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**Preliminary Septic System Design
Proposed Concrete Plant
2596 Carp Road
Ottawa, ON**

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Submitted to:

Thomas Cavanagh Construction Ltd
9094 Cavanagh Road
Ottawa, ON
K0A 1B0

**Preliminary Septic System Design
Proposed Concrete Plant
2596 Carp Road
Ottawa, ON**

November 30, 2018
Project: 61318.20

GEMTEC Consulting Engineers and Scientists Limited
32 Steacie Drive
Ottawa, ON, Canada
K2K 2A9

November 30, 2018

File: 61318.20

Thomas Cavanagh Construction Ltd
9094 Cavanagh Road
Ottawa, ON
K0A 1B0

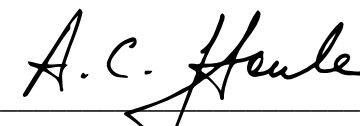
**Re: Preliminary Preliminary Septic System Design – Proposed Concrete Plant
2596 Carp Road**

Please find enclosed, our revised, preliminary design and associated documents for the septic system to be constructed at 2596 Carp Road.

The details of the enclosed documents will require review and finalization prior to submission for a permit.

Should you require any additional information, please contact the undersigned.


Matthew Rainville, C.E.T.


Craig Houle, M.Eng., P.Eng.

Enclosures

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1.0 INTRODUCTION

It is understood that the construction of a commercial concrete batching plant is proposed. The facility will be located at 2596 Carp Road in Ottawa, Ontario.

In addition, the existing dwelling located at the subject site is to be converted to an office building associated with the operation of the concrete plant.

In consideration of the above, our firm has been retained to prepare:

- An septic system application for a 'change of use' amendment for the proposed change in occupancy of the existing dwelling, and;
- A design for a septic system that will service the proposed concrete plant.

The details of the proposed amendment and the proposed system are provided in the following sections.

2.0 SEPTIC SYSTEM DESIGN

2.1 Daily Design Sewage Flow

The Ontario Building Code (OBC) provides information regarding the Daily Design Sanitary Sewage Flow (DDSSF) for various occupancies.

2.1.1 Proposed Office Building

The existing dwelling, that is proposed to be converted to an office building, is currently serviced by a Class 4 onsite wastewater system. Details for the system were provided to our office for review (OSSO File Search FS-18-111 – see Appendix A). Based on the documents, the dwelling contains a liveable area of 339 square metres and was designed for a DDSSF of 3000 litres.

In regards to the DDSSF for an office occupancy, the OBC stipulates that 75 litres must be provided for every 9.3 square metres of office area. As such, an office with 339 square metres of space will result in a DDSSF of 2,734 litres. This in turn would allow for a maximum of 36 employees within the office building (from an OBC Part 8 perspective).

Given that the existing septic system has a capacity of 3,000 litres per day, no alterations to the Class 4 leaching bed are required. The existing septic tank has a working capacity of 6,000 litres. Commercial occupancies require that the septic tank have a working capacity of three times the DDSSF. As such, a septic tank with a minimum working capacity of 8,202 litres will be required.

A 'Part 10/11 Amendment' application for the proposed change of use, along with necessary documents for the replacement of the septic tank, will be provided under separate cover.

2.1.2 Proposed Concrete Plant

It is understood that the proposed septic system will receive only domestic strength sewage from the subject building (eg. solely from domestic style plumbing fixtures); no process water or similar will be dispersed to the system.

The DSSF for the concrete plant building is 3,750 litres, based on 50 employees and an allowance of 75 litres per employee per day (it is understood that no showers are to be available within the plant building).

2.2 Septic System Design Details

Based on Boreholes 4 and 5, that were advanced at the subject site (the Record of Borehole sheets are provided in Appendix B), the subsurface conditions in the area of the proposed leaching bed consist of fill (sandy silt, clay, gravel, cobbles). No groundwater inflow was observed within Boreholes 4 and 5 at the time of excavation. Groundwater levels fluctuate seasonally and following precipitation events.

Given the available area for the construction of a leaching bed at the subject site, a Class 4 absorption trench leaching bed is proposed.

2.2.1 Septic Tank (Primary Treatment)

Based on provisions in the OBC, the minimum required septic tank operating volume is 11,250 litres. The tank is to be CSA approved and incorporate an NSF approved effluent filter.

It is understood that the tank will be installed in an area over which heavy equipment traffic will be present. As such, it is recommended that the area of the septic tank and the balancing tank be protected from traffic (eg. bollards). Furthermore, it is recommended that the sewage pipe from the building to the septic tank be adequately bedded in compacted granular material. Furthermore, as precautionary measures, it is recommended that the pipe be installed within a protective sleeve (eg. larger diameter lpex piping, or equivalent) and insulated for frost protection.

2.2.2 Equalization (Balancing) Tank

Given the distance between the subject concrete plant building and the proposed leaching bed, it will be necessary to pump effluent between the two locations. Because pumping will be required, and given that the DDSSF will typically be generated during the daytime hours, it is recommended that the generated septic effluent be dispersed to the dispersal field on a timed interval basis versus on a 'demand' basis, therefore providing equally spaced, smaller volumes of effluent to the bed versus larger volumes of effluent at fewer, condensed periods throughout 24 hours. This method greatly reduces the stress that may otherwise be applied to the system, therefore likely extending the lifespan of the system.

Given the above, it is recommended that a balancing tank with a minimum operating volume of 3,600 litres be installed - approximately the volume of one peak day of sewage generation from the facility. It is important to ensure that the minimum stated volume is provided in the balancing tank in addition to the volume that will remain in the tank due to the maximum drawdown level of the selected pump).

The balancing tank is to be equipped with two (2) 0.5 HP effluent pumps (Myers ME50, or equivalent). The pumps are to be controlled by a timed-dosing capable panel, also capable of operating the pumps on an alternating basis, and furthermore have one pump assume the duty of the other should a pump fail.

Effluent will be transported from the pumps to the header of the leaching bed through a 50 millimetre diameter flexible pipe forcemain. It is understood that the forcemain will extend through areas over which heavy equipment/vehicular traffic will be present. As such, it is recommended that the forcemain be adequately bedded in compacted granular material. Furthermore, as precautionary measures, it is recommended that the forcemain be installed within a protective sleeve (eg. larger diameter lpex piping, or equivalent) and insulated for frost protection.

2.2.2.1 Flow Equalization Concept

It is assumed that the majority of the daily volume of sewage will be generated mainly between 7 a.m. and 7 p.m., daily.

