

ARVAI DRAIN
Municipality of West Elgin



**SPRIET
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Our Job No. 219204

August 10, 2020

London, Ontario
August 10, 2020

ARVAI DRAIN

Municipality of West Elgin

To the Mayor and Council of
the Municipality of West Elgin

Mayor and Council:

We are pleased to present our report on the reconstruction of the Arvai Municipal Drain serving parts of Lot 18, Concession 9 in the Municipality of West Elgin.

AUTHORIZATION

This report was prepared pursuant to Section 4 of the Drainage Act. Instructions were received from your Municipality with respect to a motion of Council. The work was initiated by a petition signed by the affected landowners.

DRAINAGE AREA

The total watershed area as described above contains approximately 1.85 hectares. The area requiring drainage for the Arvai Drain is described as the lands located within Lot 18, Concession 9, bounded by Ridge Street to the east and the existing residential lands located within the village of West Lorne, located south of Elm Street.

HISTORY

The Arvai Drain is a new municipal drain and, as such, has no history. It is located within the Wilton Drain which was originally constructed pursuant to a report submitted by G.A. McCubbin, P. Eng. dated July 6, 1914 and consisted of the installation of 1,700 lineal feet of 600mm diameter sewer pipe as well as 2,400 lineal feet of open ditch cleanout to provide a sufficient outlet to the new closed drain. The closed drain commenced at the west edge of Graham Street and ran westerly parallel to Chestnut Street through the residential lots to the Wilton Drain open ditch. The drain was constructed to alleviate flooding along Graham Street from its connection point to the north end of the limits of the village. This drain essentially served as the outlet to the village.

EXISTING DRAINAGE CONDITIONS

A site meeting held with respect to the project and through later discussions, the owners reported the following:

- that the requesting landowner, Arvai Developments (Roll No. 1-295), indicated their intention to develop their lands and required a legal outlet to do so



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EXISTING DRAINAGE CONDITIONS

- that the landowner, J. & L. Fischer (Roll No. 1-077), indicated that any drainage works constructed on their lands should not interfere with the development potential along the current residential lands fronting King Street

A field investigation and survey were completed. Upon reviewing our findings, we note the following:

- that the lands are tributary to the Wilton Open Drain located in Lot 15, Concession 9 and has sufficient depth to provide an outlet
- that the lands could be serviced by a drain outletting into the existing Wilton Drain – Open Portion
- that an investigation in using the existing Wilton Drain – Closed Portion was undertaken and determined not to be feasible as its condition could not be properly assessed. Furthermore, the watershed area draining to this drain is not easily determined as it appears to be cross connected with the Graham Street Drain which services a large portion of West Lorne

Preliminary design, cost estimates and assessments were prepared, and informal conversations were held to review the findings and preliminary proposals. Further input and requests were provided by the affected owners at that time and at later dates. Based on the proposed design it was decided to proceed with the report.

DESIGN CONSIDERATIONS

The proposed drain was designed, with respect to capacity, using the storm sewer design methods with a design storm based with a return period of 2 years.

We would like to point out that there have been indications of sandy soil conditions, but no formal soil investigation has been made.

All of the proposed work has been generally designed and shall be constructed in accordance with the DESIGN AND CONSTRUCTION GUIDELINES FOR WORK UNDER THE DRAINAGE ACT.

RECOMMENDATIONS

We are therefore recommending the following:

- that a drain be constructed, to be referred to as the Arvai Drain, commencing at the Main Drain, running north through the lands of J. & L. Fischer (Roll No. 1-077) and Hydro One Networks Inc. (Roll No. 2-560) to its head just within the lands of Arvai Developments Inc. (Roll No. 1-295) for a total length of 306 lineal meters
- that the drains be constructed using sealed HDPE pipe to prevent the inclusion of tree roots and provide a more economical solution than concrete sewer pipe



ENVIRONMENTAL CONSIDERATIONS AND MITIGATION MEASURES

There are no significant wetlands or sensitive areas within the affected watershed area or along the route of the drains. The proposed construction of the Arvai Drain includes quarry stone outlet protection and surface inlets which greatly help reduce the overland surface flows and any subsequent erosion. A temporary flow check of silt fencing is to be installed in the ditch downstream of the tile outlet for the duration of the construction.

SUMMARY OF PROPOSED WORK

The proposed work consists of approximately 306 lineal meters of 375mm (15") diameter HDPE sewer pipe including related appurtenances.

