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## **Stormwater Management Report and Servicing Brief**

ZBLA Application for  
7628 Flewellyn Road

Ottawa, Ontario

Prepared for:

Cash for Trash Canada  
7628 Flewellyn Road,  
Stittsville, Ontario  
K2S 1B6

LRL File No.: 210092

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## 1 INTRODUCTION AND SITE DESCRIPTION

Cash for Trash engaged LRL to carry out a Storm Water Analysis and Servicing Brief to support the application for a Zoning By-Law Amendment on the subject property. Additionally, LRL has completed a review and design for future development of two proposed buildings, encompassing a two storeyed warehouse and office spaces, truck maintenance and repair facilities, drive aisles, along with associated parking lots. These developments are planned for the 7628 Flewellyn street location. The existing site incorporates five buildings, with plans to retain three buildings and demolish two. Buildings A (Ferrous Metals, 59 m<sup>2</sup>) and C (Staff Trailers, 111 m<sup>2</sup>) are slated for demolition, while Buildings B (Weigh Scale Office, 50 m<sup>2</sup>), D (Wet Drawing Station, 81 m<sup>2</sup>), and E (ATM, 14 m<sup>2</sup>) are planned for relocation.

Zoning regulations RG1 [21r] and RU apply to the site. The site location is shown in Figure 1.



**Figure 1: Aerial view of proposed site**

The subject site has an approximate frontage of 102.413 meters and has an approximate area of 20.725 hectares. The site is subject to two zoning regulations, namely RG1 (Rural General Industrial) and RG (Rural Countryside), with proposed development exclusively designated for RG1.

## 2 EXISTING SITE AND DRAINAGE DESCRIPTION

The property spans an area of 20.725 hectares and currently features five structures: Building A (Ferrous Metals, 59 m<sup>2</sup>), Building B (Weigh Scale Office, 50 m<sup>2</sup>), Building C (Staff Trailers, 111 m<sup>2</sup>), Building D (Wet Drawing Station, 81 m<sup>2</sup>), and Building E (ATM, 14 m<sup>2</sup>), totaling 396 m<sup>2</sup> in area. The site is bordered by Flewellyn Road to the northwest, vacant land to the east, and an existing quarry and associated access roads and fills storage areas to the south and west.

There is an existing private well in the site and no municipal servicing on the site. There are no sanitary lines, storm, or water pipes or septic tanks on the existing property. An existing drilled well is located at the north-east of the property and will be used to service the future development.

### 2.1.1 Existing 1-Story Building

Existing building north of the site is intended to remain in current location and is serviced through a well and septic tank.

## 3 PROPOSED DEVELOPMENT

Upon completion, it is intended that the site will feature a total of 3,108 m<sup>2</sup> of proposed buildings for utilization, along with 226 m<sup>2</sup> of existing structures, of which 213 m<sup>2</sup> is slated for demolition. The development will also encompass a driveway aisle and parking area providing 128 parking spots.

The new construction includes two primary buildings: Building 2, housing Administration Offices (2-storeys) covering 994.5 m<sup>2</sup>, and a Warehouse spanning 994.5 m<sup>2</sup>, with a combined area of 1,989 m<sup>2</sup>. Additionally, Building 4 comprises a Repair/Mechanical Shop with an area of 936.7 m<sup>2</sup>. The proposed total gross floor area (GFA) for these new structures is 3,108 m<sup>2</sup>.

Buildings A (Ferrous Metals, 59 m<sup>2</sup>) and C (Staff Trailers, 111 m<sup>2</sup>) are slated for demolition, while Buildings B (Weigh Scale Office, 50 m<sup>2</sup>), D (Wet Drawing Station, 81 m<sup>2</sup>), and E (ATM, 14 m<sup>2</sup>) are planned for relocation.

Regarding the existing structures set to remain, Building 1, the Weigh Scale Office (to be relocated), covers an area of 80 m<sup>2</sup>, Building 3, the Engine Puller/Drain Station (to be relocated), spans 91 m<sup>2</sup>, and Building 5, the ATM Machine (to remain), occupies 12 m<sup>2</sup>. Collectively, the total area of existing buildings earmarked for detention is 183 m<sup>2</sup>.

The storm water for most of the site will be directed via overland flow, and conveyed to the rear detention area via a series of swales located on the East and West end of the development. The stormwater will be ultimately release to an existing ditch from the detention area. Drainage from the grass section on the Eastern side of the property will flow uncontrolled to the nearby ditch, mimicking pre-development conditions.

Currently, the site does not include any septic system and requires one to be installed. A septic tank is proposed at the South East side of Building 2; and a new septic field is proposed at the east side of parking lot adjacent to building 2.

A private supply well located at the north east side of the site will be used to service the proposed development.

A fire hydrant is planned for installation on the West side of Building 4.

## 4 FIELD WORK

A topographic survey of the property was completed by Annis, O'Sullivan, Vollebek Ltd. in July, 2021. Prior to the proposed site development, the contractor completing the work is to confirm the location and elevation of the benchmark utilized and noted on the plans in **Appendix D**.

A geotechnical investigation was also performed by Paterson group on August 16<sup>th</sup>, 2021; six (6) boreholes were drilled to a maximum depth of 10.1 m below the existing ground surface, and groundwater was carefully monitored and measured during the investigation. Immediately upon completion of drilling, groundwater was measured in all boreholes. The long-term groundwater table can be expected at approximately 1 to 2 m depth.

## 5 STORMWATER MANAGEMENT

### 5.1 Existing Stormwater Infrastructure

There are no existing storm sewers servicing the site. In pre-development conditions, the water flows from the site are carried overland in the northeast direction towards a watercourse, which ultimately carries flows south towards a ditch located in the Fallowfield Road Right-of-Way.

### 5.2 Design Criteria

- As per the pre-consultation meeting with City of Ottawa officials, the required TSS removal of 80%.
- The peak flow rate post-development must match the peak flow rate pre-development as per section 8.3.6.1 of the City of Ottawa Sewer Design Guidelines (SDG).

### 5.3 Method of Analysis

The stormwater management criteria for this development are based on the pre-consultation with City of Ottawa and the Rideau Valley Conservation Authority officials, the City of Ottawa Sewer Design Guidelines including City of Ottawa Stormwater Management Design Guidelines, 2012 (City standards), as well as the Ministry of the Environment's Stormwater Management Planning and Design Manual, 2003 (SWMPD Manual). Refer to **Appendix A** for pre-consultation notes.

Based on the pre-consultation meeting, the stormwater objectives are as follows:

- Design post-development to pre-development flow rates and retain flows up to the 100- 5 year storm event
- Assume the pre-development site cover to be representative of the site from 2011
- 80% TSS removal required

#### 5.3.1 Water Quality

The subject property lies within the Jock River Subwatershed – Hobbs Drain Catchment and is subject to review by the Rideau Valley Conservation Authority (RVCA). Based on the RVCA comments found in the Pre-Application Consulting Meeting Notes, 80% TSS removal for water quality protection will be required for this site.

Part of the stormwater design will be the construction of an onsite storm detention area. The stormwater conveyed to the detention area, will be stored and eventually outlet to the east at a release rate of 359.82 L/s. To achieve 80% TSS removal water quality protection, an OGS Stormceptor EF012 is proposed at the outlet of the detention area to treat water outletting into the existing ditch. Moreover, the grassed area and the detention area will promote ground infiltration and minimize sediment conveyance.

Refer to **Appendix C** for the selection, the type, and for more information on the treatment unit.

#### 5.3.2 Water Quantity

Based on pre-consultation with City officials, the quantity control for the site will be based on a pre to post development stormwater design. To be conservative and ensure the site functions

well, the stormwater design for the site is based on controlling the 100-year post development event to the 5-year pre-development storm event.

The Modified Rational Method has been used to calculate the runoff rate from the site to quantify the detention storage required for quantity control of the development. Based on these stormwater objectives for the subject site, a runoff coefficient of **C=0.26** and a time of concentration of **32 minutes**, it was determined that the allowable release rate for subject site will be **377.57 L/s**. This release rate is based on the 5-year pre-development release rate. Refer to **Appendix B** for calculations. Additionally, when calculating the allowable release rate for the site, only the areas that will be disturbed are considered in this calculation. These areas have a combined total area of 10.263ha.

**Table 1: Summary of Stormwater Quantity Control Requirements**

Quantity Control Parameters	5 Year Post-Development	100 Year Post-Development
Pre-Development Storm Event	5 Year	100 Year
Calculated Allowable Release Rate (L/s)	377.57	377.57

#### 5.4 Proposed Stormwater Quantity Controls

The proposed stormwater management quantity controls for this development will be accomplished through the use of a stormwater detention area which will be located within the existing grassed area in the southeast portion of the site.

Onsite flows from the gravel drive aisles, gravel onsite areas and portions of the grassed areas will be collected and directed via swales towards the onsite detention area. The remainder of the controlled areas onsite will sheet flow overland towards the onsite detention area. The proposed area and swales locations are shown in drawings C401 and C601 in **Appendix D** and detailed calculations can be found in **Appendix B**.

The post development condition has been analyzed and there are three (3) post-development watersheds.

- WS-01 (1.52ha) consists of gravel parking and drive aisle areas, the roof of building 2 and the grass section covering the septic field. This surface water from this watershed will flow towards the onsite swale located on the northeast side of the site and convey the flow to the stormwater detention area. The stormwater from this watershed will ultimately be controlled via an orifice plate located at the outlet pipe of the storm detention area.
- WS-02 (8.74ha) consists primarily of gravel parking and drive aisle areas, the roofs of buildings 1, 4 and 5, and grass sections. A portion of this watershed will flow overland to the swale located in the southeast side of the site to the detention area. The remainder of the watershed will sheet flow into the detention area and a portion of the watershed will be the detention area. The stormwater from this watershed will ultimately be controlled via an orifice plate located at the outlet pipe of the storm detention area.



- EWS-01 (6.10ha) primarily consists of grassed areas. This watershed existed in predevelopment conditions and will ultimately remain untouched and continue to have the same topography as in pre-development conditions. The watershed will flow uncontrolled to the northeast boundary of the site towards an offsite watercourse.

All flows from the site will ultimately flow towards the northeast boundary of the site to an offsite watercourse which ultimately carries the flows towards a ditch within the Fallowfield Road Right-of-Way.

Table 2 below summarizes post-development drainage areas. Calculations can be seen in **Appendix B**.

**Table 2: Post-Development Watershed Areas & Runoff Coefficients**

Drainage Area	Area (ha)	Runoff Coefficient (C)
EWS-01 (uncontrolled)	6.096	0.20
WS-01 (controlled)	1.525	0.64
WS-02 (controlled)	8.736	0.62
<b>Total</b>	<b>10.263</b>	<b>0.62</b>

Refer to C601, Stormwater Management Plan and C702, Post-Development Watershed Plan in **Appendix D** for reference.

Calculations were conducted to determine the required storage volumes for the 5-year and 100-year storm events at the allowable release rate of 359.82 L/s (this allowable release rate does not take into account EWS-01 as this area will remain untouched and will continue to follow the same topography as pre-development conditions). Stormwater quantity control downstream of the detention area will be provided by means of the outlet pipe. The proposed 500mm dia concrete pipe was designed to convey stormwater at full capacity ensuring a controlled release rate of 359.82 L/s for both 100-year and 5-year storm events. The required storage volumes at the 5-year and 100-year storms are **1077.69 m<sup>3</sup>** and **3167.58 m<sup>3</sup>**, respectively. The proposed onsite stormwater detention area will have an available storage capacity of **4,511.00m<sup>3</sup>**. Table 3 summarizes the release rates and required storage volumes for the 5-year and 100-year storms. For detailed release rate and storage calculations, refer to **Appendix B**.

**Table 3: Stormwater Release Rates & Storage Volume Summary**

CATCHMENT AREAS	DRAINAGE AREAS (ha)	RUNOFF/ STORAGE				Total Storage Provided (m <sup>3</sup> )
		100-YEAR		5-YEAR		
		RELEASE RATE (L/s)	REQUIRED STORAGE (m <sup>3</sup> )	RELEASE RATE (L/s)	REQUIRED STORAGE (m <sup>3</sup> )	
WS-01, WS-02 (CONTROLLED)	10.263	359.82	3167.58	359.82	1077.69	4,511.00
<b>TOTAL</b>	<b>10.263</b>	<b>359.82</b>	<b>3167.58</b>	<b>359.82</b>	<b>1077.69</b>	<b>4,511.00</b>



The release rates from the site meet the allowable release rate of **377.57 L/s** at the 5-year and 100-year storms. Storage requirements are met through the onsite stormwater detention area. There will be no surface ponding at the 2-year and 5-year storms as there is enough volume capacity within the stormwater detentions area to take on the required storage volumes. For detailed release rate and storage calculations, refer to **Appendix B**. For additional information on the stormwater detention area and pipe sizing and calculations, refer to drawings C601, C901, C902 in **Appendix D and Appendix B**.

The proposed stormwater quantity control measures at the outlet will be achieved via the proposed 500mm conc sewer pipe conveying water from the detention area to the existing swale/ditch and stormwater to be conveyed downstream of the existing ditch. The pipe is intended to convey stormwater at a full capacity and will provide quantity controls with a controlled release rate of 359.82 L/s for the 100 year and 5 year storm event. From the pipe inlet, stormwater will be conveyed to the proposed treatment unit and ultimately to the ditch outlet.

## 6 WATER SUPPLY

A licensed well contractor (Air Rock Drilling) was retained to install a new drilled well onsite on May 18, 2023. The new drilled well, referred to as TW1, was tested in support of the proposed development and was able to provide a sufficient volume of groundwater for the proposed development. LRL drawing included in **Appendix D** outlines the location of the supply well.

At this preliminary stage, it is assumed that the water demand requirements are calculated for a total of potential 100 employees. Considering an average water consumption rate of 75L/person/day, the total projected water demand will be 7500 L/ day; which remains below the total 10,000 L/ day flow accounted for in the septic design.

A comprehensive water demand calculation will be conducted during the later Site Plan Control stage, where the total required water volume, including the volume required for fire flow, will be calculated and confirmed.

The revised hydrogeological assessment and terrain analysis report (November 23, 2023) states that the intended use of the new supply well meets the quantity demands of the proposed constructions, however, also recommends considering treatment options for the quality of the water for the parameters exceeding the ODWS and D-5-5 guidelines outlined in the study report.

## 7 SANITARY SERVICE

There are no municipal services available in this area. Hence a new septic system is proposed to be constructed on the North- East side of the property to service the proposed development. LRL drawing C401 (**Appendix D**) outlines the proposed location of the septic system. At this stage, the ability of the overall site has been assessed to attenuate the proposed flows. A complete septic design and an approved permit from OSSO will be provided at the later Site Plan Control stage. At the SPC stage, a Class 4 sewage system design of less than 10,000 L/day is anticipated to be proposed. The septic tank shall be cleaned whenever sludge and scum occupy one-third of the tank capacity.

## 8 EROSION AND SEDIMENT CONTROL

During construction, erosion and sediment controls will be provided via a sediment control fence to be erected along the perimeter of the proposed rezoning area where runoff has the potential of leaving the site. Construction and maintenance requirements for erosion and sediment controls are to comply with Ontario Provincial Standard Specification OPSS.MUNI 805.

Light duty straw bale to be placed at the downstream portion of the pipe outlet and will be used to trap sediment. Upon removal of these straw bale check dams, the built-up sediment along the proposed ditches is to be removed.

Construction vehicles will enter and leave the site at one (1) construction entrance off Flewellyn Road. This entrance will have a stabilized construction entrance mud mat installed to limit the amount of sediment tracked off the site. Once the mud mat is not operating properly, it is to be removed and replaced. Refer to Erosion and Sediment Control Plan C101 in **Appendix D** for additional details.

## 9 MAINTENANCE

Maintenance is the key issue for all types of stormwater management practices. It ensures performance efficiency of the facilities and prevents undesirable consequences such as flooding or events leading to contamination to the neighboring properties.

The proposed enhanced grassed swale maintenance would consist of inspecting the swale and outlet on a periodic basis as well as routine cleaning to remove sedimentation build up as deemed necessary. It is the responsibility of the owner to maintain and clean swale, and keep a log of all the maintenance activities.

The proposed quality control Stormceptor (oil and grit separator) maintenance would consist of inspecting the structure (inlet, outlet, cover) on a periodic basis as well as routine cleaning to remove sedimentation build up as deemed necessary. It is the responsibility of the Owner to maintain and clean the detention area outlet and the treatment unit; and keep a log of all the maintenance activities.

The proposed septic tank will require regular maintenance including scheduled cleaning to ensure that the sludge and scum does not occupy more than one-third of the working capacity of the tank.

## 10 CONCLUSION

This stormwater management and servicing report for the proposed development at 7628 Flewellyn Road presents the rationale and details for the design requirements for the subject property. In accordance with the report objectives, the servicing requirements for the development are summarized below.

### Stormwater Quantity

The site will include a detention area outlet at the north east side of the site (rear end) and adheres to the following quantity control measures:

- The post-development flows for the 5-year and 100-year storm events will be less than or equal to pre-development release rates, respectively.

- Stormwater quantity control rates will be met with the storm -sewer pipe to limit and control stormwater flow leaving a storm water detention area.

#### Stormwater Quality

- The site design uses low-impact development measures on the controlled watershed to achieve the goal of 80% TSS removal; uncontrolled watersheds are grassed areas and considered clean water.
- Stormwater quality control objectives will be met with the installation of a Stormceptor EF012 oil and grit separator (or approved equivalent) at the outlet of the stormwater detention area.

#### Domestic Water

- The proposed new supply well is anticipated to adequately service the proposed construction.

#### Sanitary sewer

- A new septic system will be designed to accommodate the sanitary discharge from the proposed buildings.



## 11 REPORT CONDITIONS AND LIMITATIONS

The report conclusions are applicable only to this specific project described in the preceding pages. Any changes, modifications or additions will require a subsequent review by LRL Associates Ltd. to ensure the compatibility with the recommendations contained in this document.

In addition, this report has been prepared in consideration of the terms and conditions noted above and with the civil drawings prepared for the new development. Should there be any changes in the design features, which may relate to the stormwater considerations, LRL Associates Ltd. should be advised to review the report recommendations.

If you have any questions or comments, please contact the undersigned.

Prepared by:

**LRL Associates Ltd.**

*Sarthak Vora*

Sarthak Vora, EIT  
Civil E.I.T.



Virginia Johnson, P.Eng  
Civil Engineer



## **Appendices**

# **Appendix A**

## **Pre-consultation Meeting Minutes**

PC 2020-0260 – 7628 Flewellyn Road  
November 9, 2020  
Via video call

### In Attendance

Anissa McAlpine - Planner, anissa.mcalpine@ottawa.ca  
Kevin Hall - Senior Project Manager, Kevin.Hall@ottawa.ca  
Matthew Hayley - Environmental planner, Matthew.hayley@ottawa.ca  
Eric Lalonde – RVCA planner, eric.lalonde@rvca.ca

Mike Szilagyi, Fotenn szilagyi@fotenn.com  
victoria@cashfortrashcanada.com;  
charbel@cashfortrashcanada.com;

### **Proposal**

The proposal seeks to rezone the lands such that

- a) the portion of the lot fronting on to Flewellyn Road would be zoned RU for the purpose of developing a residential dwelling and,
- b) rezoning the remaining portion RG with an exception to permit shifting the existing light industrial use further south to establish a greater separation distance from surrounding residential uses as well as other screening measures such as fencing or berms, as an example.

Staff notes:

- The concept plan shows a future residential block is shown in the ME designated quarry to the east. Staff knows of no approvals for this residential block and it has not been considered in these pre-con notes.
- Rezoning the front part of the property to an RU is not appropriate due to ME designation found on adjacent lands to the south. Please note that a dwelling is a permitted use under the current zone, accessory to the permitted RG use.
- The provided list of required studies and plans assumes that the existing RG is retained at the front of the property and that the proposed zoning amendment is to permit an industrial use further south on the property (from RU to RG).
- An air strip was identified on the site. While not within municipal jurisdiction, the airstrip details need to be reflected in the technical studies and plans submitted.
- Staff will be looking for confirmation of MECP approval for the recycling facility.

### **Existing Designations and Zones**

#### OP:

The General Rural Area contains a variety of land uses, such as farms, rural housing, wood lots and forests, small industries, golf courses, and in many places, existing clusters of residential subdivisions and severances and commercial development. The intent of this designation is to accommodate a variety of land uses that are appropriate for a rural location and to limit the amount of residential development such that development will not preclude or resist continued agricultural and or other non-residential uses.

## Zoning

Existing zoning RG [21r] The Rural General Industrial zone: where the intent is generally to

- permit the development of light industrial uses in areas mainly designated as General Rural Area, Village and Carp Road Corridor Rural Employment in the Official Plan;
- accommodate a range of light industrial uses and limited service commercial uses for the travelling public;
- and, regulate development in a manner that respects adjacent land uses and will have a minimal impact on the surrounding rural area.
- Special exception to 21r to also allow a detached dwelling. The detached dwelling must be accessory to a permitted use.

Existing zoning RU Rural Countryside, where the purpose is to:

- accommodate agricultural, forestry, country residential lots created by severance and other land uses characteristic of Ottawa's countryside, in areas designated as General Rural Area, Rural Natural Features and Greenbelt Rural in the Official Plan;
- recognize and permit this range of rural-based land uses which often have large lot or distance separation requirements; and
- regulate various types of development in manners that ensure compatibility with adjacent land uses and respect the rural context.

## **Required studies and plans**

### **Planning Rationale:**

The Planning Rationale serves to organize and substantiate the planning justification in support of the proposed development, how the proposal represents good planning and how it is consistent with the Official Plan, the Provincial Policy Statement and other relevant plans and policies. Please be sure to address the adjacent Mineral extraction operation and discuss the proposal sensitivity to the adjacent extraction operation.

### **Site plan:**

If a zoning by-law amendment is submitted separately from the site plan, a conceptual site plan is required. A detailed site plan with landscaping and architectural drawings for any proposed structures is required for a site plan submission. A survey is required with all application types.

**A Phase 1 ESA** is required for any development application on the site. A phase 2 will be required depending on the outcome of the Phase 1 ESA

### **Environmental**

An Environmental Impact Statement (EIS) and tree conservation report (TCR) are required to support a rezoning application due to potential Endangered and Threatened Species habitat and significant woodlands. The EIS/TCR will have to include a section on the wetland and the watercourse. The EIS/TCR will need to be a full EIS as per the



EIS Guidelines and include multiple season surveys. It is recommended that the EIS consultant contacts Matthew Hayley, Environmental Planner, to discuss the term of reference. The local MECP office should be contacted to determine which species should be looked at. The EIS Guidelines are available here: <http://ottawa.ca/en/development-application-review-process-0/environmental-impact-statement-guidelines> If you have any questions on the EIS please contact Matthew Hayley at 613-580-2424 x23358. Be advised that some elements of the EIS are season specific therefore you should contact the MECP as soon as possible to get started on your field work. The Rideau Valley Conservation Authority (RVCA) will review this study also as they are interested in the wetland and watercourse components.

A watercourse runs along the eastern property boundary. A concept Site Plan indicating development will be setback from the watercourse as per Section 4.7.3 of the Official Plan. This means the development will need a setback which is greater of, 15 m from top of bank, 30 m from edge of normal highwater mark, geotechnical limit of hazard or flood plain.

