



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 Separator (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

Reviewed By



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

Ishaque Jafferjee
Manager
Land Development Ottawa

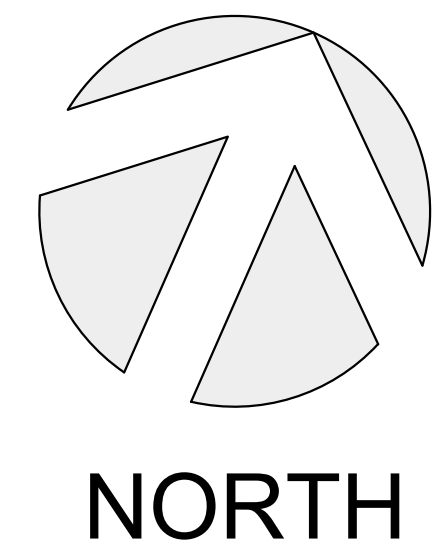
APPENDIX

A

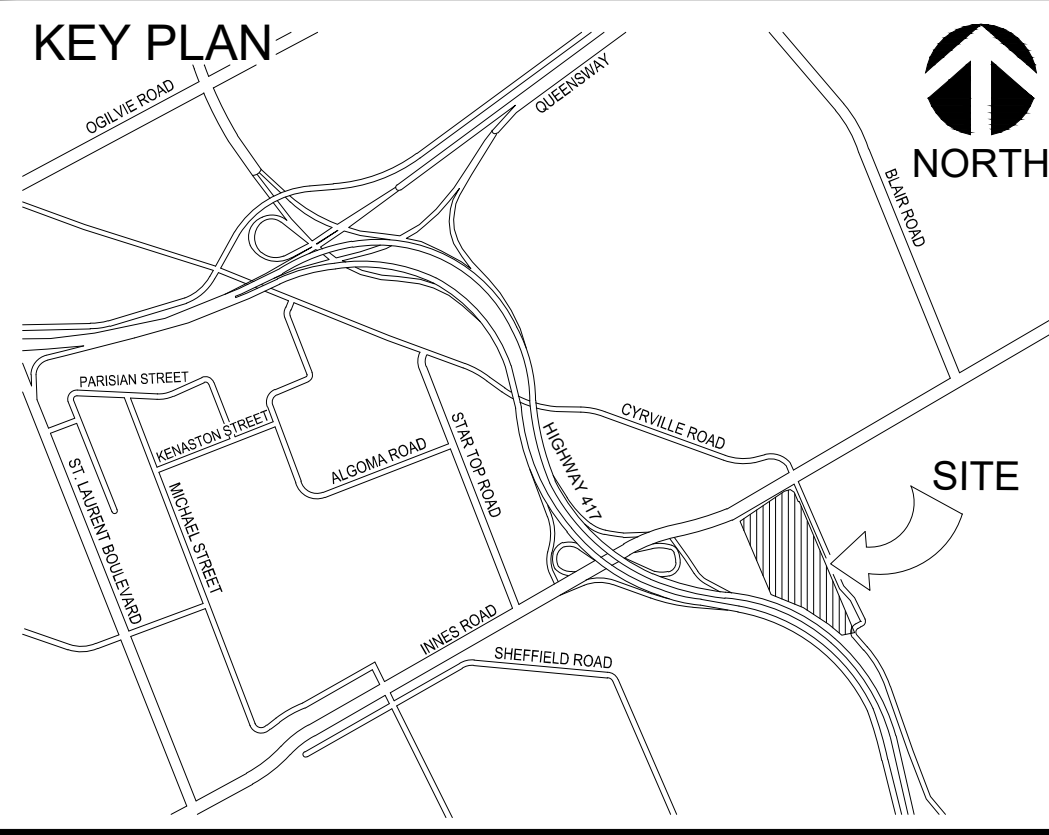
SUPPORTING DOCUMENTS



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



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



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 126,559ft²
PROPOSED FUEL FACILITY CANOPY HEIGHT: 5.64m	
PROPOSED MECHANICAL ENCLOSURE HEIGHT: 2.82m	
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



DESIGNED CJM/KH	DRAWN CJM	CHECKED KH
SCALE 1:500	DATE MARCH 3, 2026	DWG. NUMBER 211-12161-00-P01
PROJECT NUMBER 211-12161-00-P01		DWG. NUMBER SP-19

- 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

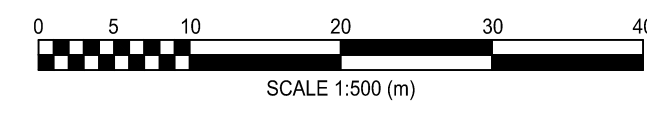


EXISTING PARKING: 603 STALLS
 PROPOSED PARKING: 470 STALLS
 20 DELIVERY TRUCK STALLS
 EXISTING AREA: 11.76 ACRES
 PROPOSED AREA: 11.58 ACRES

