



Preliminary Report For the Gorrell Drain

The Municipality of Leamington

August 1, 2017
(Preliminary Report)

Project No. 14-163

August 1, 2017

The Municipality of Leamington
111 Erie Street North
Leamington, Ontario
N8H 2Z9

27 Princess St.
Unit 102
Leamington, ON
N8H 2X8
519.326.6161
1.844.842.9188

bairdAE.ca

Mayor Paterson and Members of Council

Subject: Preliminary Drainage Report – Gorrell Drain
In the Municipality of Leamington
Our File Reference 14-163

1.0 INTRODUCTION

A petition for stormwater management improvements was received by the Drainage Superintendent for the Municipality of Leamington by Dr. Gerald J. Gorrell, owner of Roll No. 530-43300, residing at 418 Seacliff Drive West. Dr. Gorrell reported to the Drainage Superintendent that the natural waterway located east of his residence was eroding at an alarming rate and exposing portions of the foundation of a structure located on the southeast portion of his property. The Drainage Superintendent explained to Dr. Gorrell that the drain was not a municipal drain and the Municipality has no jurisdiction on this portion of waterway. Dr. Gorrell was informed that a petition may be initiated with the Municipality in order to address the erosion concerns. On April 2, 2013, a petition for drainage works was signed and submitted to the Municipality requesting improvements to the portion of drain that is located between 418 Seacliff Drive West and 402 Seacliff Drive West. The petition was signed by Dr. Gerald and Janice Gorrell of 418 Seacliff Drive West, John Robert and Bridget Colquhoun of 412 Seacliff Drive West, and William A. and Denise T. Grabowski of 402 Seacliff Drive West.

The natural drain for the purposes of this report will be referred to as the “Gorrell Drain”. The drain as defined under the Drainage Act will extend from Lake Erie (Station 0+010) to County Road 20. It will include drainage of properties along the north side of County Road 20. The width of the open drain shall be measured from east top of bank to west top of bank.

Stantec Consulting Ltd. was appointed on January 24, 2013 to prepare a Drainage Report for the Gorrell Drain under Section 4 of the Drainage Act, R.S.O. 1990 (the Act), as amended. Stantec was to address the severe erosion and bank stabilization concerns associated with a section of the natural watercourse south of County Road 20 (Seacliff Drive West) that uses Lake Erie as its outlet, and to provide a sufficient stormwater conveyance capacity for the watershed boundary that utilizes the drain.

Work was started including a full topographical survey of the drain and a number of meetings and site visits.

Through further investigation, the Engineer-of-Record determined that the petition was in fact, not valid. It was determined that because of the extent of the drainage area, additional property

owners or the Road Authority, being the County of Essex, must sign the petition in order to make it valid.

Subsequent to further work being carried out, the work was transferred from Stantec Consulting to Baird AE.

Discussions were held with a number of property owners over the next year regarding the project and a sufficient petition was achieved on October 22, 2015. The total area of land requiring drainage is 15.687 ha. Owners holding a total of 9.412 ha of land or 63.2% of the drainage area have signed the petition. In accordance with Section 4(1) of the Drainage Act, owners of 60% of the area requiring drainage must sign the petition.

Through review of the previous engineers' reports, discussions with the Municipality of Leamington, and land owners, it was decided that a full examination of the drain would be required to ascertain its operational capabilities under its current condition and to determine the extent of the repairs and stabilization needed to bring the drain to a sufficient condition for watershed conveyance.

Prior to preparation of the Final Report, this preliminary report has been prepared to describe all options available for repair and stabilization of the drain. This will be reviewed with the property owners draining to this outlet to allow them to select the preferred options prior to preparation of the final report.

Baird AE hereby submits this Preliminary Drainage Report for the improvements to the Gorrell Drain.

2.0 DESCRIPTION OF DRAIN AND WATERSHED

The current drainage system consists of a combination of enclosed gravity flow drains currently owned by the County of Essex and drainage from abutting residential properties and greenhouse complexes to the north. This system of covered drains outlets into a natural channel on the south side of County Road 20 across from 403 County Road 20 (Sunlight Hydroponics). The open channel runs diagonally across 402, 412 and 418 County Road 20. The drainage area is approximately 15.69 hectares.

3.0 ON-SITE & SUPPLEMENTARY MEETINGS

An onsite meeting was held on Monday, July 29, 2013 at 9:00 a.m. at 403 County Road 20, Leamington, Ontario. Notices were sent out by the clerk to all residents believed to be assessable to the Drainage Area utilizing the Gorrell Drain. Meeting Minutes are included in **Appendix "A"**.

Several meetings between the landowners within the watershed and Stantec were held to discuss issues and solutions. The following meetings took place on August 14, 2013:

1. Stantec visited the landowners from the onsite meeting that inquired about drainage to the proposed Gorrell Drain. Upon visiting Carl Mastronardi of CRC Farms Ltd, Roll No. 653-20900, the current drainage scheme on the parcel was inspected. The owner demonstrated areas of severe flooding and claimed that the water was coming from the

lands to the north of his property. The lands to the north drain into the Judson A. Morse Drain and unless there is a problem with the system, the Mastronardi lands should not receive any water from the lands to the north. There are various catch basins within the property which seem to be part of the County Road 20 sewer system. These catch basins in particular, are on the east side of the property and include inlets from the adjacent property to the east which is not currently in the drainage area for the proposed Gorrell Drain. It was indicated to Mr. Mastronardi that further study will be done on this to confirm the direction of conveyance and the contribution of each parcel to the watershed.

2. Stantec also visited the landowner of Roll No. 653-20700 to discuss flooding concerns. Mr. Abe Klassen was present and indicated that flooding has become a major problem in his greenhouse operations. While inspecting the property to investigate storm water management, there was an excess amount of water on the interior roads within the farm. When asked about the standing water, Mr. Klassen stated that all this flood water comes from the lands to the north. It overflows the ditch and culvert area and continues down the interior roads and stops in the building where his boiler room is situated. He has on many occasions witnessed the water coming from these parts and following the roads into his greenhouse.
3. Stantec also visited the landowners at Roll No. 653-43300. Dr. Gorrell and Janice Gorrell who live adjacent to the ravine where the proposed work is to occur and stated to Stantec that they are concerned with the groundwater flow in the area. They also stated that it has been increasing over the years as greenhouses have been constructed. Dr. Gorrell indicated his concern for the banks of the ravine as well as the natural life of the system, and requested that caution be used to address any work within the habitat of the species within the drain. Stantec assured Dr. Gorrell that the mitigation measures will be put in place before any work is done on the drain and only during specified times set out by the Ministry of Natural Resources can work occur on this drain. Also Mr. Sam Paglia of Stantec, indicated that the MNR is involved in the process and will need to approve any proposed works.
4. Stantec visited the landowners at Roll No. 653-20250. Mr. Bert Mastronardi inquired about his land drainage scheme. Stantec investigated the property and determined that the watershed boundary was correct in the 1984 Report for the Judson A. Morse Drain and showed contour maps to illustrate the land and the direction of flow.

In various additional meetings over the past 2 years, the following were also discussed:

1. Bill Grabowski (lot 402) noted he has a pump system that takes water from the drain to water his property. He would like to maintain that system after the drain improvements.
2. Bob Calquhoun's property (lot 408) is cut in 2 pieces by the drain and he would like to have access to the south half of his property over the drain. He currently has to access the south section of his property by crossing over to his neighbour's property (lot 402) at County Road 20 and then to the back of his property. He noted that a bridge previously spanned the channel and would like to reestablish the access across the drain in this report.
3. Subsequent research and discussions with Carl Mastronardi (CRC Farms) (lot 381) revealed that some of his property (approximately 7 acres based on the 1964 report) is assessed to the Pettapiece Drain. There is one 300mm pipe extending into his property

with one catchbasin. However, Mr. Mastronardi has indicated very little of his property actually drains to this pipe and his property is flooding during average storms. There has been significant damage to his property and crops.

4. The Klassen greenhouses (lot 387) immediately west of CRC Farms has also experienced recent significant flooding. Mr. Klassen and Mr. Mastronardi have indicated they would be agreeable to sharing a drainage scheme for both properties. The report could determine a pipe size and grade to accommodate a 2 year storm. The report would provide an outlet from the front property line of their parcels to the Gorrell Drain.
5. County of Essex drainage pipes on County Road 20 are currently picking up stormwater from a number of fronting properties to the north in the Gorrell drainage area. The pipe will be investigated for size and condition and would be incorporated into the proposed Gorrell Drain subject to the maintenance provisions of the report.
6. Stantec investigated a claim made by Mr. Carl Mastronardi that a neighboring parcel of land may be contributing to the watershed, as well causing some flooding concerns to the green houses in which he operates at Fresh Pack Farms. On August 14, 2013 Stantec visited the area in question and met with Mr. Mastronardi. It was determined that part of the lands may be assessed and should be draining to the Pettapiece Drain, but there are still significant flooding problems.
7. Stantec also investigated concerns raised by Mr. Bert Mastronardi, of 453 Seacliff Drive W., Roll No. 530-20300, regarding this parcel's contribution to the watershed.

4.0 EXISTING CONDITIONS

The proposed Gorrell Drain is currently considered a Natural Watercourse located south of County Road 20 (Seacliff Drive W) approximately 450 metres West of Fraser Road and 865 metres east of County Road 31. This section of watercourse is currently collecting runoff from the County Road 20 drainage system which conveys runoff from approximately 30 hectares of surrounding land, mainly residential and greenhouse agricultural.

Stormwater conveyed to the natural channel includes a 400mm storm sewer on County Road 20 that drains the road and right-of-way plus fronting residential properties on the north side of the road. There is also an 900mm CSP that carries runoff from Sunlight Hydroponics. It is our understanding that the CSP is a previous road culvert that drained the north side of County Road 20 when the natural channel extended further north. It is unknown when the north section of the channel was filled. No other properties are currently using this pipe.

The channel is separated from Lake Erie by a concrete wall approximately 600mm high at Station 0+010.

Attached to this report are plans showing the extents of the area served by the Gorrell Drain and includes parcel information.

The following existing conditions will be addressed in this preliminary report:

Existing Open Channel

The natural watercourse varies in depth from approximately 3 metres at the upstream end just south of County Road 20 to approximately 7 metres 160 metres south of County Road 20. Then it drops off sharply to Lake Erie with another 7 metre drop over the next 40 metres. The top width varies from 15 metres approximately 30 metres south of County Road 20 to more than 30 metres approximately 150 metres south of County Road 20.

