

Amendment to the
Engineer's Report for the
Van Gaal Municipal Drain

Prepared For:



Prepared By:

Robinson Consultants Inc.
Consulting Engineers

Our Project No. 13056
January 2019

January 14th, 2019

Mayor and Members of Council
City of Ottawa
110 Laurier Avenue West
Ottawa, ON K1P 1J1

Attention: **Mr. Rick O'Connor**
 City Clerk

Reference: **Amendment to the Engineer's Report**
 Van Gaal Municipal Drain
 Richmond, Rideau - Goulbourn Ward
 Our Project No. 13056

Dear Sir:

This Amendment to the Engineer's Report for the Van Gaal Municipal Drain, Rideau-Goulbourn Ward, which is respectfully submitted for Council's consideration, was initiated by the City of Ottawa under Section 78 of the Drainage Act, RSO 1990. The purpose of the report is to accommodate a change in land use from rural/agricultural to urban development for portions of the lands within the drainage area of the Van Gaal Municipal Drain. This Report makes modifications to the existing Engineer's Report entitled "Engineer's Report Van Gaal Municipal Drain", July 2003, by Robinson Consultants Inc. All sections of the Van Gaal Municipal Drain including the unmodified portions of the West Main Drain and East Main Drain are incorporated and governed by this report. The Arbuckle Award Drain remains tributary to the Van Gaal Municipal Drain, but is not modified by this report and, will continue to be governed by the applicable Engineer's Report and the Ontario Drainage Act, R.S.O. 1990 with regard this type of drain. All above noted sections of the Van Gaal Municipal Drain and its tributaries outlet to the Arbuckle Municipal Drain south of Perth Street and ultimately to the Jock River – the Arbuckle Municipal Drain is not modified by this Report.

All costs associated with this Engineer's Report will be assessed to the owners/developers of the lands identified as Block N1 and N3 on Dwg. No. 13056-A4. Modifications to the Van Gaal Municipal Drain will be completed by the developer in advance of the development of the lands at the developer's expense.

If you have any questions, please feel free to contact the undersigned at 613-592-6060 extension 104.

Yours very truly,

ROBINSON CONSULTANTS INC.

A handwritten signature in black ink, appearing to read 'A.J. Robinson', with a long horizontal flourish extending to the right.

A.J. Robinson, P.Eng.
Drainage Engineer

AJR: plw

c.c. David Ryan, P. Geo., Municipal Drainage Manager/Drainage Superintendent,
City of Ottawa

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1.0 INTRODUCTION

Robinson Consultants Inc. was appointed by the City of Ottawa on September 13, 2013 to complete an Engineer's Report to amend the existing Engineer's Report for the Van Gaal Municipal Drain. The Amendment to the Engineer's Report for the modifications to the Municipal Drain was initiated by the City of Ottawa under Section 78 of the Drainage Act at the request of the developers/landowners of the lands within the development area.

1.1 History

The existing Van Gaal Municipal Drain in the geographic Township of Goulbourn is divided into two parts known as the West Main Drain and East Main Drain. The East and West Main Drains were improved by the report of A. J. Graham Engineering Consultants Lt. dated December 1971. The Van Gaal Municipal Drain was last improved under an Engineer's Report by Robinson Consultants Inc., dated July 2003. The East Main Drain and the portions of the West Main Drain are not altered by this new report, however, these portions are incorporated into this report and will now be governed by this Report. A copy of the unaffected portions of the profile and cross-sections for the West Main and East Main drains as incorporated are provided in **Appendix A**.

Portions of the "Arbuckle Award Drain" (upstream of the Van Gaal Municipal Drain) remain tributary to the limit of construction for the Van Gaal Municipal Drain. The Award Drain was constructed in the late 1800's. We have not been able to locate original documentation for this drain, however, we are of the understanding that this portion of the Award Drain will continue to have status under the applicable legislation and will not be affected by this report.

1.2 On-Site Meeting

An on-site meeting of the affected landowners and concerned parties was held on December 4, 2013.

2.0 PURPOSE OF THE AMENDMENT REPORT

The City of Ottawa initiated the Amendment to the Engineer's Report under Section 78 of the Drainage Act, RSO 1990, in conjunction with the development of lands within the drainage area. The purpose of the Report is to accommodate the change in land use from rural/agricultural to urban development for the lands identified as Block N (N1 through N5) on Dwg. No. 13056-A4.

To accommodate these changes, amendments are required to the existing Engineer's Report, entitled "Engineer's Report Van Gaal Municipal Drain", July 2003, by Robinson Consultants Inc. The amendment includes modifications to portions of the main drain.

Modifications are as detailed in the followings sections.

2.1 Modifications – Main Drain

Modifications to the existing Van Gaal Municipal Drain include relocating the drain, lowering the profile and increasing the cross-section of the drain to accommodate the proposed drainage and stormwater management systems for the development area.

2.2 Modifications to the West Main Drain

The existing West Main Drain between Station 1+754 and Station 1+935 of the Van Gaal Municipal Drain is abandoned. The West Main Drain will now connect to the Van Gaal Municipal Drain at Station 0+281.30.

3.0 EXISTING CONDITIONS

3.1 Location of the Drain

The portion of the main drain as identified by this Report commences at the southerly limit of the proposed subdivision at Station 0+000 on Sheet CH-1 of Project No. 11-468 by David Shaeffer Engineering Ltd (DSEL). Modifications to the existing drain commence at this location and continue downstream for 933.4 metres, terminating at the north end of the existing culvert under Perth Street tying into the existing drain, identified as Station 0+933.372 on DSEL Sheet. No. CH-4, Project 11-468.

The location of the drain is shown on the Location Plan - **Figure 3.1**.

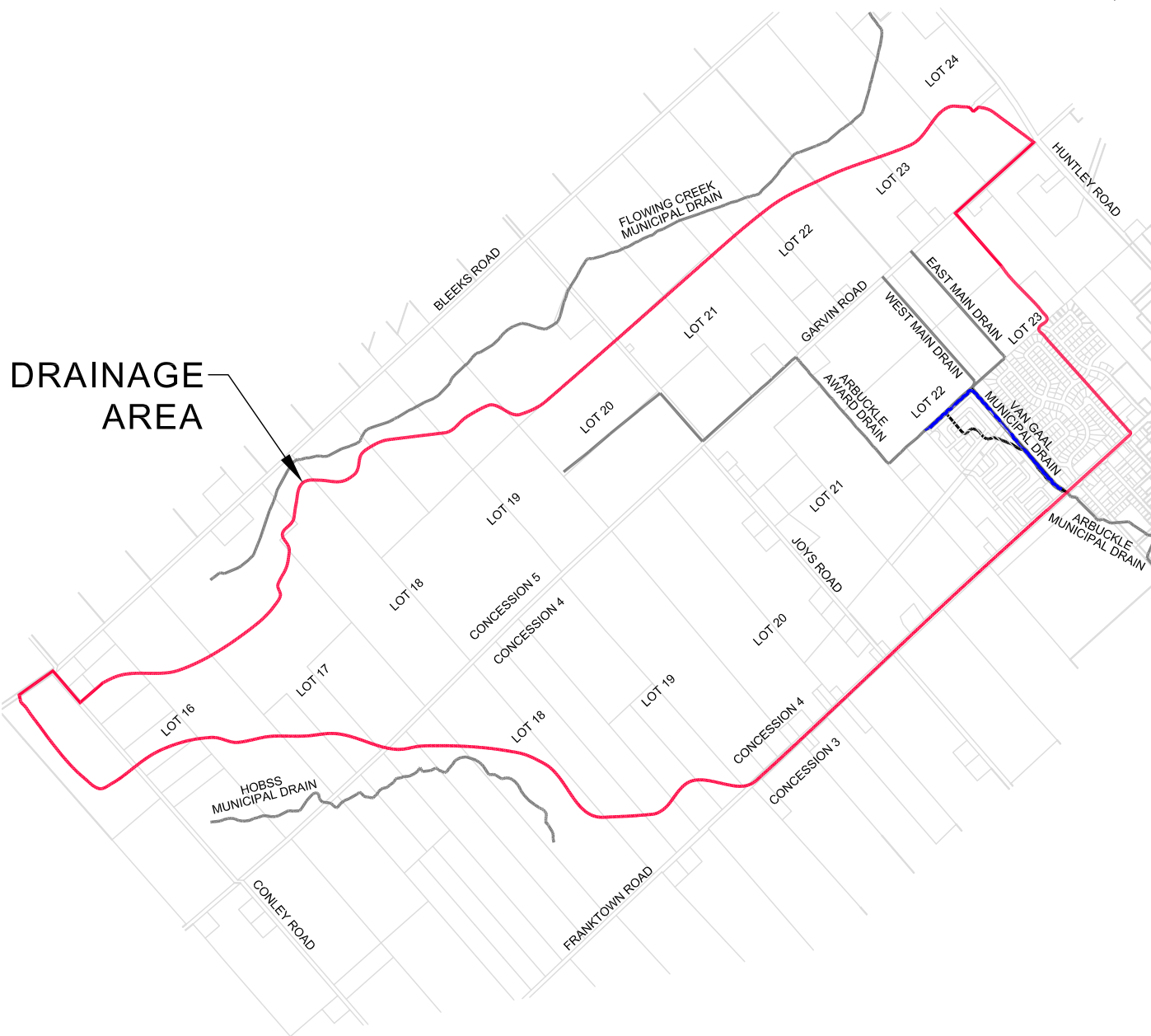
3.2 Drainage Basin and Limits

The drainage area of the Van Gaal Municipal drain is approximately 807 hectares (1,994 acres). The limits of the drainage boundary (drainage basin) are shown on Dwg. No. 13056-A1. These limits have been determined by the drainage design of the proposed development and the drainage area boundaries of adjacent drains.

The drainage basin lies within Part of Lots 15 to 24, Concession V and Part of Lots 17 to 23, Concession IV former Township of Goulbourn, City of Ottawa.

3.3 Drawings Forming Part of the Engineer's Report

Dwg. No. 13056-A1 has been prepared showing the drainage area boundary, the proposed drain, the area that forms Block N (N1 through N5) and Block O (O1 through O3), as well as existing Block M from the July 2003 Engineer's Report by Robinson Consultants Inc. Proposed main internal property lines and streets (individual lots for Block N) are shown on Dwg. No. 13056-A1. Proposed lotting is not currently available for Block O, however, it is anticipated that this area will be included in the urban development.



DRAINAGE
AREA

Robinson
Consultants

Title		LOCATION PLAN		Fig. No.
Project		VAN GAAL MUNICIPAL DRAIN		3.1
		Scale	NTS	Job No.
				13056
				Date
				JANUARY 2019

Dwg. No. 13056-A2 shows the proposed realignment of the drain as well as the original alignment (to be abandoned) in greater detail.

Dwg. No. 13056-A3 shows individual properties that form part of the drainage area indicating an ID number for reference to the Schedules of Assessment, and the hectareage that forms part of the drainage area.

Dwg. No. 13056-A4 shows the existing Block M, and the proposed Block N and Block O in detail, including the sub-block breakdown for N1-N5 (inclusive) and O1-O3 (inclusive)

Dwg. No. 00063-P1, "Drain Profile – West Main Drain" and Dwg. No. 00063-P2 "Drain Profile – East Main Drain" show the profile for portions of the existing branch drains as per the 2003 Robinson Consultants Inc. Engineer's Report that are now incorporated and form part of this Report and the associated by-law (when passed).

The drawings as noted above are attached to this report in **Appendix A**.

Detailed design plan/profile drawings, channel cross-sections and siltation control plan for the modifications to the main drain are included in the Engineering/Design drawings for the proposed development including Sheets No. CH-1 through CH-6 of Project No. 11-468, Revision No. 5, prepared by David Schaeffer Engineering Ltd. Detail planting plans for Van Gaal Drain Channel Re-alignment, Sheets P1 through P3 and No. D2, Revision No. 8, prepared by NAK Design Strategies complete the drawings of the alterations to the Van Gaal Municipal Drain. The drawings for the alterations and re-alignment of the Van Gaal Municipal Drain are provided in **Appendix B**.

4.0 DESIGN CONSIDERATIONS

The drainage design within Block N and for the alterations to the Van Gaal Municipal Drain was completed by David Schaeffer Engineering Ltd. as the engineer retained for the development of the lands in question, and approved by the City of Ottawa and the Rideau Valley Conservation Authority in conjunction with the development application process. David Schaeffer Engineering Ltd. also has the responsibility to obtain approvals or permits from Ministry of Natural Resources and Forestry, Department of Fisheries and Oceans and other agencies as required.

4.1 Hydrology, Hydraulics and Channel Design

The hydrological and hydraulic analysis for the proposed re-alignment of the Van Gaal Municipal Drain is included in the report entitled Richmond Village Development -- Proposed Re-alignment of Van Gaal Drain, J. F. Sabourin and Associates Inc., April 20, 2017. The final design of the configuration of the proposed re-alignment is included in the report entitled Natural Channel Design: Van Gaal Drain, Richmond Village Development, Richmond, On, Coldwater Consultants Ltd., 23 February, 2017.

Hydrology and Hydraulics associated with the design and the design of the Channel Re-alignment has been completed by or on behalf of David Schaeffer Engineering Ltd., and it is the responsibility of that firm to insure that all approvals are in place.

4.2 Existing and Proposed Culverts

There are no culverts required in the relocated Van Gaal Municipal Drain.

4.3 Drain Relocation and Abandonment

The portion of the existing West Main Van Gaal Municipal Drain between Stations 1+000 and 1+784 on Dwg. No. 00063-P1 of the 2003 Robinson Consultants Inc. report will be abandoned and replaced by the re-aligned Van Gaal Municipal Drain on Sheets CH-1 through CH-4, Project 11-468, Revision No. 5 by David Schaeffer Engineering Ltd.

A section of the West Main Drain (Van Gaal) Municipal Drain will be abandoned between Station 1+784 and 1+935 on Dwg. No. 00063-P2 of the 2003 Robinson Consultants Inc. report. The West Main Drain and East Main Drain will connect to the re-aligned Van Gaal Municipal Drain at the new centre line Station 0+281.30, Sheet CH-2, Project 11-468 by David Schaeffer Engineering Ltd.

5.0 CONSTRUCTION

All required construction within the proposed development area will be completed in conjunction with the development of the lands within the subdivision at the cost of the developer. All excavated material will be addressed as per the development approval conditions. Access will be required for construction equipment on the west and south side adjacent to the drain. Due to the nature and extent of the proposed work, additional access may also be required on the North and East side adjacent to the drain

6.0 ASSESSMENTS

6.1 General

The Drainage Act requires that the total estimated cost be assessed against the affected lands and roads under the categories of benefit (Section 22), outlet liability (Section 23), injuring liability (Section 23), special benefit (Section 24) and special assessment of public utility or road authority (Section 26). On this project there is no assessment for injuring liability.

6.2 Benefit

Benefit by definition under the Drainage Act, RSO 1990 is the “advantages to any lands, roads, building 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 subsurface water, or any other advantages relating to the betterment of lands, roads, buildings, or other structures”.

6.3 Outlet

Lands and roads that may be assessable for outlet liability are those lands that use a drainage works as an outlet or for which after construction or improvement of the drainage works an improved outlet is provided. The outlet or improved outlet may be provided either directly or indirectly through any drainage works, overland flow, swale, ravine, creek or watercourse. Assessment for outlet is based on location, area and rate of flow.

6.4 Special Benefit/Special Assessment

Special Benefit by definition under the Drainage Act, RSO 1990 is “any additional work or feature included in the construction, repair or improvement of a drainage works that has no effect on the functioning of the drainage works.” A Special Benefit Assessment and/or a Special Assessment is charged against any owner, public utility, agency, authority or municipality for which special consideration was required to accommodate special design consideration or a special feature.

For the portion of the drain within the development area all costs associated with the initial design, construction, allowances, other costs and the Engineer's Report are assessed as a Special Assessment to the owner(s) of the lands in Block N (N1 and N3), as shown on Dwg. 13056-A4.

The proposed realignment and construction of the Van Gaal Municipal Drain provides for special features, construction, and significant storage capacity that in-turn allows for the development of the adjacent lands while mitigating for the loss of flood-plain storage. Ultimately, these special features do not impact the outlet or benefit (use of the drain) for non-development lands currently tributary to the West Main Drain, East Main Drain or the Arbuckle Award Drain. As such, for the purpose of future maintenance, the full cost of maintaining these special features is charged as a Special Benefit to the residential landowners of the development Blocks (Blocks N1, N3, O1 and O3). A total of seventy-five percent (75%) of the total cost of maintenance for Section 1 and Section 2 of the Van Gaal Municipal Drain as shown on **Figure 6.1** shall be considered the cost of the Special Benefit for each time maintenance is completed in this area.

6.5 Assessment Schedules

6.5.1 Initial Construction

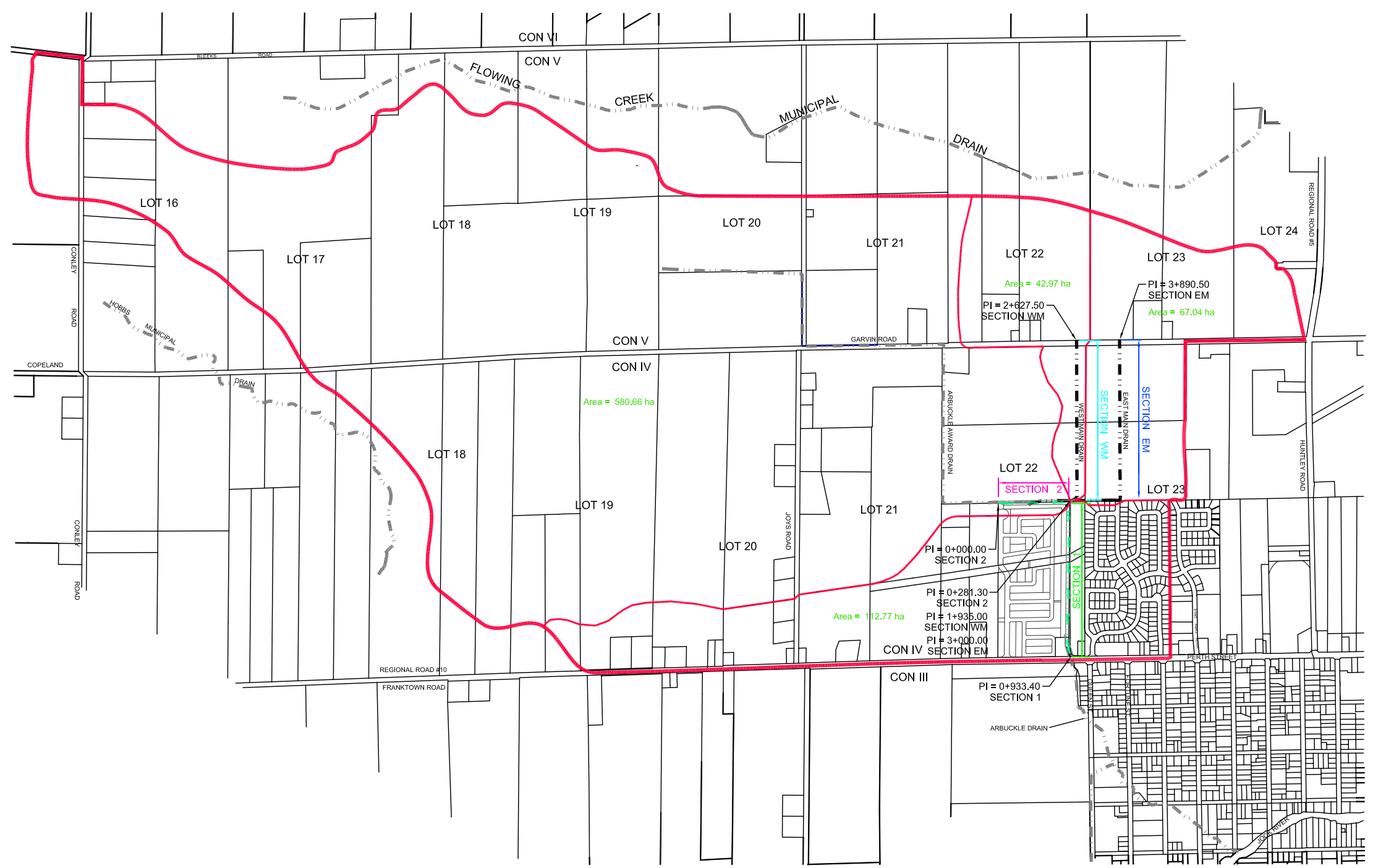
All costs associated with this report, the initial design, allowances, other costs and construction form part of the development and will be completed and paid for by the developer. As such, there is no distribution of costs to other landowners for the Engineer's Report, allowances, other costs or construction.



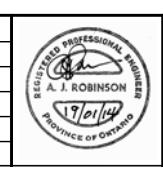
LEGEND

- PROPERTY LINE
- - - EXISTING CONSTRUCTED DRAINS
- MUNICIPAL DRAIN
- DRAINAGE AREA BOUNDARY
- BRANCH DRAINAGE AREA BOUNDARY
- - - RELOCATED DRAIN

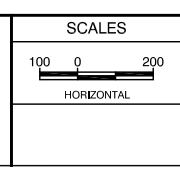
- SECTION 1 STA. 0+933.40 - STA. 0+281.30
- SECTION 2 STA. 0+000.00 - STA. 0+281.30
- SECTION WM STA. 1+935.00 - STA. 2+627.50
- SECTION EM STA. 3+000.00 - STA. 3+890.50



No.	DATE	REVISION	BY
1	14.01.19	ISSUED FOR DISTRIBUTION	AJR



Professional Engineers
Ontario
Licensed Engineering Technologist
Name: L. FRANKLIN
Number: H0501333
Limitation: Providing plans, non-technical content of reports and other non-technical advice for infrastructure under the Ontario Drainage Act.
19/01/14
Association of Professional Engineers of Ontario



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CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA
VAN GAAL
MUNICIPAL DRAIN

MAINTENANCE SECTIONS and
SECTION DRAINAGE AREAS

PROJECT No.	13056
CONTRACT No.	
DATED	JANUARY 2019
DWG. No.	Fig 6.1

6.5.2 Future Maintenance

Following the completion of the initial construction, the cost for any future maintenance is to be distributed to all landowners within the drainage area as shown on Dwg. 13056-A3 and A4 and the Schedule of Assessment for Future Maintenance. As part of this Engineer's Report an assessment schedule has been developed for the Van Gaal Municipal Drain that reflects a fair and equitable distribution of costs for future maintenance. The Schedules of Assessment for Future Maintenance are provided in **Appendix C**.

The exact method of determining the appropriate assessment and the distribution between outlet and benefit is left to the Drainage Engineer using best judgment to provide a system of assessments that is fair to all concerned. There are a number of basic principles that apply to the assessment for future maintenance of the Van Gaal Municipal Drain. The principles are:

1. You cannot assess a property for any part of the cost of work that is completed upstream from it, unless there is a special circumstance.
2. You cannot make a benefit assessment against a property for work completed some distance downstream, although you do assess the property for outlet liability for this work.
3. You can only assess benefit for lands that are reasonably close to the drain. These usually are properties abutting the drain or which have direct access to the drain.
4. You cannot assess those lands that are too low to make use of the works, such as a gravel pit or quarry, unless they are clearly connected by an outlet to the drain.
5. You must assess public utilities and road authorities for the increase in the actual cost of the proposed drainage work caused by the existence of the works of the public utility or road authority. An example is a culvert on a public roadway.
6. In assessing lands covered with bush and trees, if the situation is such that once the drain is in place, the property owner will be able to clear the bush and cultivate the land, then the property should be assessed in the same way as land already under cultivation, unless there is an agreement or legal restrictions which prevent clearing and cultivation.

The principles of assessment for municipal drains have evolved over time. At present, the recommended approach is to divide the drain into a series of sections in arriving at the ultimate benefit and outlet assessment schedules. This permits the cost estimates to be developed for each section and should result in a fair distribution of costs throughout the drainage basin. The division of the drain into sections is most beneficial for assessing the cost of future maintenance.

A technique that we employ to simplify the assessment process, involves converting all the lands within the watershed into a factored or equivalent area. In the case of benefit assessment, this includes the area of the land within the basin and a factor that is related to land use. In the case of outlet assessment, we use the area of the land within the drainage basin, the land use and a factor that represents the location of the land relative to the drain. For the location factor (or the distance from the drain), the principle is to apply a higher factor for land that is closer to the drain, or to an outlet that connects directly into the drain, and a lower factor to land that is more remote from the drain. The factored area method allows the Drainage Engineer to recognize that the volume and rate of flow of water differs with different land uses, soil types, surface conditions and distance from the drain. This method brings the entire area within a watershed to a common denominator and simplifies the application of outlet assessments.

Based on the principle that properties are only assessed for works that are undertaken downstream of the property in question, we have further introduced a factor within each section which divides the section into three equal parts (subsections) and applies a subsection factor to the outlet assessment. Therefore, the properties with an outlet within the downstream one-third of a section of the drain are in essence only using one-third of the total section of drain, whereas the lands that are in the upstream one-third or beyond, are using the whole section of the drain. Hence, we have applied a subsection factor to the lands within the section of the drain where maintenance is being carried out. All of the lands upstream of the section where maintenance is being undertaken are also assessed a portion of the costs of the drainage works. The assessment on the lands upstream of the section where maintenance is being completed are charged a section factor equal to the most upstream portion of the lands within the section where the work is being completed.

6.6 Maintenance Section

The drain has been subdivided into separate maintenance sections in order to develop schedules for future maintenance charges for the Van Gaal Municipal Drain, as such there are four sections as follows:

- Section 1 -- From the outlet of the drain at the end of the culvert under Perth Street at Station 0+933.4, to the point where the West Main Drain connects at Station 0+281.30.
- Section 2 -- From Station 0+281.30 to the upstream limit of the drain at Station 0+000.
- Section 3 (Branch -- West Main Drain) – From the point of intersection at the main drain (Station 0+281.30 = 1+935 WM/OLD) to the upstream limit of the ROW for Garvin Road at Station 2+627.50
- Section 4 (Branch – East Main Drain) – From the point of intersection at the main drain (Station 0+281.30 = 3+000 EM/OLD) to the upstream limit of the ROW for Garvin Road at Station 3+890.50

The locations of the sections are shown on Figure 6.1.

The area that is tributary to each section has been determined based on the sub-drainage basins. In calculating the outlet assessment for the sections of the Van Gaal Municipal Drain indicated in the previous paragraph, each section has been divided into three subsections or parts. The upstream subsection is assigned a factor of 1.00, the middle subsection of the drain is assigned a factor of 0.67 and the downstream subsection is assigned a factor of 0.33.

Each individual property is assigned a subsection factor corresponding to the location where the drainage from the property enters the drain. All properties upstream of the section where maintenance is being undertaken are assigned a subsection factor of 1.0.

The use of the subsection or section factor is based on the principle that all land is assessed for maintenance that is undertaken downstream of the location where the runoff from the land enters the drain.

6.7 Land Use Factor

A land use factor is included in the assessment calculation in order to account for the volume of runoff from lands that are used for different purposes. A numeric value of 1.0 is given to all agricultural land. A value of 2.0 is given to small, non-agricultural lots (residential) that are 5 acres (2.0 Ha) or less, and a value of 4.0 is given to land that is classified as higher density residential, institutional and commercial or is a road right-of-way. A value of 2.0 is used for the Hydro right-of-way and a value of 0.5 is assigned to Provincially Significant Wetlands (PSW).

The area of each parcel of land within the drainage basin is multiplied by the land use factor to arrive at a factored area that in turn is used to determine the final benefit and outlet assessment. For example, one hectare of road right-of-way is assessed at four times the rate applied to one hectare of agricultural land.

Surface water for Block N (N1 through N5) and Block O (O1 through O3) is to be directed via storm sewers to the proposed Storm Water Management Pond south of Perth Street. As such the development is primarily excluded from direct drainage to the adjacent Van Gaal Municipal Drain (Section 1 and Section 2 as shown on Figure 6.1). However, it is estimated that 10% of the surface drainage will ultimately continue a direct contribution to the adjacent section of the drain. To account for this reduction, the Land Use Factor (LUF) is calculated as noted above and multiplied by 10% to find the final LUF to be applied. Therefore, the urban development lands typically assessed a LUF of 4.0 applied at 10% are assessed a LUF of 0.40.