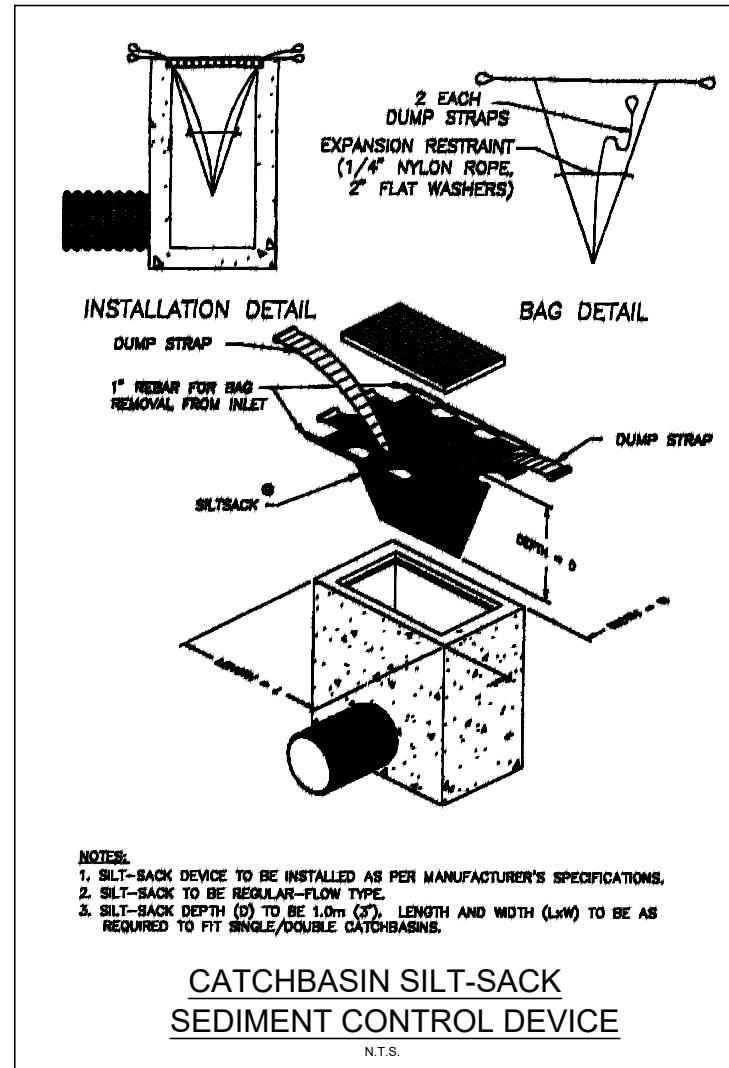
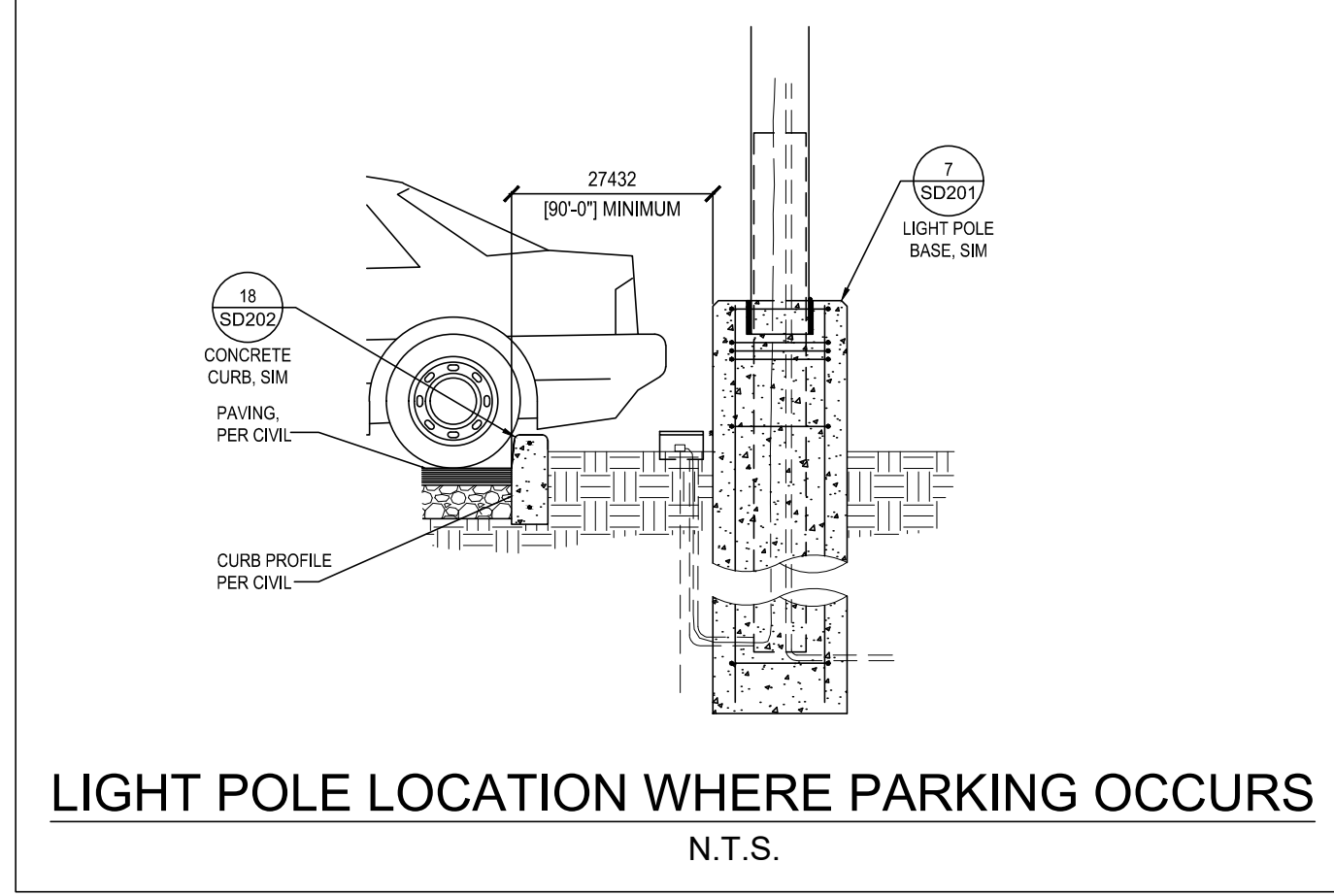
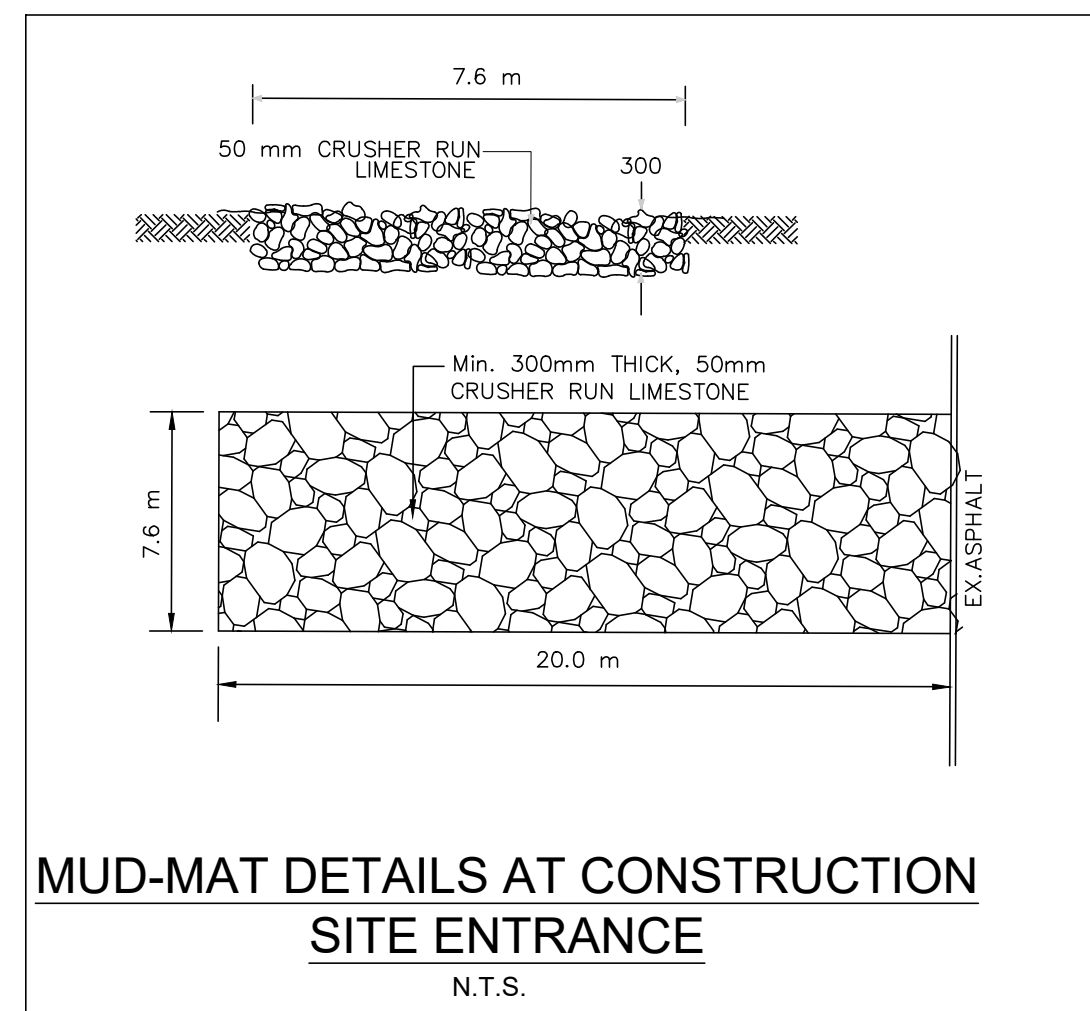
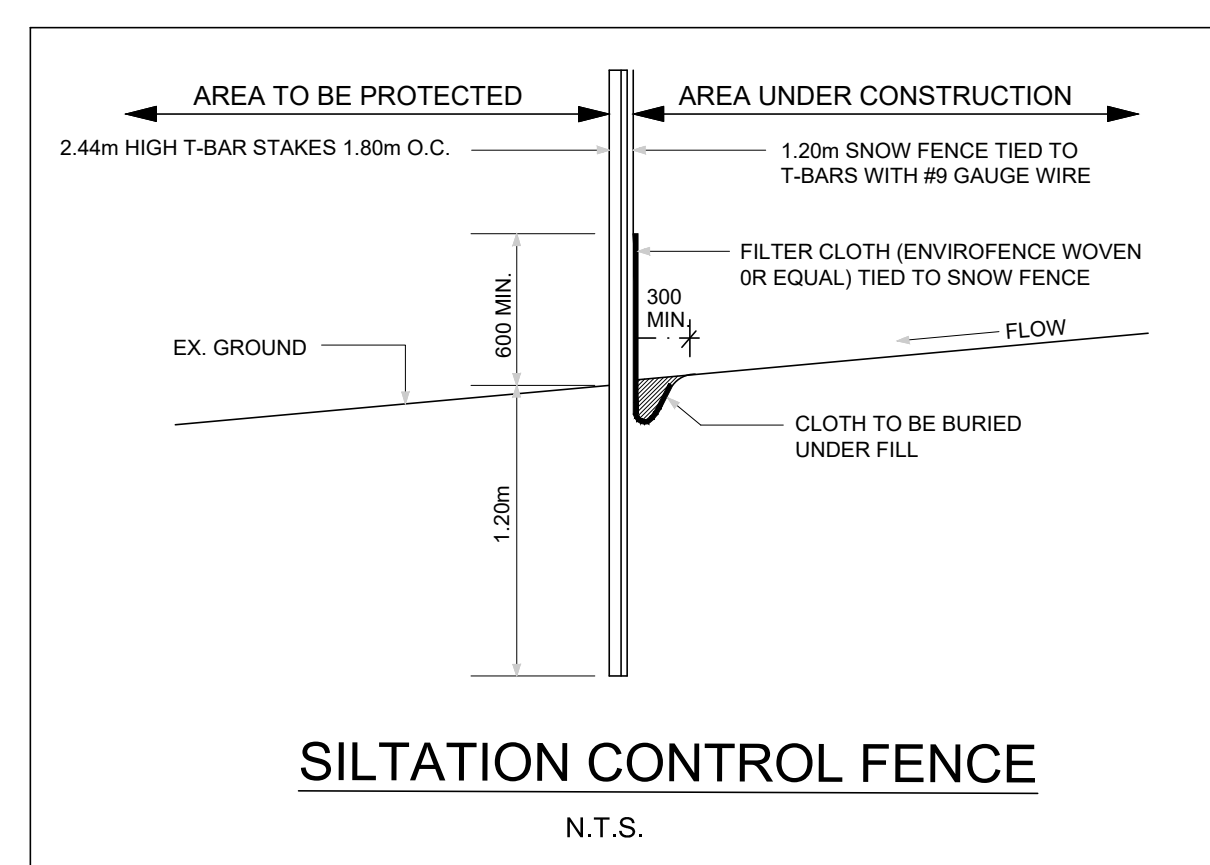
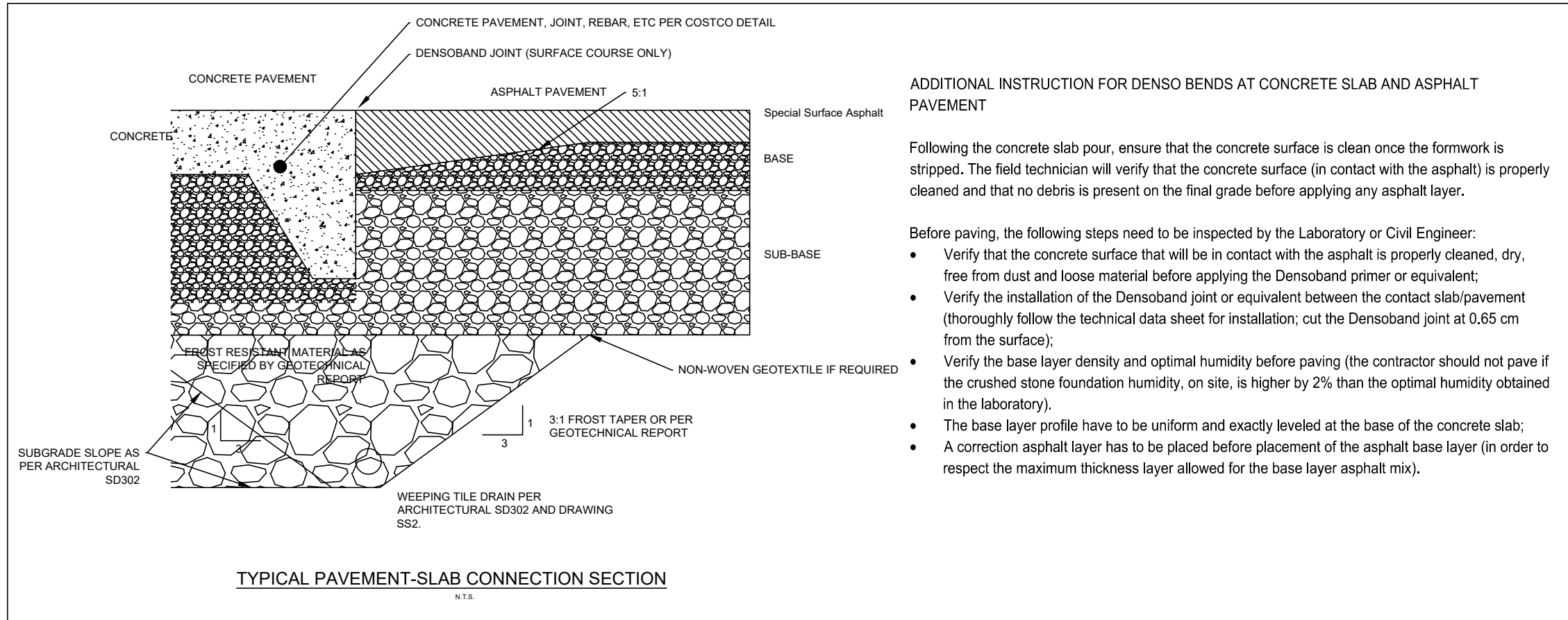
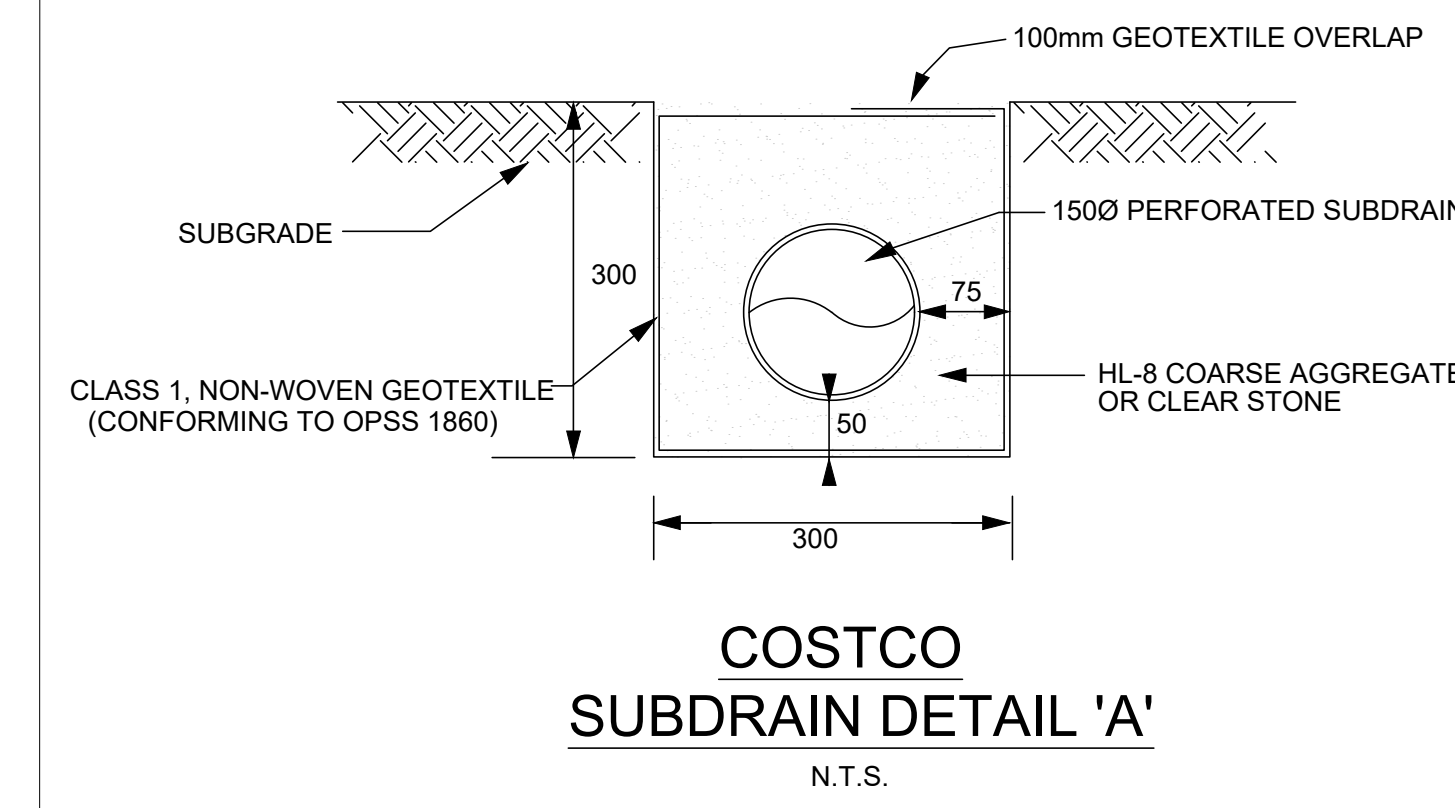