The control panel should be calibrated so as to run the pump for approximately 1.3 minutes every 90 minutes (again, alternating pumps between pump cycles). Assuming a system output rate of approximately 190 litres per minute, about 240 litres will be transported to the leaching bed during every cycle. This will result in 16 pump cycles per 24 hour period (total output of approximately 3,800 litres). If less than 240 litres is present in the balancing tank at a scheduled dose interval, the pump cycle will be delayed until this volume is present (this is to ensure that enough effluent is present to ensure an even distribution throughout the leaching bed piping).

It is recommended that upon system installation, a draw down test be performed so as to verify the actual flow rate from the pump to the dispersal field.

Upon determining the actual flow rate, the estimated settings provided in the following table should be revised as needed to ensure approximately 240 litres of effluent is dispersed at each pump cycle (about 3,800 litres every 24 hours, when present).

TABLE 2.2.2.1 – Control Panel Settings

'ON' time	01:18 (min:sec)
'OFF' time	58:42 (min:sec)

Note: The figures above were established using an estimated pumping rate of 190 litres/minute. The installer is to verify the pump rate by draw down test, and notify the designer of any discrepancies that exist.

The required alarm, both audible and visual, should be installed in a location that will ensure an alarm will be readily noticeable should a system failure occur.

2.2.3 Dispersal Field (Septic Bed)

2.2.3.1 Area of Imported Sand

Given the soil conditions in the area of the proposed leaching bed, it is proposed that the leaching bed be fully raised and constructed of imported sand. The imported sand should have a percolation rate (T-Time) of between 4 and 8 minutes per centimetre and contain a maximum of 5% of finer material (material passing the no. 200 sieve).

In order to provide adequate loading area over the native soil, the minimum area of the imported sand, including mantle area, has been determined as follows:

$A = V/6$, where

- A = Minimum area (imported sand), (m^2)
- V = Daily Sewage Flow (Litres)

$$A = 3,750/6 = 625 \text{ m}^2 \text{ (min)}$$

An area of 725 m^2 has been proposed, including a 15 metre sand mantle installed in the assumed direction of flow (downward gradient).

See Figure 1 and 2 for additional details.

2.2.3.2 Distribution Piping

The minimum total length of distribution piping has been determined as follows:

$L = (V * T)/200$, where

- V = Daily Sewage Flow (Litres)
- T = Percolation Rate of the imported septic sand fill

$$L = (3,750 * 8)/200 = 150.0 \text{ (min)}$$

A total of 150.4 metres of distribution piping has been proposed.

In order to ensure equal distribution of effluent throughout the leaching bed at each pump cycle, it is proposed that the distribution piping be pressurized. The distribution piping (including the header), will consist of 50 millimetre diameter PVC piping. The piping will be placed as 8 runs each having a length of 18.8 metres, placed on 1.6 metre centres. Along each length of distribution piping (lateral), 3 millimetres orifices will be drilled at 1.2 metre spacing at the 6 o'clock position. The runs of piping will be connected to a solid header with a diameter of 50 millimetres.

It is recommended that clean-out ports be installed at the end of each lateral in order to facilitate future maintenance and cleaning of the piping.

Additional information is provided on Figures 1 and 2.

2.3 Tank Buoyancy Assessment

Given the site conditions, including the relatively shallow groundwater condition in the proposed installation area of the tanks, the potential exists for the septic tank and balancing tank to become buoyant under an elevated groundwater condition. As such, our firm has conducted a preliminary buoyancy assessment assuming a tank manufacturer and model for both the proposed septic tank and the balancing tank: MacGregor MAC-13500-1P septic tank and MacGregor MAC-4500-PC.

The details of our assessment are provided in the following table:

DEPTH TANK BELOW SURFACE (m)	G.W. LEVEL BELOW G.S. ¹	WEIGHT OF TANK (Kg) (EMPTY) ²	SLIDING RESISTANCE ³ (Kg)	UPLIFT FORCE (Kg) AT F.S. 1.5 ³	ADDITIONAL BALLAST REQUIRED (Kg)
MacGregor MAC-13500-1P Septic Tank					
0.0	0.76	15,450	8,960	19,940	0
MacGregor MAC-4500-PC					
0.2	0.76	4,140	4,990	7,260	0

1 – Groundwater level was measured at 1.5 m depth on August 17, 2018, in Borehole 18-7. Groundwater levels will fluctuate seasonally. Arbitrarily a groundwater depth of 0.76 m was utilized in our assessment.

2 – Based on manufacturer product details.

3 – Assuming cover and backfill material consists of compacted granular material such as OPSS Granular B Type I or Granular A.

3.0 SEWAGE SYSTEM MANAGEMENT/MONITORING

Maintenance of the septic system will be the responsibility of the owner/operator of the facility or its designated maintenance provider. As a minimum, it is suggested that the maintenance include the following:

- Inspection/cleaning of the septic tank effluent filter as per manufacturer's recommendations;
- Inspection and pumping of the septic tank when determined to be necessary (typically every 3 to 5 years);
- The pump output rate be verified quarterly; and,
- Inspection and maintenance of pumps, controls, etc., per manufacturer recommendations.

All components of the system shall be inspected and maintained per the manufacturer requirements.

We trust this report provides sufficient information for your present purposes. If you have any questions concerning this report, please do not hesitate to contact our office.



Matthew Rainville, C.E.T.
Senior Technologist



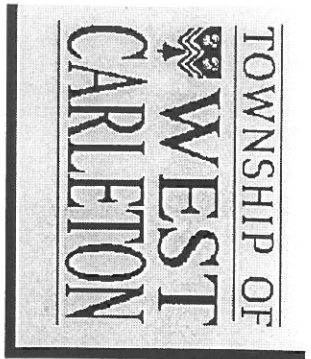
Craig Houle, M.Eng., P.Eng.
Senior Engineer





APPENDIX A

OSSO File Search FS-18-111



BUILDING PERMIT

NO. 99-0249

PERMISSION IS HEREBY GIVEN TO: R. RAMP

PROJECT DESCRIPTION: INSTALL 2 STOREY S.F.D. - CONSTRUCT ADDITION CH ATTACHED

STREET ADDRESS: 2596 GARAGE CARP ROAD

LOT NO.: PT 6 CONCESSION NO.: 2 PLAN NO.: _____ PART: _____ WARD: HUNTER

FREEDOM OF INFORMATION

"Personal information contained on this form is collected under Section 8 of the Building Code Act, S.O. 1992 Chapter 23. The information will be used within the municipality. Questions arising about this collection should be directed to the Chief Building Official."

JULY 7, 1999

Date

R. RAMP

Chief Building Official

THIS CARD MUST BE POSTED NEAR PROPERTY LINE AND
VISIBLE FROM THE MAINTAINED ROAD.