6.8 Distance Factor

A distance factor was developed to take into account the proximity of land to the drain and the relative amount of water that will enter the drain. A band is drawn on each side of the drain at a distance of approximately 200 metres, a second band is drawn at a distance of approximately 600 metres from the drain, and a third at 1000 meters from the drain. A property that is included entirely within the first band is given a distance

factor of 1.0. A property that falls entirely within the second band is given a distance factor 0.75. A property that falls entirely within the third band is given a distance factor 0.5 and the land that is located beyond 1000 metres from the drain (outside the third band), is given a distance factor of 0.3. In many cases, a property will not be entirely included within one of the bands. For example, one-half of a property might fall within the first band and the other half might fall in the second band. In this case, a distance factor of 0.875 is assigned to that property. The distance factor information is included on **Figure 6.2**.

6.9 Outlet Assessment

Each parcel of land that lies within the drainage basin and is upstream of the location where maintenance is being undertaken pays for a portion of the cost of the maintenance through an outlet assessment.

The outlet assessment factored area for each property is determined by multiplying the area of each property in the drainage basin by the land use factor, the distance factor and the section or subsection factor. Using the outlet assessment factored area for all of the properties being assessed and the cost of the future maintenance assigned to outlet assessment, a cost per unit outlet factored area (factored hectare) is determined. This is then multiplied by the total outlet assessment factored area of each property to calculate the outlet assessment that is applied to that property.

6.10 Benefit Assessment

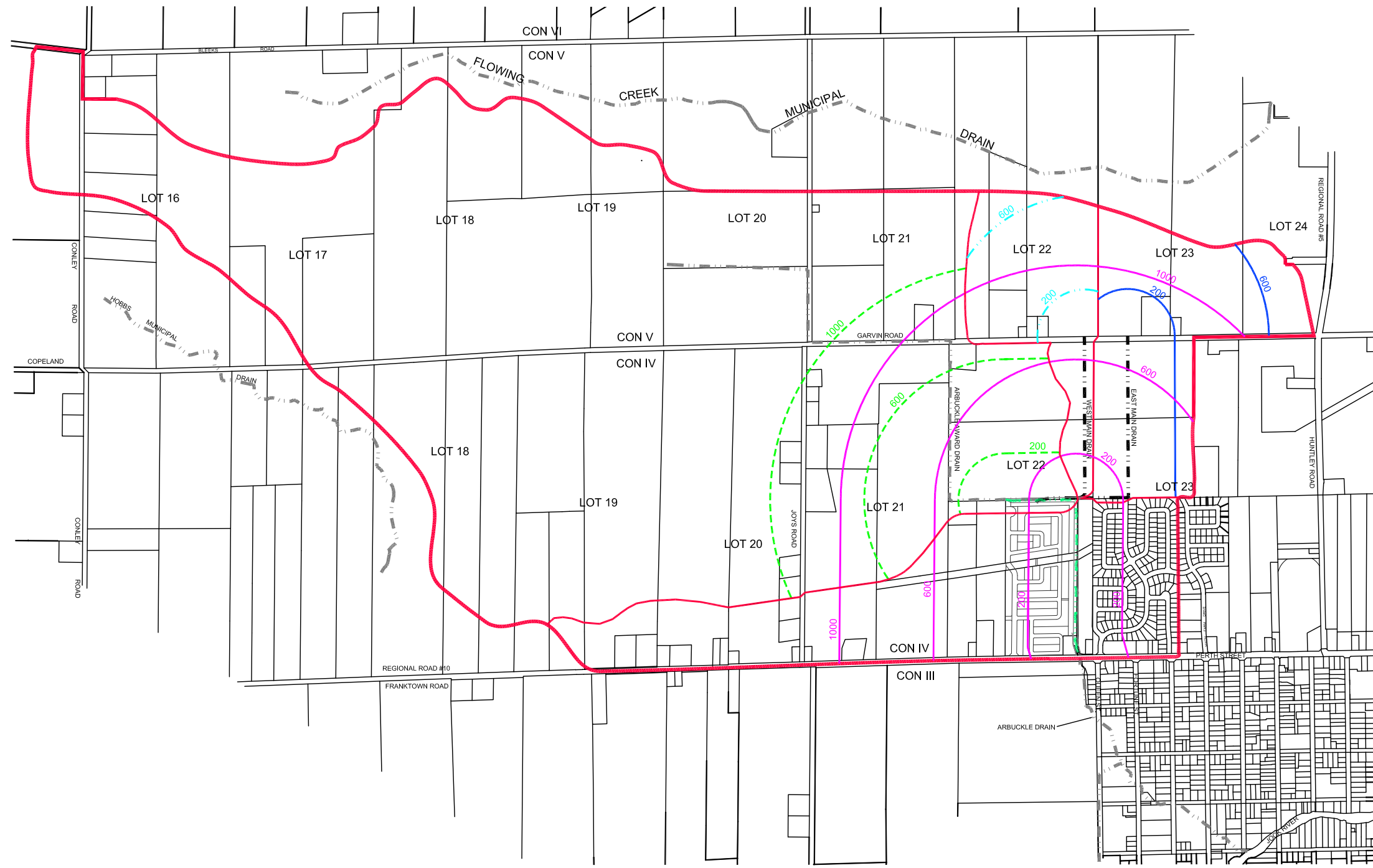
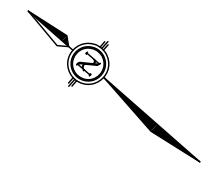
Lands that are located immediately adjacent to the drain are charged a benefit assessment. A benefit assessment for maintenance is only charged against properties in the section where work is being completed. The benefit factored area is determined by multiplying the individual assessed area of each property that is immediately adjacent to the drain, by the land use factor. Using the benefit factored area for all of the properties and the cost of maintenance assigned to benefit assessment, a cost per unit benefit factored area (factored hectare) is determined. This amount is then multiplied by the total benefit factored area of each property to calculate the benefit assessment that is applied to that property.

6.11 Special Assessment

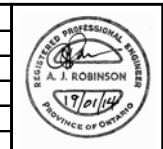
For the portion of the drain within the development area all costs associated with the initial design, construction, allowances, other costs and the Engineer's Report are assessed as a Special Assessment to the property owners of the lands in Block N (N1 and N3).

LEGEND

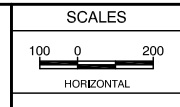
- PROPERTY LINE
- EXISTING CONSTRUCTED DRAINS
- - - MUNICIPAL DRAIN
- DRAINAGE AREA BOUNDARY
- BRANCH DRAINAGE AREA BOUNDARY
- RELOCATED DRAIN
- SECTION 1 DISTANCE FACTORS
- SECTION 2 DISTANCE FACTORS
- SECTION WM DISTANCE FACTORS
- SECTION EM DISTANCE FACTORS



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Number: H0501333
Limitation: Providing plans, non-technical content of reports and other non-technical advice for sub-contractors under the Ontario Drainage Act, 19/01/14
Association of Professional Engineers of Ontario



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DESIGN	LF
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DRAWN	JHB
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA
VAN GAAL
MUNICIPAL DRAIN

DISTANCE FACTORS

PROJECT No.	13056
CONTRACT No.	
DATED	JANUARY 2019
DWG. No.	FIG 6.2

6.12 Block Assessment

Lands that are located within Block M, Block N (N1 through N5) and Block O (Block O1 through O3) as shown on Dwg. No. 13056-A4 are charged a Block Assessment. Block assessments are also shown on the Assessment Schedule for Future Maintenance.

With regard to Block Assessments the Drainage Act states the following:

Engineer may assess a block, etc.

25. (1) of the Drainage Act: The council of the local municipality may direct the engineer to assess as a block, a built-up area designated by the council, and the sum assessed therefore may be levied against all the ratable properties in the designated area proportionately on the basis of the assessed value of the land and buildings. R.S.O. 1990, c. D.17, s. 25 (1).

Assessment to be charged against public roads

(2) Where the engineer makes a block assessment under subsection (1), the engineer shall designate the proportion of the assessment to be charged against the public roads in the designated area. R.S.O., 1990, c. D.17, s. 25 (2).

As such, the cost with regard to the assessments as noted above (where applicable), associated with each block, is charged as a block assessment to the individual block.

For the initial distribution of costs within the development group, all lands, including roads, within the development have been included in the Special Assessment charged to the property owners in Block N (N1 and N3) subject to any internal agreement in this regard.

For the distribution of costs associated with future maintenance within the identified Blocks the costs for roads, (including transitway), utility corridors and other public lands are to be excluded from the property portion of the Block and charged as a separate assessment to the road authority, owner of public lands or utility authority (Utility Corridors) respectively based on the amounts shown in **Table 6.1**. Future maintenance costs assigned to the block for all properties are distributed to the individual properties within the block proportionately based on the current assessed property value at the time of assessment.

Table 6.1
Distribution of Costs by Land Use
Within Blocks M, N & O
For Future Maintenance

Property Type	% Total (For Distribution)	Assessed To
Block M		
Residential Properties	76.0	Landowner
Roads and Public Lands	24.0	City of Ottawa
Block N1		
Residential Properties	70.6	Landowner
Roads and Public Lands	29.4	City of Ottawa
Block N2		
Hydro ROW	100.00	Utility
Block N3		
Residential Properties	69.1	Landowner
Roads and Public Lands	30.9	City of Ottawa
Block N4		
Storm Water Management	100.00	City of Ottawa
Block N5		
Storm Water Management	100.00	City of Ottawa
Block O1*		
Residential Properties	79.1	Landowner
Roads and Public Lands	20.9	City of Ottawa
Block O2		
Hydro ROW	100.00	Utility
Block O3*		
Residential Properties	84.3	Landowner
Roads and Public Lands	15.7	City of Ottawa

**Note: Subject to adjustment based on the actual proportion of residential and roads/public lands provided for in the future final plan of Subdivision.*

6.13 Assessment Schedules

As described in this report, the drain is divided into two maintenance sections plus the existing West Main and East Main Branches. The land area, land use factor, section or subsection factor and distance factor have been entered into an Excel spreadsheet for each section of the drain. The total area of each land parcel is further divided as required, placing the appropriate portion of area in each sub-section of the drain. Once the total cost of future maintenance is determined, this amount can be entered on the spreadsheet and the outlet, benefit, special benefit and total assessments are calculated. Where the one-third grant on agricultural land is applicable, this is calculated and deducted from the total assessment to arrive at the net cost assessed against the property. For lands where the agricultural grant is available the Drainage Superintendent should modify the schedules to apply the amount of grant that is in existence at the time that maintenance is undertaken.

In developing the Assessment Schedules, the cost for outlet and benefit has been varied to reflect the relative use of the drain by immediate benefiting landowners and the landowners in the urbanized upstream part of the watershed. The Assessment Schedules have been developed with the percentage split between Outlet Assessment and Benefit Assessment as follows:

Summary Schedule of Assessment

Section 1	–	Station 0+933.4 to Station 0+281.30
		Outlet Assessment - 90.0%
		Benefit Assessment - 10.0%
Section 2	–	Station 0+281.30 to Station 0+000
		Outlet Assessment - 90.0%
		Benefit Assessment - 10.0%
Section 3	–	Branch – West Main Drain Station 0+281.30 (1+935 WM/OLD) to Station 2+627.50 (WM/OLD)
		Outlet Assessment - 62.5%
		Benefit Assessment - 37.5%
Section 4	–	Branch – East Main Drain Station 0+281.30 (3+000 EM/OLD) to Station 3+890.50 (EM/OLD)
		Outlet Assessment - 50.0%
		Benefit Assessment - 50.0%

7.0 COST ESTIMATE

7.1 General

The total estimated cost associated with the initial construction, engineering, contract administration, engineer's report, allowances, other costs and contingencies for the section of drain modifications and re-alignment between Sta. 0+000 and 0+933.4 on Sheets CH-1 to CH-6, Project No. 11-468, Revision 5, David Schaeffer Engineering Ltd. will be paid directly by the property owners of the lands in Block N (N1 and N3) in conjunction with the development approval process. There is no assessment to the remaining landowners for the initial construction.

7.2 Allowances

Allowances have been made for land incorporated into the drain as a result of the re-construction of the drain on the properties adjacent to and outside the limits of the proposed development. The allowances associated with the re-alignment of the Van Gaal Municipal Drain are included in **Appendix D**. Because the cost of the Engineer's Report, initial construction and all other associated costs are being paid for by the developer of Block N, there is no offsetting assessments to the landowners who have

been granted allowances. Therefore, a direct payment for the calculated allowance will be made by the City of Ottawa to the property owners in question. The City of Ottawa will in turn collect the amount from the developer of Block N.

Allowances are proposed for crops disturbed by construction/re-alignment of the drain where it is required that any construction be completed from the adjacent (non-development owned) property. The Crop Loss Allowance is based on an assumed 100% loss in the year of the initial disturbance and a further 60% loss (year 2) and 40% loss (year 3) related to the impact to crops and recovery from the disturbance. Should no construction be completed from the adjacent lands the Crop Loss Allowance is not applicable and will not be collected (from the developer) or distributed (to the adjacent landowner). Where construction is completed from the adjacent land the Crop Loss Allowance is applicable and shall be paid by the developer of Block N and distributed to the affected landowner by the City of Ottawa. Where no construction or access is completed from the adjacent land no crop loss allowance shall be paid.

8.0 CHANGING THE SCOPE OF THE WORK

Should changes, deletions or extensions in construction be requested or required after the bylaw is passed, the report must be amended and a revised bylaw must be passed. Since this project will be constructed through provisions of the Drainage Act, a bylaw must first be passed to authorize the work. If it is desired to make any substantial increase or decrease in the scope of work as designed it will be necessary that either a revised report be prepared and processed or, if the desired works are considered to be a gross error in accordance with the Drainage Act, that an application be made to the Agricultural, Food and Rural Affairs Appeal Tribunal (Drainage Tribunal) pursuant to Section 58(4) of the Drainage Act to obtain approval for such change. If any individual or group of owners require additional work and are prepared to apply for such and do not wish to be part of the drainage works they may make their own arrangements with the Contractor, but the Drainage Engineer must approve such in order to ensure that no detrimental effect to the drain or its maintenance results.

9.0 MAINTENANCE

Future maintenance of the project shall be the responsibility of the City of Ottawa, although the individual owners shall be responsible for periodic inspection of the drain and reporting maintenance problems to the City's Drainage Superintendent.

The cost of future maintenance is to be assessed in proportion to the Schedule(s) of Assessment for Future Maintenance. The schedule(s) for this drain, as well as a schedule of distribution for properties within Block M, Block N and Block O is provided in **Appendix C** of this report. Therefore, maintenance costs are to be levied against the lands upstream from the location of the maintenance work pro-rata with the assessments for Benefit, Outlet and Maintenance Special Benefit in the Schedule for Future Maintenance, which is in accordance with the requirements of the Drainage Act. For the purpose of calculation, the schedules are based on \$10,000.00 of maintenance work completed in Section 1, \$5,000 in Section 2 including the 75% Special Benefit

Assessment (as described in Section 6.4 of this Report) and a further \$2,500 (each) completed on the West Main Drain and the East Main Drain. However, the actual value of the maintenance undertaken will be used in determining the amount to be assessed in proportion to the schedule when maintenance is undertaken.

Maintenance of private culverts and fences shall be the responsibility of the adjacent landowners at their own cost. Maintenance of public roads shall be the responsibility of the Road Authority, however, if the Road Authority does not complete the maintenance, then the City of Ottawa will complete the maintenance and charge the cost to the Road Authority.

Future maintenance of tile outlets shall be the responsibility of and shall be at the cost of the affected landowners.

10.0 WORKING SPACE – FUTURE MAINTENANCE

A right-of-way or working area must be available, preferably along the west and south sides of the proposed drain, or the side that is best suited for construction. For open drainage works, a right-of-way of a minimum of 5 m from the bottom of the main slope of the bank, in accordance with the Cross-sections on Sheet CH-5, Project No. 11-468, Revision No.5, David Schaeffer Engineering Ltd. and Sheet D2, Revision No. 8 of Van Gaal Drain Re-alignment by Nak Design Strategies is necessary to allow maintenance to be carried out and excavated material to be removed. This right-of-way is designated for future access and maintenance along the side of the drain designated on the noted cross-sections.

All excavated material must be removed off-site for construction and/or future maintenance for any area within the designated flood-plain of the Jock River (current at the time the work is completed). Where applicable, the cost of removing excavated material from the designated flood plain shall be excluded from the future maintenance costs assessed to property owners and will be assessed directly as a Special Benefit Assessment to the City of Ottawa as the owner of the Stormwater Management Blocks (Block N4 and N5).

11.0 PERMITS AND AUTHORIZATIONS

All required permits and authorizations required for the initial construction, including, but not limited to, Department of Fisheries and Oceans (DFO), Ministry of Natural Resources and Forestry – Species at Risk (MNRF-SAR), the Rideau Valley Conservation Authority (RVCA) and Ontario Ministry of the Environment, Conservation and Parks (MOECP) are to be completed in conjunction with the development and are solely the responsibility of the developers.

All of which is respectfully submitted,

ROBINSON CONSULTANTS INC.



A.J. Robinson, P.Eng.
Drainage Engineer



Lorne Franklin, L.E.T., C.E.T., rcca, CISEC
Licensed Engineering Technologist
Drainage Services



Professional Engineers
Ontario

Licensed Engineering Technologist

Name: L. FRANKLIN

Number: 100501335

Limitations: Providing plans, non-technical content of reports and other non-technical advice for submission under the Ontario Drainage Act. 19/01/14

Association of Professional Engineers of Ontario

Appendix A

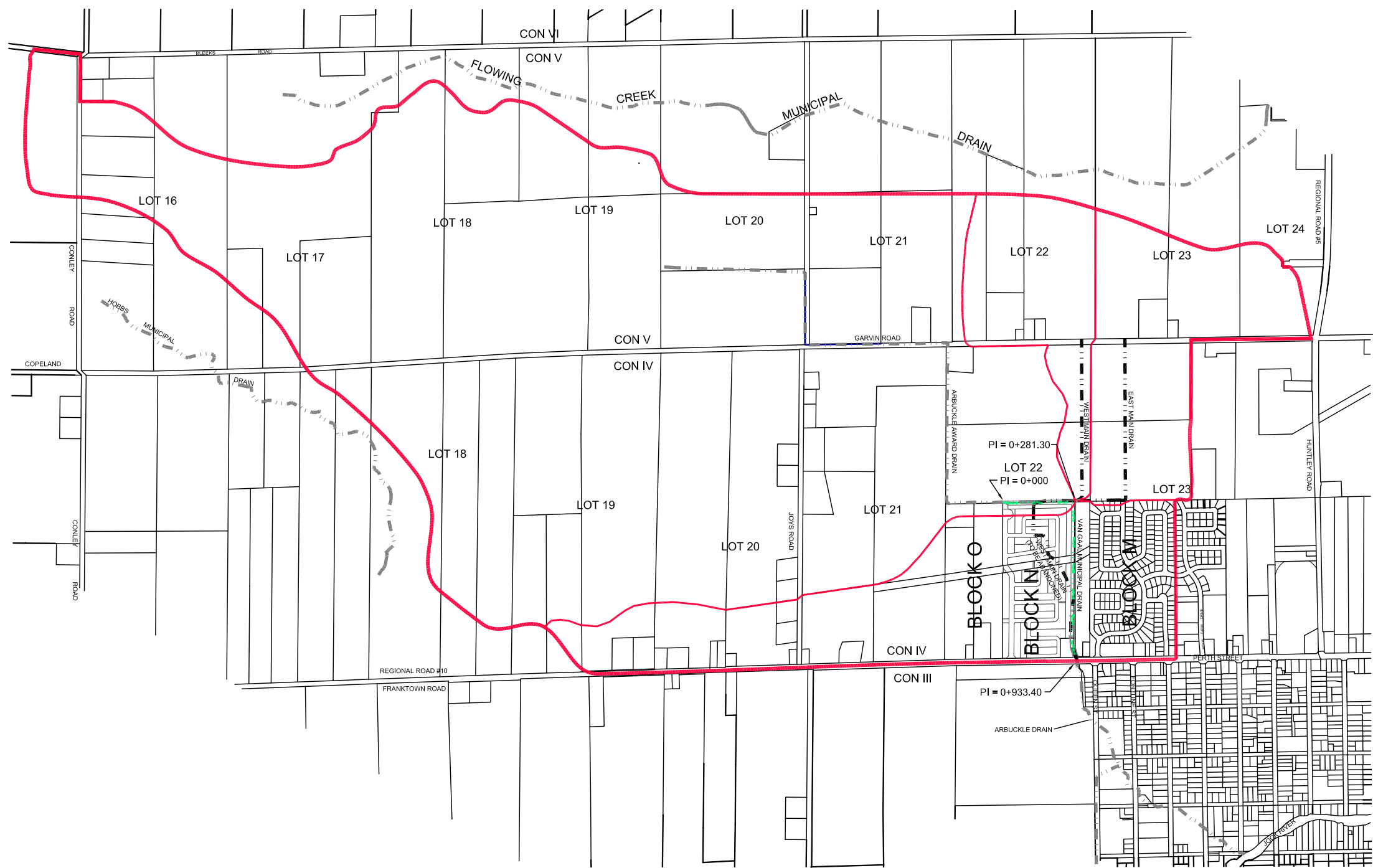
Robinson Consultants Inc. Plan and Profiles

Drainage Area Plan	13056-A1
Re-Alignment Plan	13056-A2
Property Ownership Plan	13056-A3
Block Area Plan	13056-A4
West Main Drain Profile	00063-P1
East Main Drain Profile	00063-P2

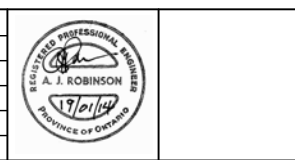


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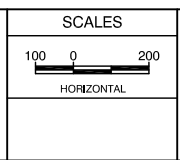
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- — — — — EXISTING CONSTRUCTED DRAINS
- — — — — MUNICIPAL DRAIN
- — — — — DRAINAGE AREA BOUNDARY
- — — — — BRANCH DRAINAGE AREA BOUNDARY
- — — — — ADJACENT DRAINAGE AREA BOUNDARY
- — — — — RELOCATED DRAIN



No.	DATE	REVISION	BY
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Robinson
Consultants

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KANATA, ONTARIO K2V 1A8
TELEPHONE (613) 592-6060

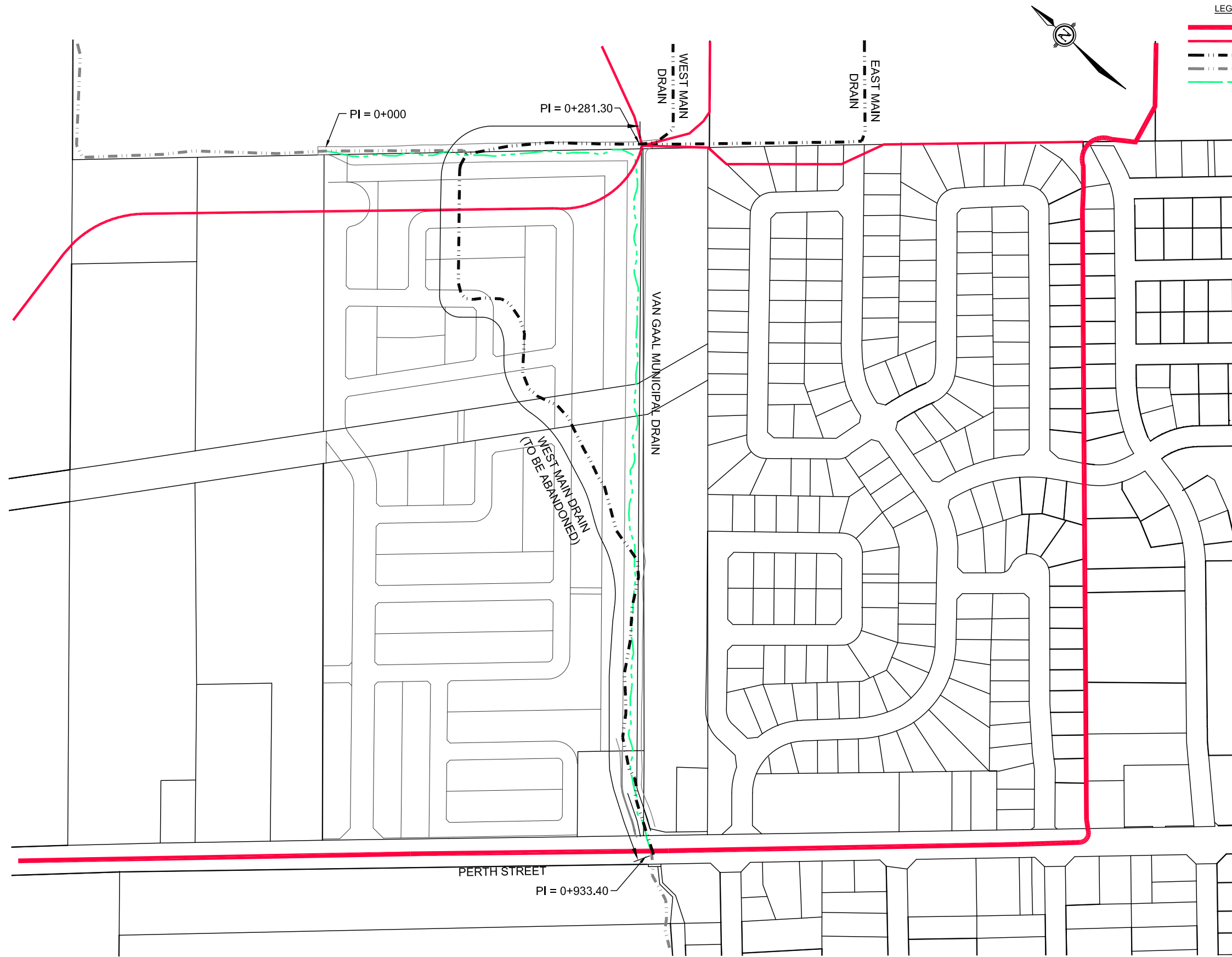
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CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

VAN GAAL
MUNICIPAL DRAIN

DRAINAGE AREA PLAN

PROJECT No.	13056
CONTRACT No.	
DATED	JANUARY 2019
DWG. No.	13056-A1



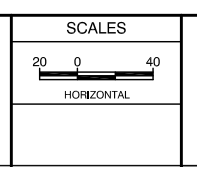
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- - - - - BRANCH DRAINAGE AREA BOUNDARY
- MUNICIPAL DRAIN
- - - - - EXISTING CONSTRUCTED DRAINS
- - - - - RELOCATED DRAIN

No.	DATE	REVISION	BY
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Licensed Engineering Technologist
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Number: H0509-133
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CONSULTING ENGINEERS
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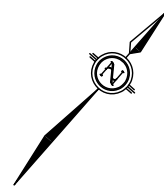
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CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA

VAN GAAL
MUNICIPAL DRAIN

PROPOSED REALIGNMENT PLAN

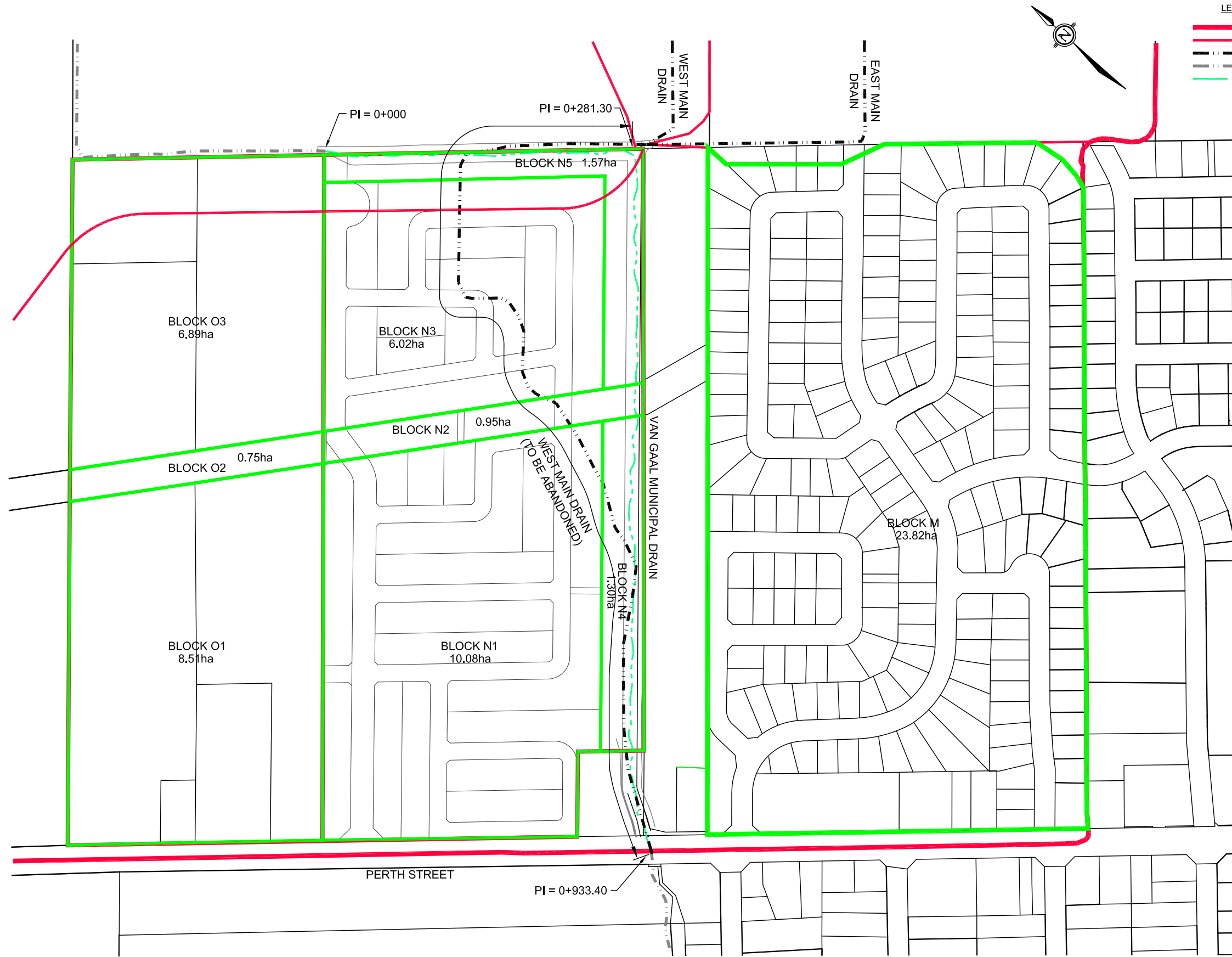
PROJECT No.	13056
CONTRACT No.	
DATED	JANUARY 2019
DWG. No.	13056-A2



