. PRIOR TO THE COMMENCEMENT OF ANY WORK ON THE SITE, SILT FENCE IS TO BE INSTALLED ON THE PERIMETER OF THE PROPERTY AND AT LOCATIONS AS DETERMINED BY THE DIRECTOR, DEVELOPMENT ENGINEERING, AND THE SILT FENCE SHALL REMAIN IN PLACE UNTIL SUCH TIME AS OTHERWISE DIRECTED BY THE DIRECTOR DEVELOPMENT ENGINEERING
8. PARKING STALL DELINEATION SHALL BE WITH 100mm WIDE WHITE OR YELLOW MARKINGS
9. THE EXISTING BOULEVARD IS TO BE RESTORED IMMEDIATELY FOLLOWING CONSTRUCTION TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE TOWN OF MILTON

GRADING NOTES:
1. SILT CONTROLS ARE TO BE IN PLACE PRIOR TO THE START OF SITE WORKS, AND BE MAINTAINED FOR THE DURATION OF CONSTRUCTION.
2. MATCH TO EXISTING GRADES AT PROPERTY LINE.
3. PROPOSED CONCRETE BARRIER CURB AS PER OPSD 600.110.
4. PROPOSED CONCRETE CURB AND GUTTER AS PER OPSD 600.04
5. CONTRACTOR SHALL PROVIDE AS BUILT SURVEY OF THE SITE FOR FINAL REVIEW.

BENCHMARK

ELEVATIONS HEREON ARE GEODETIC AND ARE REFERRED TO THE ONTARIO MINISTRY OF NATURAL RESOURCES AND FORESTRY CONTROL STATION 0011967U056 AND 0011960U9506. HAVING PUBLISHED ELEVATIONS OF 77.489m AND 79.568m (CGVD-2013) RESPECTIVELY.

SURVEY INFORMATION BY: J.D. BARNES LIMITED
REFERENCE No: 20-25-815-00
DATED: 05/14/2020

NO.	ISSUES	DATE	BY
1	ISSUED FOR REZONING	8/28/20	CD

LEGEND

CB	EXISTING CATCHBASIN
GV	EXISTING GAS VALVE
MH	EXISTING MANHOLE
HP	EXISTING HYDRO POLE
PED	EXISTING TELEPHONE PEDESTAL
WK	EXISTING WATER KEY
WV	EXISTING WATER VALVE
OC	EXISTING OVERHEAD CABLES
	EXISTING CONIFEROUS TREE
	EXISTING DECIDUOUS TREE
99.22	PROPOSED GRADE ELEVATION
2.0%	PROPOSED SLOPE
CB	PROPOSED CATCH BASIN
AD1	PROPOSED AREA DRAIN
CBMH1	PROPOSED CB MANHOLE
MH1	PROPOSED STORM MANHOLE
OGS	PROPOSED OIL GRID SEPERATOR
	PROPOSED STORM SEWER
MHA1	PROPOSED SANITARY MANHOLE
	PROPOSED SANITARY SEWER
WV	PROPOSED WATER VALVE
	PROPOSED WATERMAIN

NO.	REVISIONS	DATE	BY

MGM CONSULTING INC
Consulting Engineering & Project Managemont
400 Bronte Street South, Suite 201, Milton, Ontario L9T 0H7
Tel: (905) 567-8678 Fax: (905) 875-1339 Email: mgm@mgm.on.ca www.mgm.on.ca

PROJECT:

EGLIN PARK REDEVELOPMENT PROJECT

287-327 Eglin Street East
Coburg, Ontario

DRAWING:

GRADING PLAN

BBA
BARRY BRYAN ASSOCIATES
Architects
Engineers
Project Managers
250 Water Street
Suite 201
Whitby, Ontario
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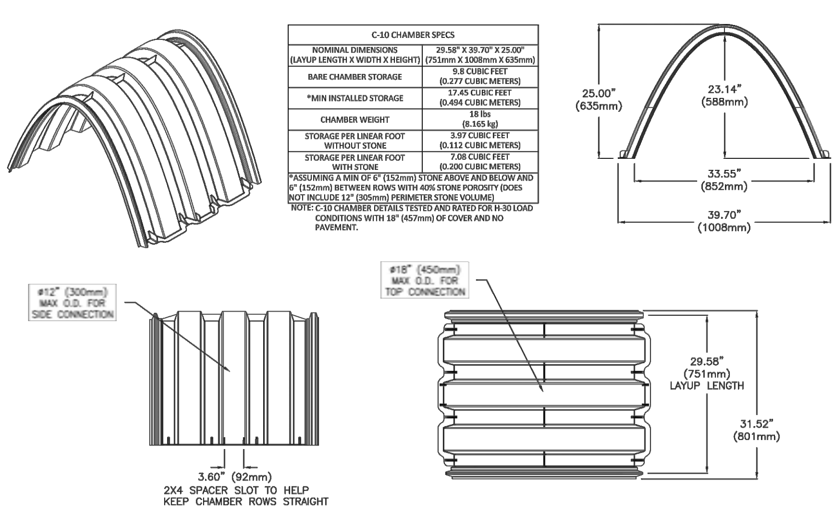
Tel: (905) 666-5252
Fax: (905) 666-5256
e-mail: bba@bba-archeng.com

PROFESSIONAL ENGINEER — M. L. STAIRS — AUG 28, 2020 — Province of Ontario

DESIGN BY: AP	DOC. CONTROL DATE:
DRAWN BY: XX	% COMPLETE:
CHECKED BY: XX	INITIAL:
DATE: JULY 2020	
SCALE: 1:300	
FILE: 2020-034	

PROJECT NO: **19284**

DRAWING NO: **CV-3**



C-10 CHAMBER SPECS	
NOMINAL DIMENSIONS (LAYUP LENGTH X WIDTH X HEIGHT)	29.58" X 39.70" X 25.00" (751mm X 1008mm X 635mm)
BARE CHAMBER STORAGE	9.8 CUBIC FEET (0.277 CUBIC METERS)
*MIN INSTALLED STORAGE	17.45 CUBIC FEET (0.494 CUBIC METERS)
CHAMBER WEIGHT	18 lbs (8.165 kg)
STORAGE PER LINEAR FOOT WITHOUT STONE	3.97 CUBIC FEET (0.112 CUBIC METERS)
STORAGE PER LINEAR FOOT WITH STONE	7.08 CUBIC FEET (0.200 CUBIC METERS)
*ASSUMING A MIN OF 6" (152mm) STONE ABOVE AND BELOW AND 6" (152mm) BETWEEN ROWS WITH 40% STONE POROSITY (DOES NOT INCLUDE 12" (305mm) PERIMETER STONE VOLUME)	

NOTE: C-10 CHAMBER DETAILS TESTED AND RATED FOR H-30 LOAD CONDITIONS WITH 18" (457mm) OF COVER AND NO PAVEMENT.

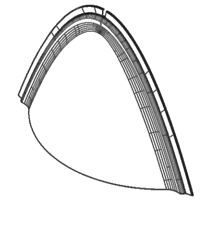
CONCEPTUAL PLAN DISCLAIMER
THIS GENERIC DETAIL DOES NOT ENCOMPASS THE SIZING, FIT, AND APPLICABILITY OF THE TRITON CHAMBER SYSTEM FOR THIS SPECIFIC PROJECT. IT IS THE ULTIMATE RESPONSIBILITY OF THE DESIGN ENGINEER TO ASSURE THAT THE STORMWATER SYSTEM DESIGN IS IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS AND REGUALTIONS. TRITON PRODUCTS MUST BE DESIGNED AND INSTALLED IN ACCORDANCE WITH TRITON'S MINIMUM REQUIREMENTS. TRITON STORMWATER SOLUTIONS DOES NOT APPROVE PLANS, SIZING, OR SYSTEM DESIGNS. THE DESIGN ENGINEER IS RESPONSIBLE FOR ALL DESIGN DECISIONS.

