Jp2g Consultants Inc.
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Project No. 20-5060

Design and Stormwater Management Report

Ottawa Carleton Detention Centre Rev 1

2244 Innes Road, Ottawa, Ontario

March 15, 2023

Prepared for

Colliers INTERNATIONAL

Colliers Project Leaders
Domenico Giangregorio

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1 *Introduction*

Jp2g Consultants Inc. was retained by Colliers International to complete a Stormwater Management Report suitable for the City of Ottawa Site Plan Control Application regarding the Ottawa Carleton Detention Centre Parking Lot at 2244 Innes Road.

The site development's limit of works in the extended parking area is approximately **1.03 ha** in size. The proposed development includes upgrading the existing parking area, and preservation of the existing wetlands.

A Pre-Consultation meeting was held with City of Ottawa staff on August 17, 2021 to determine the project constraints and requirements. The following report details the stormwater management calculations used for capacity, water quantity and quality control in accordance with the City of Ottawa's requirements.

1.1 Design Drawings

The following reference civil design drawings are included.

- C1 – Existing Conditions
- C2 – Site Plan
- C3 – Site Grading Plan
- C4 – Details and Notes

1.2 Parking Lot Requirements

The existing gravel parking lot is not large enough to support the staff at the OCDC. The parking lines are not marked. The proposed parking lot upgrades includes additional parking spaces and paving the parking area with designated parking lines. The proposed site development will include upgrading the existing parking area by adding 6233m^2 of asphalt and including suitable accessibility parking spaces in accordance with the City of Ottawa Accessibility Design Standards.

In accordance with the City of Ottawa Accessibility Design Standards, 4% of the total parking spaces are to be accessible parking spaces. Of the 167 proposed parking spaces, 5 are Type A and 6 are Type B Accessible parking spaces, exceeding the 4% requirement. Type A accessible parking spaces were designed for a width of 3.4m, and Type B parking spaces with a width of 2.4m. Additionally in accordance with the City of Ottawa Parking By Law Section 106, parking spaces are designed for the 5.2m length and 2.6m width requirement.

2 Objective

This study will outline the stormwater management requirements for the development of the parking area and identify the impact of the development on the existing receiving watercourse.

The stormwater management plan is to control post-development peak flows to pre-determined levels, and detain onsite, stormwater up to and including the 100-year storm event with a 20% increase of rainfall intensity without affecting adjacent lands, and to provide clean runoff to minimize pollution of the downstream receiving watercourse.

3 Stormwater Management

3.1 Pre-Development Conditions

The existing site consists of existing parking areas, both paved and gravel/grassed parking. For pre-development drainage considerations, the existing gravel parking areas are considered to have a runoff coefficient of C=0.45, existing paved parking areas of C=0.9, and existing grassed areas of C=0.20. The weighted c-value of the existing parking lot was calculated to be C=0.48, refer to calculations provided in **Appendix B**.

3.2 Allowable Release Rate

The site's allowable release rate was calculated in conjunction with the City of Ottawa requirements. For the existing conditions, the site's release rate was determined using a weighted c-value of 0.48, and the 5-year storm intensity. Therefore, the site will be restricted to an allowable release rate of **$Q_{allowable}$ = 143.0 l/s,** for all storms up to and including the 100-year storm. Detailed calculations can be seen in **Appendix B**.

3.3 Post-Development Conditions

The proposed site development will include upgrading the existing parking areas to a paved parking lot, including new curbs and sidewalk entrances. Flows will be managed to limit the 100-year post-development flow rate to the pre-development 5-year release rate identified in section 3.2.

The site development area is approximately **1.03 ha** with a post-development average weighted run-off coefficient of **C = 0.63** and **C = 0.71** for the 5-year and 100-year* storm events, respectively. Refer to calculations in **Appendix B**. Stormwater management techniques are required to reduce peak flows from the area, given that post-development peak flows will exceed the pre-development allowable release rate of **143.0 l/s**.

3.4 Stormwater Quality Control

Stormwater quality will be provided through the existing marshed area before runoff is released through the replaced culvert into the receiving watercourse. The parking lot provides positive drainage to the existing stormwater pond/marsh area so all surface runoff generated on the proposed development will end up in the existing wetland. The marsh will act as a natural filter for the stormwater, using the soil, plants, and microbes in the area to remove sediment and contaminants. After natural filtration through the vegetated area, treated runoff will discharge into the existing ditch through the replaced culvert.

3.5 Stormwater Quantity Control

The proposed parking and paved areas will drain into the existing marsh area/stormwater pond. Excess runoff will be detained on site in the existing stormwater pond. The existing culvert is proposed to be removed and replaced with a new 450mm CSP Culvert. Based on the manning's equation, the proposed 450mm dia. CSP culvert at a slope 0.55% will provide a flow rate of **143.0 l/s** under full flow conditions, restricting runoff from the site to the allowable release rate of 143.0 l/s identified in section 3.3. Therefore, for all storms up to and including the 100 year +20% storm, flows in excess of the allowable release rate will be detained on site within the wetland pond. Storage requirements are seen in **Table 1**.

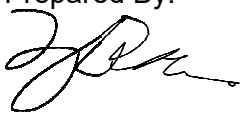
Table 1: Controlled Flow Breakdown

ID	Description	Controlled Flows	Maximum Head (m)	Wetland Storage (m^3)		
				5-Year Requirement	100-Year Requirement	100+20% Requirement
	Net-allowable controlled release rate (Table 1)	**143.0 L/s**				
1.1	Parking Area	**143 L/s**	**0.275**	**27**	**133**	**185**

** Note: Must be controlled to net-allowable 100-year.*

Based on the restricted flow rates, storage will be required to detain the excess runoff on site. On site storage requirements are calculated to be **27m^3** for the 5-year event, **133m^3** for the 100-year, and **185m^3** for the 100+20% stress test event. Based on the existing grading of the wetland ponds, sufficient storage for these events can be provided within the wetland. Maximum storage provided by the existing marshed area is **496m^3**.

