2026-03-20

Public

City of Ottawa
110 Laurier Avenue West
Ottawa, ON
K1P 1J1

Dear Sir/Madam:

Subject: Functional Servicing and Stormwater Management Letter for Site Plan Application - 1900 Cyrville Road, Ottawa
Costco Wholesale Canada – Costco Gloucester Gas Bar

On behalf of our client Costco Wholesale Canada Ltd, we are providing this letter to support the proposed fueling facility.

EXISTING CONDITIONS

The existing Costco Warehouse located at 1900 Cyrville Road was converted to a Business Centre Warehouse which opened to its members in 2021. In general, the site is primarily impervious, with grading directing rainfall towards on-site catchbasin structures. The site storm sewers discharge to the municipal storm network within the Cyrville Road right-of-way, with ultimate discharge to Green's Creek immediately south of the site.

Site domestic water is supplied by an existing connection to the 203mm municipal watermain within Cyrville Road. Similarly, site sanitary servicing is provided by an existing connection to the 250mm sanitary sewer main within Cyrville Road.

PROPOSED FUELING FACILITY CONCEPT AND LAYOUT

The north-eastern portion of the existing parking lot within the property is proposed to be modified to accommodate an on-site fueling facility. The proposed Site Plan (SP-19) has been provided for layout reference. In general, the existing northern entrance off of Cyrville Road has been pushed further south, and there is an overall net reduction of 133 parking spaces to accommodate the gas bar layout. The revised entrance location requires a realignment of the Cyrville Road western sidewalk, as detailed in the supporting design drawings.

The proposed fueling facility is comprised of 3 rows of fuel dispensers on a concrete slab beneath a canopied roof. The fuel dispensers will service 6 vehicle stacking queues aligned from north to south through the facility. Three additional fuel dispensers have been identified for potential future expansion. Three underground fuel storage tanks and two attendant enclosures are proposed for the facility. Additional requirements such as bollards, emergency shut-offs, transformers, line painting, and other items are as detailed per the Site Plan.

PROPOSED GRADING

The proposed grading for the fueling facility will relatively match existing conditions and conform to the Site's overall existing overland flow paths. The re-developed area will match into existing on-site pavement grades via clean saw-cuts. Landscaped areas along the north and eastern property extents have been graded to match existing elevations at the property line and minimize off-site direct runoff. Similarly, the new Site entrance has been graded with a high-point to minimize off-site direct runoff and appropriately tie into existing Cyrville Road, curbs, and sidewalk. Proposed grading for the realigned Cyrville Road sidewalk has been provided in conformance to City of Ottawa design standards. Refer to Site Grading Plan (SG1) for further information.

PROPOSED FUNCTIONAL SERVICING

Storm

The existing storm servicing in conflict with the proposed expansion will be removed and re-routed to match the existing downstream storm sewers. Spill retention measures including an Oil Water Separator (OWS) and Oil Grit Separator (OGS) have been proposed for the facility. As detailed in the following stormwater management section, as the site imperviousness has decreased from pre-development conditions, no downstream replacement or upsizing of the storm network is required. Refer to Site Servicing Plan (SS1) for further information.

Sanitary

The proposed fueling facility does not require any additional sanitary services. The building's existing sanitary service connecting to the Cyrville Road sanitary sewer main will remain in place. Adequate utility clearance has been provided between the existing sanitary sewer and proposed utilities. Refer to Site Servicing Plan (SS1) for further information.

Water

The proposed fueling facility does not require domestic water service. A new 150mm fire service and hydrant is proposed branching off the existing 203mm private watermain on-site. Refer to Site Servicing Plan (SS1) for further information.

EXISTING STORMWATER MANAGEMENT SYSTEM

The existing Costco Business Centre Site located at 1900 Cyrville Road is not known to have any stormwater management controls implemented. As outlined in previous sections, rainfall is presently directed to on-site catchbasins, conveyed to the Cyrville Road 1350mm storm sewer, and discharged to Green's Creek immediately south of the Site. There are no known quantity controls designed to restrict the flows, nor quality controls to treat the flow prior to off-site discharge. The existing site is not known to have any drainage issues.

PROPOSED MINOR STORM SYSTEM

As noted previously, the proposed site work will remove any conflicting existing storm sewers, then install new services and reconnect as required. Refer to Site Servicing Plan (SS1) and Site Removal Plan (RM1) for further information.

The proposed fueling facility will function similar to the existing site design, with runoff from the paved areas directed to catchbasins / catchbasin maintenance holes. Landscaped areas have been graded to direct storm runoff to paved surfaces or via swale to catchbasin.

An overhead canopy will cover the fuel dispensing locations. Runoff collected from the canopy's roof drains will be conveyed via downspouts to a dedicated 150mm buried sewer line to the Site's main storm sewers. The primary attendant enclosure, exterior to the canopy, has similarly been provided with a dedicated roof drain connection to the main storm sewer. The proposed storm sewers have been sized to accommodate runoff resulting from up to the 5-year storm event. Refer to the storm sewer design sheet for additional information.

PROPOSED WATER QUALITY CONTROL

Runoff collected from the study area is conveyed to an adequately sized OGS (Stormceptor EF04 or equivalent) prior to reconnection to the existing Site storm sewer system. This is viewed as a large improvement to the conditions of the existing study area, as there are presently no quality control measures implemented.

PROPOSED WATER QUANTITY CONTROL

The overall study area, which includes the area altered by the proposed works, has an overall increase in landscaped areas and decrease in impervious paved areas in comparison to the existing conditions. The pre-development runoff coefficient for the 1.104 hectare study area was calculated at 0.79 and the post-development runoff coefficient as 0.75. As such, the post-development storm runoff flows generated from the site are expected to be less than pre-development flows. As there are no known capacity concerns with the existing downstream storm infrastructure, the proposed site alterations are not anticipated to cause any adverse impacts. Therefore, no quantity control measures are proposed for the fueling facility. Refer to the stormwater management calculations, storm sewer design sheet, and the Drainage Area Plan (ST1) for additional information.

PROPOSED MAJOR STORM WATER SYSTEM

For major storm events exceeding the capacity of the minor storm system, stormwater will pond above each catchbasin up to a maximum depth of 0.20m before cascading along the overland flow route. The drainage will be conveyed overland south through the primary drive aisle, eastward towards the Cyrville Road right-of-way through the new southern Site entrance, with ultimate outlet southward to Green's Creek. Refer to the Site Grading Plan (SG1) for major overland flow route.

PROPOSED SPILL RETENTION MEASURES

In the event of a spill, the concrete fueling station slab beneath the canopy is graded south towards a concrete swale and dedicated catchbasin. Captured spills are directed to the Oil Water Seperator (Echelon HSD22 or equivalent). Per section 4.6 of the National Fire Code of Canada, the OWS has been adequately sized to control a flammable or combustible liquid spill of up to 1000L.

In the event of spills, the OWS 250mm outlet pipe is outfitted with a manual shut-off gate valve. Similarly, catchbasin 3 adjacent to the underground fuel storage tanks is designed with a manual shut-off gate valve. This is intended to halt flows entering the storm system in the event of a spill during storage tank refuelling operations.

If there are any questions on the information presented within this letter, please do not hesitate to contact the undersigned.

Prepared By

Spencer Manoryk, P. Eng.
Project Engineer
Land Development Ottawa

Reviewed By

Ishaque Jafferjee
Manager
Land Development Ottawa

APPENDIX

A SUPPORTING DOCUMENTS

APPROXIMATE PROPERTY TAKING PER CITY'S "1900 CYRVILLE ROAD" DRAWING. BOUNDARY TO BE VERIFIED. SURVEY REQUIRED

NORTH

LEGEND
- SOFT LANDSCAPING
- CONCRETE PAVING
- ASPHALT PAVING
- FIRE ROUTE
- CART CORRAL
- LIMIT OF CONSTRUCTION

PROPOSED SIDEWALK EXTENSION

POTENTIAL FUTURE FUEL FACILITY EXPANSION

AREA OF DEVELOPMENT

SIDEWALK ORIENTATION DEPENDANT ON GUY WIRE LOCATION / TREATMENT

LIMIT OF CONSTRUCTION

UNDERGROUND STORAGE TANKS

ATTENDANT ENCLOSURE

MECHANICAL ENCLOSURE

TRANSFORMER

EDGE OF GAS BAR CANOPY

COSTCO WHOLESALE Business Centre

EXISTING PARKING: 603 STALLS
PROPOSED PARKING: 470 STALLS
20 DELIVERY TRUCK STALLS
EXISTING AREA: 11.76 ACRES
PROPOSED AREA: 11.58 ACRES

ENTRANCE

TRANSFORMER

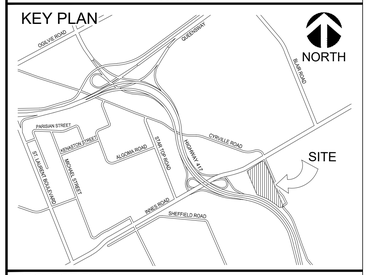
SHORE POWER BUILDING

SCALE 1:500 (m)

COSTCO WHOLESALE Business Centre
OTTAWA (GLOUCESTER), ONTARIO
NEW BUSINESS CENTRE (CONVERTED WAREHOUSE)

COSTCO WHOLESALE CORPORATION
999 LAKE DRIVE
ISSAQUAH, WA 98027
T: 425.313.8100
Costco.com

KEY PLAN



PROJECT DATA

PROJECT ADDRESS:	1900 CYRVILLE ROAD OTTAWA, ONTARIO
EXISTING AREA:	47,574.2m² (4.76 ha) / 11.76 ac
PROPOSED AREA:	46,850.8m² (4.69 ha) / 11.58 ac
ZONING:	GM12 - GENERAL MIXED USE ZONE
JURISDICTION:	CITY OF OTTAWA
BOUNDARY INFORMATION:	THIS DRAWING IS BASED ON A SURVEY FROM WSP GEOMATICS ONTARIO LIMITED O.L.S. DATED 2020.

EXISTING BUILDING DATA	AREA	
BUILDING GROSS FLOOR AREA	11,730.0m²	126,261ft²
SHORE POWER BUILDING	8.7m²	94ft²
TOTAL GROSS FLOOR AREA	**11,738.7m²**	**126,355ft²**
PROPOSED BUILDING DATA	AREA	
BUILDING GROSS FLOOR AREA	11,730.0m²	126,261ft²
SHORE POWER BUILDING	8.7m²	94ft²
PROPOSED GAS BAR MECHANICAL ENCLOSURE	17.2m²	185ft²
PROPOSED GAS BAR ATTENDANT ENCLOSURE	1.4m²	15ft²
TOTAL GROSS FLOOR AREA	**11,757.3m²**	**126,555ft²**
PROPOSED FUEL FACILITY CANOPY HEIGHT: 5.64m		
PROPOSED MECHANICAL ENCLOSURE HEIGHT: 2.62m		
EXISTING SITE DATA (47,574.2m² / 11.76 ac)	AREA	
LOT COVERAGE	24.7%	11,738.7m²
LANDSCAPE OPEN SPACE	16.1%	7,687.1m²
PAVED PARKING AREA	59.2%	28,148.4m²
PROPOSED SITE DATA (46,850.8m² / 11.58 ac)	AREA	
LOT COVERAGE	25.1%	11,757.3m²
LANDSCAPE OPEN SPACE	17.3%	8,108.4m²
PAVED PARKING AREA	57.6%	26,985.1m²
EXISTING PARKING DATA	PARKING SPACES	
REQUIRED PARKING (3.4 / 100m²)		400
NUMBER OF 3.0m WIDE PARKING SPACES PROVIDED (#)		555
NUMBER OF 2.75m WIDE PARKING SPACES PROVIDED (#)		14
NUMBER OF LOADING SPACES PROVIDED (#)		14
NUMBER OF BARRIER-FREE PARKING SPACES PROVIDED (#)		20
TOTAL COSTCO PARKING SPACES PROVIDED		603
NO. STALLS PROVIDED PER 100m² OF COSTCO BUILDING AREA		5.14
NUMBER OF 3.66m WIDE DELIVERY TRUCK STALLS (#)		20
PROPOSED PARKING DATA	PARKING SPACES	
REQUIRED PARKING (3.4 / 100m²)		400
NUMBER OF 3.0m WIDE PARKING SPACES PROVIDED (#)		429
NUMBER OF 2.75m WIDE PARKING SPACES PROVIDED (#)		9
NUMBER OF LOADING SPACES PROVIDED (#)		12
NUMBER OF BARRIER-FREE PARKING SPACES PROVIDED (#)		20
TOTAL COSTCO PARKING SPACES PROVIDED		470
NO. STALLS PROVIDED PER 100m² OF COSTCO BUILDING AREA		4.00
NUMBER OF 3.66m WIDE DELIVERY TRUCK STALLS (#)		20

-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
	REVISIONS	BY	DATE	APPR.

ISSUED FOR APPROVAL, NOT FOR CONSTRUCTION

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

SHEET TITLE
SITE PLAN

CONSULTANT
wsp

DESIGNED	DRAWN	CHECKED
CJM/KH	CJM	KH

SCALE 1:500 | DATE MARCH 3, 2026

PROJECT NUMBER 211-12161-00-P01 | DWG. NUMBER SP-19

FILENAME: M:\Jobs\Costco\Gosbors\211-12161-00 - Costco Gloucester Business Centre Gas Bar\DWG\2026 03\Gloucester Business Centre Fuel SP-19.dwg
PLOTDATE: Mar 03, 2026 - 4:27pm

GENERAL NOTES

1. SEDIMENT CONTROL MEASURE

a. Protect all exposed surfaces and control all runoff during construction.

b. Protect all catch basins, maintenance holes and pipe ends from sediment intrusion with geotextile (Terrafix 270r)

c. Prevent wind-blown dust.

d. Keep all sumps clean during construction.

e. All of the above notes and any sediment and erosion control measures are at the minimum to be in accordance with the Ministry of Natural Resources guidelines on erosion and sediment control for urban construction sites.

f. The Contractor shall construct temporary measures to control silt entering the storm drainage system to the specifications outlined in the guidelines on erosion and sediment control for urban construction sites prepared by the Ontario Ministry of Natural Resources. These measures are to be installed prior to commencing any construction for this project, and are to remain in place until construction has been completed to the satisfaction of the city engineer.

g. All work shall meet the minimum standards and specifications of the City of Ottawa.

h. The Contractor is responsible for cleanup of mudtracking on a daily basis or on a more frequent basis if directed by the City or the Consultant. Any tracking of deleterious materials along adjacent roads shall be mitigated immediately.

