TECHNICAL MEMORANDUM

PROJECT: **Larry Robinson Arena Expansion**
DATE: August 20th, 2024
TO: Kevin Voelker, C.E.T.
FROM: Adam Poapst, P. Eng
RE: **Inspection of Existing Sewage Works**

1 INTRODUCTION

1.1 BACKGROUND

EVB Engineering was retained by the City of Ottawa to complete an assessment of the existing sewage works servicing the Larry Robinson Arena, located at 2785 8th Line Road, Metcalfe, Ontario.

It is our understanding that the City is intending on constructing an approximately 7,600 square foot building addition on the north side of the existing building. The addition will consist of the modernization and expansion of the current change rooms, providing an enhanced barrier-free entrance, expansive lobby areas with accessible seating facilities, and retrofitting the existing bleachers to meet accessibility standards.

1.2 OBJECTIVES

The following Technical Memorandum has been prepared to address the following requirements:

- Completion of an intrusive condition assessment of the existing sewage works, including probing and excavations of the tile bed system to confirm the construction and arrangement of the system.
- A review of the capacity of the existing septic system based on the original design documents and the “as-constructed” condition of the leaching bed components, in an effort to determine the maximum sewage flow that can be supported by the system.
- Develop recommendations for the existing system upgrades which would provide longevity of the system and potential future expansion.

1.3 METHODOLOGY

On August 8th, 2024, EVB staff were on site to complete a field investigation for the existing on-site sewage system.

This investigation included a visual assessment of the area where the bed is located, probing the area of the septic bed to determine the extents of the distribution pipes, and exposing sections of the distribution piping via test pits to determine the construction details for the septic system.

1.4 EXISTING DOCUMENTATION

1.4.1 ORIGINAL SEPTIC BED (1987)

The original septic system servicing the Larry Robinson Arena was constructed in 1987 and was approved by the Ministry of Environment, Conservation, and Parks under Certificate of Approval (CofA) Number 82 (22-8) 980.

The calculated design flow for the original septic system was determined based on water meter readings for the Lietrim Arena, as the two rinks had similar operating hours and a comparably sized banquet hall on the second floor. The average daily flow for the Lietrim Arena was 13,000 L/d between January and February 1986. To provide a safety factor for peak flows, the design flow included an additional 20 L/seat/day for the 300-person capacity banquet hall. As such, the total daily design sewage flow was 19,000 L/d.

The septic system was constructed as a conventional Class 4 leaching bed, comprised of two beds, each containing 16 runs of 75mm diameter, 30m long, tile piping. The existing septic system included one (1) 45,500 L concrete septic tank and one (1) 4,500L concrete pumping chamber.

1.4.2 UPDATED SEPTIC BED (2001)

The City has provided a drawing titled “Sewage System Layout Plan” prepared by John D. Patterson and Associates Ltd. in August 2000, that indicates the original septic bed has been replaced with a much smaller Class 4 septic system, constructed with a tertiary treatment system. However no other records of this system could be located in the City files.

Based on the notes provided in the drawing, the design sewage flow appears to have been calculated based on a review of pump out records for the existing septic tank between 1997 and 1999. From the pump out records, it was determined that the system produced an average daily flow of 3,800 L/d.

The updated septic system appears to be a Class 4 conventional leaching bed comprised of 10 runs of 75mm diameter, 15m long, perforated PVC pipe. A safety factor of 1.5 was used in sizing the bed to account for peak sewage flows.

The updated septic system includes the existing 45,500 L concrete septic tank, as well as two (2) 22,700 L concrete septic tanks. It appears that the first 22,700 L tank includes duplex sewage pumps in the primary compartment that send effluent to the secondary compartment. Effluent would then flow by gravity into the primary compartment of the second 22,700 L tank, which includes a Clearstream 1000N treatment system. The secondary compartment of the final tank contains a duplex pump system that sends effluent through the forcemain to the septic bed.

2 ASSESSMENT OF EXISTING SYSTEM

2.1 EXISTING SEPTIC TANKS

The existing septic tanks were not assessed during the field investigation, aside from confirming the inlet invert elevation of the primary septic tank.

The location of the existing tanks are directly within the extents of the proposed building addition and given the age of the existing tanks (41 years), it is likely that any attempt to relocate them would result in adverse affects to the structural integrity of the tanks. As such, it is recommended that the existing septic tanks be replaced with new tanks.

2.2 EXISTING LEACHING BED

2.2.1 VISUAL INSPECTION

At the time of the site visit, EVB located the existing septic bed within a fenced area in the field on the east side of the arena. Upon initial inspection, the construction of the leaching bed appeared to be consistent with the design drawings prepared by Paterson in 2001.

The leaching bed did not display any visual signs of failure, such as blowouts or seeps, and/or spongy wet spots throughout the area of the bed.

Figure 2-1: Existing Leaching Bed

2.2.2 INTRUSTIVE INSPECTION

In order to confirm the length and configuration of the existing distribution piping, EVB staff located the header and footer at the four corners of the distribution piping. Once one corner was confirmed, EVB located each run of distribution piping by probing the soil along the header and footer and marking each pipe location with spray paint. Additional locations along the header and/or footer were exposed to confirm the location the distribution pipe run.

The inspection confirmed that the leaching bed was comprised of 10 runs of 15m long, 75mm diameter, perforated distribution piping, spaced at 1.6m. The header and footer pipe were comprised of solid 75mm diameter white PVC pipe. The configuration of the leaching bed is consistent with the Patterson drawing from 2000.

One test pit was dug down to determine the total depth of sand in below the distribution piping and confirm whether any signs of failure could be observed. The test pit indicated the leaching bed consisted of 0.30m of septic sand below a layer of topsoil, followed by a 75mm diameter distribution pipe installed with a geosynthetic liner within a 0.30m thick layer of clean septic stone. Below the septic stone was approximately 0.90m of septic sand. The gravel and septic sand below the distribution piping was dry and did not show any evidence of failure (i.e., saturate soils, ponding effluent, biofilm, etc.).

Figure 2-2: Septic Sand in TP1

Figure 2-3: Septic Stone in TP1

3 CAPACITY ASSESSMENT

The design capacity for the existing sewage works has been determined following a review of the original design details and the observations made on-site, in comparison to the Ontario Building Code.

3.1 REVIEW OF DESIGN SEWAGE FLOWS

Table 8.2.1.3.B of the Ontario Building Code (OBC) does not include Hockey Arenas in it's list of establishments, however "Stadiums, Racetracks, Ball Parks" would be the closest establishment to an arena. As such, the design sewage flow would be based on a volume of 20 L/seat/day. Additionally, there is a community center and kitchen located on the second floor of the arena. Table 8.2.1.3.B of the OBC states that assembly halls with food services provided have a design flow of 36 L/seat/day.

In order to calculate the design sewage flows based off Part 8 of the OBC, the following assumptions were made regarding the arenas capacity:

1. Arena stands: 824 seats – based on As-Built Drawing "Second Floor Plan" by Graham Berman & Associates (date unknown)
2. Community Center: 300 seats – based on Metcalfe Arena Sewage System prepared by Oliver, Mangione, McCalla & Associates, dated October 29, 1987.

Based on the assumptions above, the design flow for the Larry Robinson Arena would be as follows:

Stadiums, Racetracks, Ball Parks

1 – Per Seat	= 824 seats x 20 L//seat/ d	= 16,480 L/d +

Assembly Halls with Food Service Provided

2 – Per Seat	= 300 x 36 L/seat/d	= 10,800 L/d

Total Estimated Design Sewage Flow

Total Design Flow	= 16,480 L/d + 10,800 L/d	= **27,280 L/d**

3.2 CAPACITY ASSESSMENT

The following equations from Part 8 of the Ontario Building Code are used to determine the minimum size requirements of a new septic system based on the design sewage flow.

Minimum Length of Distribution Piping:	L = Qt/300	(with Level IV Tertiary Treatment)
Minimum Volume of Septic Tank:	V = 3Q	(for commercial systems)

Where L is the length of distribution piping required, Q is the design sewage flow for the system, and t is the design percolation rate of the imported sand material. Septic sand typically has a percolation rate of 6 to 10 min/cm, as such, an assumed value of 8 min/cm has been used.

Based on the Length of Distribution Piping:

L	= Qt/300
Q	= L x 300 / t
	= 150m x 300 / 8
	= 5,625 L/d

Based on the Size of Septic Tanks:

V = 3Q
Q = V/3
= (45,500 + 22,700) / 3
= 68,200 / 3
= 22,733 L/d

From the calculations above, the size of the leaching bed is the limiting factor on the capacity of the existing septic system servicing the Larry Robinson Arena. As such, the system should be capable of handling a maximum sewage flow of 5,625 L/d.

Based on Table 8.2.1.3.B. of the OBC, the average daily design flow for the arena would be approximately 27,280 L/d, which is 4.8x higher than the capacity of the leaching bed. Although the daily water use may be less than the calculated design flow, there are no historical water use records for the Larry Robinson Arena. As such, the OBC design flow should be used as the basis for the design of a new leaching bed.

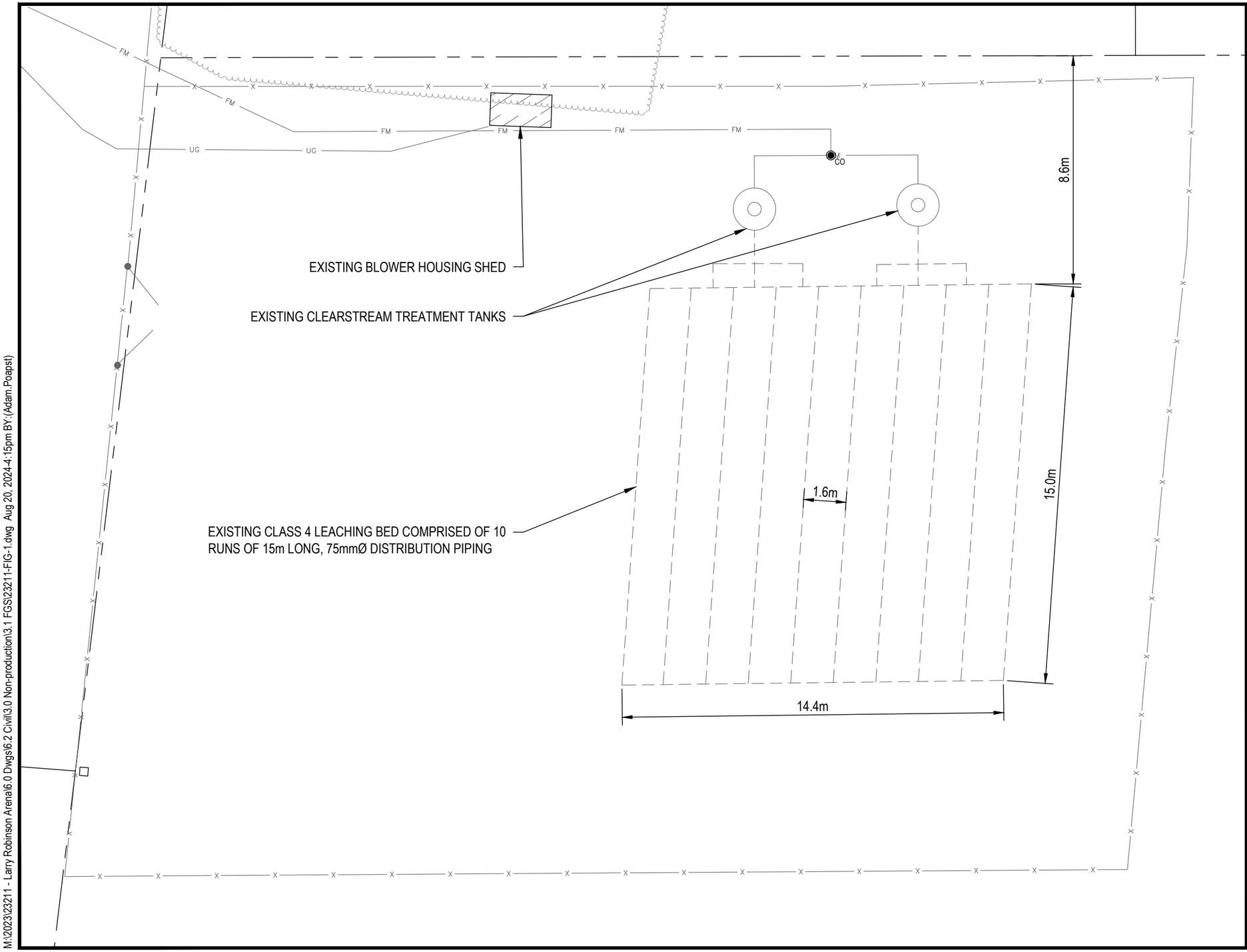
Aside from a drawing titled “Sewage System Layout Plan” prepared by John D. Paterson and Associates Ltd in August 2000, there does not appear to be any record/approval of this septic bed on file at the City. Given the large reduction in design flows, further attempt to locate this approval should be made in order to determine whether the bed can remain in place.