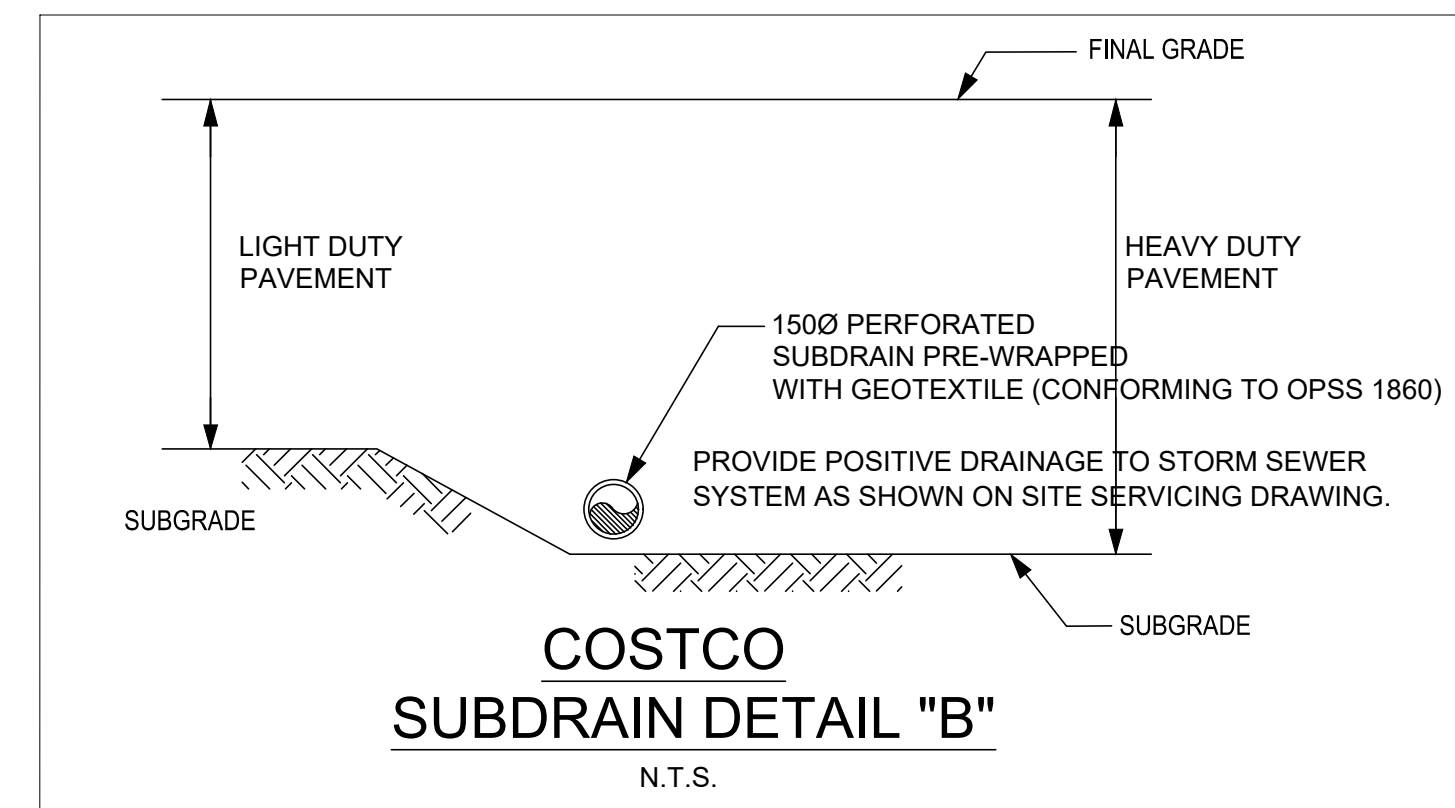
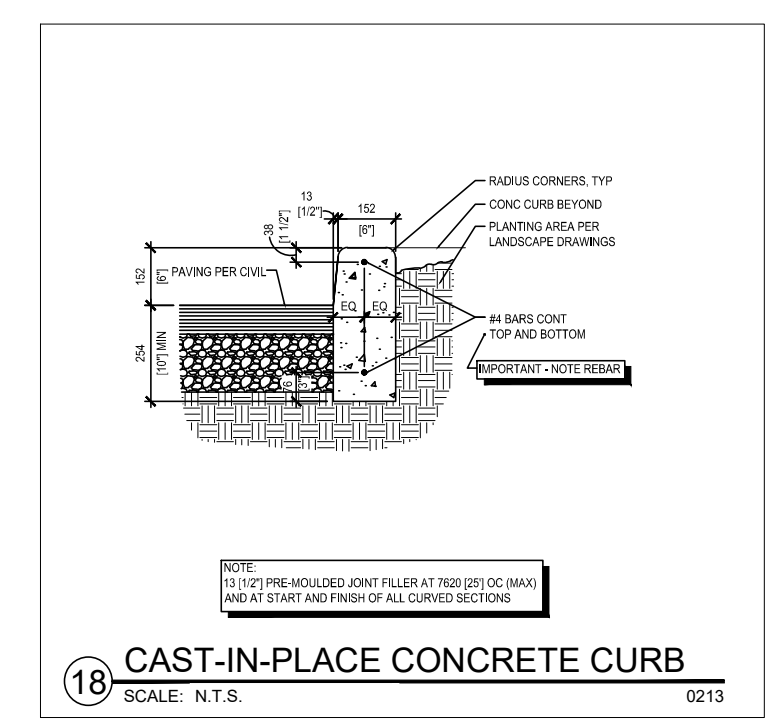
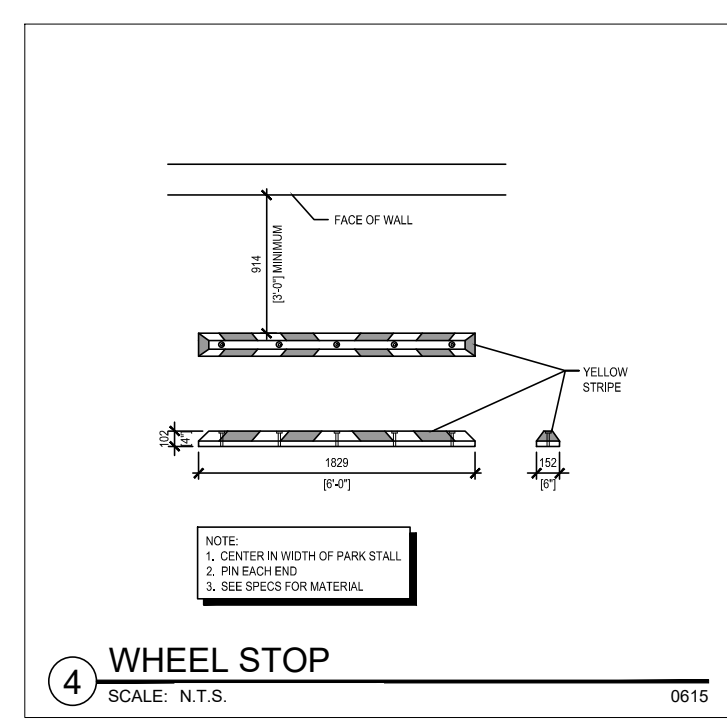
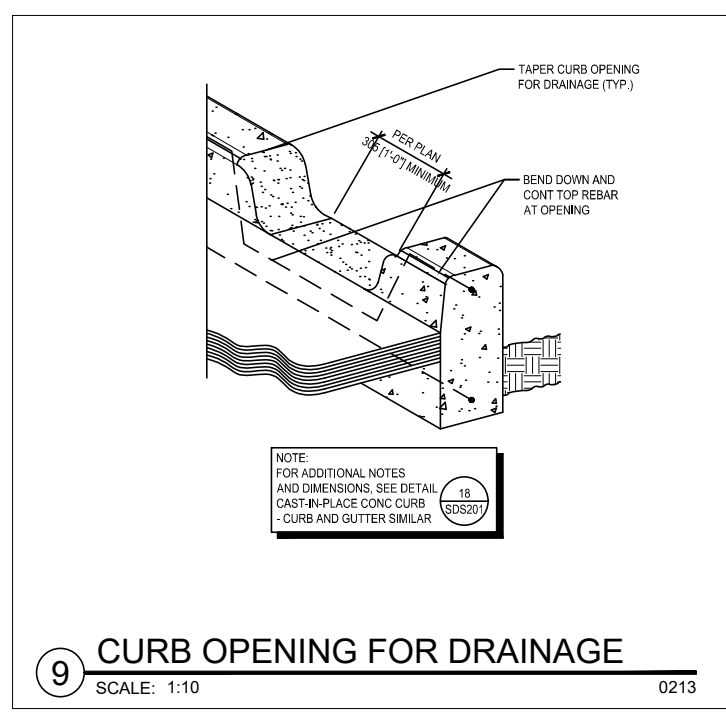
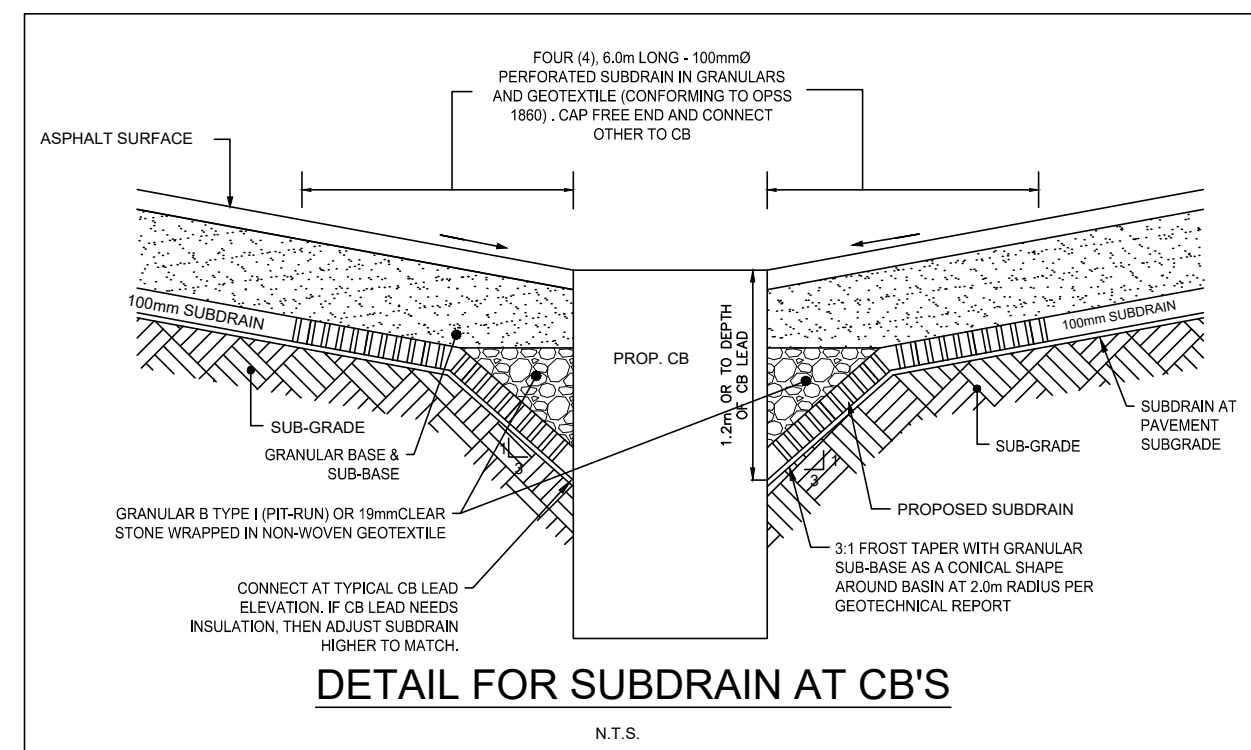
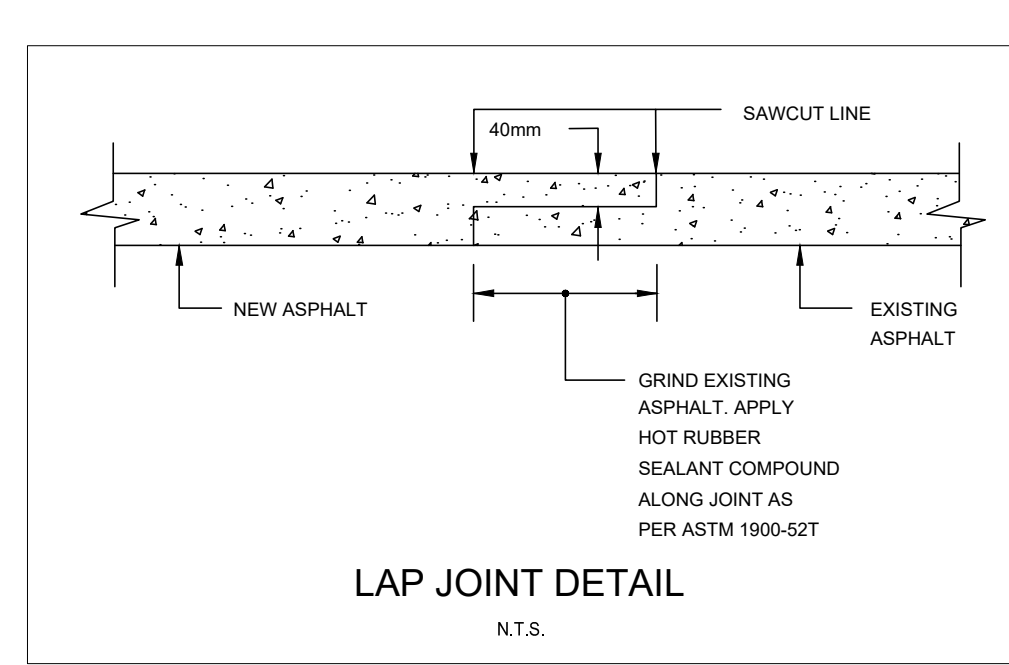