TRITON STORMWATER SOLUTIONS
7600 EAST GRAND RIVER, STE.195
BRIGHTON, MI 48114
PHONE: (810) 222-7652 • FAX: (810) 222-1769
WWW.TRITONSWS.COM

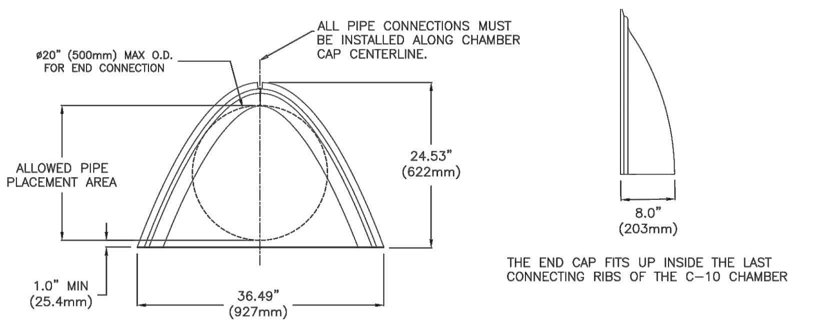
C-10 CHAMBER DETAIL

TRITON - STANDARD DETAILS
REVISED: 03-02-16 JWM

3 / 5



C-10 END CAP SPECS	
NOMINAL DIMENSIONS (LAYUP LENGTH X WIDTH X HEIGHT)	8.0" X 36.49" X 24.53" (203mm X 921mm X 622mm)
BARE END CAP STORAGE	1.21 CUBIC FEET (0.034 CUBIC METERS)
*MIN INSTALLED STORAGE	3.86 CUBIC FEET (0.109 CUBIC METERS)
*ASSUMING A MIN OF 6" (152mm) STONE ABOVE AND BELOW AND 6" (152mm) BETWEEN ROWS WITH 40% STONE POROSITY (DOES NOT INCLUDE 12" (305mm) PERIMETER STONE VOLUME)	



CONCEPTUAL PLAN DISCLAIMER
THIS GENERIC DETAIL DOES NOT ENCOMPASS THE SIZING, FIT, AND APPLICABILITY OF THE TRITON CHAMBER SYSTEM FOR THIS SPECIFIC PROJECT. IT IS THE ULTIMATE RESPONSIBILITY OF THE DESIGN ENGINEER TO ASSURE THAT THE STORMWATER SYSTEM DESIGN IS IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS AND REGUALTIONS. TRITON PRODUCTS MUST BE DESIGNED AND INSTALLED IN ACCORDANCE WITH TRITON'S MINIMUM REQUIREMENTS. TRITON STORMWATER SOLUTIONS DOES NOT APPROVE PLANS, SIZING, OR SYSTEM DESIGNS. THE DESIGN ENGINEER IS RESPONSIBLE FOR ALL DESIGN DECISIONS.

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C-10 CHAMBER END CAP DETAIL

TRITON - STANDARD DETAILS
REVISED: 03-02-16 JWM

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TRITON C-10 PRODUCT SPECIFICATIONS

1.0 General

1.1 Triton chambers are designed to control stormwater runoff. As a subsurface retention or detention system, Triton chambers retain and allow effective infiltration of water into the soil. As a subsurface detention system, Triton chambers detain and allow for the metered flow of water to an outfall.

2.0 Chamber Parameters

2.1 The chamber shall be injection compression molded of a structural grade 1010 green soy resin composite to be inherently resistant to environmental stress cracking (ESCR), creep, and to maintain proper stiffness through temperature ranges of -40 degrees Fahrenheit to 180 degrees Fahrenheit (-40 degrees Celsius to 82.2 degrees Celsius).

2.2 The material property for the chamber and end cap must meet or exceed the following:
Tensile Strength- Ultimate: 21,755 PSI (150 Mpa)
Tensile Strength-Yield: 17,404 PSI (120 Mpa)
Tensile Modulus: 1,750-2,240 KSI (12,066 Mpa - 15,444 Mpa)
Flex Modulus: 1,600 KSI (11,032 Mpa)
Flex Yield Strength: 33,100 PSI (228 Mpa)
Compressive Strength: 30,457 PSI (210 Mpa)
Shear Strength: 11,500 PSI (79 Mpa)

2.3 The nominal chamber dimensions of the Triton C-10 shall be 25.0 inches tall (635 millimeters), 39.7 inches wide (1008 millimeters) and 31.52 inches long (801 millimeters). Lay-up length is 29.58 inches (751 millimeters).

2.4 The chamber shall have an elliptical curved section profile.

2.5 The chamber shall be open-bottomed.

2.6 The chamber shall incorporate an overlapping corrugation joint system to allow chamber rows to be constructed.

2.7 The nominal storage volume of a Triton C-10 chamber shall be 17.45 cubic feet (0.494 cubic meters) per chamber when installed per Triton's typical details. This equates to 1.86 cubic feet (0.053 cubic meters) of storage per square foot of bed. This does not include perimeter stone.

2.8 The chamber shall have both of its ends open to allow for unimpeded hydraulic flows and visual inspections down a row's entire length.

2.9 The chamber shall have five corrugations to achieve strengths defined above.

2.10 The chamber shall have five circular and elliptical, indented and raised, surfaces on the top to the chamber for a maximum of 18 inch (450 millimeter) diameter optional top feed inlets, inspection ports and/or clean-out access ports.

2.11 The chamber side shall be capable of accepting pipe O.D. up to 12 inches (300 millimeters).

2.12 The chamber shall be analyzed, designed and field tested using AASHTO LRFD bridge design specifications 1. Design live load shall meet or exceed the AASHTO HS30 or a rear axle load of 48,000 pounds (21,772.4 kg). Design shall consider earth and live loads without pavement as appropriate for the minimum 18 inches (457 millimeters) of total cover to a maximum total cover of 50 feet (15.24 meters).

2.13 The chamber shall be manufactured in an ISO/TS16949:2002 and ISO 14001:2004 certified facility

2.14 The service life of the product is over 60 years under a constant sustained load of 10,000 PSI (68.95 Mpa) which is equal to the H-20 loading condition. Under typical loading conditions the Chamber and End Cap has a useful life span of 120 years from date of when manufactured.

3.0 End Cap Parameters

3.1 The end cap shall be Injection Compression molded of 1010 green soy resin to be inherently resistant to environmental stress cracking (ESCR), creep and to maintain proper stiffness through temperature ranges of -40 degrees Fahrenheit to 180 degrees Fahrenheit (-40 degrees Celsius to 82.2 degrees Celsius).

3.2 The end cap shall be designed to fit inside the last corrugation of a chamber, which allows the capping of each end of the chamber row.

3.3 The end cap shall have 7 different diameter connection guides across the front face of the bull nosed surface. The maximum diameter that the end cap can accept is 20 inches (500 millimeter) PS46, ASTM F679 PVC pipe.

3.4 The end cap shall have excess structural adequacies to allow cutting an orifice of any size at any invert elevation.

3.5 The primary face of an end cap shall have five corrugations and be angled outward to resist horizontal loads generated near the edges of beds.

3.6 The end cap shall be manufactured in an ISO/TS16949:2002 and ISO 14001:2004 certified facility.

3.7 The service life of the product to be over 60 years under a sustained load of 10,000 PSI (68.95 Mpa) which is equal to the H-20 loading condition.

3.8 The nominal storage volume of a Triton C-10 end cap shall be 3.86 cubic feet (0.109 cubic meters) per end cap when installed per triton's typical details. This equates to 1.52 cubic feet (0.043 cubic meters) of storage per square foot of bed.