Because the calculated design flow exceeds 10,000 L/d, a new septic system would be regulated under Section 53 of the Ontario Water Resources Act (OWRA) and administered by the Ministry of Environment, Conservation, and Parks (MECP) and an Environmental Compliance Approval would need to be issued by for the system.

Respectfully Submitted,

EVB Engineering

Adam Poapst, P. Eng
Environmental Engineer
cc. Jamie Baker, EVB Engineering



LEGEND

- EXISTING FENCE
- EXISTING PROPERTY LINE
- EXISTING POWER SUPPLY
- EXISTING TREELINE
- EXISTING BUILDING
- EXISTING DISTRIBUTION PIPE
- EXISTING SEPTIC TANK
- EXISTING FORCEMAIN
- EXISTING CLEAN OUT

EVB ENGINEERING

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CLIENT:

CITY OF OTTAWA

PROJECT:

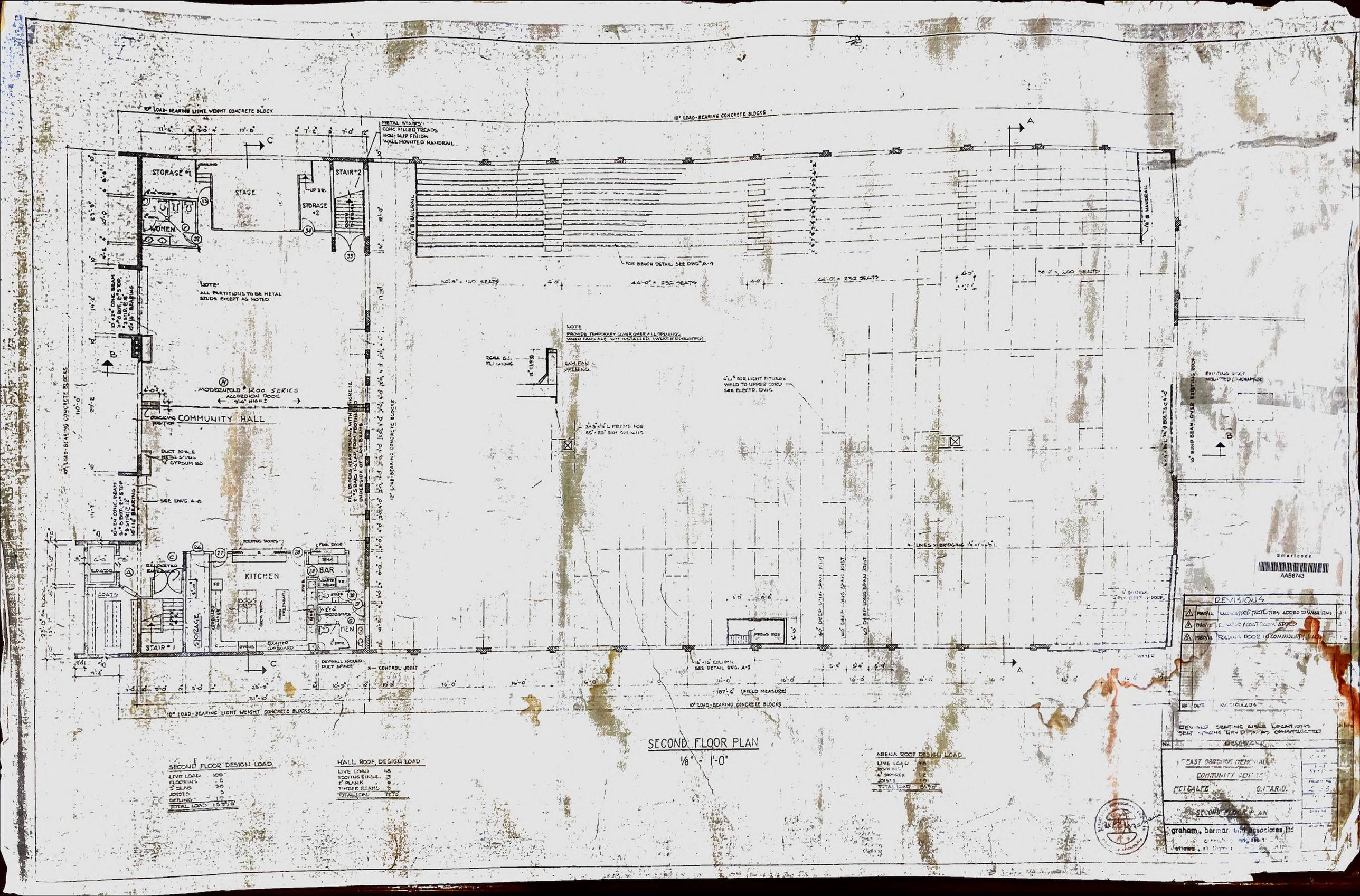
LARRY ROBINSON ARENA
NEW ADDITION

TITLE:

EXISTING SEPTIC BED

SCALE: 1:150	JOB NO: 23211
DESIGNED BY:	DATE: 24/08/20
DRAWN BY: AP	DRAWING NO.
CHECKED BY: JB	FIG. 1

M:\2023\23211 - Larry Robinson Arena\6.0 Dwgs\6.2 Civil\3.0 Non-production\3.1 FGS\23211-FIG-1.dwg Aug 20, 2024-4:15pm BY:(Adam.Poapst)



SECOND FLOOR DESIGN LOAD

LIVE LOAD	100
FLOORING	5
3" SLAB	30
JOISTS	3
CEILING	10
TOTAL LOAD	148 PSF

HALL ROOF DESIGN LOAD

LIVE LOAD	45
ROOFING & INSUL.	5
2" PLANK	6
TIMBER BEAMS	5
TOTAL LOAD	72 PSF

ARENA ROOF DESIGN LOAD

LIVE LOAD	45
ROOFING	7
¾" PLYWOOD	12
JOISTS	10
TOTAL LOAD	84 PSF

REVISIONS

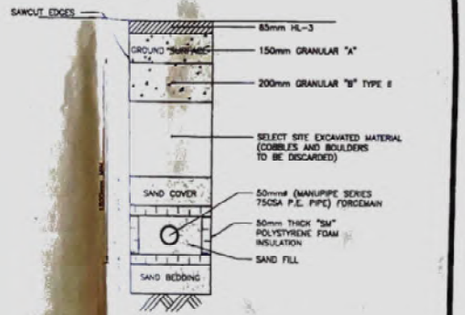
NO.	DATE	DESCRIPTION
1	1980/12	HANDICAPPED FACILITIES ADDED TO WASHROOMS
2	1980/12	ELEVATOR / COAT ROOM ADDED
3	1980/12	FOLDING DOOR TO COMMUNITY HALL
4	DATE	REVISIONS

REVISED SEATING AISLE LOCATIONS SEAT COUNTING DRAWINGS NO LONGER CONSTRUCTED

NO.	DESCRIPTION
	EAST GLOUCESTER TOWNSHIP
	COMMUNITY CENTRE
	METCALFE ONTARIO
	SECOND FLOOR PLAN

graham, barmar, [illegible] associates ltd.
ottawa, [illegible]

Smartcode
AAB8743



FORCEMAIN TRENCH DETAIL

SCALE - NOT TO SCALE

NOTES:

- ALL TRENCH BACKFILL MATERIALS TO BE COMPACTED.
- IF BEDROCK IS ENCOUNTERED ABOVE THE SPECIFIED TRENCH LEVELS, INSULATION THICKNESS CAN BE INCREASED. ASSISTANCE IN THIS REGARD CAN BE PROVIDED UPON SITE EVALUATION.

NOTES:

ESTIMATE OF DAILY SEWAGE FLOW:

PUMP RECORDS FOR THREE CONSECUTIVE YEARS OF OPERATION (1997 TO 1999) WERE PROVIDED AND ANALYZED. A SUMMARY OF THESE RECORDS IS SHOWN BELOW.

- 1997 – AVERAGE DAILY SEWAGE FLOW BASED ON TOTAL VOLUME PUMPED PER YEAR = 3132 L/DAY
  - PEAK DAILY SEWAGE FLOW BASED ON GREATEST MONTHLY VOLUME PUMPED = 3800 L/DAY
- 1998 – AVERAGE DAILY SEWAGE FLOW BASED ON TOTAL VOLUME PUMPED PER YEAR = 3857 L/DAY
  - PEAK DAILY SEWAGE FLOW BASED ON GREATEST MONTHLY VOLUME PUMPED = 9600 L/DAY

NOTE: SEWAGE FLOWS UNUSUALLY HIGH DUE TO ICE STORM.

- 1999 – AVERAGE DAILY SEWAGE FLOW BASED ON TOTAL VOLUME PUMPED PER YEAR = 3351 L/DAY
  - PEAK DAILY SEWAGE FLOW BASED ON GREATEST MONTHLY VOLUME PUMPED = 4704 L/DAY

TYPICALLY, PUMP RECORDS ARE A CONSERVATIVE ESTIMATE OF THE ACTUAL SEWAGE FLOW IF IT IS OUR UNDERSTANDING THAT THE PUMP RECORDS FOR 1999 ARE LIKELY A MORE ACCURATE ESTIMATE OF THE ACTUAL FLOWS SINCE THE PUMPING CONTRACTOR WAS ON A PER CALL BASIS ONLY.