BUILDING PERMIT CIRCULATION FORM

APPLICANT: R RUMP DATE: JUN 2, 1999

CIVIC ADDRESS 2596 CARP ROAD ROLL # 4030810 06700

APPROVALS APPLICABLE: * REVISED *

Req.	Date Approved	Req.	Date Approved	Req.	Date Approved
Authorization Letter/Deed <input type="checkbox"/>		Arch/Eng. Review <input type="checkbox"/>		O.M.A.F./MDS <input type="checkbox"/>	
M.V.C.A. (fill/flood) <input type="checkbox"/>		M.O.E.E. Air Discharge <input type="checkbox"/>		Arch/Eng Review <input type="checkbox"/>	
Septic Approval/Location <input checked="" type="checkbox"/> <u>JUN 12/99</u>		M.N.R. <input type="checkbox"/>		RMOC Water <input type="checkbox"/>	
Site /Lot Grading Plan <input type="checkbox"/>		Zoning (see below) <input checked="" type="checkbox"/> <u>JUN 12/99</u>		Regional Health <input type="checkbox"/>	
Reviewed By: <u>TO BE VERIFIED</u>		Severance <input type="checkbox"/>		Solicitor Gen/Fire Marshal <input type="checkbox"/>	
Entrance: MTO <input type="checkbox"/> RMOC <input checked="" type="checkbox"/> WC <input type="checkbox"/>		Minor Variance <input type="checkbox"/>		MTO Bldg/Land Use <input type="checkbox"/>	
New <input type="checkbox"/> Existing <input checked="" type="checkbox"/>		M.O.L. <input type="checkbox"/>		Plans Examination <input checked="" type="checkbox"/> <u>JUNE 30/99</u>	
		Council <input type="checkbox"/>		Finance <input checked="" type="checkbox"/> <u>JUNE 11/99</u>	
		Site Plan <input type="checkbox"/>			

BUILDING DEPARTMENT: * REVISED - JUNE 24/99 *

AREA CALCULATIONS:

1. GROSS BLDG. AREA: (all floor levels including exterior walls) 2290 C/W ADD. 3126 ft

deck / balcony / porch 1000 5x23 115

house 2290 2226 + 900 = 3126 ft

garage 1050 900 ft

2. BUILDING AREA FOOTPRINT 2400 ft

3. INTERIOR BUILDING AREA (all floor levels - living area) 2100 2800 ft

4. BUILDING DESCRIPTION INSIDE 2500 FT OED + CONGT GARAGE C/W ADDITION

PLANNING DEPARTMENT: Reviewed by: R. Smith Date: June 10/99

Planning June 25/99 okay Zoning Compliance Other

Zone Designation <u>RUM-1</u>	Existing Undersized Lot <u>no</u>	Subdivision Agreement <u>no</u>
Official Plan Designation <u>NR 121</u>	Bldg Height <u>okay</u>	Special Covenants/Easements <u>no</u>
Wetland/ANSI/Minerals/Pits/Quarries <u>no</u>	Dwelling Unit Area <u>okay</u>	NOTE: <u>BB/99 sevcd. bldg on back</u>
Lamp Post <u>no</u>	Separation Distance <u>okay</u>	<u>from this parcel.</u>
	Setbacks Met <u>okay</u>	<u>Finalized June 9/99.</u>
	Maximum Coverage <u>okay</u>	

FEES APPLICABLE

FINANCE:	DEVELOPMENT CHARGES	BUILDING:
Reviewed by: <u>for Baucher June 11/99</u>	Municipal Dev. Charge \$ <u>1500.00</u>	Building \$ <u>1020</u>
Comments:	Regional Dev. Charge \$ <u>4994.00</u>	Plumbing \$ <u>500</u>
	Education Dev. Charge: <u>1473.00</u>	Stove/Fireplace/Chimney \$ <u>111</u>
	OCDSB \$ <u>689.00</u>	Demolition/Moving \$ <u>111</u>
	OCCSB \$ <u>381.00</u>	Entrance <u>RUM-1</u> \$ <u>111</u>
	OCFLCSB. \$ <u>164.00</u>	Septic \$ <u>2500</u>
	OCFLPSB \$ <u>20.00</u>	Civic Sign \$ <u>400</u>
	Water Lateral \$ <u>0</u>	Pool Enclosure \$ <u>111</u>
	Sewer Lateral \$ <u>0</u>	Revision \$ <u>111</u>
	RMOC Water (221) \$ <u>0</u>	Admin \$ <u>111</u>
	RMOC Sewer (221) \$ <u>4227.00</u>	Subtotal B \$ <u>1360</u>
	TWSP Local Sewer (221) \$ <u>6548</u>	
	Subtotal A \$ <u>6548</u>	ZONING/PLANNING:
		Subtotal C \$ <u>4227.00</u>
		+ Subtotal A \$ <u>6548</u>
		+ Subtotal B \$ <u>1360</u>
		TOTAL \$ <u>7308</u>

REVISED JUNE 24/99



BUILDING PERMIT APPLICATION

Personal information on this form is collected under the authority of the Building Code Act and the Township of West Carleton Building By-law and will be used in the processing of your building permit. Questions about this collection of personal information should be directed to the Municipal Clerk.

PERMIT NO. 99-0249
ROLL # 03860 06700

APPLICATION DATE: MAY 27/99

ESTIMATED VALUE: \$ 101150
920,000

WORK TYPE: CONSTRUCT ☐ MOVE ☒ DEMOLISH ☐ PLUMBING ☐ ADD TO ☐ ALTER ☐ REVISE ☐ INSTALL ☐ SEPTIC ☐

USE TYPE: RESIDENTIAL ☒ COMMERCIAL ☐ FARM ☐ INSTITUTIONAL ☐ INDUSTRIAL ☐ ASSEMBLY ☐

PERMIT FOR Relocate Home & CONSTRUCT ATTACHED GARAGE
(Describe Work) * AND ADDITIONAL LIVING AREA ABOVE GARAGE

LOCATION

CONTRACTOR

LOT 6 CON 2 WARD Huntley
PLAN 4R-946 PART(S) 1 ^{North} _{West} HALF
Address/Street Name 2596 CARP RD. ^{lot 6}

Name Rick Rump
Address 669 - Oak Creek
City/Prov Ontario Postal Code K0A 1H0
Phone w () 762-0461 h () 831-8454

OWNER

APPLICANT

Name Rick Rump
Address _____
City/Prov Same
Phone w () _____ h () _____

Name Rick Rump
Address _____
City/Prov Same
Phone w () _____ h () _____

PLUMBER

SEPTIC INSTALLER

Name Self
Address _____
City/Prov _____
Phone w () _____ h () _____
License # 306 A