LEGEND

- PROPERTY LINE
- - - - - EXISTING CONSTRUCTED DRAINS
- - - - - MUNICIPAL DRAIN
- DRAINAGE AREA BOUNDARY
- - - - - DRAIN TO ABANDONED
- - - - - DRAIN TO BE IMPROVED OR CONSTRUCTED
- BRANCH DRAINAGE AREA BOUNDARY
- - - - - ADJACENT DRAINAGE AREA BOUNDARY
- ① PROPERTY ID#
- RELOCATED DRAIN

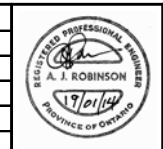




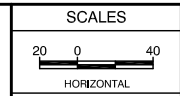
LEGEND

	DRAINAGE AREA BOUNDARY
	BRANCH DRAINAGE AREA BOUNDARY
	MUNICIPAL DRAIN
	EXISTING CONSTRUCTED DRAINS
	RELOCATED DRAIN

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Licensed Engineering Technologist
Name: L. FLORENZ
Number: H0509133
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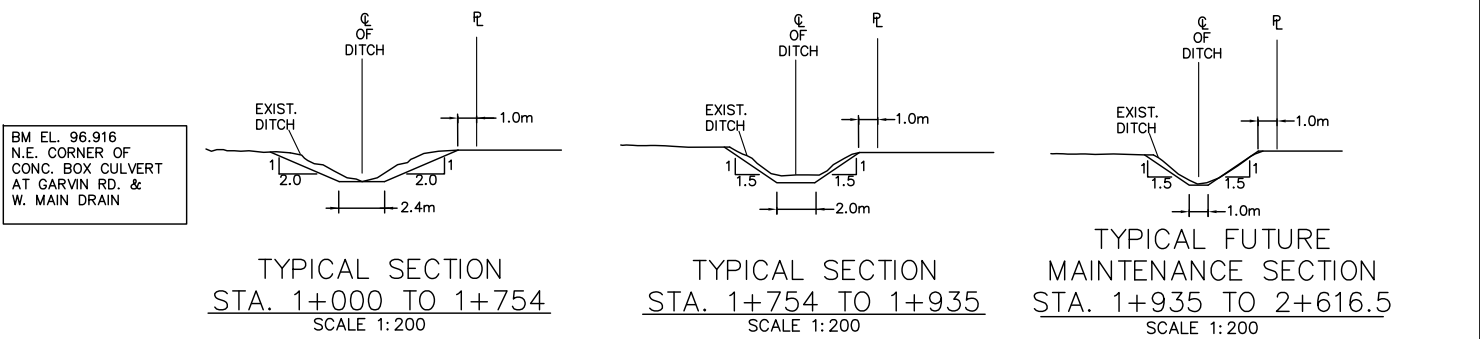
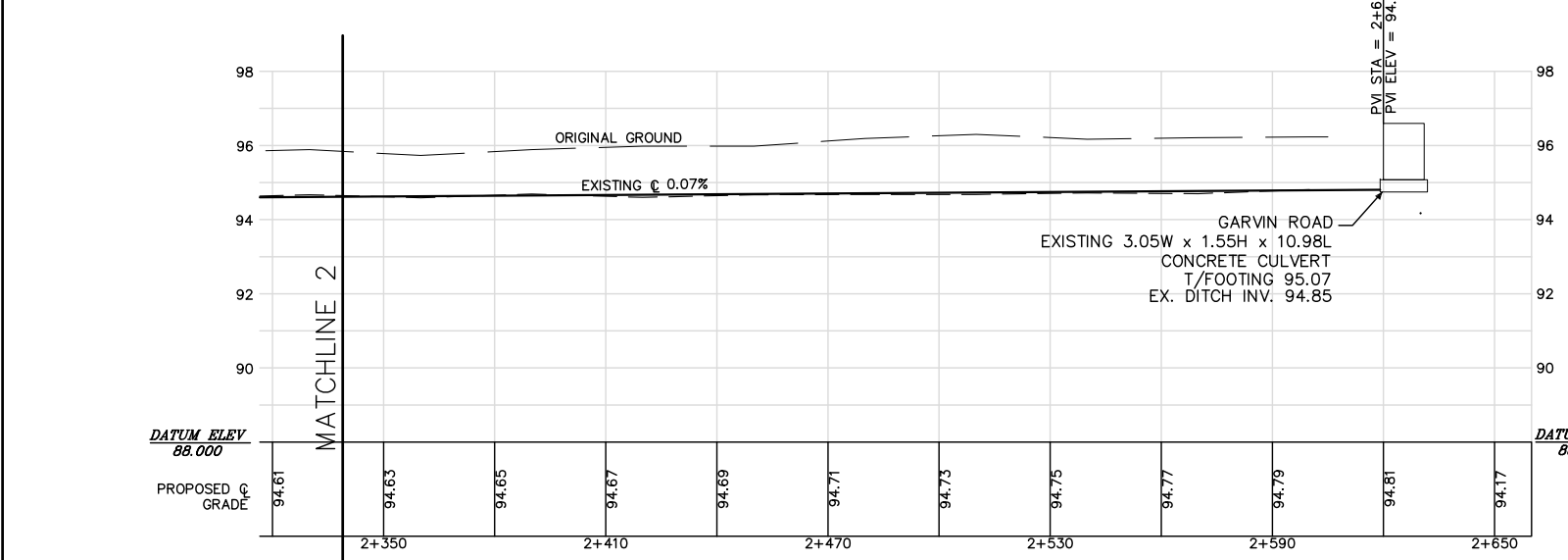
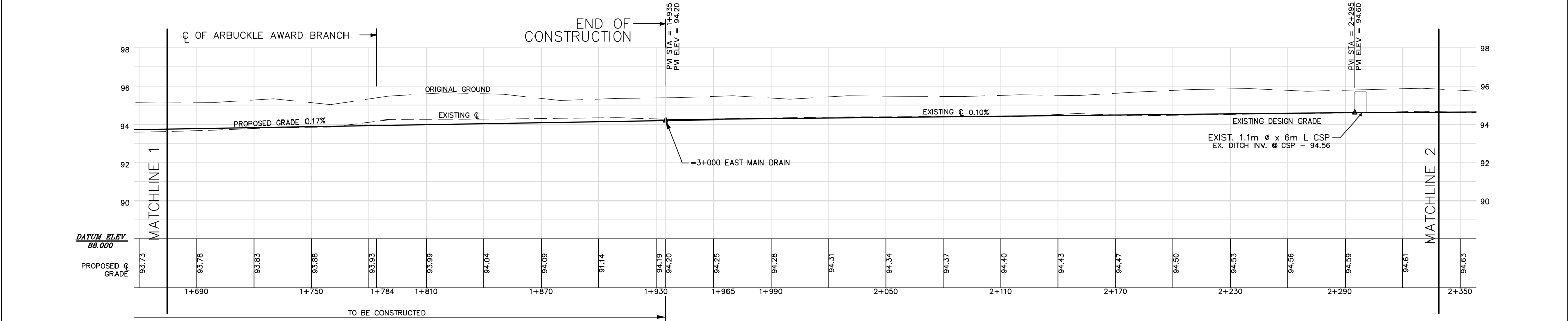
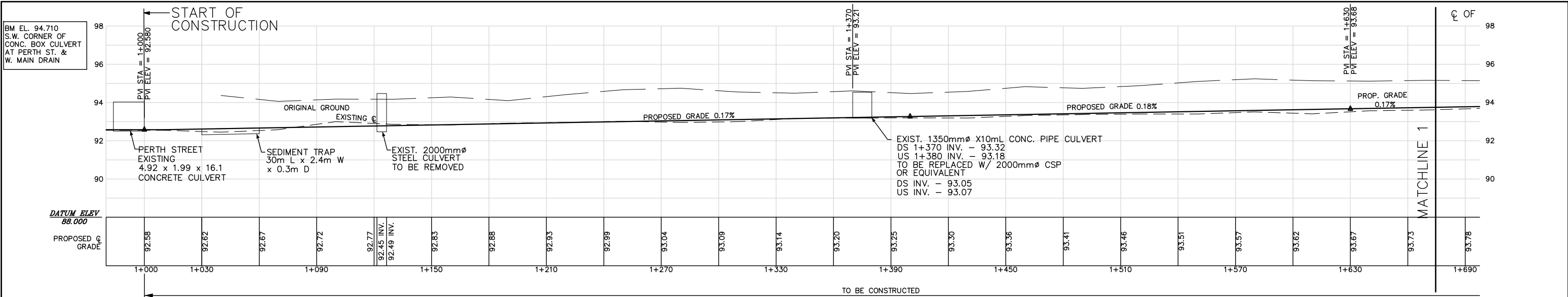
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DESIGN	LF
CHECKED	AJR
DRAWN	JHB
CHECKED	LF
APPROVED	AJR

CITY OF OTTAWA
**VAN GAAL
MUNICIPAL DRAIN**

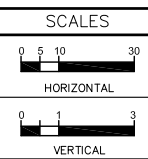
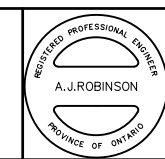
BLOCK AREA PLAN

PROJECT No.	13056
CONTRACT No.	
DATED	JANUARY 2019
DWG. No.	13056-A4



NOTE: THIS PLAN WAS PRODUCED ON AN AUTOCAD DRAFTING SYSTEM

No.	DATE	REVISION	BY	No.	DATE	REVISION	BY
1	02.11.15	CITY OF OTTAWA COMMENTS	D.H.				



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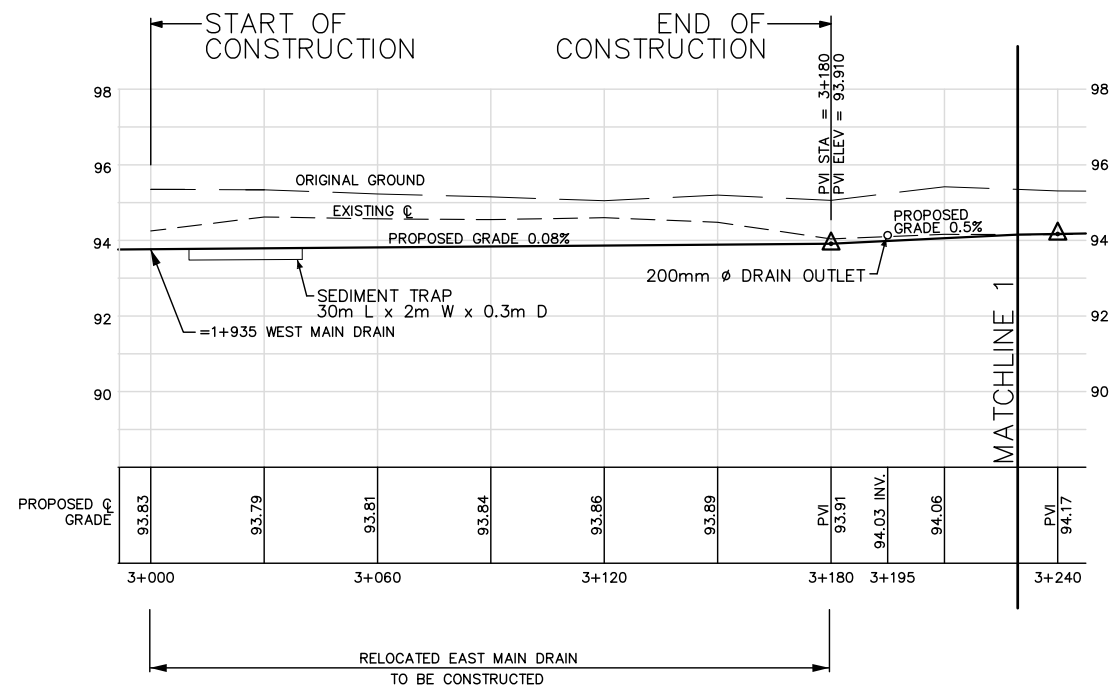
CONSULTING ENGINEERS
350 Palladium Drive
Kanata, Ontario K2V 1A8
Telephone (613)592-6060

DESIGN: MMG
CHECKED: AJR
DRAWN: DWH
CHECKED: MMG
APPROVED: AJR

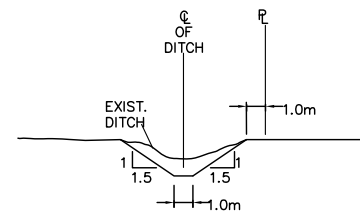
GOULBOURN WARD
VILLAGE OF RICHMOND
VAN GAAL
MUNICIPAL DRAIN

DRAIN PROFILE
WEST MAIN DRAIN

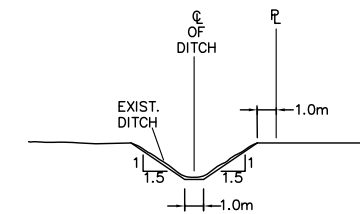
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CONTRACT No.
DATED OCTOBER 2002
DWG. No. 00063-P1



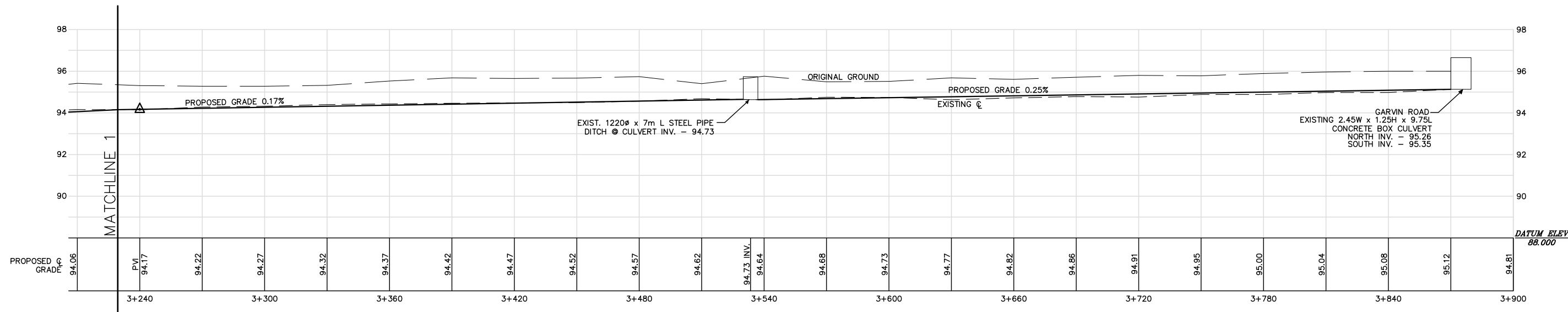
BM EL. 96.662
 NAIL IN HYDRO POLE
 S. SIDE, GARVIN RD.
 10m W. OF E. MAIN DRAIN



TYPICAL SECTION
 STA. 3+000 TO 3+180
 SCALE 1:200

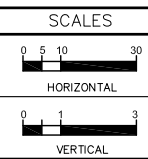
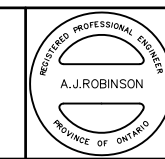


TYPICAL SECTION
 FUTURE MAINTENANCE
 STA. 3+180 TO 3+870
 SCALE 1:200



NOTE: THIS PLAN WAS PRODUCED ON AN AUTOCAD DRAFTING SYSTEM

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1.	02.11.15	CITY OF OTTAWA COMMENTS	D.H.				



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DESIGN	MMG
CHECKED	AJR
DRAWN	DWH
CHECKED	MMG
APPROVED	AJR

GOLBOURN WARD
 VILLAGE OF RICHMOND
 VAN GAAL
 MUNICIPAL DRAIN

DRAIN PROFILE
 EAST MAIN DRAIN

PROJECT No.	00063
CONTRACT No.	
DATED	OCTOBER 2002
DWG. No:	00063-P2

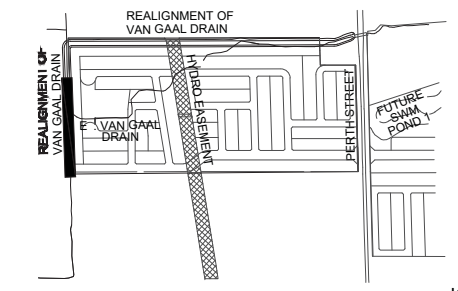
Appendix B

Developer Plan and Profiles Van Gaal Municipal Drain

DSEL – Channel Re-Alignment	CH-1
DSEL – Channel Re-Alignment	CH-2
DSEL – Channel Re-Alignment	CH-3
DSEL – Channel Re-Alignment	CH-4
DSEL – Channel Re-Alignment	CH-5
DSEL – Channel Re-Alignment	CH-6
NAK – Planting Plan	P-1
NAK – Planting Plan	P-2
NAK – Planting Plan	P-3
NAK – Detail Sheet	D-2

LIST OF DRAWINGS

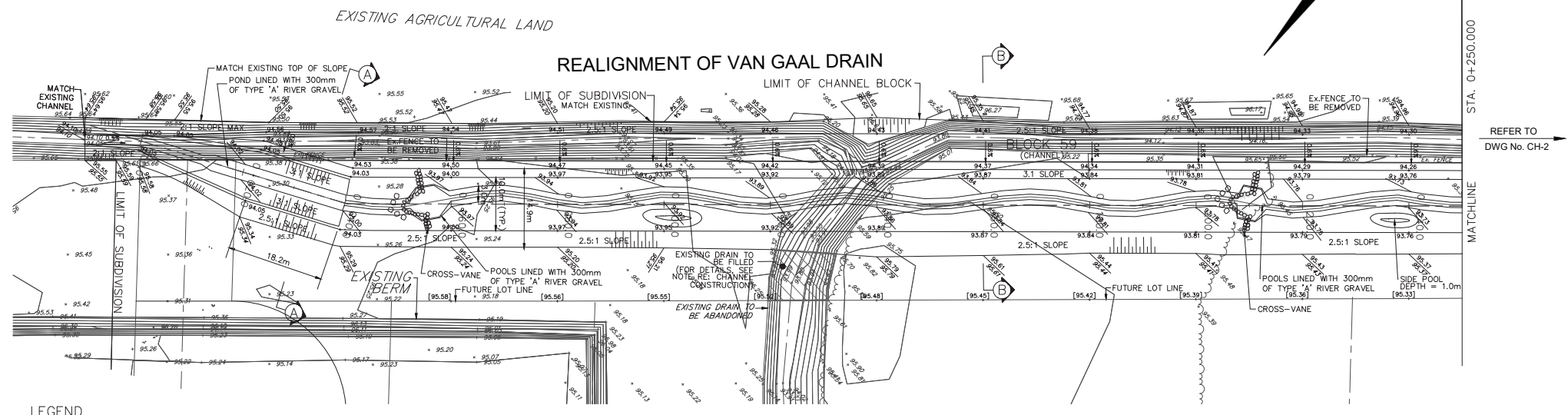
- CH-1 VAN GAAL DRAIN (STA. 0+000.000 TO STA. 0+250.000)
- CH-2 VAN GAAL DRAIN (STA. 0+250.000 TO STA. 0+510.000)
- CH-3 VAN GAAL DRAIN (STA. 0+510.000 TO STA. 0+770.000)
- CH-4 VAN GAAL DRAIN (STA. 0+770.000 TO STA. 0+980.000)
- CH-5 SECTIONS
- CH-6 SILTATION CONTROL PLAN, TOPSOIL STRIPPING AND GRADING STAGES



KEY PLAN
SCALE 1:12500

ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION

PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS



NOTE RE: CHANNEL CONSTRUCTION

1. ALL CHANNEL CONSTRUCTION AND RESTORATION OF RIVER BANK TO BE COMPLETED UNDER THE FULL-TIME INSPECTION OF THE PROJECT ENVIRONMENTAL CONSULTANT, GEOTECHNICAL CONSULTANT AND THE FLUVIAL GEOMORPHOLOGIST
2. ALL FILL MATERIAL TO BE APPROVED BY THE PROJECT GEOTECHNICAL ENGINEER PRIOR TO PLACING.
3. ALL COMPACTION TO BE COMPLETED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AS SET OUT BY THE GEOTECHNICAL ENGINEER.
4. GRADING SHOWN ON THIS DRAWING APPLIES ONLY WITHIN THE LIMIT OF THE CHANNEL BLOCK.

NOTE RE: EXISTING SOIL CONDITIONS

REFER TO: GEOTECHNICAL INVESTIGATION FOR PRELIMINARY GEOTECHNICAL INVESTIGATION REPORT, PROPOSED RESIDENTIAL SUBDIVISION PERTH AND OTTAWA STREETS, RICHMOND AREA PROJECT NO. 1026929 PREPARED BY: JACQUES WHITFORD INC. DATED JUNE 22, 2007

LEGEND

210.18 EXISTING ELEVATION
210.71 PROPOSED ELEVATION
210.00 EXISTING CONTOUR ELEVATION
[210.50] FUTURE ELEVATION

VILLAGE OF RICHMOND
REFER TO
DAVID SCHAEFFER ENGINEERING LIMITED
PROJECT NO. 11-468

NOTE:
FOR CROSS SECTIONS A-A & B-B, REFER TO DRAWING NO. CH-5



TOPOGRAPHIC INFORMATION
TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, DATED SEPTEMBER 26, 2012.

LEGAL INFORMATION
DRAFT PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 10-10-314-00-DRAFT, DATED DECEMBER 07, 2012.

4th SUBMISSION 17-03-17
NOT FOR CONSTRUCTION

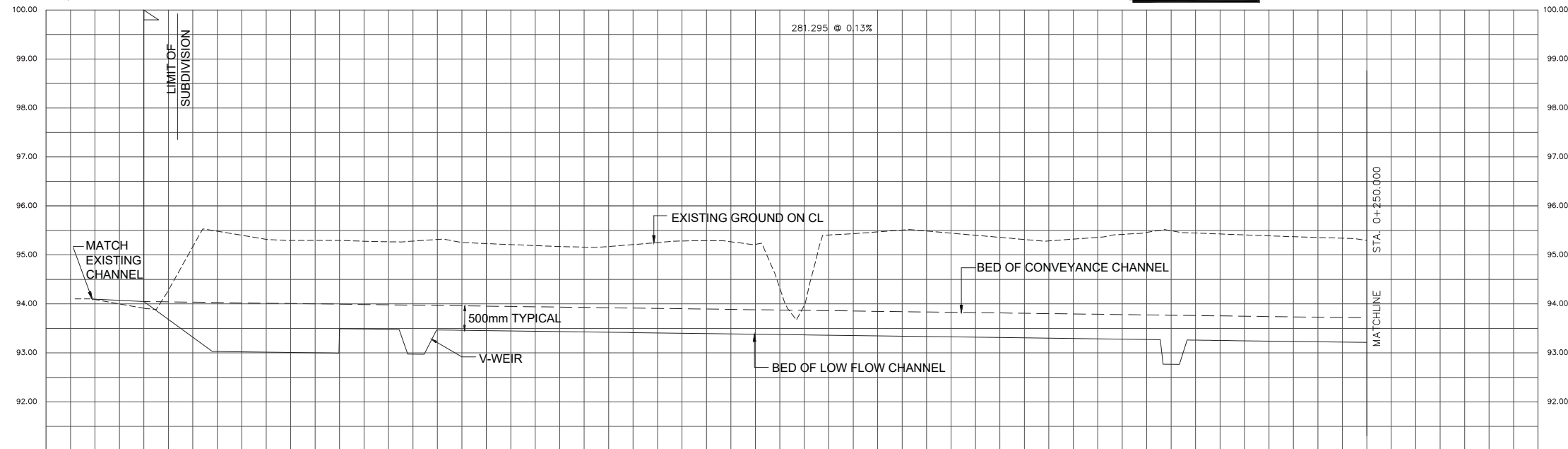
BENCH MARK No. 0011968U124
ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO BENCHMARK No. 0011968U124 HAVING A PUBLISHED ELEVATION OF 95.186m. LOCATION: BRIDGE OVER JOCK RIVER IN RICHMOND, 0.8 KM SOUTH OF RICHMOND ROAD, BARRIS CAP IN TOP OF EAST WALL, 2.7M FROM NORTH END.