4.0 Installation

4.1 Installation shall be in accordance with the latest Triton Installation manual that can be downloaded from the Triton website: www.tritonsws.com/support/downloads

CONCEPTUAL PLAN DISCLAIMER
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C-10 PRODUCT SPECIFICATIONS

TRITON - STANDARD DETAILS
REVISED: 03-02-16 JWM

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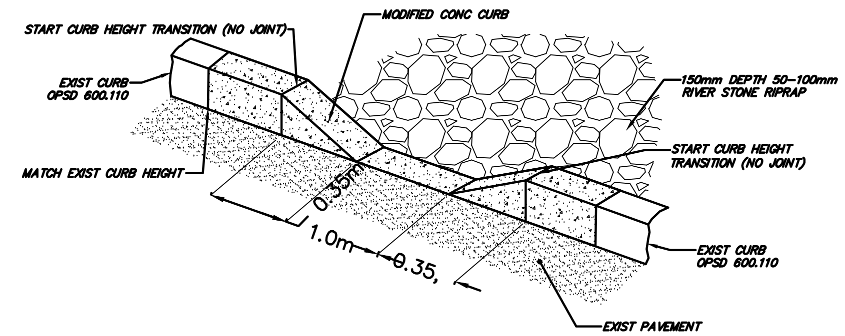
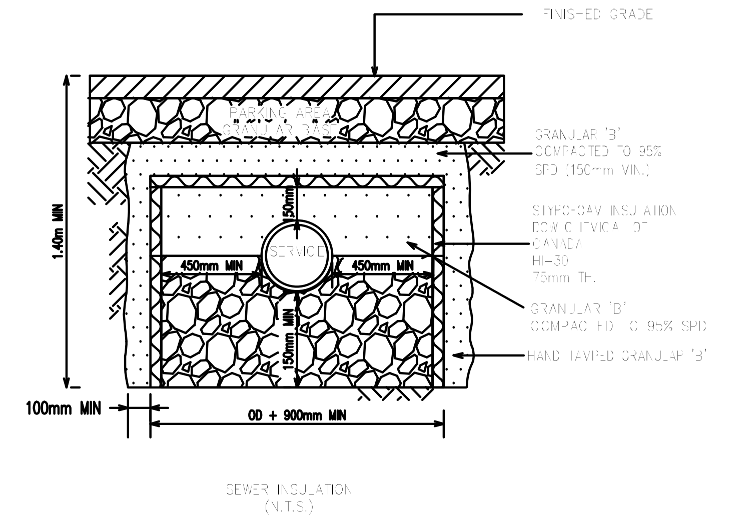
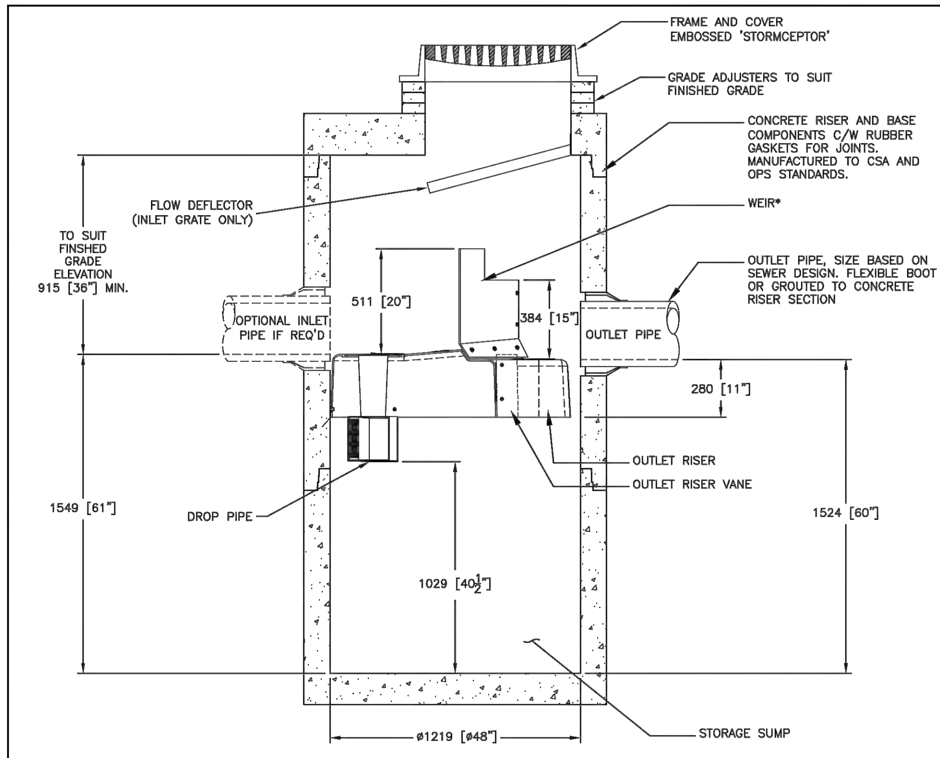


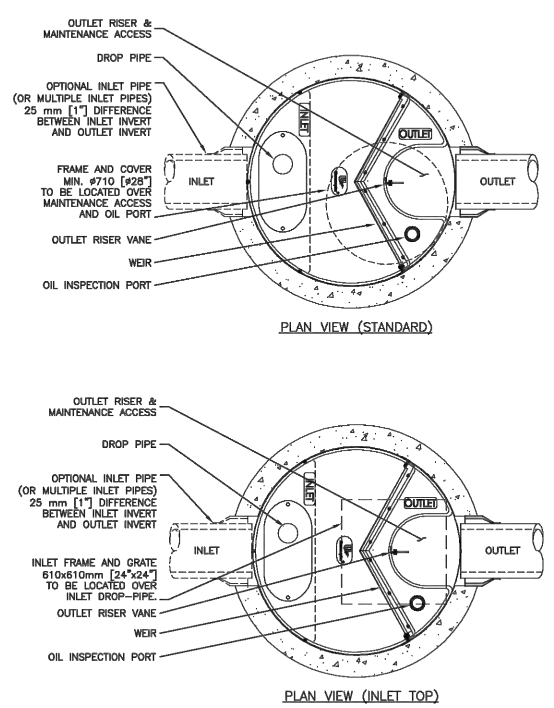
CURB CUT DETAIL
SCALE: NTS



SEWER INSULATION
(N.T.S.)



SECTION VIEW



FOR SITE SPECIFIC DRAWINGS PLEASE CONTACT YOUR LOCAL STORMCEPTOR REPRESENTATIVE. SITE SPECIFIC DRAWINGS ARE BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME. SOME FIELD REVISIONS TO THE SYSTEM LOCATION OR CONNECTION PIPING MAY BE NECESSARY BASED ON AVAILABLE SPACE OR SITE CONFIGURATION REVISIONS. ELEVATIONS SHOULD BE MAINTAINED EXCEPT WHERE NOTED ON BYPASS STRUCTURE (IF REQUIRED).

GENERAL NOTES:

* MAXIMUM SURFACE LOADING RATE (SLR) INTO LOWER CHAMBER THROUGH DROP PIPE IS 1135 L/min/m^2 (27.9 gpm/ft^2) FOR STORMCEPTOR EF4 AND 535 L/min/m^2 (13.1 gpm/ft^2) FOR STORMCEPTOR EFO4 (OIL CAPTURE CONFIGURATION). WEIR HEIGHT IS 150 mm (6 INCH) FOR EF04.

1. ALL DIMENSIONS INDICATED ARE IN MILLIMETERS (INCHES) UNLESS OTHERWISE SPECIFIED.
2. STORMCEPTOR STRUCTURE INLET AND OUTLET PIPE SIZE AND ORIENTATION SHOWN FOR INFORMATIONAL PURPOSES ONLY.
3. UNLESS OTHERWISE NOTED, BYPASS INFRASTRUCTURE, SUCH AS ALL UPSTREAM DIVERSION STRUCTURES, CONNECTING STRUCTURES, OR PIPE CONDUITS CONNECTING TO COMPLETE THE STORMCEPTOR SYSTEM SHALL BE PROVIDED AND ADDRESSED SEPARATELY.
4. DRAWING FOR INFORMATION PURPOSES ONLY. REFER TO ENGINEER'S SITE/UTILITY PLAN FOR STRUCTURE ORIENTATION.
5. NO PRODUCT SUBSTITUTIONS SHALL BE ACCEPTED UNLESS SUBMITTED 10 DAYS PRIOR TO PROJECT BID DATE, OR AS DIRECTED BY THE ENGINEER OF RECORD.

INSTALLATION NOTES

A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STRUCTURE (LIFTING CLUTCHES PROVIDED)
C. CONTRACTOR WILL INSTALL AND LEVEL THE STRUCTURE, SEALING THE JOINTS, LINE ENTRY AND EXIT POINTS (NON-SHRINK GROUT WITH APPROVED WATERSTOP OR FLEXIBLE BOOT)
D. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT THE DEVICE FROM CONSTRUCTION-RELATED EROSION RUNOFF.
E. DEVICE ACTIVATION, BY CONTRACTOR, SHALL OCCUR ONLY AFTER SITE HAS BEEN STABILIZED AND THE STORMCEPTOR UNIT IS CLEAN AND FREE OF DEBRIS.