2. GENERAL

a. Topographic survey completed by Stantec on June 12, 2025. Contractor to verify in the field prior to construction of any work and notify the engineer of any discrepancies.

b. All services shall be installed and tested to the current Ontario Building Code, City of Ottawa Standards (City Std.), Ontario Provincial Standard Drawings (OPSD), and Ontario Provincial Standard Standard Specifications (OPSS), Costco Wholesale Development Requirements dated October 26, 2018 unless otherwise specified and to the satisfaction of the City of Ottawa, the Engineer, and the Geotechnical Consultant.

c. The position of existing pole lines, conduits, watermains, sewers and other underground and aboveground utilities, structures and appurtenances is not necessarily shown on the contract drawing, and where shown, the accuracy of the position of such utilities and structures is not guaranteed. Prior to construction, the Contractor shall satisfy himself of the exact location of all such utilities and structures, shall adequately support them, and shall assume all liability for damage to them during the course of construction. Any relocation of existing utilities required by the development of subject lands is to be undertaken at the Contractor's expense.

d. The Contractor must notify all existing utility company officials five (5) business days prior to start of construction and have all existing utilities and services located in the field or exposed prior to the start of construction, including but not limited to Hydro, Bell, Cable TV and Gas lines.

e. All trenching to be in accordance with the latest revisions of the Occupational Health and Safety Act and Regulations for Construction Projects. Refer to geotechnical report for excavation recommendations.

f. All trenches shall be backfilled in accordance with the Geotechnical Investigation Report revision date March 2026, reference number 1216262971, by Stante.

g. All disturbed areas outside proposed grading limits to be restored to original elevations and conditions unless otherwise specified. All restoration shall be completed with the geotechnical requirements for backfill, compaction and approved engineering drawings. Sodded areas to be restored with No.1 Nursery sod and 150mm of topsoil.

h. The Contractor shall limit construction activity only to within the limits of construction shown.

i. All dimensions and elevations in metres, pipe sizes in millimetres.

j. Contractor shall satisfy himself of all geotechnical information and recommendations. From Stantec's Geotechnical Investigation Report. Groundwater level seems to be expected below excavation depth. Conventional construction dewatering techniques should be taken during construction to minimize disturbance to soils.

k. Alternative materials may be acceptable, provided approval has first been obtained from the City/City Engineer.

l. No blasting is permitted.

m. Contractor to expose and verify location, elevation, and size of existing pipes. Contractor to verify location, elevation, and size of all proposed building services to be constructed by others. If there are any discrepancies contractor is to notify the Engineer 48 hours prior to construction.

n. Maintain traffic on municipal roads at all times. All existing services are to remain in service at all times during construction (unless otherwise noted).

o. At least 48 hours prior to commencing construction for services within a municipal right-of-way and/or municipal easements the contractor is to obtain a permit of approved work from the City.

p. Contractor shall coordinate with the landscape contractor for planting bed locations and corresponding subgrade elevations.

q. All dimensions shall be checked and verified in the field by the contractor prior to the start of construction. Any discrepancies shall be reported immediately to the engineer. Lost time due to failure of the contractor to confirm utility locations and notify engineer of possible conflicts prior to construction will be at the contractors expense.

r. All construction signage must conform to the Ministry of Transportation of Ontario Manual of Uniform Traffic Control Devices per latest amendment.

s. The contractor is advised that works by others may be ongoing during the period of this contract. The contractor shall coordinate construction activities to prevent conflicts.

t. All construction shall be carried out in accordance with the recommendations of Stantec's Geotechnical Investigation Report.

u. All sewers constructed with grades less than 1.0% shall be installed using laser alignment and checked with level instrument prior to backfilling.

v. The contractor is responsible for obtaining all permits required and to bear the cost of the same.

w. Should deeply buried archaeological remains be found on the property during construction activities, the Heritage Operations Unit of the Ontario Ministry of Culture must be notified immediately.

x. Drawings shall be read in conjunction with the architectural site plan.

y. The contractor shall provide the Project Engineer one set of as constructed site servicing drawings and topographic survey.

z. Benchmarks: It is the responsibility of the contractor to verify that the site benchmark(s) has not been altered or disturbed and that its relative elevation and description agrees with the information depicted on this plan.

3. PAVEMENT AND SURFACE WORKS

a. Native subgrade shall have a crossfall of 2% and the material shall be approved by the Geotechnical Consultant.

b. The pavement sub-grade must be proof rolled under the supervision of the Geotechnical Consultant prior to Granular 'B' placement to confirm the design subbase is sufficient. Unstable areas may require sub-excavation, re-compaction, and replacement with additional Granular 'B' sub-base.

c. The suitability and compaction of all existing and fill materials shall be confirmed by a geotechnical consultant prior to placement of road base.

d. Pavement structure Stantec's Geotechnical Investigatoin Report.

Standard duty use within Costco Property

40 mm	Surface Course Asphalt PG 58-28
55 mm	Base Course Asphalt PG 58-28
150 mm	Granular 'A' base (OPSS 1010)
400 mm	Granular 'B' sub-base (OPSS 1010)

Heavy duty use within Costco Property

40 mm	Surface Course Asphalt PG 64-28
75 mm	Base Course Asphalt PG 64-28
150 mm	Granular 'A' Base (OPSS 1010)
550 mm	Granular 'B' sub-base(OPSS 1010)

e. All engineered fill shall be OPSS 1010 Granular 'A' or Granular 'B' and shall pass the 75mm sieve as outlined in Stantec's Geotechnical Investigation Report.

f. All disturbed pavement on adjacent roads shall be restored to existing depths and types of materials or better upon completion of pavement works.

g. Concrete curb within Costco Property shall be Concrete Barrier Curb to match existing site condition as per Detail 18 on this drawing. Concrete to be 30 MPa.

h. If road construction does not immediately follow the trench backfilling, the subgrade should be properly crowned and smooth-rolled to allow interim precipitation to be properly drained.

i. Pavement markings to be applied after base asphalt if top asphalt are not scheduled to follow and base asphalt pavement surfaces are to be used by the public. After top asphalt, pavement markings with double coat.

j. Step joints are to be used where proposed asphalt meets existing asphalt. All joints must be sealed.

4. COMPACTION REQUIREMENTS

a. Engineered fill to be compacted to not less than 95% MPMDD under the full time supervision of the geotechnical engineer.

b. Prior to constructing the pavements, all service trenches must be compacted to at least 95% Modified Proctor Maximum Dry Density (MPMDD).

c. The subgrade should be properly shaped and crowned. Proof-rolling per Geotechnical engineer's recommendation. Soft or spongy subgrade areas should be sub-excavated and properly replaced with suitable approved backfill compacted to 95% MPMDD as directed by the consultant.

d. The granular base and sub-base material shall be compacted to 100%

e. The asphalt concrete must be compacted per project specification.

5. STORM SEWERS AND MANHOLES

a. All storm sewers and appurtenances shall conform to the current City Standards, and specifications and Ministry of Environment, Conservation and Parks (MECP) Guidelines.

b. Concrete sewers shall conform to CSA-A257.2, class 50-D with rubber gaskets per CSA-A257.3. PVC pipes are an acceptable alternative up to and including 450 mm dia. Pipe to be SDR-35 and conform to CSA-B182.2 (stiffness 320kPa or greater).

c. All sewer bedding and cover material to be installed in accordance with City of Ottawa standard S6, and S7 Class 'B' and to be compacted Granular 'A' or other material approved by City and Geotechnical Consultant. At crossings, Contractor to adequately support pipe with granular bedding or concrete as required. Refer to Section 2. General Notes, item j) for additional information.

d. Where storm sewer is in common trench with sanitary sewer, common trench spacing to be 0.80 m barrel-to-barrel.

e. All storm sewers to have 2.0m cover (minimum) as per City of Ottawa Sewer Design Guidelines. If minimum cover cannot be provided, sewer insulation shall be installed per City of Ottawa standard S35. Granular 'A' as per OPSS 1010 shall be used as bedding material.

f. Where trench widths are over-excavated, Contractor to increase structural capacity of sewer bedding as directed by the Consultant in accordance with the requirements of the Geotechnical Consultant.

g. Where trench backfill consists of suitable excavated native material (within optimum moisture content per Geotechnical report), the backfill is to be compacted to a minimum of 95% MPMDD. Backfill within City ROW per City of Ottawa Standards.

h. All structures within roadways shall have 10:1 frost tapers from frost line to subgrade.

i. Approved native material or granular backfill as specified by the Geotechnical consultant shall be installed on all pipes per City of Ottawa standard S6 and S7.

j. Precast manholes, catchbasins, and fittings shall conform to CSA-A257.4-M.

k. Storm manholes per OPSD 701.010 (1200 mm diameter), 701.011 (1500 mm diameter), 701.012 (1800 mm diameter), and 701.013 (2400 mm diameter), and 701.014 (3000mm diameter). Manhole components in accordance with OPSD 701.030, 701.040, 701.050, 701.060 and 701.070. Frame and cover per City of Ottawa Standard S25 and S24.1 for maintenance holes, and S28.1 for catch basin maintenance holes. Adjustment sections shall be per OPSD 704.010. First joint concrete encased if concrete, or flexible joint if PVC used.

l. Benching per OPSD 701.021. For storm sewers 900mm dia. and over, benching per City guideline section 6.2.6

m. If top course asphalt not placed immediately after base course asphalt top of manhole cover and top of catchbasin cover to be set to base course asphalt grade and then adjusted to final grade with Moduloc rings when top lift of asphalt is placed. Parge adjustment units on the outside only.

n. All connections to new storm sewers up to 375 mm in diameter shall be made with approved pre-manufactured wyes as per OPSD 1006.020. Connections to larger size sewers shall be made with approved factory made wyes or approved saddles, as per OPSD 1006.010.

o. Where storm sewers are to be pressure tested, they shall be in accordance with the Ontario Building Code (OBC) 7.3.7., with results to be provided to the consultant and/or City as directed.

p. Provide CCTV camera inspection of sewers after completion of work and flushing of lines.

6. CATCHBASINS

a. Single catchbasins per OPSD 705.010, frame and grate per City of Ottawa Standard S19. Double catchbasins per OPSD 705.020. All catchbasins to be fitted with four - 6.0m lengths of 100mm subdrain as shown on drawing. Subdrains with Filter Fabric sock on granular B Type II bedding. (see Costco subdrain Detail 'A' or drawing SD1). Catchbasin connections to be 200mm dia. PVC pipe CSA B182.2, SDR-35 unless otherwise noted.

b. Catchbasin connection to main line sewer in accordance with OPSD 708.030 and OPSD 708.010. First joint concrete encased if concrete, or flexible joint if PVC used.

c. Openings to subdrains and catchbasins should be shielded with a fabric filter to prevent silting.

d. Single catchbasin manholes to be 1200ø P.C. manhole with catchbasin frame and grate. Double catchbasin manholes to be 1500ø P.C. manhole. Catchbasins to have 0.6 m sumps.

7. WATERMAINS

a. All watermain installation shall conform to the latest revisions of the City of Ottawa and the Ontario Provincial Standard Drawings (OPSD), Specifications (OPSS) and Costco Wholesale Development Requirements dated October 26,2018.

b. All PVC watermains shall be AWWA C-900 Class 150, SDR 18 or approved equivalent.

c. Watermain trench and bedding shall be in accordance with the City of Ottawa standard W17. unless specified otherwise. bedding and cover material shall be specified by the project geotechnical engineer.

d. All PVC watermains shall be installed with a 10 gauge standard copper TWU or RWU tracer wire in accordance with City of Ottawa standard W36.

e. Cathodic protection is require on all metallic fittings per City of Ottawa standard W40 and W42.

f. Valve boxes shall be installed per City of Ottawa standard W24.

g. Watermain in fill areas to be installed with restrained joints per City of Ottawa standard W25.5 and W25.6.

h. Thrust blocking of watermains to be installed per City of Ottawa standard W25.3 and W25.4.

i. The contractor shall supply testing water if necessary, provide all temporary caps, plugs, blow-offs, and nozzles required for testing and disinfecting of the watermain.

j. Watermain crossing over and below sewers shall be in accordance with the City of Ottawa standard W25.2 and W25, respectively.

k. Water services to be insulated per City of Ottawa standard W23 where separation between services and maintenance holes are less than 2.4m.

l. The minimum vertical clearance between watermain and sewer / utility is 0.50m per MOE guidelines. For watermain crossing under sewers refer to City of Ottawa Standard W25, and W25.2 for crossing over sewer.

m. All watermain shall have a minimum cover of 2.4m, otherwise thermal insulation is required as per City of Ottawa standard W22.

n. General water plant utility clearance as per City of Ottawa standard R20.

o. Fire hydrant installation as per City of Ottawa standard W19, all bottom of hydrant flange elevations to installed 0.10m above proposed finished grade at hydrant; fire hydrant location as per City of Ottawa standard W18.

p. All watermain shall be hydrostatically tested in accordance with the City of Ottawa and Ontario guidelines unless otherwise directed. Provisions for flushing water line prior to testing, etc. must be provided.

q. All watermains shall be bacteriologically tested in accordance with the City of Ottawa and Ontario guidelines. all chlorinated water to be discharged and pretreated to acceptable levels prior to discharge. All discharged water must be controlled and treated so an not to adversely effect the environment. It is the responsibility of the contractor to ensure that all municipal and/or provincial requirements are met.

r. All watermains shall be terminated with a plug and 50mm blow off unless otherwise noted.

s. Contractor to submit watermain commissioning plan to consultant for review prior to any watermain works.

8. SILTATION AND EROSION CONTROL

a. Siltation control barriers shall be placed as detailed.

b. All siltation control measures shall be cleaned and maintained weekly (as minimum) and after each rainfall as directed and to the satisfaction of the City of Ottawa.

c. Additional silt control locations may be required as determined by the City of Ottawa.

d. If building activity does not commence within 45 days after construction is completed, arrangements shall be made to seed any stripped areas and topsoil stockpiles that are not covered by vegetation and maintain them until ground cover is established.

e. Sedimentation control measures shall be kept in place until satisfactory ground cover has been established and all building activity has been completed.

9. REINSTATEMENT

a. All surface features not designated as to be removed including but not limited to curbs, landscaping, pavement, pavement marking and sidewalks but are disturbed, damaged or removed during the contractor's activities shall be reinstated to its original conditions at no extra cost.

b. All existing features to remain, i.e. manhole lids, catchbasins, valve chamber lids, valve boxes, etc. shall be adjusted to suit the finished elevations as required.

c. Pavement reinstatement for service and utility cuts shall be in accordance with the City of Ottawa Std. R10, Costco Wholesale Development Requirements (October 26, 2018), OPSD 509.010 and OPSS 310.

10. PERMITS AND APPROVALS

The following approvals are required prior to commencing construction.
Owner has applied for the following permits/approvals:
Site Plan
Site Plan Approval (or Clearance Letter from City)

Underground Service
Above noted approvals
Building Permit

Contractor shall be responsible for securing all other necessary permits.

The Contractor shall not commence work in any area requiring a permit until the Contractor possesses a copy of a permit, together with any and all conditions, drawings and sketches attached to the permit.

The Contractor shall keep a copy of all permits and attachments on site at all times and shall produce them on demand by the Municipality, Consultant, Owner or approving authority.

8. BENCHMARK

HORIZONTAL DATUM NOTE
PROJECTION: MODIFIED TRANSVERSE MERCATOR (MTM, ZONE 9, CM:76°30'W)
DATUM: NAD 83 (ORIGINAL)

VERTICAL DATUM NOTE
ELEVATION ARE REFERRED TO THE CANADIAN GEODETIC VERTICAL DATUM (CGVD-1928: 1978) AND ARE DERVIED FROM BENCHMARK MONUMENT No.001196530389, HAVING A PUBLISHED ELEVATION OF 67.097 METERS.