SITE BENCHMARK IS A CUT CROSS LOCATED ON THE PERTH STREET BOX CULVERT WITH COORDINATES 5005680.863, 356133.553 AND GEODETIC ELEVATION 94.824

No.	BY	DATE	DESCRIPTION	BY
5	K.M.	17-06-05	REVISED PER CITY COMMENTS	
4	K.M.	17-03-17	4th SUBMISSION	
3	K.M.	16-12-09	3rd SUBMISSION	
2	K.M.	14-11-18	2nd SUBMISSION	
1	Z.L.	12-11-23	1st SUBMISSION	



PROJECT No. 11-468



BED OF CHANNEL ELEV.	94.048	94.021	93.995	93.969	93.942	93.915	93.888	93.862	93.835	93.809	93.782	93.755	93.729	BED OF FLOODPLAIN ELEV.
BED OF LOW FLOW CHANNEL ELEV.	94.099	94.046	93.029	92.995 92.495	93.478 92.976 92.972 93.468							93.270 92.771 92.765 93.263		BED OF LOW FLOW CHANNEL ELEV.
TYPICAL SECTION USED	U/S SEDIMENT DETENTION			CONVEYANCE AND LOW FLOW CHANNEL	CROSS-VANE	CONVEYANCE AND LOW FLOW CHANNEL						CROSS-VANE	CONVEYANCE AND LOW FLOW CHANNEL	TYPICAL SECTION USED
CENTERLINE CHAINAGE	0+000.000	0+020.000	0+040.000	0+060.000	0+080.000	0+100.000	0+120.000	0+140.000	0+160.000	0+180.000	0+200.000	0+220.000	0+240.000	CENTERLINE CHAINAGE

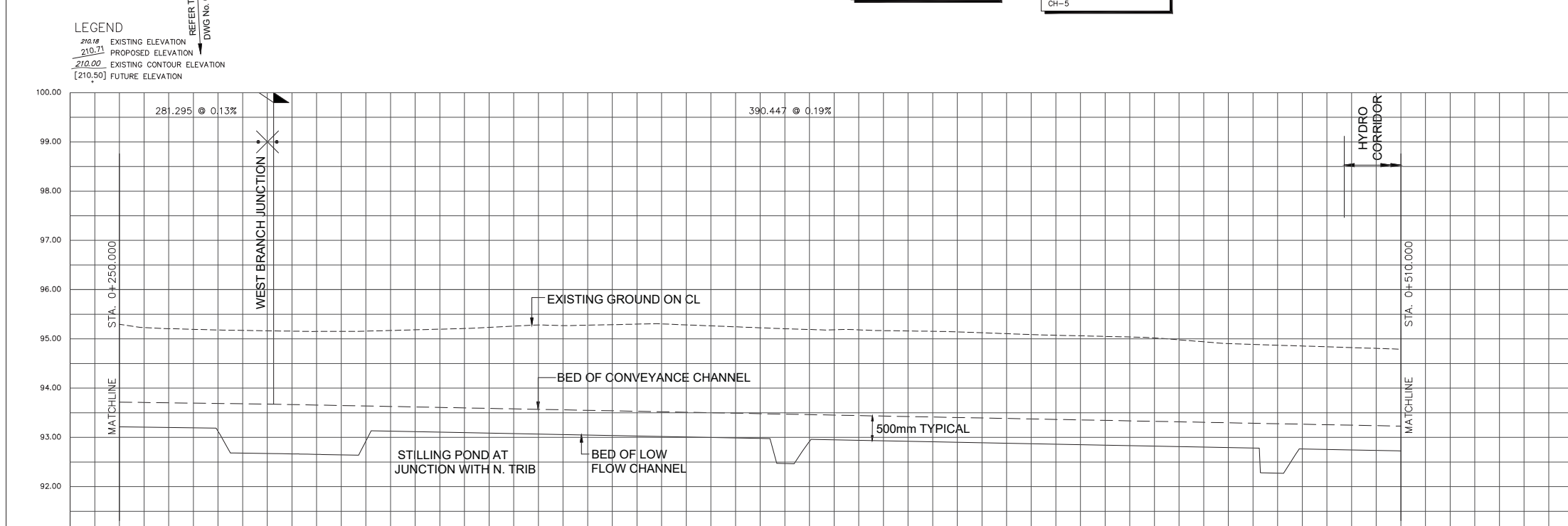
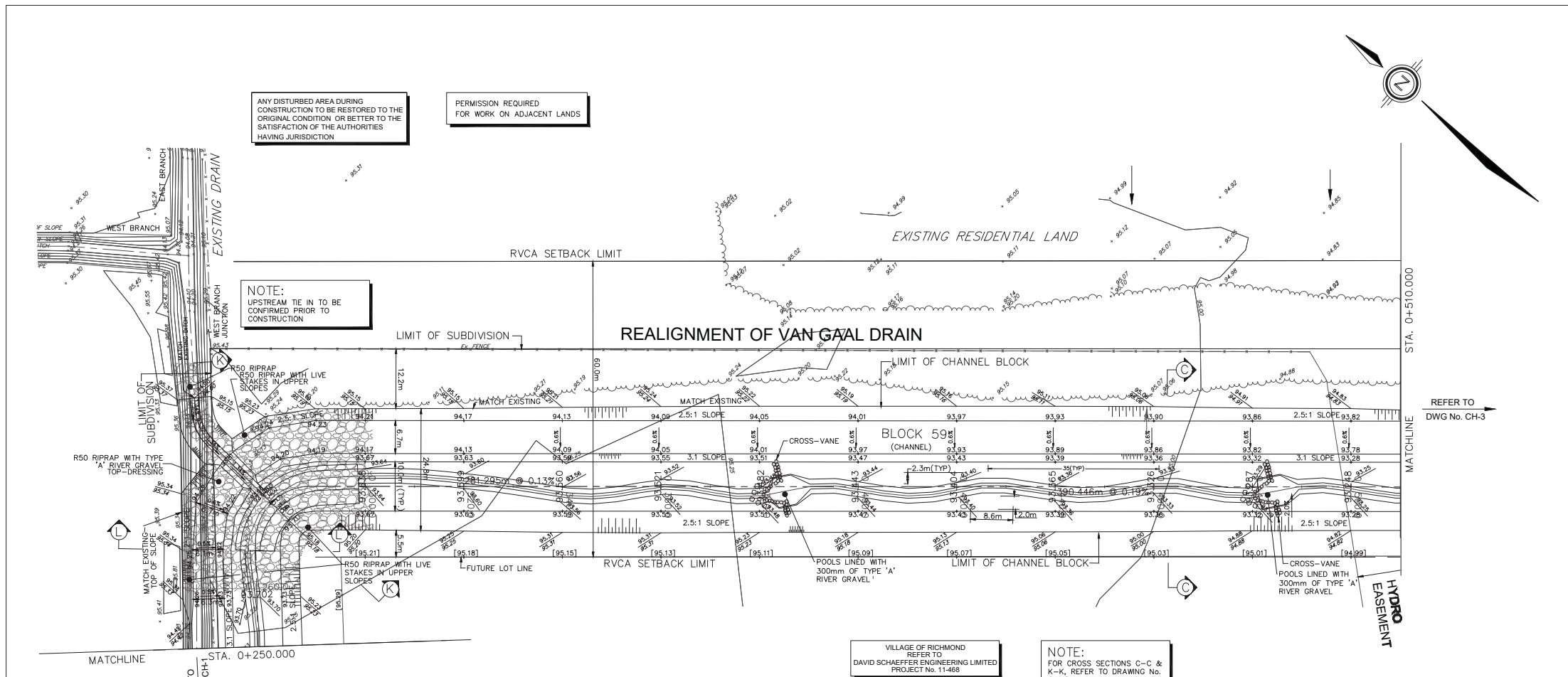
PLAN AND PROFILE OF
VAN GAAL DRAIN
STA. 0+000.000 TO 0+250.000 © DSEL

RICHMOND VILLAGE (SOUTH) LIMITED | VILLAGE OF RICHMOND CHANNEL RE-ALIGNMENT

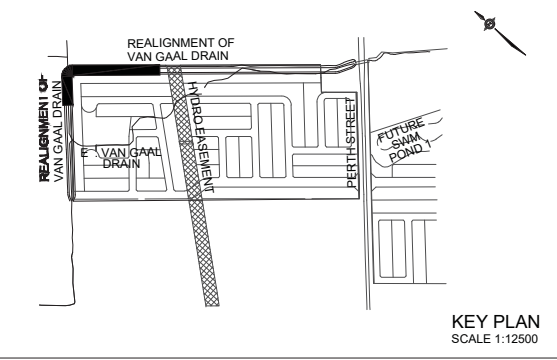
DSEL david schaeffer engineering ltd

1201 Tr Road, Unit 203
Suite 17, ONK2S 1E9
Tel: (613) 836-0856
Fax: (613) 836-7183
www.DSEL.ca

DRAWN BY: I.V.	CHECKED BY: K.M.	DRAWING NO.:	SHEET NO.:
DESIGNED BY: K.M.	CHECKED BY: Z.L.		CH-1
SCALE: H:1:500, V:1:50	DATE: NOV. 2012		



BED OF CHANNEL ELEV.	93.702	93.676	93.638	93.599	93.580	93.521	93.482	93.443	93.404	93.365	93.326	93.287	93.248
BED OF LOW FLOW CHANNEL ELEV.		91.188 92.685	92.640 91.134				92.975 92.475	92.468 92.959				92.751 92.281	92.275 92.765
TYPICAL SECTION USED	CONVEYANCE AND LOW FLOW CHANNEL	STILLING POND		CONVEYANCE AND LOW FLOW CHANNEL			CROSS-VANE		CONVEYANCE AND LOW FLOW CHANNEL			CROSS-VANE	CONVEYANCE AND LOW FLOW CHANNEL
CENTERLINE CHAINAGE	0+280.000	0+290.000 0+292.500 PI	0+300.000	0+320.000	0+340.000	0+360.000	0+380.000	0+400.000	0+420.000	0+440.000	0+460.000	0+480.000	0+500.000



NOTE RE: CHANNEL CONSTRUCTION

1. ALL CHANNEL CONSTRUCTION AND RESTORATION OF RIVER BANK TO BE COMPLETED UNDER THE FULL-TIME INSPECTION OF THE PROJECT ENVIRONMENTAL CONSULTANT, GEOTECHNICAL CONSULTANT AND THE FLUVIAL GEOMORPHOLOGIST.
2. ALL FILL MATERIAL TO BE APPROVED BY THE PROJECT GEOTECHNICAL ENGINEER PRIOR TO PLACING.
3. ALL COMPACTION TO BE COMPLETED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AS SET OUT BY THE GEOTECHNICAL ENGINEER.
4. GRADING SHOWN ON THIS DRAWING APPLIES ONLY WITHIN THE LIMIT OF THE CHANNEL BLOCK.

NOTE RE: EXISTING SOIL CONDITIONS

REFER TO: GEOTECHNICAL INVESTIGATION FOR PRELIMINARY GEOTECHNICAL INVESTIGATION REPORT, PROPOSED RESIDENTIAL SUBDIVISION PERTH AND OTTAWA STREETS, RICHMOND AREA PROJECT NO. 1026929 PREPARED BY: JACQUES WHITFORD INC. DATED JUNE 22, 2007



TOPOGRAPHIC INFORMATION
TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, DATED SEPTEMBER 26, 2012.

LEGAL INFORMATION
DRAFT PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 10-10-314-00-DRAFT, DATED DECEMBER 07, 2012.
4th SUBMISSION 17-03-17

NOT FOR CONSTRUCTION

BENCH MARK No. 0011968U124
ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO BENCHMARK No. 0011968U124 HAVING A PUBLISHED ELEVATION OF 95.186m, LOCATION: BRIDGE OVER JOCK RIVER IN RICHMOND, 0.8 KM SOUTH OF RICHMOND ROAD, BARRIS CAP IN TOP OF EAST WALL, 2.7M FROM NORTH END.
SITE BENCHMARK IS A CUT CROSS LOCATED ON THE PERTH STREET BOX CULVERT WITH COORDINATES 5005680.863, 356133.553 AND GEODETIC ELEVATION 94.824

No.	BY	DATE	DESCRIPTION	BY
5	K.M.	17-06-05	REVISED PER CITY COMMENTS	
4	K.M.	17-03-17	4th SUBMISSION	
3	K.M.	16-12-09	3rd SUBMISSION	
2	K.M.	14-11-18	2nd SUBMISSION	
1	Z.L.	12-11-23	1st SUBMISSION	



PROJECT No. 11-468

PLAN AND PROFILE OF
VAN GAAL DRAIN
STA. 0+250.000 TO 0+510.000 © DSEL

RICHMOND VILLAGE (SOUTH) LIMITED | VILLAGE OF RICHMOND CHANNEL RE-ALIGNMENT

DSEL david schaeffer engineering ltd

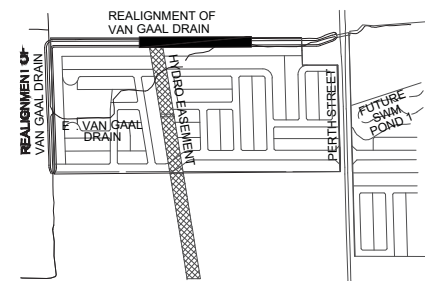
1201 T-Road, Unit 203
Suite 17, ONTARIO, ON
T - (613) 836-0856
Fa - (613) 836-7183
www.DSEL.ca

DRAWN BY:	I.V.	CHECKED BY:	K.M.	DRAWING NO.	SHEET NO.
DESIGNED BY:	K.M.	CHECKED BY:	Z.L.		CH-2
SCALE:	H:1:500, V:1:50	DATE:	NOV. 2012		

ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION

PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS

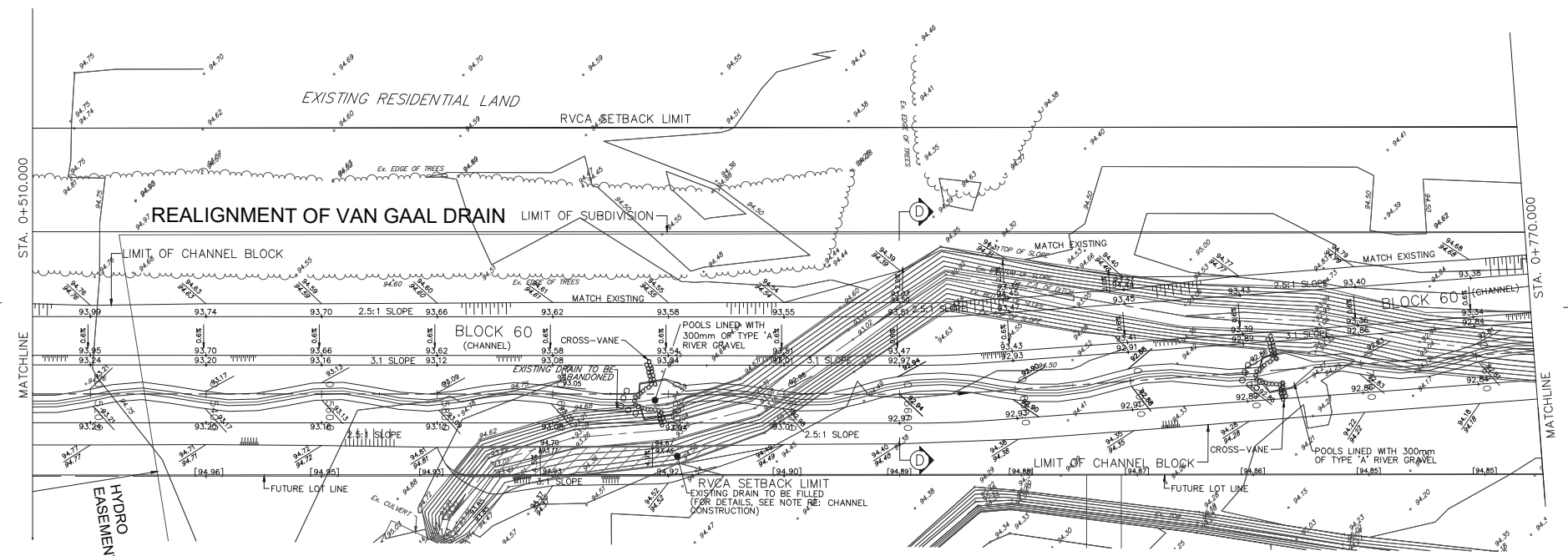
NOTE RE: 100 YR WATER LEVEL FREEBOARD FOR CHANNEL
 1. CHANNEL GRADING AT NORTH EAST LIMIT HAS BEEN DESIGNED TO MATCH EXISTING GRADES TO MAINTAIN EXISTING DRAINAGE PATTERN
 2. 0.30m FREEBOARD ABOVE 100 YR WATER LEVEL FOR REALIGNED CHANNEL ON THE NORTH EAST LIMIT FROM STATION 0+540 TO 0+900 TO BE PROVIDED UPON FUTURE DEVELOPMENT OF EXISTING RESIDENTIAL LAND



KEY PLAN SCALE 1:12500

NOTE RE: CHANNEL CONSTRUCTION
 1. ALL CHANNEL CONSTRUCTION AND RESTORATION OF RIVER BANK TO BE COMPLETED UNDER THE FULL-TIME INSPECTION OF THE PROJECT ENVIRONMENTAL CONSULTANT, GEOTECHNICAL CONSULTANT AND THE FLUVIAL GEOMORPHOLOGIST
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 3. ALL COMPACTION TO BE COMPLETED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AS SET OUT BY THE GEOTECHNICAL ENGINEER
 4. GRADING SHOWN ON THIS DRAWING APPLIES ONLY WITHIN THE LIMIT OF THE CHANNEL BLOCK

NOTE RE: EXISTING SOIL CONDITIONS
 REFER TO: GEOTECHNICAL INVESTIGATION FOR PRELIMINARY GEOTECHNICAL INVESTIGATION REPORT, PROPOSED RESIDENTIAL SUBDIVISION PERTH AND OTTAWA STREETS, RICHMOND AREA PROJECT NO. 1026929 PREPARED BY: JACQUES WHITFORD INC. DATED JUNE 22, 2007



REFER TO DWG No. CH-2

REFER TO DWG No. CH-4

LEGEND
 210.18 EXISTING ELEVATION
 210.71 PROPOSED ELEVATION
 210.00 EXISTING CONTOUR ELEVATION
 [210.50] FUTURE ELEVATION

VILLAGE OF RICHMOND REFER TO DAVID SCHAEFFER ENGINEERING LIMITED PROJECT No. 11-468

NOTE:
 FOR CROSS SECTION D-D REFER TO DRAWING No. CH-5



TOPOGRAPHIC INFORMATION
 TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, DATED SEPTEMBER 26, 2012.

LEGAL INFORMATION
 DRAFT PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 10-10-314-00-DRAFT, DATED DECEMBER 07, 2012.

4th SUBMISSION 17-03-17
NOT FOR CONSTRUCTION

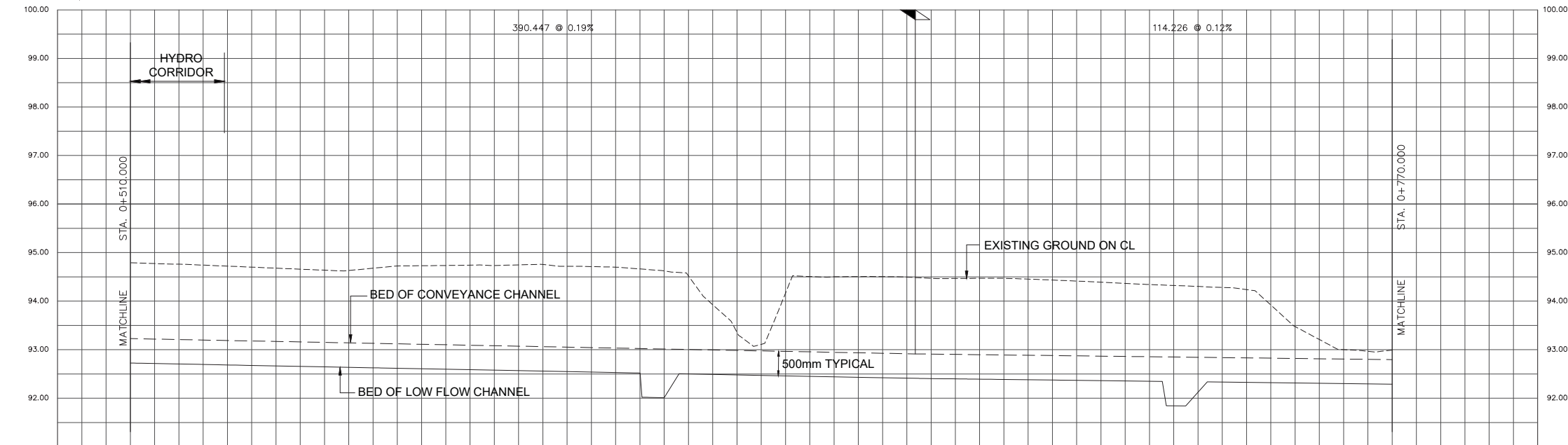
BENCH MARK No. 0011968U124
 ELEVATIONS SHOWN ARE GEOETIC AND ARE REFERRED TO BENCHMARK No. 0011968U124 HAVING A PUBLISHED ELEVATION OF 95.186m. LOCATION: BRIDGE OVER JOCK RIVER IN RICHMOND, 0.8 KM SOUTH OF RICHMOND ROAD, BARRIS CAP IN TOP OF EAST WALL, 2.7M FROM NORTH END.

SITE BENCHMARK IS A CUT CROSS LOCATED ON THE PERTH STREET BOX CULVERT WITH COORDINATES 8005680.863, 356133.553 AND GEODETIC ELEVATION 94.824

No.	BY	DATE	DESCRIPTION	BY
5	K.M.	17-06-05	REVISED PER CITY COMMENTS	
4	K.M.	17-03-17	4th SUBMISSION	
3	K.M.	16-12-09	3rd SUBMISSION	
2	K.M.	14-11-18	2nd SUBMISSION	
1	Z.L.	12-11-23	1st SUBMISSION	



PROJECT No. 11-468



BED OF CHANNEL ELEV.	93.209	93.170	93.131	93.092	93.053	93.014	92.975	92.936	92.893	92.855	92.813	92.807		
BED OF FLOODPLAIN ELEV.														
BED OF LOW FLOW CHANNEL ELEV.						92.520 92.085	92.014	92.504		92.348 91.851	91.846	92.336		
TYPICAL SECTION USED	CONVEYANCE AND LOW FLOW CHANNEL					CROSS-VANE	CONVEYANCE AND LOW FLOW CHANNEL					CROSS-VANE	CONVEYANCE AND LOW FLOW CHANNEL	
CENTERLINE CHAINAGE	0+520.000	0+540.000	0+560.000	0+580.000	0+600.000	0+620.000	0+640.000	0+660.000	0+671.741	0+680.000	0+700.000	0+720.000	0+740.000	0+760.000

PLAN AND PROFILE OF VAN GAAL DRAIN STA. 0+510.000 TO 0+770.000 © DSEL

RICHMOND VILLAGE (SOUTH) LIMITED VILLAGE OF RICHMOND CHANNEL RE-ALIGNMENT

DSEL david schaeffer engineering ltd

1201 T. Road, Unit 203
 Suite 17, ONTARIO
 Tel: (613) 836-0856
 Fax: (613) 836-7183
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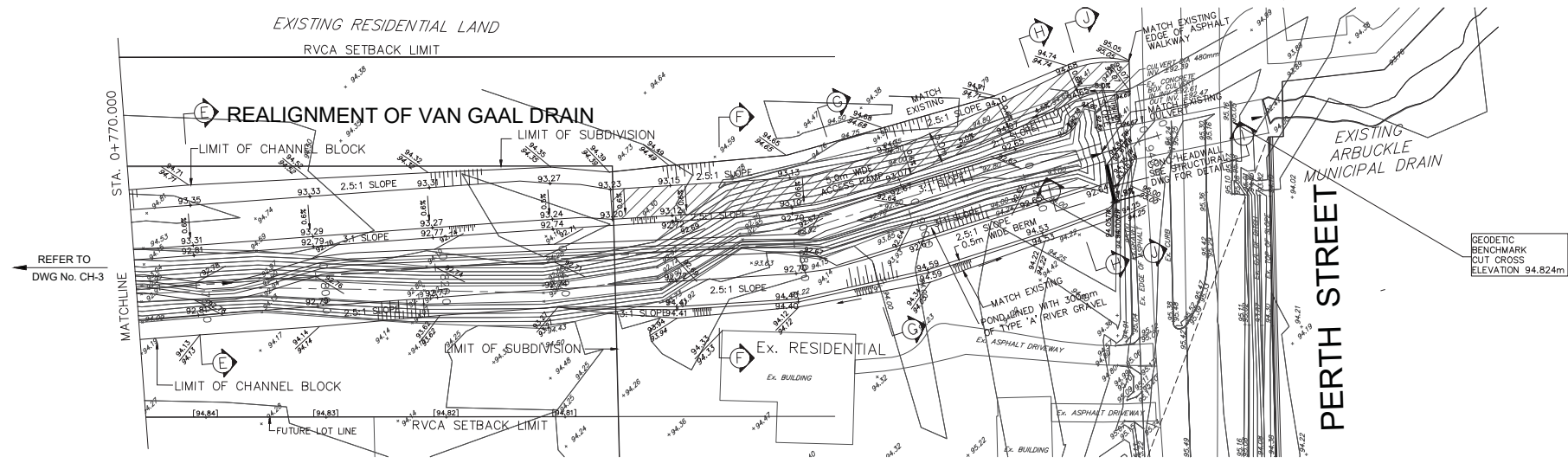
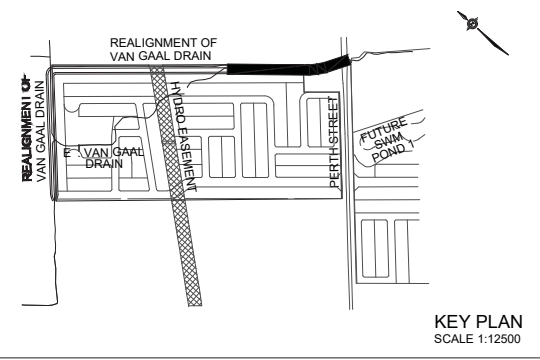
DRAWN BY: I.V.	CHECKED BY: K.M.	DRAWING NO.:	SHEET NO.:
DESIGNED BY: K.M.	CHECKED BY: Z.L.		CH-3
SCALE: H:1:500, V:1:50	DATE: NOV. 2012		

ANY DISTURBED AREA DURING CONSTRUCTION TO BE RESTORED TO THE ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE AUTHORITIES HAVING JURISDICTION

PERMISSION REQUIRED FOR WORK ON ADJACENT LANDS

NOTE RE: 100 YR WATER LEVEL FREEBOARD FOR CHANNEL
 1. CHANNEL GRADING AT NORTH EAST LIMIT HAS BEEN DESIGNED TO MATCH EXISTING GRADES TO MAINTAIN EXISTING DRAINAGE PATTERN
 2. 0.30m FREEBOARD ABOVE 100 YR WATER LEVEL FOR REALIGNED CHANNEL ON THE NORTH EAST LIMIT FROM STATION 0+540 TO 0+900 TO BE PROVIDED UPON FUTURE DEVELOPMENT OF EXISTING RESIDENTIAL LAND

NOTE:
 UPSTREAM TIE IN TO BE CONFIRMED PRIOR TO CONSTRUCTION



NOTE RE: CHANNEL CONSTRUCTION
 1. ALL CHANNEL CONSTRUCTION AND RESTORATION OF RIVER BANK TO BE COMPLETED UNDER THE FULL-TIME INSPECTION OF THE PROJECT ENVIRONMENTAL CONSULTANT, GEOTECHNICAL CONSULTANT AND THE FLUVIAL GEOMORPHOLOGIST
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 4. GRADING SHOWN ON THIS DRAWING APPLIES ONLY WITHIN THE LIMIT OF THE CHANNEL BLOCK

NOTE RE: EXISTING SOIL CONDITIONS
 REFER TO: GEOTECHNICAL INVESTIGATION FOR PRELIMINARY GEOTECHNICAL INVESTIGATION REPORT, PROPOSED RESIDENTIAL SUBDIVISION PERTH AND OTTAWA STREETS, RICHMOND AREA PROJECT NO. 1026929 PREPARED BY: JACQUES WHITFORD INC. DATED JUNE 22, 2007

NOTE:
 FOR CROSS SECTIONS E-E, F-F, G-G, H-H, I-I AND J-J, REFER TO DRAWING No. CH-5

LEGEND
 210.10 EXISTING ELEVATION
 210.71 PROPOSED ELEVATION
 210.00 EXISTING CONTOUR ELEVATION
 [210.50] FUTURE ELEVATION

VILLAGE OF RICHMOND REFER TO DAVID SCHAEFFER ENGINEERING LIMITED PROJECT No. 11-488



TOPOGRAPHIC INFORMATION
 TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED, DATED SEPTEMBER 26, 2012.

LEGAL INFORMATION
 DRAFT PLAN PROVIDED BY J.D. BARNES LIMITED, PROJECT No. 10-10-314-00-DRAFT, DATED DECEMBER 07, 2012.
 4th SUBMISSION 17-03-17

NOT FOR CONSTRUCTION

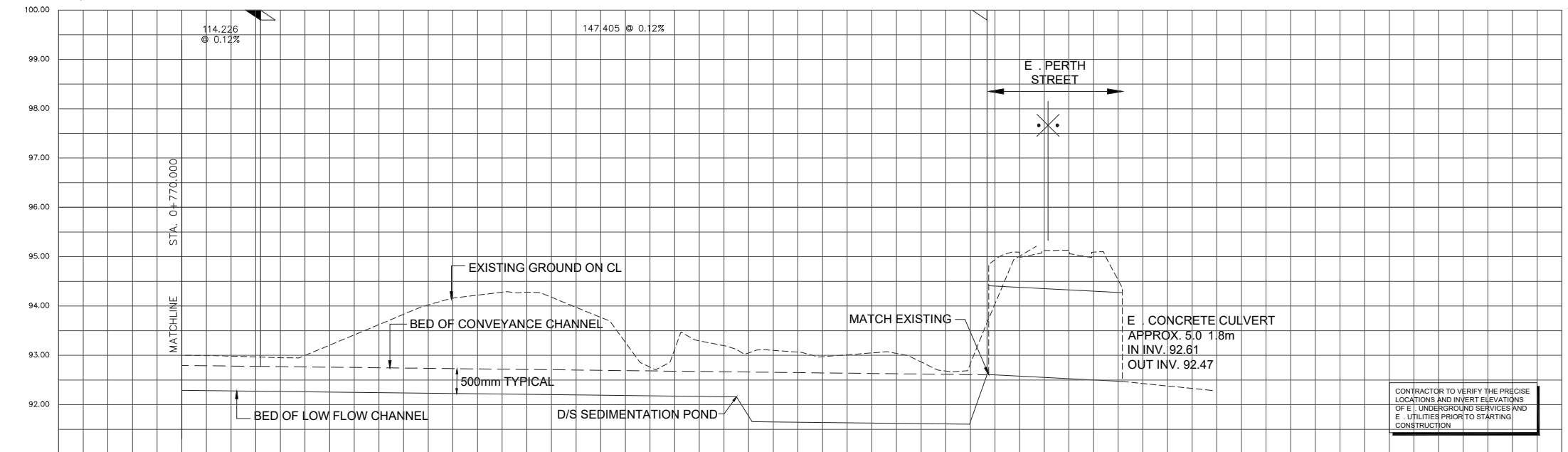
BENCH MARK No. 0011968U124
 ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO BENCHMARK No. 0011968U124 HAVING A PUBLISHED ELEVATION OF 95.186m. LOCATION: BRIDGE OVER JOCK RIVER IN RICHMOND, 0.8 KM SOUTH OF RICHMOND ROAD, BARRIS CAP IN TOP OF EAST WALL, 2.7M FROM NORTH END.