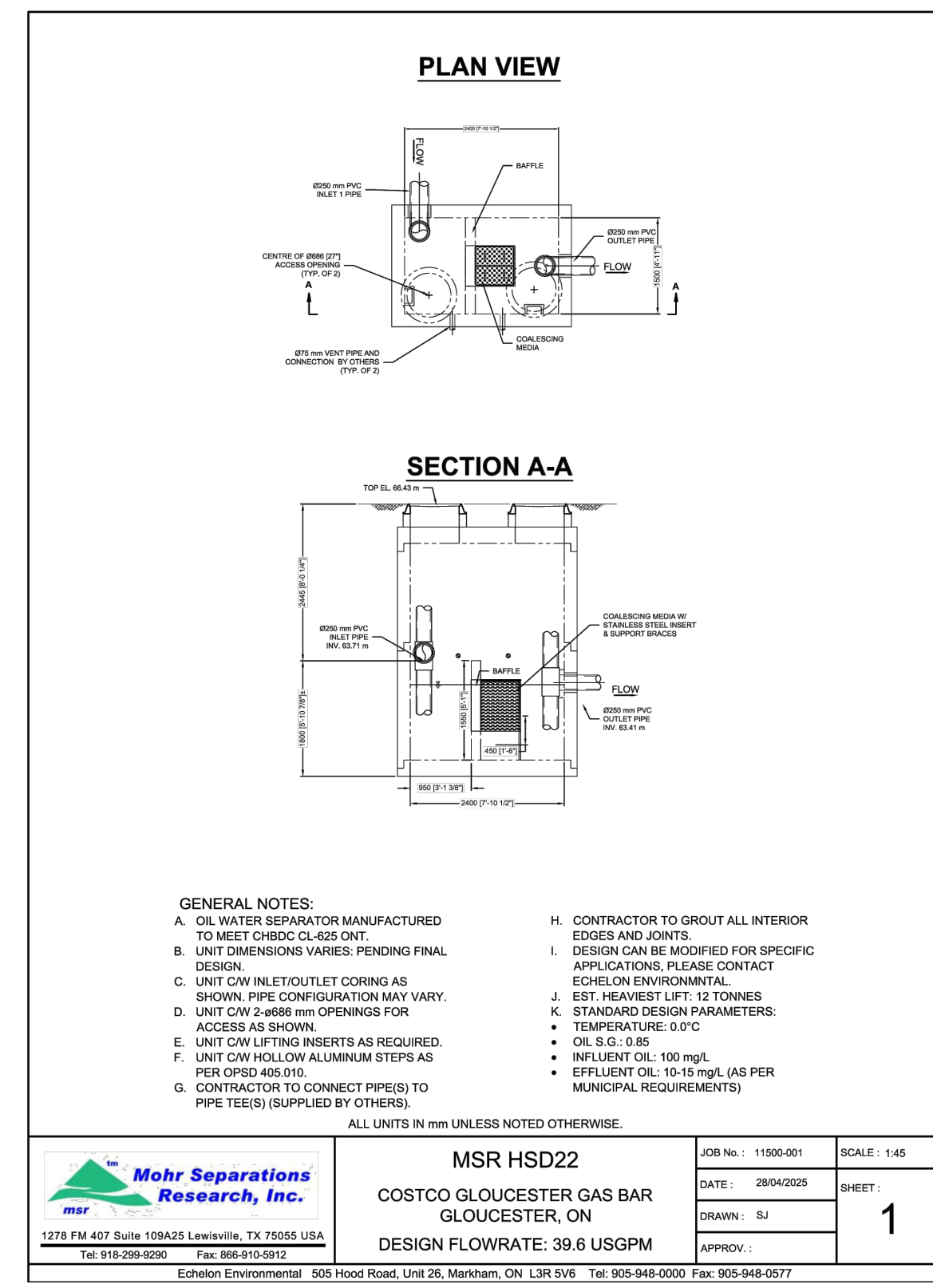
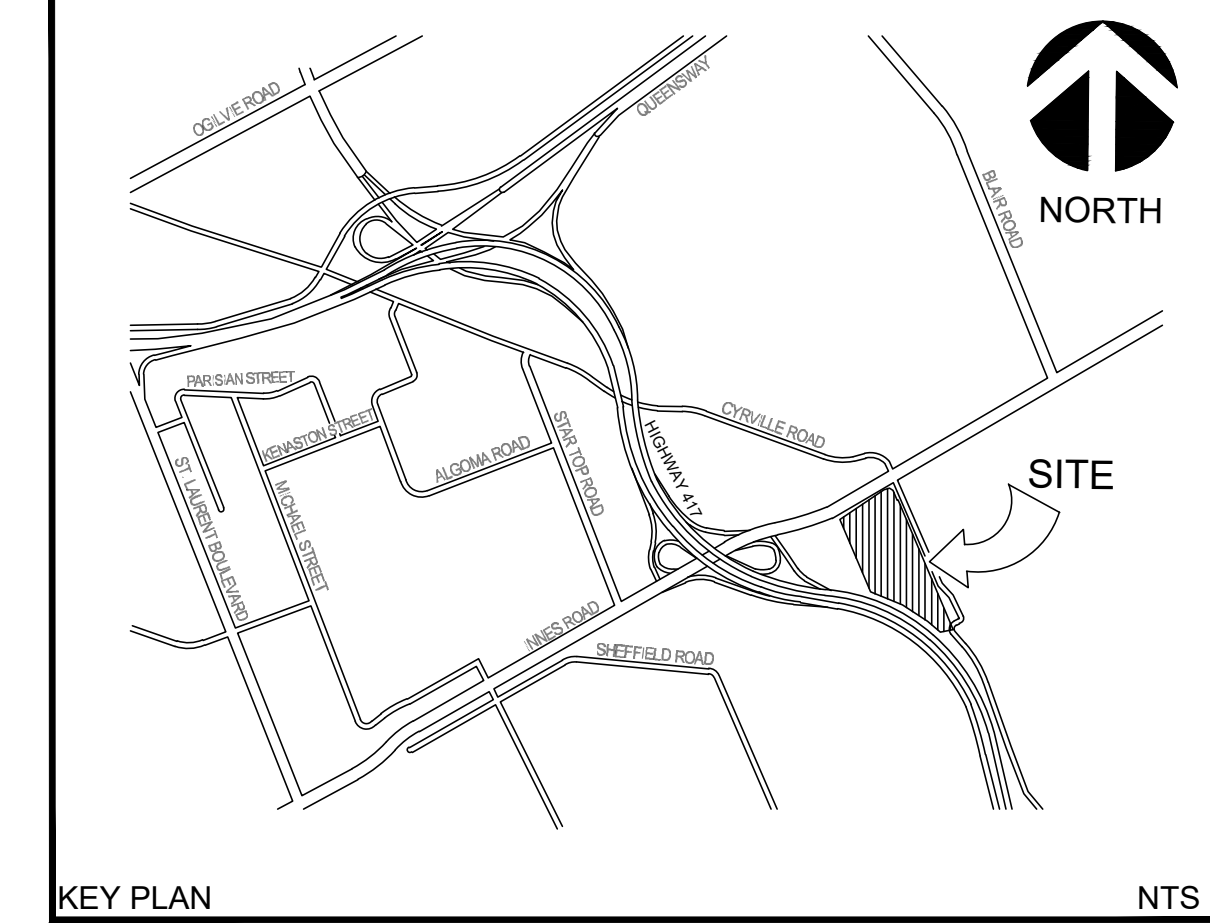
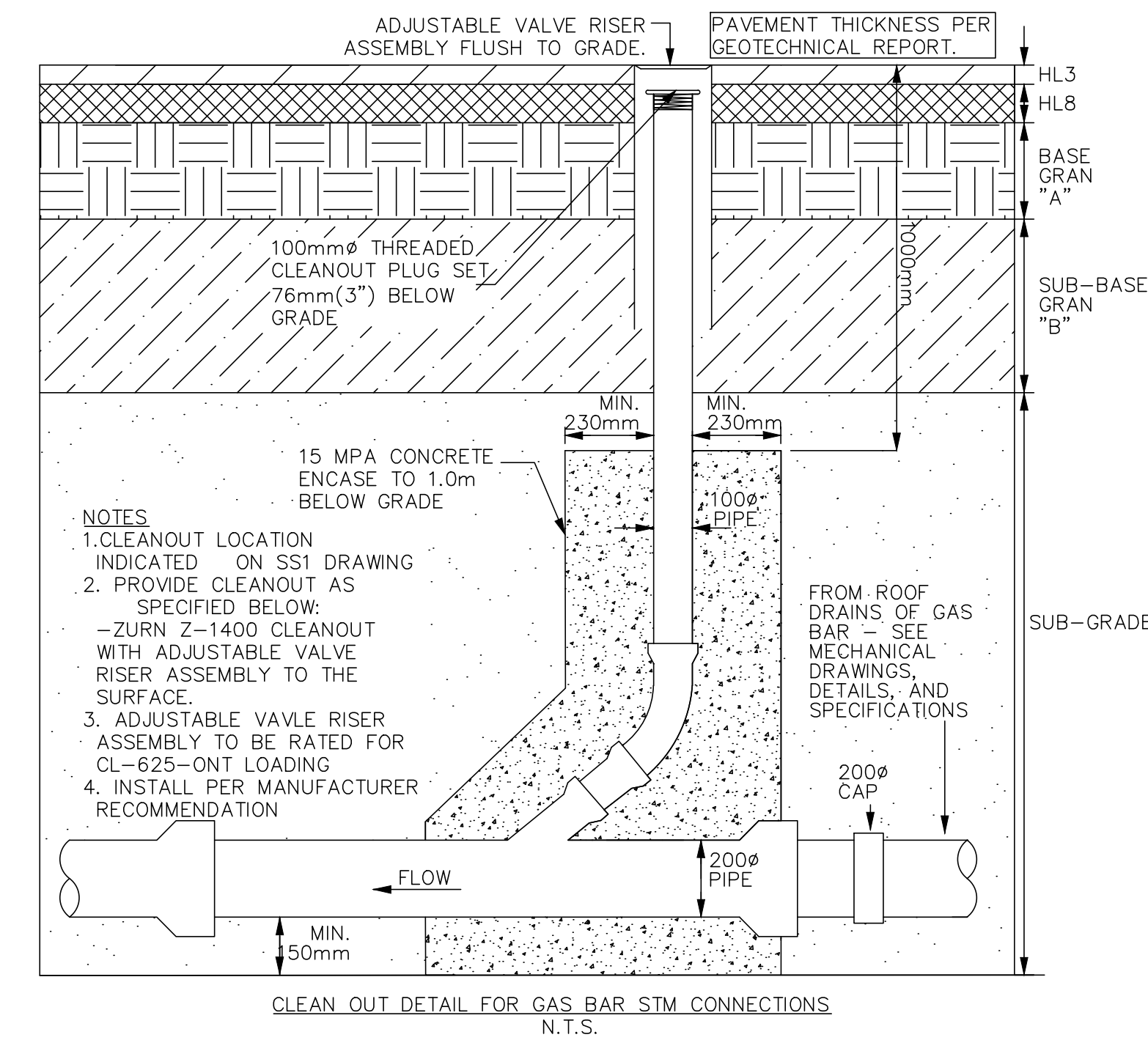
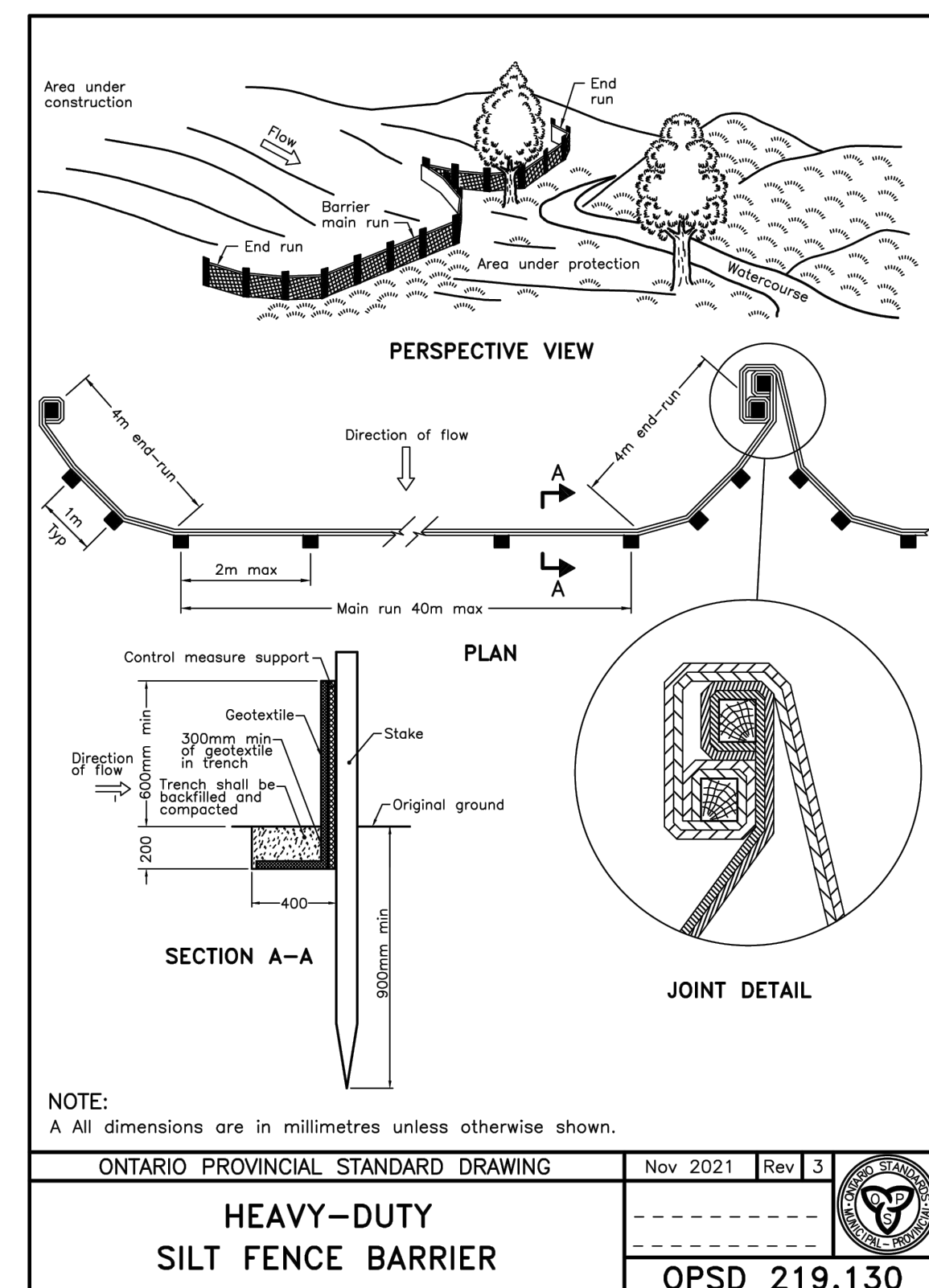
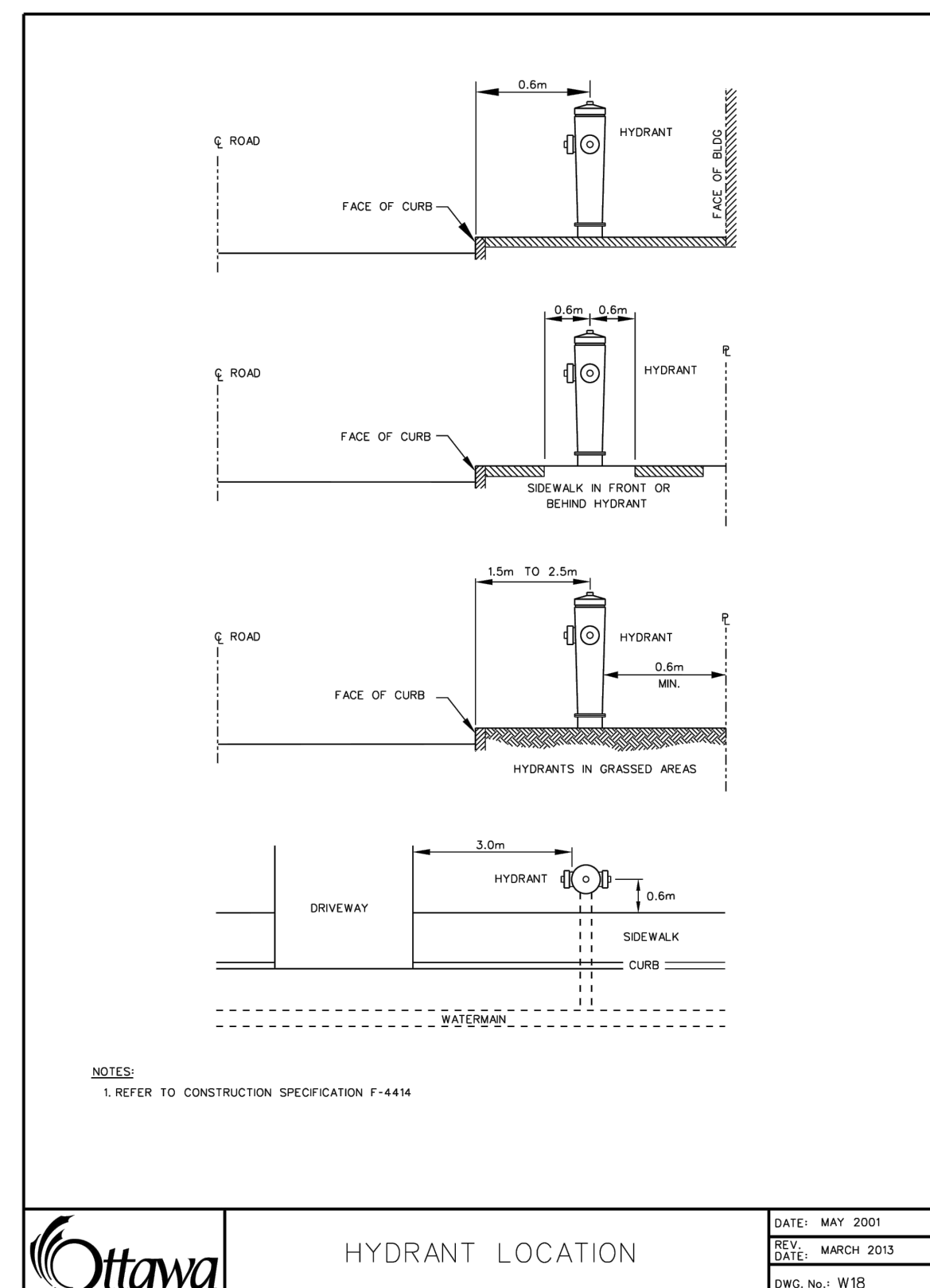
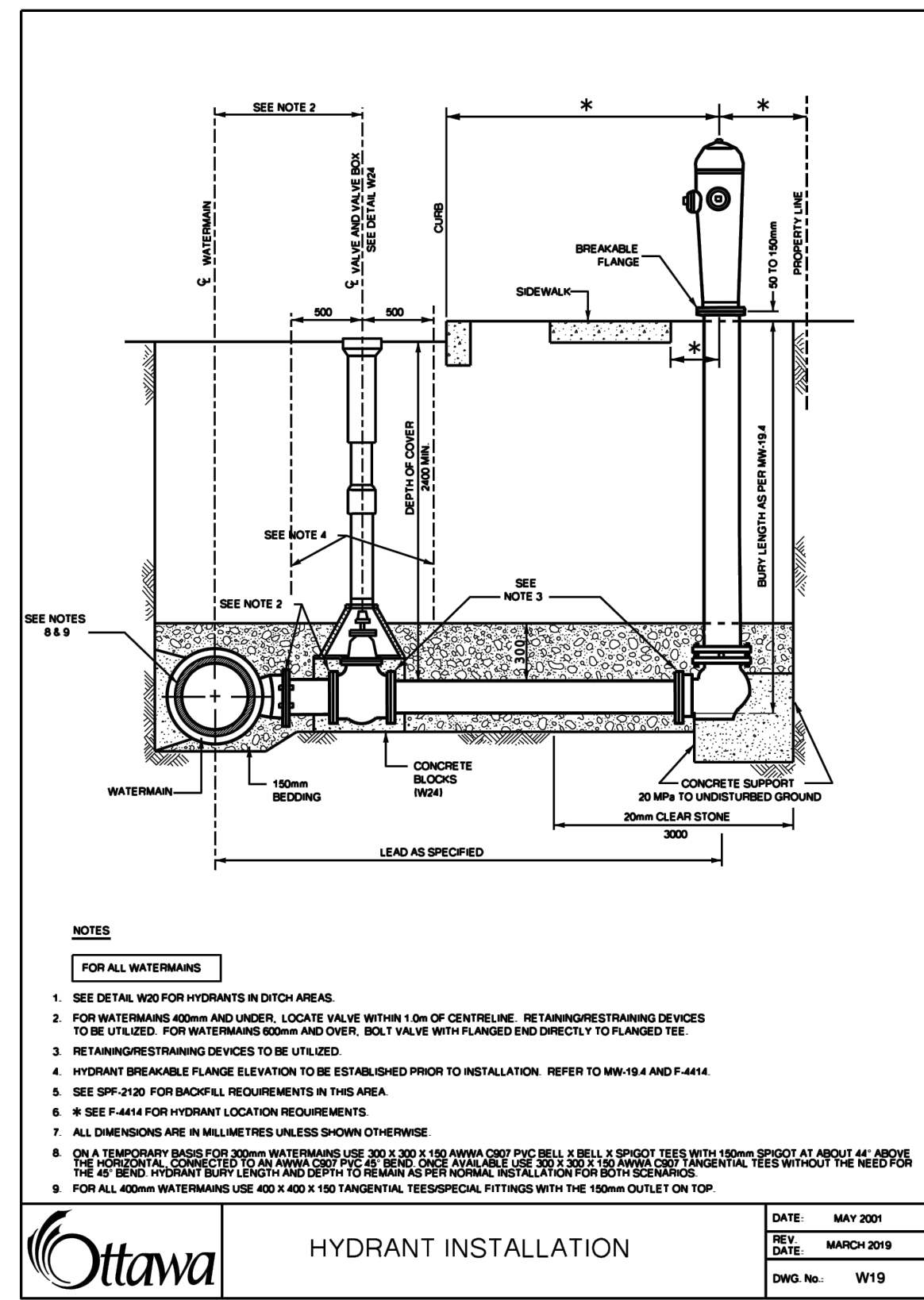
ENTRANCE