### **Parks**

Cash in lieu of parkland will be calculated and collected at site plan.

### **Noise**

A noise study will be required. Section 4.8.7 Environmental Noise Control - New Stationary Noise Sources dictates that:

9. Development proposals that introduce new sources of stationary noise in proximity to existing noise sensitive land uses will require a noise feasibility study and/or noise control detailed study if within the following proximities of noise sensitive land uses: 100 metres for:

- A) new stationary noise sources;
- b) *lands to be zoned for a new industrial use;*

### **Engineering**

For a zoning bylaw amendment, a servicing brief is needed. If the zoning by-law amendment application is submitted simultaneously with a site plan, the servicing brief is not required.

For a site plan application, we will need to see

- Engineering drawings (grading, ESC plans, etc.)
- Geotech report
- Stormwater Management report is required with 80 % TSS removal (enhanced level protection). Must match pre to post flows
- A pre-consult with MECP is recommended for industrial stormwater ECA.

Please contact:

Emily Diamond  
(613) 521-3450, ext. 238  
Emily.Diamond@ontario.ca

### Hydrogeology

- Discussion of the need for a well and septic was not raised at the meeting. For a zoning by-law amendment, a hydrogeological assessment to confirm water quantity/quality and the potential impact on adjacent users. At site plan applications, a supply well will need to be established if a well is needed.
- The site has thin soils and is likely hydrogeologically sensitive, in addition the bedrock in this area is identified as potential karst. For areas of thin soil, nitrate dilution is challenging since there is little dilution happening in thin soil (the calculation is not really applicable, and should be modified to include only areas where infiltration/dilution can occur). Thus, a terrain analysis should accompany a septic impact assessment; soil type and thickness across the site should be identified and recommendations provided for the best location for septic.
- Please note that the site is located in the Wellhead Protection Area D (vulnerability score 2)

### **Transportation:**

No Transportation Impact Assessment required.

### **Relevant City of Ottawa Links to Preparing Studies and Plans:**

Based on the illustration provided, this is a **major zoning amendment** application and **site plan and zoning bylaw amendment**. Please review the fees associated with this [here](#). Please note that there is a discount in planning fees when multiple applications for the same site are submitted simultaneously. Submitting both the ZBLA and Site plan control application simultaneously will result in the need for less studies to be completed/submitted.

Attached is the *Applicant's Study and Plan Identification List*, which identifies the required studies and plans to support your application. For additional information on preparing studies and plans, please click on the following hyperlink: [Guide to Preparing Studies and Plans](#).

Servicing Study Guidelines for Development Applications:

<http://ottawa.ca/en/development-application-review-process-0/servicing-study-guidelines-development-applications>

As you may know, the property is in ward 21 – Scott Moffatt. It is in your best interest to initiate contact with close neighbours as well as the Councillor and Registered

Community Groups. In addition, it may be beneficial to contact key technical agencies that may be involved in this file to discuss the proposal before submitting an application.

You may also want to reference information available on the City's website for building permits/demolition permits and development charges as well. For additional information on these items, please follow the following associated links: [Building Permits](#) or [Development Charges](#). Please contact Building Code Services if you have any questions regarding permits or charges; they can be reached by phoning 311.

The above pre-consultation comments are valid for one year. If you submit a development application after this time, you may be required to meet for another pre-consultation meeting and/or the submission requirements may change.

Please do not hesitate to contact me if you have questions or require clarification.


All identified required plans are to be submitted digitally in PDF format. Application submission information during COVID-19 is available here: <https://ottawa.ca/en/business/economic-support-and-recovery/planning-applications-and-building-permits-during-covid-19>

If you have any questions do not hesitate to me at the below email address.

Sincerely,

# **Appendix B**

## **Stormwater Management Design Sheets**

	<b>LRL File No.</b> 210092
	<b>Project:</b> Cash For Trash
	<b>Location:</b> 7628 Flewellyn Road
	<b>Date:</b> January 30, 2024
	<b>Designed:</b> T.Harb
	<b>Checked:</b> V.Johnson
	<b>Dwg Reference:</b> C701, C702

**Pre-Development Catchments**

<b>Watershed</b>	<b>C = 0.20</b>	<b>C = 0.80</b>	<b>C = 0.90</b>	<b>Total Area (ha)</b>	<b>Combined C</b>
EWS-01 (uncontrolled)	6.096	0.000	0.000	6.096	0.20
EWS-02 (uncontrolled)	3.194	0.064	0.000	3.258	0.21
EWS-03 (uncontrolled)	1.084	0.572	0.040	1.696	0.42
EWS-04 (uncontrolled)	1.783	0.136	0.000	1.919	0.24
EWS-05 (uncontrolled)	2.895	0.132	0.000	3.027	0.23
EWS-06 (uncontrolled)	0.149	0.014	0.000	0.163	0.25
EWS-07 (uncontrolled)	0.200	0.000	0.000	0.200	0.20
<b>Total</b>	<b>9.305</b>	<b>0.918</b>	<b>0.040</b>	<b>10.263</b>	<b>0.26</b>

**Post-Development Catchments**

<b>Watershed</b>	<b>C = 0.20</b>	<b>C = 0.8</b>	<b>C = 0.90</b>	<b>Total Area (ha)</b>	<b>Combined C</b>
EWS-01 (uncontrolled)	6.096	0.000	0.000	6.096	0.20
WS-01 (controlled)	0.428	0.948	0.149	1.525	0.64
WS-02 (controlled)	2.786	5.227	0.725	8.738	0.62
<b>Total</b>	<b>3.214</b>	<b>6.175</b>	<b>0.874</b>	<b>10.263</b>	<b>0.62</b>

Watershed EWS-01 is not taken into consideration for the calculation.



**LRL File No.** 210092  
**Project:** Cash For Trash  
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**Designed:** T.Harb  
**Checked:** V.Johnson  
**Drawing Ref.:** C701, C702

**Stormwater Management  
Design Sheet**

**STORM - 5 YEAR**

**Runoff Equation**

**Q = 2.78CIA (L/s)**  
 C = Runoff coefficient  
 I = Rainfall intensity (mm/hr) =  $A / (T_d + C)^B$   
 A = Area (ha)  
 T<sub>c</sub> = Time of concentration (min)

**Pre-Development Catchments within Development Area**

		Total Area =	10.263	ha	ΣR=	0.26
<b>Un-Controlled</b>	EWS-01	6.096	ha	R=	0.20	
	EWS-02	3.258	ha	R=	0.21	
	EWS-03	1.696	ha	R=	0.42	
	EWS-04	1.919	ha	R=	0.24	
	EWS-05	3.027	ha	R=	0.23	
	EWS-06	0.163	ha	R=	0.25	
	EWS-07	0.200	ha	R=	0.20	
	<b>Total Uncontrolled =</b>		<b>10.263</b>	<b>ha</b>	<b>ΣR=</b>	<b>0.26</b>

**Pre-development Stormwater Management (5-Yr)**

$I_5 = 998.071 / (T_d + 6.053)^{0.814}$

**A = 998.071**

**B = 0.814**

**C = 6.053**

C = 0.26 max of 0.5 as per City of Ottawa  
 I = 51.6 mm/hr  
 T<sub>c</sub> = 32 min  
 Total Area = 10.263 ha

Release Rate = 377.57 L/s

**Pre-development Stormwater Management (100-Yr)**

$$I_{100} = 1735.688 / (Td + 6.014)^{0.820}$$

A = 1735.688

B = 0.820

C = 6.014

C = 0.26  
 I = 87.9 mm/hr  
 Tc = 32 min  
 Total Area = 10.263 ha  
 Release Rate = 642.97 L/s

Allowable Release Rate = 377.57 L/s

Controlled Release Rate = 359.82 L/s

(5-yr pre-development level, see drawing C701)

**Post-development Stormwater Management**

				$\Sigma R_{2\&5}$	$\Sigma R_{100}$	
<b>Total Site Area =</b>		<b>16.359</b>	ha	$\Sigma R =$	<b>0.62</b>	<b>0.78</b>
<b>Controlled</b>	WS-01	1.525	ha	R =	0.64	0.80
	WS-02	8.738	ha	R =	0.62	0.77
	<b>Total Controlled =</b>	<b>10.263</b>	<b>ha</b>	$\Sigma R =$	<b>0.62</b>	<b>0.78</b>
<b>Uncontrolled</b>	EWS-01	6.096	ha	R =	0.20	0.25
	<b>Total Uncontrolled =</b>	<b>6.096</b>	<b>ha</b>	$\Sigma R =$	<b>0.20</b>	<b>0.25</b>

**Post-development Stormwater Management (5-Yr)**

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m <sup>3</sup> )	*Controlled Release	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	104.19	1844.94	891.07	359.82	0.00	359.82
15	83.56	1479.54	1007.75	359.82	0.00	359.82
20	70.25	1243.93	1060.93	359.82	0.00	359.82
25	60.90	1078.28	1077.69	359.82	0.00	359.82
30	53.93	954.89	1071.13	359.82	0.00	359.82
35	48.52	859.10	1048.48	359.82	0.00	359.82
40	44.18	782.37	1014.12	359.82	0.00	359.82
45	40.63	719.41	970.89	359.82	0.00	359.82
50	37.65	666.72	920.71	359.82	0.00	359.82
55	35.12	621.93	864.95	359.82	0.00	359.82
60	32.94	583.33	804.63	359.82	0.00	359.82

65	31.04	549.69	740.49	359.82	0.00	359.82
70	29.37	520.09	673.12	359.82	0.00	359.82
75	27.89	493.82	602.99	359.82	0.00	359.82
80	26.56	470.33	530.46	359.82	0.00	359.82
85	25.37	449.20	455.84	359.82	0.00	359.82
90	24.29	430.07	379.36	359.82	0.00	359.82
95	23.31	412.67	301.24	359.82	0.00	359.82
100	22.41	396.76	221.65	359.82	0.00	359.82
105	21.58	382.16	140.73	359.82	0.00	359.82
110	20.82	368.70	58.62	359.82	0.00	359.82
115	20.12	356.26	0.00	359.82	0.00	359.82
120	19.47	344.71	0.00	359.82	0.00	359.82

**On-site stormwater detention**

<b>Storage required =</b>	<b>1077.69</b>	<b>m<sup>3</sup></b>	
Surface storage provided =	1369.00	m <sup>3</sup>	(See Dwg C601)
Underground Storage provided =	0.00	m <sup>3</sup>	(See 2-Yr STM Design Sheet)
<b>Total storage provided =</b>	<b>4511.00</b>	<b>m<sup>3</sup></b>	





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**Drawing Ref.:** C701, C702

**Stormwater Management  
Design Sheet**

**STORM - 100 YEAR**

**Runoff Equation**

**Q = 2.78CIA (L/s)**  
 C = Runoff coefficient  
 $I = \text{Rainfall intensity (mm/hr)} = A / (T_d + C)^B$   
 A = Area (ha)  
 $T_c = \text{Time of concentration (min)}$

**Pre-Development Catchments within Development Area**

	<b>Total Area =</b>	<b>10.263</b>	ha	<b>ΣR=</b>	<b>0.26</b>
<b>Un-Controlled</b>	EWS-01	6.096	ha	R=	0.20
	EWS-02	3.258	ha	R=	0.21
	EWS-03	1.696	ha	R=	0.42
	EWS-04	1.919	ha	R=	0.24
	EWS-05	3.027	ha	R=	0.23
	EWS-06	0.163	ha	R=	0.25
	EWS-07	0.200	ha	R=	0.20
	<b>Total Uncontrolled =</b>	<b>10.263</b>	<b>ha</b>	<b>ΣR=</b>	<b>0.26</b>

**Pre-development Stormwater Management (5-Yr)**

$I_5 = 998.071 / (T_d + 6.053)^{0.814}$

**A = 998.071**

**B = 0.814**

**C = 6.053**

C = 0.26 max of 0.5 as per City of Ottawa  
 I = 51.6 mm/hr  
 T<sub>c</sub> = 32 min  
 Total Area = 10.263 ha  
 Release Rate = 377.57 L/s

**Pre-development Stormwater Management (100-Yr)**

$$I_{100} = 1735.688 / (Td + 6.014)^{0.820}$$

A = 1735.688

B = 0.820

C = 6.014

C = 0.26  
 I = 87.9 mm/hr  
 Tc = 32 min  
 Total Area = 10.263 ha  
 Release Rate = 642.97 L/s

Allowable Release Rate = 377.57 L/s  
 Controlled Release Rate = 359.82 L/s

(5-yr pre-development level, see drawing C701)

**Post-development Stormwater Management**

					$\Sigma R_{2\&5}$	$\Sigma R_{100}$	
		Total Site Area =	16.359	ha	$\Sigma R =$	0.62	0.78
Controlled	WS-01		1.525	ha	R =	0.64	0.80
	WS-02		8.738	ha	R =	0.62	0.77
	Total Controlled =		10.263	ha	$\Sigma R =$	0.62	0.78
Uncontrolled	EWS-01		6.096	ha	R =	0.20	0.25
	Total Uncontrolled =		6.096	ha	$\Sigma R =$	0.20	0.25

**Post-development Stormwater Management (100-Yr)**

Time (min)	Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m <sup>3</sup> )	*Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	178.56	3952.17	2155.41	359.82	0.00	359.82
15	142.89	3162.77	2522.66	359.82	0.00	359.82
20	119.95	2654.94	2754.15	359.82	0.00	359.82
25	103.85	2298.52	2908.04	359.82	0.00	359.82
30	91.87	2033.38	3012.41	359.82	0.00	359.82
35	82.58	1827.77	3082.69	359.82	0.00	359.82
40	75.15	1663.24	3128.21	359.82	0.00	359.82
45	69.05	1528.34	3155.00	359.82	0.00	359.82
50	63.95	1415.54	3167.16	359.82	0.00	359.82
55	59.62	1319.69	3167.58	359.82	0.00	359.82
60	55.89	1237.15	3158.40	359.82	0.00	359.82
65	52.65	1165.26	3141.22	359.82	0.00	359.82
70	49.79	1102.03	3117.27	359.82	0.00	359.82

75	47.26	1045.94	3087.53	359.82	0.00	359.82
80	44.99	995.81	3052.77	359.82	0.00	359.82
85	42.95	950.73	3013.63	359.82	0.00	359.82
90	41.11	909.94	2970.62	359.82	0.00	359.82
95	39.43	872.83	2924.18	359.82	0.00	359.82
100	37.90	838.93	2874.68	359.82	0.00	359.82
105	36.50	807.82	2822.41	359.82	0.00	359.82
110	35.20	779.16	2767.64	359.82	0.00	359.82
115	34.01	752.66	2710.61	359.82	0.00	359.82
120	32.89	728.08	2651.50	359.82	0.00	359.82

**On-site stormwater detention**

**Storage required = 3167.58 m<sup>3</sup>**  
 Surface storage provided = 4511.00 m<sup>3</sup> (See Surface Ponding Sheet)  
 Underground storage provided = 0.00 m<sup>3</sup> (See 2-Yr STM Design Sheet)  
**Total storage provided = 4511.00 m<sup>3</sup>**



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**Drawing Ref.:** C701, C702

**Stormwater Management  
Design Sheet**

**STORM - 100 YEAR + Stress Test**

**Runoff Equation**

**Q = 2.78CIA (L/s)**  
 C = Runoff coefficient  
 I = Rainfall intensity (mm/hr) =  $A / (T_d + C)^B$   
 A = Area (ha)  
 T<sub>c</sub> = Time of concentration (min)

**Pre-Development Catchments within Development Area**

		Total Area =	10.263	ha	ΣR=	0.25
<b>Un-Controlled</b>	EWS-01	6.096	ha	R=	0.20	
	EWS-02	3.258	ha	R=	0.21	
	EWS-03	1.696	ha	R=	0.42	
	EWS-04	1.919	ha	R=	0.24	
	EWS-05	3.027	ha	R=	0.23	
	EWS-06	0.163	ha	R=	0.25	
	EWS-07	0.200	ha	R=	0.20	
	<b>Total Uncontrolled =</b>		<b>10.263</b>	<b>ha</b>	<b>ΣR=</b>	<b>0.25</b>

**Pre-development Stormwater Management (5-Yr)**

$$I_5 = 998.071 / (T_d + 6.053)^{0.814}$$

**A = 998.071**

**B = 0.814**

**C = 6.053**

C = 0.26 max of 0.5 as per City of Ottawa

I = 51.6 mm/hr

Tc = 32 min  
 Total Area = 10.263 ha  
 Release Rate = 377.57 L/s

**Pre-development Stormwater Management (100-Yr)**

$$I_{100} = 1735.688 / (Td + 6.014)^{0.820}$$

A = 1735.688

B = 0.820

C = 6.014

C = 0.26  
 I = 87.9 mm/hr  
 Tc = 32 min  
 Total Area = 10.263 ha  
 Release Rate = 642.97 L/s

**Allowable Release Rate = 377.57 L/s**  
**Controlled Release Rate = 359.82 L/s**

(5-yr pre-development level).

**Post-development Stormwater Management**

					$\Sigma R_{2&5}$	$\Sigma R_{100}$	
		<b>Total Site Area =</b>	<b>16.359</b>	ha	<b><math>\Sigma R =</math></b>	<b>0.62</b>	<b>0.78</b>
<b>Controlled</b>		WS-01	1.525	ha	R=	0.64	0.80
		WS-02	8.738	ha	R=	0.62	0.77
	<b>Total Controlled =</b>		<b>10.263</b>	<b>ha</b>	<b><math>\Sigma R =</math></b>	<b>0.62</b>	<b>0.78</b>
<b>Uncontrolled</b>		EWS-01	6.096	ha	R=	0.20	0.25
	<b>Total Uncontrolled =</b>		<b>6.096</b>	<b>ha</b>	<b><math>\Sigma R =</math></b>	<b>0.20</b>	<b>0.25</b>

**Post-development Stormwater Management (100-Yr + Stress Test)**

Time (min)	**Intensity (mm/hr)	Controlled Runoff (L/s)	Storage Volume (m <sup>3</sup> )	Controlled Release Rate (L/s)	Uncontrolled Runoff (L/s)	Total Release Rate (L/s)
10	214.27	4742.60	2629.67	359.82	0.00	359.82
15	171.47	3795.33	3091.96	359.82	0.00	359.82
20	143.94	3185.93	3391.33	359.82	0.00	359.82
25	124.62	2758.22	3597.60	359.82	0.00	359.82
30	110.24	2440.06	3744.42	359.82	0.00	359.82
35	99.09	2193.32	3850.35	359.82	0.00	359.82
40	90.17	1995.89	3926.57	359.82	0.00	359.82


45	82.86	1834.01	3980.30	359.82	0.00	359.82
50	76.74	1698.65	4016.48	359.82	0.00	359.82
55	71.55	1583.63	4038.58	359.82	0.00	359.82
60	67.07	1484.58	4049.15	359.82	0.00	359.82
65	63.18	1398.31	4050.12	359.82	0.00	359.82
70	59.75	1322.43	4042.97	359.82	0.00	359.82
75	56.71	1255.12	4028.87	359.82	0.00	359.82
80	53.99	1194.98	4008.75	359.82	0.00	359.82
85	51.54	1140.87	3983.37	359.82	0.00	359.82
90	49.33	1091.92	3953.35	359.82	0.00	359.82
95	47.32	1047.40	3919.22	359.82	0.00	359.82
100	45.48	1006.72	3881.40	359.82	0.00	359.82
105	43.80	969.39	3840.26	359.82	0.00	359.82
110	42.24	934.99	3796.13	359.82	0.00	359.82
115	40.81	903.19	3749.28	359.82	0.00	359.82
120	39.47	873.70	3699.94	359.82	0.00	359.82
125	38.23	846.26	3648.33	359.82	0.00	359.82
130	37.08	820.67	3594.62	359.82	0.00	359.82
135	36.00	796.73	3538.97	359.82	0.00	359.82

\*\*20% increase in intensity for "Stress Test"

**On-site stormwater detention**

<b>Storage required =</b>	<b>4050.12</b>	<b>m<sup>3</sup></b>	
Surface storage provided =	4511.00	m <sup>3</sup>	(See Dwg C601)
Underground storage provided =	0.00	m <sup>3</sup>	(See 2-Yr STM Design Sheet)
<b>Total storage provided =</b>	<b>4511.00</b>	<b>m<sup>3</sup></b>	

LRL Associates Ltd.  
Storm Design Sheet

	<b>LRL File No.</b> 210092 <b>Project:</b> Cash For Trash <b>Location:</b> 7628 Flewellyn Road <b>Date:</b> January 15, 2024 <b>Designed:</b> S.Vora <b>Drawing Ref.:</b> C701, C702	<b>Rational Method</b> $Q = 2.78CIA$ $Q =$ Peak flow in litres per second (L/s) $A =$ Drainage area in hectares (ha) $C =$ Runoff coefficient $I =$ Rainfall intensity (mm/hr)	<b>Storm Design Parameters</b> <b>Runoff coefficient (C)</b> Grass = 0.2 Gravel = 0.8 Asphalt / rooftop = 0.9	<b>Pipe Design Parameters</b> IDF curve: Ottawa Macdonald-Cartier International Airport Storm event: 100 Years Intensity equation: $I_{100} = 1735.688 / (Tc + 6.014)^{0.620}$ (mm/hr)	Minimum velocity = 0.80 m/s Manning's "n" = 0.013

LOCATION		AREA (ha)			FLOW					STORM SEWER								
WATERSHED / STREET	From MH	To MH	C = 0.20	C = 0.80	C = 0.90	Acc. 2.78AC	Time of Conc. (min.)	Rainfall Intensity (mm/hr)	Peak Flow Q (L/s)	Controlled Flow $Q_{CONT}$ (L/s)	Proposed Pipe Diameter (mm)	Type	Slope (%)	Length (m)	Capacity Full $Q_{FULL}$ (L/s)	Velocity Full (m/s)	Time of Flow (min)	Ratio $Q/Q_{FULL}$
SITE	DET AREA	RS DITCH	3.174	6.215	0.874	17.77	10.00	178.56	3173.65	359.82	525	PVC	0.70%	9.0	359.82	1.66	0.09	1.00