Name Ken White
Address _____
City/Prov _____
Phone w () _____ h () _____
License # _____

NO CHANGES TO PLUMB CONNECTIONS TO NEW SEPTIC ONLY

PLUMBING / SEPTIC

APPLIANCES/FIXTURES

No. of Bedrooms 2
No. of Fixtures 3
Fixture Units 3

Auto Washer ☐ Sewage Pump ☒
Dishwasher ☒ Urinal/Bidet _____
Toilet ☒ Vent Roof _____
Septic Connect 1 Sink/Basin _____ Laundry Tub _____
Hopper Oil/Int _____ Floor Drain _____ Shower/Tub _____
Hot Water Tank _____ B/W Valve _____ Other _____

FEES

Building Permit	\$ <u>1020</u>	EDC O.C.D.S.B.	\$ <u>689</u>	Municipal Development Charge	\$ <u>1500</u>	Stove/Fireplace/Chimney	\$ <u>1</u>
Plumbing	\$ <u>50</u>	EDC O.C.C.S.B.	\$ <u>384</u>	Regional Development Charge	\$ <u>3194</u>	Civic Sign	\$ <u>40</u>
Demolition/Moving	\$ <u>1</u>	EDC O.C.F.L.C.S.B.	\$ <u>124</u>	Entrance	\$ <u>1473.00</u>	Administration	\$ <u>1</u>
Pool Enclosure	\$ <u>1</u>	EDC O.C.F.L.P.S.B.	\$ <u>20</u>	Septic	\$ <u>250</u>	Revision	\$ <u>1</u>

TO THE CHIEF BUILDING OFFICIAL; THE UNDERSIGNED HEREBY APPLIES FOR A PERMIT TO BUILD ACCORDING TO PLANS, SPECIFICATIONS, AND SITE PLAN HEREWITH SUBMITTED, AND AGREES TO COMPLY WITH ALL BY-LAWS AND MUNICIPAL REGULATIONS, IT BEING EXPRESSLY UNDERSTOOD THAT THE ISSUING OF A PERMIT DOES NOT RELIEVE THE APPLICANT FROM COMPLYING WITH ALL SAID BY-LAWS AND REGULATIONS, THOUGH NOT CALLED FOR IN THE SPECIFICATIONS OR SHOWN ON THE PLANS SUBMITTED. THE APPLICANT FURTHER AGREES THAT IF A PERMIT IS REVOKED FOR ANY CAUSE OR IRREGULARITY OR NON-CONFORMANCE TO THE SAID BY-LAW OR REGULATIONS, THAT IN THE CONSIDERATION OF THE ISSUANCE OF THE PERMIT ALL CLAIMS ARE WAIVED ARISING THEREFROM AGAINST THE CORPORATION OF THE TOWNSHIP OF WEST CARLETON

ONHWP: (STATEMENT WITH RESPECT TO THE ONTARIO NEW HOME WARRANTIES PLAN ACT) I AM BUILDING TO SELL (VENDOR/BUILDER) OR CONTRACTING AS A BUILDER. BUILDERS REGISTRATION # _____ EXPIRY DATE _____ OR
I AM NOT A BUILDER AS DEFINED BY THE ONTARIO HOME WARRANTIES PLAN ACT. AS OWNER/BUILDER IT IS MY INTENTION TO RETAIN OWNERSHIP FOR MY OWN USE. I UNDERSTAND THAT THIS HOME IS NOT ELIGIBLE FOR ENROLMENT OR COVERAGE UNDER THE ONTARIO NEW HOME WARRANTIES PLAN ACT. YES _____ (Applicant to initial)

PROVINCE OF ONTARIO, REGIONAL MUNICIPALITY OF OTTAWA CARLETON TO WIT:

IN THE MATTER OF THE APPLICATION FOR A BUILDING PERMIT, IN PURSUANCE OF BUILDING BY-LAW NO. 13-98 OF THE CORPORATION OF THE TOWNSHIP OF WEST CARLETON

I, R. RUMP OF THE TWP OF WEST CARLETON
IN THE REGIONAL MUNICIPALITY OF OTTAWA-CARLETON, MAKE OATH AND SAY: THAT I AM THE AGENT OF THE OWNER/OWNER NAMED IN THE APPLICATION AND THE INFORMATION IN THE SAID APPLICATION AND THE PLANS AND SPECIFICATIONS SUBMITTED HEREWITH IS TRUE AND CORRECT IN EVERY RESPECT AND NO RELEVANT INFORMATION HAS BEEN WITHHELD. AND I MAKE THIS SOLEMN DECLARATION CONSCIENTIOUSLY BELIEVING IT TO BE TRUE AND KNOWING THAT IT IS OF THE SAME FORCE AND EFFECT AS IF MADE UNDER OATH, AND BY VIRTUE OF THE CANADA EVIDENCE ACT. DECLARED BEFORE ME AT THE TOWNSHIP OF WEST CARLETON, REGIONAL MUNICIPALITY OF OTTAWA-CARLETON, THIS 1 DAY OF June, 1999.

Witness: [Signature]
(Municipal employee)

[Signature]
(To be signed by Owner or authorized Agent of Owner)