THE MAJOR USE OF THE METCALFE ARENA IS ASSOCIATED WITH HOCKEY AND, AS SUCH, THE MAJOR SEWAGE FLOWS OCCUR DURING THE HOCKEY SEASON (NOVEMBER TO MARCH). IN ADDITION, THE WEEKEND FLOWS ARE SIGNIFICANTLY HIGHER THAN THE WEEKDAY FLOWS. THEREFORE, IT IS RECOMMENDED THAT THE SEWAGE FLOWS BE BALANCED.

THE DESIGN BALANCED SEWAGE FLOW = 3800 L/DAY. OCCASIONAL HIGHER SEWAGE FLOWS MAY OCCUR AND, AS SUCH, THE LEACHING BED HAS BEEN DESIGNED TO HANDLE A DAILY SEWAGE FLOW OF 5625 L/DAY.

THE CLIENT SHOULD BE AWARE THAT, SHOULD THIS FACILITY BE UTILIZED FOR AN UNUSUAL EVENT, WHERE THE SEWAGE FLOWS WOULD INCREASE SIGNIFICANTLY, THE TANKS WILL BE REQUIRED TO BE PUMPED REGULARLY FOR THE DURATION OF THE EVENT.

SUBSURFACE CONDITIONS

SOIL PROFILE CONSISTS OF TOPSOIL OVER GLACIAL TILL. THE GLACIAL TILL STRATUM CAN BE CLASSIFIED AS SILTY SAND-GRAVEL WITH NUMEROUS COBBLES AND BOULDERS.

THE DEPTH TO BEDROCK VARIES ACROSS THE SITE. BEDROCK MAY BE ENCOUNTERED ALONG THE FORCEMAIN ROUTE.

SEWAGE SYSTEM COMPONENTS:

1) BALANCING TANK – TANK #1 AND PRIMARY COMPARTMENT OF TANK #2

- THE EXISTING CAST-IN-PLACE SEPTIC TANK SHALL BE UTILIZED AS A BALANCING TANK. TANK #1 SHALL BE CONNECTED TO THE PRIMARY COMPARTMENT OF TANK #2 WITH A 200mm SDR 35 SEWER PIPE. THE PIPE INVERT LEVEL AT TANK #1 SHALL BE LOCATED AT THE TANK BASE LEVEL AND SHALL SLOPE @ 1% SLOPE MIN. TO END WALL OF THE PRIMARY COMPARTMENT OF TANK #2. PIPE CONNECTIONS TO BE SEALED USING LINK-SEAL.
- TWO 150mmø HOLES SHALL BE CORED THRU THE CENTRE WALL NEAR THE BASE LEVEL OF THE SECONDARY COMPARTMENT.
- NEW MANHOLE COVER AND FRAME (OPSD 401.01) TO BE INSTALLED OVER EACH CO ACCESS HOLE.
- TANK TO BE PUMPED AND CLEANED.

2) SEPTIC TANK – TANK #2

- THE PRIMARY COMPARTMENT OF TANK #2 SHALL SERVE AS A BALANCING TANK AND THE SECONDARY COMPARTMENT WILL SERVE AS A SEPTIC TANK.
- DUPLEX SEWAGE PUMP (2 MYERS WHISPER SEWAGE PUMPS) SHALL BE INSTALLED IN THE PRIMARY COMPARTMENT. THE PUMPS SHALL BE INSTALLED ON A MYERS GUIDE RAIL AND LIFT OUT ASSEMBLY.
- THE SEWAGE PUMP SHALL BE OPERATED BY FLOAT AND TIMER SWITCHES. THE TIMER SHALL OPERATE EVERY HOUR AND PUMP APPROX. 180 L/DOSE. THE PUMP CYCLE SHALL BE SET FOR APPROXIMATELY 20 SECONDS. CONTROL PANEL TO BE SUPPLIED BY PUMP MANUFACTURER.
- THE PUMPS SHALL OUTLET INTO THE SECONDARY COMPARTMENT OF TANK #2, USING A
- A FLOW CONTROL SWITCH SHALL ENCHANCE THE TIMER SWITCH TO MAINTAIN THE LIQUID LEVEL WITHIN THE WORKING CAPACITY OF THE TANK.
- THE TANK SHALL BE PUMPED AND CLEANED.
- A MANHOLE COVER AND FRAME (OPSD 401.01) TO BE INSTALLED OVER THE SECONDARY CHAMBER ACCESS HOLE. RISERS TO BE PROVIDED TO SUIT.
- A NEW INLET AND OUTLET HOLE SHALL BE CORED THRU THE END WALLS. THE EXISTING INLET AND OUTLET SHALL BE SEALED. ALSO, THE 4" PVC PIPE CONNECTION SHALL BE SEALED.
- AN OSI FT 0444-38 BIOTUBE EFFLUENT FILTER TO BE INSTALLED ON OUTLET PIPE.
- TWO 150mmø CORE-HOLES SHALL BE CORED THROUGH THE CENTREWALL ABOVE THE TANK OPERATING LEVEL.

3) TREATMENT TANK – TANK #3

- THE TREATMENT UNIT SPECIFIED CONSISTS OF CLEARSTREAM 1000H WASTEWATER TREATMENT UNIT
- AN EQUIVALENT TREATMENT UNIT CAN BE INSTALLED. HOWEVER, THE COSTS OF ANY REVISION WORKS SHALL BE PAID BY THE CONTRACTOR. THE TREATMENT UNIT MUST BE PRE-APPROVED BY THE OWNER.
- THE TREATMENT UNIT SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S SPECIFICATIONS BY A CERTIFIED INSTALLER.
- THE OWNER OF THE SYSTEM SHALL ENTER INTO A MAINTENANCE AGREEMENT WITH THE MANUFACTURER'S REPRESENTATIVE.
- THE TREATMENT UNIT SHALL BE INSTALLED IN THE PRIMARY COMPARTMENT OF THE EXISTING 22500L SEPTIC TANK (TANK #3).
- THE TOP OF THE EXISTING TANK SHALL BE SAWCUT TO ALLOW FOR THE INSTALLATION OF THE TREATMENT UNIT. THE OPENING SHALL BE APPROX. 200mm GREATER THAN THE OUTER DIMENSIONS OF THE TREATMENT UNIT.
- AFTER CLEANING THE EXISTING TANK AND REMOVING ALL DEBRIS, 25mm THICK "SM" INSULATION BOARDS SHALL BE INSTALLED OVER THE CONCRETE BASE.
- THE TREATMENT UNIT SHALL BE INSTALLED IN THE TANK ON THE INSULATION BOARDS.
- THE TREATMENT UNIT SHALL BE BACKFILLED WITH 10mm CLEAR STONE. THE CLEAR STONE SHOULD BE PLACED IN LIFTS AND TAMPED.
- A NEW INLET HOLE (150mmø) SHALL BE CORED THRU THE TANK END WALL AND AN OUTLET HOLE SHALL BE CORED THRU THE TANK CENTRE WALL.
- A CONCRETE RISER SECTION (2400mmø) SHALL BE INSTALLED OVER THE TREATMENT UNIT AND A MANHOLE COVER AND FRAME (OPSD 401.01) SHALL BE INSTALLED ON THE RISER. THE COVER SHALL BE FLUSH WITH THE FINAL PAVEMENT SURFACE.
- THE BLOWER UNIT SHALL BE INSTALLED INSIDE THE BUILDING IN THE STORAGE AREA BELOW THE ARENA STANDS. THE LOCATION OF THE UNIT SHALL BE PRE-APPROVED BY THE OWNER PRIOR TO ITS INSTALLATION.
- THE BLOWER UNIT SHALL BE INSTALLED LEVEL AND SHALL BE PROTECTED FROM ANY OBSTRUCTION.

4) PUMP CHAMBER

- THE SECONDARY COMPARTMENT OF TANK #3 SHALL BE CONVERTED TO A PUMP CHAMBER.
- ALL EXISTING OPENINGS IN THE CENTRE WALL SHALL BE SEALED.
- THE PUMP CHAMBER SHALL BE EQUIPPED WITH DUPLEX EFFLUENT PUMPS (MYERS MEW) OPERATED BY FLOATS. THE PUMPS SHALL BE INSTALLED ON A GUIDE RAIL AND LIFT OUT ASSEMBLY.
- THE PUMP CHAMBER SHALL BE EQUIPPED WITH A HIGH WATER ALARM.
- THE RECOMMENDED PUMP DUTY CYCLE IS 600 L (APPROX. 75% OF VOLUME OF DISTRIBUTION PIPING IN LEACHING BED).

5) DISTRIBUTION BOX / FORCEMAIN

- A 50mmø RIGID POLY PIPE FOR PRESSURE APPLICATIONS (MANUPPE SERIES 75 CSA P.E. PIPE) SHALL BE INSTALLED FROM THE PUMP CHAMBER TO THE DISTRIBUTION BOX.
- THE FORCEMAIN SHALL BE PROVIDED WITH AT LEAST 1.5m OF SOIL COVER AND BOXED WITH 50mm THICK RIGID POLYSTYRENE FOAM (SM) INSULATION.
- THE PIPE SHALL BE BEDDED ON 150mm (MIN.) THICK LAYER OF CLEAN SAND (OPSS GRAN. B TYPE I) AND BACKFILLED TO AT LEAST 150mm ABOVE THE INSULATION BOARD (SEE DETAIL).
- THE REMAINDER OF THE FORCEMAIN TRENCH MAY BE BACKFILLED WITH SELECT SITE EXCAVATED FILL (ALL COBBLES AND BOULDERS SHALL BE DISCARDED).
- ALL BACKFILL MATERIALS SHALL BE PLACED IN LIFTS AND COMPACTED TO AT LEAST 95% OF THE STANDARD PROCTOR VALUE.
- THE FORCEMAIN SHALL DISCHARGE INTO A LARGE (1.2m L x 0.6m W) PRECAST DISTRIBUTION BOX.
- THE DISTRIBUTION BOX SHALL BE INSTALLED LEVEL ON COMPACTED SAND FILL.

6) LEACHING FIELD

DISTRIBUTION PIPING NETWORK:

- LENGTH OF PIPE REQUIRED = 07/300 = 3800(0)/300 = 101 LINEAR METRES
- USE 10 RUNS OF 15.0m EACH RUN.
- TOTAL LENGTH OF PIPE PROVIDED = 150 LINEAR METRES
- BED OVERSIZED BY 1.5 TIMES TO HANDLE OCCASIONAL HIGHER FLOWS.