Prepared By:



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Reviewed By:

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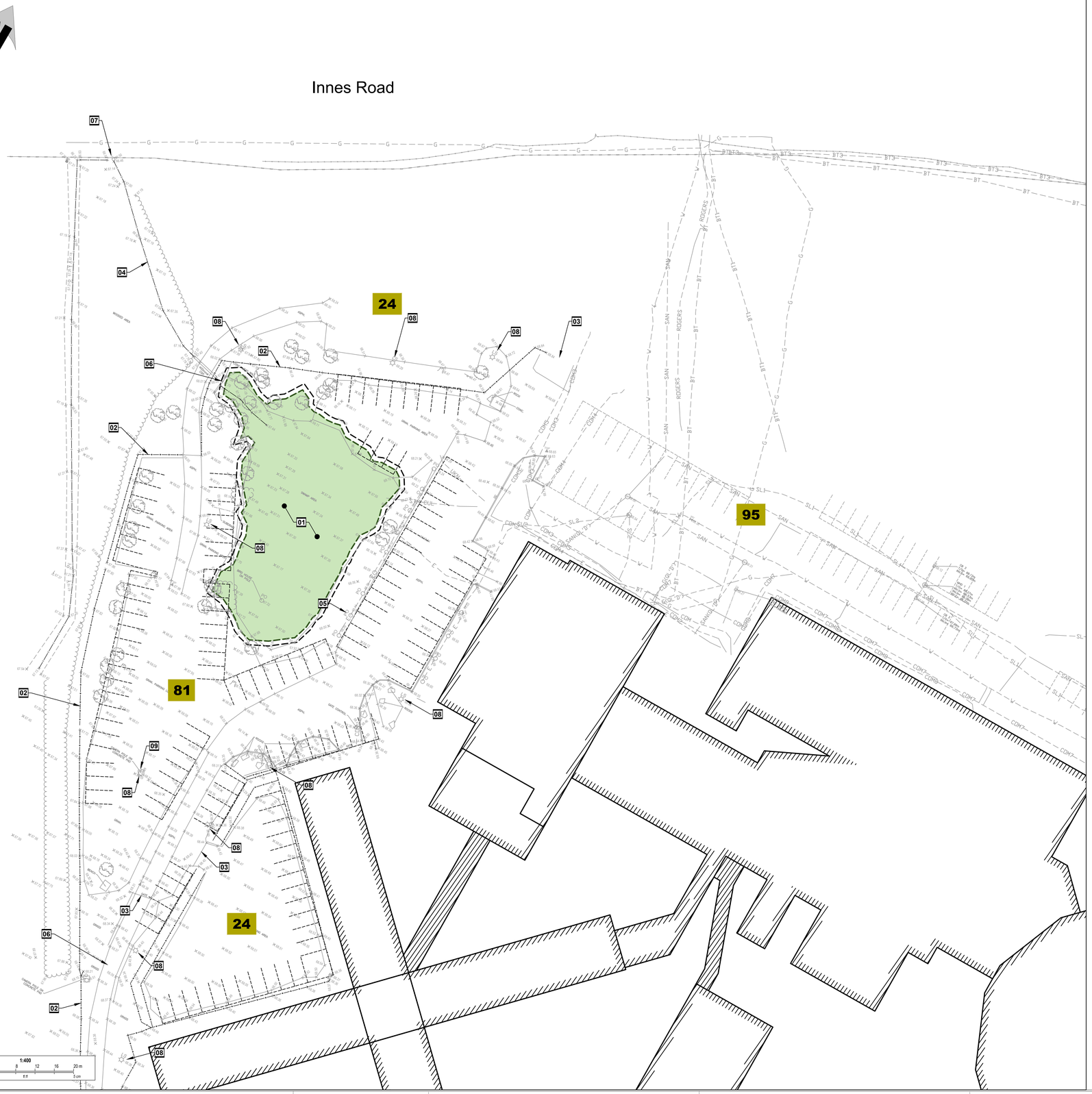
Appendix A - Drawings



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- ST — EXISTING STORM SEWER
- W — EXISTING WATERMAIN
- SA — NEW SANITARY SEWER
- ST — NEW STORM SEWER
- W — NEW WATERMAIN
- 95 — EXISTING NUMBER OF PARKING STALLS
- EX–CB — EXISTING CATCHBASIN
- EX–CBMH — EXISTING CATCHBASIN MANHOLE
- +54.83 — EXISTING ELEVATION

DRAWING NOTES

01 EXISTING WETLAND.
02 EXISTING SECURITY FENCE.
03 EXISTING ACCESS GATE.
04 EXISTING DITCH.
05 EXISTING PARKING POSTS.
06 EXISTING CULVERT AND HEADWALL.
07 EXISTING DITCH INLET AT INNES ROAD.
08 EXISTING LIGHT POLE.
09 EXISTING POLE FOR SECURITY CAMERAS.

GENERAL NOTES

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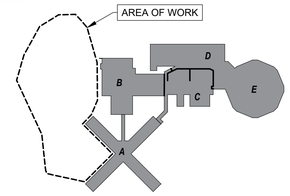
KEY PLAN



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Ontario
Infrastructure Ontario

AMIS N B

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OTTAWA CARLETON DETENTION CENTRE
TEMPORARY PARKING LOT EXPANSION

Location
INNES ROAD, GLOUCESTER TOWNSHIP
OTTAWA

IO Project No | Site No | Building No

Client
MCSCS

Drawing Title
EXISTING CONDITIONS

Scale: AS NOTED	Date: DECEMBER 2022
Drawn by: R.W.	Substantial Performance Date: –
Designed by: D.N.	Drawing No: C1 of
Approved by:	CADD File NAME: –