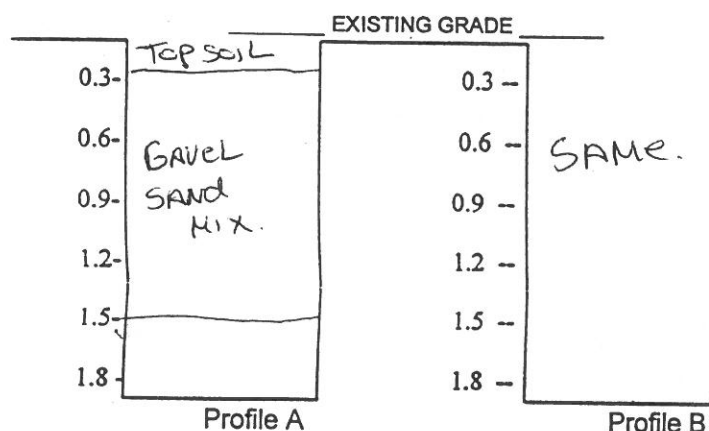
SEPTIC SYSTEM SITE EVALUATION

<input type="checkbox"/> CLASS 2 LEACHING PIT <input type="checkbox"/> CLASS 3 CESS POOL <input checked="" type="checkbox"/> CLASS 4 SYSTEMS <input checked="" type="checkbox"/> ABSORPTION TRENCH CONVENTIONAL <input type="checkbox"/> ABSORPTION TRENCH RAISED <input type="checkbox"/> FILTER BED (ATTACH GRADING CERTIFICATE) <input type="checkbox"/> PROPRIETARY SYSTEM DESCRIBE <input type="checkbox"/> CLASS 5 HOLDING TANK TYPE OF ALARM <input type="checkbox"/> AUDIO <input type="checkbox"/> VISUAL PUMP OUT CONTRACT <input type="checkbox"/> ATTACH DOCUMENTATION	NAME <u>Ken White Const LTP</u> <small>(Name of Individual Preparing Site Evaluation)</small> ADDRESS <u>P.O. Box 296</u> CITY <u>Camp Osh</u> POSTAL CODE <u>KOA 1LO</u> PHONE O () <u>839-5460</u> H () _____ LICENCE # <u>L1998-1654</u>
	DESIGN PARAMETERS <input type="checkbox"/> NUMBER OF BEDROOMS - EXIST _____ PROPOSED <u>3</u> <input type="checkbox"/> BUILDING AREA GROSS TOTAL ALL FLOORS - LIVING AREA <u>339 m²</u> <input type="checkbox"/> WATER SUPPLY - DUG WELL <input type="checkbox"/> - SAND POINT <input type="checkbox"/> - CASED WELL (min 6M) <input checked="" type="checkbox"/> Proposed

SEPTIC SYSTEM DESIGN		PLUMBING FIXTURES		EXIST	PROPOSED	FIXTURE UN
✓ <u>6000</u> L TANK SIZE _____ PROPRIETARY TREATMENT SYSTEM DESCRIBE _____ (ATTACH MANUFACTURERS INFORMATION)		Bathroom Group (3 PCs)		_____	<u>3</u>	X 6 <u>18</u>
✓ <u>18.75</u> LENGTH DISTRIBUTION PIPING EACH RUN		Bathtub/Shower		_____	<u>0</u>	X 1.5 _____
✓ <u>8</u> NUMBER OF RUNS		Basin (Lavatory)		_____	<u>0</u>	X 1.5 _____
✓ <u>150</u> TOTAL LENGTH OF DISTRIBUTION PIPING		Toilet		_____	<u>0</u>	X 4 _____
✓ <u>3000</u> L DAILY FLOW RATE		Bidet		_____	<u>0</u>	X 1.0 _____
MINIMUM LOADING AREA		Sink		_____	<u>1</u>	X 1.5 <u>1.5</u>
MINIMUM CONTACT AREA		Dishwasher		_____	<u>1</u>	X 1.5 <u>1.5</u>
TANK TYPE	<input type="checkbox"/> CONCRETE <input type="checkbox"/> PLASTIC <input type="checkbox"/> OTHER	<input type="checkbox"/> MANUFACTURER <u>Boucher Pre-Cast</u>	Laundry Tub	_____	<u>1</u>	X 1.5 <u>1.5</u>
		<input type="checkbox"/> MODEL	Auto Washer	_____	<u>1</u>	X 1.5 <u>1.5</u>
DESCRIBE _____		Water Softener		_____	<u>0</u>	X _____
<input type="checkbox"/> PUMP REQUIRED MANUFACTURER (ATTACH MANUFACTURER SPECS AND INSTALLATION INSTRUCTIONS)		Other		_____	_____	_____
		TOTALS		_____	<u>7</u>	<u>24</u>

NOTICE: Depth to bedrock/watertable and description of soil type are to be shown for both profiles.
TWO test locations are required of BURIED beds.

SOIL PROFILES



IDENTIFY SOIL TYPE, LAYERS AND DEPTHS, WATER TABLE AND ROCK

The percolation rate shall be determined by test OR soil classification, according to the unified soil classification system.

T Time

Native Soil 10

Imported Soil 10

TOWNSHIP OF WEST CARLETON

DESIGN REVIEW CLASS 4 SEPTIC SYSTEM

Permit No. 99-0249 Date July 2/09

Plan review By T. USHER

Owner R. RUMP

Applicant copy _____

Office copy ✓

Calculate daily design flow Additional flows

1 bedroom 750 litre
2 bedroom 1100 litre
3 bedroom 1600 litre
4 bedroom 2000 litre
5 bedroom 2500 litre
Daily design flow
< 10,000 litre/day ✓ > 10,000 litre/day _____

additional bedrooms 500 litre each
additional bldg area exceeding 200m²
100 litre / 10m²
additional fixture units exceeding 20
50 litre each fixture unit