SCHEDULES

Four schedules are attached hereto and form part of this report, being Schedule 'A' - Allowances, Schedule 'B' - Cost Estimate, Schedule 'C' - Assessment for Construction, and Schedule 'D' - Assessment for Maintenance.

Schedule 'A' - Allowances. In accordance with Sections 29 and 30 of the Drainage Act, allowances are provided for right-of-way and damages to lands and crops along the route of the drain as defined below.

Schedule 'B' - Cost Estimate. This schedule provides for a detailed cost estimate of the proposed work which is in the amount of \$ 55,000.00. This estimate includes engineering and administrative costs associated with this project.

Schedule 'C' - Assessment for Construction. This schedule outlines the distribution of the total estimated cost of construction over the roads and lands which are involved.

Schedule 'D' - Assessment for Maintenance. In accordance with Section 38 of the Drainage Act, this schedule outlines the distribution of future repair and/or maintenance costs for portions of, or the entire drainage works.

Drawing No. 1, Job No. 219204, and specifications form part of this report. They show and describe in detail the location and extent of the work to be done and the lands which are affected.

ALLOWANCES

DAMAGES: Section 30 of the Drainage Act provides for the compensation to landowners along the drain for damages to lands and crops caused by the construction of the drain. The amount granted is based on \$3,613.00/ha. for closed drain installed with wheel machine. This base rate is multiplied by the hectares derived from the working widths shown on the plans and the applicable lengths.

RIGHT-OF-WAY Section 29 of the Drainage Act provides for an allowance to the owners whose land must be used for the construction, repair, or future maintenance of a drainage works.



ALLOWANCES (cont'd)

For tile drains where the owners will be able to continue to use the land, the allowance provides for the right to enter upon such lands, and at various times for the purpose of inspecting such drain, removing obstructions, and making repairs. Also, the allowance provides for the restrictions imposed on those lands to protect the right-of-way from obstruction or derogation. The amounts granted for right-of-way on tile drains is based on a percentage of the value of the land designated for future maintenance. Therefore, the amounts granted are based on \$6,670.00/ha. through cropped lands. This value is multiplied by the hectares derived from the width granted for future maintenance and the applicable lengths.

ASSESSMENT DEFINITIONS

In accordance with the Drainage Act, lands that make use of a drainage works are liable for assessment for part of the cost of constructing and maintaining the system. These liabilities are known as benefit, outlet liability and special benefit liability as set out under Sections 22, 23, 24 and 26 of the Act.

BENEFIT as defined in the Drainage Act means the advantages to any lands, roads, buildings or other structures from the construction, improvement, repair or maintenance of a drainage works such as will result in a higher market value or increased crop production or improved appearance or better control of surface or sub-surface water, or any other advantages relating to the betterment of lands, roads, buildings or other structures.

OUTLET liability is assessed to lands or roads that may make use of a drainage works as an outlet either directly or indirectly through the medium of any other drainage works or of a swale, ravine, creek or watercourse.

In addition, a Public Utility or Road Authority shall be assessed for and pay all the increased cost to a drainage works due to the construction and operation of the Public Utility or Road Authority. This may be shown as either benefit or special assessment.

ASSESSMENT

A modified "Todgham Method" was used to calculate the assessments shown on Schedule 'C'- Assessment for Construction. This entailed breaking down the costs of the drain into sections along its route. Special Assessments were then extracted from each section.

The remainder is then separated into Benefit and Outlet costs. The Benefit cost is distributed to those properties receiving benefit as defined under "Assessment Definitions", with such properties usually being located along or close to the route of the drain. The Outlet Costs are distributed to all properties within the watershed area of that section on an adjusted basis. The areas are adjusted for location along that section, and relative run-off rates. Due to their different relative run-off rates, forested lands have been assessed for outlet at lower rates than cleared lands. Also, roads and residential properties have been assessed for outlet at higher rates than cleared farmlands. It should be noted that the cost of agricultural design was assessed to all lands within the watershed area with increased costs to obtain a 2-year design standard to the developable lands and roadway.



ASSESSMENT (cont'd)

The actual cost of the work involving this report, with the exception of Special Assessments, is to be assessed on a pro-rata basis against the lands and roads liable for assessment for benefit and outlet and for special assessments as shown in detail below and on Schedule 'C' - Assessment for Construction. The Special Assessments shall be levied as noted in the Section "Special Assessment".

