March 15, 2024
Project Number: 240056

Rayan Zaher
364 Wisteria Crescent
Ottawa, ON K1V 0N9
Email: rayanzaher52@gmail.com

**Re: Hydrogeological Assessment and Terrain Analysis for Septic System Suitability
Commercial Site Development (Storage and Repair Facility)
5254 Bank Street, Ottawa, Ontario**

Dear Mr. Zaher:

BluMetric Environmental Inc. (BluMetric®) was retained to conduct a hydrogeological assessment and terrain analysis to support an application for a commercial development at 5254 Bank Street, Ottawa, Ontario. The location of the site is indicated in Figure 1. The land parcel covers an area of approximately 0.17 hectares. The site is in an area that is serviced by the Ottawa municipal water supply system. The Ottawa municipal wastewater treatment system does not extend to the area where the site is located. It is proposed that the site will be developed for commercial use and will be serviced by an onsite septic wastewater system.

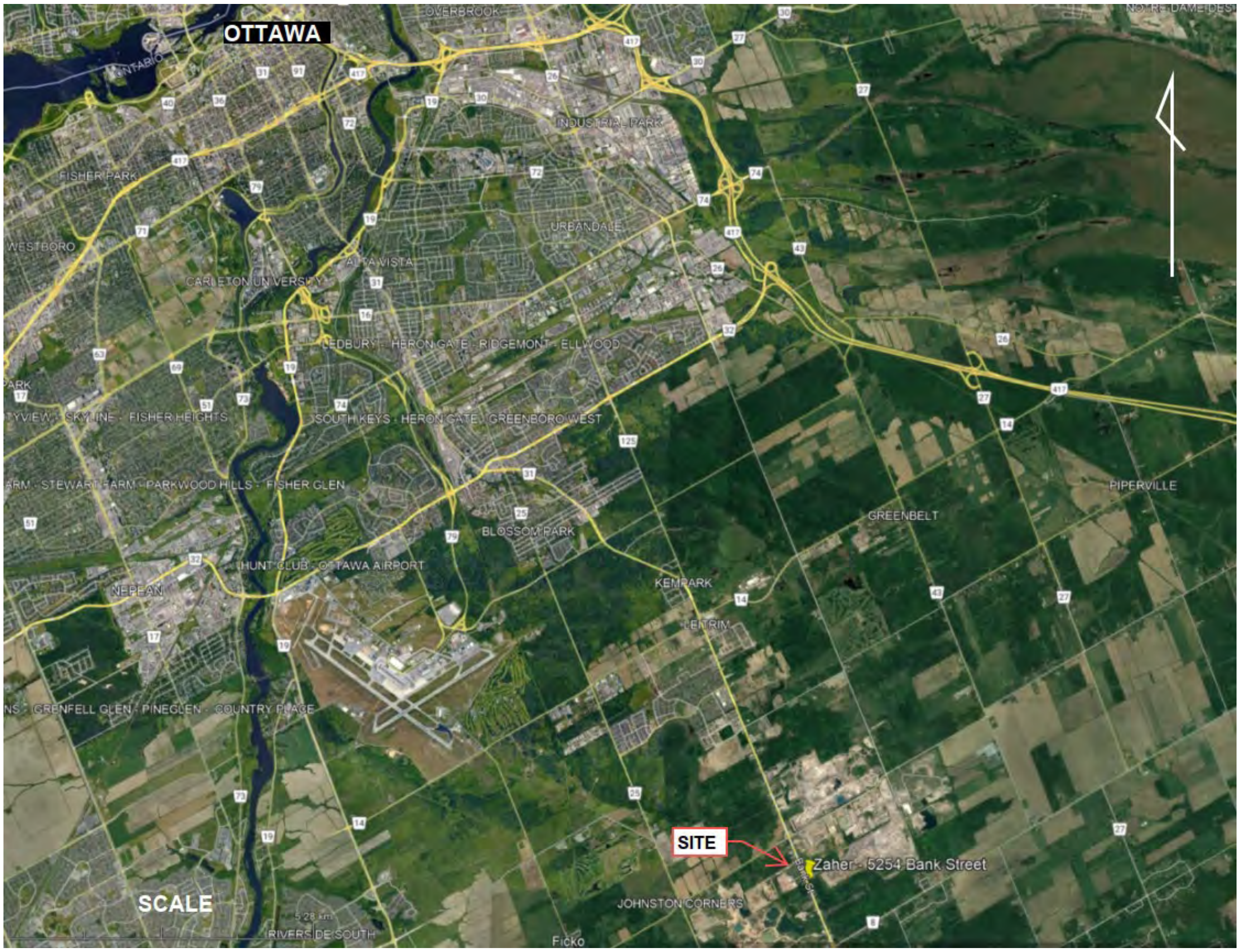
1. CONTEXT

1.1 TERMS OF REFERENCE

This study was conducted with general reference to the following regulations and guidelines:

- City of Ottawa Hydrogeology and Terrain Analysis Guidelines, 2021.
- Ontario Ministry of the Environment, Conservation and Parks (MECP) Procedure D-5-4, Technical Guideline for Individual On-Site Sewage Systems, Water Quality Impact Risk Assessment (MOEE, 1996).

Figure 1: Site Location



1.2 SCOPE OF WORK

The scope of this assessment was developed based on requirements of Procedure D-5-4 and Procedure D-5-5 (MOE, 1996). The scope of work included the following components:

- Desktop review of background information (water well records, geological databases, hydrology information, topography).
- Pre-consultation with Lanark County peer review representative.
- Terrain analysis based on geotechnical report by LRL Engineering (LRL).
- Predictive nitrate impact assessment based on 2024 site development concept by Unpoised Architecture and engineering site plans by LRL Engineering.

1.3 Proposed Commercial Development

The commercial site plan concept (a storage and repair facility) was updated by Unpoised Architecture in January 2024 (see site concept architectural drawings in Attachment A) and consists of the following elements:

- Slab on grade commercial storage/repair building with three garage bays and two offices.
- Paved area for access and parking
- Nitrate reducing 'tertiary treatment' septic system with leaching bed.

2. METHODOLOGY

2.1 Pre-Consultation

A pre-submission consultation meeting was conducted with the City of Ottawa on November 1, 2023. The City of Ottawa indicated that development of the site will be challenging as the parcel area is relatively small at 0.17 hectares.

The City indicated that nitrate reducing tertiary treatment is not a preferred option from the City's perspective, but it was determined through further discussion that nitrate attenuation assessment could potentially incorporate the use of tertiary treatment since the City has previously approved tertiary treatment systems for commercial development on existing land parcels, and that tertiary treatment systems are subject to the requirements of the Ottawa Septic System Office (OSSO) who are the approval agency.

A previous terrain analysis and private sewage disposal system impact assessment report by LRL was discussed (LRL, 2020). The City of Ottawa indicated that the LRL report does not reflect the current site development design, so a new comprehensive hydrogeological and terrain analysis report reflecting the current development design plan for the site will be required.

2.2 Background Information Review

A review of available background information was conducted including:

- MECP water well records.
- MECP permit to take water (PTTW) database.
- Topographic databases.
- The Rideau Valley Conservation Authority (RVCA) geographic information system (GIS).
- Ontario Geological Survey (OGS) online geology mapping databases.

2.3 Terrain Analysis

A review of available information from water well records and a geotechnical investigation of the site by LRL Engineering in 2019 and 2023 (LRL. 2023) was conducted. Details of the geotechnical investigation are provided in Section 4.1.

3. SITE DESCRIPTION

3.1 Land Parcel

The land parcel at 5254 Bank Street has an area of 1708.73 square metres (0.17 hectares). The site will be accessed from Bank Street. A topographic plan of survey (Farley, Smith & Denis Surveying, 2022) showing existing site features is included as Attachment B. The site is currently developed as a rural residential site with a one-story residence with basement, septic bed and three outbuildings (garage and two storage sheds).

The site is within the City of Ottawa and is within the boundaries of the South Nation Conservation Authority (SNCA).

Zoning at the site is RG3[900r]-h (Rural General Industrial Zone). The parcel to the north (5224 Bank Street) is RG1[290r] (Rural General Industrial Zone). The parcel to the south and west (5304 Bank Street) is ME2 (Mineral Extraction Zone).

3.2 Surrounding Land Use

Surrounding land uses within 500 m of the site include:

North:

- Bank Street.
- A campground/trailer park.
- Automotive garages.
- Rural residence.
- Undeveloped areas with trees.
- Commercial use property (former Brickyards Quarry site).

East:

- Bank Street.
- Two Quarry sites.
- Forested areas / undeveloped.
- Commercial use properties.

West:

- Lumber Yard
- Undeveloped land with some trees
- Aggregate pit (5304 Bank Street) including undeveloped land.

South:

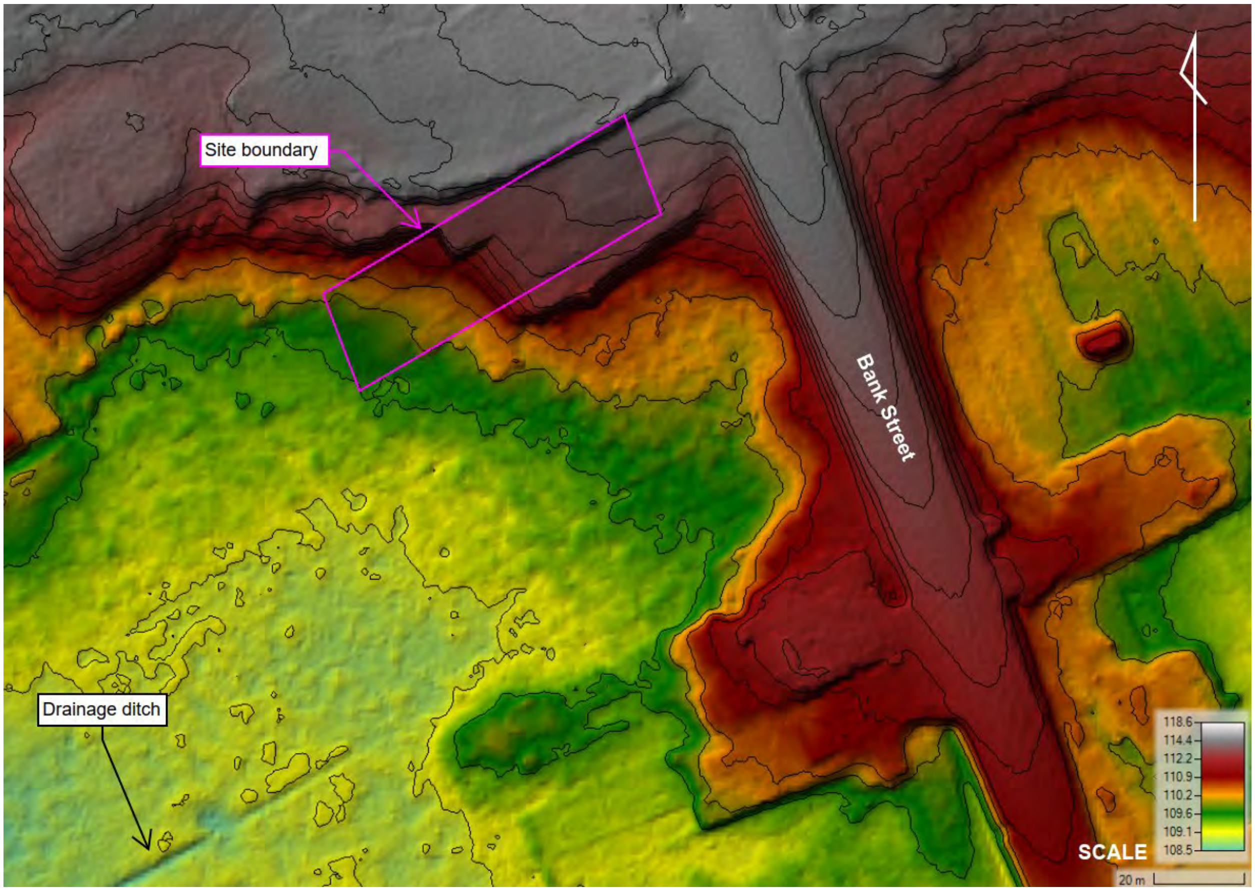
- Bank Street
- Commercial use properties.
- Residences
- A church.
- Aggregate pit (5304 Bank Street) including undeveloped land.

3.3 TOPOGRAPHY

The land parcel is undulating with a general slope from northeast to southwest. An elevation change occurs near the middle of the site, and the eastern and western ends of the site are relatively flat. The highest elevation (115 m asl) occurs at the northeastern corner of the site. The lowest elevation (109.5 M asl) occurs at the southwestern corner of the site.

The terrain at the site was analysed using 'laser imaging, detection, and ranging' (LIDAR) data. High resolution digital elevation model (HRDEM) data was obtained from the Government of Canada Open Maps website (Canada, 2024 - CanElevation Series). Digital terrain model (DTM) data was analysed using public domain software developed by the US Army Corps of Engineers, Hydrologic Engineering Center, River Analysis System (HEC-RAS). A hill shade' terrain model was generated. Figure 2 shows a 'hill shaded' DTM image covering the site and surrounding areas.

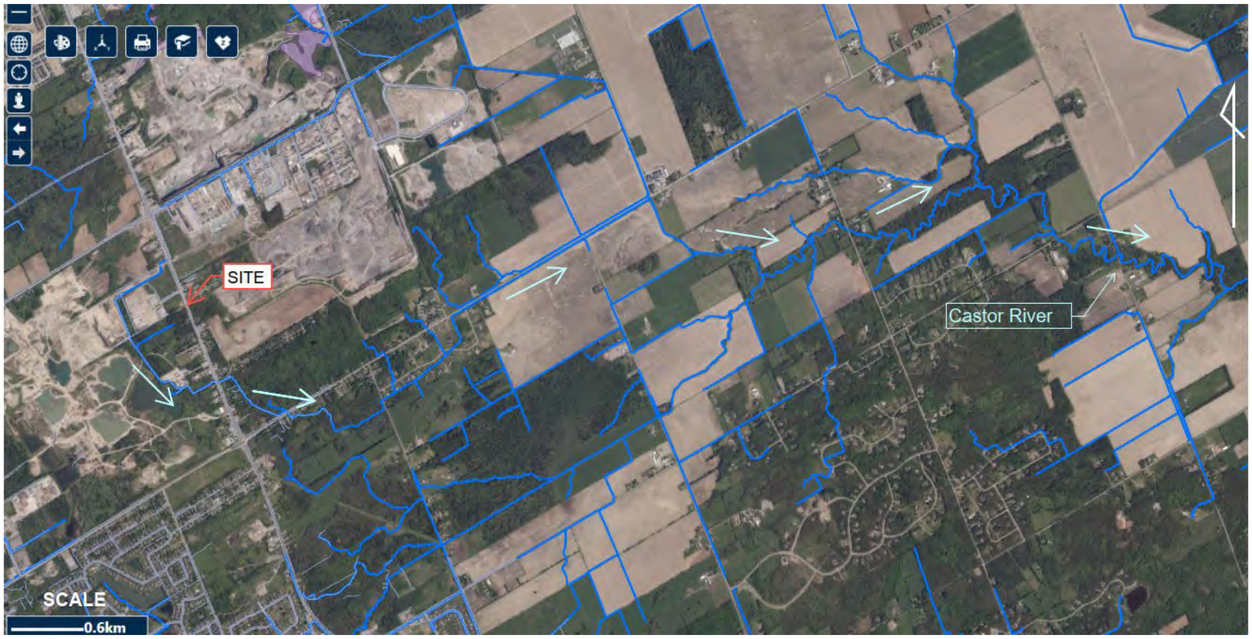
Figure 2: Hill Shaded Digital Terrain



3.4 HYDROLOGY

Onsite drainage is by infiltration and overland flow towards a drainage ditch to the southwest. The site occurs in the Castor River Watershed which is part of the South Nation Watershed. Drainage from the site flows to the southwest towards a drainage ditch that flows southwest to a drainage ditch that flows to the south. The drainage ditches in this area follow to the south and then to the east towards an unnamed creek and drainage ditches that flow into the Castor River at a point that is approximately 7.5 km to the east of the site. Surface water flow directions in the vicinity of the site are indicated on Figure 3.

Figure 3: Surface Water Flow Directions (GeoOttawa)



The SNCA online GIS (SNCA, 2024) indicates a 'regulation boundary' associated with drainage ditches to the west of the site (Figure 4). At its closet point the boundary is approximately 230 m to the west of the western boundary of the site. The SNCA GIS indicates areas of wetland swamp and marsh as shown in Figure 4 (locations are approximate). The regulation boundary appears to be a flood boundary, but the SNCA GIS does not provide any further information.

Figure 4: SNCA Regulation Boundary

4. GEOLOGY

4.1 SURFICIAL GEOLOGY

Surficial geology information from the Ontario Geological Survey was obtained from the OGS Earth website (OGS, 2023). The data shows that the site is in an area of till (stone-poor, sandy silt to silty sand-textured) on Paleozoic terrain.

This description is generally consistent with the findings of the water well records search (sand, silt, gravel, and clay) and the geotechnical study by LRL (gravel fill over native silt and sand – see below). The well record that occurs closest to the site (well record 1502205 at 5304 Bank Street – see Attachment C) encountered 1.8 m of "boulder till" above bedrock.

A geotechnical investigation of the site was conducted by LRL Engineering in 2019 and 2023 (LRL. 2023). Eight boreholes were drilled. The locations of the boreholes are indicated in Figure 5. Geotechnical borehole logs are included in Attachment D. All of the boreholes were drilled to refusal. Borehole depths varied from 0.66 m at BH4 to 3.66 m at BH3. Groundwater was not identified at any of the borehole locations.

The general stratigraphy at the site is summarized as follows:

- Asphalt at BH3 — 0.05 m thick
- Topsoil — 0.1 to 0.45 m
- Fill material (sand/gravel) — 0.5 to 1.5 m
  - At all boreholes
- Silt at BH3 — 2.2 m thick
- Silt and sand at BH6 — 2.2 m thick
- Limestone bedrock at BH2 — at 0.65 m below ground surface (bgs)

One sample (BH3 silt from 2.3-2.9 m bgs) was submitted for grain size (sieve) analysis. Two samples (BH6 silt and sand from 2.3-2.9 m bgs, and BH8 fill from 0.8-1.2 m bgs) were submitted for laboratory gradation analysis. Analytical results for the samples are included in the LRL geotechnical report and show that estimates of hydraulic conductivity were 7×10^{-5} m/sec, which is within in the typical range for these materials (Freeze and Cherry, 1979).

Figure 5: Geotechnical Borehole Locations

The geotechnical report by LRL indicates that excavations for building footings are not expected to exceed 2.4 m bgs, and that seepage of overburden groundwater is expected to minimal if there is any at all. BluMetric agrees with this interpretation as there is no evidence to suggest that an overburden water table exists at the site. Groundwater seepage into excavations is expected to be limited to water that is draining through the overburden unit due to any recent precipitation and/or snow melt. See Section 4.3 for a detailed description of the site hydrogeology.

4.2 Bedrock Geology

Geological mapping information from the Ontario Geological Survey (OGS) Earth website (OGS, 2021) shows that the site is located in an area where the Oxford Formation is the uppermost bedrock unit. The Oxford Formation is part of the Beekmantown Group, and is described as dolostone, with minor shale and sandstone.

4.3 HYDROGEOLOGY

An unconfined water table was not identified by the eight geotechnical boreholes installed by LRL (LRL, 2023). Drainage within the overburden unit is expected to be influenced by topography and is inferred to have a southwesterly component (towards a drainage ditch that occurs approximately 250 m to the southwest of the site).

The highest water table elevation in the area to the southwest of the site is expected to have an elevation of approximately 108.6 m asl (based on DTM elevation at the ditch to southwest of site), which is approximately 1.4 m below the ground surface elevation at LRL borehole BH8. BH8 encountered refusal (assumed to bedrock) at 1.27 m below ground surface and no groundwater was identified, so it assumed that the water table at the site occurs within the bedrock unit.

The primary water supply aquifer in the vicinity of the site occurs within the horizontally bedded Ordovician sedimentary bedrock. The bedrock aquifer has water bearing fracture zones (i.e. horizontal bedding plane fractures) that occur between sedimentary layers of bedrock. Permeability within these strata is controlled by fractures. The primary porosity (i.e. the 'primary fracture network') is associated with horizontal bedding plane fractures. A secondary porosity is associated with subvertical fracturing.

Overburden groundwater drainage is inferred to be to the southwest based on topography. The direction of regional groundwater flow in bedrock at the site is inferred to be to the to the north towards the Ottawa River.

Information from the Ontario Source Water Protection Atlas, (MECP, 2023) website indicates that the site is not within a wellhead protection area (WHPA) or intake protection zone (IPZ), or a significant groundwater recharge area (SGRA). A highly vulnerable aquifer occurs beneath the site (score of 6).

4.3.1 Water Well Records

18 water well records that occur within 50 m of the site were obtained from the MECP Water Well Information System (WWIS - MECP, 2023). The well record locations are shown on Figure 6. Please note that the well record locations are based on MECP database coordinates and may be subject to varying degrees of error. A summary of relevant information from the water well records is provided in Table 1. All of the records that were reviewed are for wells completed in the bedrock aquifer. The wells range in depth from 11 to 65 m and have an average depth of 31 m.

No nearby downgradient wells were identified. It is assumed that the water supply wells in the area were decommissioned when the municipal water supply system was installed.

Figure 6: Water Well Records

Table 1: Water Well Records Summary

MECP WATER WELL RECORDS SUMMARY											
Well Record ID	Year Drilled	Depth to Bedrock (m)	Overburden Material	Bedrock Material	Total Depth (m)	Casing Depth (m)	Depth to Water Bearing Zone(s) (m)	Static Water Level (m)	Drawdown after Drillers Pumping Test (m)	Recommended pumping rate (L/min)	Comments
1502270	1954			Sandstone	35.1	21.3	35.1	9.1	9.1		Clear
1502193	1955	1.8	Clay	Limestone	32.9	4.3	32.9	7.3	11.0		Clear
1502271	1955	8.2	Sand	Grey Limestone	29.0	8.2	27.1	3.0	24.4		Clear
1502205	1956	1.8	Boulder till	Sandstone	49.7	4.9	47.2	2.4	12.8	49	Clear
1502203	1956	1.8	Clay	Limestone	14.6	2.7	14.6	2.4	2.4	11	Clear
1502268	1961			Sandstone	51.8		28.0 / 44.5	15.2		15	Fresh
1502272	1958	3.7	Clay	Limestone	15.2	6.4	15.2	2.4	4.3		Clear
1502204	1959	2.4	Gravel	Limestone	15.2	3.0	15.2	2.4	6.1	19	Clear
1502273	1960	4.3	Loam / gravel	Limestone	17.7	4.9	17.7	2.7	4.3	8	Clear
1502274	1960	1.2	Clay	Grey Rock	11.0	1.2	11.0	3.0	7.9	15	Clear
1502275	1961	0.0		Grey limestone	30.5	3.0	30.5	2.4	2.4	15	Clear
1502276	1961	0.0		Limestone / sandstone	46.3	6.1	21.3 / 41.1	15.2	28.7	38	Cloudy
1502267	1964	1.5	Sandy loam	Limestone / sandstone	65.2	3.4	29.0 / 49.4 / 57.3 / 65.2	21.3	24.4	38	Clear
1502277	1964	1.5	Topsoil / sand	Limestone	46.3	10.4	46.3	6.7	18.3	8	Cloudy
1502284	1965	1.2	Clay and loam	Limestone	14.6	3.7	14.6	1.5	1.5	15	Clear
1510284	1969	4.3	Sand	Blue limestone	14.6	5.5	14.6	3.0	3.0	19	Fresh
1516460	1978	1.5	Sand	Grey limestone	41.2	7.3	39.0	3.0	15.2	19	Clear
1516981	1979	2.4	Sand	Limestone	29.9	6.7	23 / 29.9	2.4	16.8	45	Cloudy

4.3.2 Water Taking Permits

A review of the MECP Permit to Take Water (PTTW) database was carried out within a 1 km radius of the site. PTTW information was obtained from the MECP interactive GIS system (MECP, 2023). The following water taking permits were identified:

- 6400-BLWMAC, Pomerleau Sand & Gravel Inc, for dewatering of pits and quarries. Taking of up to 9,000,000 L/day of surface and groundwater.
- 3754-C2GLXC, R.W. Tomlinson Limited, for dewatering and construction. Taking of up to 19,920,000 L/day of groundwater.

These water taking activities are not expected to have any impact on the subject site which is serviced by the Ottawa municipal water supply system.