Number of bedrooms 3

Additional Flows Building Area 139 m²

Additional Flows Fixture Units 4 FU 200 litres

24 > 20

1600 litres

1400 litres

339 m² > 200 m²

1600 + 1400

Total daily design flow 3000 litres

Min Septic tank size 6000 litres

✓ 2 Size treatment unit septic tank

2 x daily design flow res ✓ 3x non-res _____

Proposed 6000 2

3 Type of leaching bed (check one)

Absorption trench

Raised bed Partially raised bed Buried Bed Raised bed _____

Filter media

Partially raised bed _____ Buried bed _____

Proprietary treatment units

Manufacturers installation

Instructions or Ministry

Guidelines, BMEC or Buildings

Branch Opinion

✓ 4 Size distribution pipe

T time > 2 < 20 min / cm T time > 20 < 50 min / cm

$L = \frac{QT}{200}$ $L = \frac{QT}{300}$

1 = 10 300

Length of distribution pipe 150 m

Daily design flow

< 5000 litre/day _____ > 5000 litre/day _____

Daily design flow

< 3000 litre > 3000 litre Secondary or tertiary treatment _____

Minimum 2 beds

5 Bed loading 6 litre / m² Bed loading Area Proposed _____ m² 500 m²

✓ 6 Bed size No. of runs 8

Length of runs 18.75 m

7 Distribution piping > 150 metres

requires dosing pump and chamber

Determine dosage volume 75%

of distribution piping

Volume dia. X length

PROPOSED

150 m x 150 mm

Dosage Volume _____ litres

4 Size bed effective area

Maximum 75 litre / m² / day _____ Maximum 50 litre / m² / day _____

proposed _____ m² Min bed area _____ m²

Bed size minimum 10 m² maximum 50 m² area

5 Size contact area $A = \frac{QT}{850}$

Minimum contact area _____ m²

6 750 mm x min bed area Size volume of filter sand _____ m³

45.36 kg per ft³ 1602 kg per m³

7 Size mantel contact area Daily design flow

4 litre / m²

8 Distribution piping maximum spacing 1.2 metre

evenly spaced with 1/4 space at bed edges

_____ mm 750 mm filter sand below stone

_____ mm 250 mm material depth below filter sand where on rock or impervious soil

Raised beds fill material mantel T time

minimum 75 % of leaching bed soil

BURIED BED

9 Raised beds mantel minimum 1.5 metre extension in direction of natural drainage

250-mm depth of material _____ Length of Mantle Extension _____ m

10

300 to 600 mm topsoil over stone

Paper over stone

50 mm stone over tiles

75 mm minimum tile diameter

150 mm minimum stone depth below tile

Slope of pipe minimum 30 mm maximum 50 mm / 10 metre

300 mm

125 mm

50 mm

75 mm

150 mm

56.25 mm to 73.75 mm

No slope required on filter beds

11 Increase clearances for raised beds

2 x _____

12 Clearances Required

Treatment unit to structure 1.5 metre

2 x bed height above existing grade

Treatment unit to potable water supply

Tile bed to water supply

Tile bed to Property lines

Tile bed to Bodies of water

Tile bed to Trees

Tile bed to structures 5 metres

Mantel slopes minimum 4:1 BURIED

Clearances Actual

1.5 m

15 metres 15 m

15 metres 15 m

15 39 metres 15 m

30 metres _____ m

3 metres 3 m

15 metres 15 m

3 metres 3 m

5 metres 5 m

_____ m

Total Mantel width

_____ m

13 Design conforms to regulation ✓

Design does not conform to regulation _____

14 Required inspections

1

2

3

4

Test pit

Scarify clay

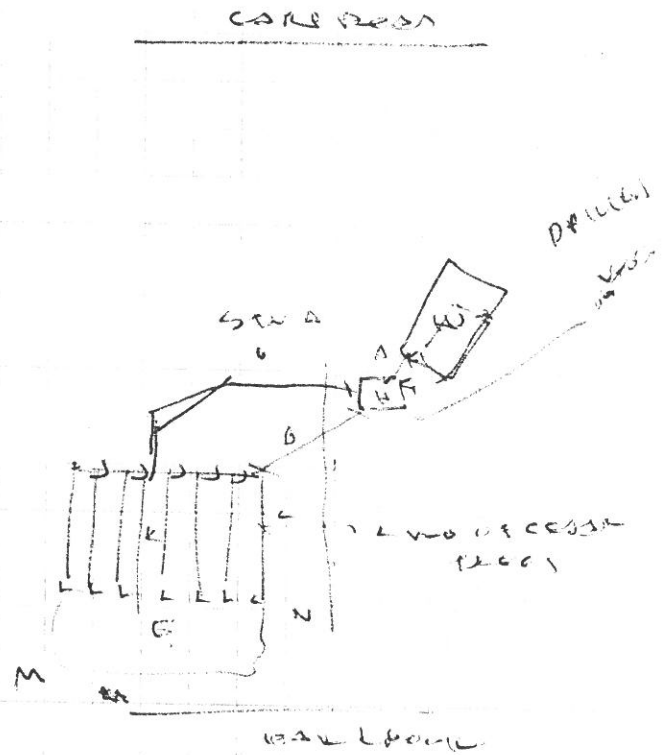
Septic system installation

Final grading

PUMP
CARD ROOM
DEC 8/99

PUMP ~~house~~
KNOX CONC
MANUAL BOULDER
SIZ CONC L
BARRER

ASSUMPTION TANKS ARE HIGH
B PUMP
- MAX OF TIME 16.8m



A HOUSE & TANK 4.18m
B TANK TO TIV 13.92m
C TIV TO TANKS 8.1m
D TANK TO WALL 1.55m
E MAX OF TIME - NO INSTRUCTIONS

SLOPE TANK 10.6
3 5
56.4 90.6
56.4 - 90.6m PUMP

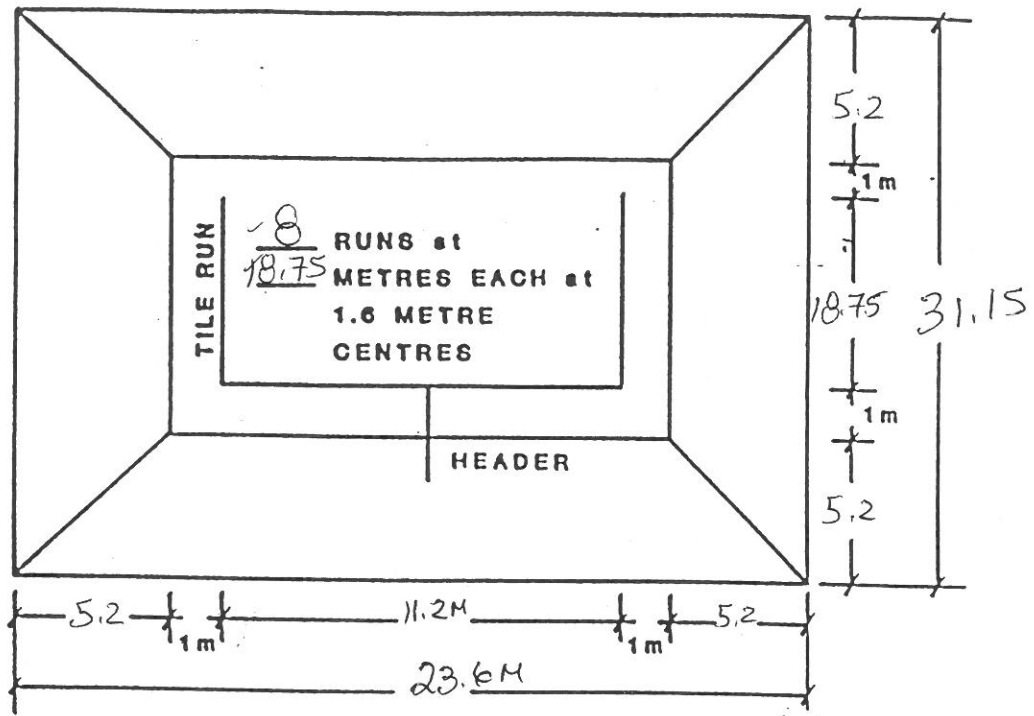
END OF TIV 1.035
WALL 0.0
1.035m

F TOP FLOOR 0.47
G TOP FLOOR - NO INSTRUCTIONS
H TOP TANK 0.64
I TOP TANK 0.875
J TOP TANK 0.96
K TOP TANK 1.235
L TOP TANK 1.035
M TOP TANK 2.48
N TOP TANK 1.965