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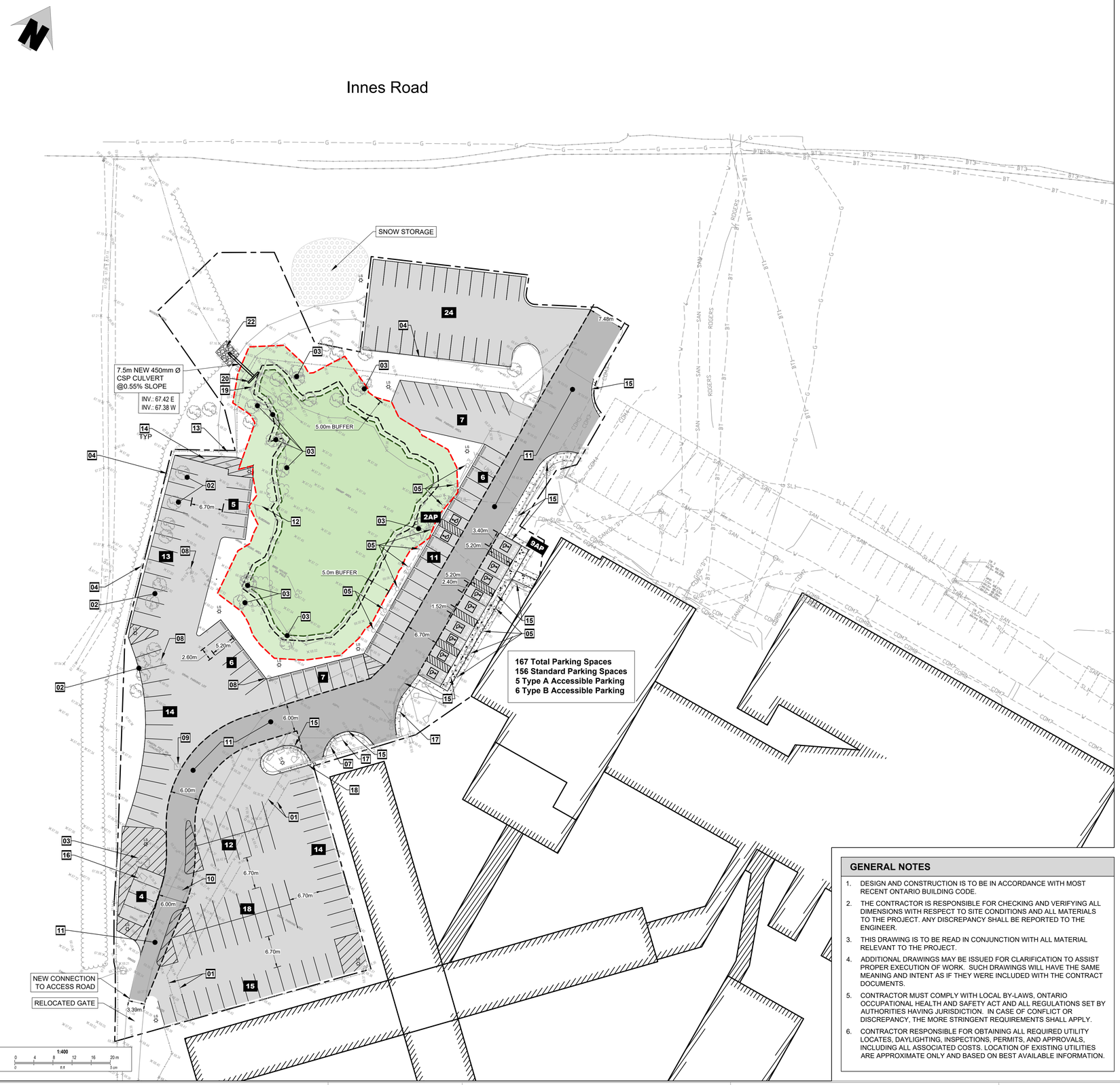

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- ST — NEW STORM SEWER
- NEW BARRIER CURB
- NEW DEPRESSED BARRIER CURB
- NEW EDGE OF PAVEMENT
- NEW REALIGNED FIRE ROUTE
- NEW SILT FENCE
- NEW LIGHT DUTY ASPHALT AS PER DETAIL 1/C4
- NEW HEAVY DUTY ASPHALT AS PER DETAIL 2/C4
- NEW CONCRETE SIDEWALK
- NEW GRASS
- NEW RIP RAP
- EX–CB — EXISTING CATCHBASIN
- EX–CBMH — EXISTING CATCHBASIN MANHOLE
- 54.83 — EXISTING GRADE
- NEW WHEEL STOP 1.83m LENGTH

DRAWING NOTES

01 REMOVE AND DISCARD EXISTING DOUBLE SECURITY FENCE.
02 REMOVE EXISTING TREES.
03 EXISTING TREES TO REMAIN.
04 REPAIR OR REPLACE EXISTING FENCE WHERE INDICATED TBC.
05 REMOVE AND REINSTATE ELECTRICAL VEHICLE PLUG IN STATIONS. COORDINATE WITH ELECTRICAL.
06 NOT USED
07 PROTECT EXISTING FIRE HYDRANT DURING CONSTRUCTION.
08 TREE STUMP TO BE REMOVED.
09 RELOCATE EXISTING POLE.
10 RELOCATE EXISTING GATE.
11 PROPOSED REALIGNED FIRE ROUTE.
12 REMOVE AND DISCARD EXISTING SUBDRAIN.
13 EXISTING GATE FOR SNOW REMOVAL OPERATIONS.
14 NO PARKING TO ALLOW ACCESS FOR PARKING EGRESS.
15 EXISTING CURB TO BE REMOVED.
16 EXISTING PICNIC TABLE TO BE RELOCATED.
17 EXISTING LANDSCAPE FEATURES TO BE RELOCATED.
18 PROVIDE CURB TERMINATION
19 REMOVE EXISTING CONCRETE HEADWALL
20 NEW PROPOSED HEADWALL PER OPSD 804.030
21 REMOVE AND REPLACE 450mm CSP CULVERT. EXTEND OUTLET OF CULVERT INTO EXISTING DITCH
22 INSTALL RIP RAP AND GEOTEXTILE PER OPSD 810.010