TRANSFORMER
 SHORE POWER BUILDING

UNDERGROUND STORAGE TANKS
 ATTENDANT ENCLOSURE
 MECHANICAL ENCLOSURE
 TRANSFORMER
 EDGE OF GAS BAR CANOPY



FILENAME: M:\Users\Cosco\OneDrive\2026\03\Gloicester Business Centre Fuel SP-19.dwg
 PLOTDATE: Mar 03, 2026 - 4:20pm



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

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

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

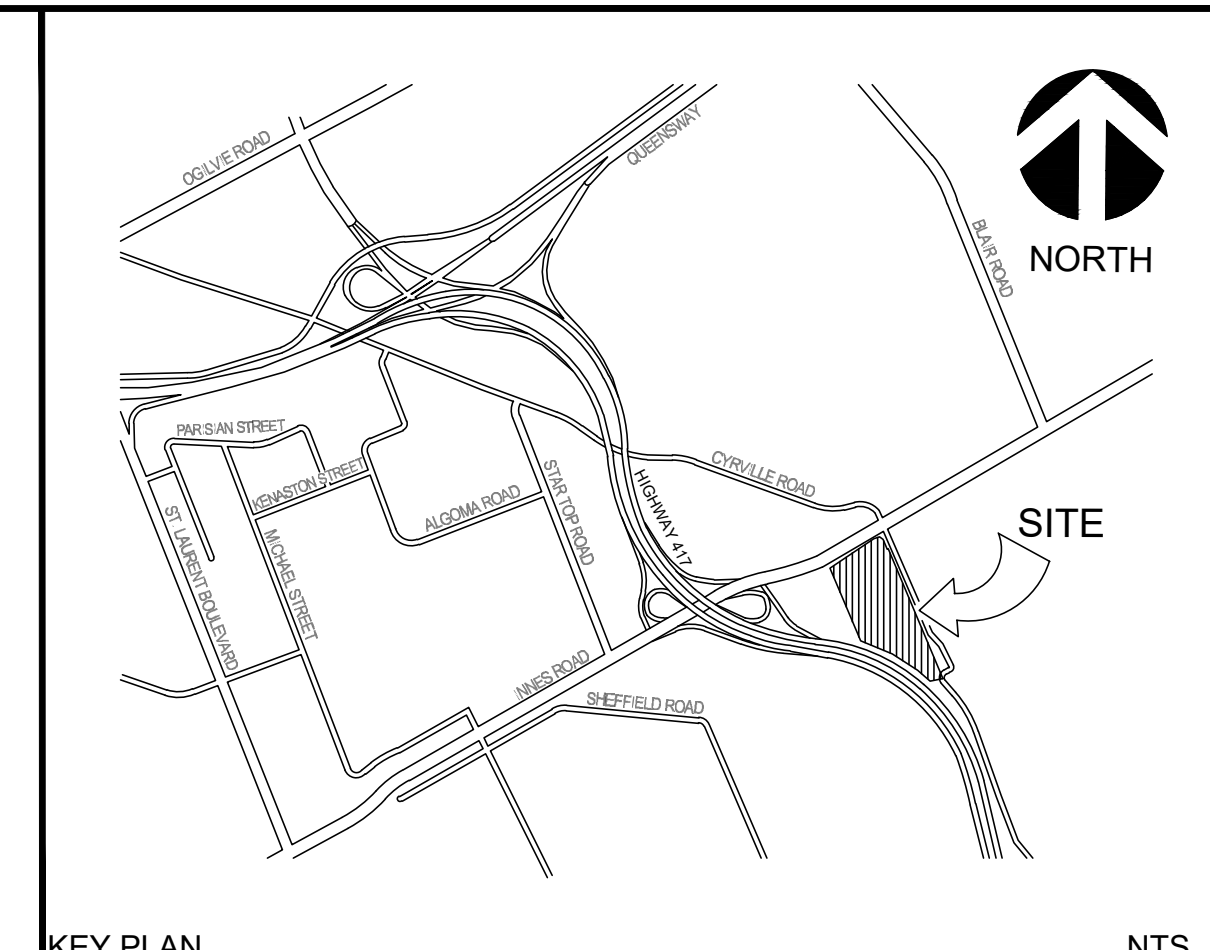
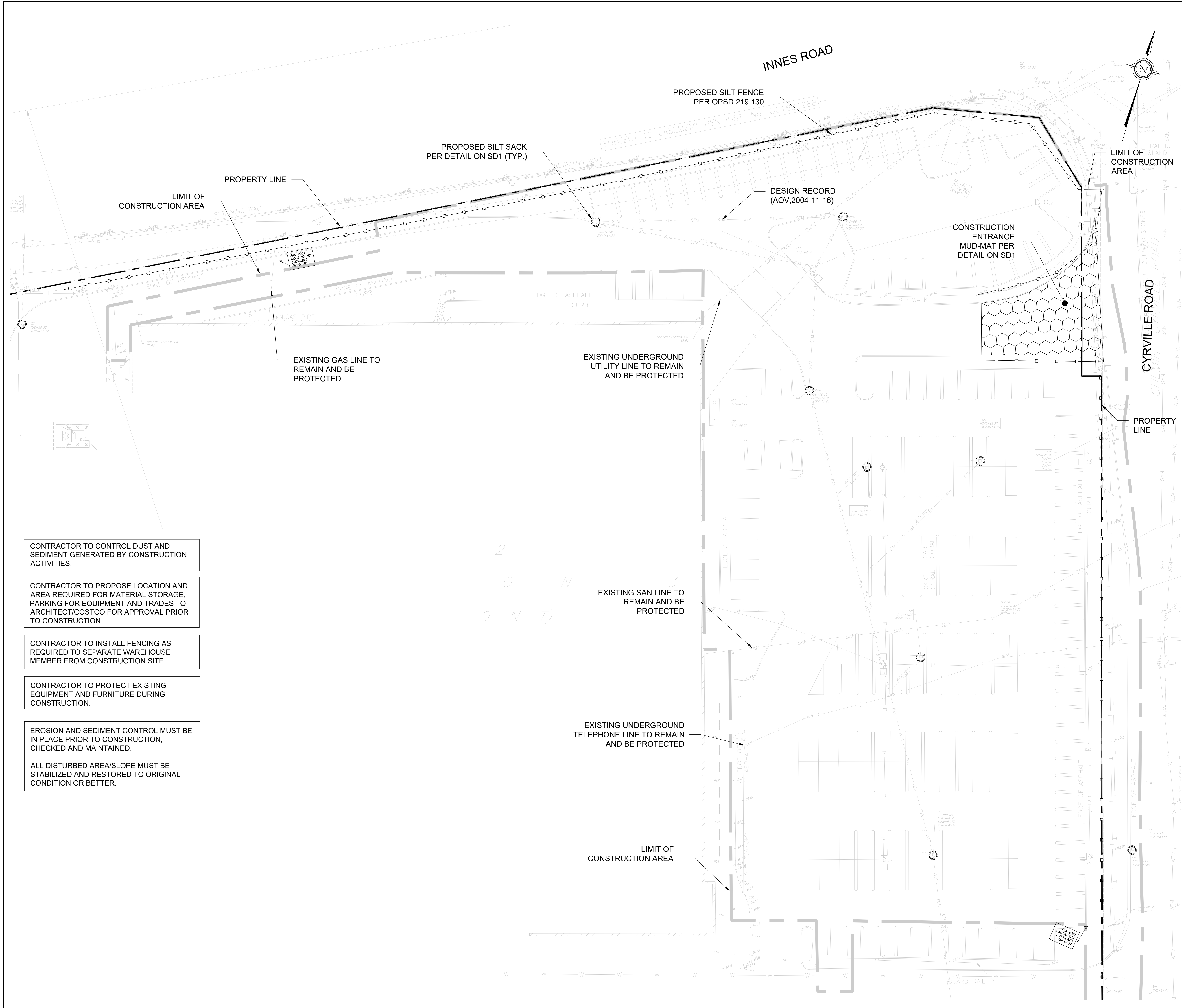
SCALE: AS NOTED DATE: MARCH 2026

PROJECT NUMBER: 211-12161 DWG. NUMBER: SD1

PROFESSIONAL ENGINEER: S. YANDRYK 100631937 2026-03-20 PROVINCE OF ONTARIO

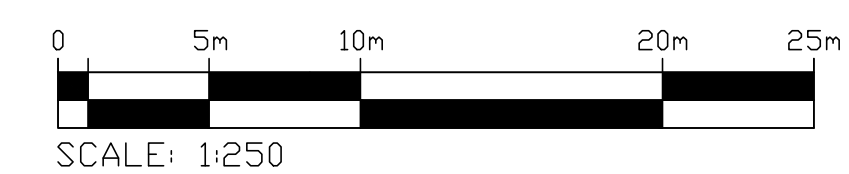
REGISTERED PROFESSIONAL DESIGNER: I.M. JAFFERIE 100164153 2026-03-20 PROVINCE OF ONTARIO

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 PLOTDATE: Mar 26, 2026 - 11:59am, C:\OTW\603



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.)
□	CATCHBASIN
○	CATCHBASIN MANHOLE
○	STORM MANHOLE
○	SANITARY MANHOLE
○	EMERGENCY SPILL SHUTOFF VALVE
○	WATER VALVE
○	HYDRANT
—	LIMIT OF CONSTRUCTION
—	PROPERTY LINE
○	EXISTING WATER VALVE
○	EXISTING GAS MANHOLE
○	CATCHBASIN SILT-SACK SEDIMENTATION CONTROL DEVICE
—	SILTATION FENCE



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.

EXISTING SAN LINE TO REMAIN AND BE PROTECTED

EXISTING UNDERGROUND TELEPHONE LINE TO REMAIN AND BE PROTECTED

LIMIT OF CONSTRUCTION AREA

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.
5.	ISSUED FOR BID	SM	05-16-2025	I.J.
4.	ISSUED FOR PERMIT/BID	SM	04-30-2025	I.J.
3.	ISSUED FOR QA3	SM	04-21-2025	
2.	ISSUED FOR QA2	SM	04-09-2025	
1.	ISSUED FOR QA	NCW	03-27-2025	

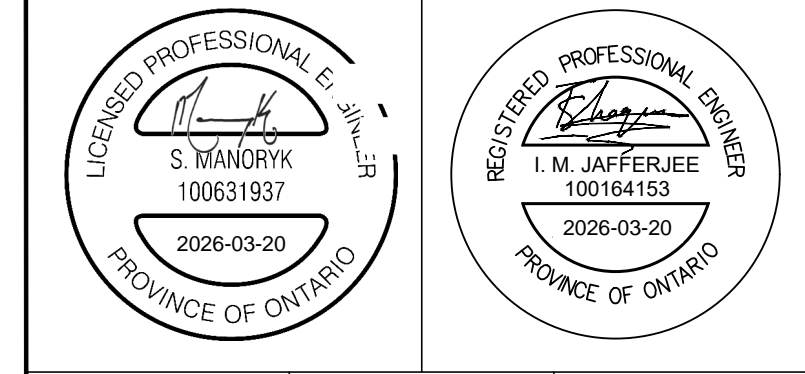
ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT: **COSTCO WHOLESALE**

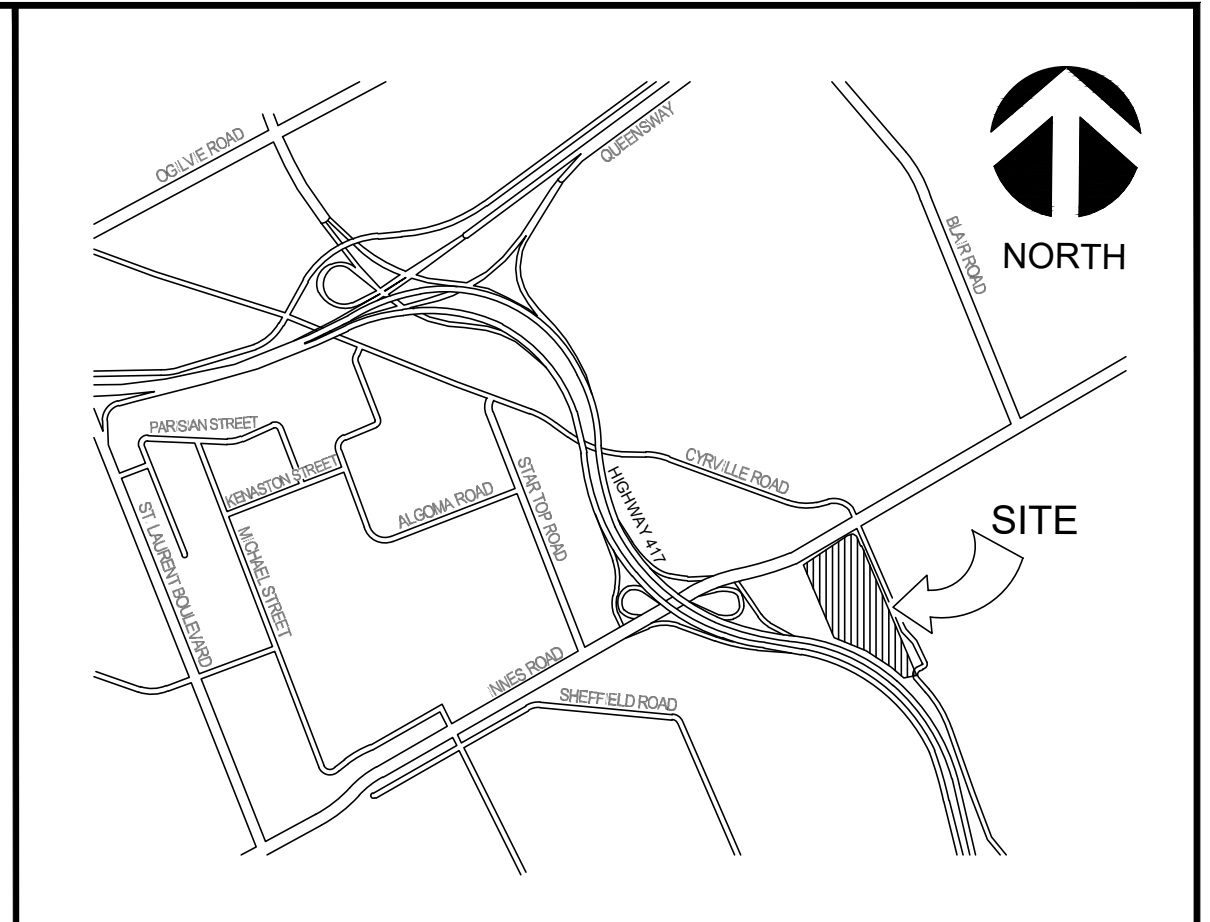
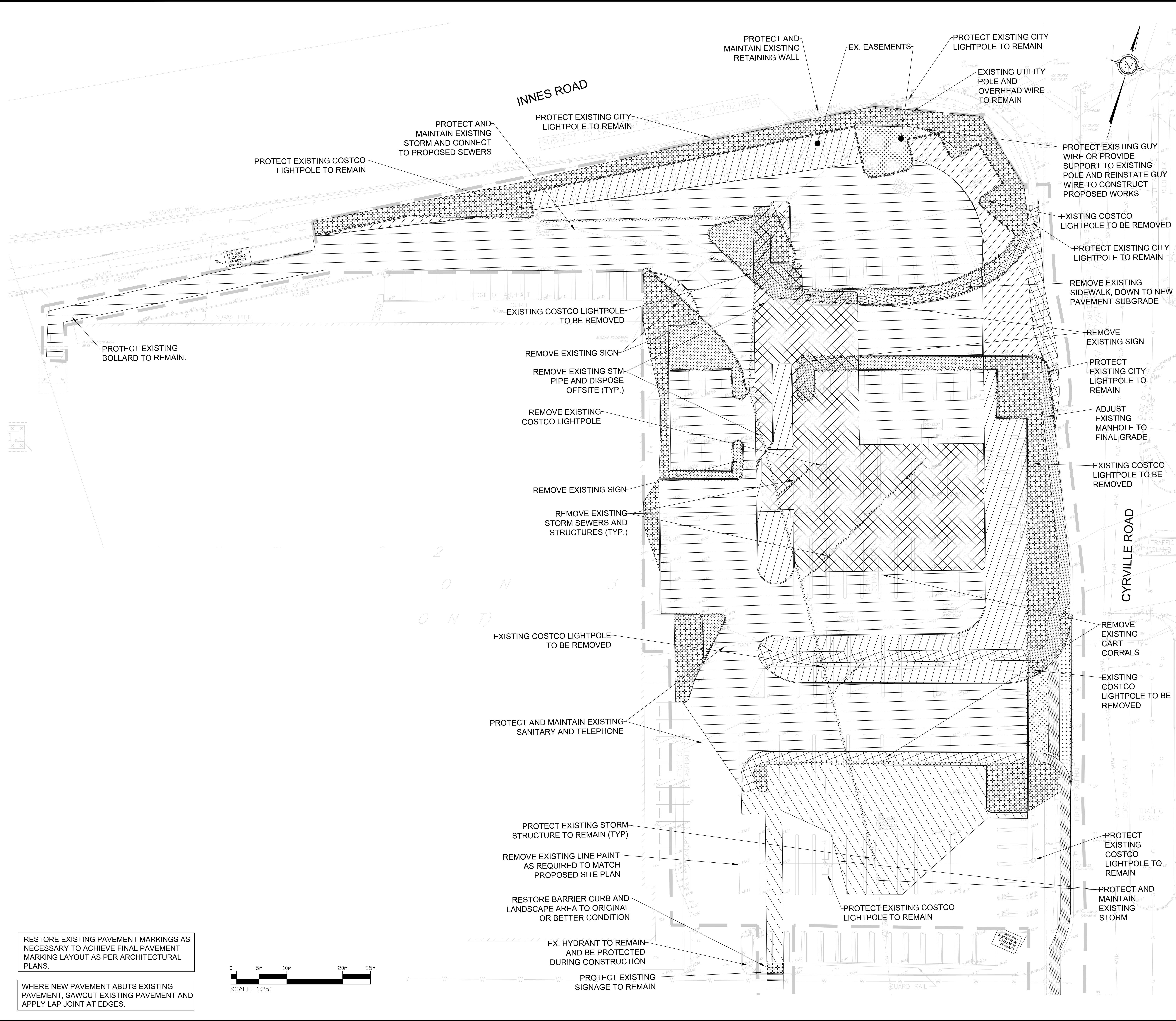
MUNICIPALITY: **CITY OF OTTAWA**

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

SHEET TITLE: **EROSION CONTROL PLAN**



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



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

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

MUNICIPALITY

CITY OF OTTAWA

PROJECT TITLE

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

SHEET TITLE

SITE REMOVAL PLAN

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

SCALE 1:250 DATE APRIL 2025

PROJECT NUMBER 211-12161 DWG NUMBER RM1

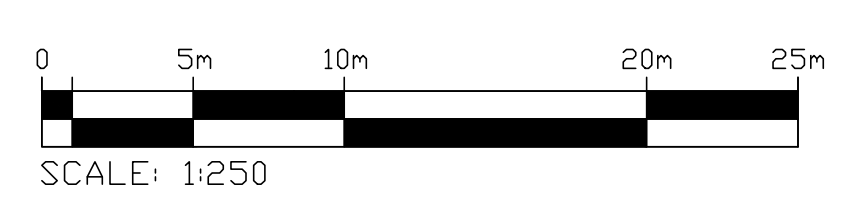
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 PLOTDATE: Mar 20, 2026 11:58AM (GMT-05:00)