# **Appendix C**

## **SWM Quality Control Sheets**



Stormceptor® EF Sizing Report

<b>Imbrium® Systems</b>		01/18/2024															
<b>ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION</b>																	
Province:	Ontario	Project Name:	7628 Flewellyn Rd.														
City:	Ottawa	Project Number:	210092														
Nearest Rainfall Station:	OTTAWA CDA RCS	Designer Name:	Brandon O'Leary														
Climate Station Id:	6105978	Designer Company:	Rinker Pipe														
Years of Rainfall Data:	20	Designer Email:	brandon.oleary@RinkerPipe.com														
Site Name: 7628 Flewellyn Rd.		Designer Phone:	905-630-0359														
Drainage Area (ha):	10.26	EOR Name:	Sarthak Vora														
Runoff Coefficient 'c':	0.62	EOR Company:	LRL Associates Ltd.														
Particle Size Distribution: Fine		EOR Email:															
Target TSS Removal (%):	80.0	EOR Phone:															
Estimated Water Quality Flow Rate (L/s):	90.0	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="text-align: center;"><b>Net Annual Sediment (TSS) Load Reduction Sizing Summary</b></th> </tr> <tr> <th style="width: 50%;">Stormceptor Model</th> <th style="width: 50%;">TSS Removal Provided (%)</th> </tr> </thead> <tbody> <tr> <td>EFO4</td> <td>35</td> </tr> <tr> <td>EFO6</td> <td>51</td> </tr> <tr> <td>EFO8</td> <td>63</td> </tr> <tr> <td>EFO10</td> <td>72</td> </tr> <tr> <td style="background-color: yellow;">EFO12</td> <td style="background-color: yellow;">80</td> </tr> </tbody> </table>		<b>Net Annual Sediment (TSS) Load Reduction Sizing Summary</b>		Stormceptor Model	TSS Removal Provided (%)	EFO4	35	EFO6	51	EFO8	63	EFO10	72	EFO12	80
<b>Net Annual Sediment (TSS) Load Reduction Sizing Summary</b>																	
Stormceptor Model	TSS Removal Provided (%)																
EFO4	35																
EFO6	51																
EFO8	63																
EFO10	72																
EFO12	80																
Oil / Fuel Spill Risk Site?	Yes																
Upstream Flow Control?	Yes																
Upstream Orifice Control Flow Rate to Stormceptor (L/s):	359.82																
Peak Conveyance (maximum) Flow Rate (L/s):	359.82																
<p><b>Recommended Stormceptor EFO Model: EFO12</b></p> <p><b>Estimated Net Annual Sediment (TSS) Load Reduction (%): 80</b></p> <p><b>Water Quality Runoff Volume Capture (%): &gt; 90</b></p>																	



Stormceptor® **EF** Sizing Report

**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

Upstream Flow Controlled Results

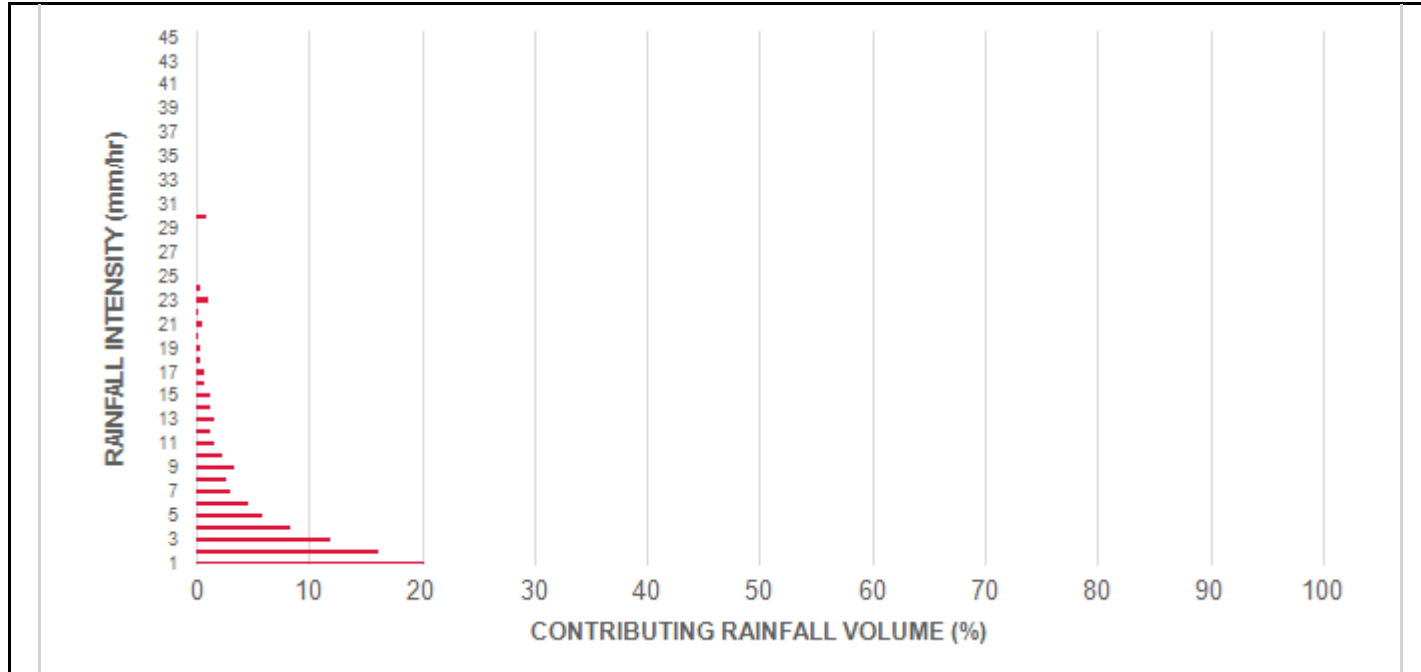
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	8.6	8.6	8.84	531.0	42.0	100	8.6	8.6
1.00	20.3	29.0	17.68	1061.0	85.0	98	20.0	28.6
2.00	16.2	45.2	35.37	2122.0	170.0	87	14.1	42.7
3.00	12.0	57.2	53.05	3183.0	255.0	81	9.7	52.4
4.00	8.4	65.6	70.74	4244.0	340.0	77	6.5	58.9
5.00	5.9	71.6	88.42	5305.0	424.0	73	4.3	63.2
6.00	4.6	76.2	106.10	6366.0	509.0	69	3.2	66.4
7.00	3.1	79.3	123.79	7427.0	594.0	65	2.0	68.4
8.00	2.7	82.0	141.47	8488.0	679.0	64	1.8	70.2
9.00	3.3	85.3	159.16	9549.0	764.0	63	2.1	72.3
10.00	2.3	87.6	176.84	10610.0	849.0	63	1.4	73.7
11.00	1.6	89.2	194.53	11672.0	934.0	62	1.0	74.7
12.00	1.3	90.5	212.21	12733.0	1019.0	61	0.8	75.5
13.00	1.7	92.2	229.89	13794.0	1103.0	59	1.0	76.5
14.00	1.2	93.5	247.58	14855.0	1188.0	57	0.7	77.2
15.00	1.2	94.6	265.26	15916.0	1273.0	55	0.6	77.9
16.00	0.7	95.3	282.95	16977.0	1358.0	53	0.4	78.2
17.00	0.7	96.1	300.63	18038.0	1443.0	51	0.4	78.6
18.00	0.4	96.5	318.31	19099.0	1528.0	48	0.2	78.8
19.00	0.4	96.9	336.00	20160.0	1613.0	45	0.2	79.0
20.00	3.1	100.0	353.68	21221.0	1698.0	43	1.4	80.4
21.00	0.0	100.0	360.00	21600.0	1728.0	43	0.0	80.4
22.00	0.0	100.0	360.00	21600.0	1728.0	43	0.0	80.4
23.00	0.0	100.0	360.00	21600.0	1728.0	43	0.0	80.4
24.00	0.0	100.0	360.00	21600.0	1728.0	43	0.0	80.4
25.00	0.0	100.0	360.00	21600.0	1728.0	43	0.0	80.4
30.00	0.0	100.0	360.00	21600.0	1728.0	43	0.0	80.4
35.00	0.0	100.0	360.00	21600.0	1728.0	43	0.0	80.4
40.00	0.0	100.0	360.00	21600.0	1728.0	43	0.0	80.4
45.00	0.0	100.0	360.00	21600.0	1728.0	43	0.0	80.4
<b>Estimated Net Annual Sediment (TSS) Load Reduction =</b>								<b>80 %</b>

Climate Station ID: 6105978 Years of Rainfall Data: 20

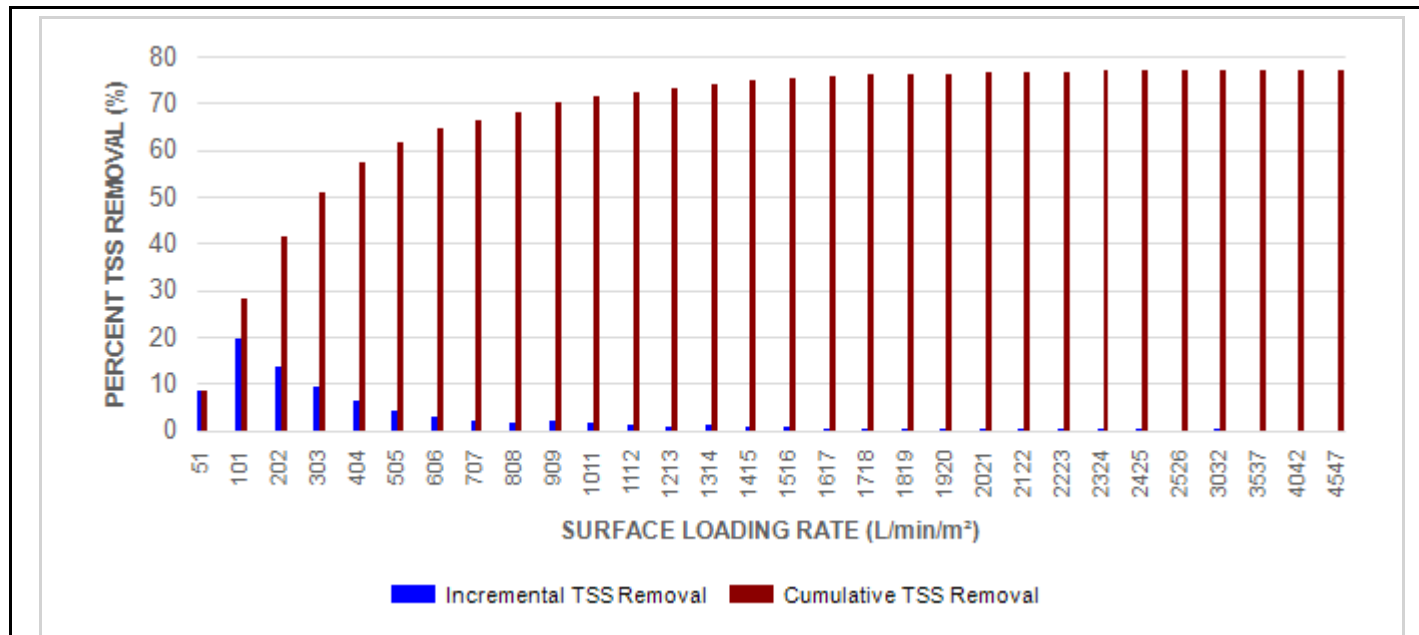


Stormceptor® EF Sizing Report

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
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**

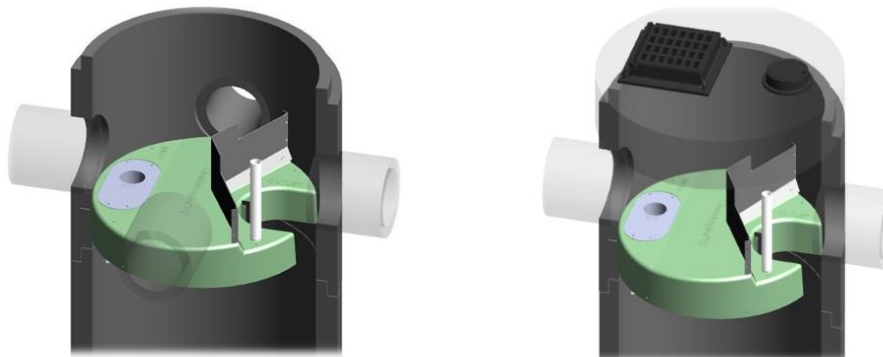
► Stormceptor® EF and EFO feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance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

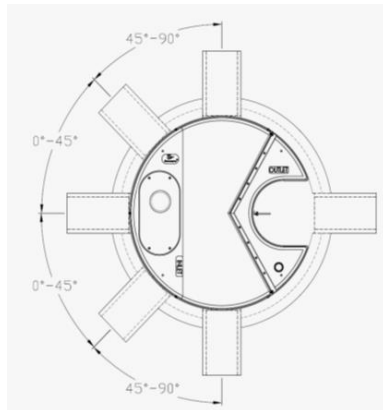
► Stormceptor® EF and EFO offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, 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)	(ft³)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

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

\*\* Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/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>



**Stormceptor® EF Sizing Report**

## 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 <sup>3</sup> sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m <sup>3</sup> sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m <sup>3</sup> sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m <sup>3</sup> sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m <sup>3</sup> sediment / 2,476 L oil



**Stormceptor® EF Sizing Report****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<sup>2</sup> to 1400 L/min/m<sup>2</sup>, 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<sup>2</sup> and 1400 L/min/m<sup>2</sup> 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<sup>2</sup> shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m<sup>2</sup>. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m<sup>2</sup>.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m<sup>2</sup> shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m<sup>2</sup>, and shall be calculated using a simple proportioning formula, with 1400 L/min/m<sup>2</sup> 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<sup>2</sup>.

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

## Stormceptor<sup>®</sup> EF Sizing Report

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<sup>2</sup>.

### 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<sup>2</sup> to 2600 L/min/m<sup>2</sup>) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators**. However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.



# **Appendix D**

## **Civil Engineering Drawings**

# CASH FOR TRASH 7628 FLEWELLYN ROAD, OTTAWA

## REVISION 02



KEY PLAN (N.T.S.)

DRAWING INDEX	
TITLE PAGE	
SEDIMENT AND EROSION CONTROL PLAN	C101
GRADING AND DRAINAGE PLAN	C301-C303
SERVICING PLAN	C401
STORMWATER MANAGEMENT PLAN	C601
PRE-DEVELOPMENT WATERSHED PLAN	C701
POST-DEVELOPMENT WATERSHED PLAN	C702
CONSTRUCTION DETAILS	C901,C902



**LRL**

ENGINEERING | INGÉNIERIE

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www.lrl.ca | (613) 842-3434

CASH FOR TRASH  
7628 FLEWELLYN ROAD, OTTAWA, ON  
REV.02: RE-ISSUED FOR APPROVAL - SEPTEMBER, 2024  
LRL PROJECT no: 210092



NOT AUTHENTIC UNLESS SIGNED AND DATED

## GENERAL NOTES

- ALL WORKS MATERIALS SHALL CONFORM TO THE LAST REVISION OF THE STANDARDS AND SPECIFICATIONS FOR THE CITY OF OTTAWA, ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS), WHERE APPLICABLE. LOCAL UTILITY STANDARDS AND MINISTRY OF TRANSPORTATION STANDARDS WILL APPLY WHERE REQUIRED.
- THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL EXISTING UTILITIES WITHIN THE SITE AND ADJACENT WORK AREAS. THE CONTRACTORS SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF ANY SERVICES OR UTILITIES DISTURBED DURING CONSTRUCTION , TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION.
- 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 CONTRACTORS TO CONFIRM UTILITY LOCATIONS AND NOTIFY ENGINEER OF POSSIBLE CONFLICTS PRIOR TO CONSTRUCTION WILL BE AT CONTRACTORS EXPENSE.
- ANY AREA BEYOND THE LIMIT OF THE SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITY HAVING JURISDICTION AT THE CONTRACTORS EXPENSE. RELOCATING OF EXISTING SERVICES AND/OR UTILITIES SHALL BE AS SHOWN ON THE DRAWINGS OR DETECTED BY THE ENGINEER AT THE EXPENSE OF DEVELOPERS.
- ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE 'OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS'. THE GENERAL CONTRACTORS SHALL BE DEEMED TO BE THE 'CONTRACTOR' AS DEFINED IN THE ACT.
- ALL THE CONSTRUCTION SIGNAGE MUST CONFORM TO THE MINISTRY OF TRANSPORTATION OF ONTARIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PER LATEST AMENDMENT.
- THE CONTRACTOR IS ADVISED THAT WORKS BY OTHERS MAY BE ONGOING DURING THE PERIOD OF THE CONTRACT. THE CONTRACTOR SHALL COORDINATE CONSTRUCTION ACTIVITIES TO PREVENT CONFLICTS.
- ALL DIMENSIONS ARE IN METRES UNLESS SPECIFIED OTHERWISE.
- THERE WILL BE NO SUBSTITUTION OF MATERIALS UNLESS PRIOR WRITTEN APPROVAL IS RECEIVED FROM THE ENGINEER.
- ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT.
- FOR DETAILS RELATING TO STORMWATER MANAGEMENT AND ROOF DRAINAGE REFER TO THE SITE SERVICES AND STORMWATER MANAGEMENT REPORT.
- ALL SEWERS CONSTRUCTED WITH GRADES LESS THAN 1.0% SHALL BE INSTALLED USING LASER ALIGNMENT AND CHECKED WITH LEVEL INSTRUMENT PRIOR TO BACKFILLING.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND TO BEAR THE COST OF THE SAME.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDITIONAL BEDDING, OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH AS SPECIFIED BY OPSD IS EXCEEDED.
- ALL PIPE/CULVERT SECTION SIZES REFER TO INSIDE DIMENSIONS.
- 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.
- ALL NECESSARY CLEARING AND GRUBBING SHALL BE COMPLETED BY THE CONTRACTOR. REVIEW WITH CONTRACT ADMINISTRATOR AND THE CITY OF OTTAWA PRIOR TO ANY TREE CUTTING/REMOVAL.
- DRAWINGS SHALL BE READ ON CONJUNCTION WITH ARCHITECTURAL SITE PLAN.
- THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER ON SET OF AS CONSTRUCTED SITE SERVICING AND GRADING DRAWINGS.
- 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.

## EROSION AND SEDIMENT CONTROL NOTES

### GENERAL

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.

THE CONTRACTOR ACKNOWLEDGES THAT SURFACE EROSION AND SEDIMENT RUNOFF RESULTING FROM THEIR CONSTRUCTION OPERATIONS HAS POTENTIAL TO CAUSE A DETRIMENTAL IMPACT TO ANY DOWNSTREAM WATERCOURSE OR SEWER, AND THAT ALL CONSTRUCTION OPERATIONS THAT MAY IMPACT UPON WATER QUALITY SHALL BE CARRIED OUT IN MANNER THAT STRICTLY MEETS THE REQUIREMENT OF ALL APPLICABLE LEGISLATION AND REGULATIONS.

AS SUCH, THE CONTRACTOR SHALL BE RESPONSIBLE FOR CARRYING OUT THEIR OPERATIONS, AND SUPPLYING AND INSTALLING ANY APPROPRIATE CONTROL MEASURES, SO AS TO PREVENT SEDIMENT LADEN RUNOFF ENTERING ANY SEWER OR WATERCOURSE WITHIN OR DOWNSTREAM OF THE WORKING AREA.

THE CONTRACTOR ACKNOWLEDGES THAT NO ONE MEASURE IS LIKELY TO BE 100% EFFECTIVELY FOR EROSION PROTECTION AND CONTROLLING SEDIMENT RUNOFF AND DISCHARGES FROM THE SITE. THEREFORE, WHERE NECESSARY THE CONTRACTOR SHALL IMPLEMENT ADDITIONAL MEASURES ARRANGED IN SUCH MANNER AS TO MITIGATE SEDIMENT RELEASE FROM THE CONSTRUCTION OPERATIONS AND ACHIEVE SPECIFIC MAXIMUM PERMITTED CRITERIA WHERE APPLICABLE. SUGGESTED ON-SITE MEASURES MAY INCLUDE, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING METHODS: SEDIMENT PONDS, FILTER BAGS, PUMP FILTERS, SETTLING TANKS, SILT FENCE, STRAW BALES, FILTER CLOTHS, CATCH BASIN FILTERS, CHECK DAMS AND/OR OTHER RECOGNIZED TECHNOLOGIES AND METHOD AVAILABLE AT THE TIME OF CONSTRUCTION. SPECIFIC MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH REQUIREMENTS OF OPSS 577 WHERE APPROPRIATE, OR IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

WHERE, IN THE OPINION OF THE CONTRACT ADMINISTRATOR OR REGULATORY AGENCY, THE INSTALLED CONTROL MEASURES FAIL TO PERFORM ADEQUATELY, THE CONTRACTOR SHALL SUPPLY AND INSTALL ADDITIONAL OR ALTERNATIVE MEASURES AS DIRECTED BY THE CONTRACT ADMINISTRATOR OR REGULATORY AGENCY. AS SUCH, THE CONTRACTOR SHALL HAVE ADDITIONAL CONTROL MATERIALS ON SITE AT ALL TIME WHICH ARE EASILY ACCESSIBLE AND MAY BE IMPLEMENTED BY HIM AT THE MOMENTS NOTICE.

PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL SUBMIT TO THE CONTRACT ADMINISTRATOR SIX COPIES OF A DETAILED EROSION AND SEDIMENT CONTROL PLAN (ESCP). THE ESCP WILL CONSIST OF WRITTEN DESCRIPTION AND DETAILED DRAWINGS INDICATING THE ON-SITE ACTIVITIES AND MEASURES TO BE USED TO CONTROL EROSION AND SEDIMENT MOVEMENT FOR EACH STEP OF THE WORK.

### CONTRACTOR'S RESPONSIBILITIES

THE CONTRACTOR SHALL ENSURE THAT ALL WORKERS, INCLUDING SUB-CONTRACTOR, IN THE WORKING AREA ARE AWARE OF THE IMPORTANCE OF THE EROSION AND SEDIMENT CONTROL MEASURES AND INFORMED OF THE CONSEQUENCES OF THE FAILURE TO COMPLY WITH THE REQUIREMENTS OF ALL REGULATORY AGENCIES.

THE CONTRACTOR SHALL PERIODICALLY, AND WHEN REQUESTED BY THE CONTRACT ADMINISTRATOR, CLEAN OUT ACCUMULATED SEDIMENT DEPOSITS AS REQUIRED AT THE SEDIMENT CONTROL DEVICES, INCLUDING THOSE DEPOSITS THAT MAY ORIGINATE FROM OUTSIDE THE CONSTRUCTION AREA. ACCUMULATED SEDIMENT SHALL BE REMOVED IN SUCH A MANNER THAT PREVENTS THE DEPOSITION OF THIS MATERIAL INTO THE SEWER WATERCOURSE AND AVOIDS DAMAGE TO CONTROL MEASURES. THE SEDIMENT SHALL BE REMOVED FROM THE SITE AT THE CONTRACTOR'S EXPENSE AND MANAGED IN COMPLIANCE WITH REQUIREMENTS OF PRO EXCESS EARTH MATERIAL, AS SPECIFIED ELSEWHERE IN THE CONTRACT.

THE CONTRACTOR SHALL IMMEDIATELY REPORT TO THE CONTRACT ADMINISTRATOR ANY ACCIDENTAL DISCHARGES OF SEDIMENT MATERIAL INTO EITHER THE WATERCOURSE OR THE STORM SEWER SYSTEM. FAILURE TO REPORT WILL BE CONSTITUTE A BREACH OF THIS SPECIFICATION AND THE CONTRACTOR MAY ALSO BE SUBJECT TO THE PENALTIES IMPOSED BY THE APPLICABLE REGULATORY AGENCY. APPROPRIATE RESPONSE MEASURES, INCLUDING ANY REPAIRS TO EXISTING CONTROL MEASURES OR THE IMPLEMENTATION OF ADDITIONAL CONTROL MEASURES, SHALL BE CARRIED OUT BY THE CONTRACTOR WITHOUT DELAY.