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1. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATER COURSE, DURING CONSTRUCTION ACTIVITIES; THIS INCLUDES LIMITING THE AMOUNT OF EXPOSED SOIL, INSTALLING SILT FENCES AND OTHER EFFECTIVE SEDIMENT TRAPS, AND INSTALLING AND MAINTAINING MUD MATS FOR OUTGOING CONSTRUCTION TRAFFIC DURING CONSTRUCTION ACTIVITIES.
2. PREVENT SOIL LOSS DURING CONSTRUCTION (BY STORM WATER RUNOFF OR WIND EROSION).
3. PROTECT TOPSOIL BY STOCKPILING FOR REUSE.
4. PREVENT SEDIMENTATION OF STORM SEWERS AND RECEIVING STREAMS.
5. PREVENT AIR POLLUTION FROM DUST AND PARTICULATE MATTER.
6. ALL STORM MANHOLES AND CATCHBASIN MANHOLES TO HAVE 300mm SUMPS; ALL CATCHBASINS TO HAVE 600mm SUMPS.
7. INSTALL FILTER BAG INSERT IN ALL STORM MANHOLES AND CATCH BASINS IMPACTED DURING CONSTRUCTION, INCLUDING CATCH BASINS IN THE RIGHT OF WAY.
8. SEDIMENT AND EROSION CONTROL MEASURES MAY BE MODIFIED IN THE FIELD AT THE DISCRETION OF THE CITY OF OTTAWA INSPECTOR OR CONSERVATION AUTHORITY.
9. STORM WATER PUMPED INTO CITY SERVICE SHALL FLOW THROUGH A FILTER SOCK.
10. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENTATION CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

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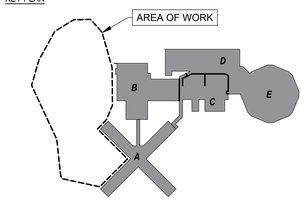

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AMIS N B

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OTTAWA CARLETON DETENTION CENTRE TEMPORARY PARKING LOT EXPANSION

Location
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IO Project No | Site No | Building No

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Drawing Title
SITE PLAN – NEW PARKING LAYOUT

Scale: AS NOTED	Date: DECEMBER 2022
Drawn by: R.W.	Substantial Performance Date: –
Designed by: D.N.	Drawing No: C2 of
Approved by:	CADD File NAME: –

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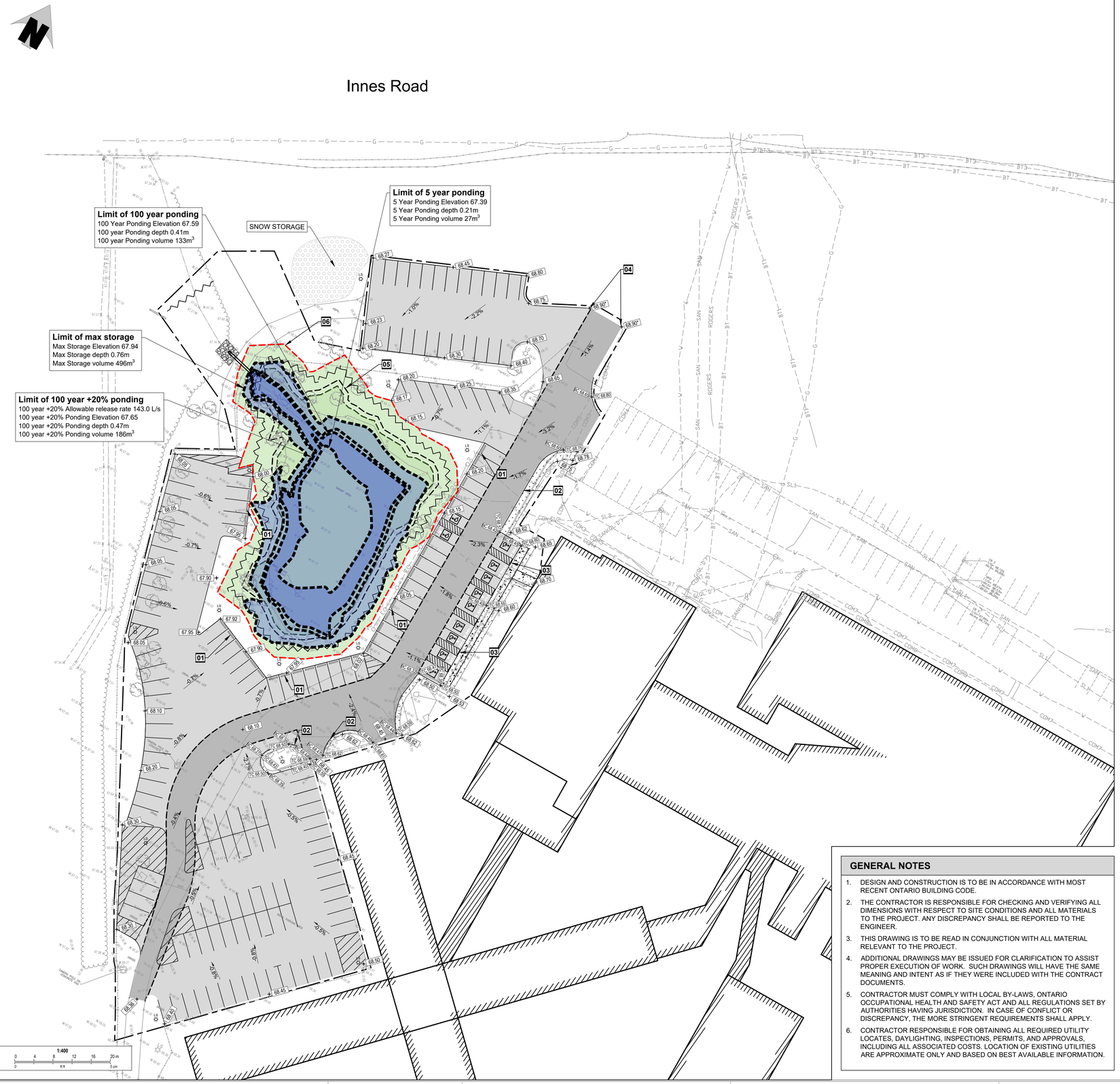

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- EX-CBMH — EXISTING CATCHBASIN MANHOLE
- +54.83 — EXISTING GRADE
- 68.65+ — NEW GRADE
- -1.4% — NEW SLOPE
- BC 68.65 TC 68.80 — NEW TOP AND BOTTOM OF CURB
- NEW BARRIER CURB
- NEW DEPRESSED BARRIER CURB

DRAWING NOTES

01 INSTALL NEW PRECAST WHEEL STOPPER, TYPICAL

02 CONSTRUCT NEW CONCRETE BARRIER CURB IN ACCORDANCE WITH CITY OF OTTAWA STANDARD DETAIL SC1.1

03 CONSTRUCT NEW CONCRETE BARRIER CURB WITH SIDEWALK IN ACCORDANCE WITH CITY OF OTTAWA STANDARD DETAILS SC1.4. PROVIDE DEPRESSIONS BESIDE EACH ACCESSIBLE PARKING SPOT AS DENOTED BY THE MARKING LINES.