LIST OF DRAWINGS

For civil site preparation, grading, and servicing refer to the following. These drawings are to be used in conjunction with each other and the contract specifications

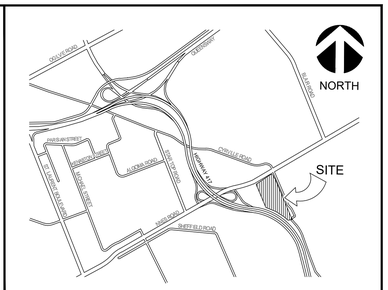
SP-19	Site Plan
NT1	Notes
SD1	Details
ES1	Erosion Control Plan
RM1	Site Removal Plan
SG1	Site Grading Plan
SS1	Site Servicing Plan
ST1	Drainage Area Plan

STORM STRUCTURE TABLE

STRUCTURE	TOP OF GRATE ELEVATION	STRUCTURE INFO							OUTLET	
		INLET	INLET	INLET	OUTLET	SIZE	DETAIL	COVER	DIAMETER	TYPE
CB2	66.30				64.850	600X600mm	OPSD 705.010	S19.1	250	PVC SDR-35
CB3	66.24				64.790	600X600mm	OPSD 705.010	S19.1	250	PVC SDR-35
CB5	66.23				64.780	600X600mm	OPSD 705.010	S19.1	250	PVC SDR-35
CB6	66.34				64.890	600X600mm	OPSD 705.010	S19.1	250	PVC SDR-35
CB8	66.15				64.700	600X600mm	OPSD 705.010	S19.1	250	PVC SDR-35
CB10	66.41				64.360	600X600mm	OPSD 705.010	S19.1	250	PVC SDR-35
CB11	66.25				64.800	600X600mm	OPSD 705.010	S19.1	250	PVC SDR-35
CBMH4	66.21			63.860	63.830	1200mm DIA.	OPSD 701.010	S28.1	375	PVC SDR-35
STM MH1	66.33		64.630	±64.59	64.160	1200mm DIA.	OPSD 701.010	S24.1	375	PVC SDR-35
STM MH2	66.33			63.450	63.400	1200mm DIA.	OPSD 701.010	S24.1	375	PVC SDR-35
STM MH3	66.42	64.690	64.200	64.030	63.590	1200mm DIA.	OPSD 701.010	S24.1	300	PVC SDR-35
STM MH4	66.37		64.200	63.480	63.420	1200mm DIA.	OPSD 701.010	S24.1	300	PVC SDR-35
STM MH5	66.40		63.350	63.280	63.240	1200mm DIA.	OPSD 701.010	S24.1	375	PVC SDR-35
STM MH6	66.47		63.080	63.070	63.040	EF04	EF041	EF04	450	PVC SDR-35
STM OWS	66.43			63.710	63.410	HSD-22	HSD-22	HSD-22	250	PVC SDR-18

WATERMAIN SCHEDULE

STATION	DESCRIPTION	FINISHED GRADE	TOP OF WATERMAIN	COVER
150mm WATERMAIN SERVICE FROM EX.W/M TO FIRE HYDRANT				
0+000.00	Connect to EX.200mm W/M with Tee	66.29	63.890	2.40
0+021.52	Crossing with EX.375mm PVC STM	66.35	63.950	2.40
0+053.75	Crossing with 375mm PVC STM	66.29	64.080	**2.21**
0+060.87	Crossing with EX.200mm SAN	66.48	64.080	2.40
0+070.25	150mm VB	66.35	63.950	2.40
0+073.07	Connect to Fire Hydrant	66.42	64.020	2.40



KEY PLAN NTS

EXISTING LEGEND

■		DENOTES	FOUND MONUMENTS
□		"	SET MONUMENTS
IB		"	IRON BAR
IBø		"	ROUND IRON BAR
SIB		"	STANDARD IRON BAR
SSIB		"	SHORT STANDARD IRON BAR
CC		"	CUT CROSS
CP		"	CONCRETE PIN
WIT		"	WITNESS
PIN		"	PROPERTY IDENTIFICATION NUMBER
M/MEAS		"	MEASURED
PROP		"	PROPORTIONED
OU		"	ORIGIN UNKNOWN
SG		"	STANTEC GEOMATICS LTD.
PL		"	PLAN SR-14540
PL1		"	PLAN 4R-28038
PL2		"	PLAN SR-8624
PL3		"	PLAN SR-9014
	ACU	"	AIR CONDITIONING UNIT
	AN	"	ANCHOR
	AP	"	AIR PUMP
	ANT	"	ANTENNA
	BH	"	BOREHOLE
	BOL	"	BOLLARD
	CB	"	CATCH BASIN
	CBMH	"	CB MANHOLE
	FP	"	FLAG POLE
	FL	"	FLOOD LIGHT
	GC	"	GARBAGE CAN
	GP	"	POLE GUYWIRE
	GSR	"	GAS SERVICE REGULATOR
	GV	"	GAS VALVE
	HLS	"	HYDRO LIGHT STANDARD
	HM	"	HYDRO METER
	HTN	"	HYDRO TRANSFORMER
	HW	"	HAND WELL
	HYD	"	FIRE HYDRANT
	JBX	"	JUNCTION BOX
	LS	"	LIGHT STANDARD
	MP	"	MONITORING PIN
	MH	"	MAINTENANCE HOLE UNIDENTIFIED
	MHB	"	MAINTENANCE HOLE BELL
	MHF	"	MAINTENANCE HOLE FIBRE OPTIC
	MHH	"	MAINTENANCE HOLE HYDRO
	MHSAN	"	MAINTENANCE HOLE SANITARY
	MHSTM	"	MAINTENANCE HOLE STORM
	MHT	"	MAINTENANCE HOLE TRAFFIC
	MW	"	MONITORING WELL
	OLS	"	LIGHT STANDARD ORNAMENTAL
	PLBX	"	PULL BOX
	PLP	"	PILLAR
	SN	"	SIGN
	TB BELL	"	TERMINAL BOX - BELL
	TB CATV	"	TERMINAL BOX - CABLE
	TCB	"	TRAFFIC CONTROL BOX
	TPIT	"	TEST PIT
	TSL	"	TRAFFIC SIGNAL LIGHT
	UMB	"	MARKER BELL UNDERGROUND
	UMC	"	MARKER CABLE UNDERGROUND
	UMG	"	MARKER GAS UNDERGROUND
	UMO	"	MARKER OIL UNDERGROUND
	UP	"	UTILITY POLE
	VB	"	VALVE BOX
	VC	"	VALVE CHAMBER
	WV	"	WATER VALVE
		"	TREE STUMP
		"	TREE CONIFEROUS (D.B.H. SHOWN)
		"	TREE DECIDUOUS (D.B.H. SHOWN)
T		"	UNDERGROUND TELEPHONE
P		"	UNDERGROUND HYDRO
WTM		"	WATERMAIN
G		"	GASMAIN
STM		"	STORM SEWER
FOTS		"	UNDERGROUND FIBRE OPTIC
OHW		"	OVERHEAD WIRE
SAN		"	SANITARY SEWER
CATV		"	UNDERGROUND CABLE
P		"	UNDERGROUND HYDRO
T		"	UNDERGROUND TELEPHONE

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
7.	REVISED PER CITY COMMENTS	S.M.	03-20-2026	I.J.
6.	ISSUED FOR SITE PLAN APPROVAL	S.M.	11-27-2025	I.J.
5.	ISSUED FOR BID	S.M.	05-16-2025	I.J.
4.	ISSUED FOR PERMIT/BID	S.M.	04-30-2025	I.J.
3.	ISSUED FOR QA3	S.M.	04-21-2025	
2.	ISSUED FOR QA2	S.M.	04-09-2025	
1.	ISSUED FOR QA	N.C.W.	03-27-2025	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
COSTCO WHOLESALE

MUNICIPALITY
CITY OF OTTAWA

PROJECT TITLE
COSTCO GLOUCESTER
GAS BAR
1900 CYRVILLE RD, ON, K1B 3V5

SHEET TITLE
NOTES

wsp

LICENSED PROFESSIONAL ENGINEER
S. MANDRYK
100631937
2026-03-20
PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER
I. M. JAFFERJEE
100164153
2026-03-20
PROVINCE OF ONTARIO

DESIGNED	DRAWN	CHECKED
S.M.	J.T.	I.J.

SCALE	DATE
1:250	MARCH 2026

PROJECT NUMBER	DWG. NUMBER
211-12161	NT1

PLOTTED: Mar 20, 2026 - 1:14pm, CATHYHU
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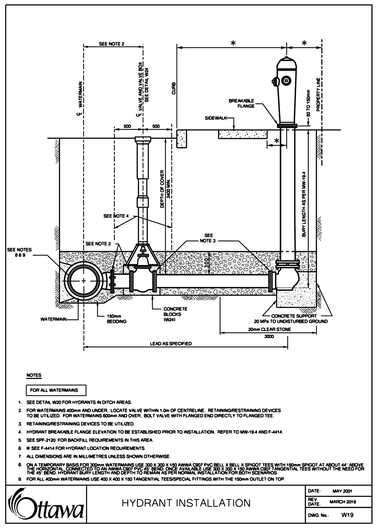
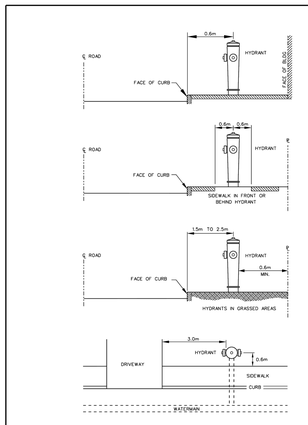


NOTES

FOR ALL WATERMAINS

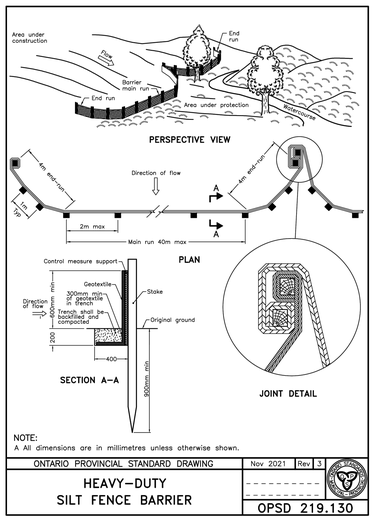
1. SEE DETAIL W20 FOR HYDRANTS IN DITCH AREAS.
2. FOR WATERMAINS 400mm AND UNDER, LOCATE VALVE WITHIN 1.0m OF CENTRELINE. RETAINING/RESTRAINING DEVICES TO BE UTILIZED. FOR WATERMAINS 600mm AND OVER, BOLT VALVE WITH FLANGED END DIRECTLY TO FLANGED TEE.
3. RETAINING/RESTRAINING DEVICES TO BE UTILIZED.
4. HYDRANT BREAKABLE FLANGE ELEVATION TO BE ESTABLISHED PRIOR TO INSTALLATION. REFER TO W9-19.4 AND F-4414.
5. SEE SPP-2120 FOR BACKFILL REQUIREMENTS IN THIS AREA.
6. @ SEE F-4414 FOR HYDRANT LOCATION REQUIREMENTS.
7. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS SHOWN OTHERWISE
8. ON A TEMPORARY BASIS FOR 300mm WATERMAINS USE 300 x 300 x 150 ASPAWN CERT PVC BELL & BELL & SPIGOT TEES WITH 150mm SPIGOT AT ABOVE AS ABOVE THE HORIZONTAL CONNECTED TO AN ANCHORED VERTICAL PIPE. BELOW GRADE ALL FITTINGS SHALL BE MECHANICAL TEES WITHOUT THE NEED FOR ANCHORED VERTICAL PIPE. ALL FITTINGS SHALL BE RESTRAINED AS PER SPP-2120.
9. FOR ALL 400mm WATERMAINS USE 400 X 400 X 150 TANGENTIAL TEES/SPECIAL FITTINGS WITH THE 150mm OUTLET ON TOP.

Ottawa | HYDRANT INSTALLATION | DATE: MAY 2021 | REV. DATE: MARCH 2019 | DWG No.: W19



NOTES:
1. REFER TO CONSTRUCTION SPECIFICATION F-4414

Ottawa | HYDRANT LOCATION | DATE: MAY 2001 | REV. DATE: MARCH 2013 | DWG. No.: W15

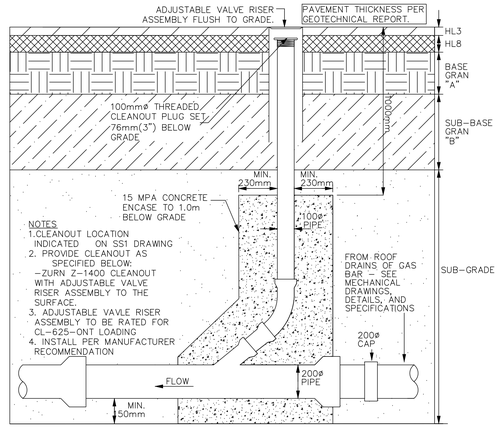


NOTE:
A All dimensions are in millimetres unless otherwise shown.

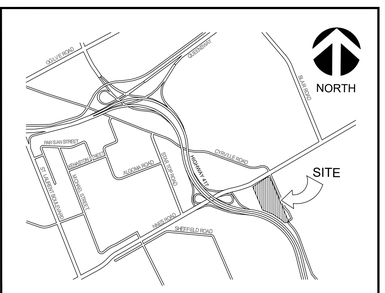
ONTARIO PROVINCIAL STANDARD DRAWING | Nov 2021 | Rev 3

HEAVY–DUTY SILT FENCE BARRIER

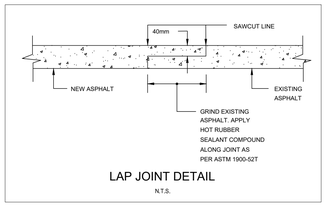
OPSD 219.130



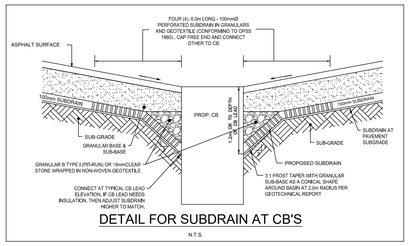
CLEAN OUT DETAIL FOR GAS BAR STM CONNECTIONS
N.T.S.



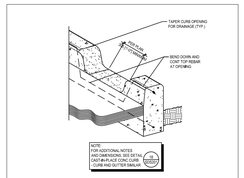
KEY PLAN NTS



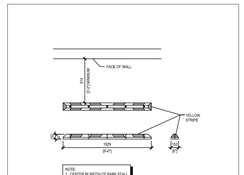
LAP JOINT DETAIL
N.T.S.



DETAIL FOR SUBDRAIN AT CB'S
N.T.S.