HYDRAULIC LOADING RATE:

- TOTAL BED AND MANTLE AREA = 838 m2
- HYDRAULIC LOADING RATE = 4.1 L/DAY/m2

LEACHING BED

- A PARTIALLY-RAISED BASED ABSORPTION TRENCH STYLE LEACHING BED TO BE INSTALLED.
- A MINIMUM THICKNESS OF 0.6m OF IMPORTED SAND FILL, HAVING A PERCOLATION RATE OF NOT GREATER 8 min/cm, SHALL BE PROVIDED BELOW THE BASE OF THE TRENCHES.
- THE SUBGRADE SURFACE FOR THE BED AND MANTLE AREAS SHOULD BE PREPARED BY STRIPPING ALL TOPSOIL AND SUBSCARIFYING TO AT LEAST ELEV. 100.10m TO THE IN SITU SILTY SAND-GRAVEL STRATUM.
- ALL SUBGRADE SURFACES SHOULD BE SCARIFIED UNDER DRY CONDITIONS PRIOR TO THE PLACEMENT OF THE IMPORTED SAND FILL.
- THE DISTRIBUTION PIPES SHOULD CONSIST OF 75mmø PERFORATED SEPTIC PIPE WHICH SHOULD BE EMBEDDED IN A 300mm THICK BY 500mm (MIN.) WIDE LAYER OF 19 TO 25mm# CLEAR STONE.
- THE DISTRIBUTION PIPES SHOULD BE INSTALLED WITH A UNIFORM DOWNWARD SLOPE FROM ELEV. 101.15m AT THE HEADER TO ELEV. 101.08m AT THE FOOTER.
- THE ENDS OF EACH RUN SHALL BE INTERCONNECTED WITH A FOOTER PIPE.
- THE CLEAR STONE LAYER SHOULD BE COVERED WITH AN APPROVED GEOTEXTILE FABRIC.
- THE SURFACE OF THE BED SHOULD BE COVERED WITH PERMEABLE SAND FOLLOWED BY APPROXIMATELY 100mm OF SANDY TOPSOIL. THE BED AREA SHOULD BE VEGETATED.
- THE TOTAL THICKNESS OF THE COVER OVER THE BASE OF THE TRENCHES SHOULD BE WITHIN THE RANGE OF 0.6m TO 0.8m.
- THE SIDES OF THE BED SHOULD BE SLOPED IN THE RANGE OF 4H:1V OR SHALLOWER.

MINIMUM CLEARANCE FROM LEACHING BED

- 8.0m FROM ANY PROPERTY LINE.
- 8.0m FROM ANY STRUCTURE.
- 18.0m FROM ANY DRILLED WELL.
- 6.0m FROM ANY TREES UNLESS OTHERWISE APPROVED.

MINIMUM CLEARANCE FROM TANK(S)

- 1.0m FROM ANY STRUCTURE.
- 15.0m FROM ANY DRILLED WELL.
- 3.0m FROM ANY PROPERTY LINE

SITE WORKS

1) GENERAL

- THE CONTRACTOR SHALL CONFIRM THE LOCATION OF UTILITIES BY CONSULTING THE MUNICIPAL AUTHORITIES AND UTILITY COMPANIES AND SHALL BE RESPONSIBLE FOR ADEQUATE PROTECTION OF UTILITIES AND SERVICES FROM DAMAGE DURING CONSTRUCTION.
- THE CONTRACTOR IS RESPONSIBLE FOR DAMAGE TO PROPERTY, STRUCTURES, CURBS AND SERVICES, AND SHALL REPAIR AT HIS OWN EXPENSE.
- THE CONTRACTOR IS RESPONSIBLE FOR CLEAN-UP OF THE WORK AREA AND SHALL REMOVE ALL DEBRIS AND SURPLUS MATERIALS.
- ALL ELEVATIONS AND DIMENSIONS ARE TO BE CONFIRMED BY THE CONTRACTOR.

2) ASPHALTIC PAVEMENT AREAS

- SAWCUT EXISTING ASPHALT ALONG PROPOSED FORCEMAIN ROUTE AND 300mm BEYOND EXISTING FENCE PERIMETER AT TANK NEST.
- REMOVE EXISTING CHAIN LINK FENCING AT THE TANK NEST. FENCE POLES WHICH SHALL BE RE-USED SHALL REMAIN IN PLACE, OTHER POLES SHALL BE REMOVED. FENCING TO BE RE-USED
- REMOVE ALL EXISTING ASPHALT AND DISCARD ACCORDING TO ACCEPTABLE PRACTICE.
- AT THE TANK NEST, EXCAVATE TO AT LEAST 200mm BELOW THE PROPOSED FINISHED GRADE.
- THE EXPOSED SUBGRADE SURFACE SHALL BE PREPARED AS
- RE-ESTABLISH TO SPECIFIED BASE LEVEL WITH OPSS GRANULAR "A". THE GRANULAR "A" BASE MATERIAL SHALL BE COMPACTED TO AT LEAST 98% OF ITS STANDARD PROCTOR MAXIMUM
- ALONG THE PROPOSED FORCEMAIN ROUTE, THE UPPER PORTION OF THE TRENCH BACKFILL SHALL CONSIST OF 200mm OF GRANULAR "B" TYPE II OVERLAIN BY 150mm OF GRANULAR "A".
- THE NEW ASPHALTIC PAVEMENT SHALL CONSIST OF 85mm THICK LIFT OF HL-3.
- NEW PAVEMENT SURFACES TO MATCH EXISTING.

3) LANDSCAPED AREAS

- ALL SURPLUS MATERIALS ARE TO BE REMOVED.
- CONSTRUCTION ACCESS ROUTE, LEACHING BED, AND FORCEMAIN ROUTE SHALL BE COVERED WITH A MINIMUM THICKNESS OF 100mm OF SCREENED TOPSOIL.
- TOPSOIL SHALL BE FINE GRADED, SEEDED AND ROLLED.
- FINAL GRADING TO BE CARRIED OUT BY CONTRACTOR AND, THEREAFTER, BY OWNER.

4) FENCING

- THE PERIMETER OF THE LEACHING BED AREA (30mx40m) SHALL BE FENCED WITH A 1.2m HIGH CHAIN LINK FENCE. THE FENCE CONSTRUCTION SHALL MATCH EXISTING FENCING.
- A DOUBLE GATE (2-2.4m WIDE GATES) SHALL BE INSTALLED TO PROVIDED ACCESS TO THE BED AREA.
- THE CONSTRUCTION AT THE TANK NEST SHALL BE RE-INSTALLED. NEW MATERIALS, TO MATCH EXISTING, SHALL BE USED ALONG THE NEW FENCE ALIGNMENT.
- TWO 1.2m SE GATES, WITH A LOCKING LATCH, SHALL BE INSTALLED TO PROVIDE ACCESS TO THE TANK (SEE PLAN).

REV #	DATE	DESCRIPTION

Client: TOWNSHIP OF OSGOODE

Project: METCALFE COMMUNITY CENTRE

Title: SEWAGE SYSTEM LAYOUT PLAN
METCALFE COMMUNITY CENTRE

Report No. G7639-01

Date AUGUST 2000

Drwg. No. G7639-1

PROFESSIONAL ENGINEER 22.09.00

PO Box 599, 3889 Rideau Valley Drive, Manotick, Ontario K4M 1A5
T (613) 692-3571 ext 4 F (613) 692-1507 septic@rvca.ca info@rvca.ca www.rvca.ca

Rideau Valley Conservation Authority

SEPTIC OFFICE

File Search Reply – Match Found

To:	Kevin Voelker	**Date:**	July 3, 2024
Email:	Kevin.voelker@ottawa.ca	**Phone:**	613-580-2424 x23728

Follow up Inquiries Please Reference:	**24OT077F** **Archive file: 1987-890**	
Civic Address:	**2785 8th Line Rd**	
Former Township:	**Osgoode**	
	Septic system designed per the attached records for:	**Real estate feature listing obtained via the internet:**
Bedrooms	**n/a**	
Bathrooms		
Square M		

Attachment(s):

- Permit / Application
- Drawings

The foregoing information is given for your convenience only. Supplementary requests are necessary for conformity with other legislation such as flood plain or shoreline works. ***It should be clearly understood that you must satisfy yourself as to whether the premises and the existing or proposed use thereof is or would be in conformity with all applicable regulations.*** *For further information please contact the Septic Office staff at the number listed above.*
Thank you for contacting the Septic Approval Office.

Part 8 Inspector: Alex Dekleine

Ministry of the Environment
Ontario

APPLICATION FORM AND CERTIFICATE OF APPROVAL FOR A CLASS 2-6 SEWAGE SYSTEM

(Please Print Clearly)

Application No. 82(22-8)980
Fee Receipt No. 4771
Date Received 30 Oct 87

1. Name of Owner	Tel. No.	2. Installer's Name	Tel. No.
Township of Osgoode	821-1107		
Address (No., Street, City, Town, etc.) P.O.Box 130 Metcalfe, Ontario K0A 2P0		Address (No., Street, City, Town, etc.)	

3. Propose to construct (Construct/Install/Alter/Extend/Enlarge) a Class 4A sewage system to serve the arena (METCALFE) (Facility: e.g. Single Family Dwelling, Motel, etc.)

4. Location — Region, County, District	Ward, Township, Town	Lot No.	Conc. No.	Sub.Lot. No.	Plan No.	Area of Lot (m^2)
R.M.O.C.	Osgoode	22	8			

5. State No. of	Bedrooms or Motel Units	People	Flush Toilets	Urinals	Washbasins	Showers and Bathtubs
		SEE ATTACHED DESIGN				

6. Water Supply
Dug or Bored Well ☐
Drilled Well ☒ Municipal ☐
Other
Proposed ☐ or Existing ☒

7. Attach completed sketch on Page 2 — List other attachments:

8. Relationship to Severance if applicable
☐ Lot Approval Pending
☐ Lot Approved
Under Severance Application No.

9. Directions to Lot:— Highway No., Secondary Roads, Signs to Follow, etc.
ALBERT STREET — ULG OF METCALFE

10. I certify that the above information is complete and correct and that, if approved, the work will conform with Provincial requirements for sewage systems and local Municipal By-Laws.

Name of Agent Oliver, Mangione, McCalla & Assoc. Ltd. Tel. No. 225-9940
Address (No., Street, City, Town, etc.) 154 Colonnade Road South, Nepean, Ontario K2E 7J5
Signature of Owner or Agent
Date S.G. Simmering, P.Eng. September 24, 1987

11. INSPECTOR'S REPORT
Inspection Time and Date 9:50 AM PM Nov 3 1987
Weather: Cloudy, RAIN
Representing Owner
Leaching Bed Design Criteria: Depth to Rock ..... m. Design H.W.T. ..... m.
REQUIREMENTS: Length of Distribution Pipe (metres) .....
Working Capacity of Septic/~~Holding~~ Tank (Litres) .....

Sub-Surface Conditions Encountered

Rock & G.W.T.	Depth (m)	Soil Type
	0	
	0.25	
	0.50	
	0.75	
	1.00	
	1.25	
	1.50	

Conditions of Approval and Reasons (e.g. fill, grading, drainage improvements, design sewage flows) ☐
OR
Reasons where Proposal not Acceptable (add additional pages if required) ☐

1040 3/82

OFFICE COPY

Ministry of the Environment
Ontario

APPLICATION NO.
82(22-8)

12. **LOT DIAGRAM AND SEWAGE SYSTEM PLAN:** – Draw to scale indicating north point and showing:
   a) Location of sewage system components (e.g. tanks, leaching bed). Locate and show horizontal distances from system to adjacent existing or proposed buildings, water supplies (including neighbours), existing on-site sewage systems, driveways, property lines, lakes, rivers, water courses, swimming pools.
   b) Lot dimensions, topographic features (e.g. swamps, steep slopes) near system.
   c) If any part of proposal conforms to a specific standard drawing, give reference number(s).