SPECIAL ASSESSMENT

If any additional work is required to the drainage works due to the existence of buried utilities such as gas pipe lines, communications cables, etc. or if any of the utilities require relocation or repair, then, the extra costs incurred shall be borne by the utility involved in accordance with the provisions of Section 26 of the Drainage Act.

GRANTS

In accordance with the provisions of Section 85 of the Drainage Act, a grant **may** be available for assessments against privately owned parcels of land which are used for agricultural purposes and eligible for the Farm Property Class Tax rate. Assessments to agricultural lands are based on an agricultural 38.1mm design. Section 88 of the Drainage Act directs the Municipality to make application for this grant upon certification of completion of this drain. The Municipality will then deduct the grant from the assessments prior to collecting the final assessments.

MAINTENANCE

Upon completion of construction, all owners are hereby made aware of Sections 80 and 82 of the Drainage Act which forbid the obstruction of or damage or injury to a municipal drain.

After completion, the Arvai Drain, including the existing drain, shall be maintained by the Municipality of West Elgin at the expense of all upstream lands and roads assessed in Schedule 'D' - Assessment for Maintenance and in the same relative proportions until such time as the assessment is changed under the Drainage Act.

Respectfully submitted,

SPRIET ASSOCIATES LONDON LIMITED

JMS:bv



J.M. Spriet, P.Eng.



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SCHEDULE 'A' - ALLOWANCES

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In accordance with Sections 29 and 30 of the Drainage Act, we determine the allowances payable to owners entitled thereto as follows:

CONCESSION	LOT	ROLL NUMBER (Owner)	Section 29 Right-of-Way	Section 30 Damages	TOTALS
MAIN DRAIN					
4	Pt. 18	1-077 (J. & L. Fischer)	\$ 1,850.00	\$ 1,500.00	\$ 3,350.00
4	Pt. 18	1-295 (Arvai Developments Inc)	40.00	30.00	70.00
Total Allowances			\$ 1,890.00	\$ 1,530.00	\$ 3,420.00
TOTAL ALLOWANCES ON THE MAIN DRAIN			\$ 3,420.00		

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We have made an estimate of the cost of the proposed work which is outlined in detail as follows:

MAIN DRAIN

6 meters of 375mm dia., H.D.P.E. plastic sewer pipe including rodent gate,
quarry stone rip-rap protection around pipe and end of ditch
(Approximately 6m³ quarry stone req'd)

Supply	\$	400.00
Installation	\$	800.00

Installation of the following HDPE sewer pipe, including granular bedding
300 meters of 375mm dia. HDPE sewer pipe

\$ 13,500.00

Supply of the above listed pipe

\$ 15,000.00

Strip, stockpile and relevel topsoil from tile trench and adjacent working area
(4m wide) specified on drawings (approx. 306m)

\$ 1,800.00

Supply and install one 600mm x 600mm ditch inlet catchbasin online
complete with berm, grate and ditching

\$ 1,800.00

Exposing and locating existing tile drains and utilities

\$ 500.00

Tile connections and contingencies

\$ 1,200.00

Allowances under Sections 29 & 30 of the Drainage Act

\$ 3,420.00

ADMINISTRATION

Interest and Net Harmonized Sales Tax

\$ 1,230.00

Survey, Plan and Final Report

\$ 12,500.00

Expenses

\$ 1,090.00

Supervision and Final Inspection

\$ 1,760.00

TOTAL ESTIMATED COST

\$ 55,000.00

CON.	LOT	HECTARES AFFECTED	ROLL No. (OWNER)	BENEFIT	OUTLET	TOTAL
MAIN DRAIN						
4	Pt. 18	0.25	1-077 (J. & L. Fischer)	9,490.00	382.00	9,872.00
* 4	Pt. 18	0.06	1-095 (N. & M. McColl)		352.00	352.00
* 4	Pt. 18	0.06	1-095-02 (J. & K. Kelly)		323.00	323.00
* 4	Pt. 18	0.05	1-095-03 (J. & J. Prince)		294.00	294.00
* 4	Pt. 18	0.04	1-095-04 (L. & N. Labadie)		235.00	235.00
* 4	Pt. 18	0.05	1-095-05 (J. & M. Da Mota)		294.00	294.00
* 4	Pt. 18	0.05	1-119 (D. Kekys)		294.00	294.00
* 4	Pt. 18	0.05	1-296 (J. Dias & D. Oliveira)		176.00	176.00
* 4	Pt. 18	0.02	1-081 (R. Boodram)		60.00	60.00
* 4	Pt. 18	0.67	1-295 (Arvai Developments Inc)	17,310.00	16,439.00	33,749.00
* 4	Pt. 18	0.45	2-560 (Hydro One Networks Inc)	3,060.00	1,997.00	5,057.00
TOTAL ASSESSMENT ON LANDS				\$ 29,860.00	\$ 20,846.00	\$ 50,706.00
* Ridge Street	0.10	Municipality of West Elgin		\$	\$ 4,294.00	\$ 4,294.00
TOTAL ASSESSMENT ON ROADS				\$	\$ 4,294.00	\$ 4,294.00
TOTAL ASSESSMENT ON THE MAIN DRAIN						\$ 55,000.00