SITE BENCHMARK IS A CUT CROSS LOCATED ON THE PERTH STREET BOX CULVERT WITH COORDINATES 5005660.863, 356133.553 AND GEODETIC ELEVATION 94.824

No.	BY	DATE	DESCRIPTION	BY
5	K.M.	17-06-05	REVISED PER CITY COMMENTS	
4	K.M.	17-03-17	4th SUBMISSION	
3	K.M.	16-12-09	3rd SUBMISSION	
2	K.M.	14-11-18	2nd SUBMISSION	
1	Z.L.	12-11-23	1st SUBMISSION	



PROJECT No. 11-468



CONTRACTOR TO VERIFY THE PRECISE LOCATIONS AND INVERT ELEVATIONS OF E UNDERGROUND SERVICES AND E UTILITIES PRIOR TO STARTING CONSTRUCTION

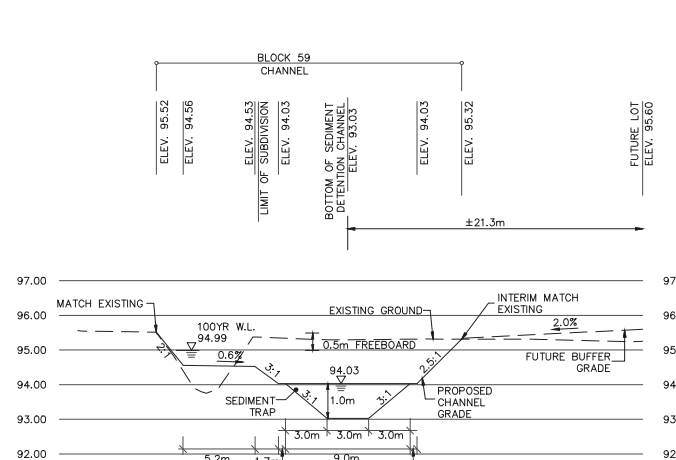
BED OF CHANNEL ELEV.	92.783	92.776	92.760	92.737	92.713	92.690	92.667	92.644	92.621	92.605	92.47
BED OF FLOODPLAIN ELEV.											
BED OF LOW FLOW CHANNEL ELEV.							92.159 91.677			91.609 92.599	
TYPICAL SECTION USED	CONVEYANCE AND LOW FLOW CHANNEL						D/S SEDIMENT DETENTION				
CENTERLINE CHAINAGE	0+780.000	0+785.967	0+800.000	0+820.000	0+840.000	0+860.000	0+880.000	0+900.000	0+920.000	0+933.372	0+940.000

PLAN AND PROFILE OF VAN GAAL DRAIN
 STA. 0+770.000 TO 0+980.000 © DSEL

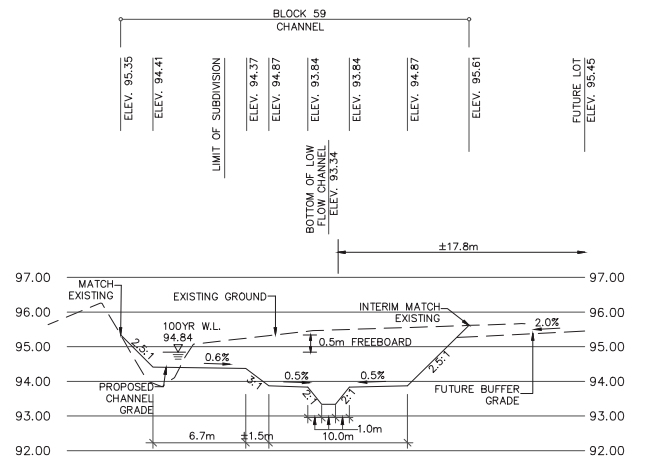
RICHMOND VILLAGE (SOUTH) LIMITED | VILLAGE OF RICHMOND CHANNEL RE-ALIGNMENT

DSEL david schaeffer engineering ltd
 1201 T. Road, Unit 203
 Suite 17, ONTARIO
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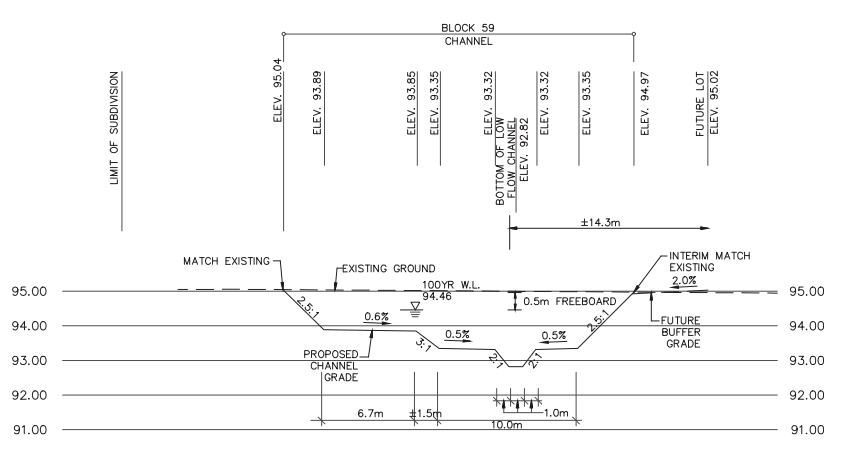
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DESIGNED BY: K.M.	CHECKED BY: Z.L.		CH-4
SCALE: H:1:500, V:1:50	DATE: NOV. 2012		



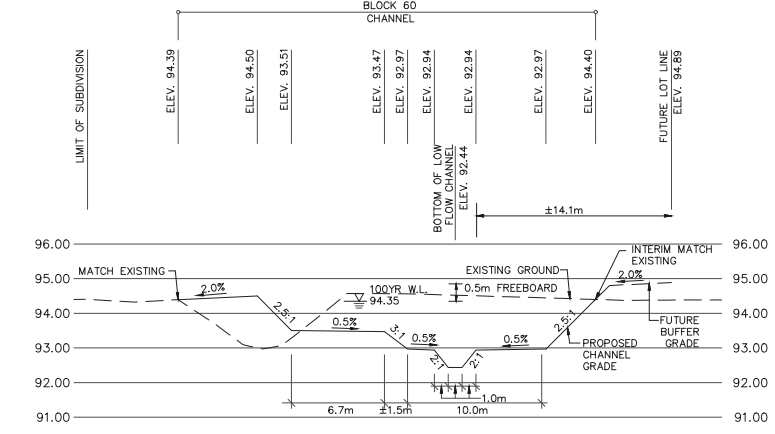
SECTION A-A
SCALE HOR. 1:250
VER. 1:100



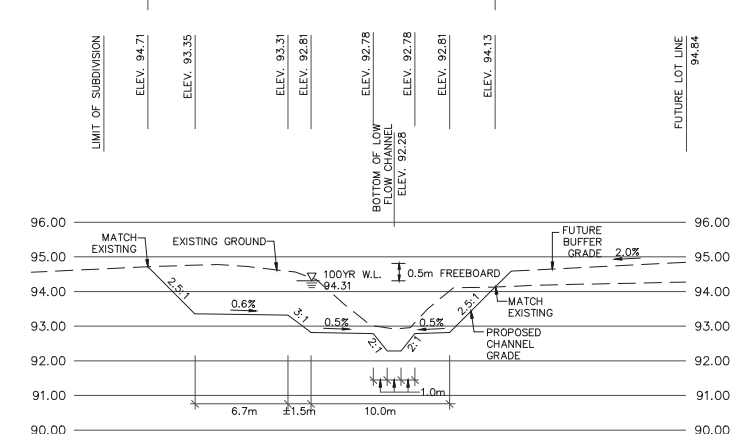
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SCALE HOR. 1:250
VER. 1:100



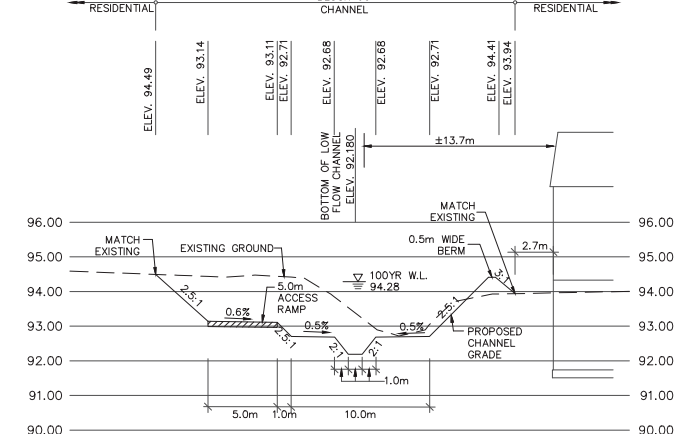
SECTION C-C
SCALE HOR. 1:250
VER. 1:100



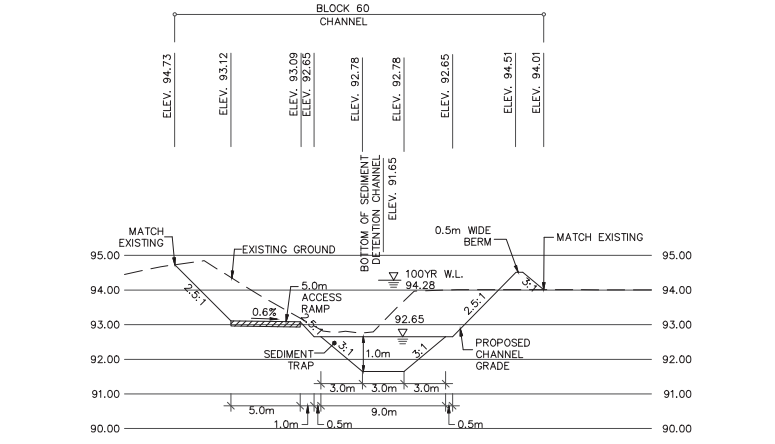
SECTION D-D
SCALE HOR. 1:250
VER. 1:100



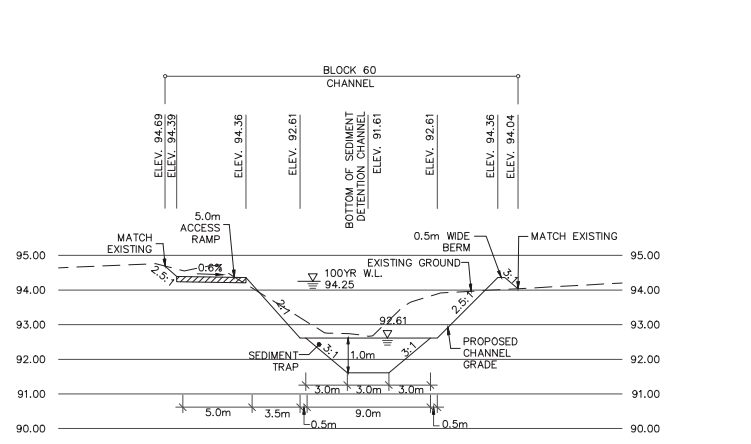
SECTION E-E
SCALE HOR. 1:250
VER. 1:100



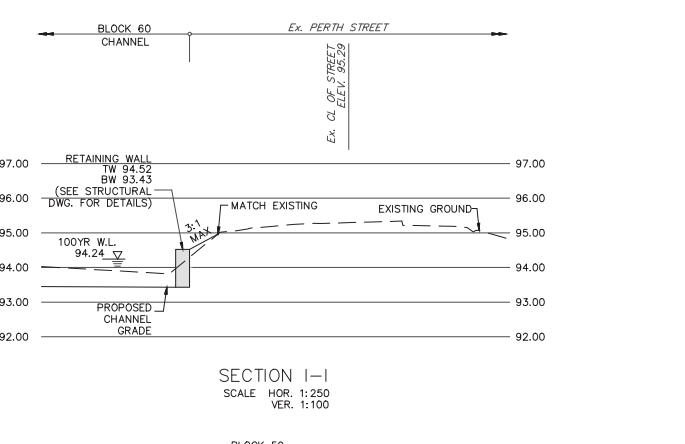
SECTION F-F
SCALE HOR. 1:250
VER. 1:100



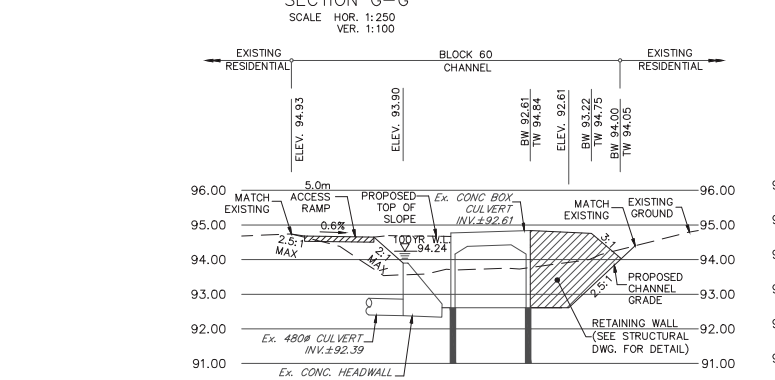
SECTION G-G
SCALE HOR. 1:250
VER. 1:100



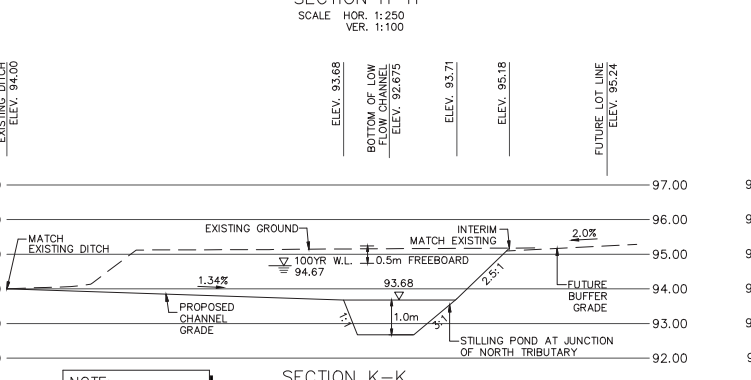
SECTION H-H
SCALE HOR. 1:250
VER. 1:100



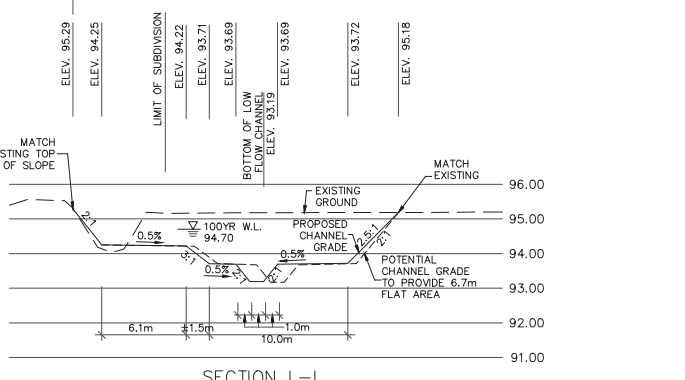
SECTION I-I
SCALE HOR. 1:250
VER. 1:100



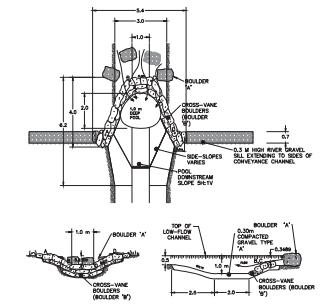
SECTION J-J
SCALE HOR. 1:250
VER. 1:100



SECTION K-K
SCALE HOR. 1:250
VER. 1:100



SECTION L-L
SCALE HOR. 1:250
VER. 1:100



TYPICAL SECTIONS OF CROSS VANES
SCALE HOR. 1:200
VER. 1:200



TOPOGRAPHIC INFORMATION
TOPOGRAPHIC INFORMATION PROVIDED BY J.D. BARNES LIMITED,
DATED SEPTEMBER 26, 2012.

LEGAL INFORMATION
DRAFT PLAN PROVIDED BY J.D. BARNES LIMITED,
PROJECT No. 10-10-314-00-DRAFT, DATED DECEMBER 07, 2012.

4th SUBMISSION 17-03-17
NOT FOR CONSTRUCTION

BENCH MARK No. 0011968U124
ELEVATIONS SHOWN ARE GEODETIC AND ARE REFERRED TO BENCHMARK No. 0011968U124 HAVING A PUBLISHED ELEVATION OF 95.186m. LOCATION: BRIDGE OVER JOCK RIVER IN RICHMOND, 0.8 KM SOUTH OF RICHMOND ROAD, BARRIS GAP IN TOP OF EAST WALL, 2.7M FROM NORTH END.

SITE BENCHMARK IS A CUT CROSS LOCATED ON THE PERTH STREET BOX CULVERT WITH COORDINATES 5005680.863, 356133.553 AND GEODETIC ELEVATION 94.824

No.	BY	DATE	DESCRIPTION	BY
5	K.M.	17-06-05	REVISED PER CITY COMMENTS	
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3	K.M.	16-12-09	3rd SUBMISSION	
2	K.M.	14-11-18	2nd SUBMISSION	
1	Z.L.	12-11-23	1st SUBMISSION	



PROJECT No. 11-468

SECTIONS © DSEL

RICHMOND VILLAGE (SOUTH) LIMITED
VILLAGE OF RICHMOND CHANNEL RE-ALIGNMENT

DSEL
david schaeffer engineering ltd

1201 T Road, Unit 203
Stittsville, ON K2S 1E9
T: (613) 836-8856
F: (613) 836-7183
www.DSEL.ca

DRAWN BY: L.V.	CHECKED BY: K.M.	DRAWING NO.	SHEET NO.
DESIGNED BY: K.M.	CHECKED BY: Z.L.		CH-5
SCALE: AS SHOWN	DATE: NOVEMBER 2012		

NOTE:
UPSTREAM TIE IN TO BE
CONFIRMED PRIOR TO
CONSTRUCTION

NOTE:
UPSTREAM TIE IN TO BE
CONFIRMED PRIOR TO
CONSTRUCTION

Contractor shall check all dimensions on the work and report any discrepancy to the Landscape Architect before proceeding. All drawings and specifications are the property of the Landscape Architect and must be returned at the completion of the work. This drawing is not to be used for construction until signed by the Landscape Architect.

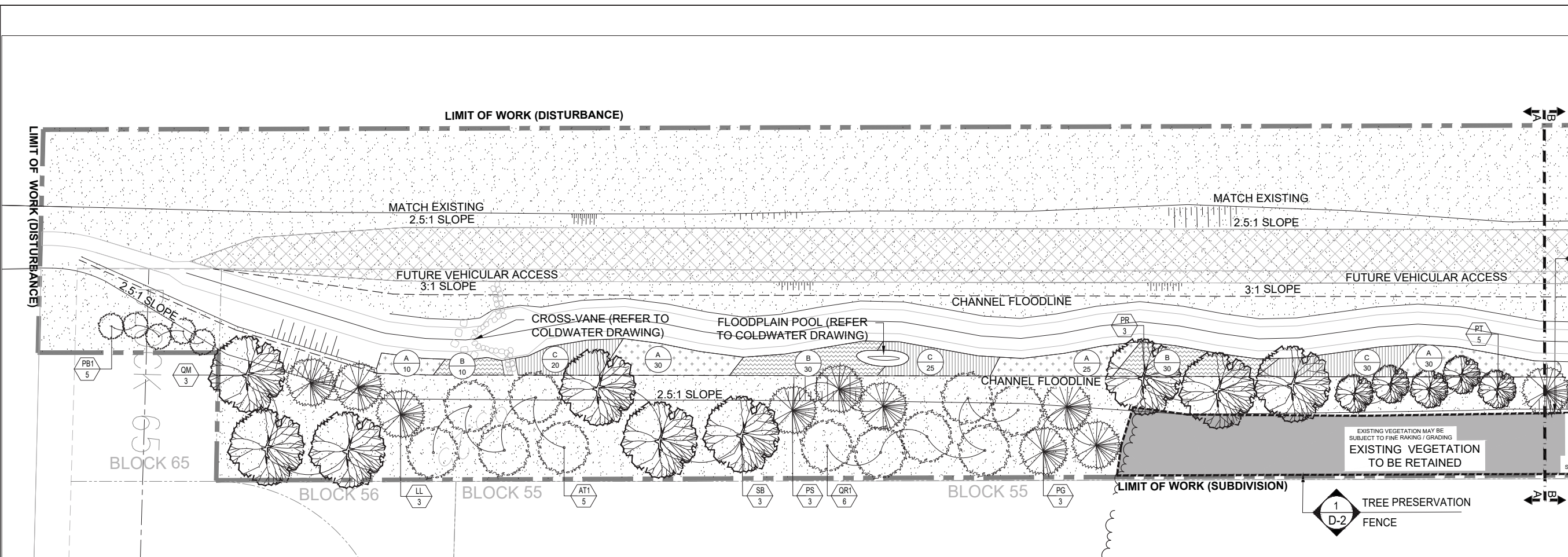


LEGEND

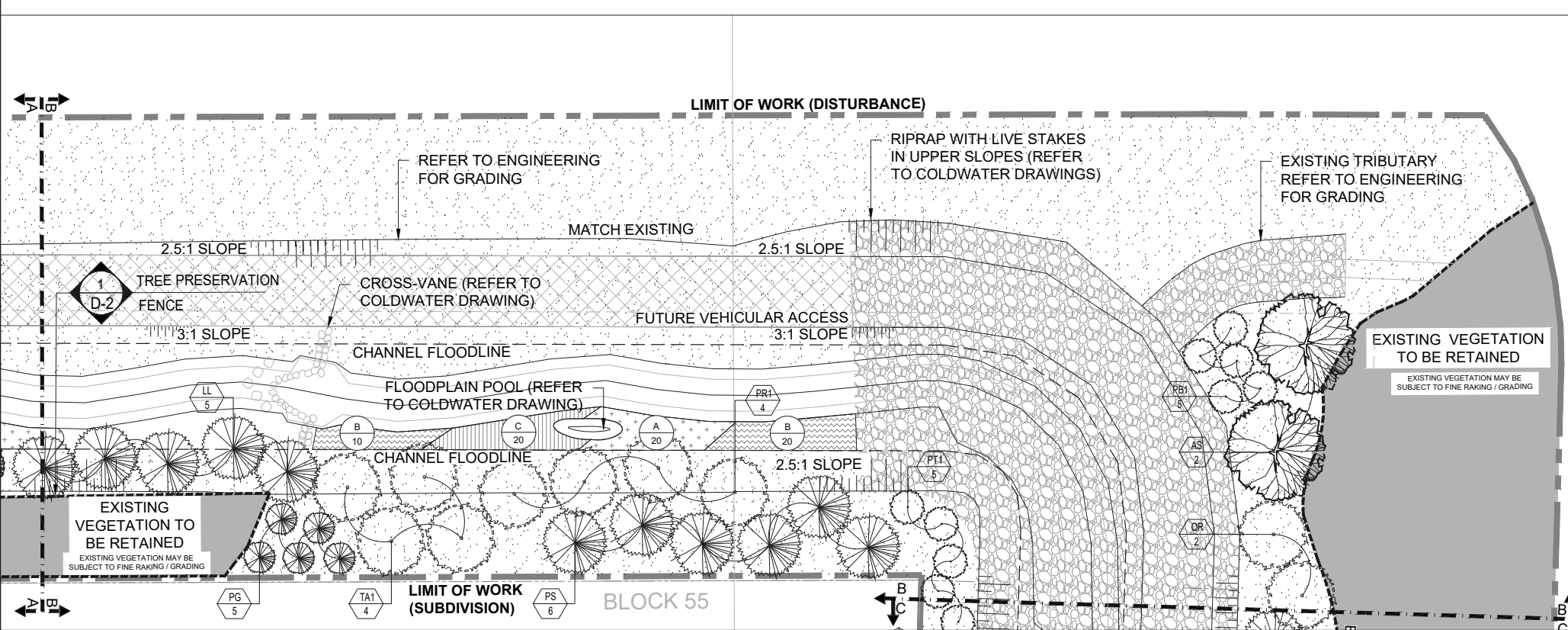
- LIMIT OF WORKS
- - - CHANNEL FLOODLINE
- PROPERTY LINE
- - - TREE PRESERVATION TREE
- - - MATCH LINE
- DECIDUOUS TREE
- DECIDUOUS TREE
- CONIFEROUS TREE
- WET MEADOW SEED MIX
- DRY-MESIC MEADOW SEED MIX
- SHRUB MIX 'A'
- SHRUB MIX 'B'
- SHRUB MIX 'C'
- EXISTING VEGETATION TO BE RETAINED
- GRAVEL (REFER TO COLDWATER DRAWINGS)
- FUTURE VEHICULAR ACCESS (REFER TO COLDWATER DRAWINGS)

PLANTING KEY

- XX-00 TREE SPECIES QUANTITY
- XX-00 SHRUB GROUP QUANTITY
- XX-XX DETAIL SHEET



A PLANTING PLAN



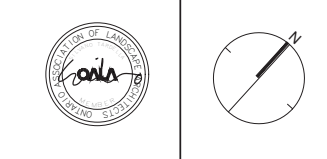
B PLANTING PLAN

PLANT LIST - FOR PLANTING PLAN 1, 2, AND 3

KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS
DECIDUOUS TREES					
AR	14	ACER RUBRUM	RED MAPLE	175cm	B.R.
AR1	15	ACER RUBRUM	RED MAPLE	150cm	B.R.
AS	16	ACER SACCHARINUM	SILVER MAPLE	175cm	B.R.
AS1	13	ACER SACCHARINUM	SILVER MAPLE	150cm	B.R.
AT	9	ACER SACCHARUM	SUGAR MAPLE	175cm	B.R.
AT1	27	ACER SACCHARUM	SUGAR MAPLE	150cm	B.R.
OV	6	OSTRYA VIRGINIANA	IRON WOOD	175cm	B.R.
OV1	24	OSTRYA VIRGINIANA	IRON WOOD	150cm	B.R.
PB	10	POPULUS BALSAMIFERA	BALSAM POPLAR	175cm	B.R.
PB1	17	POPULUS BALSAMIFERA	BALSAM POPLAR	150cm	B.R.
PR	23	PRUNUS SEROTINA	BLACK CHERRY	175cm	B.R.
PR1	17	PRUNUS SEROTINA	BLACK CHERRY	150cm	B.R.
PT	22	POPULUS TREMULOIDES	TREMBLING ASPEN	175cm	B.R.
PT1	31	POPULUS TREMULOIDES	TREMBLING ASPEN	150cm	B.R.
QM	12	QUERCUS MACROCARPA	BURR OAK	175cm	B.R.
QM1	10	QUERCUS MACROCARPA	BURR OAK	150cm	B.R.
QR	15	QUERCUS RUBRA	RED OAK	175cm	B.R.
QR1	16	QUERCUS RUBRA	RED OAK	150cm	B.R.
SB	16	SALIX NIGRA	BLACK WILLOW	175cm	B.R.
SB1	15	SALIX NIGRA	BLACK WILLOW	150cm	B.R.
TA	9	TILIA AMERICANA	BASS WOOD	175cm	B.R.
TA1	15	TILIA AMERICANA	BASS WOOD	150cm	B.R.
CONIFEROUS TREES					
LL	42	LARIX LARICINA	EASTERN TAMARACK	60cm	F.P.
PG	54	PICEA GLAUCA	WHITE SPRUCE	60cm	F.P.
PS	57	PINUS STROBUS	WHITE PINE	60cm	F.P.
TO	20	THUJA OCCIDENTALIS	WHITE CEDAR	60cm	F.P.
DECIDUOUS SHRUB MIX 'A' - 1.069sq.m. @ 1.5m SPACING (555 PLANTS TOTAL)					
%	QTY	BOTANICAL NAME	COMMON NAME	ROOT	
25%	135	ILEX VERTICILLATA	WINTERBERRY	SEEDLING / BARE-ROOT	
25%	140	SALIX AMYGDALOIDES	PEACH-LEAVED WILLOW	SEEDLING / BARE-ROOT	
25%	140	SALIX BEBBIANA	BEBB'S WILLOW	SEEDLING / BARE-ROOT	
25%	140	SALIX DISCOLOR	FUSSY WILLOW	SEEDLING / BARE-ROOT	
DECIDUOUS SHRUB MIX 'B' - 1.055sq.m. @ 1.5m SPACING (555 PLANTS TOTAL)					
%	QTY	BOTANICAL NAME	COMMON NAME	ROOT	
25%	140	RHUS TYPHINA	STAGHORN SUMAC	SEEDLING / BARE-ROOT	
25%	140	SAMBUCUS CANADENSIS	COMMON ELDERBERRY	SEEDLING / BARE-ROOT	
25%	140	AMELANCHIER CANADENSIS	SERVICEBERRY	SEEDLING / BARE-ROOT	
25%	135	VIBURNUM LENTAGO	NANNYBERRY	SEEDLING / BARE-ROOT	
DECIDUOUS SHRUB MIX 'C' - 1.083sq.m. @ 1.5m SPACING (560 PLANTS TOTAL)					
%	QTY	BOTANICAL NAME	COMMON NAME	ROOT	
20%	140	RUBUS CANADENSIS	BLACKBERRY	SEEDLING / BARE-ROOT	
20%	140	VIBURNUM TRILOBUM	HIGHBUSH CRANBERRY	SEEDLING / BARE-ROOT	
20%	140	CORNUS OBLIQUE	SILKY DOGWOOD	SEEDLING / BARE-ROOT	
20%	140	CORNUS SERICEA	RED OSIER DOGWOOD	SEEDLING / BARE-ROOT	
20%	140	PRUNUS VIRGINIANA	CHOKECHERRY	SEEDLING / BARE-ROOT	
SEED MIX					
WET MEADOW SEED MIX - 32.600m²			DRY-MESIC MEADOW SEED MIX - 2100m²		
25%	CANADA BLUE JOINT GRASS	25%	CANADA BLUE GRASS		
25%	ROUGH-STALKED MEADOW GRASS	25%	ORCHARD RED FESCUE		
20%	HIGHLAND COLONIAL BENTGRASS	25%	PERENNIAL RYEGRASS		
15%	CREeping RED FESCUE	10%	RED CLOVER		
5%	TALL WHITE ASTER	10%	BLACK-EYED SUSAN		
10%	NEW ENGLAND ASTER	5%	NEW ENGLAND ASTER		

No.	Description	Date
8	Revised as per Comments	Jun.8/17
7	Revised as per Comments	Mar.30/17
6	Issued for Fourth Submission	Dec.16/16
5	Revised as per Comments	Mar.19/15
4	Issued for Third Submission	Feb.11/15
3	Issued for Second Submission	Mar.04/13
2	Re-issued for First Submission	Dec.06/12
1	Issued for First Submission	Nov.23/12

Revision
City Approval Stamp

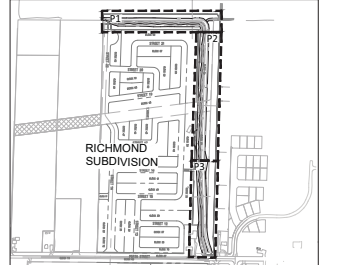


Project
VAN GAAL DRAIN CHANNEL RE-ALIGNMENT
Richmond Village Development Corporation

Title
PLANTING PLAN I

Date JANUARY 2015 Sheet
Scale NTS
Drawn AB
Checked LM
Job No. 1-12128

Contractor shall check all dimensions on the work and report any discrepancy to the Landscape Architect before proceeding. All drawings and specifications are the property of the Landscape Architect and must be returned at the completion of the work. This drawing is not to be used for construction until signed by the Landscape Architect.