SEE DRAWING #87-5707-SS1
#87-5707-SD1
BY OLIVER, MANGIONE, McCALLA & ASSOCIATES LIMITED

13. **A Certificate of Approval for this application is refused for the reasons given in Section 11 Page 1**

INSPECTED AND RECOMMENDED BY	REFUSED DIRECTOR	DATE

CERTIFICATE OF APPROVAL

Application approved and this Certificate of Approval under Section 65 of the Environmental Protection Act is hereby issued for the proposal outlined on Pages 1 and 2 of the application and its attachments as amended by the requirements and conditions of Section 11 provided that the sewage system shall be completed and a Use Permit issued within 12 months of the issue hereof or such extended period as the Director on application allows. DO NOT OPERATE THE SYSTEM UNTIL A USE PERMIT IS ISSUED.

INSPECTED AND RECOMMENDED BY	ISSUED DIRECTOR	DATE

Under Section 121 of the Environmental Protection Act, an applicant may appeal a decision by writing to the Director and to the Environmental Appeal Board, 1 St. Clair Avenue West, Toronto, Ont., M4V 1K7 within 15 days of receipt of the decision.

OFFICE COPY

L. Bredeson, B.Sc., P.Eng.
B. F. Cummings, B.A.Sc., P.Eng.
S. J. Walker, B.Sc., P.Eng.
A. J. Tovell, B.A.Sc., P.Eng.

JOHN D. PATERSON & ASSOCIATES LTD.
Consulting Engineers & Geologists
Soil Investigations
Inspection & Testing Services
Damage Claims

Offices & Laboratory
28 Concourse Gate
Nepean, Canada K2E 7T7
Telephone (613) 226-7381

July 17, 1987

Oliver, Mangione, McCalla and
Associates Limited
154 Colonnade Road South
Nepean, Ontario
K2E 7J5

Attention: Mrs.Sheila Clark, P. Eng.

Subject: New Septic Sewage System
Metcalfe Arena
Project No. 5707

Dear Mrs. Clark;

The soil sample that was submitted to this firm from the above noted project has been analyzed and the results interpreted in terms of the soil's applicability to the proposed leaching bed for the septic system.

The sample is comprised of 26% gravel-sized particles, 36% sand-sized particles, and 38% finer than the #200 mesh seive. From a visual examination of the fine particles, it was determined that they were predominantly silt-sized with less than 15% being clay-sized particles. The coarse fraction is generally angular to sub-angular. The sample can be texturally classified as a silty sand-gravel (SM-SC).

The percolation time (T-time) has been estimated to be 15 min/cm on the basis of the grain size distribution results. Also, the hydraulic conductivity (K) has been estimated to be on the order of 10^{-4} cm/s.

We trust that this letter will provide you with sufficient information for your present needs. If we can be of further assistance, please call.

Yours truly,

JOHN D.PATERSON & ASSOCIATES LTD.

David Harding

David R. Harding, M.Sc.

DH/hj

REPORT NO. CL 6259-87

GRAIN SIZE DISTRIBUTION

JOHN D. PATERSON & ASSOCIATES LTD.
Consulting Engineers and Geologists
1479 LAPERRIERE AVE. OTTAWA, CANADA K1Z 7S8

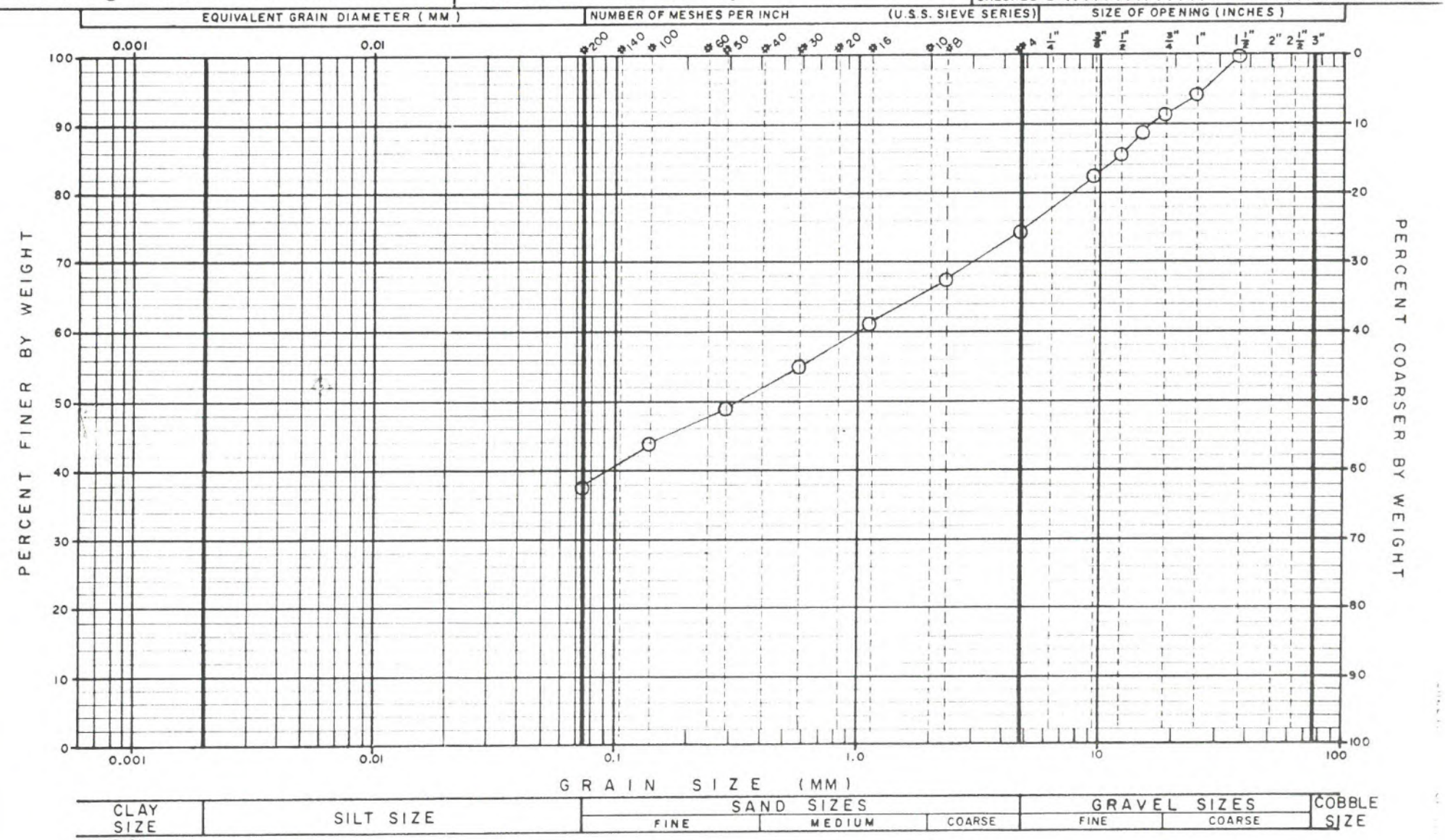
Oliver,Mangione,McCalla & Assoc.Ltd.

SOIL SAMPLE DESCRIPTION:

26% gravel
36% sand
38% silt with some clay

SILTY SAND-GRAVEL
(SM-SC)

LOCATION: Metcalfe Arena
PROJECT: #5707
BORE HOLE NO. ..... SAMPLE NO. .....
LAB. NO. CL 6259-87
TESTED BY: SY DATE July 15/87
CHECKED BY: DWRH DATE July 17/87



REMARKS:

EFFECTIVE GRAIN SIZE, D_{10}= .....(CM) D_{60}= .....(CM) UNIFORMITY COEFFICIENT, C_u = ...

OLIVER, MANGIONE, McCALLA & ASSOCIATES LIMITED
CONSULTING ENGINEERS

Job: 87-5707 October 29, 1987

METCALFE ARENA SEWAGE SYSTEM

1. Calculation of Sewage Quantities

The sewage quantity for the arena system is based on the water metre reading for the Lietrim Arena for January and February 1986. The Lietrim Arena like the Metcalfe Arena has ice only in the winter and has banquet facilities upstairs of comparable size. The metre reading for the two winter months averaged 13,000 L/day.

- SEATING CAPACITY??
- NO OF FIXTURE UNITS?
- WHAT ABOUT PEAK READING PER DAY?

In order to add a factor of safety for a peak day we have added an extra 20 L/day/seat for the assembly hall licensed for 300 people, for a total of 6000 L/day.

Total peak flow for a day is therefore estimated to be 19,000 L.

Sewage characteristics are anticipated to be of domestic strength given waste is primarily from washroom use.

2. Septic Tank

Double flow per day since facility is not in 24 hour use and peak flow should only be on weekends on a 12 hour flow basis.

19,000 x 2 = 38,000 litre tank or 8,400 gallons
propose 45,500 L or 10,000 gallon
(existing tank 3200 gallons)

?

3 X

3. Tile Bed

Two - 6 hour percolation tests were performed and the average rate was 6.6 min/cm and 7.7 min/cm for percolation hole #1 and #2 respectively.

Grain size distribution analysis performed by J.D. Paterson on soil samples taken by the soils consultant indicated a hydraulic conductivity estimated to be in the order of 10^{-4} cm/sec. with an estimated "T"-time of 15 min/cm.

L = (19,000) (10) /200 = 950 m of tile

Using the above information plus the fact that imported Granular 'C' material will have an approximate "T" of 5 min/cm and less than 5% passing the No. 200 seive, the "T" used for design was 10 min/cm.
As a result, two (2) beds are proposed, each consisting of 16 runs at 30 m for a total of 960 lineal metres of 75 mm diameter tile.

4. Pumping Chambers

CHECK DOSING ? CALCS.

A duplex pumping system is proposed, each 1 Hp. pump serving one-half of the tile field. At a rate of 200 L/min, the 1930 litre dosage volume will have a duration of 9.7 min and a maximum frequency of 9.8/day.

5. Test Holes

A series of 8 test holes were dug by a backhoe in the proposed tile field area. They ranged in depth from 0.6 m to 2.25 m to hardpan; no water table was found.

Typically, 150 - 200 mm topsoil over silty - sand gravel to hardpan was encountered. The grain size analysis is attached in Appendix A.

6. Mounding Calculations

- GIVE CALCS - MOUNDING UNDER BED?

Mounding calculations were performed, based on tile field effluent quantities only, by Darcy's Law using the hydraulic conductivity of the existing native soil as well as the imported sand. The mounding shape is shown on Section A-A of Drawing SS1 based on permeabilities of 10^{-2} and 10^{-4} cm/sec for imported and native materials, respectively.

7. Hydrogeology

The direction of the bedrock ground water flow is in a southeast direction as determined from an examination of the existing well records in the area.

?

There is only one existing well in the immediate vicinity of the new tile bed as shown on the plan. It is a 46 m deep drilled well and is located over 30 m away and up-gradient from the new bed. The rest of the area around the bed is vacant land.