9 CURB OPENING FOR DRAINAGE
SCALE: 1:10 0213



4 WHEEL STOP
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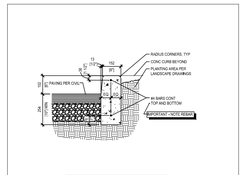

18 CAST-IN-PLACE CONCRETE CURB
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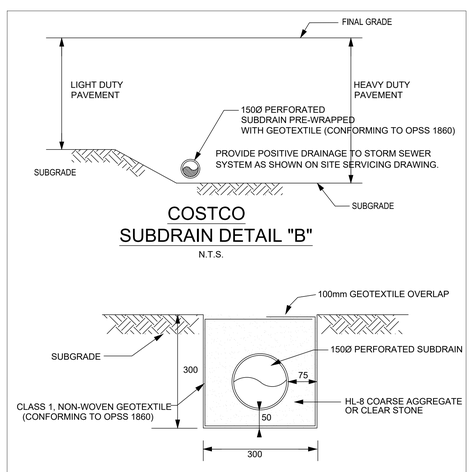
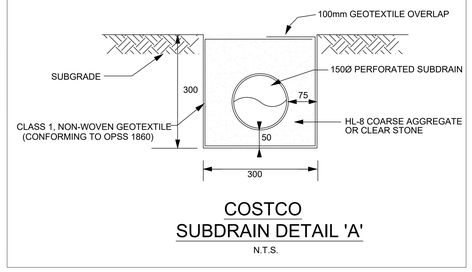
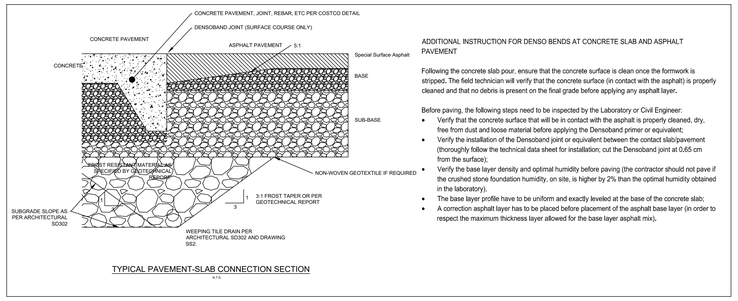


COSTCO
SUBDRAIN DETAIL "B"
N.T.S.



COSTCO
SUBDRAIN DETAIL 'A'
N.T.S.



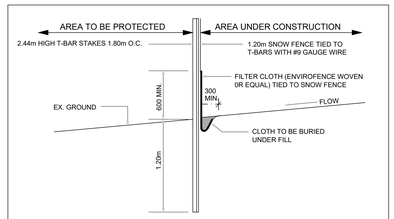
TYPICAL PAVEMENT-SLAB CONNECTION SECTION
N.T.S.

ADDITIONAL INSTRUCTION FOR DENSO BENDS AT CONCRETE SLAB AND ASPHALT PAVEMENT

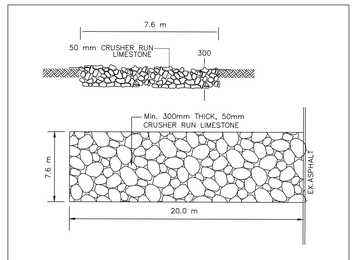
Following the concrete slab pour, ensure that the concrete surface is clean once the formwork is stripped. The field technician will verify that the concrete surface (in contact with the asphalt) is properly cleaned and that no debris is present on the final grade before applying any asphalt layer.

Before paving, the following steps need to be inspected by the Laboratory or Civil Engineer:

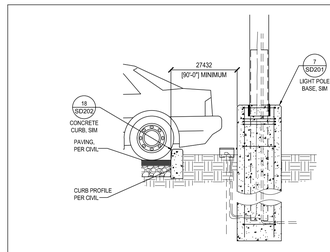
- Verify that the concrete surface that will be in contact with the asphalt is properly cleaned, dry, free from dust and loose material before applying the Densoband primer or equivalent;
- Verify the installation of the Densoband joint or equivalent between the contact slab/pavement (thoroughly follow the technical data sheet for installation; cut the Densoband joint at 0,65 cm from the surface);
- Verify the base layer density and optimal humidity before paving (the contractor should not pave if the crushed stone foundation humidity, on site, is higher by 2% than the optimal humidity obtained in the laboratory);
- The base layer profile have to be uniform and exactly leveled at the base of the concrete slab;
- A correction asphalt layer has to be placed before placement of the asphalt base layer (in order to respect the maximum thickness layer allowed for the base layer asphalt mix).



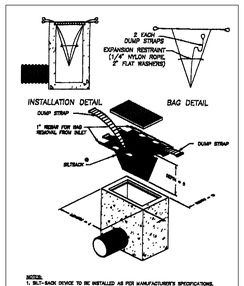
SILTATION CONTROL FENCE
N.T.S.



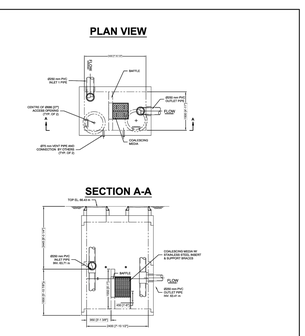
MUD-MAT DETAILS AT CONSTRUCTION SITE ENTRANCE
N.T.S.



LIGHT POLE LOCATION WHERE PARKING OCCURS
N.T.S.



CATCHBASIN SILT-SACK
SEDIMENT CONTROL DEVICE
N.T.S.



Mohr Separations Research, Inc.
1278 FM 407 Suite 109A26 Lewisville, TX 75068 USA
Tel: 919-256-9200 Fax: 866-810-0872
Echelon Environmental: 505 Hood Road, Unit 26, Markham, ON L3R 5V6 Tel: 905-948-0000 Fax: 905-948-0577

MSR HSD22
COSTCO GLOUCESTER GAS BAR
GLOUCESTER, ON
DESIGN FLOWRATE: 39.6 USGPM

JOB No.: 11680-001 | SCALE: 1:48
DATE: 28/04/2025 | SHEET: 1
DRAWN: IU
APPROV.:

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
7.	REVISED PER CITY COMMENTS	SM	03-20-2026	IJ
6.	ISSUED FOR SITE PLAN APPROVAL	SM	11-27-2025	IJ
5.	ISSUED FOR BID	SM	05-16-2025	IJ
4.	ISSUED FOR PERMIT/BID	SM	04-30-2025	IJ
3.	ISSUED FOR QA3	SM	04-21-2025	
2.	ISSUED FOR QA2	SM	04-09-2025	
1.	ISSUED FOR QA	NCW	03-27-2025	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT: COSTCO WHOLESALE

MUNICIPALITY: CITY OF OTTAWA

PROJECT TITLE: COSTCO GLOUCESTER
GAS BAR
1900 CYRVILLE RD, ON, K1B 3V5

SHEET TITLE: DETAILS

wsp

LICENSED PROFESSIONAL ENGINEER
S. MANDRYK
100631937
2026-03-20
PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER
I. M. JAFFERJEE
100164153
2026-03-20
PROVINCE OF ONTARIO

DESIGNED	DRAWN	CHECKED
S.M.	J.T.	I.J.

SCALE	DATE
AS NOTED	MARCH 2026

PROJECT NUMBER	DWG. NUMBER
211-12161	SD1

FILENAME: C:\Users\CATDYA512\OCA\CDocs\WP Canada projects (AMER)\LIDAR (ON 24)\Files\211-12161-00-Costco Gloucester Business Centre Gas Bar\MUK\Eng Dwgs\211-12161_SD1.dwg
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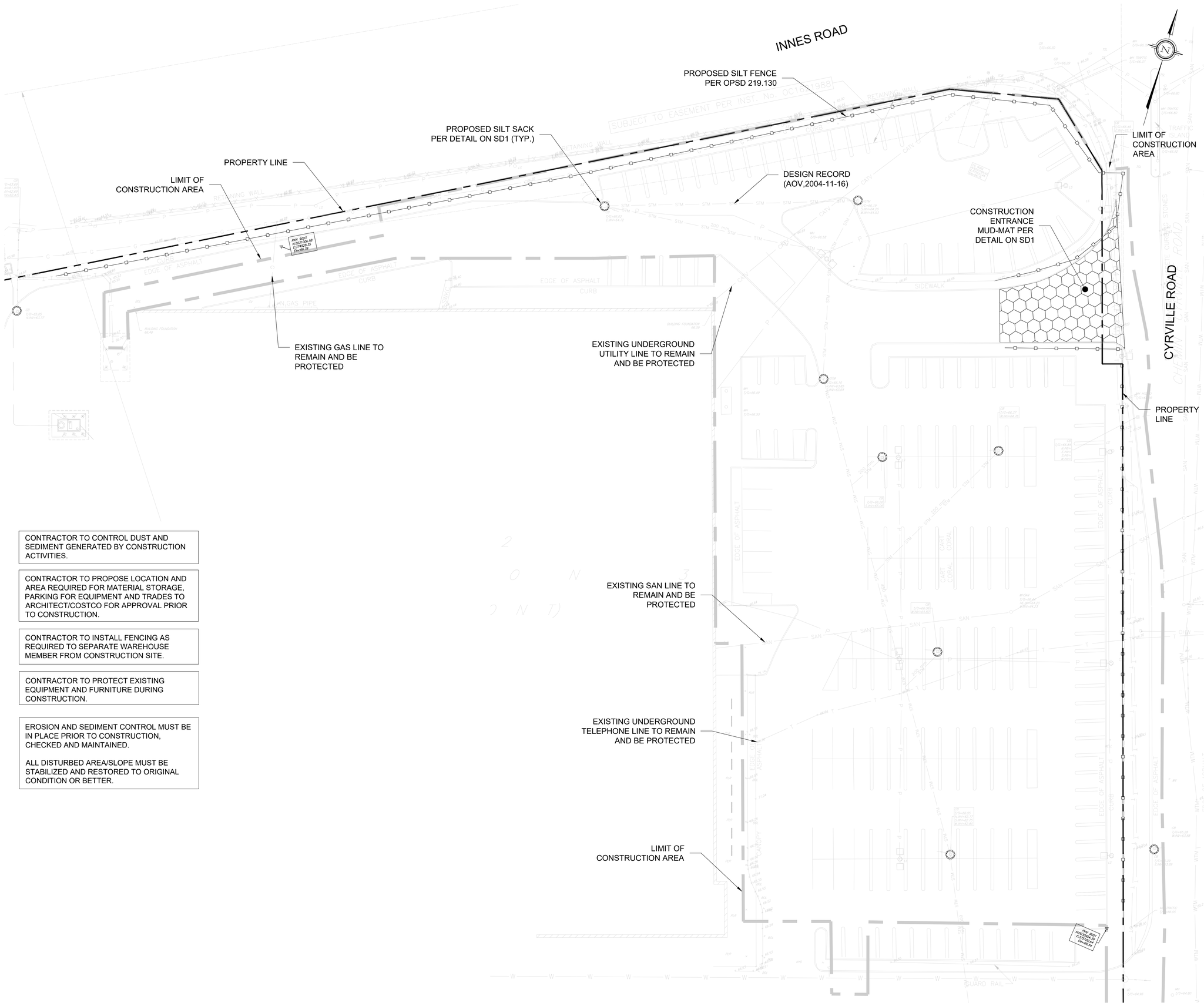


CONTRACTOR TO CONTROL DUST AND SEDIMENT GENERATED BY CONSTRUCTION ACTIVITIES.

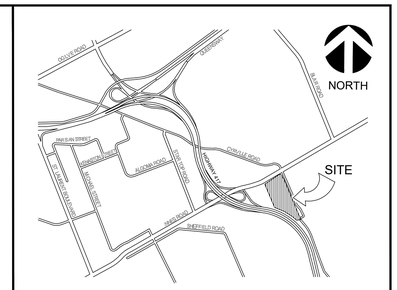
CONTRACTOR TO PROPOSE LOCATION AND AREA REQUIRED FOR MATERIAL STORAGE, PARKING FOR EQUIPMENT AND TRADES TO ARCHITECT/COSTCO FOR APPROVAL PRIOR TO CONSTRUCTION.

CONTRACTOR TO INSTALL FENCING AS REQUIRED TO SEPARATE WAREHOUSE MEMBER FROM CONSTRUCTION SITE.

CONTRACTOR TO PROTECT EXISTING EQUIPMENT AND FURNITURE DURING CONSTRUCTION.

EROSION AND SEDIMENT CONTROL MUST BE IN PLACE PRIOR TO CONSTRUCTION, CHECKED AND MAINTAINED.

ALL DISTURBED AREA/SLOPE MUST BE STABILIZED AND RESTORED TO ORIGINAL CONDITION OR BETTER.



KEY PLAN NTS

LEGEND

FFE	FINISHED FLOOR ELEVATION
═	BARRIER CURB OPSD 600.110
▬	DEPRESSED CURB
☰	CART STORAGE (SEE ARCH. DRAWINGS FOR DETAILS)
▭	CONC. PAVING
→	DIRECTION OF DRAINAGE
□○□	LIGHT POLE (B.O.)
□CB	CATCHBASIN
⊡	CATCHBASIN MANHOLE
○	STORM MANHOLE
◉	SANITARY MANHOLE
⊗	EMERGENCY SPILL SHUTOFF VALVE
○	WATER VALVE
⌖	HYDRANT
▬ ▬	LIMIT OF CONSTRUCTION
▬ ▪ ▬	PROPERTY LINE
Ⓦ	EXISTING WATER VALVE
Ⓖ MH	EXISTING GAS MANHOLE
○	CATCHBASIN SILT-SACK SEDIMENTATION CONTROL DEVICE
─□─□─	SILTATION FENCE

0 5m 10m 20m 25m
SCALE: 1:250

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
7.	REVISED PER CITY COMMENTS	SM	03-20-2026	I.J
6.	ISSUED FOR SITE PLAN APPROVAL	SM	11-27-2025	I.J
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2.	ISSUED FOR QA2	SM	04-09-2025	
1.	ISSUED FOR QA	NCW	03-27-2025	

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COSTCO WHOLESALE

MUNICIPALITY
CITY OF OTTAWA

PROJECT TITLE
COSTCO GLOUCESTER
GAS BAR
1900 CYRVILLE RD, ON, K1B 3V5

SHEET TITLE
EROSION CONTROL PLAN

wsp

LICENSED PROFESSIONAL ENGINEER
S. MANORYK
100631937
2026-03-20
PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER
I. M. JAFFERJEE
100164153
2026-03-20
PROVINCE OF ONTARIO