04 CONTRACTOR TO CONFIRM EXISTING ELEVATION AT LIMIT OF ASPHALT. TIE IN NEW ASPHALT TO EXISTING.

05 INSTALL SILT FENCE IN ACCORDANCE WITH OPSD 219.130 AROUND EXISTING WETLAND

06 PROTECT EXISTING WETLAND DURING CONSTRUCTION. DO NOT ALTER GRADE OR MATERIAL WITHIN 5M OF EXISTING WETLAND

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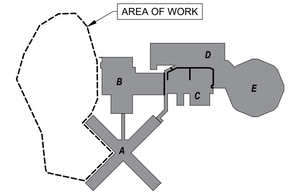

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24x36in

General Notes

1. DRAWINGS TO BE READ IN CONJUNCTION WITH ARCHITECTURAL AND LANDSCAPE DRAWINGS
2. ALL SERVICES, MATERIALS, CONSTRUCTION METHODS AND INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE LATEST STANDARDS AND REGULATIONS OF THE: CITY OF OTTAWA STANDARD SPECIFICATIONS AND DRAWINGS, ONTARIO PROVINCIAL SPECIFICATION STANDARD SPECIFICATION (OPSS) AND ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD), UNLESS OTHERWISE SPECIFIED, TO THE SATISFACTION OF THE CITY AND THE CONSULTANT
3. 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, 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 CONTRACTOR'S EXPENSE.
4. 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 POWER, COMMUNICATION AND GAS LINES.
5. ALL TRENCHING AND EXCAVATIONS TO BE IN ACCORDANCE WITH THE LATEST REVISIONS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS AND AS PER THE RECOMMENDATIONS INCLUDED IN THE GEOTECHNICAL REPORT.
6. REFER TO ARCHITECTS PLANS FOR BUILDING DIMENSIONS, LAYOUT AND REMOVALS. REFER TO LANDSCAPE PLAN FOR LANDSCAPED DETAILS AND OTHER RELEVANT INFORMATION. ALL INFORMATION SHALL BE CONFIRMED PRIOR TO COMMENCEMENT OF CONSTRUCTION.
7. TOPOGRAPHIC SURVEY COMPLETED AND PROVIDED BY J.D. BARNES LTD., PROJECT NO.: 17-10-013-00, DATED APRIL 24, 2017. CONTRACTOR TO VERIFY IN THE FIELD PRIOR TO CONSTRUCTION OF ANY WORK AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
8. ALL ELEVATIONS ARE GEODETIC AND UTILIZE METRIC UNITS. VERIFY THAT JOB BENCHMARKS HAVE NOT BEEN ALTERED OR DISTURBED.
9. ALL GROUND SURFACES SHALL BE EVENLY GRADED WITHOUT PONDING AREAS AND WITHOUT LOW POINTS EXCEPT WHERE APPROVED SWALE OR CATCH BASIN OUTLETS ARE PROVIDED.
10. ALL EDGES OF DISTURBED PAVEMENT SHALL BE SAW CUT TO FORM A NEAT AND STRAIGHT LINE PRIOR TO PLACING NEW PAVEMENT. PAVEMENT REINSTATEMENT SHALL BE WITH STEP JOINTS OF 500mm WIDTH MINIMUM.
11. 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 AND COMPACTION.
12. ABUTTING PROPERTY GRADES TO BE MATCHED UNLESS OTHERWISE SHOWN.
13. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND APPROVALS FROM THE MUNICIPAL AUTHORITIES PRIOR TO COMMENCING CONSTRUCTION, INCLUDING WATER PERMIT AND ROAD CUT PERMIT.
14. MINIMIZE DISTURBANCE TO EXISTING VEGETATION DURING THE EXECUTION OF ALL WORKS.
15. REMOVE FROM SITE ALL EXCESS EXCAVATED MATERIAL UNLESS OTHERWISE DIRECTED FROM THE ENGINEER. EXCAVATE AND REMOVE ALL ORGANIC MATERIAL AND DEBRIS LOCATED WITHIN THE PROPOSED BUILDING, PARKING AND ROADWAY LOCATIONS.
16. AT PROPOSED UTILITY CONNECTION POINTS AND CROSSINGS (I.E. STORM SEWER, SANITARY SEWER, WATER, ETC.) THE CONTRACTOR SHALL DETERMINE THE PRECISE LOCATION AND DEPTH OF EXISTING UTILITIES AND REPORT ANY DISCREPANCIES OR CONFLICTS TO THE ENGINEER BEFORE COMMENCING WORK.
17. CONTRACTOR TO OBTAIN POST-CONSTRUCTION TOPOGRAPHIC SURVEY, COMPLETED BY OLS OR P.ENG CONFIRMING COMPLIANCE WITH DESIGN GRADING AND SERVICING. SURVEY IS TO INCLUDE LOCATION AND INVERTS FOR BURIED UTILITIES.
18. ABIDE BY RECOMMENDATIONS OF GEOTECHNICAL REPORT. REPORT ANY VARIATIONS IN OBSERVED CONATIONS FROM THOSE INCLUDED IN REPORT.
19. REPORT REFERENCES;
    i. INSTITUTIONAL PARKING SPACE STUDY, PREPARED BY STEPHENSON ENGINEERING LTD., PROJECT NO.: 20180784, DATED SEPTEMBER 27, 2018.
20. PROVIDE CCTV INSPECTION REPORT FOR ALL SEWERS AND CATCHBASIN LEADS 200mm DIAMETER AND LARGER. REPEAT CCTV INSPECTION FOLLOWING RECTIFICATION OF ANY DEFICIENCIES.