THE SEDIMENT CONTROL MEASURES SHALL ONLY BE REMOVED WHEN, IN THE OPINION OF THE CONTRACT ADMINISTRATOR, THE MEASURE OR MEASURES, IS NO LONGER REQUIRED. NO CONTROL MEASURE MAY BE PERMANENTLY REMOVED WITHOUT PRIOR AUTHORIZATION FROM THE CONTRACT ADMINISTRATOR. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL BE REMOVED IN A MANNER THAT AVOIDS THE ENTRY OF ANY EQUIPMENT, OTHER THAN HAND-HELD EQUIPMENT, INTO ANY WATERCOURSE, AND PREVENTS THE RELEASE OF ANY SEDIMENT OR DEBRIS INTO ANY SEWER OR WATERCOURSE WITHIN OR DOWNSTREAM OF THE WORKING AREA. ALL ACCUMULATED SEDIMENT SHALL BE REMOVED FROM THE WORKING AREA AT THE CONTRACTOR'S EXPENSE AND MANAGED IN COMPLIANCE WITH THE REQUIREMENTS FOR EXCESS EARTH MATERIAL.

WHERE, IN THE OPINION OF EITHER THE CONTRACT ADMINISTRATOR OR A REGULATORY AGENCY, ANY OF THE TERMS SPECIFIED HEREIN HAVE NOT BEEN COMPLIED WITH OR PERFORMED IN A SATISFACTORY MANNER, OR THAT ALL THE CONTRACTOR OR ADMINISTRATOR OR A REGULATORY AGENCY HAS THE RIGHT TO IMMEDIATELY WITHDRAW ITS PERMISSION TO CONTINUE THE WORK BUT MAY RENEW ITS PERMISSION UPON BEING SATISFIED THAT THE DEFAULTS OR DEFICIENCIES IN THE PERFORMANCE OF THIS SPECIFICATION BY THE CONTRACTOR HAVE BEEN REMEDIED.

## SPILL CONTROL NOTES

- ALL CONSTRUCTION EQUIPMENT SHALL BE RE-FUELED, MAINTAINED, AND STORED NO LESS THAN 30 METRES FROM WATERCOURSE, STREAMS, CREEKS, WOODLOTS, AND ANY ENVIRONMENTALLY SENSITIVE AREAS, OR AS OTHERWISE SPECIFIED.
- THIS CONTRACTOR MUST IMPLEMENT ALL NECESSARY MEASURES IN ORDER TO PREVENT LEAKS, DISCHARGES OR SPILLS OF POLLUTANTS, DELETERIOUS MATERIALS, OR OTHER SUCH MATERIALS OR SUBSTANCES WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT.
- IN THE EVENT OF A LEAK, DISCHARGE OR SPILL OF POLLUTANT, DELETERIOUS MATERIAL OR OTHER SUCH MATERIAL OR SUBSTANCE WHICH WOULD OR COULD CAUSE AN ADVERSE IMPACT TO THE NATURAL ENVIRONMENT, THE CONTRACTOR SHALL:
  - IMMEDIATELY NOTIFY APPROPRIATE FEDERAL, PROVINCIAL, AND LOCAL GOVERNMENT MINISTRIES, DEPARTMENTS, AGENCIES, AND AUTHORITIES OF THE INCIDENT IN ACCORDANCE WITH ALL CURRENT LAWS, LEGISLATION, ACTS, BY-LAWS, PERMITS, APPROVALS, ETC.
  - TAKE IMMEDIATE MEASURES TO CONTAIN THE MATERIAL OR SUBSTANCE, AND TO TAKE SUCH MEASURES TO MITIGATE AGAINST ADVERSE IMPACTS TO THE NATURAL ENVIRONMENT.
  - RESTORE THE AFFECTED AREA TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.

## MUD MAT NOTES

- THE GRANULAR MATERIAL WILL REQUIRE PERIODIC REPLACEMENT AS IT BECOMES CONTAMINATED BY VEHICLE TRAFFIC.
- SEDIMENT SHALL BE CLEANED FROM PUBLIC ROADS AT THE END OF EACH DAY.
- SEDIMENT SHALL BE REMOVED FROM PUBLIC ROADS BY SHOVELING OR SWEEPING AND DISPOSED OR PROPERLY IN A CONTROLLED SEDIMENT DISPOSAL AREA.

## SITE GRADING NOTES

- PRIOR TO THE COMMENCEMENT OF THE SITE GRADING WORKS, ALL SILTATION CONTROL DEVICES SHALL BE INSTALLED AND OPERATIONAL PER EROSION CONTROL PLAN.
- ALL GRANULAR AND PAVEMENT FOR ROADS/PARKING AREAS SHALL BE CONSTRUCTED IN ACCORDANCE WITH GEOTECHNICAL ENGINEER'S RECOMMENDATIONS.
- ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD AND PARKING AREAS ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
- CONCRETE CURB SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. SC1.1 PROVISION SHALL BE MADE OR CURB DEPRESSIONS AS INDICATED ON ARCHITECTURAL SITE PLAN. CONCRETE SIDEWALK SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STD SC1.4. ALL CURBS, CONCRETE ISLANDS, AND SIDEWALKS SHOWN ON THIS DRAWING ARE TO BR PRICED IN SITE WORKS PORTION OF THE CONTRACT.
- CONCRETE FINISH/STATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. R10 AND OPSD 509.010 AND OPSS 310.
- GRANULAR 'A' SHALL BE PLACED TO A MINIMUM THICKNESS OF 30MM AROUND ALL STRUCTURES WITHIN THE PAVEMENT AREA.
- SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'B' COMPACTED IN MAXIMUM 30MM LIFTS.
- ALL WORK ON THE MUNICIPAL RIGHT OF WAY AND EASEMENTS TO BE INSPECTED BY THE MUNICIPALITY PRIOR BACKFILLING.
- CONTRACTOR TO OBTAIN A ROAD OCCUPANCY PERMIT 48 HOURS PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL ROAD ALLOWANCE, IF REQUIRED BY THE MUNICIPALITY.
- ALL PAVEMENT MARKING FEATURES AND SITE SIGNAGE SHALL BE PLACED PER ARCHITECTURAL SITE PLAN. LINE PAINTING AND DIRECTIONAL SYMBOLS SHALL BE APPLIED WITH A MINIMUM OF TWO COATS OF ORGANIC SOLVENT PAINT.
- REFER TO ARCHITECTURAL SITE PLAN FOR DIMENSIONS AND SITE DETAILS.
- STEP JOINTS ARE TO BE USED WHERE PROPOSED ASPHALT MEETS EXISTING ASPHALT. ALL JOINTS MUST BE SEALED.
- SIDEWALKS TO BE 13MM & BEVELED AT 2:1 OR 6MM WITH NO BEVEL REQUIRED BELOW THE FINISHED FLOOR SLAB ELEVATION AT ENTRANCES REQUIRED TO BE BARRIER-FREE, UNLESS OTHERWISE NOTED. ALL IN ACCORDANCE WITH OBC 3.8.1.3 & OTTAWA ACCESSIBILITY DESIGN STANDARDS.
- WHERE APPLICABLE THE CONTRACTOR IS TO SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION. SHOP DRAWINGS MUST BE SITE SPECIFIC, SIGNED AND SEALED BY A LICENSED STRUCTURAL ENGINEER. THE CONTRACTOR WILL ALSO BE REQUIRED TO SUPPLY AND GEOTECHNICAL CERTIFICATION OF THE AS-CONSTRUCTED RETAINING WALL TO THE ENGINEER PRIOR TO FINAL ACCEPTANCE.

## ROADWORK SPECIFICATIONS

- ROADWORK TO BE COMPLETED IN ACCORDANCE WITH GEOTECHNICAL REPORT, PREPARED BY LRL ASSOCIATES, DATED NOVEMBER 2020.
- ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND STOCK PILED ON SITE AS DIRECTED BY NATIONAL MUNICIPALITY.
- THE SUBGRADE SHALL BE CROWNED AND SLOPED AT LEAST 2% AND PROOF ROLLED WITH HEAVY ROLLERS.
- SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'A', TYPE II COMPACTED IN MAXIMUM 300MM LIFTS.
- ALL GRANULAR FOR ROADS SHALL BE COMPACTED TO MINIMUM OF 100% STANDARD PROCTOR DENSITY MAXIMUM DRY DENSITY (SPMDD).
- CONCRETE RAMP C/W TACTILE WALKING SURFACE INDICATORS COMPONENT AS PER OPSD 310.039. TACTILE WALKING SURFACE INDICATORS TO BE INSTALLED AT ALL RAMPS. MATERIAL TO BE POLYMER COMPOSITE, COLOR GREY.

## SANITARY, FOUNDATION DRAIN, STORM SEWER AND WATERMAIN NOTES

### GENERAL

- LASER ALIGNMENT CONTROL TO BE UTILIZED ON ALL SEWER INSTALLATIONS.
- CLAY SEALS TO BE INSTALLED AS PER CITY STANDARD DRAWING 58. THE SEALS SHOULD BE AT LEAST 1.5M LONG (IN THE TRENCH DIRECTION) AND SHOULD EXTEND FROM TRENCH WALL TO TRENCH WALL. THE SEALS SHOULD EXTEND FROM THE FROST LINE AND FULLY PENETRATE THE BEDDING, SUB-BEDDING, AND COVER MATERIAL. THE BARRIERS SHOULD CONSIST OF RELATIVELY DRY AND COMPATIBLE BROWN SILTY CLAY PLACED IN MAXIMUM 25MM LIFTS AND COMPACTED TO A MINIMUM OF 95% SPMDD. THE CLAY SEALS SHOULD BE PLACED AT THE SITE BOUNDARIES AND AT 60M INTERVALS IN THE SERVICE TRENCHES.
- SERVICES TO BUILDING TO BE TERMINATED 1.0M FROM THE OUTSIDE FACE OF BUILDING UNLESS OTHERWISE NOTED.
- ALL MAINTENANCE STRUCTURE AND CATCH BASIN EXCAVATIONS TO BE BACKFILLED WITH GRANULAR MATERIAL COMPACTED TO 98% STANDARD PROCTOR DENSITY. A MINIMUM OF 300MM AROUND STRUCTURES.
- 'MODULOC' OR APPROVED PRE-CAST MAINTENANCE STRUCTURE AND CATCH BASIN ADJUSTERS TO BE USED IN LIEU OF BRICKING. PARGE ADJUSTING UNITS ON THE OUTSIDE ONLY.
- SAFETY PLATFORMS SHALL BE PER OPSD 404.02.
- DROP STRUCTURES SHALL BE IN ACCORDANCE WITH OPSD 1003.01, IF APPLICABLE.
- THE CONTRACTOR IS TO PROVIDE CCTV CAMERA INSPECTIONS OF ALL SEWERS, INCLUDING PICTORIAL REPORT, ONE (1) CD COPY AND TWO (2) VIDEO RECORDING IN A FORMAT ACCEPTABLE TO ENGINEER. ALL SEWER ARE TO BE FLUSHED PRIOR TO CAMERA INSPECTION. ASPHALT WEAR COURSE SHALL NOT BE PLACED UNTIL THE VIDEO INSPECTION OF SEWERS AND NECESSARY REPAIRS HAVE BEEN COMPLETED TO THE SATISFACTION OF THE ENGINEER.
- CONTRACTOR SHALL PERFORM LEAKAGE TESTING, IN THE PRESENCE OF THE CONSULTANT, FOR SANITARY SEWERS IN ACCORDANCE WITH OPSS 407. CONTRACTOR SHALL PERFORM VIDEO INSPECTION OF ALL SEWERS. A COPY OF THE VIDEO AND INSPECTION REPORT SHALL BE SUBMITTED TO THE CONSULTANT FOR REVIEW AND APPROVAL PRIOR TO PLACEMENT OF WEAR COURSE ASPHALT.

### SANITARY

- ALL SANITARY SEWER INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
- ALL SANITARY GRAVITY SEWER SHALL BE PVC SDR 35, IPEX 'RING-TITE' (OR APPROVED EQUIVALENT) PER CSA STANDARD B182.2 OR LATEST AMENDMENT, UNLESS SPECIFIED OTHERWISE.
- EXISTING MAINTENANCE STRUCTURES TO BE RE-BENCHED WHERE A NEW CONNECTION IS MADE.
- SANITARY GRAVITY SEWER TRENCH AND BEDDING SHALL BE PER CITY OF OTTAWA STD. 56 AND S7 CLASS 'B' BEDDING, UNLESS SPECIFIED OTHERWISE.
- SANITARY MAINTENANCE STRUCTURE FRAME AND COVERS SHALL BE PER CITY OF OTTAWA STD. S24 AND S25.
- SANITARY MAINTENANCE STRUCTURES SHALL BE BENCHED PER OPSD 701.021.
- 100MM THICK HIGH-DENSITY GRADE 'A' POLYSTYRENE INSULATION TO BE INSTALLED IN ACCORDANCE WITH CITY STD W22 WHERE INDICATED ON DRAWING SSP-1.

### STORM

- ALL REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.2, OR LATEST AMENDMENT. ALL NON-REINFORCED CONCRETE STORM SEWER PIPE SHALL BE IN ACCORDANCE WITH CSA A257.1, OR LATEST AMENDMENT. PIPE SHALL BE JOINED WITH STD. RUBBER GASKETS AS PER CSA A257.2, OR LATEST AMENDMENT.
- ALL STORM SEWER TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. 56 AND S7 CLASS 'B' UNLESS OTHERWISE SPECIFIED. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY PROJECT GEOTECHNICAL ENGINEER.
- ALL PVC STORM SEWERS ARE TO BE SDR 35 APPROVED PER C.S.A. B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE SPECIFIED.
- CATCH BASIN SHALL BE IN ACCORDANCE WITH OPSD 705.010.
- CATCH BASIN LEADS SHALL BE IN 200MM DIA. AT 1% SLOPE (MIN) UNLESS SPECIFIED OTHERWISE.
- ALL CATCH BASINS SHALL HAVE 600MM SUMPS, UNLESS SPECIFIED OTHERWISE.
- ALL CATCH BASIN LEAD INVERTS TO BE 1.5M BELOW FINISHED GRADE UNLESS SPECIFIED OTHERWISE.
- THE STORM SEWER CLASS/WHERE BEEN DESIGNED BASED ON BEDDING CONDITIONS SPECIFIED ABOVE. WHERE THE SPECIFIED TRENCH WIDTH IS EXCEEDED, THE CONTRACTOR IS REQUIRED TO PROVIDE AND SHALL BE RESPONSIBLE FOR EXTRA TEMPORARY AND/OR PERMANENT REPAIRS MADE NECESSARY BY THE WIDENED TRENCH.
- ALL ROAD AND PARKING LOT CATCH BASINS TO BE INSTALLED WITH ORTHOGONALLY PLACED SUBDRAINS IN ACCORDANCE WITH DETAIL. PERFORATED SUBDRAIN FOR ROAD AND PARKING LOT CATCH BASIN SHALL BE INSTALLED PER CITY STD R1 UNLESS OTHERWISE NOTED.
- PERFORATED SUBDRAIN FOR REAR YARD AND LANDSCAPING APPLICATIONS SHALL BE INSTALLED PER CITY STD S29, S30 AND S31, WHERE APPLICABLE.
- RIP-RAP TREATMENT SEWER AND CULVERT OUTLETS PER OPSD 810.010.
- ALL STORM SEWER/ CULVERTS TO BE INSTALLED WITH FROST TREATMENT PER OPSD 803.031 WHERE APPLICABLE.
- ALL STORM MANHOLES WITH PIPE LESS THAN 900MM IN DIAMETER SHALL BE CONSTRUCTED WITH A 300MM SUMP AS PER SDG, CLAUSE 6.2.6.

### WATERMAIN

- ALL WATERMAIN INSTALLATION SHALL CONFORM TO THE LATEST REVISIONS OF THE CITY OF OTTAWA AND THE ONTARIO PROVINCIAL STANDARD DRAWINGS (OPSD) AND SPECIFICATIONS (OPSS).
- ALL PVC WATERMANS SHALL BE AWWA C-900 CLASS 150, SDR 18 OR APPROVED EQUIVALENT.
- ALL WATER SERVICES LESS THAN OR EQUAL TO 50MM IN DIAMETER TO BE TYPE 'K' COPPER.
- WATERMAIN TRENCH AND BEDDING SHALL BE IN ACCORDANCE WITH CITY OF OTTAWA STANDARD W17. UNLESS SPECIFIED OTHERWISE. BEDDING AND COVER MATERIAL SHALL BE SPECIFIED BY THE PROJECT GEOTECHNICAL ENGINEER.
- ALL PVC WATERMANS, SHALL BE INSTALLED WITH A 10 GAUGE STRANDED COPPER TWU OR RWU TRACER WIRE IN ACCORDANCE WITH CITY OF OTTAWA STD. W.36.
- CATHODIC PROTECTION IS REQUIRED ON ALL METALLIC FITTINGS PER CITY OF OTTAWA STD.25.5 AND W25.6.
- VALVE BOXES SHALL BE INSTALLED PER CITY OF OTTAWA STD. W24.
- WATERMAIN IN FILL AREAS TO BE INSTALLED WITH RESTRAINED JOINTS PER CITY OF OTTAWA STD.25.5 AND W25.6.
- THRUST BLOCKING OF WATERMANS TO BE INSTALLED PER CITY OF OTTAWA STD. W25.3 AND W25.4.
- THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY CAPS, PLUGS, BLOW-OFFS, AND NOZZLES REQUIRED FOR TESTING AND DISINFECTION OF THE WATERMAIN.
- WATERMAIN CROSSING OVER AND BELOW SEWERS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. W25.2 AND W25, RESPECTIVELY.
- WATER SERVICES ARE TO BE INSULATED PER CITY STD. W23 WHERE SEPARATION BETWEEN SERVICES AND MAINTENANCE HOLES ARE LESS THAN 2.4M.
- THE MINIMUM VERTICAL CLEARANCE BETWEEN WATERMAIN AND SEWER/UTILITY IS 0.5M PER MCE GUIDELINES. FOR CROSSING UNDER SEWERS, ADEQUATE STRUCTURAL SUPPORT FOR THE SEWER IS REQUIRED TO PREVENT EXCESSIVE DEFLECTION OF JOINTS AND SETTLING. THE LENGTH OF WATER PIPE SHALL BE CENTERED AT THE POINT OF CROSSING TO ENSURE THAT THE JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER.
- ALL WATERMANS SHALL HAVE A MINIMUM COVER OR 2.4M, OTHERWISE THERMAL INSULATION IS REQUIRED AS PER STD DWG W22.
- GENERAL WATER PLANT TO UTILITY CLEARANCE AS PER STD DWG R20.
- FIRE HYDRANT INSTALLATION AS PER STD DWG W19, ALL BOTTOM OF HYDRANT FLANGE ELEVATIONS TO BE INSTALLED 0.10M ABOVE PROPOSED FINISHED GRADE AT HYDRANT. FIRE HYDRANT LOCATION AS PER STD DWG W19.
- BUILDING SERVICE TO BE CAPPED 1.0M OFF THE FACE OF THE BUILDING UNLESS OTHERWISE NOTED AND MUST BE RESTRAINED A MINIMUM OF 12M BACK FROM STUB.
- ALL WATERMANS 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.
- ALL WATERMANS SHALL BE BACTERIOLOGICALLY TESTED IN ACCORDANCE WITH THE CITY OF OTTAWA AND ONTARIO GUIDELINES. ALL CHLORINATED WATER TO BE DISCHARGED AND PRE-TREATED TO ACCEPTABLE LEVELS PRIOR TO DISCHARGE. ALL DISCHARGED WATER MUST BE CONTROLLED AND TREATED SO AS NOT TO ADVERSELY EFFECT ENVIRONMENT. IT IS RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL MUNICIPAL AND/OR PROVINCIAL REQUIREMENTS ARE FOLLOWED.
- ALL WATERMAIN STUBS SHALL BE TERMINATED WITH A PLUG AND 50MM BLOW OFF UNLESS OTHERWISE NOTED.

### USE AND INTERPRETATION OF DRAWINGS

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE OWNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, THE SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS IF REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILARLY AS WORK SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

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### UNAUTHORIZED CHANGES

IN THE EVENT THE CLIENT, THE CLIENT'S CONTRACTORS OR SUBCONTRACTORS, OR ANYONE FOR WHOM THE CLIENT IS LEGALLY LIABLE MAKES OR PERMITS TO BE MADE ANY CHANGES TO ANY REPORTS, PLANS, SPECIFICATIONS OR OTHER CONSTRUCTION DOCUMENTS PREPARED BY LRL ASSOCIATES LTD. (LRL) WITHOUT OBTAINING LRL'S PRIOR WRITTEN CONSENT, THE CLIENT SHALL ASSUME FULL RESPONSIBILITY FOR THE RESULTS OF SUCH CHANGES. THEREFORE THE CLIENT AGREES TO WAIVE ANY CLAIM AGAINST LRL AND TO RELEASE LRL FROM ANY LIABILITY ARISING DIRECTLY OR INDIRECTLY FROM SUCH UNAUTHORIZED CHANGES.

IN ADDITION, THE CLIENT AGREES, TO THE FULLEST EXTENT PERMITTED BY LAW, TO INDEMNIFY AND HOLD HARMLESS LRL FROM ANY DAMAGES, LIABILITIES OR COST, INCLUDING REASONABLE ATTORNEY'S FEES AND COST OF DEFENSE, ARISING FROM SUCH CHANGES.

IN ADDITION, THE CLIENT AGREES TO INCLUDE IN ANY CONTRACTS FOR CONSTRUCTION APPROPRIATE LANGUAGE THAT PROHIBITS THE CONTRACTOR OR ANY SUBCONTRACTORS OF ANY TIER FROM MAKING ANY CHANGES OR MODIFICATIONS TO LRL'S CONSTRUCTION DOCUMENTS WITHOUT THE PRIOR WRITTEN APPROVAL OF LRL AND THAT FURTHER REQUIRES THE CONTRACTOR TO INDEMNIFY BOTH LRL AND THE CLIENT FROM ANY LIABILITY OR COST ARISING FROM SUCH CHANGES MADE WITHOUT SUCH PROPER AUTHORIZATION.

### GENERAL NOTES

EXISTING SERVICES AND UTILITIES SHOWN ON THESE DRAWINGS ARE TAKEN FROM THE BEST AVAILABLE RECORDS, BUT MAY NOT BE COMPLETE OR TO DATE. CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH FOR LOCATION AND DEPTH OF PIPES AND CHECK WITH THE UTILITY COMPANIES BEFORE DIGGING OR PERFORMING WORK.

CONTRACTOR IS ADVISED TO COLLECT INFORMATION ON SOIL CONDITIONS BEFORE START OF CONSTRUCTION.

THE ENGINEER WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS WHICH ARISE FROM FAILURE TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY, OR FOR PROBLEMS WHICH ARISE FROM OTHERS' FAILURE TO OBTAIN AND/OR FOLLOW THE ENGINEERS' GUIDANCE AND/OR INSTRUCTIONS, OR FROM ANY ERRORS, OMISSIONS, INCONSISTENCIES AMBIGUITIES OR CONFLICTS WHICH ARE ALLEGED.

CONTRACTOR TO VERIFY ALL DIMENSIONS AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE WORK COMMENCES. DO NOT SCALE DRAWINGS.