SCHEDULE 'D' - ASSESSMENT FOR MAINTENANCE

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CON.	LOT	HECTARES AFFECTED	ROLL No. (OWNER)	PERCENTAGE OF MAINTENANCE COST
MAIN DRAIN				
4	Pt. 18	0.25	1-077 (J. & L. Fischer)	12.8 %
4	Pt. 18	0.06	1-095 (N. & M. McColl)	0.9
4	Pt. 18	0.06	1-095-02 (J. & K. Kelly)	0.8
4	Pt. 18	0.05	1-095-03 (J. & J. Prince)	0.7
4	Pt. 18	0.04	1-095-04 (L. & N. Labadie)	0.6
4	Pt. 18	0.05	1-095-05 (J. & M. Da Mota)	0.7
4	Pt. 18	0.05	1-119 (D. Kekys)	0.7
4	Pt. 18	0.05	1-296 (J. Dias & D. Oliveira)	0.4
4	Pt. 18	0.02	1-081 (R. Boodram)	0.1
4	Pt. 18	0.67	1-295 (Arvai Developments Inc)	62.6
4	Pt. 18	0.45	2-560 (Hydro One Networks Inc)	8.8
				=====
TOTAL ASSESSMENT ON LANDS				89.1 %
				=====
Ridge Street		0.10	Municipality of West Elgin	10.9 %
				=====
TOTAL ASSESSMENT ON ROADS				10.9 %
				=====
TOTAL ASSESSMENT FOR MAINTENANCE OF THE MAIN DRAIN				<u>100.0 %</u>

SCHEDULE OF NET ASSESSMENT

ARVAI DRAIN

Municipality of West Elgin

(FOR INFORMATION PURPOSES ONLY)