Since the site is underlain by hardpan with no unconfined water table to be affected by tile field effluent, the proposed installation will have no effect on ground water in the area.

Ministry Of The Environment
Ontario

VILLAGE OF METCALFE
Township Of Osgoode

Kostuch Engineering Limited

Private Waterworks Project No. 8-0099

OWNER & ADDRESS	TELEPHONE	TENANT & ADDRESS	TELEPHONE	PERSON INTERVIEWED
METCALFE COMMUNITY CENTRE METCALFE, ONT. K0A 2P0				H. COWAN PREVIOUS OWNER

BUILDING DESCRIPTION	BUILDING USE	NORMAL OCCUPANCY	No. OF BEDROOMS
BLOCK ARENA	___ SINGLE FAMILY X OTHER (HALL RINK)		
LOT DIMENSIONS (m)	**BUILDING DIMENSIONS (m)**	**BASEMENT PLUMBING DEPTH**	
	70 x 34	___ FULL ___ HALF X NONE X PUMP	

M.O.E. IDENTIFICATION No.	SURVEYED BY	DATE	LOCATION
78	R.E.S.	16 08 84	2785

EXISTING SEWAGE SYSTEM

TYPE: X SEPTIC SYSTEM ___ CESSPOOL ___ LEACHING PIT
___ HOLDING TANK CLASS 4 YEAR 51
M.O.E. APPROVAL _____ No. _____
TANK SIZE 2m x 8m MATERIAL CONCRETE
LAST CLEANED 1983 TILE LENGTH 180(6ROWS)m
RAISED TILE BED _____ YES X NO
ROCK DEPTH 2.0 m SOIL TYPE CLAY
SEPARATION DISTANCES STANDARD
WATER TABLE DEPTH 3.5 m
INCONCLUSIVE RATING/INSPECTION REQUIRED _____
PERCOLATION RATE _____ CLASSIFICATION ___ A X B

COMMENTS :

* WELL INSIDE BUILDING SINCE ORIGINAL RINK (1951) BURNED DOWN - NEW BLDG (1973) BUILT OVER EXISTING WELL.
* SURFACE PONDING AT LEACHING BED SITE

RECOMMENDATIONS/COSTS

CLASS 4

SEPTIC TANK	_____
TILE BED	_____ m

CLASS 6

REPLACE SEPTIC TANK	_____
REPLACE TILE BED	_____ m
RAISED BED	_____ m
PUMP INSTALLATION	_____
PUMP OUT	_____
HOLDING TANK	_____
LAND	_____ m X _____ m
OTHER: PLUMBING	_____
:	_____
PROVISIONAL ALLOWANCE	_____ _____

TOTAL SEWAGE $

EXISTING WATER SUPPLY

SOURCE: ___ DRILLED WELL ___ DUG WELL X SHARED
YEAR 51 DEPTH 26 m
WELL RECORD No. _____
DRILLERS NAME MAURICE CAYER
DRILLER'S LICENCE No. 1517
CASING: YES DIA 150 mm DEPTH 4.0 m
QUALITY: X G ___ F ___ P QUANTITY: X G ___ F ___ P
TREATMENT NONE DATE SAMPLED 83 09 23 / 84 08 13
SEPARATION DISTANCES STANDARD
BACTERIAL: TOTAL <2 -<2 FAECAL 0 - 0
HARDNESS 277 ALKALINITY 270 IRON 0.16
CHLORIDE 164 pH 7.87 CONDUCT. 1230*
AMMONIA 0.51 NITRITE 0.01 NITRATE 0.22
CLASSIFICATION X A ___ B

★ BEYOND MAXIMUM ACCEPTABLE CONCENTRATION

COMMENTS :

- WELL SERVICES ARENA & CURLING CLUB (#2793)
- WHEM #2793 IS NOT BEING FED BY LIONS DEN (#2803)

RECOMMENDATIONS/COSTS

DRILL NEW WELL	_____
SEAL OLD WELL	_____
INSPECT & UPGRADE	_____
SULPHUR AND/OR IRON REMOVAL UNIT	_____
NEW PUMP	_____
OTHER:	_____ _____

COMMENTS: TOTAL WATER $

CLASS 4	RATING B
◑	RATING A
	TOTAL ESTIMATED COST $

2785 ALBERT

Geological/Hydrogeological Constraints
- generally not suitable for residential development due to potential for groundwater contamination with septic effluent
- site specific evaluation by hydrogeologist may permit construction of houses in certain localities within this terrain unit

Till Plain (Unit 1a)

General Stratigraphy

- sandy and silty, poorly sorted and compact
- grey at depth but brown where oxidized
- calcareous where not leached
- consists dominantly of lodgement till (ie. deposited beneath glacial ice lobe) showing compact fissile structure
- in areas that lie below marine limit (approx. 198 m/650 feet ASL) this unit is overlain by a discontinuous lag deposit consisting of sand, gravel and boulders
- this unit directly overlies bedrock within study area with a thickness of +/- 1 metre
- thickness of this unit over bedrock may be highly variable especially in areas where rock outcrops are nearby

Slope
- generally 0-3%
- local relief less than 5 metres

Drainage
- fair to good depending on localized relief and existing drainage pattern

Hydraulic Conductivity
- 10-3 to 10-6 cm/s
- generally decreasing with depth

Estimated Depth to Water Table
- +/- 1 metre below surface

Geological/Hydrogeological Constraints
- bedrock may be near the surface, therefore, site specific evaluation of residential development potential is required

Drumlinized Till (Unit 1b)

General Stratigraphy
- same as terrain unit 1a
- some of the drumlins within study area may have bedrock cores with a minimal thickness (0.5 - 1.0 metre) of sediment

100 igpm (7.4 l/s) from this zone. The potential for well interference was not assessed during our testing work. However, it is highly probable that a communal water supply sufficient for the needs of Metcalfe could be developed in this area. Several points are worthy of note .

1) A well field would be required to obtain the over 200 igpm of safe yield necessary to service the community.

2) The use of the shallow aquifer would require the isolation or 'sterilization' of the well field from any surrounding land uses that would produce contaminants. A 100 acre land parcel would probabley be necessary for this purpose.

3) Extensive aquifer testing would be required to determine if boundary conditions exist in this fractured limestone aquifer.

5.0 DISCUSSION OF CONTAMINATION PROBLEMS

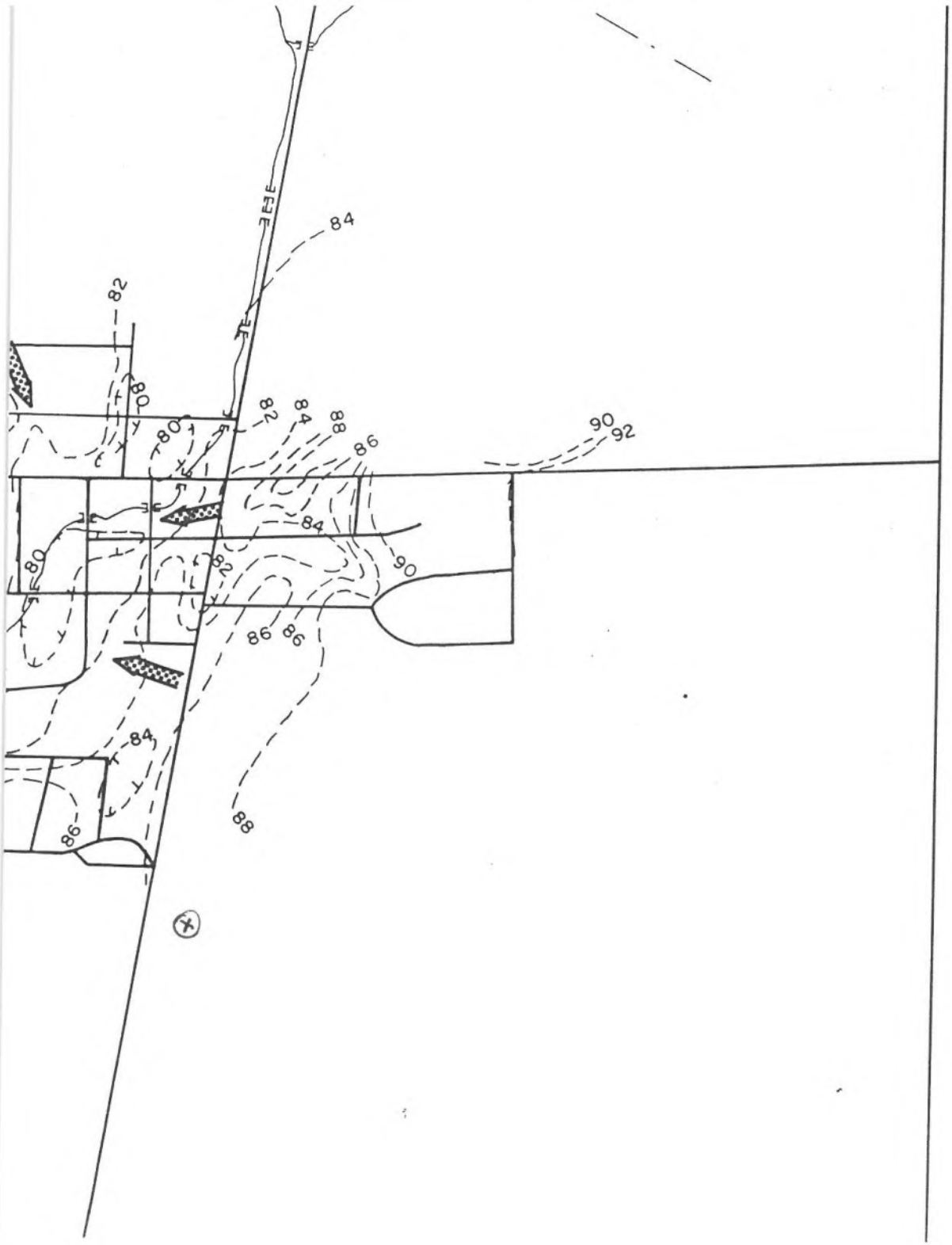
All available water chemistry data have been studied in light of our field evidence about the hydrogeological conditions present in the Village of Metcalfe. We would like to address a number of points based on these data.

1) The source of contamination to wells in the village is septic tank effluent. The geological conditions beneath the village have permitted the migration of contaminants between tile beds and wells throughout Terrain units 1A and R which comprise most of the village area. In clay terrain (unit 3) the impermeable soil has protected the bedrock aquifer to some extent and well contamination is not as wide spread.

2) It is probable that almost all the wells in present use in the village have not been cement grouted. These wells are improperly constructed for the terrain conditions present and all wells which are now free of contamination have a high potential to become contaminated in the future.

3) If wells are constructed to depths of greater than 21 meters low levels of hydrogen sulphide gas can be expected in the groundwater in most areas of the village. If wells are drilled to depths in excess of 30 meters, especially in the south western quadrant of the village high natural chloride concentrations will be encountered. It is important therefore that chloride levels be monitored during the drilling of new wells and that wells be terminated as soon as an adequate water supply for a domestic residence is obtained.