03	RE- ISSUED FOR APPROVAL	S.V.	SEP 23 2024
02	ISSUED FOR APPROVAL	S.V.	JAN 29 2024
01	ISSUED FOR APPROVAL	T.H.	DEC 21 2023

No.	REVISIONS	BY	DATE
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NOT AUTHENTIC UNLESS SIGNED AND DATED



**LRL**

ENGINEERING | INGÉNIERIE

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CLIENT

CASH FOR TRASH CANADA

DESIGNED BY:	DRAWN BY:	APPROVED BY:
M.L.	M.L.	V.J.

PROJECT

CASH FOR TRASH - 7628 FLEWELLYN ROAD  
OTTAWA, ON

DRAWING TITLE

GENERAL NOTES

PROJECT NO.

210092

DATE

JANUARY 2024

**C001**

PROPOSED SILT FENCE BARRIER AS PER OPSD 219.110

**LEGEND:**

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED GRASS SWALE
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED RIP RAP
- PROPOSED ELEVATION
- PROPOSED BOTTOM OF SWALE ELEVATION
- MATCH INTO EXISTING ELEVATION
- EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- PROPOSED MANHOLE
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WATERSHED NAME
- RUNOFF COEFFICIENT
- AREA IN HECTARES

**USE AND INTERPRETATION OF DRAWINGS**

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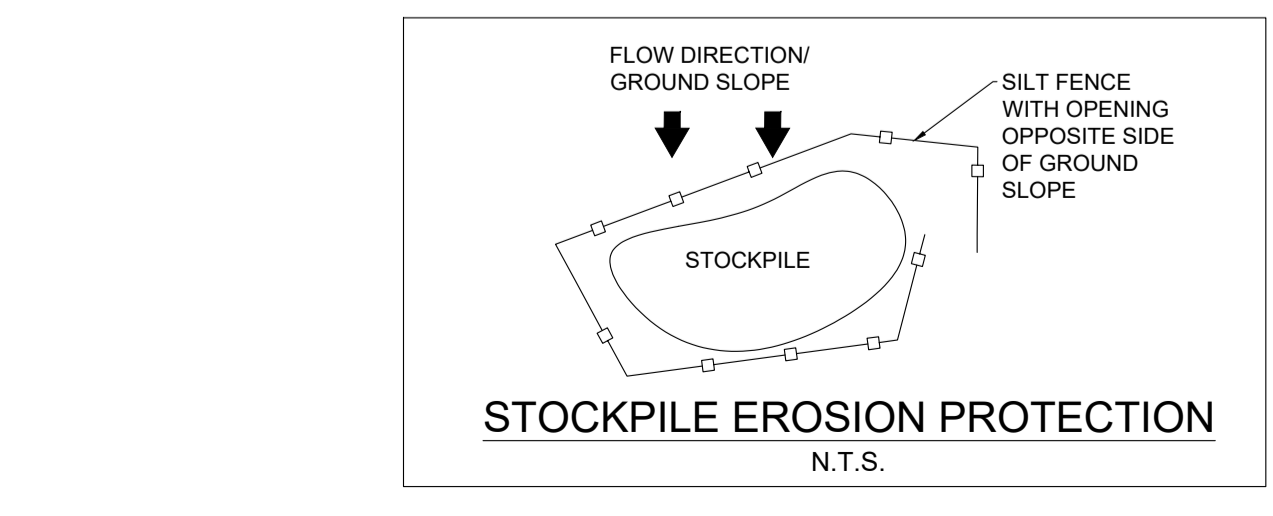
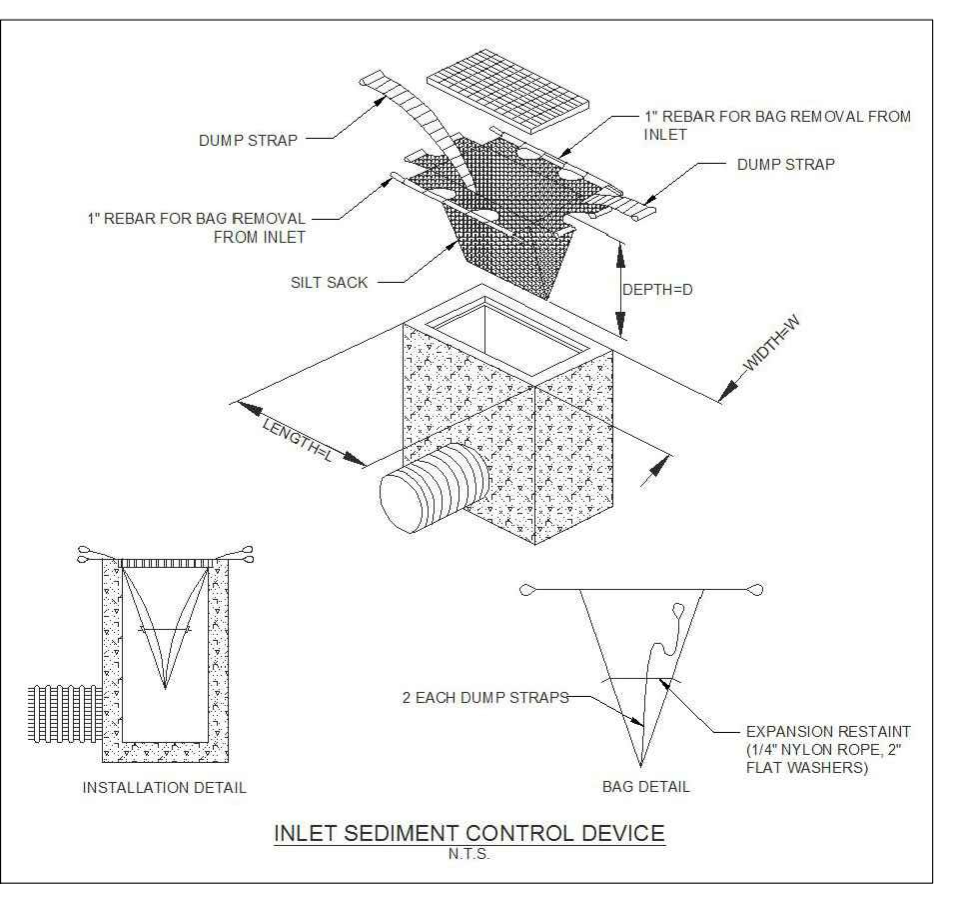
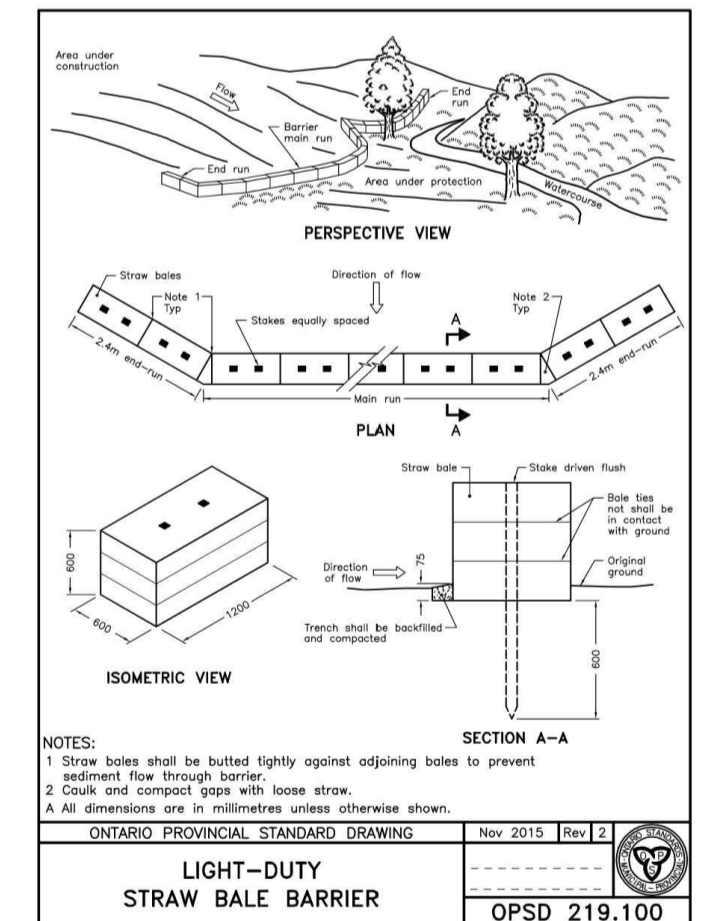
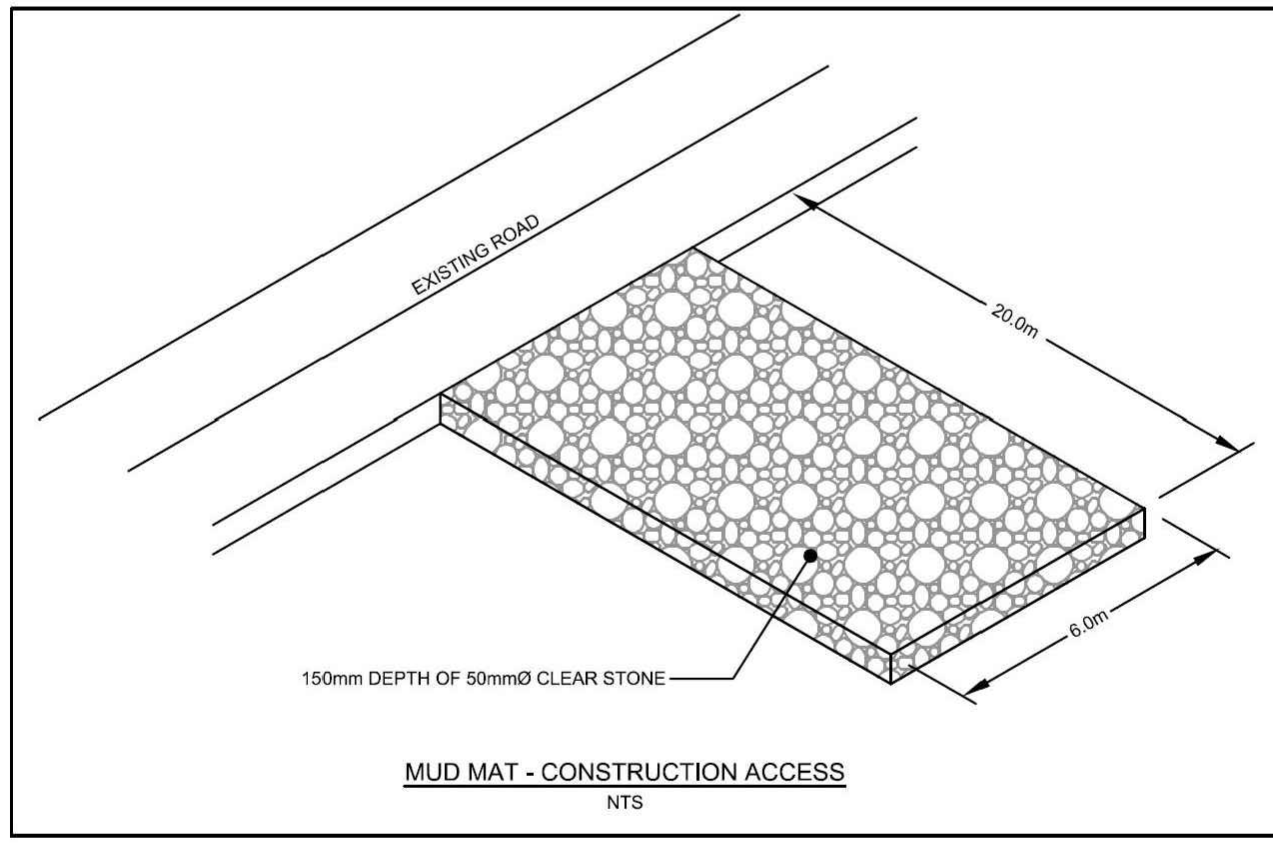
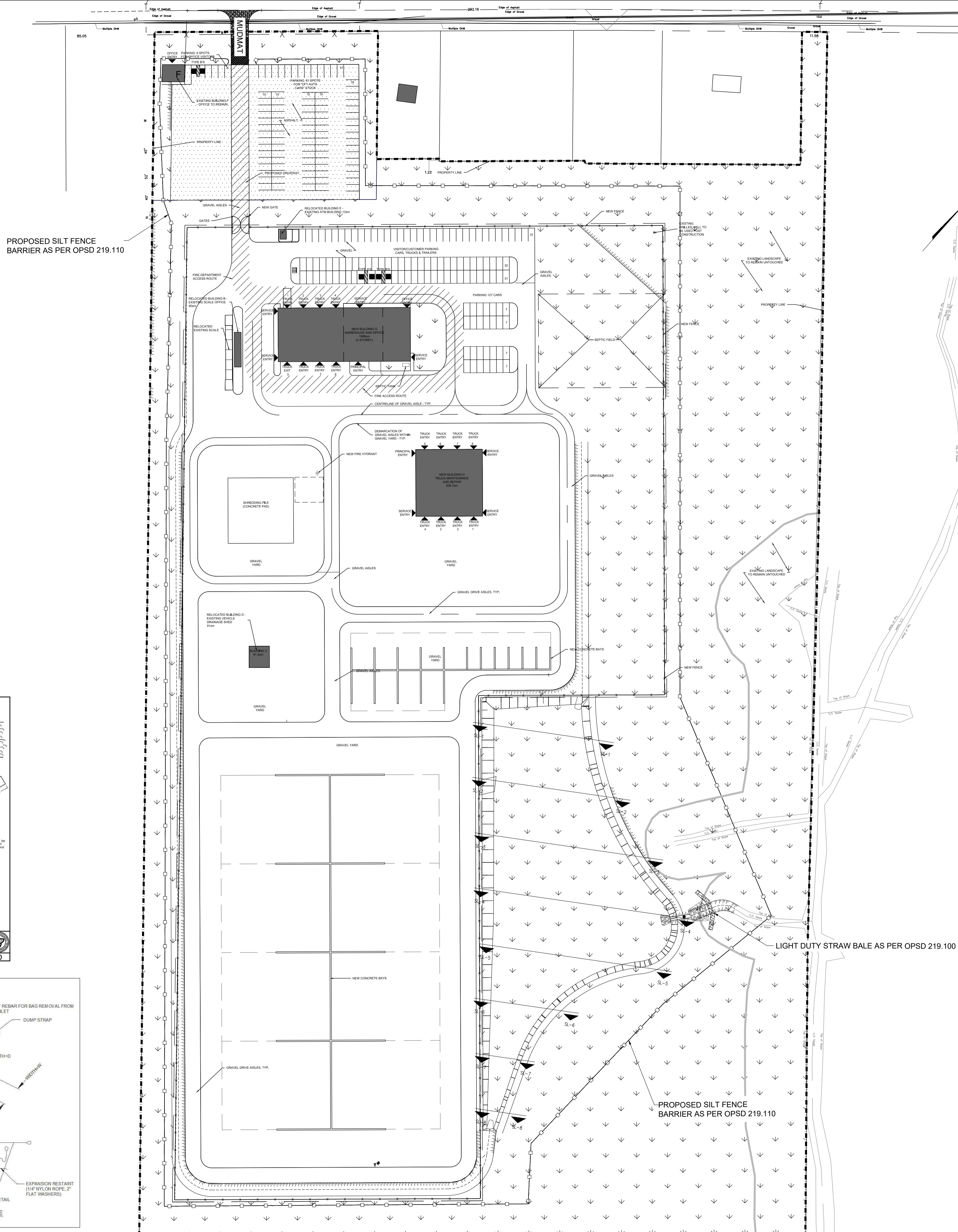
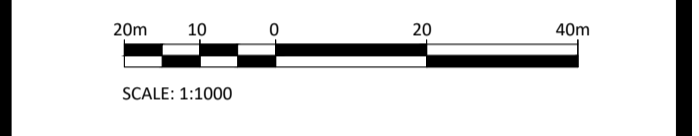
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No.	REVISIONS	BY	DATE
03	RE- ISSUED FOR APPROVAL	S.V.	SEP 23 2024
02	ISSUED FOR APPROVAL	S.V.	JAN 29 2024
01	ISSUED FOR APPROVAL	T.H.	DEC 21 2023



NOT AUTHENTIC UNLESS SIGNED AND DATED

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ENGINEERING | INGÉNIÉRIE  
5430 Canotek Road | Ottawa, ON, K1J 9G2  
www.lrl.ca | (613) 842-3434

CLIENT  
**CASH FOR TRASH CANADA**

DESIGNED BY: M.L. DRAWN BY: M.L. APPROVED BY: V.J.

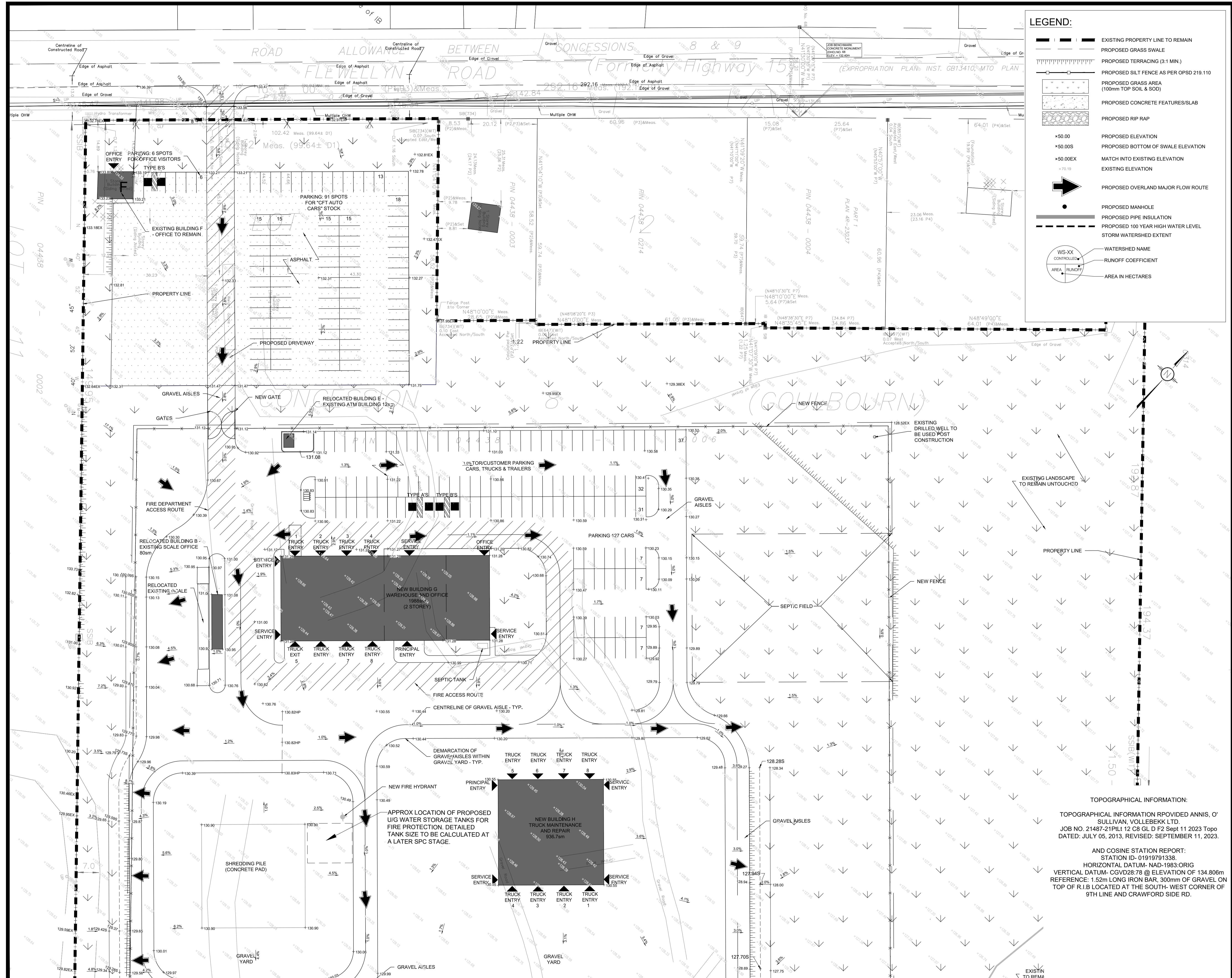
PROJECT  
**CASH FOR TRASH - 7628 FLEWELLYN ROAD OTTAWA, ON**

DRAWING TITLE  
**EROSION AND SEDIMENT CONTROL PLAN**

PROJECT NO.  
**210092**

DATE  
**JANUARY 2024**





**LEGEND:**

- — — — — EXISTING PROPERTY LINE TO REMAIN
- — — — — PROPOSED GRASS SWALE
- — — — — PROPOSED TERRACING (3:1 MIN.)
- — — — — PROPOSED SILT FENCE AS PER OPSD 219.110
- — — — — PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- — — — — PROPOSED CONCRETE FEATURES/SLAB
- — — — — PROPOSED RIP RAP
- — — — — PROPOSED ELEVATION
- — — — — PROPOSED BOTTOM OF SWALE ELEVATION
- — — — — MATCH INTO EXISTING ELEVATION
- — — — — EXISTING ELEVATION
- ➔ PROPOSED OVERLAND MAJOR FLOW ROUTE
- PROPOSED MANHOLE
- — — — — PROPOSED PIPE INSULATION
- — — — — PROPOSED 100 YEAR HIGH WATER LEVEL
- — — — — STORM WATERSHED EXTENT
- WS-XX CONTROLLED AREA RUNOFF COEFFICIENT
- AREA IN HECTARES

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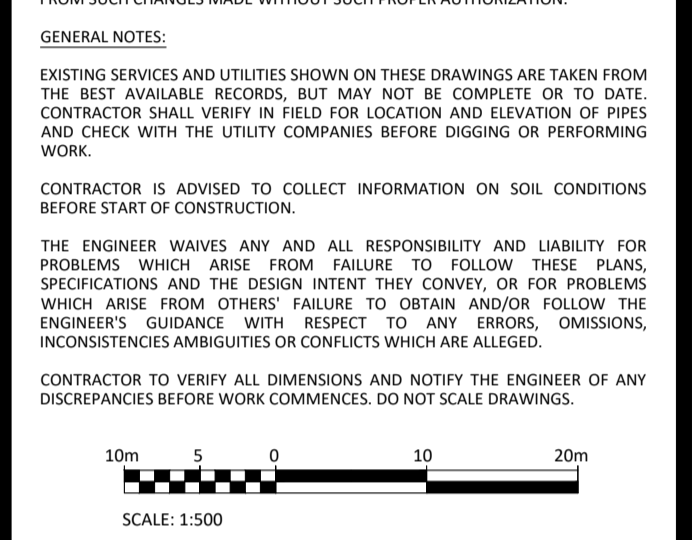
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www.lrl.ca | (613) 842-3434

**CASH FOR TRASH CANADA**

DESIGNED BY: M.L. DRAWN BY: M.L. APPROVED BY: V.J.