STANDARD DETAIL
NOT FOR CONSTRUCTION

SITE SPECIFIC DATA REQUIREMENTS					
STORMCEPTOR MODEL	EF4				
STRUCTURE ID	*				
WATER QUALITY FLOW RATE (L/s)	*				
PEAK FLOW RATE (L/s)	*				
RETURN PERIOD OF PEAK FLOW (yrs)	*				
DRAINAGE AREA (HA)	*				
DRAINAGE AREA IMPERVIOUSNESS (%)	*				
PIPE DATA:	I.E.	MAT'L	DIA	SLOPE %	HGL
INLET #1	*	*	*	*	*
INLET #2	*	*	*	*	*
OUTLET	*	*	*	*	*
* PER ENGINEER OF RECORD					

Stormceptor EF
SCALE = NTS
imbrium

1	5/29/17	UPDATES		JSK
0	5/26/17	INITIAL RELEASE		JSK
MARK	DATE	REVISION DESCRIPTION		BY

DATE: 5/26/2017	
DESIGNED: JSK	DRAWN: JSK
CHECKED: BSF	APPROVED: SP
PROJECT No.: EF4	SEQUENCE No.: *
SHEET: 1 OF 1	

BENCHMARK

ELEVATIONS HEREON ARE GEODETIC AND ARE REFERRED TO THE ONTARIO MINISTRY OF NATURAL RESOURCES AND FORESTRY CONTROL STATION 0011967U056 AND 0011960U9506, HAVING PUBLISHED ELEVATIONS OF 77.489m AND 79.568m (CGVD-2013) RESPECTIVELY.

SURVEY INFORMATION BY: J.D. BARNES LIMITED
REFERENCE No: 20-25-815-00
DATED: 05/14/2020

NO.	ISSUES	DATE	BY
1	ISSUED FOR REZONING	8/28/20	CD

NO.	REVISIONS	DATE	BY

MGM CONSULTING INC
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PROJECT:

EGLIN PARK REDEVELOPMENT PROJECT

287-327 Eglin Street East
Coburg, Ontario

DRAWING:

DETAILS PLAN

BARRY BRYAN ASSOCIATES
Architects
Engineers
Project Managers
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Fax: (905) 666-5256
e-mail: bba@bba-archeng.com

REGISTERED PROFESSIONAL ENGINEER
M. L. STAIRS
AUG 28, 2020
PROVINCE OF ONTARIO

DESIGN BY: AP	DOC CONTROL: DATE:
DRAWN BY: XX	% COMPLETE:
CHECKED BY: XX	INITIAL:
DATE: JULY 2020	
SCALE: 1:300	
FILE: 2020-034	

PROJECT NO: 19284
DRAWING NO: CV-3

APPENDIX A

STORMWATER MANAGEMENT CALCULATIONS

EGLIN PARK REDEVELOPMENT PROJECT
287-327 EGLIN STREET EAST
STORMWATER MANAGEMENT CALCULATIONS

1.0 Drainage Area Characteristics

1.1 Existing Drainage Areas (see Figure No. 4):

	"c"	Area (ha)
Attenuated Areas:		
Building	0.90	0.094
Paved Area	0.95	0.131
Landscaped Area	0.25	0.571
Sub Total	**0.44**	**0.796**
Total Area		**0.796**
Runoff Coefficient (Entire Site)		**0.44**

1.2 Proposed Drainage Areas (see Figure No. 5):

	"c"	Area (ha)
Attenuated Areas:		
Building	0.90	0.177
Paved Area	0.95	0.368
Landscaped Area	0.25	0.205
Sub Total	**0.75**	**0.75**
Unattenuated Areas:		
Paved Area	0.95	0.007
Landscaped Area	0.25	0.039
Sub Total	**0.36**	**0.046**
Total Area		**0.796**
Runoff Coefficient (Entire Site)		**0.72**

2.0 Allowable Post Development Flows

2.1 Allowable Flows from Area to be Redeveloped

Post development flows from the redevelopment area for the 2 and 100 year storm event are to be controlled to the pre-development flow rate for designed drainage area

Storm (years)	Td (min)	I (mm/hr)	C	A (ha)	Q (allow.) (cms)
2	15	63.5	0.44	0.796	0.0621
5	15	79.5	0.44	0.796	0.0777
10	15	90.9	0.44	0.796	0.0889
25	15	117.8	0.44	0.796	0.1151
50	15	121.8	0.44	0.796	0.1190
100	15	130.0	0.44	0.796	0.1270

3.0 Rooftop Controlled Flow Calculations

There is no roof control proposed to the development

4.0 Storage Calculations

4.1 Two Year Site Storage

Rainfall Duration min.	s	2 Year Rainfall Intensity (I) mm/h	Attenuated Flow cms	Unattenuated Flow cms	Controlled Flow cms	Aprox. Detention Volumes cu.m.
15	**900**	**63.5**	**0.0988**	**0.003**	**0.0531**	**43.7**
20	1200	53.9	0.0838	0.002	0.0531	39.8
25	1500	46.8	0.0728	0.002	0.0531	32.7
30	1800	41.3	0.0643	0.002	0.0531	23.6

4.1 Five Year Site Storage

Rainfall Duration min.	s	5 Year Rainfall Intensity (I) mm/h	Attenuated Flow cms	Unattenuated Flow cms	Controlled Flow cms	Aprox. Detention Volumes cu.m.
15	**900**	**79.5**	**0.1237**	**0.004**	**0.0569**	**63.4**
20	1200	68.4	0.1065	0.003	0.0569	63.3
25	1500	60.1	0.0935	0.003	0.0569	59.1
30	1800	53.6	0.0833	0.002	0.0569	52.1

4.1 Ten Year Site Storage

Rainfall Duration min.	s	10 Year Rainfall Intensity (I) mm/h	Attenuated Flow cms	Unattenuated Flow cms	Controlled Flow cms	Aprox. Detention Volumes cu.m.
15	900	90.9	0.1415	0.004	0.0637	73.7
20	**1200**	**78.3**	**0.1218**	**0.004**	**0.0637**	**74.0**
25	1500	68.8	0.1070	0.003	0.0637	69.6
30	1800	61.3	0.0954	0.003	0.0637	62.0

4.1 Twenty-five Year Site Storage

Rainfall Duration min.	s	25 Year Rainfall Intensity (I) mm/h	Attenuated Flow cms	Unattenuated Flow cms	Controlled Flow cms	Aprox. Detention Volumes cu.m.
15	900	117.8	0.1832	0.005	0.0845	93.6
20	**1200**	**102.3**	**0.1591**	**0.005**	**0.0845**	**95.1**
25	1500	90.4	0.1406	0.004	0.0845	90.3
30	1800	81.0	0.1260	0.004	0.0845	81.2

4.1 Fifty Year Site Storage

Rainfall Duration min.	s	50 Year Rainfall Intensity (I) mm/h	Attenuated Flow cms	Unattenuated Flow cms	Controlled Flow cms	Aprox. Detention Volumes cu.m.
15	900	121.8	0.1895	0.006	0.0881	96.2
20	**1200**	**108.0**	**0.1680**	**0.005**	**0.0881**	**101.7**
25	1500	96.9	0.1508	0.004	0.0881	100.7
30	1800	88.0	0.1369	0.004	0.0881	95.0

4.2 One Hundred Year Site Storage

Rainfall Duration min.	s	100 Year Rainfall Intensity (I) mm/h	Attenuated Flow cms	Unattenuated Flow cms	Controlled Flow cms	Aprox. Detention Volumes cu.m.
15	900	130.0	0.2022	0.006	0.0904	105.9
20	1200	116.4	0.1811	0.005	0.0904	115.2
25	**1500**	**105.4**	**0.1641**	**0.005**	**0.0904**	**117.6**
30	1800	96.3	0.1499	0.004	0.0904	115.0

5.0 Controlled Flow Calculations

Flows from the proposed storm system are to be controlled with the installation of an orifice over the outlet at manhole 1 as indicated on the site servicing plan.