DESIGNED S.M.
DRAWN J.T.
CHECKED I.J.
SCALE 1:250
DATE MARCH 2026
PROJECT NUMBER 211-12161
DWG. NUMBER ES1

FILENAME: C:\Users\CAJT074512\DC\ACCDocs\WSP Canada projects (AMER)\LDME ON 24\Files\211-12161-00-Costco Gloucester Business Centre Gas Bar\MUN\Eng Dwgs\211-12161_ESC.dwg
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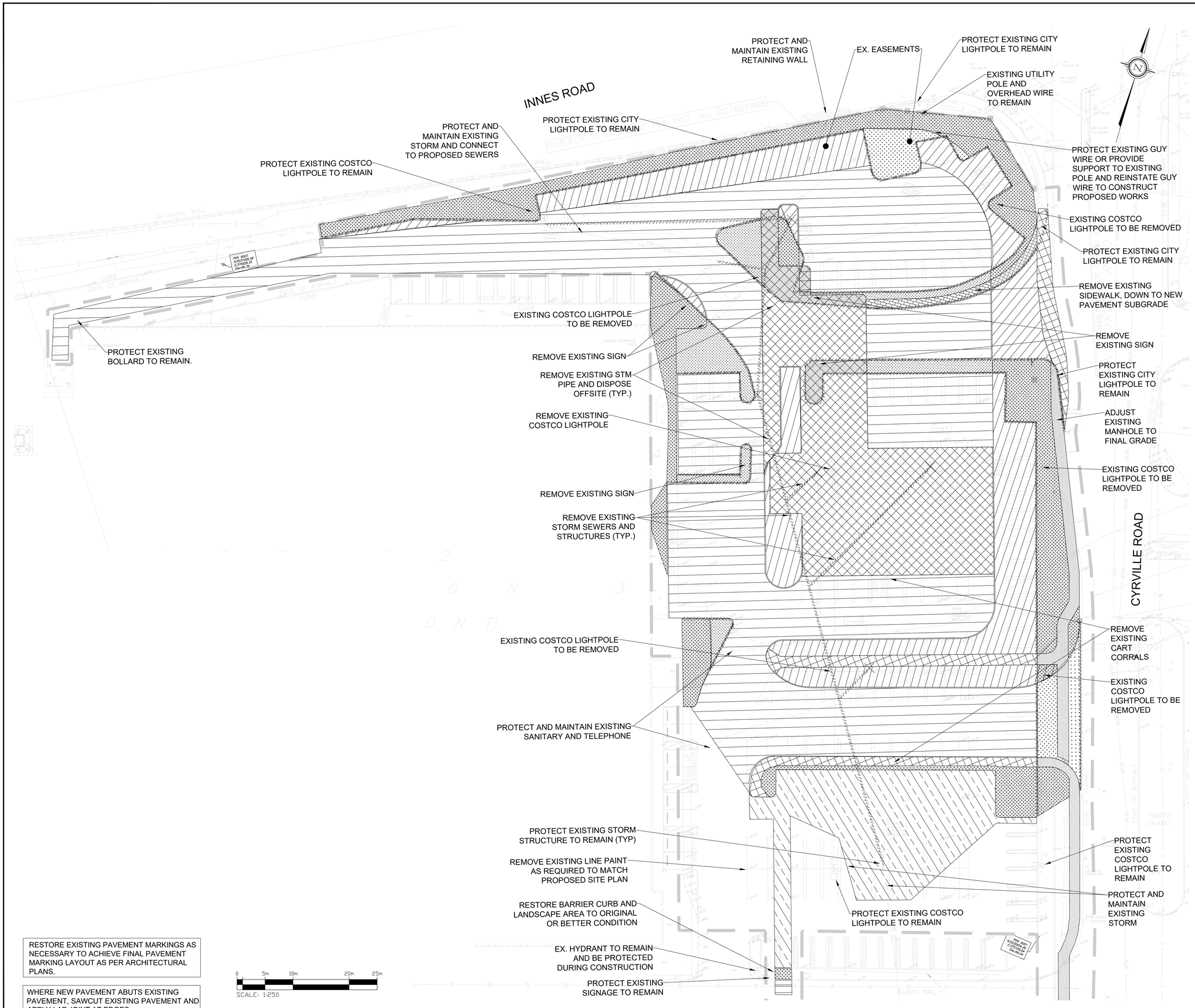

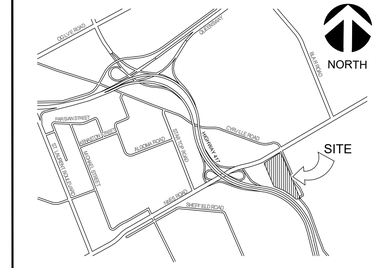

LEGEND

- BARRIER CURB OPSD 600.110
- DEPRESSED CURB
- CART STORAGE
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING CATCHBASIN
- PROPOSED STORM MANHOLE
- PROPOSED CATCHBASIN
- LIMIT OF CONSTRUCTION
- PROPERTY LINE
- EXISTING WATER VALVE
- EXISTING GAS MANHOLE
- REMOVAL OF CURB AND SERVICING
- FULL DEPTH LANDSCAPE, PLANTING AND ADDITIONAL SUB-GRADE REMOVAL AND REPLACEMENT WITH HEAVY DUTY PAVEMENT
- FULL DEPTH LANDSCAPE, PLANTING AND ADDITIONAL SUB-GRADE REMOVAL AND REPLACEMENT WITH CONCRETE PAVEMENT
- FULL DEPTH LANDSCAPE, PLANTING AND ADDITIONAL SUB-GRADE REMOVAL AND REPLACEMENT WITH PROPOSED LANDSCAPE
- FULL DEPTH CONCRETE SIDEWALK AND ADDITIONAL SUBGRADE REMOVAL AND REPLACEMENT WITH HEAVY DUTY PAVEMENT
- FULL DEPTH CONCRETE SIDEWALK AND ADDITIONAL SUBGRADE REMOVAL AND REPLACEMENT WITH LANDSCAPE ISLAND
- FULL DEPTH ASPHALT PAVEMENT AND ADDITIONAL SUBGRADE REMOVAL AND REPLACEMENT WITH HEAVY DUTY PAVEMENT
- FULL DEPTH ASPHALT PAVEMENT AND ADDITIONAL SUBGRADE REMOVAL AND REPLACEMENT WITH LANDSCAPE ISLAND
- FULL DEPTH ASPHALT AND ADDITIONAL SUBGRADE REMOVAL AND REPLACEMENT WITH CONCRETE PAVEMENT
- FULL DEPTH ASPHALT PAVEMENT AND ADDITIONAL SUBGRADE REMOVAL AND REPLACEMENT WITH LIGHT DUTY PAVEMENT

RESTORE EXISTING PAVEMENT MARKINGS AS NECESSARY TO ACHIEVE FINAL PAVEMENT MARKING LAYOUT AS PER ARCHITECTURAL PLANS.

WHERE NEW PAVEMENT ABUTS EXISTING PAVEMENT, SAWCUT EXISTING PAVEMENT AND APPLY LAP JOINT AT EDGES.

0 5m 10m 20m 25m
SCALE: 1:250

No.	REVISIONS TO DRAWING	BY	DATE	APPR
8.	REVISED PER CITY COMMENTS	SM	03-20-2026	U
7.	ISSUED FOR SITE PLAN APPROVAL	SM	11-27-2025	U
6.	ISSUED FOR BID	SM	05-16-2025	U
5.	ISSUED FOR PERMIT/BID	SM	04-30-2025	U
4.	ISSUED FOR QA3	SM	04-21-2025	
3.	ISSUED FOR QA2	SM	04-09-2025	
2.	ISSUED FOR QA	NCW	03-27-2025	
1.	ISSUED FOR GREEN INK	NCW	02-18-2025	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT: COSTCO WHOLESALE

MUNICIPALITY: CITY OF OTTAWA

PROJECT TITLE: COSTCO GLOUCESTER
GAS BAR
1900 CYRVILLE RD, ON, K1B 3V5

SHEET TITLE: SITE REMOVAL PLAN

wsp

LICENSED PROFESSIONAL ENGINEER — S. MANORYK — 100631937 — 2026-03-20 — PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER — I. M. JAFFERJEE — 100164153 — 2026-03-20 — PROVINCE OF ONTARIO

DESIGNED	DRAWN	CHECKED
S.M.	J.T.	I.J./N.C.W.

SCALE	DATE
1:250	APRIL 2025

PROJECT NUMBER	DWG. NUMBER
211-12161	RM1

FILENAME C:\Users\NCW\AUTODESK\ACCDocs\WSP Canada projects (AMER)\LUNE ON 24\Files\211-12161-00-Costco Gloucester Business Centre Gas Bar\MEng Dwgs\211-12161_RM1.dwg
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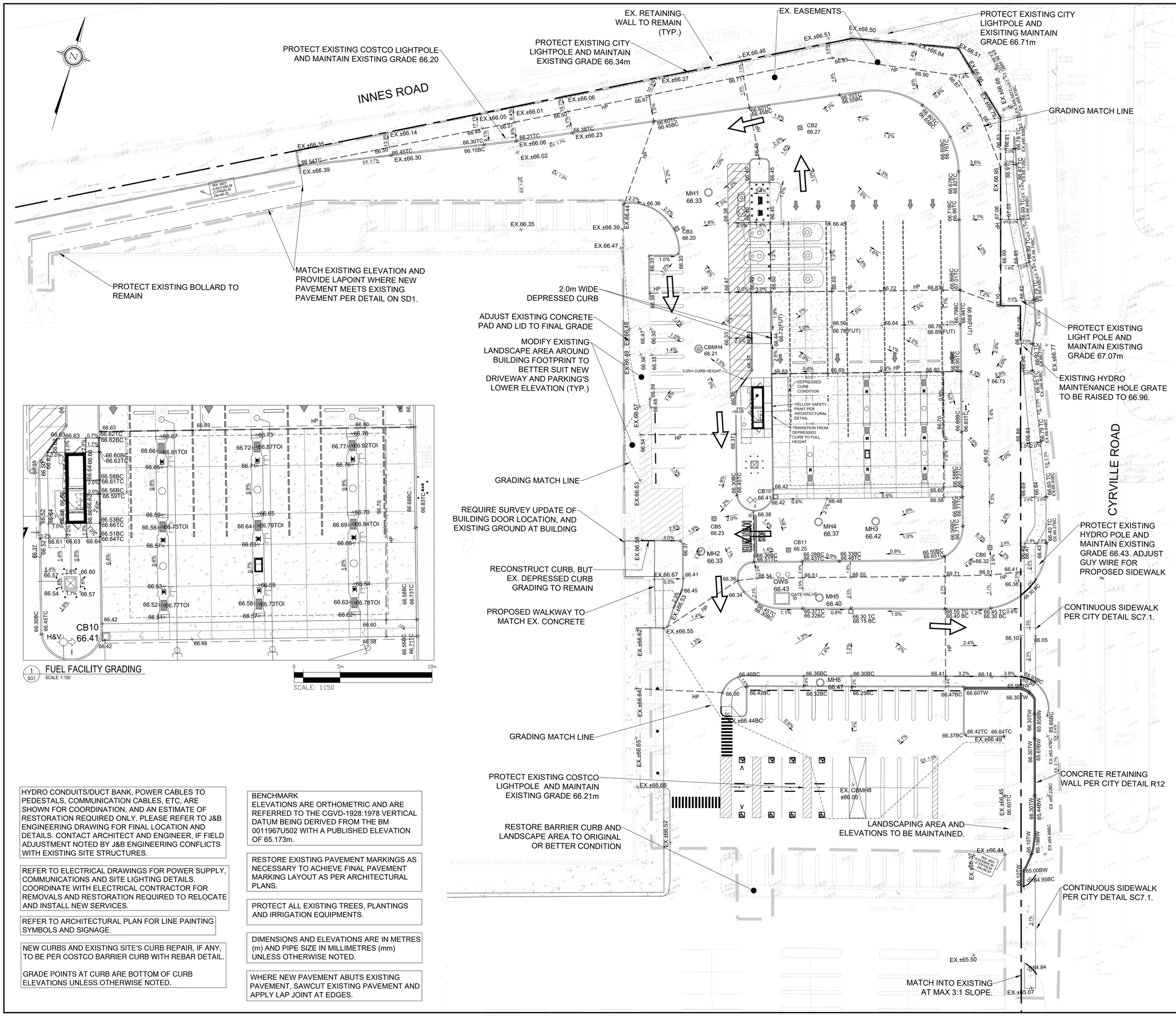


1 SG1 FUEL FACILITY GRADING
SCALE: 1:150

0 5m 10m
SCALE: 1:150

HYDRO CONDUITS/DUCT BANK, POWER CABLES TO PEDESTALS, COMMUNICATION CABLES, ETC, ARE SHOWN FOR COORDINATION, AND AN ESTIMATE OF RESTORATION REQUIRED ONLY. PLEASE REFER TO J&B ENGINEERING DRAWING FOR FINAL LOCATION AND DETAILS. CONTACT ARCHITECT AND ENGINEER, IF FIELD ADJUSTMENT NOTED BY J&B ENGINEERING CONFLICTS WITH EXISTING SITE STRUCTURES.

REFER TO ELECTRICAL DRAWINGS FOR POWER SUPPLY, COMMUNICATIONS AND SITE LIGHTING DETAILS. COORDINATE WITH ELECTRICAL CONTRACTOR FOR REMOVALS AND RESTORATION REQUIRED TO RELOCATE AND INSTALL NEW SERVICES.

REFER TO ARCHITECTURAL PLAN FOR LINE PAINTING SYMBOLS AND SIGNAGE.

NEW CURBS AND EXISTING SITE'S CURB REPAIR, IF ANY, TO BE PER COSTCO BARRIER CURB WITH REBAR DETAIL.

GRADE POINTS AT CURB ARE BOTTOM OF CURB ELEVATIONS UNLESS OTHERWISE NOTED.

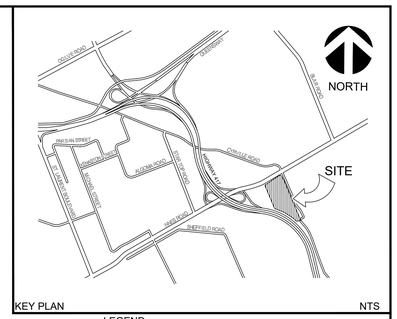
BENCHMARK
ELEVATIONS ARE ORTHOMETRIC AND ARE REFERRED TO THE CGVD-1928:1978 VERTICAL DATUM BEING DERIVED FROM THE BM 0011967U502 WITH A PUBLISHED ELEVATION OF 65.173m.

RESTORE EXISTING PAVEMENT MARKINGS AS NECESSARY TO ACHIEVE FINAL PAVEMENT MARKING LAYOUT AS PER ARCHITECTURAL PLANS.

PROTECT ALL EXISTING TREES, PLANTINGS AND IRRIGATION EQUIPMENTS.

DIMENSIONS AND ELEVATIONS ARE IN METRES (m) AND PIPE SIZE IN MILLIMETRES (mm) UNLESS OTHERWISE NOTED.

WHERE NEW PAVEMENT ABUTS EXISTING PAVEMENT, SAWCUT EXISTING PAVEMENT AND APPLY LAP JOINT AT EDGES.