The existing drain is heavily overgrown with brush and trees for the first 70 metres across 402 County Road 20. There are also many downed trees and debris from the 2010 tornado that passed through the area. There is a section of bank failure on the east bank approximately 50 metres south of County Road 20. There is also considerable bank failure at the outlet pipes at County Road 20. The 450mm concrete pipe from the County system has been undermined and a pipe section has been totally exposed and fallen to the drain bottom. The bank at the 900 CSP under County Road 20 has also been badly eroded so that approximately 2 metres of pipe is extended out of the bank. The drain bottom is approximately 1 metre below the pipe invert.

The 40 metre section across 412 County Road 20 has been cleaned of most brush and trees, but heavy weeds are overtaking the grassed banks.

The last section across 418 County Road 20 is again heavily vegetated and shows the remnants of the tornado. The channel is deeper and has the remains of an old fish hatchery and other structures. There is a significant bank failure on the west side approximately 140 metres south of County Road 20. Parts of a building foundation have been exposed adjacent to the bank.

Klassen and Carl Mastronardi Properties (lots 387 and 381)

There is a buried manhole, on private property, on the north side of County Road 20 approximately 30 metres northeast of the 900mm dia. CSP outlet pipe. It was noted at the onsite meeting that an underground manhole or storage area was believed to be in the location. The manhole is not part of a municipal drain and was installed by the owner (Mike Mastronardi – lot 403). Stormwater and excess greenhouse water is directed to the 1200mm by 1275 mm manhole through a 450 mm CSP pipe. The 900mm CSP pipe was corroded in some areas along the bottom but the overall condition of the pipe was satisfactory. The overall condition of the manhole and pipes was fair, but the manhole lid should be raised to ground elevation and the manhole cleaned out.

The Klassen property (lot 387) east of lot 403 does not appear to have a drainage outlet. Mr. Klassen has indicated he has severe flooding problems.

The Carl Mastronardi property (lot 381) east of the Klassen property is also experiencing significant flooding problems. It appears that the Pettapiece Drain, which extends into the property, does not currently provide relief to these lands.

5.0 TOPOGRAPHICAL SURVEY AND GEOTECHNICAL INVESTIGATION

A full topographical survey of the open channel was completed by Total Tech Surveying in October 2013. The survey included cross sections taken at 10 metre intervals with more concentrated survey at locations of obvious deficiencies.

As part of the preliminary report, two (2) test pits were excavated on August 25, 2016. The purpose was to determine the type of soil, depth of various soil layers, water table, etc. by observation and field measurement.

Test Hole 1

Located on lot 402 on the east side of the drain approximately 25m south of County Road 20

The excavation was approximately 3 metres (10') deep. The top 0.75 metres was a brown silty-sand fill material. The original ground surface was evident. The next 0.45 metres was a brown silty sand native material. From 1.2 metres to 3 metres, the material was a clean, relatively dry, gray sand similar to beach sand.

At this depth, there was no evidence of water seepage or standing water.

Test Hole 2

Located on lot 412 on the west side of the drain approximately 100m south of County Road 20

The excavation was approximately 3 metres (10') deep. The top 1.5 metres was a brown silty-sand native material. From 1.5 metres to 3 metres, the material was a clean, relatively dry, gray sand similar to beach sand.

At this depth, there was no evidence of water seepage or standing water.

6.0 REMEDIATION NEEDS

Based on the topographic survey, detailed investigations/discussions with affected land owners, experience on similar drains, the following options for remediation of the drainage area are proposed:

1. Cleaning of the entire length of the channel of dead vegetation and debris from the 2010 tornado and general growth over time. There is a considerable amount of dead brush and tree trunks scattered throughout the channel. (The extent of cleaning permitted will ultimately be dependent on the findings of an environmental assessment that will be required before any works can be approved by MNR, DFO, ERCA.)
2. Flows in the drain result from rainfall events and groundwater seepage. Larger flows are contributed by County Road 20 and the lands to the north. To protect the drain against erosion from these flows, we would recommend reinforcement of the existing low flow channel with a geotextile or fiber mat. The geotextile or fiber mat would also better define the channel.
3. Stabilize the drain banks:
 - i) Along the entire length of the drain on both sides, install a 150mm perforated subdrain in a sock 1.5 metres inside the toe of slope (or at the interface between

the sand and underlying clay) to intercept water flowing from the bank sand and outlet at designated reinforced outlets. (Total length of subdrain equals 300 metres with an outlet approximately every 15 metres.)

- ii) Where required, flatten or fill banks to 2:1 slope, cover with 150mm of topsoil and seed with native grasses and vegetation.

4. At areas of bank failure:

- i) Station 0+155 to 0+165 on the east bank (Grabowski property):
 - a) Strip away the loose bank material and vegetation to the bottom of the slope.
 - b) Stabilize the toe of slope by removing the soft, loose material from the bottom 1.5 metres and replace with 450mm thick rip-rap (300mm in size) placed on a Class II non-woven geotextile fabric, sloped at 1.75:1 or flatter and keyed into the bottom of the drain a minimum of 300mm or to stable ground. (Note: The subdrain will be in place from item 1.i)
- ii) Station 0+055 to 0+085 on the west bank (Gorrell property):
 - a) Remove all loose bank material, brush, dead trees and other debris to the bottom of the slope. Bank is currently at a 1.5 to 1 slope. Minimum for sandy soils should be 2 to 1.
 - b) Construct a short section of wall approximately 1.5 metres high with cast-in-place concrete or large concrete blocks or gabion baskets and fill behind the wall with 300mm of clear stone, native sand material and cover with 150mm of topsoil. Plant with native species and grass (Note: The subdrain will be in place from item 1.i) The wall design will be finalized in the final report.

*Note: A final design cannot be confirmed until a Geotechnical investigation has been carried out to confirm the type and depths of soils and water table depth.

5. Pipe Outlet from County Road 20:

Option 1: Fill in the area adjacent to the road right-of-way where the existing pipes outlet with imported clay material compacted in 300mm lifts extending approximately 25 metres from the existing vertical bank. Extend existing pipes through the fill area to outlet approximately 25 metres further to the south. Provide rip rap at the outlet pipes 300mm thick on geotextile around the pipes and extend 3 metres further to the south.

Option 2: Construct cast-in-place concrete headwall where the existing pipes outlet into the proposed Gorrell Drain. The headwall would be constructed rather than extending the existing pipes downstream.

7.0 ADDITIONAL WORKS

1. Drainage outlet for Klassen/Mastronardi (lot 387/381):

Provide a 1200mm diameter MH with 600mm stub to the north at the property line between lots 387 and 381. (Sufficient for 2-year rain event). Install 600mm diameter pipe to the west along the County Road 20 right-of-way to connect to the existing 900mm CSP crossing County Road 20. The option of a new pipe for the two (2) properties or sharing the existing 900mm CSP under County Road 20 (owned by Mike Mastronardi – lot 403) would be explored.

Should the 900mm pipe not be accessible or too small, a new pipe will need to be installed across County Road 20, or the existing pipe will be replaced with a larger one.

2. County of Essex Storm Sewer System

The County storm sewer system along County Road 20 drains the road right-of-way and a number of fronting lots. This system includes the existing 300mm and 400mm diameter storm sewers aligned along the north side of County Road 20. There are a few options to deal with this drainage system.

Option 1: Incorporate the County of Essex's road drainage system into the Gorrell Drain system. Repair as required to accommodate drainage from the road right-of-way and properties currently connected to it and possible additional drainage from assessed properties. Review the capacity of the pipe and recommend increases in size as required. (The County shall only be responsible for sizing pipe for road right-of-way drainage. Adjacent properties will be responsible for costs to oversize pipes above what the County requires.) Costs for repairs and upgrades will be assessed to fronting roads and the County as applicable, but the County would be compensated for constructing the existing system.

Option 2: Construct a new storm sewer system for lots along the north side of County Road 20 sized to carry the 2-year storm from lands north of County Road 20. The County system would be left as is. The pipe would connect to the existing 900mm diameter CSP crossing County Road 20. Pipes would be in the 300mm to 450mm diameter range. Pipe would be approximately 350 metres long with 3 catch basin manholes for maintenance access. We estimate the cost of this work to be approximately \$100,000.

Options 3: Leave as is with no improvements and no relief from current flooding issues. The County would be responsible for repairs to the system. Issues with existing condition of catch basins have been noted.

3. Irrigation Water Supply for Lot 402:

Install a pit to collect water for lawn watering on lot 402. There is an existing pump and irrigation lines set up on the property.

Option 1: The pit would include two (2) concrete MH barrels set on existing native material (no bottom) to collect ground water and some drainage tile flows. The structure will have a concrete slab top and will be protected by large concrete blocks.

Option 2: The proposed 1800mm MH to be installed could have additional barrels installed to create a 2.0 metre + sump to collect irrigation water. It would also require a safety landing for maintenance access.

4. Access Bridge for lot 412:

Provide an access across the drain for lot 412. The drain cuts the property in 2 pieces and the owner has requested the access. There was previously an elevated concrete bridge across the channel. This access would include a 6 metre long aluminized 1500mm diameter CSP with sloped rip rap end treatments to provide a top access width of 3 metres.

Based on the preliminary report, the owners are to provide direction on the extent of the Additional Works to be undertaken on the proposed Gorrell Drain.

8.0 ENVIRONMENTAL CONCERNS

Essex Region Conservation Authority (ERCA) Review

An official inquiry was made in August 2013 requesting review and approval to satisfy the regulation under the Essex Region Conservation Authority (E.R.C.A.) for drainage works that fall within the Province of Ontario. It is a requirement that feedback and approval is obtained from all pertinent Provincial Authorities on any municipal project that falls within their jurisdiction. Upon the adoption of this report, the applicable Provincial Authorities will obtain copies of the report and all pertinent information supplied by them through correspondence and consultation.

Ministry of Natural Resources – Species at Risk Review

The Ministry of Ontario Species at Risk Act provides federal legislation to prevent wildlife species from becoming extinct and provides long and short term objectives in a recovery strategy and action plan for protection and recovery. On behalf of the Ministry of Natural Resources (MNR), the Municipality's Drainage Superintendent has reviewed the details of the proposed drainage works with respect to the Endangered Species Act. This review has been conducted by the Municipality pursuant to an agreement with the Ministry of Natural Resources (MNR) under Section 23 of Ontario Regulation 242/08 of the Endangered Species Act which allows a municipality to review drainage projects under certain sections of the Drainage Act to determine potential impacts on endangered species identified as existing within the municipality, specifically within the area requiring drainage.

In recognition of the impacts that these species may experience as a result of the subject works, the municipality has available, comprehensive mitigation measures as well as species identification guides for reference. These documents will be included as part of the contract documents and must be followed by the Contractor throughout construction.

The Contractor must be familiar with the mitigation plans and Ontario Identifier Guidelines for turtles and snakes that are included with this report, and be responsible for providing the necessary equipment and materials required in the mitigation plans. The Contractor should contact the Municipality's Drainage Superintendent immediately if any endangered species are encountered during construction.