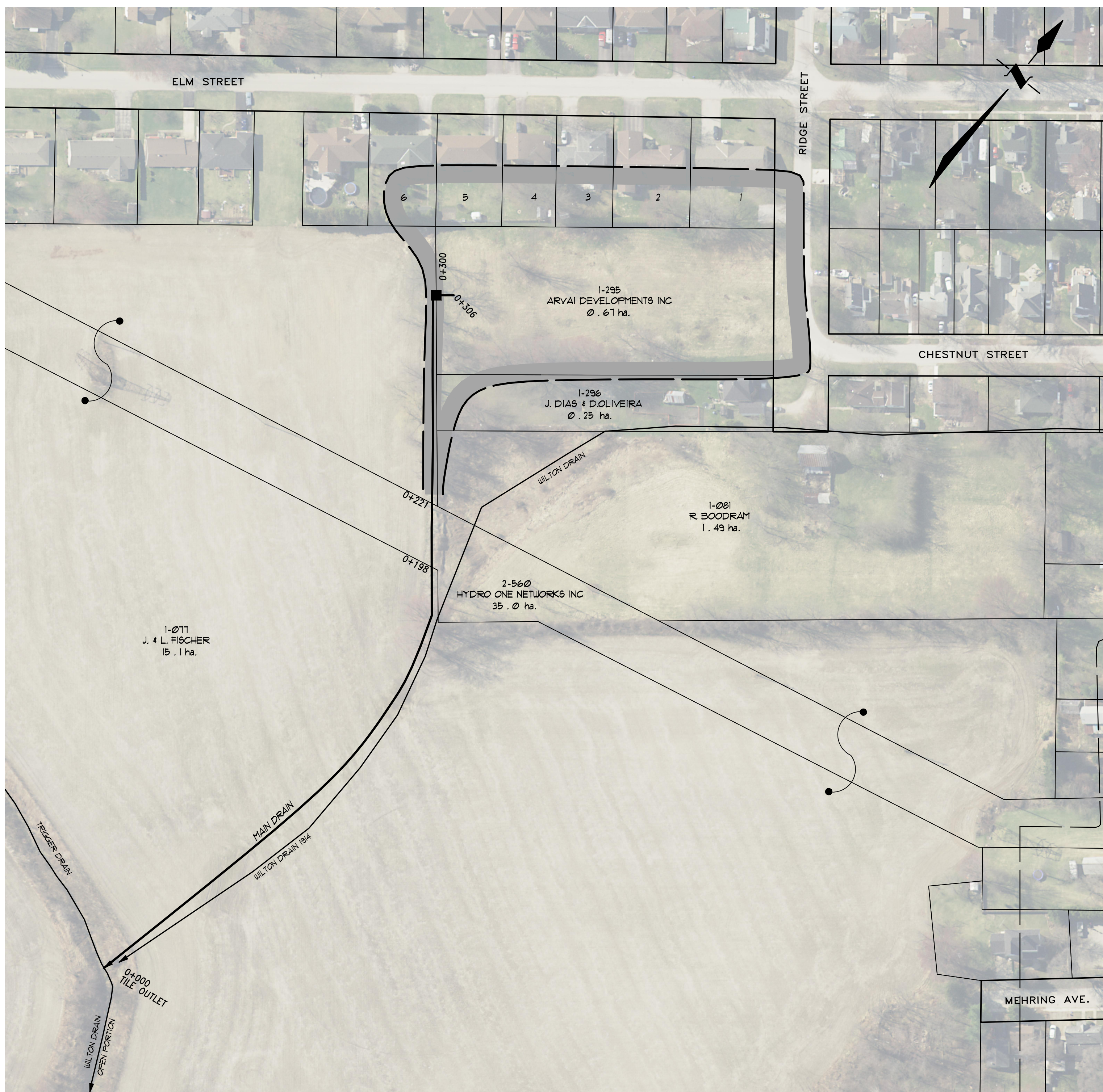
Job No. 219204

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* = Non-agricultural

ROLL NUMBER (OWNER)	TOTAL ASSESSMENT	GRANT	ALLOWANCES	APPROX. NET
1-077 (J. & L. Fischer)	\$ 9,872.00	\$ 3,291.00	\$ 3,350.00	\$ 3,231.00
* 1-095 (N. & M. McColl)	352.00			352.00
* 1-095-02 (J. & K. Kelly)	323.00			323.00
* 1-095-03 (J. & J. Prince)	294.00			294.00
* 1-095-04 (L. & N. Labadie)	235.00			235.00
* 1-095-05 (J. & M. Da Mota)	294.00			294.00
* 1-119 (D. Kekys)	294.00			294.00
* 1-296 (J. Dias & D. Oliveira)	176.00			176.00
* 1-081 (R. Boodram)	60.00			60.00
* 1-295 (Arvai Developments Inc)	33,749.00		70.00	33,679.00
* 2-560 (Hydro One Networks Inc)	5,057.00			5,057.00
* Ridge Street	\$ 4,294.00	\$	\$	\$ 4,294.00
TOTALS	\$ 55,000.00	\$ 3,291.00	\$ 3,420.00	\$ 48,289.00