Parking Lot

**** CONTRACTOR IS RESPONSIBLE FOR ALL INSTALLATION, MONITORING, REPAIR AND REMOVAL OF ALL EROSION AND SEDIMENT CONTROL FEATURES.****

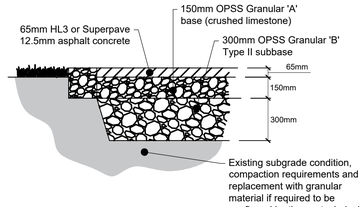
1. PRIOR TO START OF CONSTRUCTION:
   1.1. INSTALL SILT FENCE IN LOCATION SHOWN.
   1.2. INSTALL FILTER FABRIC OR SILT SACK FILTERS IN ALL THE CATCHBASINS AND MANHOLES TO REMAIN DURING CONSTRUCTION WITHIN THE SITE (SEE TYPICAL DETAIL).
   1.3. INSPECT MEASURES IMMEDIATELY AFTER INSTALLATION.
2. DURING CONSTRUCTION:
   2.1. MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE AND IMPACTS TO EXISTING GRADING.
   2.2. PERIMETER VEGETATION TO REMAIN IN PLACE UNTIL PERMANENT STORM WATER MANAGEMENT IS IN PLACE. OTHERWISE, IMMEDIATELY INSTALL SILT FENCE WHEN THE EXISTING SITE IS DISTURBED AT THE PERIMETER.
   2.3. PROTECT DISTURBED AREAS FROM OVERLAND FLOW BY PROVIDING TEMPORARY SWALES TO THE SATISFACTION OF THE FIELD ENGINEER. TIE-IN TEMPORARY SWALE TO EXISTING CB'S AS REQUIRED.
   2.4. PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT BE REHABILITATED WITHIN 30 DAYS.
   2.5. INSPECT SILT FENCES, FILTER FABRIC FILTERS AND CATCH BASIN SUMPS WEEKLY AND WITHIN 24 HOURS AFTER A STORM EVENT. CLEAN AND REPAIR WHEN NECESSARY.
   2.6. DRAWING TO BE REVIEWED AND REVISED AS REQUIRED DURING CONSTRUCTION.
   2.7. EROSION CONTROL FENCING TO BE ALSO INSTALLED AROUND THE BASE OF ALL STOCKPILES.
   2.8. DO NOT LOCATE TOPSOIL PILES AND EXCAVATION MATERIAL CLOSER THAN 2.5m FROM ANY PAVED SURFACE, OR ONE WHICH IS TO BE PAVED BEFORE THE PILE IS REMOVED. ALL TOPSOIL PILES ARE TO BE SEEDED IF THEY ARE TO REMAIN ON SITE LONG ENOUGH FOR SEEDS TO GROW (LONGER THAN 30 DAYS).
   2.9. CONTROL WIND-BLOWN DUST OFF SITE BY SEEDING TOPSOIL PILES AND OTHER AREAS TEMPORARILY (PROVIDE WATERING AS REQUIRED AND TO THE SATISFACTION OF THE ENGINEER).
   2.10. NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THE FIELD ENGINEER.
   2.11. CITY ROADWAY AND SIDEWALK TO BE CLEANED OF ALL SEDIMENT FROM VEHICULAR TRACKING AS REQUIRED.
   2.12. DURING WET CONDITIONS, TIRES OF ALL VEHICLES/EQUIPMENT LEAVING THE SITE ARE TO BE SCRAPED.
   2.13. ANY MUD/MATERIAL TRACKED ONTO THE ROAD SHALL BE REMOVED IMMEDIATELY BY HAND OR RUBBER TIRE LOADER.
   2.14. TAKE ALL NECESSARY STEPS TO PREVENT BUILDING MATERIAL, CONSTRUCTION DEBRIS OR WASTE BEING SPILLED OR TRACKED ONTO ABUTTING PROPERTIES OR PUBLIC STREETS DURING CONSTRUCTION AND PROCEED IMMEDIATELY TO CLEAN UP ANY AREAS SO AFFECTED.
   2.15. ALL EROSION CONTROL STRUCTURE TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN STABILIZED EITHER BY PAVING OR RESTORATION OF VEGETATIVE GROUND COVER.
   2.16. THE CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES, TO PROVIDE FOR PROTECTION OF THE AREA DRAINAGE SYSTEM AND THE RECEIVING WATERCOURSE, DURING CONSTRUCTION ACTIVITIES. THE CONTRACTOR ACKNOWLEDGES THAT FAILURE TO IMPLEMENT APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES MAY BE SUBJECT TO PENALTIES IMPOSED BY ANY APPLICABLE REGULATORY AGENCY.