4.3.3 Hydrogeological Sensitivity

The site is not within an area mapped as ‘known, potential, or inferred karst’ as determined by the OGS Karst mapping layer (OGS, 2023).

The water well records show that the overburden thickness within 500 m of the subject property varies from 0 to 8.2 m and has an average thickness of 2.4 m. The overburden material is primarily described in well records as sand, gravel and clay. LRL geotechnical boreholes varied in depth from 0.2 to 0.72 m bgs and the material encountered was mostly sand gravel fill (with native silt and sand at two locations).

Based on the terrain analysis findings, the subject site is hydrogeologically sensitive due to thin soils in some locations.

4.3.4 Potential Sources of Contamination

The following potential sources of contamination were identified:

- A Phase 1 ESA by EXP Services Inc. (EXP) identified two liquid fuel storage tanks at the site so there is a potential for some localised hydrocarbon contamination.
- Application of road salt along Bank Street is expected to have caused some limited impacts to the areas immediately bordering the roads and ditches. No onsite impact is expected as a result of road salt application activities.
- The site is in an area of commercial development including automotive garages and a wood treatment facility. The garage at 5217 Bank Street (Wallace Service Centre at 5217 Bank Street) and the wood treatment facility (Grandore Lumber at 5224 Bank Street) are directly upgradient of the site. These operations are discussed in detail a Phase One ESA by EXP (EXP, 2023).
- Neighbouring septic systems have a potential to cause some limited impacts to bedrock groundwater quality.

The site is serviced by the Ottawa municipal water supply system so potential impacts to the bedrock aquifer will not affect the potable water supply at the site.

5. DEVELOPMENT CONSIDERATIONS

5.1 SEPTIC SYSTEM SUITABILITY

MECP's Procedure D-5-4 (MOEE, 1996) provides a methodology for assessing the risks associated with individual onsite sewage systems. Developments of land parcels which average 1 hectare may not require a detailed hydrogeological assessment if it can be demonstrated that the area is not hydrogeologically sensitive. The site covers an area of 0.17 hectares, so a predictive nitrate impact assessment was completed.

The assessment is based on a reasonable estimate of groundwater recharge by infiltration from precipitation. The method relies on estimates of evaporation, evapotranspiration, infiltration and runoff and inputs regarding surficial soil type, vegetative ground cover and topography. A nitrate effluent concentration of 40 mg/L is used as per MECP Procedure D-5-4. Further details regarding the septic design flow for the proposed development are provided in Section 5.2.

A septic design flow rate of 670 L/day was used based on input from Absolute Drafting and Design Inc.). The septic design flow rate is based on Ontario Building Code (OBC, 2012) sewage system design flow elements.

A mean annual precipitation value (net of evaporation and evapotranspiration processes) of 929.8 mm/year was used (Environment Canada, Climate Normals, Ottawa Airport). An estimation of infiltration was calculated based on site specific information and the infiltration factors provided in the document MOEE Hydrogeological Technical Information Requirements for Land Development Applications (MOEE, 1995). A value for ‘water surplus’ was obtained from Environment Canada (see Attachment E). It should be noted that the Environment Canada calculations use a lower precipitation value for Ottawa (911 mm/year) so the value used for water surplus is conservative.

A nitrate effluent concentration of 20 mg/L can be used as the site design specifies that the onsite septic sewage system will incorporate a proprietary ‘tertiary’ pre-treatment component to ensure that the concentration of nitrates can be reduced by at least 50%. It is expected that the Ottawa Septic System Office (OSSO) will provide conditions as part of an approval for such a system addressing concerns about ongoing inspection and maintenance to ensure long term efficient performance.

The predictive nitrate impact assessment calculations are provided in Attachment E. The assessment shows that the nitrate impact for the proposed development will be 9.9 mg/L, which is a significant reduction compared to existing conditions.

5.2 SEWAGE SYSTEM DESIGN

Site development will include the installation of a nitrate reducing tertiary treatment system to reduce nitrate loading to the site. These systems employ various technologies from porous bacterial enriched foam and denitrifying lignocellulose mediums to microbial electrochemical septic tanks (MESTs). Tertiary treatment systems significantly reduce the size of the septic bed footprint. They are classified as Class 4 sewage systems and are therefore held to the same building code in the OBC (OBC, 2012). The following are examples of certified tertiary pre-treatments systems that may be suitable for the site:

- Waterloo Biofilter systems are manufactured in Canada and are certified by the National Sanitation Foundation (NSF).
- Eljen GSF systems are manufactured in the U.S. and are NSF certified.
- Premier Tech Ecoflo systems are manufactured in the U.S. and are NSF certified.

The site owner is advised to have the on-site wastewater system inspected regularly and to follow a wastewater system management program to minimize the risk of failure and impact to the groundwater. Best management practices are recommended such as regular pumping of the septic system, cursory inspection of break-out, and consideration as to what materials are being discharged to the septic system. It is recommended that homeowners take all reasonable measures to conserve water and promote infiltration of water into the subsurface within the site boundaries.

Civil Engineering plans for the site by LRL show the location of the septic leaching bed, and are included as Attachment F. A septic system design drawing by Absolute Drafting and Design Ltd. is included as Attachment G. A product brochure for the Eljen system that is indicated in the septic design drawing is included as Attachment H.

6. CONCLUSIONS

- The site is located in an area dominated by commercial / industrial development including automotive repair shops and aggregate extraction sites. The downgradient parcel is occupied by an aggregate pit including undeveloped land at the eastern end of the parcel.
- A geotechnical investigation by LRL (2023) did not identify an unconfined water table at the site. Drainage within the overburden unit is expected to be influenced by topography and is inferred to be to the southwest towards a drainage ditch that occurs approximately 250 m to the southwest of the site).
- Groundwater is not used as a potable water supply in the area. The site and surrounding properties are serviced by the Ottawa municipal water supply system.
- Site development is expected to include the installation of a nitrate reducing tertiary treatment system in order to reduce nitrate loading. A nitrate impact assessment was completed which shows that nitrate concentrations from treated septic system effluent will be acceptable.
- The site is suitable for commercial development based on servicing by an individual onsite septic wastewater treatment system incorporating nitrate reducing tertiary treatment technology.
- Commercial development will not cause an adverse effect to the environment and neighbouring properties.

7. RECOMMENDATIONS

- A site development design should include wastewater treatment that includes nitrate reducing technology (tertiary treatment) to ensure nitrate concentrations in effluent are maintained within acceptable levels.
- The existing septic system and leaching bed at the site should be decommissioned.
- If a well is identified during site preparation it should be decommissioned according to O.Reg. 903 requirements.

8. LIMITATIONS

The conclusions presented in this report represent our professional opinion, in light of the terms of reference, scope of work, and the limiting conditions noted herein.

The findings presented in this report are based on conditions observed at the specified dates and locations, the analysis of samples for the specified parameters, and information obtained for this project. Unless otherwise stated, the findings cannot be extended to previous or future site conditions, locations that were not investigated directly, or types of analysis not performed.

BluMetric makes no warranty as to the accuracy or completeness of the information provided by others, or of conclusions and recommendations predicated on the accuracy of that information. Nothing in this report is intended to constitute or provide a legal opinion.

This report describes the site conditions and observations made by the BluMetric team at the time of the site investigation and have been prepared solely for the use of the client. No other party may use or rely upon the above-captioned report or portion thereof without the express written consent of BluMetric. BluMetric will consent to any reasonable request to approve the use of this report by other parties as “Approved Users”.

In summary, it is BluMetric's professional opinion that this site is suitable for the proposed commercial development. We trust that this assessment satisfies local requirements. If you have any questions, please do not hesitate to contact the undersigned.

Respectfully submitted,
BluMetric Environmental Inc.

Russell Chown, B.Sc., P.Geo.
Senior Hydrogeologist

Encl.

Ref: Zaher Terrain-Hydrog 5254 Bank St - FINAL - 15mar24.docx

9. REFERENCES

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ATTACHMENT A

Architectural Concept Plan

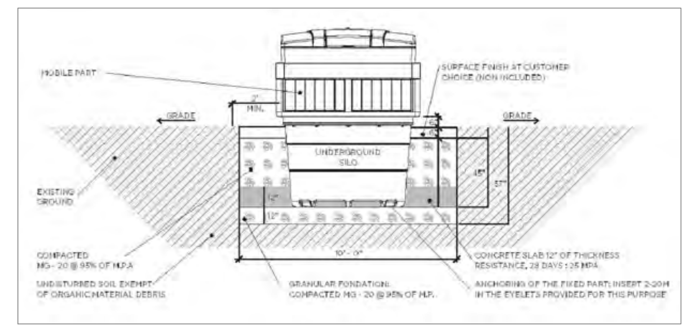
ZONING REQUIREMENTS: **RG3 [900r]-h - Rural Commercial Industrial (schedule 219 and 220) + BUILDING INFORMATION**

PARKING PROVISIONS (AREA D) Required: 12 — 321 sq.m service and repair shop = 11 spaces (3.4 spaces / 100 sq.m); 16 sq.m office = 1 space (2.4 spaces / 100 sq.m)	**Provided 12 (6 exterior + 6 inside bays)**
BICYCLE PARKING PROVISIONS Required: 1 / 1500 sq.m @ 552 sq.m = 0	**Provided** **0**
VEHICLE LOADING SPACE PROVISIONS Required: 1 for 350 to 999 sq.m @ 552 sq.m = 0	**Provided** **0**
MINIMUM FRONT YARD SETBACK Required: 15m (49'-3")	**Provided** **1.02 m (3'-4")**
MINIMUM NORTH NTERIOR SIDE YARD SETBACK Required: 3m (9'-11") from RG ZONE	**Provided** **13.41 m (44'-0")**
MINIMUM SOUTH INTERIOR SIDE YARD SETBACK Required: 8m (26'-3") from ME2 ZONE	**Provided** **0.61 m (2'-0")**
REAR YARD SETBACK Required: 15m (49'-3")	**Provided** **38.30 m (125'-8")**
MAXIMUM BUILDING HEIGHT Required: 15m (49'-3")	**Provided** **8.23 m (27'-0")**
MAXIMUM LOT COVERAGE Required: 50%	**Provided** **16 %**

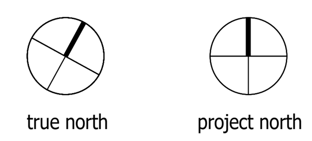
LOT AREA	**18,342 sq.ft (1,704 sq.m)**
GROSS AREA zoning definition	**4,010 sq.ft (373 sq.m)**
BUILDING AREA	**2,961 sq.ft (275 sq.m)**
GROSS AREA building code definition	**2,961 sq.ft (275 sq.m) - does not include mezzzanine**
BUILDING HEIGHT	**1 storey (mezzanine not included as storey)**
FACING STREET	**1**
OCCUPANCY TYPE	**F2 - medium hazard industrial**
BUILDING FIRE SAFETY	**Part 3 - 3.2.2.71**
PERMITTED CONSTRUCTION	**Combustible or Non - Combustible**

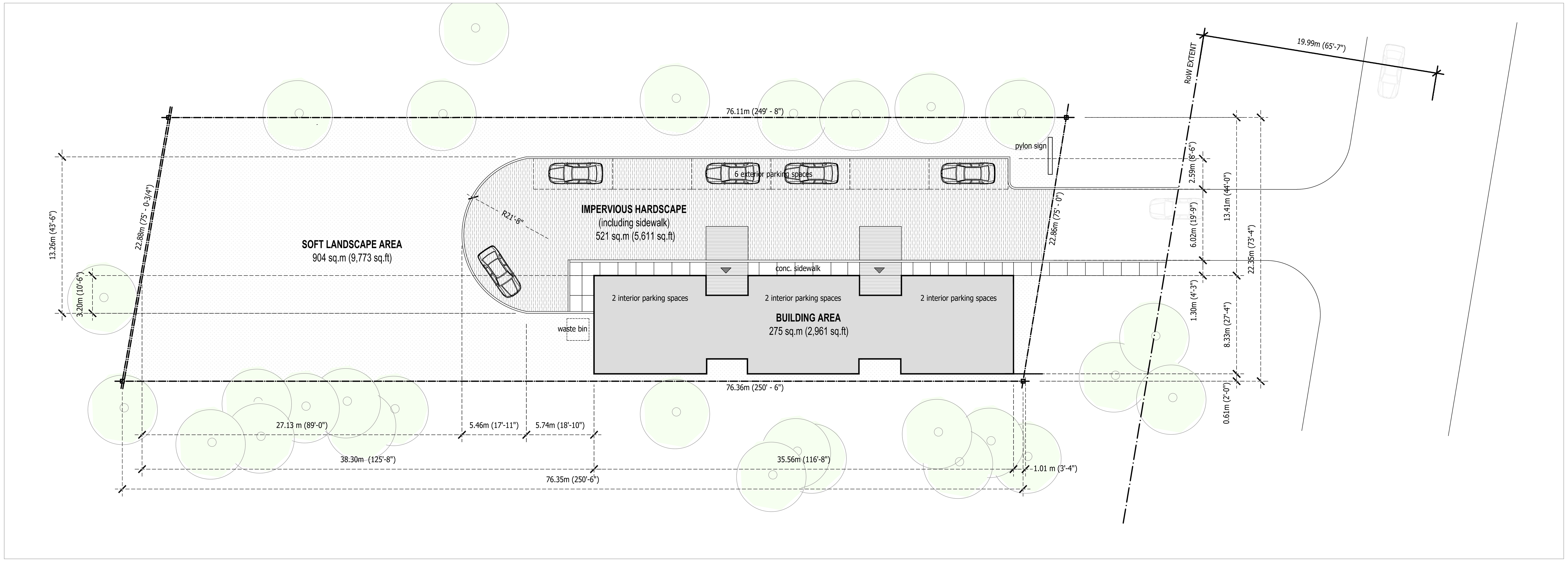
LEGEND

LC - LIGHT UNDER CANOPY
LW - LIGHT WALL MOUNT
DP - DEPRESSED CURB
WB - IN-GROUND WASTE BIN
CU - PRECAST CONCRETE CURB STOP



DETAIL FOR IN-GROUND WASTE BIN





SITE PLAN

owner
Rayan Zaher
364 Wisteria Crescent
Ottawa ON

architect
unPoised Architecture INC
5-16 Sweetland Avenue
Ottawa ON

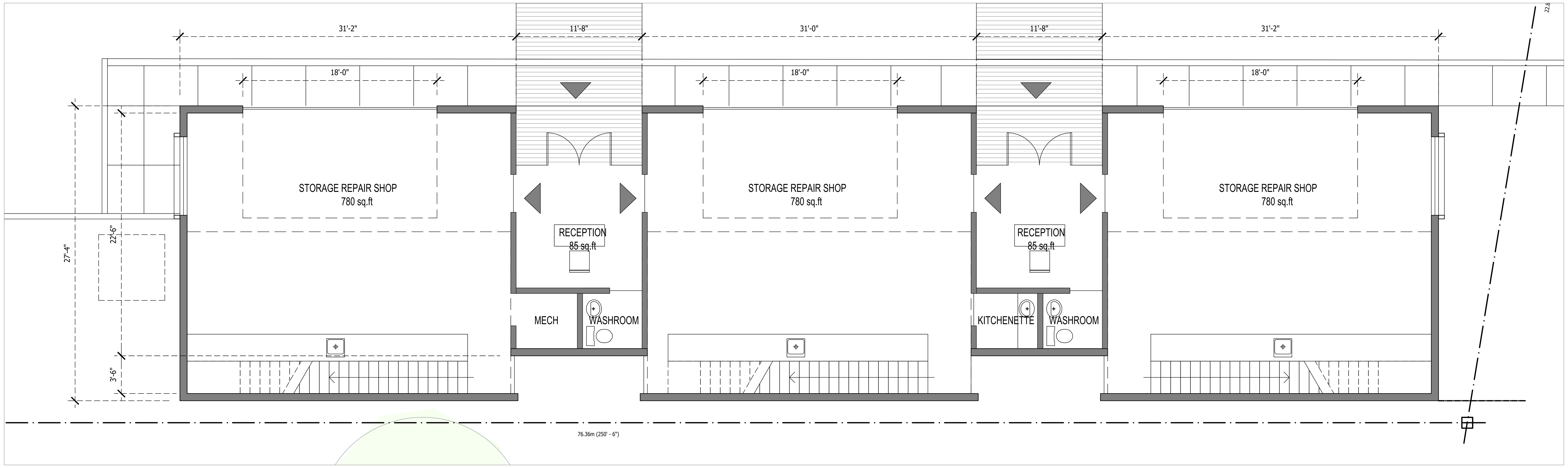
unPoised Architecture INC

revisions	date
XXXXX XXXXX	XXXXX
XXXXX XXXXX	XXXXX
PROGRESS REVIEW	2023-12-20
SPC SUBMISSION	2023-09-14
PROGRESS REVIEW	2022-12-15

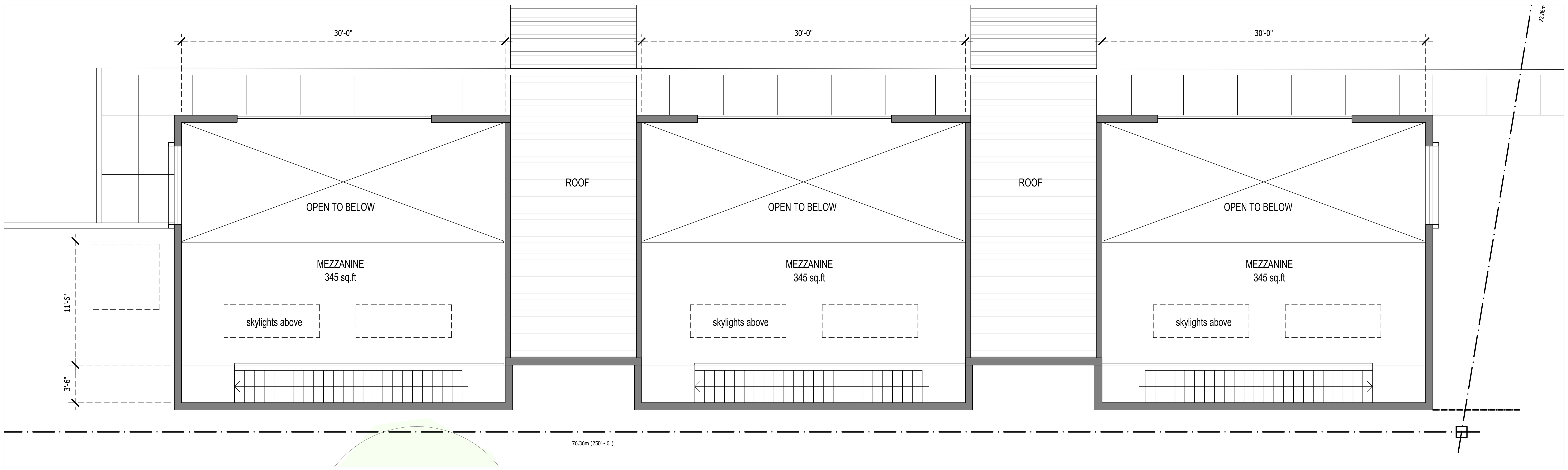
project title
STORAGE and REPAIR FACILITY
5254 Bank Street, Ottawa ON

drawing title
SITE PLAN and ZONING

sheet number
A01



FIRST FLOOR PLAN



MEZZANINE PLAN

owner
Rayan Zaher
364 Wisteria Crescent
Ottawa ON

architect
unPoised Architecture INC
5-16 Sweetland Avenue
Ottawa ON

unPoised Architecture INC

true north
project north

revisions	date
XXXXX XXXXX	XXXXX
XXXXX XXXXX	XXXXX
XXXXX XXXXX	XXXXX
XXXXX XXXXX	XXXXX
PROGRESS REVIEW	2023-12-20

project title

STORAGE and REPAIR FACILITY

5254 Bank Street, Ottawa ON

drawing title

FLOOR PLANS

sheet number

A02

NORTH ELEVATION

SOUTH ELEVATION

EAST ELEVATION

WEST ELEVATION

owner
Rayan Zaher
364 Wisteria Crescent
Ottawa ON

architect
unPoised Architecture INC
5-16 Sweetland Avenue
Ottawa ON

unPoised Architecture INC

revisions	date
XXXXX XXXXX	XXXXX
XXXXX XXXXX	XXXXX
XXXXX XXXXX	XXXXX
PROGRESS REVIEW	2023-12-20
SPC SUBMISSION	2023-09-14

project title

STORAGE and REPAIR FACILITY

5254 Bank Street, Ottawa ON

drawing title

ELEVATIONS

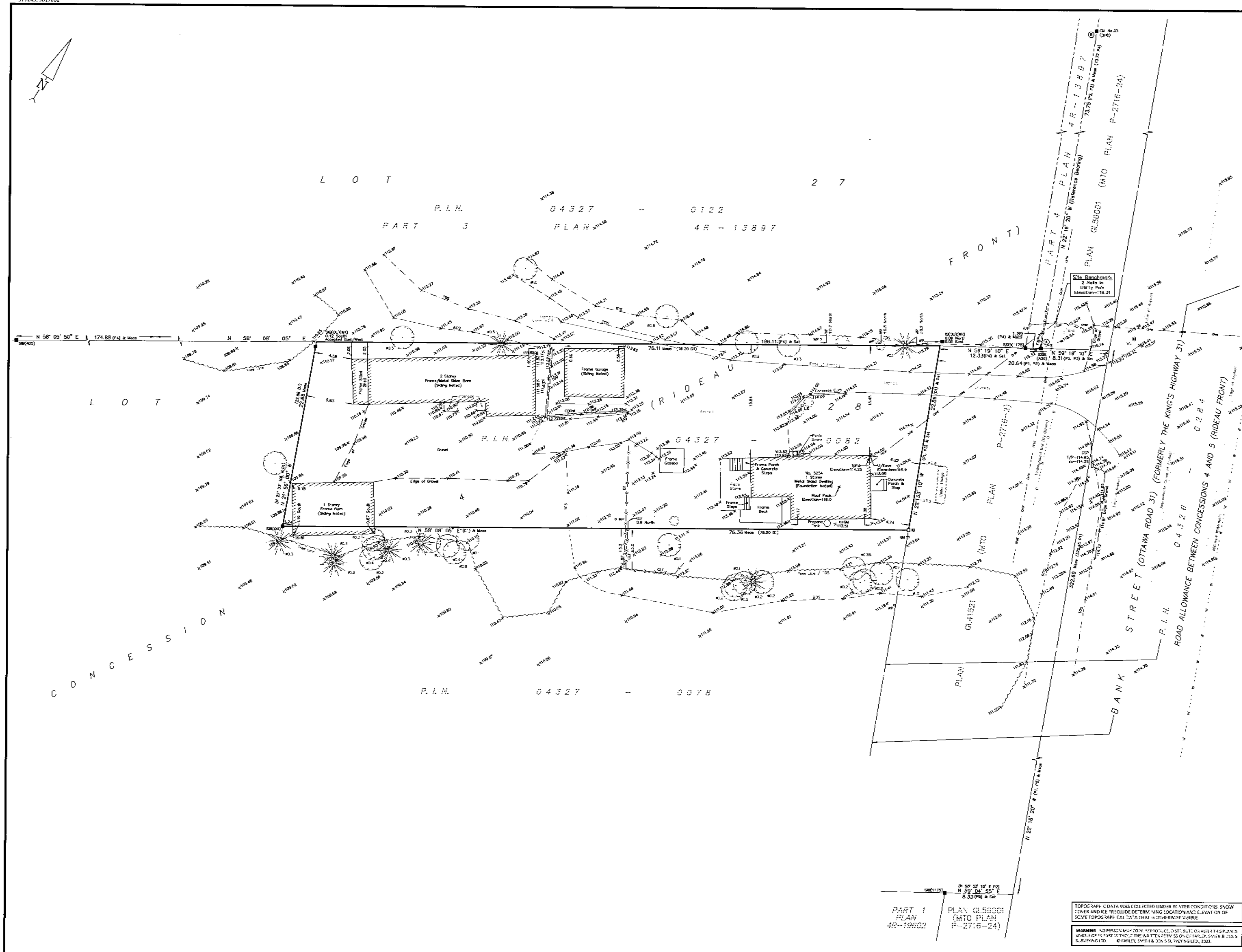
sheet number

A03

ATTACHMENT B

Survey Plan

377249, 5017062



TOPOGRAPHIC PLAN OF SURVEY OF

PART OF LOT 28
CONCESSION 4 (RIDEAU FRONT)
GEOGRAPHIC TOWNSHIP OF GLOUCESTER
CITY OF OTTAWA

FARLEY, SMITH & DENIS SURVEYING LTD. 2022

Scale 1: 200

0 2.5 5 10 15 20 metres

Metric Note
Distances and coordinates on this plan are in metres and can be converted to feet by dividing by 0.3048.