PROJECT: CASH FOR TRASH - 7628 FLEWELLYN ROAD OTTAWA, ON

DRAWING TITLE: GRADING AND DRAINAGE PLAN

PROJECT NO: 210092 DATE: JANUARY 2024

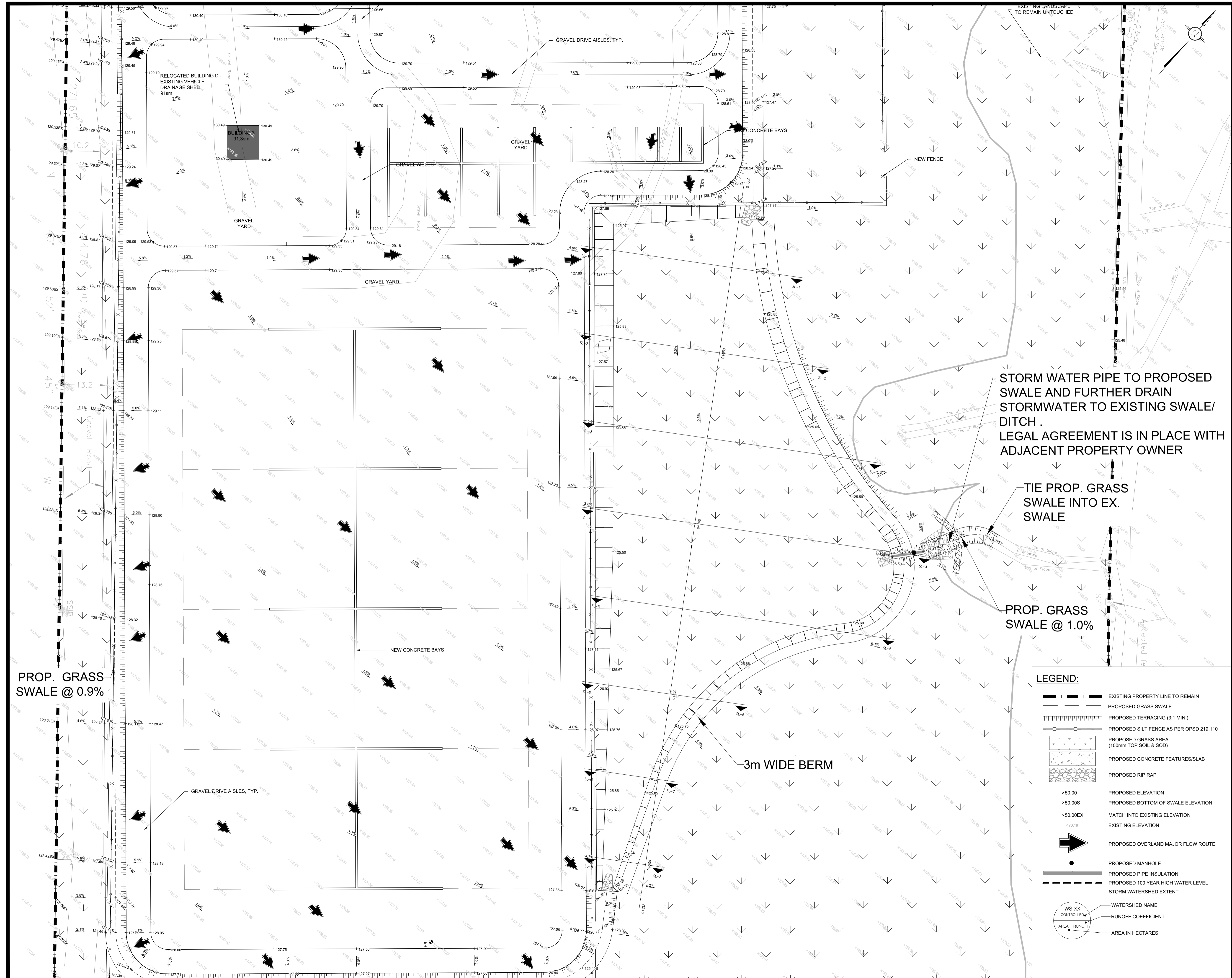
**C301**

**TOPOGRAPHICAL INFORMATION:**

TOPOGRAPHICAL INFORMATION PROVIDED ANNIS, O' SULLIVAN, VOLLEBEKK LTD.  
JOB NO. 21487-21P11 12 C8 GL D F2 Sept 11 2023 Topo  
DATED: JULY 05, 2013, REVISED: SEPTEMBER 11, 2023.

**AND COSINE STATION REPORT:**  
STATION ID- 01919791338.  
HORIZONTAL DATUM- NAD-1983-ORIG  
VERTICAL DATUM- CGVD2878 @ ELEVATION OF 134.806m  
REFERENCE: 1.52m LONG IRON BAR, 300mm OF GRAVEL ON TOP OF R.I.B LOCATED AT THE SOUTH- WEST CORNER OF 9TH LINE AND CRAWFORD SIDE RD.





**USE AND INTERPRETATION OF DRAWINGS**

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www.lrl.ca | (613) 842-3434

CLIENT  
**CASH FOR TRASH CANADA**

DESIGNED BY: M.L. DRAWN BY: M.L. APPROVED BY: V.J.

PROJECT  
**CASH FOR TRASH - 7628 FLEWELLYN ROAD  
OTTAWA, ON**

DRAWING TITLE  
**GRADING AND DRAINAGE PLAN**

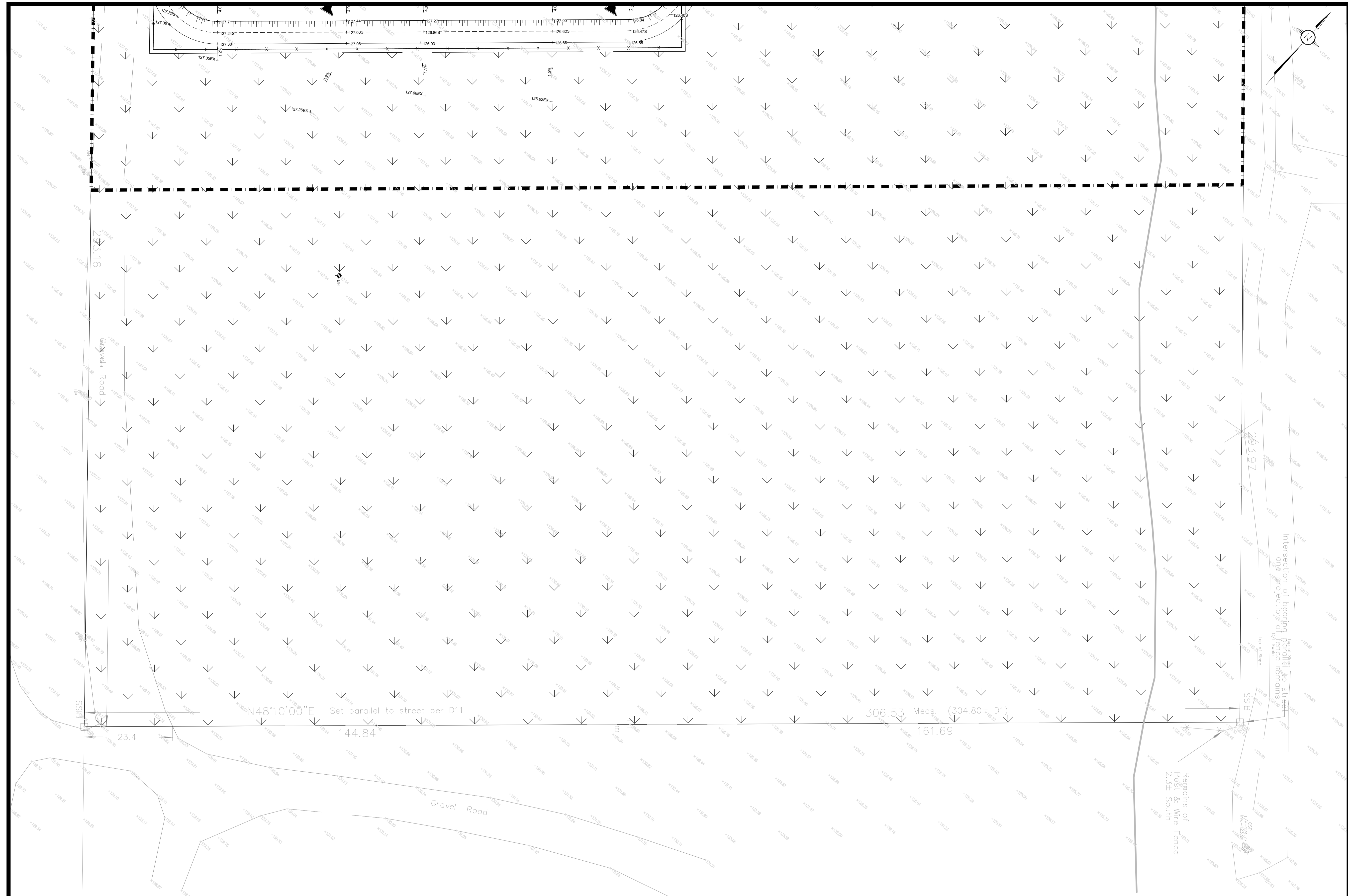
PROJECT NO.  
**210092**

DATE  
**JANUARY 2024**

**C302**

**LEGEND:**

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED GRASS SWALE
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED RIP RAP
- PROPOSED ELEVATION
- PROPOSED BOTTOM OF SWALE ELEVATION
- MATCH INTO EXISTING ELEVATION
- EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- PROPOSED MANHOLE
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WATERSHED NAME
- RUNOFF COEFFICIENT
- AREA IN HECTARES



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**SCALE**

10m 5 0 10 20m  
SCALE: 1:500

**REVISIONS**

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**PROFESSIONAL ENGINEER**  
V. JOHNSON  
100510576  
09-24-2024  
PROVINCE OF ONTARIO

**LRL**  
ENGINEERING | INGÉNIERIE  
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**CLIENT**  
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**PROJECT**  
CASH FOR TRASH - 7628 FLEWELLYN ROAD  
OTTAWA, ON

**DRAWING TITLE**  
GRADING AND DRAINAGE PLAN

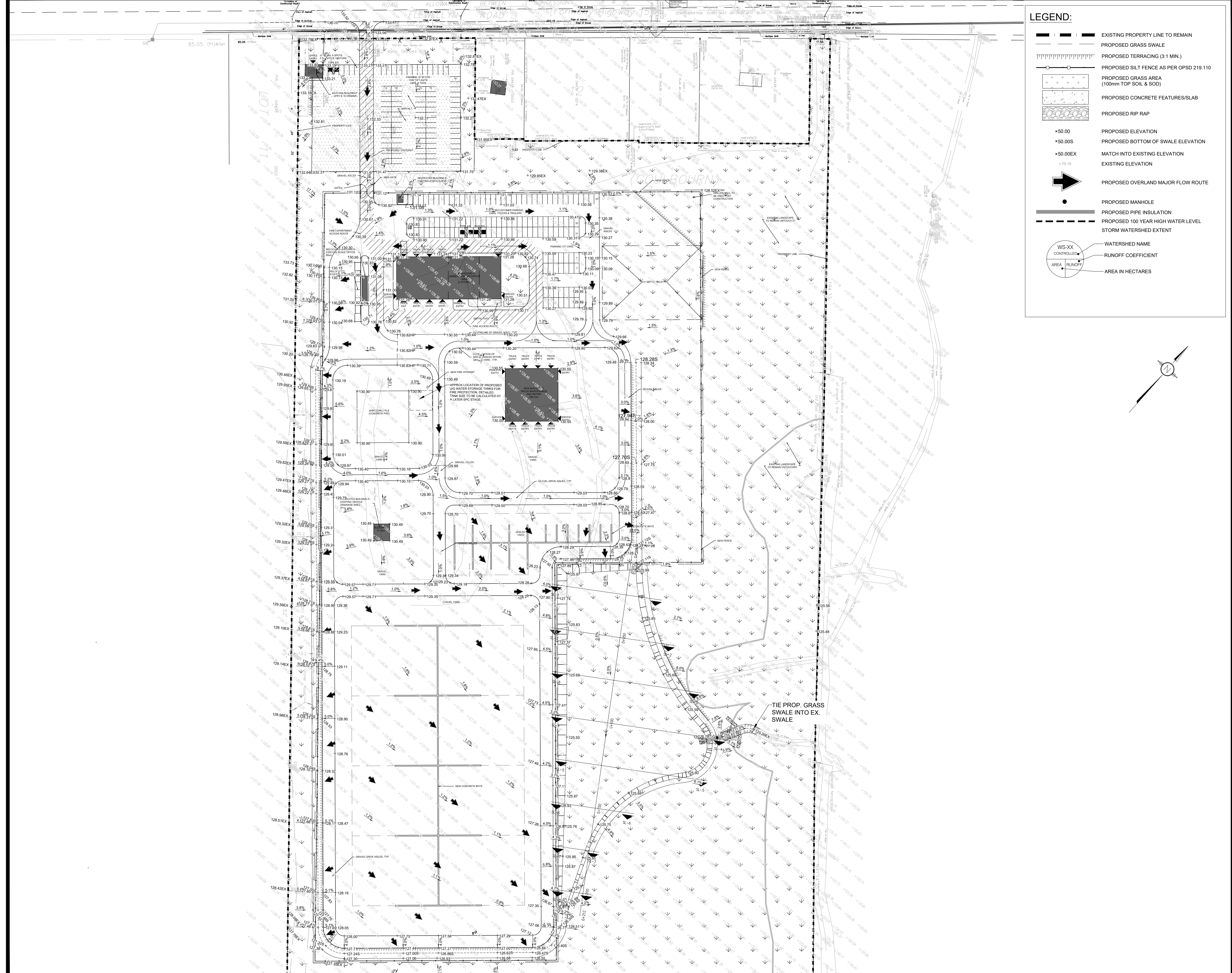
**PROJECT NO.** 210092  
**DATE** JANUARY 2024

**C303**

**LEGEND:**

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED GRASS SWALE
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
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- PROPOSED RIP RAP
- \*50.00 PROPOSED ELEVATION
- \*50.00S PROPOSED BOTTOM OF SWALE ELEVATION
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- PROPOSED PIPE INSULATION
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03	RE- ISSUED FOR APPROVAL	S.V.	SEP 23 2024
02	ISSUED FOR APPROVAL	S.V.	JAN 29 2024
01	ISSUED FOR APPROVAL	T.H.	DEC 21 2023
No.	REVISIONS	BY	DATE



NOT AUTHENTIC UNLESS SIGNED AND DATED

**LRL**  
ENGINEERING | INGÉNIÉRIE  
5430 Canotek Road | Ottawa, ON, K1J 9G2  
www.lrl.ca | (613) 842-3434

CLIENT  
**CASH FOR TRASH CANADA**

DESIGNED BY: M.L.      DRAWN BY: M.L.      APPROVED BY: V.J.

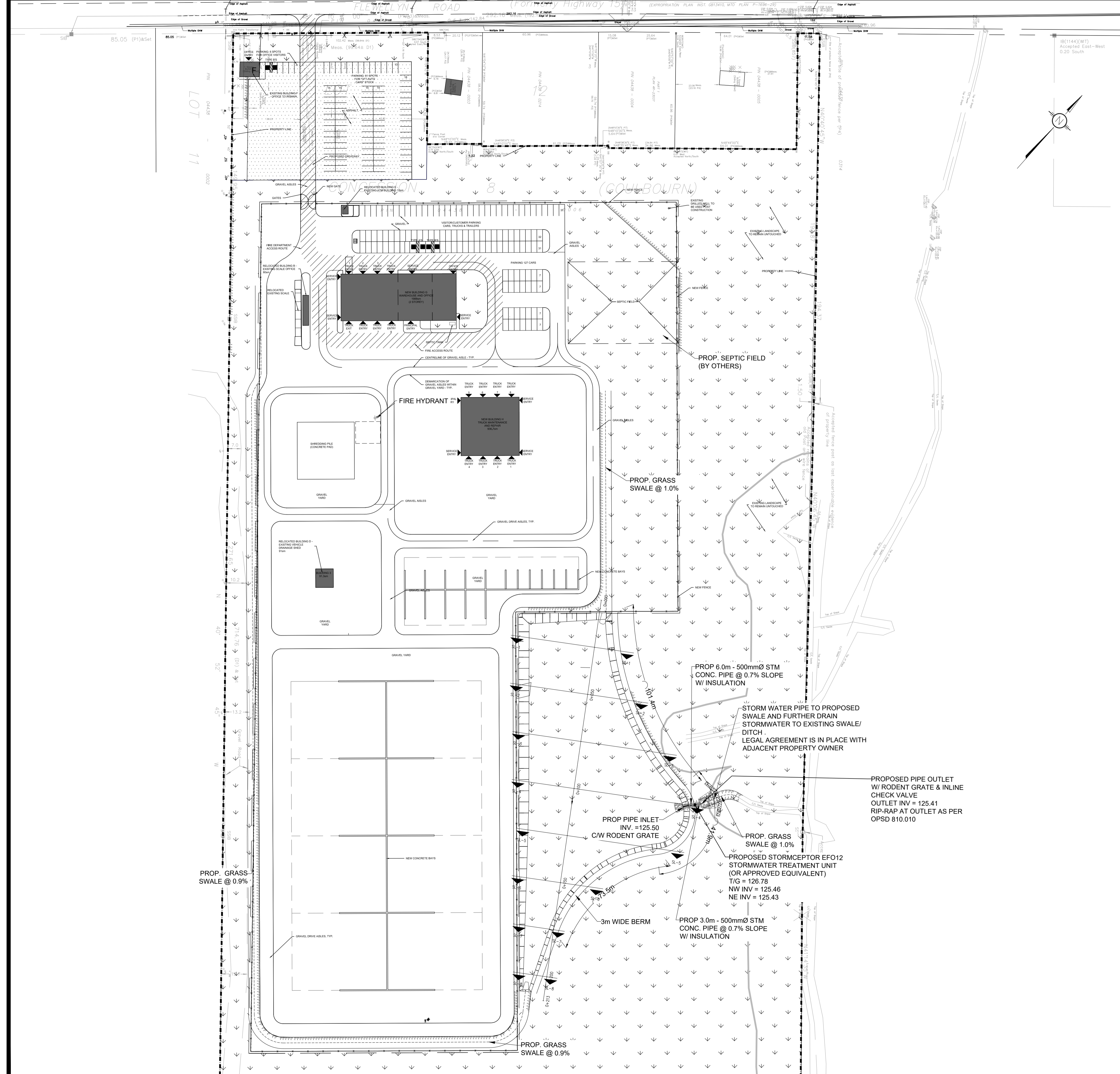
PROJECT  
**CASH FOR TRASH - 7628 FLEWELLYN ROAD  
OTTAWA, ON**

DRAWING TITLE  
**GRADING AND DRAINAGE PLAN**

PROJECT NO.  
210092

DATE  
JANUARY 2024

**C304**



**LEGEND:**

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED GRASS SWALE
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED RIP RAP
- PROPOSED ELEVATION
- PROPOSED BOTTOM OF SWALE ELEVATION
- MATCH INTO EXISTING ELEVATION
- EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- PROPOSED MANHOLE
- PROPOSED PIPE INSULATION
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WATERSHED NAME
- RUNOFF COEFFICIENT
- AREA IN HECTARES

**NOTES:**  
 OUTLET OF DRY POND TO BE FIELD ADJUSTED  
 HYDROSEEDING TO BE DONE ON POND SURFACE

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DESIGNED BY: M.L. DRAWN BY: M.L. APPROVED BY: V.J.

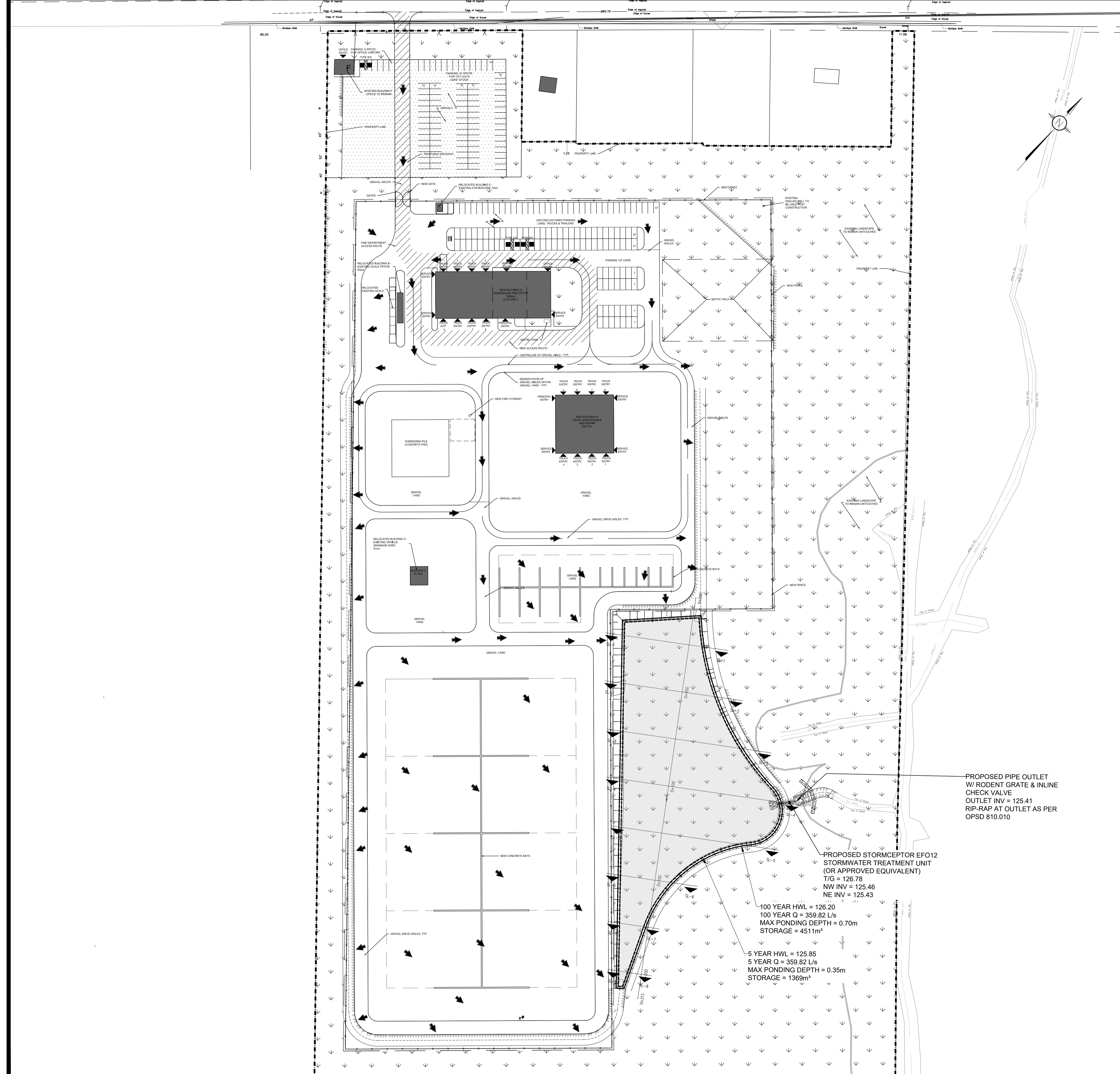
PROJECT  
**CASH FOR TRASH - 7628 FLEWELLYN ROAD  
 OTTAWA, ON**

DRAWING TITLE  
**SERVICING PLAN**

PROJECT NO.  
**210092**

DATE  
**JANUARY 2024**

**C401**



**LEGEND:**

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED GRASS SWALE
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
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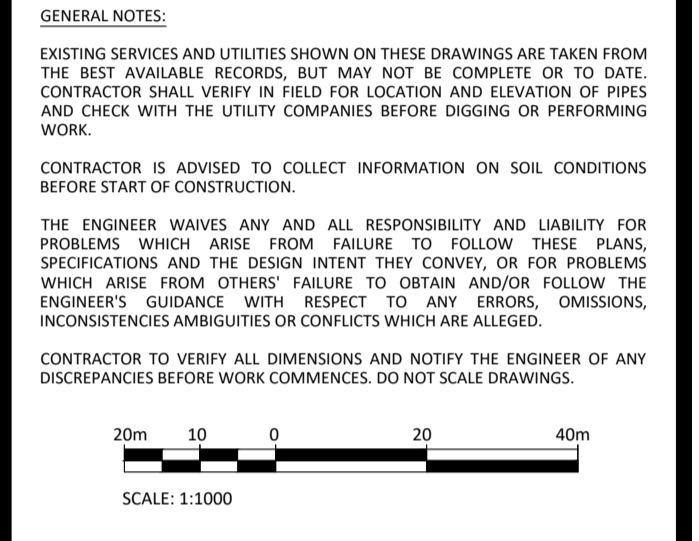
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CLIENT  
**CASH FOR TRASH CANADA**

DESIGNED BY: M.L. DRAWN BY: M.L. APPROVED BY: V.J.