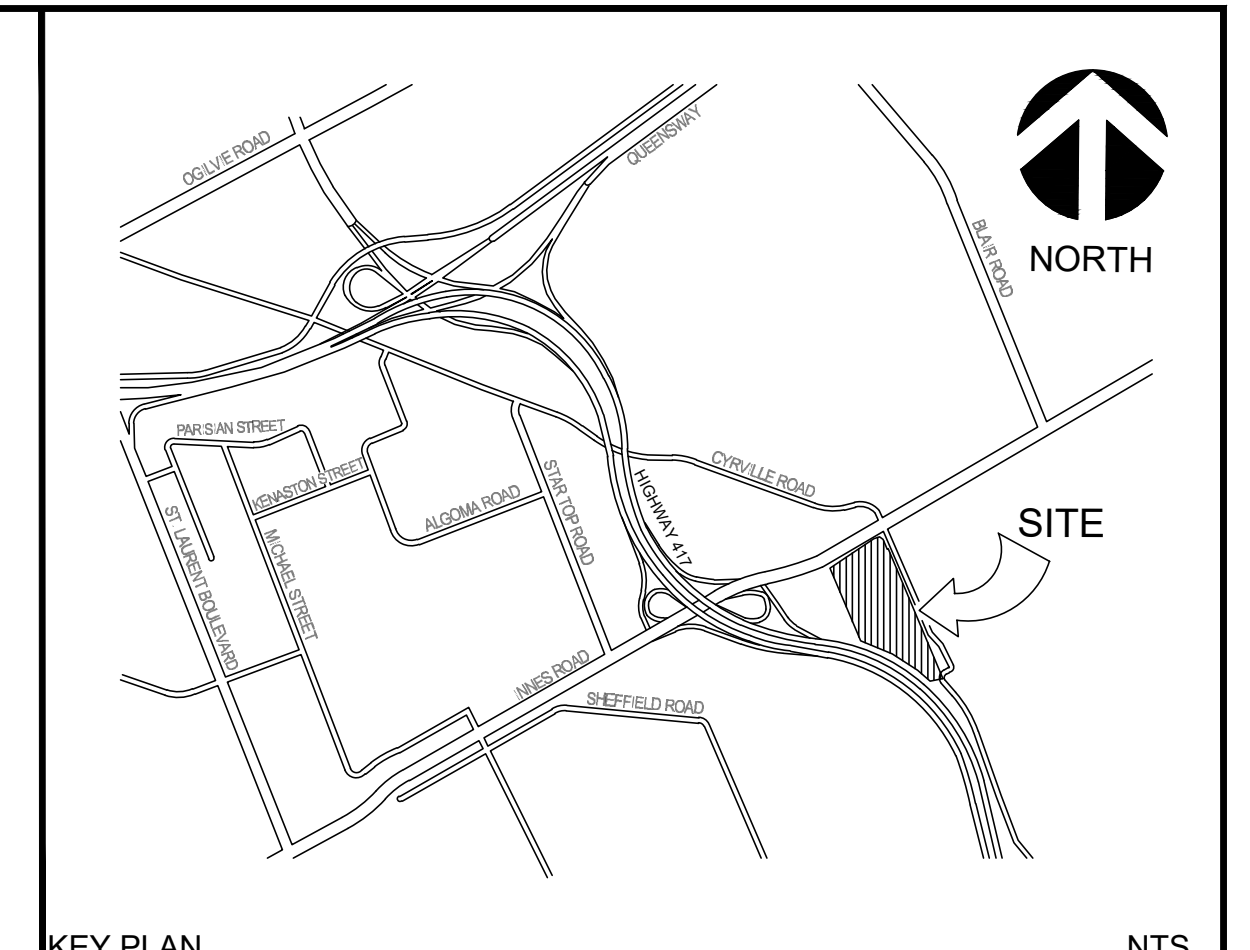
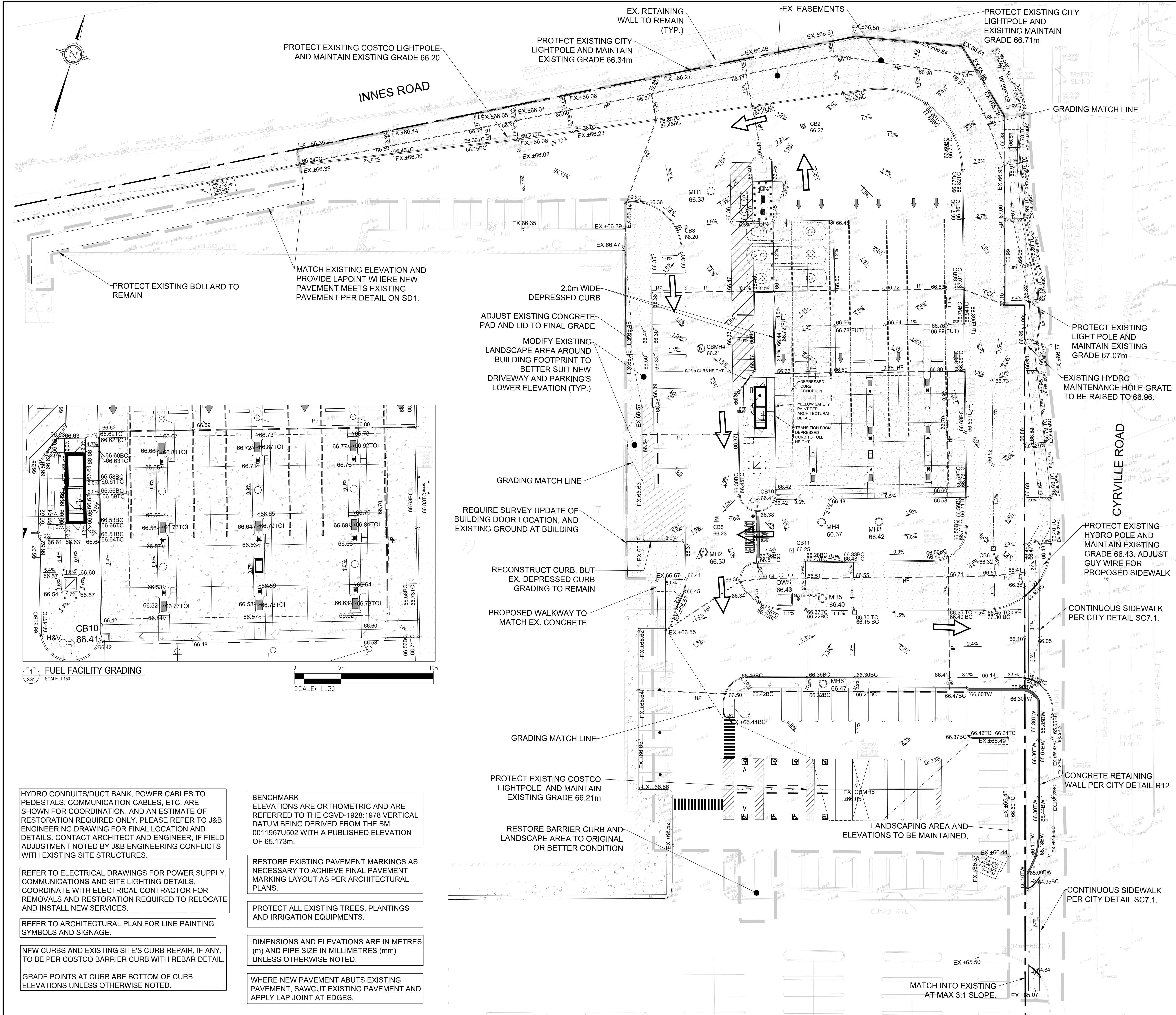
RESTORE EXISTING PAVEMENT MARKINGS AS NECESSARY TO ACHIEVE FINAL PAVEMENT MARKING LAYOUT AS PER ARCHITECTURAL PLANS.

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



EX. HYDRANT TO REMAIN AND BE PROTECTED DURING CONSTRUCTION

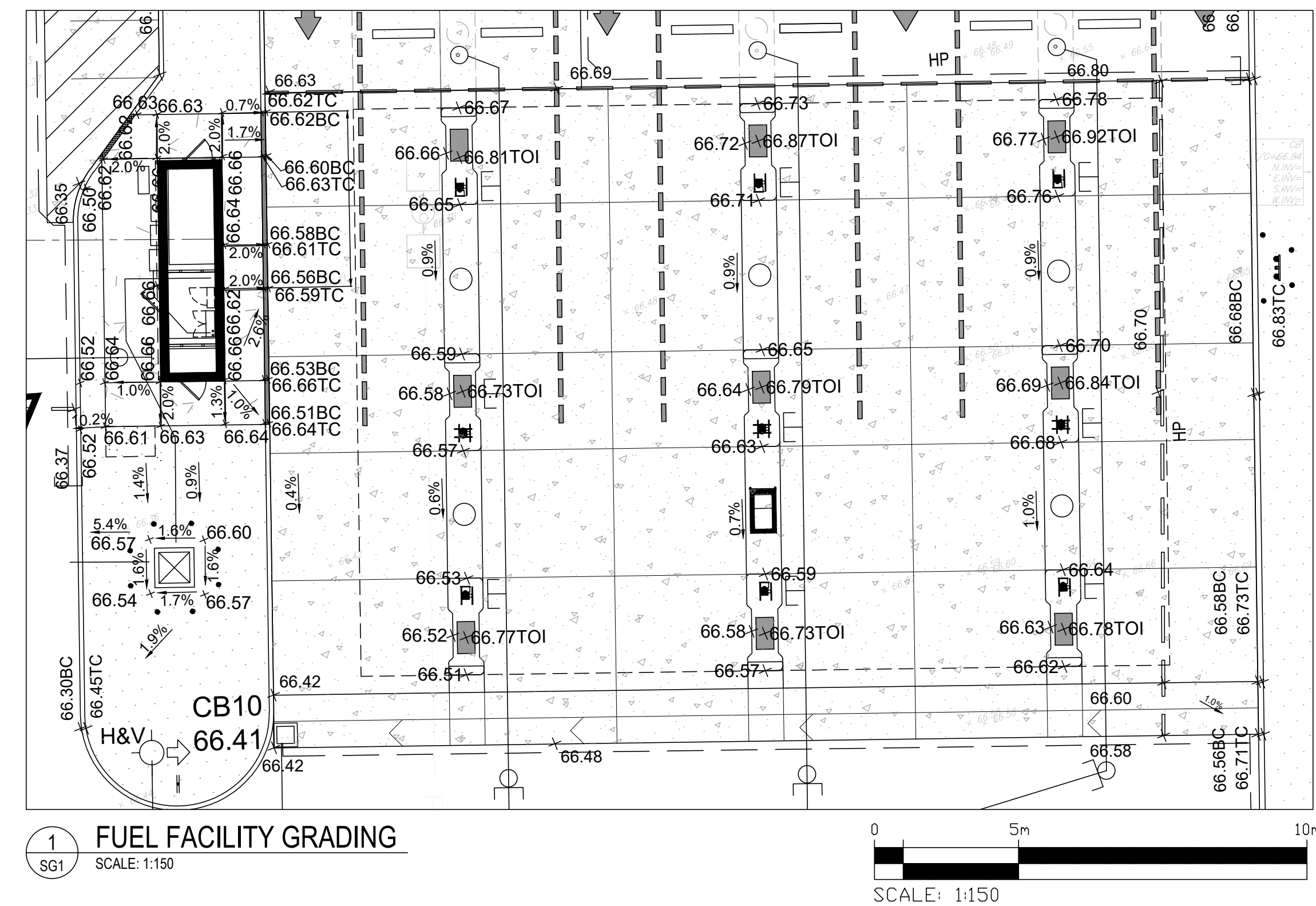
PROTECT EXISTING SIGNAGE TO REMAIN



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
⊠	EXISTING GAS MANHOLE
⊠	PROPOSED GRADE
⊠	PROPOSED TOP OF ISLAND
⊠	FUTURE GRADE
⊠	EXISTING GRADE
—	HIGH POINT RIDGE
—	PROPOSED SWALE
—	GRADING MATCH LINE
—	PROPOSED ELECTRICAL UTILITY
⊠	PROPOSED ROAD PAINTING
→	MAJOR OVERLAND FLOW
—	RETAINING WALL
—	CONCRETE SIDEWALK
—	LANDSCAPE AREA

SCALE: 1:250



- 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.

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	IJ
3.	ISSUED FOR QA2	SM	04-09-2025	IJ
2.	ISSUED FOR QA	NCW	03-27-2025	IJ
1.	ISSUED FOR GREEN INK	NCW	02-19-2025	IJ