Distance Note
Distances shown on this plan are ground distances and can be converted to grid distances by multiplying by the combined scale factor of 0.99995.

Bearing Note
Bearings are MTM grid, derived from the Can-Net Real Time Network.
GPS observations on reference points A and B, shown hereon, having a bearing of N 22° 16' 20" W and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) Nad-83 (Original).

For bearing comparisons, a rotation of 6°16'20" counter-clockwise was applied to bearings on P1.

For bearing comparisons, a rotation of 0°39'20" counter-clockwise was applied to bearings on P2, P3, P4 & P5.

Elevation Notes
1. Elevations shown are geodetic and are referred to Geodetic Datum CGVD-1928 :1978.
2. It is the responsibility of the user of this information to verify that the job bench mark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

Utility Notes
1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. Underground utility data derived from City of Ottawa utility sheet reference: 7123 (sheet 6).
4. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

Notes & Legend

	Denotes	
	▪	Survey Monument Planted
	▪	Survey Monument Found
SIB	▪	Standard Iron Bar
SSIB	▪	Short Standard Iron Bar
IB	▪	Iron Bar
(Wit)	▪	Witness
Meas	▪	Measured
(OU)	▪	Origin Unknown
(P1)	▪	Plan GL41521
(P2)	▪	Plan GL56001
(P3)	▪	Plan 5R-8330
(P4)	▪	Plan 4R-13897
(P5)	▪	Plan 4R-19602
(D1)	▪	Inst GL76777
— W —	▪	Underground Water
— B —	▪	Underground Bell
— OW —	▪	Overhead Wires
OUP	▪	Utility Pole
O AN	▪	Anchor
O LS	▪	Light Standard
CSP	▪	Corrugated Steel Pipe
O FH	▪	Fire Hydrant
O TB-B	▪	Bell Terminal Box
GM	▪	Gas Meter
AC	▪	Air Conditioner
Ø	▪	Diameter
O WP	▪	Wooden Post
CLF	▪	Chain Link Fence
BF	▪	Board Fence
P&W	▪	Post and Wire
CBRW	▪	Concrete Block
TOS	▪	Top of Slope
BOS	▪	Bottom of Slope
Inv.	▪	Invert
T/P	▪	Top of Pipe
U/Eave	▪	Underside of Eave
TofFdn	▪	Top of Foundation
C/L	▪	Centreline
TOW	▪	Top of Wall
+65.00	▪	Location of Elevations
+65.00	▪	Top of Concrete Curb Elevation
	▪	Property Line
	▪	Deciduous Tree
	▪	Coniferous Tree
	▪	Shrub

Revision Note
Revised to show trees along the southerly property line and the changes to the edge of asphalt along Bank Street. Fieldwork completed on the 24th day of August, 2022.

Aug 29/22
Date

Jamie Leslie
Ontario Land Surveyor

Surveyor's Certificate
I certify that :
1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act and the Regulations made under them.
2. The survey was completed on the 25th day of April, 2019.

April 24, 2019
Date

Jamie Leslie
Ontario Land Surveyor

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2088411

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR
In accordance with Regulation 1026, Section 29 (3).

TOPOGRAPHIC DATA WAS COLLECTED UNDER WINTER CONDITIONS. SNOW COVER AND ICE PRECLUDE DETERMINING LOCATION AND ELEVATION OF SOME TOPOGRAPHICAL DATA THAT IS OTHERWISE VISIBLE.

FILE No.: 67-19

FARLEY, SMITH & DENIS SURVEYING LTD.

ONTARIO LAND SURVEYORS
CANADA LAND SURVEYORS

190 COLONNADE ROAD, OTTAWA, ONTARIO K2E 7J5
TEL. (613) 727-8226 FAX. (613) 727-1826

J:\2022\481-22_5254 Bank St_topo update\Final\481-22_5254 Bank St_Pt28 Con 4 (RF) Glo_T_F.dwg

ATTACHMENT C

Well Records

316/58.

1502205 - 5304 Bank Street

UTM 18 Z 4547770 E

9 R 5011505050 N

Elev. 9 R 0370

Basin 2RS? 4 Rideau Front

Con IV

lot 28

ONTARIO

15 № 2205

The Water-well Drillers Act, 1954

Department of Mines

Water-Well Record

County or Territorial District Carleton Township, Village, Town or City Glouceater

Con 4RF Lot 28 Not Known Street and Number (if in Village, Town or City)

Owner St Lawrence Rendering Co. Ltd Address South Gloucester

Date completed I4 (day) June (month) 56 (year)

Pipe and Casing Record

Casing diameter(s) 5in

Length(s) I6' ft

Type of screen

Length of screen

Pumping Test

Static level 8½ ft

Pumping rate 800 gph

Pumping level 42 ft

Duration of test I hr

Well Log / Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	No. of feet water rises	Kind of water (fresh, salty, or sulphur)
Boulder Till	0	6			
Sandstone	6	163½	155	146½	fresh

For what purpose(s) is the water to be used? Domestic (Company house)

Is water clear or cloudy? Clear

Is well on upland, in valley, or on hillside? Hillside

Drilling firm R.H.Casselman

Address Williamsburg

Name of Driller Philip Casselman

Address Williamsburg Ontario

Licence Number IO25

I certify that the foregoing statements of fact are true.

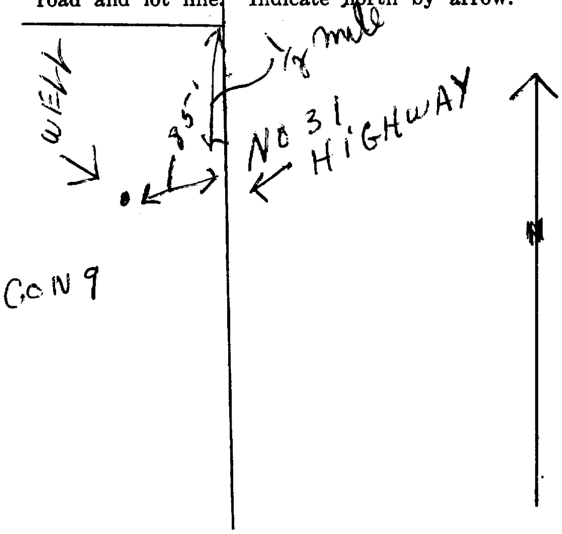
Date June I4/56 Phil Casselman

Signature of Licensee

Con 9

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



Con 9

Form 5

31G/5?

1502268 - 5227 Bank Street

UTM 1|8 Z |4|5|4|9|0|0| E

|5|0|9|5|2|4|0| N

Elev. |4| |9|3|9|2|

Basin |2|5|

The Ontario Water Resources Commission Act

WATER WELL RECORD

GROUND WATER BRANCH
15 No 2268
DEC 1 1961
ONTARIO WATER RESOURCES COMMISSION

County or District Carleton Township, Village, Town or City Gloucester

Con. V RF Lot 27 Date completed 8 (day) Nov (month) 61 (year)

[redacted] ddress RR #4 Ottawa

Casing and Screen Record

Inside diameter of casing 4"

Total length of casing none

Type of screen

Length of screen

Depth to top of screen

Diameter of finished hole 3¾"

Pumping Test

Static level 50'

Test-pumping rate 5 G.P.M.

Pumping level 165

Duration of test pumping 1 hr

Water clear or cloudy at end of test clear

Recommended pumping rate 4 G.P.M.

with pump setting of 160 feet below ground surface

Well Log / Water Record

Overburden and Bedrock Record	From ft.	To ft.	Depth(s) at which water(s) found	Kind of water (fresh, salty, sulphur)
Previously drilled to 63'	0	63		
hard sandstone	63'	170'	92	fresh
			146	

For what purpose(s) is the water to be used? Farm

Is well on upland, in valley, or on hillside? upland.

Drilling or Boring Firm N C Johnston Drilling Co Ltd

Address 1340 Bank Ottawa

Licence Number 240

Name of Driller or Borer R W Renwick

Address Pakenham

Date Nov 30/61

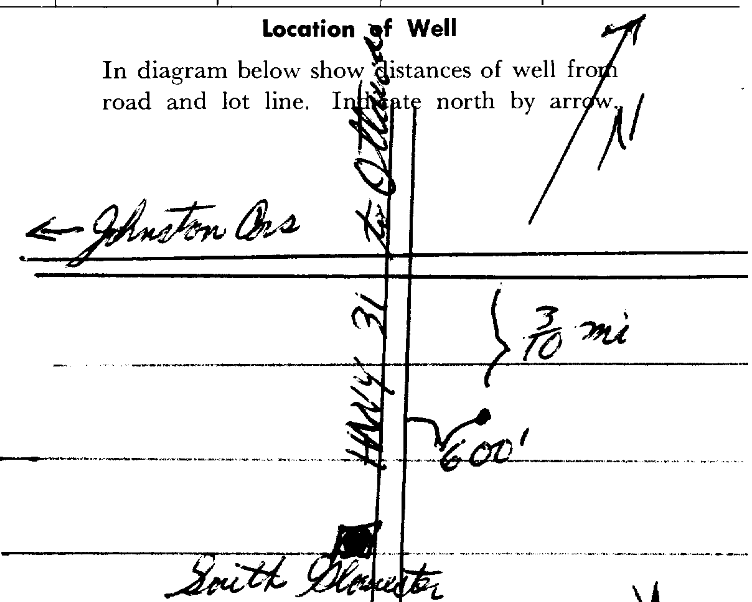
N C Johnston Drilling Co Ltd
(Signature of Licensed Drilling or Boring Contractor)
Per Roy W Renwick

Form 7 15M Sets 60-5930

OWRC COPY

Location of Well

In diagram below show distances of well from road and lot line. Indicate north by arrow.



OK

CSS.53

ATTACHMENT D

Geotechnical Borehole Logs (LRL)

Borehole Log: BH1

Project No.: 190271
Project: Proposed Automotive Dealership and Body Shop
Client: Holzman Consultants Inc.
Location: 5254 Bank Street, Ottawa ON
Date: October 8, 2019
Field Personnel: BJ
Driller: CCC Geotech and Enviro Drilling Ltd.
Drilling Equipment: Truck Mount CME 55
Drilling Method: HSA

Soil Description	Elev./Depth (m)	Sample Number	N or RQD	Recovery (%)	SPT N Value (Blows/0.3 m)	Water Content (%)	Water Level (Standpipe or Open Borehole)
Ground Surface	110.17						
Topsoil- sandy, about 450 mm thick.	0.00 / 109.72	SS1	7	42	7	9	
FILL- sand, some organic material, brown, moist, compact.	0.45 / 108.80	SS2	15	75	15	9	
End of Borehole	1.37						

Easting: 454743 m
Northing: 5015270 m
Site Datum: Site Benchmark - 2 nails in utility pole - 116.310 m
Groundsurface Elevation: 110.170 m
Top of Riser Elev.: N/A
Hole Diameter: 200 mm

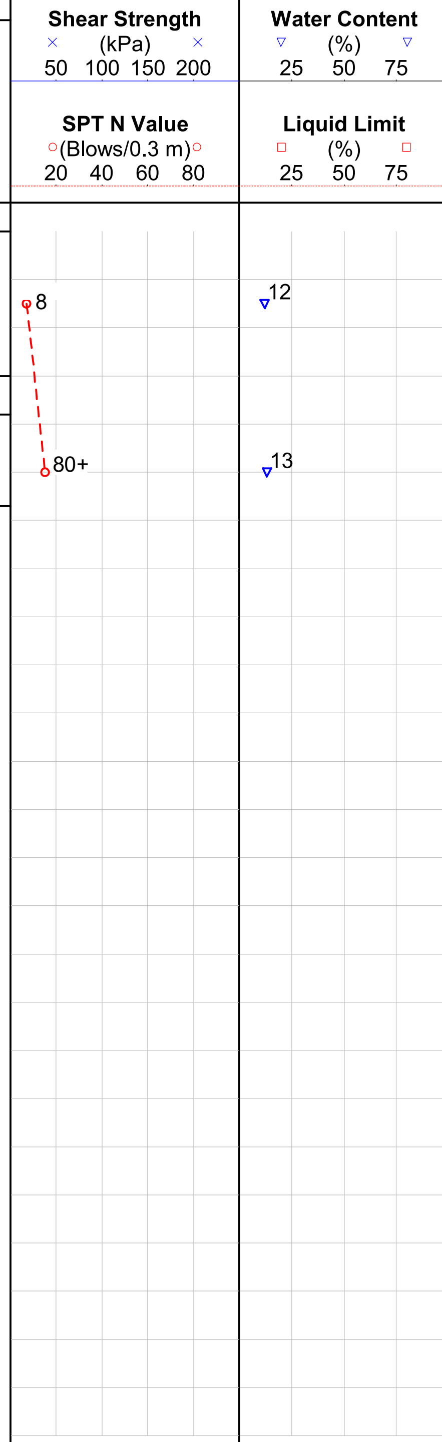
NOTES: Borehole terminated after practical auger refusal.

Borehole Log: BH2

Project No.: 190271
Project: Proposed Automotive Dealership and Body Shop
Client: Holzman Consultants Inc.
Location: 5254 Bank Street, Ottawa ON
Date: October 8, 2019
Field Personnel: BJ
Driller: CCC Geotech and Enviro Drilling Ltd.
Drilling Equipment: Truck Mount CME 55
Drilling Method: HSA

SUBSURFACE PROFILE / SAMPLE DATA

Soil Description	Elev./Depth(m)	Type	Sample Number	N or RQD	Recovery (%)	SPT N Value (Blows/0.3 m)	Water Content (%)
Ground Surface	110.95						
Topsoil- sandy, about 450 mm thick.	0.00						
FILL- sand, brown, moist, loose.	110.65 / 0.30		SS1	8	33	8	12
BEDROCK- limestone, weathered at surface, grey.	110.30 / 0.65		SS2	80+	100	80+	13
End of Borehole	109.88 / 1.07						



Water Level (Standpipe or Open Borehole)

Easting: 454767 m
Northing: 5015273 m
Site Datum: Site Benchmark - 2 nails in utility pole - 116.310 m
Groundsurface Elevation: 110.950 m
Top of Riser Elev.: N/A
Hole Diameter: 200 mm

NOTES: Borehole terminated after practical auger refusal.

Borehole Log: BH3

Project No.: 190271
Project: Proposed Automotive Dealership and Body Shop
Client: Holzman Consultants Inc.
Location: 5254 Bank Street, Ottawa ON
Date: October 8, 2019
Field Personnel: BJ
Driller: CCC Geotech and Enviro Drilling Ltd.
Drilling Equipment: Truck Mount CME 55
Drilling Method: HSA

SUBSURFACE PROFILE

Soil Description	Elev./Depth(m)
Ground Surface	113.65
Asphalt - about 50 mm thick.	0.00
FILL- sand, some gravel, brown, moist, loose to compact.	
SILT- some sand, trace gravel sized stone, brown, moist, dense to very dense.	112.20 / 1.45
End of Borehole	109.99 / 3.66

SAMPLE DATA

Sample Number	N or RQD	Recovery (%)	SPT N Value (Blows/0.3 m)	Water Content (%)
SS1	6	17	6	5
SS2	12	8	12	4
SS3	8	17	8	10
SS4	68	85	68	10
SS5	48	75	48	11

Shear Strength (kPa): 50 100 150 200
SPT N Value (Blows/0.3 m): 20 40 60 80
Water Content (%): 25 50 75
Liquid Limit (%): 25 50 75
Water Level (Standpipe or Open Borehole)

Easting: 454776 m
Northing: 5015290 m
Site Datum: Site Benchmark - 2 nails in utility pole - 116.310 m
Groundsurface Elevation: 113.650 m
Top of Riser Elev.: N/A
Hole Diameter: 200 mm

NOTES: Borehole terminated after practical auger refusal.

Borehole Log: BH4

Project No.: 190271
Project: Proposed Automotive Dealership and Body Shop
Client: Holzman Consultants Inc.
Location: 5254 Bank Street, Ottawa ON
Date: October 8, 2019
Field Personnel: BJ
Driller: CCC Geotech and Enviro Drilling Ltd. **Drilling Equipment:** Truck Mount CME 55 **Drilling Method:** HSA

Depth (ft / m)	Soil Description	Elev./Depth(m)	Lithology	Type	Sample Number	N or RQD	Recovery (%)	Shear Strength (kPa) 50 100 150 200 / SPT N Value (Blows/0.3 m) 20 40 60 80	Water Content (%) 25 50 75 / Liquid Limit (%) 25 50 75	Water Level (Standpipe or Open Borehole)
0 / 0	Ground Surface	114.14								
	Topsoil- sandy, about 100 mm thick.	0.00								
	FILL- sand, some gravel, brown, moist, compact.	0.10			SS1	44	85	44	11	
	BEDROCK- limestone, weathered at surface, grey.	113.73 / 0.41								
	End of Borehole	113.48 / 0.66								

Easting: 454795 m **Northing:** 5015306 m

Site Datum: Site Benchmark - 2 nails in utility pole - 116.310 m

Groundsurface Elevation: 114.140 m **Top of Riser Elev.:** N/A

Hole Diameter: 200 mm

NOTES: Borehole terminated after practical auger refusal.

Borehole Log: BH5

Project No.: 190271

Client: Holzman Consultants Inc.

Date: October 8, 2019

Project: Proposed Automotive Dealership and Body Shop

Location: 5254 Bank Street, Ottawa ON

Field Personnel: BJ

Driller: CCC Geotech and Enviro Drilling Ltd. **Drilling Equipment:** Truck Mount CME 55 **Drilling Method:** HSA

SUBSURFACE PROFILE

Depth (m)	Soil Description	Elev./Depth(m)
0	Ground Surface	114.04
0.00	**Topsoil-** sandy, about 250 mm thick.	114.04 / 0.00
0.25	**FILL-** sand, some gravel, brown, moist, compact.	113.79 / 0.25
1.42	End of Borehole	112.62 / 1.42

SAMPLE DATA

Type	Sample Number	N or RQD	Recovery (%)	SPT N Value (Blows/0.3 m)	Water Content (%)
SS	SS1	18	33	18	12
SS	SS2	16	75	16	12

Shear Strength (kPa): 50 100 150 200
Water Content (%): 25 50 75
SPT N Value (Blows/0.3 m): 20 40 60 80
Liquid Limit (%): 25 50 75
Water Level (Standpipe or Open Borehole)

Easting: 454809 m **Northing:** 5015303 m

Site Datum: Site Benchmark - 2 nails in utility pole - 116.310 m

Groundsurface Elevation: 114.040 m **Top of Riser Elev.:** N/A

Hole Diameter: 200 mm

NOTES: Borehole terminated after practical auger refusal.

Borehole Log: BH6

Project No.: 220536

Project: Proposed Industrial Service/Repair Building

Client: Unpoised Architecture Inc.

Location: 5254 Bank Street, Ottawa ON

Date: June 9, 2023

Field Personnel: SV

Driller: CCC Geotech and Enviro Drilling Ltd. **Drilling Equipment:** Truck Mount CME 55 **Drilling Method:** Hollow Stem Auger

SUBSURFACE PROFILE / SAMPLE DATA

Depth (m)	Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)
0	Ground Surface	113.01				
0.00 – 0.69	**FILL** sand and gravel, brown, loose, moist.	113.01 / 0.00	Split spoon	SS1	8	50
0.69 – 2.84	**SILT and SAND** trace clay, greyish brown, loose to very loose, moist.	112.32 / 0.69	Split spoon	SS2	1	25
			Split spoon	SS3	4	50
			Split spoon	SS4	11	50
2.84	End of Borehole	110.17 / 2.84				

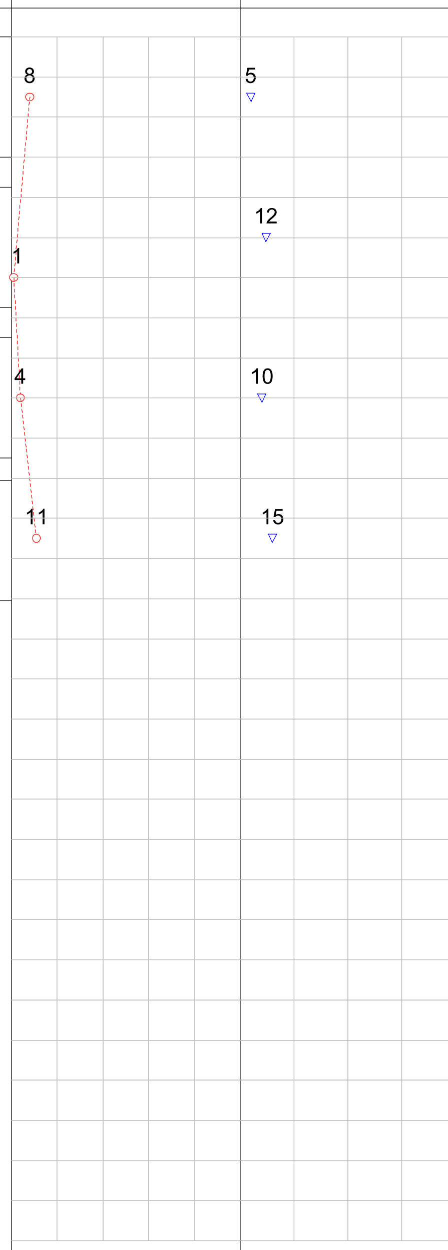
Shear Strength (kPa): 50, 150

SPT N Value (Blows/0.3 m): 20, 40, 60, 80

Water Content (%): 25, 50, 75

Liquid Limit (%): 25, 50, 75

Monitoring Well Details



Easting: 454770 m **Northing:** 5015283 m

Site Datum: Site Benchmark - 2 nails in utility pole - 116.310 m

Groundsurface Elevation: 113.011 m **Top of Riser Elev.:** NA

Hole Diameter: 200 mm **Monitoring Well Diameter:** N/A

NOTES:
Borehole terminated after practical auger refusal.

Borehole Log: BH7

Project No.: 220536
Client: Unpoised Architecture Inc.
Date: June 9, 2023
Project: Proposed Industrial Service/Repair Building
Location: 5254 Bank Street, Ottawa ON
Field Personnel: SV
Driller: CCC Geotech and Enviro Drilling Ltd. **Drilling Equipment:** Truck Mount CME 55 **Drilling Method:** Hollow Stem Auger

SUBSURFACE PROFILE		SAMPLE DATA							
Depth (ft / m)	Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)	Shear Strength (kPa) 50 150 / SPT N Value (Blows/0.3 m) 20 40 60 80	Water Content (%) 25 50 75 / Liquid Limit (%) 25 50 75	Monitoring Well Details
0 / 0	Ground Surface	110.94							
0–3 ft	**FILL MATERIAL** sand and gravel, brown, compact, moist.	0.00	SS	SS1	11	50	11	8	
	End of Borehole	110.08 0.86							

Easting: 454771 m **Northing:** 5015280 m
Site Datum: Site Benchmark - 2 nails in utility pole - 116.310 m
Groundsurface Elevation: 110.94 m **Top of Riser Elev.:** NA
Hole Diameter: 200 mm **Monitoring Well Diameter:** N/A

NOTES:
Borehole terminated after practical auger refusal.

Borehole Log: BH8

Project No.: 220536
Project: Proposed Industrial Service/Repair Building
Client: Unpoised Architecture Inc.
Location: 5254 Bank Street, Ottawa ON
Date: June 9, 2023
Field Personnel: SV
Driller: CCC Geotech and Enviro Drilling Ltd.
Drilling Equipment: Truck Mount CME 55
Drilling Method: Hollow Stem Auger

Depth	Soil Description	Elev./Depth (m)	Type	Sample Number	N or RQD	Recovery (%)	SPT N Value (Blows/0.3 m)	Water Content (%)	Monitoring Well Details
0 ft / 0 m	Ground Surface	110.15							
	FILL MATERIAL silt-sand, trace gravel, brown, loose to compact, moist.	0.00		SS1	6	42	6	8	
				SS2	15	56	15	15	
	End of Borehole	108.88 / 1.27							

Easting: 454773 m
Northing: 5015273 m
Site Datum: Site Benchmark - 2 nails in utility pole - 116.310 m
Groundsurface Elevation: 110.15 m
Top of Riser Elev.: NA
Hole Diameter: 200 mm
Monitoring Well Diameter: N/A

NOTES:
Borehole terminated after practical auger refusal.