Fisheries and Oceans Canada (DFO)

Work on the Gorrell Drain may only take place during specified times of the year so as to not disrupt the habitat of sensitive species present. In order to mitigate any disturbance of the existing drain inhabitants, no work can proceed on the drain between March 15 and June 30 which is the Restricted Activity Period (RAP) set out by Fisheries and Oceans Canada.

Future Environmental Investigation

Prior to finalizing a report for the work, an Environmental Investigation must be carried out by a qualified biologist. Investigations shall consider fish communities, habitat and vegetation. There will likely need to be a two season visit for terrestrial vegetation and faunal habitat to identify resident Species at Risk or their habitat. A Natural Heritage Report will be provided. If Species at Risk are identified, further investigations may be required to address any Harmful Alterations to the channel.

9.0 ALLOWANCES

In accordance with the provisions of the Act, monetary allowances are provided to those landowners from which land is required to be used for the construction of a new drain or for the establishment of an easement for the construction and future maintenance of a drain or for land required to dispose of excavated material or for land required to obtain access to a Municipal Drainage System.

We find that no land is required to be used for the construction of a new drain or for the establishment of an easement for the construction and future maintenance of a drain or for land required to obtain access to a Municipal Drainage System, therefore, we have not provided any allowance for lands taken in our estimate as is otherwise normally provided for under sub-section (a) of Section 29 of the Act.

10.0 CONSTRUCTION ESTIMATE

The estimated cost of the work described in **Section 6.0 Remediation Needs** is as follows:

Section No.	Description	Quantity	Unit	Unit Price	Extended Price (\$)
1	Entire Open Channel				
i)	Clearing and removal offsite of the dead vegetation and debris	1	ls	10,000	10,000
ii)	Excavate the low flow channel to the cross-section shown on the drawings and line the banks with a fiber mat and hydroseed.	150	lm	50	<u>7,500</u>
Total Section 1. Entire Open Channel					17,500

Section No.	Description	Quantity	Unit	Unit Price	Extended Price (\$)
2	Bank Failures				
2.1	Stabilize the drain banks				
i)	Supply and install a 150mm dia. subdrain 1.5m inside the toe of slope including tee and outlet pipe to the low flow channel every 15 metres.				
a)	150mm diameter perforated subdrain with sock	300	lm	30	9,000
b)	Outlet pipe 150mm dia. approximately 6 metre long non-perforated including tee	20	each	200	4,000
ii)	Various locations Supply clay fill material and flatten banks to 2:1 slope (areas not specifically identified in section 2.B)	100	m ²	20	<u>2,000</u>
	<i>Total Stabilize the drain banks</i>				15,000
2.2	Areas of Bank Failure				
i)	Station 0+155 to 0+165 on the east bank (Grabowski property)				
6.	Strip away the loose bank material and vegetation to the bottom of the slope.	1	ls	1,000	1,000
7.	Supply and place 450mm thick rip rap on Class II non-woven geotextile, 1.5 metre from bottom of bank sloped at 2:1 and keyed 300mm minimum below bottom of bank including required excavation	50	t	75	3,750
8.	Supply and place 150mm topsoil and hydroseed bank	25	m ²	15	<u>375</u>

Section No.	Description	Quantity	Unit	Unit Price	Extended Price (\$)
	<i>Total Station 0+155 to 0+165 on the east bank (Grabowski property)</i>				5,125
ii)	Station 0+055 to 0+085 on the west bank (Gorrell property)				
a)	Remove all loose bank material, brush, dead trees and other debris to the bottom of the slope.	1	ls	1,000	1,000
b)	Construct a concrete block wall 1.5 metre high, fill behind the wall with 300mm of clear stone including ties into bank (prior to filling).	30	lm	1,000	30,000
c)	Supply clay fill material, grade bank to 2:1 slope, (approximately 225 cubic metres of clay), supply and place 150mm of topsoil and hydroseed	300	m ²	25	<u>7,500</u>
	<i>Total Station 0+055 to 0+085 on the west bank (Gorrell property)</i>				38,500

2.3 At Pipe Outlets from County Road 20

i)	Station 0+190 to 0+213				
a)	Remove and dispose of existing vegetation, debris, organic material	1	ls	1,000	1,000
b)	Fill in the area adjacent to the road right-of-way where the existing pipes outlet with imported clay material compacted in 300mm lifts extending approximately 15 metres from the existing vertical bank	500	m ³	20	10,000
c)	Remove and dispose of existing vegetation, debris, organic material. Supply and place pipe, manhole and granular material				

Section No.	Description	Quantity	Unit	Unit Price	Extended Price (\$)
	450mm diameter Concrete pipe	5	lm	200	1,000
	1800mm diameter MH	1	each	8,000	8,000
	900mm diameter CSP	5	lm	400	2,000
	1200mm diameter CSP	20	lm	550	11,000
d)	Provide rip rap at the outlet pipes 300mm thick on geotextile around the pipes and extend 3 metres further to the south.	30	m ³	65	<u>1,950</u>
	<i>Total at Pipe Outlets from County Road 20</i>				<u>34,950</u>
	Total Section 2. Bank Failures				93,575
Remediation Needs Cost Summary					
	1 Entire Open Channel				17,500
	2 Bank Failures				<u>93,575</u>
	Remediation Needs Estimate of Cost				111,075
	Remediation Needs Incidental Fees				50,000
	Remediation Needs Total Estimate of Cost				161,075

Item 2.3 c) describes pipe extensions to existing pipes that currently outlet into the proposed Gorrell Drain. Alternatively, a cast-in-place concrete headwall could be constructed at this location. We have estimated the cost to construct the headwall to be approximately \$60,000 including incidental and engineering fees.

The estimated cost of the work described in **Section 7.0 Additional Works** is as follows. These works are not required to improve the function of the drain but will provide value to particular parcels within the watershed. Many of these works are being included at the request of certain landowners.

Section No.	Description	Quantity	Unit	Unit Price	Extended Price (\$)
3	Lot 381/ 387 Drainage				
i)	600mm HDPE pipe including granular bedding and cover material	105	lm	300	31,500
ii)	Connection of 600 mm HDPE to existing 900mm CSP	1	ls	1,200	1,200
iii)	1200mm MH including base, flat top, frame and cover and all backfill material including 1 metre 600mm HDPE stub to the north.	1	ls	3,000	<u>3,000</u>
	Total Section 3. Lot 381/ 387 Drainage				35,700
4	County Road 20 Drainage System				
i)	Repairs as required	1	ls	5,000	<u>5,000</u>
	Total Section 4. County Road 20 Drainage System				5,000
5	Other Requests				
i)	Install a pit to collect water for lawn watering on lot 402. There is an existing pump and irrigation lines set up on the property. The pit to include 2 concrete MH barrels set on existing native material (no bottom) to collect ground water and some drainage tile flows. The structure will have a concrete slab top and will be protected by concrete large concrete blocks	1	ls	7,500	7,500

ii) Provide an access across the drain for lot 412. The drain cuts the property in 2 pieces and the owner has requested the access. There used to be an elevated concrete bridge across the channel. This access would include a 6 metre long aluminized 1500mm diameter CSP with sloped rip rap end treatments to provide a top access width of 3 metre.	1	Is	7,500	<u>7,500</u>
Total Section 5. Other Requests				15,000

Additional Works Cost Summary				
3	Lot 381/ 387 Drainage			35,700
4	County Road 20 Drainage System			5,000
5	Additional Requests			15,000
	Additional Works Estimate of Cost			55,700
	Additional Works Incidental Fees			18,000
	Additional Works Total Estimate of Cost			73,700
	Remediation Needs Total Estimate of Cost (brought forward)			161,075
	Biological Assessment			<u>8,000</u>
	Remediation Needs and Additional Works Total Project Cost			242,775

Note that HST has not been included in the preliminary report as the Municipality is able to recover the majority of these costs.

Additionally, Mr. Grabowski has inquired about extending the pipe enclosure described in Item 2.3) an additional 25 metres downstream for a total enclosure length of 50 metres. Should Mr. Grabowski wish to proceed, the cost to construct the additional 25 metre enclosure would be assessed 100% to the Grabowski lands. We have not included this item in our cost estimate; however, we estimate the cost of this work to be approximately \$30,000.00 including engineering and incidental fees.

It should be noted that an enclosure 50 metres in length may not be approved by the ERCA or MNR because of concern for animal and plant species in the proposed Gorrell Drain.

11.0 ESTIMATED ASSESSMENT VALUES

In accordance with the Act, assessments will be determined as Outlet Liability, Benefit and Special Benefit against the lands and roads that lie upstream of the proposed improvements to the proposed Gorrell Drain.

Preliminary assessment calculations have been prepared for the overall cost for the above options to illustrate how costs will be assessed to the affected lands and roads.

Based on the Total Estimate of Cost shown above, the affected agricultural lands north of County Road 20 will be assessed approximately \$765.00 per affected hectare, plus lot specific Special Benefit, less the Provincial 1/3 grant that is currently available from the Ministry of Agriculture Food and Rural Affairs. The average non-agricultural lot (average lot area = 0.19 ha) on the north side of County Road 20 will be assessed \$1,340.00 per affected hectare. The estimated assessments levied against The County of Essex equal approximately \$10,000.

The estimated assessments of the non-agricultural lands owned by the petitioners south of County Road 20 are as follows:

Roll No.	Owner Name	Estimated Assessment
530-43300	Gerald & Janice Gorrell	\$67,680
530-43100	William A. & Denise T. Grabowski	\$30,800
530-43200	John Robert & Bridget Colquhoun	\$20,325

Should the Grabowski's wish to extend the enclosure an additional 25 metres and all approvals for said extension are received, the Grabowski's estimated assessment would increase to approximately \$60,800.

The estimated assessments of certain agricultural lands north of County Road 20 are as follows:

Roll No.	Owner Name	Estimated Assessment
530-20900	CRC Farms Ltd. & Carl Mastronardi	\$30,510
530-20700	Cornelius & Abraham Klassen	\$27,490

Should construction of a cast-in-place concrete headwall be the preferred option (rather than pipe extension), the assessments of affected upstream landowners would increase by approximately \$345 per hectare for agricultural lands; \$600 per hectare for non-agricultural lands; and \$1,200 per hectare for the roads.

These preliminary assessment values are only estimates for the purpose of evaluating the project. The final report will include a Schedule of Assessment that will be used by the Municipality to assess the actual cost of the works. The final report will include an Assessment Schedule that will be used to invoice the final actual costs of the work.