DEPTH OF SLOPE 2.48
TOP OF TANK 1.235
1.245m

IS A MANUAL EX
ALL CTS TO TANK LUIS PUMP
INLET PUMP TO TANK
DRAIN PUMP

PLAN

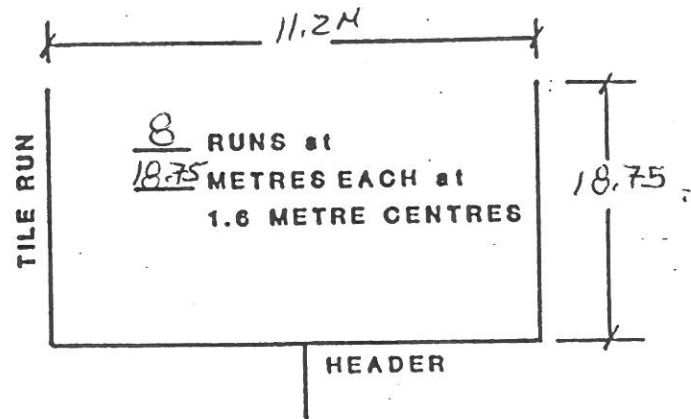


The diagram illustrates a cross-section of a landfill cell. The top horizontal dimension is 5.2m, divided into 1m and 1.6m segments. The left side shows a slope with a 4:1 ratio. The cell is filled with SAND FILL. Below the sand fill is a layer of CRUSHED STONE, 150mm thick, with a 3" layer of PAPER on top. The total height of the cell is 1.3m. The bottom layer is IMPERVIOUS SOIL, 0.5m thick. The existing grade elevation is shown at the bottom. The water table is indicated by a line with a downward arrow. The finished grade is shown at the top right.

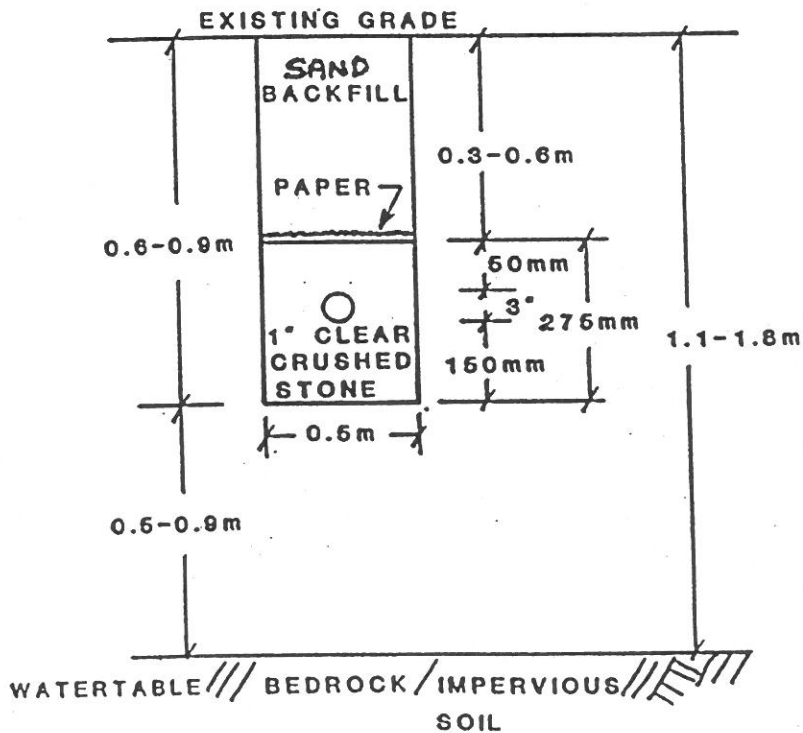
TYPICAL DRAWING A

BURIED BED-ABSORPTION TRENCH METHOD

PLAN



PROFILE



END VIEW

Construction Site Inspection Report

Permit Number 22-0249 Date of Inspection DEC. 8, 1999
Civic Address 2596 CARP RD. Owner RUMP
Contractor K. WHITE CONST. LTD. Inspector P. MOORE
Weather _____ Time 9:45

Inspection

<u>Building</u>	<u>Plumbing</u>	<u>Septic</u>	<u>Other</u>
Site <input type="checkbox"/>	Underground <input type="checkbox"/>	Site <input type="checkbox"/>	Pool Enclosure <input type="checkbox"/>
Excavation <input type="checkbox"/>	Sanitary Sewer <input type="checkbox"/>	Scarification <input type="checkbox"/>	Wood Appliance <input type="checkbox"/>
Foundation <input checked="" type="checkbox"/> #0	Rough In <input type="checkbox"/>	Installation <input checked="" type="checkbox"/>	Chimney <input type="checkbox"/>
Framing <input type="checkbox"/>	Completion <input type="checkbox"/>	Final Grading <input type="checkbox"/>	Heating <input type="checkbox"/>
Insulation <input type="checkbox"/>			
Progress <input type="checkbox"/>			
Occupancy <input type="checkbox"/>			
Final <input type="checkbox"/>			

<u>Inspection Status</u>	Passed <input type="checkbox"/>
	Passed with Conditions <input checked="" type="checkbox"/> <u>SEPTIC</u>
	Not passed <input checked="" type="checkbox"/> <u>FOUND</u>
	Do Not Cover <input type="checkbox"/>
	Call For Reinspection <input type="checkbox"/>
	832-5644 (224)

Inspection Remarks

1. FOUNDATION INSPECTION NOT PASSED
ITEMS NOTED AUG 20/99 OUTSTANDING
 - 2 ENG DWGS SIDE WALL OPENING
 - 3 FILLING HORIZONTAL CONCRETE *
 - 4 DAMPROPPING NOT INSTALLED
 - 4 DRAINAGE TILE INSTALLATION
 - 5 FROST PROTECTION FOOTING C SIDE ENTRY
- 2 SEPTIC - MANHOLE EXTENSION 15m
- 3 ACCESS TO TANK - LIDS FROZEN
- 4 PAPER ON TILE
- 5 INLET PIPE TO TANK NOT INSTALLED - FULLY DES, INSPECTION PRIOR TO COVER



APPENDIX B

Record of Borehole Logs

RECORD OF BOREHOLE 18-4

CLIENT: Cavanagh Developments
 PROJECT: 2596 Carp Road
 JOB#: 61318.20
 LOCATION: See Borehole Location Plan, Figure 2

SHEET: 1 OF 1
 DATUM: CGVD2013
 BORING DATE: Aug 8 2018


DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES				● PENETRATION RESISTANCE (N), BLOWS/0.3m ▲ DYNAMIC PENETRATION RESISTANCE (N), BLOWS/0.3m	SHEAR STRENGTH (Cu), kPA + NATURAL ⊕ REMOULDED WATER CONTENT, % W_p — W — W_L	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m				
0	Power Auger Hollow Stem Auger (210mm OD)	Ground Surface		113.88								
		TOPSOIL FILL		0.05								
		Brown sandy silt, trace gravel and clay, with possible cobbles and boulders (FILL MATERIAL)			1	GS			○		M	Backfilled with soil cuttings
1												
		End of borehole		112.36 1.52								No groundwater seepage observed upon completion of borehole
2												
3												
4												
5												