ATTACHMENT E

Nitrate Impact Assessment

Predictive Nitrate Impact Assessment

PRE DEVELOPMENT CONDITIONS			POST DEVELOPMENT CONDITIONS		
Infiltration Factors			**Infiltration Factors**		
Topography	0.2	undulating	Topography	0.2	undulating
Soil	0.4	sand / silt	Soil	0.4	sand / silt
Cover	0.1	cultivated	Cover	0.1	cultivated
Total	**0.7**		**Total**	**0.7**	
Site Characteristics			**Site Characteristics**		
Area of Site :	1719	m^2 (GeoOttawa)	Area of Site :	1,719	m^2
	0.17	hectares		0.17	hectares
			Area of each roof:	276	m^2
			Total of roof areas:	276	m^2
			Total of driveway / parking areas (approx):	521	m^2
			Length of roadways:	0	m
			Width of roadways:	0	m
			Total area of roadways:	-	m^2
Impervious Area (approx.)	690	m^2	Impervious Area	797	m^2
			Percent Impervious Area =	46.37	%
Infiltration Area =	1,029	m^2	Infiltration Area =	922	m^2
Septic Effluent			**Septic Effluent**		
Concentration of Effluent (Cs) =	40	mg/L	Concentration of Effluent (Cs) =	40	mg/L
Daily Sewage Flow (Qs)=	1	m^3	Daily Sewage Flow (Qs)=	0.67	m^3
Infiltration Calculation			**Infiltration Calculation**		
Nitrate concentration in precipitation (C_i) =	0	mg/L	Nitrate concentration in precipitation (C_i) =	0	mg/L
Environment Canada Climate Normals: OTTAWA AIRPORT STATION Ontario	929.8	mm/yr	Environment Canada Climate Normals: OTTAWA AIRPORT STATION Ontario	929.8	mm/yr
EC Canada (Ottawa Airport) Precipitation	911	mm/yr	EC Canada (Ottawa Airport) Precipitation	911	mm/yr
Soil moisture retention (shallow rooted crops)	75	mm/yr	Soil moisture retention (shallow rooted crops)	75	mm/yr
Surplus Water (EC Canada - Ottawa)	384	mm/yr	Surplus Water (EC Canada - Ottawa)	384	mm/yr
Factored Surplus Water =	269	mm/yr	Factored Surplus Water =	269	mm/yr
Total volume of Infiltration	277	m^3	Total volume of Infiltration	248	m^3
					mm/yr
Infiltration flow entering the system (Q_i) =	1	m^3/day	Infiltration Flow Entering the System (Q_i) =	0.68	m^3/day
Mass Balance Model (MOEE, 1995)			**Mass Balance Model (MOEE, 1995)**		
$C_T = (Q_bC_b+Q_eC_e+Q_iC_i)/(Q_b+Q_e+Q_i)$ = Cumulative Nitrate Concentration			$C_T = (Q_bC_b+Q_eC_e+Q_iC_i)/(Q_b+Q_e+Q_i)$ = Cumulative Nitrate Concentration		
Q_b = flow entering the system across the upgradient area	0	m^3/day	Q_b = flow entering the system across the upgradient area	0	m^3/day
C_b = background nitrate concentration	0	mg/L	C_b = background nitrate concentration	0	mg/L
Q_e = flow entering the system from the septic drainfield	1	m^3/day	Q_e = flow entering the system from the septic drainfield	0.67	m^3/day
C_e = concentration of nitrates in the septic effluent	40	mg/L	C_e = concentration of nitrates in the septic effluent	40	mg/L
Q_i = flow entering the system from infiltration	1	m^3/day	Q_i = flow entering the system from infiltration	1	m^3/day
C_i = Concentration of nitrates in the infiltrate	0	mg/L	C_i = Concentration of nitrates in the infiltrate	0	mg/L
C_T =	22.8	mg/L	C_T =	19.9	mg/L
Estimate Number of Lots	1	lots	Estimate Number of Lots	1	lots
			with 50% nitrate reduction (tertiary treatment)	**9.9**	**mg/L**

OBC T.8.2.1.3.B.15. Sanitary volume for office space is calculated as 75 L/d per 8 employees or per 9.3m2 of floor space.

The washrooms are proposed within the office space, so volume is calculated as per B.15.

Total daily septic design flow rate = 670 L/day as per Absolute Drafting & Design communications 2024.

Ottawa Airport, ON WATER BUDGET MEANS FOR THE PERIOD 1950-2010 DC20492

LAT.... 45.32 WATER HOLDING CAPACITY... 75 MM HEAT INDEX... 36.41
LONG... 75.67 LOWER ZONE............... 45 MM A............ 1.075

DATE	TEMP (C)		PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	-10.6		64	13	15	0	0	0	27	83	75	299
28- 2	-8.8		57	12	18	1	1	0	29	110	75	356
31- 3	-2.7		66	32	80	5	5	0	107	64	75	422
30- 4	5.9		72	67	69	32	32	0	104	0	75	494
31- 5	13.0		74	74	0	80	80	0	13	0	56	568
30- 6	18.3		82	82	0	116	107	-10	4	0	28	651
31- 7	20.8		89	89	0	135	104	-32	2	0	10	740
31- 8	19.5		87	87	0	117	85	-32	1	0	12	827
30- 9	14.6		84	84	0	75	66	-9	4	0	26	912
31-10	8.1		77	76	0	36	35	-1	15	0	52	77
30-11	1.3		80	63	8	10	10	0	42	9	71	157
31-12	-7.0		78	26	15	1	1	0	36	47	75	236
AVE	5.9	TTL	911	705	205	608	526	-84	384			

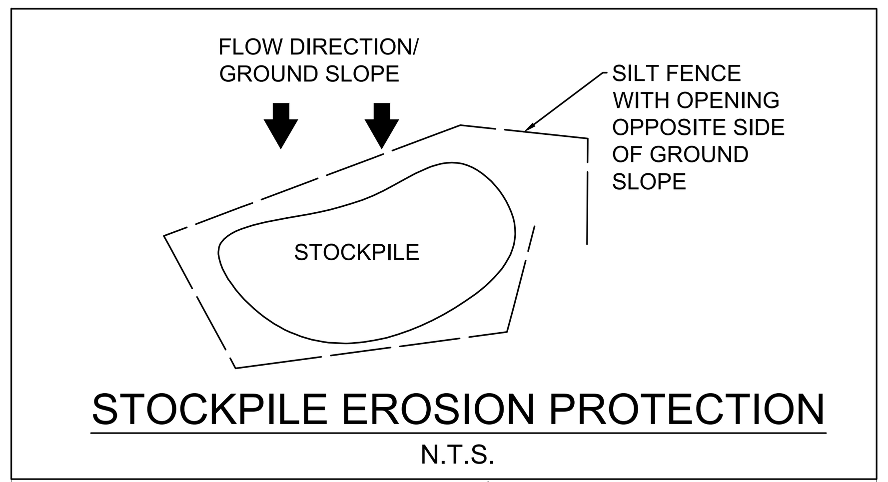
Ottawa Airport, ON STANDARD DEVIATIONS FOR THE PERIOD 1950-2010 DC20492

DATE	TEMP (C)	PCPN	RAIN	MELT	PE	AE	DEF	SURP	SNOW	SOIL	ACC P
31- 1	3.0	26	16	18	1	1	0	30	43	0	55
28- 2	2.6	29	15	27	1	1	0	37	59	0	59
31- 3	2.3	28	22	47	4	4	0	53	83	0	65
30- 4	1.7	31	31	84	8	8	0	84	0	2	74
31- 5	1.9	32	32	0	12	12	0	21	0	22	85
30- 6	1.2	38	38	0	9	19	19	17	0	28	93
31- 7	1.2	42	42	0	8	28	30	11	0	22	93
31- 8	1.3	39	39	0	8	29	31	5	0	23	107
30- 9	1.5	38	38	0	8	14	14	17	0	29	110
31-10	1.4	37	37	2	7	7	2	23	0	28	37
30-11	1.7	27	28	9	4	4	0	33	13	11	45
31-12	3.0	30	22	14	1	1	0	30	34	3	56

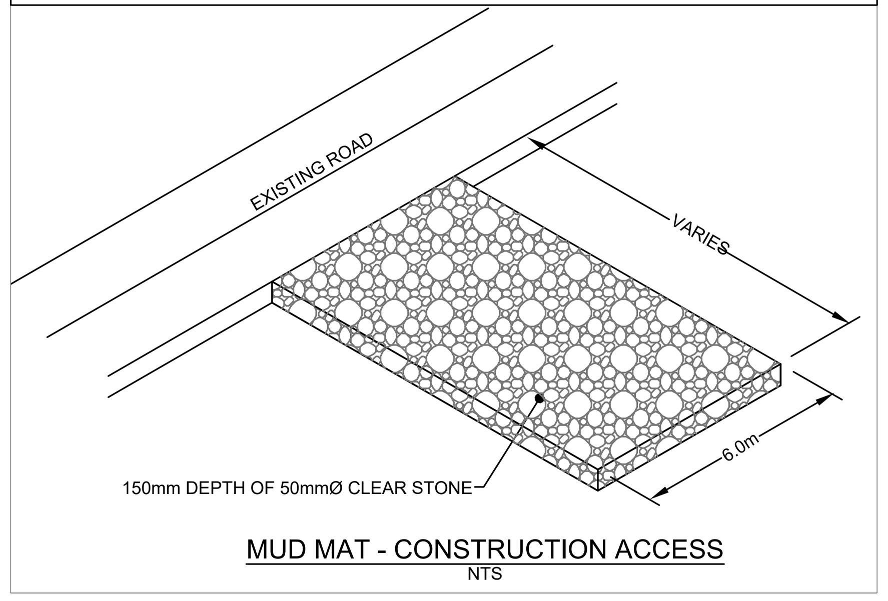
ATTACHMENT F

Civil Engineering Plans (LRL)

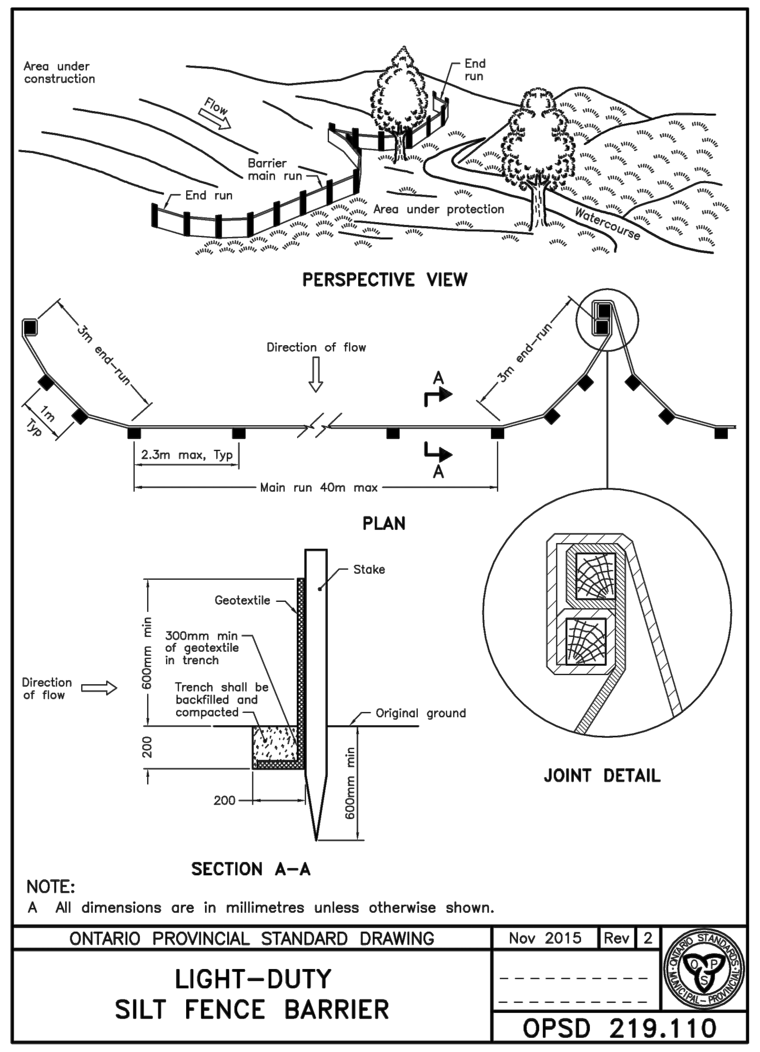
1.

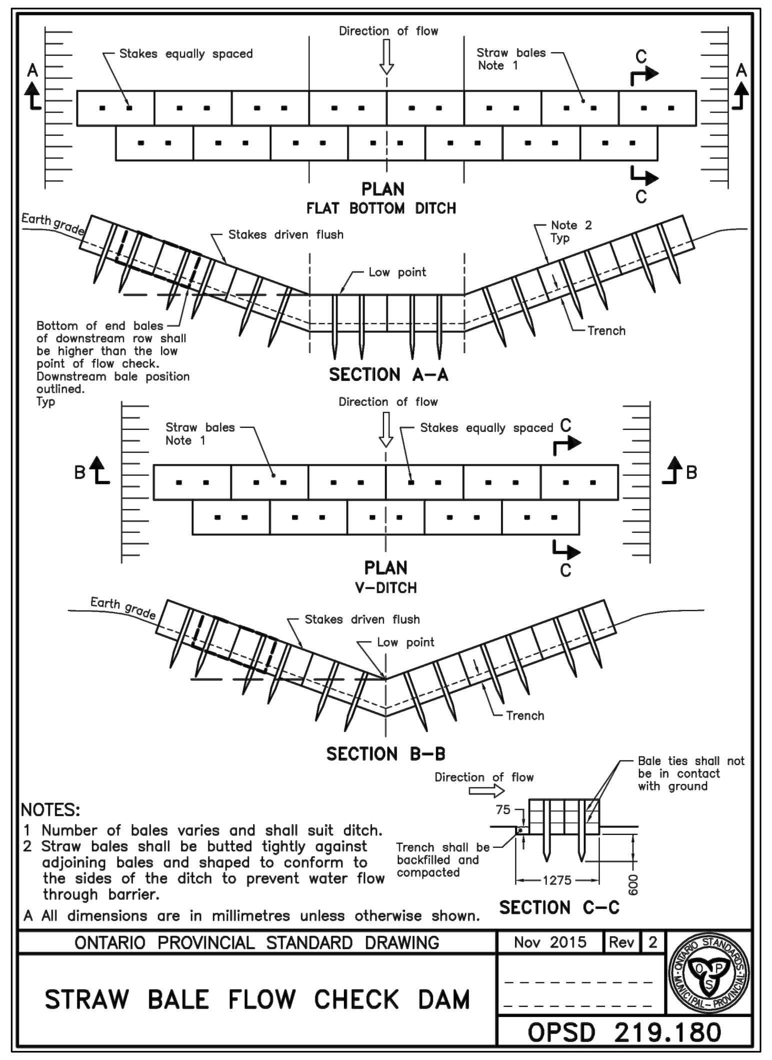


STOCKPILE EROSION PROTECTION
N.T.S.



MUD MAT - CONSTRUCTION ACCESS
NTS





EROSION AND SEDIMENT CONTROL MEASURES:

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

1. PRIOR TO START OF CONSTRUCTION:

- PRIOR TO THE REMOVAL OF ANY VEGETATIVE COVER, MOVING OF SOIL AND CONSTRUCTION:
- INSTALL SILT FENCE IMMEDIATELY DOWNSTREAM FROM AREAS TO BE DISTURBED (SEE PLAN FOR LOCATION).
- INSTALL GEOSOCK INSERTS WITH AN OVERFLOW IN ALL THE DOWNSTREAM CATCHBASINS AND MANHOLES
- INSTALL SILTSACK FILTERS IN ALL CONCRETE CATCH BASINS STRUCTURES
- INSPECT MEASURES IMMEDIATELY AFTER INSTALLATION.

2. DURING CONSTRUCTION:

- WORK TO BE DONE IN THE VICINITY OF MAJOR WATERWAYS TO BE CARRIED OUT FROM JULY TO SEPTEMBER ONLY.
- MINIMIZE THE EXTENT OF DISTURBED AREAS AND THE DURATION OF EXPOSURE.
- PROTECT DISTURBED AREAS FROM RUNOFF.
- PROVIDE TEMPORARY COVER SUCH AS SEEDING OR MULCHING IF DISTURBED AREA WILL NOT BE REHABILITATED WITHIN 30 DAYS.
- INSPECT SILT FENCES, FILTER CLOTHS AND CATCH BASIN SUMPS WEEKLY AND AFTER EVERY MAJOR STORM EVENT. CLEAN AND REPAIR WHEN NECESSARY.
- CONSTRUCT SWALES AS PER DETAIL.
- PLAN TO BE REVIEWED AND REVISED AS REQUIRED DURING CONSTRUCTION
- EROSION CONTROL FENCING TO BE ALSO INSTALLED AROUND THE BASE OF ALL STOCKPILES.
- DO NOT LOCATE TOPSOIL PILES AND EXCAVATION MATERIAL CLOSER THAN 2.5m FROM ANY PAVED SURFACE, OR ONE WHICH IS TO BE PAVED BEFORE THE PILE IS REMOVED. ALL TOPSOIL PILES ARE TO BE SEEDED IF THEY ARE TO REMAIN ON SITE LONG ENOUGH FOR SEEDS TO GROW (LONGER THAN 30 DAYS).
- CONTROL WIND-BLOWN DUST OFF SITE TO ACCEPTABLE LEVELS BY SEEDING TOPSOIL PILES AND OTHER AREAS TEMPORARILY (PROVIDE WATERING AS REQUIRED).
- ALL EROSION CONTROL STRUCTURE TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN STABILIZED EITHER BY PAVING OR RESTORATION OF VEGETATIVE GROUND COVER.
- NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THIS CONSULTING ENGINEER AND THE CITY DEPARTMENT OF PUBLIC WORKS.
- CONTRACTOR RESPONSIBLE FOR CITY ROADWAY AND SIDEWALK TO BE CLEANED OF ALL SEDIMENT FROM VEHICULAR TRACKING ETC. AT THE END OF EACH WORK DAY.
- PROVIDE GRAVEL ENTRANCE WHEREVER EQUIPMENT LEAVES THE SITE TO PREVENT MUD TRACKING ONTO PAVED SURFACES. GRAVEL BED SHALL BE A MINIMUM OF 15m LONG, 4M WIDE AND 0.3m DEEP AND SHALL CONSIST OF COARSE (50mm CRUSHERT-RUN LIMESTONE) MATERIAL. MAINTAIN GRAVEL ENTRANCE IN CLEAN CONDITION.
- DURING WET CONDITIONS, TIRES OF ALL VEHICLES/EQUIPMENT LEAVING THE SITE ARE TO BE SCRAPED.
- ANY MUD/MATERIAL TRACKED ONTO THE ROAD SHALL BE REMOVED IMMEDIATELY BY HAND OR RUBBER TIRE LOADER.
- TAKE ALL NECESSARY STEPS TO PREVENT BUILDING MATERIAL, CONSTRUCTION DEBRIS OR WASTE BEING SPILLED OR TRACKED ONTO ABUTTING PROPERTIES OR PUBLIC STREETS DURING CONSTRUCTION AND PROCEED IMMEDIATELY TO CLEAN UP ANY AREAS SO AFFECTED.

3. AFTER CONSTRUCTION:

- PROVIDE PERMANENT COVER CONSISTING OF TOPSOIL AND SEED TO DISTURBED AREAS.
- REMOVE STRAW BALE FLOW CHECK DAMS, SILT FENCES AND FILTER CLOTHS ON CATCH BASINS AND MANHOLE COVERS AFTER DISTURBED AREAS HAVE BEEN REHABILITATED AND STABILIZED.
- INSPECT AND CLEAN CATCH BASIN SUMPS AND STORM SEWERS.

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 MOMENT'S 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 ARE 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 FRO 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 BRACH 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

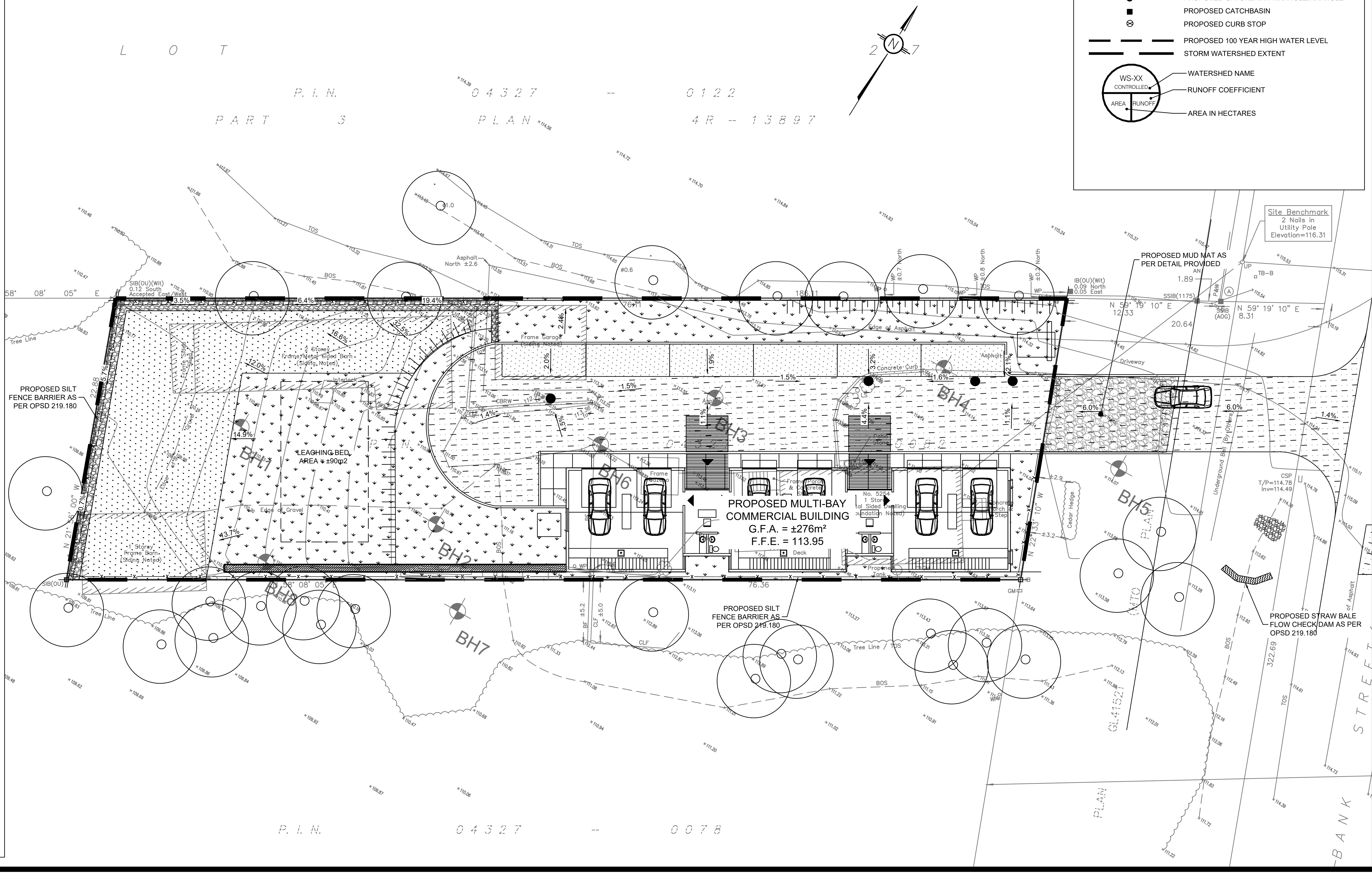
WHERE, IN THE OPINION OF EITHER THE CONTRACT ADMINISTRATOR OR A REGULATORY AGENCY, ANY OF THE TERMS SPECIFIED HEREIN HAVE NOT BEEN COMPLIED WITH OR PERFORMED IN A SUITABLE MANNER, OR TAT ALL, THE CONTRACTOR ADMINISTRATOR OR A REGULATORY AGENCY HAS THE RIGHT TO IMMEDIATELY WITHDRAW ITS PERMISSION TO CONTINUE 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

1. ALL CONSTRUCTION EQUIPMENT SHALL BE RE-FUELED, MAINTAINED, AND STORED NO LESS THAN 30 METRES FROM WATERCOURSE, STEAMS, CREEKS, WOODLOTS, AND ANY ENVIRONMENTALLY SENSITIVE AREAS, OR AS OTHERWISE SPECIFIED.
2. THE 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.
3. 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:
   - 3.1. 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.
   - 3.2. TAKE IMMEDIATE MEASURES TO CONTAIN THE MATERIAL OR SUBSTANCE, AND TO TAKE SUCH MEASURES TO MITIGATE AGAINST ADVERSE IMPACTS TO THE NATURAL ENVIRONMENT.
   - 3.3. RESTORE THE AFFECTED AREA TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION.