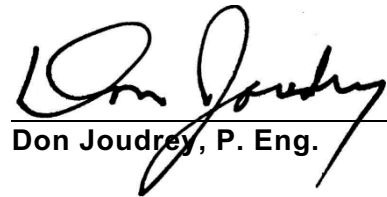
12.0 CONSIDERATION OF PRELIMINARY REPORT

This preliminary report will be distributed to all of the affected landowners for their review. The Municipality will schedule a Consideration Meeting before Council for this preliminary report. All landowners are encouraged to attend this meeting. It is anticipated that at the Consideration Meeting Council will establish a clear consensus on the Option that the affected landowners wish to proceed with, therefore, their input is valuable. Based on the outcome of the Meeting to

Consider, the Municipality will provide further instruction to the Engineer regarding preparation of a Final Report for the preferred option.

All of which is respectfully submitted,

BAIRD AE
27 PRINCESS STREET, SUITE 102
LEAMINGTON, ONTARIO
N8H 2X8



Don Joudrey, P. Eng.



Appendix A

Record of On-Site Meeting

Meeting Notes



Stantec

ONSITE MEETING JULY 29, 2013 – GORRELL DRAIN MUNICIPALITY OF LEAMINGTON

Stantec Consulting Ltd. – 165601372 (DR-15-13)

Date/Time: July 29, 2013 / 9:00 AM
Place: 403 County Rd. No. 20, Leamington, ON
Next Meeting: To be announced
Attendees: ± 20 Landowner/Representatives in the Gorrell Drain
Drainage Area (See attached sign-in sheets)
Lu-Ann Barreto Municipality of Leamington
Lindsay Malhiot Municipality of Leamington
Don Huber Essex County Highways
Mike Todd Stantec Consulting Ltd.
Sam Paglia Stantec Consulting Ltd.

Absentees: ± 30 Landowners within the watershed.
Distribution: Lu-Ann Barretto, Lindsay Malhiot

Item:

Action:

Introduction

Lu-Ann Barreto introduced herself as the Drainage Superintendent for the Municipality of Leamington and began with an explanation of the purpose of the meeting. Lu-Ann introduced **Sam Paglia** as the appointed engineer from Stantec Consulting Ltd. and the author of the report, **Mike Todd** from Stantec Consulting Ltd., **Don Huber** from Essex County, and **Lindsay Malhiot** from the Municipality of Leamington. Lu-Ann then explained that Sam Paglia will proceed with an introduction to the purpose of Stantec's involvement with this project followed by a question and answer period.

Sam Paglia introduced the project and informed the attendees of the topics that will be covered and provided background information on the current condition of the Gorrell Drain. Sam explained the Drainage Act and how it pertains to the Gorrell Drain, along with a description of the current drainage area. Sam handed out information packages for this project that had Stantec's contact information and a questionnaire allowing landowners to send in any questions or concerns they have. Sam explained that the section of drain that is in need of repair has major bank stabilization problems and is eroding rapidly and that this report will try to address the issues and rectify them by providing opinions on methods to repair the drain. Sam also explained how the costs will be assessed to each landowner owner within the drainage area.

At approximately 9:20 am, Mr. Paglia was able to answer any questions that the landowners may have and asked that everyone provide their name and

location in the watershed before presenting their questions.

Questioning Period

Some of the common questions asked at onsite meetings are listed below for convenience and the provided answers are for informational purposes only. The numbered questions in the next section of this document were asked by landowners and are not necessarily in any particular order during the meeting.

GENERAL TOPIC OF QUESTIONS

- A. Purpose of the meeting?**
- B. Who pays for work?**
- C. Why should everyone pay for the Gorrell Drain erosion problems?**
- D. What are our next steps?**

RESPONSES TO GENERAL QUESTIONS

- A. The purpose of the meeting is set out under Sections of the Drainage Act, and is a result of correspondence with the Municipality of Leamington Drainage Superintendent. The meeting is intended to provide and solicit information to the effected landowners as well as to explain the purpose of this project, the procedures under the Drainage Act and the Professional Engineers Act as it relates to drainage works, encourage community involvement. The municipality and the appointed engineer must practice due diligence so as to better serve the lands requiring drainage. Notice of this meeting was distributed to all effected landowners as well as each public utility that may be affected by the proposed drainage works.
- B. The Drainage Act, specifically, Sections 21 through 28 depict assessments and are used by the engineer to determine the assessment schedule for the work and the liability of each affected Landowner, Public Utility, Road Authority, and Building. Any parcel of land that uses the Gorrell Drain to drain their excess water is liable under the Drainage Act and will be assessed according by the engineer as stipulated under the Act.
- C. A report of an appointed engineer must accompany any maintenance, improvement, or repair involving a municipal drain regarding the collection and release of storm water. The engineer in the report shall assess for benefit, outlet liability and injuring liability, and shall insert in an assessment schedule. In separate columns, the sums assessed for each parcel of land

and road liable therefor. The engineer has the responsibility to take water to a sufficient outlet and any upstream lands are assessed a portion of the necessary works according to the amount of water artificially expected to flow from the lands within the watershed that use the drain.

- D. As indicated at the onsite meeting with interested landowners within the watershed, our next step is to assess the drainage area and provide a drainage report with a list of options to repair the Gorrell Drain and present them to the Leamington Drainage Board. Ultimately, our objective is to have the recommended options of the engineer approved to provide the best solution to the remediate the issues within the Gorrell Drain watershed.

The following are questions asked by attendees present at the meeting (in no particular order). Note that the response along with other pertinent information is given so as to address the questions more accurately in some cases.

1. **Bill Grabowski of 402 Seacliff Dr. W;** Asked about property rights for the drain.
 - Sam Paglia stated that since the drain is a natural water course and is currently a private drain; the adjacent land owners have property rights to the drain under Common Law.
2. **Jim Raeside of 426 Seacliff Dr. W;** Asked how his water runoff gets to the drain. He also stated that he has a well in his backyard and always thought his water runoff drained to the Lake
 - Sam Paglia stated that during the preliminary investigation process Stantec will evaluate individual parcels to see how their water drains. Sam explained it is possible some of the landowners in the watershed do not drain to the Gorrell Drain and that will be looked at in detail as the project progresses. Sam also stated that a property could have half of the land drain one way and the other half drain another, if so, that is how it will be assessed.
3. **Bert Mastronardi of 453 Seacliff Dr. W;** Asked if the land owners are assessed now for the county municipal storm drains.
 - Sam deferred the question to Don Huber. Don explained to him how the storm sewers work in the county.
4. **Carl Mastronardi of 381 Seacliff Dr. W;** Stated that he owns farm property and he has been severely flooding recently. He says he has

been getting runoff from an adjacent property that is not currently apart of the Gorrell Drain drainage area. He said that he will provide photo's to Stantec to show the flooding, and requested a site visit to determine where the water is coming from. He also stated that his neighbor recently added a large area of concrete to his lands and believes that this is contributing to the runoff onto his lands. He also wants to make sure that if his neighbor is in the watershed that he will be assessed part of the cost as well.

Stantec to visit
parcel to
investigate.

- Sam Paglia said the watershed will be assessed to include all landowners draining to Gorrell Drain. Sam also stated all land owners will be individually assessed and Carl Mastronardi's property would be surveyed to see where the water drains.
- Lu-Ann Barreto explained Stantec will send out a survey crew and will talk to everyone within the watershed to document their concerns as well as see how their lands drain to determine if they will be assessed for part of these works.

5. Jim Raeside of 426 Seacliff Dr. W; Asked who owns the drainage ditch.

- **Lu-Ann Barreto** explained that the land owners currently that are adjacent to the ditch own the ditch property since it is a natural water course and a private drain and not part of the municipal infrastructure yet.
- **Sam Paglia** talked about the importance of making this drain legal since the water from land owners within the watershed is unrightfully draining to this portion of privately owned drain. Sam explained the property owners where the natural watercourse lies have allowed the drainage of other lands but have every right to deny drainage that is causing erosion on their property. If the land owners choose to plug the drain, they legally can and the effected land owners within the watershed will have to find a new way to drain their water. This stresses the importance of legalizing this portion of ditch so that storm water within the watershed can legally have a sufficient outlet.

6. Bill Grabowski of 402 Seacliff Dr. W; asked what the difference between a County drain and this private drain was. Bill also asked the time frame for this project and the process that will take place in order to complete this project.

- **Sam Paglia** stated it normally takes a year if everything goes smooth for a final report, but drainage projects can get complicated sometimes. Stantec will try their best to expedite this project with minimal expense. Sam stated that correspondence with the landowners is crucial and encouraged landowners to call or email him with any questions or concerns, or fill out the questionnaire provided if there are any issues with

your property. Stantec and The Municipality of Leamington are available to address any concerns and it is important that landowners utilize this as the project moves forward.

7. **Bain Iles of 428 Seacliff Dr. W;** Asked how the landowners would pay for the work that is performed on the drain.

- **Sam Paglia** explained that the costs are assessed by Stantec once we can determine the extent of repairs, and all values assessed are collected in the same way that property taxes are collected. Your individual assessment will be added on to your property taxes by the municipality once this project is completed.

8. **Jim Raeside of 426 Seacliff Dr. W;** Asked if the plan was to take a private drain and make it a legal municipal drain for everyone to use.

- **Sam Paglia** said that making the drain legal is one of the steps to this project and this allows sufficient outlet for the users.

9. **Bert Mastronardi of 453 Seacliff Dr. W;** Asked about his property and said that it drained through another municipal ditch and did not drain to the road drain which drains into Gorrell Drain.

- **Sam Paglia** stated that this is possible, and that Stantec will try to evaluate individual properties to see where the storm water drains. Sam also stated that he would like to arrange a site visit with Mr. Mastronardi to survey his lands in order to make that determination.

Stantec to visit landowner to investigate drainage of land.

10. **Neal Klassen of 387 Seacliff Dr. W;** Stated he would like to know where his land drains because he isn't sure.

- **Sam Paglia** stated that a site visit is possible to determine this.

Stantec to visit landowner to investigate drainage of land.

11. **Bob Colquhoun of 412 Seacliff Dr. W;** Stated he would like a culvert (possibly CSP) through his yard so he can cross over the drain.

- **Lu-Ann Barreto** told everyone to make sure they attend the town meetings on this project and voice their concerns or wishes because this project is directly affecting them and it's important to get the landowners feedback and wishes included within the report and not after the fact.
- **Lu-Ann Barreto** stated that individual requests may not be assessed to the watershed, but the individual landowner making that request.
- **Sam Paglia** stated that if a request is beyond what the drain requires, then the value of work requested will be assessed to the landowner making the request as a Special Benefit to those lands.

12. **Lu-Ann Barreto** asked the landowners what the name of the new drain

Stantec

ONSITE MEETING JULY 29, 2013 – GORRELL DRAIN
MUNICIPALITY OF LEAMINGTON

Page 6 of 6

should be and everyone was okay with naming it Gorrell Drain.

The meeting adjourned at 9:40 AM

The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

All of which is respectfully submitted.

Stantec Consulting Ltd.