2 year ponding elevation =	97.70	m.
5 year ponding elevation =	97.80	m.
10 year ponding elevation =	98.00	m.
25 year ponding elevation =	98.75	m.
50 year ponding elevation =	98.90	m.
100 year ponding elevation =	99.00	m.

Orifice equation: Q = CA(2hg)^0.5, where,

orifice invert elev. =	96.94	m.
c =	0.82	
g =	9.81	cu.m./sec
Orifice Diameter =	150	mm.
A =	0.0177	sq.m.
centreline orifice =	97.02	m.

	h (m)	Q (cms)	Attenuated Flow + Unattenuated Flow = Total Site Flow (cms)
2 year storm =	0.69	0.0531	0.056
5 year storm =	0.78	0.0569	0.060
10 year storm =	0.98	0.0637	0.068
25 year storm =	1.74	0.0845	0.090
50 year storm =	1.89	0.0881	0.094
100 year storm =	1.99	0.0904	0.096

6.0 On-Site Storage Provided

6.1 Pipe Storage

	Length (m)	**Size (mm)**	**Area (m^2)**	**Volume (m^3)**
AD2-AD1	12.2	150	0.018	0.22
AD1-CBMH11	23.5	150	0.018	0.42
CBMH11-CBMH9	22.3	250	0.049	1.09
CB10-CBMH9	22.7	250	0.049	1.11
CBMH9-CBMH8	32.5	300	0.071	2.30
CBMH8-CBMH5	39.8	375	0.110	4.40
CB7-CBMH5	21.9	250	0.049	1.08
CBMH5-CBMH4	31.1	450	0.159	4.95
CBMH4-CBMH3	32.3	525	0.216	6.99
CBMH3-MH2	22.9	600	0.283	6.47
MH2-OGS	1.0	150	0.018	0.02
OGS-MH1	6.4	300	0.071	0.45
TOTAL VOLUME				**29.5**

6.2 Surface Ponding

The detention volume available within the ponding areas at an assumed elev of 99.00 m. is as follows:

Structure	Grate Elev. Elevation	Ponding Elevation	Area	Depth	Volume
AD1	98.90	99.00	12	0.10	0.4
AD2	98.90	99.00	18	0.10	0.6
CBMH11	98.70	99.00	412	0.30	41.2
CB10	98.85	99.00	45	0.15	2.2
CBMH9	98.78	99.00	172	0.22	12.6
CBMH8	98.70	99.00	398	0.30	39.8
CBMH5-CBMH4	98.80	99.00	536	0.20	35.8
CBMH3	98.70	99.00	396	0.30	39.6

Total SurfaceStorage = **172.3** **cu.m.**

6.3 Underground Storm Chambers

Triton Storm Chamber-Model C-10
No of Chambers = 95
Dimension = 0.635x4.0x22.6(m)
Total Storage Volume = **35** m^3
Stone Base = 150 mm

6.3 Total Stormwater Storage Provided Onsite

2-5yr Storage **64.5** **cu.m.**
5-100 yr Storage **236.7** **cu.m.**

7.0 TSS Removal Summary

	Area Contributed** (ha)	TSS Removal (%)	Treated Area** (%)	Weight TSS (%)
Roof	0.177	80	22	17.8
Bioswale (80% TSS removal)	0.153	80	19	15.4
*OGS (50% TSS Removal)	0.750	50	94	47.1
Remaining untreated from bioswale & roof to be treated by OGS	0.330	10	41	4.1

* By GRCA policy, to consider the TSS removal efficiency of standalone OGS to be 50% regardless of manufraturer's claim.
** Refer to site grading plan for detail on captured areas.

Total site area as per site plan = 0.796 ha. **84.4**
Which achieved level 1 water quality treatment as per MOE requirement.

APPENDIX B

WATER DEMAND & FIRE CALCULATIONS

Fire Flow Calculation

The FUS requires that a minimum water supply source 'F' be provided at 140 kPa
The min flow 'F' can be calculated as such:

$F=220C\sqrt{A}$
where:
F- Required fire flow in L/min
C- Coefficient related to construction
A- Total area in sq.m

C = 1 (Combusitble construction)

For non-combustible construction, the area shall be a total of all floors (excluding basements at least 50 percent below grade) in the building being considered.

A = 1083 sq.m

Therefore,

F= 7240.0 L/min
= 7000 L/min (rounded to nearest 1000)

Reduction Factors:

F'=F*f1*f2

where:
f1- Occupancy factor
Low hazard occupancy, f1 = 25%

Therefore, the reduction due to low hazard occupancy = 1750 l/min.
and F = **5250** l/min

f2- Sprinkler protection factor

Based no fully automated sprinkler system, maximum reduction = 0%

Reduction = **0** L/min

Exposure Factors:
F" = F'*f3
where:
f3- Exposure factor not to exceed 75%

Separation between subject building and other structures, and associated charges are as follows:

	Distance (m)	Charge
North Side	Road	0%
South Side	30-45	5%
East Side	15	15%

West Side	Road	0%	
Total		**20%**	

The total increase for exposures is 20%
and the increase due to exposures = 1050

The resulting required minimum flow, F = **6300** l/min

Therefore a minimum flow of approximately **6000** L/min must be available
at the nearest hydrant with a minimum pressure of 140 kPa.

Note: This fireflow calculation has been prepared as a guide only. Confirmation should be obtained from a Fire Protection professional for confirmation

Appendix B
Elgin Park Redevelopment
Town Of Cobourg

Site Redevelopment
Water Demand Calculations

Date: August 26, 2020

According to the MOE Design Guildlines for Drinking Water System

Connection Point – Main Street			
	Residential		
Total equivalent population to be serviced	76	persons	
Residential Per Capital Demand (L/ha/Day)	191		
Total Lands to be Serviced	0.796	ha	
Hydrant Flow Test Location			
	Hydrant Flow Test Location		
		Pressure (kPa)	Time
Minimum water pressure		N/A	
Maximum water pressure		N/A	

	Water Demands			
	Demand type	Demand (units)		
No.		Use 1	Use 2	Total
1	Average day flow (l/s)	0.242	0	0.242
2	Maximum day flow (l/s)	1.52	0	1.52
3	Peak hour flow (l/s)	2.27	0	2.27
4	Fire Flow (l/s)	83.33	0	83.33
Analysis				
5	Maximum day plus fire flow (l/s)			84.86
6	Peak hour flow (l/s)			2.27
7	Maximum demand flow (l/s)			84.86

Note: Fire flow calculated based on the largest proposed building on the site.

APPENDIX C

TREATMENT UNIT SIZING REPORT

Stormceptor®

FORTERRA

Stormceptor® EF Sizing Report

STORMCEPTOR®
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

08/27/2020

Province:	Ontario
City:	Town of Cobourg
Nearest Rainfall Station:	TORONTO CENTRAL
NCDC Rainfall Station Id:	0100
Years of Rainfall Data:	18

Site Name:	Elgin Park Redevelopment
Drainage Area (ha):	0.80
% Imperviousness:	72.00

Runoff Coefficient 'c': 0.73

Particle Size Distribution:	OK-110
Target TSS Removal (%):	80.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	9.20
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	96.00
Site Sediment Transport Rate (kg/ha/yr):	

Project Name:	Elgin Park Redevelopment
Project Number:	2020-034
Designer Name:	Calvin Dang
Designer Company:	MGM Consulting
Designer Email:	cdang@mgm.on.ca
Designer Phone:	416-985-1214
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	93
EFO6	98
EFO8	99
EFO10	100
EFO12	100

Recommended Stormceptor EFO Model: EFO4

Estimated Net Annual Sediment (TSS) Load Reduction (%): 93

Water Quality Runoff Volume Capture (%): > 90

imbrium

THIRD-PARTY TESTING AND VERIFICATION

►**Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

►**Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterwavs.