MUD MAT NOTES

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



LEGEND:

- EXISTING PROPERTY LINE TO REMAIN
- PROPOSED CURB
- DC PROPOSED DEPRESSED CURB
- PROPOSED TERRACING (3:1 MIN.)
- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED RIP RAP
- ×50.00 PROPOSED ELEVATION
- ×50.00HP PROPOSED HIGH POINT ELEVATION
- ×50.00BC PROPOSED BOTTOM OF CURB / ASPHALT ELEVATION
- ×50.00TC PROPOSED TOP OF CURB ELEVATION
- ×50.00BW PROPOSED EXPOSED BOTTOM OF RETAINING WALL
- ×50.00TW PROPOSED TOP OF RETAINING WALL
- ×50.00EX MATCH INTO EXISTING ELEVATION
- ×70.19 EXISTING ELEVATION
- PROPOSED OVERLAND MAJOR FLOW ROUTE
- STM STM PROPOSED STORM SEWER
- SAN SAN PROPOSED SANITARY SEWER
- WTR WTR PROPOSED WATERMAIN
- STM STM EXISTING STORM SEWER
- SAN SAN EXISTING SANITARY SEWER
- WTR WTR EXISTING WATERMAIN
- EXISTING CATCHBASIN-MANHOLE/MANHOLE
- EXISTING CATCHBASIN
- PROPOSED CATCHBASIN-MANHOLE/MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED CURB STOP
- PROPOSED 100 YEAR HIGH WATER LEVEL
- STORM WATERSHED EXTENT
- WS-XX CONTROLLED — WATERSHED NAME
- RUNOFF — RUNOFF COEFFICIENT
- AREA — AREA IN HECTARES

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.

BY USE OF THE DRAWINGS FOR CONSTRUCTION OF THE PROJECT, THE OWNER CONFIRMS THAT HE HAS REVIEWED AND APPROVED THE DRAWINGS. THE CONTRACTOR CONFIRMS THAT HE HAS VISITED THE SITE, FAMILIARIZED HIMSELF WITH THE LOCAL CONDITIONS, VERIFIED FIELD DIMENSIONS AND CORRELATED HIS OBSERVATIONS WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.

AS INSTRUMENTS OF SERVICE, ALL DRAWINGS, SPECIFICATIONS, CADD FILES OR OTHER ELECTRONIC MEDIA AND COPIED THERE OF FURNISHED BY THE ENGINEER ARE HIS PROPERTY. THEY ARE TO BE USED ONLY FOR THIS PROJECT AND ARE NOT TO BE USED ON ANY OTHER PROJECT, INCLUDING REPEATS OF THE PROJECT. CHANGES TO THE DRAWINGS MAY ONLY BE MADE BY THE ENGINEER.

UNLESS THE REVISION TITLE IS "ISSUED FOR CONSTRUCTION", THESE DRAWINGS SHALL BE CONSIDERED PRELIMINARY AND SHALL NOT BE USED AS A CONSTRUCTION DOCUMENT.

THESE DRAWINGS ILLUSTRATES THE WORK TO BE DONE. THE ENGINEER IS NOT RESPONSIBLE FOR THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES USED TO DO THE WORK, OR THE SAFETY ASPECTS OF CONSTRUCTION, AND NOTHING ON THESE DRAWINGS EXPRESSED OR IMPLIED CHANGES THIS CONDITION. CONTRACTOR SHALL DETERMINE ALL CONDITIONS AT THE SITE AND SHALL BE RESPONSIBLE FOR KNOWING HOW THEY AFFECT THE WORK. SUBMITTAL OF A BID TO PERFORM THIS WORK IS ACKNOWLEDGEMENT OF THE RESPONSIBILITIES, AND THAT THEY HAVE BEEN FULLY CONSIDERED IN PLANNING OF THE WORK, AND THE BID PRICE. NO CLAIMS FOR EXTRA CHARGES DUE TO THESE CONDITIONS WILL BE FORTHCOMING.

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 IN FIELD FOR LOCATION AND ELEVATION 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 ENGINEER'S GUIDANCE WITH RESPECT TO 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.

5m 2 0 5m

SCALE: 1:200

NOT FOR CONSTRUCTION TENDER OR PERMIT

No.	REVISIONS	BY	DATE
03	RE-ISSUED FOR SITE PLAN CONTROL	K.H.	XX FEB 2024
02	RE-ISSUED FOR SITE PLAN CONTROL	K.H.	13 SEPT 2023
01	ISSUED FOR SITE PLAN CONTROL	K.H.	15 DEC 2022

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT
UNPOISED ARCHITECTURE INC

DESIGNED BY:	DRAWN BY:	APPROVED BY:
K.H.	K.H.	M.B.

PROJECT
PROPOSED MULTI-UNIT COMMERCIAL DEVELOPMENT
5254 BANK STREET, OTTAWA

DRAWING TITLE
EROSION AND SEDIMENT CONTROL PLAN

PROJECT NO.
220536

DATE
JUNE2022

C101

GENERAL NOTES

1. ALL WORKS MATERIALS SHALL CONFIRM 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.
2. THE CONTRACTORS 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.
3. 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.
4. 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 CONTRACTOR'S 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.
5. 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.
6. ALL THE CONSTRUCTION SIGNAGE MUST CONFIRM TO THE MINISTRY OF TRANSPORTATION OF ONTARIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PER LATEST AMENDMENT.
7. 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.
8. ALL DIMENSIONS ARE IN METRES UNLESS SPECIFIED OTHERWISE.
9. THERE WILL BE NO SUBSTITUTION OF MATERIALS UNLESS PRIOR WRITTEN APPROVAL IS RECEIVED FROM THE ENGINEER.
10. ALL CONSTRUCTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS MADE IN THE GEOTECHNICAL REPORT.
11. FOR DETAILS RELATING TO STORMWATER MANAGEMENT REFER TO THE SITE SERVICING AND STORMWATER MANAGEMENT REPORT.
12. ALL SEWERS CONSTRUCTED WITH GRADES LESS THAN 1.0% SHALL BE INSTALLED USING LASER ALIGNMENT AND CHECKED WITH LEVEL INSTRUMENT PRIOR TO BACKFILLING.
13. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED AND TO BEAR THE COST OF THE SAME.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADDITIONAL BEDDING, OR ADDITIONAL STRENGTH PIPE IF THE MAXIMUM TRENCH WIDTH AS SPECIFIED BY OPSD IS EXCEEDED.
15. ALL PIPE/CULVERT SECTION SIZES REFER TO INSIDE DIMENSIONS.
16. 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.
17. 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.
18. DRAWINGS SHALL BE READ ON CONJUNCTION WITH ARCHITECTURAL SITE PLAN.
19. THE CONTRACTOR SHALL PROVIDE THE PROJECT ENGINEER ON SET OF AS CONSTRUCTED SITE SERVICING AND GRADING DRAWINGS.
20. 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.

SITE GRADING NOTES

1. ALL GRANULAR AND PAVEMENT FOR ROADS/PARKING AREAS SHALL BE CONSTRUCTED IN ACCORDANCE WITH GEOTECHNICAL ENGINEER'S RECOMMENDATIONS (AS APPLICABLE).
2. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD AND PARKING AREAS ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
3. PAVEMENT REINSTATEMENT FOR SERVICE AND UTILITY CUTS SHALL BE IN ACCORDANCE WITH THE CITY OF OTTAWA STD. R10 AND OPSD 509.010 AND OPSS 310.
4. GRANULAR 'A' SHALL BE PLACED TO A MINIMUM THICKNESS OF 300MM AROUND ALL STRUCTURES WITHIN THE PAVEMENT AREA.
5. SUB-EXCAVATE SOFT AREAS AND FILL WITH GRANULAR 'B' COMPACTED IN MAXIMUM 300MM LIFTS.
6. ALL WORK ON THE MUNICIPAL RIGHT OF WAY AND EASEMENTS TO BE INSPECTED BY THE MUNICIPALITY PRIOR BACKFILLING.
7. CONTRACTOR TO OBTAIN A ROAD OCCUPANCY PERMIT 48 HOURS PRIOR TO COMMENCING ANY WORK WITHIN THE MUNICIPAL ROAD ALLOWANCE, IF REQUIRED BY THE MUNICIPALITY.
8. 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.
9. REFER TO ARCHITECTURAL SITE PLAN FOR DIMENSIONS AND SITE DETAILS.
10. STEP JOINTS ARE TO BE USED WHERE PROPOSED ASPHALT MEETS EXISTING ASPHALT. ALL JOINTS MUST BE SEALED.
11. 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 ENGINEER.

ROADWORK SPECIFICATIONS

12. ROADWORK TO BE COMPLETED IN ACCORDANCE WITH GEOTECHNICAL REPORT.
13. ALL TOPSOIL AND ORGANIC MATERIAL SHALL BE STRIPPED WITHIN THE ROAD ALLOWANCE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND STOCK PILLED ON SITE AS DIRECTED BY THE MUNICIPAL AUHTORITY.
14. THE SUBGRADE SHALL BE CROWNED AND SLOPED AT LEAST 2% AND PROOF ROLLED WITH HEAVY ROLLERS.
15. 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).

PAVEMENT STRUCTURE

COURSE	MATERIAL	THICKNESS (mm)	
		AUTOMOBILE PARKING	TRUCK ROUTE (HEAVY TRAFFIC)
SURFACE	HL.3 A/C (PG 58-28)	50	40
BINDER	HL.8 A/C (PG 58-28)	--	50
BASECOURSE	OPSS GRANULAR "A"	150	150
SUBBASE	OPSS GRANULAR "B" TYPE II	350	450

NOTE:
IN PREPARATION FOR PAVEMENT CONSTRUCTION AT THIS SITE, ANY SURFICIAL OR NEAR SURFACE/SUBGRADE LEVEL TOPSOIL AND ANY SOFT, WET OR DELETERIOUS MATERIALS SHOULD BE REMOVED FROM THE PROPOSED PAVED AREAS. THE EXPOSED SUBGRADE SHOULD BE INSPECTED AND APPROVED BY GEOTECHNICAL PERSONNEL AND ANY SOFT AREAS EVIDENT SHOULD BE SUBEXCAVATED AND REPLACED WITH SUITABLE EARTH BORROW APPROVED BY THE GEOTECHNICAL ENGINEER. THE SUBGRADE SHOULD BE SHAPED AND CROWNED TO PROMOTE DRAINAGE OF THE SITE DRAINAGE STRUCTURES. FOLLOWING APPROVAL OF THE PREPARATION OF THE SUBGRADE, THE PAVEMENT GRANULARS MAY BE PLACED.

REFER TO GEOTECHNICAL INVESTIGATION REPORT PREPARED BY LRL ASSOCIATES DATED JULY 2021.

LEGEND:

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- PROPOSED SILT FENCE AS PER OPSD 219.110
- PROPOSED DOOR ENTRANCE/EXIT
- PROPOSED GRASS AREA (100mm TOP SOIL & SOD)
- PROPOSED CONCRETE FEATURES/SLAB
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- SAN PROPOSED SANITARY SEWER
- WTR PROPOSED WATERMAIN
- STM EXISTING STORM SEWER
- SAN EXISTING SANITARY SEWER
- WTR EXISTING WATERMAIN
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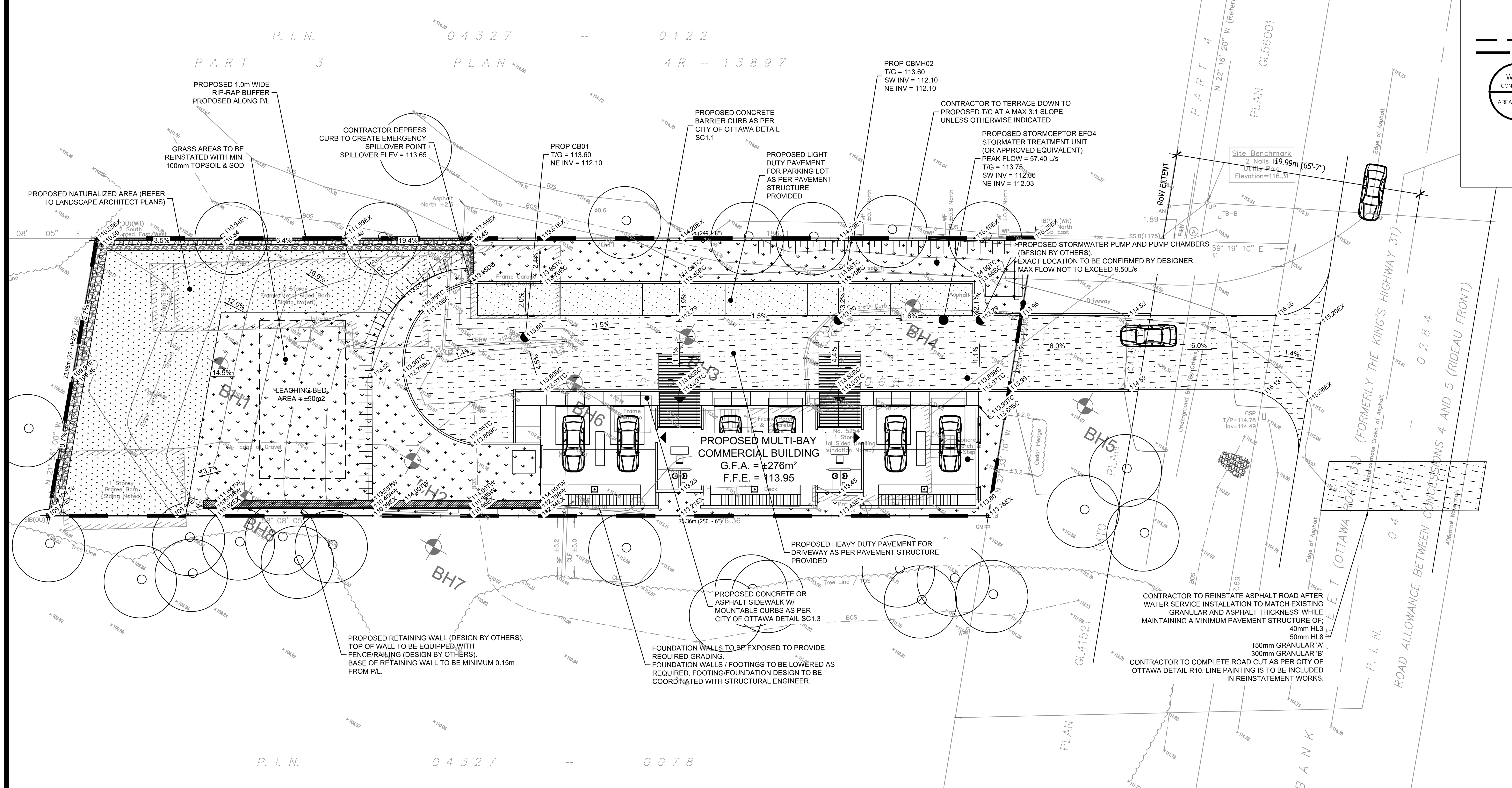
- WS-XX CONTROLLED AREA RUNOFF: WATERSHED NAME; RUNOFF COEFFICIENT; AREA IN HECTARES



Topographical Information
Topographic information provided by Farley, Smith and Denis Surveying Ltd.
File No: 67-19
Dated: April 24th, 2019

Metric Note
Distances and coordinates on this plan are in metres and can be converted to feet by dividing by 0.3048.

Distance Note
Distances shown on this plan are ground distances and can be converted to grid distances by multiplying by the combined scale factor of 0.99995.

Bearing Note
Bearings are MTM grid, derived from the Can-Net Real Time Network.
GPS observations on reference points A and B, shown hereon, having a bearing of N 22° 16' 20" W and are referred to the Central Meridian of MTM Zone 9 (76°30' West Longitude) Nad-83 (Original).

For bearing comparisons, a rotation of 6°16'20" counter-clockwise was applied to bearings on P1.

For bearing comparisons, a rotation of 0°39'20" counter-clockwise was applied to bearings on P2, P3, P4 & P5.

Elevation Notes
1. Elevations shown are geodetic and are referred to Geodetic Datum CGVD-1928 :1978.
2. It is the responsibility of the user of this information to verify that the job benchmark has not been altered or disturbed and that it's relative elevation and description agrees with the information shown on this drawing.

Utility Notes
1. This drawing cannot be accepted as acknowledging all of the utilities and it will be the responsibility of the user to contact the respective utility authorities for confirmation.
2. Only visible surface utilities were located.
3. Underground utility data derived from City of Ottawa utility sheet reference: 7123 (sheet 6).
4. A field location of underground plant by the pertinent utility authority is mandatory before any work involving breaking ground, probing, excavating etc.

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5m 2 0 5m
SCALE: 1:200

NOT FOR CONSTRUCTION TENDER OR PERMIT

No.	REVISIONS	BY	DATE
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02	RE-ISSUED FOR SITE PLAN CONTROL	K.H.	13 SEPT 2023
01	ISSUED FOR SITE PLAN CONTROL	K.H.	15 DEC 2022

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT
UNPOISED ARCHITECTURE INC

DESIGNED BY:	DRAWN BY:	APPROVED BY:
K.H.	K.H.	M.B.

PROJECT
PROPOSED MULTI-UNIT COMMERCIAL DEVELOPMENT
5254 BANK STREET, OTTAWA

DRAWING TITLE
GRADING AND DRAINAGE PLAN

PROJECT NO.
220536

DATE
JUNE2022

C301

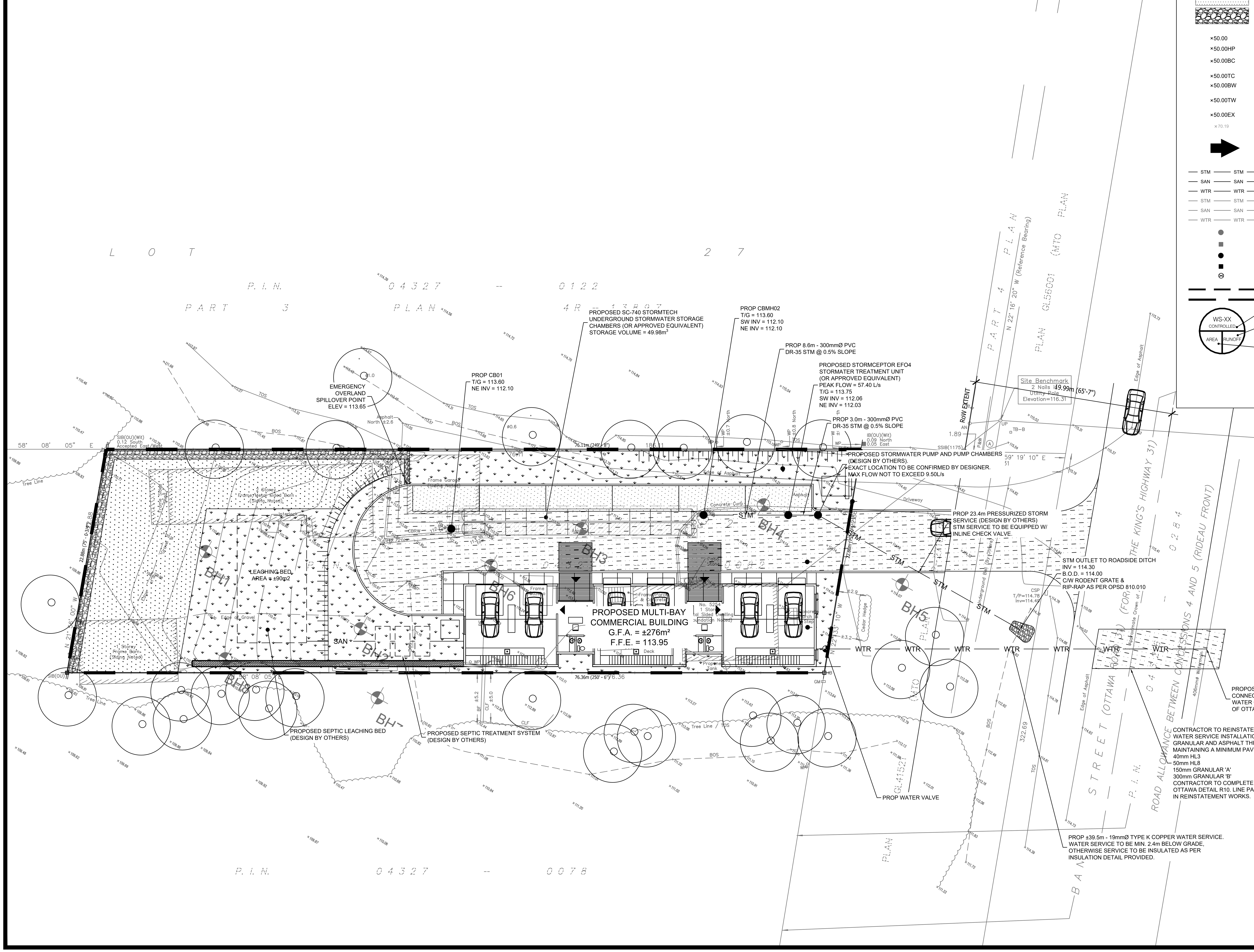
SANITARY, FOUNDATION DRAIN, STORM SEWER AND WATERMAIN NOTES

GENERAL

1. LASER ALIGNMENT CONTROL TO BE UTILIZED ON ALL SEWER INSTALLATIONS.
2. 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.

STORM

3. ALL PVC STORM SEWERS ARE TO BE SDR 35 APPROVED PER C.S.A. B182.2 OR LATEST AMENDMENT, UNLESS OTHERWISE SPECIFIED.
4. CATCH BASIN SHALL BE IN ACCORDANCE WITH OPSD 705.010.
5. CATCH BASIN LEADS SHALL BE IN 200MM DIA. AT 1% SLOPE (MIN) UNLESS SPECIFIED OTHERWISE.
6. ALL CATCH BASINS SHALL HAVE 600MM SUMPS, UNLESS SPECIFIED OTHERWISE.
7. ALL CATCH BASIN LEAD INVERTS TO BE 1.5M BELOW FINISHED GRADE UNLESS SPECIFIED OTHERWISE.
8. THE STORM SEWER CLASSES HAVE 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.
9. ALL STORM MANHOLES WITH PIPE LESS THAN 900MM IN DIAMETER SHALL BE CONSTRUCTED WITH A 300MM SUMP AS PER SDG, CLAUSE 6.2.6.