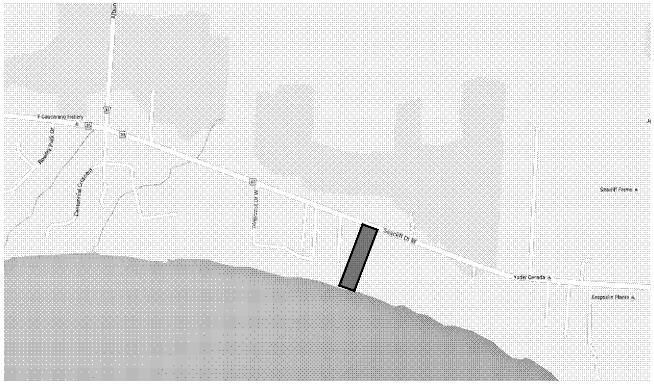
Mike Todd, EIT
Stantec Consulting Ltd.
140 Ouellette Place Suite 100
Windsor ON N8X 1L9
Ph: (519) 966-2250 ext (324)
Fx: (519) 966-5523
mike.todd@stantec.com

Meeting Attendees:

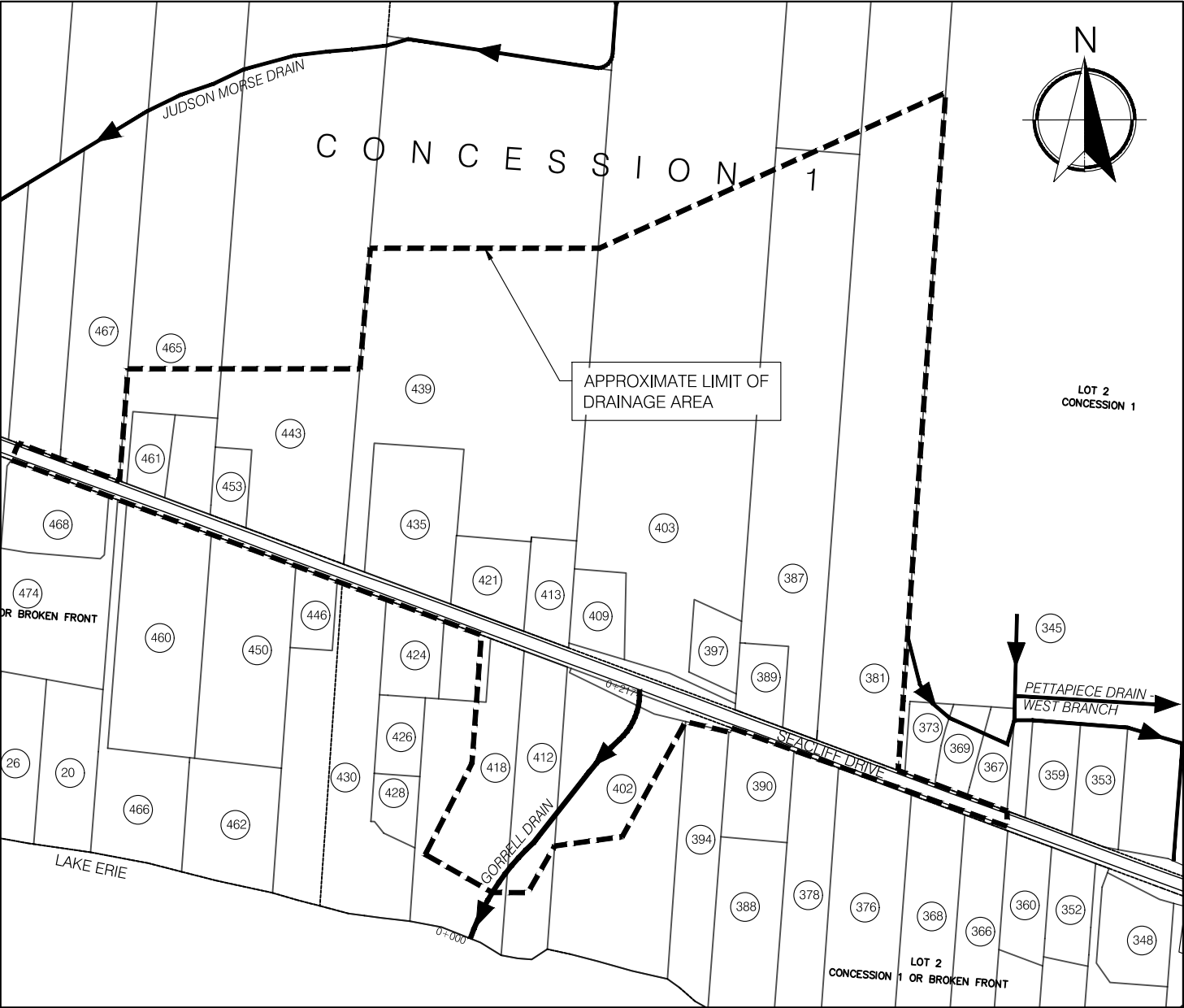
Jim Raeside	426 Seacliff Drive West
Brian Iles	428 Seacliff Drive West
Mike Mastronardi	409 Seacliff Drive West
Bob Colquhoun	412 Seacliff Drive West
Abe Klassen	387 Seacliff Drive West
Bill Grabowski	402 Seacliff Drive West
Janice Gorrell	418 Seacliff Drive West
Jim Gorrell	418 Seacliff Drive West
Steven Mastronardi	453 Seacliff Drive West
Bert Mastronardi	453 Seacliff Drive West
Carl Mastronardi	381 Seacliff Drive West
Lu-Ann Barreto	Municipality of Leamington
Lindsay Malhiot	Municipality of Leamington
Don Huber	Essex County Highways
Mike Todd	Stantec Consulting Ltd.
Sam Paglia	Stantec Consulting Ltd.

SHEET SET INDEX:

SHEET NO.	SHEET TITLE
1	TITLE PAGE AND DRAINAGE AREA
2	GORRELL DRAIN - PLAN VIEW
3	GORRELL DRAIN - PROFILE VIEW
4	COUNTY ROAD 20 - PLAN VIEW
5	CROSS-SECTIONS
6	CROSS-SECTIONS



AREA OF CONSTRUCTION



DRAINAGE AREA
SCALE: N.T.S.

Number	Roll #	Name	Area (m²)
381	530-20900	CRC FARMS LTD & CARL MASTRONARDI	59134
387	530-20700	CORNELIUS & ABRAHAM KLASSEN	19693
389	530-20610	OLINDO & DOROTHY MASTRONARDI	1604
397	530-20605	RAFFAELE & BAMBINA & MICHAEL MASTRONARDI	1567
402	530-43100	WILLIAM & DENISE GRABOWSKI	14315
403	530-20600	MICHAEL MASTRONARDI & SUNLITE HYDROPONICS	106083
409	530-20602	LILLIAN MASTRONARDI	1918
412	530-43200	JOHN & BRIDGET COLQUHOUN	5928
413	530-20505	RENZO ESPOSITO	2038
418	530-43300	GERALD & JANICE GORRELL	10641
421	530-20502	RENZO & NANCY ESPOSITO	2629
435	530-20510	1814375 ONTARIO INC	4018
439	530-20500	1814375 ONTARIO INC	47352
443	530-20400	1814375 ONTARIO INC	180463
453	530-20300	BERT & ASCENZINA MASTRONARDI	1182
461	530-20210	BERT MASTRONARDI	1391
465	530-20200	MASTR VEGGIES FARMS INC	57574

PARCEL INFORMATION

CAUTION:

THE LOCATION OF THE UNDERGROUND UTILITIES AS SHOWN ON THE DRAWING ARE APPROXIMATE ONLY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE ACTUAL LOCATION OF ALL UNDERGROUND UTILITIES DURING THE CONSTRUCTION OF THE PROJECT. THE CONTRACTOR AGREES TO INDEMNIFY THE OWNER AND CROZIER BAIRD ENGINEERS AGAINST ANY CLAIMS WHICH ARISE FROM HIS ACTIONS.

NOTE:

THE PROPERTY LINES AND DIMENSIONS SHOWN ARE BASED ON SURVEY BARS FOUND ON THE SITE AND ARE NOT BASED ON A SURVEY DRAWING PRODUCED BY AN ONTARIO LAND SURVEYOR. THE PROPERTY LINES SHOULD BE CONSIDERED AS APPROXIMATELY ONLY AND NOT A LEGAL PLAN OF SURVEY



27 PRINCESS STREET, SUITE #102
LEAMINGTON, ONTARIO
N8H 2X8

1000 - 267 PELISSIER STREET,
WINDSOR, ONTARIO
N9A 4K4.

PROJECT TITLE:

REPAIR AND IMPROVEMENTS TO THE GORRELL DRAIN

LEAMINGTON, ONTARIO

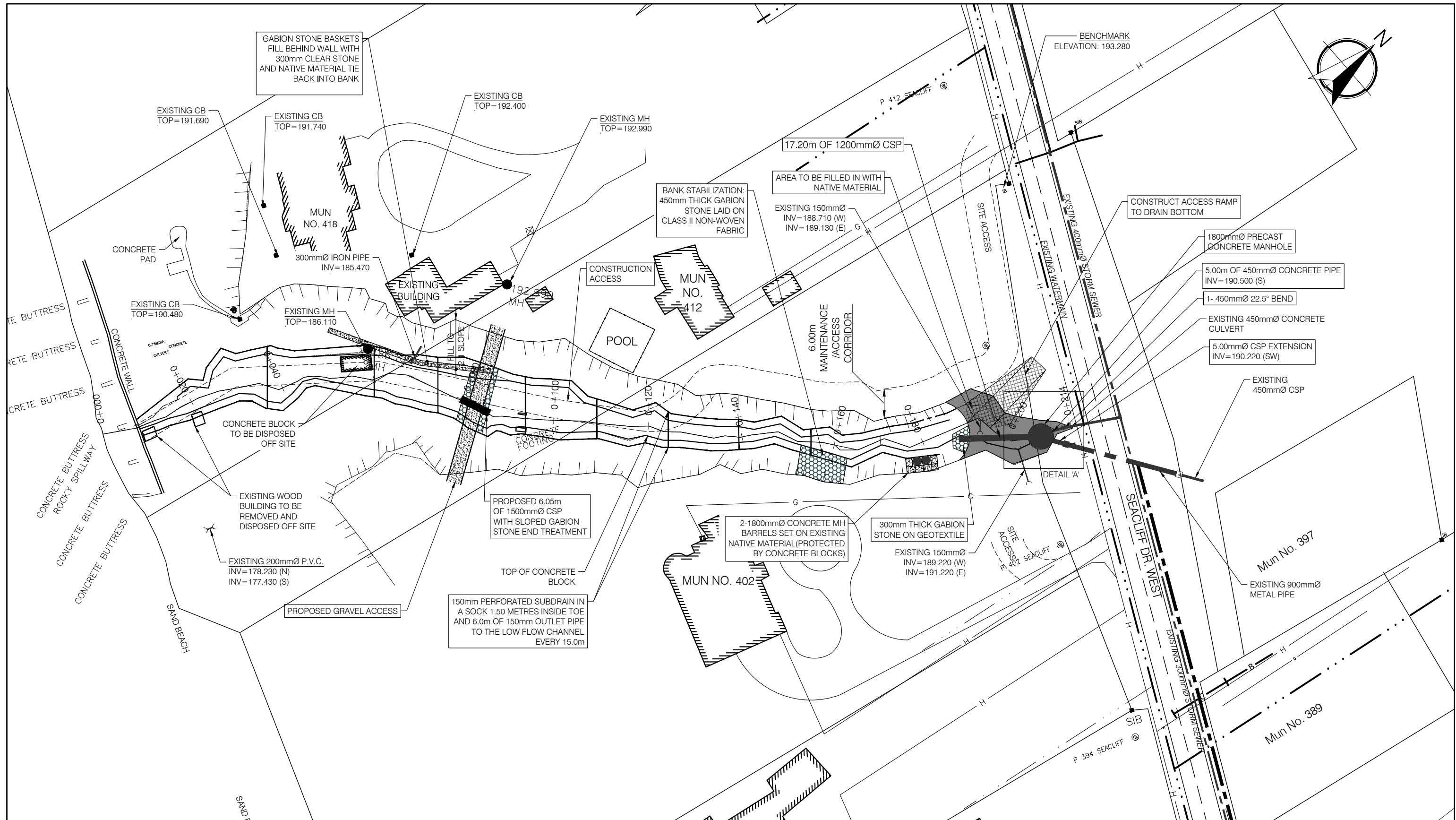
SHEET TITLE:

TITLE PAGE



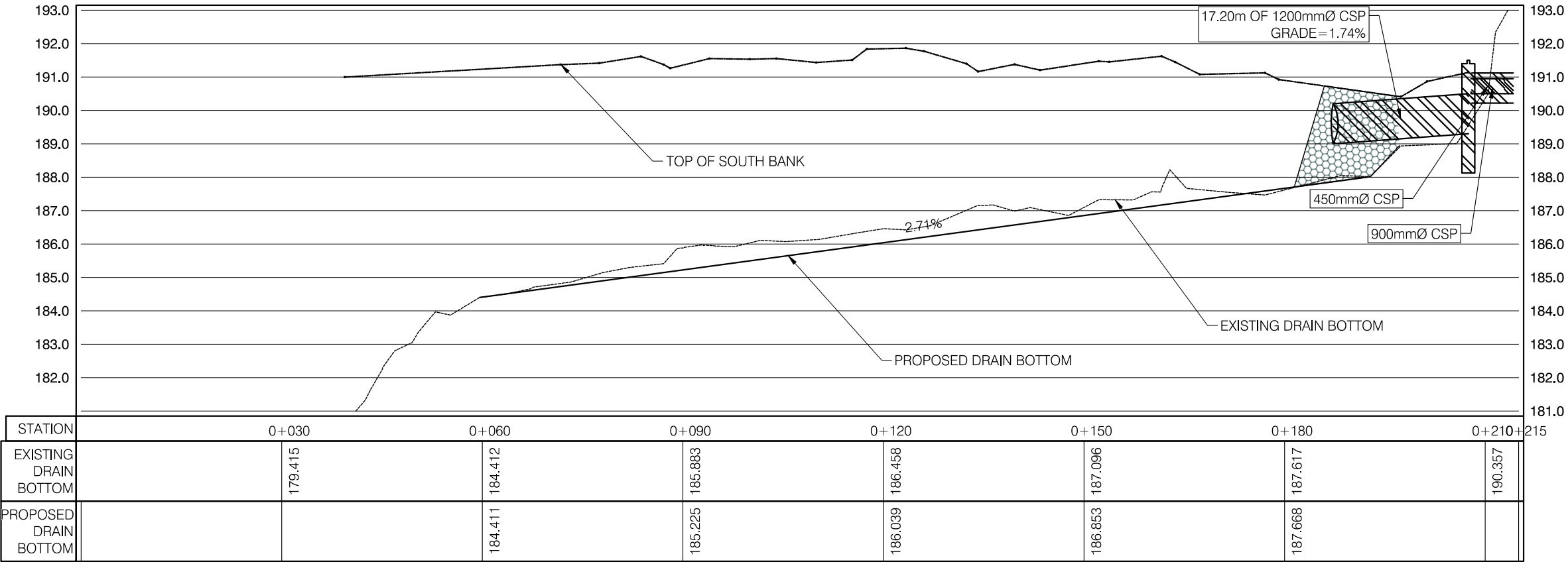
DON J. JOUDREY, P.ENG.

DRAWN BY: D.B.	SCALE: AS NOTED	DATE: AUGUST 1, 2017
CHK'D BY: D.A.J./H.P.P.	SHEET No.: 1 OF 7	PROJECT No.: 14-163



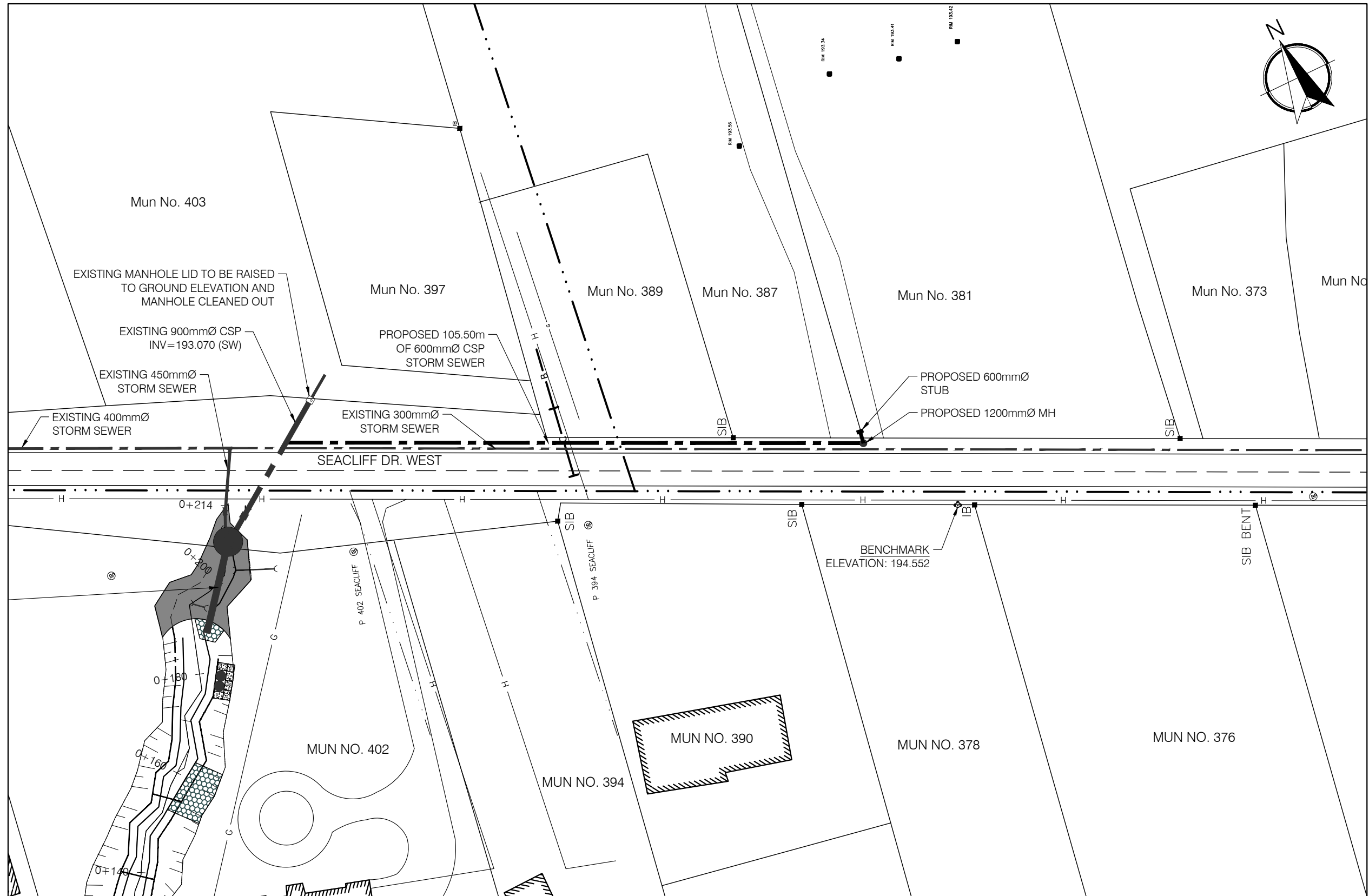
SITE PLAN
SCALE 1:750

PROJECT TITLE: REPAIR AND IMPROVEMENTS TO THE GORRELL DRAIN			
LEAMINGTON, ON			
SHEET TITLE: GORRELL DRAIN - PLAN VIEW	DRAWN BY:	SCALE:	DATE:
	D.B.	AS NOTED	AUGUST 1, 2017
	CHK'D BY:	SHEET No. :	PROJECT No. :
	D.A.J./H.P.P	2 OF 7	14-163