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT: **COSTCO**

MUNICIPALITY: CITY OF OTTAWA

PROJECT TITLE: COSTCO GLOUCESTER GAS BAR

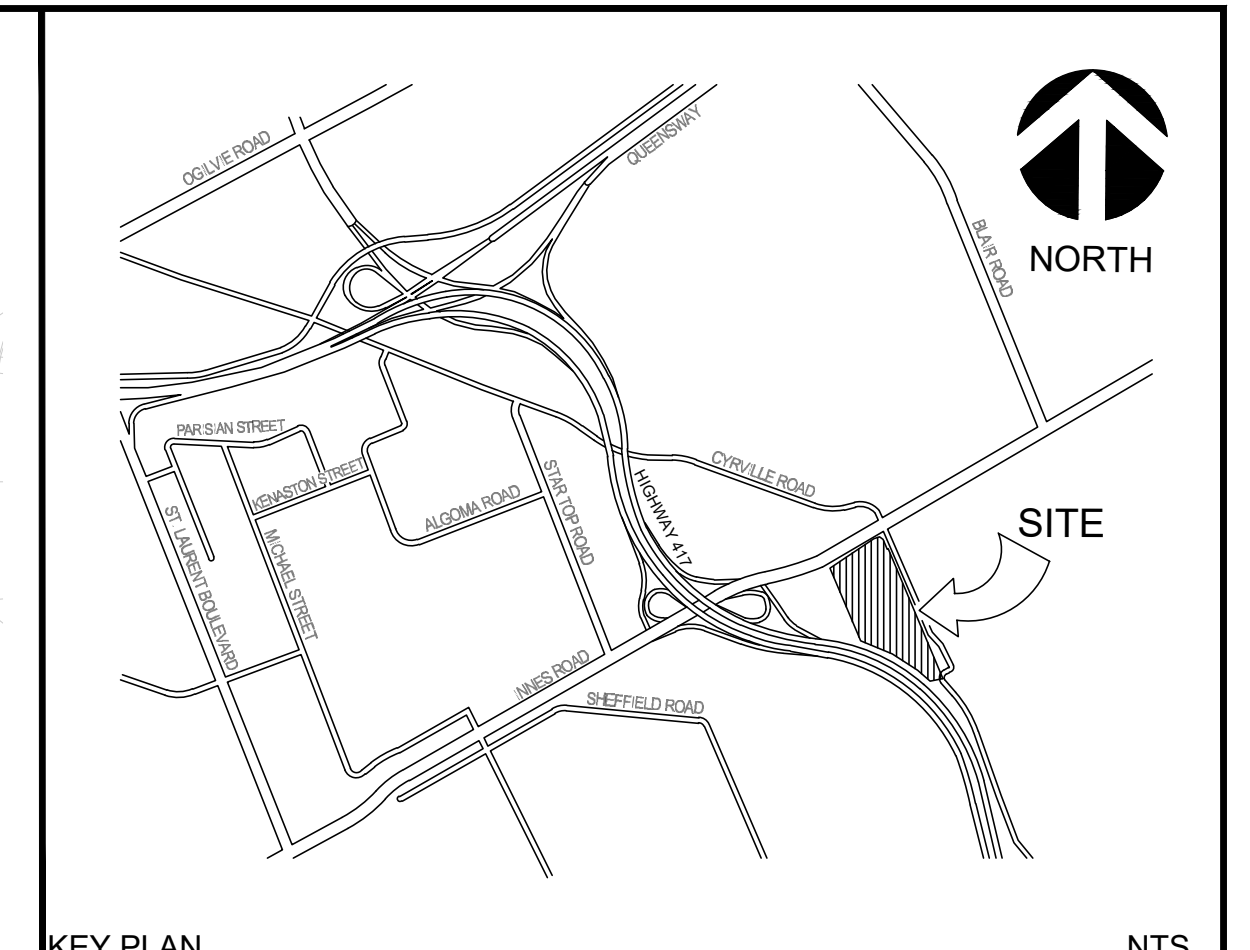
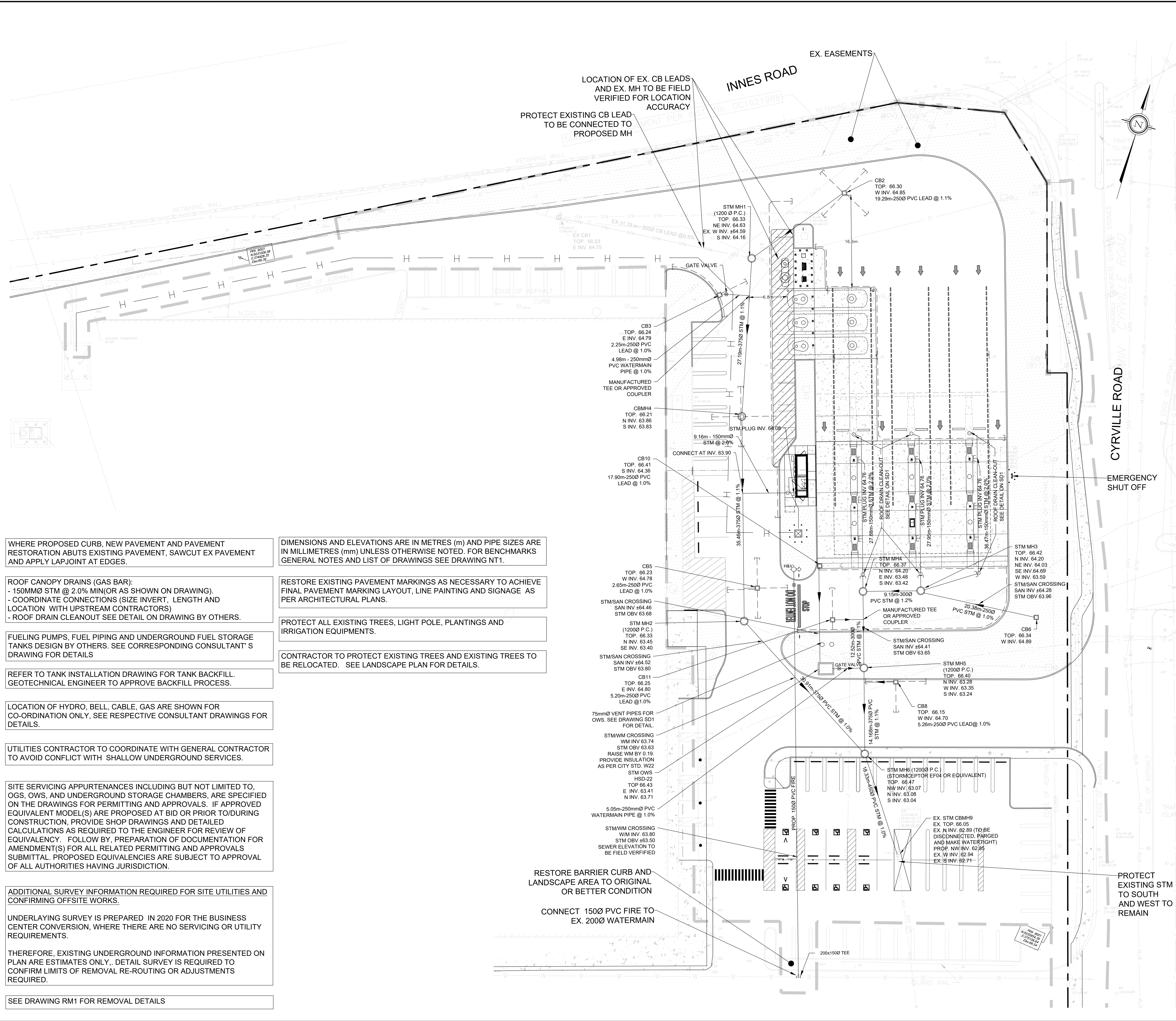
SHEET TITLE: SITE GRADING PLAN

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

SCALE: 1:250 DATE: MARCH 2026

PROJECT NUMBER: 211-12161 DWG NUMBER: SG1

FILENAME: C:\Users\jandrew\Documents\Projects\211-12161\211-12161-02-Costco Gloucester\Business Centre Gas Bar\SiteGrading\211-12161_SG1.dwg
 PLOTDATE: Mar 20, 2026 1:03:00 PM, C:\Users\jandrew\Documents\Projects\211-12161\211-12161-02-Costco Gloucester\Business Centre Gas Bar\SiteGrading\211-12161_SG1.dwg



LEGEND

- LIMIT OF CONSTRUCTION
- - - PROPERTY LINE
- ===== 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
- XXXXX 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 NT.1.

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.

RESTORE BARRIER CURB AND LANDSCAPE AREA TO ORIGINAL OR BETTER CONDITION

CONNECT 150Ø PVC FIRE TO EX. 200Ø WATERMAIN

EMERGENCY SHUT OFF

FILENAME: C:\Users\jw\Documents\Projects\211-12161\211-12161-000\Drawings\Business Center\211-12161_SSI.dwg
 PLOT DATE: Mar 20, 2026 10:20 AM CDT/EST

No.	REVISIONS TO DRAWING	BY	DATE	APPR.
6	REVISED PER CITY COMMENTS	SM	03-20-2026	UJ
7	ISSUED FOR SITE PLAN APPROVAL	SM	11-27-2025	UJ
8	ISSUED FOR BID	SM	05-16-2025	UJ
9	ISSUED FOR PERMIT/BID	SM	04-30-2025	UJ
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	02-19-2025	

CLIENT: **COSTCO WHOLESALE**

MUNICIPALITY: **CITY OF OTTAWA**

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

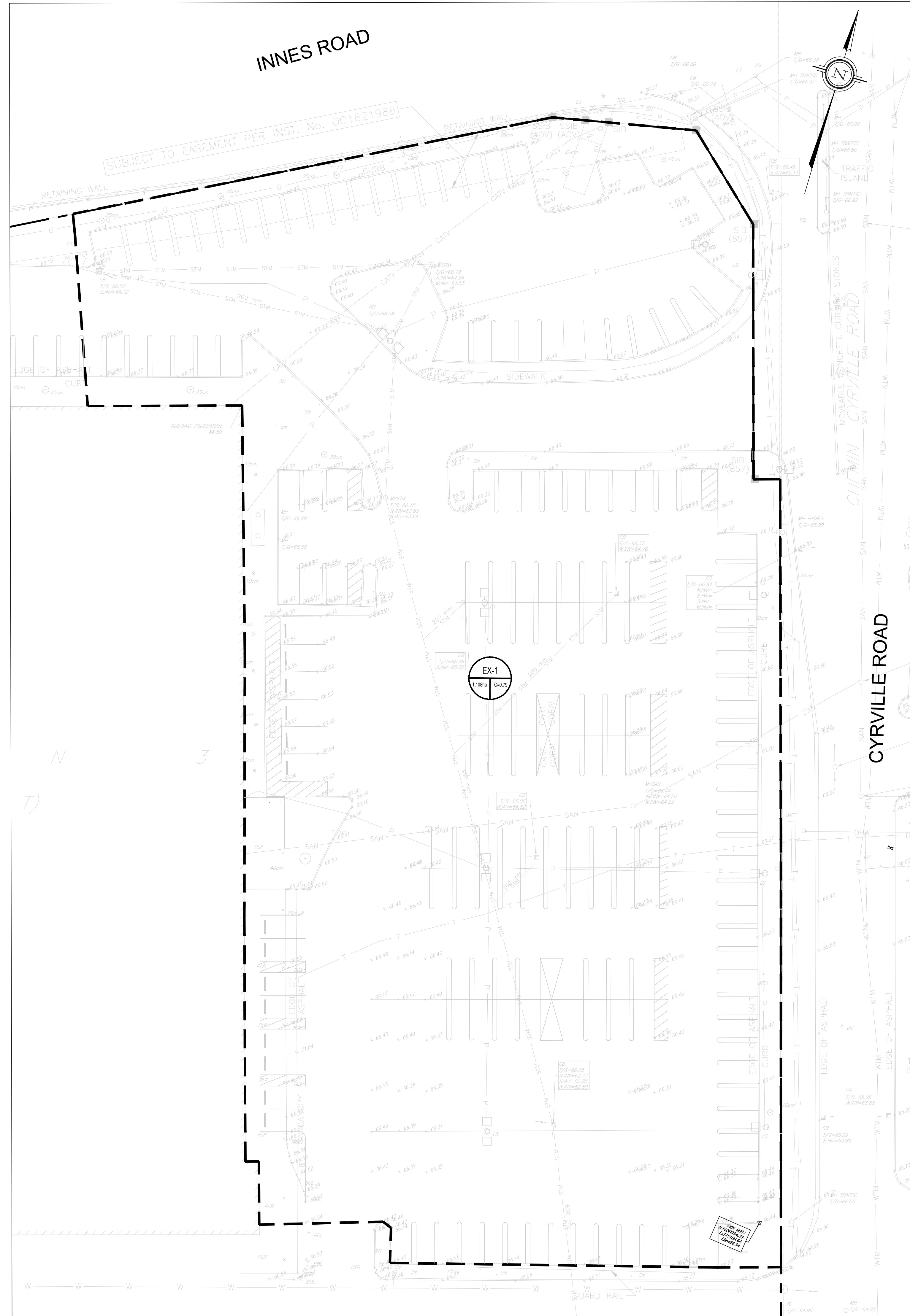
SHEET TITLE: **SITE SERVICING PLAN**

wsp

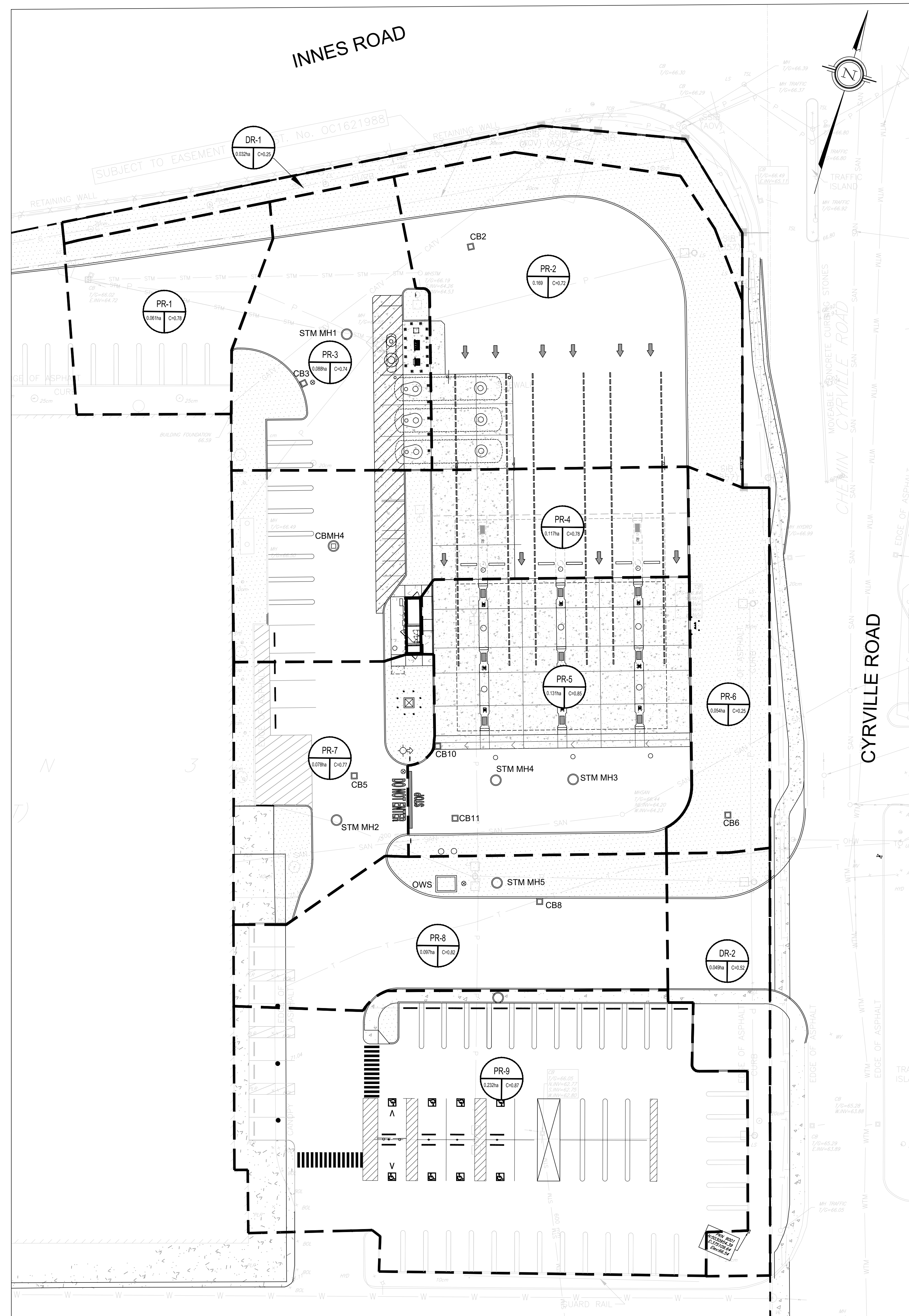
DESIGNED: S.M. DRAWN: J.T. CHECKED: I.J.