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- WS-XX CONTROLLED — WATERSHED NAME
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- AREA — AREA IN HECTARES

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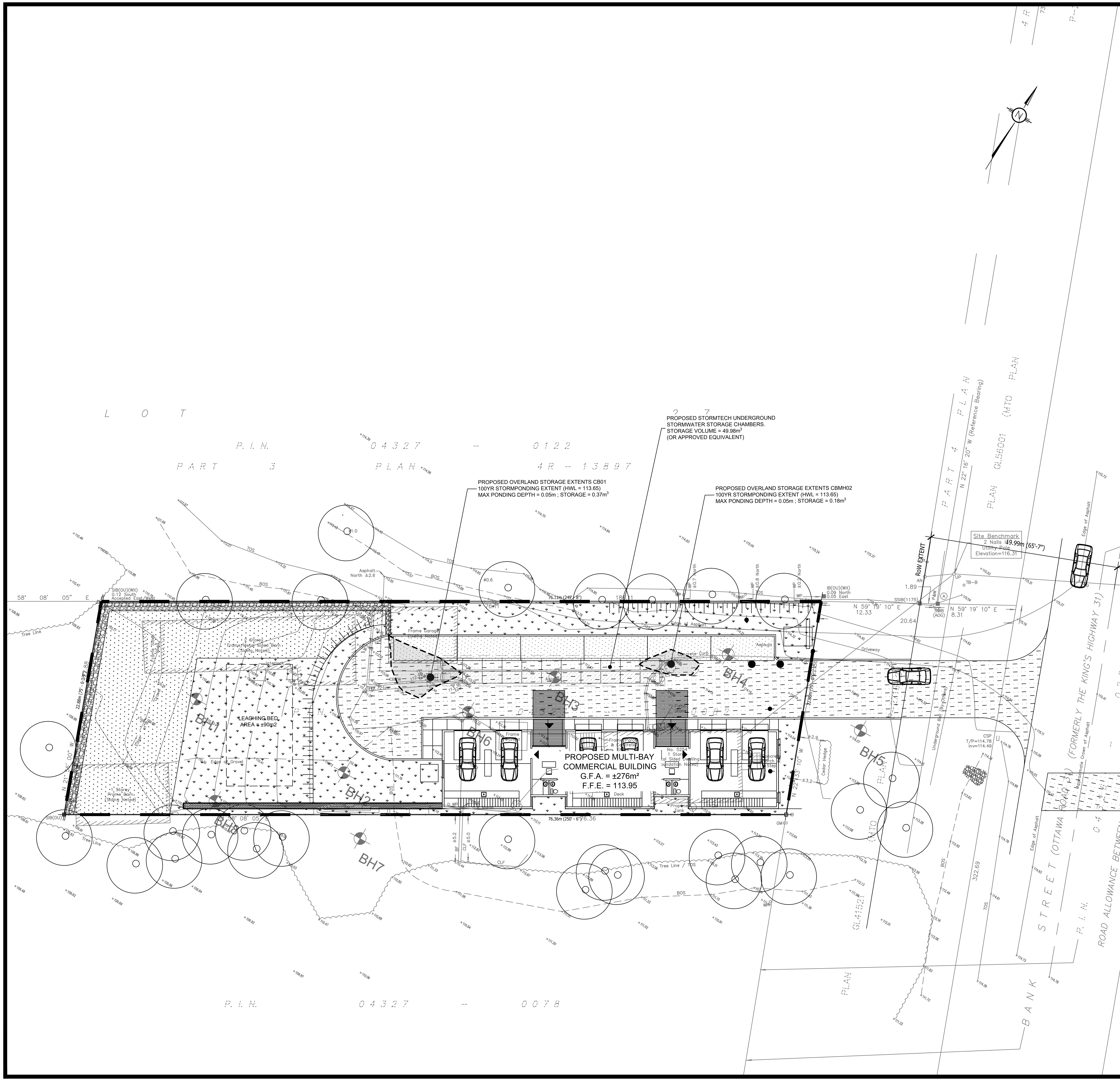
PROPOSED MULTI-UNIT COMMERCIAL DEVELOPMENT
5254 BANK STREET, OTTAWA

DRAWING TITLE
SERVICING PLAN

PROJECT NO.
220536

DATE
JUNE2022

C401



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5m 2 0 5m

SCALE: 1:200

NOT FOR CONSTRUCTION TENDER OR PERMIT

No.	REVISIONS	BY	DATE
03	RE-ISSUED FOR SITE PLAN CONTROL	K.H.	XX FEB 2024
02	RE-ISSUED FOR SITE PLAN CONTROL	K.H.	13 SEPT 2023
01	ISSUED FOR SITE PLAN CONTROL	K.H.	15 DEC 2022

NOT AUTHENTIC UNLESS SIGNED AND DATED

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

CLIENT
UNPOISED ARCHITECTURE INC

DESIGNED BY:	DRAWN BY:	APPROVED BY:
K.H.	K.H.	M.B.

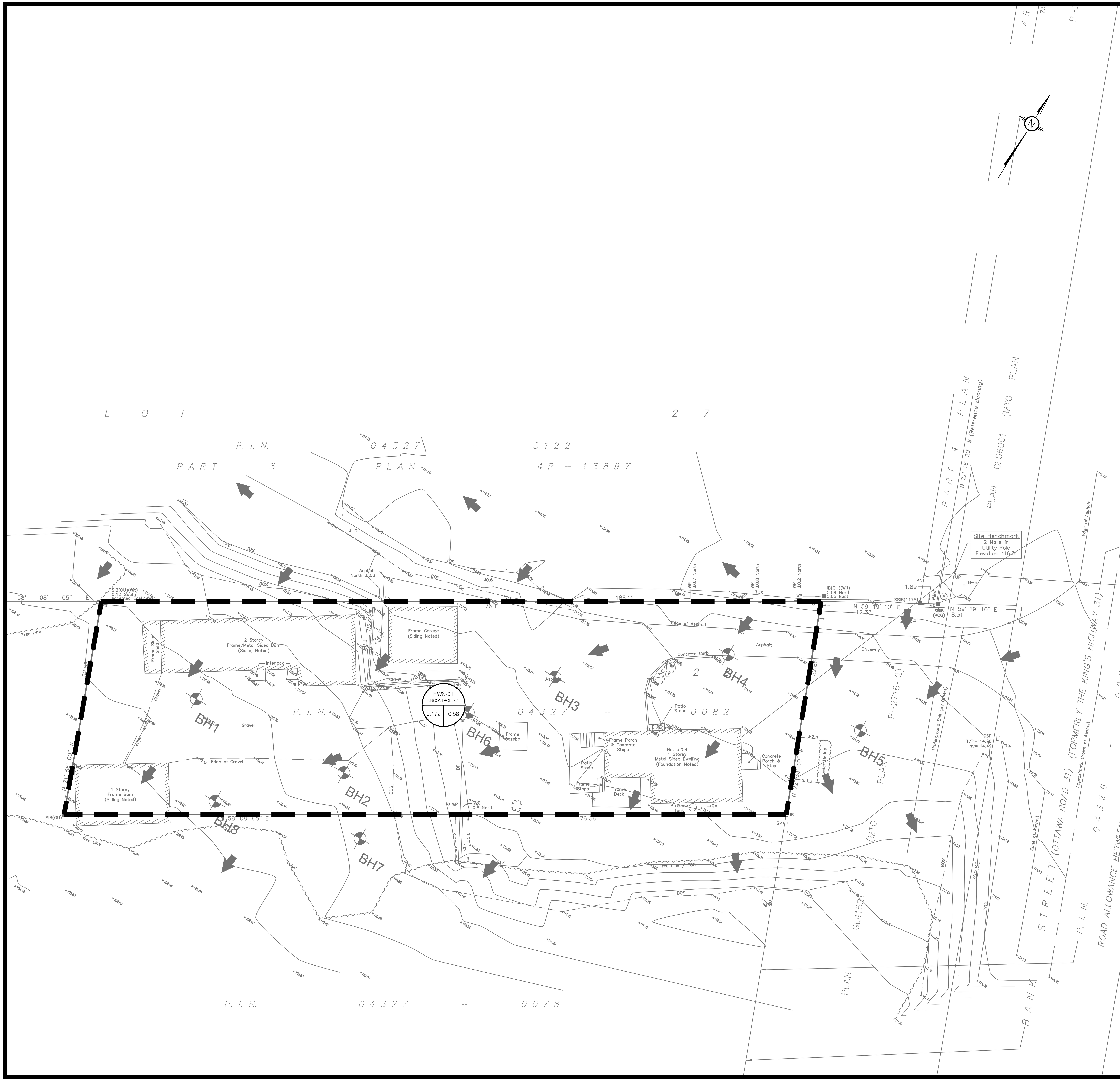
PROJECT
PROPOSED MULTI-UNIT COMMERCIAL DEVELOPMENT
5254 BANK STREET, OTTAWA

DRAWING TITLE
STORMWATER MANAGEMENT PLAN

PROJECT NO.
220536

DATE
JUNE2022

C601



LEGEND:

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	PROPOSED CURB
	PROPOSED DEPRESSED CURB
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	PROPOSED 100 YEAR HIGH WATER LEVEL
	STORM WATERSHED EXTENT
WS-XX CONTROLLED	WATERSHED NAME
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DESIGNED BY:	DRAWN BY:	APPROVED BY:
K.H.	K.H.	M.B.

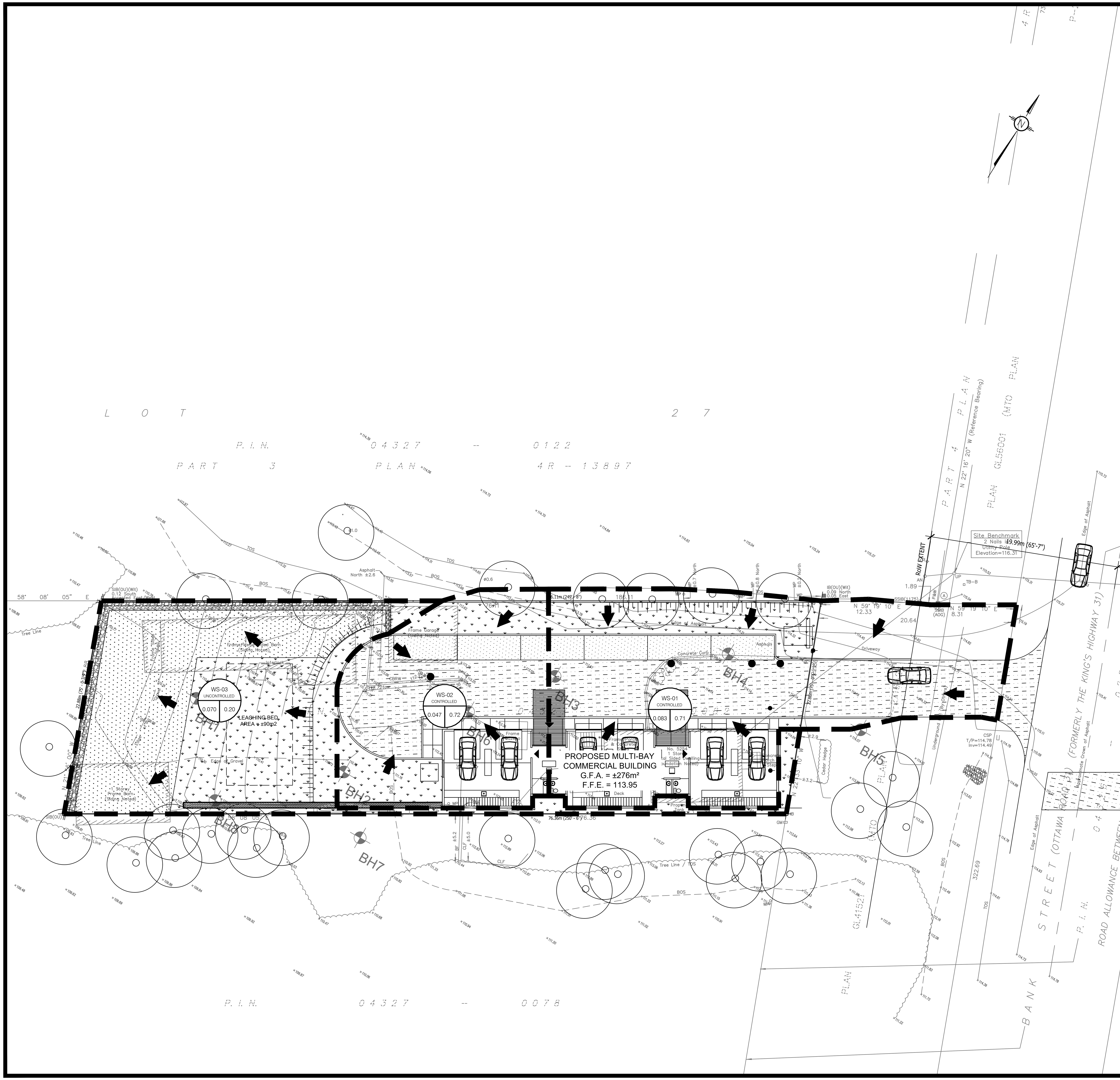
PROJECT
PROPOSED MULTI-UNIT
COMMERCIAL DEVELOPMENT
5254 BANK STREET, OTTAWA

DRAWING TITLE
PRE-DEVELOPMENT
WATERSHED PLAN

PROJECT NO.
220536

DATE
JUNE2022

C701



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CLIENT
UNPOISED ARCHITECTURE INC

DESIGNED BY:	DRAWN BY:	APPROVED BY:
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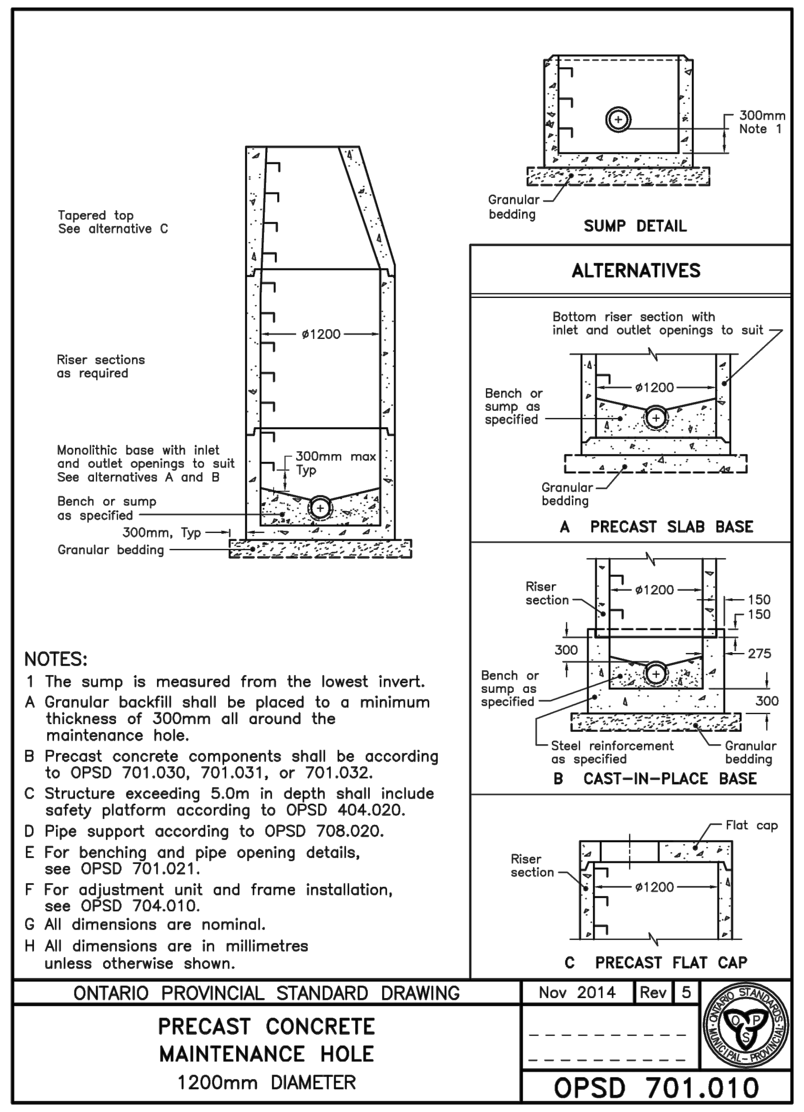
PROJECT
PROPOSED MULTI-UNIT COMMERCIAL DEVELOPMENT
5254 BANK STREET, OTTAWA

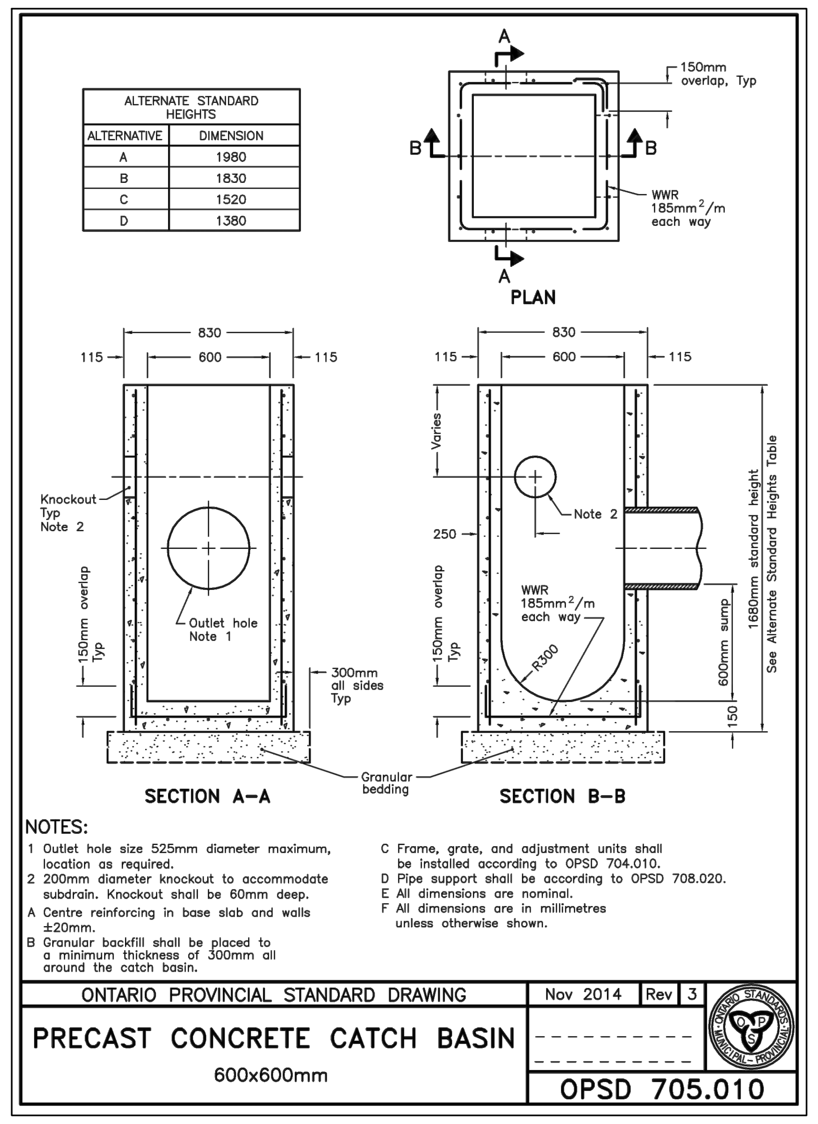
DRAWING TITLE
POST-DEVELOPMENT WATERSHED PLAN