KEY PLAN NTS

LEGEND

FFE	FINISHED FLOOR ELEVATION
	BARRIER CURB OPSD 600.110
	DEPRESSED CURB
	CURB TRANSITION
	0.3m CURB
	CART STORAGE
	EXISTING STORM SEWER
	EXISTING SANITARY SEWER
	EXISTING CATCHBASIN
	PROPOSED STORM MANHOLE
	PROPOSED CATCHBASIN
	LIMIT OF CONSTRUCTION
	PROPERTY LINE
	EXISTING WATER VALVE
MH	EXISTING GAS MANHOLE
×66.50	PROPOSED GRADE
×66.50 (TOI)	PROPOSED TOP OF ISLAND
×66.50 (FUT)	FUTURE GRADE
×EX. ±66.50	EXISTING GRADE
	HIGH POINT RIDGE
	PROPOSED SWALE
	GRADING MATCH LINE
H	PROPOSED ELECTRICAL UTILITY
	PROPOSED ROAD PAINTING
	MAJOR OVERLAND FLOW
	RETAINING WALL
	CONCRETE SIDEWALK
	LANDSCAPE AREA

0 5m 10m 20m 25m
SCALE: 1:250

No.	REVISIONS TO DRAWING	BY	DATE	APPR
8.	REVISED PER CITY COMMENTS	SM	03-20-2026	IJ
7.	ISSUED FOR SITE PLAN APPROVAL	SM	11-27-2025	IJ
6.	ISSUED FOR BID	SM	05-16-2025	IJ
5.	ISSUED FOR PERMIT/BID	SM	04-30-2025	IJ
4.	ISSUED FOR QA3	SM	04-21-2025	
3.	ISSUED FOR QA2	SM	04-09-2025	
2.	ISSUED FOR QA	NCW	03-27-2025	
1.	ISSUED FOR GREEN INK	NCW	02-18-2025	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT
COSTCO WHOLESALE

MUNICIPALITY
CITY OF OTTAWA

PROJECT TITLE
COSTCO GLOUCESTER
GAS BAR
1900 CYRVILLE RD, ON, K1B 3V5

SHEET TITLE
SITE GRADING PLAN

wsp

LICENSED PROFESSIONAL ENGINEER
S. MANORYK
100631937
2026-03-20
PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER
I. M. JAFFERJEE
100164153
2026-03-20
PROVINCE OF ONTARIO

DESIGNED	DRAWN	CHECKED
S.M.	J.T.	I.J.

SCALE	DATE
1:250	MARCH 2026

PROJECT NUMBER	DWG. NUMBER
211-12161	SG1

FILENAME: C:\Users\CALITOY4\3DOCACCDocs\WSP Canada projects (AMER)\LOME ON 24\Files\211-12161-00-Costco Gloucester Business Centre Gas Bar\MUNI\Eng Dwgs\211-12161_SG1.dwg
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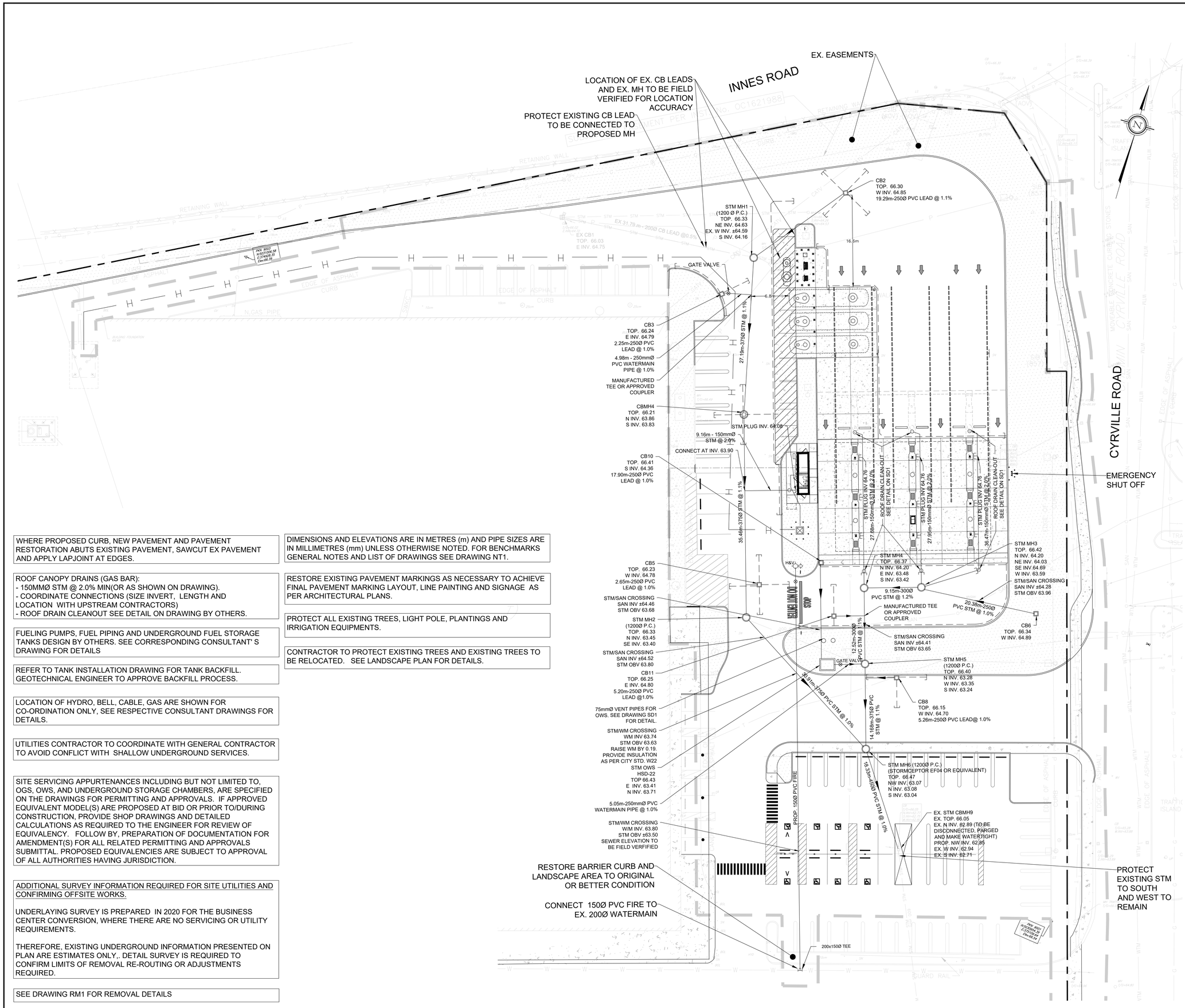

KEY PLAN NTS

LEGEND

- LIMIT OF CONSTRUCTION
- PROPERTY LINE
- FFE — FINISHED FLOOR ELEVATION
- BARRIER CURB OPSD 600.110
- DEPRESSED CURB
- CART STORAGE
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING TELECOM. CABLE
- EXISTING CATCHBASIN
- EXISTING MANHOLE
- EXISTING WATER VALVE
- EXISTING GAS MANHOLE
- REMOVALS
- EXISTING LIGHT POLE
- PROPOSED STORM MANHOLE
- PROPOSED STORM CATCHBASIN MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED WATER VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED SUBDRAIN
- PROPOSED ROAD PAINTING
- GAS BAR CANOPY
- CONCRETE SIDEWALK
- LANDSCAPE AREA

0 5m 10m 20m 25m

SCALE: 1:250

WHERE PROPOSED CURB, NEW PAVEMENT AND PAVEMENT RESTORATION ABUTS EXISTING PAVEMENT, SAWCUT EX PAVEMENT AND APPLY LAPJOINT AT EDGES.

ROOF CANOPY DRAINS (GAS BAR):
- 150MMØ STM @ 2.0% MIN(OR AS SHOWN ON DRAWING).
- COORDINATE CONNECTIONS (SIZE INVERT, LENGTH AND LOCATION WITH UPSTREAM CONTRACTORS)
- ROOF DRAIN CLEANOUT SEE DETAIL ON DRAWING BY OTHERS.

FUELING PUMPS, FUEL PIPING AND UNDERGROUND FUEL STORAGE TANKS DESIGN BY OTHERS. SEE CORRESPONDING CONSULTANT' S DRAWING FOR DETAILS

REFER TO TANK INSTALLATION DRAWING FOR TANK BACKFILL. GEOTECHNICAL ENGINEER TO APPROVE BACKFILL PROCESS.

LOCATION OF HYDRO, BELL, CABLE, GAS ARE SHOWN FOR CO-ORDINATION ONLY, SEE RESPECTIVE CONSULTANT DRAWINGS FOR DETAILS.

UTILITIES CONTRACTOR TO COORDINATE WITH GENERAL CONTRACTOR TO AVOID CONFLICT WITH SHALLOW UNDERGROUND SERVICES.

SITE SERVICING APPURTENANCES INCLUDING BUT NOT LIMITED TO, OGS, OWS, AND UNDERGROUND STORAGE CHAMBERS, ARE SPECIFIED ON THE DRAWINGS FOR PERMITTING AND APPROVALS. IF APPROVED EQUIVALENT MODEL(S) ARE PROPOSED AT BID OR PRIOR TO/DURING CONSTRUCTION, PROVIDE SHOP DRAWINGS AND DETAILED CALCULATIONS AS REQUIRED TO THE ENGINEER FOR REVIEW OF EQUIVALENCY. FOLLOW BY, PREPARATION OF DOCUMENTATION FOR AMENDMENT(S) FOR ALL RELATED PERMITTING AND APPROVALS SUBMITTAL. PROPOSED EQUIVALENCIES ARE SUBJECT TO APPROVAL OF ALL AUTHORITIES HAVING JURISDICTION.

ADDITIONAL SURVEY INFORMATION REQUIRED FOR SITE UTILITIES AND CONFIRMING OFFSITE WORKS.

UNDERLAYING SURVEY IS PREPARED IN 2020 FOR THE BUSINESS CENTER CONVERSION, WHERE THERE ARE NO SERVICING OR UTILITY REQUIREMENTS.

THEREFORE, EXISTING UNDERGROUND INFORMATION PRESENTED ON PLAN ARE ESTIMATES ONLY,. DETAIL SURVEY IS REQUIRED TO CONFIRM LIMITS OF REMOVAL RE-ROUTING OR ADJUSTMENTS REQUIRED.

SEE DRAWING RM1 FOR REMOVAL DETAILS

DIMENSIONS AND ELEVATIONS ARE IN METRES (m) AND PIPE SIZES ARE IN MILLIMETRES (mm) UNLESS OTHERWISE NOTED. FOR BENCHMARKS GENERAL NOTES AND LIST OF DRAWINGS SEE DRAWING NT1.

RESTORE EXISTING PAVEMENT MARKINGS AS NECESSARY TO ACHIEVE FINAL PAVEMENT MARKING LAYOUT, LINE PAINTING AND SIGNAGE AS PER ARCHITECTURAL PLANS.

PROTECT ALL EXISTING TREES, LIGHT POLE, PLANTINGS AND IRRIGATION EQUIPMENTS.

CONTRACTOR TO PROTECT EXISTING TREES AND EXISTING TREES TO BE RELOCATED. SEE LANDSCAPE PLAN FOR DETAILS.

No.	REVISIONS TO DRAWING	BY	DATE	APPR
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4.	ISSUED FOR QA3	SM	04-21-2025	
3.	ISSUED FOR QA2	SM	04-09-2025	
2.	ISSUED FOR QA	NCW	03-27-2025	
1.	ISSUED FOR GREEN INK	NCW	02-18-2025	

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT: COSTCO WHOLESALE

MUNICIPALITY: CITY OF OTTAWA

PROJECT TITLE: COSTCO GLOUCESTER
GAS BAR
1900 CYRVILLE RD, ON, K1B 3V5

SHEET TITLE: SITE SERVICING PLAN

wsp

LICENSED PROFESSIONAL ENGINEER — S. MANORYK — 100631937 — 2026-03-20 — PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER — I. M. JAFFERJEE — 100164153 — 2026-03-20 — PROVINCE OF ONTARIO

DESIGNED	DRAWN	CHECKED
S.M.	J.T.	I.J.