PARTICLE SIZE DISTRIBUTION (PSD)

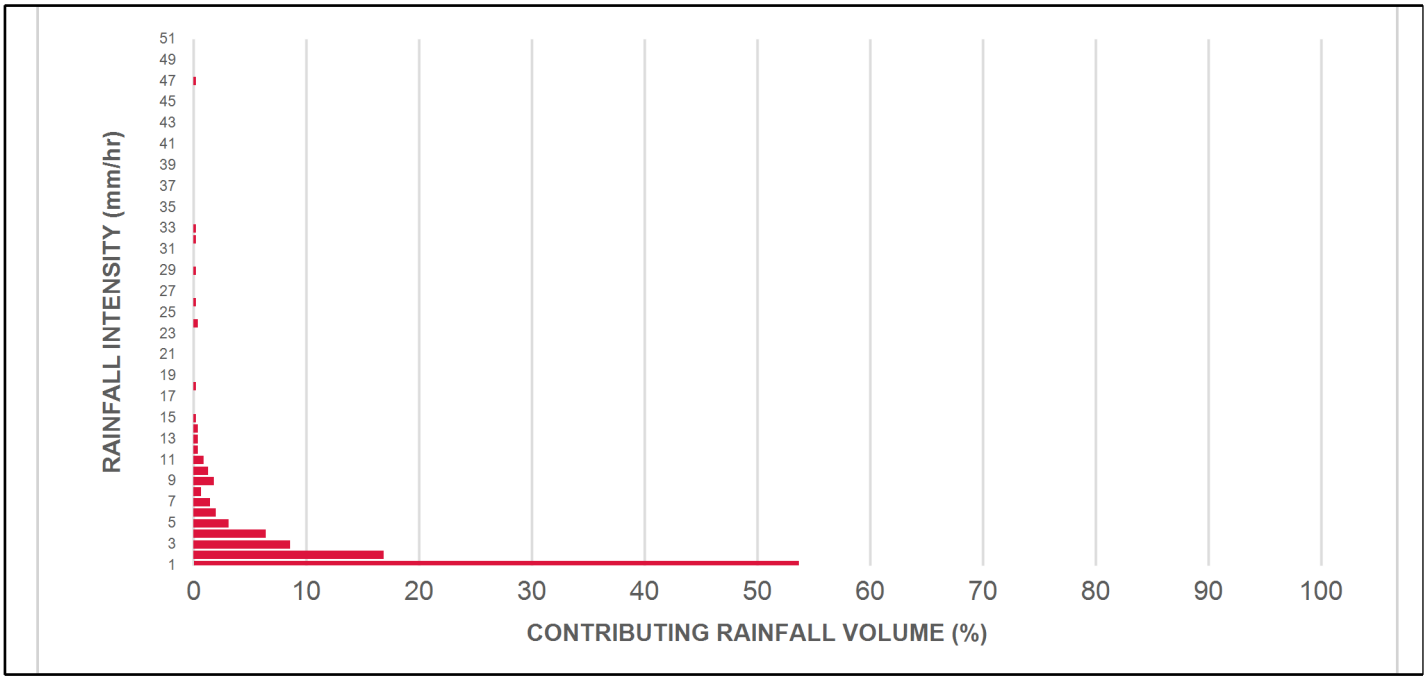
►The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

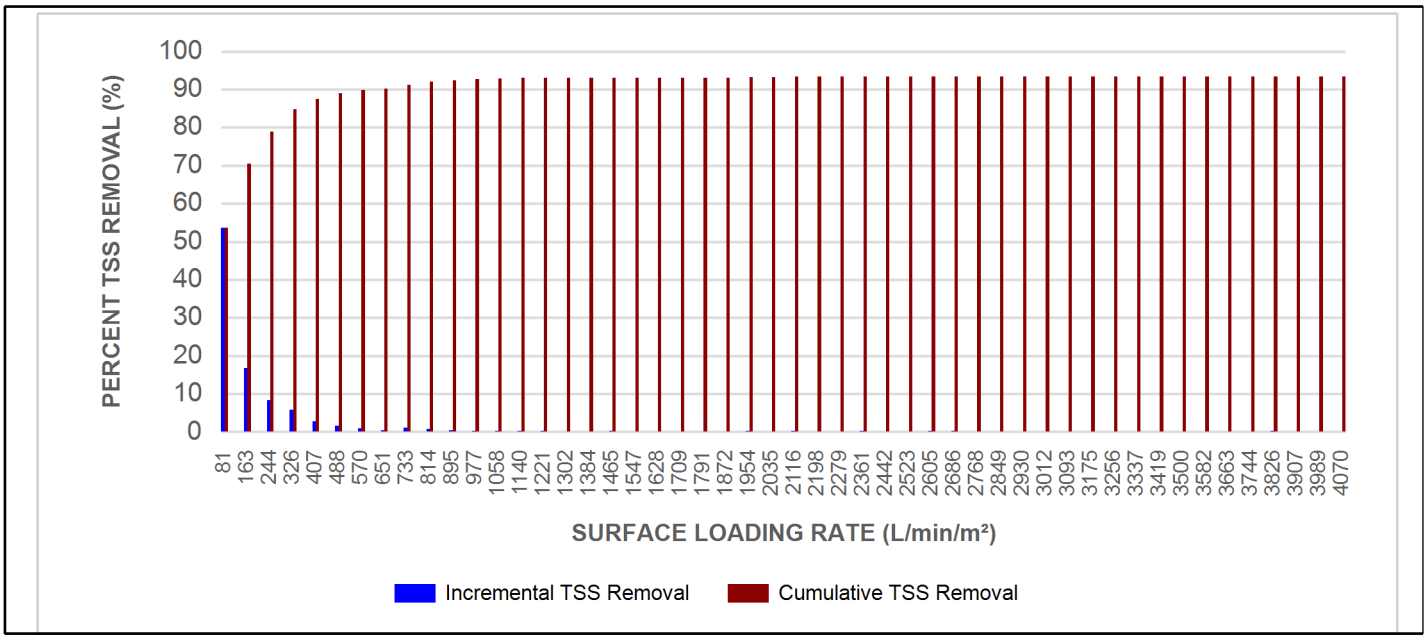
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
1	53.7	53.7	1.63	98.0	81.0	100	53.7	53.7
2	16.9	70.6	3.26	195.0	163.0	99	16.8	70.5
3	8.6	79.2	4.88	293.0	244.0	97	8.3	78.8
4	6.4	85.6	6.51	391.0	326.0	92	5.9	84.7
5	3.1	88.7	8.14	488.0	407.0	87	2.7	87.4
6	2.0	90.7	9.77	586.0	488.0	76	1.5	88.9
7	1.5	92.2	11.40	684.0	570.0	63	0.9	89.8
8	0.7	92.9	13.02	781.0	651.0	58	0.4	90.2
9	1.8	94.7	14.65	879.0	733.0	56	1.0	91.2
10	1.3	96.0	16.28	977.0	814.0	54	0.7	92.0
11	0.9	96.9	17.91	1074.0	895.0	52	0.5	92.4
12	0.4	97.3	19.54	1172.0	977.0	51	0.2	92.6
13	0.4	97.7	21.16	1270.0	1058.0	48	0.2	92.8
14	0.4	98.1	22.79	1367.0	1140.0	43	0.2	93.0
15	0.2	98.3	24.42	1465.0	1221.0	40	0.1	93.1
16	0.0	98.3	26.05	1563.0	1302.0	36	0.0	93.1
17	0.0	98.3	27.68	1661.0	1384.0	32	0.0	93.1
18	0.2	98.5	29.30	1758.0	1465.0	30	0.1	93.1
19	0.0	98.5	30.93	1856.0	1547.0	28	0.0	93.1
20	0.0	98.5	32.56	1954.0	1628.0	27	0.0	93.1
21	0.0	98.5	34.19	2051.0	1709.0	25	0.0	93.1
22	0.0	98.5	35.82	2149.0	1791.0	24	0.0	93.1
23	0.0	98.5	37.44	2247.0	1872.0	23	0.0	93.1
24	0.4	98.9	39.07	2344.0	1954.0	22	0.1	93.2
25	0.0	98.9	40.70	2442.0	2035.0	21	0.0	93.2