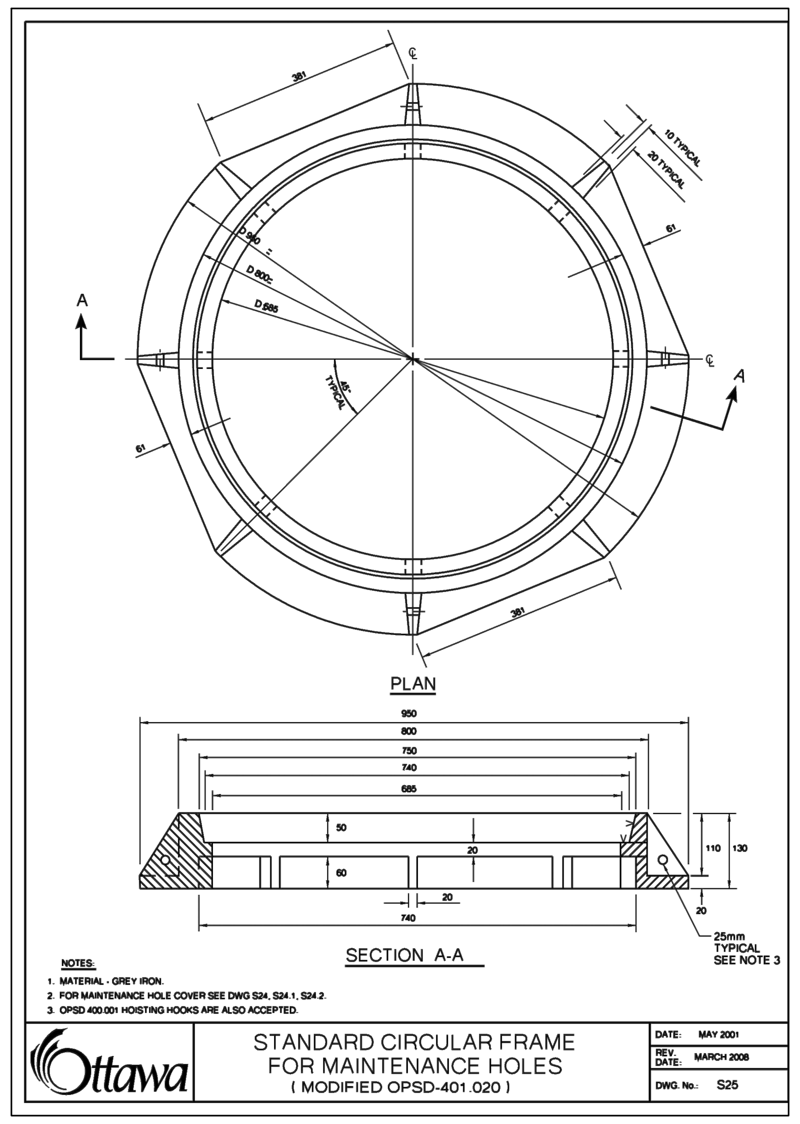
PROJECT NO.
220536

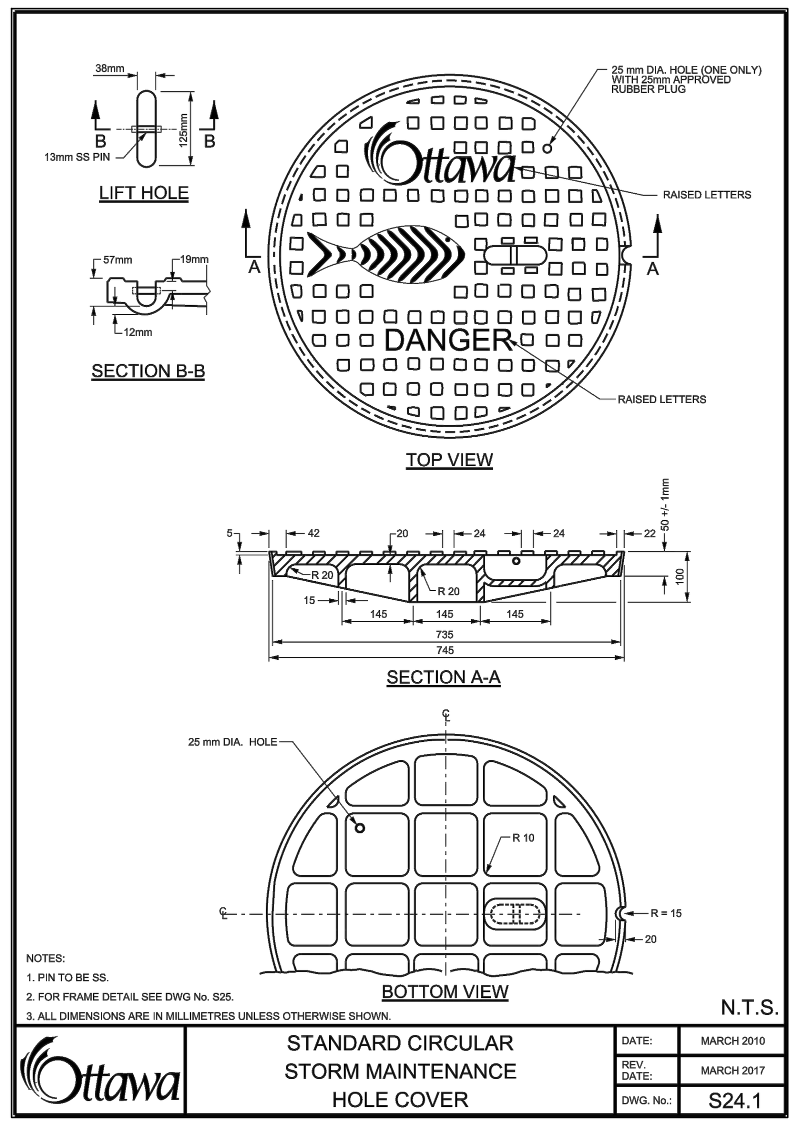
DATE
JUNE2022

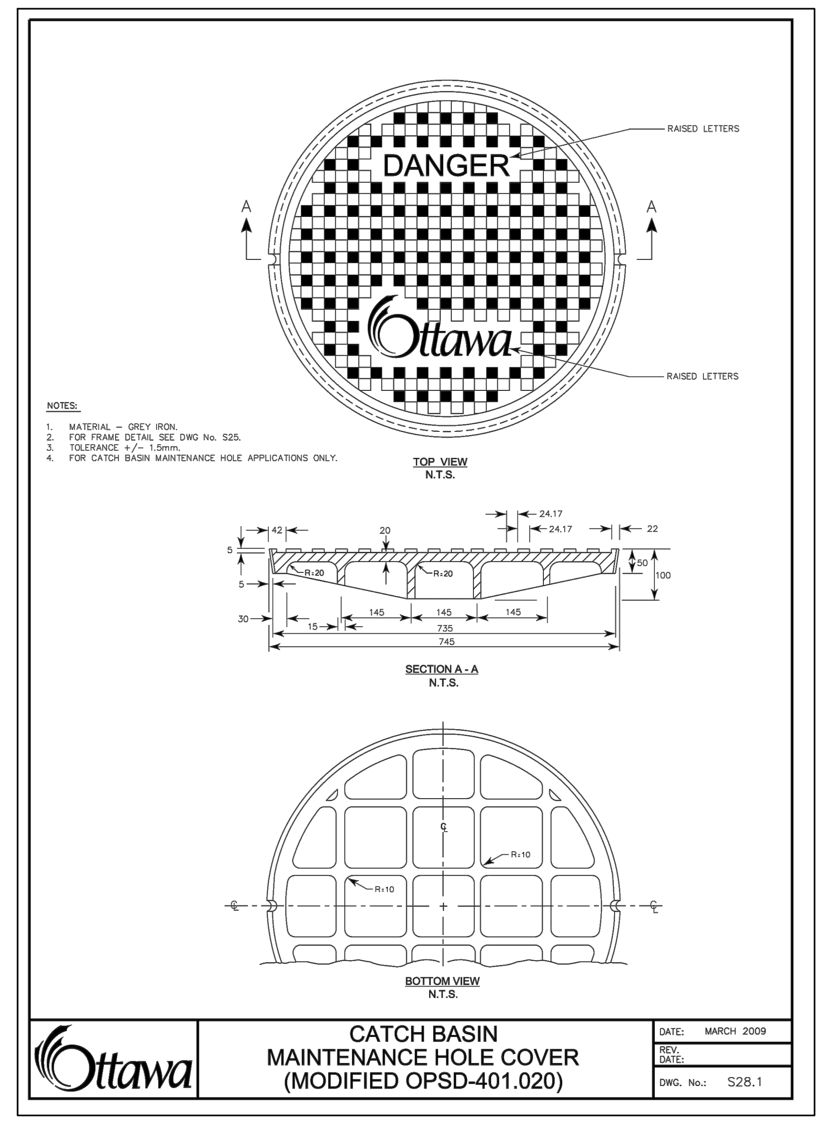
C702

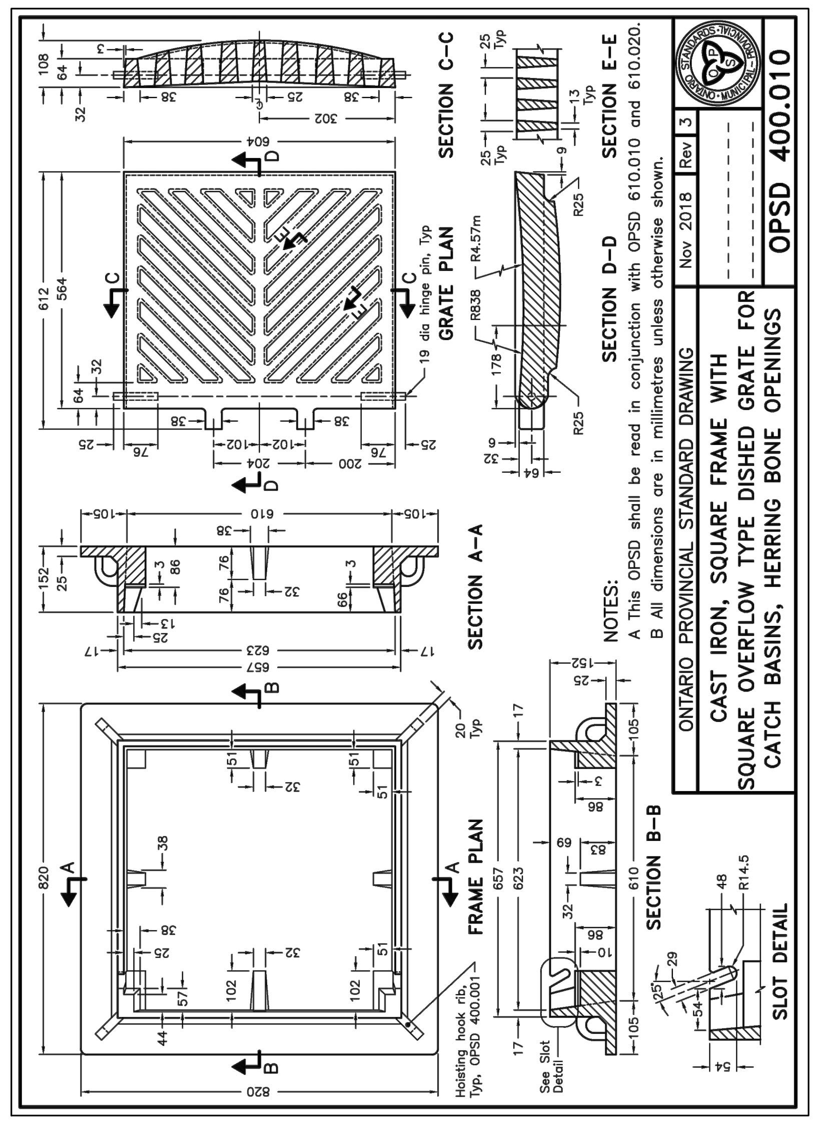


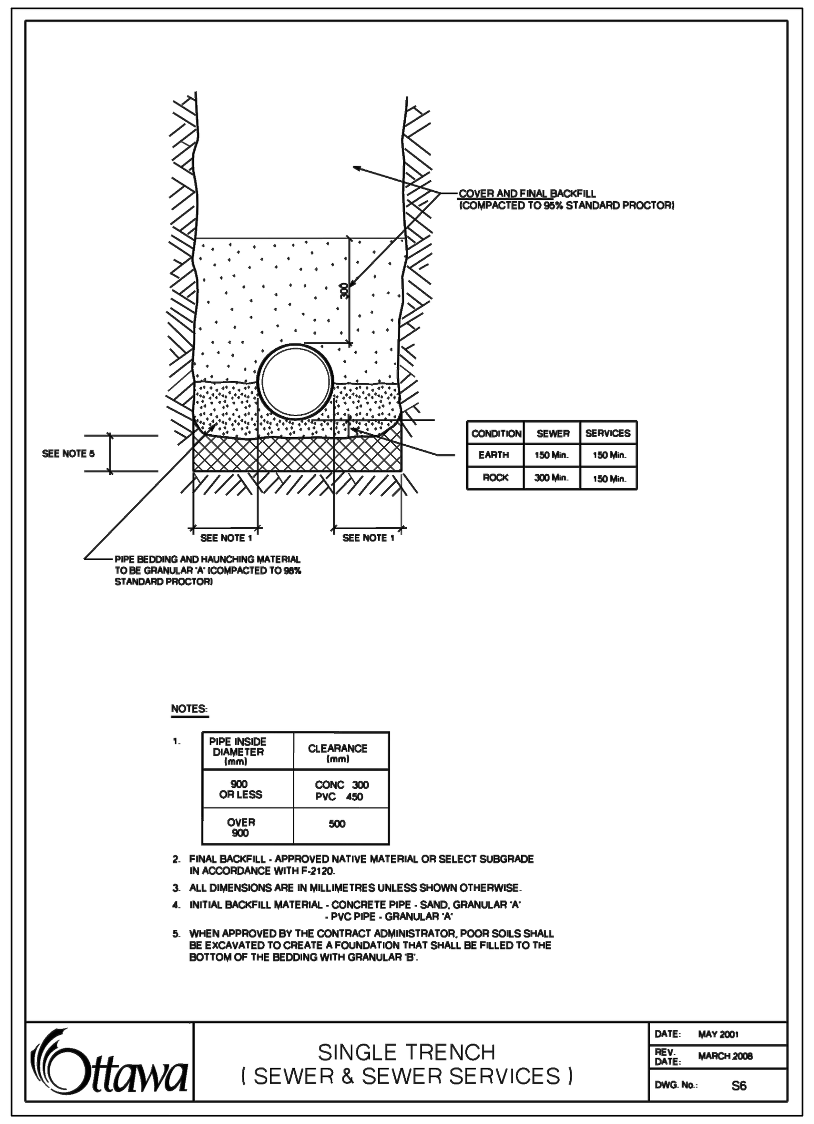


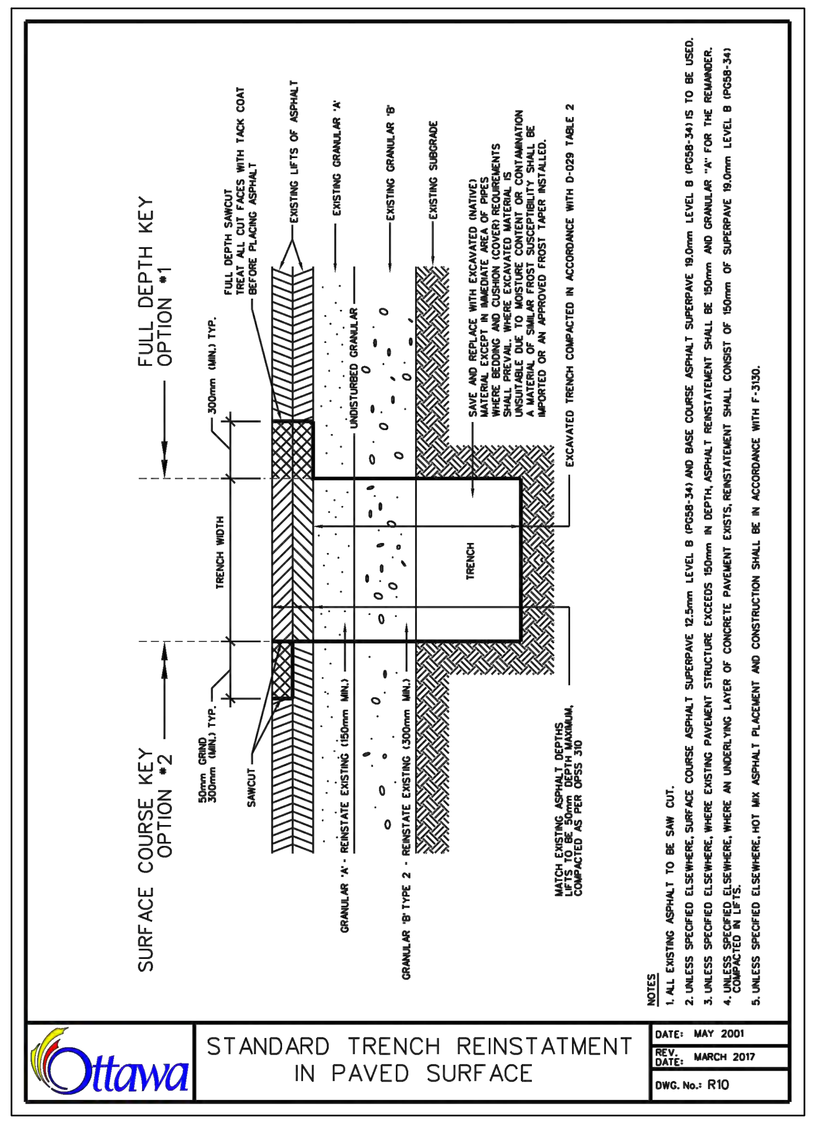


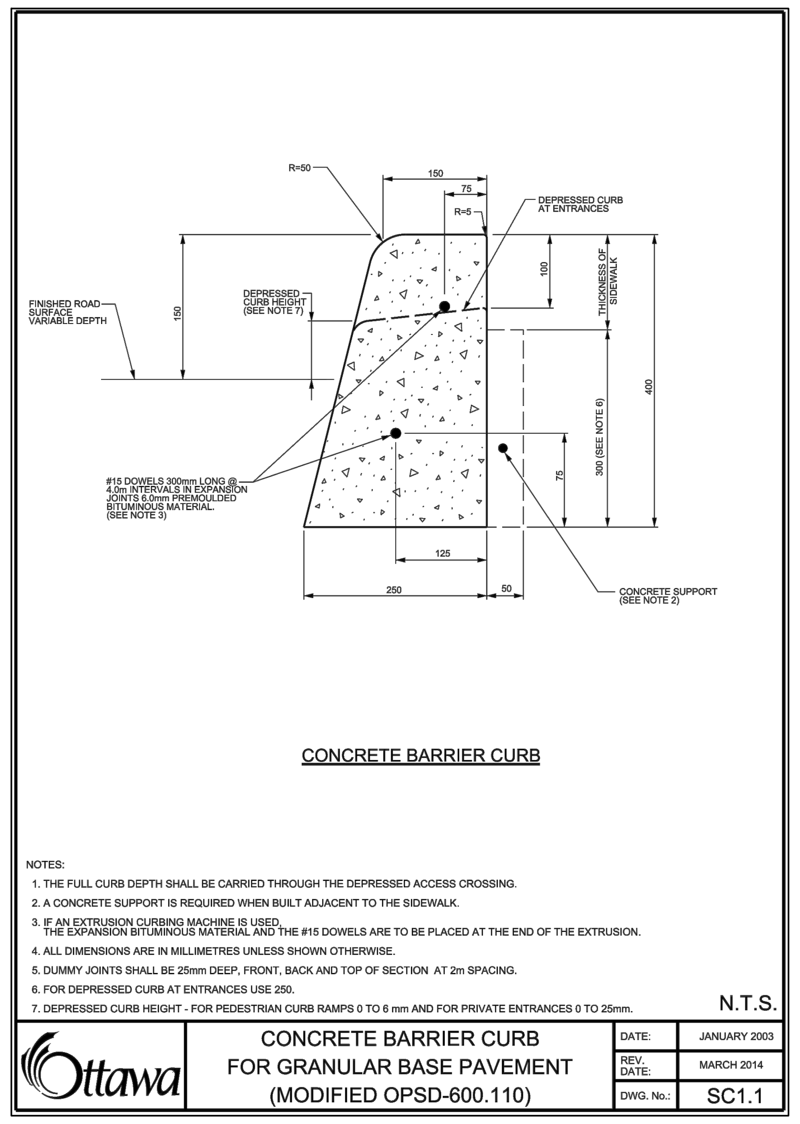


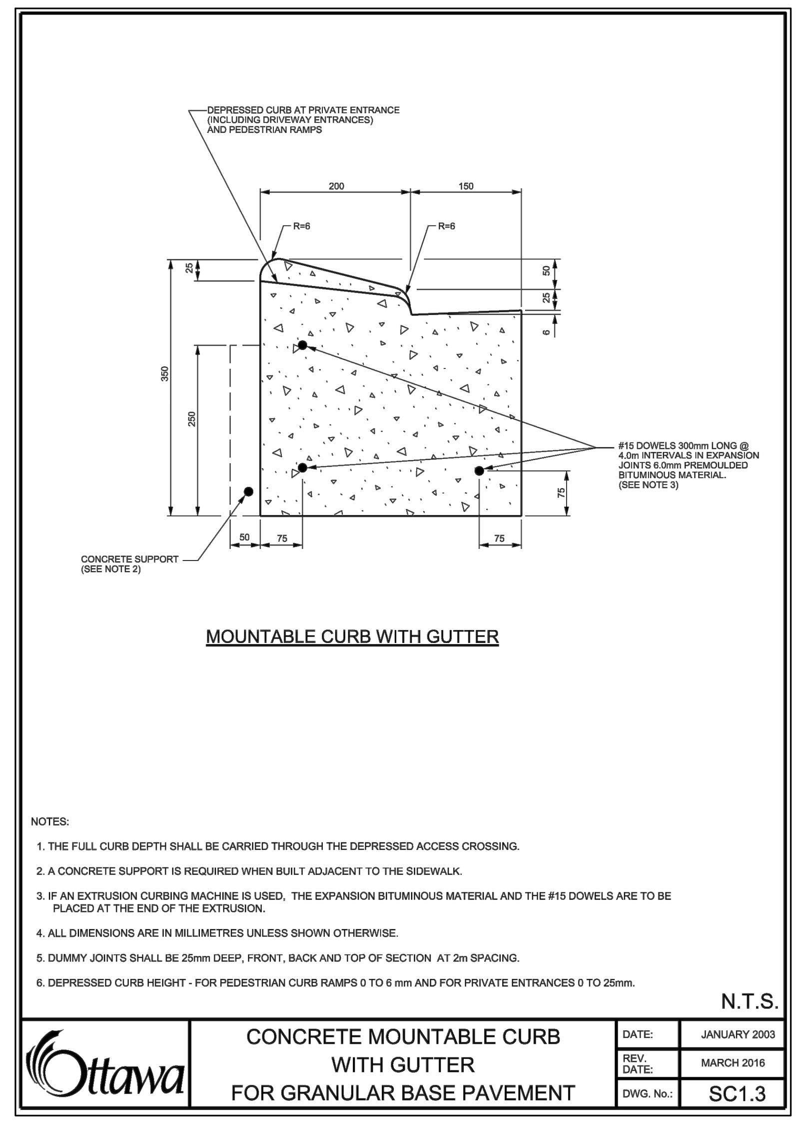


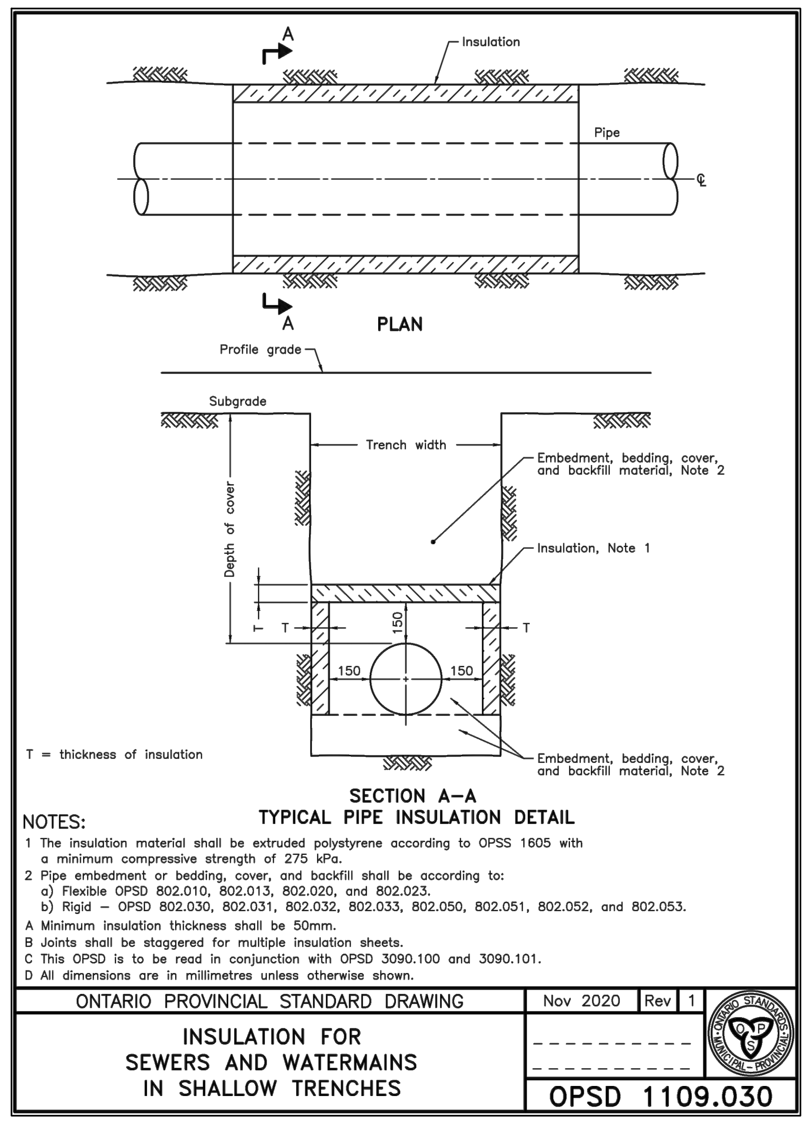


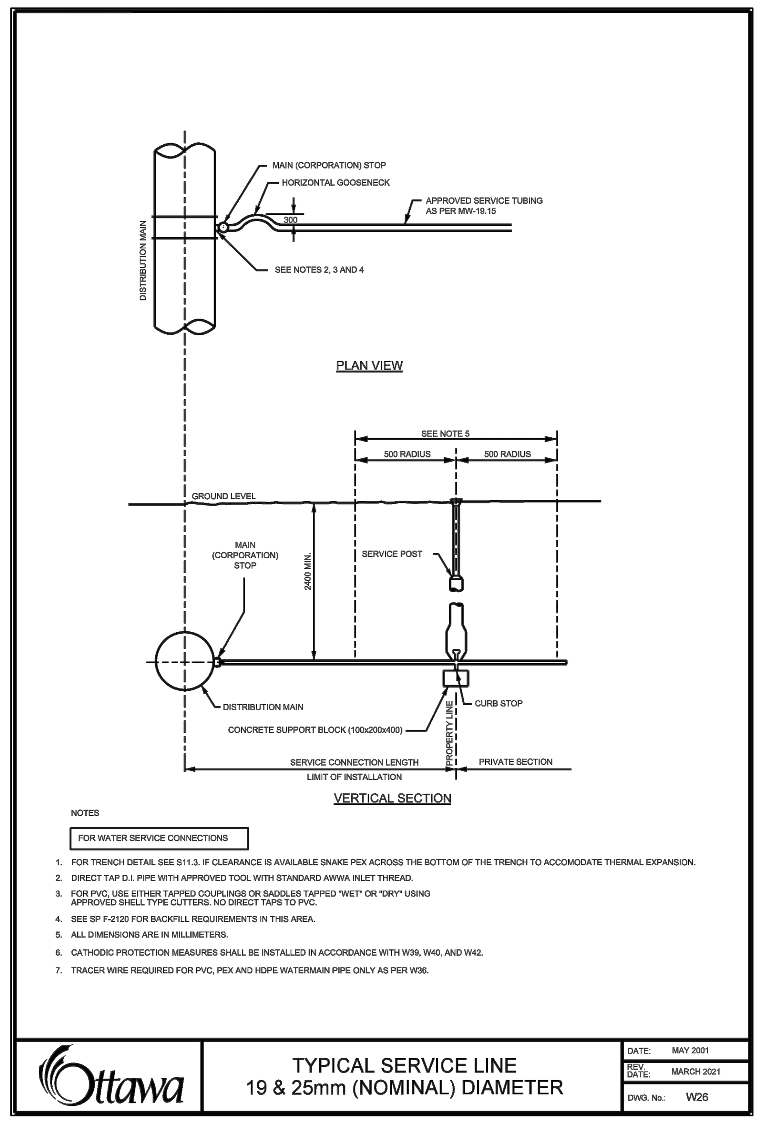


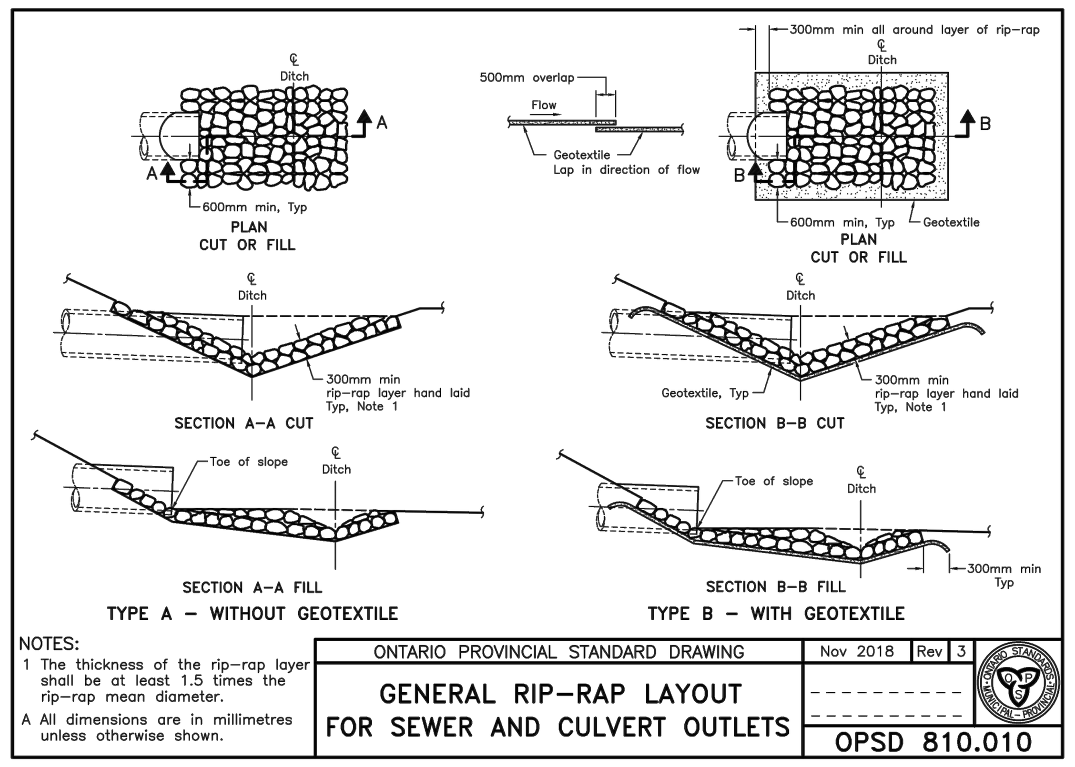












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5254 BANK STREET, OTTAWA

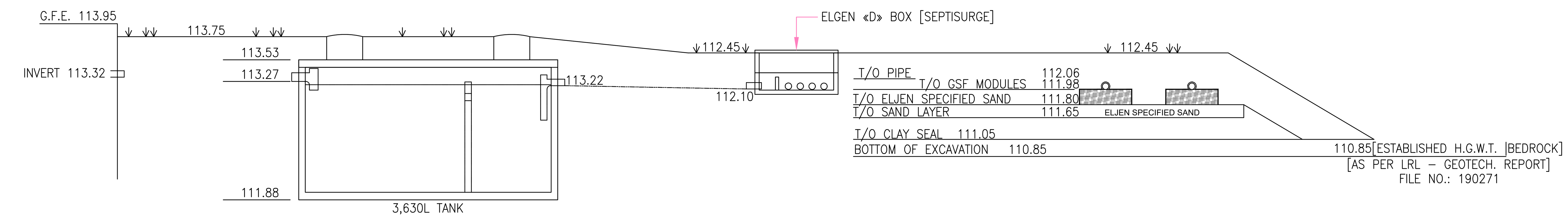
DRAWING TITLE
CONSTRUCTION DETAIL PLAN

PROJECT NO.
220536
DATE
JUNE2022

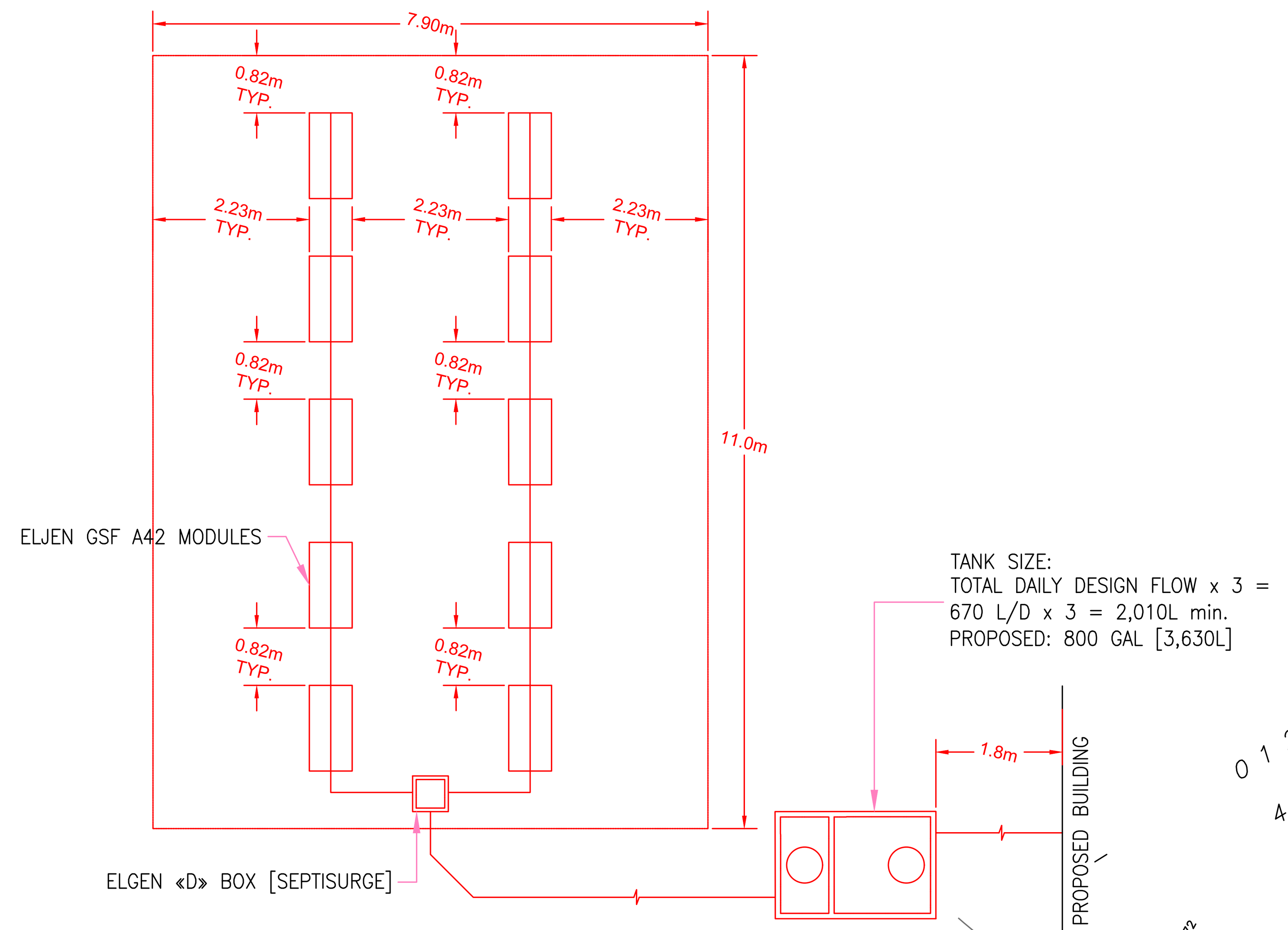
C901

ATTACHMENT G

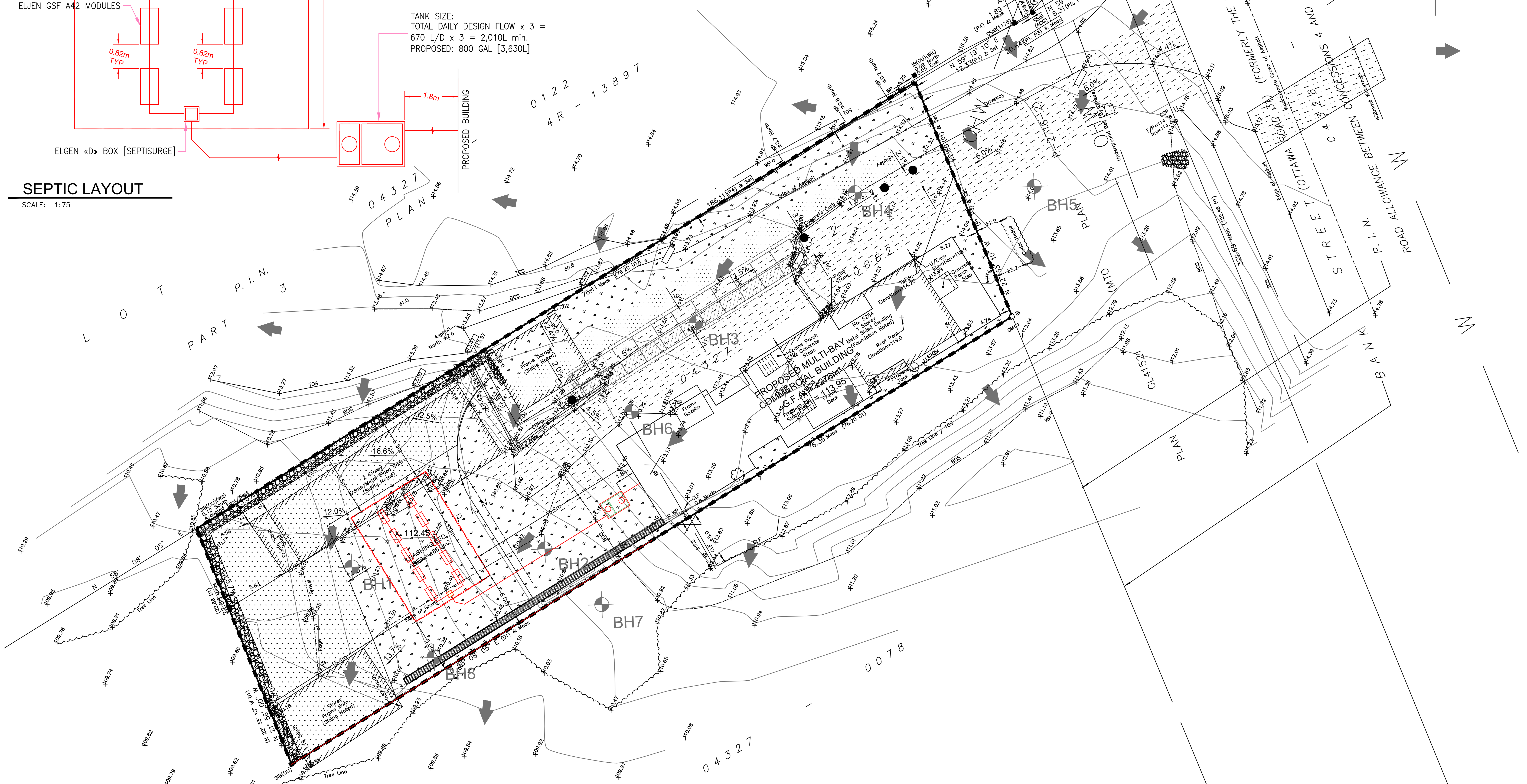
Septic Design Drawing (Absolute Drafting and Design)



SEPTIC SECTION
SCALE: 1:35



SEPTIC LAYOUT
SCALE: 1:75



SEPTIC SITE LOCATION
SCALE: 1:200

ALL CONTRACTORS SHALL PERFORM THEIR WORK WHETHER DESCRIBED OR NOT, ACCORDING TO THE APPLICABLE BUILDING CODE REQUIREMENTS AND MUNICIPAL REGULATIONS.

THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND REPORT ERRORS AND OMISSIONS TO THE DESIGN CONSULTANT.

NO DIMENSION SHOULD BE SCALED ON DRAWINGS.

THE GENERAL CONTRACTOR OR SUB-CONTRACTORS WILL BE HELD RESPONSIBLE FOR ALL WORK DONE ON THE CONSTRUCTION SITE. IN NO EVENT WILL THE DESIGNER BE HELD RESPONSIBLE BEFORE, DURING AND AFTER THE PROJECT.

ABSOLUTE DRAFTING + DESIGN INC.

SCALE: AS INDICATED

DATE: 2024.03.06.

ISSUED FOR PERMIT

PROJECT: 23A066-REV01

ABSOLUTE DRAFTING + DESIGN INC.
PERS. BCIN #44555
FIRM. BCIN #45254

I, ABSOLUTE DRAFTING + DESIGN INC., HAVE REVIEWED THE FOLLOWING DOCUMENTS AND TAKE RESPONSIBILITY FOR THE DESIGN ACTIVITIES.

DESSIN/DRAWING
SEPTIC LOCATION + DETAILS

PROJET/PROJECT
WAREHOUSE | STORAGE FACILITY
5254 BANK ST., OTTAWA

CLIENT
UNPOISED ARCHITECTURE INC.

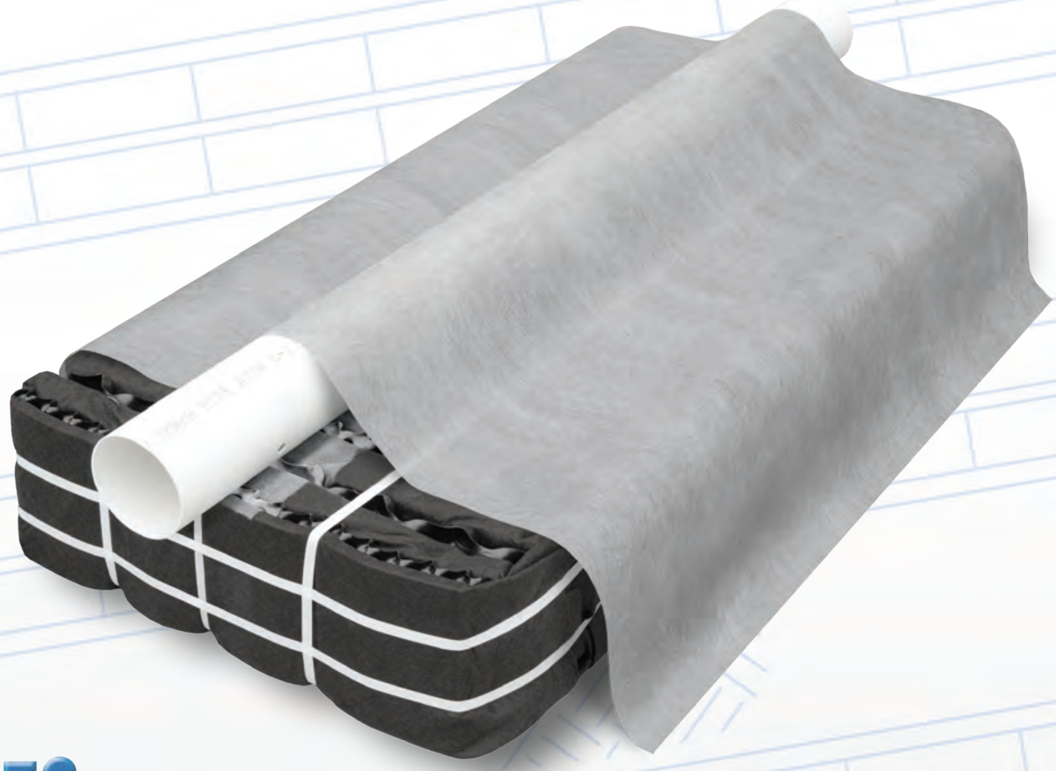
ATTACHMENT H

Eljen GSF Product Brochure

GSF®

Geotextile Sand Filter

Eljen GSF System Overview



eljen CORPORATION

Innovative Onsite Products & Solutions Since 1970

www.eljen.com

Eljen GSF System Description

Each GSF Module is made up of geotextile fabric and a plastic core material that work together to provide vertical surface area and oxygen transfer. The GSF System applies secondary treated effluent to the soil, increasing the soil's long-term acceptance rate. A Specified Sand layer provides additional filtration, and prevents saturated conditions.

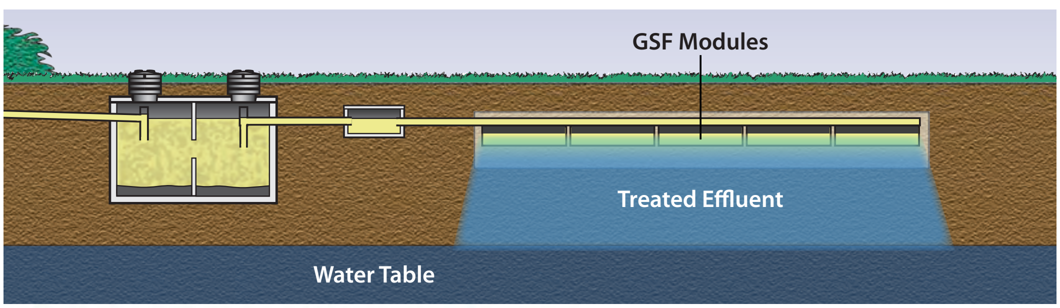
PRIMARY TREATMENT ZONE

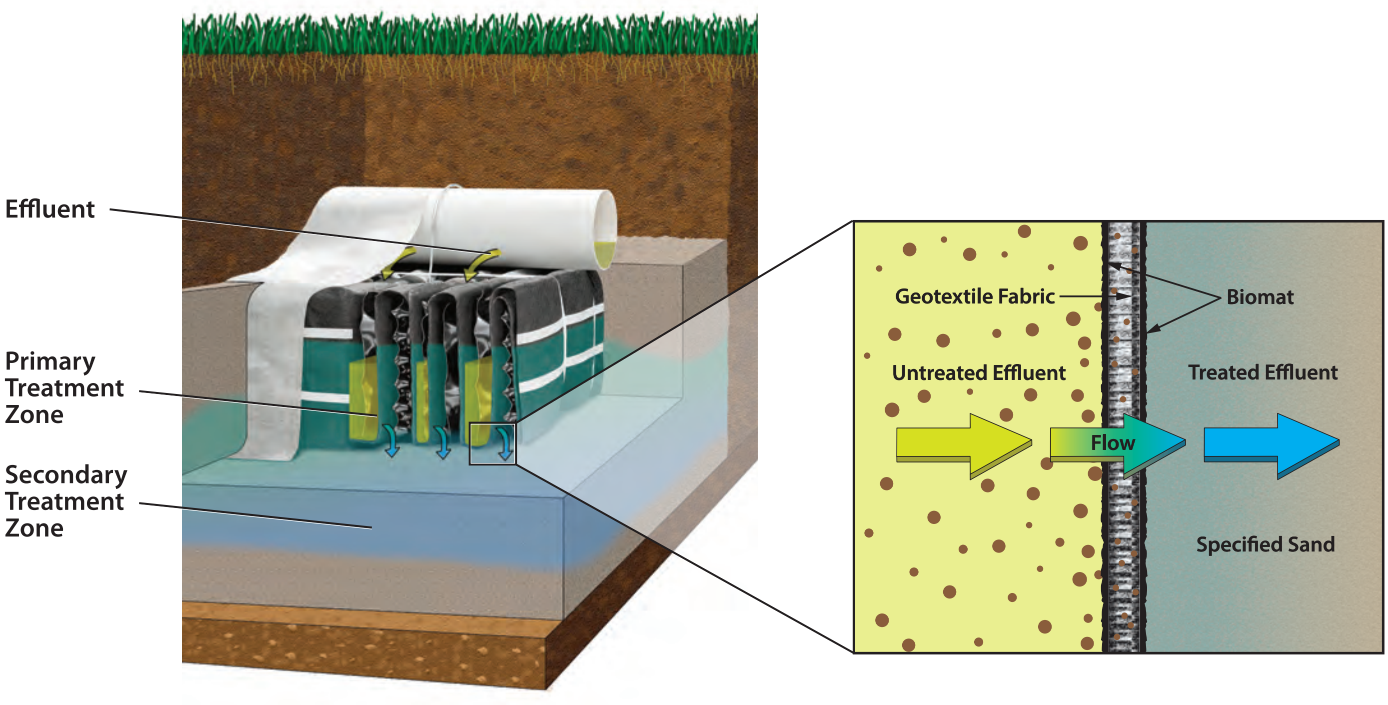
- Perforated pipe is centered above the GSF Module to distribute septic effluent over and into corrugations created by the plastic core of the GSF Module.
- The Module's unique design provides increased surface area for biological treatment of nutrients and contaminants.
- Open air channels within the Module support aerobic bacterial growth on the Module's geotextile fabric interface, and promote oxygen in the system.
- An anti-siltation geotextile fabric covers the top and sides of the GSF Module to protect the system from the migration of fines.
- The GSF Module provides biomat management, and takes the burden of treatment and biomat development off of the native soil.

SECONDARY TREATMENT ZONE