GEO - BOREHOLE LOG 61318.20_GINT_V01_2018-08-08.GPJ GEMTEC 2018.GDT 30/8/18

RECORD OF BOREHOLE 18-5

CLIENT: Cavanagh Developments
 PROJECT: 2596 Carp Road
 JOB#: 61318.20
 LOCATION: See Borehole Location Plan, Figure 2

SHEET: 1 OF 1
 DATUM: CGVD2013
 BORING DATE: Aug 8 2018

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m		SHEAR STRENGTH (Cu), kPA		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV.	NUMBER	TYPE	RECOVERY, mm	BLOWS/0.3m	● RESISTANCE (N), BLOWS/0.3m	+ NATURAL ● REMOULDED	WATER CONTENT, %			
				DEPTH (m)							W _p	W _L		
0	Power Auger Hollow Stem Auger (210mm OD)	Ground Surface		113.91										
		TOPSOIL FILL		0.03										
		Grey to brown sandy silt, some clay, trace gravel (FILL MATERIAL)												Backfilled with soil cuttings
1				1	GS									
														No groundwater seepage observed upon completion of borehole
				2	GS									
		End of borehole		112.39 1.52										
2														
3														
4														
5														

Backfilled with
soil cuttings

No
groundwater
seepage
observed upon
completion of
borehole

GEO - BOREHOLE LOG 61318.20_GINT_V01_2018-08-08.GPJ GEMTEC 2018.GDT 30/8/18

RECORD OF BOREHOLE 18-7

CLIENT: Cavanagh Developments
 PROJECT: 2596 Carp Road
 JOB#: 61318.20
 LOCATION: See Borehole Location Plan, Figure 2

SHEET: 1 OF 1
 DATUM: CGVD2013
 BORING DATE: Aug 8 2018

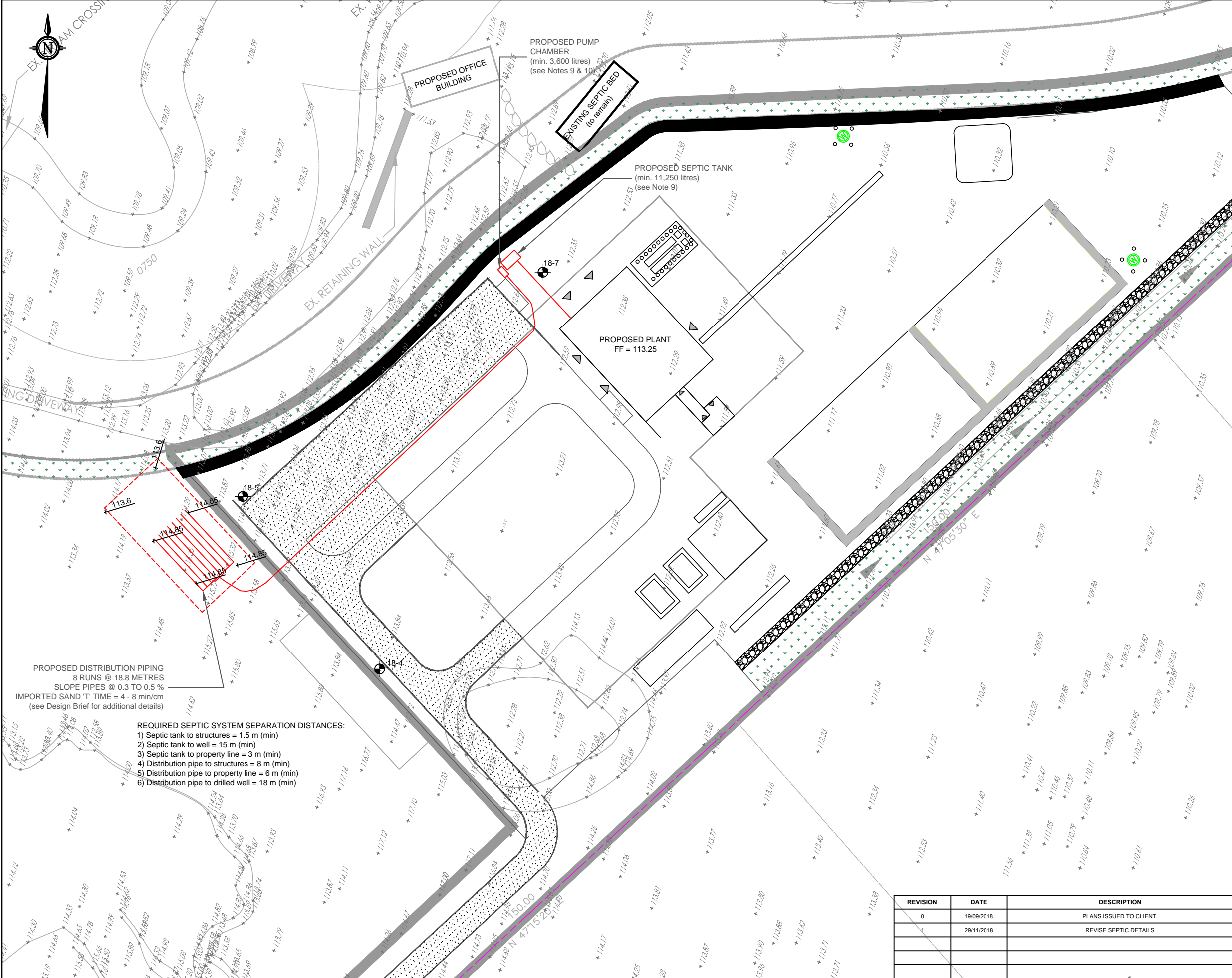
DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES				PENETRATION RESISTANCE (N), BLOWS/0.3m											ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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GROUNDWATER OBSERVATIONS		
DATE	DEPTH (m)	ELEV. (m)
18/08/17	1.52	111.16

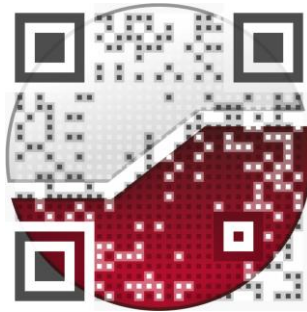


APPENDIX C

Figures 1 and 2



experience • knowledge • integrity



civil
geotechnical
environmental
field services
materials testing

civil
géotechnique
environnementale
surveillance de chantier
service de laboratoire des matériaux

expérience • connaissance • intégrité