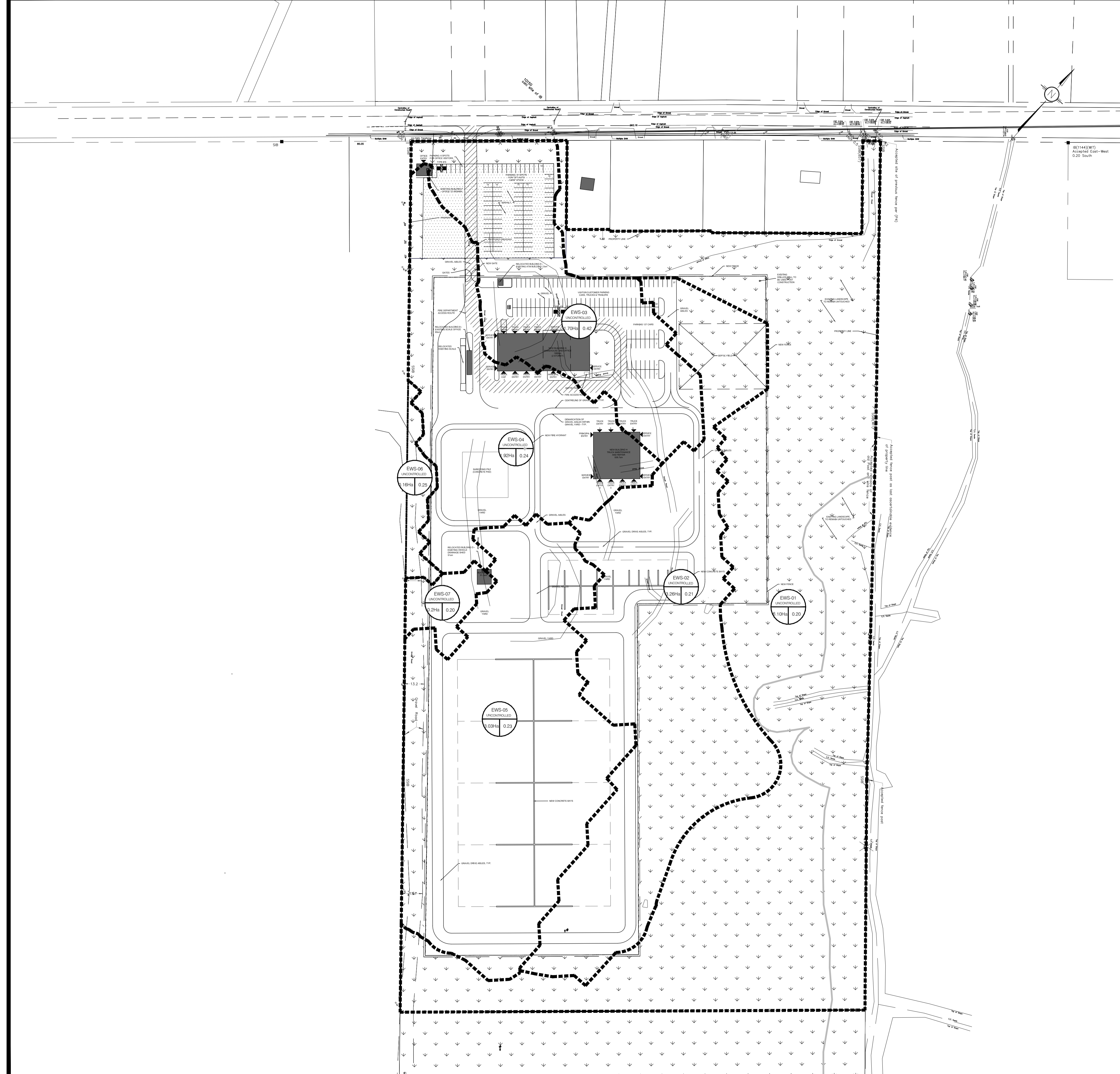
PROJECT  
**CASH FOR TRASH - 7628 FLEWELLYN ROAD  
OTTAWA, ON**

DRAWING TITLE  
**STORMWATER MANAGEMENT PLAN**

PROJECT NO.  
**210092**

DATE  
**JANUARY 2024**

**C601**



**LEGEND:**

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED GRASS SWALE
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED RIP RAP
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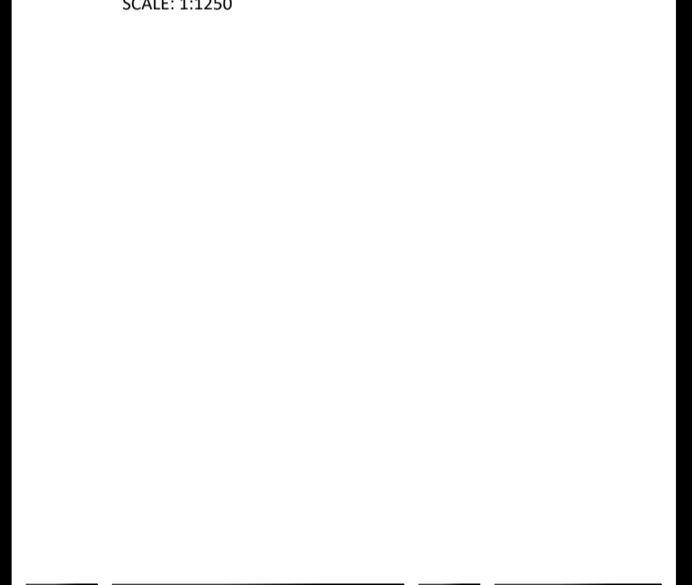
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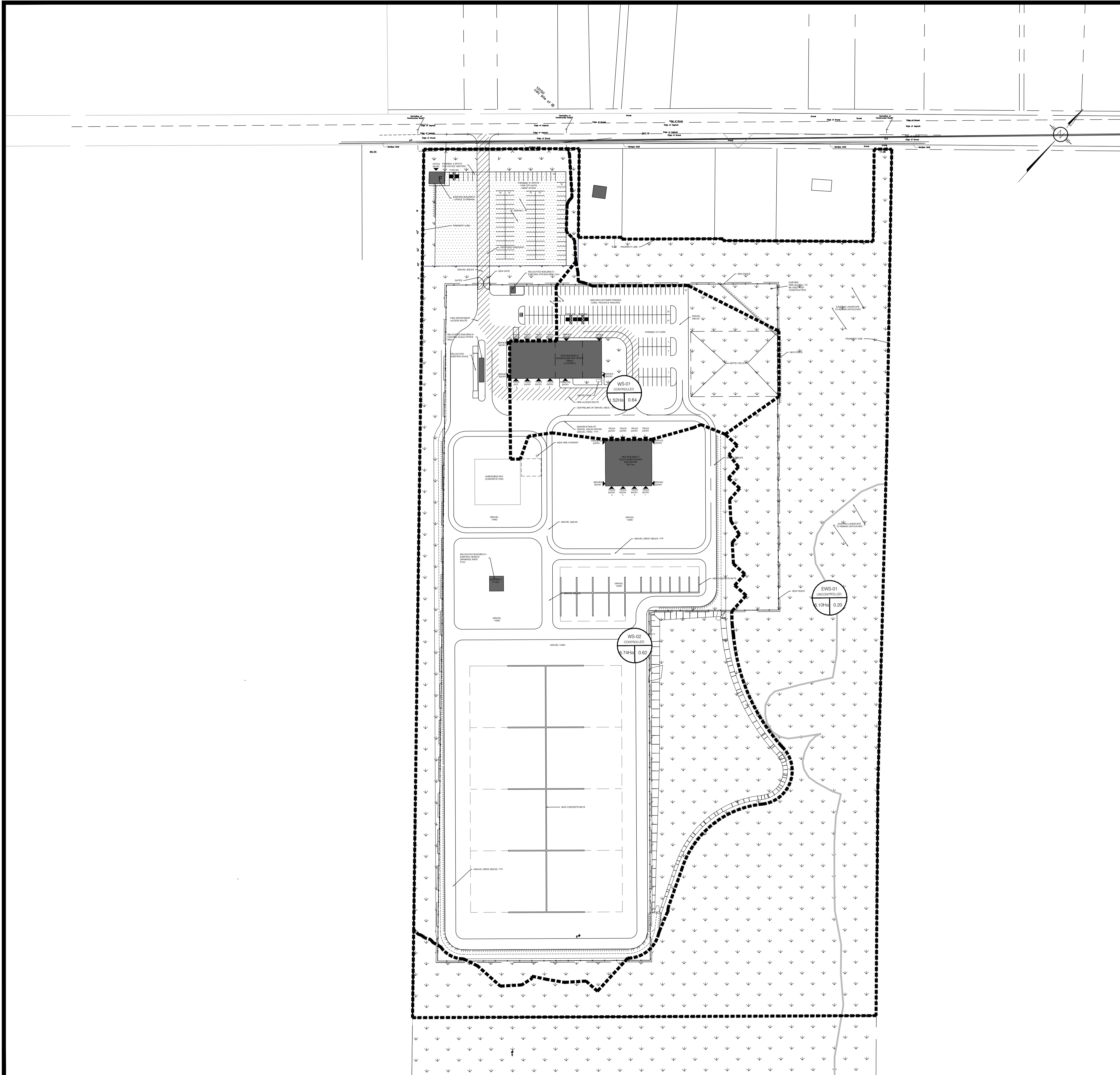
PROJECT  
**CASH FOR TRASH - 7628 FLEWELLYN ROAD  
OTTAWA, ON**

DRAWING TITLE  
**PRE-DEVELOPMENT  
WATERSHED PLAN**

PROJECT NO.  
**210092**

DATE  
**JANUARY 2024**

**C701**



**LEGEND:**

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED GRASS SWALE
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
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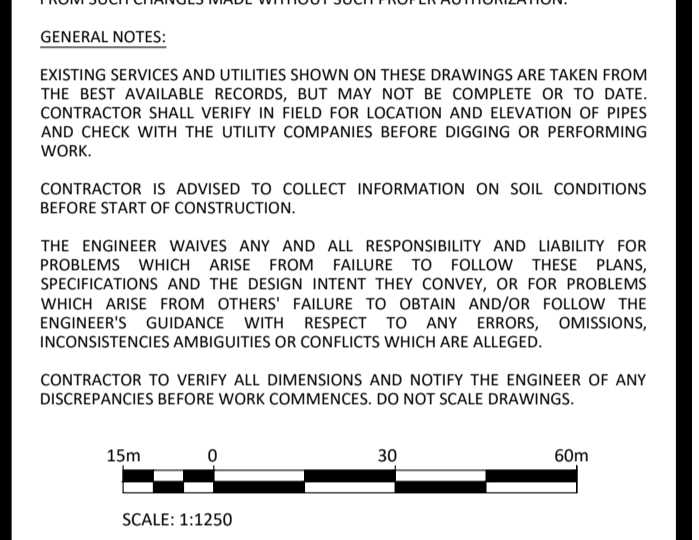
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5430 Canotek Road | Ottawa, ON, K1J 9G2  
www.lrl.ca | (613) 842-3434

CLIENT  
**CASH FOR TRASH CANADA**

DESIGNED BY: M.L.      DRAWN BY: M.L.      APPROVED BY: V.J.

PROJECT  
**CASH FOR TRASH - 7628 FLEWELLYN ROAD  
OTTAWA, ON**

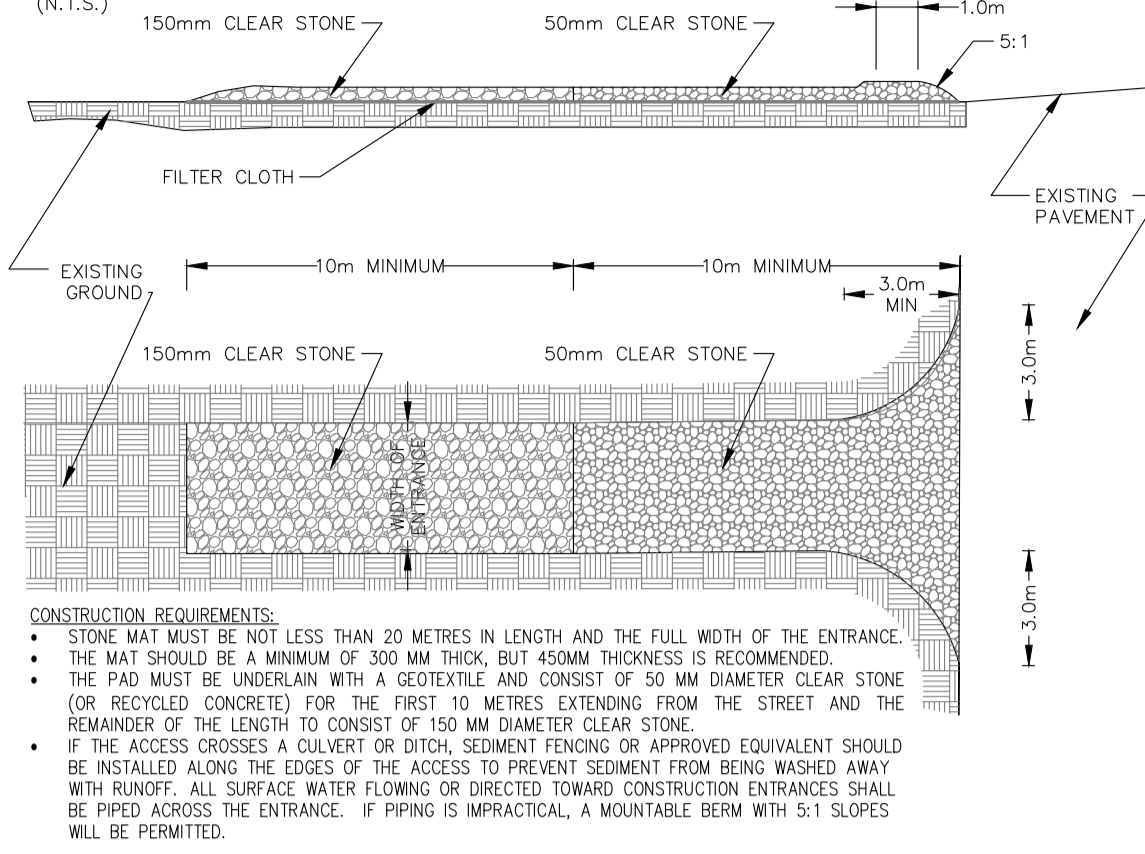
DRAWING TITLE  
**POST-DEVELOPMENT  
WATERSHED PLAN**

PROJECT NO.  
**210092**

DATE  
**JANUARY 2024**



**STONE MUD MAT DETAIL**  
(N.T.S.)



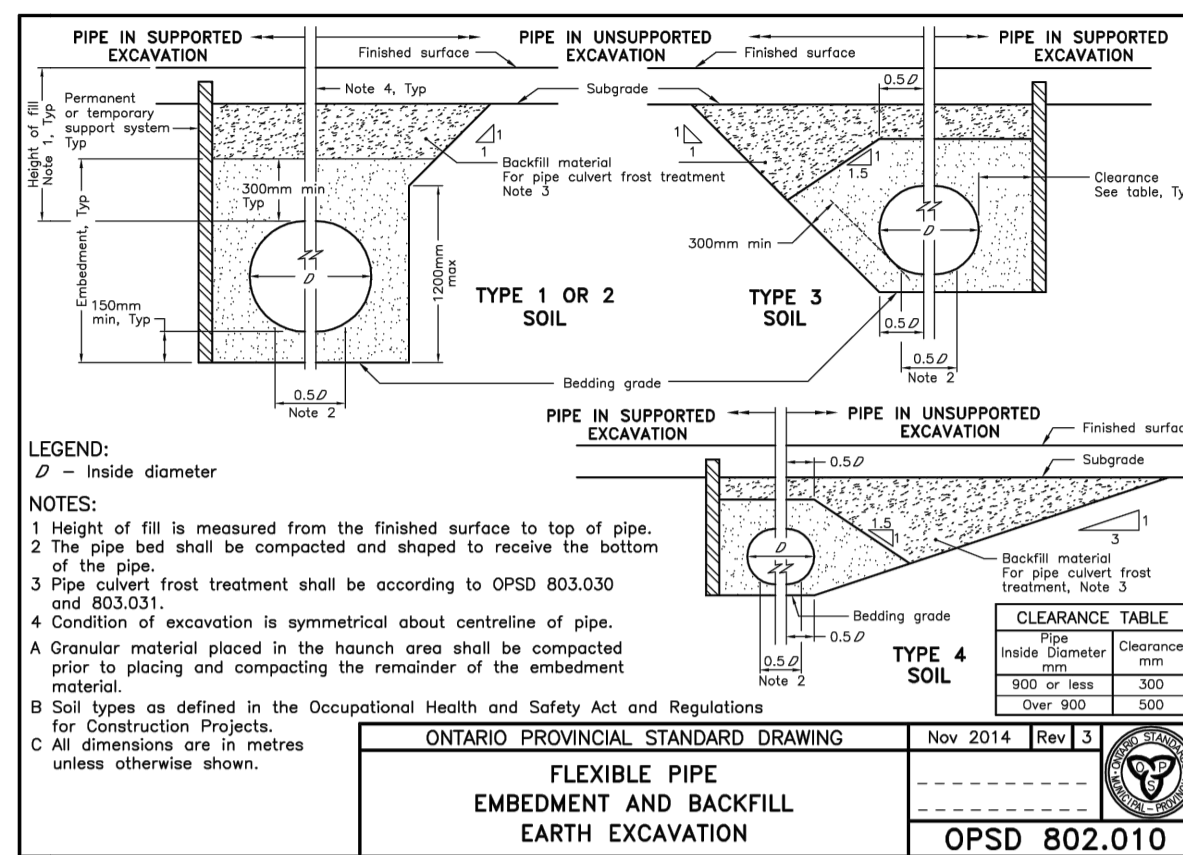
- CONSTRUCTION REQUIREMENTS:**
- STONE MAT MUST BE NOT LESS THAN 20 METRES IN LENGTH AND THE FULL WIDTH OF THE ENTRANCE.
  - THE MAT SHOULD BE A MINIMUM OF 300 MM THICK, BUT 450MM THICKNESS IS RECOMMENDED.
  - THE PAD MUST BE UNDERLAIN WITH A GEOTEXTILE AND CONSIST OF 50 MM DIAMETER CLEAR STONE (OR RECYCLED CONCRETES) FOR THE FIRST 10 METRES EXTENDING FROM THE STREET AND THE REMAINDER OF THE LENGTH TO CONSIST OF 150 MM DIAMETER CLEAR STONE.
  - IF THE ACCESS CROSSES A CULVERT OR DITCH, SEDIMENT FENCING OR APPROVED EQUIVALENT SHOULD BE INSTALLED ALONG THE EDGES OF THE ACCESS TO PREVENT SEDIMENT FROM BEING WASHED AWAY WITH RUNOFF. ALL SURFACE WATER FLOWING OR DIRECTED TOWARD CONSTRUCTION ENTRANCES SHALL BE RIPPED ACROSS THE ENTRANCE. IF RIPPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.

- INSTALLATION & MAINTENANCE REQUIREMENTS:**
- CONTRACTOR WILL REPLACE GRANULAR MATERIAL BY TOP DRESSING OR COMPLETE REPLACEMENT AS REQUIRED WHEN IT BECOMES CONTAMINATED BY VEHICLE TRAFFIC.
  - SEDIMENT SHALL BE CLEANED FROM ADJACENT ROADS AT THE END OF EACH DAY; SILTATION CONTROL MEASURES SHALL BE INSPECTED AFTER EACH RAIN.
  - SEDIMENT SHALL BE REMOVED FROM PUBLIC ROADS BY SHOVELING OR SKEEPING AND DISPOSED OF PROPERLY IN A CONTROLLED SEDIMENT DISPOSAL AREA.
  - STORM INLETS BOTH ON AND IN PROXIMITY OF THE SITE SHALL BE PROTECTED WITH INLET CONTROL MEASURES PRIOR TO SITE DEVELOPMENT AND ROAD CLEANING ACTIVITIES.