LEGEND

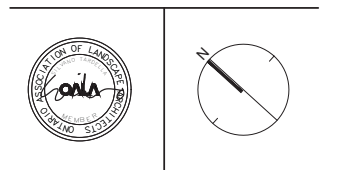
- LIMIT OF WORKS
- - - CHANNEL FLOODLINE
- PROPERTY LINE
- TREE PRESERVATION TREE
- MATCH LINE
- DECIDUOUS TREE
- DECIDUOUS TREE
- CONIFEROUS TREE
- ▨ WET MEADOW SEED MIX
- ▨ DRY-MESIC MEADOW SEED MIX
- ▨ SHRUB MIX 'A'
- ▨ SHRUB MIX 'B'
- ▨ SHRUB MIX 'C'
- ▨ EXISTING VEGETATION TO BE RETAINED
- ▨ GRAVEL (REFER TO COLDWATER DRAWINGS)
- ▨ FUTURE VEHICULAR ACCESS (REFER TO COLDWATER DRAWINGS)

- PLANTING KEY**
- XX-00 TREE SPECIES QUANTITY
 - XX-00 SHRUB GROUP QUANTITY
 - XX-XX DETAIL SHEET

No.	Description	Date
8	Revised as per Comments	Jun.8/17
7	Revised as per Comments	Mar.30/17
6	Issued for Fourth Submission	Dec.16/16
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3	Issued for Second Submission	Mar.04/13
2	Re-issued for First Submission	Dec.06/12
1	Issued for First Submission	Nov.23/12

Revision: _____ Date: _____

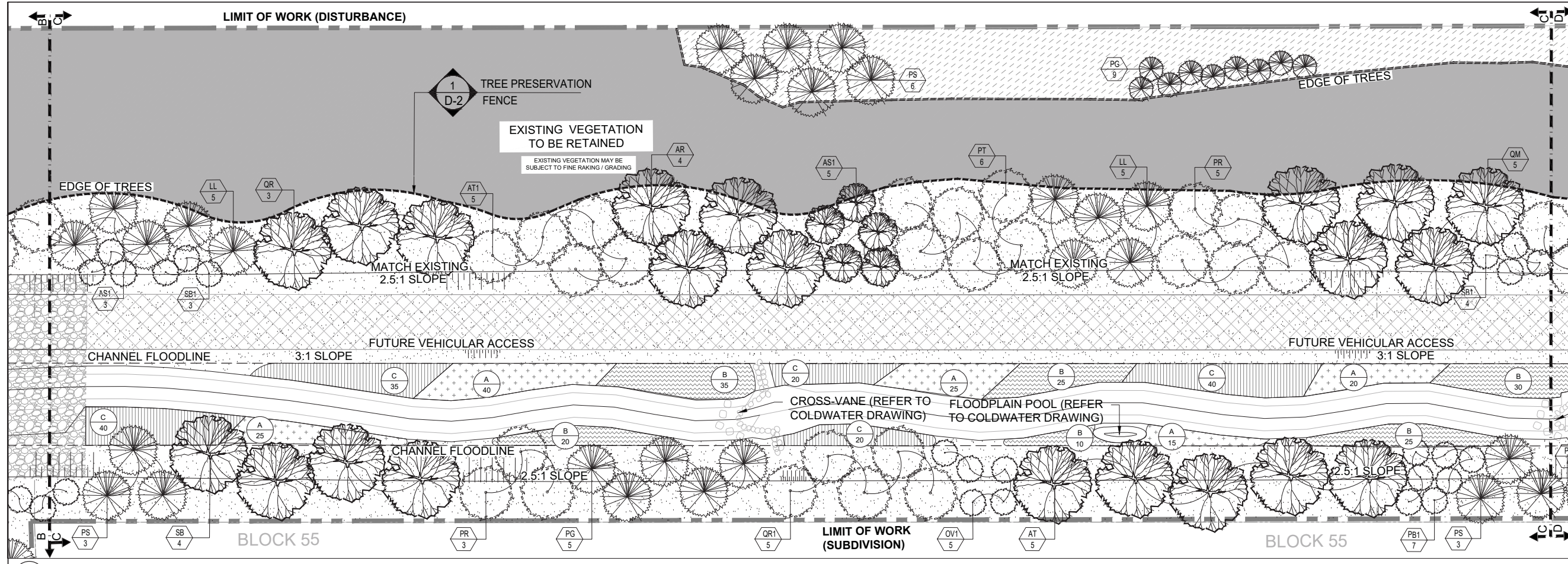
City Approval Stamp



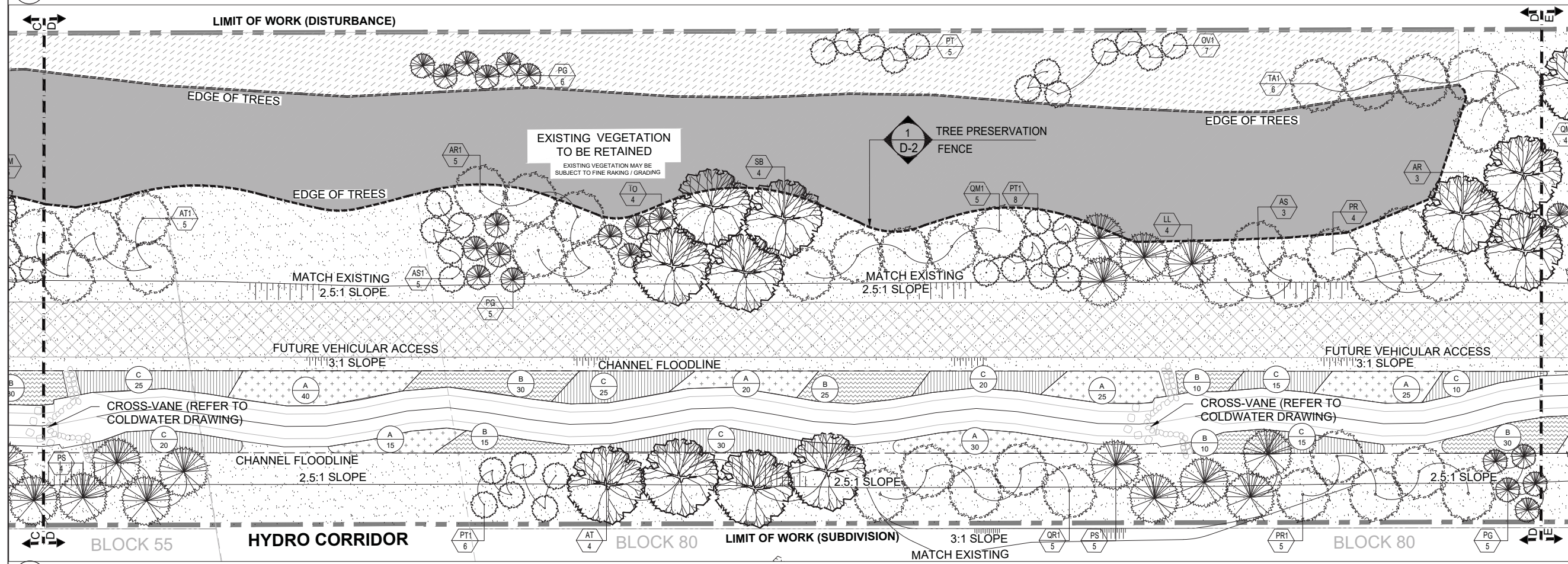
Project: VAN GAAL DRAIN CHANNEL RE-ALIGNMENT
Richmond Village Development Corporation

Title: PLANTING PLAN II

Date: JANUARY 2015 | Sheet: P2
Scale: NTS
Drawn: AB
Checked: LM
Job No.: 1-12128



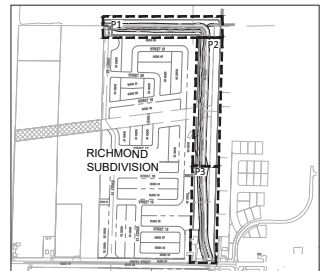
(C) PLANTING PLAN



(D) PLANTING PLAN

FOR PLANTING PLAN REFER TO P1

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LEGEND

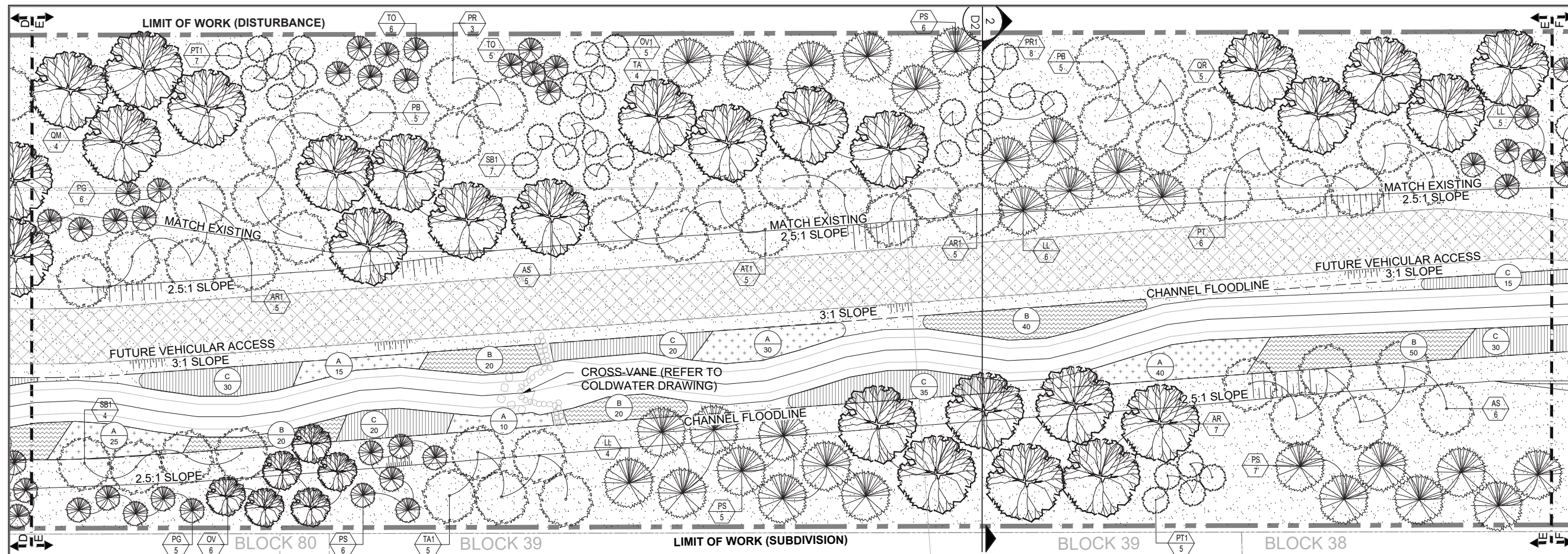
- LIMIT OF WORKS
- - - CHANNEL FLOODLINE
- PROPERTY LINE
- - - TREE PRESERVATION TREE
- - - MATCH LINE

- DECIDUOUS TREE
- DECIDUOUS TREE
- CONIFEROUS TREE

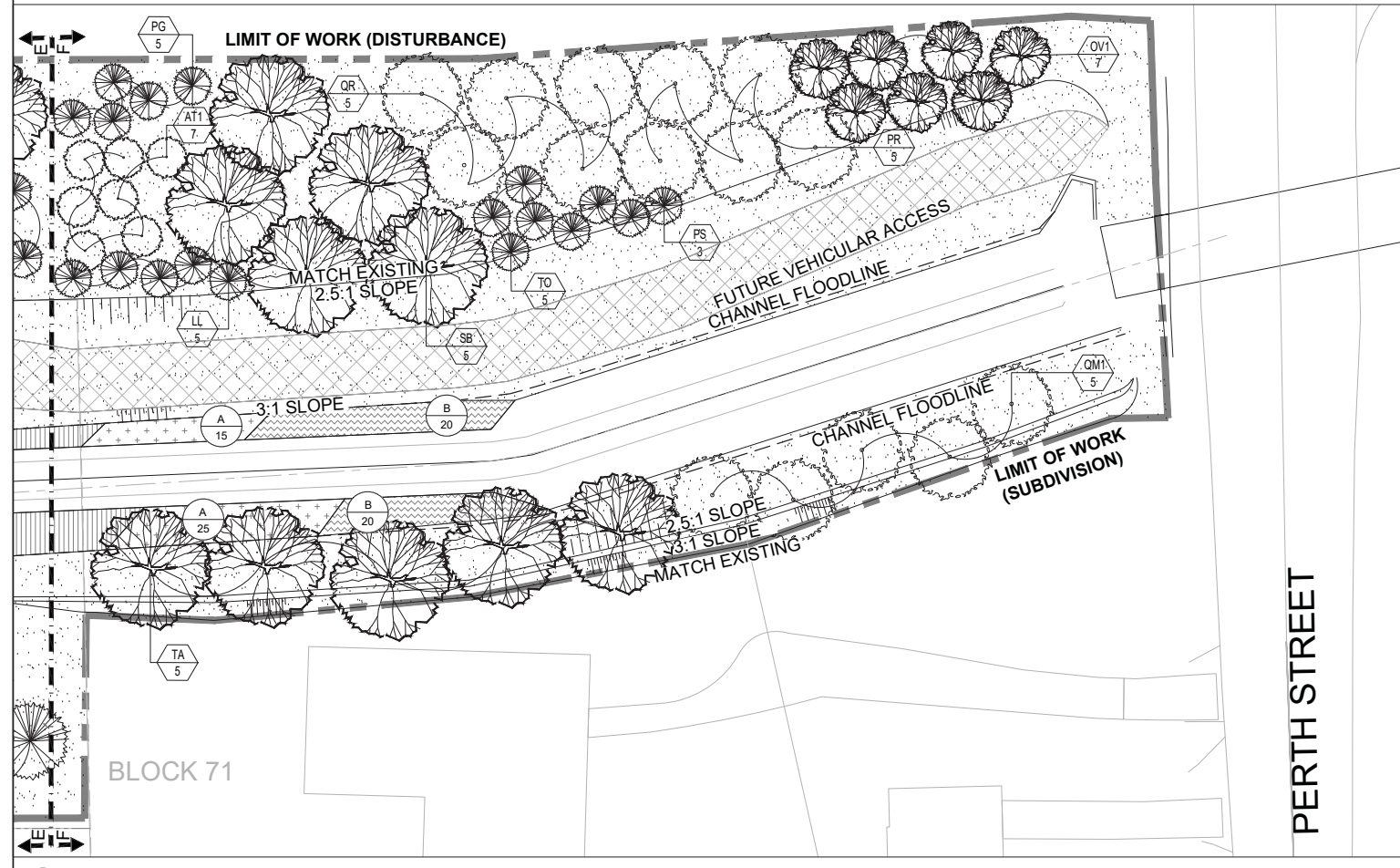
- WET MEADOW SEED MIX
- DRY-MESIC MEADOW SEED MIX
- SHRUB MIX 'A'
- SHRUB MIX 'B'
- SHRUB MIX 'C'
- EXISTING VEGETATION TO BE RETAINED
- GRAVEL (REFER TO COLDWATER DRAWINGS)
- FUTURE VEHICULAR ACCESS (REFER TO COLDWATER DRAWINGS)

PLANTING KEY

- TREE SPECIES QUANTITY
- SHRUB GROUP QUANTITY
- DETAIL SHEET



E PLANTING PLAN



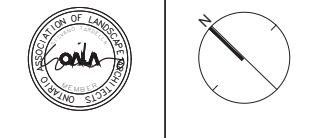
F PLANTING PLAN

PLANT LIST - FOR PLANTING PLAN 1, 2, AND 3

DECIDUOUS TREES						
KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS	
AR 14		ACER RUBRUM	RED MAPLE	175cm	B.R.	
AR1 15		ACER RUBRUM	RED MAPLE	150cm	B.R.	
AS 16		ACER SACCHARINUM	SILVER MAPLE	175cm	B.R.	
AS1 13		ACER SACCHARINUM	SILVER MAPLE	150cm	B.R.	
AT 9		ACER SACCHARUM	SUGAR MAPLE	175cm	B.R.	
AT1 27		ACER SACCHARUM	SUGAR MAPLE	150cm	B.R.	
OV 6		Ostrya virginiana	IRON WOOD	175cm	B.R.	
OV1 24		Ostrya virginiana	IRON WOOD	150cm	B.R.	
PB 10		Populus balsamifera	BALSAM POPLAR	175cm	B.R.	
PB1 17		Populus balsamifera	BALSAM POPLAR	150cm	B.R.	
PR 23		Prunus serotina	BLACK CHERRY	175cm	B.R.	
PR1 17		Prunus serotina	BLACK CHERRY	150cm	B.R.	
PT 22		Populus tremuloides	TREMBLING ASPEN	175cm	B.R.	
PT1 31		Populus tremuloides	TREMBLING ASPEN	150cm	B.R.	
QM 12		Quercus macrocarpa	BURR OAK	175cm	B.R.	
QM1 10		Quercus macrocarpa	BURR OAK	150cm	B.R.	
QR 15		Quercus rubra	RED OAK	175cm	B.R.	
QR1 16		Quercus rubra	RED OAK	150cm	B.R.	
SB 16		Salix nigra	BLACK WILLOW	175cm	B.R.	
SB1 18		Salix nigra	BLACK WILLOW	150cm	B.R.	
TA 9		Tilia americana	BASS WOOD	175cm	B.R.	
TA1 15		Tilia americana	BASS WOOD	150cm	B.R.	
CONIFEROUS TREES						
KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	REMARKS	
LL 42		Larix laricina	EASTERN TAMARACK	60cm	F.P.	
PD 54		Picea glauca	WHITE SPRUCE	60cm	F.P.	
PS 57		Pinus strobus	WHITE PINE	60cm	F.P.	
TO 20		Thuja occidentalis	WHITE CEDAR	60cm	F.P.	
DECIDUOUS SHRUB MIX 'A' - 1.069sq.m. @ 1.5m SPACING (555 PLANTS TOTAL)						
%	QTY	BOTANICAL NAME	COMMON NAME	ROOT		
25%	135	Ilex verticillata	WINTERBERRY	SEEDLING / BARE-ROOT		
25%	140	Salix amygdaloides	PEACH-LEAVED WILLOW	SEEDLING / BARE-ROOT		
25%	140	Salix bebbiana	BEBB'S WILLOW	SEEDLING / BARE-ROOT		
25%	140	Salix discolor	PUSHY WILLOW	SEEDLING / BARE-ROOT		
DECIDUOUS SHRUB MIX 'B' - 1.065sq.m. @ 1.5m SPACING (555 PLANTS TOTAL)						
%	QTY	BOTANICAL NAME	COMMON NAME	ROOT		
25%	140	Rhus typhina	STAGHORN SUMAC	SEEDLING / BARE-ROOT		
25%	140	Sambucus canadensis	COMMON ELDERBERRY	SEEDLING / BARE-ROOT		
25%	140	Amelanchier canadensis	SERVICEBERRY	SEEDLING / BARE-ROOT		
25%	135	Viburnum lentago	NANNYBERRY	SEEDLING / BARE-ROOT		
DECIDUOUS SHRUB MIX 'C' - 1.083sq.m. @ 1.5m SPACING (560 PLANTS TOTAL)						
%	QTY	BOTANICAL NAME	COMMON NAME	ROOT		
20%	140	Rubus canadensis	BLACKBERRY	SEEDLING / BARE-ROOT		
20%	140	Viburnum trilobum	HIGHBUSH CRANBERRY	SEEDLING / BARE-ROOT		
20%	140	Cornus oblique	SILKY DOGWOOD	SEEDLING / BARE-ROOT		
20%	140	Cornus sericea	RED OSIER DOGWOOD	SEEDLING / BARE-ROOT		
20%	140	Prunus virginiana	CHOKECHERRY	SEEDLING / BARE-ROOT		
SEED MIX						
WET MEADOW SEED MIX - 32,800m ²			DRY-MESIC MEADOW SEED MIX - 2100m ²			
25%		CANADA BLUE JOINT GRASS	25%		CANADA BLUE GRASS	
25%		ROUGH-STALKED MEADOW GRASS	25%		CREeping RED FESCUE	
20%		HIGHLAND COLONIAL BENTGRASS	25%		PERENNIAL RYEGRASS	
15%		CREeping RED FESCUE	10%		RED CLOVER	
5%		TALL WHITE ASTER	10%		BLACK-EYED SUSAN	
10%		NEW ENGLAND ASTER	5%		NEW ENGLAND ASTER	

No.	Description	Date
8	Revised as per Comments	Jun.8/17
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4	Issued for Third Submission	Feb.11/15
3	Issued for Second Submission	Mar.04/13
2	Re-issued For First Submission	Dec.06/12
1	Issued for First Submission	Nov.23/12

Revision
City Approval Stamp



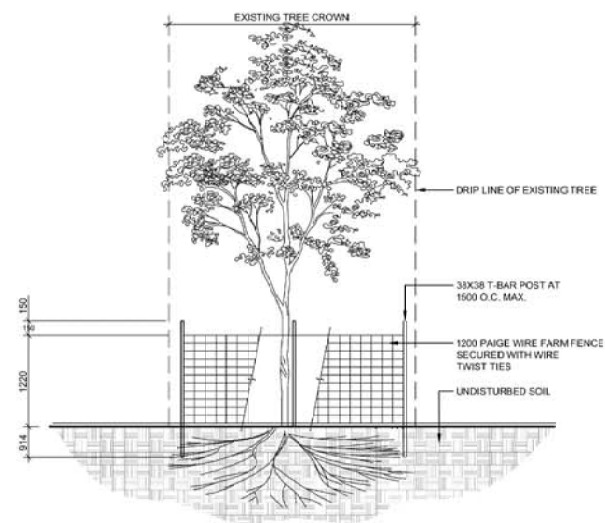
NAK
design strategies
200 BESSERER ST. SUITE 100 | OTTAWA ON | K1N 4B3
1-613-237-2548 | fax: (613) 237-6423 | info@nak-design.com

Project
VAN GAAL DRAIN
CHANNEL RE-ALIGNMENT
Richmond Village Development Corporation

Title
PLANTING PLAN III

Date JANUARY 2015 Sheet
Scale NTS
Drawn AB
Checked LM
Job No. 1-12128

Contractor shall check all dimensions on the work and report any discrepancy to the Landscape Architect before proceeding. All drawings and specifications are the property of the Landscape Architect and must be returned at the completion of the work. This drawing is not to be used for construction until signed by the Landscape Architect.

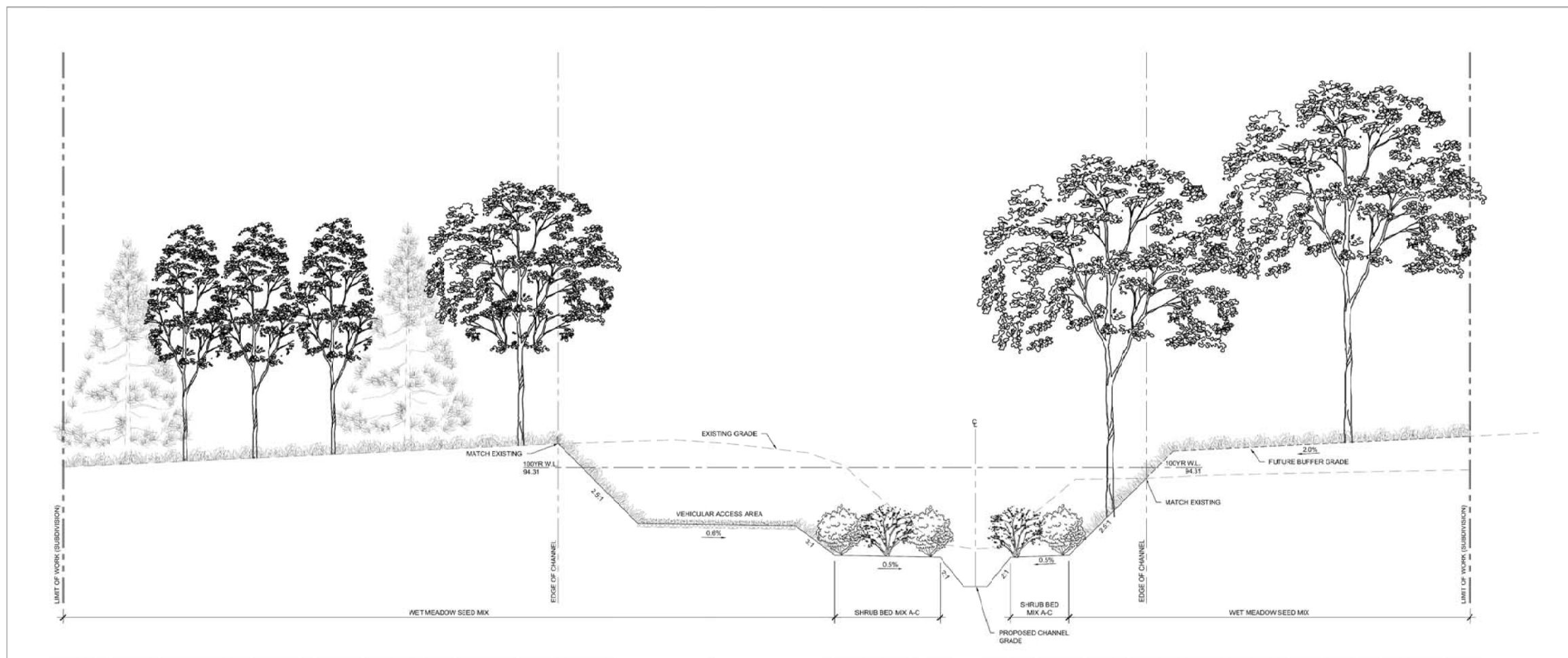


FOR POOL, RUN AND CROSS-VANE SECTION REFER TO DSEL DRAWING CH-5

NOTES:

1. THE AREA WITHIN THE DRIPLINE OF ALL EXISTING TREES SHALL BE PROPERLY PROTECTED WITH TEMPORARY FENCING AS PER THE APPROVED LANDSCAPE PLAN.
2. THE SURVEY SHALL SHOW EXISTING ELEVATION AT BASE OF ALL TREES TO BE PRESERVED AS SHOWN BY "M".
3. THE AREA WITHIN THE PROTECTED FENCING SHALL REMAIN UNDISTURBED AND SHALL NOT BE USED FOR THE STORAGE OF BUILDING MATERIALS OR EQUIPMENT. REMOVE ALL DEBRIS.
4. PRUNE BRANCHES TO REMOVE DAMAGED OR OBJECTIONABLE BRANCHES. DO NOT PRUNE LEADERS.
5. TREE PROTECTION SHALL REMAIN UNTIL SUBSTANTIAL PERFORMANCE OF THE PROJECT.
6. IF CUTTING OF ROOTS OR CHANGING OF GRADES AROUND EXISTING TREES IS CALLED FOR, FOLLOW APPROPRIATE DETAILS AS DIRECTED BY LANDSCAPE ARCHITECT.
7. IF TREES ARE BEING AFFECTED BY CONSTRUCTION, A WATER AND FERTILIZING PROGRAM WILL BE REQUIRED TO THE SATISFACTION OF THE CITY.