SCALE	DATE
1:250	MARCH 2026

PROJECT NUMBER	DWG. NUMBER
211-12161	SS1

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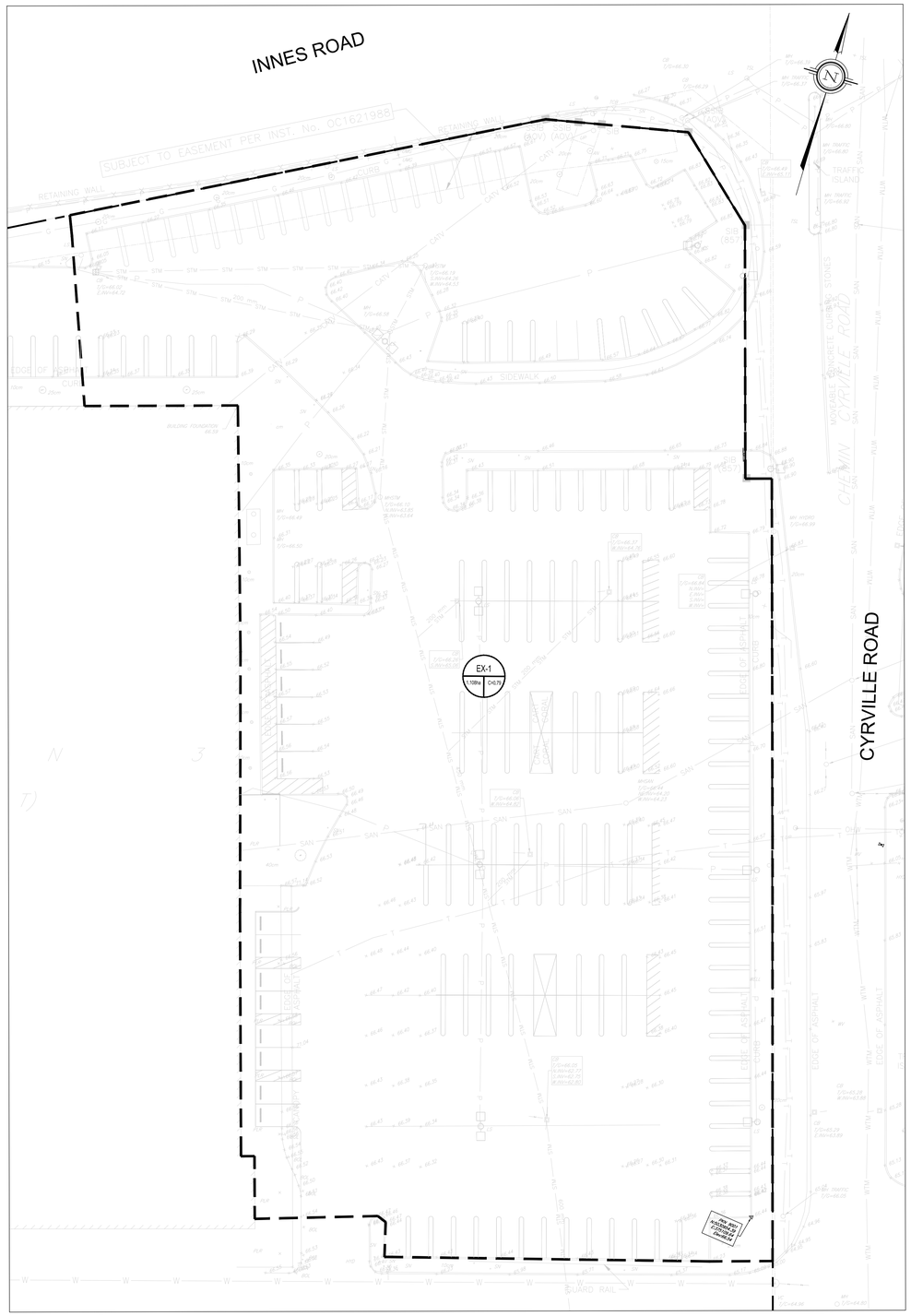
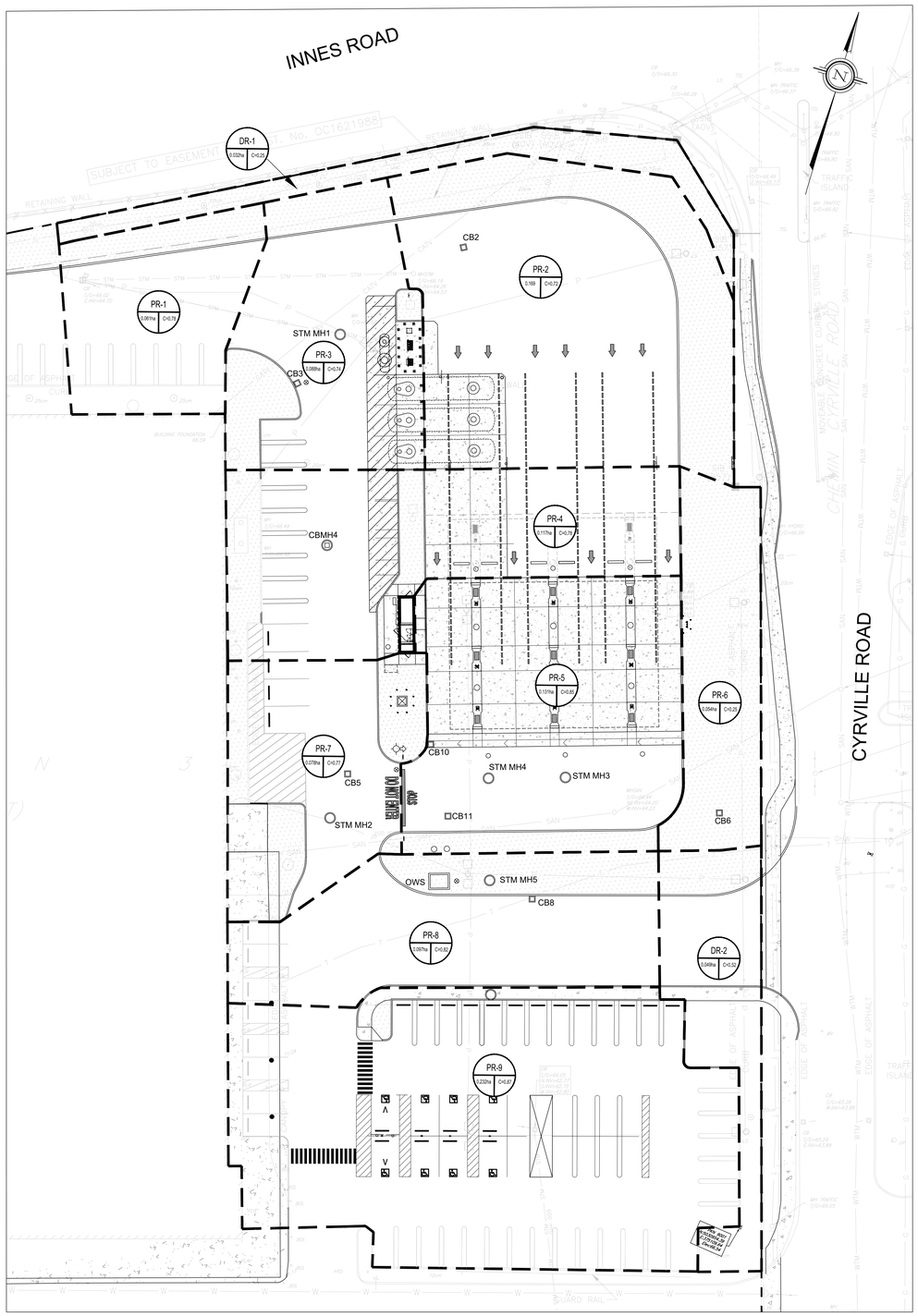
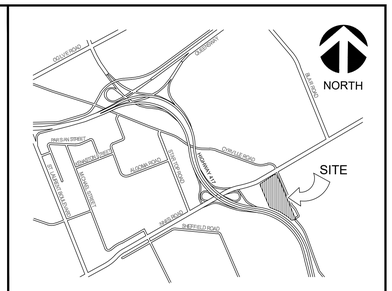


1 ST1 EXISTING DRAINAGE AREA PLAN
SCALE: 1:300



2 ST1 PROPOSED DRAINAGE AREA PLAN
SCALE: 1:300



KEY PLAN NTS

LEGEND

FFE	FINISHED FLOOR ELEVATION
	BARRIER CURB OPSD 600.110
	DEPRESSED CURB
	CART STORAGE (SEE ARCH. DRAWINGS FOR DETAILS)
	CONC. PAVING
	LIGHT POLE (B.O.)
CB	CATCHBASIN
	CATCHBASIN MANHOLE
	STORM MANHOLE
	SANITARY MANHOLE
	EMERGENCY SPILL SHUTOFF VALVE
	WATER VALVE
	HYDRANT
	PROPERTY LINE
WV	EXISTING WATER VALVE
GMH	EXISTING GAS MANHOLE
	GAS BAR CANOPY
	DRAINAGE AREA BOUNDARY
PR-6	DRAINAGE AREA NAME
0.049ha	AREA IN HECTARES
C=0.23	RUNOFF COEFFICIENT
	CONCRETE SIDEWALK
	LANDSCAPE AREA

0 5m 10m 20m 30m
SCALE: 1:300

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
7.	REVISED PER CITY COMMENTS	SM	03-20-2026	IJ
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1.	ISSUED FOR QA	NCW	03-27-2025	

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COSTCO WHOLESALE

MUNICIPALITY
CITY OF OTTAWA

PROJECT TITLE
COSTCO GLOUCESTER
GAS BAR
1900 CYRVILLE RD, ON, K1B 3V5

SHEET TITLE
DRAINAGE AREA PLAN

wsp

LICENSED PROFESSIONAL ENGINEER
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100631937
2026-03-20
PROVINCE OF ONTARIO

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DESIGNED	DRAWN	CHECKED
S.M.	J.T.	I.J.
SCALE	DATE	
1:250	MARCH 2026	
PROJECT NUMBER	DWG. NUMBER	
211-12161	ST1	

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PLOTDATE Mar 20, 2026 - 12:32pm, CA1721612

CITY OF OTTAWA
STORM SEWER DESIGN
WITH

5 Yr. MODIFIED STORM

5 Year Intensity = 998.071/(Time in min + 6.053)^0.814

Q = KCrCIA
K = Conversion Factor = 0.00278

Cr = Routing Coef.

C = Runoff Coef.
i = Rainfall Intensity
A = Area (ha)

CONSULTANT WSP Canada Group Ltd.

PROJECT Costco Gloucester

Designed By Spencer Manoryk, P.Eng
PROJECT NO. 211-12161-00
FILE NO.
Date 2026-03-20

Notes	FROM MH	TO MH	LENGTH (m)	AREA (ha)	CUMUL AREA (ha)	RUN OFF COEF.	CA	CUMUL CA	INT. (I 0) (mm/hr)	FLOW (Q100) (m^3/s)	PIPE DIA. (mm)	ACTUAL PIPE DIA. (mm)	SLOPE (%)	CAPACITY (m^3/s)	VELOCITY (m/s)	SECTION TIME (min)	ACCUM TIME (min)	INLET TIME (min)	% FULL
PR-1	**EX. CB1**	**MH1**	34.13	0.061	0.061	0.78	0.048	0.048	104.19	0.014	200	203	0.50	0.024	0.75	0.76	10.76	10.00	57.0%
PR-2	**CB2**	**MH1**	19.29	0.169	0.169	0.72	0.122	0.122	104.19	0.035	250	254	1.10	0.065	1.28	0.25	10.25	10.00	54.2%
PR-3	**CB3**	**MH1**	2.25	0.088	0.088	0.74	0.065	0.065	104.19	0.019	250	254	1.00	0.062	1.22	0.03	10.03	10.00	30.4%
	MH1	**CBMH4**	27.19	0.000	0.318	0.00	0.000	0.234	100.33	0.065	375	381	1.10	0.192	1.68	0.27	11.03	10.76	
PR-7	**CB5**	**CBMH4**	2.65	0.078	0.078	0.77	0.060	0.060	104.19	0.017	250	254	1.00	0.062	1.22	0.04	10.04	10.00	28.0%
PR-4	**CBMH4**	**MH2**	35.46	0.117	0.513	0.78	0.091	0.386	99.04	0.106	375	381	1.10	0.192	1.68	0.35	11.38	11.03	55.4%
	CB10	**OWS**	17.90	0.023	0.023	0.90	0.021	0.021	104.19	0.006	250	254	1.00	0.062	1.22	0.24	10.24	10.00	9.6%
PR-6	**CB6**	**MH3**	20.38	0.054	0.054	0.25	0.014	0.014	104.19	0.004	250	254	1.00	0.062	1.22	0.28	10.28	10.00	6.3%
PR-5 (sub-area)	**STM STUB**	**MH3**	27.95	0.020	0.020	0.85	0.017	0.017	104.19	0.005	150	152	2.00	0.022	1.23	0.38	10.38	10.00	22.2%
PR-5 (sub-area)	**STM STUB**	**MH3**	36.47	0.018	0.018	0.85	0.015	0.015	104.19	0.004	150	152	2.00	0.022	1.23	0.49	10.49	10.00	19.2%
PR-5 (sub-area)	**CB11**	**MH4**	5.20	0.053	0.053	0.85	0.045	0.045	104.19	0.013	250	254	1.00	0.062	1.22	0.07	10.07	10.00	21.0%
PR-5 (sub-area)	**STM STUB**	**MH4**	27.68	0.018	0.018	0.85	0.015	0.015	104.19	0.004	150	152	2.00	0.022	1.23	0.37	10.37	10.00	19.2%
	MH3	**MH4**	9.15	0.000	0.092	0.00	0.000	0.046	101.66	0.013	300	305	1.20	0.111	1.51	0.10	10.59	10.49	11.7%
	MH4	**MH5**	12.52	0.000	0.162	0.00	0.000	0.105	101.16	0.030	300	305	1.10	0.106	1.45	0.14	10.74	10.59	28.0%
	OWS	**MH5**	5.05	0.000	0.023	0.00	0.000	0.021	102.92	0.006	250	254	1.00	0.062	1.22	0.07	10.31	10.24	9.5%
PR-8	**CB8**	**MH5**	5.26	0.097	0.097	0.82	0.080	0.080	104.19	0.023	250	254	1.00	0.062	1.22	0.07	10.07	10.00	37.1%
	MH2	**MH6**	30.91	0.000	0.513	0.00	0.000	0.386	97.41	0.104	375	381	1.10	0.192	1.68	0.31	11.69	11.38	54.4%
	MH5	**MH6**	14.17	0.000	0.282	0.00	0.000	0.206	100.45	0.057	375	381	1.10	0.192	1.68	0.14	10.88	10.74	29.9%
	MH6	**EX. CBMH9**	18.33	0.000	0.795	0.00	0.000	0.59	96.04	0.158	450	457	1.00	0.297	1.81	0.17	11.86	11.69	53.1%
PR-9	**EX. CBMH9**	**EX MH**	68.91	0.231	1.026	0.87	0.201	0.79	95.31	0.210	600	610	1.16	0.690	2.36	0.49	12.34	11.86	30.4%
* Note: PR-9 excludes building storm serv																			

CONSULTANT WSP Canada Group Ltd.

PROJECT Costco Gloucester - Gas Bar
Designed By Spencer Manoryk, P.Eng
PROJECT NO. 211-12161-00
FILE NO.
Date 2026-03-20

Drainage Area - Runoff Coefficients

Drainage Area	Total (Ha)	Pervious Area (Ha) C=0.25	Impervious Area (Ha) C=0.90	C_{avg}
EX-1	1.108	0.186	0.922	0.79
PR-1	0.061	0.011	0.050	0.78
PR-2	0.169	0.048	0.121	0.72
PR-3	0.088	0.021	0.067	0.74
PR-4	0.117	0.021	0.096	0.78
PR-5	0.131	0.010	0.121	0.85
PR-6	0.054	0.054	0.000	0.25
PR-7	0.078	0.016	0.062	0.77
PR-8	0.097	0.012	0.085	0.82
PR-9	0.231	0.010	0.221	0.87
DR-1	0.032	0.032	0.000	0.25
DR-2	0.049	0.028	0.020	0.52
Total	1.108	0.264	0.844	0.75

Stormceptor®

Rinker MATERIALS™

Stormceptor® EF Sizing Report

Imbrium® Systems
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

04/23/2025

Province:	Ontario
City:	Ottawa
Nearest Rainfall Station:	OTTAWA CDA RCS
Climate Station Id:	6105978
Years of Rainfall Data:	20

Site Name:	MH-6

Drainage Area (ha):	0.79
Runoff Coefficient 'c':	0.81

Particle Size Distribution:	Fine
Target TSS Removal (%):	80.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	20.65
Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	
Influent TSS Concentration (mg/L):	100
Estimated Average Annual Sediment Load (kg/yr):	366
Estimated Average Annual Sediment Volume (L/yr):	297

Project Name:	Costco Gloucester
Project Number:	211-12161-00
Designer Name:	Kathryn Kerker
Designer Company:	WSP
Designer Email:	kathryn.kerker@wsp.com
Designer Phone:	613-690-1206
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	80
EFO5	85
EFO6	89
EFO8	94
EFO10	97
EFO12	98

Recommended Stormceptor EFO Model: EFO4

Estimated Net Annual Sediment (TSS) Load Reduction (%): 80

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.