Parking Lot

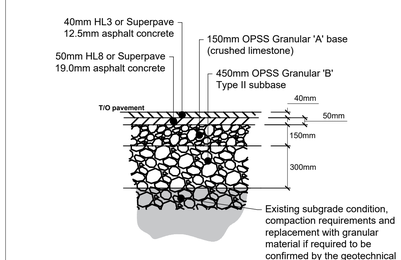
1. CONTRACTOR TO REINSTATE ROAD CUTS AS PER CITY OF OTTAWA DETAIL R10.
2. CONTRACTOR TO PREPARE SUBGRADE, INCLUDING PROOFROLLING, TO THE SATISFACTION OF THE GEOTECHNICAL CONSULTANT PRIOR TO THE COMMENCEMENT OF PLACEMENT OF GRANULAR B MATERIAL.
3. FILL TO BE PLACED AND COMPACTED AS FOLLOWS:
   3.1. GRANULAR A AND B: 100% SPMDD STANDARD PROCTOR MAXIMUM DRY DENSITY, ASTM, D-698-12e2
   3.2. ASPHALT: 97% MRD, MAXIMUM RELATIVE DENSITY, ASTM D2041
4. CONTRACTOR TO SUPPLY, PLACE AND COMPACT GRANULAR B MATERIAL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL CONSULTANT. CONTRACTOR TO PROVIDE CONSULTANT WITH SAMPLES OF GRANULAR B MATERIAL FOR TESTING AND CERTIFICATION FROM THE GEOTECHNICAL CONSULTANT THAT THE MATERIAL MEETS THE GRADATION REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT.
5. GRANULAR A MATERIAL TO BE PLACED ONLY UPON APPROVAL BY THE GEOTECHNICAL CONSULTANT OF GRANULAR B PLACEMENT.
6. CONTRACTOR TO SUPPLY, PLACE AND COMPACT GRANULAR A MATERIAL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL CONSULTANT. CONTRACTOR TO PROVIDE CONSULTANT WITH SAMPLES OF GRANULAR A MATERIAL FOR TESTING AND CERTIFICATION FROM THE GEOTECHNICAL CONSULTANT THAT THE MATERIAL MEETS THE GRADATION REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT.
7. ASPHALT MATERIAL TO BE PLACED ONLY UPON APPROVAL BY THE GEOTECHNICAL CONSULTANT OF GRANULAR A PLACEMENT.
8. CONTRACTOR TO SUPPLY, PLACE AND COMPACT ASPHALT MATERIAL IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL CONSULTANT. CONTRACTOR TO PROVIDE CONSULTANT WITH SAMPLES OF ASPHALT MATERIAL FOR TESTING AND CERTIFICATION FROM THE GEOTECHNICAL CONSULTANT THAT THE MATERIAL MEETS THE REQUIREMENTS SPECIFIED IN THE GEOTECHNICAL REPORT.
9. CONTRACTOR IS RESPONSIBLE FOR ESTABLISHING LINE AND GRADE IN ACCORDANCE WITH THE PLANS, AND FOR PROVIDING THE CONSULTANT WITH VERIFICATION PRIOR TO PLACEMENT.
10. ALL EXCESS MATERIAL TO BE HAULED OFFSITE AND DISPOSED OF AT AN APPROVED DUMP SITE. SHOULD THE CONTRACTOR DISCOVER ANY HAZARDOUS MATERIAL, CONTRACTOR IS TO NOTIFY CONSULTANT. CONSULTANT TO DETERMINE APPROPRIATE DISPOSAL METHOD/LOCATION.
11. PAVEMENT STRUCTURE (MATERIAL TYPES AND THICKNESS) FOR HEAVY DUTY, AND LIGHT DUTY COURT AREAS TO BE AS SPECIFIED IN THE GEOTECHNICAL REPORT AND SHOWN ON THE PLANS.

Notes: Culvert

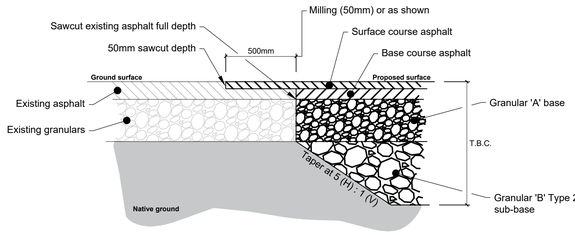
1. CULVERT BEDDING TO BE CONSTRUCTED AS PER OPSD 802.031
2. RIP RAP TO BE INSTALLED AT CULVERT OUTLET AS PER OPSD 810.01



1 C4 **Pavement Structure for Light Duty Pavement (Typ.)**
Scale: **As shown**

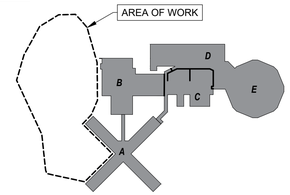


2 C4 **Pavement Structure for Heavy Duty Pavement (Typ.)**
Scale: **As shown**



3 C4 **Key Joint Detail**
Scale: **As shown**

KEY PLAN



No	Revisions	Date
06	99% DESIGN REVIEW	2023.03.15
05	90% DESIGN REVIEW	2022.12.21
04	66% DESIGN REVIEW	2022.02.02
03	33% DESIGN REVIEW R2	2021.11.08
02	33% DESIGN REVIEW R1	2021.10.08
01	33% DESIGN REVIEW	2020.12.07

Orientation

Seal

The Contractor shall check and verify all dimensions and report all errors and omissions to the IO–Owner's/MBS Designee (as applicable) for his/her written direction before proceeding with the Work.

A/B A Detail No
B Sheet No where detailed

PROJECT ENGINEER: CIVIL, STRUCTURAL, MECHANICAL & ELECTRICAL

Jp2g Consultants Inc.
ENGINEERS • PLANNERS • PROJECT MANAGERS
1150 MORRISON DRIVE, SUITE 410, OTTAWA, ON K2H 8S9
PHONE: 613-828-7800 FAX: 613-828-2600
Jp2g Project #: 20-5060A

Ontario
Infrastructure Ontario

AMIS N B

Project
OTTAWA CARLETON DETENTION CENTRE
TEMPORARY PARKING LOT EXPANSION

Location
INNES ROAD, GLOUCESTER TOWNSHIP
OTTAWA

IO Project No | Site No | Building No

Client
MCSCS

Drawing Title
DETAILS AND NOTES

Scale: AS NOTED	Date: DECEMBER 2022
Drawn by: R.W.	Substantial Performance Date: –
Designed by: D.N.	Drawing No: C4 of
Approved by:	CADD File NAME: –

Folder: J:\5-Civil\2020\20-5060A - Colliers - IO - OCDC Temporary Parking Lot Expansion\05 Drawings\1 Ongoing | Drawing: C1-C2 OCDC v11.dwg | Layout: C4 details and notes | Print date: 12:35 PM March 15, 2023
24x36in