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
26	0.2	99.1	42.33	2540.0	2116.0	21	0.0	93.3
27	0.0	99.1	43.96	2637.0	2198.0	20	0.0	93.3
28	0.0	99.1	45.58	2735.0	2279.0	19	0.0	93.3
29	0.2	99.3	47.21	2833.0	2361.0	18	0.0	93.3
30	0.0	99.3	48.84	2930.0	2442.0	18	0.0	93.3
31	0.0	99.3	50.47	3028.0	2523.0	17	0.0	93.3
32	0.2	99.5	52.09	3126.0	2605.0	17	0.0	93.3
33	0.2	99.7	53.72	3223.0	2686.0	17	0.0	93.4
34	0.0	99.7	55.35	3321.0	2768.0	16	0.0	93.4
35	0.0	99.7	56.98	3419.0	2849.0	16	0.0	93.4
36	0.0	99.7	58.61	3516.0	2930.0	15	0.0	93.4
37	0.0	99.7	60.23	3614.0	3012.0	14	0.0	93.4
38	0.0	99.7	61.86	3712.0	3093.0	14	0.0	93.4
39	0.0	99.7	63.49	3809.0	3175.0	14	0.0	93.4
40	0.0	99.7	65.12	3907.0	3256.0	14	0.0	93.4
41	0.0	99.7	66.75	4005.0	3337.0	13	0.0	93.4
42	0.0	99.7	68.37	4102.0	3419.0	13	0.0	93.4
43	0.0	99.7	70.00	4200.0	3500.0	12	0.0	93.4
44	0.0	99.7	71.63	4298.0	3582.0	12	0.0	93.4
45	0.0	99.7	73.26	4396.0	3663.0	12	0.0	93.4
46	0.0	99.7	74.89	4493.0	3744.0	12	0.0	93.4
47	0.2	99.9	76.51	4591.0	3826.0	11	0.0	93.4
48	0.0	99.9	78.14	4689.0	3907.0	11	0.0	93.4
49	0.0	99.9	79.77	4786.0	3989.0	11	0.0	93.4
50	0.0	99.9	81.40	4884.0	4070.0	11	0.0	93.4
Estimated Net Annual Sediment (TSS) Load Reduction =								**93 %**

RAINFALL DATA FROM TORONTO CENTRAL RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

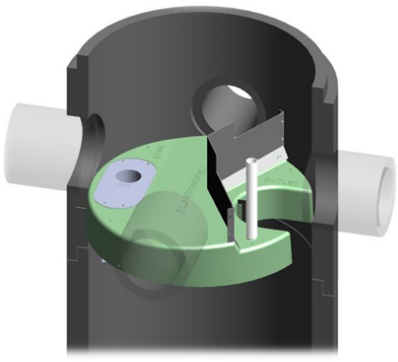
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

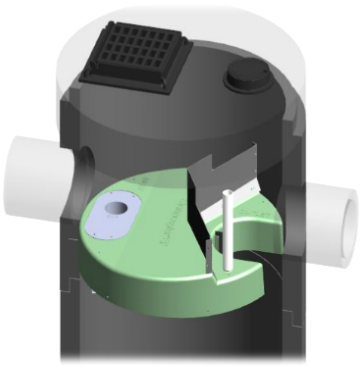
DESIGN FLEXIBILITY

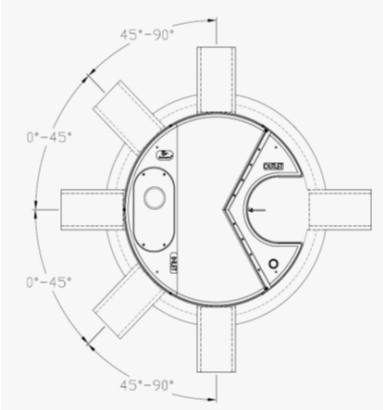
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

►While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff,**Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.







INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.

0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.

45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft^3)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity

** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft^3)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall

remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing shall be determined using historical rainfall data and a sediment removal performance curve derived from the actual third-party verified laboratory testing data. The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators,** with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m2 to 2600 L/min/m2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

APPENDIX D

SANITARY DESIGN CALCULATIONS

TOWN OF COBOURG

SANITARY SEWER DESIGN SHEET

Project No. 2020-034
Subdivision Eglin Park Redevelopment Project
Date: 26-Aug-20
Des. By: DT Chk. By: CD

1. Sanitary Design Flow for Proposed Development

	Tributary Area Hectare				Population Tributary				Average	Average					SEWER					PIPE			
	Increment			Total	Increment			Total	Increment	Total	Peaking	Max.	Infiltration	Max. Flow			Q	V m/S					
Street	Res. ha	Comm. ha	Ind. ha	ha	Res.	Comm.	Ind.		L/s	L/s	Factor	m^3/s	L/s	L/s	mm.	%	L/s	Full Flow	Act. Flow	Type	n	Class	**REMARKS**
MHA2 TO MHA1	0.796			0.80	107.2			107	0.452	0.452	4.235	1.716	0.207	1.923	200	1.00	32.81	1.04	0.2	PVC	0.013	SDR35	

* Max peaking factor based on Town of Cobourg Design Guidelines = 3.8
* Population density for townhouse unit = 2.68
* Average Flow = 364 L/person.day
* Infiltration = 0.2604 L/s

2. Sanitary Design Flow for Existing Development

	Tributary Area Hectare				Population Tributary				Average	Average					SEWER					PIPE			
	Increment			Total	Increment			Total	Increment	Total	Peaking	Max.	Infiltration	Max. Flow			Q	V m/S					
Street	Res. ha	Comm. ha	Ind. ha	ha	Res.	Comm.	Ind.		L/s	L/s	Factor	m^3/s	L/s	L/s	mm.	%	L/s	Full Flow	Act. Flow	Type	n	Class	**REMARKS**
Elgin Street	0.796			0.80	58.14			58	0.245	0.245	4.301	0.931	0.207	1.138									

* Max peaking factor based on Town of Cobourg Design Guidelines = 3.8
* Population density for semi-detached = 3.23
* Average Flow = 364 L/person.day
* Infiltration = 0.2604 L/s

APPENDIX E

PROJECT COORDINATION

From:	Leslie Benson
To:	Calvin Dang
Cc:	"Nick Swerdfeger"; John Bishop; "Ken Thajer"; "Glenn McGlashon"; "Terry Hoekstra"
Subject:	RE: 19284-Elgin Park Redevelopment - Civil Services (Pre Con Follow Up Meeting-Zoom)
Date:	August 18, 2020 3:07:04 PM
Attachments:	image001.png

Hi Calvin,
Thank you for this confirmation. The regulatory water surface elevation in this area is 98.95 m from Midtown Creek to the northwest. This is well below the perimeter elevations that you have shown which is what we anticipated.
Thanks again for the survey which we will, of course, keep on file.
Leslie Benson

From: Calvin Dang [mailto:cdang@mgm.on.ca]
Sent: August-17-20 11:01 AM
To: Leslie Benson
Cc: Nick Swerdfeger; John Bishop
Subject: RE: 19284-Elgin Park Redevelopment - Civil Services (Pre Con Follow Up Meeting-Zoom)

Leslie,

Our topographic survey is currently cover the the perimeter grade of the site plus an additional 10m outside of the property. i have attached our current survey for your reference. Please review and advise whether the survey here is adequately provide the data that you are looking for. Please also highlight the area on the plan which requires additional survey information. I also would like to request the GRCA regulated mapping of the site for our record.