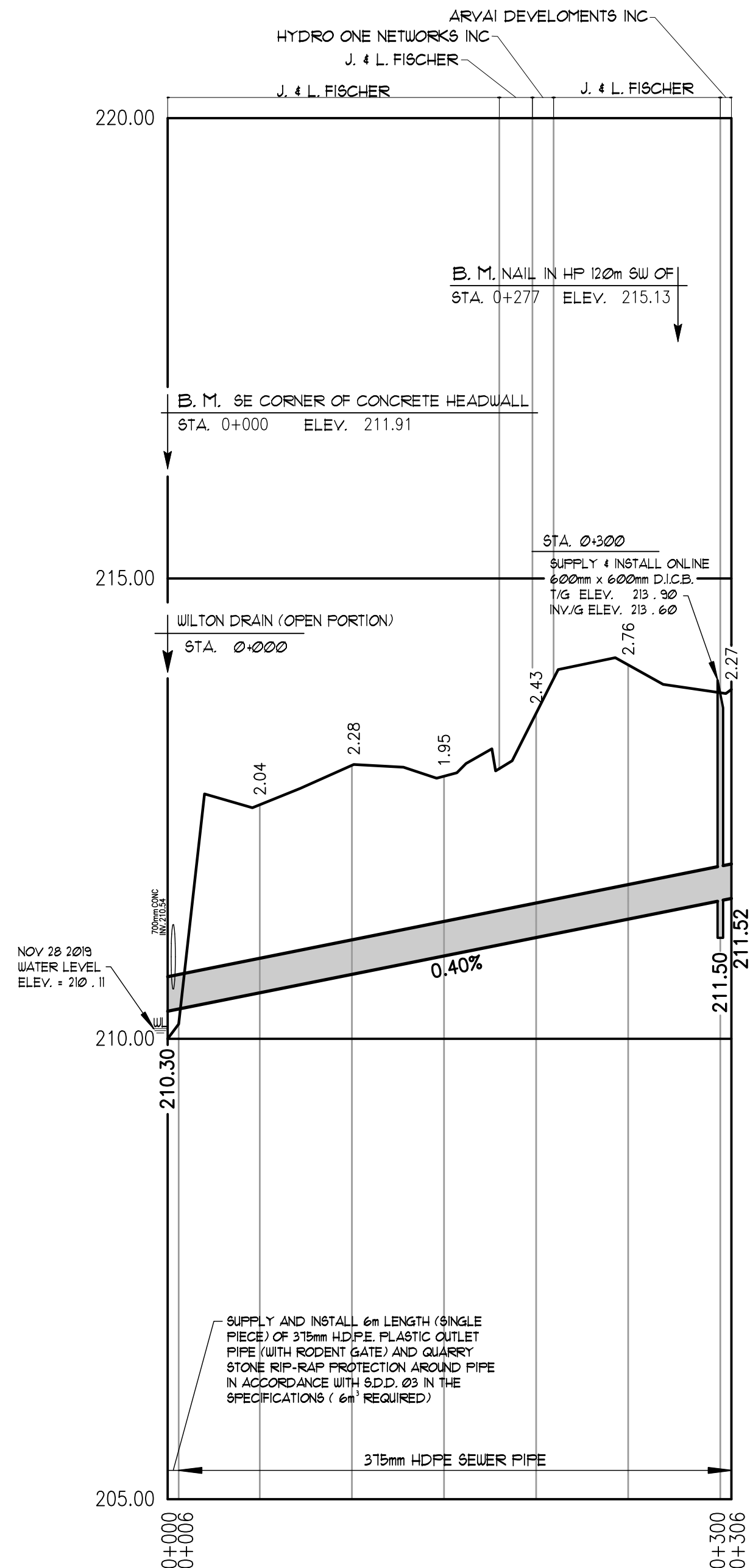
LOT 18



PLAN SCALE 1 : 1,000

LOT LEGEND		
ROLL No.	OWNERSHIP	HECTARES OWNED
1) 1-095	N. & M. MCCOLL	0.12
2) 1-095-02	J. & K. KELLY	0.11
3) 1-095-03	J. & J. PRINCE	0.08
4) 1-095-04	L. & N. LABADIE	0.08
5) 1-095-05	J. & M. DA MOTA	0.10
6) 1-119	D. KEKYS	0.10

PLAN LEGEND	
	LIMIT OF WATERSHED AREA
	PROPOSED DRAINAGE WORKS
	EXTERIOR OR INTERIOR WATERSHED
	TO BE INCLUDED FOR FUTURE MAINTENANCE
	EXIST. MUNICIPAL DRAIN
	PRIVATE TILE OR SURFACE WATER RUN
	EXIST. WATERCOURSE OR PRIVATE DITCH
10 - 023 J. 04TH 40.9 ha. HECTARES OWNED	