- Effluent drips into the Specified Sand layer and supports unsaturated flow into the native soil.
- The Specified Sand layer also protects the soil from compaction and helps maintain cracks and crevices in the soil.
- Native soil provides final filtration and allows for groundwater recharge.

GSF SYSTEM OPERATION





Testing Overview and Performance

NSF Standard 40

NSF Certified to NSF/ANSI Standard 40

This standard determines whether treatment systems product secondary treatment effluent quality, with Class I systems achieving a 30-day average effluent quality of 25 mg/L CBOD5 and 30 mg/L TSS or less, and pH 6.0-9.0. Testing and certification are done at an independent third party testing facility.

SETUP: Gravity GSF system with 6″ of ASTM C33 sand in a bed configuration. 450 gal/day, (2.0 gal/ ft^2 loading rate).

RESULTS: The Eljen GSF is Tested and Certified by NSF to NSF Standard 40 Class 1 since 2014.

More information can be found at www.NSF.org.

NSF Standard 245

NSF Certified to NSF/ANSI Standard 245

This standard includes Total Nitrogen reduction requirements with Class I systems achieving a 30-day average effluent quality of more than 50% Total Nitrogen removal, 25 mg/L CBOD5 and 30 mg/L TSS or less, and PH 6.0-9.0. Testing and certification are done at an independent third party testing facility.

SETUP: Gravity GSF system in a bed configuration with 18″ of ASTM C33 sand, 12″ of sand/woodchip mixture, and 2″ of limestone. 450 gal/day (2.0 gal/ft^2 loading rate).

RESULTS: Tested and Certified by NSF to NSF Standard 245 Class 1 since 2018.

More information can be found at www.NSF.org.

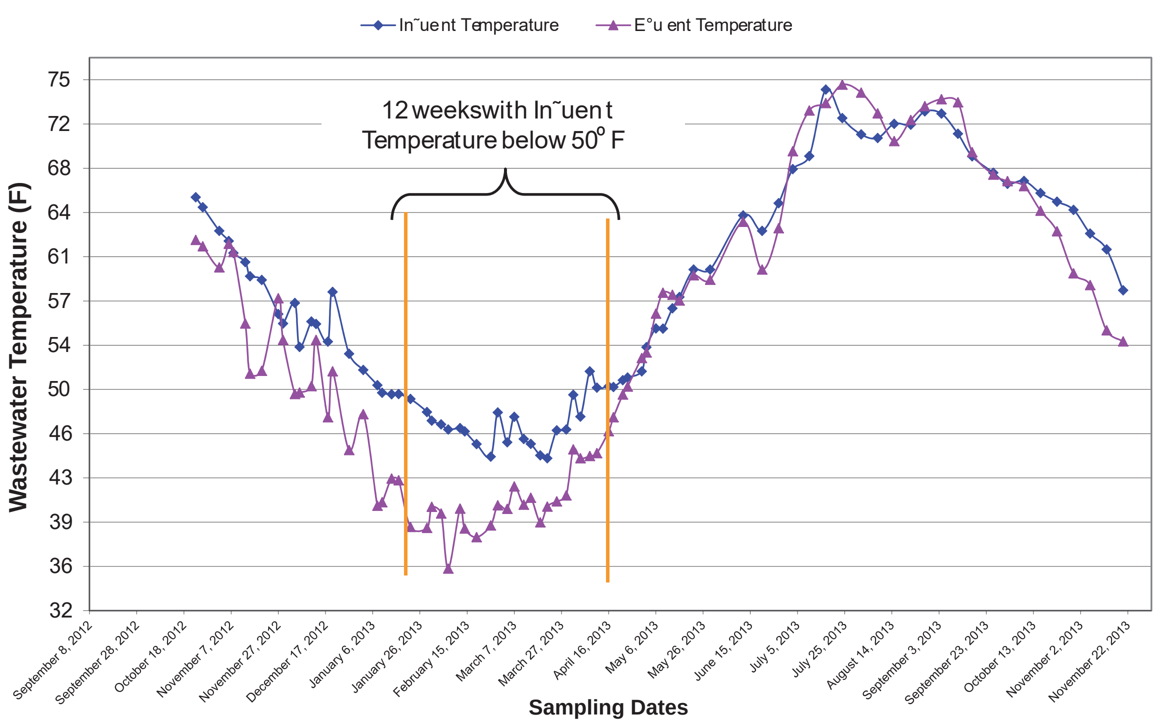
The third-party testing results listed below were taken over a 12 month consecutive period. This extended sampling period provided verification to the stability and consistency of the Eljen GSF's performance and capability to handle colder weather conditions. A summary of the test results from the independent third-party evaluation are listed below:

Eljen GSF A42 Modules Treatment Performance during third party 12 months testing (includes 12 consecutive weeks with influent temperature below 50° F)

	CBOD (mg/L)	TSS (mg/L)	Fecal Coliform (MPN/100ml)
Average	2.0	2.7	66*
Average (cold water period)	1.2	1.7	13*
Median	1.0	2.5	71*
Min Value	1.0	2.5	2*
Max Value	7.2	7.0	10 965*

*Geometric average

Eljen GSF - A42 Influent and Effluent Temperature (degree F)



COMPANY HISTORY

Established in 1970, Eljen Corporation created the world's first prefabricated drainage system for foundation drainage and erosion control applications. In the mid-1980s, we introduced our Geotextile Sand Filter products for the passive advanced treatment of onsite wastewater in both residential and commercial applications. Today, Eljen is a global leader in providing innovative products and solutions for protecting our environment and public health.

COMPANY PHILOSOPHY

Eljen Corporation is committed to advancing the onsite industry through continuous development of innovative new products, delivering high-quality products and services to our customers at the best price, and building lasting partnerships with our employees, suppliers, and customers.

eljen CORPORATION

Innovative Onsite Products & Solutions Since 1970

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