Thanks

Regards,

Calvin Dang, B.Eng
MGM Consulting Inc.
* 201 - 555 Industrial Drive, Milton, Ontario, L9T 5EI
Tel: 905-567-8678 | Fax: 905-875-1339
apalaganas@mgm.on.ca | www.mgm.on.ca

From: Leslie Benson <lbenson@grca.on.ca>
Sent: August 12, 2020 1:51 PM
To: John Bishop <jbishop@mgm.on.ca>; 'Nick Swerdfeger' <nswerdfeger@bba-archeng.com>; sbolender@lusi.on.ca; lspyrka@lusi.on.ca; FHyder@lusi.on.ca; 'Jered Marshall' <jmarshall@cobourg.ca>; mvilneff@cobourg.ca; johnstonek@northumberlandcounty.ca; nstewart@cobourg.ca; jchartrand@cobourg.ca; thoekstra@cobourg.ca; kthajer@grca.on.ca; Calvin Dang <cdang@mgm.on.ca>
Cc: 'Glenn McGlashon' <gmcglashon@cobourg.ca>; 'Esseghaier, Kaela' <esseghaierk@northumberlandcounty.ca>; 'McIntosh, Mark' <mcintoshm@northumberlandcounty.ca>; 'Carman, Rebecca'

<carmanr@northumberlandcounty.ca>; 'Cameron Mitchelmore' <cmitchelmore@bba-archeng.com>; 'Holly Smith' <hsmith@bba-archeng.com>
Subject: RE: 19284-Elgin Park Redevelopment - Civil Services (Pre Con Follow Up Meeting-Zoom)

Good afternoon John,
Thank you for your email. My role in this is only with respect to the storm servicing and SWM.
For clarity: the property is definitely (partially) within the GRCA regulated area. I permit will be required from the Authority for the redevelopment. What I had asked was for perimeter grades to be shot to confirm that the property is not within the floodplain. I do not anticipate that the County's lands will fall within the flood plain, but the area is very flat, and we are requesting a more site specific survey to confirm that.
I hope that helps. Feel free to contact me anytime. Thanks again.
Leslie Benson, P.Eng.
Water Resources Engineer

From: John Bishop [mailto:jbishop@mgm.on.ca]
Sent: August-12-20 10:54 AM
To: Nick Swerdfeger; sbolender@lusi.on.ca; lspyrka@lusi.on.ca; FHyder@lusi.on.ca; Jered Marshall; mvilneff@cobourg.ca; johnstonek@northumberlandcounty.ca; nstewart@cobourg.ca; jchartrand@cobourg.ca; thoekstra@cobourg.ca; lbenson@grca.on.ca; kthajer@grca.on.ca; Calvin Dang
Cc: Glenn McGlashon; Esseghaier, Kaela; McIntosh, Mark; Carman, Rebecca; Cameron Mitchelmore; Holly Smith
Subject: RE: 19284-Elgin Park Redevelopment - Civil Services (Pre Con Follow Up Meeting-Zoom)

Hi all,

I want to thank everyone for the time they took to speak with us last Wednesday morning regarding the Elgin Park Redevelopment. I am summarizing our discussion and providing our input on what will be provided within the FSR which is required for the rezoning process. I have also included some general questions which we will need direction on before commencing our work. I want to make sure we capture all the requirements of each department in order to move the development forward.

Storm Servicing and SWM

SWM will be implemented on site to reduce post development flows to predevelopment flows for all events between and 2 and 100 year return period. On site storage will be provided within the private onsite storm sewers and within the rear parking area up to a maximum ponding level of 300mm at cb's. An orifice located within an inspection mh located at the property line will control flows as required prior to outletting to the municipal sewer. Due to the constraints associated with the 1500mm storm sewer located within the Elgin Street right of way, we will be proposing a connection to the D'Arcy Street storm sewer. A portion of the roof drainage may be directed toward Elgin for area where gutters or downspouts cannot be directed to the rear of the units. This will be address by overcontrolling the rear portion of the site. Quality control will be addressed through the use of a package oil/grit separator. Where feasible, LID's will be employed depending on site constraints and opportunities. Infiltrating roof water to granular pits will be considered depending on geotechnical recommendations. Bioswales may be incorporated where the site grading is conducive.

In addition to the above, we will be reviewing the topo plan to confirm the elevations to verify we are outside of the conservation regulation area. Further discussion with Ganaraska may be required.

Sanitary Servicing

The sanitary discharge for the subject development will be conveyed from induvial units and directed to a private sanitary sewer located within the rear parking lot. The private sanitary sewer will be discharged to an inspection manhole at the property line prior to outletting to the municipal sanitary sewer within the D'Arcy Street right of way. A calculation will be completed based on population densities to determine the slight increase in flows due to the density intensification anticipated.

Please advise on what the municipality's preferred method is for the capping and abandonment of the existing sanitary laterals and whether municipal forces would carry out this work or the owner's contractor.

Water Servicing

Domestic
Depending on the municipality's preference, individual domestic water servicing can be provided to each unit via the 400mm watermain within the Elgin Street right of way. The new services will be 1 inch (size to be confirmed). This would require separate meters but further direction on this matter will be required from the municipality as the entire site will be under a single ownership and this approach may not be in accordance with local by-laws or standards.

As an alternative, a single watermain can be installed under the rear parking lot to feed the individual units with a feed from the D'Arcy street watermain. A water meter chamber could be installed at the property line which would meter the entire development. Private sub-meters could be installed in each unit if required for the owner to determine individual unit billing. We will require additional feedback from the municipality.

Fire
A review of the existing fire hydrants located within the Elgin and D'Arcy street right of ways will be completed to ensure fire coverage is met (90m unobstructed from hydrant to every main entrance). In the event the coverage is found insufficient, a new hydrant will be proposed within the municipal right of way to bring the fire coverage up to code.

Please advise on what the municipality's preferred method is for the capping and abandonment of the existing water services and whether municipal forces would carry out this work or the owner's contractor.

Thanks in advance for everyone's assistance and l look forward to your responses.

Regards,

John

John Bishop, CET.
Principal
MGM Consulting Inc.
555 Industrial Drive, Suite 201 Milton, Ontario, L9T 5E1
Tel: 905-567-8678 | Fax: 905-875-1339
jbishop@mgm.on.ca | www.mgm.on.ca

From: Nick Swerdfeger <nswerdfeger@bba-archeng.com>
Sent: July 30, 2020 9:40 AM
To: sbolender@lusi.on.ca; lspyrka@lusi.on.ca; FHyder@lusi.on.ca; Jered Marshall <jmarshall@cobourg.ca>; mvilneff@cobourg.ca; johnstonek@northumberlandcounty.ca; nstewart@cobourg.ca; jchartrand@cobourg.ca; thoekstra@cobourg.ca; lbenson@grca.on.ca; kthajer@grca.on.ca
Cc: John Bishop <jbishop@mgm.on.ca>; Glenn McGlashon <gmcglashon@cobourg.ca>; Esseghaier, Kaela <esseghaierk@northumberlandcounty.ca>; McIntosh, Mark <mcintoshm@northumberlandcounty.ca>; Carman, Rebecca <carmanr@northumberlandcounty.ca>; Cameron Mitchelmore <cmitchelmore@bba-archeng.com>; Holly Smith <hsmith@bba-archeng.com>
Subject: 19284-Elgin Park Redevelopment - Civil Services (Pre Con Follow Up Meeting-Zoom)

All

I have been given your contacts through Terry Hoekstra at the Town to have a Civil Services Pre Con meeting for the proposed re development at Elgin Park (Elgin and D'Arcy) which some of you are aware
(I have attached a brief communications package) – simplicity and the pre con package is with Planning – from our previous meeting.

We like to request the meeting for August 5th at 9:30am or at the latest 10am (as our consultant- John Bishop from MGM) has another appointment at 10:30am- it was recommended from Terry that I select Wednesdays given the development meetings are around that time.
Please indicate if you are available otherwise if we need to re schedule an alternative is the following week (August 13) at the same time slots
The purpose of this meeting is to get an understanding of specific requirements for our civil team(as they relate to functional servicing) for the submission on re zoning and later SPA for the above noted project, which recently has received funding to proceed in late 2020.

From: Terry Hoekstra <thoekstra@cobourg.ca>
Sent: August 14, 2020 10:29 AM
To: John Bishop <jbishop@mgm.on.ca>
Cc: Neil Stewart <nstewart@cobourg.ca>; Joseph Chartrand <jchartrand@cobourg.ca>
Subject: RE: 19284-Elgin Park Redevelopment - Civil Services (Pre Con Follow Up Meeting-Zoom)

John,

I reviewed some of our CCTV footage and there are 18 services going to Elgin Street that will require capping with a concrete plug at the property line. Each semi has its own sanitary service. Concrete plugs to be min. 300mm in length and using 20MPa concrete. Plugging to be completed in presence of Town inspector and is the responsibility of the proponent.

It will be a requirement to install a maintenance hole at the existing sanitary sewer main and another near the property line, on the private side of the property line.
Regards,

Terry Hoekstra, C.E.T.
Manager of Engineering and Capital Projects
Town of Cobourg
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