MAIN DRAIN

SCALE : HOR 1 : 2,500
VERT. 1 : 50

GENERAL NOTES

- 1/ OUR SPECIFICATIONS DATED JANUARY 2020 APPLY TO THIS PROJECT.
 - 2/ THE WORKING WIDTH AVAILABLE TO THE CONTRACTOR TO CONSTRUCT THE NEW DRAINS SHALL CONSIST OF THOSE LANDS IMMEDIATELY ADJACENT TO THE DRAIN AND CONNECTIONS AND SHALL NOT EXCEED THE FOLLOWING AVERAGE WIDTHS:
CLOSED PORTIONS : 15 meters
THE WORKING WIDTH FOR PURPOSES OF FUTURE MAINTENANCE SHALL BE 10m.
 - 3/ ALL OWNERS ALONG THE COURSE OF THE DRAIN SHALL MAKE AN ACCESS ROUTE FROM THE NEAREST ROAD TO THE DRAIN LOCATION AVAILABLE TO THE CONTRACTOR THE AVERAGE WIDTH OF THIS ROUTE SHALL NOT EXCEED 8 METERS. THE ACCESS ROUTE SHALL ALSO APPLY FOR FUTURE MAINTENANCE PURPOSES.
 - 4/ a) ALL UTILITIES TO BE LOCATED AND EXPOSED PRIOR TO CONSTRUCTION SO THAT THE NEW TILE GRADES CAN BE CONFIRMED. IF THERE IS A CONFLICT IN ELEVATION BETWEEN THE PROPOSED DRAIN AND THE UTILITY, THE ENGINEER IS TO BE NOTIFIED IMMEDIATELY.
b) CONTRACTOR TO NOTIFY ALL UTILITIES 12 HOURS PRIOR TO HIS SCHEDULED TIME FOR STARTING THE ABOVE WORK.
c) THE COST FOR THIS WORK SHALL BE INCLUDED IN THE ITEM ON THE EXTENT OF WORK AND NO EXTRA PAYMENT SHALL BE MADE TO THE CONTRACTOR, EXCEPT IF ROAD RESTORATION IS REQUIRED.
 - 5/ ALL TREES, SCRUB, BRUSH, ETC. TO BE CLEARED AND GRUBBED IN ACCORDANCE WITH 'SECTION B.3 AND C.4' SPECIFICATIONS.
 - 6/ RIP-RAP TO BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH 'SECTION A.12' IN THE SPECIFICATIONS.
 - 7/ TURF REINFORCEMENT MAT SHALL BE 'NORTH AMERICAN GREEN C 350' OR APPROVED EQUAL. MAT SHALL BE INSTALLED ON SEDED BANK IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS WITH THE FOLLOWING EXCEPTIONS:
a) STAPLES TO BE 200mm LONG AND SHALL BE INSTALLED TO MANUFACTURER'S 'D' PATTERN
b) MAT TO BE KEYED 300mm BELOW DITCH BOTTOM, 200mm INTO BANK SLOPE AT UPSTREAM LIMIT AND SHALL BE STAPLED 200mm BELOW TOE OF BANK.
 - 8/ CONTRACTOR TO ARRANGE A PRE-CONSTRUCTION MEETING WITH THE ENGINEER, DRAINAGE SUPERINTENDENT, AND THE AFFECTED OWNERS. ALL PARTIES SHALL RECEIVE 48 HOURS NOTICE TO THE MEETING.
- ### CLOSED PORTIONS
- 9/ ALL CONCRETE AND PLASTIC TILE AND PIPE TO CONFORM TO 'SECTION C.1' IN THE SPECIFICATIONS.
a) SEWER PIPE TO BE H.D.P.E. PLASTIC 320 KPA (BELL & SPIGOT WITH RUBBER GASKETS, CONFORMING TO CSA 1026-08), PVC ULTRA RIB OR PVC SDR 35
 - 10/ ALL CATCHBASINS SHALL BE SUPPLIED AND INSTALLED IN ACCORDANCE WITH 'SECTION C.16' IN THE SPECIFICATIONS, EXCEPT AS FOLLOWS:
 - 11/ EXACT LOCATION OF NEW DRAIN TO BE DETERMINED AT TIME OF CONSTRUCTION BY DRAINAGE SUPERINTENDENT OR ENGINEER.
 - 12/ SILT FENCE TO BE PLACED ACROSS DITCH BOTTOM AT STA. 0+000 DURING CONSTRUCTION TO PREVENT SILT FROM FLUSHING DOWNSTREAM, AND ARE TO BE MAINTAINED AS NECESSARY DURING CONSTRUCTION. SILT FENCE AND SILT TO BE REMOVED AND DISPOSED OF AFTER CONSTRUCTION.

ARVAI DRAIN			
Municipality of West Elgin			
Drainage Superintendent: TOM MOHAN 519-785-0560		No.	REVISIONS
Date: AUG. 10, 2020		Field Book G.F.S.	JOB No. 219204
Drawing No. 1 of 1		PLAN, PROFILE, & DETAIL	
SPRIET ASSOCIATES LIMITED LONDON CONSULTING ENGINEERS 155 YORK STREET - LONDON (519) 672-4100 - NEA 1A8			