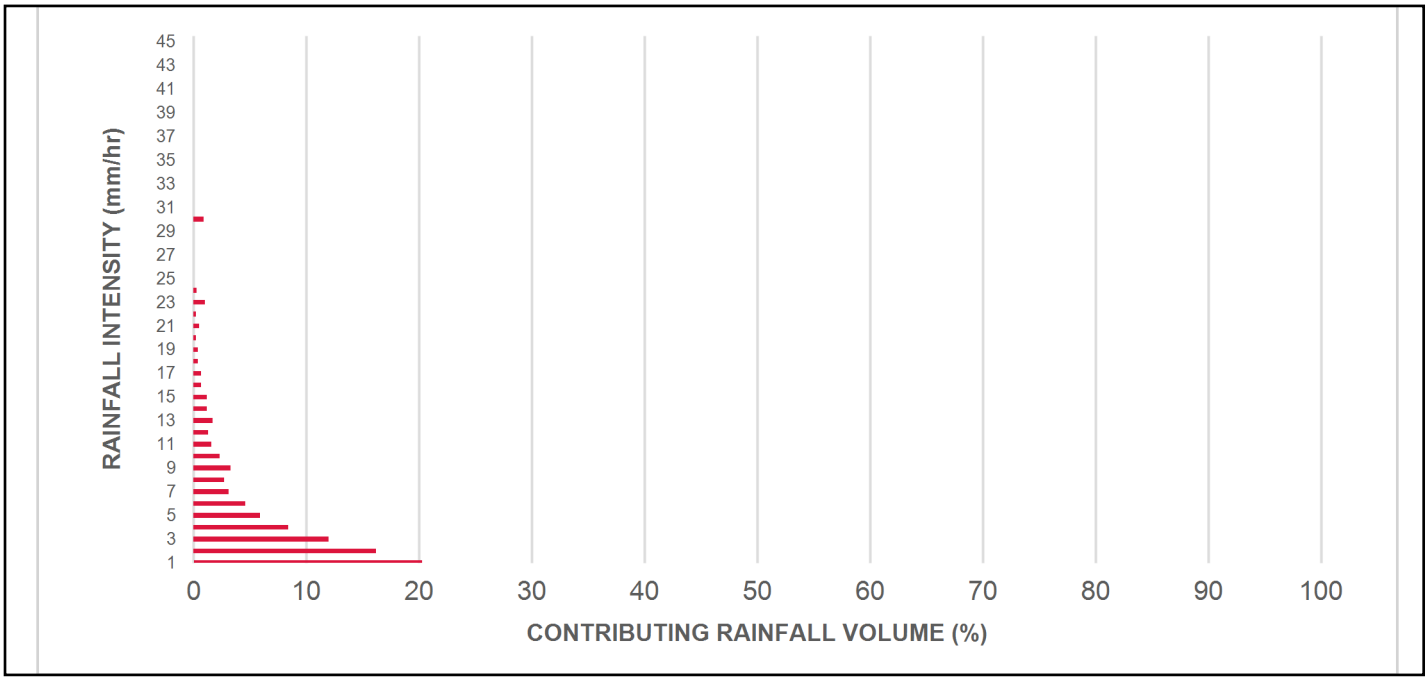
Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Stormceptor® EF Sizing Report

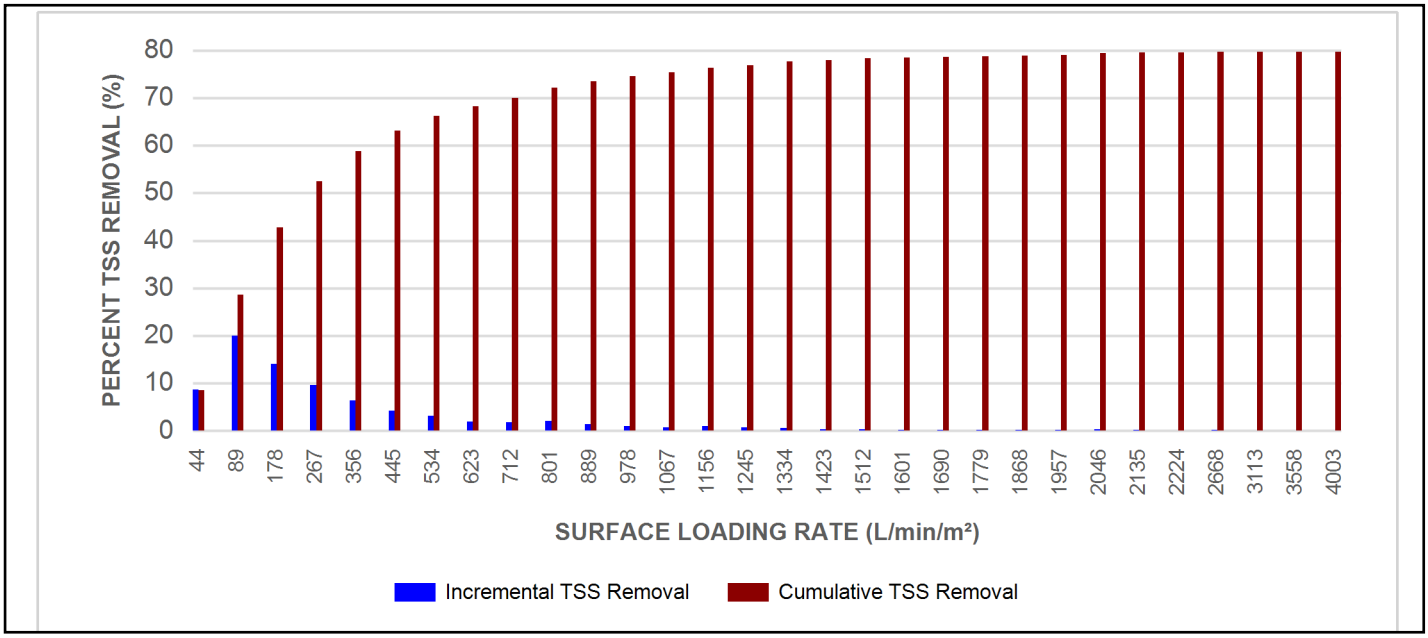
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.6	8.6	0.89	53.0	44.0	100	8.6	8.6
1.00	20.3	29.0	1.78	107.0	89.0	98	20.0	28.6
2.00	16.2	45.2	3.56	213.0	178.0	87	14.1	42.7
3.00	12.0	57.2	5.34	320.0	267.0	80	9.6	52.4
4.00	8.4	65.6	7.12	427.0	356.0	76	6.4	58.8
5.00	5.9	71.6	8.89	534.0	445.0	72	4.3	63.1
6.00	4.6	76.2	10.67	640.0	534.0	68	3.1	66.2
7.00	3.1	79.3	12.45	747.0	623.0	64	2.0	68.2
8.00	2.7	82.0	14.23	854.0	712.0	64	1.7	70.0
9.00	3.3	85.3	16.01	961.0	801.0	63	2.1	72.1
10.00	2.3	87.6	17.79	1067.0	889.0	62	1.4	73.5
11.00	1.6	89.2	19.57	1174.0	978.0	62	1.0	74.5
12.00	1.3	90.5	21.35	1281.0	1067.0	60	0.8	75.3
13.00	1.7	92.2	23.13	1388.0	1156.0	58	1.0	76.3
14.00	1.2	93.5	24.90	1494.0	1245.0	56	0.7	76.9
15.00	1.2	94.6	26.68	1601.0	1334.0	54	0.6	77.6
16.00	0.7	95.3	28.46	1708.0	1423.0	52	0.4	77.9
17.00	0.7	96.1	30.24	1815.0	1512.0	48	0.4	78.3
18.00	0.4	96.5	32.02	1921.0	1601.0	46	0.2	78.5
19.00	0.4	96.9	33.80	2028.0	1690.0	43	0.2	78.6
20.00	0.2	97.1	35.58	2135.0	1779.0	41	0.1	78.7
21.00	0.5	97.5	37.36	2241.0	1868.0	39	0.2	78.9
22.00	0.2	97.8	39.14	2348.0	1957.0	38	0.1	79.0
23.00	1.0	98.8	40.92	2455.0	2046.0	36	0.4	79.4
24.00	0.3	99.1	42.69	2562.0	2135.0	34	0.1	79.5
25.00	0.0	99.1	44.47	2668.0	2224.0	33	0.0	79.5
30.00	0.9	100.0	53.37	3202.0	2668.0	28	0.3	79.7
35.00	0.0	100.0	62.26	3736.0	3113.0	24	0.0	79.7
40.00	0.0	100.0	71.16	4269.0	3558.0	21	0.0	79.7
45.00	0.0	100.0	80.05	4803.0	4003.0	18	0.0	79.7
Estimated Net Annual Sediment (TSS) Load Reduction =								**80 %**

Climate Station ID: 6105978 *Years of Rainfall Data*: 20

RAINFALL DATA FROM OTTAWA CDA RCS 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
EF5 / EFO5	1.5	5	90	762	30	762	30	710	25
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

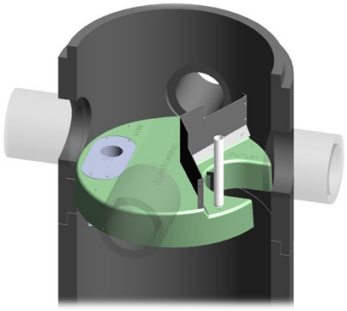
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test 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.

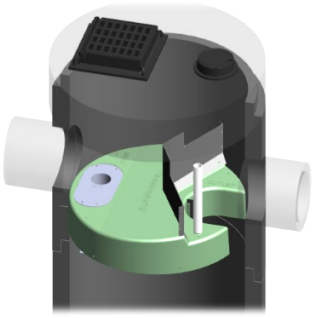
DESIGN FLEXIBILITY

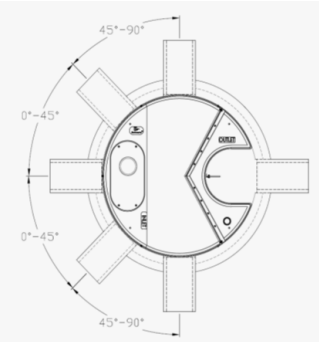
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend 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
EF5 / EFO5	1.5	5	1.62	5.3	420	111	305	10	2124	75	2612	5758
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 TREAMENT 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
	5 ft (1524 mm) Diameter OGS Units:	1.95 m^3 sediment / 420 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 of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m^2 to 1400 L/min/m^2, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m^2 and 1400 L/min/m^2 shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m^2 shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m^2. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m^2.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m^2 shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m^2, and shall be calculated using a simple proportioning formula, with 1400 L/min/m^2 in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m^2.

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.

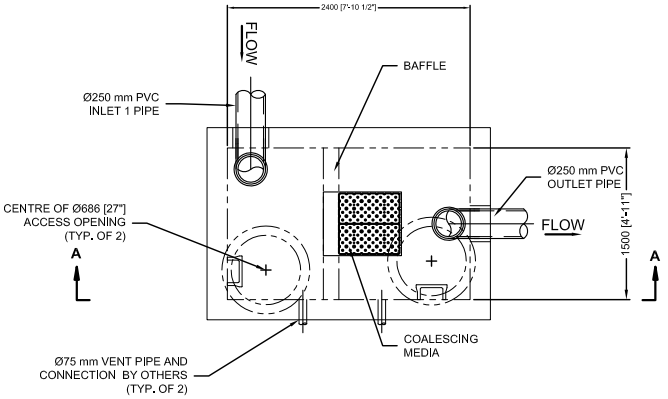
3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid

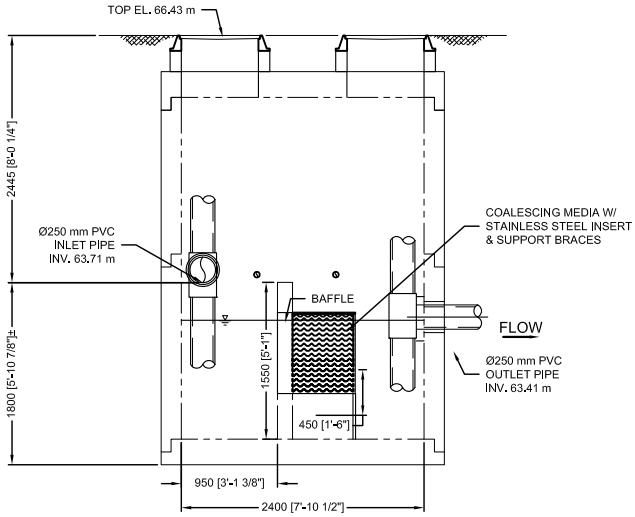
Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators,** with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density 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/m^2 to 2600 L/min/m^2) 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.

PLAN VIEW



SECTION A-A



GENERAL NOTES:

A. OIL WATER SEPARATOR MANUFACTURED TO MEET CHBDC CL-625 ONT.
B. UNIT DIMENSIONS VARIES: PENDING FINAL DESIGN.
C. UNIT C/W INLET/OUTLET CORING AS SHOWN. PIPE CONFIGURATION MAY VARY.
D. UNIT C/W 2-ø686 mm OPENINGS FOR ACCESS AS SHOWN.
E. UNIT C/W LIFTING INSERTS AS REQUIRED.
F. UNIT C/W HOLLOW ALUMINUM STEPS AS PER OPSD 405.010.
G. CONTRACTOR TO CONNECT PIPE(S) TO PIPE TEE(S) (SUPPLIED BY OTHERS).
H. CONTRACTOR TO GROUT ALL INTERIOR EDGES AND JOINTS.
I. DESIGN CAN BE MODIFIED FOR SPECIFIC APPLICATIONS, PLEASE CONTACT ECHELON ENVIRONMNTAL.
J. EST. HEAVIEST LIFT: 12 TONNES
K. STANDARD DESIGN PARAMETERS:

- TEMPERATURE: 0.0°C
- OIL S.G.: 0.85
- INFLUENT OIL: 100 mg/L
- EFFLUENT OIL: 10-15 mg/L (AS PER MUNICIPAL REQUIREMENTS)

ALL UNITS IN mm UNLESS NOTED OTHERWISE.

Mohr Separations Research, Inc.
msr
1278 FM 407 Suite 109A25 Lewisville, TX 75055 USA
Tel: 918-299-9290 Fax: 866-910-5912

MSR HSD22

COSTCO GLOUCESTER GAS BAR
GLOUCESTER, ON

DESIGN FLOWRATE: 39.6 USGPM

JOB No. : 11500-001	SCALE : 1:45
DATE : 28/04/2025	SHEET : 1
DRAWN : SJ	
APPROV. :	

Mohr Separations Research, Inc.

Coalescing Plate Analysis
Rev 2: August 2010

Customer: Echelon Costco Ottawa
Customer Ref:

MSR Ref: Q25 3784 rev 1
Date 28-Apr-25

Continuous Fluid		Immiscible Phase	
Fluid:	Water	Material:	Oil
Flow Rate: US gpm =	105		
Temperature, Deg. F.=	32	Specific Gravity:	0.85
Viscosity Used, Cp =	1.792	Measured at Deg. F.	60
Specific Gravity Used =	1.001	Specific Gravity at Temp.=	0.862
Flow Rate, m3 / hour =	23.85	Log Normal Distribution	
Temperature, Deg. C =	0.0	Concentration, mg/l	100
		Mean size, microns	120
		Standard Deviation	2

Plate Pack Configuration

Packs Wide =	2	Number of Rows	1
Total Width, inches =	23.6	Flow Path, Inches =	23.6
Total Width, mm =	600	FLow Path, mm	600
Height, inches =	31.5	Plates / Stack foot =	30
Height, mm =	800		

Plates / Fluid Characteristics		Effluent Characteristics	
Flow Rate, gpm	105.0		
Stack Feet provided	5.25		Oil
gpm / stack foot	20.00	Effluent mg/l	11.3
Frontal Area, ft2	5.167		
Plate Volume, ft3	10.172	Percent Reduction	88.7
gpm/ft2 frontal area	20.320		
Velocity in plates, ft/min	3.394	Size 100% collected, microns	73.2
Res. time in plates, min	0.589		
Plates / stack foot	30.0	Collection rate, lbs / hour	4.66
Plate spacing nominal	8 mm NOM.	Gallons / hour	0.65
Plate Surface area, ft2	915		
Pressure drop, in H2O	0.06	Collection rate, kg/hour	2.12
Reynolds No. in plates	101.4	l / hour	2.45
Percent of Laminar Limit	5.1		