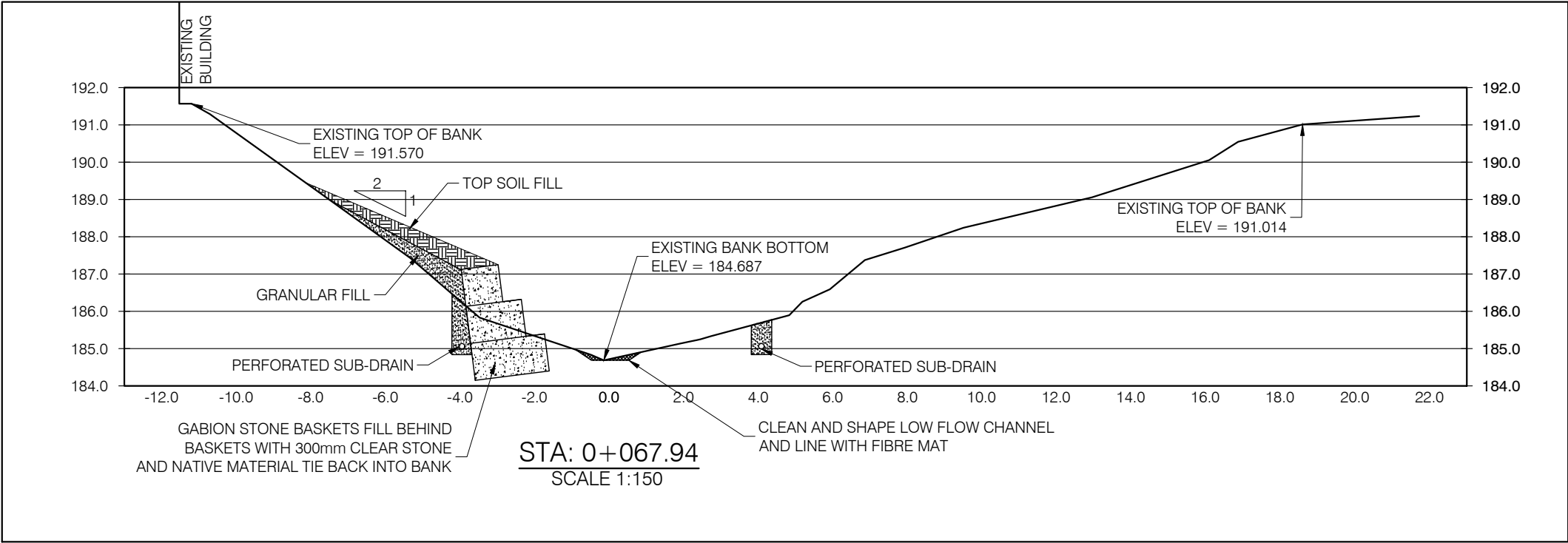
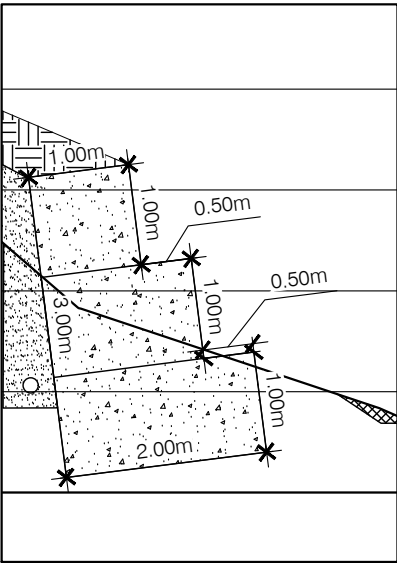
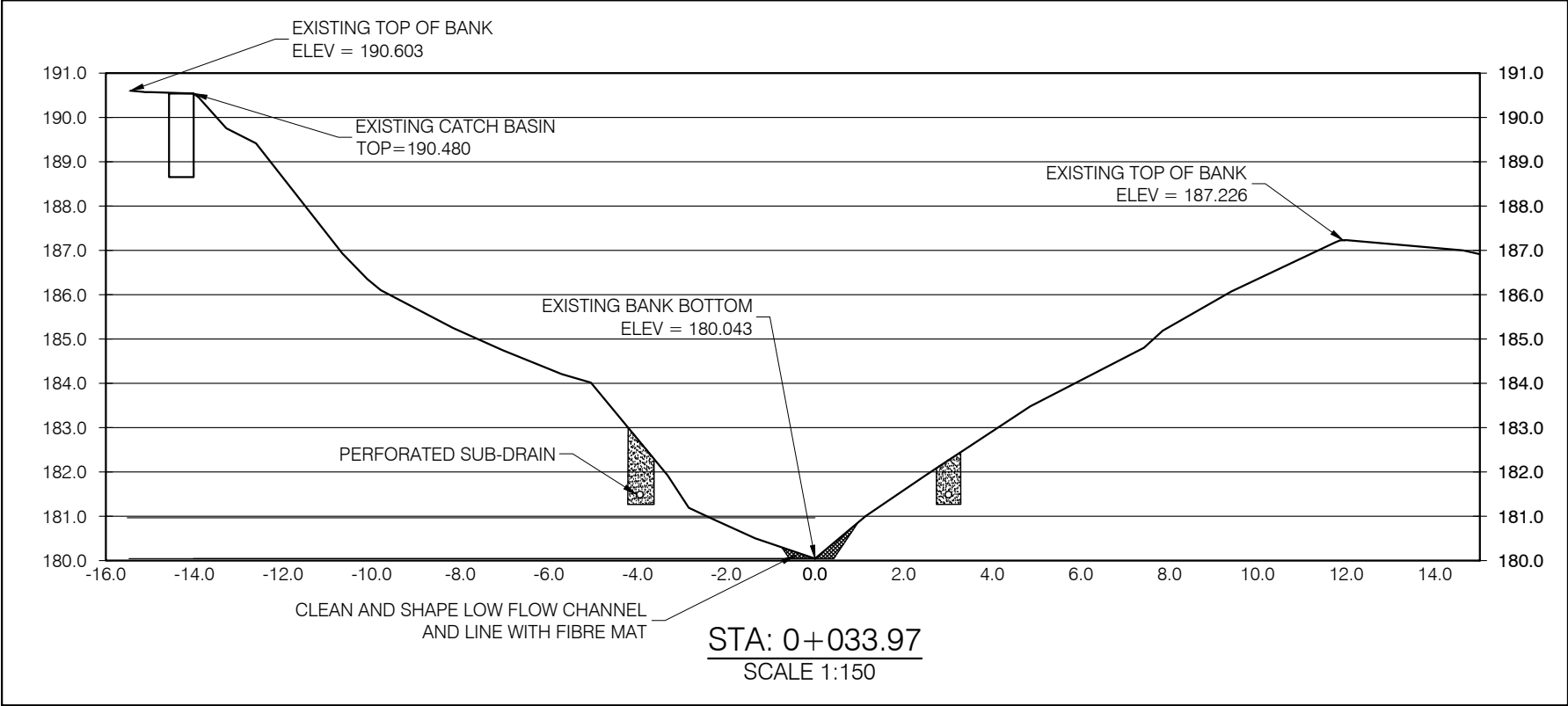
PROFILE VIEW
HOR: 1:750
VER: 1:150

PROJECT TITLE: REPAIR AND IMPROVEMENTS TO THE GORRELL DRAIN			
LEAMINGTON, ON			
SHEET TITLE: GORRELL DRAIN - PROFILE VIEW	DRAWN BY: D.B.	SCALE: AS NOTED	DATE: AUGUST 1, 2017
	CHK'D BY: D.A.J./H.P.P	SHEET No. : 3 OF 7	PROJECT No. : 14-163



COUNTY ROAD 20 - PLAN VIEW
SCALE 1:750

PROJECT TITLE: REPAIR AND IMPROVEMENTS TO THE GORRELL DRAIN			
LEAMINGTON, ON			
SHEET TITLE: COUNTY ROAD 20 - PLAN VIEW	DRAWN BY: D.B.	SCALE: AS NOTED	DATE: AUGUST 1, 2017
	CHK'D BY: D.A.J./H.P.P	SHEET No. : 4 OF 7	PROJECT No. : 14-163



PROJECT TITLE:
REPAIR AND IMPROVEMENTS TO THE GORRELL DRAIN

LEAMINGTON, ON

SHEET TITLE:
CROSS-SECTIONS

DRAWN BY:
D.B.

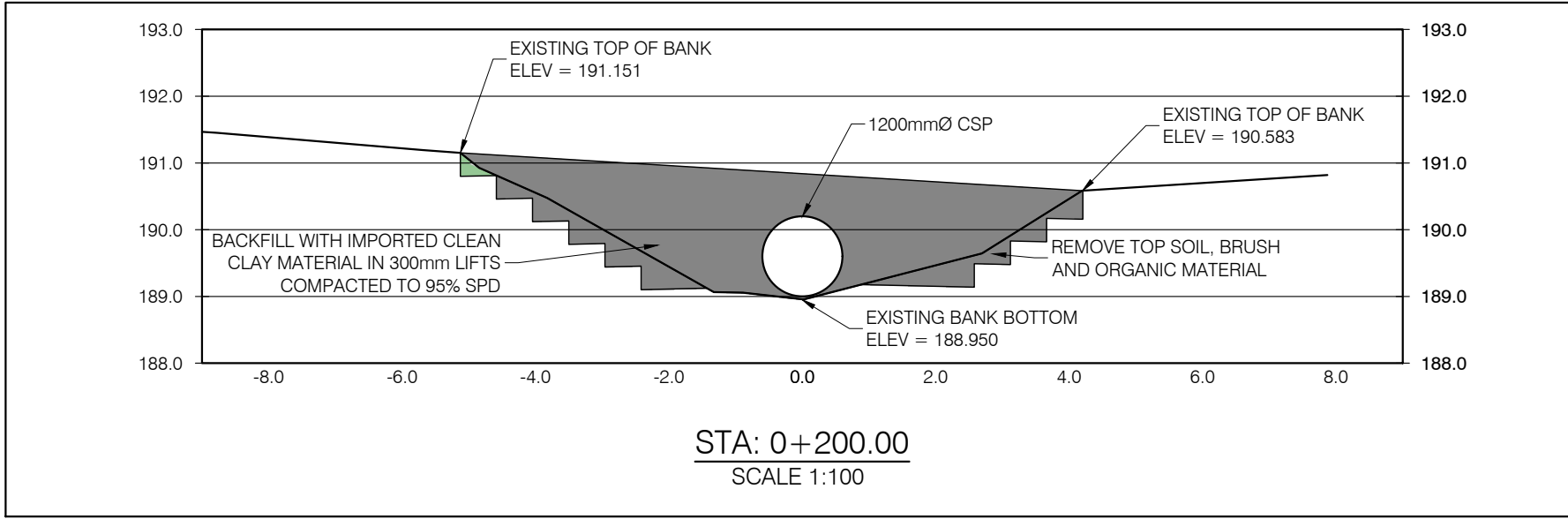
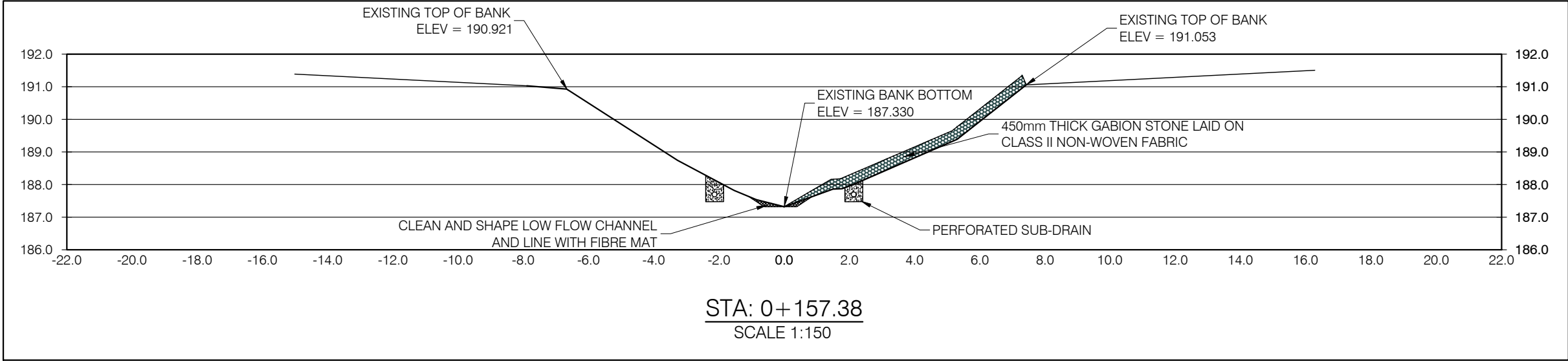
SCALE:
AS NOTED