SCALE: 1:250 DATE: MARCH 2026

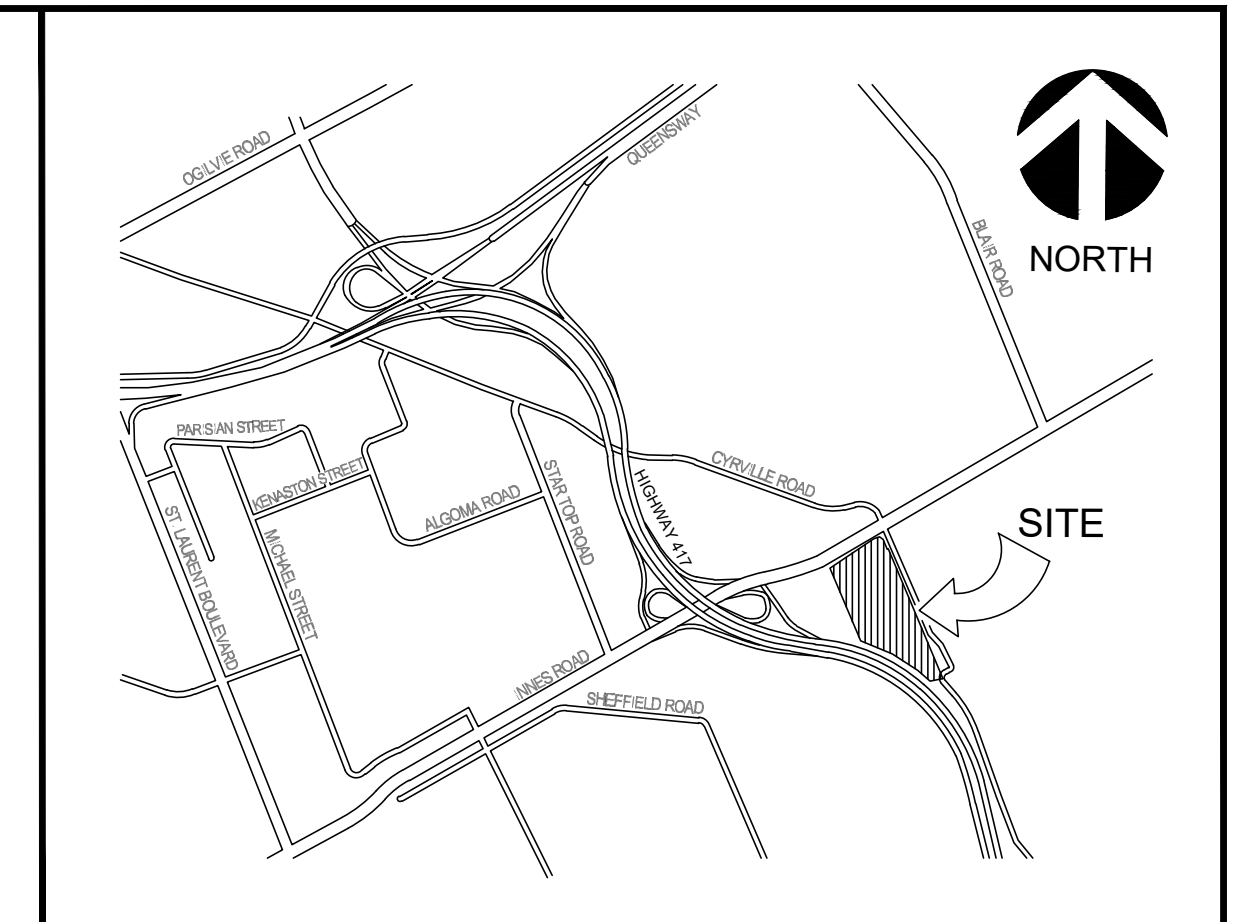
PROJECT NUMBER: 211-12161 DWG. NUMBER: SS1



1 EXISTING DRAINAGE AREA PLAN
SCALE: 1:300



2 PROPOSED DRAINAGE AREA PLAN
SCALE: 1:300



KEY PLAN NTS

LEGEND

- FFE FINISHED FLOOR ELEVATION
- BARRIER CURB OPSD 600.110
- DEPRESSION 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
- EXISTING WATER VALVE
- EXISTING GAS MANHOLE
- GAS BAR CANOPY
- DRAINAGE AREA BOUNDARY
- DRAINAGE AREA NAME
- RUNOFF COEFFICIENT

AREA IN HECTARES

- 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
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	IJ
2.	ISSUED FOR QA2	SM	04-09-2025	IJ
1.	ISSUED FOR QA	NCW	03-27-2025	IJ

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: **DRAINAGE AREA PLAN**

wsp

REGISTERED PROFESSIONAL ENGINEER
S. STANORZYK
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 ST1	

FILENAME: C:\Users\jtaff\OneDrive\Documents\Projects\211-12161\211-12161-STA-1.dwg
 PLOT DATE: Mar 20, 2026 12:10:00 PM
 PLOT BY: J.T.

**CITY OF OTTAWA
STORM SEWER DESIGN
WITH
5 Yr. MODIFIED STORM**

Q = KCrCIA
K = Conversion Factor = 0.00278

CONSULTANT WSP Canada Group Ltd.

Cr = Routing Coef.

PROJECT Costco Gloucester

5 Year Intensity = $998.071 / (\text{Time in min} + 6.053)^{0.814}$

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

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. (l 0) (mm/hr)	FLOW (Q100) (m³/s)	PIPE DIA. (mm)	ACTUAL PIPE DIA. (mm)	SLOPE (%)	CAPACITY (m³/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® 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

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:	

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

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



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 waterways.

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

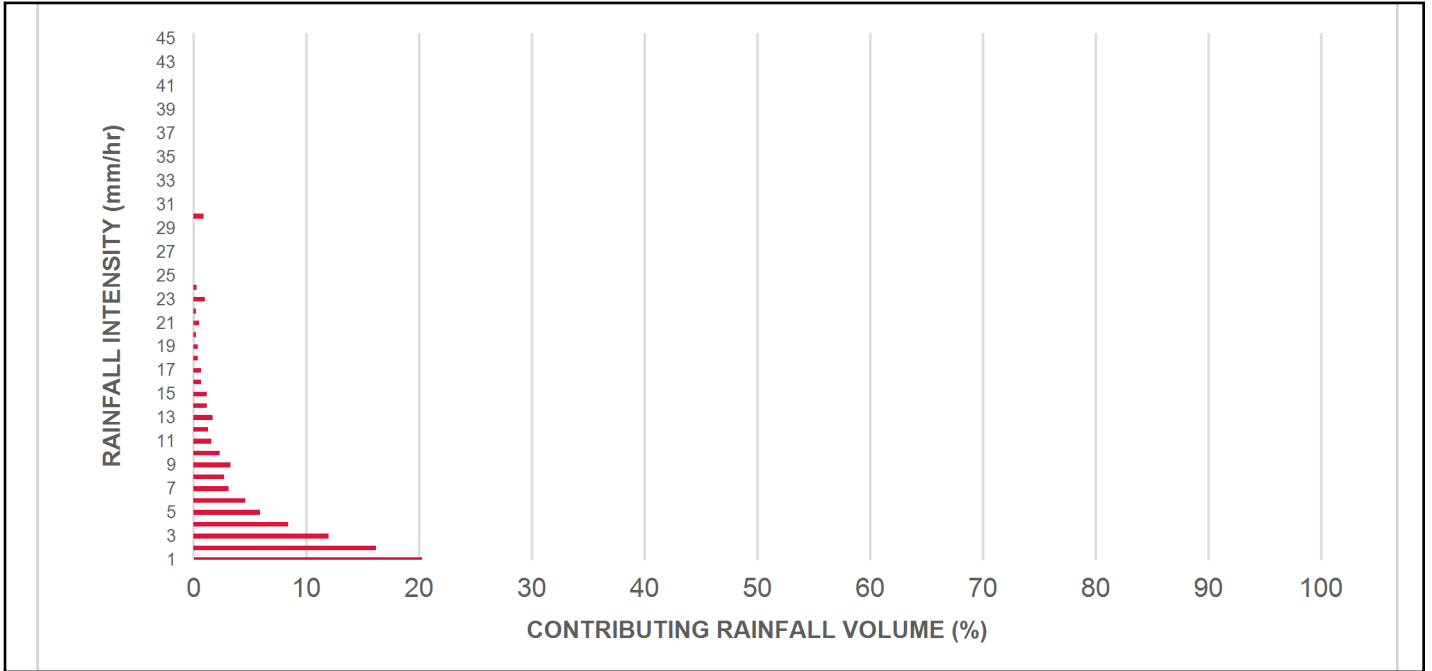
Stormceptor[®] EF Sizing Report

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m ²)	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 %

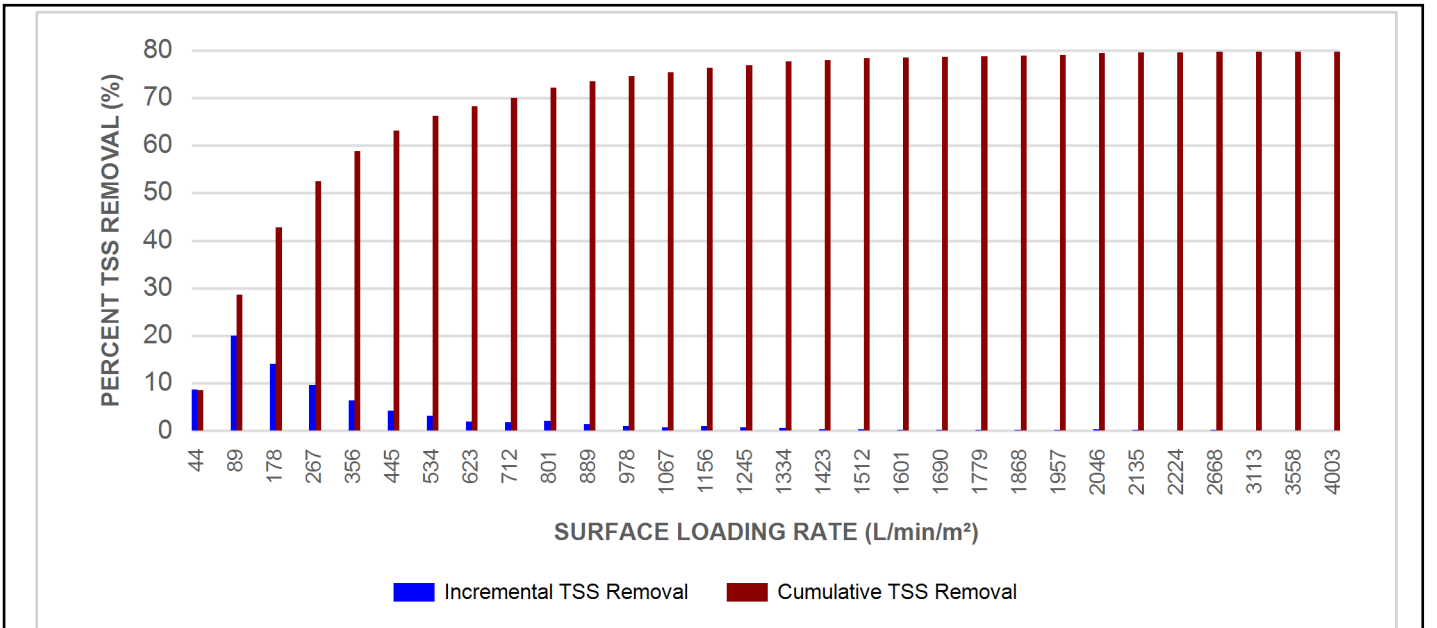
Climate Station ID: 6105978 Years of Rainfall Data: 20

Stormceptor® EF Sizing Report

RAINFALL DATA FROM OTTAWA CDA RCS RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Stormceptor® EF Sizing Report

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

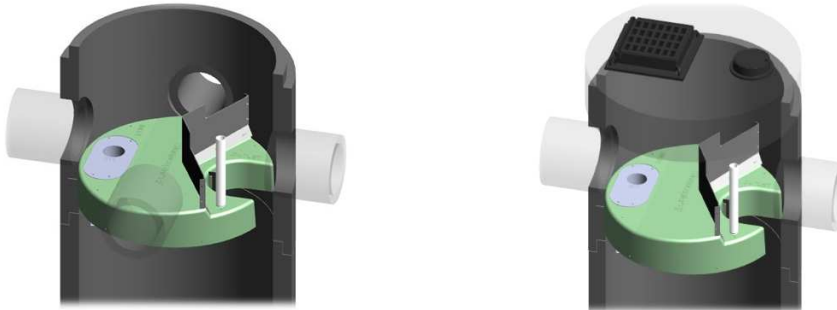
► **Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test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

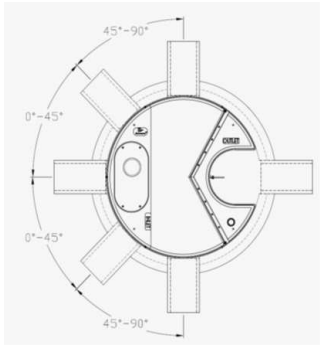
► **Stormceptor® EF and EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend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



Stormceptor® EF Sizing Report



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/ft³)

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
	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

Stormceptor® EF Sizing Report

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/m² to 1400 L/min/m², 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/m² and 1400 L/min/m² 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/m² shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m². No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m².

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m² shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m², and shall be calculated using a simple proportioning formula, with 1400 L/min/m² 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/m².

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/m².

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

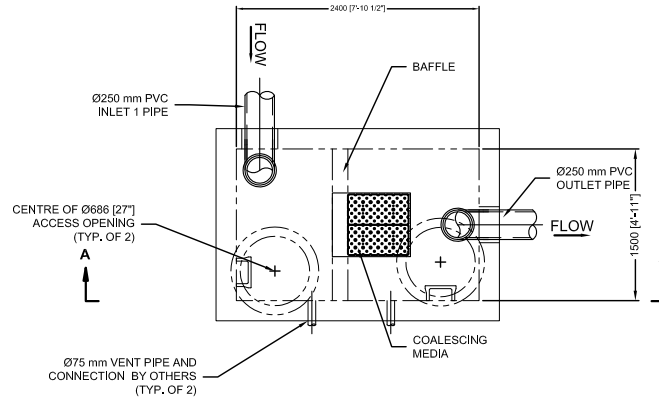
The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid

Stormceptor[®] EF Sizing Report

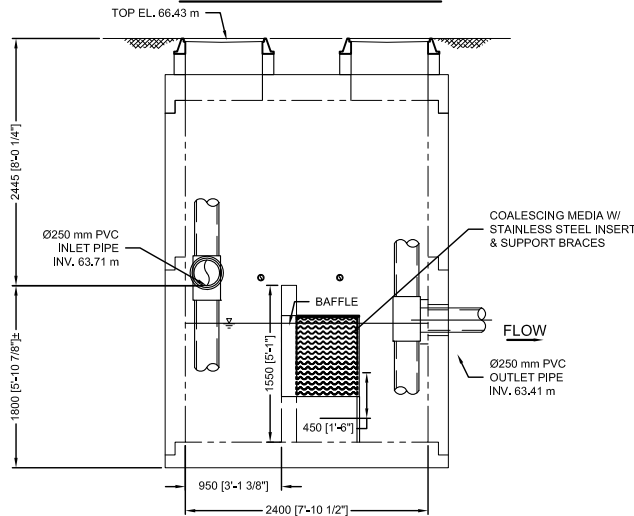
Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators**, with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density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

PLAN VIEW



SECTION A-A



GENERAL NOTES:

- | | |
|--|---|
| <p>A. OIL WATER SEPARATOR MANUFACTURED TO MEET CHBDC CL-625 ONT.</p> <p>B. UNIT DIMENSIONS VARIES: PENDING FINAL DESIGN.</p> <p>C. UNIT C/W INLET/OUTLET CORING AS SHOWN. PIPE CONFIGURATION MAY VARY.</p> <p>D. UNIT C/W 2-Ø686 mm OPENINGS FOR ACCESS AS SHOWN.</p> <p>E. UNIT C/W LIFTING INSERTS AS REQUIRED.</p> <p>F. UNIT C/W HOLLOW ALUMINUM STEPS AS PER OPSD 405.010.</p> <p>G. CONTRACTOR TO CONNECT PIPE(S) TO PIPE TEE(S) (SUPPLIED BY OTHERS).</p> | <p>H. CONTRACTOR TO GROUT ALL INTERIOR EDGES AND JOINTS.</p> <p>I. DESIGN CAN BE MODIFIED FOR SPECIFIC APPLICATIONS, PLEASE CONTACT ECHELON ENVIRONMENTAL.</p> <p>J. EST. HEAVIEST LIFT: 12 TONNES</p> <p>K. STANDARD DESIGN PARAMETERS:</p> <ul style="list-style-type: none"> • 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.



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

DATE: 28/04/2025

DRAWN: SJ

APPROV.:

SCALE: 1:45

SHEET:

1



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

Fluid: Water
Flow Rate: US gpm = 105
Temperature, Deg. F.= 32
Viscosity Used, Cp = 1.792
Specific Gravity Used = 1.001

Flow Rate, m3 / hour = 23.85
Temperature, Deg. C = 0.0

Immiscible Phase

Material: Oil
Specific Gravity: 0.85
Measured at Deg. F. 60
Specific Gravity at Temp.= 0.862

Log Normal Distribution
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

Flow Rate, gpm 105.0
Stack Feet provided 5.25
gpm / stack foot 20.00
Frontal Area, ft² 5.167
Plate Volume, ft³ 10.172
gpm/ft² frontal area 20.320
Velocity in plates, ft/min 3.394
Res. time in plates, min 0.589
Plates / stack foot 30.0
Plate spacing nominal 8 mm NOM.
Plate Surface area, ft² 915
Pressure drop, in H₂O 0.06
Reynolds No. in plates 101.4
Percent of Laminar Limit 5.1

Effluent Characteristics

Oil
Effluent mg/l 11.3
Percent Reduction 88.7
Size 100% collected, microns 73.2
Collection rate, lbs / hour 4.66
Gallons / hour 0.65
Collection rate, kg/hour 2.12
l / hour 2.45