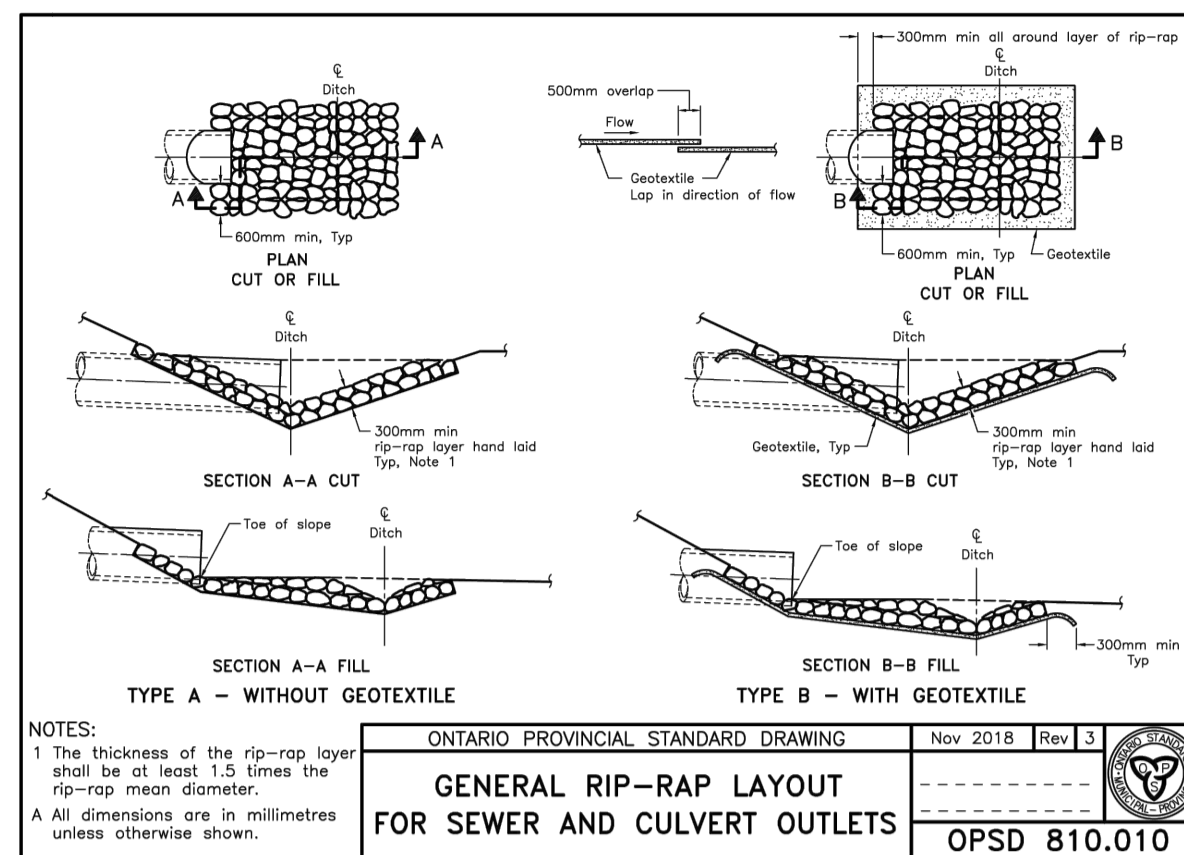
- NOTES:**
- IN THE EVENT THAT THE MUD MAT AS CONSTRUCTED IS DEEMED TO NOT PROVIDE ADEQUATE PROTECTION, ADDITIONAL MEASURES SUCH AS WHEEL WASHING SYSTEMS MAY BE REQUIRED, IN ADDITION TO THE MUD MAT, TO ENSURE SEDIMENT FROM A CONSTRUCTION SITE WILL NOT BE TRANSPORTED OFF THE SITE VIA THE EXITING CONSTRUCTION VEHICLES.
  - WHERE SITE CONSTRAINTS PROHIBIT CONSTRUCTION OF A MUD MAT, AN APPROVED WHEEL WASHING SYSTEM IS REQUIRED TO PREVENT SEDIMENT FROM BEING TRANSPORTED OFF THE SITE.
  - WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

Recommended Pavement Structure - Car Only Parking Areas	
Thickness (mm)	Material Description
50	Wear Course - HL-3 or Superpave 12.5 Asphaltic Concrete
150	BASE - OPSS Granular A Crushed Stone
300	SUBBASE - OPSS Granular B Type II
SUBGRADE - Either fill, in situ soil or OPSS Granular B Type I or II material placed over in situ soil or bedrock	

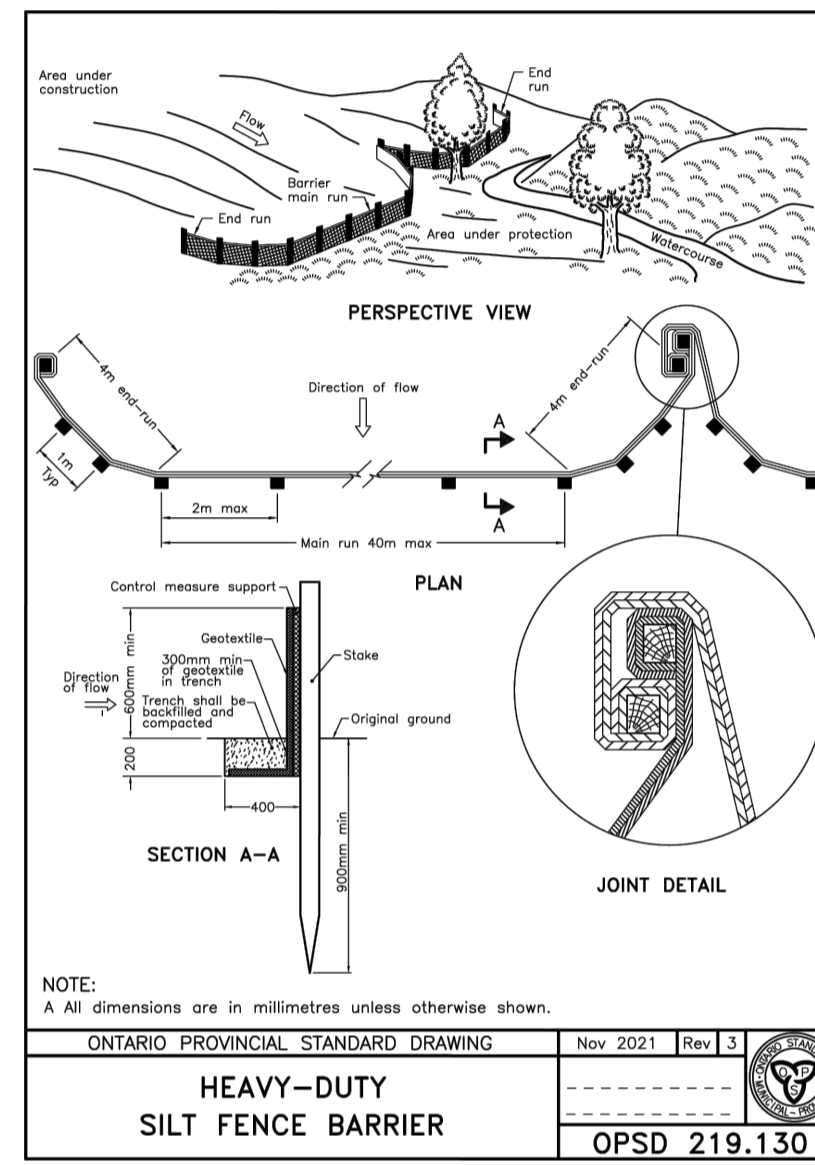
Recommended Pavement Structure - Access Lanes and Heavy Truck Parking Areas	
Thickness (mm)	Material Description
40	Wear Course - HL-3 or Superpave 12.5 Asphaltic Concrete
50	Binder Course - HL-8 or Superpave 19.0 Asphaltic Concrete
150	BASE - OPSS Granular A Crushed Stone
400	SUBBASE - OPSS Granular B Type II
SUBGRADE - Either fill, in situ soil, or OPSS Granular B Type I or II material placed over in situ soil or bedrock.	



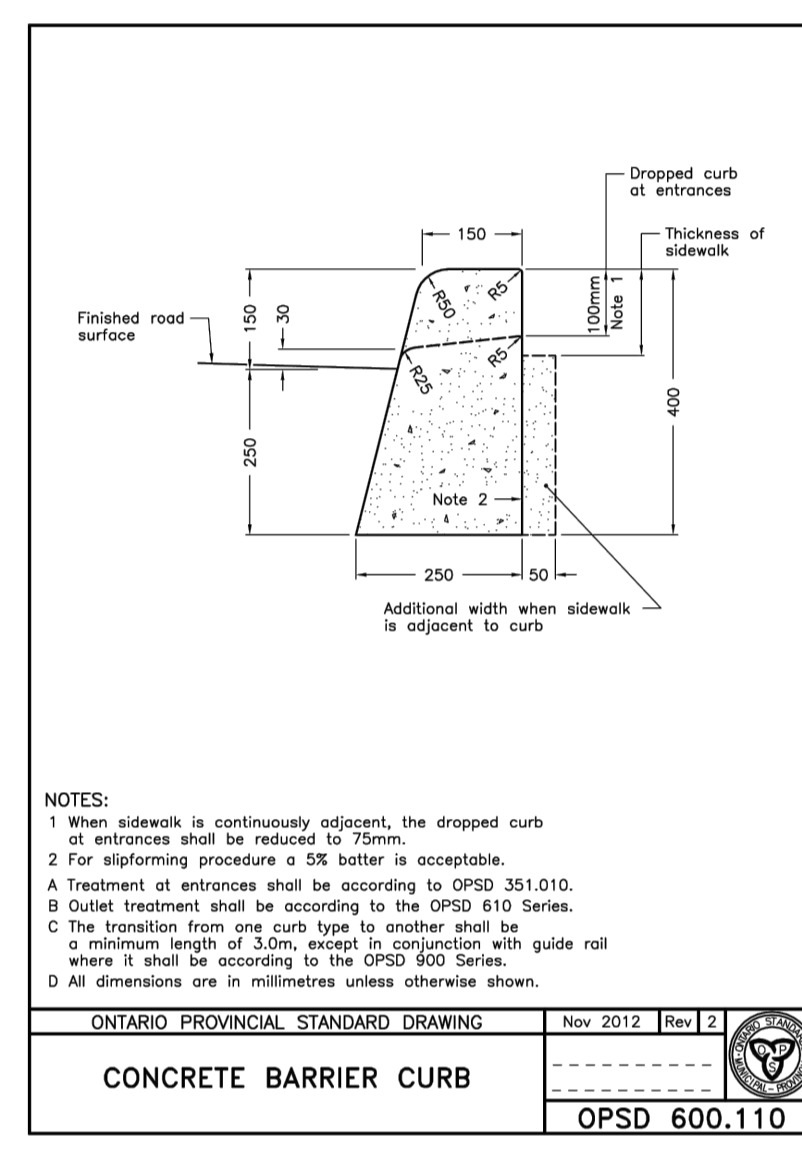
ONTARIO PROVINCIAL STANDARD DRAWING Nov 2014 Rev 3  
**FLEXIBLE PIPE EMBEDMENT AND BACKFILL**  
EARTH EXCAVATION  
OPSD 802.010



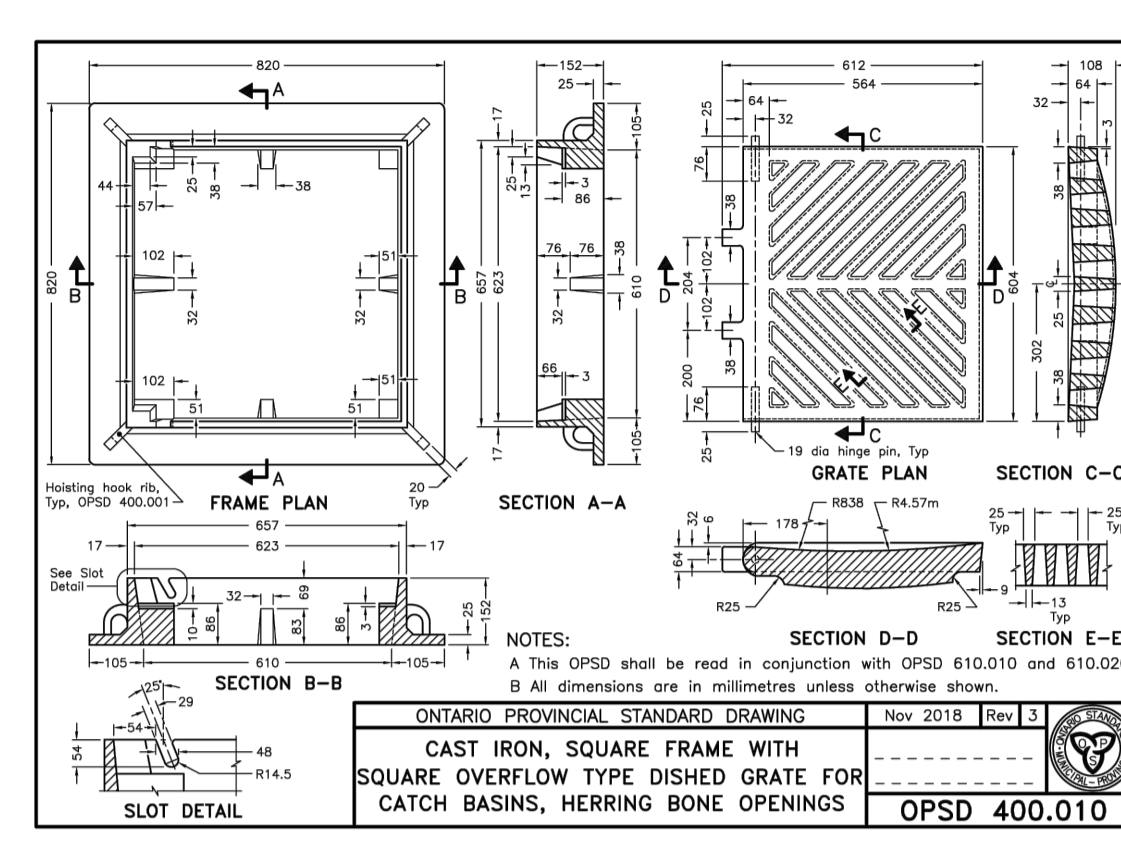
ONTARIO PROVINCIAL STANDARD DRAWING Nov 2018 Rev 3  
**GENERAL RIP-RAP LAYOUT FOR SEWER AND CULVERT OUTLETS**  
OPSD 810.010



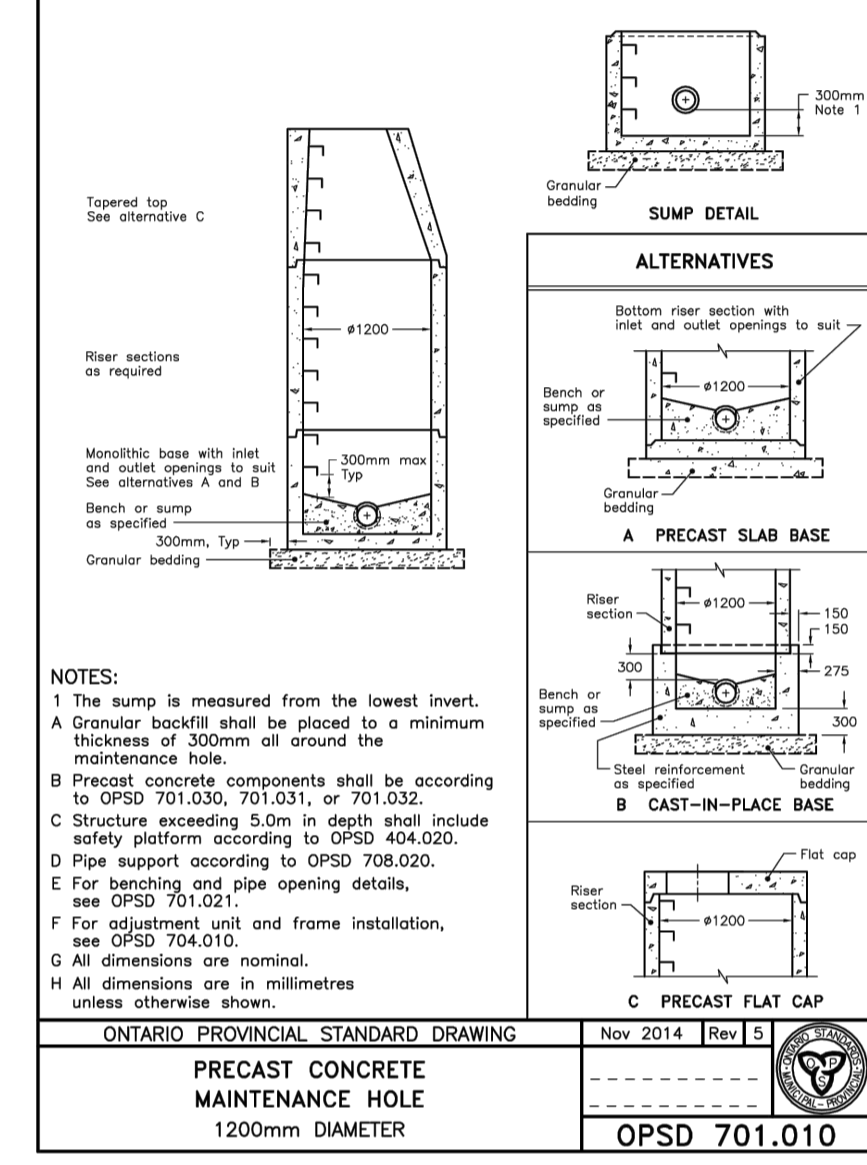
ONTARIO PROVINCIAL STANDARD DRAWING Nov 2021 Rev 3  
**HEAVY-DUTY SILT FENCE BARRIER**  
OPSD 219.130



ONTARIO PROVINCIAL STANDARD DRAWING Nov 2012 Rev 2  
**CONCRETE BARRIER CURB**  
OPSD 600.110

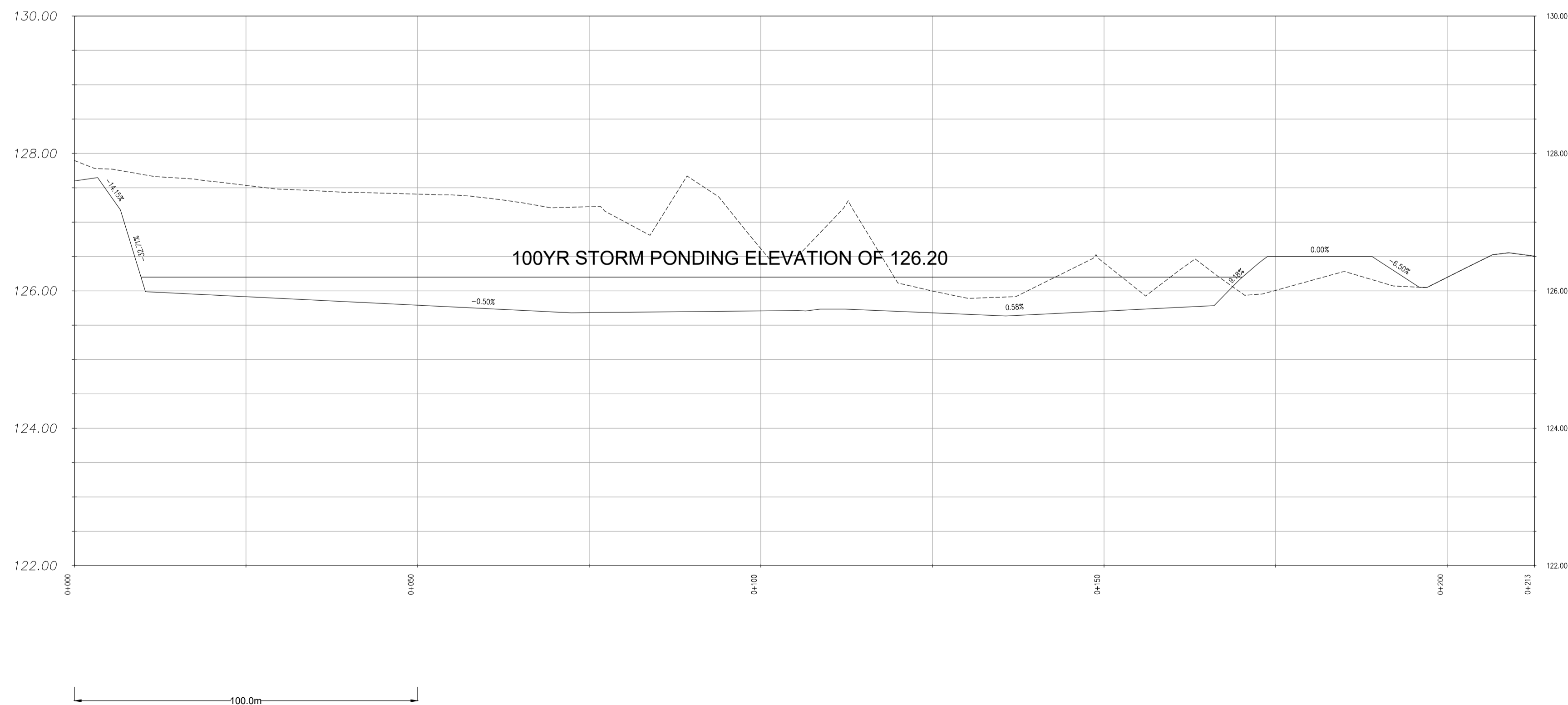


ONTARIO PROVINCIAL STANDARD DRAWING Nov 2018 Rev 3  
**CAST IRON, SQUARE FRAME WITH SQUARE OVERFLOW TYPE DISHED GRATE FOR CATCH BASINS, HERRING BONE OPENINGS**  
OPSD 400.010



ONTARIO PROVINCIAL STANDARD DRAWING Nov 2014 Rev 5  
**PRECAST CONCRETE MAINTENANCE HOLE 1200mm DIAMETER**  
OPSD 701.010

**POND PROFILE STA. 0+000 TO 0+213**



**USE AND INTERPRETATION OF DRAWINGS**

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION ARE PART OF THE CONTRACT DOCUMENTS AND DESCRIBE USE AND INTENT OF THE DRAWING. THE CONTRACT DOCUMENTS INCLUDE NOT ONLY THE DRAWINGS, BUT ALSO THE OWNER-CONTRACTOR AGREEMENTS, CONDITIONS OF THE CONTRACT, THE SPECIFICATIONS, ADDENDA, AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT. THESE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ANY ONE SHALL BE BINDING AS REQUIRED BY ALL. WORK NOT COMPLETELY DELINEATED HEREON SHALL BE CONSTRUCTED OF THE SAME MATERIALS AND DETAILED SIMILAR TO THAT SHOWN MORE COMPLETELY ELSEWHERE IN THE CONTRACT DOCUMENTS.

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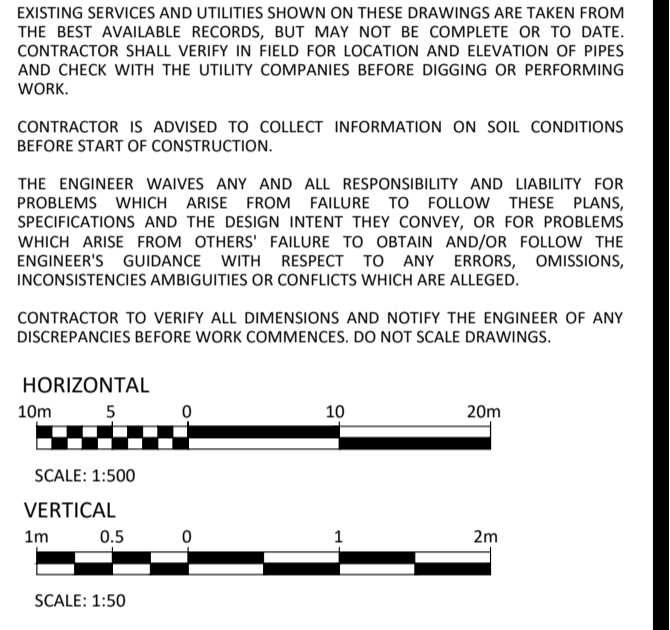
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DESIGNED BY: M.L. DRAWN BY: M.L. APPROVED BY: V.J.

PROJECT  
**CASH FOR TRASH - 7628 FLEWELLYN ROAD OTTAWA, ON**

DRAWING TITLE  
**CONSTRUCTION DETAIL PLAN**

PROJECT NO.  
**210092**

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**C901**



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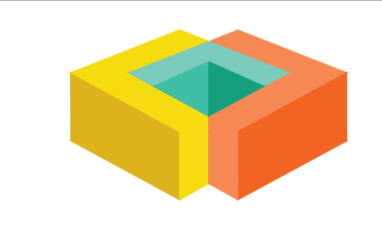
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