Appendix B - Stormwater Management Calculations

Appendix B - Storm Sewer Design Sheet

B.1.1 - Allowable release rate

ID	Description	Type	Areas (m2)	Cvalue	Weighted C Value	$C_{pre\text{-}5\text{-}yr}$	$C_{pre\text{-}100\text{-}yr}$*
A	Gravel Parking	uncontrolled	3332	0.45	1499	0.45	0.56
A	Asphalt Parking	uncontrolled	2901	0.90	2611	0.90	1.00
A	Property Grounds	uncontrolled	4118	0.20	824	0.65	0.25
		SUM	**10351**		0.48		

**including 25% increase as per City of Ottawa Sewer Design Guidelines*

Estimated time of concentration, t_c = **10.0** minutes ***As per City of Ottawa Sewer Design Guidelines (Section 5.4.5.2)**

Based on Ottawa IDF curve, $i_{5\text{-}years}$ = $998.071/(t_c+6.053)^{0.814}$

104.2 mm/hr

Total Area, A = **1.04** ha

$Q_{allowable\ (5\text{-}year)}$ = **143** l/s ①

B.1.2 - Post-development release rate

ID	Description	Type	Areas (m2)	Cvalue	Weighted C Value	$C_{post\text{-}5\text{-}yr}$	$C_{post\text{-}100\text{-}yr}$*
	Paved Parking Area	controlled	6233	0.90	5610	0.90	1.00
	Sidewalk	uncontrolled	71	0.90	64	0.90	1.00
	Grassed Area	controlled	4047	0.20	809	0.20	0.25
			10351		0.63	**0.63**	**0.71**
			(A)	(B)	©	(D)	(E)

**including 25% increase as per City of Ottawa Sewer Design Guidelines*

Calculations for post-development runoff coefficient

$C_{post\text{-}5\text{-}yr\ (col.\ D)}$ = (column A * 0.9 + column B * 0.2) / column C

$C_{post\text{-}100\text{-}yr\ (col.\ E)}$ = (column A * 1.0 + column B * 0.2*1.25) / column C

Note: 0.90 x 1.25 = 1.125, use max. 1.0

Estimated time of concentration, t_c = **10.0** minutes ***As per City of Ottawa Sewer Design Guidelines (Section 5.4.5.2)**

Based on Ottawa IDF curve, $i_{5\text{-}years}$ = $998.071/(t_c+6.053)^{0.814}$

104.2 mm/hr

Based on Ottawa IDF curve, $i_{100\text{-}years}$ = $1735.688/(t_c+6.014)^{0.820}$

178.6 mm/hr

B.1.3 - Post-development pond storage

B.1.3.1 - Estimated detention Stormwater Wetland

Area	**1.035**	ha
5-year Runoff coefficient	**0.63**	
100-year Runoff coefficient	**0.71**	
Controlled Flow	**143.0**	l/s

Table 1.3.1a - 5-year estimated detention Building Roof

	Time (minutes)	$i_{5\text{-years}}$ (mm/hr)	Q_{actual} (l/s)	$Q_{allowable}$ (l/s)	Q_{stored} (l/s)	V_{stored} (m^3)
peak V_{stored} →	10	104.2	187.8	143.0	44.8	26.9
	15	83.6	150.6	143.0	7.6	6.8
	20	70.3	126.6	143.0	-16.4	-19.7
	25	60.9	109.7	143.0	-33.3	-49.9
	30	53.9	97.2	143.0	-45.8	-82.5
	35	48.5	87.4	143.0	-55.6	-116.7
	40	44.2	79.6	143.0	-63.4	-152.1
	45	40.6	73.2	143.0	-69.8	-188.4
	50	37.7	67.9	143.0	-75.1	-225.4
	55	35.1	63.3	143.0	-79.7	-263.0
	60	32.9	59.4	143.0	-83.6	-301.1
	Therefore	**27**	m^3 estimated roof detention			

Table 1.3.1b - 100-year estimated detention Building Roof

	Time (min)	$i_{100\text{-years}}$ (mm/hr)	Q_{actual} (l/s)	$Q_{allowable}$ (l/s)	Q_{stored} (l/s)	V_{stored} (m^3)
	10	178.6	363.1	143.0	220.1	132.1
peak V_{stored} →	15	142.9	290.6	143.0	147.6	132.8
	20	120.0	243.9	143.0	100.9	121.1
	25	103.8	211.2	143.0	68.2	102.3
	30	91.9	186.8	143.0	43.8	78.9
	35	82.6	167.9	143.0	24.9	52.4
	40	75.1	152.8	143.0	9.8	23.6
	45	69.1	140.4	143.0	-2.6	-6.9
	50	64.0	130.1	143.0	-12.9	-38.8
	55	59.6	121.3	143.0	-21.7	-71.7
	60	55.9	113.7	143.0	-29.3	-105.6
	Therefore	**133**	m^3 estimated yard detention			

Table 1.3.2b - 100-year +20% estimated detention in School Yard

	Time (min)	$i_{100\text{-years}}$ (mm/hr)	Q_{actual} (l/s)	$Q_{allowable}$ (l/s)	Q_{stored} (l/s)	V_{stored} (m^3)
peak V_{stored} →	10	214.3	435.8	143.0	292.8	175.7
	15	171.5	348.7	143.0	205.7	185.2
	20	143.9	292.7	143.0	149.7	179.7
	25	124.6	253.4	143.0	110.4	165.7
	30	110.2	224.2	143.0	81.2	146.2
	35	99.1	201.5	143.0	58.5	122.9
	40	90.2	183.4	143.0	40.4	96.9
	45	82.9	168.5	143.0	25.5	68.9
	50	76.7	156.1	143.0	13.1	39.2
	55	71.5	145.5	143.0	2.5	8.3
	60	67.1	136.4	143.0	-6.6	-23.7
	Therefore	**185**	m^3 estimated yard detention			

B.1.4 - Site storage

Storage Elevation	Required Storage (m3)	Ponding depth (m)	100 year Ponding Elev.	Ponding area (m2)	Provided Storage (m3)
5 Year	**27**	0.21	67.39	**352**	**27**
100 Year	**133**	0.41	67.59	**752**	**138**
100 Year + 20%	**185**	0.47	67.65	**853**	**186**
Max Provided Storage	**NA**	0.76	67.94	**1313**	**496**