4) The contamination throughout the village is of point source origin, however many tile beds are contributing effluent to the bedrock aquifer as shown by the random and variable distribution of contaminants accross the study area. Our investigations in the Mandor area showed that migration of effluent between lots is occuring but on a localized not widespread scale.



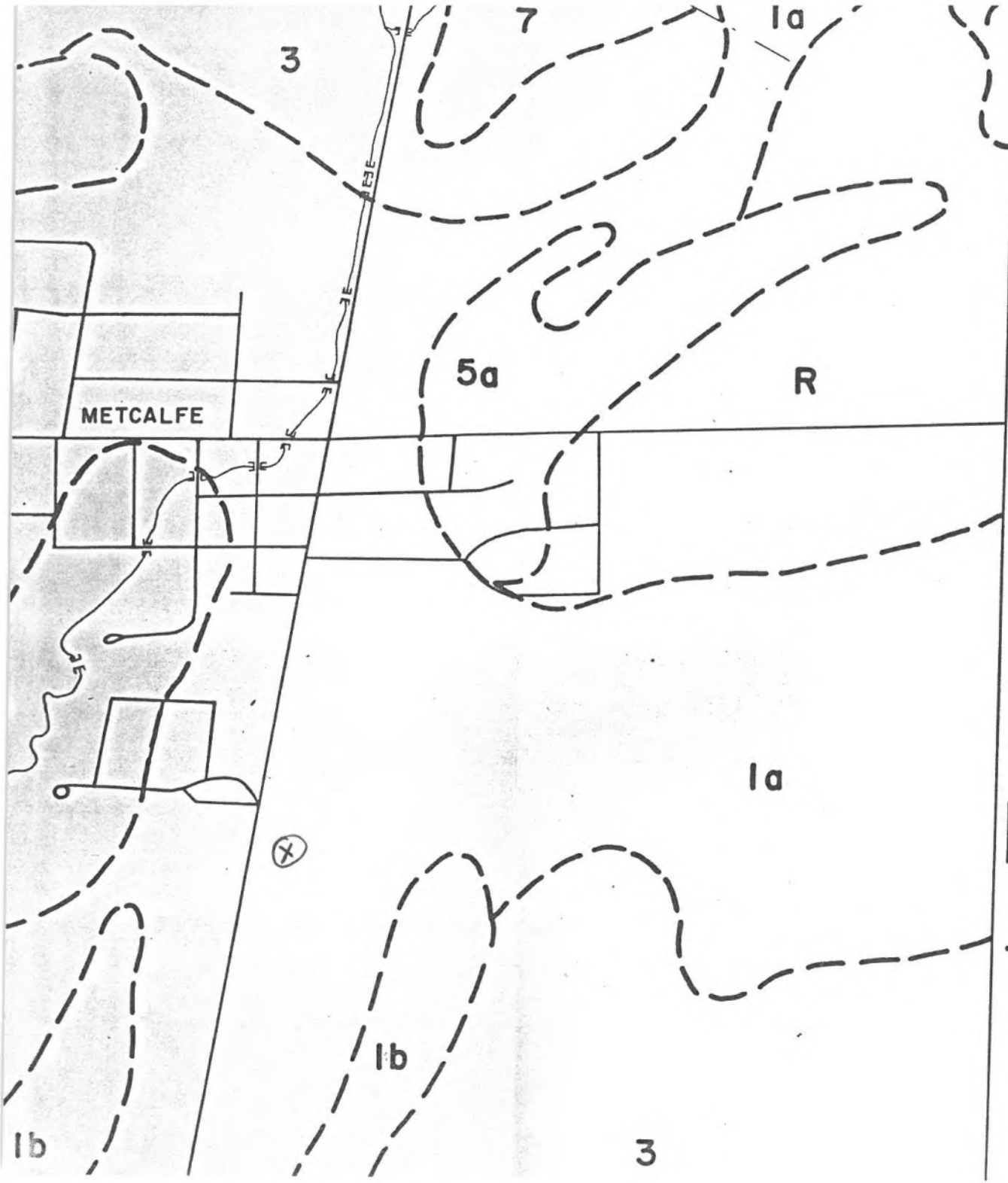
POTENTIOMETRIC SURFACE CONTOUR MAP

METCALFE, ONTARIO

LEGEND

82 — POTENTIOMETRIC SURFACE CONTOUR (metres A.S.L.)

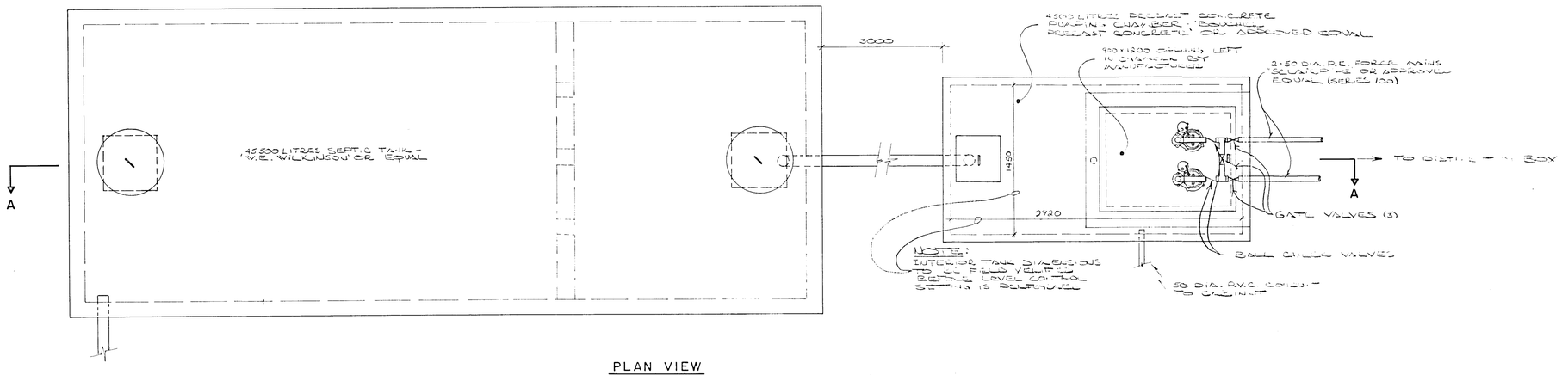
GROUNDWATER FLOW DIRECTION



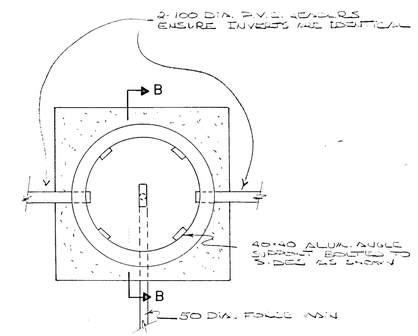
METCALFE, ONTARIO

LEGEND

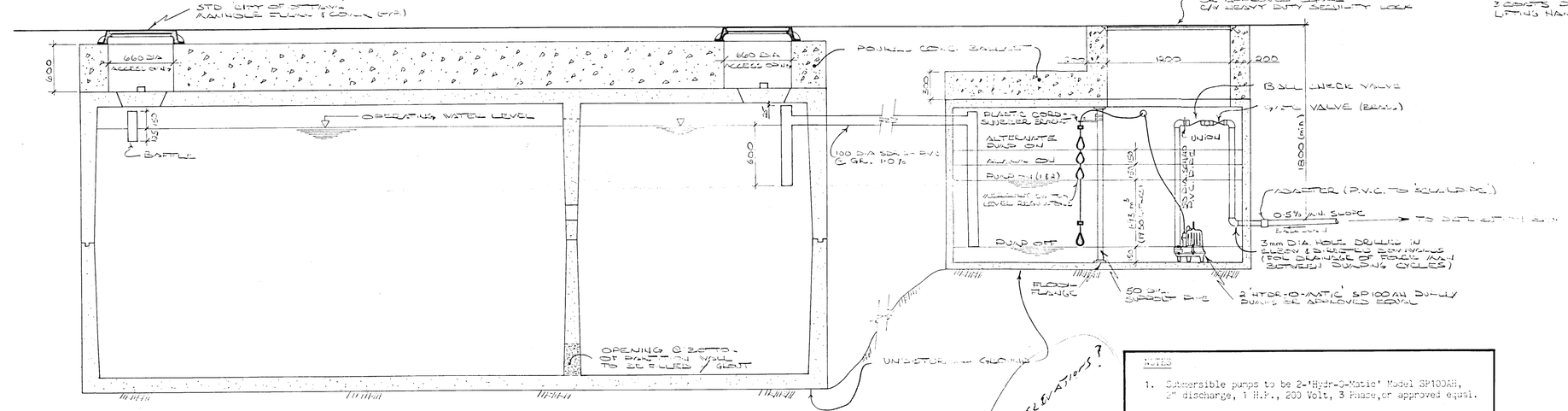
NUMBER	TERRAIN UNIT	DESCRIPTION and DEVELOPMENT POTENTIAL
1a	TILL PLAIN	RELIEF <5m POOR TO GOOD POTENTIAL DEPENDING ON DRAINAGE
1b	TILL DRUMLINS	RELIEF >25m GOOD POTENTIAL
3	SILTY CLAY	OFFSHORE MARINE DEPOSITS POOR TO GOOD POTENTIAL DEPENDING ON DRAINAGE
5a	GRAVEL/SAND BOULDERS	NEARSHORE AND BEACH DEPOSITS EXCELLENT DEVELOPMENT POTENTIAL DUE TO GOOD DRAINAGE AND THICK SAND
7	ORGANIC SOILS	MUCK AND PEAT DEPOSITS NO DEVELOPMENT POSSIBLE
R	BEDROCK	ROCK COVERED WITH THIN VENEER OF SEDIMENTS GENERALLY POOR POTENTIAL DUE TO THIN SOIL COVER
— —	TERRAIN UNIT BOUNDARY	



PLAN VIEW



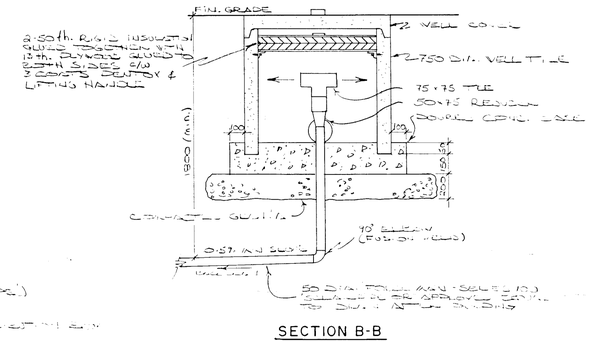
PLAN VIEW



SECTION A-A

SEPTIC TANK & PUMPING CHAMBER DETAIL

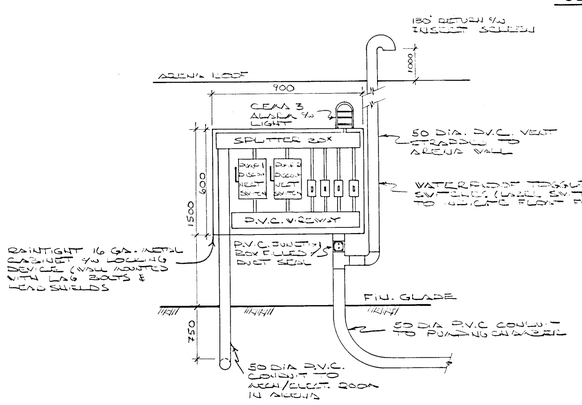
SCALE - 1:25



SECTION B-B

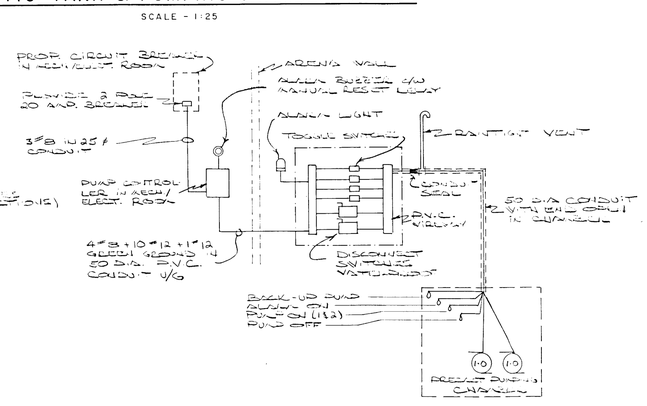
DISTRIBUTION BOX DETAIL

N.T.S.