DATE:
AUGUST 1, 2017

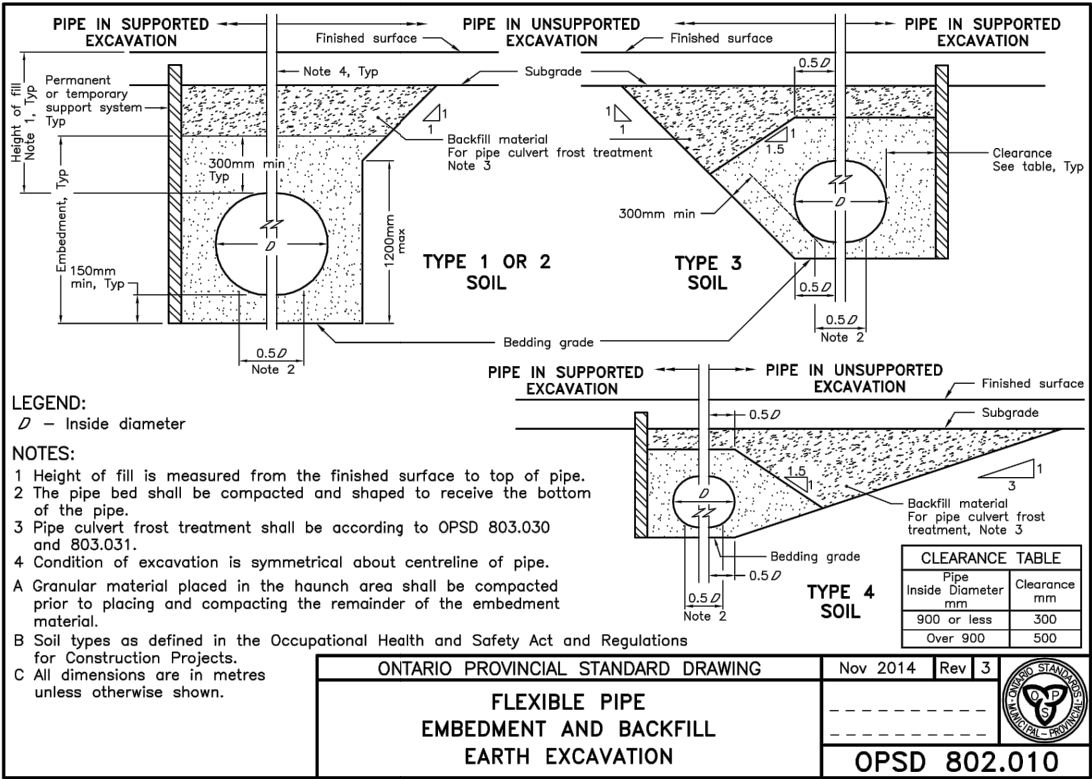
CHK'D BY:
D.A.J./H.P.P

SHEET No. :
5 OF 7

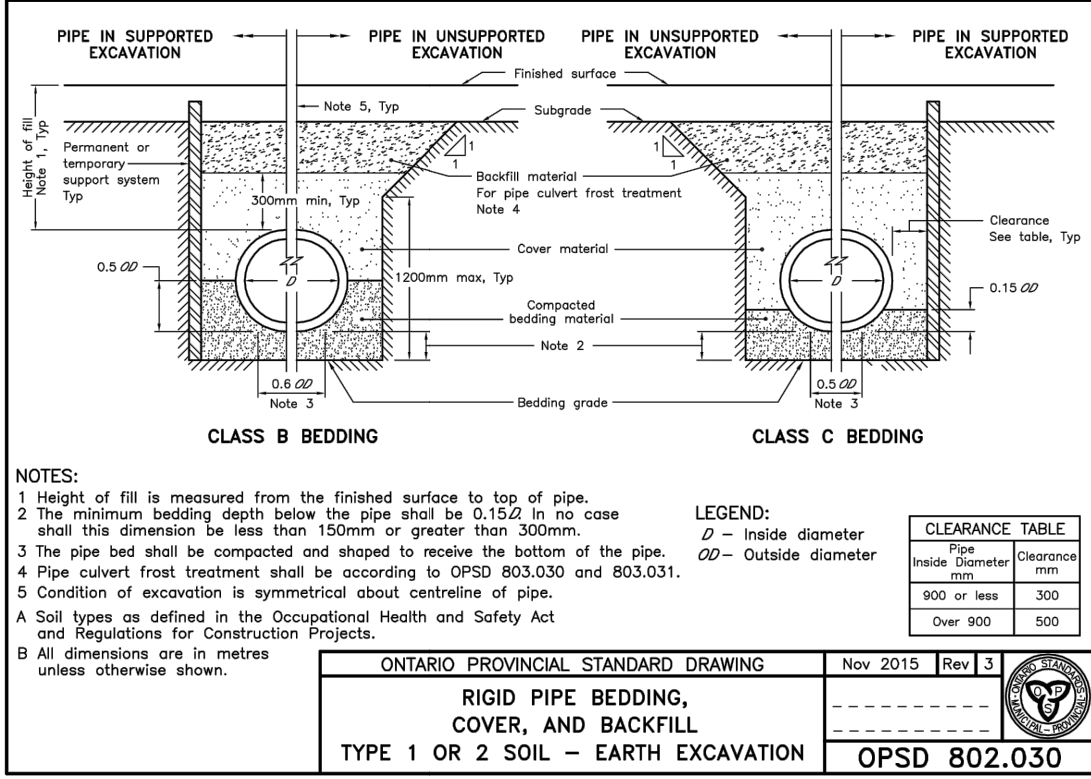
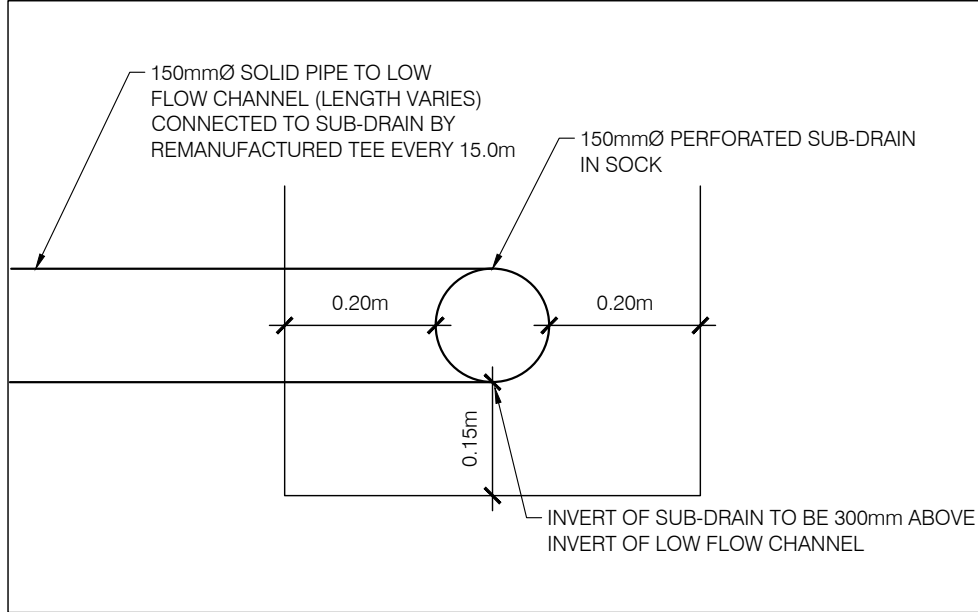
PROJECT No. :
14-163



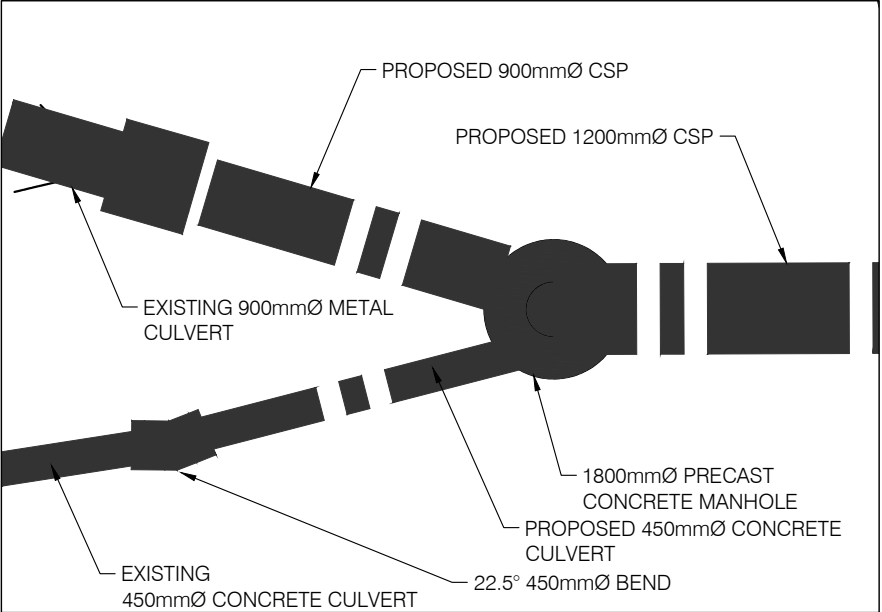
PROJECT TITLE: REPAIR AND IMPROVEMENTS TO THE GORRELL DRAIN			
LEAMINGTON, ON			
SHEET TITLE: CROSS-SECTIONS	DRAWN BY: D.B.	SCALE: AS NOTED	DATE: AUGUST 1, 2017
	CHK'D BY: D.A.J./H.P.P	SHEET No. : 6 OF 7	PROJECT No. : 14-163



SUB-DRAIN DETAIL (TYPICAL)
SCALE 1:10



DETAIL 'A'
SCALE 1:100



PROJECT TITLE:
REPAIR AND IMPROVEMENTS TO THE GORRELL DRAIN

LEAMINGTON, ON

SHEET TITLE:
DETAILS

DRAWN BY:
D.B.

SCALE:
AS NOTED

DATE:
AUGUST 1, 2017

CHK'D BY:
D.A.J./H.P.P

SHEET No. :
7 OF 7

PROJECT No. :
14-163