1 PRESERVATION FENCE
N.T.S.



2 CHANNEL CROSS SECTION (TYP.)
N.T.S.

8	Revised as per Comments	Jun. 8/17
7	Revised as per Comments	Mar. 30/17
6	Issued for Fourth Submission	Dec. 16/16
5	Revised as per Comments	Mar. 19/15
4	Issued for Third Submission	Feb. 11/15
3	Issued for Second Submission	Mar. 04/13
2	Re-issued for First Submission	Dec. 06/12
1	Issued for First Submission	Nov. 23/12
No.	Description	Date

Revision
City Approval Stamp



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Project
**VAN GAAL DRAIN
CHANNEL RE-ALIGNMENT**
Richmond Village Development Corporation

Title
DETAIL SHEET

Date: JANUARY 2015
Scale: NTS
Drawn: AB
Checked: LM
Job No.: 1-12128

Sheet
D2

Appendix C

Schedule of Assessment For Future Maintenance

Schedule A – Summary

Schedule B – Section 1

Schedule C – Section 2

Schedule D – West Main Drain

Schedule E – East Main Drain

SCHEDULE A - SUMMARY
FOR FUTURE MAINTENANCE OF SECTION(S) OF THE VAN GAAL MUNICIPAL DRAIN



Project No.: B13056
 Date: Jan-19

ID	Roll No.	Area (ha)	Benefit Cost (Maintenance)	Outlet Cost (Maintenance)	Sub-total Costs	Grants	Special Benefit (Maintenance)	Total Net Costs
		Total	Total	Total		Total	Total	Total
INDIVIDUAL LANDOWNERS								
1	2718 152 040 00000	12.62	\$ -	\$ 54.66	\$ 54.66	\$ -	\$ -	\$ 54.66
2	2718 101 220 00000	3.99	\$ -	\$ 17.28	\$ 17.28	\$ -	\$ -	\$ 17.28
3	2718 101 200 00000	5.20	\$ -	\$ 22.37	\$ 22.37	\$ -	\$ -	\$ 22.37
4	2718 101 210 00000	3.87	\$ -	\$ 16.20	\$ 16.20	\$ -	\$ -	\$ 16.20
5	2718 101 230 00000	14.13	\$ -	\$ 46.48	\$ 46.48	\$ -	\$ -	\$ 46.48
6	2718 101 250 10000	27.72	\$ -	\$ 91.09	\$ 91.09	\$ 30.06	\$ -	\$ 61.03
7	2718 101 240 00000	0.31	\$ -	\$ 0.67	\$ 0.67	\$ -	\$ -	\$ 0.67
8	2718 101 260 00000	16.02	\$ -	\$ 34.69	\$ 34.69	\$ -	\$ -	\$ 34.69
9	2718 101 280 00000	34.46	\$ -	\$ 89.65	\$ 89.65	\$ -	\$ -	\$ 89.65
10	2718 101 310 00000	13.20	\$ -	\$ 42.92	\$ 42.92	\$ -	\$ -	\$ 42.92
11	2718 101 340 00000	9.99	\$ -	\$ 34.72	\$ 34.72	\$ 11.46	\$ -	\$ 23.26
12	2718 101 300 00000	40.47	\$ -	\$ 88.73	\$ 88.73	\$ -	\$ -	\$ 88.73
13	2718 101 330 00000	5.93	\$ -	\$ 25.69	\$ 25.69	\$ 8.48	\$ -	\$ 17.21
14	2718 101 350 00000	20.23	\$ -	\$ 59.47	\$ 59.47	\$ 19.63	\$ -	\$ 39.84
15	2718 101 380 00000	0.40	\$ -	\$ 1.73	\$ 1.73	\$ 0.57	\$ -	\$ 1.16
16	2718 101 370 00000	20.23	\$ -	\$ 87.62	\$ 87.62	\$ -	\$ -	\$ 87.62
17	2718 101 360 00000	20.23	\$ -	\$ 76.82	\$ 76.82	\$ 25.35	\$ -	\$ 51.47
18	2718 101 390 10000	9.83	\$ -	\$ 42.58	\$ 42.58	\$ -	\$ -	\$ 42.58
19	2718 101 410 00000	0.09	\$ -	\$ 0.39	\$ 0.39	\$ -	\$ -	\$ 0.39
20	2718 101 390 00000	9.73	\$ -	\$ 45.46	\$ 45.46	\$ -	\$ -	\$ 45.46
21	2718 101 420 00000	18.29	\$ -	\$ 90.82	\$ 90.82	\$ 29.97	\$ -	\$ 60.85
22	2718 101 420 50000	1.21	\$ -	\$ 7.78	\$ 7.78	\$ -	\$ -	\$ 7.78
23	2718 101 440 10000	9.09	\$ -	\$ 196.29	\$ 196.29	\$ 64.78	\$ -	\$ 131.51
24	2718 101 440 50000	6.69	\$ -	\$ 214.22	\$ 214.22	\$ 70.69	\$ -	\$ 143.53
25	2718 101 440 50000	3.07	\$ -	\$ 108.17	\$ 108.17	\$ 35.70	\$ -	\$ 72.47
26	2718 101 440 00000	0.16	\$ -	\$ 11.28	\$ 11.28	\$ -	\$ -	\$ 11.28
27	2718 101 450 00000	17.14	\$ -	\$ 626.58	\$ 626.58	\$ 206.77	\$ -	\$ 419.81
28	2718 101 451 00000	0.41	\$ -	\$ 28.89	\$ 28.89	\$ -	\$ -	\$ 28.89
29	2718 101 450 10000	0.40	\$ -	\$ 36.54	\$ 36.54	\$ -	\$ -	\$ 36.54
30	2718 101 460 10000	13.39	\$ -	\$ 270.10	\$ 270.10	\$ 89.13	\$ -	\$ 180.97
31	2718 101 460 00000	2.03	\$ -	\$ 100.25	\$ 100.25	\$ -	\$ -	\$ 100.25
32	2718 101 470 00000	11.67	\$ -	\$ 215.43	\$ 215.43	\$ 71.09	\$ -	\$ 144.34
33	2718 101 470 10000	0.35	\$ -	\$ 13.69	\$ 13.69	\$ -	\$ -	\$ 13.69
34	2718 101 490 00000	9.38	\$ -	\$ 135.32	\$ 135.32	\$ 44.66	\$ -	\$ 90.67
36	2718 100 850 00000	0.63	\$ -	\$ 1.36	\$ 1.36	\$ -	\$ -	\$ 1.36
37	2718 100 860 00000	2.47	\$ -	\$ 5.35	\$ 5.35	\$ -	\$ -	\$ 5.35
38	2718 100 870 00000	14.56	\$ -	\$ 31.53	\$ 31.53	\$ -	\$ -	\$ 31.53
40	2718 100 890 00000	17.31	\$ -	\$ 37.49	\$ 37.49	\$ -	\$ -	\$ 37.49
41	2718 100 920 00000	20.23	\$ -	\$ 43.81	\$ 43.81	\$ -	\$ -	\$ 43.81
42	2718 100 900 00000	6.70	\$ -	\$ 14.51	\$ 14.51	\$ -	\$ -	\$ 14.51
43	2718 100 910 00000	8.56	\$ -	\$ 16.84	\$ 16.84	\$ -	\$ -	\$ 16.84
44	2718 100 930 00000	40.74	\$ -	\$ 93.41	\$ 93.41	\$ -	\$ -	\$ 93.41
45	2718 100 931 00000	1.22	\$ -	\$ 5.71	\$ 5.71	\$ -	\$ -	\$ 5.71
46	2718 100 932 00000	1.22	\$ -	\$ 5.71	\$ 5.71	\$ -	\$ -	\$ 5.71
47	2718 100 940 00000	38.53	\$ -	\$ 108.45	\$ 108.45	\$ 35.79	\$ -	\$ 72.66
48	2718 100 950 00000	0.47	\$ -	\$ 2.20	\$ 2.20	\$ -	\$ -	\$ 2.20
49	2718 100 960 00000	0.64	\$ -	\$ 3.00	\$ 3.00	\$ -	\$ -	\$ 3.00
50	2718 100 980 00000	0.40	\$ -	\$ 1.87	\$ 1.87	\$ -	\$ -	\$ 1.87
51	2718 100 990 00000	0.40	\$ -	\$ 1.87	\$ 1.87	\$ -	\$ -	\$ 1.87

SCHEDULE A - SUMMARY
FOR FUTURE MAINTENANCE OF SECTION(S) OF THE VAN GAAL MUNICIPAL DRAIN



Project No.: B13056
 Date: Jan-19

ID	Roll No.	Area (ha)	Benefit Cost (Maintenance)	Outlet Cost (Maintenance)	Sub-total Costs	Grants	Special Benefit (Maintenance)	Total Net Costs
		Total	Total	Total		Total	Total	Total
52	2718 101 000 50000	29.16	\$ -	\$ 121.16	\$ 121.16	\$ -	\$ -	\$ 121.16
53	2718 101 000 40000	0.81	\$ -	\$ 9.17	\$ 9.17	\$ -	\$ -	\$ 9.17
54	2718 101 000 30000	0.81	\$ -	\$ 9.17	\$ 9.17	\$ -	\$ -	\$ 9.17
55	2718 101 000 20000	0.81	\$ -	\$ 9.17	\$ 9.17	\$ -	\$ -	\$ 9.17
56	2718 101 000 10000	0.81	\$ -	\$ 9.17	\$ 9.17	\$ -	\$ -	\$ 9.17
57	2718 101 000 00000	5.87	\$ -	\$ 13.74	\$ 13.74	\$ -	\$ -	\$ 13.74
58	2718 101 000 60000	0.81	\$ -	\$ 3.79	\$ 3.79	\$ -	\$ -	\$ 3.79
59	2718 101 000 70000	0.81	\$ -	\$ 3.79	\$ 3.79	\$ -	\$ -	\$ 3.79
60	2718 101 010 00000	0.25	\$ -	\$ 1.17	\$ 1.17	\$ -	\$ -	\$ 1.17
61	2718 101 020 00000	0.20	\$ -	\$ 0.94	\$ 0.94	\$ -	\$ -	\$ 0.94
62	2718 101 051 00000	13.81	\$ -	\$ 86.21	\$ 86.21	\$ 28.45	\$ -	\$ 57.76
63	2718 101 050 00000	0.48	\$ -	\$ 5.43	\$ 5.43	\$ -	\$ -	\$ 5.43
64	2718 101 050 50000	0.33	\$ -	\$ 3.73	\$ 3.73	\$ -	\$ -	\$ 3.73
65	2718 101 050 10000	0.53	\$ -	\$ 6.00	\$ 6.00	\$ 1.98	\$ -	\$ 4.02
66	2718 101 060 00000	24.77	\$ -	\$ 205.34	\$ 205.34	\$ 67.76	\$ -	\$ 137.58
67	2718 101 040 40000	1.66	\$ -	\$ 18.79	\$ 18.79	\$ -	\$ -	\$ 18.79
68	NOT AVAILABLE	4.05	\$ -	\$ 27.70	\$ 27.70	\$ -	\$ -	\$ 27.70
69	2718 101 040 30000	2.01	\$ -	\$ 22.75	\$ 22.75	\$ -	\$ -	\$ 22.75
70	2718 101 040 00000	12.69	\$ -	\$ 87.45	\$ 87.45	\$ 28.86	\$ -	\$ 58.59
71	2718 101 040 20000	8.40	\$ -	\$ 19.66	\$ 19.66	\$ 6.49	\$ -	\$ 13.17
72	2718 101 030 00000	0.20	\$ -	\$ 0.94	\$ 0.94	\$ -	\$ -	\$ 0.94
73	2718 101 040 10000	0.85	\$ -	\$ 6.63	\$ 6.63	\$ -	\$ -	\$ 6.63
75	2718 101 060 00000	9.51	\$ -	\$ 41.98	\$ 41.98	\$ 13.85	\$ -	\$ 28.12
76	2718 101 070 50000	1.24	\$ 12.50	\$ 17.90	\$ 30.40	\$ -	\$ -	\$ 30.40
77	2718 101 070 00000	19.06	\$ 457.50	\$ 299.30	\$ 756.80	\$ 249.74	\$ -	\$ 507.05
78	2718 101 100 20000	35.02	\$ -	\$ 538.70	\$ 538.70	\$ 177.77	\$ -	\$ 360.93
85	2738 150 210 10000	3.43	\$ 30.32	\$ 26.76	\$ 57.08	\$ -	\$ -	\$ 57.08
86	2738 150 220 10000	0.53	\$ 9.37	\$ 8.27	\$ 17.64	\$ -	\$ -	\$ 17.64
87	2738 150 210 00000	0.18	\$ -	\$ 2.81	\$ 2.81	\$ -	\$ -	\$ 2.81
88	2718 101 090 00000	19.54	\$ 953.36	\$ 460.99	\$ 1,414.34	\$ 466.73	\$ -	\$ 947.61
BLOCKS								
BLOCK M		23.82	\$ -	\$ 202.40	\$ 202.40	\$ -	\$ -	\$ 202.40
BLOCK N1		10.08	\$ 35.64	\$ 14.56	\$ 50.19	\$ -	\$ 2,400.00	\$ 2,450.19
BLOCK N2		0.95	\$ 1.68	\$ 0.68	\$ 2.36	\$ -	\$ -	\$ 2.36
BLOCK N3		6.02	\$ 16.71	\$ 25.22	\$ 41.93	\$ -	\$ 3,180.62	\$ 3,222.55
BLOCK N4		1.30	\$ 11.49	\$ 5.07	\$ 16.56	\$ -	\$ -	\$ 16.56
BLOCK N5		1.57	\$ 10.91	\$ 16.45	\$ 27.36	\$ -	\$ -	\$ 27.36
BLOCK O1		8.51	\$ -	\$ 9.96	\$ 9.96	\$ -	\$ 2,026.19	\$ 2,036.15
BLOCK O2		0.75	\$ -	\$ 0.44	\$ 0.44	\$ -	\$ -	\$ 0.44
BLOCK O3		6.89	\$ 6.95	\$ 25.28	\$ 32.24	\$ -	\$ 3,643.19	\$ 3,675.42

SCHEDULE A - SUMMARY
FOR FUTURE MAINTENANCE OF SECTION(S) OF THE VAN GAAL MUNICIPAL DRAIN



Project No.: B13056
 Date: Jan-19

ID	Roll No.	Area (ha)	Benefit Cost (Maintenance)	Outlet Cost (Maintenance)	Sub-total Costs	Grants	Special Benefit (Maintenance)	Total Net Costs
		Total	Total	Total		Total	Total	Total
CITY OF OTTAWA -- LANDS & ROADS								
		2.13	\$ 75.30	\$ 8.21	\$ 83.52	\$ -	\$ -	\$ 83.52
		1.37	\$ 48.43	\$ 12.13	\$ 60.56	\$ -	\$ -	\$ 60.56
		2.69	\$ 62.89	\$ 32.41	\$ 95.29	\$ -	\$ -	\$ 95.29
		5.42	\$ 829.46	\$ 398.32	\$ 1,227.78	\$ -	\$ -	\$ 1,227.78
		3.03	\$ -	\$ 13.12	\$ 13.12	\$ -	\$ -	\$ 13.12
		1.08	\$ -	\$ 10.11	\$ 10.11	\$ -	\$ -	\$ 10.11
39	2718 100 880 00000	15.82	\$ -	\$ 34.26	\$ 34.26	\$ -	\$ -	\$ 34.26
PUBLIC UTILITIES/AUTHORITIES								
74	2718 250 270 10000	0.93	\$ -	\$ 2.56	\$ 2.56	\$ -	\$ -	\$ 2.56
Total		807.00	\$ 2,562.50	\$ 6,187.50	\$ 8,750.00	\$ 1,785.76	\$ 11,250.00	\$ 18,214.24

SCHEDULE B
FOR FUTURE MAINTENANCE OF SECTION 1 -- VAN GAAL MUNICIPAL DRAIN

ID	Roll No.	Area	Land Use Factor	Factored Area	Backs on Drain	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	Special Benefit (Maintenance)	ADIP Eligibility	1/3 Grant	Total Net Cost
		S1		S1	S1			S1	S1				S1			
INDIVIDUAL LANDOWNERS																
1	2718 152 040 00000	12.62	1.00	12.62	N		\$ -	0.30	1.00	3.79	\$ 29.54	\$ 29.54	\$ -	0%	\$ -	\$ 29.54
2	2718 101 220 00000	3.99	1.00	3.99	N		\$ -	0.30	1.00	1.20	\$ 9.34	\$ 9.34	\$ -	0%	\$ -	\$ 9.34
3	2718 101 200 00000	5.20	0.99	5.17	N		\$ -	0.30	1.00	1.55	\$ 12.09	\$ 12.09	\$ -	0%	\$ -	\$ 12.09
4	2718 101 210 00000	3.87	0.97	3.74	N		\$ -	0.30	1.00	1.12	\$ 8.75	\$ 8.75	\$ -	0%	\$ -	\$ 8.75
5	2718 101 230 00000	14.13	0.76	10.73	N		\$ -	0.30	1.00	3.22	\$ 25.12	\$ 25.12	\$ -	0%	\$ -	\$ 25.12
6	2718 101 250 10000	27.72	0.76	21.03	N		\$ -	0.30	1.00	6.31	\$ 49.22	\$ 49.22	\$ -	100%	\$ 16.24	\$ 32.98
7	2718 101 240 00000	0.31	0.50	0.16	N		\$ -	0.30	1.00	0.05	\$ 0.36	\$ 0.36	\$ -	0%	\$ -	\$ 0.36
8	2718 101 260 00000	16.02	0.50	8.01	N		\$ -	0.30	1.00	2.40	\$ 18.75	\$ 18.75	\$ -	0%	\$ -	\$ 18.75
9	2718 101 280 00000	34.46	0.60	20.70	N		\$ -	0.30	1.00	6.21	\$ 48.45	\$ 48.45	\$ -	0%	\$ -	\$ 48.45
10	2718 101 310 00000	13.20	0.75	9.91	N		\$ -	0.30	1.00	2.97	\$ 23.20	\$ 23.20	\$ -	0%	\$ -	\$ 23.20
11	2718 101 340 00000	9.99	0.80	8.02	N		\$ -	0.30	1.00	2.40	\$ 18.76	\$ 18.76	\$ -	100%	\$ 6.19	\$ 12.57
12	2718 101 300 00000	40.47	0.51	20.49	N		\$ -	0.30	1.00	6.15	\$ 47.95	\$ 47.95	\$ -	0%	\$ -	\$ 47.95
13	2718 101 330 00000	5.93	1.00	5.93	N		\$ -	0.30	1.00	1.78	\$ 13.88	\$ 13.88	\$ -	100%	\$ 4.58	\$ 9.30
14	2718 101 350 00000	20.23	0.68	13.73	N		\$ -	0.30	1.00	4.12	\$ 32.14	\$ 32.14	\$ -	100%	\$ 10.61	\$ 21.53
15	2718 101 380 00000	0.40	1.00	0.40	N		\$ -	0.30	1.00	0.12	\$ 0.94	\$ 0.94	\$ -	100%	\$ 0.31	\$ 0.63
16	2718 101 370 00000	20.23	1.00	20.23	N		\$ -	0.30	1.00	6.07	\$ 47.35	\$ 47.35	\$ -	0%	\$ -	\$ 47.35
17	2718 101 360 00000	20.23	0.88	17.74	N		\$ -	0.30	1.00	5.32	\$ 41.51	\$ 41.51	\$ -	100%	\$ 13.70	\$ 27.81
18	2718 101 390 10000	9.83	1.00	9.83	N		\$ -	0.30	1.00	2.95	\$ 23.01	\$ 23.01	\$ -	0%	\$ -	\$ 23.01
19	2718 101 410 00000	0.09	1.00	0.09	N		\$ -	0.30	1.00	0.03	\$ 0.21	\$ 0.21	\$ -	0%	\$ -	\$ 0.21
20	2718 101 390 00000	9.73	1.00	9.73	N		\$ -	0.30	1.00	2.92	\$ 22.77	\$ 22.77	\$ -	0%	\$ -	\$ 22.77
21	2718 101 420 00000	18.29	1.00	18.29	N		\$ -	0.34	1.00	6.25	\$ 48.74	\$ 48.74	\$ -	100%	\$ 16.08	\$ 32.66
22	2718 101 420 50000	1.21	1.00	1.21	N		\$ -	0.40	1.00	0.48	\$ 3.77	\$ 3.77	\$ -	0%	\$ -	\$ 3.77
23	2718 101 440 10000	9.09	1.00	9.09	N		\$ -	0.43	1.00	3.93	\$ 30.64	\$ 30.64	\$ -	100%	\$ 10.11	\$ 20.53
24	2718 101 440 50000	6.69	1.00	6.69	N		\$ -	0.36	1.00	2.38	\$ 18.59	\$ 18.59	\$ -	100%	\$ 6.14	\$ 12.46
25	2718 101 440 50000	3.07	1.00	3.07	N		\$ -	0.50	1.00	1.54	\$ 11.98	\$ 11.98	\$ -	100%	\$ 3.95	\$ 8.02
26	2718 101 440 00000	0.16	2.00	0.32	N		\$ -	0.50	1.00	0.16	\$ 1.25	\$ 1.25	\$ -	0%	\$ -	\$ 1.25
27	2718 101 450 00000	17.14	1.00	17.14	N		\$ -	0.40	1.00	6.86	\$ 53.49	\$ 53.49	\$ -	100%	\$ 17.65	\$ 35.84
28	2718 101 451 00000	0.41	2.00	0.82	N		\$ -	0.50	1.00	0.41	\$ 3.20	\$ 3.20	\$ -	0%	\$ -	\$ 3.20
29	2718 101 450 10000	0.40	2.00	0.80	N		\$ -	0.50	1.00	0.40	\$ 3.12	\$ 3.12	\$ -	0%	\$ -	\$ 3.12
30	2718 101 460 10000	13.39	1.00	13.39	N		\$ -	0.40	1.00	5.36	\$ 41.80	\$ 41.80	\$ -	100%	\$ 13.79	\$ 28.00
31	2718 101 460 00000	2.03	2.00	4.06	N		\$ -	0.50	1.00	2.03	\$ 15.84	\$ 15.84	\$ -	0%	\$ -	\$ 15.84
32	2718 101 470 00000	11.67	1.00	11.67	N		\$ -	0.36	1.00	4.20	\$ 32.78	\$ 32.78	\$ -	100%	\$ 10.82	\$ 21.96

SCHEDULE B
FOR FUTURE MAINTENANCE OF SECTION 1 -- VAN GAAL MUNICIPAL DRAIN

ID	Roll No.	Area	Land Use Factor	Factored Area	Backs on Drain	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	Special Benefit (Maintenance)	ADIP Eligibility	1/3 Grant	Total Net Cost
		S1		S1	S1			S1	S1				S1			
33	2718 101 470 10000	0.35	2.00	0.70	N		\$ -	0.50	1.00	0.35	\$ 2.73	\$ 2.73	\$ -	0%	\$ -	\$ 2.73
34	2718 101 490 00000	9.38	1.00	9.38	N		\$ -	0.30	1.00	2.81	\$ 21.96	\$ 21.96	\$ -	100%	\$ 7.25	\$ 14.71
36	2718 100 850 00000	0.63	0.50	0.32	N		\$ -	0.30	1.00	0.09	\$ 0.74	\$ 0.74	\$ -	0%	\$ -	\$ 0.74
37	2718 100 860 00000	2.47	0.50	1.24	N		\$ -	0.30	1.00	0.37	\$ 2.89	\$ 2.89	\$ -	0%	\$ -	\$ 2.89
38	2718 100 870 00000	14.56	0.50	7.28	N		\$ -	0.30	1.00	2.18	\$ 17.04	\$ 17.04	\$ -	0%	\$ -	\$ 17.04
40	2718 100 890 00000	17.31	0.50	8.66	N		\$ -	0.30	1.00	2.60	\$ 20.26	\$ 20.26	\$ -	0%	\$ -	\$ 20.26
41	2718 100 920 00000	20.23	0.50	10.12	N		\$ -	0.30	1.00	3.03	\$ 23.68	\$ 23.68	\$ -	0%	\$ -	\$ 23.68
42	2718 100 900 00000	6.70	0.50	3.35	N		\$ -	0.30	1.00	1.01	\$ 7.84	\$ 7.84	\$ -	0%	\$ -	\$ 7.84
43	2718 100 910 00000	8.56	0.50	4.28	N		\$ -	0.30	1.00	1.28	\$ 10.02	\$ 10.02	\$ -	0%	\$ -	\$ 10.02
44	2718 100 930 00000	40.74	0.56	22.79	N		\$ -	0.30	1.00	6.84	\$ 53.34	\$ 53.34	\$ -	0%	\$ -	\$ 53.34
45	2718 100 931 00000	1.22	2.00	2.44	N		\$ -	0.30	1.00	0.73	\$ 5.71	\$ 5.71	\$ -	0%	\$ -	\$ 5.71
46	2718 100 932 00000	1.22	2.00	2.44	N		\$ -	0.30	1.00	0.73	\$ 5.71	\$ 5.71	\$ -	0%	\$ -	\$ 5.71
47	2718 100 940 00000	38.53	0.70	27.02	N		\$ -	0.30	1.00	8.10	\$ 63.24	\$ 63.24	\$ -	100%	\$ 20.87	\$ 42.37
48	2718 100 950 00000	0.47	2.00	0.94	N		\$ -	0.30	1.00	0.28	\$ 2.20	\$ 2.20	\$ -	0%	\$ -	\$ 2.20
49	2718 100 960 00000	0.64	2.00	1.28	N		\$ -	0.30	1.00	0.38	\$ 3.00	\$ 3.00	\$ -	0%	\$ -	\$ 3.00
50	2718 100 980 00000	0.40	2.00	0.80	N		\$ -	0.30	1.00	0.24	\$ 1.87	\$ 1.87	\$ -	0%	\$ -	\$ 1.87
51	2718 100 990 00000	0.40	2.00	0.80	N		\$ -	0.30	1.00	0.24	\$ 1.87	\$ 1.87	\$ -	0%	\$ -	\$ 1.87
52	2718 101 000 50000	29.16	0.91	26.44	N		\$ -	0.30	1.00	7.93	\$ 61.89	\$ 61.89	\$ -	0%	\$ -	\$ 61.89
53	2718 101 000 40000	0.81	2.00	1.62	N		\$ -	0.30	1.00	0.49	\$ 3.79	\$ 3.79	\$ -	0%	\$ -	\$ 3.79
54	2718 101 000 30000	0.81	2.00	1.62	N		\$ -	0.30	1.00	0.49	\$ 3.79	\$ 3.79	\$ -	0%	\$ -	\$ 3.79
55	2718 101 000 20000	0.81	2.00	1.62	N		\$ -	0.30	1.00	0.49	\$ 3.79	\$ 3.79	\$ -	0%	\$ -	\$ 3.79
56	2718 101 000 10000	0.81	2.00	1.62	N		\$ -	0.30	1.00	0.49	\$ 3.79	\$ 3.79	\$ -	0%	\$ -	\$ 3.79
57	2718 101 000 00000	5.87	1.00	5.87	N		\$ -	0.30	1.00	1.76	\$ 13.74	\$ 13.74	\$ -	0%	\$ -	\$ 13.74
58	2718 101 000 60000	0.81	2.00	1.62	N		\$ -	0.30	1.00	0.49	\$ 3.79	\$ 3.79	\$ -	0%	\$ -	\$ 3.79
59	2718 101 000 70000	0.81	2.00	1.62	N		\$ -	0.30	1.00	0.49	\$ 3.79	\$ 3.79	\$ -	0%	\$ -	\$ 3.79