CABINET DETAIL FOR DISCONNECT SWITCHES

N.T.S.



POWER DISTRIBUTION DIAGRAM

N.T.S.

NOTES

1. Submersible pumps to be 2-'Hydr-O-Matic' Model SP100AH, 4" discharge, 1 H.P., 200 Volt, 3 Phase,or approved equal.
2. Contractor to provide 'Hydr-O-Matic' or approved equal standard duplex pump controls, 3 phase (install in Mech./Elect. Room inside arena complete with audible "buzzer" alarm) for operating pumps in an alternating sequence and activating back up pump and Cema 3 alarm light complete with protective screen and manual reset relay (mounted on top of raintight enclosure.)
3. Pump disconnect switches and separate toggle switches for controls to be located in raintight enclosure mounted on arena wall, adjacent to pump chamber.
4. All wiring shall be splice free from pump chamber to enclosure at arena wall.
5. All piping inside pumping chamber shall be schedule 40 PVC or equal.
6. All voids and any unused knockouts to be filled and made watertight with expandable grout.
7. Contractor to be responsible for complete coordination of electrical and mechanical subcontractors including; connection in Mechanical/Elestrical Room; obtaining Hydro inspection and approval; delivery of duplex pump assembly in working order.

SUBJECT TO M.O.E. APPROVAL

No	DATE	BY	REVISIONS

APP'D

DESIGN S.J.C.
DRAWN M.F.K.
CHECKED S.G.S.

CLIENT: TOWNSHIP OF OSGOODE
PROJECT: METCALFE ARENA-SEPTIC SYSTEM
TITLE: SEPTIC TANK & PUMPING CHAMBER DETAILS

OLIVER MANGIONE McCALLA & ASSOCIATES LIMITED
Consulting Engineers
Nepean, Ontario

DATE: OCTOBER, 1987
SCALE: AS SHOWN
DRAWING NO: 87-5707-SD1
REV.

Hughes-Owens Gestalt

EXISTING TILE BED
(TO BE REMOVED BY OTHERS)

EXISTING SUMP OUTLET

LIMIT OF CONTRACT
(REMOVE EXIST. SEVER)

EXACT LOCATION OF WATER LINE TO BE FIELD DETERMINED

4500 LITRES PUMPING CHAMBER

45,500 LITRES PREFABRICATED SEPTIC TANK

EXIST. 38 DIA. WATER LINE

1/C ELECT. CONDUIT

CABINET FOR DISCONNECT SWITCHES

FILL OLD EXIST. TANK WITH GRANULAR MATERIAL
- LOCATION OF INLET PIPE TO BE FIELD DETERMINED

2-50 DIA. PE FORCE MAINS
SCLAIRPIPE, SERIES 100
OR APPROVED EQUAL

TO MECH./ELECT. ROOM

EXIST. DRILLED WELL

ARENA

ALBERT STREET

CURLING CLUB

EXISTING SEPTIC SYSTEM

BARN

BARN

EXISTING HOLDING TANK

LIONS DEN

LOT 22
LOT 23

EXIST. DRILLED WELL

PRECAST DIST. BOX
c/w 50 mm th. RIGID INSULATION
(TYPICAL)

DISTRIBUTION BOX (TYP.)
(SEE DETAIL)

2 BEDS at 16 RUNS per BED
(8 RUNS per HEADER) 30.0m
LONG - 1.6m c/c

75 DIA. DISTRIBUTION PIPE (TYP)

OUTER LIMIT OF 250 thick MANTLE

SOLID 75 DIA. HEADER

TOE OF 7:1 SLOPE

T1 T2 T3 T4 T5 T6 T7 T8

PP1 PP2

INV. 88.42

INV. 88.27

89.00

88.70

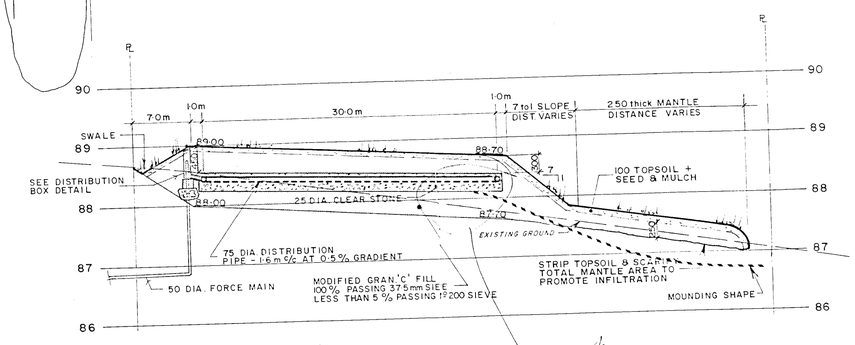
15.0m

7.0m

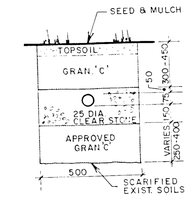
TEST HOLE Nº	DEPTH TO HARDPAN
1	1.81
2	1.95
3	1.65
4	1.46
5	1.56
6	2.25
7	0.65
8	0.60

EXIST. GROUND
TOPSOIL (0.1-0.2m)
SILTY SAND & GRAVEL
HARDPAN
DEPTH AS PER ABOVE TABLE

TYPICAL
SOIL PROFILE



SECTION A-A
SCALE - HORZ. 1:300
VERT. 1:50



TYPICAL
TRENCH DETAIL
N.T.S.

SUBJECT TO
M.O.E. APPROVAL

No.	REVISIONS	DATE	BY

APP'D

DESIGN S.J.C.
DRAWN M.F.K.
CHECKED S.G.S.

CLIENT: TOWNSHIP OF OSGOODE

PROJECT: METCALFE ARENA-SEPTIC SYSTEM

TITLE: SITE PLAN

OLIVER MANGIONE McCALLA & ASSOCIATES LIMITED
Consulting Engineers
Nepean, Ontario

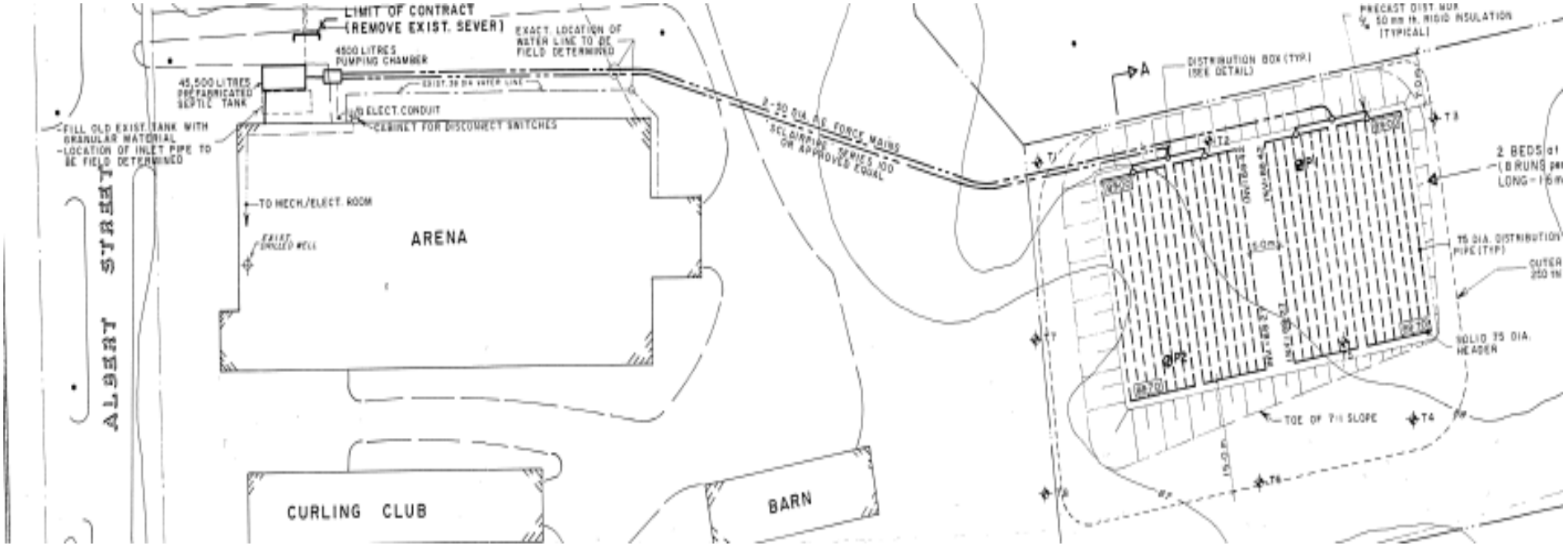
DATE: OCTOBER, 1987

SCALE: 1:500

DRAWING Nº: 87-5707-SSI

REV.

Hughes-Owens Geotim


LIMIT OF CONTRACT
(REMOVE EXIST. SEWER)
4500 LITRES
PUMPING CHAMBER
45,500 LITRES
PREFABRICATED
SEPTIC TANK
EXACT LOCATION OF
WATER LINE TO BE
FIELD DETERMINED
ELECT. CONDUIT
CABINET FOR DISCONNECT SWITCHES
FILL OLD EXIST. TANK WITH
GRANULAR MATERIAL
-LOCATION OF INLET PIPE TO
BE FIELD DETERMINED
TO MECH./ELECT. ROOM
EXIST. DRILLED WELL
ARENA
ALBERT STREET
CURLING CLUB
BARN
DISTRIBUTION BOX (TYP.)
(SEE DETAIL)
TOE OF 7:1 SLOPE
SOLID 75 DIA.
HEADER
75 DIA. DISTRIBUTION
PIPE (TYP.)


rue Van Rens St.
ch. 8th Line Rd.
8248
8250A
2785
2763
Ward/Quartier 20
O'goode
Georges Darouze