SCHEDULE B
FOR FUTURE MAINTENANCE OF SECTION 1 -- VAN GAAL MUNICIPAL DRAIN

ID	Roll No.	Area	Land Use Factor	Factored Area	Backs on Drain	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	Special Benefit (Maintenance)	ADIP Eligibility	1/3 Grant	Total Net Cost
		S1		S1	S1			S1	S1				S1			
60	2718 101 010 00000	0.25	2.00	0.50	N		\$ -	0.30	1.00	0.15	\$ 1.17	\$ 1.17	\$ -	0%	\$ -	\$ 1.17
61	2718 101 020 00000	0.20	2.00	0.40	N		\$ -	0.30	1.00	0.12	\$ 0.94	\$ 0.94	\$ -	0%	\$ -	\$ 0.94
62	2718 101 051 00000	13.81	1.00	13.81	N		\$ -	0.38	1.00	5.32	\$ 41.47	\$ 41.47	\$ -	100%	\$ 13.68	\$ 27.78
63	2718 101 050 00000	0.48	2.00	0.96	N		\$ -	0.30	1.00	0.29	\$ 2.25	\$ 2.25	\$ -	0%	\$ -	\$ 2.25
64	2718 101 050 50000	0.33	2.00	0.66	N		\$ -	0.30	1.00	0.20	\$ 1.54	\$ 1.54	\$ -	0%	\$ -	\$ 1.54
65	2718 101 050 10000	0.53	2.00	1.06	N		\$ -	0.30	1.00	0.32	\$ 2.48	\$ 2.48	\$ -	100%	\$ 0.82	\$ 1.66
66	2718 101 060 00000	24.77	1.00	24.77	N		\$ -	0.57	1.00	14.14	\$ 110.28	\$ 110.28	\$ -	100%	\$ 36.39	\$ 73.89
67	2718 101 040 40000	1.66	2.00	3.32	N		\$ -	0.30	1.00	1.00	\$ 7.77	\$ 7.77	\$ -	0%	\$ -	\$ 7.77
68	NOT AVAILABLE	4.05	1.00	4.05	N		\$ -	0.44	1.00	1.79	\$ 13.93	\$ 13.93	\$ -	0%	\$ -	\$ 13.93
69	2718 101 040 30000	2.01	2.00	4.02	N		\$ -	0.30	1.00	1.21	\$ 9.41	\$ 9.41	\$ -	0%	\$ -	\$ 9.41
70	2718 101 040 00000	12.69	1.00	12.69	N		\$ -	0.43	1.00	5.48	\$ 42.75	\$ 42.75	\$ -	100%	\$ 14.11	\$ 28.64
71	2718 101 040 20000	8.40	1.00	8.40	N		\$ -	0.30	1.00	2.52	\$ 19.66	\$ 19.66	\$ -	100%	\$ 6.49	\$ 13.17
72	2718 101 030 00000	0.20	2.00	0.40	N		\$ -	0.30	1.00	0.12	\$ 0.94	\$ 0.94	\$ -	0%	\$ -	\$ 0.94
73	2718 101 040 10000	0.85	2.00	1.70	N		\$ -	0.50	1.00	0.85	\$ 6.63	\$ 6.63	\$ -	0%	\$ -	\$ 6.63
75	2718 101 060 00000	9.51	1.00	9.51	N		\$ -	0.57	1.00	5.38	\$ 41.98	\$ 41.98	\$ -	100%	\$ 13.85	\$ 28.12
76	2718 101 070 50000	1.24	2.00	2.48	N		\$ -	0.50	1.00	1.24	\$ 9.67	\$ 9.67	\$ -	0%	\$ -	\$ 9.67
77	2718 101 070 00000	19.06	1.00	19.06	N		\$ -	0.64	1.00	12.23	\$ 95.42	\$ 95.42	\$ -	100%	\$ 31.49	\$ 63.93
78	2718 101 100 20000	35.02	1.00	35.02	N		\$ -	0.79	1.00	27.74	\$ 216.43	\$ 216.43	\$ -	100%	\$ 71.42	\$ 145.01
85	2738 150 210 10000	3.43	1.00	3.43	Y	3.43	\$ 30.32	1.00	1.00	3.43	\$ 26.76	\$ 57.08	\$ -	0%	\$ -	\$ 57.08
86	2738 150 220 10000	0.53	2.00	1.06	Y	1.06	\$ 9.37	1.00	1.00	1.06	\$ 8.27	\$ 17.64	\$ -	0%	\$ -	\$ 17.64
87	2738 150 210 00000	0.18	2.00	0.36	N		\$ -	1.00	1.00	0.36	\$ 2.81	\$ 2.81	\$ -	0%	\$ -	\$ 2.81
88	2718 101 090 00000	19.54	1.00	19.54	N		\$ -	0.61	1.00	11.86	\$ 92.55	\$ 92.55	\$ -	100%	\$ 30.54	\$ 62.01

SCHEDULE B
FOR FUTURE MAINTENANCE OF SECTION 1 -- VAN GAAL MUNICIPAL DRAIN

Project No.: B13056
 Date: Jan-19

ID	Roll No.	Area	Land Use Factor	Factored Area	Backs on Drain	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	Special Benefit (Maintenance)	ADIP Eligibility	1/3 Grant	Total Net Cost
		S1		S1	S1			S1	S1							
BLOCKS																
BLOCK M		23.82	4.00	95.28	N		\$ -	0.83	0.33	25.94	\$ 202.40	\$ 202.40	\$ -	0%	\$ -	\$ 202.40
BLOCK N1		10.08	0.40	4.03	Y	4.03	\$ 35.64	0.93	0.50	1.87	\$ 14.56	\$ 50.19	\$ 2,400.00	0%	\$ -	\$ 2,450.19
BLOCK N2		0.95	0.20	0.19	Y	0.19	\$ 1.68	0.91	0.50	0.09	\$ 0.68	\$ 2.36	\$ -	0%	\$ -	\$ 2.36
BLOCK N3		6.02	0.40	2.41	Y	1.20	\$ 10.64	0.92	1.00	2.21	\$ 17.23	\$ 27.87	\$ 1,433.33	0%	\$ -	\$ 1,461.20
BLOCK N4		1.30	1.00	1.30	Y	1.30	\$ 11.49	1.00	0.50	0.65	\$ 5.07	\$ 16.56	\$ -	0%	\$ -	\$ 16.56
BLOCK N5		1.57	1.00	1.57	Y	0.79	\$ 6.98	0.92	1.00	1.45	\$ 11.27	\$ 18.26	\$ -	0%	\$ -	\$ 18.26
BLOCK O1		8.51	0.40	3.40	N		\$ -	0.75	0.50	1.28	\$ 9.96	\$ 9.96	\$ 2,026.19	0%	\$ -	\$ 2,036.15
BLOCK O2		0.75	0.20	0.15	N		\$ -	0.75	0.50	0.06	\$ 0.44	\$ 0.44	\$ -	0%	\$ -	\$ 0.44
BLOCK O3		6.89	0.40	2.76	N		\$ -	0.75	1.00	2.07	\$ 16.13	\$ 16.13	\$ 1,640.48	0%	\$ -	\$ 1,656.60
CITY OF OTTAWA -- LANDS & ROADS																
	FRANKTOWN ROAD	2.13	4.00	8.52	Y	8.52	\$ 75.30	0.37	0.33	1.05	\$ 8.21	\$ 83.52	\$ -	0%	\$ -	\$ 83.52
	PERTH STREET	1.37	4.00	5.48	Y	5.48	\$ 48.43	0.86	0.33	1.55	\$ 12.13	\$ 60.56	\$ -	0%	\$ -	\$ 60.56
	JOYS ROAD	2.69	4.00	10.76	Y	2.28	\$ 20.15	0.30	0.33	1.07	\$ 8.31	\$ 28.46	\$ -	0%	\$ -	\$ 28.46
	GARVIN ROAD	5.42	4.00	21.68	N		\$ -	0.41	1.00	8.87	\$ 69.22	\$ 69.22	\$ -	0%	\$ -	\$ 69.22
	ROW -- CON 4/5	3.03	1.00	3.03	N		\$ -	0.30	1.00	0.91	\$ 7.09	\$ 7.09	\$ -	0%	\$ -	\$ 7.09
	CONLEY ROAD	1.08	4.00	4.32	N		\$ -	0.30	1.00	1.30	\$ 10.11	\$ 10.11	\$ -	0%	\$ -	\$ 10.11
39	2718 100 880 00000	15.82	0.50	7.91	N		\$ -	0.30	1.00	2.37	\$ 18.51	\$ 18.51	\$ -	0%	\$ -	\$ 18.51
PUBLIC UTILITIES/AUTHORITIES																
74	2718 250 270 10000	0.93	2.00	1.86	N		\$ -	0.53	0.33	0.33	\$ 2.56	\$ 2.56	\$ -	0%	\$ -	\$ 2.56
Total		807.00		776.47		28.29	\$ 250.00			288.38	\$ 2,250.00	\$ 2,500.00	\$ 7,500.00		\$ 377.09	\$ 9,622.91

SCHEDULE C
FOR FUTURE MAINTENANCE OF SECTION 2 -- VAN GAAL MUNICIPAL DRAIN

ID	Roll No.	Area	Land Use Factor	Factored Area	Backs on Drain	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	Special Benefit (Maintenance)	ADIP Eligibility	1/3 Grant	Total Net Cost
		S2		S2	S2			S2	S2				S2			
INDIVIDUAL LANDOWNERS																
1	2718 152 040 00000	12.62	1.00	12.62	N		\$ -	0.30	1.00	3.79	\$ 25.12	\$ 25.12	\$ -	0%	\$ -	\$ 25.12
2	2718 101 220 00000	3.99	1.00	3.99	N		\$ -	0.30	1.00	1.20	\$ 7.94	\$ 7.94	\$ -	0%	\$ -	\$ 7.94
3	2718 101 200 00000	5.20	0.99	5.17	N		\$ -	0.30	1.00	1.55	\$ 10.28	\$ 10.28	\$ -	0%	\$ -	\$ 10.28
4	2718 101 210 00000	3.87	0.97	3.74	N		\$ -	0.30	1.00	1.12	\$ 7.45	\$ 7.45	\$ -	0%	\$ -	\$ 7.45
5	2718 101 230 00000	14.13	0.76	10.73	N		\$ -	0.30	1.00	3.22	\$ 21.36	\$ 21.36	\$ -	0%	\$ -	\$ 21.36
6	2718 101 250 10000	27.72	0.76	21.03	N		\$ -	0.30	1.00	6.31	\$ 41.87	\$ 41.87	\$ -	100%	\$ 13.82	\$ 28.05
7	2718 101 240 00000	0.31	0.50	0.16	N		\$ -	0.30	1.00	0.05	\$ 0.31	\$ 0.31	\$ -	0%	\$ -	\$ 0.31
8	2718 101 260 00000	16.02	0.50	8.01	N		\$ -	0.30	1.00	2.40	\$ 15.95	\$ 15.95	\$ -	0%	\$ -	\$ 15.95
9	2718 101 280 00000	34.46	0.60	20.70	N		\$ -	0.30	1.00	6.21	\$ 41.20	\$ 41.20	\$ -	0%	\$ -	\$ 41.20
10	2718 101 310 00000	13.20	0.75	9.91	N		\$ -	0.30	1.00	2.97	\$ 19.73	\$ 19.73	\$ -	0%	\$ -	\$ 19.73
11	2718 101 340 00000	9.99	0.80	8.02	N		\$ -	0.30	1.00	2.40	\$ 15.96	\$ 15.96	\$ -	100%	\$ 5.27	\$ 10.69
12	2718 101 300 00000	40.47	0.51	20.49	N		\$ -	0.30	1.00	6.15	\$ 40.78	\$ 40.78	\$ -	0%	\$ -	\$ 40.78
13	2718 101 330 00000	5.93	1.00	5.93	N		\$ -	0.30	1.00	1.78	\$ 11.81	\$ 11.81	\$ -	100%	\$ 3.90	\$ 7.91
14	2718 101 350 00000	20.23	0.68	13.73	N		\$ -	0.30	1.00	4.12	\$ 27.33	\$ 27.33	\$ -	100%	\$ 9.02	\$ 18.31
15	2718 101 380 00000	0.40	1.00	0.40	N		\$ -	0.30	1.00	0.12	\$ 0.80	\$ 0.80	\$ -	100%	\$ 0.26	\$ 0.53
16	2718 101 370 00000	20.23	1.00	20.23	N		\$ -	0.30	1.00	6.07	\$ 40.27	\$ 40.27	\$ -	0%	\$ -	\$ 40.27
17	2718 101 360 00000	20.23	0.88	17.74	N		\$ -	0.30	1.00	5.32	\$ 35.31	\$ 35.31	\$ -	100%	\$ 11.65	\$ 23.65
18	2718 101 390 10000	9.83	1.00	9.83	N		\$ -	0.30	1.00	2.95	\$ 19.57	\$ 19.57	\$ -	0%	\$ -	\$ 19.57
19	2718 101 410 00000	0.09	1.00	0.09	N		\$ -	0.30	1.00	0.03	\$ 0.18	\$ 0.18	\$ -	0%	\$ -	\$ 0.18
20	2718 101 390 00000	9.73	1.00	9.73	N		\$ -	0.35	1.00	3.42	\$ 22.69	\$ 22.69	\$ -	0%	\$ -	\$ 22.69
21	2718 101 420 00000	18.29	1.00	18.29	N		\$ -	0.35	1.00	6.34	\$ 42.08	\$ 42.08	\$ -	100%	\$ 13.89	\$ 28.19
22	2718 101 420 50000	1.21	1.00	1.21	N		\$ -	0.50	1.00	0.61	\$ 4.01	\$ 4.01	\$ -	0%	\$ -	\$ 4.01
23	2718 101 440 10000	3.66	1.00	3.66	N		\$ -	0.40	1.00	1.46	\$ 9.71	\$ 9.71	\$ -	100%	\$ 3.21	\$ 6.51
36	2718 100 850 00000	0.63	0.50	0.32	N		\$ -	0.30	1.00	0.09	\$ 0.63	\$ 0.63	\$ -	0%	\$ -	\$ 0.63
37	2718 100 860 00000	2.47	0.50	1.24	N		\$ -	0.30	1.00	0.37	\$ 2.46	\$ 2.46	\$ -	0%	\$ -	\$ 2.46
38	2718 100 870 00000	14.56	0.50	7.28	N		\$ -	0.30	1.00	2.18	\$ 14.49	\$ 14.49	\$ -	0%	\$ -	\$ 14.49
40	2718 100 890 00000	17.31	0.50	8.66	N		\$ -	0.30	1.00	2.60	\$ 17.23	\$ 17.23	\$ -	0%	\$ -	\$ 17.23
41	2718 100 920 00000	20.23	0.50	10.12	N		\$ -	0.30	1.00	3.03	\$ 20.14	\$ 20.14	\$ -	0%	\$ -	\$ 20.14
42	2718 100 900 00000	6.70	0.50	3.35	N		\$ -	0.30	1.00	1.01	\$ 6.67	\$ 6.67	\$ -	0%	\$ -	\$ 6.67
43	2718 100 910 00000	6.85	0.50	3.43	N		\$ -	0.30	1.00	1.03	\$ 6.82	\$ 6.82	\$ -	0%	\$ -	\$ 6.82
44	2718 100 930 00000	35.99	0.56	20.13	N		\$ -	0.30	1.00	6.04	\$ 40.08	\$ 40.08	\$ -	0%	\$ -	\$ 40.08

SCHEDULE C
FOR FUTURE MAINTENANCE OF SECTION 2 -- VAN GAAL MUNICIPAL DRAIN

ID	Roll No.	Area	Land Use Factor	Factored Area	Backs on Drain	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	Special Benefit (Maintenance)	ADIP Eligibility	1/3 Grant	Total Net Cost
		S2		S2	S2			S2	S2				S2			
47	2718 100 940 00000	32.39	0.70	22.71	N		\$ -	0.30	1.00	6.81	\$ 45.21	\$ 45.21	\$ -	100%	\$ 14.92	\$ 30.29
52	2718 101 000 50000	29.16	0.91	26.44	N		\$ -	0.34	1.00	8.93	\$ 59.28	\$ 59.28	\$ -	0%	\$ -	\$ 59.28
53	2718 101 000 40000	0.81	2.00	1.62	N		\$ -	0.50	1.00	0.81	\$ 5.37	\$ 5.37	\$ -	0%	\$ -	\$ 5.37
54	2718 101 000 30000	0.81	2.00	1.62	N		\$ -	0.50	1.00	0.81	\$ 5.37	\$ 5.37	\$ -	0%	\$ -	\$ 5.37
55	2718 101 000 20000	0.81	2.00	1.62	N		\$ -	0.50	1.00	0.81	\$ 5.37	\$ 5.37	\$ -	0%	\$ -	\$ 5.37
56	2718 101 000 10000	0.81	2.00	1.62	N		\$ -	0.50	1.00	0.81	\$ 5.37	\$ 5.37	\$ -	0%	\$ -	\$ 5.37
62	2718 101 051 00000	13.81	1.00	13.81	N		\$ -	0.49	1.00	6.74	\$ 44.74	\$ 44.74	\$ -	100%	\$ 14.77	\$ 29.98
63	2718 101 050 00000	0.48	2.00	0.96	N		\$ -	0.50	1.00	0.48	\$ 3.19	\$ 3.19	\$ -	0%	\$ -	\$ 3.19
64	2718 101 050 50000	0.33	2.00	0.66	N		\$ -	0.50	1.00	0.33	\$ 2.19	\$ 2.19	\$ -	0%	\$ -	\$ 2.19
65	2718 101 050 10000	0.53	2.00	1.06	N		\$ -	0.50	1.00	0.53	\$ 3.52	\$ 3.52	\$ -	100%	\$ 1.16	\$ 2.36
66	2718 101 060 00000	19.65	1.00	19.65	N		\$ -	0.73	1.00	14.33	\$ 95.06	\$ 95.06	\$ -	100%	\$ 31.37	\$ 63.69
67	2718 101 040 40000	1.66	2.00	3.32	N		\$ -	0.50	1.00	1.66	\$ 11.02	\$ 11.02	\$ -	0%	\$ -	\$ 11.02
68	NOT AVAILABLE	4.05	1.00	4.05	N		\$ -	0.51	1.00	2.08	\$ 13.77	\$ 13.77	\$ -	0%	\$ -	\$ 13.77
69	2718 101 040 30000	2.01	2.00	4.02	N		\$ -	0.50	1.00	2.01	\$ 13.34	\$ 13.34	\$ -	0%	\$ -	\$ 13.34
70	2718 101 040 00000	12.69	1.00	12.69	N		\$ -	0.53	1.00	6.74	\$ 44.70	\$ 44.70	\$ -	100%	\$ 14.75	\$ 29.95
76	2718 101 070 50000	1.24	2.00	2.48	Y	2.48	\$ 12.50	0.50	1.00	1.24	\$ 8.23	\$ 20.73	\$ -	0%	\$ -	\$ 20.73
78	2718 101 100 20000	16.56	1.00	16.56	N		\$ -	0.86	1.00	14.31	\$ 94.96	\$ 94.96	\$ -	100%	\$ 31.34	\$ 63.62
BLOCKS																
BLOCK N3		3.01	0.40	1.20	Y	1.20	\$ 6.07	1.00	1.00	1.20	\$ 7.99	\$ 14.06	\$ 1,747.29	0%	\$ -	\$ 1,761.35
BLOCK N5		0.78	1.00	0.78	Y	0.78	\$ 3.93	1.00	1.00	0.78	\$ 5.18	\$ 9.11	\$ -	0%	\$ -	\$ 9.11
BLOCK O3		3.45	0.40	1.38	Y	1.38	\$ 6.95	1.00	1.00	1.38	\$ 9.16	\$ 16.11	\$ 2,002.71	0%	\$ -	\$ 2,018.82
CITY OF OTTAWA -- LANDS & ROADS																
JOYS ROAD		2.12	4.00	8.48	Y	8.48	\$ 42.74	0.43	1.00	3.63	\$ 24.10	\$ 66.83	\$ -	0%	\$ -	\$ 66.83
GARVIN ROAD		2.62	4.00	10.48	Y	10.48	\$ 52.81	0.37	1.00	3.90	\$ 25.91	\$ 78.72	\$ -	0%	\$ -	\$ 78.72
ROW -- CON 4/5		3.03	1.00	3.03	N		\$ -	0.30	1.00	0.91	\$ 6.03	\$ 6.03	\$ -	0%	\$ -	\$ 6.03
39	2718 100 880 00000	15.82	0.50	7.91	N		\$ -	0.30	1.00	2.37	\$ 15.75	\$ 15.75	\$ -	0%	\$ -	\$ 15.75
Total		580.44		466.54		24.80	\$ 125.00			169.54	\$ 1,125.00	\$ 1,250.00	\$ 3,750.00		\$ 169.30	\$ 4,830.70

SCHEDULE D
FOR FUTURE MAINTENANCE OF THE WEST MAIN DRAIN -- VAN GAAL MUNICIPAL DRAIN

Project No.: B13056
 Date: Jan-19

ID	Roll No.	Area	Land Use Factor	Factored Area	Backs on Drain	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	Special Benefit (Maintenance)	ADIP Eligibility	1/3 Grant	Total Net Cost
		WM		WM	WM			WM	WM				WM			
INDIVIDUAL LANDOWNERS																
23	2718 101 440 10000	5.43	1.00	5.43	N		\$ -	0.69	1.00	3.73	\$ 155.94	\$ 155.94		100%	\$ 51.46	\$ 104.48
24	2718 101 440 50000	6.69	1.00	6.69	N		\$ -	0.70	1.00	4.68	\$ 195.63	\$ 195.63		100%	\$ 64.56	\$ 131.07
25	2718 101 440 50000	3.07	1.00	3.07	N		\$ -	0.75	1.00	2.30	\$ 96.19	\$ 96.19		100%	\$ 31.74	\$ 64.45
26	2718 101 440 00000	0.16	2.00	0.32	N		\$ -	0.75	1.00	0.24	\$ 10.03	\$ 10.03		0%	\$ -	\$ 10.03
27	2718 101 450 00000	17.14	1.00	17.14	N		\$ -	0.80	1.00	13.72	\$ 573.09	\$ 573.09		100%	\$ 189.12	\$ 383.97
28	2718 101 451 00000	0.41	2.00	0.82	N		\$ -	0.75	1.00	0.62	\$ 25.69	\$ 25.69		0%	\$ -	\$ 25.69
29	2718 101 450 10000	0.40	2.00	0.80	N		\$ -	1.00	1.00	0.80	\$ 33.42	\$ 33.42		0%	\$ -	\$ 33.42
77	2718 101 070 00000	4.88	1.00	4.88	Y	4.88	\$ 457.50	1.00	1.00	4.88	\$ 203.88	\$ 661.38		100%	\$ 218.25	\$ 443.12
78	2718 101 100 20000	3.90	1.00	3.90	N		\$ -	1.00	0.50	1.95	\$ 81.47	\$ 81.47		100%	\$ 26.88	\$ 54.58
CITY OF OTTAWA -- LANDS & ROADS																
GARVIN ROAD		1.28	4.00	5.12	Y	5.12	\$ 480.00	0.88	1.00	4.48	\$ 187.17	\$ 667.17		0%	\$ -	\$ 667.17
Total		43.36		48.17		10.00	\$ 937.50			37.40	\$ 1,562.50	\$ 2,500.00	\$ -		\$ 582.02	\$ 1,917.98

SCHEDULE E
FOR FUTURE MAINTENANCE OF THE EAST MAIN DRAIN -- VAN GAAL MUNICIPAL DRAIN

Project No.: B13056
 Date: Jan-19

ID	Roll No.	Area	Land Use Factor	Factored Area	Backs on Drain	Benefit Factored Area	Benefit Cost	Distance Factor	Sub-Section Factor	Outlet Factored Area	Outlet Cost	Sub-Total Cost	Special Benefit (Maintenance)	ADIP Eligibility	1/3 Grant	Total Net Cost
		EM		EM	EM			EM	EM				EM			
INDIVIDUAL LANDOWNERS																
30	2718 101 460 10000	13.39	1.00	13.39	N		\$ -	0.82	1.00	10.94	\$ 228.30	\$ 228.30		100%	\$ 75.34	\$ 152.96
31	2718 101 460 00000	2.03	2.00	4.06	N		\$ -	1.00	1.00	4.05	\$ 84.41	\$ 84.41		0%	\$ -	\$ 84.41
32	2718 101 470 00000	11.67	1.00	11.67	N		\$ -	0.75	1.00	8.75	\$ 182.65	\$ 182.65		100%	\$ 60.28	\$ 122.38
33	2718 101 470 10000	0.35	2.00	0.70	N		\$ -	0.75	1.00	0.53	\$ 10.96	\$ 10.96		0%	\$ -	\$ 10.96
34	2718 101 490 00000	9.38	1.00	9.38	N		\$ -	0.58	1.00	5.43	\$ 113.37	\$ 113.37		100%	\$ 37.41	\$ 75.96
78	2718 101 100 20000	14.56	1.00	14.56	N		\$ -	0.96	0.50	6.99	\$ 145.85	\$ 145.85		100%	\$ 48.13	\$ 97.72
88	2718 101 090 00000	19.54	1.00	19.54	Y	19.54	\$ 953.36	0.90	1.00	17.66	\$ 368.43	\$ 1,321.79		100%	\$ 436.19	\$ 885.60
CITY OF OTTAWA -- LANDS & ROADS																
GARVIN ROAD		1.52	4.00	6.08	Y	6.08	\$ 296.64	0.91	1.00	5.56	\$ 116.03	\$ 412.67		0%	\$ -	\$ 412.67
Total		72.44		79.38		25.62	\$ 1,250.00			59.90	\$ 1,250.00	\$ 2,500.00	\$ -		\$ 657.35	\$ 1,842.65

Appendix D

Schedule of Allowances
For Construction

Schedule F – Land Allowance
Schedule G – Crop Allowance

SCHEDULE F -- LAND ALLOWANCES
FOR LAND LOST DUE TO THE RECONSTRUCTION OF THE VAN GAAL MUNICIPAL DRAIN



Project No.: B13056
 Date: Jan-19

ID	Roll No.	LAND ALLOWANCE								Total Allowance
		S1		S2		WM		EM		
		AREA (ha)	VALUE	AREA (ha)	VALUE	AREA (ha)	VALUE	AREA (ha)	VALUE	
INDIVIDUAL LANDOWNERS										
78	2718 101 100 20000	0.00	\$ -	0.28	\$ 23,910.50	0.00	\$ -	0.00	\$ -	\$ 23,910.50
Total		0.00	\$ -	0.28	\$ 23,910.50	0.00		0.00	\$ -	\$ 23,910.50

SCHEDULE G -- CROP ALLOWANCES
FOR CROP LOSS DUE TO THE RECONSTRUCTION OF THE VAN GAAL MUNICIPAL DRAIN



Project No.: B13056
 Date: Jan-19

ID	Roll No.	CROP ALLOWANCE								Total Allowance
		S1		S2		WM		EM		
		AREA	VALUE	AREA	VALUE	AREA	VALUE	AREA	VALUE	
INDIVIDUAL LANDOWNERS										
78	2718 101 100 20000	0.00	\$ -	1.41	\$ 3,952.71	0.00	\$ -	0.00	\$ -	\$ 3,952.71
85	2738 150 210 10000	3.23	\$ 9,063.28	0.00	\$ -	0.00	\$ -	0.00	\$ -	\$ 9,063.28
Total		3.23	\$ 9,063.28	1.41	\$ 3,952.71	0.00		0.00	\$ -	\$ 13,015.99

Note: Allowance for Crop Loss shall not be paid if no construction or access is completed on or from the above listed lands